European Commission

Ecodesign Impact Accounting

STATUS REPORT
2016

Prepared by
VHK for the European Commission
December 2016

The information and views set out in this study are those of the author(s) and do not necessarily reflect the official opinion of the European Commission

Energy

Prepared by:

Van Holsteijn en Kemna B.V. (VHK)
Elektronicaweg 14,
2628 XG Delft, The Netherlands
www.vhk.nl
Authors: René Kemna, Leo Wierda, Sanne Aarts (VHK)

Date: 15 December 2016

Prepared for the European Commission, DG Energy, unit C.3
Contact person: Juan MORENO-ACEDO
SPECIFIC CONTRACT No ENER/C3/2013-523/09/FV2015-543/SI2.722015

Status: Annual Report 2016

This report was ordered and paid for by the European Commission, Directorate-General for Energy.

The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.

The data in this report and in other associated deliverables have been retrieved and analysed to the best of the author's ability and knowledge. However, many forward looking statements are implicitly or explicitly presented and neither the contractor nor the author personally assume any liability for damages, material or immaterial, that may arise from the use of these documents and the data therein.

© European Union, December 2016

Reproduction is authorised provided the source is acknowledged.

More information on the European Union is available on the internet

(http://europa.eu).

Corrigendum

After preparation of this document an error was found in the sales quantities for small air-cooled chillers, CHAE-S (≤ 400 kW), for years following 2030. The corrected sales quantities (thousands of units) are shown in the table below.

Table: Correction of unit sales (in thousands) for CHAE-S (≤ 400 kW)

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
current sales	21	88	97	107	119	130	108	55	17	3
corrected sales	21	88	97	107	119	130	141	152	163	173

As a consequence, many of the parameters for CHAE-S (≤ 400 kW) change, only for years following 2030. The corrected values for selected parameters are reported below:

Table: Correction of other parameters for CHAE-S (≤ 400 kW), after 2030 only

CHAE-S (≤ 400 kW)			2030	2035	2040	2045	2050
Stock	000 units	Is:	2181	2318	2188	1768	1174
		Corrected:	2181	2397	2621	2845	3063
EU-Load	TWh cool/a	Is:	47	48	43	33	21
		Corrected:	47	49	51	53	54
NRGBAU	TWh primary	Is:	31	30	27	20	12
		Corrected:	31	31	32	32	32
NRGECO	TWh primary	Is:	30	28	24	18	11
		Corrected:	30	29	29	29	30
NRGSAVE	TWh primary	Is:	1.6	2.1	2.1	1.6	0.9
		Corrected:	1.6	2.1	2.4	2.3	2.0
EMISSBAU	$MtCO_2eq/a$	Is:	8.7	8.6	7.6	5.8	3.7
		Corrected:	8.7	8.9	9.1	9.3	9.5
EMISSECO	$MtCO_2eq/a$	Is:	8.5	8.3	7.4	5.6	3.6
		Corrected:	8.5	8.6	8.8	9.1	9.3
EMISSSAVE	$MtCO_2eq/a$	Is:	0.22	0.26	0.25	0.18	0.10
		Corrected:	0.22	0.27	0.29	0.26	0.20
EXPENSBAU	bn euros	Is:	6.6	6.9	6.1	4.8	3.3
		Corrected:	6.6	7.6	8.7	10.0	11.4
EXPENSECO	bn euros	Is:	6.5	6.7	5.8	4.5	3.2
		Corrected:	6.5	7.4	8.4	9.6	11.0
EXPENSSAVE	bn euros	Is:	0.1	0.2	0.3	0.2	0.2
		Corrected:	0.1	0.2	0.3	0.4	0.4

The corrections regard only data after 2030 and consequently do not alter the key-facts as presented in Annexes E-G of this document, nor those in the separately issued EIA Overview Report, that summarize the situation until 2030.

The corrections will be integrated in the report during the next review.

The authors apologize for any inconvenience deriving from these corrections.

This page intentionally blank

Acronyms & accounting units

../a	.. per annum (year)
€	Euro
AC	Air Cooled (refrigeration)
AC	Air Conditioning (electric)
ACF	Air Conditioning, Fossil fuel fired
AHC	Air Heating & Cooling equipment
AHE	Air Heaters, Electric
AHF	Air Heaters, Fossil fuel fired
BAU	Business as usual (scenario)
BC	Battery charged
BC	Backward curved (fan)
bn	billion (10^9)
BW	Black and white (copier, printer)
C1	Tyres designed primarily for vehicles of categories M1, N1, O1 and O2 ('passenger cars')
C2	Tyres designed primarily for vehicles of categories M 2, M3, N, O3 and O4 with a load capacity index in single formation ≤ 121 and the speed category symbol ≥'N' ('vans')
C3	Tyres designed primarily for vehicles of categories M2, M3, N, O3 and O4 with specific load capacity indices ('trucks')
CA	Cooking appliances
CEXH	Central exhaust VU
CF	Commercial refrigeration products
CFL	Compact fluorescent light
CH	Central heating
CHAE-L	Chiller, Air-cooled, Electric, Large
CHAE-S	Chiller, Air-cooled, Electric, Small
CHC	Central heating combi (boiler)
CHF	Chiller combustion engine driven
CHWE-L	Chiller, Water-cooled, Electric, Large
CHWE-M	Chiller, Water-cooled, Electric, Medium
CHWE-S	Chiller, Water-cooled, Electric, Small
CIRC	Circulator
CM	Coffee maker
CO	Carbon Monoxide (emission)
CO_2	Carbon Dioxide (emission equivalent)
CP	Compressor
CSTB	Complex set-up box
cyc	Cycles
dB(A)	Decibel (A)
dm^2	square decimetre (surface area)
DP	Electronic Display
DW	Dishwasher
ECO	Ecodesign (scenario)
ED	Ecodesign
EEI	Energy efficiency index
EIA	Ecodesign Impact Accounting
EL	Energy Labelling
EP	Electro-photographic ('laser')
eq.	equivalent
ES	Energy Star; Enterprise Servers
FC	Forward curved (fan)
GCV	Gross calorific value
GHG	Greenhouse gas emissions
GJ	Giga Joule = 10^9 J
GLS	General lighting service ('incandescent')
GWh	Giga watt hours= 10^9 Wh
GWP	Global warming potential (GWP-100)
h on/d	Hours 'on' per day
h sb/d	Hours 'standby' per day
h/a	annual (operating) hours
HID	High intensity discharge lamp
HiNA	High network availability
HT PC	High Temperature Process Chiller
IJ	Ink jet
ipm	Images per minute
ipy	Images per year
kg	Kilogrammes
km^2	square kilometre
kt, kton	Kilo-tonne (1 million kg)
kWh	Kilowatt hour
kWh cool	kWh cooling output (formula P as for heating output minus possibly losses for condensation)
kWh elec	kWh electricity
kWh flow	kWh fluid-dynamic output ($P=\Delta p \cdot Q$ with P power in W; Δp pressure difference in Pa; Q flow in m^3/s)
kWh heat	kWh heating output ($P=\Delta T \cdot V \cdot c$ with P power in W; ΔT temperature difference in K; V volume in m^3 (or mass in kg), c specific heat capacity in $Wh/m^3.K$ (or Wh/kg.K)
kWh output	kWh output (for motors: $P=\Omega \cdot \tau$ with P power in W; Ω angular speed in rad/s; τ torque in Nm)
kWh prim	kWh primary energy consumption in -- unless indicated differently-- Net Calorific Value of the fuel(s) used
LD	Laundry dryer
LED	Light emitting diode
LFL	linear fluorescent lamps
LH	Local heaters
LIFE	Lifetime
lm	Lumen
LoNA	Low network availability
LS	Light source

LSH	Local Space Heater
LT	Low-Temperature (refrigeration)
ltr	Litres
M, mln	million
m €	million euro
max.	maximum
MeNA	Medium network availability
MFD	Multi function device
mg	milligrams (0.001 gram)
min.	minimum
MT	Medium-Temperature (refrigeration)
MT	Industrial motors
Mt	Mega tonnes (10^9 kg)
mtoe	mega tonne oil equivalent
MWh	Megawatt hours (1000 kWh)
NAS	Network attached storage
NCV	Net calorific value
NMVOC	Non-Methane Volatile Organic Compound (emission)
NOx	Nitrogen Oxides (emission)
NRVU	Non-residential VU
OGC	Organic Gaseous Carbon (emission)
PC	Personal computer
PF	Professional refrigeration products
PJ	Peta Joule = 10^{15} J
PM	Particulate Matter (emission)
ps	Place setting (dishwasher load unit, consisting of a defined set of different plates, cutlery, etc.)
R...1	Rate (price per unit) for residential customers
R...2	Rate (price per unit) for non-residential customers
RAC	Room air conditioner
rpm	Rounds per minute
RR	Rolling resistance
RRC	Rolling resistance coefficient
RVU	Residential VU
SB, sb	Standby
SCOP	Seasonal coefficient of performance (for space heating of heat pump)
SEER	Seasonal energy efficiency ratio (for space cooling of heat pump)
SFB	Solid fuel boilers
SFD	Single function device
SHR	Slow Heat Release (stoves)
SSTB	Simple set-up box
STB	Set-up box
t	metric tonne (1000 kg)
TEC	Test energy consumption
Th	Tera (10^{12}) hours
Th on	Tera hours 'on'
Th sb	Tera hours 'standby'
Tlm	Tera lumen
Tm³	Tera cubic metre
toe	Tonne of oil equivalent
TRAFO	Distribution transformer
TWh	Terawatt hours=10^{12} Wh = 10^9 kWh
TYRE	Replacement Tyre
UPS	Uninterruptable Power Supply
UV,UVA, UVB,UVC	Ultraviolet, types A, B, C (radiation)
VC	Vacuum cleaner
VRF	Variable Refrigerant Flow (AC)
VU	Ventilation unit
W	Watt
WH	Water heater
WM	Washing machine
WP	Water pump

Energy units conversion for statistics (source: Eurostat)

From | /To →	**TJ**	**Gcal**	**Mtoe**	**GWh**
TJ	1	238.8	2.388×10^{-5}	0.2778
Gcal	4.1868×10^{-3}	1	1×10^{-7}	1.163×10^{-3}
Mtoe	4.1868×10^{4}	1×10^{7}	1	11630
GWh	3.6	860	8.6×10^{-5}	1

Net Calorific Values, as used in statistics.

(source: Eurostat, 2010)

		kJ (NCV)	kgoe (NCV)
Hard coal	1 kg	17 200 - 30 700	0.411 - 0.733
Recovered hard coal	1 kg	13 800 - 28 300	0.330 - 0.676
Patent fuels	1 kg	26 800 - 31 400	0.640 - 0.750
Hard coke	1 kg	28 500	0.681
Brown coal	1 kg	5 600 - 10 500	0.134 - 0.251
Black lignite	1 kg	10 500 - 21 000	0.251 - 0.502
Peat	1 kg	7 800 - 13 800	0.186 - 0.330
Brown coal briquettes	1 kg	20 000	0.478
Tar	1 kg	37 700	0.9
Benzol	1 kg	39 500	0.943
Oil equivalent	1 kg	41 868	1
Crude oil	1 kg	41 600 - 42 800	0.994 - 1.022
Feedstocks	1 kg	42 500	1.015
Refinery gas	1 kg	50 000	1.194
LPG	1 kg	46 000	1.099
Motor spirit	1 kg	44 000	1.051
Kerosenes, jet fuels	1 kg	43 000	1.027
Naphtha	1 kg	44 000	1.051
Gas diesel oil	1 kg	42 300	1.01
Residual fuel oil	1 kg	40 000	0.955
White spirit	1 kg	44 000	1.051
Lubricants	1 kg	42 300	1.01
Bitumen	1 kg	37 700	0.9
Petroleum cokes	1 kg	31 400	0.75
Other petro. products	1 kg 1 kWh	30 000	0.717
Natural gas	1 MJ(GCV)	900	0.0215
Coke-oven gas	"	900	0.0215
Blast-furnace gas	"	1000	0.0239
Works gas	"	900	0.0215
Nuclear energy	1 MJ(GCV)	1000	0.024
Biomass	1 MJ(GCV)	1000	0.024
Solar energy	"	1000	0.024
Geothermal energy	"	1000	0.024
Hydro energy	1 kWh	3600	0.086
Wind energy	1 kWh	3600	0.086
Derived heat	1 MJ(GCV)	1000	0.024
Electrical energy	1 kWh	3600	0.086

Note: The tonne of oil equivalent is a conventional standardized unit defined on the basis of a tonne of oil with a net calorific value of 41868 kilojoules/kg. The conversion coefficients from the specific units to kgtoe (kilogramme of oil equivalent) are thus computed by dividing the conversion coefficients to the kilojoules by 41868.

Executive Summary

The European Commission has identified a need to systematically monitor and report on the impact of Ecodesign, Energy Labelling, Energy Star and Tyre Labelling measures, including potentially new forthcoming actions, with a view to improve its understanding of the impacts over time as well as its forecasting and reporting capacity.

In a previous study [1] that ran from September 2013 to November 2015 an Ecodesign Impact Accounting (EIA) methodology was developed, providing a practical tool to achieve those goals. Specific details of the method are given on the following page. That study also applied the accounting method to the existing Ecodesign preparatory studies and impact assessment reports. The results were published in the Part 1 report [2] of May 2014, which took into account the information available on 1st November 2013, and updated and extended in the Part 2 report [3] of December 2015, covering the information available on 1st May 2015.

The Ecodesign Impact Accounting is being continued in the current study [4] (EIA II) for a period of three years starting from December 2015. Existing data will be updated following Ecodesign review studies, new product groups will be added to EIA, the accounting method will be detailed and enhanced, and an accounting of material resources will be added.

Following the interim report of June 2016, which took into account the information available on 1st January 2016 [5], the present document is the 2016 Annual Report of the EIA II study and takes into account the information available on 1st September 2016. As no new Ecodesign and Energy Labelling measures were introduced in 2016, the annual report is identical to the interim report, except for some minor error corrections and editorial changes.

The accounting covers projections for the period 2010-2050, with inputs going as far back as 1990 and earlier. Studies of over 35 product groups with over 180 base case products were harmonised and complemented to fit the methodology. For the period up to 2025-2030 inputs were derived from the available studies. The period beyond 2025-2030 is an extrapolation of the existing trend without any new measures, i.e. it is not in the scope of this study to develop new policies.

Projections use two scenarios: a 'business-as-usual' (BAU) scenario, which represents what was perceived to be the baseline without measures at the moment of the decision making, and an ECO scenario that is derived from the policy scenario in the studies which comes closest to the measure taken.

[1] SPECIFIC CONTRACT No ENER/C3/412-2010/FV575-2012/12/SI2.657835 (previous EIA study)
[2] ECODESIGN IMPACT ACCOUNTING Part 1 – Status Nov. 2013, VHK May 2014 for the European Commission, https://ec.europa.eu/energy/sites/ener/files/documents/2014_06_ecodesign_impact_accounting_part1.pdf
[3] ECODESIGN IMPACT ACCOUNTING Part 2 - Status May 2015, VHK December 2015 for the European Commission
[4] SPECIFIC CONTRACT No ENER/C3/2013-523/09/FV2015-543/SI2.722015 *"Extended impact accounting of Ecodesign, Energy Label and Tyre labelling legislation as well as actions under the Energy Star programme (EIA II)"* (current ongoing EIA II study)
[5] ECODESIGN IMPACT ACCOUNTING – Status Report January 2016 – VHK for the European Commission, June 2016, https://ec.europa.eu/energy/sites/ener/files/documents/Ecodesign%20Impacts%20Accounting%20%20-%20status%20January%202016%20-%20Final-20160607%20-%20N....pdf

In 2010 the products included in the accounting represent approximately 38 700 PJ (925 Mtoe) of direct and indirect primary energy consumption. This is 53% of total EU-28 gross energy consumption in 2010 (1759 Mtoe).

For these products the following main results were obtained for the EU-28 in 2020 (ECO versus BAU):

- Close to 6900 PJ (165 mtoe, 1918 TWh) primary energy saving, i.e. a saving of 18% for the average product;
- Of this, 4320 PJ (103 mtoe, 1200 TWh) is primary energy saving due to saving 480 TWh (41 mtoe) of electricity, and 2588 PJ (62 mtoe, 719 TWh) is direct fuel saving. The sum of electricity saving and direct fuel saving ('final' energy saving) is 1199 TWh (103 mtoe);
- 319 Mt CO_2 equivalent (7% of 2010 EU-total) less greenhouse gas emissions;
- 336 million m^3 drinking water and 0.4 Mt printer paper saving; avoided 144 kt SO_2 equivalent direct NO_x-emissions, 141 kt direct CO-emissions, 10 kt direct OGC-emissions and 9 kt direct PM-emissions [6];
- € 112 bn net saving on consumer expenditure (€ 174 bn gross saving, € 62 bn extra acquisition);
- € 57 bn extra revenue for industry, wholesale, retail and installation sector;
- 0.8 million extra direct jobs for industry, wholesale, retail and installation sector.[7]
- Nearly 52% of the 2020 savings comes from the residential sector, 31% from the tertiary sector, 14% from the industry sector and 3% from other sectors [8].

For 2030 these results increase by over 60%. The monetary consumer savings on expenditure are tripled, also due to rising energy prices. The projections for the period 2030-2050 show that without new measures the pace of improvements slows down and eventually evens out.

The 2020 savings represent approximately 9% of the current EU energy consumption total (1759 mtoe in 2010) and 7% of the carbon emission total (5054 $MtCO_2$ eq. in 2010). In 2030 this is projected to grow to 15% of EU energy consumption and 11% of carbon emission totals. The consumer's monetary saving is close to 1% (in 2020) and 2.6% (in 2030) of the current GDP of the European Union (12790 billion euros in 2010).

Specific details of the ecodesign impact accounting method are:

- The scope is to establish exclusively the impacts of ecodesign and labelling measures. Possible supply-side measures, e.g. relating to power generation efficiency or fuel-specific pricing, are neutralized by using fixed factors for power generation and distribution (40% efficiency) and a generic 4% annual escalation rate for all energy sources (from 2010 tariffs) throughout the projection period. Only for Greenhouse Gas emissions the continued improvement of the power generation is included. For possible building-related measures influencing heating

[6] Direct emissions are intended here as those that occur during the use of products burning fuels (mainly for heating). This does not include emissions during the generation of electricity or emissions during non-use phases, e.g. manufacturing, distribution, end-of-life.

[7] Direct jobs means jobs in the value-added chain. Indirect employment effects may be a factor 3 to 5 higher, but no consensus agreed factor is available.

[8] Other sectors include e.g. the Energy sector and Agriculture and Forestry.

and cooling load, the historical trends have been extrapolated with a fixed percentage (minus 1% per year) in both the BAU and the ECO scenarios.

- Energy accounting is compatible with Eurostat conventions: Fuel energy values are expressed in Net Calorific Value of the fuels and no bonus was given e.g. for biomass being renewable.
- Double counting, e.g. where products are regulated both at component and product level, has been taken into account as well as the increase in load where appropriate, i.e. the trend toward more and bigger appliances, lamps, computers, displays, etc. in households;
- Possible deficiencies in market surveillance and the effectiveness of the policy instruments are not taken into account.
- For some product groups, given a choice, the accounting has been conservative. As regards the effect of labelling of new products (i.e. beyond Ecodesign) there is always uncertainty and it may well be that the IA reports on which the accounting is based, have been too conservative;
- The BAU scenario is not a 'freeze' scenario; it is derived from extrapolating historical trends at the time of the first preparatory study analysis, including ongoing market trends in energy efficiency improvement and emission abatement;
- A comparison of the current accounting figures with other figures, such as those derived from PRIMES, needs to be done cautiously, since the assumptions of the current accounting and the PRIMES model, or other models, might differ considerably.

Contents

Annexes

1. Introduction

1.1. Background

This study on the "*Extended impact accounting of Ecodesign, Energy Label and Tyre labelling legislation as well as actions under the Energy Star programme (EIA II)*" is part of the framework services contract for impact assessment studies of possible implementing measures under the Ecodesign Framework Directive on Energy Related Products and the Framework Directive on Energy Labelling.

The European Commission (EC) is charged with reporting on the progress towards the European 20-20-20 policy goals. Implementing measures, inter alia the dual and related legislations on Energy Labelling ('EL') and Ecodesign ('ED'), are important tools to meet aforementioned policy targets. The EC is charged with following up the member states' implementation of framework legislation in national legislation, and coordination and monitoring of market surveillance. The EC is currently reviewing the EL Directive.

It is important to monitor the implementation and performance of legislation relating to the 20-20-20 goals, and to assess related impacts in real time. Timely and accurate information allows for adjustment of policies and may contribute towards establishing a baseline for reviews. The assessment of impacts will generate information relevant for future policy projections, inter alia for 2020, 2030, 2040 and 2050. Such information is needed in particular with regard to ED (including voluntary agreements), EL and Tyre Labelling ('TL') legislation, including their implementing measures, and on the Energy-Star ('ES') programme.

The EC has therefore identified a need to systematically monitor and report on impacts of the above legislation and actions, including potentially new forthcoming actions, with a view to improve its:

- Understanding of the impacts of policies, implementing measures and actions over time.
- Forecasting, based on scenarios considered versus the business as usual scenario (baseline).
- Capacity building on reporting.

The first issue of the Ecodesign Impact Accounting of May 2014 was extensively used during the preparation for a possible review of the EL- and ED-Directives and provided important insights [9].

[9] 'Assistance to the Impact Assessment for the Review of the Energy Labelling Directive and certain aspects of the Ecodesign Directive', prepared by VHK for the EC, September 2014, and used as a source of information for the EC's 'Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU' swd_2015_0139

1.2. History

The Ecodesign Impact Accounting (EIA) methodology was developed under the previous contract No ENER/C3/412-2010/FV575-2012/12/SI2.657835 during the period September 2013 to November 2015. That study also applied the accounting method to the existing Ecodesign preparatory studies and impact assessment reports and the results were published in two reports:

- Part 1 report [10] of May 2014, taking into account the information available on 1 November 2013;
- Part 2 report [11] of December 2015, covering the information available on 1 May 2015.

The description of the methodology is included in chapter 2 of this report. A survey of the main differences between this report and the Part 2 report of the previous study can be found in par. 3.1.

1.3. Tasks

The follow-up study (EIA II) is performed under contract No ENER/C3/2013-523/09/FV2015-543/SI2.722015 "*Extended impact accounting of Ecodesign, Energy Label and Tyre labelling legislation as well as actions under the Energy Star programme*". The study foresees the following tasks:

1. Set up the ecodesign impact accounting, in accordance with the existing consistent calculation method, for new, not previously regulated products at an average rate of 3 new product groups per year for the next 3 years;

2. Update the ecodesign impact accounting, in accordance with the harmonised calculation method, for existing regulated products that have been subject to a review, at an average rate of 10 products per year over the next 3 years;

3. For the purpose of supporting the role of ecodesign in meeting circular economy objectives, develop and implement in the ecodesign impact accounting for all regulated product groups and base cases an extension to account for the non-energy materials inputs. These should be derived from the EcoReport inputs in the preparatory studies, distinguishing between the more than 100 material groups identified in the EcoReport, and valid for the year for which the EcoReport was performed.

4. Provide an indicative subdivision of at least market data and energy/climate data between residential, commercial (tertiary sector), industrial and other (energy and agricultural) sectors for all products.

[10] ECODESIGN IMPACT ACCOUNTING Part 1 – Status Nov. 2013, VHK May 2014 for the European Commission, https://ec.europa.eu/energy/sites/ener/files/documents/2014_06_ecodesign_impact_accounting_part1.pdf

[11] ECODESIGN IMPACT ACCOUNTING Part 2 - Status May 2015, VHK December 2015 for the European Commission

5. Improve the ecodesign impact accounting method to realize improvements for light sources [12], products with indirect energy impacts [13], and accounting for products with a wide variation in sizes [14].

6. Present the data in EIA Annual Reports, once per year over the next 3 years, supplemented with infographics, examples and other means to communicate/ illustrate the ecodesign policy effort.

1.4. Deliverables required

The deliverables of the contract include an interim report and three annual impact assessment reports (IARs), to be delivered to the EC on:

- 3 months after the kick-off meeting (8 April 2016): draft interim report reflecting the work delivered in Tasks 1 to 5;
- Annually, in Nov.- Dec. 2016, 2017 and 2018: draft and final EIA Annual Report, as further specified below.

EIA Annual Report in pdf format, targeted at a wider audience and containing the results of all tasks, including:

- Executive summary and overview of new developments in the past period;
- Infographics, illustrated examples and possibly case histories;
- Up-to-date lists of regulated products, relevant legislation, preparatory studies and impact assessments;
- Summary of key facts for each product group with reference years 2010, 2020 and 2030;
- Data tables for all relevant parameters and product groups, including their base cases, for 1990 and for every five years over the period 2010-2050;
- Employment data, i.e. direct jobs as calculated ex-post from business revenues for 1990 and for every five years over the period 2010-2050;
- Annex with a short description of the methodology;
- Annex with acronyms, references, etc.

EIA Annual Presentation in ppt format, targeted at a wider audience, entailing:

- Slide presentation of the main results with detailed notes, to further communicate the study and its results.

[12] For light sources (Lot 8/9/19), EIA I uses 'flat' summary data from the more comprehensive MELISA model that is actually used in the preparatory study. The EIA data in their present form are not suited for a dynamic update of policy scenarios. For that a coupling with the more comprehensive MELISA model is needed.

[13] For ventilation units and other products (e.g. windows) that indirectly impact space heating or other indirect energy users, the accounting in EIA I is not transparent and the indirect impacts are modelled as an ad-hoc subtraction of the overall space heating load. To solve this problem the LOAD parameter could be split between scenarios, e.g. a LOADBAU and LOADECO scenario, to make clear how exactly the partitioning takes place.

[14] For product groups with a wide range of sizes/capacities, e.g. industrial motors, the aggregation with sales-weighted averages poses some specific accounting problems as regards the appropriate weighting of efficiency. These accounting problems may result in deviations of earlier projections and should be solved in a universal way.

EIA Annual Methodology report, targeted at expert use and interested analysts, consisting of:

- All Word and Excel files (5 year interval) used for the EIA Annual Report;
- Extended methodology report in Word and pdf format, reporting amongst others in detail on the calculation method and the execution of Tasks 3, 4 and 5;
- Extended data report, mainly in Excel format, documenting specific problems and solutions per product group in translating the data from preparatory studies and impact assessments.

1.5. Planning

The European Commission sent out a Request for services, ENER.C.3.dir(2015) 6001524, on 30 November 2015.

VHK's proposal for services was sent in 4 December 2015.

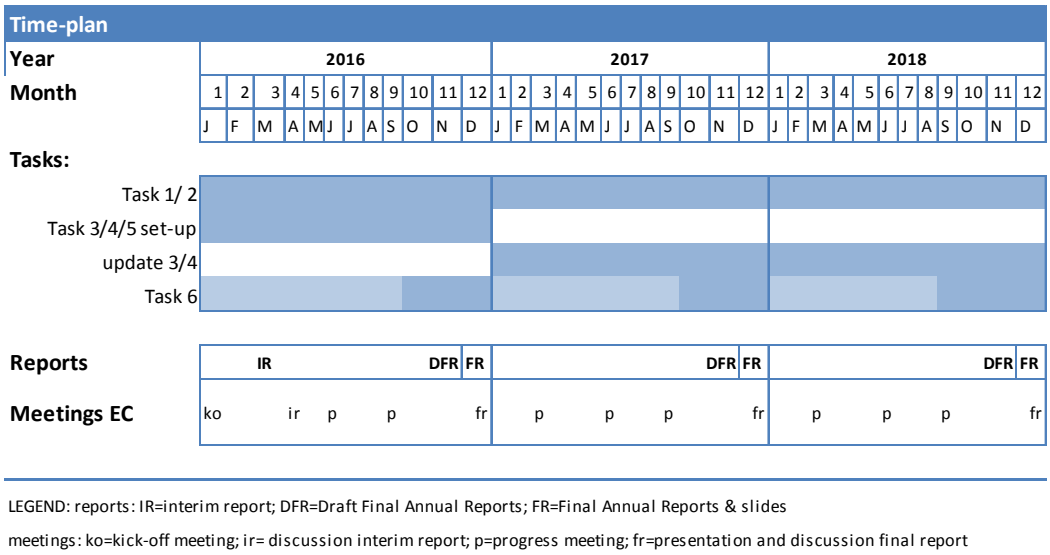
The signature date and start of contract was 16 December 2015.

Planning milestones:

- Project start: 16 December 2015
- Kick-off meeting within 10 working days following the signature of the contract, to determine details of the study. Actual date was 8 January 2016.
- Inception report (Interim report): 8 April 2016 (3 months after kick-off)
- Draft and Final Annual report 2016: Nov.-Dec. 2016
- Draft and Final Annual report 2017: Nov.-Dec. 2017
- Draft and Final Annual report 2018: Nov.-Dec. 2018
- Project end: 16 December 2018 (duration of contract 36 months)

An average of three progress meetings per year is foreseen between the contractor and the European Commission, in addition to the presentations of the reports.

See Figure 1 for an overview of the time-plan.



LEGEND: reports: IR=interim report; DFR=Draft Final Annual Reports; FR=Final Annual Reports & slides

meetings: ko=kick-off meeting; ir= discussion interim report; p=progress meeting; fr=presentation and discussion final report

Figure 1 Time-plan for the EIA II project. Tasks refer to par. 1.3.

1.6. Activities for the Interim Report of March 2016

The main activities in the period January 2016 (start of project) – April 2016 (due date Interim report) were:

- **Croatia**: Extrapolation of EU-27 sales data to EU-28 sales data, including Croatia. The following data were found in Eurostat:
  - Croatian population on January 1st 2015 is 0.84% of EU-27 population;
  - Croatian households in 2014 are 0.71% of EU-27 households;
  - Croatian GDP in 2014 is 0.31% of EU-27 GDP;
  - Croatian gross inland consumption of energy (in mtoe) in 2013 is 0.47% of EU-27 total [15].
  - Croatian final energy consumption in 2013 is 0.53% of EU-27 total [16].

  Considering that the Croatian contribution is anyway small and within error margins of the EU-27 data, 0.5% has been added to all EU-27 sales to include the contribution of Croatia, constant for all years and all products [17].

- **SAVE sheets**: following the request of the European Commission during the kick-off meeting, the MASTER Excel file now also includes, for most parameters, a SAVE sheet (BAU-ECO values) in addition to the BAU and ECO sheets. Three of these sheets, i.e. NRGSAVE, EMISSSAVE and EXPENSSAVE, are also included in Annex A of this report.

- **Sector shares**: considering task 4 of par. 1.3, a start was made with the subdivision of data over the residential, tertiary, industry and other sectors. A new sheet 'CLASSES' has been added (see start of Annex A) that provides the sector shares for each base case. These shares are to be interpreted as shares in energy consumption, not necessarily identical to shares in e.g. sales, stock, or purchase costs. These shares are used on the NRGBAU, NRGECO and NRGSAVE sheets to present the sector subdivision of primary energy consumption. Results are presented near the end of these sheets in three ways:
  - Summary table per sector over all functional groups
  - For each functional group the subdivision over the sectors, in TWh
  - For each functional group the subdivision over the sectors, in %

  For the sector subdivision of other parameters additional work is required. This is foreseen for the EIA Annual Report of December 2016.

- **VIDEO, game consoles**: the impacts of the 2015 Voluntary Agreement on game consoles have been added in EIA II.

- **PF Professional Refrigeration**: the impacts of the 2015 Regulations have been inserted in EIA II, substituting the previous data that did not show any savings.

[15] Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Consumption_of_energy
[16] Source: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdpc320&plugin=1
[17] In principle this resulted in a 0.5% increase in energy, emissions, expenses and associated savings. However, data for Lighting products were not updated as the stock for those products is currently not linked to the sales. See also task 5 in par. 1.3 and footnote 12. This will be improved when updating Lighting products in EIA following the 2015 review study and the corresponding impact assessment (to be performed in the 1st half of 2016).

This covers storage cabinets, low- and medium-temperature process chillers and condensing units. Regarding the latter, a dedicated study was performed to identify the **double counting of energy between condensing units and other PF and CF products** accounted in EIA. A technical note has been prepared on this topic, and was discussed with the European Commission on 17 February 2016. Taking into consideration that Walk-in cold rooms and Blast cabinets have been removed from EIA for the time being (see next point) and that their energy is consequently not double counted in EIA, it has been established that approximately 60% of the CU-energy reported in EIA would be double counted. This energy has been subtracted when determining the total for the PF product group.

- **CF Commercial Refrigeration**: the data for this product group in the December 2015 issue of EIA are not compatible with the last public Commission proposal for regulation and the associated impact assessment. Walk-in cold rooms are no longer in the scope of the proposed regulation while for Blast cabinets there are only information requirements that are not expected to have relevant energy efficiency effects. It was therefore agreed with the Commission to **remove Walk-in cold rooms and Blast cabinets from EIA II**.

  In addition, the impact assessment also reports energy savings that include the effects of the proposed regulation on **non-base-case supermarket display cabinets**. These non-base-case products were not included in the estimates of the preparatory study, but they are subject to the proposed regulation and according to the impact assessment they give a significant contribution to the savings. It was therefore agreed with the Commission to include these non-base-cases in EIA II. JRC provided additional data underlying their impact assessment, but nevertheless a data-gap remained for the non-base-cases. VHK estimated the missing data as good as possible, in such a way that EIA II total savings for the CF product group match the total savings reported in the impact assessment [18].

- **Emissions**: in addition to the greenhouse gas emissions, the EIA issue of December 2015 also contained a small section on the direct NO_x emissions resulting from Dedicated water heaters and Central heating boilers and combis. This section has now been expanded with NO_x emissions from some of the Local Space Heaters and Air heating products. However, insufficient data were available to quantify the NO_x emissions from Solid Fuel Boilers and from another part of the Local Space Heaters, so direct NO_x emissions in EIA II remain incomplete.

  In addition, direct emissions [19] of CO (carbon monoxide), OGC (organic gaseous carbon) and PM (particulate matter) from Solid Fuel Boilers and from Local Space Heaters have been added to EIA II (near the end of the EMISS… sheets). The corresponding Ecodesign regulations specify limits for these emissions.

- **Utility Transformers / Energy sector**: utility transformers are used in the distribution of electricity. This means that their energy consumption is already represented in the CC=40% that is used in EIA as the efficiency of the electricity generation and distribution. This is modelled in EIA by using NRGBAU=0 as a reference for the Energy sector and considering only the improvement over BAU in

[18] The non-base cases have been represented in EIA II as a single line 'other supermarket displays'. This groups a large variety of product models: vertical and horizontal, chilled and frozen, with plug-in and remote configuration. Consequently there is no clear link between this hypothetical average product and the M & N values used in the proposed regulation to compute the Energy Efficiency Index.

[19] Direct emissions are intended here as those that occur during the use of products burning fuels (mainly for heating). This does not include emissions during the generation of electricity or emissions during non-use phases, e.g. manufacturing, distribution, end-of-life.

the ECO scenario. In the December 2015 edition of EIA, the same principle was used for all parameters except acquisition costs, running costs and total consumer expenses. This was judged confusing and has therefore been changed in EIA II: all parameters now use BAU=0 as reference for the Energy sector and consider only the improvement over BAU in the ECO scenario. This includes the assumption that BAU acquisition costs for utility transformers are already included in some way in the electricity rates and should therefore not be counted again. Revenues and jobs are computed for utility transformers / energy sector in the same way as for all other products. See also par. 2.6.3.

- **Minor corrections**: some minor errors have been encountered in the EIA issue of December 2015 and have now been corrected. This involved revenues and jobs for air conditioners, jobs for compressors, stock efficiencies for stand-by, calculation of SO_2 equivalent for NO_x emissions, ECO efficiencies for solid fuel boilers using pellets, ECO efficiencies for cross-flow fans after 2020, BAU and ECO efficiencies for external power supplies, sales of C3 truck tyres (rethreading now considered), totals for electronics on some sheets, general total on some sheets. The impact of these corrections on the total energy savings is small, see par. 3.1.

- **Material resources**: for all product groups the information from the Bills-of-Material (BoM) of the various preparatory studies was collected in an Excel file. These data were ordered, checked and integrated and then multiplied by the corresponding EIA sales/stock data to get a first overview of the quantity of materials used in the EIA products. This work will be published in a separate report and a separate Excel file; the material resource data are not included in this report.

1.7. Activities for the Annual Report of December 2016

No new Ecodesign or Energy Labelling measures were introduced between January and September 2016. New information was available from review studies that completed in 2016, from draft impact assessments, and from proposals for new regulations, but as these did not lead to final measures yet, it was agreed with the Commission that it would be premature to already include new data in EIA. Other study tasks (par. 1.3 point 5) have been postponed for the same reason. Consequently, except for minor error corrections and editorial changes, the figures in the 2016 annual report are identical to those in the interim report of June 2016 [5].

The activities in the period April – December 2016 consisted in:

- **Sheet General**: A sheet with general, non-product-specific data has been added to the EIA Excel file, on request of the Commission. This sheet highlights EU population, EU households, Global Warming Potential (GWP) for electricity, and rates for electricity and natural gas. Data sources for these parameters are also indicated.

- **Minor corrections and editorial changes**: these changes had a negligible effect on the overall EIA outcomes.

- **EIA Overview Report**: This is a separately issued report that aims at making EIA data more easily accessible for a wider audience. It illustrates, in non-technical terms, the types of products for which measures have been taken, highlights the major impacts of these measures and provides key facts and figures.

- **EcoReport for the average EIA product**: As a continuation of the June 2016 Special Report on Materials [20], a single EcoReport for the average EIA product has been created. This provides further insights in the impacts of EIA products during production, distribution and end-of-life. This work is published in a separate report and a separate Excel file.

1.8. Reporting

This EIA II annual report 2016 uses the same layout as the previous EIA I reports and the EIA II interim report of June 2016. A first step has been made towards the requested split in a Results report for a wider audience and a more detailed Methodology report for analysts and experts (see par. 1.4) by separately issuing the EIA Overview Report.

No changes have been made yet in the accounting method. The description of the accounting method has been reviewed but is essentially maintained from previous reports (chapter 2). The application of the accounting method, i.e. the inventory of impacts per 1 September 2016, is introduced in Chapter 0, but is mostly performed in the MS Excel files. The print-out of those files, for 5 year intervals only, are contained in Appendices A to G of this report. Annex H is a reference list.

[20] Special Report, Material Inputs for Production, pertaining to the study on Ecodesign Impact Accounting, VHK for the European Commission, March 2016. https://ec.europa.eu/energy/sites/ener/files/documents/EIA%20Special%20Report%20Material%20Consumption%2020160607.pdf

2. Accounting method

2.1. Overview: parameters and scenarios

The calculation method follows the procedures as laid down in the Methodology for Ecodesign of Energy-related Products (MEErP), which takes into account the relevant requirements of the European Commission's Impact Assessment Guidelines. Having said that, the calculation method is streamlined to make maintenance and reporting as simple as possible.

Also, with respect to the definitions in MEErP and Ecodesign regulations, some concessions have been made to be in line with the Eurostat energy balance accounting that is usually the reference for policy studies at an aggregate level (e.g. PRIMES, POTENCIA). Paragraph 2.2.4 gives more details.

The following paragraphs describe parameters and equations:

- Scenarios: the BAU ('Business-As-Usual') and ECO scenario;
- Generic parameters: historical energy prices, future energy price escalation (growth rate corrected for inflation), electricity to primary energy conversion coefficient (CC, static and real), global warming potential for energy sources (GWP-100, real);
- Core parameters (SLEPIX): **S**ales volume per year, **L**ife, **E**co-impacts per new product and year, **P**rice, **I**mprovement potential eco-impacts, E**x**tra costs for improvement;
- Derived variables and constants: Stock (volume installed), eco-impacts of stock, installation, maintenance, auxiliary inputs, end-of-life unit costs;
- Consumer expenditure: Total acquisition and running costs;
- Business revenue: Total turnover for industry, wholesale, retail/installation sectors;
- Socio-economic parameters: Average turnover per employee and total jobs for industry, wholesale, retail/installation sectors.

2.2. Scenarios

The ecodesign impact accounting distinguishes a BAU scenario (Business as Usual) and an ECO scenario. The BAU represents the situation without measures as assessed during the first preparatory and IA study for a product[21]. It is not necessarily how a 'Business-as-Usual' would be judged today.

The BAU scenario is not a 'freeze' scenario, i.e. in most preparatory studies ongoing market trends in energy efficiency improvement and emission abatement are taken into account in the BAU. It is derived from extrapolating historical trends at the time of the preparatory study analysis, including possible ongoing market trends in energy efficiency improvement and emission abatement.

The ECO scenario is the scenario which –in the most recent preparatory and IA studies— comes closest to the (projection of the) situation with measures taken, i.e. with Ecodesign requirements, Energy labelling, Energy Star and Tyre labelling. In most

[21] Note that for the first products with an Energy Label like household refrigerators and washing machines this may go back to 1992-1993.

studies, the measures in the ECO scenario work as a catalyst and compass, accelerating the trend towards energy efficient and environmentally friendly products [22].

Three ground rules for scenarios were followed in the study:

- Scenarios should be based on the existing preparatory and impact assessment (IA) studies. If policy is a ship, accounting is the compass and not the captain. In other words, it is not the task of accounting to propose new measures.
- Scenarios should be as realistic as possible, i.e. the results from the 'bottom-up' approach of the ecodesign impact accounting should ideally be consistent with the results from the 'top down' approach in Eurostat and others.
- Scenarios should be fit for purpose, i.e. in principle they are used to study only the impact of ecodesign and labelling measures, not of other demand-side measures (e.g. EPBD, NEEAP) and not of supply-side measures such as the use of renewables and overall efficiency improvement in electric power generation

In part, these ground rules are conflicting:

Based on the existing measures

The time scope of impact scenarios in existing studies runs at the most up to 2030 (and often before that). This is the time by which most installed products have been replaced by products meeting the ecodesign requirements and labelling has lost most of its effectiveness because most of the products are rated in the highest classes. So, given that the study is required to develop scenarios up to 2050, this means that effectively the ECO-scenario assumes that ecodesign and labelling legislation will not be updated and that there will be no measures for new products.

The consequence is, as will be shown, that in the 2030-2050 period the effect of the measures diminishes and eventually flattens out.

Such a scenario provides a valuable insight for policy decisions, e.g. as reference baseline, and has been maintained, because there is no alternative within the scope of the study. But with input from policy makers it should be possible to calculate alternative scenarios.

Realistic

Paragraphs 2.3 to 2.6 describe how accounting from ecodesign studies was converted to be consistent with the statistical accounting units and conventions employed by Eurostat.

Double counting, e.g. where products are regulated both at component and product level, has been taken into account as well as the increase in load where appropriate,

[22] For some product groups the ECO-scenario has been taken identical to the BAU scenario and consequently no savings are reported.
Simple set-top boxes don't exist anymore and are replaced by complex set-top boxes in all relevant applications, as shown in the Omnibus 2013 study and confirmed by the Commission in the CF of mid-2014. This is a perfectly normal evolution within the ITC market.
For PCs (Lot 3) the minimum requirements were based on the prep. study of 2007 and for this fast-moving sector were not effective when introduced in 2013.

i.e. the trend toward more and bigger appliances, lamps, computers, displays, etc. in households (see par. 2.7).

The example given in par. 2.8 indicates that –historically for the period 1990-2010—the results from ecodesign impact accounting could be made to match Eurostat outcomes with appropriate partitioning between the sectors.

However, for future projections the possible deficiencies in market surveillance or the effectiveness of the policy instruments are not taken into account. Analysts are not commonly asked to correct for fraud and flaws in implementation.

Also not taken into account is an ex post re-evaluation where some specific adopted measures were subject to 'last-minute' changes before the vote. Preparatory and impact assessment studies are primarily an input to decision making; ex post re-evaluation for accounting purposes is not a priority.

On the other hand, for some product groups the accounting has been conservative. This has been the case e.g. for personal computers where in November 2013 there were no indications to differentiate between the BAU and the ECO scenario.[23]

Also as regards the effect of labelling of new products -- i.e. beyond the impact of Ecodesign-- there is a large uncertainty and it may well be that the IA reports on which the accounting is based, have been too conservative.

Past experience from household appliances, e.g. household refrigeration appliances which were subject to both energy labelling and a specific directive with minimum requirements in the 1990s, has shown that the energy labelling accounted for two-thirds of the savings and the minimum requirements for one-third. Also the EU Energy Star programme on office equipment has been evaluated in 2011 and proven successful. On the other hand, the energy labelling of light sources (since 1998) has proven to be largely ineffective, while the ecodesign measures introduced in 2009 had a much bigger impact. For professional appliances, where the buyers are assumed to be indeed professionals, stakeholders in all sectors have claimed that energy labelling is not effective at all. Nonetheless, there is the exception of circulator pumps, where manufacturers have pushed for an energy label. Also in other professional sectors it can be observed that 'ErP 2015'-level or similar designations are used in commercial publications.

The transition between BAU and ECO scenario in most studies is smooth. There is no 'big bang' effect whereby large parts of manufacturer's product range is eliminated overnight on the implementation date. Negative impact for industry is avoided, because the design cycle, i.e. the rate at which the products in the catalogue are renewed, is taken into account. Most manufacturers start anticipating imminent measures already 2-3 years before the decision is taken, i.e. at the outset of studies. Once the decision is taken it still takes another 2-3 years before the first tier of measures is implemented, while the most ambitious second or third tier follow a few years later still.

Fit for purpose

The ecodesign impact accounting aims to identify the impact of ecodesign and labelling measures, not (necessarily) of other measures with the same policy goals, such as

[23] For instance, there is no savings for PCs, because it was not possible to quantify them with the data available.

building-related measures and supply side measures on renewables, the efficiency of power generation and the fuel mix.

In order to 'neutralize' the possible effect of these other measures:

- fixed factors for power generation and distribution (40% efficiency) are used throughout the projection period 2010-2050;
- a generic 4% annual escalation rate for the pricing of all energy sources is used (based on 2010 tariffs), independent of the energy type;
- for space heating and cooling load of buildings, the historical trends are extrapolated using the same percentage for the BAU and ECO scenario;
- the BAU and the ECO scenario use the same performance/load, only the product's efficiency differs.

Having said that, the Excel files can easily be adapted to use dynamic power generation efficiency (see par. 2.3.4), work with individually adjusted pricing of the energy sources or adjust the heating/cooling load for individual years.

2.3. Generic parameters

2.3.1. Overview

Generic parameters are parameters that are not product-specific but apply across the whole range of calculations for regulated products. Furthermore, they are not dependent on a scenario, i.e. they are the same between BAU and ECO scenario.

The text box on the right gives the relevant year arrays --symbol '{ }'—and variables for

- Prices/rates of energy and other consumables *{Rel}, {Rgas}* in €/kWh (fixed Euros 2010, inflation corrected);
- Future energy escalation rates *Relinc, Rgasinc* in % (annual increase beyond inflation rate of 2%);
- Static (*CC_1*=40%) and real (*{CC_2}*) correction coefficients for the efficiency of electric power generation and distribution, calorific value of fuels;
- Global Warming Potential for a 100 year period *{GWP}* in CO_2 equivalent per kWh (primary energy or electricity);

var
{Rel}, {Rgas}, etc.
Relinc, Rgasinc, etc.
CC_1 or *{CC_2}*
{GWP}
t

and the array index *t* (subscript), indicating the year to which the parameter relates.

2.3.2. Time-step and year-index

Note that ***t*** can vary between the oldest products that are still on stock, e.g. 1950 for some distribution transformers, and the end of the projection period 2050. The time-step of the calculation method is 1 year, but for precision also fractional years can be emulated.[24]

[24] The calculation is first done for full years (rounded down) and then for the remaining fractional (oldest) year. This may introduce a small error (some overlap or gap in subsequent time periods), especially when the product life over the years varies, but the error is still smaller than with a restriction to use only full integer years.

2.3.3. Pricing of energy and other resources

The nominal energy rates, i.e. not inflation corrected, are given for the period from 1990 to 2010 --or later where available-- in the NOMRATES sheet (see Annex A). For most energy sources there are two rates, e.g. Rel1 and Rel2 for electricity, whereby the former relates to the residential sector and the latter relates to the non-residential sector. Apart from rates for energy, the sheet also contains rates for water (in €/m³), printer toner & paper, detergents and vacuum cleaner bags. The nominal energy rates are not used in the calculation, but only given as a background information.

The inflation corrected rates, i.e. whereby all rates are recalculated to fixed 2010 euros, are given in the RATES sheet (see Annex A). These are the ones used in the calculation method.

The same RATES sheet also gives the escalation rates for energy prices beyond 2010 (column 'Inc'). As a default, because it corresponds to the MEErP, which in turn follows the price trends of the last 5 years, the escalation rate for all energy sources is set at 4%. This value can be changed, even at the level of individual years and individual energy sources, if alternative scenarios need to be considered.

However, as mentioned in the MEErP, it is advantageous for the simplicity of Life Cycle Costs (LCC) calculations that –at a value of 4%-- the energy escalation rate is approximately (within <1%-point) the same as the default 4% discount rate[25] that the European Commission prescribes. Furthermore, using the same escalation for all energy sources (from 2010 tariffs) neutralizes possible price effects that may occur from other (non-ecodesign or non-labelling) measures, whose impact should be excluded from the scope.

The escalation rate for water (incl. sewage levies) is 3%, whereas for the other resources the escalation rate is 0% (meaning that their average annual price increase equals inflation).

2.3.4. Correction coefficient for power generation & distribution

The calculation method uses a correction coefficient CC (with reverse also known as primary energy factor *pef*) to convert electricity to primary energy. The CC value, which is actually the denominator in a coefficient for the energy value, approximately represents the efficiency of power generation & distribution. In order to give a correct assessment of the impacts of Ecodesign and labelling measures, i.e. without also counting improvements in electric power generation and distribution, the calculation method uses a fixed, static coefficient *CC_1* of 40% for all years. It means that 1 kWh of electricity is counted as (1/40%=) 2.5 kWh primary energy.

This coefficient is a consensual value, first introduced in Ecodesign accounting following the Energy Services Directive (now replaced by the Energy Efficiency Directive) where for the first time Member States had to come to an agreement on a harmonized value.

The alternative to this static number is a dynamic correction factor per year *{CC_2}.* The spreadsheet is prepared –through a toggle switch[26]—to use this dynamic *{CC_2}* array, with different efficiencies for each year. But, as mentioned in par. 2.2, the use of *{CC_2}* would muddle the insight of which improvement is actually due to Ecodesign

[25] Discount rate is usually defined as the interest minus the inflation rate and it is used to calculate the present worth factor (PWF). However, the European institutions always –independent of the real interest and inflation rates—prescribe a 4% discount rate in investment (LCC) calculations.

[26] Boolean parameter CC in the Excel sheets.

and labelling measures and mix it up with additional improvements in power generation efficiency.

A second drawback of using *{CC_2}* is that, although there seems to be a fair amount of consensus amongst most Member States to use *CC_1*=40%, there is no real consensus on the real power generation & distribution coefficient. The MEErP Part 2 report (par. 2.3.5) shows that there are several ways to calculate the efficiency of power generation & distribution, depending on the viewpoint of the one who is making the calculation.

The only reason why *{CC_2}* option is offered in the model is the possibility that the accounting method at some point may be extended not only to study the energy impacts of Ecodesign and labelling, but of all efficiency measures, i.e. also on the supply side.

The table below gives the *CC_2* values for some reference years. These particular values are used in several preparatory studies as described in the MEErP, Part 2 report (par. 2.3.5). In this accounting approach, which uses Eurostat data like all the alternatives, the final electricity demand (minus electricity imports) is taken as the useful output.[27] The input is the calorific value of the fuel input of thermal and nuclear power stations minus the derived heat from these power stations (typically used as district heating or process heat), i.e. the heat that is cogenerated with the electricity production. [28]

Table 1 Power generation & distribution efficiency values (CC_2)

	Year →										projections		
	Useful output in Mtoe	**1990**	**1995**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2020**	**2030**	**2050**
A	Final Energy Consumption electricity	185	193	217	238	242	244	245	232	243	238			
B	Import minus exports	3	2	2	1	0	1	1	1	0	0			
C	**Total output (A-B)**	**182**	**192**	**215**	**237**	**242**	**243**	**243**	**231**	**242**	**238**			
	'Transformation input' in Mtoe (NCV)											the future efficiency values are a linear extrapolation of the 1990-2010 trend		
D	Conventional Thermal Power Stations	389	372	383	428	437	444	430	399	415	404			
E	Nuclear Power Stations	205	227	244	258	255	241	242	231	237	234			
F	**Total input (D+E)**	**595**	**599**	**627**	**685**	**693**	**685**	**672**	**630**	**651**	**638**			
	Credit for 'transformation output-derived heat' in Mtoe													
G	Conventional Thermal Power Stations	41	38	36	52	52	43	43	42	46	43			
H	Nuclear Power Stations	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1			
I	**Total credit derived heat (G+H)**	**41**	**38**	**36**	**52**	**52**	**44**	**43**	**42**	**46**	**44**			
	Power gen. & distr. efficiency (C/(F-I) in % (=CC_2)	**32.8**	**34.2**	**36.4**	**37.5**	**37.8**	**37.9**	**38.7**	**39.2**	**40.1**	**40.0**	**43.3**	**47.0**	**54.1**

Source: own calculation VHK, data Eurostat nrg_105a

To be in line with Eurostat, the fuel input to thermal power stations is expressed in NCV and not in GCV. The difference between power generation efficiency in NCV and GCV is around 0.5 to 1.1 percentage-point.[29] On the other hand, and largely compensating for

[27] Alternative proposals may use the gross electricity production as output (i.e. including distribution losses and the own energy consumption of utilities).

[28] Alternative proposals may take the in- and outputs of all district heating plants, i.e. also the district heat that is produced by conventional boilers (non-CHP). The efficiency of conventional boilers is relatively high (85-95%), so including this share in the total would give an extra boost to the overall power generation efficiency.

[29] For instance, in 2010 the share of gas (GCV=1.1*NCV) amounted to 22.9%. The share of oil (GCV=1.065*NCV) amounted to 2.6%. (source PRIMES). This gives 0.9 percentage-points difference in efficiency of power generation: 39.0% (GCV) instead of 40.1% (NCV) in 2010. At a lower share of gas, i.e. in 1990, the difference was 0.5 percentage-points (32.3% instead of 32.8%).

this, Eurostat uses geothermal heat –i.e. not fossil fuel-- as a transformation input for conventional thermal power plants.

2.3.5. Calorific value of fuels

As mentioned, with respect to definitions in MEErP and most Ecodesign regulations, some concessions have been made to be in line with the Eurostat energy balance accounting.

Notably the Net Calorific Value NCV (a.k.a. lower heating value H_i) of fuels has been used as an accounting basis and not the Gross Calorific Value GCV (a.k.a. higher heating value H_s). This means that for all products using gaseous and liquid fuels directly, the efficiency values in the preparatory and IA studies –which were usually in GCV-- had to be corrected upwards, e.g. with a factor 1.11 for natural gas, 1.08 for LPG and 1.065 for heating oil. For solid fuels the NCV equals GCV; for solid biomass products the humidity content of the fuel plays a role, but this was already taken into account in the various studies and did not require correction.

In Eurostat energy balances, at the level of the final demand, the NCV (in kWh) relates strictly to the combustion value of the fuel end product (heating oil from the tank, the natural gas from the pipe, etc.). There is no record of, or correction for, the energy needed in their procurement outside the EU (exploration, drilling, mining, transport, etc.). Most LCA (Life Cycle Assessment) literature and standards include this energy expenditure at the level of final demand. Also in the MEErP's *EcoReport* tool there is a correction, depending on the fuel, between 5 and 10%.[30] However, apart from some incompatibility with the *EcoReport* outcomes, this particular practice does not pose too much of a problem, because the (conventional) energy analyses in the various preparatory and IA studies also use the calorific value without an extra correction for fuel extraction and -transport. And also the power generation & distribution coefficient for electricity does not use such a correction and thus a fair comparison between electricity and primary energy is still guaranteed and no correction was applied.[31]

Also in line with Eurostat, no extra energy credit is given to biomass products, because of their renewable character. For the two product groups where this could have an impact, i.e. local heaters (i.e. including biomass stoves) and solid fuel boilers, this does not give a problem because the regulations for these product groups treat the credit (BLF=1.45) as an ex-post factor that is clearly separated from the overall calculation, regarding only the determination of the Energy Efficiency Index for energy labelling purposes.

The same goes for the Global Warming energy efficiency bonus for Room Air Conditioners (RACs) that RAC Ecodesign regulation applies to RACs using refrigerants with a low-GWP value. This bonus, which is evidently not a part of the Eurostat accounting, is treated separately in the underlying studies and no correction was needed.

A table with NCV-values (from Eurostat) is given in the acronym section at the beginning of this report.

[30] MEErP, Part 2, Table 18 (p. 118). For fuel extraction & transport of gas +7%, of oil +10%, of wood pellets and –logs +5% (original data from the GEMIS database v.4).

[31] Note that if such a correction was applied then strictly speaking the conversion would be 1 kWh electricity = 2.7 kWh primary energy, but also 1 kWh natural gas = 1.07 kWh primary energy. And thus it is plausible that the power generation factor CC_1 is still 40% (reverse of factor 2.5)

2.3.6. Global Warming Potential

In accordance with EU legislation, the GWP-100 emission rates for fuels and refrigerants are given by the latest reports from the IPCC (Intergovernmental Panel on Climate Change). Values for the fuels and the average refrigerant mix for relevant (cooling) products can be found in the sheet EMISSRATES (see Annex A).

The GWP-100 emission rates for electricity production are in accordance with MEErP and also given on the same sheet.

The EMISSRATES sheet also contains emission rates for NO_x, CO, OGC, PM and Noise, but these are product-specific and not generic parameters.

Direct fuel-related NO_x, CO, OGC and PM emissions were addressed in studies on central heating boilers, water heaters, solid fuel boilers, local space heaters and some air heating products using fuel input. In some cases the associated Ecodesign regulation also specifies emission limits, see details on the EMISS sheets in Annex A.

Indirect fuel-related CO_2 emissions were addressed in all the other studies, i.e. those dealing with electricity consuming products.

GHG emissions from refrigerants were addressed in all studies on cooling appliances: domestic and non-domestic refrigeration as well as domestic and non-domestic air-conditioning. For domestic refrigeration the GHG-emissions did not result in measures because almost all products used low GHG refrigerants (isobutane). For room air-conditioners a bonus on energy efficiency requirements of 10%, when using low GWP refrigerants (GWP = 150), is included in the Ecodesign Regulation.

A similar low-GWP bonus is also present in the regulation on professional refrigeration for Condensing Units and Process Chillers (not for Storage cabinets). The proposed regulation for Commercial refrigerated display cabinets does not foresee a similar bonus.

Global Warming Potential (GWP-100, latest IPCC) of electricity, fuels and refrigerants is given in the EMISSRATES sheet, Annex A.

2.4. Core variables: SLEPIX

There are 6 core variables that are the backbone of Ecodesign impact accounting: Sales, Life, Eco-impacts, Price, Improvement and eXtra costs (SLEPIX). The first four (SLEP) are essential for both the BAU and ECO scenario; the last two (IX) are –also—needed for the ECO scenario. The core variables apply to all base cases, i.e. the typical subcategories, in the product group.

BAU & ECO

- Sales (annual unit sales for relevant years t, in 000 units), symbol S_t
- Life (product service life in years), symbol L or L_t
- Eco-impacts per new product (see 2009/125 Annex I, e.g. energy in kWh/a for relevant years t), symbol E_t
- Price (consumer end price in year t, in fixed Euro 2010; also includes installation costs, VAT and possible End-of-Life costs), symbol P_t

ECO (with new measures)

- Improvements of Eco-impacts per new product (e.g. energy saving in kWh/a), symbol I_t

var
S_t
L or L_t
E_t
P_t
I_t
X

- eXtra costs and benefits from improvements (e.g. from price elasticity in euro/(kWh/a), fixed Euro 2010), symbol ***X***

Note that 'fixed Euro 2010' means that all tariffs and prices from other years are inflation-corrected back to 2010 euros. The year 2010 is chosen because it is the most recent and robust reference.

In principle, the retrieval of these variables from most preparatory and IA studies did not pose too much trouble. Only in some cases, e.g. the IA study for Tyre Labelling, not all of these variables were given and this required the contractor to do additional study.

2.4.1. Sales and Life

In principle, the sales and life data for both the BAU and ECO scenario are assumed to be identical. Only the projected sales data scenarios (from 2009 onwards) for light sources are not identical, since the key to energy saving lies in the switch between the base-case types (incandescent bulbs, compact fluorescent lamps, LED lamps, etc.). Hence, the SALES sheet shows two sets of sales data for light sources: One for BAU and one for ECO.

The product life is also assumed to be the same for BAU and ECO base-case scenarios. For 90% of the products, the product life is a fixed integer number ***L***. Only when the product life is less than 8-10 years approximately, the relevant data is expressed by a fractional number. Such is the case of light sources (LS), vacuum cleaners (VC) and electronic displays (DP), (see also par. 2.3.2 on time index t). Finally, there are two product groups – household vacuum cleaners and electronic displays - whose product life (expressed by the year index L_t) varies per year. This approach was required in order to ensure that the stock and sales data match with the real figures. The product life data (in years) appear in the 3rd column of the STOCK sheet. For televisions and vacuum cleaners, data are displayed as a time series, below the general table of the STOCK sheet.

2.4.2. Eco-impacts

Absolute figures

In principle, the Eco-impact data relate to the whole range of direct and indirect use of resources and emissions of the energy-related product (ErP) considered. So far, they include energy consumption during use (expressed in kWh/a [32]), water consumption (litres per year[33]), emissions (g or kg per year), paper consumption (kg per year). The EU totals, on the other hand, are expressed in larger unit scales, e.g. TWh (terawatthours=10^{12} Wh), M m³ (million m³= 10^{12} litres), Mt (megatonnes= 10^{12} kg), etc.

On the emission side, it is clear that energy savings also reduce fuel-related CO_2 emissions. The CO_2-emissions from refrigerants are also addressed in the relevant products covered by Ecodesign (e.g. air conditioners and commercial cooling appliances). NO_x emission limits are covered by the regulations on central heating

[32] For some appliances, e.g. using fossil fuels, preparatory studies express energy values also in MJ (1 kWh=3.6 MJ). These values were all converted to kWh for reasons of consistency and easier accounting. For statistical purposes also ktoe (kiloton of oil equivalent, 1 ktoe= 11.63 kWh= 41.868 MJ) is used.

[33] Or per test cycle and then –through a default number of test cycles- translated to litres per year. Note that the preferred ISO-unit is dm³, but 'litres' is more easily understood by the sector and the larger public.

boilers, water heaters, solid fuel boilers (SFB), certain local space heaters (LSH) and by the proposed regulation on other fossil-fuel fired space cooling and –heating products (AHC). For solid fuel combustion appliances and non-electric local space heaters, limits on other direct emissions - such as CO (carbon monoxide), PM (particulate matter) and OCG (organic gaseous compounds)- have also been introduced. Finally, noise emissions limits (sound power) are reported for heat pumps (part of CH and WH), room air-conditioners (RAC), vacuum cleaners (VC) and replacement tyres (TYRE). Further noise emission limits may follow for e.g. central air conditioners (CAC).

The EU total ECO impact figures can be found in the following sheets: NRGBAU/NRGECO/NRGSAVE (primary energy total), ELECBAU/ELECECO (electricity), FUELBAU/FUELECO (fossil fuels), EMISSBAU/EMISSECO/EMISSSAVE (emissions) and the RESOURCES sheet.

Load and functional performance

The ecodesign measures do not stand alone, but are linked to the functional performance of the product for the consumer. The accounting method and this report use the expression 'load' for this functional performance, i.e. the term used in the test standards that are dealing with the technical and quantitative assessment of this parameter. Load values are described in Annex A (LOAD sheet), with further explanations of the test and calculation procedures in 'LOAD Notes'. The load of the product is expressed by parameters such as:

- kWh per year heating or cooling for a given nominal capacity of the product (in kW),
- the energy equivalent in kWh per year of the annual hot-water volume delivered with a certain temperature according to a declared standardised tapping pattern,
- m^3 of ventilation air per m^2 building surface with a certain effectiveness and heat recovery[34],
- lumens (lm) emitted by light sources,
- dm^2 of viewable surface area of TVs displaying standardized dynamic video content,
- standard test cycles, mimicking typical (standby- and) usage pattern as well as usage intensity,
- m^3 of storage volume at chill (e.g. +5°C) and/or freezing (e.g. -18°C) conditions, for food preservation,
- dust pick-up (dpu in grammes of test dust) on hard floor and/or carpets, for vacuum cleaners,
- kg of laundry washed and dried according to predefined test cycles,
- kWh of mechanical or aero-/ hydrodynamic labour performed by motors, fans, pumps and compressors, etc..

The description is simplified. Typically, these parameters are based on comprehensive European test standards, which guarantee that the tests are accurate, repeatable (i.e. produce the same results independent of the lab), cost-effective as well as representative of real-life as possible. In the LOAD Notes sheet (Annex A) a brief introduction to the relevant test- and calculation procedures can be found. Also in Annex

[34] And at a minimum pressure difference (in Pa) to overcome the resistance of the system.

A, in the EU-LOAD sheet, the aggregated EU levels are provided as background information.

Efficiency

The 'efficiency'[35] is the ratio of the Eco-impacts per unit of load for energy and material-inputs. For most emissions, the thresholds ('emission limits') are also expressed indirectly, as a function of the unit load, e.g. per unit of energy input (mg/kWh). Efficiency, not the absolute value of the Eco-impact, is the parameter which is usually regulated by the ecodesign and labelling measures, since – as it is explicitly stated in the legislation—there should be no significant negative impact on functional performance as a result of these measures.

The efficiency values are shown in the EFNBAU/EFNECO sheets. The data refer to the efficiency of the new products on the market in a particular year. The efficiency of the average installed product (the 'stock') is a derived parameter, which is displayed in the EFSBAU/EFSECO sheets. By stock efficiency is meant the sales-weighted average efficiency of all products that were sold in past years, which have not yet reached the end of their life-cycle.

The 'efficiency' value/data represents the ratio between the relevant Eco-impact measuring unit (parameter) and the load unit (parameter). Sometimes the efficiency value is given in percentage value, when the two parameters are expressed by the same measuring unit. Such is the case, for instance, of space cooling and heating, whose input (Net Calorific Value of the fuel input) and output/load are both expressed in kWh (heat output). The value then becomes 'dimensionless' (usually a decimal value, often expressed in %). In some instances, when the 'load' is established through a test cycle which could include simultaneous testing of several functions that a typical product performs, the suitable measure is the energy input (in kWh) for the test cycle. In this case the expression TEC is used (Test Energy Consumption), according to the relevant measures, mentioning a maximum allowed TEC. If the outcome of a test cycle (expressed by TEC) is weighted against the TEC of a predefined reference product having the same performance, we obtain the so-called 'Energy Efficiency Index' (EEI), a parameter commonly used for many household appliances.

Where possible, for reasons of transparency, the same efficiency-unit has been used in EIA as in the Regulation.

In many cases, the efficiency can easily be converted back to energy consumption. It suffices to divide the load by the energy efficiency (using the EFSBAU and EFSECO sheets). Where the 'efficiency' is expressed by a TEC value, the energy use in kWh per test cycle and the aggregated kWh data per year are already indicated in the test standard. If for the calculation an EEI has been used, the extraction of the calculation energy consumption from the EEI is less straightforward, because several additional parameters have to be estimated.

The largest difficulties arise when the performance test standards are not conceived according to real-life operation, for reasons such as repeatability and accuracy of the performance test findings. This is for instance the case of household washing machines, where the wash temperatures actually set by the consumer are considerably lower than those used in the test standard. In such a case, where 'real-life operation' and the 'standard' base-case findings are provided in the relevant preparatory studies, for the purpose of ecodesign impact evaluation the 'real life' energy consumption has been

[35] Or 'luminous efficacy' for light sources, 'Seasonal space heating/cooling energy efficiency for the heating/cooling performance of heat pumps/air-conditioners, 'Seasonal Energy Performance Ratio, SEPR' for high temperature process chillers, etc.

favoured, because –even if less accurate—it affords a higher level of consistency with other sources (Eurostat, in-situ measurements, etc.).

2.4.3. Price

A base-case price comprises the total acquisition costs per unit, including the installation costs, the price of auxiliary materials and VAT. In general, the preparatory studies have retrieved the prices for various EU countries (Task 2 of the study) and subsequently determined an average sales weighted price for the reference year of the study, in consensus with the stakeholders.

In order to apply the accounting / calculation method to all products, the authors had to process prices referring to different reference years, and convert them to fixed 2010 prices – i.e. inflation adjusted.

The base case price, however, changes not only as a result of inflation, but also as a result of efficiency gains of most products. In order to incorporate this effect, and make the prices comparable on an equal footing, the authors opted for the dynamic correction mechanism that was used for determining the improvement (I) and the extra costs (X), when establishing the base-case (BC) price per year. (see e.g. Annex A, sheet PRICE)

2.4.4. Improvement potential and extra costs

In line with the framework directive and as further detailed in the MEErP, the preparatory and IA studies strive to determine the mix of design options for a product at the least life cycle cost (LLCC) point and the point in the curve with the Best Available Technology (BAT), for benchmarking. To this end technical analysis and costing of design options were carried out. Further explanation on LLCC and BAT can be found in the MEErP.

This implies that, beside the BC (Base-Case) price referred to in the previous paragraph, information should be available on both the Eco-impacts (usually energy during use, expressed in in kWh/a or % efficiency), and the price (in euros) at the LLCC point and BAT point of the curve.

By interpolation between three anchor-points –BC, LLCC and BAT—the price at any efficiency point can be calculated. The relevant information on the three anchor points is given in the PRICE sheet (Annex A). The outcome of the interpolation - expressed, in €/unit for the given efficiency figures (from EFSBAU and EFSECO sheets) -, is reported in the PRICEBAU and PRICEECO sheets.

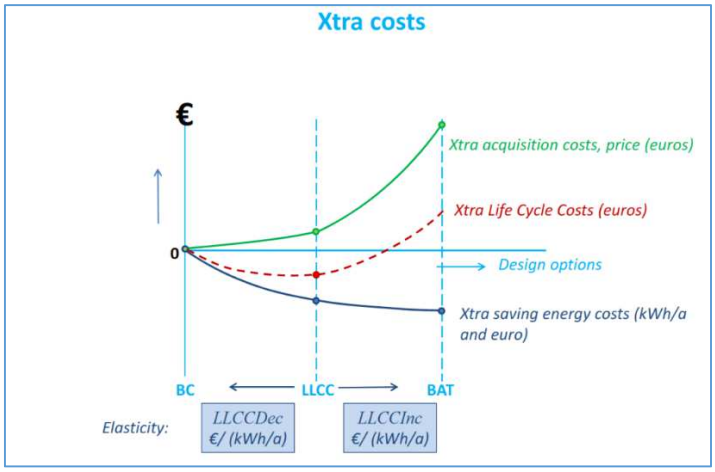


Figure 2. Illustration of anchor points in the calculation of the Least Life Cycle Costs.

2.5. Derived variables and constants

2.5.1. Eco-impacts

From the core variables the following variables can be derived in the BAU & ECO scenarios:

General

- EU Stock (EUS): the sum of the sales (S) over a number of years that equal the product life (L) *[sheet STOCK]*

For Eco-impacts

- Unit Eco-impact Stock (UES): the average sales-weighted Eco-impact per unit installed [sheet EFSBAU and EFSECO for energy, sheet EMISSRATES for refrigerants and some emission types, sheet RESOURCES for water and paper consumption]
- EU Eco impact: the EU stock (EUE) multiplied by the average sales-weighted Eco-impact per unit installed (UES) [sheet NRGBAU and NRGECO for primary energy, split between electricity ELECBAU & ELECECO and fossil fuels FUELBAU & FUELECO, sheet EMISSBAU & EMISSECO]

The following are equations for Eco-impacts:

$$EUS_0 = \sum_{t=0}^{-L} S_t \quad [1]$$

$$EUE_0 = \sum_{t=0}^{-L} S_t \times E_t \quad [2]$$

$$UES_0 = EUE_0 / EUS_0 \quad [3]$$

2.5.2. Monetary impact for the consumer

For the assessment of monetary impact for the consumer, the maintenance and repair costs per unit (in euro/a) are also needed. These constants are provided in the PRICE2 sheet (5th data column with header 'maint').

Monetary impact for the consumer

- EU acquisition costs (EUA): the business-as-usual price P (BAU scenario) or the improved product price (P + X*I) multiplied by the unit sales (S) *[sheets ACQBAU and ACQECO]. This includes purchase price, installation costs (if any), end-of-life costs (if any) and VAT (for residential buyers);*
- The energy costs (EUE), which can be determined by multiplying the energy consumption (data from ELECBAU/ELECECO/FUELBAU/FUELECO) by the appropriate energy rates (see par. 2.3.3). *[sheets NRGCOSTBAU and ERGCOSTECO]*;
- Maintenance costs (EUM), which are determined by multiplying the EU stock (EUS) by the constants mentioned above *[sheet MAINT_INCL]*;
- The costs of consumables such as water, paper, etc. are stated per unit and as EU total (EUAUX) *[sheet RESOURCES]*;

- EU Running costs (EUR): the sum of the energy costs (EUE), the maintenance & repair costs (EUM) and the costs of auxiliary resources (EUAUX) *[sheets RUNBAU and RUNECO]*;
- EU consumer costs (EUX): the sum of acquisition costs (incl. End-of-Life costs if applicable) EUA and the running costs EUR.

The following are the equations on consumer expenditure:

$$EUA_0 = S_0 \times P_0 \quad [4]$$

$$EUM€_0 = EUS_0 \times Rmaint \quad [5]$$

$$Rel\ (>2010) = Rel_0 \times (1 + Relinc)^{(year-2010)} \quad [6]$$

$$EUE€_0 = EUE_0 \times Rel_0 \quad [7]$$

$$EUR€_0 = EUM€_0 + EUE€_0 + EUAUX_0 \quad [8]$$

$$EUX€_0 = EUA_0 + EUR€_0 \quad [9]$$

2.5.3. Monetary business impacts/revenues

For the estimate of the business revenue for the various stakeholders, a number of constants needs to be assessed to further subdivide the unit prices [P of *sheets PRICEBAU/PRICEECO*] or the total acquisition costs for EU-28 [EUA of *sheets ACQBAU/ACQECO*]. These are given in the PRICE2 sheet:

Economic constants

- Installation cost fraction of Price (*Instfrac*); the Price excluding installation costs (but including VAT) is P*(1-Instfrac).
- Manufacturer fraction of P*(1-Instfrac) (*Manufrac*);
- Wholesaler fraction of P*(1-Instfrac) (*Wholefrac*);
- Retailer fraction of P*(1-Instfrac) (*Retailfrac*);
- Value Added Tax (*VAT*) of P*(1-Instfrac) (*VATfrac*);
- Maintenance and repair costs (*Rmaint*), in euro/a (if applicable)[36].

constants
Instfrac
Manufrac
Wholefrac
Retailfrac
VATfrac
Rmaint

Residential consumers are assumed to pay 20% VAT. Non-residential consumers are assumed to pay no VAT. The share of consumers paying 20% VAT is an input parameter on the sheet PRICE2 (*VATshare*). The average consumer thus pays *VATavg%= 20%*VATshare*. This amount of taxes is already included in Price, so *VATfrac = VATavg% / (1+VATavg%)*.

[36] Rmaint, Manufrac, Wholefrac and Retailfrac values differ in principle per product, but –because they tend to be very similar across a large range of products—the current modelling uses single default values for clusters of products.

For the assessment of the business revenues, the following equations apply:

$$EUManu€_0 = EUA_0 \times (1\text{-}Instfrac) \times Manufrac \quad \text{(excl. VAT)} \quad [10]$$

$$EUWhole€_0 = EUA_0 \times (1\text{-}Instfrac) \times Wholefrac \quad \text{(excl. VAT)} \quad [11]$$

$$EURetail€_0 = EUA_0 \times (1\text{-}Instfrac) \times Retailfrac \quad \text{(excl. VAT)} \quad [12]$$

$$EUVAT€_0 = EUA_0 \times VATfrac \quad \text{(incl. VAT on Install costs)} \quad [13]$$

$$EUInst€_0 = EUA_0 \times Instfrac \quad \text{(incl. VAT)} \quad [14]$$

2.5.4. Socio-economic (employment) parameters

The direct employment impact of the measures - i.e. the increase of employees in the value-adding chain - is derived from the business revenues in the various sectors, using the following constants. The same constants ('wages' [37]) are used for all products:

- Manufacturer's 'wages': 0.15 m euro/employee ±10%. It is assumed that associated OEM jobs and Service jobs are each of the same order of magnitude. Including also these jobs the 'wage' reduces to 0.05 m euro/employee, which is the quantity used in EIA. Currently no distinction is made if these jobs are inside or outside EU-28.
- Wholesale 'wages': 0.25 m euro/employee ±20%
- Retailer 'wages': 0.06 m euro/employee ±20%
- Installer 'wages': 0.1 m euro/employee ±20%
- Maintenance 'wages': 0.1 m euro/employee ±20%

constants
Manuwages
Wholewages
Retailwages
Installwages
Maintwages

All constants are in fixed 2010 euros. Equations are given below

$$EUManuJobs_0 = EUManu€_0 / ManuWages \quad \text{(incl. OEM and Service jobs)} \quad [15]$$

$$EUWholeJobs_0 = EUWhole€_0 / WholeWages \quad [16]$$

$$EURetailJobs_0 = EURetail€_0 / RetailWages \quad [17]$$

$$EUInstallJobs_0 = EUInstall€_0 / InstallWages \quad [18]$$

$$EUMaintJobs_0 = EUMaint€_0 / MaintWages \quad [19]$$

[37] These are not actual wages but total company revenue divided by staff.

2.6. Aggregation

The data aggregation is done at four levels:

1. Base cases: average products –possibly subdivided—covered by a measure (data in normal font in the tables and spread sheets);
2. Product groups: aggregate of the base cases (data in **bold** font);
3. Functional groups: aggregates of one or more product groups having the same basic functionality. These are: water heating, space heating, space cooling, ventilation, lighting, electronics, cooking, food preservation, cooking, cleaning, energy sector, transport sector. (**COLOURED CAPITAL** font)
4. EU totals: aggregate of the functional groups (**BLACK CAPITAL** font).

In principle, each level is the straight sum of the figures at the previous level. Yet, there are some exceptions, as explained hereafter.

2.6.1. Double counting and transparency

There are several product groups, for which whole or a part of the energy consumption / savings are implicitly included in other parts of the accounting. Ignoring this fact leads to double counting and, consequently, unrealistic energy savings and energy figures, inconsistent with Eurostat total figures.

When tackling this problem, the first priority is transparency. Whatever the accounting solution applied, this means that it must be reversible. In other words, the original data need to be provided and it must be possible to adopt another partitioning or accounting method –for whatever reason-. Hence, the table always presents the original data from the underlying studies, be it at the level of base cases or –only if there is no split-up in base cases—at the level of product group totals.

2.6.2. Double counting of components and products

The most frequent case of (partial) double counting occurs when a product is regulated both at the level of components and at the level of the product as a whole. As an example, a part of the industrial motors is included in the industrial fans and a part of the industrial fans is included in non-residential mechanical ventilation units (e.g. centrifugal fans), air conditioning/heat pump/refrigeration products (e.g. axial convection fans), very large boilers (typically centrifugal combustion fans), etc. In such an instance, the regulation takes place possibly at 3 levels and, by and large, the energy figures in the 3 underlying studies relate to these 3 levels separately. Summing the energy data from these three studies could result in a considerable overestimation of the energy consumption and savings. A double counting correction factor ('*db*') has therefore been introduced to avoid this.

The *db* correction applies to motors (*db*=0.5), fans (*db*=0.5), circulators (*db*=1, auxiliary energy of boilers) and condensing units (*db*=0.6, double counting with commercial and professional refrigeration products). It is listed in the first column of the relevant spreadsheets/tables. For motors and condensing units the value of the *db* is based on a first dedicated study, even if more work remains to be done; for other products the *db* correction factor is a first rough estimate by the author, since there is no comprehensive underlying information on this issue.

For the sake of transparency (see above), the *db* correction is not applied at base case level, but at product-group totals level or –as mentioned above—at the level of functional group totals. The EU total being the sum of the functional groups, a *db*

correction applied to a product group or to a functional group total leads to only 50% (*db*=0.5) or 0% (*db*=1) of the original energy data to be taken into account in the EU total.

As already stated, the introduction of the double counting correction is new. At product level studies it has so far been treated only in a qualitative way. The correction is very relevant for policy purposes, when the implication of the overall measures are considered.

2.6.3. Complex double counting issues

The *db* correction (*db*=1) also applies to the space heating energy impact (saving) of mechanical ventilation units (VU), and the energy consumption of distribution transformers (TRAFO).

In this case, it is not so much a question of being a physical component of another regulated product group. The double counting issue is more complex.

Ventilation units

Ventilation Units (VUs) consume electricity in order to drive fans, etc., which in a regular aggregation is taken into account without *db* correction. However, VUs also reduce heat losses in buildings compared to the reference case (natural ventilation: opening windows and infiltration). They allow for a more effective (controlled) and efficient air exchange and for heat recovery. Since ventilation heat losses account for 30-50% of the net heat load of a building, the load decreases and consequently the space heating products (so-called 'Energy related Products' of ventilation units), use less energy.

A full dynamic modelling/accounting of this interaction was not included in the scope of the underlying preparatory and IA studies. The ventilation unit studies took into account the interaction to a certain extent (i.e. where data were available), but there is no detailed study of BAU and ECO scenario for the net heating load. In the impact assessment studies on space heating products, such an approach is not even desirable, since they aim to identify the savings resulting only from the space heating system efficiency.

For this reason a pragmatic solution has been chosen to overcome the double counting issue

- For transparency sake, the BAU and ECO scenarios show at base case level the absolute heating energy savings as reported in the underlying studies;
- As can be expected, in the ECO and BAU scenarios the base case data for both electricity (in primary energy equivalent) and space heating savings are aggregated at the level of product group;
- The functional group totals (and thus the EU totals) include the electricity consumption, that is the total electricity consumption of the base cases. For the ECO scenario — and only for this scenario –this value is combined with the marginal improvement in net heat load saving, i.e. added as a negative figure in the NRGECO sheet or expressed as a negative value in the FUELECO sheet.

The savings produced by the ventilation units have been calculated with a fixed boiler efficiency of 75%, the representative value for the years 2013-2015 according to the preparatory study. The boiler efficiency has actually been changing over the years. At first, there was an increase in the benefits of lower heat load improvements, and later– after 2013/2015—a slight decrease in the benefits of lower ventilation heat losses. In order to take these developments into account, the heat savings from the VUs have

been first multiplied by 0.75 and then divided by the actual boiler efficiency (from Lot 1[38]).

On the NRG-, ELEC- and FUEL-sheets in Annex A, the product group 'Total VU' provides the electricity consumption + the saving on space heating as compared to the reference case of natural ventilation. The functional group 'TOTAL VENTILATION' provides the same electricity consumption + the saving on space heating (in the ECO-scenario) with respect to the BAU-scenario, corrected for space heating efficiency different from 75%.

Distribution transformers

Distribution transformers are part of the 'power generation & distribution efficiency', of 40% (default), which is applied to all electricity consumed. Adding their consumption in the EU final demand totals would lead to double counting. As with ventilation units the accounting sets the BAU scenario, at the level of functional group (Energy sector), to zero (0) and only looks at the marginal improvements (the savings), expressed as negative numbers, in the ECO scenario.

In the December 2015 issue of EIA the use of BAU=0 as reference was applied to all parameters except acquisition costs (ACQ), running costs (RUN) and total consumer expenses (EXPENS). This was judged confusing because running costs and total expenses included the costs of the entire energy consumption while the energy sheets (NRG, ELEC) counted only the energy savings with respect to BAU. In addition it can be argued that the acquisition costs of distribution transformers are already included in the electricity rates (the electricity consumer also pays for the distribution), so that considering them again would be a double counting. Therefore, in EIA II, BAU=0 as a reference is now applied to all parameters, including ACQ, RUN and EXPENS, and the ECO scenario only considers the improvement over BAU. This changes only the BAU and ECO values but not the savings (BAU-ECO). Revenues and jobs for the Energy sector are determined in the same way as for all other products.

This approach also solves the problem when –instead of the 40% default value—a more realistic time series for power generation & distribution efficiency is used.

2.6.4. Multifunctional product groups

There are two product groups with possibly –if they are reversible- a double function. This occurs with central air conditioners (AC, part of Lot 6/21) and room air conditioners (RAC, Lot 10). Each function is accounted in a separate aggregated functional group, i.e. space heating and space cooling.

The costs of these products have to be partitioned between those two functions. For the running costs this does not pose any particular problems because the cooling and the heating function each has its own energy consumption and also maintenance costs can be considered proportional to the intensity of use. The multifunctional product can thus be treated as two separate products, a cooling product and a heating product, in the accounting.

For the acquisition costs there is a problem, because it still is one single product with a single price and installation costs. In that case it would be misleading to partition those costs only to one function (e.g. cooling), because it would make the alternative function extremely cheap (zero costs). A partitioning according to the kWh cooling and heating performance would also not be completely fair, because it means that the climate

[38] The designation 'Lot' plus a number refers to the numbering of the preparatory study contracts, commonly used instead of the full title . Numbers are given in the Appendices B to D.

determines the price and –in the average EU climate with a 7 month heating season and a 3-5 month cooling season this results in a dominance of the heating function. It would also not reflect the consideration of the buyer/user of the product, who definitely –and sometimes mainly—is interested in the cooling functionality.

In short, a simple partitioning according to basic functions (cooling and/or heating) seems most appropriate and was applied. The formula for the price split is: sales of product with (also) cooling functionality divided by the sum of sales of products with (also) cooling and sales of products with (also) heating[39]. This split is done in the ACQBAU and ACQECO sheets.

The price-elasticity of the efficiency improvement (in €/% or €/kWh) for both functions may be different, i.e. it may be more costly to improve heating efficiency than the cooling efficiency. So there are in principle, in the PRICEBAU and PRICEECO sheets, two different datasets: one for cooling and one for heating. In a second instance, depending on the measures implemented, it is then determined in the ACQBAU and ACQECO sheets which function leads to the highest price of the single product. In Excel formula the MAX formula is used, e.g. MAX(PRICECOOL, PRICEHEAT), to determine which one is dominant.

2.7. Increase in material wealth and rebound effect

As mentioned in par. 2.2, the BAU scenario is not a 'freeze' scenario; it is derived from extrapolating historical trends, at the time of the preparatory study analysis, including possible ongoing market trends in efficiency improvement and emission abatement.

Both the BAU and ECO scenarios are –in most underlying studies- dynamic in the assumptions on market demand and increase in performance. Population is growing and the trend is towards more and bigger appliances, lamps, computers, televisions, etc. in households. For a small part this is a *'rebound'* effect, i.e. the effect of lower energy consumption (costs) induce more abundant use of the product's services. But in general it is more a matter of steadily increasing material wealth.

This can be illustrated by the case of televisions, where there has been a –still ongoing-- tremendous growth in screen size and the number of televisions per household. Few people would claim that this is a result of a 'rebound' effect that is linked to the energy consumption of the TVs, even though –since the CRT and plasma TVs were replaced by the LCD TVs—there has been a large increase in television energy efficiency (expressed in W/dm² screen area, see Figure 3). It is simply a matter of increased wealth, i.e. satisfying more wants and needs. And both the BAU and ECO scenario assume that these wants and needs continue at roughly the same pace.

[39] Equation e.g. PRICE_COOL= PRICE* COOL_SALES/(COOL_SALES+HEAT_SALES) and PRICE_HEAT= PRICE* HEAT_SALES/(COOL_SALES+HEAT_SALES)

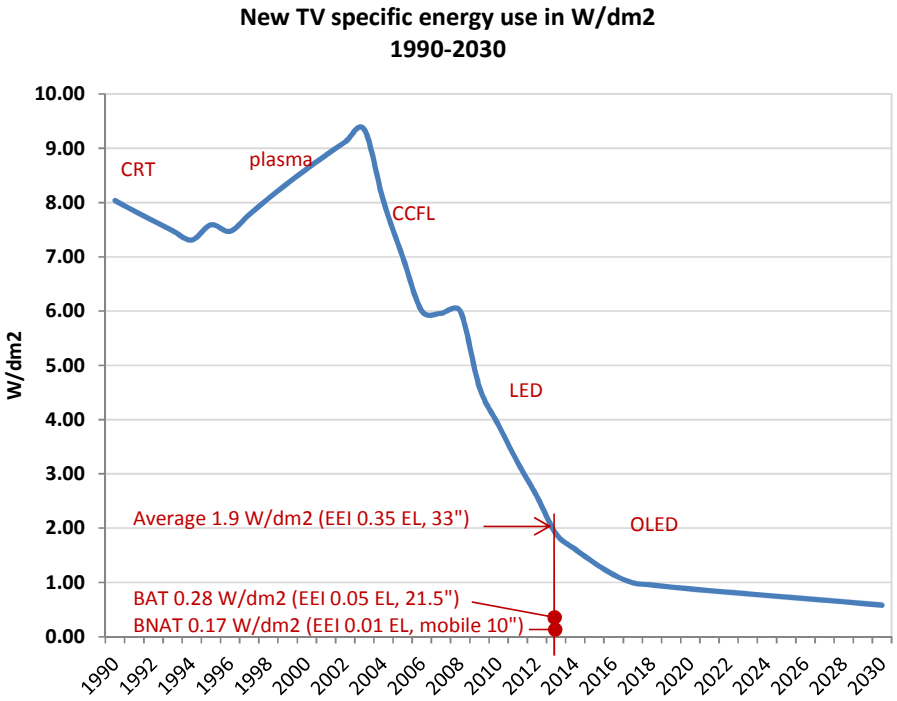


Figure 3. Specific energy use in W/dm² of new TVs

The average viewable surface area grew from 10 dm² (19" diagonal) in 1990 to 28 dm² (32") in 2010 and is projected to rise to an average 71 dm² (51") in 2030. In parallel, the number of televisions per households grew from 1.3 in 1990 to 1.9 in 2010 and will be close to 3 TVs per household in 2030. The average viewing hours per TV, or rather per 'electronic display'[40], are assumed the same.

The result is an increase in TV-performance, i.e. viewable surface area, per household of a factor 16 between 1990 and 2030. In an imaginary 'freeze' scenario, with efficiency at 1990 level, this would lead to an increase in electricity consumption with a factor 20. Instead, due to an efficiency improvement with a factor 20 –with technologies largely known today-- the ECO scenario shows an absolute electricity consumption in 2030 that is even lower than in 1990. The 2030 BAU scenario is higher than in 1990 (factor 2) but still nowhere near the factor 16 of a 'freeze' scenario.

The text box on the next page gives the numbers at EU level, i.e. also taking into account population growth.

The TVs are an extreme case, but many products in the 'electronics' group show a similar pattern. For light sources there has been, and is projected to be, a steady increase in the number per household (and non-residential applications). Water heaters and combi-boilers show a continuous trend for more hot water (mainly due to more showers). Most household appliances, like fridges, freezers, laundry appliances, etc., showed an increase in capacity (larger refrigerated volume, larger drum of washing machine, etc.) often considerably beyond population growth. The numbers are given in the LOAD and EULOAD sheets of Annex A. The summary per product group in Annex E gives a short overview of these trends.

[40] There has been a convergence of functionality between TVs and (non-integrated) computer monitors. Therefore the latest Commission proposals combine them as 'electronic displays'.

The only product groups where the load per product actually diminishes –following the ongoing historical trend from the last decades—is 'space heating' and 'space cooling'. In general, both the BAU and ECO scenarios (so there is no effect on the differences between the scenarios, see par. 2.2) assume a fixed heating/cooling load-reduction of 1% per year, as a result of the building related measures.

CASE: Televisions

The accumulated EU viewable surface area grew from 21 km² in 1990 to 125 km² in 2010. This is a factor 5 growth, while the energy consumption grew only by a factor 2.5. This is a 50% efficiency improvement, but because the absolute energy use went up it passed largely unnoticed.

In 2030 the total viewable surface area is projected to be 429 km²,a surface comparable to that of the city of Paris. With the latest miniaturisation in electronics and ever more efficient LED backlighting the energy efficiency improvement will be stronger and is projected to result –in the BAU scenario— in an electricity consumption that is lower than in 2010 (going from 86 to 62 TWh/a). In the ECO scenario it is projected that in 2030, with technologies largely known today, a further 58% reduction versus BAU is possible and the electricity consumption can be contained at 26 TWh according to the latest impact assessment. Compared to 1990 this is an efficiency improvement, in W per dm² of viewable area, of around a factor 25.

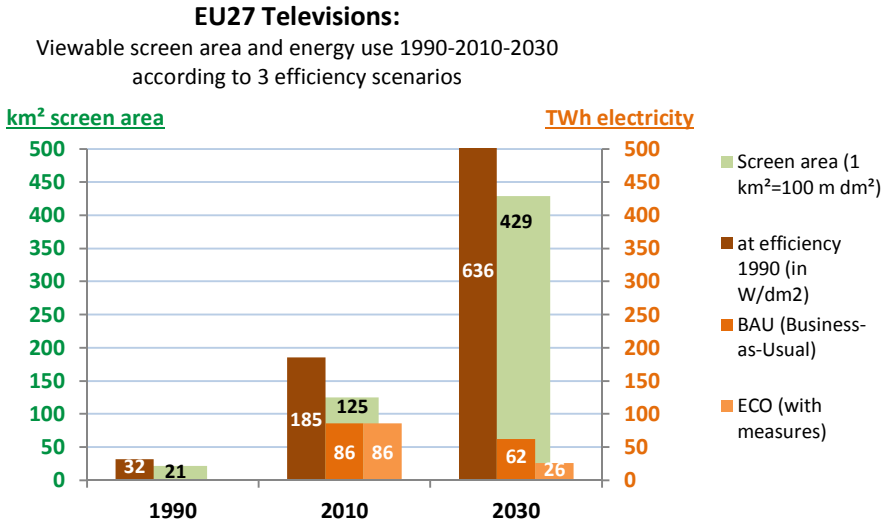


Figure 4. EU-28 television 1990-2030. Evolution of the load as well as the energy consumption according to 'freeze', BAU and ECO scenarios

2.8. Compatibility with Eurostat conventions

The results of the calculation method are used for EU policy purposes. This means that they should be comparable to Eurostat data for the whole of Europe and thus preferably be compatible with the main Eurostat conventions in the field of energy statistics.

The efficiency units are thus in line with the conventions used in the Eurostat energy balance, i.e.

a) The efficiency of fossil fuel fired space heating devices is expressed in Net Calorific Value (NCV) of the fuel, which means that the latent heat of the combustion is not taken into account and therefore can lead to efficiency numbers higher than 100% for gaseous and liquid fossil fuels.

b) In line with the convention under point a) there is no credit for the renewable character of pellets- or biomass driven space heating devices.

c) As a result of convention under point b), the efficiency of micro-CHP (cogeneration) is the ratio between the sum of kWh heat and kWh electricity output and Net Calorific Value of the fuel input, i.e. there is no credit for the fact that the electricity output is displacing electricity output, generated with a 40% efficiency, from the grid.

Note that the above Eurostat conventions are in line with other national statistics, they are not in line with the metrics used in most current and upcoming Ecodesign and Energy Labelling (delegated) regulations. There –for various technical and political reasons-- indeed bonuses and penalties may be taken into account and for engineering purposes it is considered more appropriate to use the Gross Calorific Value (GCV) of fuels.

In order to check compatibility with Eurostat data, the contractor performed a cursory analysis, to verify whether there could be a match with EIA II data also in the results. This was done for the sector with the most complete coverage, i.e. the **residential** electricity consumption.

On average, over the period 1990-2013 the residential electricity consumption estimated in EIA is approximately 10% higher than the Eurostat data. The deviation is somewhat larger in the period 1990-2002 and lower in the period 2003-2013. Figure 5 shows the comparison, where EIA data have been reduced by 10%. This is a surprisingly good match, considering that the Ecodesign impact accounting was always performed at individual product level, without any attempt to match the outcome with the aggregate Eurostat energy balance data. There are several possible reasons for the (small) difference between EIA and Eurostat:

- The average useful lifetime of products is difficult to determine and could be slightly lower than estimated in the various studies. For most products EIA assumes a constant lifetime (same value for all years); in addition, EIA does not apply a lifetime distribution (some products are substituted earlier, others later) but one average value. These are (necessary) approximations. Note that a 10% lower average lifetime would imply a 10% lower stock and hence a 10% lower energy consumption.
- The various sources for sales data (e.g. Eurostat Prodcom, stakeholder information, market research reports) often show differences, and a 10% error in the estimates made in the studies would not be surprising. In addition, not all studies reported the sales back to 1990, so that EIA sales in earlier years are often a backwards extrapolation of trends in later periods. This could contribute to the larger deviation between EIA and Eurostat in the period 1990-2002. Also in this case, 10% lower sales would imply 10% lower energy consumption.

- For several products, the efficiencies according to standard measurement procedures are not identical to the real-time efficiencies during actual use. Related to this, there is a difference between the nominal power of products and the average power at which they actually operate. In addition, the actual operating time of the products (at the various load levels) typically shows a wide spread and it is not an easy task to determine an average value for the annual operating hours. Although most studies tried to take these aspects into account, this is a possible cause for differences between EIA and Eurostat: efficiencies, load factors and annual operating hours have a direct effect on the energy consumption.
- The EIA residential electricity data depend on the assumed residential energy shares (see sheet CLASSES in Annex A). These shares are preliminary estimates and for several product groups data on the sector subdivision was lacking. In addition the same share is assumed for all years, which is not necessarily true: e.g. in recent years legacy incandescent lamps remained only in the residential sector, but in 1990 they were still widespread also in the other sectors.
- Although very useful as a reference and widely used, Eurostat data also have an error margin [41]. Instead of judging that EIA residential electricity data are slightly on the high side, it is also possible that Eurostat data are slightly on the low side, or a mix of the two.
- The EIA assumes perfect market surveillance for the ECO-scenario. Reality is different, and consequently the real energy consumption (assumed to be represented by Eurostat data) will tend to be higher than the EIA ECO-data.

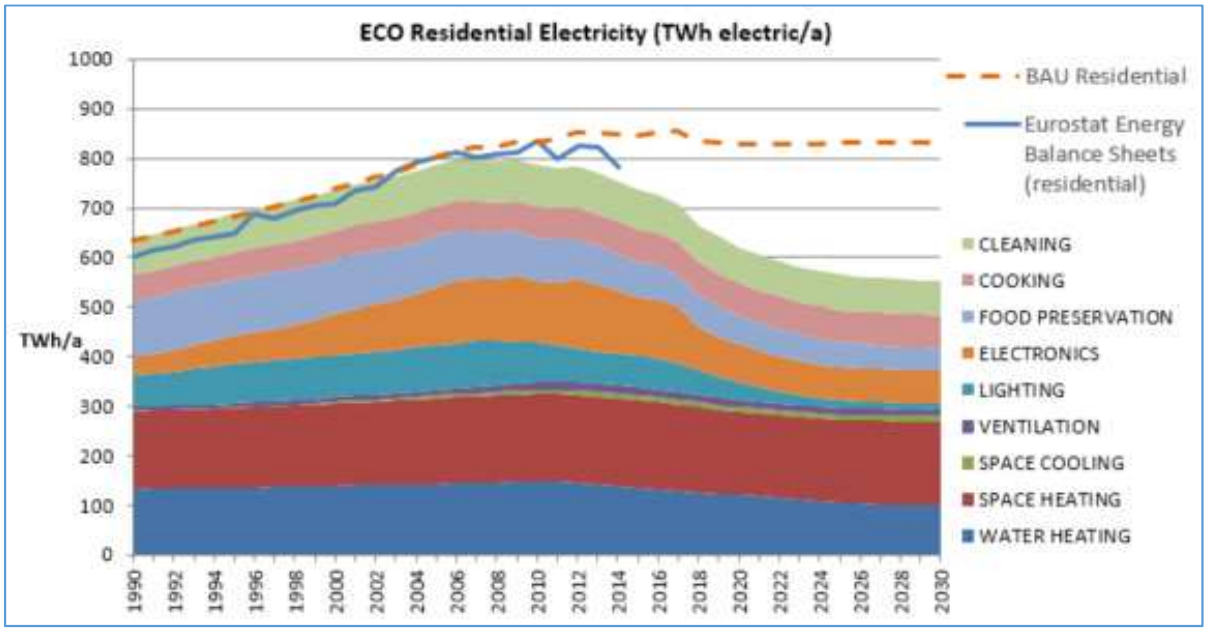


Figure 5. Comparison of data from ecodesign impact accounting (ECO: coloured graph; BAU total: dotted orange line) versus Eurostat energy balance outcomes (dark blue line), for the EU residential electricity consumption in TWh/a. In this graph EIA data have been reduced by 10% for ease of comparison. (VHK, March 2016).

[41] Eurostat data is based on input of national statistics offices in the 28 EU Member States. Only a few (UK, NL) base their assessments on direct utility data, i.e. billing of private residential customers, but many of them use their own or third-party (e.g. utility association) surveys or consumer panels to subdivide aggregate utility data.

For the purpose of the underlying study this exercise is enough as a test for compatibility. But it shows that there is a large potential, also with regards to other policy instruments such as POTENCIA, for future work to realize consistent 'bottom-up' and 'top-down' analyses between the data-sets.

3. Ecodesign Impact Accounting, Status 1.9.2016

3.1. Product groups and updates

The accounting method from the previous chapter is applied to the data from preparatory and/or impact assessment studies that were available on the 1st of September 2016. This includes studies for product groups where measures have been taken (published in the OJ or at least a positive vote by the Ecodesign Regulatory Committee on a final text).

It also includes products for which enough data is available to calculate at least a BAU ('Business-as-Usual') scenario. The ECO-scenario, i.e. the one that gives the closest matches to the final regulation(s), will then be provisional, using either a scenario that matches a draft Working Document of the Commission, a preferred scenario in the preparatory or impact assessment study or even –if none of the above is available—just a repetition of the BAU scenario.

Table 2 below gives an overview of the main changes with energy impact implemented in the accounting, between the December 2015 issue and the current EIA II issue. Due to the additions, updates and corrections in EIA II, the 2020 primary energy savings increased by 28 TWh/a (from 1890 to 1918 TWh/a) and the 2030 savings increased by 72 TWh/a (from 3134 to 3206 TWh/a). Note that these changes were already implemented in the June 2016 interim report. The figures in that report are identical to those in the present document (see par.1.7).

Table 2 List of main changes in EIA II compared to the EIA I issue of December 2015

Product Group added or updated in EIA II	Change in BAU Primary Energy Consumption in TWh/a **in year 2010**	Change in Primary Energy Savings in TWh/a in **year 2020**	Change in Primary Energy Savings in TWh/a in **year 2030**	Main reason for change in savings
Addition of Croatia (EU-27 -> EU-28) (all products)	EIA I: 10684 EIA II: 10733 Variation: + 49	EIA I saving: 1890 EIA II saving: 1898 **Variation: +8**	EIA I saving: 3134 EIA II saving: 3148 **Variation: + 14**	Extension from EU-27 to EU-28 (all sales +0.5% for Croatia)
Lot ENTR 3, VIDEO, e.g. game consoles	EIA I: 13 EIA II: 22 Variation: + 9	EIA I saving: 0 EIA II saving: 3 **Variation: +3**	EIA I saving: 0 EIA II saving: 3 **Variation: + 3**	Update following 2015 IA and VA for game consoles
Lot 12, CF, Commercial Refrigeration	EIA I: 168 EIA II: 168 Variation: 0	EIA I saving: 5 EIA II saving: 16 **Variation: +11**	EIA I saving: 18 EIA II saving: 47 **Variation: + 29**	Update following 2014/2015 WD and IA; addition non-base case supermarket displays
Lot ENTR 1, PF, Professional Refrigeration	EIA I: 161 EIA II: 188 Variation: +27	EIA I saving: 0 EIA II saving: 9 **Variation: +9**	EIA I saving: 0 EIA II saving: 28 **Variation: + 28**	Update following 2015 CR and CDR and final IA; considered double counting condensing units
Tyres	EIA I: 516 EIA II: 492 Variation: -24	EIA I saving: 58 EIA II saving: 58 **Variation: 0**	EIA I saving: 136 EIA II saving: 139 **Variation: + 3**	Considering rethreading and adapted life for C3 truck tyres
Minor corrections	Variation: +12	Variation: - 3	Variation: - 5	Error correction
Sum all products	EIA I: 10684 EIA II: 10757 **Variation: + 73**	EIA I saving: 1890 EIA II saving: 1918 **Variation: + 28**	EIA I saving: 3134 EIA II saving: 3206 **Variation: + 72**	All the above

Annex B gives an overview of the various ED, EL, ES and TL measures and their status on the 1st of September 2016. The full references are given in **Annex H**.

3.2. Available studies

In principle, the accounting is strictly based on the information in the available preparatory and impact assessment reports. An overview of these reports is given in **Annex C**.

On the 1st of September 2016 useable data were available for over 35 product groups. Assuming 2-3 man-years of research for preparatory studies and 5-6 months for impact assessment studies, it means that the available studies represent an accumulated research effort of over 100 man-years over the period 2006-2015 (10 years).

The contractor did not change --and does not assume responsibility for-- the original data in preparatory and IA studies, but performed the following tasks:

- checking calculation methods and formats
- retrieving Excel files, IA reports, prep. studies for ca. 40 product groups (>130 base cases),
- understanding and selectively copying data from Excel files to templates,
- updating data where newer data are available (from later Review or IA studies),
- complementing/estimating lacking core data (exception where external sources were consulted),
- correcting calculation errors (contractors not following MEEuP/MEErP),
- updating and harmonising tariffs and price data as much as possible,
- transforming product databases to statistical distribution tables,
- preliminary total calculations to check compatibility with Eurostat conventions

The overview in Annex C shows studies, product groups where data have been used. **Annex D** gives a complete overview of also studies (product groups, base cases) that are still ongoing and have not yet rendered sufficient data to produce at least a BAU-scenario.

3.3. Structure

A harmonized accounting method aims to treat the same parameter across all product groups in the same way. Therefore, in **Annex A**, which summarizes the core calculation in the MS Excel Masterfile, the sheets are organized per parameter.

Figure 6 gives the structure with the sheet-names. A short description of the items is given below:

- The SALES and STOCK (incl. Life) sheets are essential to most calculations and expressed in **1000 units per year.**
- LOAD, EFNBAU, EFNECO, EFSBAU and EFSECO sheets give the product performance, the respective efficiencies of new products (EFN…) and of the average product installed (EFS…). They are expressed **per unit**. The NOMRATES, RATES, PRICE, PRICE2 and EMISSRATES are rates expressed **per unit and per Eco-impact unit**, e.g. €/kWh, €/% and kg CO_2 eq./kWh. All other sheets relate to **EU totals** in TWh/a, Mt CO_2/a, bn €/a, etc.
- The product performance parameter in the **LOAD** sheet is product-dependent, e.g. space heat in kWh/a, laundry load in kg/a, viewable screen surface of a television in dm², cups of coffee/a, etc.. The energy efficiency (**EFN...** or **EFS...**) may be an

actual efficiency percentage (% of ratio between in- and output) or – e.g. for computers and other products where it is difficult to quantify an output—an annual energy consumption during use in kWh/a.

- The **LOADnotes** sheet gives a short description of the test- and calculation procedures that are used to arrive at the efficiency or consumption figures. The **EULOAD** sheet aggregates the LOAD data to EU totals, expressed in appropriately upscaled units like TWh/a, Mt/a, km², bn cups/a. Both the LOADnotes and EULOAD sheets only give background information; they are not an input for other parts of the calculation.
- **NRGBAU** and **NRGECO**, both subdivided respectively in **ELECBAU & FUELBAU** and **ELECECO & FUELECO**, give the aggregates of EFSBAU and EFSECO for the whole of the EU stock, expressed in TWh/a. At the end of these sheets there is a summary calculation, not only of the BAU or ECO scenario but also –in the …ECO sheets—of the savings. Here also the mtoe equivalent of the TWh is given for reasons of convenience for readers that are more familiar with that unit. A separate **NRGSAVE** sheet also provides a detailed survey of the primary energy savings per base case. Near the end of the NRG…-sheets a subdivision of the primary energy per functional group is provided for the residential, tertiary, industry and 'other' sectors.
- Using the **EMISSRATES** sheet, the **EMISSBAU** and **EMISSECO** sheets calculate the EU totals for CO_2 (in Mt/a, both fuel-related and from refrigerants) and NO_x (in kt/a). In EIA II this has been expanded with the emissions for CO, OGC and PM. It also gives data on the noise regulations in the relevant products. A separate EMISSSAVE sheet provides details on the reduction of emissions.
- The **RESOURCES** sheet combines monetary cost and usage data as well as the BAU and ECO scenarios per unit, because it relates only to a few products: imaging equipment (using paper and toner) washing machines and dishwashers (detergent, water) as well as vacuum cleaners (bags, filters). In the structure it is given only as part of the monetary calculation, but it does also supply the physical savings on resources.
- **NRGCOSTBAU and NRGCOSTECO** calculate the EU expenditure on energy, in bn euros. Together with the maintenance costs (incl. VAT when appropriate, sheet **MAINT_INCL**, not differentiated between BAU and ECO) and possibly the costs of auxiliary resources (**RESOURCES** sheet) they constitute the annual running costs, given in the **RUNBAU** and **RUNECO** sheets.
- The total acquisition costs (including installation and VAT) are given in the **ACQBAU** and **ACQECO** sheets and they are calculated using parameters from the **PRICE** sheet.
- The total consumer expenditure is given in the **EXPENSBAU** and **EXPENSECO** sheets. The difference between these two, calculated on the **EXPENSSAVE** sheet, gives the total annual saving in consumer expenditure.
- The revenues of the measures for the various sectors are derived, as explained in the previous chapter, from the ACQBAU and ACQECO scenarios. For the BAU scenario they are given in the **REV_IND_BAU** (for industry), **REV_IND_WHOLE** (for wholesale), **REV_RETAIL_BAU** (for the retail sector), **REV_INST_BAU** (installation revenue for installers) and **REV_MAINT_EXCL** (maintenance revenue for installers). Similarly, but with suffix ECO instead of BAU, these revenues are calculated for the ECO scenario. For the maintenance revenue the ECO scenario uses the same data as the BAU scenario.

- The number of **direct jobs** that are a result from these various revenues are not calculated in Annex A, but in the summary sheets of Annex G. The inputs however are the revenue calculations in Annex A.

Annex E gives the key facts per product. In the Excel Masterfile it takes its data from the calculations per parameter in Annex A.

Annex F shows the summary tables of the Stakeholder Revenues per product group and functional group.

The direct employment (jobs) is calculated in **Annex G**, on the basis of the stakeholder revenues.

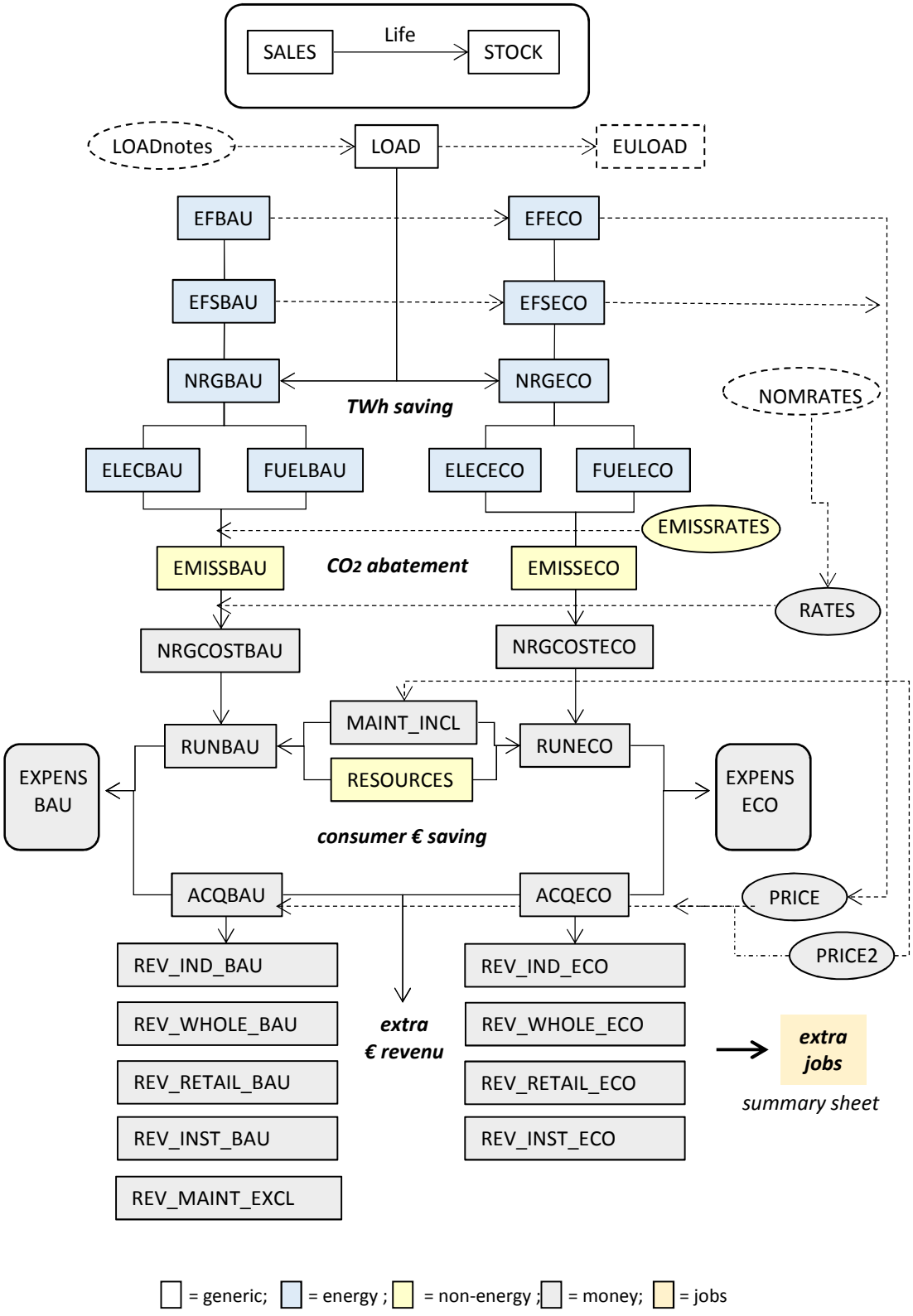


Figure 6. Structure of Annex A (core calculation).

3.4. Main results

3.4.1. Introduction

The ecodesign impact accounting is based on preparatory studies and impact assessments performed for the ecodesign and labelling measures in the scope. These studies vary considerably in data availability and quality of the analyses performed. The contractors have tried to harmonise at least the calculation method and, where it was indispensable for the accounting, to complete data.

Nonetheless, the aggregate ecodesign impact accounting will contain a large part of the imperfections of the sources used. As mentioned in par. 2.8, the individual studies were never conceived from the 'top down' perspective of having to be consistent with overall energy and monetary data. Thus, at individual product level there is always a margin for specific interest groups to exaggerate or downplay the results.

Secondly, often there is no perfect match between the measure in the ECO scenario, i.e. the scenario that comes closest to what was (or will probably be) decided as a measure, and the actual measure. The scenarios in preparatory studies and impact assessments are primarily used as an ex-ante input for decision making. Rarely there is room, unless at a review several years after the implementation, for an ex-post analysis that would take into account all aspects of the final legislation.

Finally, as regards the implementation-phase of measures, all preparatory studies and impact assessments have to assume an ideal implementation and effective market surveillance, despite the fact that such perfection is rare in the real world. Also, a few studies do not anticipate 'rebound' effects from efficiency improvements, i.e. that the lower energy impacts and costs induce the users to consume more.

The results follow from the most comprehensive accounting of ecodesign and labelling measures to date. The following paragraphs show only a small fraction of the assessments that can be made with Excel files, which are summarized in the appendices in this report.

3.4.2. Energy

In 2010 the products included in the accounting represented approximately 38 700 PJ (925 mtoe, 10 800 TWh) of direct and indirect primary energy consumption or 53% of total EU-28 gross energy consumption in 2010 (1759 mtoe).

The primary energy saving of these products for the EU-28 in 2020 (ECO versus BAU) amounts to 1918 TWh (6900 PJ, 165 mtoe), of which 218 TWh (785 PJ, 19 mtoe) are achieved in the period 1990-2010[42] and 1700 TWh (6120 PJ, 146 mtoe) in the period 2010-2020.

On average the primary energy saving in 2020 is 18% for the products included in the accounting [43]. Compared to the EU as a whole in 2010 it means an energy saving of 9% [44].

[42] from energy labelling under directive 92/75/EC and specific directives with minimum requirements

[43] For some product groups, e.g. video recorder and computers, no savings could be determined from the available data, but their energy use is included in the accounting totals. Not considering these groups, the average percentage saving per product would be slightly higher (close to 19%).

[44] Eurostat energy balance, gross inland consumption: 1760 mtoe in 2010 (165 mtoe=9.4%).

The 2020 primary energy savings are achieved from an electricity saving of 480 TWh electricity (1199 TWh primary energy, including losses of power generation and distribution) and 2588 PJ or 719 TWh fossil fuel saving.

For 2030, when there has been a full change of the stock of most regulated products, the energy saving increases by more than 60%, to 11 543 PJ (276 mtoe, 3206 TWh) with an average saving of the included products near 30%. Compared to the EU 2010 total this is a saving of 16%.

Compared to the December 2015 edition, in EIA II the 2020 primary energy savings increase by 28 TWh/a (from 1890 to 1918 TWh/a) and the 2030 savings by 72 TWh/a (from 3134 to 3206 TWh/a). This difference is mainly due to the addition of Croatia and to the updates for Commercial and Professional Refrigeration products (see Table 2 for details).

The graphs below, taken from the summary at the end of sheets NRGECO and NRGSAVE (Annex A), show the primary energy consumption time series for the period 1990-2050.

Figure 7 demonstrates that, without new measures, the savings even out after 2030. For instance, in 2050 the saving is still 30% for the average included product (16% of the EU 2010 total).

Figure 8 emphasizes that, not unexpectedly, the space- and water heating products as well as the light sources are the main contributors to the savings.

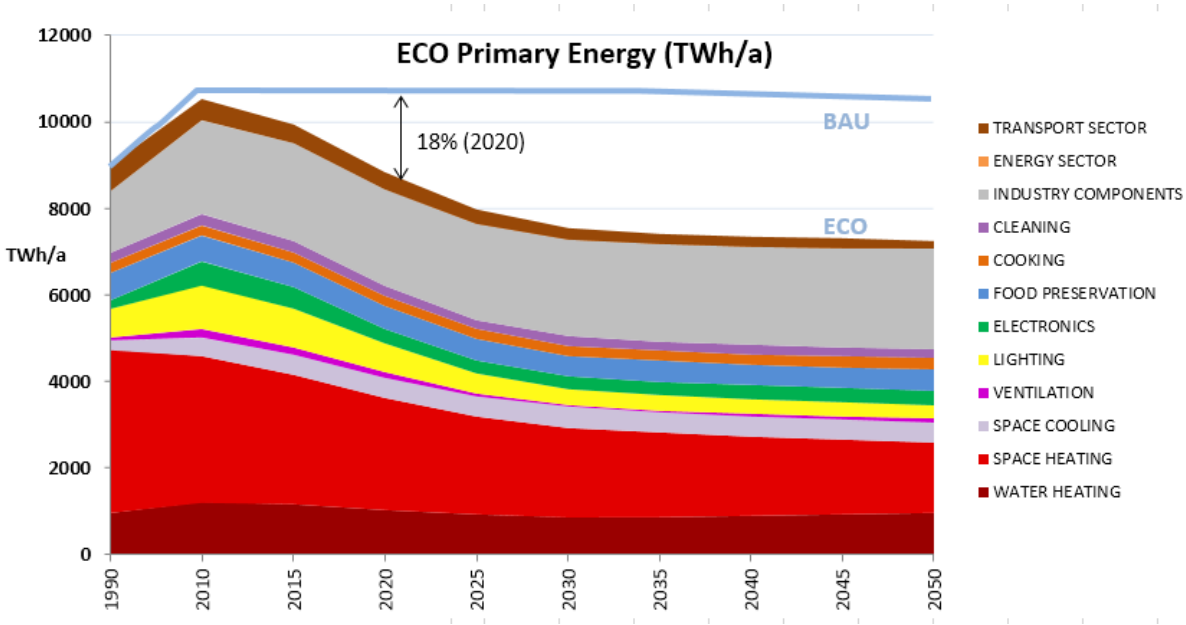


Figure 7. Primary energy consumption of products included in ecodesign impact accounting, status 1 September 2016 (energy sector impact not shown)

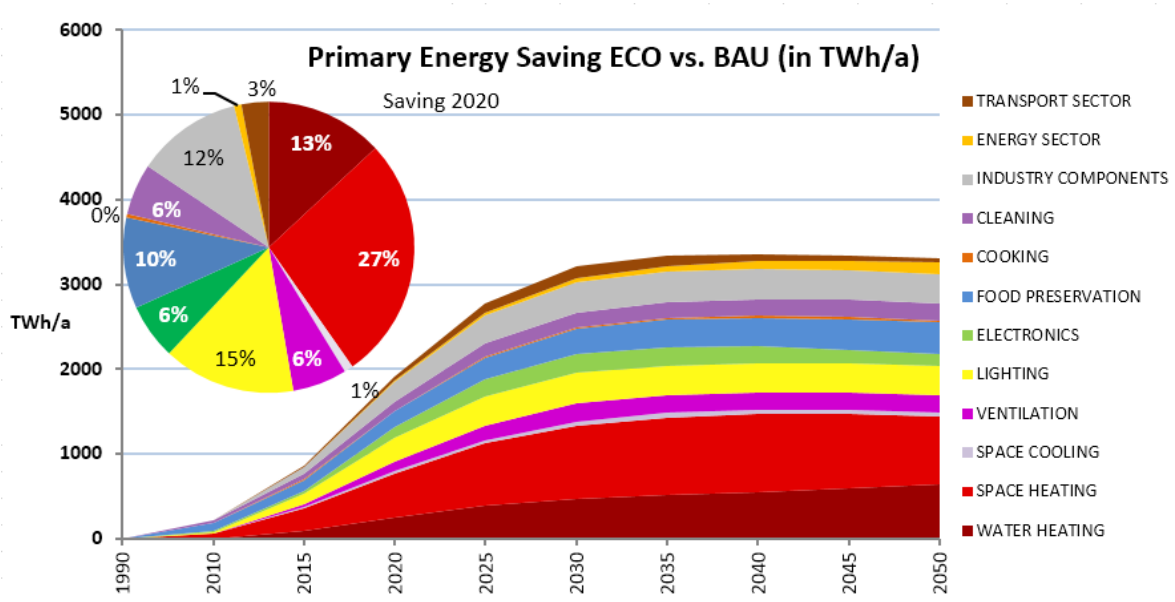


Figure 8. Primary energy saving of ECO versus BAU of products in ecodesign impact accounting, status 1 September 2016

New in this EIA edition is the subdivision of the primary energy consumption over the sectors: residential, tertiary, industry and other [45]. This subdivision is based on the sector energy shares per base case that are presented on the sheet CLASSES in Annex A. The results are reported near the end of the NRG… sheets in Annex A, in three ways:

- Summary table per sector over all functional groups
- For each functional group the subdivision over the sectors, in TWh
- For each functional group the subdivision over the sectors, in %

Figure 9 shows the 2010 ECO Primary Energy consumption per sector (total is 10 541 TWh/a). The sectors contribute for respectively 40% (residential), 33% (tertiary), 22% (industry) and 5% (other).

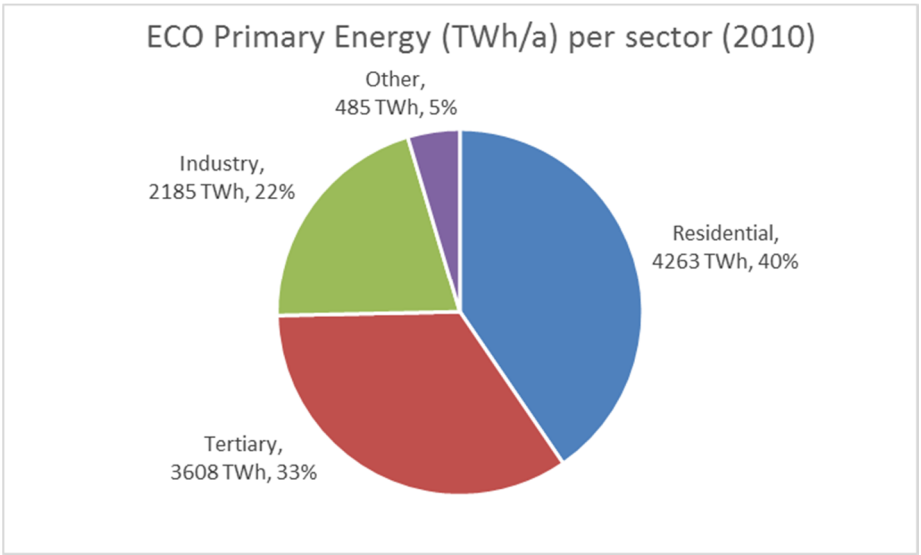


Figure 9. Subdivision per sector of the ECO primary energy consumption in 2010.

[45] The 'other' sector includes e.g. the energy sector, agriculture, forestry

The residential sector is the major energy consumer for water heating, space heating, electronics and cleaning (Table 3). The tertiary sector is dominant for space cooling (includes high temperature process cooling), ventilation and lighting, the industry sector for industry components (fans, pumps, motors, compressors), and the 'other' sector is dominant for energy sector products (distribution transformers). For food preservation, cooking and transport (tyres) the energy consumption in the residential and tertiary sector is close to 40% each. For many functional groups the 2010 sector distribution shown in Table 3 is approximately valid also for other years.

Table 3 Sector Primary Energy shares per functional group (year 2010)

2010 Primary Energy shares	Residential	Tertiary	Industry	Other
WATER HEATING	65%	31%	4%	1%
SPACE HEATING	58%	27%	12%	3%
SPACE COOLING & HT PROCESS	6%	66%	26%	8%
VENTILATION	21%	68%	9%	2%
LIGHTING	22%	62%	15%	1%
ELECTRONICS	66%	30%	3%	1%
FOOD PRESERVATION	39%	43%	16%	2%
COOKING	89%	11%	0%	0%
CLEANING	92%	8%	1%	0%
INDUSTRY COMPONENTS	0%	28%	58%	13%
ENERGY SECTOR	0%	0%	0%	100%
TRANSPORT SECTOR	43%	36%	18%	3%

The 2020 primary energy savings of 1918 TWh/a derive for 52% from the residential sector, 31% tertiary, 14% industry and 3% other sector (Figure 10).

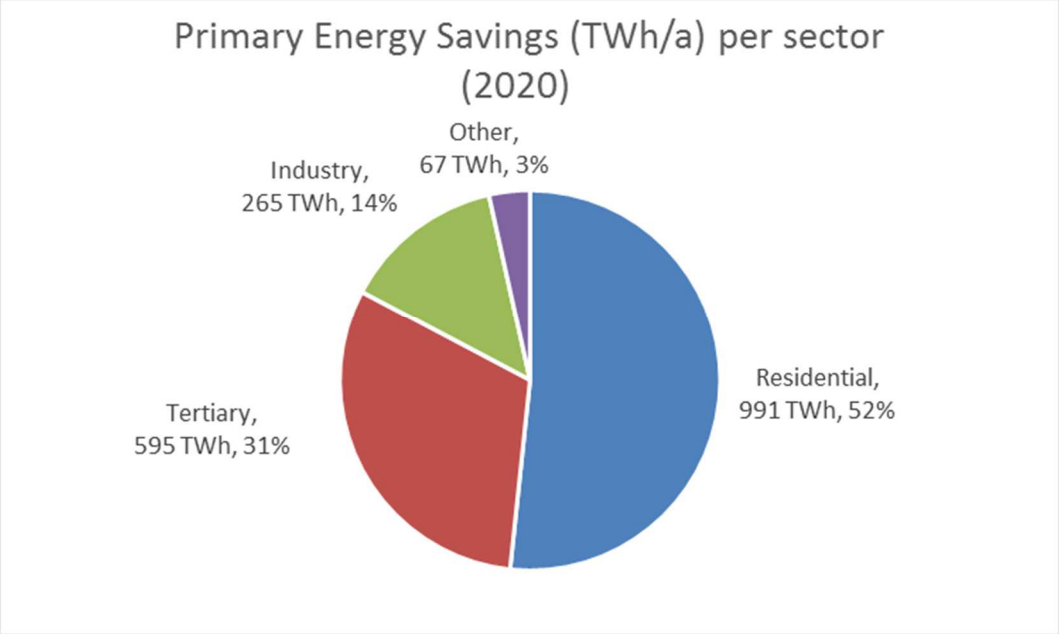


Figure 10. Subdivision per sector of the primary energy savings in 2020.

In the EU Building Heat Demand (BHD) report [46], the total EU space heating load is estimated as 2823 TWh, of which 60.3% in the residential sector, 24% in the tertiary sector and 15.7% in the industrial sector. Of this total, 2009 TWh (71%) is estimated to be in the scope of heating systems addressed by the Ecodesign directive. The rest relates to buildings heated by district heating, process waste heat, the low-temperature output of large (steam) boilers and CHP installations, etc..

In EIA the total EU space heating load is 1946 TWhheat/a, which corresponds well with the 2009 TWh from the BHD. The 60%-24%-16% sector distribution from the BHD is in good agreement with the 58%-27%-12%-3% distribution in EIA.

3.4.3. Emissions

The reduction of greenhouse gas emissions, due to fuel-related CO_2 and to losses of refrigerants, amounts to 319 Mt CO_2 equivalent in the EU in 2020 (ECO versus BAU). This is 17% of the total emissions of the products included in EIA and 6.8% of the EU total (4721 Mt CO_2 [47]). For 2030 a reduction of 509 Mt CO_2 equivalent is expected. This is a 30% reduction for the average included product and 10.8% of the EU 2010 total.

The reduction of nitrogen-oxides (NO_x) emission, acidifying agent and ozone precursor (smog), is 144 kt SO_2 equivalent [48] [49] in the EU 2020 (ca. 1.3% of EU 2010 total NO_x emissions [50]). This is a result from the Ecodesign emission limits set for heating boilers, water heaters, solid fuel boilers, local space heaters and air heating products. However, this result is incomplete because insufficient data were available from the preparatory studies and impact assessments to quantify the NO_x emissions for the Solid Fuel Boilers and for a part of the Local Space Heaters.

New in this EIA edition are the reductions of CO- (carbon monoxide), OGC- (organic gaseous carbon) and PM- (particulate matter) emissions. Limits on these emissions have been set in the regulations on Solid Fuel Boilers and Local Space Heaters.

The reduction of CO-emissions is 141 kt/a in 2020 and 507 kt/a in 2030. The latter is 18% of the 2799 kt/a emissions of the products involved in 2010. For comparison: in 2008 the total European CO-emission (including the transport sector) were 27 500 kt/a [51].

The reduction of OGC-emissions is 10 kt/a in 2020 and 22 kt/a in 2030. The latter is 10% of the 219 kt/a emissions of the products involved in 2010. For comparison: in 2008 the total European NMVOC-emission [52] (including the transport sector) were 12 500 kt/a [51].

[46] "Average EU building heat load for HVAC equipment", VHK for the European Commission, 2014, https://ec.europa.eu/energy/sites/ener/files/documents/2014_final_report_eu_building_heat_demand.pdf

[47] Source: EEA, GHG Inventory 2012. Total for EU-28 excl. LULUCF.

[48] Equals 206 kt NOx. (factor 0.7)

[49] In the December 2015 edition of EIA, NO_x emissions and SO_2 equivalent emissions were mixed up, so the new values in this report are considerably different from the previous ones.

[50] 11 150 kt SO2 equivalent in 2010 (source: European Environmental Agency (EEA), National emissions reported to the Convention on Long-range Transboundary Air Pollution (LRTAP Convention), EU-27 (national territory), 2007.

[51] Source: European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.2. http://edgar.jrc.ec.europa.eu/datasets_list.php?v=42

[52] NMVOC= Non-Methane Volatile Organic Compounds, similar to OGC but without the methane contribution.

The reduction of PM-emissions is 9 kt/a in 2020 and 38 kt/a in 2030. The latter is 20% of the 193 kt/a emissions of the products involved in 2010. For comparison: in 2008 the total European PM10-emission (including the transport sector) were 2 750 kt/a [51].

The trend line for greenhouse gas emissions is similar to that of energy (see summary at the end of the EMISSECO and EMISSSAVE sheets in Annex A).

3.4.4. Non-energy resources

The water consumption of washing machines and dishwashers is addressed through measures, resulting in a drinking water saving of 336 million m³ in the EU 2020 (1.2% of EU residential total[53]).

The self-regulatory initiative under Ecodesign for imaging equipment (copiers, printers) sets targets for duplexing to reduce printer paper consumption. The impact assessment estimates that 0.4 Mt/a of printing paper will be saved in 2020 (15% of EU total paper for imaging equipment).

More details can be found in the RESOURCES sheet, Annex A.

3.4.5. User expenditure

In 2020 approximately € 112 bn will be saved by end-users resulting from Ecodesign and labelling measures. This is the result from a € 174 bn gross saving on running costs (88% energy costs) and € 62 bn extra acquisition costs for more efficient products. Given BAU-totals in the EU 2020 of € 1424 bn spent on running costs (€ 974 bn) and acquisition costs (€ 450 bn) for the products included in the accounting, the consumer will save some 8% in total. The saving on running costs is close to 18%, while the average product price [54] will rise by almost 14% for these products.

In 2030 the net saving (ECO versus BAU) will have grown to € 338 bn, saving the EU consumers more than 17% on total costs versus the situation without measures. The figure below gives the total expenditure in the ECO scenario (running + acquisition costs) per product group and –in orange—the saving versus the BAU scenario.

The figure is a snapshot of the status on the 1st September 2016. It should be interpreted with caution, because for some product groups no final decision has been taken yet and the ECO scenario is absent or provisional.

Nonetheless, it shows that –as with energy saving— the space- and water heating as well as lighting are the largest contributors. Also the cleaning group gives a considerable contribution (washing, drying, dishwashing, vacuum cleaners).

Looking at the individual groups, the light sources give the largest monetary saving (55% versus BAU), followed by cleaning (31%) and water heating (24%). For electronics the acquisition costs are 70% of the total costs and relatively independent of energy efficiency; furthermore there is a considerable autonomous saving already in the BAU-scenario. These factors diminish the relative savings of this product group. Tyre Labelling (transport sector) and measures for ventilation appear relatively effective, whereas the money gains for distribution transformers (energy sector) and industry components (fans, motors, water pumps) are smaller compared to the total running and

[53] EU residential total water consumption, from public grid, is 27 billion m³ in 2008 (source: VHK, MEErP, 2011).

[54] Prices include installation and VAT and are all expressed in fixed euros 2010. The energy escalation rate (real annual increase above inflation) is assumed 4% (from historical trend in last 5 years).

acquisition costs. Finally, in the cooking section (ovens, hobs) the monetary gains are the smallest.

More information can be found especially in the summaries at the end of the sheets EXPENSECO, EXPENSSAVE, ACQECO and RUNECO in Annex A, but otherwise also in all money-related worksheets.

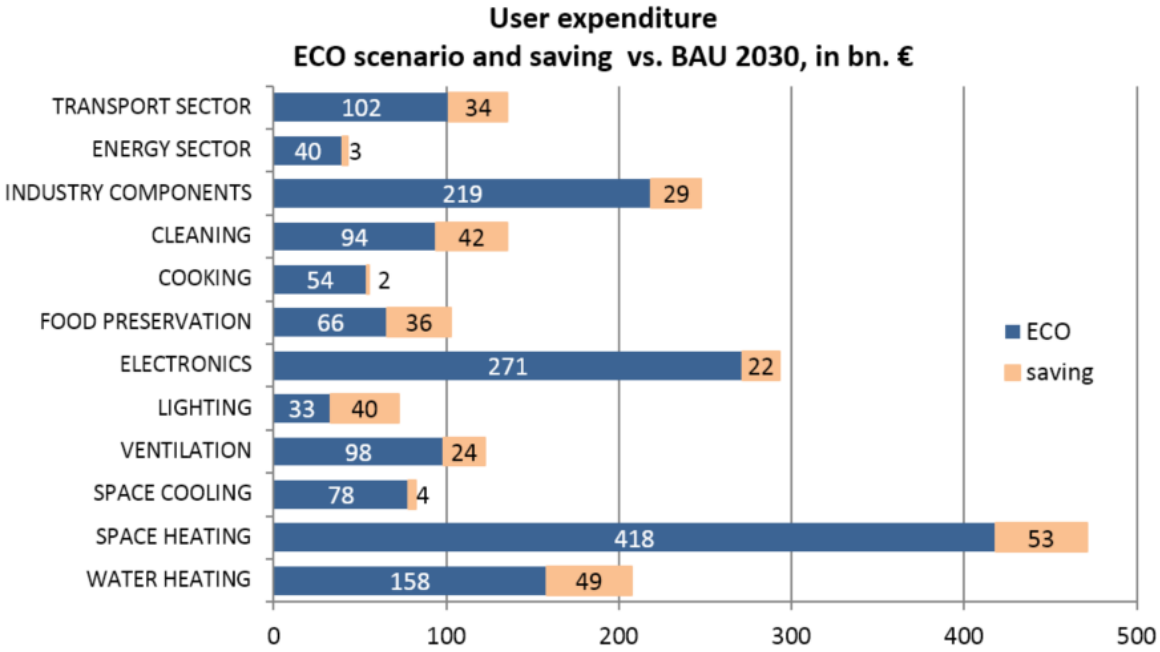


Figure 8. User expenditure EU 2030 on products included in the accounting.

3.4.6. Business revenue

The increase in acquisition costs for the users translates into higher business revenue for market actors (plus taxes). It is calculated that for 2020 the extra revenue will be € 57 bn and for 2030 it will grow to € 74 bn compared to a situation without measures. Some 42% will go to industry, 8% to wholesale, 22% to retail, 17% to installers (there is a large share of installed products) and 11% to maintenance.

More information can be found in Annex F (summary sheets) and in the REV_... sheets in Annex A.

3.4.7. Employment

The direct jobs are calculated from the increase in revenue and the average turnover per employee in the various sectors (see par. 2.5.4). The results and split up are given in Annex G.

All in all, an estimated 0.8 million additional direct jobs due to the measures are calculated in 2020. The total employment effect (including indirect jobs) is difficult to assess, as there is no consensus on the indirect employment factor (i.e. the new employees spending their money on goods and services, thereby creating new jobs for people that in turn also spend their money, etc.). In literature estimates are found setting indirect employment a factor 3-5 times the direct number of jobs.

For comparison, a recent report by Cambridge Econometrics (CE) [55] has been studied. Based on jobs/GWh-saved ratios, CE estimates maximum additional jobs related to energy efficiency of 275 000 in 2010 (EIA: 70 000), 740 000 in 2020 (EIA: 800 000) and 1 300 000 in 2030 (EIA 1 000 000). Hence, the CE-data and EIA-data seem to be in good agreement.

However, caution is necessary when comparing these data because the scope (products and services considered) and the definitions in the two studies are not the same [56]. In fact there are also CE-data that differ from those in EIA:

- CE reports jobs per million euro contract value ranging from 3.1 to 7.8 jobs/m€ [57]. EIA uses the higher figure of 20 jobs/m€ for industry (including OEM and services), with additional jobs for wholesale, retail, installation and maintenance.
- In 2010 the EIA-products account for a total of 5.8 million jobs in EU28. This is more than double the 2.4 million estimated by CE for their 'broad definition of energy efficient goods and services', notwithstanding that CE includes many items that are not (yet) included in EIA, such as 'public mass transit' (0.7 m jobs), 'energy-saving building materials' (insulation, glazing, composite doors; 0.4 m jobs), 'green architecture and construction services', 'professional energy services', 'smart meters', 'smart grids', 'electric vehicles', etc..
- There are only three product groups for which CE-data can be more or less directly compared to EIA data:

  For HVAC and building control systems CE states 158 000 jobs in 2010 (EIA 2 000 000 for space heating, space cooling and ventilation).

  For Appliances CE gives 100 000 jobs in 2010 (EIA 870 000 for food preservation, cooking and cleaning; electronics excluded)

  For Lighting CE gives 39 000 jobs in 2010 (EIA 190 000).

Concluding, some CE-data and EIA-data correspond, while others do not. The job-differences are probably caused by differences in scope and in definitions between the two studies. No clear reason was found to change the job-parameters currently used in EIA (see par. 2.5.4).

[55] "Assessing the Employment and Social Impact of Energy Efficiency", Final report, Volume 1: Main report and Volume 2: Appendices, Cambridge Econometrics, November 2015.

[56] The CE-report focuses on building and transport related products, and only a part of the data can be compared with those from EIA. CE seems to count only the jobs created in EU-28, while EIA considers all jobs associated with the considered products, regardless if they are in- or outside the EU. It is not clear if the CE values include jobs for wholesale, retail, installation and maintenance, while EIA does include these. Both CE and EIA consider only 'gross' and 'direct' jobs.

[57] Depending on the type of product and the type of contract (domestic or not). The product groups considered by CE that are relevant for comparison with EIA are: High-efficiency burning chiller, Boiler waste heat recovery, CHP installation, Variable Speed Drives, Motors, pumps, fans and compressors, Advanced process controllers, Pumps, water heaters and circulators, Ventilation, fans and air-conditioning.

Appendices

ANNEX A: Ecodesign Impact Accounting by Parameter

CONTENTS

Notes:

The BAU scenario is not a 'freeze' scenario; it is derived from extrapolating historical trends at the time of the prep. study analysis, including possible ongoing trends in energy efficiency improvement and emission abatement

The ECO scenario is the scenario with the impact of known Ecodesign, Energy Labelling, Energy Star, Tyre Label and VAs. Up to 2020-2030 it is derived from IA and prep. study scenarios for the selected/ proposed measures. Longer term scenarios are extrapolations of the trends, but do **NOT** assume that new measures will be introduced (It is not within the study scope to predict new long-term measures).

All prices, rates and euro amounts are in 2010 euros, i.e. inflation corrected (at 2%) to 2010.

Annual growth rates of tariffs and prices are escalation rates, i.e. they represent the real increase after inflation correction. The nominal rates are given strictly as background information and are not used in the calculation of impacts.

All primary energy from fossil fuels is in Net Calorific Value (NCV), i.e. where measures use Gross Calorific Values (GCV) values, these values were corrected to NCV to be in line with Eurostat data.

For the efficiency of power generation and distribution, the default value is 40% (the so-called primary energy factor pef), but also dynamic values may be used

VHK has harmonised, completed, corrected and extrapolated the values given in preparatory studies and IA reports that were available 1 Sep. 2016. VHK has not added new information that could not be derived from what was already given and therefore assumes no responsibility for the correctness of the information. VHK assumes no liability whatsoever for damages from any use of the data given here.

GENERAL Data used in EIA	ref	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
This sheet groups some general data used in EIA, i.e. data that are not product-specific											
EU-28 population (in millions)	[1]	**475.2**	**503.2**	**508.2**	**512.5**	**515.5**	**518.5**	**521.0**	**523.5**	**524.5**	**525.5**
EU-28 households (in millions)	[2]	**171.6**	**210.6**	**218.1**	**222.8**	**224.1**	**225.4**	**226.5**	**227.6**	**228.1**	**228.5**
GWP Electricity (kg CO2 eq/kWh)	[3]	**0.50**	**0.41**	**0.40**	**0.38**	**0.36**	**0.34**	**0.32**	**0.30**	**0.28**	**0.26**
(GWP-values for fuels and refrigerants: see sheet EMISRATES)											
Electricity Rate, Res., euro/kWh elec	[4]	**0.178**	**0.170**	**0.205**	**0.249**	**0.303**	**0.369**	**0.448**	**0.546**	**0.664**	**0.808**
Electricity Rate, NRes., euro/kWh elec	[5]	**0.119**	**0.105**	**0.122**	**0.149**	**0.181**	**0.220**	**0.268**	**0.326**	**0.397**	**0.483**
Natural Gas Rate, Res., euro/kWh	[6]	**0.055**	**0.060**	**0.074**	**0.090**	**0.110**	**0.134**	**0.163**	**0.198**	**0.241**	**0.293**
Natural Gas Rate, NRes., euro/kWh	[7]	**0.026**	**0.036**	**0.047**	**0.057**	**0.069**	**0.084**	**0.102**	**0.124**	**0.151**	**0.184**
(Rates for other fuels and consumables: see sheets NOMRATES and RATES)											

[1] Population for years 1990-2015 from Eurostat at 1st of January of each year, http://appsso.eurostat.ec.europa.eu/nui/show.do
Population for years 2020-2030-2040-2050 from Eurostat projections, http://epp.eurostat.ec.europa.eu/portal/page/portal/population/data/main_tables; interpolated in intermediate years

[2] Households for years 2005-2014 based on Eurostat http://appsso.eurostat.ec.europa.eu/nui/show.do
Households for years 2015-2050 computed as population/2.3
Households for years 1990-2004 based on MEErP 2011 Part 2 table 31, scaled up from EU-25 to EU-28

[3] Global Warming Potential (GWP-100) for electricity generation and distribution taken from MEErP Part 1 table 30, http://ec.europa.eu/growth/industry/sustainability/ecodesign_en (section on 'support tools for experts'). For years following 2030 extrapolation with same downward trend.

[4] Electricity rate for residential consumers, in fixed 2010 euros (inflation corrected), including VAT. The prices up to 2007 (old Eurostat methodology) are based on Eurostat nrg_pc_204_h tariff Dc: "annual consumption of 3 500 kWh among which 1 300 kWh overnight (standard dwelling of 90m²)". For years 2007-2013 (new Eurostat methodology) prices are based on Eurostat nrg_pc_204 tariff band DC " 2 500 < consumption < 5 000 kWh" . For years following 2013 an annual growth rate of 4% is applied. This value corresponds to the MEErP-recommendation and is the EIA default. The growth rate can be changed on sheet RATES.

[5] Electricity rate for non- residential consumers, in fixed 2010 euros (inflation corrected), excluding VAT. The prices up to 2007 (old Eurostat methodology) are based on Eurostat nrg_pc_205_h tariff Ie: "annual consumption of 2 000 MWh, maximum demand of 500kW and annual load of 4 000 hours". For years 2007-2013 (new Eurostat methodology) prices are based on Eurostat nrg_pc_205 tariff band IC " 500 MWh < consumption < 2 000 MWh" . For years following 2013 an annual growth rate of 4% is applied. This value corresponds to the MEErP-recommendation and is the EIA default. The growth rate can be changed on sheet RATES.

[6] Natural gas rate for residential consumers, in fixed 2010 euros (inflation corrected), including VAT. The prices up to 2007 (old Eurostat methodology) are based on Eurostat nrg_pc_202_h tariff D3 "Annual consumption 83.7 GJ". For years 2007-2013 (new Eurostat methodology) prices are based on Eurostat nrg_pc_202 tariff band D2 "20 GJ < Consumption < 200 GJ". Data have been converted from GCV (in Eurostat) to NCV (in EIA) using price/NCV = 1.106*price/GCV. For years following 2013 an annual growth rate of 4% is applied. This value corresponds to the MEErP-recommendation and is the EIA default. The growth rate can be changed on sheet RATES.

[7] Natural gas rate for non-residential consumers, in fixed 2010 euros (inflation corrected), excluding VAT. The prices up to 2007 (old Eurostat methodology) are based on Eurostat nrg_pc_203_h tariff I3-1 "Annual consumption 41 860 GJ; load factor 200 days, 1 600 hours". For years 2007-2013 (new Eurostat methodology) prices are based on Eurostat nrg_pc_203 tariff band I3 "10 000 GJ < Consumption < 100 000 GJ". Data have been converted from GCV (in Eurostat) to NCV (in EIA) using price/NCV = 1.106*price/GCV. For years following 2013 an annual growth rate of 4% is applied. This value corresponds to the MEErP-recommendation and is the EIA default. The growth rate can be changed on sheet RATES.

Lot	Subcase Classifications	Energy Shares per sector (%)			
		Residential	Tertiary	Industry	Other
2	**WH dedicated Water Heater**	65%	31%	3%	1%
1	**CHC Central Heating combi, water heating**	64%	30%	5%	1%
	CH non-electric	60%	25%	12%	3%
	CH electric resistance boiler, 1st estimate	60%	25%	12%	3%
	CH heat pump, 1st estimate	60%	25%	12%	3%
	CH auxiliary electricity (incl. circulator), 1st estimate	60%	25%	12%	3%
1	**CH Central Heating boiler, space heating**	60%	25%	12%	3%
15	SFB Wood Manual	90%	8%	2%	0%
15	SFB Wood Direct Draft	90%	8%	2%	0%
15	SFB Coal	90%	8%	2%	0%
15	SFB Pellets	70%	24%	5%	1%
15	SFB Wood chips	0%	30%	50%	20%
15	**SFB Solid Fuel Boilers**				
21 /E6	CHAE-S (≤ 400 kW)	5%	95%	0%	1%
21 /E6	CHAE-L (> 400 kW)	0%	71%	29%	0%
21 /E6	CHWE-S (≤ 400 kW)	5%	95%	0%	0%
21 /E6	CHWE-M (> 400 kW; ≤ 1500 kW)	0%	71%	29%	0%
21 /E6	CHWE-L (> 1500 kW)	0%	71%	29%	0%
21 /E6	CHF	5%	95%	0%	0%
21 /E6	HT PCH-AE-S	0%	60%	30%	10%
21 /E6	HT PCH-AE-L	0%	60%	30%	10%
21 /E6	HT PCH-WE-S	0%	60%	30%	10%
21 /E6	HT PCH-WE-M	0%	60%	30%	10%
21 /E6	HT PCH-WE-L	0%	60%	30%	10%
21 /E6	AC rooftop	0%	81%	17%	2%
21 /E6	AC splits	5%	84%	9%	2%
21 /E6	AC VRF	1%	95%	4%	0%
21 /E6	ACF	3%	82%	13%	2%
21 /E6	**AHC central Air Cooling**				
21 /E6	AC rooftop (rev)	0%	81%	17%	2%
21 /E6	AC splits (rev)	5%	84%	9%	2%
21 /E6	AC VRF (rev)	1%	95%	4%	0%
21 /E6	ACF (rev)	3%	82%	13%	2%
21 /E6	AHF	2%	42%	42%	14%
21 /E6	AHE	2%	42%	42%	14%
21 /E6	**AHC central Air Heating** (rev double)				
21 /E6	**AHC total Heating & Cooling**				
20	LH open fireplace	90%	9%	1%	0%
20	LH closed fireplace/inset	90%	9%	1%	0%
20	LH wood stove	90%	9%	1%	0%
20	LH coal stove	90%	9%	1%	0%
20	LH cooker	90%	9%	1%	0%
20	LH SHR stove	90%	9%	1%	0%
20	LH pellet stove	90%	9%	1%	0%
20	LH open fire gas	90%	9%	1%	0%
20	LH closed fire gas	90%	9%	1%	0%
20	LH flueless fuel heater	90%	9%	1%	0%
20	LH elec.portable	66%	30%	4%	0%
20	LH elec.convector	66%	30%	4%	0%
20	LH elec.storage	66%	30%	4%	0%
20	LH elec.underfloor	66%	30%	4%	0%
20	LH luminous heaters	0%	2%	12%	86%
20	LH tube heaters	0%	2%	12%	86%
20	**LH Local Heaters**				
10	RAC cooling, all RAC types <12 kW	45%	49%	5%	1%
10	o/w RAC reversible (also heating)	45%	49%	5%	1%
10	**RAC Room Air Conditioner**				
11	**CIRC Circulator pumps <2.5 kW**	60%	25%	12%	3%
E6 /10	NRVU Central Balanced >125W/fan	0%	86%	12%	2%
E6 /10	RVU Central Unidir. ≤125W/fan	100%	0%	0%	0%
E6 /10	RVU Central Balanced ≤125W/fan	100%	0%	0%	0%
E6 /10	RVU Local Balanced	100%	0%	0%	0%
E6 /10	**VU Ventilation Units** (res & nonres)				
8 /9 /19	LFL	5%	72%	22%	1%
8 /9 /19	CFL	50%	38%	12%	0%
8 /9 /19	Tungsten	65%	25%	8%	2%
8 /9 /19	GLS	70%	20%	8%	2%
8 /9 /19	HID	0%	92%	7%	1%
8 /9 /19	LED	18%	63%	18%	1%
8 /9 /19	SP Special Purpose (exempt)	0%	76%	23%	1%
8 /9 /19	lighting controls & sb	0%	76%	23%	1%
8 /9 /19	**LS Light Sources**				

Lot	Subcase Classifications	Energy Shares per sector (%)			
		Residential	Tertiary	Industry	Other
5	DP TV total	90%	10%	0%	0%
5	DP Monitor total	49%	44%	6%	1%
5	DP TV standard	90%	10%	0%	0%
5	DP TV LoNA	90%	10%	0%	0%
5	DP TV Smart	90%	10%	0%	0%
5	DP Monitor PC	49%	44%	6%	1%
5	**DP electronic DisPlays**				
18	SSTB Simple STB	90%	10%	0%	0%
18	CSTB Complex STB	90%	10%	0%	0%
18	**STB Set Top Boxes**				
E3	VIDEO DVD players/recorders	90%	9%	1%	0%
E3	VIDEO projectors	3%	93%	3%	1%
E3	VIDEO game consoles	100%	0%	0%	0%
E3	**VIDEO**				
E9	ES Rack servers	0%	86%	12%	2%
E9	ES Blade servers	0%	86%	12%	2%
E9	ES Storage	0%	86%	12%	2%
E9	**ES Enterprise Servers**				
3	PC Desktop	66%	29%	4%	1%
3	PC Notebook	66%	29%	4%	1%
3	PC Tablet/slate	90%	9%	1%	0%
3	PC Thin client	0%	86%	12%	2%
3	PC Workstation	0%	86%	12%	2%
3	**PC Personal Computers**				
4	EP-Copier mono	4%	82%	12%	2%
4	EP-Copier colour	4%	82%	12%	2%
4	EP-printer mono	5%	82%	11%	2%
4	EP-printer colour	5%	82%	11%	2%
4	IJ SFD printer	94%	5%	1%	0%
4	IJ MFD printer	94%	5%	1%	0%
4	**EP & IJ imaging equipment**				
6 /26	SB Home Gateway	100%	0%	0%	0%
6 /26	SB Home NAS	100%	0%	0%	0%
6 /26	SB Home Phones (fixed)	100%	0%	0%	0%
6 /26	SB Office Phones (fixed)	0%	86%	12%	2%
6 /26	**SB (networked) Stand-By** (rest)				
7	**BC Battery Charged devices**	100%	0%	0%	0%
27	UPS below 1.5 kVA	10%	90%	0%	0%
27	UPS 1.5 to 5 kVA	5%	90%	5%	0%
27	UPS 5 to 10 kVA	0%	90%	10%	0%
27	UPS 10 to 200 kVA	0%	80%	15%	5%
27	**UPS Total**				
13	**RF Household Refrigeration**	92%	6%	1%	1%
12	CF open vertical chilled multi deck (RVC2)	0%	100%	0%	0%
12	CF open horizontal frozen island (RHF4)	0%	100%	0%	0%
12	CF other supermarket display (non-base cases)	0%	100%	0%	0%
12	CF Plug in one door beverage cooler	0%	100%	0%	0%
12	CF Plug in horizontal ice cream freezer	0%	100%	0%	0%
12	CF Spiral vending machine	0%	76%	23%	1%
	CF Commercial Refrigeration				
E1	**PF Storage cabinets All types**	0%	100%	0%	0%
E1	**PF Process Chiller All MT&LT**	0%	2%	90%	8%
E1	**PF Condensing Unit, All MT&LT**	0%	85%	10%	5%
E1	**PF Professional Refrigeration, Total**				
22 /23	CA El. Hobs	100%	0%	0%	0%
22 /23	CA El. Ovens	80%	20%	0%	0%
22 /23	CA Gas Hobs	80%	20%	0%	0%
22 /23	CA Gas Ovens	90%	10%	0%	0%
22 /23	CA Range Hoods	80%	20%	0%	0%
22 /23	**CA Cooking Appliances**				
25	CM Dripfilter (glasss)	95%	5%	0%	0%
25	CM Dripfilter (thermos)	95%	5%	0%	0%
25	CM Dripfilter (full automatic)	95%	5%	0%	0%
25	CM Pad filter	95%	5%	0%	0%
25	CM Hard cap espresso	95%	5%	0%	0%
25	CM Semi-auto espresso	95%	5%	0%	0%
25	CM Fully-auto espresso	95%	5%	0%	0%
25	**CM household Coffee Makers**				
14	**WM household Washing Machine**	97%	3%	0%	0%
14	**DW Household Dishwashers**	93%	7%	0%	0%
16	LD el.vented	95%	5%	0%	0%
16	LD el.condensor	95%	5%	0%	0%
16	LD gas.dryer	95%	5%	0%	0%
16	**LD household Laundry Drier**				

Lot	Subcase Classifications	Energy Shares per sector (%)			
		Residential	Tertiary	Industry	Other
17	VC household	100%	0%	0%	0%
17	VC professional	0%	86%	12%	2%
17	**VC Vacuum Cleaners**				
11	FAN Axial<300Pa (all FAN types >125W)	0%	75%	23%	2%
11	FAN Axial>300Pa	0%	75%	23%	2%
11	FAN Centr.FC	0%	75%	23%	2%
11	FAN Centr.BC-free	0%	75%	23%	2%
11	FAN Centr.BC	0%	75%	23%	2%
11	FAN Cross-flow	0%	75%	23%	2%
11	**FAN Industrial Fans >125W**				
11	**MT Motors 0.75-375 kW**	0%	20%	70%	10%
11	**WP Water pumps**	0%	29%	30%	41%
31	CP Fixed Speed 5-1280 l/s	0%	1%	83%	16%
31	CP Variable speed 5-1280 l/s	0%	0%	100%	0%
31	CP Pistons 2-64 l/s	0%	80%	20%	0%
31	**CP Standard Air Compressors**				
E2	TRAFO Distribution	0%	0%	0%	100%
E2	TRAFO Industry oil	0%	0%	0%	100%
E2	TRAFO Industry dry	0%	0%	0%	100%
E2	TRAFO Power	0%	0%	0%	100%
E2	TRAFO DER oil	0%	0%	0%	100%
E2	TRAFO DER dry	0%	0%	0%	100%
E2	TRAFO Small	0%	0%	0%	100%
E2	**TRAFO Utility Transformers**				
T	**TYRE** car replacement tyres C1	80%	15%	4%	1%
T	**TYRE** van replacement tyres C2	0%	60%	35%	5%
T	**TYRE** truck replacement tyres C3	0%	60%	35%	5%
T	**TYRE Replacement Tyres**				

SALES

Lot	SALES, in 000 units (light, tyres in m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
2	**WH dedicated Water Heater**	**9855**	**10918**	**11159**	**11398**	**11638**	**11878**	**12118**	**12358**	**12599**	**12839**
1	**CHC Central Heating combi, water heating**	**3624**	**6065**	**6505**	**6946**	**7386**	**7826**	**8266**	**8706**	**9147**	**9587**
1	**CH Central Heating boiler, space heating**	**4802**	**6987**	**7469**	**7951**	**8729**	**9508**	**10287**	**11066**	**11845**	**12624**
15	SFB Wood Manual	226	136	88	50	28	26	23	21	19	17
15	SFB Wood Direct Draft	5	223	227	232	206	251	305	371	451	549
15	SFB Coal	64	28	4	3	3	2	2	2	2	2
15	SFB Pellets	0	46	71	71	71	79	87	96	106	117
15	SFB Wood chips	0	5	5	6	7	8	9	9	10	12
15	**SFB Solid Fuel Boilers**	**294**	**438**	**395**	**362**	**315**	**365**	**426**	**499**	**588**	**696**
21 /E6	CHAE-S (≤ 400 kW)	21	88	97	107	119	130	108	55	17	3
21 /E6	CHAE-L (> 400 kW)	2	6	6	7	7	7	7	8	8	8
21 /E6	CHWE-S (≤ 400 kW)	2	9	10	11	12	13	14	15	16	17
21 /E6	CHWE-M (> 400 kW; ≤ 1500 kW)	1	2	2	2	2	2	2	2	2	2
21 /E6	CHWE-L (> 1500 kW)	0	1	1	1	1	1	1	1	1	1
21 /E6	CHF	0	0	1	1	1	1	1	1	1	1
21 /E6	HT PCH-AE-S	9	15	16	17	18	19	19	20	21	22
21 /E6	HT PCH-AE-L	3	5	5	5	6	6	6	6	7	7
21 /E6	HT PCH-WE-S	2	4	4	4	5	5	5	5	5	6
21 /E6	HT PCH-WE-M	2	3	3	3	4	4	4	4	4	4
21 /E6	HT PCH-WE-L	0	0	0	0	0	0	0	0	0	0
21 /E6	AC rooftop	11	36	36	28	16	4	4	4	4	4
21 /E6	AC splits	92	335	350	338	326	313	301	289	278	266
21 /E6	AC VRF	0	91	119	173	218	263	307	346	379	403
21 /E6	ACF	0	0	1	1	1	1	1	1	1	1
21 /E6	**AHC central Air Cooling**	**146**	**595**	**650**	**697**	**734**	**769**	**782**	**760**	**745**	**746**
21 /E6	AC rooftop (rev)	7	22	21	17	10	2	0	0	0	0
21 /E6	AC splits (rev)	67	231	241	234	226	217	209	200	192	184
21 /E6	AC VRF (rev)	0	80	99	152	185	212	235	252	263	266
21 /E6	ACF (rev)	0	1	1	1	1	2	2	2	2	3
21 /E6	AHF	134	88	82	77	73	69	65	61	57	53
21 /E6	AHE	3	5	5	5	5	5	5	5	5	5
21 /E6	**AHC central Air Heating** (rev double)	**210**	**426**	**450**	**486**	**499**	**507**	**515**	**521**	**519**	**511**
21 /E6	**AHC total Heating & Cooling**	**282**	**688**	**738**	**780**	**812**	**843**	**852**	**826**	**807**	**804**
20	LH open fireplace	517	754	759	764	759	754	753	753	753	753
20	LH closed fireplace/inset	316	854	953	1052	1066	1079	1082	1082	1082	1082
20	LH wood stove	341	402	446	489	496	503	504	504	504	504
20	LH coal stove	156	121	111	101	75	50	46	46	46	46
20	LH cooker	250	503	607	712	730	748	751	751	751	751
20	LH SHR stove	216	302	374	447	500	553	564	564	564	564
20	LH pellet stove	0	231	291	352	377	402	407	407	407	407
20	LH open fire gas	63	90	101	111	111	111	111	111	111	111
20	LH closed fire gas	325	366	376	387	397	407	409	409	409	409
20	LH flueless fuel heater	250	503	477	452	402	352	342	342	342	342
20	LH elec.portable	5930	7236	7465	7695	8043	8390	8460	8460	8460	8460
20	LH elec.convector	9357	11417	11779	12141	12689	13238	13349	13349	13349	13349
20	LH elec.storage	272	332	342	353	369	385	388	388	388	388
20	LH elec.underfloor	1071	1307	1348	1389	1452	1515	1528	1528	1528	1528
20	LH luminous heaters	20	24	24	24	24	24	24	24	24	24
20	LH tube heaters	20	24	24	24	24	24	24	24	24	24
20	**LH Local Heaters**	**19103**	**24464**	**25478**	**26492**	**27513**	**28534**	**28740**	**28740**	**28740**	**28740**
10	RAC cooling, all RAC types <12 kW	394	4705	7226	9089	10032	10359	10539	10719	10899	11080
10	o/w RAC reversible (also heating)	111	3491	6370	8036	8880	9178	9345	9513	9680	9848
10	**RAC Room Air Conditioner**	**394**	**4705**	**7226**	**9089**	**10032**	**10359**	**10539**	**10719**	**10899**	**11080**
11	**CIRC Circulator pumps <2.5 kW**	**5502**	**8065**	**8593**	**9120**	**9648**	**9542**	**9015**	**8487**	**7960**	**7432**
E6 /10	NRVU Central Unidir. >125W/fan CEXH	169	277	284	291	298	306	313	320	328	335
E6 /10	NRVU Central Balanced >125W/fan	61	257	279	302	328	353	378	404	429	455
E6 /10	RVU Central Unidir. ≤125W/fan	1042	2336	2073	1949	2109	2269	2429	2589	2748	2908
E6 /10	RVU Central Balanced ≤125W/fan	37	257	636	816	917	1018	1119	1220	1321	1422
E6 /10	RVU Local Balanced	7	85	186	302	424	546	668	790	912	1035
E6 /10	**VU Ventilation Units** (res & nonres)	**1315**	**3212**	**3457**	**3660**	**4076**	**4492**	**4908**	**5324**	**5739**	**6155**
8 /9 /19	LFL	271	390	346	349	324	299	273	250	229	209
8 /9 /19	CFL	51	473	408	342	307	272	241	221	201	181
8 /9 /19	Tungsten	88	628	718	754	573	412	299	209	159	149
8 /9 /19	GLS	1696	1170	897	641	379	102	27	1	1	1
8 /9 /19	HID	17	41	37	35	34	34	34	34	34	34
8 /9 /19	LED	0	10	67	342	550	507	452	447	421	388
8 /9 /19	**LS Light Sources, mln units BAU**	**2122**	**2712**	**2473**	**2464**	**2166**	**1626**	**1326**	**1162**	**1044**	**961**

SALES

Lot	SALES, in 000 units (light, tyres in m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
8 /9 /19	LFL	271	392	296	254	134	89	64	39	14	4
8 /9 /19	CFL	51	569	230	103	2	2	2	2	2	2
8 /9 /19	Tungsten	88	653	742	170	11	4	4	4	4	4
8 /9 /19	GLS	1696	700	39	68	40	39	39	39	39	39
8 /9 /19	HID	17	42	25	16	9	6	6	6	6	6
8 /9 /19	LED	0	9	313	1158	786	529	498	544	523	549
8 /9 /19	GLS stock	0	112	224	10						
8 /9 /19	Tungsten stock	0	90	131	10						
8 /9 /19	**LS Light Sources, mln units ECO**	**2122**	**2365**	**1645**	**1769**	**983**	**670**	**613**	**634**	**588**	**604**
5	DP TV standard	26130	60139	11674	0	0	0	0	0	0	0
5	DP TV LoNA	0	8201	29185	36537	31894	26101	19808	13515	7223	930
5	DP TV Smart	0	0	17511	36537	47841	60902	74718	88535	102351	116168
5	DP Monitor PC	10050	25125	14070	14070	14070	14070	14070	14070	14070	14070
5	**DP electronic DisPlays**	**36180**	**93465**	**72440**	**87144**	**93805**	**101073**	**108596**	**116120**	**123644**	**131168**
18	SSTB Simple STB	0	26633	6030	0	0	0	0	0	0	0
18	CSTB Complex STB	0	33416	40944	44117	44626	43501	47263	51025	54787	58549
18	**STB Set Top Boxes**	**0**	**60049**	**46974**	**44117**	**44626**	**43501**	**47263**	**51025**	**54787**	**58549**
E3	VIDEO DVD players/recorders	39	35400	30500	4000	0	0	0	0	0	0
E3	VIDEO projectors	30	2100	1781	725	313	0	0	0	0	0
E3	VIDEO game consoles	0	17748	15000	11500	13622	13622	13622	13622	13622	13622
E3	**VIDEO**	**69**	**55248**	**47281**	**16225**	**13935**	**13622**	**13622**	**13622**	**13622**	**13622**
E9	ES Rack servers	90	2382	2663	3090	3719	4724	5126	5025	5025	5025
E9	ES Blade servers	6	67	69	75	89	110	119	115	115	115
E9	ES Storage	11	141	161	177	196	211	221	214	214	214
E9	**ES Enterprise Servers**	**108**	**2590**	**2893**	**3343**	**4004**	**5044**	**5465**	**5354**	**5354**	**5354**
3	PC Desktop	6666	22221	16583	15075	15075	15075	15075	15075	15075	15075
3	PC Notebook	503	36180	16583	15578	15578	15578	15578	15578	15578	15578
3	PC Tablet/slate	0	3814	60300	97988	126630	150750	158288	165825	173363	180900
3	PC Thin client	101	1206	1206	1206	1206	1206	1206	1206	1206	1206
3	PC Workstation	80	804	804	804	804	804	804	804	804	804
3	**PC Personal Computers**	**7350**	**64225**	**95475**	**130650**	**159293**	**183413**	**190950**	**198488**	**206025**	**213563**
4	EP-Copier mono	2349	943	565	239	176	113	50	0	0	0
4	EP-Copier colour	0	189	823	1234	1407	1533	1658	1784	1910	2035
4	EP-printer mono	3552	3364	2945	2404	2060	1834	1583	1332	1080	829
4	EP-printer colour	0	1300	1929	2598	3116	3618	4120	4623	5125	5628
4	IJ SFD printer	6099	9704	6758	4774	3518	3015	2387	1759	1131	503
4	IJ MFD printer	4999	16174	22191	25628	28140	30653	33165	35678	38190	40703
4	**EP & IJ imaging equipment**	**17000**	**31674**	**35212**	**36876**	**38416**	**40765**	**42964**	**45175**	**47436**	**49697**
6 /26	SB Home Gateway	0	30914	39858	48803	57747	66692	75636	84581	93525	102470
6 /26	SB Home NAS	0	2814	4824	6834	8844	10854	12864	14874	16884	18894
6 /26	SB Home Phones (fixed)	4623	23000	27594	29432	29432	29432	29432	29432	29432	29432
6 /26	SB Office Phones (fixed)	5858	11199	11916	12634	13352	14070	14788	15506	16224	16941
6 /26	**SB (networked) Stand-By** (rest)	**10481**	**67927**	**84193**	**97703**	**109376**	**121048**	**132720**	**144393**	**156065**	**167737**
7	**BC Battery Charged devices**	**24886**	**335000**	**335000**	**335000**	**335000**	**335000**	**335000**	**335000**	**335000**	**335000**
27	UPS below 1.5 kVA	505	1000	1041	1265	1489	1709	1915	2094	2234	2325
27	UPS 1.5 to 5 kVA	203	402	419	509	599	687	770	842	898	935
27	UPS 5 to 10 kVA	13	26	27	32	38	44	49	54	57	60
27	UPS 10 to 200 kVA	7	13	14	17	20	23	25	28	30	31
27	**UPS Total**	**728**	**1441**	**1500**	**1823**	**2145**	**2463**	**2760**	**3018**	**3219**	**3350**
13	**RF Household Refrigeration**	**17588**	**19196**	**19497**	**19799**	**20100**	**20402**	**20703**	**21005**	**21306**	**21608**
12	CF open vertical chilled multi deck (RVC2)	81	89	88	90	91	92	94	95	97	98
12	CF open horizontal frozen island (RHF4)	8	9	9	9	9	10	10	10	10	10
12	CF other supermarket display (non-base cases)	314	372	393	408	423	438	454	469	486	503
12	CF Plug in one door beverage cooler	675	823	818	848	877	907	937	968	1000	1033
12	CF Plug in horizontal ice cream freezer	289	353	351	363	376	389	401	415	428	443
12	CF Spiral vending machine	105	80	65	67	70	73	76	78	81	85
	CF Commercial Refrigeration	**1474**	**1726**	**1724**	**1785**	**1847**	**1908**	**1971**	**2035**	**2102**	**2171**
E1	PF Storage cabinet Chilled Vertical (CV)	144	187	195	203	212	222	232	242	251	261
E1	PF Storage cabinet Frozen Vertical (FV)	64	83	87	90	94	98	103	107	111	116
E1	PF Storage cabinet Chilled Horizontal (CH)	62	80	84	87	91	95	99	104	108	112
E1	PF Storage cabinet Frozen Horizontal (FH)	27	36	37	38	40	42	44	46	48	50
E1	**PF Storage cabinets All types**	**297**	**386**	**403**	**418**	**438**	**458**	**478**	**498**	**518**	**538**
E1	PF Process Chiller AC MT S ≤ 300 kW	1.1	2.2	2.4	2.6	2.9	3.2	3.5	3.7	4.0	4.3
E1	PF Process Chiller AC MT L > 300 kW	0.3	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.3
E1	PF Process Chiller AC LT S ≤ 200 kW	0.8	1.6	1.8	1.9	2.1	2.3	2.5	2.7	2.9	3.1
E1	PF Process Chiller AC LT L > 200 kW	0.2	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0
E1	PF Process Chiller WC MT S ≤ 300 kW	0.3	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3
E1	PF Process Chiller WC MT L > 300 kW	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
E1	PF Process Chiller WC LT S ≤ 200 kW	0.3	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.0	1.1
E1	PF Process Chiller WC LT L > 200 kW	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5
E1	**PF Process Chiller All MT&LT**	**3**	**7**	**7**	**8**	**9**	**10**	**11**	**11**	**12**	**13**

SALES

Lot	**SALES, in 000 units** (light, tyres in m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
E1	PF Condensing Unit MT S 0.2-1 kW	325	259	265	285	308	331	357	385	414	446
E1	PF Condensing Unit MT M 1-5 kW	195	156	159	171	185	199	214	231	249	268
E1	PF Condensing Unit MT L 5-20 kW	98	78	80	86	92	99	107	115	124	134
E1	PF Condensing Unit MT XL 20-50 kW	33	26	27	29	31	33	36	38	41	45
E1	PF Condensing Unit LT S 0.1-0.4 kW	47	37	38	41	44	48	51	55	60	64
E1	PF Condensing Unit LT M 0.4-2 kW	62	50	51	55	59	64	69	74	79	86
E1	PF Condensing Unit LT L 2-8 kW	31	25	25	27	30	32	34	37	40	43
E1	PF Condensing Unit LT XL 8-20 kW	16	12	13	14	15	16	17	18	20	21
E1	**PF Condensing Unit, All MT&LT**	**807**	**643**	**657**	**708**	**763**	**822**	**885**	**953**	**1027**	**1107**
E1	**PF Professional Refrigeration, Total**	**1108**	**1035**	**1067**	**1134**	**1210**	**1289**	**1374**	**1463**	**1558**	**1658**
22 /23	CA El. Hobs	6576	10401	11307	12230	12955	13649	14344	15038	15732	16427
22 /23	CA El. Ovens	9660	10520	10986	12481	12637	12796	12957	13120	13285	13451
22 /23	CA Gas Hobs	7403	6220	5921	5625	5355	5098	4841	4584	4327	4070
22 /23	CA Gas Ovens	2688	2116	1992	1982	1958	1933	1909	1886	1862	1839
22 /23	CA Range Hoods	5780	7067	7429	7808	8207	8625	9044	9463	9881	10300
22 /23	**CA Cooking Appliances**	**32107**	**36324**	**37635**	**40126**	**41112**	**42102**	**43095**	**44090**	**45087**	**46086**
25	CM Dripfilter (glasss)	18299	12733	10791	8945	8694	8694	8694	8694	8694	8694
25	CM Dripfilter (thermos)	2353	3682	3746	3809	3873	3930	3961	3993	4025	4057
25	CM Dripfilter (full automatic)	0	1841	2084	2326	2569	2812	3054	3297	3539	3782
25	CM Pad filter	0	5261	5753	6245	6737	7228	7720	8212	8704	9196
25	CM Hard cap espresso	336	1430	3058	4591	4800	4800	4800	4800	4800	4800
25	CM Semi-auto espresso	575	658	619	580	541	502	463	424	385	346
25	CM Fully-auto espresso	575	658	763	869	974	1080	1185	1291	1396	1502
25	**CM household Coffee Makers**	**22138**	**26262**	**26813**	**27365**	**28187**	**29045**	**29878**	**30711**	**31543**	**32376**
14	**WM household Washing Machine**	**9045**	**13164**	**13164**	**14151**	**13585**	**13585**	**13585**	**13585**	**13585**	**13585**
14	**DW Household Dishwashers**	**3216**	**7034**	**8157**	**9280**	**10402**	**11524**	**12646**	**13768**	**14889**	**16011**
16	LD el.vented	1938	2088	1969	1752	1788	1803	1813	1822	1832	1842
16	LD el.condensor	835	3161	3698	4152	4236	4272	4296	4320	4344	4368
16	LD gas.dryer	10	19	23	27	28	28	29	29	30	30
16	**LD household Laundry Drier**	**2783**	**5268**	**5690**	**5932**	**6052**	**6103**	**6137**	**6171**	**6205**	**6239**
17	VC household	16746	53120	74504	90645	100079	109514	118948	128383	137817	147252
17	VC professional	1110	1289	1355	1424	1496	1569	1642	1714	1787	1859
17	**VC Vacuum Cleaners**	**17856**	**54409**	**75858**	**92069**	**101576**	**111083**	**120590**	**130097**	**139604**	**149111**
11	FAN Axial<300Pa (all FAN types >125W)	1605	5260	6038	6816	6816	6816	6816	6816	6816	6816
11	FAN Axial>300Pa	1660	5743	6058	6374	6374	6374	6374	6374	6374	6374
11	FAN Centr.FC	824	2095	2417	2740	2740	2740	2740	2740	2740	2740
11	FAN Centr.BC-free	253	616	700	784	868	885	901	918	935	952
11	FAN Centr.BC	258	685	785	885	984	1004	1104	1204	1304	1404
11	FAN Cross-flow	238	530	604	678	752	766	840	914	988	1062
11	**FAN Industrial Fans >125W**	**4837**	**14928**	**16602**	**18275**	**18533**	**18584**	**18775**	**18965**	**19156**	**19346**
11	**MT Motors 0.75-375 kW**	**6753**	**9949**	**10446**	**10904**	**10904**	**10904**	**10904**	**10904**	**10904**	**10904**
11	**WP Water pumps**	**1233**	**1675**	**1800**	**1935**	**2080**	**2225**	**2371**	**2516**	**2661**	**2806**
31	CP Fixed Speed 5-1280 l/s	51	45	42	43	45	46	48	49	51	52
31	CP Variable speed 5-1280 l/s	0	9	13	14	15	15	16	16	17	17
31	CP Pistons 2-64 l/s	50	52	54	56	58	60	61	63	65	67
31	**CP Standard Air Compressors**	**101**	**106**	**109**	**113**	**117**	**121**	**125**	**129**	**133**	**137**
E2	TRAFO Distribution	61	96	103	110	118	127	136	145	154	163
E2	TRAFO Industry oil	18	30	32	34	37	39	42	45	48	51
E2	TRAFO Industry dry	3	6	6	6	7	7	8	8	9	9
E2	TRAFO Power	2	3	4	4	4	4	5	5	5	6
E2	TRAFO DER oil	0	1	2	3	4	7	11	14	17	21
E2	TRAFO DER dry	0	4	6	11	17	29	42	56	70	83
E2	TRAFO Small	38	38	38	38	38	38	38	38	38	38
E2	**TRAFO Utility Transformers**	**122**	**177**	**190**	**205**	**225**	**252**	**282**	**311**	**341**	**371**
	TYRE replacement tyres in m units										
T	**TYRE** car replacement tyres C1	181	223	221	257	289	289	289	289	289	289
T	**TYRE** van replacement tyres C2	45	56	55	64	72	72	72	72	72	72
T	**TYRE** truck replacement tyres C3	6.4	5.9	6.6	7.0	7.3	7.7	7.7	7.7	7.7	7.7
T	**TYRE Replacement Tyres**	**232**	**285**	**283**	**328**	**369**	**369**	**369**	**369**	**369**	**369**

STOCK (000 units, Lights in m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WH dedicated Water Heater	**15**	**136,218**	**158,079**	**162,549**	**166,018**	**169,531**	**173,129**	**176,730**	**180,333**	**183,936**	**187,539**
CHC Central Heating combi, water heat	**15**	**42,753**	**82,237**	**89,729**	**95,497**	**101,543**	**108,145**	**114,748**	**121,351**	**127,954**	**134,556**
CH Central Heating boiler, space heat	**18**	**69,520**	**111,531**	**120,335**	**128,929**	**138,007**	**148,980**	**161,514**	**175,355**	**189,375**	**203,395**
SFB Wood Manual	**18**	6,659	2,933	2,502	2,013	1,461	936	611	461	407	368
SFB Wood Direct Draft	**18**	71	1,040	2,092	3,116	3,915	4,070	4,346	4,924	5,943	7,231
SFB Coal	**20**	2,176	909	685	457	261	110	55	49	44	40
SFB Pellets	**20**	-	329	616	924	1,196	1,396	1,508	1,613	1,766	1,950
SFB Wood chips	**20**	-	80	103	123	122	124	140	157	174	192
SFB Solid Fuel Boilers		**8,906**	**5,292**	**5,999**	**6,633**	**6,955**	**6,636**	**6,661**	**7,204**	**8,334**	**9,781**
CHAE-S (≤ 400 kW)	**20**	288	1,210	1,526	1,790	1,984	2,181	2,318	2,188	1,768	1,174
CHAE-L (> 400 kW)	**25**	29	103	126	146	159	166	171	177	184	191
CHWE-S (≤ 400 kW)	**20**	29	122	154	180	199	219	240	262	285	306
CHWE-M (> 400 kW; ≤ 1500 kW)	**25**	8	30	36	42	46	48	50	52	54	56
CHWE-L (> 1500 kW)	**25**	3	10	12	14	15	16	17	17	18	19
CHF	**15**	0	2	5	7	8	10	12	14	16	17
HT PCH-AE-S	**15**	108	191	215	236	253	265	277	288	299	310
HT PCH-AE-L	**15**	34	60	68	75	80	84	87	91	95	98
HT PCH-WE-S	**15**	28	49	55	61	65	68	71	74	77	80
HT PCH-WE-M	**15**	21	38	42	47	50	52	54	57	59	61
HT PCH-WE-L	**20**	2	4	4	5	5	6	6	6	6	6
AC rooftop	**15**	126	502	550	537	454	307	168	86	63	63
AC splits	**15**	1,059	4,506	4,933	5,087	5,097	4,960	4,768	4,591	4,413	4,236
AC VRF	**15**	0	707	1,142	1,724	2,282	2,988	3,691	4,330	4,934	5,459
ACF	**15**	0	2	5	7	8	10	12	14	16	17
AHC central Air Cooling		**1,735**	**7,538**	**8,874**	**9,957**	**10,706**	**11,380**	**11,944**	**12,248**	**12,285**	**12,095**
AC rooftop (rev)	**15**	78	311	338	324	271	181	90	28	2	0
AC splits (rev)	**15**	767	3,110	3,402	3,512	3,522	3,430	3,300	3,178	3,055	2,932
AC VRF (rev)	**15**	0	622	991	1,467	1,939	2,501	3,013	3,367	3,653	3,850
ACF (rev)	**15**	0	5	9	13	17	20	24	28	31	35
AHF	**16**	1,589	1,573	1,441	1,345	1,262	1,189	1,122	1,058	993	929
AHE	**10**	24	86	73	50	50	50	50	50	50	50
AHC central Air Heating (rev double)		**2,459**	**5,706**	**6,255**	**6,710**	**7,060**	**7,373**	**7,600**	**7,708**	**7,785**	**7,797**
AHC total Heating & Cooling		**3,348**	**9,196**	**10,389**	**11,352**	**12,018**	**12,619**	**13,116**	**13,356**	**13,329**	**13,075**
LH open fireplace	**25**	10,408	15,205	16,497	17,561	18,351	18,815	18,939	18,919	18,874	18,834
LH closed fireplace/inset	**25**	4,661	12,757	15,884	19,063	21,970	24,240	25,713	26,556	26,903	27,012
LH wood stove	**25**	7,754	9,132	9,593	10,202	10,846	11,446	11,986	12,364	12,523	12,576
LH coal stove	**25**	5,291	3,490	3,244	3,025	2,774	2,437	2,052	1,708	1,414	1,215
LH cooker	**15**	2,981	6,028	7,185	8,539	9,787	10,663	11,071	11,216	11,270	11,270
LH SHR stove	**25**	4,455	6,228	6,908	7,860	9,018	10,330	11,687	12,778	13,505	13,928
LH pellet stove	**15**	-	1,955	2,970	3,980	4,809	5,432	5,829	6,031	6,106	6,106
LH open fire gas	**20**	990	1,563	1,706	1,864	2,008	2,121	2,191	2,211	2,211	2,211
LH closed fire gas	**20**	6,106	6,930	7,135	7,341	7,548	7,754	7,939	8,070	8,151	8,181
LH flueless fuel heater	**7**	1,584	3,207	3,427	3,271	3,020	2,673	2,423	2,394	2,394	2,394
LH elec.portable	**9**	51,316	62,657	65,401	67,602	70,022	73,009	75,446	76,144	76,144	76,144
LH elec.convector	**9**	80,966	98,858	103,188	106,661	110,479	115,192	119,037	120,138	120,138	120,138
LH elec.storage	**15**	3,807	4,648	4,865	5,059	5,243	5,444	5,641	5,769	5,817	5,817
LH elec.underfloor	**30**	27,915	34,076	35,738	37,352	38,966	40,613	42,151	43,381	44,362	45,136
LH luminous heaters	**15**	277	338	352	360	362	362	362	362	362	362
LH tube heaters	**20**	360	440	459	472	480	482	482	482	482	482
LH Local Heaters		**208,872**	**267,511**	**284,553**	**300,212**	**315,681**	**331,013**	**342,951**	**348,522**	**350,655**	**351,805**
RAC cooling, all RAC types <12 kW	**12**	4,730	49,470	65,440	82,524	104,672	117,785	123,573	126,251	128,414	130,577
o/w RAC reversible (also heating)	**12**	1,327	28,633	46,453	68,618	91,815	104,245	109,476	111,943	113,954	115,965
RAC Room Air Conditioner		**4,730**	**49,470**	**65,440**	**82,524**	**104,672**	**117,785**	**123,573**	**126,251**	**128,414**	**130,577**
CIRC Circulator pumps <2.5 kW	**10**	**50,049**	**75,601**	**81,179**	**86,455**	**91,731**	**95,108**	**94,053**	**89,621**	**84,345**	**79,068**
NRVU Central Unidir. >125W/fan CEXH (1 fan)	**17**	1,879	4,157	4,501	4,726	4,875	4,998	5,123	5,247	5,372	5,497
NRVU Central Balanced >125W/fan	**17**	233	2,826	3,614	4,329	4,902	5,318	5,742	6,174	6,606	7,039
RVU Central Unidir. ≤125W/fan	**17**	17,148	33,878	38,186	37,438	35,790	35,435	36,991	39,653	42,373	45,093
RVU Central Balanced ≤125W/fan	**17**	163	2,140	4,245	7,492	11,019	14,191	16,265	17,999	19,716	21,433
RVU Local Balanced	**17**	33	633	1,295	2,439	4,042	5,991	8,038	10,113	12,190	14,266
VU Ventilation Units (Res & nonRes)		**19,456**	**43,634**	**51,841**	**56,423**	**60,627**	**65,933**	**72,158**	**79,186**	**86,257**	**93,328**
LFL	**7**	1161	1928	2220	2304	2292	2193	2083	1968	1870	1778
CFL	**12**	325	3453	4737	4698	4084	3604	3232	2928	2667	2424
Tungsten	**4**	297	2034	2484	2639	2189	1612	1188	840	636	575
GLS	**2**	3731	2726	2057	1492	917	306	67	5	2	2
HID	**3**	40	97	89	86	81	81	81	81	81	81
LED	**23**	0	18	208	1274	3707	6261	8204	9711	10884	11754
LS Light Sources, in million units BAU		**5,554**	**10,255**	**11,796**	**12,493**	**13,270**	**14,057**	**14,855**	**15,533**	**16,140**	**16,615**

STOCK (000 units, Lights in m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LFL	**6**	1161	1930	2159	1911	1300	799	581	412	233	88
CFL	**12**	325	3682	4589	3431	1227	352	34	21	21	21
Tungsten	**4**	297	2059	2706	991	142	16	16	16	16	16
GLS	**2**	3731	1952	129	153	94	86	86	86	86	86
HID	**3**	40	98	66	47	27	15	15	15	15	15
LED	**21**	0	14	644	5482	10269	12685	13896	14705	15467	16174
GLS stock	**2**	0	187	566	47	0	0	0	0	0	0
Tungsten stock	**4**	0	90	433	73	0	0	0	0	0	0
LS Light Sources, in million units ECO		**5,554**	**10,011**	**11,292**	**12,136**	**13,058**	**13,954**	**14,628**	**15,254**	**15,838**	**16,399**
DP TV standard		216075	376787	332719	50226	0	0	0	0	0	0
DP TV LoNA		0	21193	108864	240584	254494	217550	173656	127735	81799	35863
DP TV Smart		0	0	35712	189037	296679	383864	481635	582472	683332	784192
DP Monitor PC	**7**	13065	172860	130650	98490	98490	98490	98490	98490	98490	98490
DP electronic DisPlays		**229,140**	**570,840**	**607,945**	**578,337**	**649,663**	**699,904**	**753,781**	**808,697**	**863,620**	**918,544**
SSTB	**5**	0	98691	77847.3	2010	0	0	0	0	0	0
CSTB	**5**	0	79898	194540	217571	223909	216233	228792	247602	266411	285221
STB set top boxes (Complex & Simple)		**-**	**178,589**	**272,388**	**219,581**	**223,909**	**216,233**	**228,792**	**247,602**	**266,411**	**285,221**
VIDEO DVD players/recorders	**4**	68	135545	166000	40900	3000	0	0	0	0	0
VIDEO projectors	**5**	60	10658	9204	5403	2284	422	0	0	0	0
VIDEO game consoles	**6**	0	71852	89248	79432	70322	81732	81732	81732	81732	81732
VIDEO		**129**	**218,055**	**264,452**	**125,735**	**75,606**	**82,154**	**81,732**	**81,732**	**81,732**	**81,732**
ES Rack servers	**5**	352	11192	12973	14397	17286	21407	25728	25125	25125	25125
ES Blade servers	**5**	20	335	357	359	416	501	601	573	573	573
ES Storage	**4**	41	551	640	687	759	827	915	856	856	856
ES Enterprise Servers		**413**	**12,077**	**13,970**	**15,443**	**18,461**	**22,735**	**27,244**	**26,554**	**26,554**	**26,554**
PC Desktop	**5**	28886.715	111494.7	97595.55	75877.5	75375	75375	75375	75375	75375	75375
PC Notebook	**4**	502.5	120600	94972.5	62310	62310	62310	62310	62310	62310	62310
PC Tablet/slate	**4**	0	3813.975	158287.5	339187.5	473355	589432.5	624105	654255	684405	714555
PC Thin client	**4**	100.5	4824	4824	4824	4824	4824	4824	4824	4824	4824
PC Workstation	**4**	80.4	3216	3216	3216	3216	3216	3216	3216	3216	3216
PC Personal Computers		**29,570**	**243,949**	**358,896**	**485,415**	**619,080**	**735,158**	**769,830**	**799,980**	**830,130**	**860,280**
EP-Copier mono	**4**	9803	4303	2745	1228	779	528	276	38	0	0
EP-Copier colour	**4**	0	677	2597	4613	5473	5980	6482	6985	7487	7990
EP-printer mono	**4**	14149	13859	12389	10266	8726	7663	6633	5628	4623	3618
EP-printer colour	**4**	0	4552	6874	9698	11814	13869	15879	17889	19899	21909
IJ SFD printer	**4**	22219	42349	30567	20669	15578	12939	10301	7789	5276	2764
IJ MFD printer	**4**	18213	57477	81543	99383	109545	119595	129645	139695	149745	159795
EP & IJ imaging equipment	**4**	**64,383**	**123,216**	**136,716**	**145,858**	**151,915**	**160,574**	**169,217**	**178,023**	**187,031**	**196,076**
SB Home Gateway	**5**	-	136,580	181,403	226,125	270,848	315,570	360,293	405,015	449,738	494,460
SB Home NAS	**5**	-	10,050	20,100	30,150	40,200	50,250	60,300	70,350	80,400	90,450
SB Home Phones (fixed)	**7**	13,955	141,705	173,865	200,512	206,025	206,025	206,025	206,025	206,025	206,025
SB Office Phones (fixed)	**7**	15,506	75,375	80,400	85,425	90,450	95,475	100,500	105,525	110,550	115,575
SB (networked) Stand-By (rest)		**29,461**	**363,710**	**455,768**	**542,212**	**607,523**	**667,320**	**727,118**	**786,915**	**846,713**	**906,510**
BC Battery Charged devices	**3**	**6.17E+04**	**1.01E+06**	**1.01E+06**	**1.01E+06**	**1.01E+06**	**1.01E+06**	**1.01E+06**	**1.01E+06**	**1.01E+06**	**1.01E+06**
UPS below 1.5 kVA	**4**	1,880	4,027	4,065	4,791	5,686	6,575	7,421	8,173	8,783	9,208
UPS 1.5 to 5 kVA	**8**	1,378	2,994	3,242	3,599	4,285	5,002	5,698	6,334	6,871	7,274
UPS 5 to 10 kVA	**10**	105	230	258	281	330	388	444	495	540	574
UPS 10 to 200 kVA	**12**	62	140	155	170	198	233	268	301	329	352
UPS Total		**3,425**	**7,392**	**7,720**	**8,840**	**10,500**	**12,199**	**13,830**	**15,303**	**16,523**	**17,408**
RF Household Refrigerators & freezers	**16**	**269,340**	**299,289**	**304,716**	**309,540**	**314,364**	**319,188**	**324,012**	**328,836**	**333,660**	**338,484**
CF open vertical chilled multi deck (RVC2)	**10**	724	863	886	893	897	911	926	940	955	970
CF open horizontal frozen island (RHF4)	**10**	75	90	92	93	93	95	96	98	99	101
CF other supermarket display (non-BCs)	**10**	2,794	3,448	3,734	3,938	4,095	4,246	4,397	4,552	4,712	4,877
CF Plug in one door beverage cooler	**9**	5,893	7,097	7,346	7,419	7,683	7,948	8,214	8,486	8,766	9,056
CF Plug in horizontal ice cream freezer	**9**	2,526	3,041	3,148	3,179	3,293	3,406	3,520	3,637	3,757	3,881
CF Spiral vending machine	**11**	948	1,161	916	744	742	771	800	831	863	896
CF Commercial Refrigeration		**12,960**	**15,700**	**16,122**	**16,266**	**16,803**	**17,376**	**17,953**	**18,543**	**19,152**	**19,781**
PF Storage cabinet Chilled Vertical (CV)	9	1,173	1,613	1,699	1,772	1,845	1,930	2,017	2,105	2,193	2,280
PF Storage cabinet Frozen Vertical (FV)	9	520	715	753	785	817	855	894	933	971	1,010
PF Storage cabinet Chilled Horizontal (CH)	9	503	691	728	760	791	827	865	902	940	977
PF Storage cabinet Frozen Horizontal (FH)	9	223	306	323	336	350	366	383	400	416	433
PF Storage cabinets All types	**9**	**2,418**	**3,326**	**3,502**	**3,653**	**3,803**	**3,978**	**4,158**	**4,339**	**4,520**	**4,701**
PF Process Chiller AC MT S ≤ 300 kW	15	12	25	30	34	38	42	46	50	54	58
PF Process Chiller AC MT L > 300 kW	15	3	8	9	10	11	12	14	15	16	17
PF Process Chiller AC LT S ≤ 200 kW	15	9	19	22	25	28	31	34	37	40	43
PF Process Chiller AC LT L > 200 kW	15	3	6	7	8	9	10	11	11	12	13
PF Process Chiller WC MT S ≤ 300 kW	15	3	8	9	10	11	13	14	15	16	17
PF Process Chiller WC MT L > 300 kW	15	2	4	4	5	5	6	6	7	8	8
PF Process Chiller WC LT S ≤ 200 kW	15	3	7	8	9	10	11	12	13	14	15
PF Process Chiller WC LT L > 200 kW	15	1	3	3	4	4	5	5	5	6	6
PF Process Chiller All MT&LT	**15**	**36**	**78**	**91**	**105**	**117**	**129**	**141**	**154**	**166**	**179**

STOCK (000 units, Lights in m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
PF Condensing Unit MT S 0.2-1 kW	8	2,710	2,159	2,080	2,169	2,337	2,517	2,712	2,922	3,147	3,391
PF Condensing Unit MT M 1-5 kW	8	1,626	1,295	1,248	1,302	1,402	1,510	1,627	1,753	1,888	2,034
PF Condensing Unit MT L 5-20 kW	8	813	648	624	651	701	755	814	876	944	1,017
PF Condensing Unit MT XL 20-50 kW	8	271	216	208	217	234	252	271	292	315	339
PF Condensing Unit LT S 0.1-0.4 kW	8	390	311	299	312	336	362	390	421	453	488
PF Condensing Unit LT M 0.4-2 kW	8	520	414	399	416	448	483	520	561	604	651
PF Condensing Unit LT L 2-8 kW	8	260	207	200	208	224	242	260	280	302	325
PF Condensing Unit LT XL 8-20 kW	8	130	104	100	104	112	121	130	140	151	163
PF Condensing Unit, All MT&LT	**8**	**6,720**	**5,354**	**5,157**	**5,379**	**5,795**	**6,243**	**6,725**	**7,245**	**7,805**	**8,408**
PF Professional Refrigeration, Total		**9,173**	**8,758**	**8,751**	**9,137**	**9,715**	**10,349**	**11,025**	**11,738**	**12,491**	**13,288**
CA El. Hobs	**15**	84,107	134,450	149,860	164,384	177,350	189,487	200,514	210,990	221,404	231,818
CA El. Ovens	**19**	175,517	192,782	200,328	210,549	221,607	233,220	240,287	243,758	246,820	249,921
CA Gas Hobs	**15**	117,121	97,967	93,983	90,174	86,235	82,036	78,038	74,156	70,301	66,445
CA Gas Ovens	**19**	56,974	44,958	42,602	40,477	38,941	37,841	37,102	36,646	36,190	35,740
CA Range Hoods	**14**	75,365	92,833	97,597	102,571	107,804	113,304	119,020	124,856	130,717	136,578
CA Cooking Appliances		**509,084**	**562,989**	**584,370**	**608,154**	**631,937**	**655,889**	**674,961**	**690,406**	**705,432**	**720,501**
CM Dripfilter (glass)	**6**	114,257	79,704	70,885	58,791	52,498	52,162	52,162	52,162	52,162	52,162
CM Dripfilter (thermos)	**6**	7,293	21,887	22,285	22,666	23,046	23,420	23,674	23,864	24,054	24,244
CM Dripfilter (full automatic)	**6**	-	10,184	11,775	13,231	14,686	16,141	17,597	19,052	20,507	21,963
CM Pad filter	**6**	-	29,098	33,041	35,992	38,943	41,895	44,846	47,798	50,749	53,700
CM Hard cap espresso	**6**	588	7,931	13,233	23,294	28,521	28,800	28,800	28,800	28,800	28,800
CM Semi-auto espresso	**6**	2,652	3,908	3,829	3,595	3,362	3,129	2,895	2,662	2,428	2,195
CM Fully-auto espresso	**6**	2,652	3,908	4,262	4,895	5,528	6,162	6,795	7,428	8,061	8,694
CM household Coffee Makers		**127,442**	**156,621**	**159,311**	**162,465**	**166,586**	**171,709**	**176,769**	**181,766**	**186,762**	**191,759**
WM household Washing Machine	**15**	**121,605**	**186,757**	**197,805**	**201,809**	**203,662**	**205,768**	**204,912**	**203,780**	**203,780**	**203,780**
DW Household Dishwashers	**15**	**36,816**	**83,213**	**98,836**	**115,611**	**132,456**	**149,295**	**166,129**	**182,957**	**199,783**	**216,610**
LD el.vented	**13**	19,926	28,763	27,670	25,544	24,106	23,272	23,382	23,538	23,664	23,791
LD el.condensor	**13**	3,492	34,062	40,442	46,328	51,712	54,541	55,406	55,786	56,097	56,406
LD gas.dryer	**13**	88	212	246	288	328	354	364	370	377	384
LD household Laundry Drier		**23,505**	**63,037**	**68,358**	**72,160**	**76,146**	**78,167**	**79,151**	**79,694**	**80,138**	**80,581**
VC household		150940	358502	382871	413169	481529	538709	575873	623045	670217	717389
VC professional	**6**	6,578	7,545	7,930	8,335	8,760	9,196	9,631	10,067	10,503	10,939
VC Vacuum Cleaners		**157,518**	**366,047**	**390,801**	**421,504**	**490,288**	**547,904**	**585,504**	**633,112**	**680,720**	**728,327**
FAN Axial<300Pa (all FAN types >125W)	**15**	24,068	66,073	77,557	86,583	95,235	100,682	102,238	102,238	102,238	102,238
FAN Axial>300Pa	**15**	24,905	73,340	84,119	88,978	92,764	94,973	95,604	95,604	95,604	95,604
FAN Centr.FC	**15**	12,360	26,015	31,629	35,281	38,192	40,449	41,094	41,094	41,094	41,094
FAN Centr.BC-free	**15**	3,790	7,865	9,349	10,257	11,255	12,289	13,011	13,397	13,673	13,925
FAN Centr.BC	**15**	3,863	8,709	10,452	11,497	12,669	13,887	14,985	16,083	17,461	18,959
FAN Cross-flow	**15**	3,564	6,327	7,290	8,470	9,725	10,625	11,437	12,249	13,267	14,373
FAN Industrial Fans >125W *(excl. box/ roof)*		**72,551**	**188,329**	**220,396**	**241,065**	**259,840**	**272,904**	**278,368**	**280,664**	**283,337**	**286,193**
MT Motors 0.75-375 kW	**12**	**72,643**	**107,000**	**117,028**	**124,553**	**128,915**	**130,755**	**130,847**	**130,847**	**130,847**	**130,847**
WP Water pumps	**11**	**12,589**	**17,135**	**18,447**	**19,830**	**21,317**	**22,884**	**24,480**	**26,077**	**27,673**	**29,270**
CP Fixed Speed 5-1280 l/s	12	285	616	554	502	503	519	537	554	571	588
CP Variable speed 5-1280 l/s	12	-	46	98	145	171	179	185	191	197	203
CP Pistons 2-64 l/s	9	400	505	492	494	512	531	549	566	583	600
CP Standard Air Compressors		**685**	**1,167**	**1,145**	**1,141**	**1,186**	**1,229**	**1,271**	**1,311**	**1,351**	**1,392**
TRAFO Distribution	**40**	1,530	2,553	2,855	3,167	3,488	3,817	4,152	4,487	4,817	5,150
TRAFO Industry oil	**25**	331	575	642	709	773	833	895	959	1,027	1,095
TRAFO Industry dry	**30**	72	123	137	152	166	180	194	208	222	237
TRAFO Power	**30**	48	74	82	91	100	109	117	126	135	144
TRAFO DER oil	**25**	-	8	15	25	42	69	111	168	237	317
TRAFO DER dry	**25**	-	32	58	101	167	276	445	671	949	1,267
TRAFO Small	**20**	754	754	754	754	754	754	754	754	754	754
TRAFO Utility Transformers		**2,734**	**4,118**	**4,543**	**4,998**	**5,490**	**6,039**	**6,668**	**7,373**	**8,141**	**8,965**
TYRE in m units											
TYRE car replacement tyres C1	**4**	724	881	896	1,031	1,187	1,219	1,219	1,219	1,219	1,219
TYRE van replacement tyres C2	**3**	154	178	182	210	242	246	246	246	246	246
TYRE truck replacement tyres C3	**4**	25	26	23	27	29	30	31	31	31	31
TYRE Replacement Tyres		**903**	**1,085**	**1,101**	**1,268**	**1,457**	**1,495**	**1,495**	**1,495**	**1,495**	**1,495**

Non-standard LIFE values	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
TVLIFE	10.0	6.5	7.8	7.4	7.3	7.3	7.3	7.3	7.3	7.3
VCLIFE	9.4	6.8	6.0	4.9	5.0	5.1	5.0	5.0	5.0	5.0

LOAD & TEST	unit	EXPLANATORY NOTES
Introduction		Explanations of the main test- and calculation methods are given below. The explanation is incomplete and aims only to give the reader an idea of the main principles involved. For a full overview it is indispensable to consult the original documents. The description below also provides some specific guidance as to how and where the values used in the model are different from what is mentioned in the regulations
WH dedicated Water Heater	kWh heat/a	Measurement unit for performance is the energy content of the useful hot water delivered, expressed in kWh heat. Energy efficiency of WHs is tested with a designated 24h tapping pattern, following manufacturer's instructions for intended use, and expressed as the ratio of the energy content of the useful hot water delivered and the measured energy input of the WH. The energy content of a draw-off relates to the volume of useful water ('useful' meaning that the water is above a minimum temperature threshold, depending on the type of draw-off), the average temperature difference with cold water (10 °C) over the draw-off period and the specific heat capacity of the water. Depending on the type of draw-off, minimum average or peak temperatures that need to be reached are defined. The measured energy input relates to primary energy, e.g. for electric WHs using conversion factor CC of 2.5. There are additional test- and calculation methods for solar-assisted WHs as well as for the assessment of whether or not a 'smart control' bonus applies for an electric WH. Additional guidelines from the Commission are expected in the spring of 2014. In the regulation, energy input of fossil-fuel fired WHs is expressed in GCV (Gross Calorific Value). To be compatible with Potencia/ Eurostat, the model recalculates to NCV (Net Calorific Value). For natural gas GCV=1.11 NCV; LPG factor 1.081; oil 1.065; solids ≈1. Note that in NCV the efficiency values are higher than in GCV. In the model, an aggregate GCV to NCV conversion factor of 1.02 between published values in IA study and the model is used, based on a fuel mix of 22 % fossil fuels and 78% electricity. Values used in the model are based on weighted average efficiency of tapping patterns for dedicated WHs (source: IA and preparatory studies). Note that, following the EL metric, the annual energy consumption of the WH is calculated at 60% of the 24h daily tapping pattern for 365 days (the tapping pattern represents peak performance, e.g. at certain times in the weekends)
CHC Central Heating combi, water heat	kWh heat/a	As above (dedicated WHs). Extra: for the interaction between the space heating and water heating functions special test- and calculation methods apply. Additional guidelines from the Commission are expected in the spring of 2014. In the model, an aggregate GCV to NCV conversion factor of 1.081 is used between published values in IA study and the model, based on a fuel mix of 91.5 % fossil fuels (80% gas, 20% oil) and 8.5% electricity (for heat pumps, electric resistance boilers and auxiliary electricity; reference 2010).
CH Central Heating boiler, space heat	kWh heat/a	Measurement unit for performance is the annual space heating demand in a designated heating season, calculated in the regulation as the multiplication of the rated boiler heat output (in kW) and a fixed number of full load equivalent operating hours (h). The seasonal space heating efficiency, i.e. the main regulated parameter, is the ratio of the above space heating demand and the actual energy consumption of the boiler. The actual energy consumption of the boiler is determined through testing and calculation. The testing entails measurements at the following test points: (a) 100% and 30% load heating efficiency (η100 and η30 conventional fossil fuel fired boiler and heat production of micro-CHP) or (b) 100% load efficiency (electric resistance boiler) or (c) the efficiency at 4 or 5 sink/source temperature pairs (heat pump boiler) and/or (d) electricity production at 100% heat load/30% heat load (micro-cogeneration) Also minimum and maximum auxiliary electricity is measured. The solar collector efficiency, which is an input the calculation of a possible solar contribution, is derived from testing (4 different water inlet temperatures over the operating range, 4 test samples). The basic seasonal efficiency (ηs) equation for conventional gas- and oil-boilers as well as micro-cogeneration boilers is ηs=0.85*η30 + 0.15*η100 - ∑F ∑F is the sum of: F1 temperature control correction -3%, F2 auxiliary electricity from combustion fan and CPU (conv.boiler) or source fan/pump (heat pump boiler) or solar loop circulator (solar assisted boiler) but without CH circulators (is in separate regulation Lot 11), F3 standby heat loss, F4 possible pilot flame loss, F5 for CHP: positive contribution of electricity production to seasonal efficiency. For heat pump boilers the seasonal coefficient of performance SCOP is calculated with a climate-specific 'bin-method' (comparable to the 'heating degree hours' concept) for Average, Warm and Cold climate. These 3 climate zones are also used in calculating the solar contribution to space heating. The climate zones are defined using meteorological data from Strasbourg (FR), Athens (GR) and Helsinki (FIN) respectively.

The seasonal efficiency in the regulation mainly takes into account product-related losses and assumes optimal sizing of the boiler capacity. Only through the temperature control term (F1) also some part of the comfort losses (temperature fluctuation, stratification) are taken into account. In the preparatory and IA studies, and in the model, the space heating demand is assessed on the basis of the estimated real average heat demand of the buildings in which the boilers are used. This means that all system-losses, i.e. the full fluctuation, stratification losses, distribution, buffer and timer losses at real-life boiler sizing are taken into account. For the strict boiler efficiency a more realistic, but more complex, assessment method was used to also calculate the effect of cycling below 30% of rated output.

The model uses only aggregated space heating demand data in the model, but the underlying more detailed scenario uses a 1% autonomous annual decrease (hereafter 'HeatDec') of the heating load after the year 2010 and a 1% increase before the year 2010. Note that the IA study scenarios, which are used in the model, assumed an exemption for B1.1 boilers up to 10 kW; not the (unconditional) exemption for B1 (combi) boilers up to 30 kW rated output which is in the current legislation.
In the model, an aggregate GCV to NCV conversion factor of 1.081 is used between published values in IA study and the model, based on a fuel mix of 91.5 % fossil fuels (80% gas, 20% oil) and 8.5% electricity (for heat pumps, electric resistance boilers and auxiliary electricity; reference 2010).

SFB Solid Fuel Boilers

The performance in kWh annual heat output is a multiplication of operating hours (h) and the seasonal average heat output (P, in kW) as given in the table below.

The model assumes an autonomous annual decrease (HeatDec) of the heating load after the year 2010 .

Testpoints are at full (ηn, 100%) and partial (ηp, 50%) load heating efficiency. If it is a cogeneration device the electricity production at full and part load is established (factor F3). Auxiliary electricity (elmax and elmin, pef 2.5) is taken into account in factor F2. Generic temperature control loss is F1 is 3%.

For biomass boilers, to take into account the renewable character, a biomass label factor (BLF=1.15; for fossil fuel BLF=1) is taken into account to determine the EEI.
Basic seasonal efficiency equation conventional boilers and micro-CHP-boiler :
$\eta s = BLF*(0.85*\eta p + 0.15*\eta n) - F1 - F2 + F3$

In the first version of EIA the nominal (rated) heat output and the nominal efficiencies were used. This has been changed in the second version that uses average seasonal heat output and seasonal space heating efficiencies. The use of the latter improves the link with the regulation, that expresses minimum requirements as seasonal efficiencies. Seasonal efficiencies have been taken 15 percentage points lower than the nominal efficiencies. The seasonal average loads have been taken 81% of the nominal (rated) loads. This means that BAU energy remains approximately the same as in the first EIA version.

		P (nominal, rated)	P (seasonal)	h	Load up to year 2010	HeatDec after 2010
SFB Wood Manual	kWh heat/a	18	14.6	1000	14580	1%
SFB Wood Direct Draft	kWh heat/a	20	16.2	1000	16200	1%
SFB Coal	kWh heat/a	25	20.3	1000	20250	1%
SFB Pellets	kWh heat/a	25	20.3	1000	20250	1%
SFB Wood chips	kWh heat/a	160	129.6	1000	129600	1%

Air Heating and Cooling

The data in EIA are based on a draft Impact Assessment of June 2014 and a draft Working Document of September 2015 containing a proposal for regulation. The WD is accompanied by Transitional methods for test and calculation.

The requirements in the proposed regulation are expressed in terms of minimum seasonal space heating energy efficiency and useful efficiencies for air heating and air cooling products (refer to primary energy), and in terms of seasonal energy performance ratio (SEPR) for high temperature process chillers (refers to electricity). The same efficiencies are now applied in EIA (SEER and SCOP of previous release no longer used). The detailed definition of these efficiencies is rather complex and cannot be reported here: see the draft regulation and the transitional methods.
From draft document on transitional methods:

The seasonal efficiency for cooling or heating of all comfort chillers and electric heat pumps and air conditioners is based on the approach by EN 14511 and EN 14825:2012, which requires (as for hydronic heat pumps) measurement of capacity and efficiency at 4 to 5 anchor points. Using a bin-method, describing the cooling or heating seasons, the seasonal efficiency is then calculated through inter- and extrapolation. Two corrections factors apply: 3% for control losses and 5% for pump losses (brine/water equipment only). The seasonal efficiency thus does not include distribution losses or emitter losses.

For gas-engine driven heat pumps and/or air conditioners the standards are still being developed. It is expected that the EN14825 part load approach is integrated in standards such as prEN 12309. There are no specific requirements for sorption heat pumps or air conditioners.
For high-temperature process chillers a similar approach as for the electric comfort chillers and air conditioners/heat pumps is developed, but with the following differences: 1) the cooling season is extended as process chillers operate all year long. 2) the standard rating conditions are at slightly different operating temperatures, to better reflect the performance at lower outdoor temperatures. 3) this is also reflected in the bins that describe the cooling season. The methodology for doing measurements is intended to be the same as applied in EN 14825 and related standards.

The seasonal efficiency of fuel-fired warm air heaters is based on establishing the useful (thermal) efficiency at nominal load and part load, on the basis of the GCV of the fuel, and includes the following corrections: envelope losses (as in some parts of Europe some equipment is not allowed to be installed inside the heated space), emission efficiency (which deals with the temperature and the volume flow of the heated air), type of control over heat output (modulation etc.), losses due to auxiliary electricity consumption, draught losses of gravity vented systems and a pilot flame. For electric warm air heaters the useful thermal efficiency is by default 40% on primary energy basis.

Most aspects for establishing the seasonal efficiency of warm air heaters are covered by prEn1020:2007, EN 1319:2009, EN 1196:2011, EN 621:2009 and EN 778:2009. Establishment of envelope losses requires testing according EN 1886:2007 and measurement of auxiliary power requires testing according EN 15456.

The seasonal efficiencies do not include distribution losses.

In the model, an aggregate GCV to NCV conversion factor of 1.09 for AHF is used between published values in IA study and the model. This conversion factor is NOT present in the reported efficiencies for AHF but applied directly in the NRG calculations.

		P	h	HeatDec
CHAE-S (≤ 400 kW)	kWh cool/a	44	600	1%
CHAE-L (> 400 kW)	kWh cool/a	714	600	1%
CHWE-S (≤ 400 kW)	kWh cool/a	61	600	1%
CHWE-M (< 400 ≤ 1500 kW)	kWh cool/a	834	600	1%
CHWE-L (≥ 1500 kW)	kWh cool/a	1600	600	1%
CHF	kWh cool/a	20	600	1%
HT PCH-AE-S	kWh cool/a	145	5964	0%
HT PCH-AE-L	kWh cool/a	1000	2825	0%
HT PCH-WE-S	kWh cool/a	250	4418	0%
HT PCH-WE-M	kWh cool/a	750	4375	0%
HT PCH-WE-L	kWh cool/a	1600	3984	0%
AC rooftop	kWh cool/a	70	600	1%
AC splits	kWh cool/a	17	600	1%
AC VRF	kWh cool/a	28	600	1%
ACF	kWh cool/a	20	600	1%
		P	h	HeatDec
AC rooftop (rev)	kWh heat/a	70	1400	1%
AC splits (rev)	kWh heat/a	17	1400	1%
AC VRF (rev)	kWh heat/a	28	1400	1%
ACF (rev)	kWh heat/a	40	1400	1%
AHF	kWh heat/a	59	1200	1%
AHE	kWh heat/a	20	1200	1%

Output Load = P * Hours * ((1+HeatDec)^(2010-yr))
Annual dec/increase of HeatDec% with respect to 2010

HeatDec represents decreased output demand due to improved building isolation and reduced ventilation loss
NOT applied to High-temperature Process Chillers

LH Local Space Heaters

Applicable regulations are CR (EU) 2015/1185 (ecodesign solid fuel LSH), CR (EU) 2015/1188 (ecodesign electric, gas, and liquid fuel LSH) and CDR (EU) 2015/1186 (energy labelling for LSH).

Ecodesign mnimum efficiency requirements are expressed in terms of seasonal space heating efficiency, that is defined in the regulations as the ratio between the space heating demand and the annual energy consumption required to meet this demand, expressed in %. This efficiency is derived from the efficiency at nominal heat output, applying corrections factors for e.g. suboptimal operation in real life (-10%), controls, auxiliary electricity consumption, permanent pilot flames, heat storage. See also Annex E 'Key facts' and details in the regulation.

The applicable standard for solid fuel fired local space heaters (open and closed fireplaces, wood stoves, coal stoves and pellet stoves) is EN 14785:2006 for pellet heaters, EN 15250:2007 for slow heat release stoves and EN 16510-1:2013 for the other solid fuel heaters. For gas-fired heaters there are several standards such as prEN 613:2000, EN 1266:2002 and EN 13278:2013. For oil-fired heaters there is EN 1:1998 and EN 13842. For electric heaters the thermal efficiency doesn't need to be established as it is default 40% on primary energy basis.

This efficiency is reduced by 10% to account for suboptimal operation in real life, which can be recuperated (in part or full) depending on the options the product incorporates regarding: type of heat storage options (electric storage heaters only), type of control over heat output (thermostats etc., timers, detection devices), auxiliary electricity consumption and losses from a pilot flame.

For luminous and tube heaters the approach is more elaborate. The useful efficiency is established on basis of the GCV of the fuel, for both nominal and part load operation and is then weighted according 0.85/0.15. For luminous heaters a default efficiency is assumed. Then follows a correction for envelope losses as some products may have the burners (heat generators) installed outside the heated space due to local building regulations. A correction for the emission efficiency is applied, based on the radiant factor of the products. The conversion factor applied for GCV to NCV is 1.1.

The efficiency is then further reduced by a loss factor related to the possibility of modulation of the heat output and the modulation range, the auxiliary electricity consumption and pilot flame losses.

Relevant standards for luminous and tube heaters are EN 416-1/-2 EN 419-1/-2. As these (currently) do not contain a method for establishing the useful efficiency, the chimney loss method as described in EN 1319 is suggested. Establishment of envelope losses requires testing according EN 1886:2007 and measurement of auxiliary power requires testing according to EN 15456.

In the regulations, minimum efficiency requirements for luminous and tube LSH are expressed in GCV. For application in EIA these efficiencies have been multiplied by 1.1 to convert to NCV. In the regulations, minimum efficiency requirements for electric LSH are expressed in primary energy. For applications in EIA these efficiencies have been multiplied by CC=2.5 to obtain the electric efficiency.
For other types of LSH the requirements are expressed in NCV and used in EIA as such.

The EIA Load for each type of LSH is expressed in kWh heat per year and obtained as the product of average power and average annual operating hours. This basic value is assumed for year 2010. For earlier years an increase is applied and for later years a decrease, applying an annual HeatDec rate as specified below. These HeatDec values have been taken identical to those used in the Impact Assessment for LSH.

		P	h	HeatDec
LH open fireplace	kWh heat/a	8	42	0%
LH closed fireplace/inset	kWh heat/a	8	266	0.5%
LH wood stove	kWh heat/a	8	337	0.5%
LH coal stove	kWh heat/a	8	337	0.5%
LH cooker	kWh heat/a	10	112	0.5%
LH SHR stove	kWh heat/a	8	337	0.5%
LH pellet stove	kWh heat/a	8	403	0.5%
LH open fire gas	kWh heat/a	4.2	50	0%
LH closed fire gas	kWh heat/a	4.2	269	0.5%
LH flueless fuel heater	kWh heat/a	1.5	50	0%
LH elec.portable	kWh heat/a	1	324	0.5%
LH elec.convector	kWh heat/a	1	850	0.5%
LH elec.storage	kWh heat/a	2.75	480	0.5%
LH elec.underfloor	kWh heat/a	0.62	532	0.5%
LH luminous heaters	kWh heat/a	20	610	0.5%
LH tube heaters	kWh heat/a	30	610	0.5%

Room Air Conditioners

Room air conditioners, i.e. small air-to-air heat pumps with rated output up to 12 kW, follow the same testing and calculation principles as the air/water/ground-to-water heat pumps (see CH boilers) and as the air/water/ground-to-air heat pumps (see central air heating and cooling products): Test at 4 or 5 source/sink temperature pairs, calculation on the basis of the 'bin method' for average, warmer and colder climate zones. The performance, i.e. the annual heat/cooling output, is calculated on the basis of the rated output and a fixed number of full load equivalent operating hours.

RAC (cooling demand), all types <12 kW kWh cool/a
RAC (heating demand), reversible <12kW kWh heat/a

CIRC Circulator pumps <2.5 kW, net load kWh flow/a

Test=weighted avg. of 4 part load tests= 40%*¼+30%*½+20%*¾ +10%*full load.
Net load (eff=100%) in 2005 is 90W x 3144h =283 kWh in year 2005

NRVU, Non-Residential Ventilation Units

Modelling (IA report) of Annual Electricity Consumption *AEC* of non-residential VUs in kWh/a:
$AEC = 8.76 * NrFans * (\Delta P_{int} + \Delta P_{ext}) * (q_{nom}/3600) * \eta_{fan} * MISC * (0.05 + 0.95 * (CTRL_{on} + CTRL_{var}^3))$
where 8.76=8760 operating hours x 0.001 kWh/Wh, *NrFans* =1 fan for UVU/2 for BVU, $\Delta P_{int} + \Delta P_{ext}$ = internal and external pressure difference per fan, q_{nom} =nominal flow rate in m³/h, 3600= s per h (for conversion m³/h to m³/s), η_{fan} = fan efficiency at design point (usually best efficiency point *bep*), *MISC* =factor for ventilation effectiveness, duct leakage etc., $CTRL_{on}$ = factor for on-off control, $CTRL_{var}$ = factor for (variable) demand-control of flow rate.

For Annual Heating Saving *AHS* (with respect of qref=natural ventilation) of non-residential VUs per m³ ventilation:

$q_{refcorr} = 1.36 * q_{effective}$ (includes $CTRL_{on}$ =0.8), q_{net} =1.3 m³/h
$q_{effective} = Q_{nom}/MISC$,
specific heating energy *SHE* in kWh per m³/a = 5112 heat h/a*9.5 K difference indoor/outdoor for average climate * 0.000344 kWh/m³.K * 1/75% η_h boiler efficiency = 22.21 kWh/m³.a . For Warm climate 10.05; for Cold 43.47.

$AHS = SHE * (q_{nom}/MISC) * [1.36 - MISC * CTRL_{on} * CTRL_{var} * (1-\eta_t)] - Q_{defrost}$
with $Q_{defrost} = HR_{pen} * 0.35 * q_{nom} * CTRL_{on} * CTRL_{var}$, where HR_{pen} is the market penetration of heat recovery (for an individual model 0 or 1, in a larger population can be any value between 0 and 1)
No credit is given in the model for savings on space cooling (although a non-insignificant credit in a Warm climate is plausible)

The tables below show the NRVU basecases with relevant parameters used in the model
Stock 2010 weighted: CEXH 63%, CHRV 13%, AHU-S 3%, AHU-M 10%, AHU-L 11% of units installed
The index (ndx) given in the Load sheet relates to fan efficiency (year 2010=100%=values faneff in table). For heating saving efficiency index=1 throughout the model (changes follow from sales).

NRVU Types >125W/fan		qnom (m³/h)	total M m³/a	int dP (Pa)	ext dP (Pa)	fan eff. (W/W)	specific energy (kWh elec/M m³)	kWh elec/a
NRVU Central Unidir. CEXH (1 fan)		1500	5.4	37	154	23%	247	1331
NRVU Balanced CHRV (2 fans)		2250	6.1	140	160	35%	530	1604
NRVU Balanced AHU-S (2 fans)		4000	10.8	292	244	51%	650	3497
NRVU Balanced AHU-M (2 fans)		10000	26.9	334	450	58%	836	11244
NRVU Balanced AHU-L (2 fans)		35000	94.2	391	575	61%	979	46104
NRVU avg (stock weighted 2010)	kWh elec/a	6100	17.3	125	231	38%	452	7206

	CTRLon	CTRLvar	MISC	ηt	heated M m³/a	heat saved vs. ref (kWh heat/a)	heat loss vs. 0% (kWh heat/a)
NRVU Central Unidir. CEXH	0.8	0.8	1.3	0%	4.91	13537	21331
NRVU Balanced CHRV	0.6	0.8	1.1	80%	5.52	48241	4061
NRVU Balanced AHU-S	0.6	0.8	1.1	44%	9.82	72767	20215
NRVU Balanced AHU-M	0.6	0.8	1.15	44%	24.54	179620	52836
NRVU Balanced AHU-L	0.6	0.8	1.18	44%	85.88	623845	189749
NRVU avg (stock weighted 2010)*	0.73	0.80	1.24	21%	15.74	101619	40168

*=HRpen 29.7% is stock weighted average

RVU Residential Ventilation Units

For residential VUs (RVU) the regulated parameter is the SEC

$$SEC = t_a \cdot pef \cdot q_{net} \cdot MISC \cdot CTRL^x \cdot SPI - t_h \cdot \Delta T_h \cdot \eta_h^{-1} \cdot c_{air} \cdot (q_{ref} - q_{net} \cdot CTRL \cdot MISC \cdot (1-\eta_t)) + Q_{defr}$$

where SEC = Specific Energy Consumption per unit floor area (kWh primary/a)/m²;
t_a =8760 operating h/a; *pef* =primary energy factor 2.5; q_{net} =minimum ventilation demand per floor area 1.3 (m³/h)/m²; *MISC* is correction factor ventilation effectiveness, duct leakage, etc.; *CTRL* =control factor; *x* =exponent motor & drive;
SPI =Specific Power Input in W/(m³/h) of the VU at ca. 70% rated flow and 50 Pa;
t_h =5112 h/a heating season; ΔT_h = 9.5 K; η_h = boiler efficiency 75%; c_{air}=0.000344 kWh/m³.K;
q_{ref} = natural ventilation per floor area 2.2 (m³/h)/m²; η_t =efficiency heat recovery;
Q_{defr} = defrost energy 0.45 kWh prim/a in Average climate.

The Average climate is used for the energy label (figures above apply to BAU):
Modelling in IA report preceded proposed measures and does not match exactly the values in the regulation:

Used for BAU modelling (IA report) of UVU/central BVU/2 x local BVU:
MISC 1.33/1.1/1.2, CTRL 1/1/0.9, x=1, SPI 0.3/0.4/0.35, ηt =0%/80%/64%.
Dwelling surface assumed: 100 m².

Note that IA and prep. study used climate data for the average EU dwelling= 66% average (5112h @ 9.5K), 28% warm (4392h @ 5K), 6% cold climate (6552h @ 14.5K) à heating season average EU dwelling is 5000 h @ 8.8 K (= 4625h @ 9.5K)

		nr. units/ 100m² dwelling	ext dP (Pa)	qreal (m³/h)/ 100m²	SPI (W/(m³/h))	kWh elec/ a.100m²	kWh elec/ a.unit	SEC (kWh/m²)*
RVU Central Unidir. VU ≤125W/fan (1 fan)	TEC	1	50	173	0.30	454	454	-7
RVU Central Balanced VU ≤125W/fan (2 fans)	TEC	1	50	143	0.40	501	501	-30
RVU Local Balanced VU (<125 W, also NR) (2 fans)	TEC	2	50	140	0.35	434	217	-28

*calculated as in draft regulation with, MISC=1.1 (ducted), Avg Climate data (heating season 5112h at average 9.5K), Qdefrost (0.45 kWh prim)

		CTRL	x (motor)	MISC	ηt	heat saved vs.ref, kWh prim/ a.100m²	heat saved, kWh prim/ a.unit	heat loss vs. 0% (kWh prim/ a.unit)
RVU Central Unidir. VU ≤125W/fan (1 fan)	TEC	1	1	1.33	0	951	951	3489
RVU Central Balanced VU ≤125W/fan (2 fans)	TEC	1	1	1.1	0.8	3863	3863	577
RVU Local Balanced VU (<125 W, also NR) (2 fans)	TEC	0.9	1	1.21	0.64	3411	1706	514
VU reference: natural ventilation 220 m³/h								

LS Light Sources

The main performance parameters for light sources are lumen output and operating hours.

DP Electronic Displays

DP TV viewable area	dm²	Test with dynamic video content according to EN IEC 620B7:2012 (estimate from available data) at 65% of peak luminance. Older test standards use static test image.
DP Monitor viewable area	dm²	
DP TV share of UHD/ 3D (all TV types)	%	For monitors, according to Energy Star before July 2013, test luminance is at a fixed 200 cd/m².
DP Monitor share of UHD/ 3D	%	After July 2013 the US Energy Star (not yet updated in EU) tests with dynamic video content according to EN IEC 620B7:2012 (estimate from available data) at 65% of peak luminance.
DP TV standby	h sb/d	Both for TV and monitors an on-mode use of 4h/d is assumed
DP Monitor standby	h sb/d	

The reference for modelling of W/dm² efficiency is 2D HD picture quality. The assumption is that UHD ('4k') or 3D adds 50% to W/dm² in on-mode
Standby hours include both simple standby hours for remote control (esp. before 2010) and networked standby (for LoNA and Smart TVs)

STB Set-Top Boxes

SSTB	TEC	Operating hours (24h) as CSTB, i.e. 4.5h on, 4.5h sb from APD and 15h sb
CSTB	TEC	VA Base Duty Cycle (2012) Total Energy Consumption TEC=CSTB without Auto Power Down (APD): 9h 'on' and 15h 'sb'. CSTB with APB: 4.5h on, 15h sb, 4.5 sb from APD. kWhBase is 0.001 x 365 d x hours x Power (W) for various modes. (Note that other sources e.g. Intertek and US DoE suggest on-modes up to 10h)

For limits: The TEC should meet the Total Energy Allowance TEA. TEAs differ per source (cable, satellite, IP or terrestrial). Additional allowances (for meeting limits) are for multi-decode or multi-display or both, advanced video processing, return path functionality, etc.

VIDEO

VIDEO players/recorders	TEC	DVD players and recorders (with or without HDD) and Blu-ray players and recorders (with or without HDD). 24h duty cycle depends on type, but typical: 0.25h/d record, 0.75h/d play, 9h live-pause (only types with HDD), fast start / on-idle / standby / off hours depend on type. Standby power 0.5 W, on-power varying from 10-30 W, idle power varying from 5-20 W. Average for all types leads to 16 kWh/a, 44 Wh/d or 1.8 W (weighted average of all modes, incl. standby). EU-Load is based on a use of 1 h per day.

VIDEO projectors	TEC		School projectors: on-play 3 h @ 275W, standby 6 h @ 1W, off-mode 15 h @ 0.5W, total 318 kWh/a, 871 Wh/d, 36 W. Office projectors: on-play 1.5h @250W, standby 8h @1W, off-mode 14.5h @0.5W, total 158 kWh/a, 433 Wh/d, 18 W. Home projectors: on-play 0.5h @200W, standby 20h @1W, off-mode 3.5h @0.5W, total 49 kWh/a, 134 Wh/d, 5.6 W. Overall weighted average 200 kWh/a. EU-Load is based on a weighted average use of 2.1 h per day.
VIDEO game consoles	TEC		24h duty cycle: standby hours 22 h/d @ 2W up to 2012 ('normal' standby) and in later years 15 h/d networked-standby @ 4W plus 5 h/d in 'normal standby' @ 1W. Rest is on- or idle-mode. Powers are variable with the years . The general assumption is that new models will have additional features that lead to higher power. After first issue the models will be optimized in following years and power will go down, until the next new model with more features and higher power is released. This leads to an up-and-down behavior for the annual energy consumption of new sold products (EFN) and to a continuous increase in the annual energy consumption per unit of the stock (EFS). EU-Load is based on a weighted average use of 2 h per day.
CS Computer Servers			EIA considers only the energy consumptions and related emissions due to the Enterprise Servers, NOT those of the entire data centers. This avoids double-counting issues: most cooling and air conditioning equipment is already taken into account in ENER Lot 21/ GROW Lot 6 (airco and HT chillers, measures are now in ISC-stage), UPS are already in ENER Lot 27 (prep. study finished but no measures yet) and distribution transformers are already in GROW Lot 2 (regulation in place). Possibly there is also an overlap with specific cooling solutions (e.g. water-cooled CPUs) in GROW Lot 1 on professional refrigeration.
ES Rack servers	kWh/yr	1661	These are SERT values, i.e. they include standby/off/on modes at different loads.
ES Blade servers	kWh/yr	13286	Implemented in EIA as efficiencies; LOAD is set to unit value.
ES Storage	kWh/yr	3411	
PC Personal Computers			
PC Desktop	TEC		Desktop and integrated desktop PC (Categories A, B, C, D) E_{tec} =8.76 x (0.55P_{off} +0.05P_{sleep} +0.4P_{idle}) If no sleep-mode and P_{idle} <10 W then P_{sleep} =P_{idle} (P in W). extra E_{tec} allowances for legal limits (in kWh/a): 1 for every Gb RAM over base (=2 Gb cat. A/B/C or 4 Gb cat. D), for extra internal storage 25, for discrete TV tuner 15, for discrete audio card 15, in 2014: for 1st discrete graphics card (dGfx) between 34 (G1) and 225 (G7), for additional dGfx between 20 (G1) and 133 (G7), in 2016: dGfx card allowances are 45-47% lower.
PC Notebook	TEC		Notebook PC (Categories A, B, C) Ecodesign: E_{tec} =8.76 x (0.60P_{off} +0.10P_{sleep} +0.30P_{idle}) extra E_{tec} allowances for legal limits (in kWh/a): 0.4 for every Gb RAM over base (=4 Gb), for extra internal storage 3, for discrete TV tuner 2.1, for discrete audio card 15, from 1.7.2014: for 1st discrete graphics card (dGfx) between 12 (G1) and 113 (G7), for additional dGfx between 7 (G1) and 66 (G7), from 1.7.2016: dGfx card allowances are 45-47% lower. Category C notebook computers are exempt, if they have a quadcore CPU, dGfx with total buffer frame width >225 Gb/s and >16 GB RAM. ('Mobile Workstations') EU Energy Star has similar requirements.
PC Tablet/slate	TEC		Tablet/slate/ blade PCs are exempted (provisional estimates VHK used in the model)
PC Thin client	TEC		Only regulation of internal power supply efficiency till now. Other aspects to do (provisional estimates VHK used in the model)
PC Workstation	TEC		Only regulation of internal power supply efficiency till now. Other aspects to do (provisional estimates VHK used in the model)
Imaging Equipment			
EP-Copier mono	TEC		EP (TEC) products are Standard-size copiers, Multifunction Devices (MFDs), and printers that use Electrophotography (EP), Solid Ink (SI), and High Performance Ink Jet (IJ) marking technologies. IJ (OM) products cover the remainder of mainly non high-performance inkjet (IJ) products. Voluntary Agreement (www.eurovaprint.eu) currently says that on 1.1.2012 90% of models will comply with Energy Star v.1.1. Revision is intended to result in a target that 80-90% of models sold by signatories comply with Energy Star (ES) requirements, 3 years after new (US) ES requirements' publication. (ES v. 2.0 was published June 2013). Energy Star measures the TEC (Total Energy Consumption, in kWh/a) from a daily test duty cycle --extrapolated to 1 office year (50weeks x 5 days)-- that emulates a normal ('on', 'standby', etc.) usage pattern with various operating modes ('on', 'ready', 'standby', 'off', etc.) and printing activity. The number of prints depends on the rated print speed in ipm (images per minute). In the IA study the modelling is based on Energy Star numbers, i.e. for average EP (B&W and colour) copiers 87880 images per year (ipy), printers 133120 ipy, IJ SFD 1040 ipy, IJ MFD 3900 ipy. Stock average of all EP is 123000 ipy IJ equipment is 3130 ipy. Overall 24400 ipy. Paper use is based on 65% duplexing and 15% N print and results in overall 15000 paper sheets or 75 kg/unit (80g/m²) per year. Indirect energy use for paper (from MEErP 2011) is 40 MJ/kg. Average unit ink/toner consumption is 662 g/a.(EU28 in 2010: 78 m kg at 50 MJ/kg --> 3.5 PJ/a = low impact). The preparatory study follows data from InfoTrend for EU15+NO, CH, TK and assumes them for the EU because the population is similar to the EU25. InfoTrend gives 733 bn images in 2010 (637 non-residential, 96 residential; inkjet 14% of overall total) and 685 bn images in 2005 (556 non-residential, 119 residential). On average this is 4850 ipy per unit in 2010 (28000 ipy for EP and 1000 ipy for IJ) and 5500 ipy per unit in 2005 (decrease 11.8% is ca. 2.2% per year). In aggregate there is a growth of 6.5% over 5 years (disaggregate YoY growth of 1.2%).
EP-Copier colour	TEC		
EP-printer mono	TEC		
EP-printer colour	TEC		
IJ SFD printer	OM		
IJ MFD printer	OM		
Duplexing			

Reliable sources are scarce (very non-transparent market), but suggest something in between but closer to the preparatory study data. Therefore the preparatory study was taken as a basis here, i.e. 6000 ipy per average product. This is 25% of the Energy Star ipy output in the standard TEC, but --given that the printing-mode is only 20-25% of the total energy. The corrected real-life TEC value is still 0.85 times the standard TEC for EP equipment. For IJ equipment there is no difference.

SB Standby equipment (not covered elsewhere)

The 24h duty cycle is given in the preparatory study (see table)

		on	standby	idle
SB Home Gateway, idle hours	h idle/d	7	8.5	8.5
SB Home NAS, idle hours	h idle/d	3	19	2
SB Home Phones (fixed), idle hours	h idle/d	2	0	22
SB Office Phones (fixed), idle hours	h idle/d	4	0	20

BC_EPS Mobile phones etc. h/a — based on 24h/365 d per year

UPS_Uninterrupted Power Supplies kW output — In the preparatory study the nominal active power for each base case is defined as an INPUT load. It would be misleading to use this as the LOAD in EIA, because that would mean that a higher efficiency leads to an increased OUTPUT (suggesting an increase in demand) instead of a reduced INPUT. In the EIA philosophy the LOAD sheet shows the power demand by consumers, and this should be an OUTPUT load, that is identical for the BAU and ECO scenarios. There is no indication in the prep. study that this load changes with time, so it is assumed constant throughout the years. The OUTPUT load is derived from information in the preparatory study as explained below.

UPS Output LOAD calculation scheme

The nominal active power is the reference INPUT load (1), taken from prep.study final consolidated report table 56. UPS normally operate at partial loads as indicated in prep. study table 110. The sum-product of load levels (25, 50, 75, 100% of nominal) and shares of times spent at these load levels gives an average load level (2). Table 102 in the prep.study provides the efficiencies for each load level. The sum-product of these efficiencies, the load levels and the times spent at these load levels provides a load-and-time-weighted average efficiency (3). The OUTPUT load for use in EIA (4) is computed as nominal input power * average load level * average efficiency. This value is then used as a LOAD constant for all years, identical in BAU and in ECO.

	(1) kW input	(2) Avg. Level	(3) Avg. Eff.	(4) kW output
UPS below 1.5 kVA (BC1)	0.54	67.5%	88.1%	0.32
UPS 1.5 to 5 kVA (BC2)	2.87	75.0%	89.8%	1.93
UPS 5 to 10 kVA (BC3)	6.25	75.0%	92.3%	4.33
UPS 10 to 200 kVA (BC4)	94.5	50.0%	92.7%	43.80

UPS Energy considered

The energy consumption considered for UPS is the difference between the input energy and the output energy, i.e. only UPS losses are taken into account. Unit energy is computed as (Input Energy - Output Energy) = (LOAD/efficiency · LOAD)*8760, where 8760 are the hours in a year.

RF Household Refrigerators

RF Net volume Vnet (CECED 2013) ltr — from CECED database

RF Estimated equivalent volume Veq ltr — $Veq=\sum Vc \times (25-Tc)/20 \times FFc] \times CC \times BI \approx (Freeze\_net*2.15+Vfridge\_net) \times 1.1$, with

Vfreeze_net (-18 °C)=22% x Vnet, rest is Vfridge_net (Tc=+5 °C). So Veq= 1.353 * Vnet

Note that 1.1 is the estimated average effect of correction factors FF (Frost Free=1.2), CC (Climate Correction for Tropical=1.2 and SubTropical=1.1) and Built-In (<58 cm width--> 1.2) for average product sold

RF SAEc (EEI=100) kWh/a — EEI=AEc/ SAEc , with AEc = E24h x 365, where E24h is 24h energy consumption tested according to EN 62552: 2013.

SAEc=Veq x M + N + CH, with M=0.63, N=290, CH=5-25.

CH=presence of chiller compartment (max=100%=50 kWh), runs from 5 to 25 kWh over period 1990-2030. Calculation of M and N based on 2005 CECED database.

Note that --although test ambient temperature of 25 °C (to compensate for missing door openings) is high-- it is assumed that the Standard (test) and Real-life (used here) consumption data are identical.

CF Commercial Refrigeration

No final regulation yet (March 2016). EIA data based on 2014 Commission Working Document (WD) and 2015 Impact Assessment (IA). WD expresses efficiency requirements in terms of Energy Efficiency Index, EEI = (AEC/SAEC) × 100. AEC=E24h × 365, Annual Energy Consumption of the cabinet in kWh/year. E24h in kWh/24h (according to EN ISO 23953 or other standard under development, see Transitional Methods). AEC includes remote energy. SAEC= (M + N × Y) × 365, Standard Annual Energy Consumption of the cabinet in kWh/year. The proposed regulation specifies M and N. For beverage coolers, small ice-cream freezers and vending machines Y is the net volume of the appliance in litres. For all other refrigerated cabinets Y is the total display area (TDA) in m^2. EIA uses the EEI on all efficiency sheets. The LOAD sheet is used to present the SAEC values, computed as shown below (although SAEC is not really an output load). The EU-LOAD shows the total EU-28 refrigerated Volume or Display Area, depending on the base case.

Earlier studies only considered the supermarket remote base cases RVC2 and RHF4. However the proposed regulation applies to many other supermarket models as well. The IA presents tables for 'base cases only' and tables 'including non-base cases', showing a significant impact for the non-base cases. Consequently, it was agreed to include the non-base cases in the accounting, but this required estimating some of the missing basic input data: the TDA of 2.5 m2 and the SAEC=8500 kWh/year. The non-base cases are a mix of integrated and remote models, a mix of chillers and freezers, vertical and horizontal, without precise M and N values. Also for the base cases some discrepancies between various data sets were found and in some occasions the choice of the average Volume or Display Area was changed with respect to the IA to (partially) resolve them.

	M	N	Volume (litres)	TDA (m2)	SAEC (kWh/year)	average depth assumed (m)	temperature range
CF open vertical chilled multi deck (RVC2)	9.1	9.1		4.6	18600	0.5	m^2 @ -1 /+7°C
CF open horizontal frozen island (RHF4)	4.2	9.8		4.0	15841	0.5	m^2 @ -18 /-15°C
CF other supermarket display (non-base cases)	-	-		2.5	8500	0.5	m^2 @ -18 /+7 °C

CF Plug in one door beverage cooler	1	0.013	500	2738	litres @ 1 /10°C
CF Plug in horizontal ice cream freezer	1	0.009	340	1482	litres @ -18 /-15°C
CF Spiral vending machine	4.1	0.004	750	2592	litres @ 1 /7°C

PF Professional Refrigeraton

CR 2015/1095 (ecodesign) applies to professional refrigerated storage cabinets, blast cabinets, low- and medium temperature process chillers and low- and medium temperature condensing units. CR 2015/1094 (energy labelling) applies only to professional refrigerated storage cabinets. **Walk-in cold rooms** are not covered by the regulations and consequenly have been removed from EIA. For **blast cabinets** the regulation only specifies information requirements that are assumed not to lead to quantifiable changes in energy efficiency and consequently blast cabinets have also been removed from EIA. Storage cabinets, process chillers and condensing units each have specific load- and efficiency definitions and are therefore described separately below.

PF (1): professional refrigerated storage cabinets

CR 2015/1095 expresses efficiency requirements in terms of Energy Efficiency Index, EEI = (AEC/SAEC) × 100. AEC=E24h × af x 365, Annual Energy Consumption of the cabinet in kWh/year (correction factor 'af' for light-duty cabinets. E24h in kWh/24h (Test standard to be developed with ECFEM). SAEC= (N + M × Vn) × 365, Standard Annual Energy Consumption of the cabinet in kWh/year. The proposed regulation specifies M and N for four cabinet types, see table below. EIA uses the EEI on all efficiency sheets. The LOAD sheet is used to present the SAEC values, computed as shown below (although SAEC is not really an output load). The EU-LOAD shows the total EU-28 refrigerated Volume.

	N	M	Net Volume Vn (litres)	SAEC (kWh/year)
Chilled, Vertical storage cabinet	609	1.643	600	1595
Chilled, Horizontal (counter) storage cabinet	1790	2.555	300	2557
Frozen, Vertical storage cabinet	1472	4.928	600	4429
Frozen, Horizontal (counter) storage cabinet	2380	5.84	200	3548

PF (2):low- and medium-temperature process chillers

CR 2015/1095 expresses efficiency requirements in terms of 'seasonal energy performance ratio' (SEPR), which is the efficiency ratio of a process chiller for providing cooling at standard rating conditions, representative of variations in load and ambient temperature throughout the year, and calculated as the ratio between annual cooling demand and annual electricity consumption. SEPR values depend on the type of cooling (air-cooled, AC or water-cooled, WC), on the operating temperature (low, LT or medium, MT) and on the cooling capacity (small, S or large, L). For reasons of transparency, EIA also uses SEPR on the efficiency sheets. The LOAD sheet shows the annual unit cooling demand (MWhcool/a), and the EU-LOAD sheet shows corresponding EU-28 total cooling demand (TWhcool/a). The calculation of the unit cooling load is based on data from the preparatory study, that have been aggregated to the base cases used in EIA, see table below.

	average cooling capacity (kWcool)	Annual energy consumpt., AEC in MWh/a	SEPR 2011 market average	Annual cooling demand = SEPR*AEC (MWh/a)
Process Chiller AC MT S ≤ 300 kW	167	275	2.70	743
Process Chiller AC MT L > 300 kW	589	896	3.00	2688
Process Chiller AC LT S ≤ 200 kW	164	377	1.59	599
Process Chiller AC LT L > 200 kW	588	1254	1.70	2132
Process Chiller WC MT S ≤ 300 kW	180	257	3.60	925
Process Chiller WC MT L > 300 kW	622	818	3.90	3190
Process Chiller WC LT S ≤ 200 kW	189	376	2.00	752
Process Chiller WC LT L > 200 kW	629	1156	2.25	2601

PF (3):low- and medium-temperature condensing units

CR 2015/1095 expresses efficiency requirements in terms of COP for lower capacity models and in terms of SEPR for higher capacity models. 'rated coefficient of performance' (COP) means the rated cooling capacity, expressed in kW, divided by the rated power input, expressed in kW. 'seasonal energy performance ratio' (SEPR) is the efficiency ratio of a condensing unit for providing cooling at standard rating conditions, representative of variations in load and ambient temperature throughout the year, and calculated as the ratio between annual cooling demand and annual electricity consumption. For reasons of transparency, EIA also uses COP or SEPR on the efficiency sheets. The LOAD sheet shows the annual unit cooling demand (MWhcool/a), and the EU-LOAD sheet shows the corresponding EU-28 total cooling demand (TWhcool/a). The calculation of the unit cooling load is based on data from the preparatory study and from Excel files underlying the impact assessment, see table below.

	efficiency parameter	COP/SEPR Market average in 2011	Average cooling capacity of the range (kW)	Assumed operating hours per year (h/a)	Annual cooling demand in MWhcool/a (per unit)	Base case AEC in MWh/a per unit, before Tier 1
Condensing Unit MT S 0.2-1 kW	COP	1.42	0.56	5840	3.27	2.30
Condensing Unit MT M 1-5 kW	COP	1.64	2.73	5840	16.0	9.73
Condensing Unit MT L 5-20 kW	SEPR	2.64	10.8	5840	63.2	23.9
Condensing Unit MT XL 20-50 kW	SEPR	2.71	33.1	5840	193.4	71.4
Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.28	5840	1.65	2.06
Condensing Unit LT M 0.4-2 kW	COP	0.95	0.93	5840	5.43	5.72
Condensing Unit LT L 2-8 kW	SEPR	1.46	4.64	5840	27.1	18.6
Condensing Unit LT XL 8-20 kW	SEPR	1.61	31.9	5840	186.3	115.7

COOK Cooking Appliances

COOK El. Hobs	ltr/a	New test standard prEN 60350-2:2012 measures energy per cooking zone to heat water by 75 K (pot size and water volume depending on cooking zone size) and also the energy required to keep the heated water at the final temperature for 20 minutes after heating up. The average energy consumption of the hob, in Wh/kg water heated, is the straight average of all cooking zones of the hob. Annual energy consumption in the model is based on 1229 ltr/a. Regulation is in GCV.
COOK El. Ovens	TEC	Energy Efficiency Index ovens EEI= EC (test)/SEC (average model 2012), with EC, SEC in kWh elec/cycle for electric and MJ/cycle (primary) for gas, determined per oven cavity. For electric ovens SEC= 0.0042*V+0.55. For gas ovens SEC=0.044*V+3.53. EC is based on EN 60350:2009 (electric oven) or EN 15181:2008 (gas oven). Annual energy consumption based on 110 cycles/a.
COOK Gas Hobs	kWh/a	Energy efficiency (EE) of the burner (in %) is calculated by dividing the theoretical energy needed for heating a pot with an amount of water (in MJ) by the measured energy consumption on the gas burner when heating water by 75 K in a standardised pot (pot size and water volume depending on burner) and standard conditions, expressed in MJ Net Calorific Value (NCV) of the amount of gas used. Current standard EN 30-2-1, new standard similar to the one for electric hobs is being developed (status 2013). EEburner=EEtheoretical/EEtest. In the modelling, in order to be compatible with electric hobs, it is assumed that the load=the minimum theoretical annual energy consumption to heat 1229 ltr/a by 75 K and keep it warm during 20 minutes is 181 kWh/a =651.6 MJ/a (based on 438 cooking periods/a). Regulation is in GCV. Conversion factor GCV to NCV is 1.1 .
COOK Gas Ovens	TEC	Energy Efficiency Index ovens EEI= EC (test)/SEC (average model 2012), with EC, SEC in kWh elec/cycle for electric and MJ/cycle (primary) for gas, determined per oven cavity. For electric ovens SEC= 0.0042*V+0.55. For gas ovens SEC=0.044*V+3.53. EC is based on EN 60350:2009 (electric oven) or EN 15181:2008 (gas oven). Annual energy consumption based on 110 cycles/a. Conversion factor GCV to NCV is 1.1 .
COOK Range Hoods	TEC	The annual energy consumption AEC (in kWh) is calculated on the basis of 1 h extraction operation daily at best efficiency point bep , and 2 h lighting operation daily, during 365 days per year. The electric power consumption (in W) of the extraction fan Pbep and the lighting system PL are measured according to test standard EN 61591:1997. The power consumption of the extraction fan is corrected with a so-called 'time increase factor' f, which relates to the fluid dynamic efficiency FDE of the fan . Where appropriate, i.e. in the case of a fully automatic hood, the power consumption in off-mode Po and standby mode Psb is taken into account. The standard energy annual energy consumption SAEC (in kWh) is derived from the average of the 2011 CECED database through a regression analysis. EEI= AEC/ SAEC, with SAEC=0.55*(WBEP+WL)+15.3 (in kWh/a, with Wbep and WL is electric power input in W for fans and light respectively).

CM Coffee Makers

COFFEE Dripfilter (glass)	TEC	According to Commission Working Document to CF(18.11.2011): Testing: 1) kWh over a 100 minute 'coffee period' at rated (max.) water/coffee capacity, including brewing+50% draw-off, followed by keep-hot till the end of test [test: ca. draft IEC 60661]. 2) standby mode power Pstby, measured after the coffee period [test: EN 62301]. 3) if product has auto power down, then Poff[test: EN 62301] Temperature corrections may apply if machine does not meet minimum brewing or keep-hot temperatures Real consumption drip-filter (glass) machine is based on 730 cycles (coffee periods) per year, 540 g water/cycle (24 g coffee, 1 paper filter), 45 minutes 'keep-hot' period per cycle, standby period 23.8h/24h (11.9h/12h per cycle).
COFFEE Dripfilter (thermos)	TEC	Real consumption drip-filter (glass) machine is based on 730 cycles (coffee periods) per year, 472 g water/cycle (less coffee thrown away, 21 g coffee, 1 paper filter), standby period 23.8h/24h (11.9h/12h per cycle).
COFFEE Dripfilter (full automatic)	TEC	
COFFEE Pad filter	TEC	Coffee period is 3 cups x 135 g. 730 periods per year (2190 cups/a). Standby and ready mode are included
COFFEE Hard cap espresso	TEC	For all espresso machines a coffee period is 3 cups x 48 g. 730 periods per year (2190 cups/a). Standby and ready mode (=period where heating element keeps water warm) are included
COFFEE Semi-auto espresso	TEC	
COFFEE Fully-auto espresso	TEC	

WM Household Washing Machines

WM Programme temperature, in °C	°C	SAEC=47c +51.7 (SAEC= Standard Annual Energy Consumption, calculated from c=capacity, in kg)
WM Rated capacity ***c*** , in kg	kg/cycle	EEI=AEC/SAEC (EEI=Energy Efficiency Index)
WM Real (rated) load, in kg	kg/cycle	AEC=220*[(3E60 + 2E60½ + 2E40½)/7] +Esb
WM Cycles/yr per unit (est.)	cyc/a	AEC is Annual Energy Consumption (measured); Esb is standby energy (small, see regulation)
WM programme time		E60, E60½ and E40½ are full resp. half- rated load test cycles at 60 resp. 40°C, according to EN 60456:2011. Note that there is, for various possibly valid reasons (e.g. repeatability and accuracy of tests), a significant difference between the Standard (as in regulations) and Real-life (used here) conditions.
WM SAEc (EEI=100)	kWh/a	

DW Household Dishwashers

DW Real average programme temperature, in	°C	SAEC=7ps+378 (normal size) or 25.2ps+126 (compact) EEI=AEC/SAEC
DW Rated capacity, ps, in place settings	ps/cycl	AEC=280 x Ecyc +Esb
DW Real load, in place settings	ps/cycl	Esb is standby energy (small, see regulation)
DW Cycles/yr per unit (est.)	cyc/a	Ecyc is test cycle according to EN 50242:2008, normal/compact = ca. 15% at 9 ps/0.85 at 12.5 ps (in 2005 ca. 12 ps) --> SAEC=22.5 ps +164
DW programme time		
DW SAEc (EEI=100)	kWh/a	

LD Laundry Driers

LD Spin speeds of stock WM	rpm	
LD Real inital moisture of drying load	%	
LD Standard moisture	%	
LD correction factor for initial moisture	-	
LD Rated Capacity	kg/cycle	
LD Real Capacity (71% of rated, IA report)	kg/cycle	
LD Cycles real per year (as in IA report)	cyc/a	
LD SAEc vented el. (EEI=100)	kWh elec/a	SAEc=140*capacity^0.8
LD SAEc condens el. (EEI=100)	kWh elec/a	SAEc=140 x capacity^0.8-30*(programme time/60) with programme-time is estimated 130 minutes (100 minutes for venting drier)
LD SAEc vented gas (EEI=100)	kWh prim./a	SAEc=140*capacity^0.8

VC Vacuum Cleaners

VC dom (87 m²/h) h/a
VC non-dom h/a

The annual electricity consumption (AE) is calculated with 2 double strokes per surface area -->factor 4. Surface area is 87 m^2 (average m^2/dwelling), cleaned in 50 one-hour tasks per year. The average specific energy (ASE) in Wh/m^2 is determined for hard floor (hf), carpet (c) and general purpose (50% hf and 50% c) vacuum cleaners. The actual test is done with 5 double strokes according to test standard IEC 60312-1 ed.1: 2010, to establish average power P (W), including possible battery power for active nozzles NP, from the energy consumption during the test (set against the cleaned surface A and the cleaning time t, at 0.5 m/s). The same tests establishes dust pick-up (dpu) for carpets and hard floors of the model.

In formula: AE= 4 x 87 x 50 x ASE x (1-0.2/dpu-0.2), established specifically for carpets and/or hard floors (suffixes 'c' or 'hf' for AE, ASE, dpu).

FAN Industrial (>125W)

FMEG (Fan Motor Efficiency Grade) is the fan efficiency at best efficiency point (bep), following draft ISO 12759 standard (status 2009). Depending on type, total or static pressure is used in the equation to determine fluid power output (in Pa * m^3/s = W).

The draft standard (by TC 117) gives generic equations per fan-type and per rated power category (0.125-10 kW and 10-500 kW):
For axial and centrifugal forward curved (FC) fans: 2.74*ln(Pe)-6.33+N (Pe:0.125-10kW); 0.78*ln(Pe)-1.88+N (Pe:10-500kW).
Centrifugal backwards curved (BC): 4.56ln(Pe)-10.5+N (Pe:0.125-10kW); 1.1*ln(Pe)-2.6+N (Pe:10-500kW).
Cross-flow: 1.14*ln(Pe)-2.6+N (Pe:0.125-10kW).
Where N is the FMEG-value.
The table below gives the output power and annual operating hours per basecase.

		P flow(kW)	h/a	
FAN Axial<300Pa (all FAN types >125W)	kWh flow/ a	0.123	2000	
FAN Axial>300Pa	kWh flow/ a	0.245	2000	
FAN Centr.FC	kWh flow/ a	0.071	3000	
FAN Centr.BC-free	kWh flow/ a	1.060	3000	
FAN Centr.BC	kWh flow/ a	1.026	3000	17.4
FAN Cross-flow	kWh flow/ a	0.015	1865	6%

Note that P flow is Pnominal * load factor, where load factor is 50%

MT Industrial motors 0.75-375 kW, net load kWh output/a

motor efficiency is measured according to IEC60032-30.
The net load is calculated from the following average (aggregate from 1.1, 11 and 110 kW motors):
- a rated power output Pn of 3.35 kW;
- a product life L a little over 12 years (12.4 years);
- a load factor F of 60%;
- 4000 operating hours (‘hours’);
- efficiency η of the motor of 76,7%, according to IEC60032-30.

Net Load= Pn x 60% x 4000h/ η

CP Standard Air Compressors kWh flow/a

The output (load) has been determined as energy input * efficiency based on data from the prep.study Task 8, tables 3.5 and 3.6. The reference data regard weighted averages for the three selected base cases (rotary fixed speed, rotary variable speed, pistons) over different volume flow classes in each base case. The data are available in 5 year intervals; for intermediate years values were interpolated. The LOAD can also be conceived as product of output volume flow, output pressure, and annual operating hours, i.e. the demand for compressor output in kWh flow/a.

Rotary fixed speed

The LOAD results more or less constant over the years, varying from 53392 kWh/a in 2000 to 44255 kWh/a in 2030. Indicatively this average load corresponds to a compressor with a volume flow of 70 l/s and an efficiency of 63%.

Rotary variable speed	The LOAD is decreasing in time, varying from 155526 kWh/a in 2000 to 83763 kWh/a in 2030. The reason for this decrease is that variable speeds are increasingly applied to lower capacity models. For example in 2000 the average variable speed compressor sold has 180 l/s while in 2030 this has decreased to 86 l/s. Both with an average efficiency around 65-66%.
Pistons	The LOAD results more or less constant over the years, varying from 1377 to 1391 kWh/a. Indicatively this average load corresponds to a compressor with a volume flow of 7 l/s and an efficiency of 47%.
Efficiencies	The efficiencies in EIA (both EFNBAU and EFNECO) are the sales-weighted isentropic efficiencies over the various volume flow classes in each base case. The efficiencies per volume flow class have been taken from the Excel sheets underlying the Impact Assessment, using Ecodesign Option A with Averaged replacement. See Annex E for further information on efficiencies.

TRAFO Distribution	TEC	only annual losses are counted. On average 3.3% of final demand electricty (2.6% of produced electricity)
TRAFO Industry oil	TEC	
TRAFO Industry dry	TEC	
TRAFO Power	TEC	
TRAFO DER oil	TEC	
TRAFO DER dry	TEC	
TRAFO Small	TEC	

TYRE

Parameters for the assessment of the duty cycle for replacement tyres are given below

TYRE in m units		travel km/a	fuel ltr /100km. vehicle	fuel kWh/litre (NCV)**	2010 vehicle park (m units)	replaced vs. new tyres in use	fuel TWh of 2010 EU vehicles with replaced tyres
TYRE car, kWh fuel per unit RRC (kg/t), per tyre& year	ndx (2010=1)*	13500	7.3	9.5	239	68%	1513
TYRE van, kWh fuel per unit RRC (kg/t), per tyre& year	ndx (2010=1)*	21000	12.0	10	32	74%	595
TYRE truck, kWh fuel per unit RRC (kg/t), per tyre& year	ndx (2010=1)*	57500	25.7	10	3	74%	327

	RRC 2010, in (kg/t)	RRC impact per kg/t	2010 fuel TWh due to RR	2010 repl. tyres in use (m)	kWh fuel/tyre.a	(kWh fuel/a)/ (kg/t RRC)
TYRE car, kWh fuel per unit RRC (kg/t), per tyre& year	11.5	1.5%	261	877	297	26
TYRE van, kWh fuel per unit RRC (kg/t), per tyre& year	11.0	1.5%	99	177	556	50
TYRE truck, kWh fuel per unit RRC (kg/t), per tyre& year	9.5	5.0%	156	29	5353	561

*=The index is based on an absolute 0.9% efficiency improvement/ year (18% over the period) between 1990 and 2010 [source: EEA 2013]

**=cars: 50% petrol ('motor spirit')/50% diesel (in litres): petrol 44 MJ/kg (NCV, 1.051 kgoe/kg), 0.737 kg/ltr, 32.4 MJ/litre; diesel 42.3 MJ/kg (NCV, 1.01 kgoe/kg), 0.85 kg/ltr, 36 MJ/litre; 50/50 --> 34.2 MJ/litre (0.817 kgoe/litre, 9.5 kWh/litre)
vans: diesel 36 MJ/litre (10 kWh/litre)
trucks: diesel 36 MJ/litre (10 kWh/litre)

LOAD

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WH dedicated Water Heater	kWh heat/a	1392	1524	1576	1629	1682	1735	1788	1841	1894	1947
CHC Central Heating combi, water heat	kWh heat/a	2492	2293	2314	2340	2370	2400	2430	2460	2490	2520
CH Central Heating boiler, space heat	kWh heat/a	16830	11760	10401	9188	8108	7301	6534	5767	5000	4233
SFB Wood Manual	kWh heat/a	14580	14580	13872	13199	12558	11949	11369	10817	10292	9793
SFB Wood Direct Draft	kWh heat/a	16200	16200	15414	14666	13954	13277	12632	12019	11436	10881
SFB Coal	kWh heat/a	20250	20250	19267	18332	17442	16596	15790	15024	14295	13601
SFB Pellets	kWh heat/a	20250	20250	19267	18332	17442	16596	15790	15024	14295	13601
SFB Wood chips	kWh heat/a	129600	129600	123310	117325	111631	106213	101058	96153	91486	87046
CHAE-S (≤ 400 kW)	kWh cool/a	32213	26400	25119	23900	22740	21636	20586	19587	18636	17732
CHAE-L (> 400 kW)	kWh cool/a	522729	428400	407608	387825	369002	351093	334053	317840	302414	287736
CHWE-S (≤ 400 kW)	kWh cool/a	44659	36600	34824	33134	31525	29995	28540	27154	25836	24583
CHWE-M (> 400 kW; ≤ 1500 kW)	kWh cool/a	610583	500400	476113	453006	431019	410100	390196	371258	353239	336095
CHWE-L (> 1500 kW)	kWh cool/a	1171382	960000	913407	869075	826895	786763	748578	712246	677678	644787
CHF	kWh cool/a	29285	24000	22835	21727	20672	19669	18714	17806	16942	16120
HT PCH-AE-S	kWh cool/a	864800	864800	864800	864800	864800	864800	864800	864800	864800	864800
HT PCH-AE-L	kWh cool/a	2825400	2825400	2825400	2825400	2825400	2825400	2825400	2825400	2825400	2825400
HT PCH-WE-S	kWh cool/a	1104556	1104556	1104556	1104556	1104556	1104556	1104556	1104556	1104556	1104556
HT PCH-WE-M	kWh cool/a	3281289	3281289	3281289	3281289	3281289	3281289	3281289	3281289	3281289	3281289
HT PCH-WE-L	kWh cool/a	6375000	6375000	6375000	6375000	6375000	6375000	6375000	6375000	6375000	6375000
AC rooftop	kWh cool/a	51248	42000	39962	38022	36177	34421	32750	31161	29648	28209
AC splits	kWh cool/a	12226	10020	9534	9071	8631	8212	7813	7434	7073	6730
AC VRF	kWh cool/a	20499	16800	15985	15209	14471	13768	13100	12464	11859	11284
ACF	kWh cool/a	29285	24000	22835	21727	20672	19669	18714	17806	16942	16120
AC rooftop (rev)	kWh heat/a	119579	98000	93244	88718	84412	80315	76417	72708	69180	65822
AC splits (rev)	kWh heat/a	28528	23380	22245	21166	20138	19161	18231	17346	16504	15703
AC VRF (rev)	kWh heat/a	47831	39200	37297	35487	33765	32126	30567	29083	27672	26329
ACF (rev)	kWh heat/a	68331	56000	53282	50696	48236	45894	43667	41548	39531	37613
AHF	kWh heat/a	86730	71079	67629	64347	61224	58252	55425	52735	50176	47740
AHE	kWh heat/a	29285	24000	22835	21727	20672	19669	18714	17806	16942	16120
LH open fireplace	kWh heat/a	336	336	336	336	336	336	336	336	336	336
LH closed fireplace/inset	kWh heat/a	2351	2128	2076	2024	1975	1926	1879	1832	1787	1743
LH wood stove	kWh heat/a	2979	2696	2630	2565	2502	2440	2380	2321	2264	2208
LH coal stove	kWh heat/a	2979	2696	2630	2565	2502	2440	2380	2321	2264	2208
LH cooker	kWh heat/a	1237	1120	1092	1066	1039	1014	989	964	941	917
LH SHR stove	kWh heat/a	2979	2696	2630	2565	2502	2440	2380	2321	2264	2208
LH pellet stove	kWh heat/a	3562	3224	3145	3067	2992	2918	2846	2776	2708	2641
LH open fire gas	kWh heat/a	210	210	210	210	210	210	210	210	210	210
LH closed fire gas	kWh heat/a	1248	1130	1102	1075	1048	1023	997	973	949	925
LH flueless fuel heater	kWh heat/a	75	75	75	75	75	75	75	75	75	75
LH elec.portable	kWh heat/a	358	324	316	308	301	293	286	279	272	265
LH elec.convector	kWh heat/a	939	850	829	809	789	769	750	732	714	696
LH elec.storage	kWh heat/a	1458	1320	1287	1256	1225	1195	1165	1137	1109	1081
LH elec.underfloor	kWh heat/a	364	330	322	314	306	299	291	284	277	270
LH luminous heaters	kWh heat/a	13480	12200	11900	11606	11321	11042	10770	10505	10246	9993
LH tube heaters	kWh heat/a	20220	18300	17849	17410	16981	16563	16155	15757	15369	14990
RAC (cooling demand), all RAC types <12 kW	kWh cool/a	1086	1133	1152	1172	1183	1207	1228	1249	1270	1291
RAC (heating demand), reversible <12kW	kWh heat/a	2683	2065	1952	1858	1780	1701	1619	1537	1455	1373
CIRC Circulator pumps <2.5 kW, net load	kWh flow/a	300	277	272	266	260	261	267	273	278	284
NRVU avg (stock weighted 2010)	TEC elec	1	1	1	1	1	1	1	1	1	1
NRVU avg (stock weighted 2010)	TEC heat	1	1	1	1	1	1	1	1	1	1
RVU Central Unidir ≤125W/fan (1 fan)	TEC elec	1	1	1	1	1	1	1	1	1	1
RVU Central Balanced ≤125W/fan (2 fans)	TEC elec	1	1	1	1	1	1	1	1	1	1
RVU Local Balanced <125 W (also NR, 2 fans)	TEC elec	1	1	1	1	1	1	1	1	1	1
RVU Central Unidir ≤125W/fan (1 fan)	TEC heat	1	1	1	1	1	1	1	1	1	1
RVU Central Balanced ≤125W/fan (2 fans)	TEC heat	1	1	1	1	1	1	1	1	1	1
RVU Local Balanced <125 W (also NR, 2 fans)	TEC heat	1	1	1	1	1	1	1	1	1	1

VU reference: natural ventilation 220 m³/h

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
BAU lumen/unit											
LFL	lm	2274	2239	2284	2272	2271	2271	2271	2271	2271	2271
CFL	lm	565	540	539	535	526	523	522	522	521	521
Tungsten	lm	838	704	606	682	575	556	555	555	554	554
GLS	lm	513	513	513	513	513	513	513	513	513	513
HID	lm	12039	12881	12906	13002	12974	12974	12974	12974	12974	12974
LED	lm		550	619	863	863	863	863	863	863	862
BAU hours/year											
LFL	h/a	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
CFL (weighted avg. CFLni and CFLi)	h/a	999	707	701	667	546	504	496	489	482	475
Tungsten	h/a	450	450	450	450	450	450	450	450	450	450
GLS	h/a	450	450	450	450	450	450	450	450	450	450
HID	h/a	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
LED	h/a		600	620	790	813	875	901	926	952	977
ECO lumen/unit											
LFL	lm	2274	2238	2278	2261	2237	2168	2086	2005	1924	1842
CFL	lm	565	537	535	537	535	527	528	530	531	532
Tungsten	lm	838	710	522	744	678	1046	1046	1046	1046	1046
GLS	lm	513	513	513	513	513	513	513	513	513	513
HID	lm	12039	12884	13171	13270	13267	13317	13353	13389	13425	13461
LED	lm		550	847	902	943	1026	1056	1086	1115	1145
GLS stock	lm		513	513							
Tungsten stock	lm			504	504						
ECO hours/year											
LFL	h/a	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
CFL (weighted avg. CFLni and CFLi)	h/a	999	675	647	705	667	565	580	596	612	627
Tungsten	h/a	450	450	450	450	450	450	450	450	450	450
GLS	h/a	450	450	450	450	450	450	450	450	450	450
HID	h/a	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
LED	h/a		554	707	751	809	887	913	938	964	990
GLS stock	h/a		450	450							
Tungsten stock	h/a			450	450						
DP TV viewable area (avg.of all TV types), sales	dm²	10.0	28.1	36.8	53.4	62.2	71.7	81	91	101	111
DP Monitor viewable area (avg.of all types), sales	dm²	5.0	11.4	13.5	15.9	17.9	20.1	22	25	27	29
DP TV share of UHD/ 3D (all TV types)	%		2%	10%	25%	38%	50%	50%	50%	50%	50%
DP Monitor share of UHD/ 3D	%		4%	20%	50%	75%	100%	100%	100%	100%	100%
DP TV standby	h sb/d	6.0	20.0	20.0	20.0	20.0	20.0	20	20	20	20
DP Monitor standby	h sb/d	4.0	4.0	4.0	4.0	4.0	4.0	4	4	4	4
SSTB	TEC	1	1	1	1	1	1	1	1	1	1
CSTB	TEC	1	1	1	1	1	1	1	1	1	1
VIDEO players/recorders	TEC	1	1	1	1	1	1	1	1	1	1
VIDEO projectors	TEC	1	1	1	1	1	1	1	1	1	1
VIDEO game consoles	TEC	1	1	1	1	1	1	1	1	1	1
ES Rack servers	TEC	1	1	1	1	1	1	1	1	1	1
ES Blade servers	TEC	1	1	1	1	1	1	1	1	1	1
ES Storage	TEC	1	1	1	1	1	1	1	1	1	1
PC Desktop	TEC	1	1	1	1	1	1	1	1	1	1
PC Notebook	TEC	1	1	1	1	1	1	1	1	1	1
PC Tablet/slate	TEC	1	1	1	1	1	1	1	1	1	1
PC Thin client	TEC	1	1	1	1	1	1	1	1	1	1
PC Workstation	TEC	1	1	1	1	1	1	1	1	1	1
EP-Copier mono	TEC	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
EP-Copier colour	TEC	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
EP-printer mono	TEC	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
EP-printer colour	TEC	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
IJ SFD printer	OM	1	1	1	1	1	1	1	1	1	1
IJ MFD printer	OM	1	1	1	1	1	1	1	1	1	1
SB Home Gateway, on-mode hours	h on/d	7	7	7	7	7	7	7	7	7	7
SB Home NAS, on-mode hours	h on/d	3	3	3	3	3	3	3	3	3	3
SB Home Phones (fixed), on-mode hours	h on/d	2	2	2	2	2	2	2	2	2	2
SB Office Phones (fixed), on-mode hours	h on/d	4	4	4	4	4	4	4	4	4	4
SB Home Gateway, standby hours	h sb/d	8.5	8.5	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby hours	h sb/d	19	19	19	19	19	19	19	19	19	19
SB Home Phones (fixed), standby hours	h sb/d	0	0	0	0	0	0	0	0	0	0
SB Office Phones (fixed), standby hours	h sb/d	0	0	0	0	0	0	0	0	0	0
SB Home Gateway, idle hours	h idle/d	8.50	8.50	12.75	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SB Home NAS, idle hours	h idle/d	2	2	2	2	2	2	2	2	2	2
SB Home Phones (fixed), idle hours	h idle/d	22	22	22	22	22	22	22	22	22	22
SB Office Phones (fixed), idle hours	h idle/d	20	20	20	20	20	20	20	20	20	20
BC_EPS Mobile phones etc.	h/a	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760
UPS below 1.5 kVA	kW output	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
UPS 1.5 to 5 kVA	kW output	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93
UPS 5 to 10 kVA	kW output	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
UPS 10 to 200 kVA	kW output	43.79	43.79	43.79	43.79	43.79	43.79	43.79	43.79	43.79	43.79

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
RF Net volume Vnet (CECED 2013)	ltr	203	259	278	297	316	337	358	380	401	422
RF Estimated equivalent volume Veq	ltr	274	350	377	401	428	456	485	514	542	571
RF SAEc (EEI=100)	kWh/a	468	526	545	563	582	602	623	644	664	685
CF open vertical chilled multi deck (RVC2)	SAEC,kWh/a	18600	18600	18600	18600	18600	18600	18600	18600	18600	18600
CF open horizontal frozen island (RHF4)	SAEC,kWh/a	15841	15841	15841	15841	15841	15841	15841	15841	15841	15841
CF other supermarket display (non-BCs)	SAEC,kWh/a	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
CF Plug in one door beverage cooler	SAEC,kWh/a	2738	2738	2738	2738	2738	2738	2738	2738	2738	2738
CF Plug in horizontal ice cream freezer	SAEC,kWh/a	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482
CF Spiral vending machine	SAEC,kWh/a	2592	2592	2592	2592	2592	2592	2592	2592	2592	2592
PF Storage cabinet Chilled Vertical (CV)	SAEC,kWh/a	1595	1595	1595	1595	1595	1595	1595	1595	1595	1595
PF Storage cabinet Frozen Vertical (FV)	SAEC,kWh/a	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429
PF Storage cabinet Chilled Horizontal (CH)	SAEC,kWh/a	2557	2557	2557	2557	2557	2557	2557	2557	2557	2557
PF Storage cabinet Frozen Horizontal (FH)	SAEC,kWh/a	3548	3548	3548	3548	3548	3548	3548	3548	3548	3548
PF Storage cabinets All types	**SAEC,kWh/a**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**
PF Process Chiller AC MT S ≤ 300 kW	Mwhcool/a	741	741	741	741	741	741	741	741	741	741
PF Process Chiller AC MT L > 300 kW	Mwhcool/a	2689	2689	2689	2689	2689	2689	2689	2689	2689	2689
PF Process Chiller AC LT S ≤ 200 kW	Mwhcool/a	599	599	599	599	599	599	599	599	599	599
PF Process Chiller AC LT L > 200 kW	Mwhcool/a	2131	2131	2131	2131	2131	2131	2131	2131	2131	2131
PF Process Chiller WC MT S ≤ 300 kW	Mwhcool/a	923	923	923	923	923	923	923	923	923	923
PF Process Chiller WC MT L > 300 kW	Mwhcool/a	3192	3192	3192	3192	3192	3192	3192	3192	3192	3192
PF Process Chiller WC LT S ≤ 200 kW	Mwhcool/a	752	752	752	752	752	752	752	752	752	752
PF Process Chiller WC LT L > 200 kW	Mwhcool/a	2601	2601	2601	2601	2601	2601	2601	2601	2601	2601
PF Process Chiller All MT&LT	**Mwhcool/a**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**
PF Condensing Unit MT S 0.2-1 kW	Mwhcool/a	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
PF Condensing Unit MT M 1-5 kW	Mwhcool/a	17	17	17	17	17	17	17	17	17	17
PF Condensing Unit MT L 5-20 kW	Mwhcool/a	66	66	66	66	66	66	66	66	66	66
PF Condensing Unit MT XL 20-50 kW	Mwhcool/a	203	203	203	203	203	203	203	203	203	203
PF Condensing Unit LT S 0.1-0.4 kW	Mwhcool/a	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Condensing Unit LT M 0.4-2 kW	Mwhcool/a	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
PF Condensing Unit LT L 2-8 kW	Mwhcool/a	28	28	28	28	28	28	28	28	28	28
PF Condensing Unit LT XL 8-20 kW	Mwhcool/a	196	196	196	196	196	196	196	196	196	196
PF Condensing Unit, All MT&LT	**Mwhcool/a**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**
COOK El. Hobs	ltr/a	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229
COOK El. Ovens	TEC	1	1	1	1	1	1	1	1	1	1
COOK Gas Hobs	kWh/a	181	181	181	181	181	181	181	181	181	181
COOK Gas Ovens	TEC	1	1	1	1	1	1	1	1	1	1
COOK Range Hoods	TEC	1	1	1	1	1	1	1 0	1	1	1
COFFEE Dripfilter (glass)	TEC	1	1	1	1	1	1	1	1	1	1
COFFEE Dripfilter (thermos)	TEC	1	1	1	1	1	1	1	1	1	1
COFFEE Dripfilter (full automatic)	TEC	1	1	1	1	1	1	1	1	1	1
COFFEE Pad filter	TEC	1	1	1	1	1	1	1	1	1	1
COFFEE Hard cap espresso	TEC	1	1	1	1	1	1	1	1	1	1
COFFEE Semi-auto espresso	TEC	1	1	1	1	1	1	1	1	1	1
COFFEE Fully-auto espresso	TEC	1	1	1	1	1	1	1	1	1	1
WM Programme temperature, in °C	°C	56.0	43.0	39.7	36.4	33.2	29.9	27	23	20	17
WM Rated capacity ***c*** , in kg	kg/cycle	4.1	6.8	7.1	7.6	7.6	7.6	8	8	8	8
WM Real (rated) load, in kg	kg/cycle	2.9	3.7	3.8	4.0	4.0	4.0	4	4	4	4
WM Cycles/yr per unit (est.)	cyc/a	237	189	182	174	174	174	174	174	174	174
WM programme time											
WM SAEc (EEI=100)	kWh/a	246	371	387	410	410	410	410	410	410	410
DW Real average programme temperature, in	°C	61.6	57.6	56.6	55.6	54.6	53.6	53	52	51	50
DW Rated capacity, ***ps,*** in place settings	ps/cycl	11.9	12.6	12.7	12.8	12.8	12.8	13	13	13	13
DW Real load, in place settings	ps/cycl	6.7	8.8	9.1	9.3	9.3	9.3	9	9	9	9
DW Cycles/yr per unit (est.)	cyc/a	210	210	210	210	210	210	210	210	210	210
DW programme time											
DW SAEc (EEI=100)	kWh/a	438	455	457	458	458	458	458	458	458	458
LD Spin speeds of stock WM	rpm	800	950	1000	1050	1100	1200	1300	1400	1500	1600
LD Real inital moisture of drying load	%	70%	60%	58%	56%	55%	55%	56%	56%	57%	57%
LD Standard moisture	%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
LD correction factor for initial moisture	-	*1.14*	*1.00*	*0.97*	*0.95*	*0.94*	*0.93*	*0.94*	*0.94*	*0.95*	*0.96*
LD Rated Capacity	kg/cycle	4.81	6.6	7.1	7.3	7.3	7.3	7.3	7.3	7.3	7.3
LD Real Capacity (71% of rated, IA report)	kg/cycle	3.41	4.67	5.03	5.16	5.20	5.20	5.21	5.21	5.21	5.21
LD Cycles real per year (as in IA report)	cyc/a	160	160	160	160	160	160	160	160	160	160
LD SAEc vented el. (EEI=100)	kWh elec/a	492	631	670	684	688	689	689	689	689	689
LD SAEc condens el. (EEI=100)	kWh elec/a	427	566	605	619	623	624	624	624	624	624
LD SAEc vented gas (EEI=100)	kWh prim./a	492	631	670	684	688	689	689 0	689 0	689 0	689 0
VC dom (87 m³/h)	h/a	57	33	31	31	28	25	23	20	18	16
VC nondom	h/a	500	500	500	500	500	500	500	500	500	500

LOAD

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
FAN Axial<300Pa (all FAN types >125W)	kWh flow/ a	247	247	247	247	247	247	247	247	247	247
FAN Axial>300Pa	kWh flow/ a	489	489	489	489	489	489	489	489	489	489
FAN Centr.FC	kWh flow/ a	212	212	212	212	212	212	212	212	212	212
FAN Centr.BC-free	kWh flow/ a	3180	3180	3180	3180	3180	3180	3180	3180	3180	3180
FAN Centr.BC	kWh flow/ a	3078	3078	3078	3078	3078	3078	3078	3078	3078	3078
FAN Cross-flow	kWh flow/ a	28	28	28	28	28	28	28	28	28	28
MT Motors 0.75-375 kW	kWh output/a	8039	8039	8039	8039	8039	8039	8039	8039	8039	8039
WP Water pumps (load)	kWh flow/a	4593	4593	4593	4593	4593	4593	4593	4593	4593	4593
CP Fixed Speed 5-1280 l/s	kWh flow/a	47845	49377	46677	45050	44284	44255	44226	44197	44168	44139
CP Variable speed 5-1280 l/s	kWh flow/a	183425	129646	104486	90069	84355	83763	83172	82581	81990	81399
CP Pistons 2-64 l/s	kWh flow/a	1379	1391	1384	1382	1380	1377	1373	1369	1366	1362
TRAFO Distribution	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Industry oil	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Industry dry	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Power	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO DER oil	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO DER dry	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Small	TEC	1	1	1	1	1	1	1	1	1	1
TYRE car, kWh fuel per unit RRC (kg/t), per tyre& year	ndx (2010=1)	118%	100%	96%	91%	86%	82%	77%	73%	68%	64%
TYRE van, kWh fuel per unit RRC (kg/t), per tyre& year	ndx (2010=1)	118%	100%	96%	91%	86%	82%	77%	73%	68%	64%
TYRE truck, kWh fuel per unit RRC (kg/t), per tyre& year	ndx (2010=1)	118%	100%	96%	91%	86%	82%	77%	73%	68%	64%

LOAD EU-28 Total	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	**TWh prim heat/a**	**190**	**241**	**256**	**270**	**285**	**300**	**316**	**332**	**348**	**365**
Total CH Central Heating combi, water heat	**TWh prim heat/a**	**107**	**189**	**208**	**223**	**241**	**260**	**279**	**299**	**319**	**339**
Total CH Central Heating boiler, space heat	**TWh prim heat/a**	**1170**	**1312**	**1252**	**1185**	**1119**	**1088**	**1055**	**1011**	**947**	**861**
SFB Wood Manual	TWh heat/a	97	43	35	27	18	11	7	5	4	4
SFB Wood Direct Draft	TWh heat/a	1	17	32	46	55	54	55	59	68	79
SFB Coal	TWh heat/a	44	18	13	8	5	2	1	1	1	1
SFB Pellets	TWh heat/a	0	7	12	17	21	23	24	24	25	27
SFB Wood chips	TWh heat/a	0	10	13	14	14	13	14	15	16	17
SFB total net heat demand	**TWh heat/a**	**142**	**95**	**105**	**112**	**112**	**103**	**101**	**104**	**114**	**126**
CHAE-S (≤ 400 kW)	TWh cool/a	9	32	38	43	45	47	48	43	33	21
CHAE-L (> 400 kW)	TWh cool/a	15	44	52	57	59	58	57	56	56	55
CHWE-S (≤ 400 kW)	TWh cool/a	1	4	5	6	6	7	7	7	7	8
CHWE-M (> 400 kW; ≤ 1500 kW)	TWh cool/a	5	15	17	19	20	20	20	19	19	19
CHWE-L (> 1500 kW)	TWh cool/a	3	9	11	12	13	13	13	12	12	12
CHF	TWh cool/a	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-S	TWh cool/a	93	165	186	204	218	229	239	249	259	268
HT PCH-AE-L	TWh cool/a	96	171	192	211	226	237	247	257	267	277
HT PCH-WE-S	TWh cool/a	31	54	61	67	72	76	79	82	85	88
HT PCH-WE-M	TWh cool/a	70	123	139	153	163	171	179	186	193	200
HT PCH-WE-L	TWh cool/a	13	25	28	30	33	35	37	38	40	41
AC rooftop	TWh cool/a	6	21	22	20	16	11	5	3	2	2
AC splits	TWh cool/a	13	45	47	46	44	41	37	34	31	29
AC VRF	TWh cool/a	0	12	18	26	33	41	48	54	59	62
ACF	TWh cool/a	0	0	0	0	0	0	0	0	0	0
AHC central Air Cooling	**TWh cool/a**	**356**	**721**	**816**	**896**	**949**	**986**	**1016**	**1042**	**1063**	**1082**
AC rooftop (rev)	TWh heat/a	9	30	31	29	23	15	7	2	0	0
AC splits (rev)	TWh heat/a	22	73	76	74	71	66	60	55	50	46
AC VRF (rev)	TWh heat/a	0	24	37	52	65	80	92	98	101	101
ACF (rev)	TWh heat/a	0	0	1	1	1	1	1	1	1	1
AHF	TWh heat/a	138	112	97	87	77	69	62	56	50	44
AHE	TWh heat/a	1	2	2	1	1	1	1	1	1	1
AHC central Air Heating	**TWh heat/a**	**170**	**242**	**244**	**243**	**238**	**232**	**223**	**213**	**204**	**194**
AHC total Heating & Cooling	**TWh heat/a**	**526**	**963**	**1060**	**1139**	**1187**	**1217**	**1240**	**1255**	**1267**	**1276**
								0			
LH open fireplace	TWh heat/a	3	5	6	6	6	6	6	6	6	6
LH closed fireplace/inset	TWh heat/a	11	27	33	39	43	47	48	49	48	47
LH wood stove	TWh heat/a	23	25	25	26	27	28	29	29	28	28
LH coal stove	TWh heat/a	16	9	9	8	7	6	5	4	3	3
LH cooker	TWh heat/a	4	7	8	9	10	11	11	11	11	10
LH SHR stove	TWh heat/a	13	17	18	20	23	25	28	30	31	31
LH pellet stove	TWh heat/a	0	6	9	12	14	16	17	17	17	16
LH open fire gas[3]	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH closed fire gas	TWh heat/a	8	8	8	8	8	8	8	8	8	8
LH flueless fuel heater	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH elec.portable	TWh heat/a	18	20	21	21	21	21	22	21	21	20
LH elec.convector	TWh heat/a	76	84	86	86	87	89	89	88	86	84
LH elec.storage	TWh heat/a	6	6	6	6	6	7	7	7	6	6
LH elec.underfloor	TWh heat/a	10	11	11	12	12	12	12	12	12	12
LH luminous heaters	TWh heat/a	4	4	4	4	4	4	4	4	4	4
LH tube heaters	TWh heat/a	7	8	8	8	8	8	8	8	7	7
LH total		**199**	**238**	**252**	**266**	**278**	**288**	**293**	**293**	**288**	**282**
RAC (cooling demand), <12 kW	**TWh cool/a**	**5**	**56**	**75**	**97**	**124**	**142**	**152**	**158**	**163**	**169**
RAC (heating demand), reversible <12kW	**TWh heat/a**	**4**	**59**	**91**	**128**	**163**	**177**	**177**	**172**	**166**	**159**
CIRC Circulator pumps <2.5 kW	**TWh flow/a**	**44**	**18**	**13**	**8**	**5**	**2**	**1**	**1**	**1**	**1**
TOTAL SPACE HEATING load	**TWh heat/a**	**1685**	**1946**	**1943**	**1933**	**1911**	**1888**	**1850**	**1793**	**1719**	**1623**
TOTAL SPACE COOLING load	**TWh cool/a**	**361**	**777**	**892**	**992**	**1073**	**1128**	**1168**	**1199**	**1226**	**1250**
NRVU total ventilated (17.3 Mm³/a)	T m³/a	4	49	63	75	85	92	99	107	114	122
NRVU ventilated during heating season (10.08 Mm³/a)	T m³/a	2	28	36	44	49	54	58	62	67	71
NRVU total heat saved (8606 kWh/Mm³= GWh/Tm³)	TWh/a	20	245	314	375	425	461	498	536	573	611
RVU Central Unidir. VU ≤125W/fan (173 m³/h)	T m³/a	26	51	58	57	54	54	56	60	64	68
RVU Central Balanced VU ≤125W/fan (143 m³/h)	T m³/a	0	3	5	9	14	18	20	23	25	27
RVU Local Balanced VU (<125 W, also NR) (70 m³/h per unit)	T m³/a	0	0	1	1	2	4	5	6	7	9
RVU total ventilated	T m³/a	26	54	64	68	71	75	81	89	96	104
RVU Central Unidir. , heat saved (951 kWh/a)	TWh/a	16	32	36	36	34	34	35	38	40	43
RVU Central Balanced ≤125W/fan (3863 kWh/a)	TWh/a	1	8	16	29	43	55	63	70	76	83
RVU Local Balanced VU (1706 kWh/a)	TWh/a	0	1	2	4	7	10	14	17	21	24
VU Ventilation Units, total ventilated	**T m³/a**	**30**	**103**	**127**	**143**	**155**	**167**	**181**	**196**	**211**	**226**

LOAD EU-28 Total	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
BAU lumen (total)	**Tlm**	**5.5**	**10.3**	**11.5**	**12.5**	**13.3**	**14.4**	**15.2**	**15.9**	**16.4**	**16.8**
LFL	Tlm	2.6	4.3	5.1	5.2	5.2	5.0	4.7	4.5	4.2	4.0
CFL	Tlm	0.2	1.9	2.6	2.5	2.1	1.9	1.7	1.5	1.4	1.3
Tungsten	Tlm	0.2	1.4	1.5	1.8	1.3	0.9	0.7	0.5	0.4	0.3
GLS	Tlm	1.9	1.4	1.1	0.8	0.5	0.2	0.0	0.0	0.0	0.0
HID	Tlm	0.5	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
LED	Tlm	0.0	0.0	0.1	1.1	3.2	5.4	7.1	8.4	9.4	10.1
BAU hours (total)	**Th/a**	**4.6**	**8.7**	**10.2**	**10.8**	**11.4**	**12.8**	**13.9**	**15.0**	**15.9**	**16.7**
LFL	Th/a	2.3	3.8	4.3	4.5	4.5	4.3	4.1	3.8	3.6	3.5
CFL (weighted avg. CFLni and CFLi)	Th/a	0.3	2.4	3.3	3.1	2.2	1.8	1.6	1.4	1.3	1.2
Tungsten	Th/a	0.1	0.9	1.1	1.2	1.0	0.7	0.5	0.4	0.3	0.3
GLS	Th/a	1.7	1.2	0.9	0.7	0.4	0.1	0.0	0.0	0.0	0.0
HID	Th/a	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
LED	Th/a	0.0	0.0	0.1	1.0	3.0	5.5	7.4	9.0	10.4	11.5
ECO lumen (total)	**Tlm**	**5.5**	**10.1**	**10.8**	**12.6**	**13.7**	**15.2**	**16.2**	**17.1**	**18.0**	**19.0**
LFL	Tlm	2.6	4.3	4.9	4.3	2.9	1.7	1.2	0.8	0.4	0.2
CFL	Tlm	0.2	2.0	2.5	1.8	0.7	0.2	0.0	0.0	0.0	0.0
Tungsten	Tlm	0.2	1.5	1.4	0.7	0.1	0.0	0.0	0.0	0.0	0.0
GLS	Tlm	1.9	1.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
HID	Tlm	0.5	1.3	0.9	0.6	0.4	0.2	0.2	0.2	0.2	0.2
LED	Tlm	0.0	0.0	0.5	4.9	9.7	13.0	14.7	16.0	17.3	18.5
GLS stock	Tlm	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten stock	Tlm	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO hours (total)	Th/a	**4.6**	**8.5**	**9.6**	**11.0**	**11.9**	**13.1**	**13.9**	**14.7**	**15.5**	**16.3**
LFL	Th/a	2.3	3.8	4.2	3.7	2.5	1.6	1.1	0.8	0.5	0.2
CFL (weighted avg. CFLni and CFLi)	Th/a	0.3	2.5	3.0	2.4	0.8	0.2	0.0	0.0	0.0	0.0
Tungsten	Th/a	0.1	0.9	1.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0
GLS	Th/a	1.7	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
HID	Th/a	0.2	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
LED	Th/a	0.0	0.0	0.5	4.1	8.3	11.2	12.7	13.8	14.9	16.0
GLS stock	Th/a	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten stock	Th/a	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV viewable area (avg.of all TV types), sales	km²	22	112	176	256	343	431	534	648	773	909
DP Monitor viewable area (avg.of all types), sales	km²	1	20	18	16	18	20	22	24	26	29
DP TV share of UHD/ 3D (all TV types)	%		2%	10%	25%	38%	50%	62%	75%	87%	100%
DP Monitor share of UHD/ 3D	%		4%	20%	50%	75%	100%	100%	100%	100%	100%
DP TV standby	Th sb/a	54	332	398	400	459	501	546	592	638	683
DP Monitor standby	Th sb/a	2	29	22	16	16	16	16	16	16	16
DP electronic DisPlays	km²	**22**	**131**	**193**	**272**	**361**	**451**	**556**	**672**	**799**	**937**
SSTB (4.5h on/d)	Th on/a	0.00	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CSTB (4.5 h on/d)	Th on/a	0.00	0.13	0.32	0.36	0.37	0.36	0.38	0.41	0.44	0.47
VIDEO players/recorders (1 h/d play or record)	Th on/a	0.000	0.049	0.061	0.015	0.001	0.000	0.000	0.000	0.000	0.000
VIDEO projectors (2.1 h/d on)	Th on/a	0.000	0.008	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000
VIDEO game consoles (0.5 h/d active play)	Th on/a	0.000	0.052	0.065	0.058	0.051	0.060	0.060	0.060	0.060	0.060
ES Rack servers	m units	0.4	11.2	13.0	14.4	17.3	21.4	25.7	25.1	25.1	25.1
ES Blade servers	m units	0.0	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6
ES Storage	m units	0.0	0.6	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9
PC Desktop	m units	29	111	98	76	75	75	75	75	75	75
PC Notebook	m units	1	121	95	62	62	62	62	62	62	62
PC Tablet/slate	m units	0	4	158	339	473	589	624	654	684	715
PC Thin client	m units	0	5	5	5	5	5	5	5	5	5
PC Workstation	m units	0	3	3	3	3	3	3	3	3	3
EP-BW images per yr(28k ipy/unit, colour=35% BW)	bn ipy	671	560	517	462	436	424	413	402	398	394
EP-Colour images per yr (28k ipy/unit, col.=35% BW)	bn ipy	0	95	172	260	315	361	407	453	498	544
IJ-BW images (1k ipy/unit, colour=35% BW)	bn ipy	29	62	59	55	54	55	56	57	58	59
IJ-Colour images (1k ipy/unit, colour=35% BW)	bn ipy	12	37	53	65	71	78	84	91	97	104
Total images per year	bn ipy	711	755	801	843	875	918	960	1003	1051	1101
Total sheets per year at 65% duplex, 15% N print	bn A4-sheets	444	471	500	526	547	573	599	626	656	687
EP&IJ Paper for sheets (200 sheets/ kg)	Mt/a	2.2	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4
EP&IJ Toner use (27 mg/image at 15% N print)	kt/a	19	20	22	23	24	25	26	27	28	30
SB Home Gateway, on-mode hours	Th on/a	0.00	0.35	0.46	0.58	0.69	0.81	0.92	1.03	1.15	1.26
SB Home NAS, on-mode hours	Th on/a	0.00	0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.10
SB Home Phones (fixed), on-mode hours	Th on/a	0.01	0.10	0.13	0.15	0.15	0.15	0.15	0.15	0.15	0.15
SB Office Phones (fixed), on-mode hours	Th on/a	0.02	0.11	0.12	0.12	0.13	0.14	0.15	0.15	0.16	0.17
BC_EPS Mobile phones etc.	Th sb/a	0.5	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
UPS below 1.5 kVA	GW output	0.6	1.3	1.3	1.5	1.8	2.1	2.4	2.6	2.8	3.0
UPS 1.5 to 5 kVA	GW output	2.7	5.8	6.3	7.0	8.3	9.7	11.0	12.2	13.3	14.1
UPS 5 to 10 kVA	GW output	0.5	1.0	1.1	1.2	1.4	1.7	1.9	2.1	2.3	2.5
UPS 10 to 200 kVA	GW output	2.7	6.1	6.8	7.5	8.7	10.2	11.7	13.2	14.4	15.4
Total UPS	**GW output**	**6**	**14**	**15**	**17**	**20**	**24**	**27**	**30**	**33**	**35**

LOAD EU-28 Total	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
RF freezer net volume	M m³ @ -18C°	12.0	17.1	18.7	20.2	21.9	23.7	25.5	27.5	29.4	31.4
RF refrigerator net volume	M m³ @ 5C°	42.6	60.5	66.2	71.6	77.5	83.9	90.5	97.3	104.3	111.4
CF open vertical chilled multi deck (RVC2)	M m² @ -1/+7°C	3.3	4.0	4.1	4.1	4.1	4.2	4.3	4.3	4.4	4.5
CF open horizontal frozen island (RHF4)	M m² @ -18/-15°C	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
CF other supermarket display (non-base cases)	M m² @ -18/+7°C	7.1	8.7	9.5	10.0	10.4	10.8	11.2	11.5	11.9	12.4
CF Plug in one door beverage cooler	M m³ @ 1/10C°	2.9	3.5	3.7	3.7	3.8	4.0	4.1	4.2	4.4	4.5
CF Plug in horizontal ice cream freezer	M m³ @ -18/-15C°	0.9	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
CF Spiral vending machine	M m³ @ 1/7C°	0.7	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7
PF Storage cabinet Chilled Vertical (CV, 600 l)	M m³ @ 5C°	0.7	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4
PF Storage cabinet Frozen Vertical (FV, 600 l)	M m³ @ -18C°	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
PF Storage cabinet Chilled Horizontal (CH, 300 l)	M m³ @ 5C°	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
PF Storage cabinet Frozen Horizontal (FH, 200 l)	M m³ @ -18C°	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PF Storage cabinets All types	**M m³**	**1.2**	**1.7**	**1.8**	**1.8**	**1.9**	**2.0**	**2.1**	**2.2**	**2.3**	**2.4**
PF Process Chiller AC MT S ≤ 300 kW	TWhcool/a	9	19	22	25	28	31	34	37	40	43
PF Process Chiller AC MT L > 300 kW	TWhcool/a	9	20	24	27	30	33	37	40	43	46
PF Process Chiller AC LT S ≤ 200 kW	TWhcool/a	5	11	13	15	17	18	20	22	24	26
PF Process Chiller AC LT L > 200 kW	TWhcool/a	6	12	14	17	19	20	22	24	26	28
PF Process Chiller WC MT S ≤ 300 kW	TWhcool/a	3	7	8	9	11	12	13	14	15	16
PF Process Chiller WC MT L > 300 kW	TWhcool/a	5	11	13	15	17	19	20	22	24	26
PF Process Chiller WC LT S ≤ 200 kW	TWhcool/a	2	5	6	7	8	8	9	10	11	12
PF Process Chiller WC LT L > 200 kW	TWhcool/a	3	7	8	10	11	12	13	14	15	16
PF Process Chiller All MT&LT	**TWhcool/a**	**42**	**93**	**109**	**125**	**140**	**154**	**169**	**184**	**199**	**214**
PF Condensing Unit MT S 0.2-1 kW	TWhcool/a	9	7	7	7	8	9	9	10	11	12
PF Condensing Unit MT M 1-5 kW	TWhcool/a	27	22	21	22	23	25	27	29	32	34
PF Condensing Unit MT L 5-20 kW	TWhcool/a	54	43	41	43	46	50	54	58	63	67
PF Condensing Unit MT XL 20-50 kW	TWhcool/a	55	44	42	44	47	51	55	59	64	69
PF Condensing Unit LT S 0.1-0.4 kW	TWhcool/a	1	1	1	1	1	1	1	1	1	1
PF Condensing Unit LT M 0.4-2 kW	TWhcool/a	3	2	2	2	3	3	3	3	3	4
PF Condensing Unit LT L 2-8 kW	TWhcool/a	7	6	6	6	6	7	7	8	9	9
PF Condensing Unit LT XL 8-20 kW	TWhcool/a	25	20	20	20	22	24	25	27	30	32
PF Condensing Unit, All MT&LT	TWhcool/a	**182**	**145**	**140**	**146**	**157**	**169**	**182**	**196**	**211**	**228**
COOK El. Hobs (heating + keep 20 min. warm 1229 ltr v	kt/a	103	1229	1229	1229	1229	1229	1229	1229	1229	1229
COOK El. Ovens (110 cycles/a)	bn cyc/a	19	21	22	23	24	26	26	27	27	27
COOK Gas Hobs (heating 1229 ltr water b y 75 K)	kt/a	144	120	116	111	106	101	96	91	86	82
COOK Gas Ovens (110 cycles/a)	bn cyc/a	6.3	4.9	4.7	4.5	4.3	4.2	4.1	4.0	4.0	3.9
COOK Range Hoods (365 h/a extraction)	Th/a	27.5	33.9	35.6	37.4	39.3	41.4	43.4 0	45.6	47.7	49.9
COFFEE Dripfilter (glass), 3 cups (135 g), 2 times/d	bn filter cups/a	250	175	155	129	115	114	114	114	114	114
COFFEE Dripfilter (thermos)	bn filter cups/a	16	48	49	50	50	51	52	52	53	53
COFFEE Dripfilter (full automatic)	bn filter cups/a	0	22	26	29	32	35	39	42	45	48
COFFEE Pad filter	bn filter cups/a	0	64	72	79	85	92	98	105	111	118
COFFEE Hard cap espresso 3 cups (48g), 2 times/d	bn espr.cups/a	1	17	29	51	62	63	63	63	63	63
COFFEE Semi-auto espresso	bn espr.cups/a	6	9	8	8	7	7	6	6	5	5
COFFEE Fully-auto espresso	bn espr.cups/a	6	9	9	11	12	13	15	16	18	19
COFFEE total cups/a (all types, in households)	**bn cups/a**	**279**	**343**	**349**	**356**	**365**	**376**	**387**	**398**	**409**	**420**
EU-28 no.of households	*m*	*172*	*211*	*218*	*223*	*224*	*225*	*227*	*228*	*228*	*228*
COFFEE per household/ day	*cups/d.household*	*4.46*	*4.46*	*4.38*	*4.37*	*4.46*	*4.57*	*4.68*	*4.79*	*4.91*	*5.04*
EU-28 population	*m*	*475*	*503*	*508*	*512*	*515*	*518*	*521*	*524*	*525*	*526*
COFFEE per capita/day, in households	*cups/d.capita*	*1.61*	*1.87*	*1.88*	*1.90*	*1.94*	*1.99*	*2.04*	*2.08*	*2.14*	*2.19*
WM laundry washed	**Mt laundry/a**	**83**	**132**	**139**	**140**	**142**	**143**	**142**	**142**	**142**	**142**
DW place settings washed	**bn ps/a**	**52**	**154**	**189**	**225**	**258**	**291**	**324**	**357**	**389**	**422**
LD vented el.	Mt laundry/a	10.9	21.5	22.3	21.1	20.0	19.4	19.5	19.6	19.7	19.8
LD condens el.	Mt laundry/a	1.9	25.4	32.5	38.2	43.0	45.4	46.1	46.5	46.7	47.0
LD vented gas	Mt laundry/a	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
LD total weight of laundry dried	Mt laundry/a	**13**	**47**	**55**	**60**	**63**	**65**	**66**	**66**	**67**	**67**
VC dom (87m² x 50 times/a=4350 m²-->/57h=76.3m³/h	1000 km²/a	662	894	911	963	1012	1030	1000	973	929	869
VC nondom (76.3 m²/h)	1000 km²/a	251	288	303	318	334	351	367	384	401	417
VC Vacuum Cleaners	1000 km²/a	**913**	**1182**	**1214**	**1281**	**1346**	**1381**	**1368**	**1357**	**1330**	**1286**
FAN Axial<300Pa (all FAN types >125W)	TWh flow/ a	6	16	19	21	24	25	25	25	25	25
FAN Axial>300Pa	TWh flow/ a	12	36	41	44	45	46	47	47	47	47
FAN Centr.FC	TWh flow/ a	3	6	7	7	8	9	9	9	9	9
FAN Centr.BC-free	TWh flow/ a	12	25	30	33	36	39	41	43	43	44
FAN Centr.BC	TWh flow/ a	12	27	32	35	39	43	46	49	54	58
FAN Cross-flow	TWh flow/ a	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W	TWh flow/ a	**45**	**110**	**129**	**141**	**152**	**162**	**169**	**173**	**178**	**184**
MT Motors 0.75-375 kW	**TWh output/a**	**584**	**860**	**941**	**1001**	**1036**	**1051**	**1052**	**1052**	**1052**	**1052**
WP Water pumps (load)	**TWh flow/a**	**58**	**79**	**85**	**91**	**98**	**105**	**112**	**120**	**127**	**134**

LOAD EU-28 Total	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CP Fixed Speed 5-1280 l/s	TWh flow/a	13.6	30.4	25.9	22.6	22.3	23.0	23.7	24.5	25.2	26.0
CP Variable speed 5-1280 l/s	TWh flow/a	0.0	5.9	10.2	13.1	14.4	15.0	15.4	15.8	16.2	16.5
CP Pistons 2-64 l/s	TWh flow/a	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
CP Standard Air Compressors	**TWh flow/a**	**14.2**	**37.1**	**36.8**	**36.4**	**37.4**	**38.7**	**39.9**	**41.1**	**42.2**	**43.3**
TRAFO Distribution	m units/a	1.53	2.55	2.85	3.17	3.49	3.82	4.15	4.49	4.82	5.15
TRAFO Industry oil	m units/a	0.33	0.57	0.64	0.71	0.77	0.83	0.89	0.96	1.03	1.10
TRAFO Industry dry	m units/a	0.07	0.12	0.14	0.15	0.17	0.18	0.19	0.21	0.22	0.24
TRAFO Power	m units/a	0.05	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.14
TRAFO DER oil	m units/a	0.00	0.01	0.01	0.03	0.04	0.07	0.11	0.17	0.24	0.32
TRAFO DER dry	m units/a	0.00	0.03	0.06	0.10	0.17	0.28	0.44	0.67	0.95	1.27
TRAFO Small	m units/a	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
TRAFO Utility Transformers	m units/a	**2.73**	**4.12**	**4.54**	**5.00**	**5.49**	**6.04**	**6.67**	**7.37**	**8.14**	**8.96**
TYRE cars, distance travelled with replacement tyres C1	bn km/a		2182								
TYRE vans, distance travelled with replacement tyres C2	bn km/a		496								
TYRE trucks, distance travelled with replacement tyres C3	bn km/a		119								
Tyres	bn km/a		**2797**								

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	%	28%	33%	33%	35%	38%	38%	38%	38%	38%	38%
Total CH Central Heating combi, water heat	%	42%	48%	49%	51%	51%	51%	51%	51%	51%	51%
Total CH Central Heating boiler, space heat	%	50%	62%	62%	61%	60%	61%	62%	63%	64%	65%
SFB Wood Manual	%	39%	51%	52%	54%	55%	56%	58%	59%	61%	62%
SFB Wood Direct Draft	%	57%	73%	74%	75%	76%	77%	77%	77%	77%	77%
SFB Coal	%	53%	67%	68%	69%	70%	71%	71%	71%	71%	71%
SFB Pellets	%	57%	73%	74%	75%	76%	77%	77%	77%	77%	77%
SFB Wood chips	%	57%	73%	74%	74%	75%	76%	76%	76%	76%	76%
CHAE-S (≤ 400 kW)	%	104%	136%	143%	150%	156%	163%	167%	171%	176%	180%
CHAE-L (> 400 kW)	%	108%	140%	149%	159%	168%	177%	182%	186%	191%	196%
CHWE-S (≤ 400 kW)	%	134%	186%	196%	206%	216%	226%	232%	238%	244%	250%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	158%	217%	235%	253%	271%	289%	296%	304%	311%	319%
CHWE-L (> 1500 kW)	%	158%	217%	235%	253%	271%	289%	296%	304%	311%	319%
CHF	%	60%	103%	106%	108%	111%	113%	116%	119%	122%	125%
HT PCH-AE-S	SEPR	4.2	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.7	5.9
HT PCH-AE-L	SEPR	4.5	5.1	5.3	5.5	5.7	5.9	6.0	6.2	6.3	6.5
HT PCH-WE-S	SEPR	6.7	7.3	7.6	7.8	8.1	8.4	8.6	8.8	9.0	9.2
HT PCH-WE-M	SEPR	7.7	8.5	8.8	9.0	9.3	9.6	9.8	10.0	10.3	10.6
HT PCH-WE-L	SEPR	7.6	8.5	8.8	9.1	9.4	9.7	9.9	10.1	10.4	10.7
AC rooftop	%	88%	120%	128%	136%	144%	153%	156%	160%	164%	168%
AC splits	%	121%	156%	160%	164%	169%	173%	177%	182%	186%	191%
AC VRF	%	113%	165%	169%	173%	177%	181%	186%	190%	195%	200%
ACF	%	60%	103%	106%	108%	111%	113%	116%	119%	122%	125%
AC rooftop (rev)	%	86%	99%	101%	102%	104%	106%	109%	112%	114%	117%
AC splits (rev)	%	112%	117%	121%	124%	128%	132%	135%	138%	142%	146%
AC VRF (rev)	%	108%	130%	131%	133%	134%	135%	139%	142%	146%	150%
ACF (rev)	%	101%	129%	135%	142%	148%	155%	159%	163%	167%	171%
AHF	%	57%	63%	65%	66%	67%	68%	69%	69%	70%	71%
AHE	%	26%	30%	30%	30%	30%	30%	31%	32%	32%	33%
LH open fireplace	%	27%	30%	30%	30%	31%	31%	31%	31%	31%	31%
LH closed fireplace/inset	%	62%	69%	71%	72%	73%	75%	75%	75%	75%	75%
LH wood stove	%	62%	69%	71%	72%	73%	75%	75%	75%	75%	75%
LH coal stove	%	62%	69%	71%	72%	73%	75%	75%	75%	75%	75%
LH cooker	%	58%	64%	66%	67%	68%	69%	69%	69%	69%	69%
LH SHR stove	%	80%	80%	81%	83%	84%	86%	86%	86%	86%	86%
LH pellet stove	%	77%	85%	87%	89%	91%	93%	93%	93%	93%	93%
LH open fire gas	%	37%	42%	42%	43%	43%	44%	44%	44%	44%	44%
LH closed fire gas	%	58%	64%	66%	67%	68%	69%	69%	69%	69%	69%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH elec.convector	%	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH elec.storage	%	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH elec.underfloor	%	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH luminous heaters	%	72%	81%	82%	84%	86%	88%	88%	88%	88%	88%
LH tube heaters	%	64%	71%	72%	74%	75%	76%	76%	76%	76%	76%
RAC (cooling demand), all types <12 kW	SEER	2.04	3.47	3.83	4.07	4.21	4.25	4.25	4.26	4.26	4.26
RAC (heating demand), reversible <12kW	SCOP	1.98	2.91	3.12	3.28	3.37	3.39	3.39	3.39	3.39	3.39
CIRC Circulator pumps <2.5 kW (incl. ctrl)	%	94%	102%	104%	106%	104%	104%	106%	108%	110%	112%
NRVU avg. electricity	kWh elec/a	8800	8400	7960	7653	7383	7135	6981	6946	6913	6883
NRVU avg. heat saved vs. ref	kWh heat/a	79479	94169	95720	97284	98568	99661	100754	101847	102941	104034
RVU Central Unidirectional, electricity	kWh elec/a	454	454	454	454	454	454	454	454	454	454
RVU Central Balanced, electricity	kWh elec/a	501	501	501	501	501	501	501	501	501	501
RVU Local Balanced, electricity	kWh elec/a	217	217	217	217	217	217	217	217	217	217
RVU Central Unidirect., heat saved vs. ref	kWh heat/a	951	951	951	951	951	951	951	951	951	951
RVU Central Balanced, heat saved vs. ref	kWh heat/a	3863	3863	3863	3863	3863	3863	3863	3863	3863	3863
RVU Local Balanced, heat saved vs. ref	kWh heat/a	1706	1706	1706	1706	1706	1706	1706	1706	1706	1706
ref: natural ventilation		0	0	0	0	0	0	0	0	0	0
LS Light Sources efficacy, in lumen/Watt											
LFL	lm/W	64	69	75	78	78	78	78	78	78	78
CFL	lm/W	48	50	50	54	55	55	55	55	55	55
Tungsten	lm/W	12	12	12	15	15	15	15	15	15	15
GLS	lm/W	10	10	10	10	10	10	10	10	10	10
HID	lm/W	55	67	67	74	74	74	74	74	74	74
LED	lm/W	25	30	120	200	230	255	280	300	300	300
DP TV power per screen area (avg.of all types)	W/dm^2	8.0	3.9	1.4	0.9	0.7	0.6	0.4	0.28	0.19	0.19
DP Monitor power per screen area (avg)	W/dm^2	10.9	3.2	2.6	2.2	1.7	1.2	0.8	0.5	0.19	0.19
DP TV standard, standby power	W	8.0	1.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DP TV LoNA, standby power	W	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP TV Smart, standby power	W	0.0	0.0	6.4	5.0	4.5	4.0	3.5	3.0	2.5	2.0
DP Monitor, standby power	W	9.0	1.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
SSTB	kWh/a	43	25	19.2	19.2	19	19	19	19	19	19
CSTB	kWh/a	88	88	88	88	88	88	88	88	88	88
VIDEO players/recorders	kWh/a	16	16	16	16	16	16	16	16	16	16
VIDEO projectors	kWh/a	200	200	200	200	200	200	200	200	200	200
VIDEO game consoles	kWh/a	43	64	145	190	172	172	172	172	172	172
ES Rack servers	kWh/a	1661	1661	1661	1661	1661	1661	1661	1661	1661	1661
ES Blade servers	kWh/a	13286	13286	13286	13286	13286	13286	13286	13286	13286	13286
ES Storage	kWh/a	3279	3279	3279	3279	3279	3279	3279	3279	3279	3279

EFFICIENCY SALES BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
PC Desktop	kWh/a	471	167	103	38	38	38	38	38	38	38
PC Notebook	kWh/a	148	55	32	10	10	10	10	10	10	10
PC Tablet/slate	kWh/a	0	17	10	3	3	3	3	3	3	3
PC Thin client	kWh/a	148	55	32	10	10	10	10	10	10	10
PC Workstation	kWh/a	942	334	205	77	76	76	76	76	76	76
EP-Copier mono	kWh/a	1257	359	314	314	314	314	314	314	314	314
EP-Copier colour	kWh/a		424	371	371	371	371	371	371	371	371
EP-printer mono	kWh/a	784	224	196	196	196	196	196	196	196	196
EP-printer colour	kWh/a		350	306	306	306	306	306	306	306	306
IJ SFD printer	kWh/a	51	15	12	12	12	12	12	12	12	12
IJ MFD printer	kWh/a	77	22	18	18	18	18	18	18	18	18
duplexing (N-print 15%)	%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
SB Home Gateway, on-mode power	W	15.6	11.3	10.1	8.9	7.7	6.5	5.3	4.1	2.9	1.7
SB Home NAS, on-mode power	W	26.0	18.8	16.8	14.8	12.8	10.8	8.8	6.8	4.8	2.8
SB Home Phones (fixed), on-mode power	W	5.9	4.1	3.7	3.2	2.8	2.3	1.9	1.4	1.0	0.5
SB Office Phones (fixed), on-mode power	W	7.9	5.5	4.9	4.3	3.7	3.1	2.5	1.9	1.3	0.7
SB Home Gateway, standby power	W	16.2	4.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby power	W	6.7	4.7	4.2	3.7	3.2	2.7	2.2	1.7	1.2	0.7
SB Home Phones (fixed), standby power	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Office Phones (fixed), standby power	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home Gateway, idle power	W	13.4	9.4	8.4	7.4	6.4	5.4	4.4	3.4	2.4	1.4
SB Home NAS, idle power	W	20.1	14.1	12.6	11.1	9.6	8.1	6.6	5.1	3.6	2.1
SB Home Phones (fixed), idle power	W	4.6	3.2	2.9	2.5	2.2	1.8	1.5	1.1	0.8	0.4
SB Office Phones (fixed), idle power	W	6.6	4.6	4.1	3.6	3.1	2.6	2.1	1.6	1.1	0.6
BC_EPS Mobile phones etc.	W	0.47	0.40	0.38	0.37	0.35	0.33	0.32	0.30	0.28	0.27
UPS below 1.5 kVA	%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%
UPS 1.5 to 5 kVA	%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%
UPS 5 to 10 kVA	%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%
UPS 10 to 200 kVA	%	92.7%	92.7%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%
RF AEC	kWh/a	477	430	424	417	410	403	397	390	384	377
RF EEI	EEI	102	82	78	74	70	67	64	61	58	55
CF open vertical chilled multi deck (RVC2)	EEI	109	82	75	72	70	68	68	68	68	68
CF open horizontal frozen island (RHF4)	EEI	108	81	74	71	69	68	68	68	68	68
CF other supermarket display (non-BCs)	EEI	109	82	75	73	73	73	73	73	73	73
CF Plug in one door beverage cooler	EEI	112	85	78	74	72	70	70	70	70	70
CF Plug in horizontal ice cream freezer	EEI	111	84	77	73	72	70	70	70	70	70
CF Spiral vending machine	EEI	133	85	81	81	81	81	81	81	81	81
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	96	96	96	96	96	96	96
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	91	91	91	91	91	91	91
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	109	109	109	109	109	109	109
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	106	106	106	106	106	106	106
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit, All MT&LT	COP/SEPR	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**
COOK El. Hobs	Wh/ltr	194	187	186	185	185	184	183	182	181	180
COOK El. Ovens	kWh/a	133	97	90	89	89	88	88	87	87	86
COOK Gas Hobs	%	60.2%	60.8%	60.9%	61.1%	61.2%	61.4%	61.6%	61.7%	61.9%	62.0%
COOK Gas Ovens	kWh prim/a	237	202	194	191	187	183	179	175	171	168
COOK Range Hoods	kWh/a	133	133	133	133	133	133	133	133	133	133
COFFEE Dripfilter (glass), brewing	kWh/a	55	55	55	55	55	55	55	55	55	55
COFFEE Dripfilter (thermos), brewing	kWh/a	48	48	48	48	48	48	48	48	48	48
COFFEE Dripfilter (full automatic), brewing	kWh/a	49	49	49	49	49	49	49	49	49	49
COFFEE Pad filter, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Hard cap espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Semi-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Fully-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Dripfilter (glass), standby/keep warm	kWh/a	38	38	38	38	38	38	38	38	38	38
COFFEE Dripfilter (thermos), standby/keep warm	kWh/a	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic), sb/keep warm	kWh/a	0	0	0	0	0	0	0	0	0	0
COFFEE Pad filter, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
COFFEE Hard cap espresso, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
COFFEE Semi-auto espresso, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
COFFEE Fully-auto espresso, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
WM energy/cycle	kWh/cycle	1.48	1.10	1.04	0.97	0.91	0.85	0.79	0.73	0.67	0.61
WM energy/yr	kWh/a	350	207	189	169	159	148	137	127	116	105
DW energy/cycle	kWh/cycle	1.48	1.28	1.25	1.21	1.18	1.14	1.10	1.07	1.03	1.00
DW AEC (annual energy consumption)	kWh/a	310	269	262	254	247	239	232	225	217	210

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LD AEc vented el.	kWh elec/a	402	432	455	459	456	454	457	461	465	468
LD AEc condens el.	kWh elec/a	441	447	458	453	444	433	427	422	416	411
LD AEc vented gas	kWh prim /a	376	452	472	473	470	468	471	475	479	483
VC dom	W	1275	1739	2016	2337	2711	3085	3459	3833	4207	4580
VC nondom	W	929	1293	1393	1500	1500	1500	1500	1500	1500	1500
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
FAN Axial>300Pa	%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
FAN Centr.FC	%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
FAN Centr.BC-free	%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
FAN Centr.BC	%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
FAN Cross-flow	%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MT Industrial motors, motor only		71.9%	79.1%	79.6%	80.1%	80.6%	81.1%	81.6%	82.1%	82.6%	83.1%
MT Industrial motors, extra VSD effect*											
MT Industrial motors 0.75-375 kW		71.9%	79.1%	79.6%	80.1%	80.6%	81.1%	81.6%	82.1%	82.6%	83.1%
WP Water pumps (load)	%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%
CP Fixed Speed 5-1280 l/s	%	58.8%	63.1%	63.5%	64.0%	64.4%	64.7%	65.0%	65.3%	65.6%	65.9%
CP Variable speed 5-1280 l/s	%	58.9%	64.8%	64.3%	65.0%	65.4%	65.7%	66.0%	66.3%	66.7%	67.0%
CP Pistons 2-64 l/s	%	43.8%	47.0%	47.5%	47.8%	48.1%	48.3%	48.6%	48.8%	49.0%	49.2%
TRAFO Distribution	kWh/a	7859	7859	7859	7859	7859	7859	7859	7859	7859	7859
TRAFO Industry oil	kWh/a	27168	27168	27168	27168	27168	27168	27168	27168	27168	27168
TRAFO Industry dry	kWh/a	39727	39727	39727	39727	39727	39727	39727	39727	39727	39727
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a	59094	59094	59094	59094	59094	59094	59094	59094	59094	59094
TRAFO DER dry	kWh/a	62415	62415	62415	62415	62415	62415	62415	62415	62415	62415
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
TYRE car replacement tyres C1	kg/t	13.4	11.3	10.6	9.8	9.1	8.3	7.6	6.8	6.4	6.4
TYRE van replacement tyres C2	kg/t	12.9	11.0	10.0	9.2	8.4	7.6	6.8	6.0	6.0	6.0
TYRE truck replacement tyres C3	kg/t	11.2	9.5	9.1	8.7	8.3	7.9	7.5	7.1	6.7	6.3

*= MT extra VSD Effect: By definition, this reference is 0 (zero), because the ECO scenario only takes into account the extra VSD effect from the Ecodesign measures

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	%	28%	33%	47%	53%	60%	60%	60%	60%	60%	60%
Total CH Central Heating combi, water heat	%	42%	48%	61%	76%	79%	82%	85%	89%	92%	95%
Total CH Central Heating boiler, space heat	%	50%	70%	93%	103%	113%	118%	124%	131%	137%	144%
SFB Wood Manual	%	39%	51%	58%	75%	78%	78%	78%	78%	78%	78%
SFB Wood Direct Draft	%	57%	73%	74%	75%	78%	78%	78%	78%	78%	78%
SFB Coal	%	53%	67%	70%	75%	78%	78%	78%	78%	78%	78%
SFB Pellets	%	57%	73%	74%	75%	78%	78%	78%	78%	78%	78%
SFB Wood chips	%	57%	73%	74%	77%	77%	77%	77%	77%	77%	77%
CHAE-S (≤ 400 kW)	%	104%	136%	143%	157%	169%	179%	181%	183%	185%	187%
CHAE-L (> 400 kW)	%	108%	140%	151%	177%	189%	194%	196%	199%	201%	203%
CHWE-S (≤ 400 kW)	%	134%	186%	197%	208%	218%	229%	232%	238%	244%	250%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	158%	217%	236%	255%	275%	295%	299%	304%	311%	319%
CHWE-L (> 1500 kW)	%	158%	217%	236%	265%	282%	295%	299%	304%	311%	319%
CHF	%	60%	103%	118%	164%	169%	172%	173%	174%	176%	177%
HT PCH-AE-S	SEPR	4.2	4.7	4.9	5.5	5.7	5.9	5.9	6.0	6.1	6.1
HT PCH-AE-L	SEPR	4.5	5.1	5.4	6.1	6.6	6.9	7.0	7.1	7.2	7.2
HT PCH-WE-S	SEPR	6.7	7.3	7.6	8.2	8.5	8.7	8.8	8.9	9.0	9.2
HT PCH-WE-M	SEPR	7.7	8.5	8.8	9.4	9.6	9.7	9.8	10.0	10.3	10.6
HT PCH-WE-L	SEPR	7.6	8.5	8.9	9.7	10.1	10.3	10.4	10.6	10.7	10.8
AC rooftop	%	88%	120%	129%	139%	149%	159%	161%	163%	165%	168%
AC splits	%	121%	156%	165%	186%	192%	195%	197%	199%	202%	204%
AC VRF	%	113%	165%	171%	186%	196%	204%	206%	209%	211%	213%
ACF	%	60%	103%	118%	164%	171%	177%	178%	179%	181%	182%
AC rooftop (rev)	%	86%	99%	104%	122%	127%	130%	131%	132%	134%	135%
AC splits (rev)	%	112%	117%	123%	136%	139%	142%	144%	146%	147%	149%
AC VRF (rev)	%	108%	130%	131%	136%	140%	144%	146%	148%	149%	151%
ACF (rev)	%	101%	129%	136%	144%	153%	161%	163%	165%	167%	171%
AHF	%	57%	63%	66%	76%	80%	82%	82%	83%	83%	83%
AHE	%	26%	30%	30%	31%	32%	33%	33%	33%	34%	34%
LH open fireplace	%	27%	30%	30%	41%	47%	47%	47%	47%	47%	47%
LH closed fireplace/inset	%	62%	69%	71%	81%	86%	86%	86%	86%	86%	86%
LH wood stove	%	62%	69%	71%	81%	86%	86%	86%	86%	86%	86%
LH coal stove	%	62%	69%	71%	81%	86%	86%	86%	86%	86%	86%
LH cooker	%	58%	64%	66%	72%	75%	75%	75%	75%	75%	75%
LH SHR stove	%	80%	80%	81%	84%	86%	86%	86%	86%	86%	86%
LH pellet stove	%	77%	85%	87%	92%	94%	94%	94%	94%	94%	94%
LH open fire gas	%	37%	42%	42%	57%	65%	65%	65%	65%	65%	65%
LH closed fire gas	%	58%	64%	66%	81%	88%	88%	88%	88%	88%	88%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	67%	74%	83%	90%	90%	90%	90%	90%	90%	90%
LH elec.convector	%	67%	74%	80%	85%	85%	85%	85%	85%	85%	85%
LH elec.storage	%	67%	74%	86%	96%	96%	96%	96%	96%	96%	96%
LH elec.underfloor	%	67%	74%	85%	95%	95%	95%	95%	95%	95%	95%
LH luminous heaters	%	72%	81%	84%	94%	94%	94%	94%	94%	94%	94%
LH tube heaters	%	64%	71%	74%	81%	81%	81%	81%	81%	81%	81%
RAC (cooling demand), all types <12 kW	SEER	2.04	3.47	4.74	5.06	5.26	5.31	5.31	5.31	5.31	5.31
RAC (heating demand), reversible <12kW	SCOP	1.98	2.91	3.65	3.86	3.96	3.99	3.99	3.99	3.99	3.99
CIRC Circulator pumps <2.5 kW, net load	%	94%	130%	228%	230%	233%	232%	232%	232%	232%	232%
NRVU avg (stock weighted 2010)	kWh elec/a	8800	8400	7093	6162	5967	5784	5763	5741	5720	5698
NRVU avg (stock weighted 2010)	kWh heat/a	79479	94169	107620	113000	113000	113000	113000	113000	113000	113000
RVU Central Unidir. VU ≤125W/fan (1 fan)	kWh elec/a	454	454	244	244	244	244	244	244	244	244
RVU Central Balanced VU ≤125W/fan (2 fans)	kWh elec/a	501	501	246	246	246	246	246	246	246	246
RVU Local Balanced VU (<125 W, also NR) (2 fans)	kWh elec/a	217	217	134	134	134	134	134	134	134	134
RVU Central Unidir. VU ≤125W/fan (1 fan)	kWh heat/a	951	951	2505	2505	2505	2505	2505	2505	2505	2505
RVU Central Balanced VU ≤125W/fan (2 fans)	kWh heat/a	3863	3863	4218	4218	4218	4218	4218	4218	4218	4218
RVU Local Balanced VU (<125 W, also NR) (2 fans)	kWh heat/a	1706	1706	2109	2109	2109	2109	2109	2109	2109	2109
VU reference: natural ventilation 220 m3/h											
LS Light Sources ECO lumen/Watt											
LFL	lm/W	64	69	75	78	78	79	79	79	80	80
CFL	lm/W	48	51	51	54	54	55	55	55	54	54
Tungsten	lm/W	12	12	12	16	16	15	15	15	15	15
GLS	lm/W	10	10	10	10	10	10	10	10	10	10
HID	lm/W	55	67	73	95	95	92	90	87	85	83
LED	lm/W	25	30	120	200	230	255	280	300	300	300
GLS stock	lm/W	10	10	10	10	0	0	0	0	0	0
Tungsten stock	lm/W	14	14	14	14	0	0	0	0	0	0
DP TV power per screen area (avg.of all types), sales	W/dm^2	8.0	3.9	0.8	0.2	0.2	0.1	0.1	0.1	0.1	0.1
DP Monitor power per screen area (avg), sales	W/dm^2	10.9	3.3	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1
DP TV standard, standby power	W	8.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV LoNA, standby power	W	0.0	2.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP TV Smart, standby power	W	0.0	0.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP Monitor, standby power	W	9.0	1.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
SSTB	kWh/a	19.2	19.2	16.3	15.3	15.3	15.3	15	15	15	15
CSTB	kWh/a	88	88	68	68	68	68	68	68	68	68
VIDEO players/recorders	kWh/a	16	16	16	16	16	16	16	16	16	16
VIDEO projectors (schools, offices)	kWh/a	200	200	200	200	200	200	200	200	200	200
VIDEO game consoles	kWh/a	43	64	125	170	159	159	159	159	159	159
ES Rack servers	kWh/a	1661	1661	1661	1347	1180	1180	1180	1180	1180	1180
ES Blade servers	kWh/a	13286	13286	13286	10779	9443	9443	9443	9443	9443	9443
ES Storage	kWh/a	3279	3279	3279	2192	1965	1965	1965	1965	1965	1965

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	kWh/a	471	167	103	38	38	38	38	38	38	38
PC Notebook	kWh/a	148	55	32	10	10	10	10	10	10	10
PC Tablet/slate	kWh/a	0	17	10	3	3	3	3	3	3	3
PC Thin client	kWh/a	148	55	32	10	10	10	10	10	10	10
PC Workstation	kWh/a	942	334	205	77	76	76	76	76	76	76
EP-Copier mono	kWh/a	1257	139	114	114	114	114	114	114	114	114
EP-Copier colour	kWh/a	0	297	114	114	114	114	114	114	114	114
EP-printer mono	kWh/a	784	152	92	92	92	92	92	92	92	92
EP-printer colour	kWh/a	0	318	94	94	94	94	94	94	94	94
IJ SFD printer	kWh/a	51	6	3	3	3	3	3	3	3	3
IJ MFD printer	kWh/a	77	8	4	4	4	4	4	4	4	4
duplexing (N-print 15%)	%	65%	72%	83%	85%	85%	85%	85%	85%	85%	85%
SB Home Gateway, on-mode power	W	15.6	11.3	10.1	8.9	7.7	6.5	5.3	4.1	2.9	1.7
SB Home NAS, on-mode power	W	26.0	18.8	16.8	14.8	12.8	10.8	8.8	6.8	4.8	2.8
SB Home Phones (fixed), on-mode power	W	5.9	4.1	3.7	3.2	2.8	2.3	1.9	1.4	1.0	0.5
SB Office Phones (fixed), on-mode power	W	7.9	5.5	4.9	4.3	3.7	3.1	2.5	1.9	1.3	0.7
SB Home Gateway, standby power	W	16.2	4.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby power	W	6.7	4.7	4.2	3.7	3.2	2.7	2.2	1.7	1.2	0.7
SB Home Phones (fixed), standby power	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Office Phones (fixed), standby power	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home Gateway, idle power	W	13.4	9.4	8.4	7.4	6.4	5.4	4.4	3.4	2.4	1.4
SB Home NAS, idle power	W	20.1	14.1	6.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9
SB Home Phones (fixed), idle power	W	4.6	3.2	2.9	2.5	2.2	1.8	1.5	1.1	0.8	0.4
SB Office Phones (fixed), idle power	W	6.6	4.6	4.1	3.6	3.1	2.6	2.1	1.6	1.1	0.6
BC_EPS Mobile phones etc.	W	0.47	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.28	0.27
UPS below 1.5 kVA	%	88.1%	88.1%	88.1%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%
UPS 1.5 to 5 kVA	%	89.8%	89.8%	89.8%	98.7%	98.7%	98.7%	98.7%	98.7%	98.7%	98.7%
UPS 5 to 10 kVA	%	92.3%	92.3%	92.3%	94.9%	94.9%	94.9%	94.9%	94.9%	94.9%	94.9%
UPS 10 to 200 kVA	%	92.7%	92.7%	93.9%	96.1%	96.1%	96.1%	96.1%	96.1%	96.1%	96.1%
RF AEC	kWh/a	477	242	196	165	139	117	76	76	76	76
RF EEI	EEI	102	46	36	29	24	19	12	12	11	11
CF open vertical chilled multi deck (RVC2)	EEI	109	82	70	44	39	39	39	39	39	39
CF open horizontal frozen island (RHF4)	EEI	108	81	74	44	44	44	44	44	44	44
CF other supermarket display (non-BCs)	EEI	109	82	71	56	55	53	53	53	53	53
CF Plug in one door beverage cooler	EEI	112	85	74	50	44	44	44	44	44	44
CF Plug in horizontal ice cream freezer	EEI	111	84	77	71	68	68	68	68	68	68
CF Spiral vending machine	EEI	133	85	66	50	45	45	45	45	45	45
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	57	57	57	57	57	57	57
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	53	53	53	53	53	53	53
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	65	65	65	65	65	65	65
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	61	61	61	61	61	61	61
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**58**	**58**	**58**	**58**	**58**	**58**	**58**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.9	3.9	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit, All MT&LT	COP/SEPR	**2.1**	**2.1**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
COOK El. Hobs	Wh/ltr	194	187	186	185	184	183	182	181	180	179
COOK El. Ovens	kWh/a	133	97	88	80	79	79	78	78	77	77
COOK Gas Hobs, on NCV	%	60.2%	61%	61%	62%	63%	63%	63%	63%	63%	63%
COOK Gas Ovens, on NCV	kWh prim/a	237	202	187	147	143	139	136	132	128	124
COOK Range Hoods	kWh/a	133	133	128	110	96	95	94	94	93	92
COFFEE Dripfilter (glass), brewing *	kWh/a	55	55	55	55	55	55	55	55	55	55
COFFEE Dripfilter (thermos), brewing	kWh/a	48	48	48	48	48	48	48	48	48	48
COFFEE Dripfilter (full automatic), brewing	kWh/a	49	49	49	49	49	49	49	49	49	49
COFFEE Pad filter, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Hard cap espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Semi-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Fully-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Dripfilter (glass), standby/keep warm	kWh/a	38	38	24	19	19	19	19	19	19	19
COFFEE Dripfilter (thermos), standby/keep warm	kWh/a	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic), standby/keep warm	kWh/a	0	0	0	0	0	0	0	0	0	0
COFFEE Pad filter, standby/keep warm	kWh/a	19	19	12	9	9	9	9	9	9	9
COFFEE Hard cap espresso, standby/keep warm	kWh/a	19	19	12	9	9	9	9	9	9	9
COFFEE Semi-auto espresso, standby/keep warm	kWh/a	19	19	12	9	9	9	9	9	9	9
COFFEE Fully-auto espresso, standby/keep warm	kWh/a	19	19	12	9	9	9	9	9	9	9
WM energy/cycle	kWh/cycle	1.48	0.69	0.59	0.49	0.43	0.43	0.43	0.43	0.43	0.43
WM energy/a	kWh/a	350	130	108	85	75	75	75	75	75	75
DW energy/cycle	kWh/cycle	1.48	0.94	0.87	0.83	0.79	0.76	0.72	0.69	0.65	0.62
DW AEC (annual energy consumption)	kWh/a	310	198	183	174	167	159	152	145	137	130

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LD AEc vented el.	kWh elec/a	402	432	437	434	431	429	432	436	439	443
LD AEc condens el.	kWh elec/a	441	447	378	314	285	271	259	248	237	225
LD AEc vented gas	kWh prim/a	376	452	472	473	470	468	471	475	479	483
VC dom	W	1275	1739	1192	948	925	902	879	856	834	811
VC nondom	W	929	1293	1071	905	883	861	839	817	796	774
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	36%	39%	39%	39%	39%	39%	39%	39%
FAN Axial>300Pa	%	37%	37%	39%	44%	44%	44%	44%	44%	44%	44%
FAN Centr.FC	%	32%	32%	39%	45%	45%	45%	45%	45%	45%	45%
FAN Centr.BC-free	%	56%	56%	65%	67%	67%	67%	67%	67%	67%	67%
FAN Centr.BC	%	54%	54%	63%	65%	65%	65%	65%	65%	65%	65%
FAN Cross-flow	%	7%	7%	17%	21%	21%	21%	21%	21%	21%	21%
MT Industrial motors, motor only		71.9%	80.1%	85.1%	85.6%	86.1%	86.1%	86.1%	86.1%	86.1%	86.1%
MT Industrial motors, extra VSD effect**		0.0%	0.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
MT Industrial motors 0.75-375 kW		71.9%	80.1%	95.1%	95.6%	96.1%	96.1%	96.1%	96.1%	96.1%	96.1%
WP Water pumps (load)	%	66.5%	67.1%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%
CP Fixed Speed 5-1280 l/s	%	58.8%	63.1%	64.7%	66.2%	66.5%	66.6%	66.7%	66.7%	66.8%	66.9%
CP Variable speed 5-1280 l/s	%	58.9%	64.8%	64.8%	66.6%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%
CP Pistons 2-64 l/s	%	43.8%	47.0%	48.4%	49.8%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
TRAFO Distribution	kWh/a	7859	7859	5056	5056	5056	5056	5056	5056	5056	5056
TRAFO Industry oil	kWh/a	27168	27168	15631	15631	15631	15631	15631	15631	15631	15631
TRAFO Industry dry	kWh/a	39727	39727	28629	28629	28629	28629	28629	28629	28629	28629
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a	59094	59094	35515	35515	35515	35515	35515	35515	35515	35515
TRAFO DER dry	kWh/a	62415	62415	47109	47109	47109	47109	47109	47109	47109	47109
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
TYRE car replacement tyres C1	kg/t	13.4	11.3	10.0	8.4	6.7	5.1	5.1	5.1	5.1	5.1
TYRE van replacement tyres C2	kg/t	12.9	11.0	9.3	7.4	5.4	5.0	5.0	5.0	5.0	5.0
TYRE truck replacement tyres C3	kg/t	11.2	9.5	8.6	7.4	6.2	5.1	5.1	5.1	5.1	5.1

*=There are no measures regarding on-mode (brewing), only for standby/keepwarm. So for brewing ECO=BAU

**=This is the effect of extra (on top of BAU) sales of VSDs because of Ecodesign measures.
The estimate takes into account that a) many users will opt for VSD (=positive), b) the VSD adds around 3-6% to energy use (=negative), c) instead of IE3 motors many users will opt for (VSD+)IE2 motors to comply with the regulation (=negative)

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	%	26%	30%	31%	33%	34%	36%	38%	38%	38%	38%
Total CH Central Heating combi, water heat	%	41%	45%	47%	49%	50%	51%	51%	51%	51%	51%
Total CH Central Heating boiler, space heat	%	47%	57%	59%	60%	61%	61%	61%	61%	62%	63%
SFB Wood Manual	kWh/a	28%	47%	50%	51%	52%	53%	55%	57%	58%	60%
SFB Wood Direct Draft	kWh/a	49%	71%	73%	74%	74%	75%	76%	76%	77%	77%
SFB Coal	kWh/a	41%	62%	64%	66%	67%	68%	70%	70%	71%	71%
SFB Pellets	kWh/a		70%	72%	74%	75%	75%	76%	77%	77%	77%
SFB Wood chips	kWh/a		71%	72%	73%	74%	75%	75%	76%	76%	76%
CHAE-S (≤ 400 kW)	%	97%	121%	129%	136%	144%	151%	157%	162%	165%	168%
CHAE-L (> 400 kW)	%	99%	123%	130%	137%	146%	155%	164%	172%	179%	185%
CHWE-S (≤ 400 kW)	%	124%	159%	171%	184%	197%	208%	218%	226%	233%	239%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	144%	185%	198%	212%	228%	247%	264%	278%	290%	301%
CHWE-L (> 1500 kW)	%	144%	185%	198%	212%	228%	247%	264%	278%	290%	301%
CHF	%	46%	96%	100%	104%	107%	110%	112%	115%	118%	121%
HT PCH-AE-S	SEPR	4.0	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.5	5.7
HT PCH-AE-L	SEPR	4.3	4.9	5.1	5.2	5.4	5.6	5.8	6.0	6.1	6.3
HT PCH-WE-S	SEPR	6.5	7.1	7.3	7.5	7.7	8.0	8.2	8.5	8.7	8.9
HT PCH-WE-M	SEPR	7.5	8.2	8.5	8.7	8.9	9.2	9.4	9.7	9.9	10.2
HT PCH-WE-L	SEPR	7.3	8.1	8.3	8.6	8.8	9.1	9.4	9.7	9.9	10.2
AC rooftop	%	77%	109%	117%	124%	131%	138%	145%	152%	159%	163%
AC splits	%	116%	140%	149%	157%	163%	167%	171%	176%	180%	184%
AC VRF	%	111%	146%	158%	166%	172%	176%	180%	184%	189%	193%
ACF	%	46%	96%	100%	104%	107%	110%	112%	115%	118%	121%
AC rooftop (rev)	%	84%	92%	96%	99%	101%	103%	104%	105%	107%	109%
AC splits (rev)	%	109%	118%	120%	121%	123%	126%	130%	134%	137%	140%
AC VRF (rev)	%	108%	122%	127%	130%	132%	134%	135%	138%	141%	145%
ACF (rev)	%	93%	124%	128%	134%	140%	147%	152%	157%	162%	166%
AHF	%	56%	61%	62%	64%	65%	66%	67%	68%	69%	70%
AHE	%	25%	29%	30%	30%	30%	30%	30%	31%	32%	32%
LH open fireplace	%	26%	28%	29%	29%	30%	30%	30%	31%	31%	31%
LH closed fireplace/inset	%	60%	66%	68%	69%	70%	72%	73%	73%	74%	74%
LH wood stove	%	60%	65%	67%	69%	70%	72%	73%	73%	74%	74%
LH coal stove	%	59%	65%	67%	68%	70%	71%	72%	73%	74%	74%
LH cooker	%	56%	62%	64%	65%	66%	67%	68%	69%	69%	69%
LH SHR stove	%	80%	80%	80%	81%	81%	83%	84%	85%	85%	86%
LH pellet stove	%		83%	85%	87%	88%	90%	92%	93%	93%	93%
LH open fire gas	%	36%	40%	41%	42%	42%	43%	43%	43%	44%	44%
LH closed fire gas	%	56%	61%	63%	64%	66%	67%	68%	68%	69%	69%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	65%	73%	75%	76%	78%	79%	80%	80%	80%	80%
LH elec.convector	%	65%	73%	75%	76%	78%	79%	80%	80%	80%	80%
LH elec.storage	%	64%	72%	74%	75%	77%	78%	79%	80%	80%	80%
LH elec.underfloor	%	64%	69%	71%	73%	74%	76%	77%	78%	79%	80%
LH luminous heaters	%	70%	78%	80%	82%	83%	85%	87%	87%	88%	88%
LH tube heaters	%	61%	68%	69%	71%	72%	74%	75%	76%	76%	76%
RAC (cooling demand), all types <12 kW	SEER	2.04	3.04	3.44	3.82	4.05	4.18	4.24	4.25	4.26	4.26
RAC (heating demand), reversible <12kW	SCOP	1.98	2.67	2.91	3.13	3.26	3.35	3.38	3.39	3.39	3.39
CIRC Circulator pumps <2.5 kW (efficiency, incl. ctrl)	%	93%	100%	102%	104%	105%	105%	105%	107%	109%	111%
NRVU avg. electricity	kWh elec/a	8959	8747	8516	8214	7851	7541	7286	7103	6988	6932
NRVU avg. heat saved vs. ref	kWh heat/a	64584	91097	93333	94924	96394	97778	99028	100149	101240	102331
RVU Central Unidirectional, electricity	kWh elec/a	454	454	454	454	454	454	454	454	454	454
RVU Central Balanced, electricity	kWh elec/a	501	501	501	501	501	501	501	501	501	501
RVU Local Balanced, electricity	kWh elec/a	217	217	217	217	217	217	217	217	217	217
RVU Central Unidirectional, heat saved vs. ref	kWh heat/a	951	951	951	951	951	951	951	951	951	951
RVU Central Balanced, heat saved vs. ref	kWh heat/a	3863	3863	3863	3863	3863	3863	3863	3863	3863	3863
RVU Local Balanced, heat saved vs. ref	kWh heat/a	1706	1706	1706	1706	1706	1706	1706	1706	1706	1706
ref: natural ventilation											
LS efficacy in lumen/Watt BAU	lm/W										
LFL	lm/W	64	67	72	76	78	78	78	78	78	78
CFL	lm/W	48	49	50	51	53	55	55	55	55	55
Tungsten	lm/W	12	12	12	15	15	15	15	15	15	15
GLS	lm/W	10	10	10	10	10	10	10	10	10	10
HID	lm/W	55	67	67	74	74	74	74	74	74	74
LED	lm/W		28	88	169	203	220	235	251	268	284
DP TV power per screen area	W/dm^2	8.7	5.2	2.5	1.0	0.8	0.6	0.5	0.4	0.2	0.2
DP Monitor power per screen area (avg)	W/dm^2	11.1	3.8	3.0	2.4	2.0	1.5	1.1	0.7	0.3	0.2
DP TV standard, standby power	W	8.0	1.7	0.6	0.2						
DP TV LoNA, standby power	W		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP TV Smart, standby power	W			6.6	5.7	4.8	4.3	3.8	3.3	2.8	2.3
DP Monitor, standby power	W	9.0	2.36	0.94	0.34	0.21	0.15	0.15	0.15	0.15	0.15
SSTB	kWh/a		33	19	19						
CSTB	kWh/a		88	88	88	88	88	88	88	88	88
VIDEO DVD players/recorders	kWh/a	16	16	16	16	16					
VIDEO projectors	kWh/a	200	200	200	200	200	200				
VIDEO game consoles	kWh/a		63	91	138	191	172	172	172	172	172
ES Rack servers	kWh/a	1661	1661	1661	1661	1661	1661	1661	1661	1661	1661
ES Blade servers	kWh/a	13286	13286	13286	13286	13286	13286	13286	13286	13286	13286
ES Storage	kWh/a	3279	3279	3279	3279	3279	3279	3279	3279	3279	3279

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	kWh/a	498	193	130	64	38	38	38	38	38	38
PC Notebook	kWh/a	148	62	40	17	10	10	10	10	10	10
PC Tablet/slate	kWh/a		17	11	5	3	3	3	3	3	3
PC Thin client	kWh/a	148	62	39	17	10	10	10	10	10	10
PC Workstation	kWh/a	942	373	244	115	76	76	76	76	76	76
EP-Copier mono	kWh/a	1257	359	329	314	314	314	314	314		
EP-Copier colour	kWh/a		424	384	371	371	371	371	371	371	371
EP-printer mono	kWh/a	784	224	205	196	196	196	196	196	196	196
EP-printer colour	kWh/a		350	318	306	306	306	306	306	306	306
IJ SFD printer	kWh/a	51	15	13	12	12	12	12	12	12	12
IJ MFD printer	kWh/a	77	22	19	18	18	18	18	18	18	18
duplexing (N-print 15%)	%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
SB Home Gateway, on-mode power	W		11.7	10.5	9.3	8.1	6.9	5.7	4.5	3.4	2.2
SB Home NAS, on-mode power	W		19.4	17.5	15.5	13.6	11.6	9.6	7.6	5.6	3.6
SB Home Phones (fixed), on-mode power	W	6.1	4.4	3.9	3.5	3.1	2.6	2.2	1.7	1.3	0.8
SB Office Phones (fixed), on-mode power	W	8.1	5.9	5.3	4.7	4.1	3.5	2.9	2.3	1.7	1.1
SB Home Gateway, standby power	W		5.3	2.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby power	W		4.9	4.4	3.9	3.4	2.9	2.4	1.9	1.4	0.9
SB Home Phones (fixed), standby power	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Office Phones (fixed), standby power	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home Gateway, idle power	W		9.8	8.8	7.8	6.8	5.8	4.8	3.8	2.8	1.8
SB Home NAS, idle power	W		14.6	13.1	11.7	10.2	8.7	7.2	5.7	4.2	2.7
SB Home Phones (fixed), idle power	W	4.7	3.4	3.1	2.7	2.4	2.0	1.7	1.3	1.0	0.6
SB Office Phones (fixed), idle power	W	6.7	4.9	4.4	3.9	3.4	2.9	2.4	1.9	1.4	0.9
BC_EPS Mobile phones etc.	W	0.47	0.40	0.39	0.37	0.35	0.34	0.32	0.30	0.29	0.27
UPS below 1.5 kVA	%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%	88.1%
UPS 1.5 to 5 kVA	%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%
UPS 5 to 10 kVA	%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%	92.3%
UPS 10 to 200 kVA	%	92.7%	92.7%	92.9%	93.4%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%
RF AEC	kWh/a	490	446	438	429	421	413	406	400	393	387
RF EEI	EEI	109	88	84	80	76	72	69	65	62	59
CF open vertical chilled multi deck (RVC2)	EEI	110	90	82	75	72	70	69	68	68	68
CF open horizontal frozen island (RHF4)	EEI	109	89	81	75	71	69	68	68	68	68
CF other supermarket display (non-BCs)	EEI	110	90	82	75	73	73	73	73	73	73
CF Plug in one door beverage cooler	EEI	113	92	84	77	74	71	70	70	70	70
CF Plug in horizontal ice cream freezer	EEI	112	91	83	76	73	71	70	70	70	70
CF Spiral vending machine	EEI	138	104	90	81	81	81	81	81	81	81
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	96	96	96	96	96	96	96
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	91	91	91	91	91	91	91
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	109	109	109	109	109	109	109
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	106	106	106	106	106	106	106
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit, All MT&LT	**COP/SEPR**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
COOK El. Hobs	Wh/ltr	196	190	188	187	186	185	184	183	182	181
COOK El. Ovens	kWh/a	134	122	110	99	92	89	89	88	88	87
COOK Gas Hobs	%	60.0%	60.6%	60.7%	60.9%	61.0%	61.2%	61.3%	61.5%	61.6%	61.8%
COOK Gas Ovens	kWh prim/a	244	224	214	204	195	190	186	182	178	175
COOK Range Hoods	kWh/a	133	133	133	133	133	133	133	133	133	133
COFFEE Dripfilter (glass), brewing	kWh/a	55	55	55	55	55	55	55	55	55	55
COFFEE Dripfilter (thermos), brewing	kWh/a	48	48	48	48	48	48	48	48	48	48
COFFEE Dripfilter (full automatic), brewing	kWh/a		49	49	49	49	49	49	49	49	49
COFFEE Pad filter, brewing	kWh/a		18	18	18	18	18	18	18	18	18
COFFEE Hard cap espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Semi-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Fully-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
COFFEE Dripfilter (glass), standby/keep warm	kWh/a	38	38	38	38	38	38	38	38	38	38
COFFEE Dripfilter (thermos), standby/keep warm	kWh/a	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic), sb/keep warm	kWh/a		0	0	0	0	0	0	0	0	0
COFFEE Pad filter, standby/keep warm	kWh/a		19	19	19	19	19	19	19	19	19
COFFEE Hard cap espresso, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
COFFEE Semi-auto espresso, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
COFFEE Fully-auto espresso, standby/keep warm	kWh/a	19	19	19	19	19	19	19	19	19	19
WM energy/cycle	kWh/cycle	1.72	1.18	1.12	1.06	1.00	0.94	0.88	0.82	0.75	0.69
WM energy/a	kWh/a	434	237	215	196	179	164	152	142	131	120
DW energy/cycle	kWh/cycle	1.63	1.33	1.29	1.26	1.22	1.19	1.15	1.12	1.08	1.05
DW AEC (annual energy consumption)	kWh/a	343	278	271	264	256	249	242	234	227	220

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LD AEc vented el.	kWh elec/a	427	388	418	446	456	456	455	457	460	464
LD AEc condens el.	kWh elec/a	455	415	438	453	453	445	436	428	423	417
LD AEc vented gas	kWh prim/a	387	399	438	465	472	470	469	471	474	478
VC dom	W	1176	1440	1888	1864	2564	2883	3312	3685	4059	4433
VC nondom	W	929	1247	1343	1447	1500	1500	1500	1500	1500	1500
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
FAN Axial>300Pa	%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
FAN Centr.FC	%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
FAN Centr.BC-free	%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
FAN Centr.BC	%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
FAN Cross-flow	%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MT Industrial motors 0.75-375 kW	%	71.4%	76.5%	78.5%	79.5%	80.0%	80.5%	81.0%	81.5%	82.0%	82.5%
WP Water pumps (load)	%	65.6%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%
CP Fixed Speed 5-1280 l/s	%	57.5%	62.7%	63.1%	63.5%	64.0%	64.4%	64.7%	65.0%	65.3%	65.6%
CP Variable speed 5-1280 l/s	%	58.9%	66.3%	65.0%	64.6%	64.9%	65.3%	65.7%	66.0%	66.3%	66.6%
CP Pistons 2-64 l/s	%	42.8%	46.6%	47.1%	47.5%	47.9%	48.1%	48.4%	48.6%	48.8%	49.1%
TRAFO Distribution	kWh/a	7859	7859	7859	7859	7859	7859	7859	7859	7859	7859
TRAFO Industry oil	kWh/a	27168	27168	27168	27168	27168	27168	27168	27168	27168	27168
TRAFO Industry dry	kWh/a	39727	39727	39727	39727	39727	39727	39727	39727	39727	39727
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a		59094	59094	59094	59094	59094	59094	59094	59094	59094
TRAFO DER dry	kWh/a		62415	62415	62415	62415	62415	62415	62415	62415	62415
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
TYRE car replacement tyres C1	kg/t	13.5	11.5	10.8	10.0	9.3	8.6	7.8	7.1	6.4	6.4
TYRE van replacement tyres C2	kg/t	13.0	11.0	10.2	9.4	8.6	7.8	7.0	6.2	6.0	6.0
TYRE truck replacement tyres C3	kg/t	11.4	9.7	9.2	8.8	8.4	8.0	7.6	7.2	6.8	6.4

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	%	26%	30%	35%	42%	50%	56%	59%	60%	60%	60%
Total CH Central Heating combi, water heat	%	41%	45%	49%	58%	68%	76%	81%	84%	87%	91%
Total CH Central Heating boiler, space heat	%	47%	58%	67%	79%	93%	106%	114%	121%	127%	133%
SFB Wood Manual	%	28%	47%	50%	54%	59%	67%	76%	78%	78%	78%
SFB Wood Direct Draft	%	49%	71%	73%	74%	75%	76%	77%	78%	78%	78%
SFB Coal	%	41%	62%	64%	66%	68%	71%	76%	78%	78%	78%
SFB Pellets	%		70%	72%	74%	75%	76%	77%	78%	78%	78%
SFB Wood chips	%		71%	72%	73%	75%	76%	77%	77%	77%	77%
CHAE-S (≤ 400 kW)	%	97%	121%	129%	137%	148%	159%	168%	175%	179%	181%
CHAE-L (> 400 kW)	%	99%	123%	130%	139%	153%	166%	178%	188%	195%	198%
CHWE-S (≤ 400 kW)	%	124%	159%	171%	185%	199%	210%	220%	227%	234%	239%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	144%	185%	198%	212%	229%	249%	267%	281%	293%	303%
CHWE-L (> 1500 kW)	%	144%	185%	198%	213%	232%	253%	270%	285%	296%	303%
CHF	%	46%	96%	101%	123%	147%	165%	171%	172%	174%	175%
HT PCH-AE-S	SEPR	4.0	4.5	4.7	4.9	5.3	5.6	5.8	5.9	6.0	6.0
HT PCH-AE-L	SEPR	4.3	4.9	5.1	5.4	5.9	6.4	6.7	6.9	7.1	7.1
HT PCH-WE-S	SEPR	6.5	7.1	7.3	7.6	8.0	8.3	8.6	8.7	8.8	9.0
HT PCH-WE-M	SEPR	7.5	8.2	8.5	8.8	9.2	9.5	9.7	9.8	10.0	10.2
HT PCH-WE-L	SEPR	7.3	8.1	8.4	8.7	9.2	9.6	10.0	10.3	10.5	10.6
AC rooftop	%	77%	109%	117%	125%	133%	140%	149%	157%	162%	164%
AC splits	%	116%	140%	150%	163%	176%	188%	193%	196%	198%	201%
AC VRF	%	111%	146%	159%	171%	183%	193%	200%	205%	208%	210%
ACF	%	46%	96%	101%	123%	147%	167%	174%	177%	179%	180%
AC rooftop (rev)	%	84%	92%	96%	103%	111%	120%	127%	128%	130%	131%
AC splits (rev)	%	109%	118%	120%	124%	130%	137%	141%	143%	145%	147%
AC VRF (rev)	%	108%	122%	127%	131%	135%	139%	142%	145%	147%	149%
ACF (rev)	%	93%	124%	128%	135%	142%	150%	157%	162%	164%	167%
AHF	%	56%	61%	62%	66%	71%	77%	81%	82%	83%	83%
AHE	%	25%	29%	30%	30%	31%	32%	33%	33%	33%	34%
LH open fireplace	%	26%	28%	29%	31%	34%	38%	41%	45%	47%	47%
LH closed fireplace/inset	%	60%	66%	68%	70%	75%	78%	81%	84%	86%	86%
LH wood stove	%	60%	65%	67%	70%	74%	78%	81%	84%	86%	86%
LH coal stove	%	59%	65%	67%	69%	72%	76%	79%	83%	86%	86%
LH cooker	%	56%	62%	64%	66%	70%	73%	75%	75%	75%	75%
LH SHR stove	%	80%	80%	80%	81%	82%	84%	85%	85%	86%	86%
LH pellet stove	%		83%	85%	87%	90%	93%	94%	94%	94%	94%
LH open fire gas	%	36%	40%	41%	44%	50%	56%	61%	65%	65%	65%
LH closed fire gas	%	56%	61%	63%	66%	73%	79%	84%	88%	88%	88%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	65%	73%	76%	84%	90%	90%	90%	90%	90%	90%
LH elec.convector	%	65%	73%	76%	81%	85%	85%	85%	85%	85%	85%
LH elec.storage	%	64%	72%	75%	83%	90%	96%	96%	96%	96%	96%
LH elec.underfloor	%	64%	69%	72%	76%	81%	85%	89%	92%	95%	95%
LH luminous heaters	%	70%	78%	80%	84%	89%	93%	94%	94%	94%	94%
LH tube heaters	%	61%	68%	69%	72%	76%	79%	81%	81%	81%	81%
RAC (cooling demand), all types <12 kW	SEER	2.04	3.04	3.71	4.52	5.03	5.22	5.30	5.31	5.31	5.31
RAC (heating demand), reversible <12kW	SCOP	1.98	2.67	3.10	3.56	3.83	3.94	3.98	3.99	3.99	3.99
CIRC Circulator pumps <2.5 kW, net load	%	93%	103%	154%	214%	231%	232%	232%	232%	232%	232%
NRVU avg. electricity	kWh elec/a	8959	8747	8313	7564	6797	6182	5918	5812	5755	5732
NRVU avg. heat saved vs. ref	kWh heat/a	64584	91097	95776	102184	107783	112123	113000	113000	113000	113000
RVU Central Unidirectional, electricity	kWh elec/a	454	454	419	362	298	247	244	244	244	244
RVU Central Balanced, electricity	kWh elec/a	501	501	405	320	276	248	246	246	246	246
RVU Local Balanced, electricity	kWh elec/a	217	217	186	157	142	134	134	134	134	134
RVU Central Unidirectional, heat saved vs. ref	kWh heat/a	951	951	1212	1632	2107	2486	2505	2505	2505	2505
RVU Central Balanced, heat saved vs. ref	kWh heat/a	3863	3863	4058	4150	4199	4218	4218	4218	4218	4218
RVU Local Balanced, heat saved vs. ref	kWh heat/a	1706	1706	1905	2023	2084	2109	2109	2109	2109	2109
ref: natural ventilation											
LS efficacy in lumen/Watt (ECO)											
LFL	lm/W	64	67	72	77	78	78	79	79	80	80
CFL	lm/W	48	50	50	51	52	54	55	55	55	54
Tungsten	lm/W	12	12	12	15	16	15	15	15	15	15
GLS	lm/W	10	10	10	10	10	10	10	10	10	10
HID	lm/W	55	67	72	92	95	92	90	88	85	83
LED	lm/W		28	102	173	194	206	219	246	273	289
GLS stock	lm/W		10	10	10						
Tungsten stock	lm/W		14	14	14						
DP TV power per screen area (), sales	W/dm^2	8.7	5.2	2.5	0.6	0.2	0.2	0.1	0.1	0.1	0.1
DP Monitor power per screen area (avg), sales	W/dm^2	11.1	3.8	2.8	0.57	0.16	0.15	0.15	0.15	0.15	0.15
DP TV standard, standby power	W	8.0	1.7	0.7							
DP TV LoNA, standby power	W		2.0	3.5	3.3	2.0	2.0	2.0	2.0	2.0	2.0
DP TV Smart, standby power	W			6.4	3.2	2.0	2.0	2.0	2.0	2.0	2.0
DP Monitor, standby power	W	9.0	2.4	0.9	0.3	0.2	0.2	0	0	0	0
SSTB	kWh/a		19.2	18.5	15.3						
CSTB	kWh/a		88	77	68	68	68	68	68	68	68
VIDEO players/recorders	kWh/a		16	16	16	16					
VIDEO projectors	kWh/a	200	200	200	200	200	200				
VIDEO game consoles	kWh/a		63	84	124	175	159	159	159	159	159
ES Rack servers	kWh/a	1661	1661	1661	1466	1211	1180	1180	1180	1180	1180
ES Blade servers	kWh/a	13286	13286	13286	11737	9691	9443	9443	9443	9443	9443
ES Storage	kWh/a	3279	3279	3279	2458	1965	1965	1965	1965	1965	1965

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	kWh/a	498	193	130	64	38	38	38	38	38	38
PC Notebook	kWh/a	148	62	40	17	10	10	10	10	10	10
PC Tablet/slate	kWh/a		17	11	5	3	3	3	3	3	3
PC Thin client	kWh/a	148	62	39	17	10	10	10	10	10	10
PC Workstation	kWh/a	942	373	244	115	76	76	76	76	76	76
EP-Copier mono	kWh/a	1257	209	117	114	114	114	114	114		
EP-Copier colour	kWh/a		333	125	114	114	114	114	114	114	114
EP-printer mono	kWh/a	784	174	97	92	92	92	92	92	92	92
EP-printer colour	kWh/a		327	111	94	94	94	94	94	94	94
IJ SFD printer	kWh/a	51	8	3	3	3	3	3	3	3	3
IJ MFD printer	kWh/a	77	12	5	4	4	4	4	4	4	4
duplexing (N-print 15%)	%	65%	69%	81%	85%	85%	85%	85%	85%	85%	85%
SB Home Gateway, on-mode hours	W		11.7	10.5	9.3	8.1	6.9	5.7	4.5	3.4	2.2
SB Home NAS, on-mode hours	W		19.4	17.5	15.5	13.6	11.6	9.6	7.6	5.6	3.6
SB Home Phones (fixed), on-mode hours	W	6.1	4.4	3.9	3.5	3.1	2.6	2.2	1.7	1.3	0.8
SB Office Phones (fixed), on-mode hours	W	8.1	5.9	5.3	4.7	4.1	3.5	2.9	2.3	1.7	1.1
SB Home Gateway, standby hours	W		5.3	2.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby hours	W		4.9	4.4	3.9	3.4	2.9	2.4	1.9	1.4	0.9
SB Home Phones (fixed), standby hours	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Office Phones (fixed), standby hours	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home Gateway, idle hours	W		9.8	8.8	7.6	6.8	5.8	4.8	3.8	2.8	1.8
SB Home NAS, idle hours	W		14.6	9.0	2.6	1.9	1.9	1.9	1.9	1.9	1.9
SB Home Phones (fixed), idle hours	W	4.7	3.4	3.1	2.7	2.4	2.0	1.7	1.3	1.0	0.6
SB Office Phones (fixed), idle hours	W	6.7	4.9	4.4	3.9	3.4	2.9	2.4	1.9	1.4	0.9
Total BC Battery Charged devices	W	0.47	0.36	0.30	0.30	0.30	0.30	0.30	0.30	0.29	0.27
UPS below 1.5 kVA	%	88.1%	88.1%	88.1%	96.3%	98.9%	98.9%	98.9%	98.9%	98.9%	98.9%
UPS 1.5 to 5 kVA	%	89.8%	89.8%	89.8%	93.4%	98.2%	98.7%	98.7%	98.7%	98.7%	98.7%
UPS 5 to 10 kVA	%	92.3%	92.3%	92.3%	93.2%	94.4%	94.9%	94.9%	94.9%	94.9%	94.9%
UPS 10 to 200 kVA	%	92.7%	92.7%	92.9%	93.9%	95.3%	96.1%	96.1%	96.1%	96.1%	96.1%
RF household Refrigerators & Freezers AEC	kWh/a	490	332	270	221	183	153	123	99	82	76
RF household Refrigerators & Freezers EEI	EEI	109	66	52	41	33	27	21	16	13	12
CF open vertical chilled multi deck (RVC2)	EEI	110	90	81	65	47	39	39	39	39	39
CF open horizontal frozen island (RHF4)	EEI	109	89	81	66	49	44	44	44	44	44
CF other supermarket display (non-BCs)	EEI	110	90	81	69	58	55	54	53	53	53
CF Plug in one door beverage cooler	EEI	113	92	83	66	49	44	44	44	44	44
CF Plug in horizontal ice cream freezer	EEI	112	91	83	76	70	68	68	68	68	68
CF Spiral vending machine	EEI	138	104	88	69	54	45	45	45	45	45
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	83	62	57	57	57	57	57
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	79	58	53	53	53	53	53
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	94	71	65	65	65	65	65
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	91	67	61	61	61	61	61
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**85**	**63**	**58**	**58**	**58**	**58**	**58**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.8	2.8	2.9	2.9	2.9	2.9	2.9
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.2	3.2
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.7	3.8	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	4.0	4.1	4.2	4.2	4.2	4.2	4.2
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.5**	**2.5**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.8	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit, All MT&LT	**COP/SEPR**	**2.1**	**2.1**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
CA El. Hobs	Wh/ltr	196	190	188	187	185	184	183	182	181	180
CA El. Ovens	kWh/cyc	134	122	110	97	87	82	79	79	78	78
CA Gas Hobs	%	60%	61%	61%	61%	62%	62%	63%	63%	63%	63%
CA Gas Ovens	kWh primary/a	244	224	214	195	176	159	144	139	135	131
CA Range Hoods	kWh/a	133	133	132	126	115	103	97	95	94	93
CM Dripfilter (glass), brewing	kWh/a	55	55	55	55	55	55	55	55	55	55
CM Dripfilter (thermos), brewing	kWh/a	48	48	48	48	48	48	48	48	48	48
CM Dripfilter (full automatic), brewing	kWh/a		49	49	49	49	49	49	49	49	49
CM Pad filter, brewing	kWh/a		18	18	18	18	18	18	18	18	18
CM Hard cap espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
CM Semi-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
CM Fully-auto espresso, brewing	kWh/a	18	18	18	18	18	18	18	18	18	18
CM Dripfilter (glass), standby/keep warm	kWh/a	38	38	34	20	19	19	19	19	19	19
CM Dripfilter (thermos), standby/keep warm	kWh/a	0	0	0	0	0	0	0	0	0	0
CM Dripfilter (full automatic), sb/keep warm	kWh/a		0	0	0	0	0	0	0	0	0
CM Pad filter, standby/keep warm	kWh/a		19	17	10	9	9	9	9	9	9
CM Hard cap espresso, standby/keep warm	kWh/a	19	19	16	10	9	9	9	9	9	9
CM Semi-auto espresso, standby/keep warm	kWh/a	19	19	17	10	9	9	9	9	9	9
CM Fully-auto espresso, standby/keep warm	kWh/a	19	19	16	10	9	9	9	9	9	9
WM household Washing Machine	kWh/cyc	1.72	0.92	0.75	0.63	0.53	0.47	0.43	0.43	0.43	0.43
WM household Washing Machine	kWh/a	434	186	144	117	95	82	75	75	75	75
DW energy/cycle	kWh/cycle	1.63	1.06	0.96	0.90	0.85	0.81	1	0.74	0.70	0.67
DW AEC (annual energy consumption)	kWh/a	343	223	202	189	178	169	162	154	147	140

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LD vented el.	kWh elec/a	427	388	413	433	434	431	430	432	435	439
LD condens el.	kWh elec/a	455	415	419	385	332	295	275	261	250	239
LD vented gas	kWh primary /a	387	399	438	465	472	470	469	471	474	478
VC dom	W	1176	1440	1525	793	934	894	888	865	843	820
VC nondom	W	929	1247	1208	951	894	871	850	828	807	785
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	32%	34%	37%	38%	39%	39%	39%	39%
FAN Axial>300Pa	%	37%	37%	38%	40%	42%	43%	44%	44%	44%	44%
FAN Centr.FC	%	32%	32%	33%	37%	42%	45%	45%	45%	45%	45%
FAN Centr.BC-free	%	56%	56%	59%	62%	65%	67%	67%	67%	67%	67%
FAN Centr.BC	%	54%	54%	56%	60%	63%	65%	65%	65%	65%	65%
FAN Cross-flow	%	7%	7%	9%	13%	18%	21%	21%	21%	21%	21%
MT Industrial motors 0.75-375 kW	%	71.4%	76.6%	82.1%	89.6%	95.2%	95.9%	96.1%	96.1%	96.1%	96.1%
Total WP Water Pumps	%	65.6%	66.6%	67.3%	68.2%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%
CP Fixed Speed 5-1280 l/s	%	57.5%	62.7%	63.3%	64.7%	66.0%	66.4%	66.6%	66.7%	66.7%	66.8%
CP Variable speed 5-1280 l/s	%	58.9%	66.3%	65.2%	65.3%	66.2%	66.9%	67.0%	67.0%	67.0%	67.0%
CP Pistons 2-64 l/s	%	42.8%	46.6%	47.4%	48.7%	49.7%	50.0%	50.0%	50.0%	50.0%	50.0%
TRAFO Distribution	kWh/a	7859	7859	7659	7204	6802	6439	6106	5795	5498	5216
TRAFO Industry oil	kWh/a	27168	27168	26035	23441	21091	18886	16809	15631	15631	15631
TRAFO Industry dry	kWh/a	39727	39727	38772	36596	34648	32853	31152	29544	28629	28629
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a		59094	54190	46149	41129	38090	36268	35515	35515	35515
TRAFO DER dry	kWh/a		62415	59232	53963	50751	48781	47598	47109	47109	47109
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
Total TRAFO Utility Transformers											
TYRE car replacement tyres C1	kg/t	13.5	11.5	10.5	8.9	7.2	5.6	5.1	5.1	5.1	5.1
TYRE van replacement tyres C2	kg/t	13.0	11.0	9.7	7.8	5.8	5.0	5.0	5.0	5.0	5.0
TYRE truck replacement tyres C3	kg/t	11.4	9.7	8.9	7.8	6.6	5.4	5.1	5.1	5.1	5.1

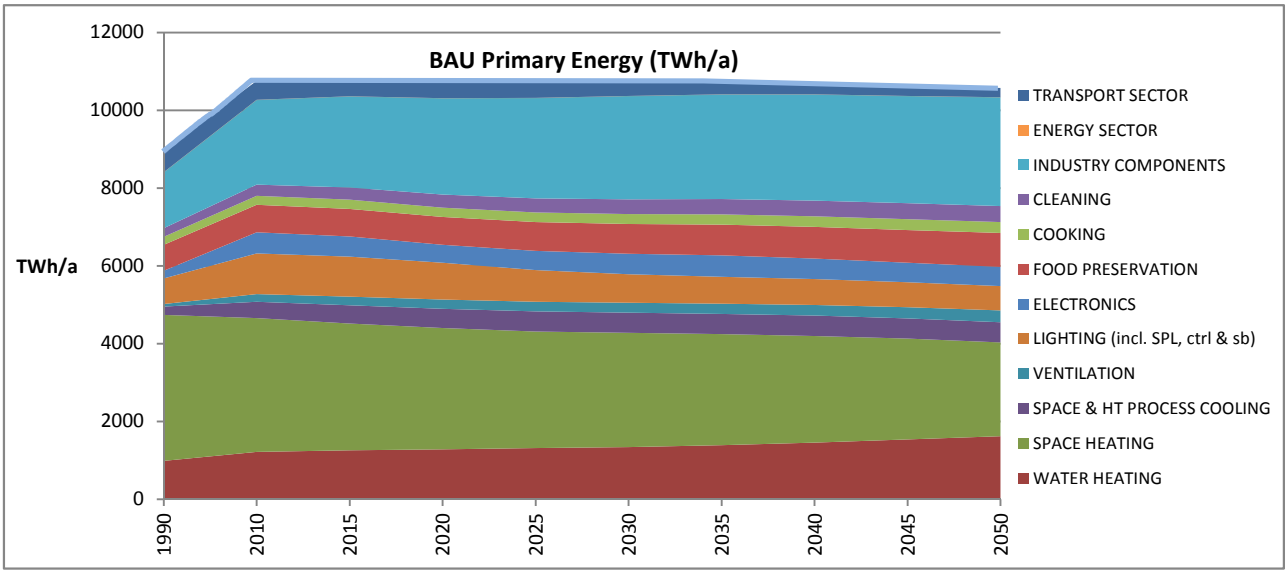
db	BAU Primary Energy (in TWh primary)	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**722**	**801**	**815**	**825**	**830**	**828**	**837**	**866**	**908**	**952**
	Total CH Central Heating combi, water heat	0	**259**	**416**	**442**	**460**	**483**	**514**	**549**	**588**	**627**	**667**
	TOTAL WATER HEATING		**981**	**1217**	**1257**	**1285**	**1313**	**1342**	**1386**	**1453**	**1535**	**1619**
	CH non-electric	0	*2213*	*2004*	*1809*	*1656*	*1535*	*1496*	*1446*	*1368*	*1248*	*1095*
	CH electric resistance boiler, 1st estimate	1	*125*	*100*	*87*	*74*	*62*	*50*	*38*	*25*	*13*	*0*
	CH heat pump, 1st estimate	1	*60*	*140*	*151*	*158*	*166*	*173*	*181*	*188*	*195*	*203*
	CH auxiliary electricity (incl. circulator), 1st estimate	1	*69*	*74*	*76*	*71*	*73*	*77*	*78*	*75*	*71*	*67*
	Total CH Central Heating boiler, space heat	0	**2467**	**2318**	**2123**	**1960**	**1835**	**1796**	**1743**	**1656**	**1527**	**1364**
	SFB Wood Manual	0	345	90	70	52	35	21	13	9	7	6
	SFB Wood Direct Draft	0	2	24	44	62	74	72	72	77	89	103
	SFB Coal	0	107	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		9	16	23	28	31	31	32	33	34
	SFB Wood chips	0		15	18	20	18	18	19	20	21	22
	Total Solid Fuel Boiler		**454**	**168**	**169**	**170**	**162**	**144**	**136**	**139**	**151**	**166**
	CHAE-S (≤ 400 kW)	1	10	26	30	31	31	31	30	27	20	12
	CHAE-L (> 400 kW)	1	15	36	40	41	40	37	35	33	31	30
	CHWE-S (≤ 400 kW)	1	1	3	3	3	3	3	3	3	3	3
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	3	8	9	9	9	8	7	7	7	6
	CHWE-L (> 1500 kW)	1	2	5	6	6	6	5	5	4	4	4
	CHF	0	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	58	91	100	106	110	112	114	115	117	118
	HT PCH-AE-L	1	56	87	95	101	104	106	107	108	109	110
	HT PCH-WE-S	1	12	19	21	22	23	24	24	24	24	25
	HT PCH-WE-M	1	23	37	41	44	46	47	47	48	49	49
	HT PCH-WE-L	1	4	8	8	9	9	10	10	10	10	10
	AC rooftop	1	8	19	19	16	13	8	4	2	1	1
	AC splits	1	11	32	31	29	27	24	22	19	17	15
	AC VRF	1	0	8	12	16	19	23	27	29	31	32
	ACF	0	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**204**	**380**	**414**	**435**	**441**	**438**	**435**	**430**	**424**	**417**
	AC rooftop (rev)	1	11	33	33	29	23	14	7	2	0	0
	AC splits (rev)	1	20	61	63	61	58	52	46	41	37	33
	AC VRF (rev)	1	0	20	29	40	49	60	68	71	72	70
	ACF (rev)	0	0	0	0	1	1	1	1	1	1	1
	AHF	0	226	169	144	124	109	96	85	75	66	58
	AHE	1	3	7	6	4	3	3	3	3	3	2
	SubTotal AHC central Air Heating		**260**	**291**	**275**	**259**	**243**	**226**	**209**	**193**	**178**	**165**
	Total AHC central Air Heating & Cooling		**464**	**671**	**688**	**694**	**683**	**664**	**644**	**622**	**602**	**581**
									0			
	LH open fireplace	0	14	18	19	20	21	21	21	21	21	21
	LH closed fireplace/inset	0	18	41	49	56	62	65	66	66	65	63
	LH wood stove	0	39	38	38	38	39	39	39	39	38	37
	LH coal stove	0	27	15	13	11	10	8	7	5	4	4
	LH cooker	0	7	11	12	14	15	16	16	16	15	15
	LH SHR stove	0	17	21	23	25	28	30	33	35	36	36
	LH pellet stove	0		8	11	14	16	18	18	18	18	17
	LH open fire gas	0	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	14	13	12	12	12	12	12	11	11	11
	LH flueless fuel heater	0	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	1	70	70	69	68	68	68	67	66	65	63
	LH elec.convector	1	291	289	287	283	281	280	279	274	267	261
	LH elec.storage	1	22	21	21	21	21	21	21	20	20	20
	LH elec.underfloor	1	40	41	41	40	40	40	40	39	39	38
	LH luminous heaters	0	5	5	5	5	5	5	5	4	4	4
	LH tube heaters	0	12	12	12	12	11	11	10	10	10	9
	LH total		**575**	**603**	**613**	**622**	**629**	**635**	**635**	**627**	**614**	**600**
	RAC (cooling demand), all types <12 kW	1	6	46	55	63	77	85	89	93	96	99
	RAC (heating demand), reversible <12kW	1	4	55	78	102	125	132	131	127	122	117
	Total RAC Room Air Conditioner		**11**	**102**	**133**	**165**	**202**	**217**	**220**	**219**	**218**	**216**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**40**	**52**	**54**	**55**	**57**	**59**	**60**	**57**	**54**	**51**
	TOTAL SPACE HEATING		**3760**	**3435**	**3258**	**3112**	**2995**	**2933**	**2854**	**2742**	**2592**	**2413**
	TOTAL SPACE COOLING		**210**	**426**	**468**	**498**	**517**	**523**	**524**	**522**	**519**	**516**
	NRVU electricity	1	47	153	173	186	192	194	198	203	209	217
1	NRVU heat (negative=saving vs. natural ventilation)	0	-136	-636	-757	-859	-942	-1009	-1076	-1144	-1213	-1283
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	19	38	43	43	41	40	42	45	48	51
	RVU Central Balanced VU ≤125W/fan (2 fans)	1	0	3	5	9	14	18	20	23	25	27
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	1	0	0	1	1	2	3	4	5	7	8
1	RVU Central Unidir., heat (negative=saving)	0	-16	-32	-36	-36	-34	-34	-35	-38	-40	-43
1	RVU Central Balanced, heat (negative=saving)	0	-1	-8	-16	-29	-43	-55	-63	-70	-76	-83
1	RVU Local Balanced, heat (negative=saving)	0	0	-1	-2	-4	-7	-10	-14	-17	-21	-24
	Total VU (electricity+ (negative) heat saving)		**-86**	**-483**	**-590**	**-689**	**-777**	**-852**	**-923**	**-992**	**-1061**	**-1130**
	TOTAL VENTILATION (electricity only)		**67**	**194**	**222**	**239**	**249**	**256**	**265**	**276**	**289**	**303**

db	BAU Primary Energy (in TWh primary), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources BAU											
	LFL Linear Fluorescent	1	203	313	343	334	325	311	295	279	265	252
	CFL Compact Fluorescent	1	9	67	90	82	56	43	38	34	30	27
	Tungsten	1	22	131	138	136	93	66	48	34	26	23
	GLS GeneralLighting Service (incandescent)	1	210	153	116	84	52	17	4	0	0	0
	HID High Intensity Discharge	1	89	188	170	151	142	142	142	142	142	142
	LED Light Emitting Diode	1	0	1	2	13	32	54	68	77	83	87
	SP Special Purpose (exempt)	1	*100*	*151*	*132*	*112*	*92*	*76*	*76*	*76*	*76*	*76*
	lighting controls & sb	1	*28*	*43*	*37*	*31*	*26*	*21*	*21*	*21*	*21*	*21*
	TOTAL LIGHTING (incl. SPL, ctrl & sb)		**661**	**1047**	**1028**	**943**	**816**	**729**	**692**	**663**	**643**	**628**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)		**533**	**853**	**859**	**800**	**698**	**632**	**595**	**566**	**546**	**531**
	DP TV, on mode	1	68.2	212.2	170.7	110.0	116.4	125.7	120.7	104.1	78.1	75.3
	DP Monitor, on mode	1	2.7	28.0	21.4	17.3	17.5	16.2	13.0	9.1	4.6	3.0
	DP TV , sb mode	1	9.5	12.6	12.2	28.5	35.3	37.9	39.6	39.6	37.8	34.1
	DP Monitor, sb mode	1	0.4	1.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	DP Total electronic DisPlays	1	**81**	**254**	**205**	**156**	**169**	**180**	**173**	**153**	**121**	**112**
	SSTB	1	0	8	4	0	0	0	0	0	0	0
	CSTB	1	0	18	43	48	49	48	50	54	59	63
	Total STB set top boxes (Complex & Simple)		**0**	**26**	**47**	**48**	**49**	**48**	**50**	**54**	**59**	**63**
	VIDEO players/recorders	1	0	5	7	2	0	0	0	0	0	0
	VIDEO projectors	1	0	5	5	3	1	0	0	0	0	0
	VIDEO game consoles	1	0	11	20	27	34	35	35	35	35	35
	Total VIDEO		**0**	**22**	**31**	**32**	**35**	**35**	**35**	**35**	**35**	**35**
	ES Rack servers	1	1	46	54	60	72	89	107	104	104	104
	ES Blade servers	1	1	11	12	12	14	17	20	19	19	19
	ES Storage	1	0	5	5	6	6	7	7	7	7	7
	Total ES Enterprise Servers		**2**	**62**	**71**	**77**	**92**	**112**	**134**	**130**	**130**	**130**
	PC Desktop	1	36	54	32	12	7	7	7	7	7	7
	PC Notebook	1	0	19	10	3	2	2	2	2	2	2
	PC Tablet/slate	1	0	0	4	4	4	4	5	5	5	5
	PC Thin client	1	0	1	0	0	0	0	0	0	0	0
	PC Workstation	1	0	3	2	1	1	1	1	1	1	1
	Total PC, electricity		**36**	**76**	**48**	**20**	**13**	**14**	**14**	**14**	**15**	**15**
	EP-Copier mono	1	26	3	2	1	1	0	0	0	0	0
	EP-Copier colour	1	0	1	2	4	4	5	5	6	6	6
	EP-printer mono	1	24	7	5	4	4	3	3	2	2	2
	EP-printer colour	1	0	3	5	6	8	9	10	12	13	14
	IJ SFD printer	1	3	2	1	1	0	0	0	0	0	0
	IJ MFD printer	1	3	3	4	4	5	5	6	6	7	7
	Total imaging equipment, electricity		**56**	**19**	**19**	**20**	**21**	**23**	**24**	**26**	**27**	**29**
	SB Home Gateway, on-mode hours	1	0.0	10.2	12.2	13.5	14.1	14.0	13.2	11.8	9.6	6.8
	SB Home NAS, on-mode hours	1	0.0	0.5	1.0	1.3	1.5	1.6	1.6	1.5	1.2	0.9
	SB Home Phones (fixed), on-mode hours	1	0.2	1.1	1.3	1.3	1.2	1.0	0.8	0.6	0.5	0.3
	SB Office Phones (fixed), on-mode hours	1	0.5	1.6	1.5	1.5	1.3	1.2	1.1	0.9	0.7	0.5
	SB Home Gateway, standby hours	1	0.0	5.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	1	0.0	0.8	1.5	2.0	2.4	2.5	2.5	2.3	1.9	1.4
	SB Home Phones (fixed), standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	1	0.0	10.4	18.5	27.3	28.5	28.3	26.8	23.8	19.5	13.8
	SB Home NAS, idle hours	1	0.0	0.3	0.5	0.6	0.7	0.8	0.8	0.7	0.6	0.4
	SB Home Phones (fixed), idle hours	1	1.3	9.7	10.7	11.0	9.8	8.4	6.9	5.5	4.1	2.6
	SB Office Phones (fixed), idle hours	1	1.9	6.7	6.4	6.1	5.6	5.0	4.4	3.7	2.8	1.9
	Total SB (networked) StandBy (rest)		**4**	**47**	**55**	**65**	**65**	**63**	**58**	**51**	**41**	**29**
	Total BC Battery Charged devices	1	**1**	**9**	**9**	**8**	**8**	**7**	**7**	**7**	**6**	**6**
	UPS below 1.5 kVA	1	1.8	3.8	3.8	4.5	5.4	6.2	7.0	7.7	8.3	8.7
	UPS 1.5 to 5 kVA	1	6.7	14.5	15.7	17.4	20.7	24.1	27.5	30.6	33.2	35.1
	UPS 5 to 10 kVA	1	0.8	1.8	2.0	2.2	2.6	3.1	3.5	3.9	4.3	4.5
	UPS 10 to 200 kVA	1	4.7	10.6	11.4	11.5	12.4	14.6	16.8	18.8	20.6	22.0
	Total UPS - Uninterrupted Power Supplies	**1**	**14**	**31**	**33**	**36**	**41**	**48**	**55**	**61**	**66**	**70**
	TOTAL ELECTRONICS		**194**	**546**	**518**	**461**	**494**	**530**	**552**	**532**	**500**	**489**
	Total RF household Refrigerators & Freezers	1	**344**	**347**	**348**	**348**	**347**	**347**	**346**	**346**	**344**	**343**
	CF open vertical chilled multi deck (RVC2)	1	37	36	34	31	30	30	30	30	30	31
	CF open horizontal frozen island (RHF4)	1	3	3	3	3	3	3	3	3	3	3
	CF other supermarket display (non-BCs)	1	65	66	65	63	63	66	68	70	73	75
	CF Plug in one door beverage cooler	1	46	45	42	39	39	39	39	40	42	43
	CF Plug in horizontal ice cream freezer	1	10	10	10	9	9	9	9	9	10	10
	CF Spiral vending machine	1	9	8	5	4	4	4	4	4	5	5
	Total CF Commercial Refrigeration		**170**	**168**	**158**	**149**	**147**	**150**	**153**	**157**	**162**	**167**

db	BAU Primary Energy (in TWh prim), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	1	4.5	6.2	6.5	6.8	7.1	7.4	7.7	8.1	8.4	8.7
	PF Storage cabinet Frozen Vertical (FV)	1	5.3	7.2	7.6	8.0	8.3	8.7	9.1	9.4	9.8	10.2
	PF Storage cabinet Chilled Horizontal (CH)	1	3.5	4.8	5.0	5.3	5.5	5.7	6.0	6.3	6.5	6.8
	PF Storage cabinet Frozen Horizontal (FH)	1	2.1	2.9	3.0	3.2	3.3	3.4	3.6	3.8	3.9	4.1
	PF Storage cabinets All types	**1**	**15**	**21**	**22**	**23**	**24**	**25**	**26**	**28**	**29**	**30**
	PF Process Chiller AC MT S ≤ 300 kW	1	8	17	20	23	26	29	32	34	37	40
	PF Process Chiller AC MT L > 300 kW	1	8	17	20	23	25	28	31	33	36	39
	PF Process Chiller AC LT S ≤ 200 kW	1	8	18	21	24	26	29	32	35	38	40
	PF Process Chiller AC LT L > 200 kW	1	8	18	21	24	27	30	33	36	39	42
	PF Process Chiller WC MT S ≤ 300 kW	1	2	5	6	7	7	8	9	10	10	11
	PF Process Chiller WC MT L > 300 kW	1	3	7	8	10	11	12	13	14	15	17
	PF Process Chiller WC LT S ≤ 200 kW	1	3	6	7	8	9	10	11	12	13	14
	PF Process Chiller WC LT L > 200 kW	1	4	8	9	11	12	13	14	16	17	18
	PF Process Chiller All MT&LT	**1**	**44**	**96**	**113**	**129**	**145**	**159**	**175**	**190**	**206**	**221**
	PF Condensing Unit MT S 0.2-1 kW	1	16	13	13	13	14	15	16	18	19	20
	PF Condensing Unit MT M 1-5 kW	1	42	33	32	33	36	39	42	45	48	52
	PF Condensing Unit MT L 5-20 kW	1	51	41	39	41	44	47	51	55	59	64
	PF Condensing Unit MT XL 20-50 kW	1	51	40	39	41	44	47	51	55	59	64
	PF Condensing Unit LT S 0.1-0.4 kW	1	2	2	2	2	2	2	2	2	2	3
	PF Condensing Unit LT M 0.4-2 kW	1	8	6	6	6	7	7	8	8	9	10
	PF Condensing Unit LT L 2-8 kW	1	13	10	10	10	11	12	13	14	15	16
	PF Condensing Unit LT XL 8-20 kW	1	39	31	30	32	34	37	40	43	46	49
0.6	**PF Condensing Unit, All MT&LT**	**1**	**222**	**177**	**170**	**178**	**191**	**206**	**222**	**239**	**258**	**278**
	PF Professional Refrigeration, Total		**148**	**188**	**203**	**224**	**245**	**267**	**290**	**313**	**337**	**362**
	TOTAL FOOD PRESERVATION		**663**	**704**	**710**	**720**	**740**	**763**	**789**	**816**	**844**	**872**
	CA El. Hobs	1	51	78	87	94	101	108	113	119	124	129
	CA El. Ovens	1	59	59	55	52	51	52	53	54	54	54
	CA Gas Hobs	0	35	29	28	27	26	24	23	22	21	19
	CA Gas Ovens	0	14	10	9	8	8	7	7	7	6	6
	CA Range Hoods	1	25	31	32	34	36	38	39	41	43	45
	Total CA Cooking Appliances		**184**	**207**	**211**	**216**	**221**	**229**	**236**	**242**	**248**	**254**
	CM Dripfilter (glass)	1	15.7	11.0	9.7	8.1	7.2	7.2	7.2	7.2	7.2	7.2
	CM Dripfilter (thermos)	1	0.9	2.6	2.7	2.7	2.8	2.8	2.8	2.9	2.9	2.9
	CM Dripfilter (full automatic)	1	0.0	1.2	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7
	CM Pad filter	1	0.0	1.3	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4
	CM Hard cap espresso	1	0.0	0.4	0.6	1.0	1.3	1.3	1.3	1.3	1.3	1.3
	CM Semi-auto espresso	1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	CM Fully-auto espresso	1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	CM Dripfilter (glass), standby/keep warm	1	10.9	7.6	6.7	5.6	5.0	5.0	5.0	5.0	5.0	5.0
	CM Dripfilter (thermos), standby/keep warm	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	1	0.0	1.4	1.6	1.7	1.8	2.0	2.1	2.3	2.4	2.6
	CM Hard cap espresso, standby/keep warm	1	0.0	0.4	0.6	1.1	1.4	1.4	1.4	1.4	1.4	1.4
	CM Semi-auto espresso, standby/keep warm	1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	CM Fully-auto espresso, standby/keep warm	1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
	Total CM household Coffee Makers		**28**	**27**	**26**	**24**	**24**	**24**	**25**	**25**	**26**	**26**
	TOTAL COOKING		**212**	**234**	**237**	**240**	**245**	**253**	**261**	**268**	**274**	**281**
	Total WM household Washing Machine	1	**132**	**110**	**106**	**99**	**91**	**84**	**78**	**72**	**67**	**61**
	Total DW household Dishwasher	1	**32**	**58**	**67**	**76**	**85**	**93**	**100**	**107**	**113**	**119**
	LD vented el.	1	21	28	29	28	28	27	27	27	27	28
	LD condens el.	1	4	35	44	52	59	61	60	60	59	59
	LD vented gas	0	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier		**25**	**63**	**73**	**81**	**86**	**87**	**87**	**87**	**87**	**87**
	VC dom	1	26	42	56	59	85	97	109	117	124	126
	VC nondom	1	8	12	13	15	16	17	18	19	20	21
	Total VC Vacuum Cleaner		**33**	**54**	**70**	**74**	**101**	**115**	**127**	**136**	**143**	**147**
	TOTAL CLEANING		**222**	**286**	**316**	**330**	**363**	**379**	**392**	**403**	**410**	**414**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	48	132	155	173	191	201	205	205	205	205
0.5	FAN Axial>300Pa	1	82	242	277	293	306	313	315	315	315	315
0.5	FAN Centr.FC	1	20	43	52	58	63	67	68	68	68	68
0.5	FAN Centr.BC-free	1	53	111	132	145	159	173	183	189	193	196
0.5	FAN Centr.BC	1	55	125	150	165	181	199	215	230	250	272
0.5	FAN Cross-flow	1	3	6	7	8	10	10	11	12	13	14
	Total FAN, industrial (excl. box & roof fans)		**131**	**329**	**387**	**421**	**455**	**482**	**498**	**509**	**522**	**535**
0.5	**Total MT Motors 0.75-375 kW**	**1**	**2044**	**2810**	**2996**	**3147**	**3237**	**3263**	**3245**	**3225**	**3206**	**3186**
	Total WP Water Pumps	1	**220**	**296**	**318**	**342**	**368**	**395**	**423**	**450**	**478**	**505**

db	BAU Primary Energy (in TWh prim), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CP Fixed Speed 5-1280 l/s	1	59	121	103	89	87	89	92	94	96	99
	CP Variable speed 5-1280 l/s	1	0	22	39	51	55	57	59	60	61	62
	CP Pistons 2-64 l/s	1	3	4	4	4	4	4	4	4	4	4
	Total CP Standard Air Compressors		**63**	**147**	**146**	**143**	**146**	**150**	**154**	**158**	**161**	**165**
	TOTAL INDUSTRY COMPONENTS		1437	2178	2349	2480	2587	2659	2698	2730	2764	2798
	TRAFO Distribution	1	30	50	56	62	69	75	82	88	95	101
	TRAFO Industry oil	1	22	39	44	48	52	57	61	65	70	74
	TRAFO Industry dry	1	7	12	14	15	17	18	19	21	22	24
	TRAFO Power	1	86	133	149	165	181	197	213	228	245	262
	TRAFO DER oil	1		1	2	4	6	10	16	25	35	47
	TRAFO DER dry	1		5	9	16	26	43	69	105	148	198
	TRAFO Small	1	5	5	5	5	5	5	5	5	5	5
	Total TRAFO Utility Transformers		**151**	**246**	**279**	**315**	**356**	**405**	**465**	**537**	**619**	**710**
	TOTAL ENERGY SECTOR (already included in power generation factor, so reference=0)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1		299	262	239	244	247	221	191	162	139	129
	TYRE van replacement tyres C2		119	99	89	91	91	79	67	56	51	48
	TYRE truck replacement tyres C3		179	131	108	115	110	104	95	85	75	66
	TYRE Replacement Tyres		**597**	**492**	**436**	**450**	**448**	**405**	**353**	**303**	**265**	**243**
	TRANSPORT SECTOR		597	492	436	450	448	405	353	303	265	243
	GENERAL TOTAL (in TWh primary)		**9004**	**10757**	**10798**	**10759**	**10765**	**10773**	**10765**	**10707**	**10636**	**10576**
	GENERAL TOTAL (in PJ primary)		32414	38726	38874	38731	38756	38782	38753	38546	38288	38072
	GENERAL TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		774	925	928	925	926	926	926	921	914	909

BAU Primary energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	981	1217	1257	1285	1313	1342	1386	1453	1535	1619
SPACE HEATING	3760	3435	3258	3112	2995	2933	2854	2742	2592	2413
SPACE & HT PROCESS COOLING	210	426	468	498	517	523	524	522	519	516
VENTILATION	67	194	222	239	249	256	265	276	289	303
LIGHTING (incl. SPL, ctrl & sb)	661	1047	1028	943	816	729	692	663	643	628
ELECTRONICS	194	546	518	461	494	530	552	532	500	489
FOOD PRESERVATION	663	704	710	720	740	763	789	816	844	872
COOKING	212	234	237	240	245	253	261	268	274	281
CLEANING	222	286	316	330	363	379	392	403	410	414
INDUSTRY COMPONENTS	1437	2178	2349	2480	2587	2659	2698	2730	2764	2798
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	597	492	436	450	448	405	353	303	265	243
TOTAL in TWh primary	**9004**	**10757**	**10798**	**10759**	**10765**	**10773**	**10765**	**10707**	**10636**	**10576**
TOTAL (in PJ primary)	32414	38726	38874	38731	38756	38782	38753	38546	38288	38072
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	774	925	928	925	926	926	926	921	914	909



BAU Primary energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	635	787	812	831	849	867	895	939	992	1046
SPACE HEATING	2297	1985	1884	1803	1740	1709	1669	1611	1531	1434
SPACE & HT PROCESS COOLING	4	24	28	32	38	41	43	44	45	46
VENTILATION	20	42	49	53	57	61	67	73	79	86
LIGHTING	176	242	233	207	146	102	80	67	60	57
ELECTRONICS	106	358	337	290	305	315	309	290	258	245
FOOD PRESERVATION	317	319	321	320	319	319	319	318	317	316
COOKING	185	208	212	215	221	228	236	242	249	255
CLEANING	207	263	291	303	334	349	360	370	376	379
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	239	210	191	195	198	177	153	130	111	103
TOTAL in TWh primary	**4186**	**4436**	**4359**	**4250**	**4207**	**4169**	**4132**	**4085**	**4019**	**3966**
TOTAL (in PJ primary)	15070	15971	15693	15299	15144	15007	14873	14706	14470	14279
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	360	381	375	365	362	358	355	351	346	341

BAU Primary energy (summary TERTIARY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	302	373	385	394	402	411	424	445	470	495
SPACE HEATING	916	938	901	870	845	830	808	773	728	676
SPACE & HT PROCESS COOLING	136	281	308	326	336	338	337	334	329	324
VENTILATION	41	131	149	160	165	167	170	174	180	187
LIGHTING	376	635	625	578	528	498	486	475	465	456
ELECTRONICS	77	166	160	151	167	190	214	213	213	216
FOOD PRESERVATION	280	270	260	255	259	268	278	289	302	315
COOKING	27	26	25	25	24	25	25	25	26	26
CLEANING	14	21	23	25	27	28	29	30	31	32
INDUSTRY COMPONENTS	370	618	686	734	775	806	825	839	855	871
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	224	177	154	160	157	143	126	109	97	88
TOTAL in TWh primary	**2763**	**3637**	**3677**	**3678**	**3686**	**3705**	**3722**	**3707**	**3696**	**3685**
TOTAL (in PJ primary)	9946	13092	13236	13242	13269	13338	13399	13344	13304	13265
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	238	313	316	316	317	319	320	319	318	317

BAU Primary energy (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	35	45	47	48	49	51	53	55	59	62
SPACE HEATING	425	398	367	340	318	306	293	278	258	235
SPACE & HT PROCESS COOLING	55	96	104	110	113	113	112	112	113	113
VENTILATION	6	18	21	22	23	23	24	24	25	26
LIGHTING	100	158	158	147	132	122	118	114	111	108
ELECTRONICS	9	18	17	17	18	21	24	24	24	25
FOOD PRESERVATION	54	99	113	128	142	156	170	185	200	215
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	1	1	2	2	2	2	2	2	2	2
INDUSTRY COMPONENTS	862	1272	1358	1426	1476	1504	1513	1520	1527	1535
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	116	91	78	82	80	73	64	56	50	45
TOTAL in TWh primary	**1662**	**2196**	**2265**	**2321**	**2354**	**2371**	**2374**	**2371**	**2369**	**2366**
TOTAL (in PJ primary)	5984	7905	8153	8357	8474	8534	8547	8536	8529	8518
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	143	189	195	200	202	204	204	204	204	203

BAU Primary energy (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	10	12	13	13	13	13	14	15	15	16
SPACE HEATING	122	115	106	98	92	88	84	79	74	68
SPACE & HT PROCESS COOLING	16	26	28	30	31	32	32	32	32	33
VENTILATION	1	3	3	4	4	4	4	4	4	4
LIGHTING	9	13	12	11	9	8	7	7	6	6
ELECTRONICS	2	3	3	3	3	4	4	4	4	4
FOOD PRESERVATION	11	15	16	17	19	20	22	23	25	27
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	205	288	304	320	336	349	360	371	382	393
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	18	14	12	13	13	11	10	9	8	7
TOTAL in TWh primary	**393**	**489**	**498**	**509**	**519**	**529**	**537**	**545**	**552**	**559**
TOTAL (in PJ primary)	1415	1759	1793	1834	1869	1904	1934	1960	1986	2011
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	34	42	43	44	45	45	46	47	47	48

BAU Primary energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	981	1217	1257	1285	1313	1342	1386	1453	1535	1619
	Residential	635	787	812	831	849	867	895	939	992	1046
	Tertiary	302	373	385	394	402	411	424	445	470	495
	Industry	35	45	47	48	49	51	53	55	59	62
	Other	10	12	13	13	13	13	14	15	15	16
SPACE HEATING.	All sectors, TWh	3760	3435	3258	3112	2995	2933	2854	2742	2592	2413
	Residential	2297	1985	1884	1803	1740	1709	1669	1611	1531	1434
	Tertiary	916	938	901	870	845	830	808	773	728	676
	Industry	425	398	367	340	318	306	293	278	258	235
	Other	122	115	106	98	92	88	84	79	74	68
SPACE COOLING.	All sectors, TWh	210	426	468	498	517	523	524	522	519	516
& HT PROCESS	Residential	4	24	28	32	38	41	43	44	45	46
	Tertiary	136	281	308	326	336	338	337	334	329	324
	Industry	55	96	104	110	113	113	112	112	113	113
	Other	16	26	28	30	31	32	32	32	32	33
VENTILATION.	All sectors, TWh	67	194	222	239	249	256	265	276	289	303
	Residential	20	42	49	53	57	61	67	73	79	86
	Tertiary	41	131	149	160	165	167	170	174	180	187
	Industry	6	18	21	22	23	23	24	24	25	26
	Other	1	3	3	4	4	4	4	4	4	4
LIGHTING.	All sectors, TWh	661	1047	1028	943	816	729	692	663	643	628
	Residential	176	242	233	207	146	102	80	67	60	57
	Tertiary	376	635	625	578	528	498	486	475	465	456
	Industry	100	158	158	147	132	122	118	114	111	108
	Other	9	13	12	11	9	8	7	7	6	6
ELECTRONICS.	All sectors, TWh	194	546	518	461	494	530	552	532	500	489
	Residential	106	358	337	290	305	315	309	290	258	245
	Tertiary	77	166	160	151	167	190	214	213	213	216
	Industry	9	18	17	17	18	21	24	24	24	25
	Other	2	3	3	3	3	4	4	4	4	4
FOOD PRESERVE.	All sectors, TWh	663	704	710	720	740	763	789	816	844	872
	Residential	317	319	321	320	319	319	319	318	317	316
	Tertiary	280	270	260	255	259	268	278	289	302	315
	Industry	54	99	113	128	142	156	170	185	200	215
	Other	11	15	16	17	19	20	22	23	25	27
COOKING.	All sectors, TWh	212	234	237	240	245	253	261	268	274	281
	Residential	185	208	212	215	221	228	236	242	249	255
	Tertiary	27	26	25	25	24	25	25	25	26	26
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	222	286	316	330	363	379	392	403	410	414
	Residential	207	263	291	303	334	349	360	370	376	379
	Tertiary	14	21	23	25	27	28	29	30	31	32
	Industry	1	1	2	2	2	2	2	2	2	2
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	1437	2178	2349	2480	2587	2659	2698	2730	2764	2798
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary	370	618	686	734	775	806	825	839	855	871
	Industry	862	1272	1358	1426	1476	1504	1513	1520	1527	1535
	Other	205	288	304	320	336	349	360	371	382	393
ENERGY SECTOR.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
(BAU=0)	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR.	All sectors, TWh	597	492	436	450	448	405	353	303	265	243
(tyres)	Residential	239	210	191	195	198	177	153	130	111	103
	Tertiary	224	177	154	160	157	143	126	109	97	88
	Industry	116	91	78	82	80	73	64	56	50	45
	Other	18	14	12	13	13	11	10	9	8	7
ALL PRODUCTS.	All sectors, TWh	9004	10757	10798	10759	10765	10773	10765	10707	10636	10576
	Residential	4186	4436	4359	4250	4207	4169	4132	4085	4019	3966
	Tertiary	2763	3637	3677	3678	3686	3705	3722	3707	3696	3685
	Industry	1662	2196	2265	2321	2354	2371	2374	2371	2369	2366
	Other	393	489	498	509	519	529	537	545	552	559

BAU Primary energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
	Tertiary	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
	Industry	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	61%	58%	58%	58%	58%	58%	58%	59%	59%	59%
	Tertiary	24%	27%	28%	28%	28%	28%	28%	28%	28%	28%
	Industry	11%	12%	11%	11%	11%	10%	10%	10%	10%	10%
	Other	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
SPACE COOLING.											
& HT PROCESS	Residential	2%	6%	6%	6%	7%	8%	8%	9%	9%	9%
	Tertiary	65%	66%	66%	66%	65%	65%	64%	64%	63%	63%
	Industry	26%	22%	22%	22%	22%	22%	21%	21%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION.											
	Residential	29%	21%	22%	22%	23%	24%	25%	26%	28%	28%
	Tertiary	61%	68%	67%	67%	66%	65%	64%	63%	62%	62%
	Industry	8%	9%	9%	9%	9%	9%	9%	9%	9%	9%
	Other	1%	2%	2%	2%	2%	2%	1%	1%	1%	1%
LIGHTING.											
	Residential	27%	23%	23%	22%	18%	14%	12%	10%	9%	9%
	Tertiary	57%	61%	61%	61%	65%	68%	70%	72%	72%	73%
	Industry	15%	15%	15%	16%	16%	17%	17%	17%	17%	17%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	55%	66%	65%	63%	62%	59%	56%	55%	52%	50%
	Tertiary	40%	30%	31%	33%	34%	36%	39%	40%	43%	44%
	Industry	5%	3%	3%	4%	4%	4%	4%	5%	5%	5%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
FOOD PRESERVE.											
	Residential	48%	45%	45%	44%	43%	42%	40%	39%	38%	36%
	Tertiary	42%	38%	37%	35%	35%	35%	35%	35%	36%	36%
	Industry	8%	14%	16%	18%	19%	20%	22%	23%	24%	25%
	Other	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
COOKING.											
	Residential	87%	89%	89%	90%	90%	90%	90%	91%	91%	91%
	Tertiary	13%	11%	11%	10%	10%	10%	10%	9%	9%	9%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	93%	92%	92%	92%	92%	92%	92%	92%	92%	92%
	Tertiary	6%	7%	7%	8%	7%	7%	7%	8%	8%	8%
	Industry	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary	26%	28%	29%	30%	30%	30%	31%	31%	31%	31%
	Industry	60%	58%	58%	58%	57%	57%	56%	56%	55%	55%
	Other	14%	13%	13%	13%	13%	13%	13%	14%	14%	14%
ENERGY SECTOR.											
(BAU=0)	Residential										
	Tertiary										
	Industry										
	Other										
TRANSPORT SECTOR.											
(tyres)	Residential	40%	43%	44%	43%	44%	44%	43%	43%	42%	42%
	Tertiary	37%	36%	35%	36%	35%	35%	36%	36%	36%	36%
	Industry	19%	18%	18%	18%	18%	18%	18%	18%	19%	19%
	Other	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	46%	41%	40%	40%	39%	39%	38%	38%	38%	38%
	Tertiary	31%	34%	34%	34%	34%	34%	35%	35%	35%	35%
	Industry	18%	20%	21%	22%	22%	22%	22%	22%	22%	22%
	Other	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%

db	ECO Primary Energy (in TWh primary)	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**722**	**801**	**736**	**647**	**567**	**535**	**533**	**552**	**579**	**607**
	Total CH Central Heating combi, water heat	0	**259**	**416**	**420**	**387**	**354**	**340**	**344**	**354**	**364**	**374**
	TOTAL WATER HEATING		**981**	**1217**	**1157**	**1034**	**921**	**876**	**878**	**906**	**943**	**981**
	CH non-electric	0	*2213*	*1957*	*1569*	*1206*	*916*	*738*	*626*	*530*	*431*	*323*
	CH electric resistance boiler, 1st estimate	1	*125*	*100*	*87*	*74*	*62*	*50*	*38*	*25*	*13*	*0*
	CH heat pump, 1st estimate	1	*60*	*140*	*156*	*165*	*186*	*207*	*228*	*250*	*271*	*292*
	CH auxiliary electricity (incl. circulator), 1st estimate	1	*69*	*68*	*59*	*47*	*34*	*35*	*35*	*34*	*33*	*31*
	Total CH Central Heating boiler, space heat	0	**2467**	**2265**	**1871**	**1492**	**1197**	**1030**	**927**	**839**	**747**	**647**
	SFB Wood Manual	0	345	90	70	49	31	17	9	6	5	5
	SFB Wood Direct Draft	0	2	24	44	62	73	71	71	76	87	101
	SFB Coal	0	107	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		9	16	23	28	31	31	31	32	34
	SFB Wood chips	0		15	18	20	18	17	18	20	21	22
	Total Solid Fuel Boiler		**454**	**168**	**168**	**167**	**157**	**138**	**131**	**134**	**146**	**162**
	CHAE-S (≤ 400 kW)	1	10	26	30	31	30	30	28	24	18	11
	CHAE-L (> 400 kW)	1	15	36	40	41	39	35	32	30	29	28
	CHWE-S (≤ 400 kW)	1	1	3	3	3	3	3	3	3	3	3
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	3	8	9	9	9	8	7	7	7	6
	CHWE-L (> 1500 kW)	1	2	5	6	6	5	5	5	4	4	4
	CHF	0	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	58	91	99	104	104	102	103	106	108	111
	HT PCH-AE-L	1	56	87	95	98	96	93	92	93	95	97
	HT PCH-WE-S	1	12	19	21	22	23	23	23	23	24	25
	HT PCH-WE-M	1	23	37	41	43	45	45	46	47	48	49
	HT PCH-WE-L	1	4	8	8	9	9	9	9	9	10	10
	AC rooftop	1	8	19	19	16	12	8	4	2	1	1
	AC splits	1	11	32	31	28	25	22	19	17	16	14
	AC VRF	1	0	8	12	15	18	21	24	26	28	29
	ACF	0	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**204**	**380**	**413**	**426**	**418**	**404**	**396**	**393**	**391**	**389**
	AC rooftop (rev)	1	11	33	33	28	21	12	5	2	0	0
	AC splits (rev)	1	20	61	63	60	55	48	43	39	35	31
	AC VRF (rev)	1	0	20	29	40	48	58	65	67	69	68
	ACF (rev)	0	0	0	0	1	1	1	1	1	1	1
	AHF	0	226	169	143	120	99	82	71	62	55	49
	AHE	1	3	7	6	4	3	3	3	3	3	2
	SubTotal AHC central Air Heating		**260**	**291**	**274**	**252**	**227**	**204**	**187**	**173**	**162**	**152**
	Total AHC central Air Heating & Cooling		**464**	**671**	**687**	**677**	**645**	**608**	**583**	**566**	**553**	**541**
	LH open fireplace	0	14	18	19	19	18	17	15	14	14	13
	LH closed fireplace/inset	0	18	41	49	55	58	60	60	58	56	55
	LH wood stove	0	39	38	38	38	37	36	35	34	33	32
	LH coal stove	0	27	15	13	11	10	8	6	5	4	3
	LH cooker	0	7	11	12	14	15	15	15	14	14	14
	LH SHR stove	0	17	21	23	25	27	30	33	35	36	36
	LH pellet stove	0		8	11	14	16	17	18	18	18	17
	LH open fire gas	0	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	14	13	12	12	11	10	9	9	9	9
	LH flueless fuel heater	0	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	1	70	70	68	62	59	59	60	59	58	56
	LH elec.convector	1	291	289	283	266	257	261	263	259	252	246
	LH elec.storage	1	22	21	21	19	18	17	17	17	17	16
	LH elec.underfloor	1	40	41	40	38	37	36	35	33	32	32
	LH luminous heaters	0	5	5	5	5	5	4	4	4	4	4
	LH tube heaters	0	12	12	12	11	11	10	10	9	9	9
	LH total		**575**	**603**	**607**	**590**	**578**	**581**	**580**	**569**	**555**	**543**
	RAC (cooling demand), all types <12 kW	1	6	46	51	53	62	68	72	74	77	79
	RAC (heating demand), reversible <12kW	1	4	55	73	89	107	112	111	108	104	100
	Total RAC Room Air Conditioner		**11**	**102**	**124**	**143**	**168**	**181**	**183**	**182**	**181**	**179**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**40**	**51**	**36**	**27**	**26**	**27**	**27**	**26**	**25**	**24**
	TOTAL SPACE HEATING		**3760**	**3382**	**2994**	**2590**	**2266**	**2065**	**1936**	**1823**	**1715**	**1603**
	TOTAL SPACE COOLING		**210**	**426**	**464**	**479**	**480**	**472**	**468**	**467**	**468**	**468**
	NRVU electricity	1	47	153	169	171	166	159	161	166	172	180
1	NRVU heat (negative=saving vs. natural ventilation)	0	-136	-636	-777	-925	-1054	-1157	-1228	-1291	-1354	-1417
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	19	38	40	34	27	22	23	24	26	28
	RVU Central Balanced VU ≤125W/fan (2 fans)	1	0	3	4	6	8	9	10	11	12	13
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	1	0	0	1	1	1	2	3	3	4	5
1	RVU Central Unidir., heat (negative=saving)	0	-16	-32	-46	-61	-75	-88	-93	-99	-106	-113
1	RVU Central Balanced, heat (negative=saving)	0	-1	-8	-17	-31	-46	-60	-69	-76	-83	-90
1	RVU Local Balanced, heat (negative=saving)	0	0	-1	-2	-5	-8	-13	-17	-21	-26	-30
	Total VU (electricity + (negative) heat saving vs. natural ventilation)		**-86**	**-483**	**-630**	**-810**	**-982**	**-1125**	**-1210**	**-1283**	**-1354**	**-1425**
	TOTAL VENTILATION (electricity +(negative) extra heat savings versus BAU)		**67**	**194**	**183**	**123**	**75**	**43**	**52**	**68**	**85**	**103**

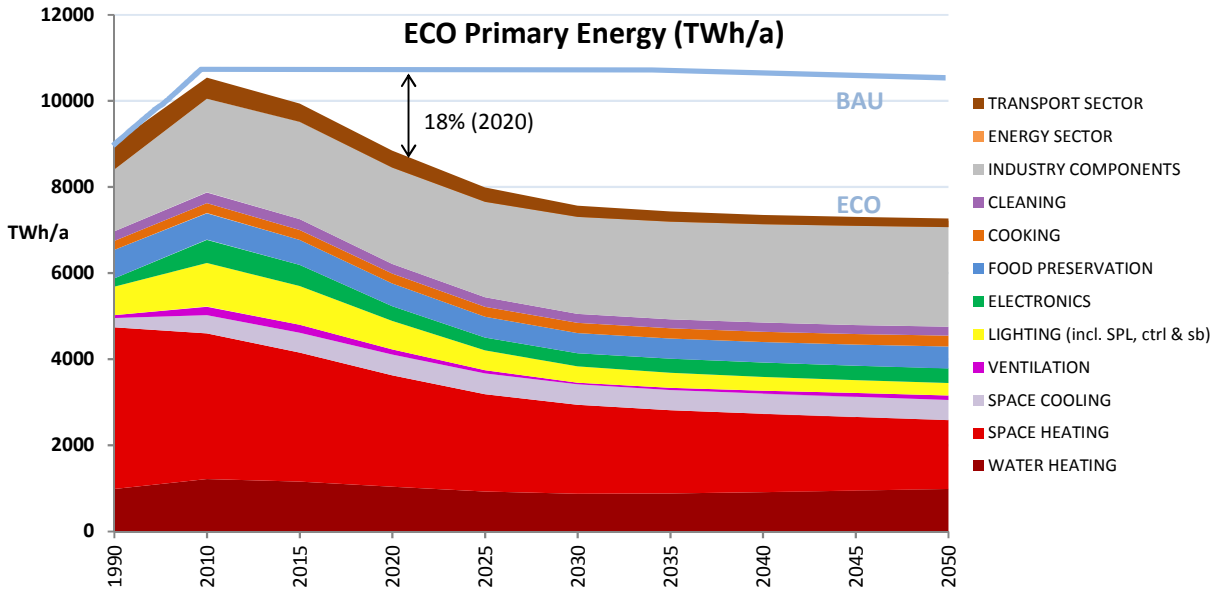
db	ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources ECO											
	LFL Linear Fluorescent	1	203	313	333	274	181	108	75	51	27	10
	CFL Compact Fluorescent	1	9	67	79	64	21	5	0	0	0	0
	Tungsten	1	22	132	129	56	7	1	1	1	1	1
	GLS GeneralLighting Service (incandescent)	1	210	110	7							
	HID High Intensity Discharge	1	89	189	121	68	38	22	22	23	24	24
	LED Light Emitting Diode	1		0	9	54	101	140	153	152	152	158
	SP Special Purpose (exempt)	1	*100*	*151*	*132*	*112*	*92*	*76*	*76*	*76*	*76*	*76*
	lighting controls & sb	1	*28*	*43*	*37*	*31*	*26*	*21*	*21*	*21*	*21*	*21*
	GLS stock	1		11	34							
	Tungsten stock	1			18	3						
	TOTAL LIGHTING (incl. SPL, ctrl & sb)		**661**	**1017**	**900**	**661**	**465**	**373**	**349**	**324**	**302**	**291**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)		**533**	**823**	**731**	**518**	**347**	**276**	**252**	**227**	**205**	**194**
	DP TV, on mode	1	68.2	212.6	165.9	58.2	30.4	31.1	33.2	40.0	47.7	56.1
	DP Monitor, on mode	1	2.7	28.1	19.5	4.0	1.4	1.6	1.8	2.0	2.2	2.3
	DP TV , sb mode	1	9.5	12.6	15.2	25.6	20.1	22.0	23.9	25.9	27.9	29.9
	DP Monitor, sb mode	1	0.4	1.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	DP Total electronic DisPlays	1	**81**	**255**	**201**	**88**	**52**	**55**	**59**	**68**	**78**	**88**
	SSTB	1	0	5	4	0	0	0	0	0	0	0
	CSTB	1	0	18	38	37	38	37	39	42	45	48
	Total STB set top boxes (Complex & Simple)		**0**	**22**	**41**	**37**	**38**	**37**	**39**	**42**	**45**	**48**
	VIDEO players/recorders	1	0	5	7	2	0	0	0	0	0	0
	VIDEO projectors	1	0	5	5	3	1	0	0	0	0	0
	VIDEO game consoles	1	0	11	19	25	31	32	32	32	32	32
	Total VIDEO		**0**	**22**	**30**	**29**	**32**	**33**	**32**	**32**	**32**	**32**
	ES Rack servers	1	1	46	54	53	52	63	76	74	74	74
	ES Blade servers	1	1	11	12	11	10	12	14	14	14	14
	ES Storage	1	0	5	5	4	4	4	4	4	4	4
	Total ES Enterprise Servers		**2**	**62**	**71**	**68**	**66**	**79**	**95**	**92**	**92**	**92**
	PC Desktop	1	36	54	32	12	7	7	7	7	7	7
	PC Notebook	1	0	19	10	3	2	2	2	2	2	2
	PC Tablet/slate	1	0	0	4	4	4	4	5	5	5	5
	PC Thin client	1	0	1	0	0	0	0	0	0	0	0
	PC Workstation	1	0	3	2	1	1	1	1	1	1	1
	Total PC, electricity		**36**	**76**	**48**	**20**	**13**	**14**	**14**	**14**	**15**	**15**
	EP-Copier mono	1	26	2	1	0	0	0	0	0	0	0
	EP-Copier colour	1	0	0	1	1	1	1	2	2	2	2
	EP-printer mono	1	24	5	3	2	2	1	1	1	1	1
	EP-printer colour	1	0	3	2	2	2	3	3	4	4	4
	IJ SFD printer	1	3	1	0	0	0	0	0	0	0	0
	IJ MFD printer	1	3	2	1	1	1	1	1	2	2	2
	Total imaging equipment, electricity		**56**	**13**	**7**	**7**	**7**	**7**	**8**	**8**	**8**	**9**
	SB Home Gateway, on-mode hours	1	0.0	10.2	12.2	13.5	14.1	14.0	13.2	11.8	9.6	6.8
	SB Home NAS, on-mode hours	1	0.0	0.5	1.0	1.3	1.5	1.6	1.6	1.5	1.2	0.9
	SB Home Phones (fixed), on-mode hours	1	0.2	1.1	1.3	1.3	1.2	1.0	0.8	0.6	0.5	0.3
	SB Office Phones (fixed), on-mode hours	1	0.5	1.6	1.5	1.5	1.3	1.2	1.1	0.9	0.7	0.5
	SB Home Gateway, standby hours	1	0.0	5.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	1	0.0	0.8	1.5	2.0	2.4	2.5	2.5	2.3	1.9	1.4
	SB Home Phones (fixed), standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	1	0.0	10.4	18.5	26.5	28.5	28.3	26.8	23.8	19.5	13.8
	SB Home NAS, idle hours	1	0.0	0.3	0.3	0.1	0.1	0.2	0.2	0.2	0.3	0.3
	SB Home Phones (fixed), idle hours	1	1.3	9.7	10.7	11.0	9.8	8.4	6.9	5.5	4.1	2.6
	SB Office Phones (fixed), idle hours	1	1.9	6.7	6.4	6.1	5.6	5.0	4.4	3.7	2.8	1.9
	Total SB (networked) StandBy (rest)		**4**	**47**	**55**	**63**	**65**	**62**	**58**	**50**	**41**	**28**
	Total BC Battery Charged devices	1	**1**	**8**	**7**	**7**	**7**	**7**	**7**	**7**	**6**	**6**
	UPS below 1.5 kVA	1	1.8	3.8	3.8	1.3	0.5	0.5	0.6	0.7	0.7	0.7
	UPS 1.5 to 5 kVA	1	6.7	14.5	15.7	10.8	3.3	2.8	3.2	3.6	3.9	4.1
	UPS 5 to 10 kVA	1	0.8	1.8	2.0	2.0	1.8	2.0	2.3	2.5	2.8	2.9
	UPS 10 to 200 kVA	1	4.7	10.6	11.4	10.5	9.3	9.2	10.5	11.8	12.9	13.8
	Total UPS - Uninterrupted Power Supplies	**1**	**14**	**31**	**33**	**25**	**15**	**15**	**17**	**19**	**20**	**22**
	TOTAL ELECTRONICS		**194**	**537**	**493**	**342**	**294**	**307**	**327**	**332**	**337**	**340**
	Total RF household Refrigerators & Freezers	1	**344**	**260**	**215**	**180**	**151**	**129**	**106**	**86**	**72**	**67**
	CF open vertical chilled multi deck (RVC2)	1	37	36	33	27	20	17	17	17	17	18
	CF open horizontal frozen island (RHF4)	1	3	3	3	2	2	2	2	2	2	2
	CF other supermarket display (non-BCs)	1	65	66	64	58	51	49	50	52	53	55
	CF Plug in one door beverage cooler	1	46	45	42	34	26	24	25	26	26	27
	CF Plug in horizontal ice cream freezer	1	10	10	10	9	9	9	9	9	9	10
	CF Spiral vending machine	1	9	8	5	3	3	2	2	2	3	3
	Total CF Commercial Refrigeration		**170**	**168**	**157**	**133**	**109**	**102**	**105**	**108**	**111**	**115**

db	ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	1	4.5	6.2	6.5	5.8	4.5	4.4	4.6	4.8	5.0	5.2
	PF Storage cabinet Frozen Vertical (FV)	1	5.3	7.2	7.6	6.8	5.3	5.0	5.3	5.5	5.7	6.0
	PF Storage cabinet Chilled Horizontal (CH)	1	3.5	4.8	5.0	4.6	3.6	3.5	3.6	3.8	3.9	4.1
	PF Storage cabinet Frozen Horizontal (FH)	1	2.1	2.9	3.0	2.7	2.1	2.0	2.1	2.2	2.2	2.3
	PF Storage cabinets All types	**1**	**15**	**21**	**22**	**20**	**16**	**15**	**16**	**16**	**17**	**18**
	PF Process Chiller AC MT S ≤ 300 kW	1	8	17	20	23	25	27	29	32	34	37
	PF Process Chiller AC MT L > 300 kW	1	8	17	20	22	24	26	28	31	33	36
	PF Process Chiller AC LT S ≤ 200 kW	1	8	18	21	23	25	27	30	32	35	38
	PF Process Chiller AC LT L > 200 kW	1	8	18	21	24	26	28	31	33	36	39
	PF Process Chiller WC MT S ≤ 300 kW	1	2	5	6	6	7	7	8	9	10	10
	PF Process Chiller WC MT L > 300 kW	1	3	7	8	9	10	11	12	13	14	15
	PF Process Chiller WC LT S ≤ 200 kW	1	3	6	7	8	9	10	11	11	12	13
	PF Process Chiller WC LT L > 200 kW	1	4	8	9	10	11	12	13	14	16	17
	PF Process Chiller All MT&LT	**1**	**44**	**96**	**113**	**127**	**138**	**148**	**162**	**176**	**191**	**205**
	PF Condensing Unit MT S 0.2-1 kW	1	16	13	13	12	13	14	15	16	17	19
	PF Condensing Unit MT M 1-5 kW	1	42	33	32	32	33	36	39	42	45	48
	PF Condensing Unit MT L 5-20 kW	1	51	41	39	39	40	43	47	50	54	59
	PF Condensing Unit MT XL 20-50 kW	1	51	40	39	39	40	43	47	50	54	59
	PF Condensing Unit LT S 0.1-0.4 kW	1	2	2	2	2	2	2	2	2	2	2
	PF Condensing Unit LT M 0.4-2 kW	1	8	6	6	6	6	6	7	7	8	9
	PF Condensing Unit LT L 2-8 kW	1	13	10	10	9	9	10	11	12	13	13
	PF Condensing Unit LT XL 8-20 kW	1	39	31	30	30	31	33	36	39	41	45
0.6	**PF Condensing Unit, All MT&LT**	**1**	**222**	**177**	**170**	**169**	**175**	**188**	**203**	**218**	**235**	**253**
	PF Professional Refrigeration, Total		**148**	**188**	**203**	**214**	**223**	**238**	**258**	**280**	**302**	**324**
	TOTAL FOOD PRESERVATION		**663**	**616**	**575**	**527**	**484**	**470**	**469**	**474**	**485**	**506**
	CA El. Hobs	1	51	78	87	94	101	107	113	118	123	128
	CA El. Ovens	1	59	59	55	51	48	48	48	48	48	49
	CA Gas Hobs	0	35	29	28	27	25	24	23	21	20	19
	CA Gas Ovens	0	14	10	9	8	7	6	5	5	5	5
	CA Range Hoods	1	25	31	32	32	31	29	29	30	31	32
	Total CA Cooking Appliances		**184**	**207**	**211**	**212**	**212**	**214**	**217**	**222**	**227**	**232**
	CM Dripfilter (glass)	1	15.7	11.0	9.7	8.1	7.2	7.2	7.2	7.2	7.2	7.2
	CM Dripfilter (thermos)	1	0.9	2.6	2.7	2.7	2.8	2.8	2.8	2.9	2.9	2.9
	CM Dripfilter (full automatic)	1	0.0	1.2	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7
	CM Pad filter	1	0.0	1.3	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4
	CM Hard cap espresso	1	0.0	0.4	0.6	1.0	1.3	1.3	1.3	1.3	1.3	1.3
	CM Semi-auto espresso	1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	CM Fully-auto espresso	1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	CM Dripfilter (glass), standby/keep warm	1	10.9	7.6	6.0	2.9	2.5	2.5	2.5	2.5	2.5	2.5
	CM Dripfilter (thermos), standby/keep warm	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	1	0.0	1.4	1.4	0.9	0.9	1.0	1.1	1.1	1.2	1.3
	CM Hard cap espresso, standby/keep warm	1	0.0	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
	CM Semi-auto espresso, standby/keep warm	1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CM Fully-auto espresso, standby/keep warm	1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	Total CM household Coffee Makers	1	**28**	**27**	**24**	**20**	**20**	**20**	**20**	**21**	**21**	**22**
	TOTAL COOKING		**212**	**234**	**236**	**232**	**232**	**234**	**238**	**243**	**249**	**254**
	Total WM household Washing Machine	1	**132**	**87**	**71**	**59**	**49**	**42**	**39**	**38**	**38**	**38**
	Total DW household Dishwasher	1	**32**	**46**	**50**	**54**	**59**	**63**	**67**	**71**	**73**	**76**
	LD vented el.	1	21	28	29	28	26	25	25	25	26	26
	LD condens el.	1	4	35	42	45	43	40	38	36	35	34
	LD vented gas	0	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier		**25**	**63**	**71**	**72**	**69**	**65**	**63**	**62**	**61**	**60**
	VC dom	1	26	42	46	25	31	30	29	28	26	23
	VC nondom	1	8	12	12	10	10	10	10	10	11	11
	Total VC Vacuum Cleaner		**33**	**54**	**57**	**35**	**41**	**40**	**39**	**38**	**36**	**34**
	TOTAL CLEANING		**222**	**250**	**249**	**221**	**217**	**211**	**209**	**209**	**209**	**208**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	48	132	149	155	159	162	162	162	162	162
0.5	FAN Axial>300Pa	1	82	242	272	275	271	268	266	266	266	266
0.5	FAN Centr.FC	1	20	43	50	50	49	48	48	48	48	48
0.5	FAN Centr.BC-free	1	53	111	127	132	137	146	154	159	162	165
0.5	FAN Centr.BC	1	55	125	143	148	154	165	178	191	207	225
0.5	FAN Cross-flow	1	3	6	6	4	4	4	4	4	5	5
	Total FAN, industrial (excl. box & roof fans)		**131**	**329**	**374**	**383**	**387**	**396**	**406**	**415**	**425**	**435**
0.5	**Total MT Motors 0.75-375 kW**	**1**	**2044**	**2807**	**2865**	**2794**	**2721**	**2740**	**2737**	**2737**	**2737**	**2737**
	Total WP Water Pumps	1	**220**	**295**	**315**	**334**	**357**	**384**	**410**	**437**	**464**	**491**

db	ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CP Fixed Speed 5-1280 l/s	1	59	121	102	87	84	86	89	92	94	97
	CP Variable speed 5-1280 l/s	1	0	22	39	50	54	56	58	59	60	62
	CP Pistons 2-64 l/s	1	3	4	4	4	4	4	4	4	4	4
	Total CP Standard Air Compressors		**63**	**147**	**145**	**141**	**142**	**146**	**150**	**155**	**159**	**163**
	TOTAL INDUSTRY COMPONENTS		1437	2176	2266	2255	2247	2296	2335	2375	2416	2457
	TRAFO Distribution	1	30	50	55	57	59	61	63	65	66	67
	TRAFO Industry oil	1	22	39	42	42	41	39	38	37	40	43
	TRAFO Industry dry	1	7	12	13	14	14	15	15	15	16	17
	TRAFO Power	1	86	133	149	165	181	197	213	228	245	262
	TRAFO DER oil	1		1	2	3	4	7	10	15	21	28
	TRAFO DER dry	1		5	9	14	21	34	53	79	112	149
	TRAFO Small	1	5	5	5	5	5	5	5	5	5	5
	Total TRAFO Utility Transformers		**151**	**246**	**274**	**299**	**326**	**358**	**397**	**445**	**505**	**571**
	TOTAL ENERGY SECTOR (only improvement over BAU)		0	0	-4	-16	-30	-47	-68	-92	-115	-139
	TYRE car replacement tyres C1		299	262	233	215	191	144	124	117	109	102
	TYRE van replacement tyres C2		119	99	85	75	61	51	48	46	43	40
	TYRE truck replacement tyres C3		179	131	105	102	86	71	63	60	56	52
	TYRE Replacement Tyres		**597**	**492**	**423**	**392**	**339**	**266**	**236**	**222**	**208**	**195**
	TOTAL TRANSPORT SECTOR		597	492	423	392	339	266	236	222	208	195
	GENERAL TOTAL (in TWh primary)		**9004**	**10541**	**9935**	**8840**	**7990**	**7566**	**7427**	**7351**	**7302**	**7266**
	GENERAL TOTAL (in PJ primary)		32414	37946	35766	31825	28763	27239	26736	26465	26286	26159
	TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		774	906	854	760	687	651	639	632	628	625

ECO Primary energy (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	981	1217	1157	1034	921	876	878	906	943	981
SPACE HEATING	3760	3382	2994	2590	2266	2065	1936	1823	1715	1603
SPACE COOLING	210	426	464	479	480	472	468	467	468	468
VENTILATION	67	194	183	123	75	43	52	68	85	103
LIGHTING (incl. SPL, ctrl & sb)	661	1017	900	661	465	373	349	324	302	291
ELECTRONICS	194	537	493	342	294	307	327	332	337	340
FOOD PRESERVATION	663	616	575	527	484	470	469	474	485	506
COOKING	212	234	236	232	232	234	238	243	249	254
CLEANING	222	250	249	221	217	211	209	209	209	208
INDUSTRY COMPONENTS	1437	2176	2266	2255	2247	2296	2335	2375	2416	2457
ENERGY SECTOR	0	0	-4	-16	-30	-47	-68	-92	-115	-139
TRANSPORT SECTOR	597	492	423	392	339	266	236	222	208	195
TOTAL in TWh primary	**9004**	**10541**	**9935**	**8840**	**7990**	**7566**	**7427**	**7351**	**7302**	**7266**
TOTAL (in PJ primary)	32414	37946	35766	31825	28763	27239	26736	26465	26286	26159
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	774	906	854	760	687	651	639	632	628	625

Compare: In 2010 the EU energy consumption amounted to 1759 mtoe. The above represents thus around 51%



ECO Primary energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	635	787	748	668	595	566	567	585	609	634
SPACE HEATING	2297	1953	1727	1493	1309	1196	1125	1064	1007	949
SPACE COOLING	4	24	26	27	31	34	35	36	37	37
VENTILATION	20	42	34	14	-2	-11	-9	-6	-4	-2
LIGHTING	176	220	182	94	42	34	32	31	30	30
ELECTRONICS	106	352	322	215	186	188	190	195	198	199
FOOD PRESERVATION	317	239	198	165	139	119	97	79	67	62
COOKING	185	208	210	209	209	212	216	222	227	233
CLEANING	207	230	228	201	199	192	189	189	189	188
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	239	210	186	172	153	115	99	93	88	82
TOTAL in TWh primary	**4186**	**4263**	**3862**	**3258**	**2862**	**2644**	**2543**	**2489**	**2447**	**2411**
TOTAL (in PJ primary)	15070	15347	13903	11730	10302	9517	9153	8959	8809	8681
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	360	367	332	280	246	227	219	214	210	207

ECO Primary energy (summary TERTIARY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	302	373	354	317	282	268	269	277	289	300
SPACE HEATING	916	924	834	734	653	603	569	536	503	469
SPACE COOLING	136	281	306	316	313	307	303	300	298	295
VENTILATION	41	131	128	94	66	47	52	64	77	90
LIGHTING	376	630	560	441	327	262	245	228	212	203
ELECTRONICS	77	163	151	112	94	104	119	119	121	123
FOOD PRESERVATION	280	265	251	223	195	192	198	206	216	226
COOKING	27	26	25	24	23	22	21	21	21	21
CLEANING	14	19	19	18	17	18	18	18	18	19
INDUSTRY COMPONENTS	370	618	662	667	670	686	701	716	731	747
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	224	177	149	138	117	95	86	81	76	71
TOTAL in TWh primary	**2763**	**3608**	**3440**	**3083**	**2759**	**2603**	**2580**	**2566**	**2561**	**2564**
TOTAL (in PJ primary)	9946.2	12989	12385	11099	9931	9371	9289	9238	9220	9230
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	238	310	296	265	237	224	222	221	220	220

ECO Primary energy (summary INDUSTRY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	35	45	43	39	35	33	33	34	36	37
SPACE HEATING	425	392	336	280	234	204	186	171	157	142
SPACE COOLING	55	96	104	107	106	103	102	102	103	105
VENTILATION	6	18	18	13	9	7	7	9	11	13
LIGHTING	100	155	147	120	91	74	68	63	58	55
ELECTRONICS	9	18	16	13	12	13	15	15	15	15
FOOD PRESERVATION	54	98	112	123	133	143	155	169	182	196
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	1	1	1	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	862	1271	1308	1289	1274	1294	1307	1320	1334	1348
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	116	91	76	71	59	48	44	42	39	36
TOTAL in TWh primary	**1662**	**2185**	**2161**	**2057**	**1954**	**1920**	**1919**	**1926**	**1936**	**1948**
TOTAL (in PJ primary)	5984	7864	7778	7404	7033	6912	6907	6933	6969	7014
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	143	188	186	177	168	165	165	166	166	168

ECO Primary energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	10	12	12	10	9	9	9	9	9	10
SPACE HEATING	122	113	98	83	70	61	56	52	48	44
SPACE COOLING	16	26	28	29	29	29	29	29	30	30
VENTILATION	1	3	3	2	2	1	1	1	2	2
LIGHTING	9	12	10	7	5	4	3	3	3	3
ELECTRONICS	2	3	3	2	2	2	3	3	3	3
FOOD PRESERVATION	11	14	15	15	16	17	18	19	21	22
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	205	287	296	298	304	316	327	339	351	362
ENERGY SECTOR	0	0	-4	-16	-30	-47	-68	-92	-115	-139
TRANSPORT SECTOR	18	14	12	11	9	8	7	6	6	6
TOTAL in TWh primary	**393**	**485**	**472**	**443**	**416**	**400**	**385**	**371**	**358**	**343**
TOTAL (in PJ primary)	1415	1747	1701	1593	1498	1440	1387	1336	1288	1234
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	34	42	41	38	36	34	33	32	31	29

ECO Primary energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	981	1217	1157	1034	921	876	878	906	943	981
	Residential	635	787	748	668	595	566	567	585	609	634
	Tertiary	302	373	354	317	282	268	269	277	289	300
	Industry	35	45	43	39	35	33	33	34	36	37
	Other	10	12	12	10	9	9	9	9	9	10
SPACE HEATING.	All sectors, TWh	3760	3382	2994	2590	2266	2065	1936	1823	1715	1603
	Residential	2297	1953	1727	1493	1309	1196	1125	1064	1007	949
	Tertiary	916	924	834	734	653	603	569	536	503	469
	Industry	425	392	336	280	234	204	186	171	157	142
	Other	122	113	98	83	70	61	56	52	48	44
SPACE COOLING.	All sectors, TWh	210	426	464	479	480	472	468	467	468	468
& HT PROCESS	Residential	4	24	26	27	31	34	35	36	37	37
	Tertiary	136	281	306	316	313	307	303	300	298	295
	Industry	55	96	104	107	106	103	102	102	103	105
	Other	16	26	28	29	29	29	29	29	30	30
VENTILATION.	All sectors, TWh	67	194	183	123	75	43	52	68	85	103
	Residential	20	42	34	14	-2	-11	-9	-6	-4	-2
	Tertiary	41	131	128	94	66	47	52	64	77	90
	Industry	6	18	18	13	9	7	7	9	11	13
	Other	1	3	3	2	2	1	1	1	2	2
LIGHTING.	All sectors, TWh	661	1017	900	661	465	373	349	324	302	291
	Residential	176	220	182	94	42	34	32	31	30	30
	Tertiary	376	630	560	441	327	262	245	228	212	203
	Industry	100	155	147	120	91	74	68	63	58	55
	Other	9	12	10	7	5	4	3	3	3	3
ELECTRONICS.	All sectors, TWh	194	537	493	342	294	307	327	332	337	340
	Residential	106	352	322	215	186	188	190	195	198	199
	Tertiary	77	163	151	112	94	104	119	119	121	123
	Industry	9	18	16	13	12	13	15	15	15	15
	Other	2	3	3	2	2	2	3	3	3	3
FOOD PRESERVE.	All sectors, TWh	663	616	575	527	484	470	469	474	485	506
	Residential	317	239	198	165	139	119	97	79	67	62
	Tertiary	280	265	251	223	195	192	198	206	216	226
	Industry	54	98	112	123	133	143	155	169	182	196
	Other	11	14	15	15	16	17	18	19	21	22
COOKING.	All sectors, TWh	212	234	236	232	232	234	238	243	249	254
	Residential	185	208	210	209	209	212	216	222	227	233
	Tertiary	27	26	25	24	23	22	21	21	21	21
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	222	250	249	221	217	211	209	209	209	208
	Residential	207	230	228	201	199	192	189	189	189	188
	Tertiary	14	19	19	18	17	18	18	18	18	19
	Industry	1	1	1	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	1437	2176	2266	2255	2247	2296	2335	2375	2416	2457
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary	370	618	662	667	670	686	701	716	731	747
	Industry	862	1271	1308	1289	1274	1294	1307	1320	1334	1348
	Other	205	287	296	298	304	316	327	339	351	362
ENERGY SECTOR.	All sectors, TWh	0	0	-4	-16	-30	-47	-68	-92	-115	-139
(BAU=0)	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	-4	-16	-30	-47	-68	-92	-115	-139
TRANSPORT SECTOR.	All sectors, TWh	597	492	423	392	339	266	236	222	208	195
(tyres)	Residential	239	210	186	172	153	115	99	93	88	82
	Tertiary	224	177	149	138	117	95	86	81	76	71
	Industry	116	91	76	71	59	48	44	42	39	36
	Other	18	14	12	11	9	8	7	6	6	6
ALL PRODUCTS.	All sectors, TWh	9004	10541	9935	8840	7990	7566	7427	7351	7302	7266
	Residential	4186	4263	3862	3258	2862	2644	2543	2489	2447	2411
	Tertiary	2763	3608	3440	3083	2759	2603	2580	2566	2561	2564
	Industry	1662	2185	2161	2057	1954	1920	1919	1926	1936	1948
	Other	393	485	472	443	416	400	385	371	358	343

ECO Primary energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
	Tertiary	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
	Industry	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	61%	58%	58%	58%	58%	58%	58%	58%	59%	59%
	Tertiary	24%	27%	28%	28%	29%	29%	29%	29%	29%	29%
	Industry	11%	12%	11%	11%	10%	10%	10%	9%	9%	9%
	Other	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
SPACE COOLING.											
& HT PROCESS	Residential	2%	6%	6%	6%	6%	7%	7%	8%	8%	8%
	Tertiary	65%	66%	66%	66%	65%	65%	65%	64%	64%	63%
	Industry	26%	22%	22%	22%	22%	22%	22%	22%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION.											
	Residential	29%	21%	19%	11%	-2%	-26%	-16%	-9%	-5%	-1%
	Tertiary	61%	68%	70%	76%	88%	108%	100%	94%	90%	87%
	Industry	8%	9%	10%	11%	12%	15%	14%	13%	13%	12%
	Other	1%	2%	2%	2%	2%	3%	2%	2%	2%	2%
LIGHTING.											
	Residential	27%	22%	20%	14%	9%	9%	9%	10%	10%	10%
	Tertiary	57%	62%	62%	67%	70%	70%	70%	70%	70%	70%
	Industry	15%	15%	16%	18%	20%	20%	20%	19%	19%	19%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	55%	66%	65%	63%	63%	61%	58%	59%	59%	59%
	Tertiary	40%	30%	31%	33%	32%	34%	36%	36%	36%	36%
	Industry	5%	3%	3%	4%	4%	4%	5%	5%	5%	5%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
FOOD PRESERVE.											
	Residential	48%	39%	34%	31%	29%	25%	21%	17%	14%	12%
	Tertiary	42%	43%	44%	42%	40%	41%	42%	44%	44%	45%
	Industry	8%	16%	19%	23%	28%	30%	33%	36%	38%	39%
	Other	2%	2%	3%	3%	3%	4%	4%	4%	4%	4%
COOKING.											
	Residential	87%	89%	89%	90%	90%	91%	91%	91%	91%	92%
	Tertiary	13%	11%	11%	10%	10%	9%	9%	9%	9%	8%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	93%	92%	92%	91%	91%	91%	91%	91%	90%	90%
	Tertiary	6%	8%	8%	8%	8%	8%	9%	9%	9%	9%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary	26%	28%	29%	30%	30%	30%	30%	30%	30%	30%
	Industry	60%	58%	58%	57%	57%	56%	56%	56%	55%	55%
	Other	14%	13%	13%	13%	14%	14%	14%	14%	15%	15%
ENERGY SECTOR.											
(ref. BAU=0)	Residential			0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary			0%	0%	0%	0%	0%	0%	0%	0%
	Industry			0%	0%	0%	0%	0%	0%	0%	0%
	Other			100%	100%	100%	100%	100%	100%	100%	100%
TRANSPORT SECTOR.											
(tyres)	Residential	40%	43%	44%	44%	45%	43%	42%	42%	42%	42%
	Tertiary	37%	36%	35%	35%	35%	36%	36%	36%	36%	36%
	Industry	19%	18%	18%	18%	18%	18%	19%	19%	19%	19%
	Other	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	46%	40%	39%	37%	36%	35%	34%	34%	34%	33%
	Tertiary	31%	34%	35%	35%	35%	34%	35%	35%	35%	35%
	Industry	18%	21%	22%	23%	24%	25%	26%	26%	27%	27%
	Other	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%

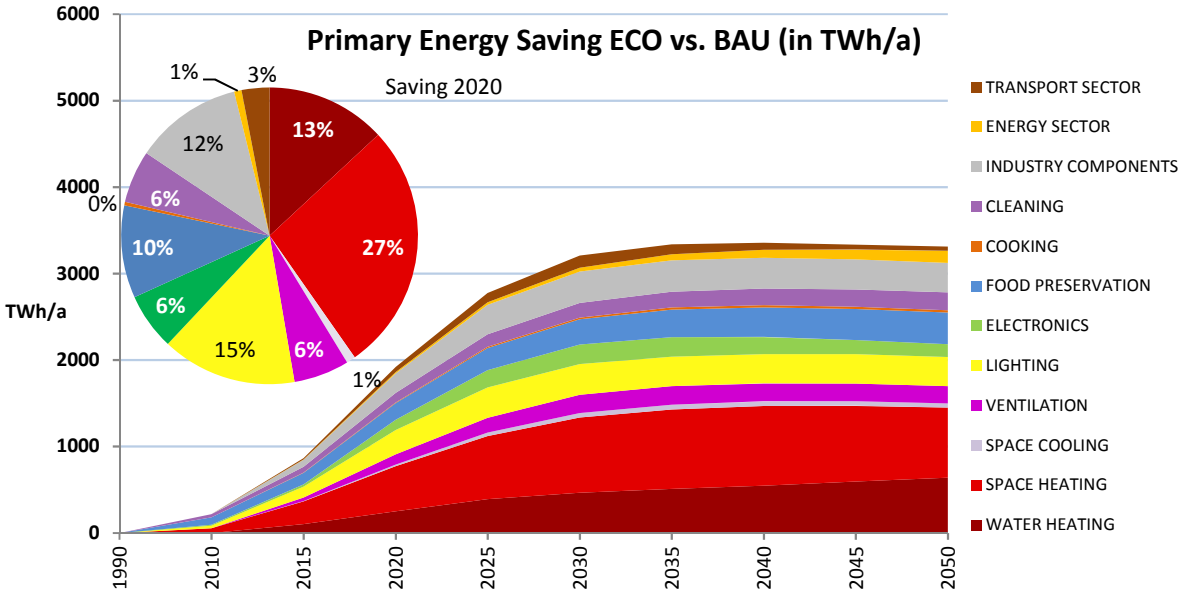
db	SAVED Primary Energy (BAU-ECO, in TWh primary)	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**0**	**0**	**0**	**79**	**177**	**262**	**293**	**304**	**314**	**329**	**345**
	Total CH Central Heating combi, water heat	0	**0**	**0**	**21**	**74**	**129**	**173**	**205**	**233**	**263**	**294**
	TOTAL WATER HEATING		**0**	**0**	**100**	**251**	**392**	**466**	**508**	**547**	**592**	**639**
	CH non-electric	0	*0*	*47*	*240*	*450*	*618*	*759*	*820*	*838*	*816*	*772*
	CH electric resistance boiler, 1st estimate	1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	CH heat pump, 1st estimate	1	*0*	*0*	*-5*	*-7*	*-20*	*-34*	*-48*	*-62*	*-75*	*-89*
	CH auxiliary electricity (incl. circulator), 1st estimate	1	*0*	*6*	*17*	*24*	*40*	*42*	*43*	*41*	*38*	*35*
	Total CH Central Heating boiler, space heat	0	**0**	**53**	**252**	**467**	**638**	**766**	**816**	**818**	**779**	**718**
	SFB Wood Manual	0	0.0	0.0	0.5	2.7	4.0	4.2	3.5	2.4	1.8	1.4
	SFB Wood Direct Draft	0	0.0	0.0	0.0	0.0	0.4	0.8	1.2	1.5	1.7	1.9
	SFB Coal	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	SFB Pellets	0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
	SFB Wood chips	0	0.0	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.3	0.3
	Total Solid Fuel Boiler		**0.0**	**0.0**	**0.5**	**2.9**	**4.8**	**5.7**	**5.4**	**4.7**	**4.2**	**4.1**
	CHAE-S (≤ 400 kW)	1	0.0	0.0	0.0	0.2	0.9	1.6	2.1	2.1	1.6	0.9
	CHAE-L (> 400 kW)	1	0.0	0.0	0.0	0.6	1.8	2.4	2.6	2.7	2.5	2.0
	CHWE-S (≤ 400 kW)	1	0.00	0.00	0.00	0.01	0.02	0.03	0.03	0.02	0.01	0.00
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
	CHWE-L (> 1500 kW)	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
	CHF	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	HT PCH-AE-S	1	0.0	0.0	0.1	2.7	6.6	9.8	10.5	9.6	8.3	7.0
	HT PCH-AE-L	1	0.0	0.0	0.2	3.0	7.8	12.5	15.0	15.3	14.5	13.3
	HT PCH-WE-S	1	0.0	0.0	0.0	0.3	0.7	1.0	1.0	0.7	0.4	0.2
	HT PCH-WE-M	1	0.0	0.0	0.0	0.5	1.1	1.4	1.2	0.5	0.2	0.0
	HT PCH-WE-L	1	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.6	0.5	0.4
	AC rooftop	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	AC splits	1	0.0	0.0	0.1	1.1	2.1	2.7	2.5	2.0	1.6	1.3
	AC VRF	1	0.0	0.0	0.0	0.4	1.1	2.1	2.7	2.9	2.8	2.5
	ACF	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SubTotal AHC central Air Cooling		**0**	**0**	**0**	**9**	**23**	**34**	**39**	**37**	**33**	**28**
	AC rooftop (rev)	1	0.0	0.0	0.1	1.1	2.0	2.1	1.2	0.3	0.0	0.0
	AC splits (rev)	1	0.0	0.0	0.1	1.6	3.1	4.0	3.5	2.8	2.0	1.4
	AC VRF (rev)	1	0.0	0.0	0.0	0.2	1.0	2.3	3.4	3.5	2.9	2.0
	ACF (rev)	0	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01
	AHF	0	0.0	0.0	0.2	4.2	9.6	13.4	13.9	12.4	10.8	9.2
	AHE	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1
	SubTotal AHC central Air Heating		**0**	**0**	**0**	**7**	**16**	**22**	**22**	**19**	**16**	**13**
	Total AHC central Air Heating & Cooling		**0**	**0**	**1**	**16**	**39**	**56**	**61**	**56**	**49**	**41**
	LH open fireplace	0	0.0	0.0	0.0	0.8	2.7	4.2	5.5	6.5	7.1	7.1
	LH closed fireplace/inset	0	0.0	0.0	0.0	1.0	3.4	5.3	6.9	8.3	8.9	8.5
	LH wood stove	0	0.0	0.0	0.0	0.6	2.0	3.2	4.1	4.9	5.3	5.0
	LH coal stove	0	0.0	0.0	0.0	0.1	0.4	0.5	0.6	0.6	0.6	0.5
	LH cooker	0	0.0	0.0	0.0	0.2	0.8	1.2	1.4	1.3	1.2	1.2
	LH SHR stove	0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.2	0.1
	LH pellet stove	0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.2	0.2
	LH open fire gas	0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.4	0.4	0.4
	LH closed fire gas	0	0.0	0.0	0.0	0.3	1.2	1.8	2.3	2.5	2.5	2.4
	LH flueless fuel heater	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.portable	1	0.0	0.0	1.4	6.6	9.2	8.2	7.5	7.2	7.0	6.8
	LH elec.convector	1	0.0	0.0	3.6	17.5	23.9	19.6	16.3	15.4	15.0	14.6
	LH elec.storage	1	0.0	0.0	0.4	1.9	3.1	3.8	3.6	3.5	3.3	3.3
	LH elec.underfloor	1	0.0	0.0	0.4	1.9	3.3	4.3	5.1	5.9	6.3	6.1
	LH luminous heaters	0	0.0	0.0	0.0	0.2	0.3	0.4	0.3	0.3	0.3	0.3
	LH tube heaters	0	0.0	0.0	0.0	0.3	0.5	0.7	0.8	0.7	0.6	0.6
	LH total		**0**	**0**	**6**	**32**	**52**	**54**	**55**	**58**	**59**	**57**
	RAC (cooling demand), all types <12 kW	1	0	0	4	10	15	17	18	18	19	20
	RAC (heating demand), reversible <12kW	1	0	0	5	12	19	20	20	19	18	18
	Total RAC Room Air Conditioner		**0**	**0**	**9**	**22**	**34**	**37**	**38**	**38**	**37**	**37**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**0**	**2**	**18**	**28**	**31**	**33**	**33**	**31**	**29**	**27**
	TOTAL SPACE HEATING		**0**	**53**	**264**	**521**	**729**	**868**	**919**	**919**	**877**	**809**
	TOTAL SPACE COOLING		**0**	**0**	**4**	**19**	**38**	**51**	**56**	**55**	**52**	**47**
	NRVU electricity	1	0	0	4	15	26	35	37	37	37	38
1	NRVU heat (negative=saving vs. natural ventilation)	0	0	0	20	66	111	148	152	147	141	134
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	0	0	3	9	14	18	19	21	22	24
	RVU Central Balanced VU ≤125W/fan (2 fans)	1	0	0	1	3	6	9	10	11	13	14
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	1	0	0	0	0	1	1	2	2	3	3
1	RVU Central Unidir., heat (negative=saving)	0	0	0	10	26	41	54	57	62	66	70
1	RVU Central Balanced, heat (negative=saving)	0	0	0	1	2	4	5	6	6	7	8
1	RVU Local Balanced, heat (negative=saving)	0	0	0	0	1	2	2	3	4	5	6
	Total VU (electricity + (negative) heat saving vs. natural ventilation)		**0**	**0**	**40**	**121**	**205**	**274**	**287**	**290**	**293**	**295**
	TOTAL VENTILATION (electricity +(negative) extra heat savings versus BAU)		**-**	**-**	**40**	**116**	**174**	**213**	**212**	**207**	**204**	**200**

db	SAVED Primary Energy (BAU-ECO, in TWh primary)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources ECO											
	LFL Linear Fluorescent	1	0	0	10	60	143	203	220	228	237	242
	CFL Compact Fluorescent	1	0	0	11	19	35	39	38	34	30	27
	Tungsten	1	0	-1	9	80	86	65	47	33	25	22
	GLS GeneralLighting Service (incandescent)	1	0	44	108	84	52	17	4	0	0	0
	HID High Intensity Discharge	1	0	-1	49	84	104	119	119	119	118	117
	LED Light Emitting Diode	1	0	0	-7	-41	-69	-87	-85	-75	-69	-71
	SP Special Purpose (exempt)	1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	lighting controls & sb	1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	GLS stock	1	0	-11	-34	0	0	0	0	0	0	0
	Tungsten stock	1	0	0	-18	-3	0	0	0	0	0	0
	TOTAL LIGHTING (incl. SPL, ctrl & sb)		**0**	**29**	**128**	**282**	**351**	**356**	**343**	**339**	**341**	**337**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)		**0**	**29**	**128**	**282**	**351**	**356**	**343**	**339**	**341**	**337**
	DP TV, on mode	1	0.0	-0.5	4.7	51.7	86.0	94.6	87.5	64.1	30.4	19.3
	DP Monitor, on mode	1	0.0	-0.1	1.9	13.2	16.1	14.5	11.2	7.1	2.5	0.6
	DP TV , sb mode	1	0.0	0.0	-3.0	2.9	15.2	16.0	15.7	13.7	9.8	4.1
	DP Monitor, sb mode	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Total electronic DisPlays	1	**0**	**-1**	**4**	**68**	**117**	**125**	**114**	**85**	**43**	**24**
	SSTB	1	0.0	3.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	1	0.0	0.0	5.2	11.1	11.4	11.1	11.7	12.7	13.6	14.6
	Total STB set top boxes (Complex & Simple)		**0**	**4**	**5**	**11**	**11**	**11**	**12**	**13**	**14**	**15**
	VIDEO players/recorders	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	1	0.0	0.0	1.5	2.7	3.0	2.7	2.7	2.7	2.7	2.7
	Total VIDEO		**0.0**	**0.0**	**1.5**	**2.7**	**3.0**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**
	ES Rack servers	1	0.0	0.0	0.0	7.0	19.4	25.7	30.9	30.2	30.2	30.2
	ES Blade servers	1	0.0	0.0	0.0	1.4	3.7	4.8	5.8	5.5	5.5	5.5
	ES Storage	1	0.0	0.0	0.0	1.4	2.5	2.7	3.0	2.8	2.8	2.8
	Total ES Enterprise Servers		**0**	**0**	**0**	**10**	**26**	**33**	**40**	**39**	**39**	**39**
	PC Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	EP-Copier mono	1	0.0	1.4	1.2	0.5	0.3	0.2	0.1	0.0	0.0	0.0
	EP-Copier colour	1	0.0	0.1	1.4	2.5	3.0	3.3	3.5	3.8	4.1	4.4
	EP-printer mono	1	0.0	1.5	2.8	2.3	1.9	1.7	1.5	1.2	1.0	0.8
	EP-printer colour	1	0.0	0.2	3.0	4.4	5.3	6.2	7.1	8.0	8.9	9.8
	IJ SFD printer	1	0.0	0.7	0.7	0.5	0.3	0.3	0.2	0.2	0.1	0.1
	IJ MFD printer	1	0.0	1.4	2.9	3.3	3.6	3.9	4.3	4.6	4.9	5.2
	Total imaging equipment, electricity		**0**	**5**	**12**	**13**	**14**	**16**	**17**	**18**	**19**	**20**
	SB Home Gateway, on-mode hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, on-mode hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Phones (fixed), on-mode hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), on-mode hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Phones (fixed), standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	1	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, idle hours	1	0.0	0.0	0.2	0.5	0.6	0.6	0.6	0.5	0.3	0.1
	SB Home Phones (fixed), idle hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), idle hours	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total SB (networked) StandBy (rest)		**0.0**	**0.0**	**0.2**	**1.3**	**0.6**	**0.6**	**0.6**	**0.5**	**0.3**	**0.1**
	Total BC Battery Charged devices	1	**0.0**	**1.0**	**1.9**	**1.5**	**1.2**	**0.8**	**0.4**	**0.1**	**0.0**	**0.0**
	UPS below 1.5 kVA	1	0.0	0.0	0.0	3.2	4.9	5.7	6.4	7.1	7.6	8.0
	UPS 1.5 to 5 kVA	1	0.0	0.0	0.0	6.6	17.3	21.3	24.3	27.0	29.3	31.0
	UPS 5 to 10 kVA	1	0.0	0.0	0.0	0.3	0.8	1.1	1.2	1.4	1.5	1.6
	UPS 10 to 200 kVA	1	0.0	0.0	0.0	1.0	3.1	5.4	6.2	7.0	7.7	8.2
	Total UPS - Uninterrupted Power Supplies	**1**	**0**	**0**	**0**	**11**	**26**	**34**	**38**	**42**	**46**	**49**
	TOTAL ELECTRONICS		**0**	**9**	**25**	**119**	**200**	**223**	**224**	**200**	**163**	**149**
	Total RF household Refrigerators & Freezers	1	**0**	**87**	**133**	**168**	**196**	**218**	**241**	**259**	**272**	**276**
	CF open vertical chilled multi deck (RVC2)	1	0.0	0.0	0.3	4.1	10.4	13.0	12.7	12.7	12.9	13.1
	CF open horizontal frozen island (RHF4)	1	0.0	0.0	0.0	0.3	0.8	0.9	0.9	0.9	0.9	0.9
	CF other supermarket display (non-BCs)	1	0.0	0.0	0.6	5.4	12.5	16.2	17.7	18.6	19.2	19.9
	CF Plug in one door beverage cooler	1	0.0	0.0	0.2	5.5	12.9	14.8	14.6	14.9	15.4	15.9
	CF Plug in horizontal ice cream freezer	1	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.3	0.3
	CF Spiral vending machine	1	0.0	0.0	0.1	0.6	1.3	1.8	1.9	1.9	2.0	2.1
	Total CF Commercial Refrigeration		**0**	**0**	**1**	**16**	**38**	**47**	**48**	**49**	**51**	**52**

db	SAVED Primary Energy (BAU-ECO, in TWh primary)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	1	0.0	0.0	0.0	0.9	2.5	3.0	3.2	3.3	3.4	3.6
	PF Storage cabinet Frozen Vertical (FV)	1	0.0	0.0	0.0	1.1	3.0	3.6	3.8	3.9	4.1	4.3
	PF Storage cabinet Chilled Horizontal (CH)	1	0.0	0.0	0.0	0.7	1.9	2.3	2.4	2.5	2.6	2.7
	PF Storage cabinet Frozen Horizontal (FH)	1	0.0	0.0	0.0	0.5	1.2	1.5	1.5	1.6	1.7	1.7
	PF Storage cabinets All types	**1**	**0**	**0**	**0**	**3**	**9**	**10**	**11**	**11**	**12**	**12**
	PF Process Chiller AC MT S ≤ 300 kW	1	0.0	0.0	0.0	0.6	1.3	2.1	2.5	2.7	2.9	3.2
	PF Process Chiller AC MT L > 300 kW	1	0.0	0.0	0.0	0.5	1.2	1.9	2.3	2.5	2.7	2.9
	PF Process Chiller AC LT S ≤ 200 kW	1	0.0	0.0	0.0	0.5	1.2	1.9	2.2	2.4	2.6	2.8
	PF Process Chiller AC LT L > 200 kW	1	0.0	0.0	0.0	0.5	1.2	2.0	2.3	2.5	2.8	3.0
	PF Process Chiller WC MT S ≤ 300 kW	1	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.8	0.9
	PF Process Chiller WC MT L > 300 kW	1	0.0	0.0	0.0	0.2	0.5	0.8	0.9	1.0	1.1	1.2
	PF Process Chiller WC LT S ≤ 200 kW	1	0.0	0.0	0.0	0.2	0.4	0.7	0.8	0.9	1.0	1.1
	PF Process Chiller WC LT L > 200 kW	1	0.0	0.0	0.0	0.2	0.6	0.9	1.1	1.2	1.3	1.3
	PF Process Chiller All MT&LT	**1**	**0**	**0**	**0**	**3**	**7**	**11**	**13**	**14**	**15**	**16**
	PF Condensing Unit MT S 0.2-1 kW	1	0.0	0.0	0.0	0.6	1.3	1.5	1.6	1.7	1.8	2.0
	PF Condensing Unit MT M 1-5 kW	1	0.0	0.0	0.0	1.1	2.4	2.6	2.8	3.1	3.3	3.5
	PF Condensing Unit MT L 5-20 kW	1	0.0	0.0	0.0	1.9	3.7	4.0	4.3	4.6	4.9	5.3
	PF Condensing Unit MT XL 20-50 kW	1	0.0	0.0	0.0	1.8	3.4	3.7	4.0	4.3	4.6	5.0
	PF Condensing Unit LT S 0.1-0.4 kW	1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	1	0.0	0.0	0.0	0.4	0.8	0.8	0.9	0.9	1.0	1.1
	PF Condensing Unit LT L 2-8 kW	1	0.0	0.0	0.0	1.0	1.7	1.8	1.9	2.1	2.2	2.4
	PF Condensing Unit LT XL 8-20 kW	1	0.0	0.0	0.0	1.8	3.3	3.5	3.8	4.1	4.4	4.7
0.6	**PF Condensing Unit, All MT&LT**	**1**	**0**	**0**	**0**	**9**	**17**	**18**	**19**	**21**	**22**	**24**
	PF Professional Refrigeration, Total		**0**	**0**	**0**	**9**	**22**	**28**	**31**	**34**	**36**	**38**
	TOTAL FOOD PRESERVATION		**0**	**87**	**134**	**194**	**256**	**294**	**320**	**342**	**359**	**366**
	CA El. Hobs	1	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	CA El. Ovens	1	0.0	0.0	0.0	1.1	2.6	4.1	5.5	5.7	5.8	5.9
	CA Gas Hobs	0	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.5	0.4	0.4
	CA Gas Ovens	0	0.0	0.0	0.0	0.3	0.8	1.2	1.6	1.6	1.6	1.6
	CA Range Hoods	1	0.0	0.0	0.2	1.7	4.8	8.3	10.7	11.8	12.7	13.5
	Total CA Cooking Appliances		**0**	**0**	**0**	**3**	**9**	**15**	**19**	**20**	**21**	**22**
	CM Dripfilter (glass)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (thermos)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Hard cap espresso	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Semi-auto espresso	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (glass), standby/keep warm	1	0.0	0.0	0.8	2.6	2.5	2.5	2.5	2.5	2.5	2.5
	CM Dripfilter (thermos), standby/keep warm	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	1	0.0	0.0	0.2	0.8	0.9	1.0	1.1	1.1	1.2	1.3
	CM Hard cap espresso, standby/keep warm	1	0.0	0.0	0.1	0.5	0.7	0.7	0.7	0.7	0.7	0.7
	CM Semi-auto espresso, standby/keep warm	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CM Fully-auto espresso, standby/keep warm	1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	Total CM household Coffee Makers	1	**0**	**0**	**1**	**4**	**4**	**4**	**4**	**5**	**5**	**5**
	TOTAL COOKING		**0**	**0**	**1**	**8**	**13**	**19**	**23**	**25**	**26**	**27**
	Total WM household Washing Machine	1	**0**	**24**	**35**	**40**	**42**	**42**	**39**	**34**	**29**	**23**
	Total DW household Dishwasher	1	**0**	**11**	**17**	**22**	**26**	**30**	**33**	**37**	**40**	**43**
	LD vented el.	1	0.0	0.0	0.3	0.9	1.3	1.4	1.5	1.5	1.5	1.5
	LD condens el.	1	0.0	0.0	1.9	7.9	15.6	20.4	22.3	23.3	24.2	25.2
	LD vented gas	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**0**	**0**	**2**	**9**	**17**	**22**	**24**	**25**	**26**	**27**
	VC dom	1	0	0	11	34	54	67	79	90	98	103
	VC nondom	1	0	0	1	5	7	7	8	8	9	10
	Total VC Vacuum Cleaner		**0**	**0**	**12**	**39**	**61**	**74**	**87**	**98**	**107**	**113**
	TOTAL CLEANING		-	**35**	**67**	**110**	**146**	**168**	**184**	**194**	**201**	**206**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	0	0	6	18	31	40	42	42	42	42
0.5	FAN Axial>300Pa	1	0	0	5	18	35	46	50	50	50	50
0.5	FAN Centr.FC	1	0	0	2	8	14	19	20	20	20	20
0.5	FAN Centr.BC-free	1	0	0	5	13	22	27	29	30	31	31
0.5	FAN Centr.BC	1	0	0	6	16	27	33	37	39	43	46
0.5	FAN Cross-flow	1	0	0	1	4	6	7	7	8	8	9
	Total FAN, industrial (excl. box & roof fans)		-	-	**13**	**39**	**68**	**85**	**93**	**95**	**97**	**99**
0.5	**Total MT Motors 0.75-375 kW**	**1**	**0**	**3**	**131**	**353**	**516**	**523**	**508**	**489**	**469**	**449**
	Total WP Water Pumps	1	**0**	**0**	**4**	**8**	**11**	**11**	**12**	**13**	**14**	**15**

db	SAVED Primary Energy (BAU-ECO, in TWh primary)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CP Fixed Speed 5-1280 l/s	1	0.0	0.0	0.4	1.5	2.6	2.7	2.5	2.3	2.1	1.8
	CP Variable speed 5-1280 l/s	1	0.0	0.0	0.1	0.5	1.1	1.3	1.1	0.9	0.6	0.4
	CP Pistons 2-64 l/s	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total CP Standard Air Compressors		**0**	**0**	**1**	**2**	**4**	**4**	**4**	**3**	**3**	**2**
	TOTAL INDUSTRY COMPONENTS		0	2	83	225	340	363	363	355	348	341
	TRAFO Distribution	1	0.0	0.0	1.4	5.2	9.2	13.5	18.2	23.2	28.4	34.0
	TRAFO Industry oil	1	0.0	0.0	1.8	6.6	11.7	17.3	23.2	27.7	29.6	31.6
	TRAFO Industry dry	1	0.0	0.0	0.3	1.2	2.1	3.1	4.2	5.3	6.2	6.6
	TRAFO Power	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TRAFO DER oil	1	0.0	0.0	0.2	0.8	1.9	3.6	6.3	9.9	14.0	18.7
	TRAFO DER dry	1	0.0	0.0	0.5	2.1	4.9	9.4	16.5	25.7	36.3	48.5
	TRAFO Small	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers		**0**	**0**	**4**	**16**	**30**	**47**	**68**	**92**	**115**	**139**
	TOTAL ENERGY SECTOR		0	0	4	16	30	47	68	92	115	139
	TYRE car replacement tyres C1		0	0	6	29	56	77	67	46	29	27
	TYRE van replacement tyres C2		0	0	4	16	29	28	19	11	9	8
	TYRE truck replacement tyres C3		0	0	3	13	23	34	32	25	19	14
	TYRE Replacement Tyres		**0**	**0**	**13**	**58**	**108**	**139**	**117**	**81**	**57**	**48**
	TOTAL TRANSPORT SECTOR		0	0	13	58	108	139	117	81	57	48
	SAVED GENERAL TOTAL (in TWh primary)		**0**	**217**	**863**	**1918**	**2776**	**3206**	**3338**	**3356**	**3334**	**3309**
	SAVED GENERAL TOTAL (in PJ primary)		0	780	3108	6906	9992	11543	12017	12081	12002	11914
	SAVED TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		0	19	74	165	239	276	287	289	287	285

SAVED Primary energy (BAU-ECO, summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	100	251	392	466	508	547	592	639
SPACE HEATING	0	53	264	521	729	868	919	919	877	809
SPACE COOLING	0	0	4	19	38	51	56	55	52	47
VENTILATION	0	0	40	116	174	213	212	207	204	200
LIGHTING	0	29	128	282	351	356	343	339	341	337
ELECTRONICS	0	9	25	119	200	223	224	200	163	149
FOOD PRESERVATION	0	87	134	194	256	294	320	342	359	366
COOKING	0	0	1	8	13	19	23	25	26	27
CLEANING	0	35	67	110	146	168	184	194	201	206
INDUSTRY COMPONENTS	0	2	83	225	340	363	363	355	348	341
ENERGY SECTOR	0	0	4	16	30	47	68	92	115	139
TRANSPORT SECTOR	0	0	13	58	108	139	117	81	57	48
TOTAL in TWh primary	**0**	**217**	**863**	**1918**	**2776**	**3206**	**3338**	**3356**	**3334**	**3309**
TOTAL (in PJ primary)	0	780	3108	6906	9992	11543	12017	12081	12002	11914
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	0	19	74	165	239	276	287	289	287	285
Saving in % versus BAU (from 1990=0)	0.0%	2.0%	8.0%	17.8%	25.8%	29.8%	31.0%	31.3%	31.3%	31.3%
Saving In % versus BAU (from 2010=0)	-2.4%	0.0%	6.0%	15.8%	23.8%	27.8%	29.0%	29.3%	29.3%	29.2%



SAVE Primary energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	65	162	253	301	328	353	382	412
SPACE HEATING	0	32	158	310	432	513	544	547	524	485
SPACE COOLING	0	0	2	4	7	8	8	9	9	9
VENTILATION	0	0	16	39	58	73	75	79	83	87
LIGHTING	0	22	51	114	104	68	48	36	31	27
ELECTRONICS	0	6	15	76	120	127	119	95	60	45
FOOD PRESERVATION	0	80	123	155	180	201	221	239	250	254
COOKING	0	0	1	7	11	16	20	21	22	22
CLEANING	0	34	63	101	135	157	171	180	187	191
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	0	0	5	23	44	62	54	37	23	21
TOTAL in TWh primary	**0**	**173**	**497**	**991**	**1345**	**1525**	**1589**	**1596**	**1572**	**1555**
TOTAL (in PJ primary)	0	624	1790	3569	4842	5489	5720	5747	5661	5598
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	0	15	43	85	116	131	137	137	135	134

SAVE Primary energy (summary TERTIARY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	31	77	120	143	156	167	181	195
SPACE HEATING	0	13	67	136	191	227	239	237	225	207
SPACE COOLING	0	0	2	11	22	31	35	34	31	28
VENTILATION	0	0	21	66	99	120	118	110	103	97
LIGHTING	0	5	65	138	201	235	241	247	254	253
ELECTRONICS	0	3	9	39	72	86	95	94	92	93
FOOD PRESERVATION	0	5	9	32	64	76	80	83	86	89
COOKING	0	0	0	1	2	3	4	4	4	4
CLEANING	0	2	4	8	10	11	11	12	13	13
INDUSTRY COMPONENTS	0	0	24	67	106	120	124	124	124	124
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	0	0	5	22	40	49	40	28	21	17
TOTAL in TWh primary	**0**	**29**	**236**	**595**	**927**	**1102**	**1142**	**1141**	**1135**	**1121**
TOTAL (in PJ primary)	0	103	851	2144	3338	3967	4111	4106	4084	4035
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	0	2	20	51	80	95	98	98	98	96

SAVE Primary energy (summary INDUSTRY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	3	9	14	17	19	21	23	25
SPACE HEATING	0	6	31	60	84	102	107	107	101	93
SPACE COOLING	0	0	0	3	7	10	11	10	9	8
VENTILATION	0	0	3	9	14	17	16	15	14	14
LIGHTING	0	2	11	27	42	49	50	52	54	54
ELECTRONICS	0	0	1	4	7	8	9	9	9	9
FOOD PRESERVATION	0	1	1	5	9	13	15	16	18	19
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	0	1	50	137	203	210	206	199	193	186
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	0	0	3	11	21	25	20	14	11	9
TOTAL in TWh primary	**0**	**11**	**104**	**265**	**400**	**451**	**455**	**445**	**433**	**418**
TOTAL (in PJ primary)	0	40	375	953	1441	1622	1640	1603	1560	1504
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	0	1	9	23	34	39	39	38	37	36

SAVE Primary energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	3	4	5	5	5	6	6
SPACE HEATING	0	2	8	15	22	26	28	27	26	24
SPACE COOLING	0	0	0	1	2	3	3	3	3	2
VENTILATION	0	0	0	2	2	3	3	3	2	2
LIGHTING	0	1	2	4	5	4	4	3	3	3
ELECTRONICS	0	0	0	1	1	1	1	1	1	1
FOOD PRESERVATION	0	1	1	2	3	3	4	4	4	5
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	8	22	32	33	33	32	31	31
ENERGY SECTOR	0	0	4	16	30	47	68	92	115	139
TRANSPORT SECTOR	0	0	0	2	3	4	3	2	2	1
TOTAL in TWh primary	**0**	**3**	**26**	**67**	**103**	**129**	**152**	**174**	**194**	**216**
TOTAL (in PJ primary)	0	12	92	240	371	465	547	625	698	777
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	0	0	2	6	9	11	13	15	17	19

SAVE Primary energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	100	251	392	466	508	547	592	639
	Residential	0	0	65	162	253	301	328	353	382	412
	Tertiary	0	0	31	77	120	143	156	167	181	195
	Industry	0	0	3	9	14	17	19	21	23	25
	Other	0	0	1	3	4	5	5	5	6	6
SPACE HEATING.	All sectors, TWh	0	53	264	521	729	868	919	919	877	809
	Residential	0	32	158	310	432	513	544	547	524	485
	Tertiary	0	13	67	136	191	227	239	237	225	207
	Industry	0	6	31	60	84	102	107	107	101	93
	Other	0	2	8	15	22	26	28	27	26	24
SPACE COOLING.	All sectors, TWh	0	0	4	19	38	51	56	55	52	47
& HT PROCESS	Residential	0	0	2	4	7	8	8	9	9	9
	Tertiary	0	0	2	11	22	31	35	34	31	28
	Industry	0	0	0	3	7	10	11	10	9	8
	Other	0	0	0	1	2	3	3	3	3	2
VENTILATION.	All sectors, TWh	0	0	40	116	174	213	212	207	204	200
	Residential	0	0	16	39	58	73	75	79	83	87
	Tertiary	0	0	21	66	99	120	118	110	103	97
	Industry	0	0	3	9	14	17	16	15	14	14
	Other	0	0	0	2	2	3	3	3	2	2
LIGHTING.	All sectors, TWh	0	29	128	282	351	356	343	339	341	337
	Residential	0	22	51	114	104	68	48	36	31	27
	Tertiary	0	5	65	138	201	235	241	247	254	253
	Industry	0	2	11	27	42	49	50	52	54	54
	Other	0	1	2	4	5	4	4	3	3	3
ELECTRONICS.	All sectors, TWh	0	9	25	119	200	223	224	200	163	149
	Residential	0	6	15	76	120	127	119	95	60	45
	Tertiary	0	3	9	39	72	86	95	94	92	93
	Industry	0	0	1	4	7	8	9	9	9	9
	Other	0	0	0	1	1	1	1	1	1	1
FOOD PRESERVE.	All sectors, TWh	0	87	134	194	256	294	320	342	359	366
	Residential	0	80	123	155	180	201	221	239	250	254
	Tertiary	0	5	9	32	64	76	80	83	86	89
	Industry	0	1	1	5	9	13	15	16	18	19
	Other	0	1	1	2	3	3	4	4	4	5
COOKING.	All sectors, TWh	0	0	1	8	13	19	23	25	26	27
	Residential	0	0	1	7	11	16	20	21	22	22
	Tertiary	0	0	0	1	2	3	4	4	4	4
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	35	67	110	146	168	184	194	201	206
	Residential	0	34	63	101	135	157	171	180	187	191
	Tertiary	0	2	4	8	10	11	11	12	13	13
	Industry	0	0	0	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	0	2	83	225	340	363	363	355	348	341
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary	0	0	24	67	106	120	124	124	124	124
	Industry	0	1	50	137	203	210	206	199	193	186
	Other	0	0	8	22	32	33	33	32	31	31
ENERGY SECTOR.	All sectors, TWh	0	0	4	16	30	47	68	92	115	139
(BAU=0)	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	4	16	30	47	68	92	115	139
TRANSPORT SECTOR.	All sectors, TWh	0	0	13	58	108	139	117	81	57	48
(tyres)	Residential	0	0	5	23	44	62	54	37	23	21
	Tertiary	0	0	5	22	40	49	40	28	21	17
	Industry	0	0	3	11	21	25	20	14	11	9
	Other	0	0	0	2	3	4	3	2	2	1
ALL PRODUCTS.	All sectors, TWh	0	217	863	1918	2776	3206	3338	3356	3334	3309
	Residential	0	173	497	991	1345	1525	1589	1596	1572	1555
	Tertiary	0	29	236	595	927	1102	1142	1141	1135	1121
	Industry	0	11	104	265	400	451	455	445	433	418
	Other	0	3	26	67	103	129	152	174	194	216

SAVE Primary energy (summary FUNCTIONS, %)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.										
Residential			65%	65%	65%	65%	65%	65%	65%	65%
Tertiary			31%	31%	31%	31%	31%	31%	31%	31%
Industry			3%	4%	4%	4%	4%	4%	4%	4%
Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.										
Residential		60%	60%	59%	59%	59%	59%	60%	60%	60%
Tertiary		25%	26%	26%	26%	26%	26%	26%	26%	26%
Industry		12%	12%	12%	12%	12%	12%	12%	12%	11%
Other		3%	3%	3%	3%	3%	3%	3%	3%	3%
SPACE COOLING.										
& HT PROCESS Residential			40%	24%	18%	15%	15%	15%	17%	19%
Tertiary			51%	57%	60%	61%	61%	61%	60%	59%
Industry			7%	15%	17%	19%	19%	18%	18%	17%
Other			2%	4%	5%	5%	5%	5%	5%	5%
VENTILATION.										
Residential			39%	34%	34%	34%	35%	38%	41%	44%
Tertiary			52%	57%	57%	57%	56%	53%	51%	48%
Industry			7%	8%	8%	8%	8%	7%	7%	7%
Other			1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.										
Residential		73%	40%	40%	30%	19%	14%	11%	9%	8%
Tertiary		17%	51%	49%	57%	66%	70%	73%	74%	75%
Industry		8%	8%	9%	12%	14%	15%	15%	16%	16%
Other		2%	1%	2%	1%	1%	1%	1%	1%	1%
ELECTRONICS.										
Residential		63%	59%	64%	60%	57%	53%	48%	37%	30%
Tertiary		32%	35%	33%	36%	39%	42%	47%	56%	62%
Industry		4%	5%	3%	3%	4%	4%	5%	6%	6%
Other		1%	1%	0%	1%	1%	1%	1%	1%	1%
FOOD PRESERVE.										
Residential		92%	91%	80%	70%	68%	69%	70%	70%	69%
Tertiary		6%	7%	17%	25%	26%	25%	24%	24%	24%
Industry		1%	1%	2%	4%	4%	5%	5%	5%	5%
Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
COOKING.										
Residential			92%	89%	86%	85%	84%	84%	84%	84%
Tertiary			8%	11%	14%	15%	16%	16%	16%	16%
Industry			0%	0%	0%	0%	0%	0%	0%	0%
Other			0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.										
Residential		96%	94%	92%	93%	93%	93%	93%	93%	93%
Tertiary		4%	5%	7%	7%	6%	6%	6%	6%	7%
Industry		0%	0%	1%	1%	1%	1%	1%	1%	1%
Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.										
Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%
Tertiary		22%	29%	30%	31%	33%	34%	35%	36%	36%
Industry		63%	61%	61%	60%	58%	57%	56%	55%	55%
Other		15%	10%	10%	9%	9%	9%	9%	9%	9%
ENERGY SECTOR.										
(ref. BAU=0) Residential			0%	0%	0%	0%	0%	0%	0%	0%
Tertiary			0%	0%	0%	0%	0%	0%	0%	0%
Industry			0%	0%	0%	0%	0%	0%	0%	0%
Other			100%	100%	100%	100%	100%	100%	100%	100%
TRANSPORT SECTOR.										
(tyres) Residential			37%	40%	41%	44%	46%	45%	41%	44%
Tertiary			39%	38%	37%	35%	34%	35%	37%	35%
Industry			21%	20%	19%	18%	17%	18%	19%	18%
Other			3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.										
Residential		80%	58%	52%	48%	48%	48%	48%	47%	47%
Tertiary		13%	27%	31%	33%	34%	34%	34%	34%	34%
Industry		5%	12%	14%	14%	14%	14%	13%	13%	13%
Other		2%	3%	3%	4%	4%	5%	5%	6%	7%

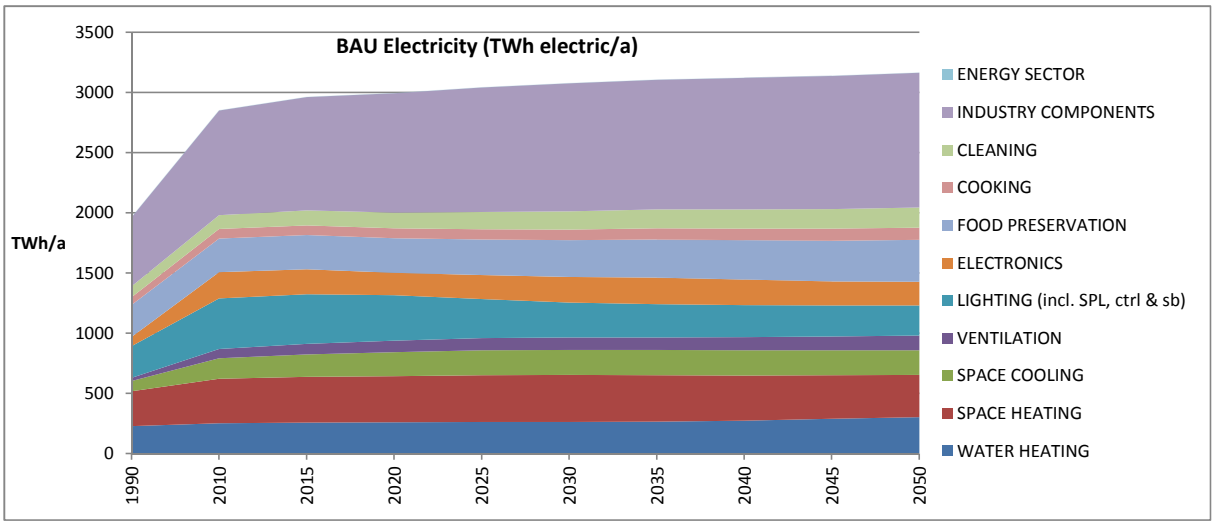
db	BAU Electricity (in TWh elec)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**225**	**250**	**254**	**257**	**259**	**258**	**261**	**270**	**283**	**297**
	Total CH Central Heating combi, water heat	0	**2%**	**2**	**3**	**4**	**4**	**4**	**4**	**4**	**5**	**5**	**5**
	TOTAL WATER HEATING			**227**	**253**	**258**	**261**	**263**	**262**	**266**	**275**	**288**	**302**
	CH electric resistance boiler, 1st estimate	1		50	40	35	30	25	20	15	10	5	0
	CH heat pump, 1st estimate	1		24	56	60	63	66	69	72	75	78	81
	CH auxiliary electricity (incl. circulator), 1st estimate	1		28	30	30	28	29	31	31	30	28	27
	Total CH Central Heating boiler, space heat	0		**102**	**126**	**126**	**121**	**120**	**120**	**118**	**115**	**112**	**108**
	SFB Wood Manual	0		0	0	0	0	0	0	0	0	0	0
	SFB Wood Direct Draft	0		0	0	0	0	0	0	0	0	0	0
	SFB Coal	0		0	0	0	0	0	0	0	0	0	0
	SFB Pellets	0		0	0	0	0	0	0	0	0	0	0
	SFB Wood chips	0		0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CHAE-S (≤ 400 kW)	1	100%	4	11	12	13	13	12	12	11	8	5
	CHAE-L (> 400 kW)	1	100%	6	14	16	17	16	15	14	13	12	12
	CHWE-S (≤ 400 kW)	1	100%	0	1	1	1	1	1	1	1	1	1
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	100%	1	3	4	4	3	3	3	3	3	3
	CHWE-L (> 1500 kW)	1	100%	1	2	2	2	2	2	2	2	2	2
	CHF	0	5%	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	100%	23	36	40	43	44	45	45	46	47	47
	HT PCH-AE-L	1	100%	22	35	38	40	42	42	43	43	44	44
	HT PCH-WE-S	1	100%	5	8	8	9	9	9	10	10	10	10
	HT PCH-WE-M	1	100%	9	15	16	18	18	19	19	19	19	20
	HT PCH-WE-L	1	100%	2	3	3	4	4	4	4	4	4	4
	AC rooftop	1	100%	3	8	8	7	5	3	2	1	0	0
	AC splits	1	100%	4	13	13	12	11	10	9	8	7	6
	AC VRF	1	100%	0	3	5	6	8	9	11	12	12	13
	ACF	0	5%	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling			**82**	**152**	**165**	**174**	**176**	**175**	**174**	**172**	**169**	**166**
	AC rooftop (rev)	1	100%	4	13	13	12	9	6	3	1	0	0
	AC splits (rev)	1	100%	8	25	25	25	23	21	19	17	15	13
	AC VRF (rev)	1	100%	0	8	12	16	20	24	27	28	29	28
	ACF (rev)	0	5%	0	0	0	0	0	0	0	0	0	0
	AHF	0	5%	5	3	3	2	2	2	2	1	1	1
	AHE	1	100%	1	3	2	1	1	1	1	1	1	1
	SubTotal AHC central Air Heating			**18**	**52**	**55**	**56**	**55**	**54**	**51**	**48**	**46**	**43**
	Total AHC central Air Heating & Cooling			**100**	**204**	**221**	**230**	**232**	**229**	**225**	**220**	**215**	**210**
										0			
	LH open fireplace	0	0%	0	0	0	0	0	0	0	0	0	0
	LH closed fireplace/inset	0	0%	0	0	0	0	0	0	0	0	0	0
	LH wood stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH coal stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH cooker	0	0%	0	0	0	0	0	0	0	0	0	0
	LH SHR stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH pellet stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH open fire gas	0	0%	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	0	0%	0	0	0	0	0	0	0	0	0	0
	LH flueless fuel heater	0	0%	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	1	100%	28	28	28	27	27	27	27	26	26	25
	LH elec.convector	1	100%	116	115	115	113	112	112	112	110	107	104
	LH elec.storage	1	100%	9	9	9	8	8	8	8	8	8	8
	LH elec.underfloor	1	100%	16	16	16	16	16	16	16	16	16	15
	LH luminous heaters	0	0%	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	0	0%	0	0	0	0	0	0	0	0	0	0
	LH total			**169**	**168**	**167**	**165**	**164**	**163**	**163**	**160**	**156**	**153**
	RAC (cooling demand), all types <12 kW	1	100%	3	18	22	25	31	34	36	37	38	40
	RAC (heating demand), reversible <12kW	1	100%	2	22	31	41	50	53	52	51	49	47
	Total RAC Room Air Conditioner			**4**	**41**	**53**	**66**	**81**	**87**	**88**	**88**	**87**	**87**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**100%**	16	21	22	22	23	24	24	23	22	20
	TOTAL SPACE HEATING			**291**	**368**	**379**	**383**	**390**	**390**	**385**	**374**	**363**	**351**
	TOTAL SPACE COOLING			**84**	**170**	**187**	**199**	**207**	**209**	**209**	**209**	**208**	**206**
	NRVU electricity	1	100%	19	61	69	74	77	78	79	81	84	87
1	NRVU heat (negative=saving vs. natural ventilation)	0	0%	0	0	0	0	0	0	0	0	0	0
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	100%	8	15	17	17	16	16	17	18	19	20
	RVU Central Balanced VU ≤125W/fan (2 fans)	1	100%	0	1	2	4	6	7	8	9	10	11
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	1	100%	0	0	0	1	1	1	2	2	3	3
1	RVU Central Unidir., heat (negative=saving)	0	0%	0	0	0	0	0	0	0	0	0	0
1	RVU Central Balanced, heat (negative=saving)	0	0%	0	0	0	0	0	0	0	0	0	0
1	RVU Local Balanced, heat (negative=saving)	0	0%	0	0	0	0	0	0	0	0	0	0
	Total VU (electricity only)			**27**	**78**	**89**	**96**	**99**	**102**	**106**	**110**	**115**	**121**
	TOTAL VENTILATION (electricity only)			**27**	**78**	**89**	**96**	**99**	**102**	**106**	**110**	**115**	**121**

db	BAU Electricity (in TWh elec), c'td	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources BAU												
	LFL Linear Fluorescent	1		81	125	137	133	130	124	118	111	106	101
	CFL Compact Fluorescent	1		4	27	36	33	22	17	15	14	12	11
	Tungsten	1		9	52	55	55	37	26	19	14	10	9
	GLS GeneralLighting Service (incandescent)	1		84	61	46	34	21	7	2	0	0	0
	HID High Intensity Discharge	1		36	75	68	61	57	57	57	57	57	57
	LED Light Emitting Diode	1		0	0	1	5	13	21	27	31	33	35
	SP Special Purpose (exempt)	1		40	61	53	45	37	30	30	30	30	30
	lighting controls & sb	1		11	17	15	13	10	9	9	9	9	9
	TOTAL LIGHTING (incl. SPL, ctrl & sb)			**265**	**419**	**411**	**377**	**326**	**292**	**277**	**265**	**257**	**251**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)			**213**	**341**	**344**	**320**	**279**	**253**	**238**	**226**	**218**	**213**
	DP TV, on mode	1		27	85	68	44	47	50	48	42	31	30
	DP Monitor, on mode	1		1	11	9	7	7	6	5	4	2	1
	DP TV , sb mode	1		4	5	5	11	14	15	16	16	15	14
	DP Monitor, sb mode	1		0	1	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	1		**32**	**102**	**82**	**62**	**68**	**72**	**69**	**61**	**48**	**45**
	SSTB	1		0	3	1	0	0	0	0	0	0	0
	CSTB	1		0	7	17	19	20	19	20	22	23	25
	Total STB set top boxes (Complex & Simple)			**0**	**10**	**19**	**19**	**20**	**19**	**20**	**22**	**23**	**25**
	VIDEO players/recorders	1		0.0	2.2	2.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	1		0.0	2.1	1.8	1.1	0.5	0.1	0.0	0.0	0.0	0.0
	VIDEO game consoles	1		0.0	4.6	8.1	10.9	13.5	14.1	14.1	14.1	14.1	14.1
	Total VIDEO			**0**	**9**	**13**	**13**	**14**	**14**	**14**	**14**	**14**	**14**
	ES Rack servers	1		1	19	22	24	29	36	43	42	42	42
	ES Blade servers	1		0	4	5	5	6	7	8	8	8	8
	ES Storage	1		0	2	2	2	2	3	3	3	3	3
	Total ES Enterprise Servers			**1**	**25**	**28**	**31**	**37**	**45**	**54**	**52**	**52**	**52**
	PC Desktop	1		14.4	21.5	12.7	4.9	2.9	2.9	2.9	2.9	2.9	2.9
	PC Notebook	1		0.1	7.4	3.8	1.0	0.6	0.6	0.6	0.6	0.6	0.6
	PC Tablet/slate	1		0.0	0.1	1.8	1.6	1.4	1.8	1.9	1.9	2.0	2.1
	PC Thin client	1		0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	1		0.1	1.2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2
	Total PC, electricity			**15**	**31**	**19**	**8**	**5**	**6**	**6**	**6**	**6**	**6**
	EP-Copier mono	1		10.5	1.3	0.8	0.3	0.2	0.1	0.1	0.0	0.0	0.0
	EP-Copier colour	1		0.0	0.2	0.8	1.5	1.7	1.9	2.0	2.2	2.4	2.5
	EP-printer mono	1		9.4	2.6	2.2	1.7	1.5	1.3	1.1	0.9	0.8	0.6
	EP-printer colour	1		0.0	1.4	1.9	2.5	3.1	3.6	4.1	4.7	5.2	5.7
	IJ SFD printer	1		1.1	0.6	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.0
	IJ MFD printer	1		1.4	1.3	1.5	1.7	1.9	2.1	2.3	2.4	2.6	2.8
	Total imaging equipment, electricity			**22**	**7**	**8**	**8**	**9**	**9**	**10**	**10**	**11**	**12**
	SB Home Gateway, on-mode hours	1		0.0	4.1	4.9	5.4	5.6	5.6	5.3	4.7	3.8	2.7
	SB Home NAS, on-mode hours	1		0.0	0.2	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.4
	SB Home Phones (fixed), on-mode hours	1		0.1	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.1
	SB Office Phones (fixed), on-mode hours	1		0.2	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.2
	SB Home Gateway, standby hours	1		0.0	2.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	1		0.0	0.3	0.6	0.8	0.9	1.0	1.0	0.9	0.8	0.6
	SB Home Phones (fixed), standby hours	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	1		0.0	4.1	7.4	10.9	11.4	11.3	10.7	9.5	7.8	5.5
	SB Home NAS, idle hours	1		0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2
	SB Home Phones (fixed), idle hours	1		0.5	3.9	4.3	4.4	3.9	3.4	2.8	2.2	1.6	1.0
	SB Office Phones (fixed), idle hours	1		0.8	2.7	2.6	2.4	2.2	2.0	1.8	1.5	1.1	0.8
	Total SB (networked) StandBy (rest)			**2**	**19**	**22**	**26**	**26**	**25**	**23**	**20**	**16**	**11**
	Total BC Battery Charged devices	**1**		**0**	**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**
	UPS below 1.5 kVA	1		0.7	1.5	1.5	1.8	2.2	2.5	2.8	3.1	3.3	3.5
	UPS 1.5 to 5 kVA	1		2.7	5.8	6.3	6.9	8.3	9.7	11.0	12.2	13.3	14.0
	UPS 5 to 10 kVA	1		0.3	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.7	1.8
	UPS 10 to 200 kVA	1		1.9	4.2	4.6	4.6	5.0	5.8	6.7	7.5	8.2	8.8
	Total UPS - Uninterrupted Power Supplies	**1**		**6**	**12**	**13**	**14**	**16**	**19**	**22**	**24**	**27**	**28**
	TOTAL ELECTRONICS			**78**	**218**	**207**	**184**	**197**	**212**	**221**	**213**	**200**	**196**
	Total RF household Refrigerators & Freezers	1		**138**	**139**	**139**	**139**	**139**	**139**	**139**	**138**	**138**	**137**
	CF open vertical chilled multi deck (RVC2)	1		15	14	13	13	12	12	12	12	12	12
	CF open horizontal frozen island (RHF4)	1		1	1	1	1	1	1	1	1	1	1
	CF other supermarket display (non-BCs)	1		26	26	26	25	25	26	27	28	29	30
	CF Plug in one door beverage cooler	1		18	18	17	16	15	16	16	16	17	17
	CF Plug in horizontal ice cream freezer	1		4	4	4	4	4	4	4	4	4	4
	CF Spiral vending machine	1		3	3	2	2	2	2	2	2	2	2
	Total CF Commercial Refrigeration			**68**	**67**	**63**	**60**	**59**	**60**	**61**	**63**	**65**	**67**

db	BAU Electricity (in TWh elec), c'td	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	1		1.8	2.5	2.6	2.7	2.8	3.0	3.1	3.2	3.4	3.5
	PF Storage cabinet Frozen Vertical (FV)	1		2.1	2.9	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1
	PF Storage cabinet Chilled Horizontal (CH)	1		1.4	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
	PF Storage cabinet Frozen Horizontal (FH)	1		0.8	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.6
	PF Storage cabinets All types	**1**		**6**	**8**	**9**	**9**	**10**	**10**	**11**	**11**	**11**	**12**
	PF Process Chiller AC MT S ≤ 300 kW	1		3.2	7.0	8.2	9.4	10.5	11.5	12.7	13.8	14.9	16.1
	PF Process Chiller AC MT L > 300 kW	1		3.1	6.7	7.9	9.1	10.1	11.1	12.2	13.3	14.4	15.5
	PF Process Chiller AC LT S ≤ 200 kW	1		3.2	7.0	8.2	9.4	10.5	11.6	12.7	13.9	15.0	16.1
	PF Process Chiller AC LT L > 200 kW	1		3.3	7.3	8.5	9.8	10.9	12.0	13.2	14.3	15.5	16.7
	PF Process Chiller WC MT S ≤ 300 kW	1		0.9	1.9	2.3	2.6	2.9	3.2	3.5	3.8	4.2	4.5
	PF Process Chiller WC MT L > 300 kW	1		1.3	2.9	3.4	3.9	4.3	4.8	5.2	5.7	6.2	6.6
	PF Process Chiller WC LT S ≤ 200 kW	1		1.1	2.5	2.9	3.4	3.8	4.1	4.5	4.9	5.3	5.8
	PF Process Chiller WC LT L > 200 kW	1		1.4	3.2	3.7	4.3	4.8	5.2	5.7	6.3	6.8	7.3
	PF Process Chiller All MT&LT	**1**		**18**	**39**	**45**	**52**	**58**	**64**	**70**	**76**	**82**	**88**
	PF Condensing Unit MT S 0.2-1 kW	1		7	5	5	5	6	6	7	7	8	8
	PF Condensing Unit MT M 1-5 kW	1		17	13	13	13	14	15	17	18	19	21
	PF Condensing Unit MT L 5-20 kW	1		20	16	16	16	18	19	20	22	24	26
	PF Condensing Unit MT XL 20-50 kW	1		20	16	16	16	18	19	20	22	24	25
	PF Condensing Unit LT S 0.1-0.4 kW	1		1	1	1	1	1	1	1	1	1	1
	PF Condensing Unit LT M 0.4-2 kW	1		3	2	2	2	3	3	3	3	4	4
	PF Condensing Unit LT L 2-8 kW	1		5	4	4	4	4	5	5	5	6	6
	PF Condensing Unit LT XL 8-20 kW	1		16	13	12	13	14	15	16	17	18	20
0.6	**PF Condensing Unit, All MT&LT**	**1**		**89**	**71**	**68**	**71**	**77**	**82**	**89**	**96**	**103**	**111**
	PF Professional Refrigeration, Total			**59**	**75**	**81**	**89**	**98**	**107**	**116**	**125**	**135**	**145**
	TOTAL FOOD PRESERVATION			**265**	**281**	**284**	**288**	**296**	**305**	**316**	**326**	**337**	**349**
	CA El. Hobs	1		20	31	35	38	40	43	45	47	50	52
	CA El. Ovens	1		23	23	22	21	20	21	21	21	22	22
	CA Gas Hobs	0	0%	0	0	0	0	0	0	0	0	0	0
	CA Gas Ovens	0	0%	0	0	0	0	0	0	0	0	0	0
	CA Range Hoods	1		10	12	13	14	14	15	16	17	17	18
	Total CA Cooking Appliances			**54**	**67**	**70**	**72**	**75**	**79**	**82**	**85**	**88**	**91**
	CM Dripfilter (glass)	1		6.3	4.4	3.9	3.2	2.9	2.9	2.9	2.9	2.9	2.9
	CM Dripfilter (thermos)	1		0.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2
	CM Dripfilter (full automatic)	1		0.0	0.5	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1
	CM Pad filter	1		0.0	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0
	CM Hard cap espresso	1		0.0	0.1	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	CM Semi-auto espresso	1		0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	CM Fully-auto espresso	1		0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CM Dripfilter (glass), standby/keep warm	1		4.3	3.0	2.7	2.2	2.0	2.0	2.0	2.0	2.0	2.0
	CM Dripfilter (thermos), standby/keep warm	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	1		0.0	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0
	CM Hard cap espresso, standby/keep warm	1		0.0	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	CM Semi-auto espresso, standby/keep warm	1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	CM Fully-auto espresso, standby/keep warm	1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	Total CM household Coffee Makers	1		**11**	**11**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**11**
	TOTAL COOKING			**65**	**78**	**80**	**82**	**85**	**89**	**92**	**96**	**99**	**102**
	Total WM household Washing Machine	1		**53**	**44**	**43**	**40**	**36**	**34**	**31**	**29**	**27**	**25**
	Total DW household Dishwasher	1		**13**	**23**	**27**	**30**	**34**	**37**	**40**	**43**	**45**	**48**
	LD vented el.	1		9	11	12	11	11	11	11	11	11	11
	LD condens el.	1		2	14	18	21	23	24	24	24	24	24
	LD vented gas	0		0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier			**10**	**25**	**29**	**32**	**34**	**35**	**35**	**35**	**35**	**35**
	VC dom	1		10	17	23	24	34	39	43	47	49	50
	VC nondom	1		3	5	5	6	7	7	7	8	8	8
	Total VC Vacuum Cleaner			**13**	**22**	**28**	**30**	**41**	**46**	**51**	**55**	**57**	**59**
	TOTAL CLEANING			**89**	**114**	**126**	**132**	**145**	**152**	**157**	**161**	**164**	**165**
0.5	FAN Axial<300Pa (all FAN types >125W)	1		19	53	62	69	76	81	82	82	82	82
0.5	FAN Axial>300Pa	1		33	97	111	117	122	125	126	126	126	126
0.5	FAN Centr.FC	1		8	17	21	23	25	27	27	27	27	27
0.5	FAN Centr.BC-free	1		21	44	53	58	63	69	73	76	77	79
0.5	FAN Centr.BC	1		22	50	60	66	73	80	86	92	100	109
0.5	FAN Cross-flow	1		1	2	3	3	4	4	4	5	5	6
	Total FAN, industrial (excl. box & roof fans)			**53**	**132**	**155**	**168**	**182**	**193**	**199**	**204**	**209**	**214**
0.5	**Total MT Motors 0.75-375 kW**	**1**		**818**	**1124**	**1198**	**1259**	**1295**	**1305**	**1298**	**1290**	**1282**	**1274**
	Total WP Water Pumps	1		**88**	**118**	**127**	**137**	**147**	**158**	**169**	**180**	**191**	**202**

db	BAU Electricity (in TWh elec), c'td	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CP Fixed Speed 5-1280 l/s	1		24	49	41	36	35	36	37	38	39	40
	CP Variable speed 5-1280 l/s	1		0	9	16	20	22	23	23	24	24	25
	CP Pistons 2-64 l/s	1		1	2	1	1	1	2	2	2	2	2
	Total CP Standard Air Compressors			**25**	**59**	**58**	**57**	**58**	**60**	**62**	**63**	**65**	**66**
	TOTAL INDUSTRY COMPONENTS			575	871	939	992	1035	1064	1079	1092	1105	1119
1	TRAFO Distribution	1		12	20	22	25	27	30	33	35	38	40
1	TRAFO Industry oil	1		9	16	17	19	21	23	24	26	28	30
1	TRAFO Industry dry	1		3	5	5	6	7	7	8	8	9	9
1	TRAFO Power	1		34	53	60	66	73	79	85	91	98	105
1	TRAFO DER oil	1		0	0	1	1	2	4	7	10	14	19
1	TRAFO DER dry	1		0	2	4	6	10	17	28	42	59	79
1	TRAFO Small	1		2	2	2	2	2	2	2	2	2	2
	Total TRAFO Utility Transformers			**60**	**98**	**111**	**126**	**142**	**162**	**186**	**215**	**248**	**284**
	TOTAL ENERGY SECTOR (already included in power generation factor, so reference=0)			0	0	0	0	0	0	0	0	0	0
	TOTAL TRANSPORT SECTOR			0	0	0	0	0	0	0	0	0	0
	GENERAL TOTAL in TWh electric			**1964**	**2851**	**2961**	**2995**	**3043**	**3077**	**3107**	**3121**	**3137**	**3163**
	GENERAL TOTAL in mtoe final demand electric			169	245	255	258	262	265	267	268	270	272

BAU Electricity (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	227	253	258	261	263	262	266	275	288	302
SPACE HEATING	291	368	379	383	390	390	385	374	363	351
SPACE COOLING	84	170	187	199	207	209	209	209	208	206
VENTILATION	27	78	89	96	99	102	106	110	115	121
LIGHTING (incl. SPL, ctrl & sb)	265	419	411	377	326	292	277	265	257	251
ELECTRONICS	78	218	207	184	197	212	221	213	200	196
FOOD PRESERVATION	265	281	284	288	296	305	316	326	337	349
COOKING	65	78	80	82	85	89	92	96	99	102
CLEANING	89	114	126	132	145	152	157	161	164	165
INDUSTRY COMPONENTS	575	871	939	992	1035	1064	1079	1092	1105	1119
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TOTAL in TWh electric	**1964**	**2851**	**2961**	**2995**	**3043**	**3077**	**3107**	**3121**	**3137**	**3163**
TOTAL in mtoe final (11.63 TWh/mtoe)	169	245	255	258	262	265	267	268	270	272



.

db	ECO Electricity (in TWh elec)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**225**	**250**	**230**	**202**	**177**	**167**	**166**	**172**	**181**	**189**
	Total CH Central Heating combi, water heat	0	**2%**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	TOTAL WATER HEATING			**227**	**253**	**233**	**205**	**180**	**170**	**169**	**175**	**184**	**192**
	CH electric resistance boiler, 1st estimate	1		50	40	35	30	25	20	15	10	5	0
	CH heat pump, 1st estimate	1		24	56	63	66	74	83	91	100	108	117
	CH auxiliary electricity (incl. circulator), 1st estimate	1		28	27	24	19	13	14	14	14	13	13
	Total CH Central Heating boiler, space heat	0		**102**	**123**	**121**	**115**	**112**	**117**	**120**	**123**	**126**	**129**
	SFB Wood Manual	0		0	0	0	0	0	0	0	0	0	0
	SFB Wood Direct Draft	0		0	0	0	0	0	0	0	0	0	0
	SFB Coal	0		0	0	0	0	0	0	0	0	0	0
	SFB Pellets	0		0	0	0	0	0	0	0	0	0	0
	SFB Wood chips	0		0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CHAE-S (≤ 400 kW)	1	100%	4	11	12	12	12	12	11	10	7	5
	CHAE-L (> 400 kW)	1	100%	6	14	16	16	15	14	13	12	11	11
	CHWE-S (≤ 400 kW)	1	100%	0	1	1	1	1	1	1	1	1	1
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	100%	1	3	4	4	3	3	3	3	3	2
	CHWE-L (> 1500 kW)	1	100%	1	2	2	2	2	2	2	2	2	2
	CHF	0	5%	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	100%	23	36	40	41	41	41	41	42	43	44
	HT PCH-AE-L	1	100%	22	35	38	39	39	37	37	37	38	39
	HT PCH-WE-S	1	100%	5	8	8	9	9	9	9	9	10	10
	HT PCH-WE-M	1	100%	9	15	16	17	18	18	18	19	19	20
	HT PCH-WE-L	1	100%	2	3	3	3	4	4	4	4	4	4
	AC rooftop	1	100%	3	8	8	7	5	3	1	1	0	0
	AC splits	1	100%	4	13	13	11	10	9	8	7	6	6
	AC VRF	1	100%	0	3	5	6	7	9	10	11	11	12
	ACF	0	5%	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling			**82**	**152**	**165**	**170**	**167**	**162**	**158**	**157**	**156**	**155**
	AC rooftop (rev)	1	100%	4	13	13	11	8	5	2	1	0	0
	AC splits (rev)	1	100%	8	25	25	24	22	19	17	15	14	13
	AC VRF (rev)	1	100%	0	8	12	16	19	23	26	27	27	27
	ACF (rev)	0	5%	0	0	0	0	0	0	0	0	0	0
	AHF	0	5%	5	3	3	2	2	2	1	1	1	1
	AHE	1	100%	1	3	2	1	1	1	1	1	1	1
	SubTotal AHC central Air Heating			**18**	**52**	**55**	**55**	**53**	**50**	**48**	**45**	**44**	**42**
	Total AHC central Air Heating & Cooling			**100**	**204**	**220**	**225**	**220**	**212**	**206**	**202**	**200**	**197**
	LH open fireplace	0	0%	0	0	0	0	0	0	0	0	0	0
	LH closed fireplace/inset	0	0%	0	0	0	0	0	0	0	0	0	0
	LH wood stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH coal stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH cooker	0	0%	0	0	0	0	0	0	0	0	0	0
	LH SHR stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH pellet stove	0	0%	0	0	0	0	0	0	0	0	0	0
	LH open fire gas	0	0%	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	0	0%	0	0	0	0	0	0	0	0	0	0
	LH flueless fuel heater	0	0%	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	1	100%	28	28	27	25	23	24	24	24	23	22
	LH elec.convector	1	100%	116	115	113	106	103	104	105	103	101	98
	LH elec.storage	1	100%	9	9	8	8	7	7	7	7	7	7
	LH elec.underfloor	1	100%	16	16	16	15	15	14	14	13	13	13
	LH luminous heaters	0	0%	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	0	0%	0	0	0	0	0	0	0	0	0	0
	LH total			**169**	**168**	**165**	**154**	**148**	**149**	**150**	**147**	**144**	**140**
	RAC (cooling demand), all types <12 kW	1	100%	3	18	20	21	25	27	29	30	31	32
	RAC (heating demand), reversible <12kW	1	100%	2	22	29	36	43	45	44	43	42	40
	Total RAC Room Air Conditioner			**4**	**41**	**50**	**57**	**67**	**72**	**73**	**73**	**72**	**72**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	100%	16	20	14	11	10	11	11	11	10	10
	TOTAL SPACE HEATING			**291**	**366**	**370**	**359**	**356**	**361**	**362**	**359**	**355**	**351**
	TOTAL SPACE COOLING			**84**	**170**	**185**	**192**	**192**	**189**	**187**	**187**	**187**	**187**
	NRVU electricity	1	100%	19	61	67	68	66	64	64	66	69	72
1	NRVU heat (negative=saving vs. natural ventilation)	0	0%	0	0	0	0	0	0	0	0	0	0
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	100%	8	15	16	14	11	9	9	10	10	11
	RVU Central Balanced VU ≤125W/fan (2 fans)	1	100%	0	1	2	2	3	4	4	4	5	5
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	1	100%	0	0	0	0	1	1	1	1	2	2
1	RVU Central Unidir., heat (negative=saving)	0	0%	0	0	0	0	0	0	0	0	0	0
1	RVU Central Balanced, heat (negative=saving)	0	0%	0	0	0	0	0	0	0	0	0	0
1	RVU Local Balanced, heat (negative=saving)	0	0%	0	0	0	0	0	0	0	0	0	0
	Total VU (electricity only)			**27**	**78**	**85**	**85**	**81**	**77**	**78**	**82**	**86**	**90**
	TOTAL VENTILATION (electricity only)			**27**	**78**	**85**	**85**	**81**	**77**	**78**	**82**	**86**	**90**

db	ECO Electricity (in TWh elec), c'td	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources ECO												
	LFL Linear Fluorescent	1		81	125	133	110	73	43	30	20	11	4
	CFL Compact Fluorescent	1		4	27	32	25	8	2	0	0	0	0
	Tungsten	1		9	53	51	23	3	0	0	0	0	0
	GLS GeneralLighting Service (incandescent)	1		84	44	3	0	0	0	0	0	0	0
	HID High Intensity Discharge	1		36	76	48	27	15	9	9	9	9	10
	LED Light Emitting Diode	1		0	0	4	22	40	56	61	61	61	63
	SP Special Purpose (exempt)	1		40	61	53	45	37	30	30	30	30	30
	lighting controls & sb	1		11	17	15	13	10	9	9	9	9	9
	GLS stock	1		0	5	14	0	0	0	0	0	0	0
	Tungsten stock	1		0	0	7	1	0	0	0	0	0	0
	TOTAL LIGHTING (incl. SPL, ctrl & sb)			**265**	**407**	**360**	**264**	**186**	**149**	**140**	**130**	**121**	**116**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)			**213**	**329**	**292**	**207**	**139**	**111**	**101**	**91**	**82**	**78**
	DP TV, on mode	1		27	85	66	23	12	12	13	16	19	22
	DP Monitor, on mode	1		1	11	8	2	1	1	1	1	1	1
	DP TV , sb mode	1		4	5	6	10	8	9	10	10	11	12
	DP Monitor, sb mode	1		0	1	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	1		**32**	**102**	**80**	**35**	**21**	**22**	**24**	**27**	**31**	**35**
	SSTB	1		0	2	1	0	0	0	0	0	0	0
	CSTB	1		0	7	15	15	15	15	15	17	18	19
	Total STB set top boxes (Complex & Simple)			**0**	**9**	**16**	**15**	**15**	**15**	**15**	**17**	**18**	**19**
	VIDEO players/recorders	1		0.0	2.2	2.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	1		0.0	2.1	1.8	1.1	0.5	0.1	0.0	0.0	0.0	0.0
	VIDEO game consoles	1		0.0	4.6	7.5	9.8	12.3	13.0	13.0	13.0	13.0	13.0
	Total VIDEO			**0**	**9**	**12**	**12**	**13**	**13**	**13**	**13**	**13**	**13**
	ES Rack servers	1		1	19	22	21	21	25	30	30	30	30
	ES Blade servers	1		0	4	5	4	4	5	6	5	5	5
	ES Storage	1		0	2	2	2	1	2	2	2	2	2
	Total ES Enterprise Servers			**1**	**25**	**28**	**27**	**26**	**32**	**38**	**37**	**37**	**37**
	PC Desktop	1		14.4	21.5	12.7	4.9	2.9	2.9	2.9	2.9	2.9	2.9
	PC Notebook	1		0.1	7.4	3.8	1.0	0.6	0.6	0.6	0.6	0.6	0.6
	PC Tablet/slate	1		0.0	0.1	1.8	1.6	1.4	1.8	1.9	1.9	2.0	2.1
	PC Thin client	1		0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	1		0.1	1.2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2
	Total PC, electricity			**15**	**31**	**19**	**8**	**5**	**6**	**6**	**6**	**6**	**6**
	EP-Copier mono	1		10.5	0.8	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	EP-Copier colour	1		0.0	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.8
	EP-printer mono	1		9.4	2.1	1.0	0.8	0.7	0.6	0.5	0.4	0.4	0.3
	EP-printer colour	1		0.0	1.3	0.6	0.8	0.9	1.1	1.3	1.4	1.6	1.8
	IJ SFD printer	1		1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	IJ MFD printer	1		1	1	0	0	0	1	1	1	1	1
	Total imaging equipment, electricity			**22**	**5**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**4**
	SB Home Gateway, on-mode hours	1		0.0	4.1	4.9	5.4	5.6	5.6	5.3	4.7	3.8	2.7
	SB Home NAS, on-mode hours	1		0.0	0.2	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.4
	SB Home Phones (fixed), on-mode hours	1		0.1	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.1
	SB Office Phones (fixed), on-mode hours	1		0.2	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.2
	SB Home Gateway, standby hours	1		0.0	2.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	1		0.0	0.3	0.6	0.8	0.9	1.0	1.0	0.9	0.8	0.6
	SB Home Phones (fixed), standby hours	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	1		0.0	4.1	7.4	10.6	11.4	11.3	10.7	9.5	7.8	5.5
	SB Home NAS, idle hours	1		0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Home Phones (fixed), idle hours	1		0.5	3.9	4.3	4.4	3.9	3.4	2.8	2.2	1.6	1.0
	SB Office Phones (fixed), idle hours	1		0.8	2.7	2.6	2.4	2.2	2.0	1.8	1.5	1.1	0.8
	Total SB (networked) StandBy (rest)			**2**	**19**	**22**	**25**	**26**	**25**	**23**	**20**	**16**	**11**
	Total BC Battery Charged devices	**1**		**0**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**
	UPS below 1.5 kVA	1		0.7	1.5	1.5	0.5	0.2	0.2	0.2	0.3	0.3	0.3
	UPS 1.5 to 5 kVA	1		2.7	5.8	6.3	4.3	1.3	1.1	1.3	1.4	1.6	1.6
	UPS 5 to 10 kVA	1		0.3	0.7	0.8	0.8	0.7	0.8	0.9	1.0	1.1	1.2
	UPS 10 to 200 kVA	1		1.9	4.2	4.6	4.2	3.7	3.7	4.2	4.7	5.2	5.5
	Total UPS - Uninterrupted Power Supplies	**1**		**6**	**12**	**13**	**10**	**6**	**6**	**7**	**7**	**8**	**9**
	TOTAL ELECTRONICS			**78**	**215**	**197**	**137**	**118**	**123**	**131**	**133**	**135**	**136**
	Total RF household Refrigerators & Freezers	1		**138**	**104**	**86**	**72**	**61**	**52**	**42**	**34**	**29**	**27**
	CF open vertical chilled multi deck (RVC2)	1		15	14	13	11	8	7	7	7	7	7
	CF open horizontal frozen island (RHF4)	1		1	1	1	1	1	1	1	1	1	1
	CF other supermarket display (non-BCs)	1		26	26	26	23	20	20	20	21	21	22
	CF Plug in one door beverage cooler	1		18	18	17	13	10	10	10	10	11	11
	CF Plug in horizontal ice cream freezer	1		4	4	4	4	3	3	4	4	4	4
	CF Spiral vending machine	1		3	3	2	1	1	1	1	1	1	1
	Total CF Commercial Refrigeration			**68**	**67**	**63**	**53**	**44**	**41**	**42**	**43**	**44**	**46**

db	ECO Electricity (in TWh elec), c'td	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	1		1.8	2.5	2.6	2.3	1.8	1.7	1.8	1.9	2.0	2.1
	PF Storage cabinet Frozen Vertical (FV)	1		2.1	2.9	3.0	2.7	2.1	2.0	2.1	2.2	2.3	2.4
	PF Storage cabinet Chilled Horizontal (CH)	1		1.4	1.9	2.0	1.8	1.4	1.4	1.4	1.5	1.6	1.6
	PF Storage cabinet Frozen Horizontal (FH)	1		0.8	1.2	1.2	1.1	0.8	0.8	0.8	0.9	0.9	0.9
	PF Storage cabinets All types	**1**		**6**	**8**	**9**	**8**	**6**	**6**	**6**	**7**	**7**	**7**
	PF Process Chiller AC MT S ≤ 300 kW	1		3.2	7.0	8.2	9.2	10.0	10.7	11.7	12.7	13.8	14.8
	PF Process Chiller AC MT L > 300 kW	1		3.1	6.7	7.9	8.9	9.6	10.4	11.3	12.3	13.3	14.3
	PF Process Chiller AC LT S ≤ 200 kW	1		3.2	7.0	8.2	9.3	10.1	10.9	11.8	12.9	14.0	15.0
	PF Process Chiller AC LT L > 200 kW	1		3.3	7.3	8.5	9.6	10.4	11.2	12.2	13.3	14.4	15.5
	PF Process Chiller WC MT S ≤ 300 kW	1		0.9	1.9	2.3	2.6	2.8	3.0	3.3	3.5	3.8	4.1
	PF Process Chiller WC MT L > 300 kW	1		1.3	2.9	3.4	3.8	4.1	4.5	4.9	5.3	5.7	6.2
	PF Process Chiller WC LT S ≤ 200 kW	1		1.1	2.5	2.9	3.3	3.6	3.9	4.2	4.6	5.0	5.3
	PF Process Chiller WC LT L > 200 kW	1		1.4	3.2	3.7	4.2	4.5	4.9	5.3	5.8	6.3	6.7
	PF Process Chiller All MT&LT	**1**		**18**	**39**	**45**	**51**	**55**	**59**	**65**	**70**	**76**	**82**
	PF Condensing Unit MT S 0.2-1 kW	1		7	5	5	5	5	5	6	6	7	7
	PF Condensing Unit MT M 1-5 kW	1		17	13	13	13	13	14	15	17	18	19
	PF Condensing Unit MT L 5-20 kW	1		20	16	16	16	16	17	19	20	22	23
	PF Condensing Unit MT XL 20-50 kW	1		20	16	16	16	16	17	19	20	22	23
	PF Condensing Unit LT S 0.1-0.4 kW	1		1	1	1	1	1	1	1	1	1	1
	PF Condensing Unit LT M 0.4-2 kW	1		3	2	2	2	2	3	3	3	3	3
	PF Condensing Unit LT L 2-8 kW	1		5	4	4	4	4	4	4	5	5	5
	PF Condensing Unit LT XL 8-20 kW	1		16	13	12	12	12	13	14	15	17	18
0.6	**PF Condensing Unit, All MT&LT**	**1**		**89**	**71**	**68**	**68**	**70**	**75**	**81**	**87**	**94**	**101**
	PF Professional Refrigeration, Total			**59**	**75**	**81**	**86**	**89**	**95**	**103**	**112**	**121**	**130**
	TOTAL FOOD PRESERVATION			**265**	**247**	**230**	**211**	**194**	**188**	**188**	**189**	**194**	**202**
	CA El. Hobs	1		20	31	35	38	40	43	45	47	49	51
	CA El. Ovens	1		23	23	22	20	19	19	19	19	19	19
	CA Gas Hobs	0	0%	0	0	0	0	0	0	0	0	0	0
	CA Gas Ovens	0	0%	0	0	0	0	0	0	0	0	0	0
	CA Range Hoods	1		10	12	13	13	12	12	12	12	12	13
	Total CA Cooking Appliances			**54**	**67**	**70**	**71**	**72**	**74**	**76**	**78**	**81**	**83**
	CM Dripfilter (glass)	1		6.3	4.4	3.9	3.2	2.9	2.9	2.9	2.9	2.9	2.9
	CM Dripfilter (thermos)	1		0.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2
	CM Dripfilter (full automatic)	1		0.0	0.5	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1
	CM Pad filter	1		0.0	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0
	CM Hard cap espresso	1		0.0	0.1	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	CM Semi-auto espresso	1		0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	CM Fully-auto espresso	1		0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CM Dripfilter (glass), standby/keep warm	1		4.3	3.0	2.4	1.2	1.0	1.0	1.0	1.0	1.0	1.0
	CM Dripfilter (thermos), standby/keep warm	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	1		0.0	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5
	CM Hard cap espresso, standby/keep warm	1		0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CM Semi-auto espresso, standby/keep warm	1		0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso, standby/keep warm	1		0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	Total CM household Coffee Makers	1		**11**	**11**	**10**	**8**	**8**	**8**	**8**	**8**	**8**	**9**
	TOTAL COOKING			**65**	**78**	**79**	**79**	**80**	**82**	**84**	**87**	**89**	**92**
	Total WM household Washing Machine	1		**53**	**35**	**28**	**24**	**19**	**17**	**15**	**15**	**15**	**15**
	Total DW household Dishwasher	1		**13**	**19**	**20**	**22**	**24**	**25**	**27**	**28**	**29**	**30**
	LD vented el.	1		9	11	11	11	10	10	10	10	10	10
	LD condens el.	1		2	14	17	18	17	16	15	15	14	13
	LD vented gas	0		0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier			**10**	**25**	**28**	**29**	**28**	**26**	**25**	**25**	**24**	**24**
	VC dom	1		10	17	18	10	12	12	12	11	10	9
	VC nondom	1		3	5	5	4	4	4	4	4	4	4
	Total VC Vacuum Cleaner			**13**	**22**	**23**	**14**	**16**	**16**	**16**	**15**	**14**	**14**
	TOTAL CLEANING			**89**	**100**	**100**	**88**	**87**	**84**	**83**	**83**	**83**	**83**
0.5	FAN Axial<300Pa (all FAN types >125W)	1		19	53	60	62	64	65	65	65	65	65
0.5	FAN Axial>300Pa	1		33	97	109	110	108	107	106	106	106	106
0.5	FAN Centr.FC	1		8	17	20	20	19	19	19	19	19	19
0.5	FAN Centr.BC-free	1		21	44	51	53	55	59	62	64	65	66
0.5	FAN Centr.BC	1		22	50	57	59	62	66	71	76	83	90
0.5	FAN Cross-flow	1		1	2	2	2	2	1	2	2	2	2
	Total FAN, industrial (excl. box & roof fans)			**53**	**132**	**149**	**153**	**155**	**159**	**162**	**166**	**170**	**174**
0.5	**Total MT Motors 0.75-375 kW**	**1**		**818**	**1123**	**1146**	**1118**	**1088**	**1096**	**1095**	**1095**	**1095**	**1095**
	Total WP Water Pumps	1		**88**	**118**	**126**	**134**	**143**	**153**	**164**	**175**	**186**	**196**

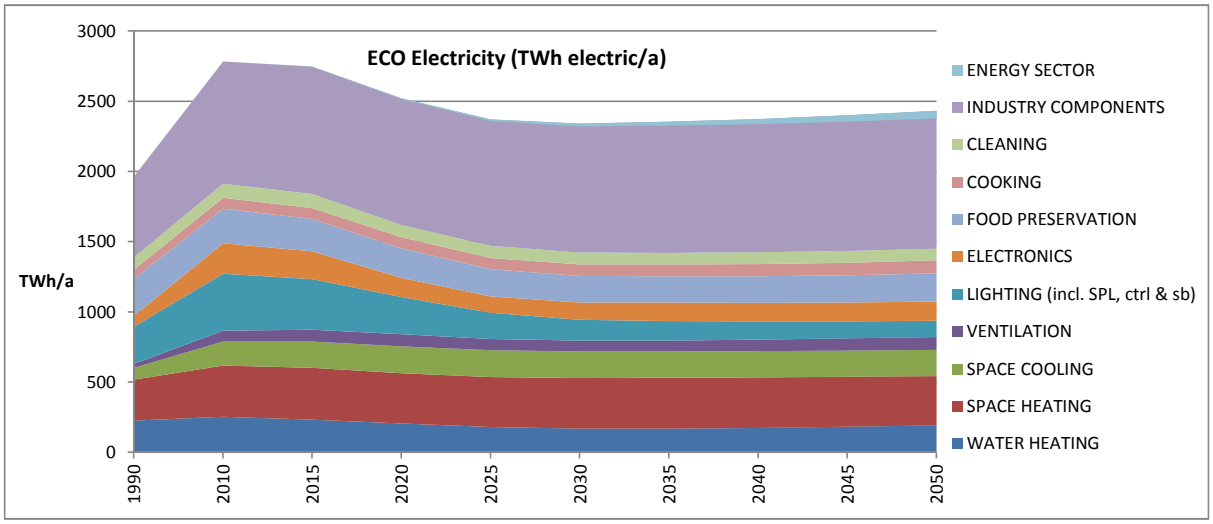
db	ECO Electricity (in TWh elec), c'td	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CP Fixed Speed 5-1280 l/s	1		24	49	41	35	34	35	36	37	38	39
	CP Variable speed 5-1280 l/s	1		0	9	16	20	22	22	23	24	24	25
	CP Pistons 2-64 l/s	1		1	2	1	1	1	1	2	2	2	2
	Total CP Standard Air Compressors			**25**	**59**	**58**	**56**	**57**	**58**	**60**	**62**	**63**	**65**
	TOTAL INDUSTRY COMPONENTS			575	870	906	902	899	918	934	950	966	983
1	TRAFO Distribution	1		12	20	22	23	24	25	25	26	26	27
1	TRAFO Industry oil	1		9	16	17	17	16	16	15	15	16	17
1	TRAFO Industry dry	1		3	5	5	6	6	6	6	6	6	7
1	TRAFO Power	1		34	53	60	66	73	79	85	91	98	105
1	TRAFO DER oil	1		0	0	1	1	2	3	4	6	8	11
1	TRAFO DER dry	1		0	2	3	5	8	13	21	32	45	60
1	TRAFO Small	1		2	2	2	2	2	2	2	2	2	2
	Total TRAFO Utility Transformers**			**60**	**98**	**110**	**120**	**130**	**143**	**159**	**178**	**202**	**228**
	TOTAL ENERGY SECTOR (only improvement over BAU)			0	0	-2	-6	-12	-19	-27	-37	-46	-56
	TOTAL TRANSPORT SECTOR			0	0	0	0	0	0	0	0	0	0
	GENERAL TOTAL in TWh electric			**1964**	**2783**	**2745**	**2516**	**2359**	**2322**	**2329**	**2338**	**2354**	**2378**
	GENERAL TOTAL in mtoe final (11.63 TWh/mtoe)			169	239	236	216	203	200	200	201	202	204

*=based on 1000 h/a full load equivalent with combustion fan 40W, valves 20W, CPU & controls 10W-->70W (probably less)

**=The energy costs of distribution transformers are already incorporated in the primary energy factor, so would lead to double counting. Therefore only improvement (extra saving is negative number) is counted.

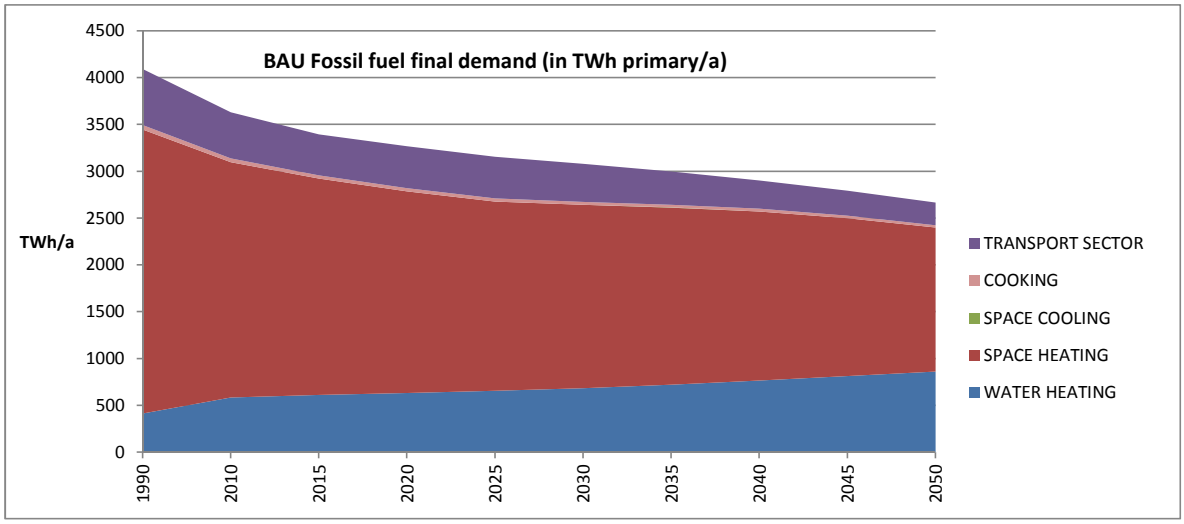
Double counting (db) : Note that circulator energys already included with CH boilers, fans and motors are largely (assumed 50%) in downstream regulated products. NRVU heat saving is already included in the diminishing net heat load of buildings (CH boilers, AC, etc.)

ECO Electricity (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	227	253	233	205	180	170	169	175	184	192
SPACE HEATING	291	366	370	359	356	361	362	359	355	351
SPACE COOLING	84	170	185	192	192	189	187	187	187	187
VENTILATION	27	78	85	85	81	77	78	82	86	90
LIGHTING (incl. SPL, ctrl & sb)	265	407	360	264	186	149	140	130	121	116
ELECTRONICS	78	215	197	137	118	123	131	133	135	136
FOOD PRESERVATION	265	247	230	211	194	188	188	189	194	202
COOKING	65	78	79	79	80	82	84	87	89	92
CLEANING	89	100	100	88	87	84	83	83	83	83
INDUSTRY COMPONENTS	575	870	906	902	899	918	934	950	966	983
ENERGY SECTOR	0	0	-2	-6	-12	-19	-27	-37	-46	-56
TOTAL in TWh electric	**1964**	**2783**	**2745**	**2516**	**2359**	**2322**	**2329**	**2338**	**2354**	**2378**



db	BAU Fossil Fuel (in TWh NCV)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**159**	**176**	**179**	**181**	**183**	**182**	**184**	**190**	**200**	**209**
	Total CH Central Heating combi, water heat	0	**2%**	**254**	**408**	**433**	**451**	**474**	**503**	**538**	**576**	**615**	**654**
	TOTAL WATER HEATING			**413**	**584**	**612**	**632**	**656**	**685**	**722**	**766**	**814**	**864**
	CH non-electric	0		2213	2004	1809	1656	1535	1496	1446	1368	1248	1095
	Total CH Central Heating boiler, space heat	0		**2213**	**2004**	**1809**	**1656**	**1535**	**1496**	**1446**	**1368**	**1248**	**1095**
	SFB Wood Manual	0		345	90	70	52	35	21	13	9	7	6
	SFB Wood Direct Draft	0		2	24	44	62	74	72	72	77	89	103
	SFB Coal	0		107	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		0	9	16	23	28	31	31	32	33	34
	SFB Wood chips	0		0	15	18	20	18	18	19	20	21	22
	Total Solid Fuel Boiler			**454**	**168**	**169**	**170**	**162**	**144**	**136**	**139**	**151**	**166**
	CHF	0	5%	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ACF	0	5%	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	SubTotal AHC central Air Cooling			**0.0**	**0.1**	**0.2**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**
	AC rooftop (rev)	1	100%	0	0	0	0	0	0	0	0	0	0
	AC splits (rev)	1	100%	0	0	0	0	0	0	0	0	0	0
	AC VRF (rev)	1	100%	0	0	0	0	0	0	0	0	0	0
	ACF (rev)	0	5%	0.0	0.2	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7
	AHF	0	5%	215	161	136	118	103	91	80	71	63	55
	AHE	1	100%	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Heating			**215**	**161**	**137**	**119**	**104**	**92**	**81**	**72**	**64**	**56**
	Total AHC central Air Heating & Cooling			**215**	**161**	**137**	**119**	**104**	**92**	**81**	**72**	**64**	**57**
	LH open fireplace	0	0%	14	18	19	20	21	21	21	21	21	21
	LH closed fireplace/inset	0	0%	18	41	49	56	62	65	66	66	65	63
	LH wood stove	0	0%	39	38	38	38	39	39	39	39	38	37
	LH coal stove	0	0%	27	15	13	11	10	8	7	5	4	4
	LH cooker	0	0%	7	11	12	14	15	16	16	16	15	15
	LH SHR stove	0	0%	17	21	23	25	28	30	33	35	36	36
	LH pellet stove	0	0%	0	8	11	14	16	18	18	18	18	17
	LH open fire gas	0	0%	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	0%	14	13	12	12	12	12	12	11	11	11
	LH flueless fuel heater	0	0%	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.portable	1	100%	0	0	0	0	0	0	0	0	0	0
	LH elec.convector	1	100%	0	0	0	0	0	0	0	0	0	0
	LH elec.storage	1	100%	0	0	0	0	0	0	0	0	0	0
	LH elec.underfloor	1	100%	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters	0	0%	5	5	5	5	5	5	5	4	4	4
	LH tube heaters	0	0%	12	12	12	12	11	11	10	10	10	9
	Total LH Local Heaters			**152**	**182**	**195**	**209**	**220**	**226**	**228**	**227**	**224**	**219**
	Total RAC Room Air Conditioner			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	100%	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING			**3033**	**2515**	**2310**	**2153**	**2020**	**1958**	**1892**	**1806**	**1685**	**1536**
	TOTAL SPACE COOLING			**0.0**	**0.1**	**0.2**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**
1	NRVU heat (negative=saving vs. natural ventilation)	0	0%	-136	-636	-757	-859	-942	-1009	-1076	-1144	-1213	-1283
1	RVU Central Unidir., heat (negative=saving)	0	0%	-16	-32	-36	-36	-34	-34	-35	-38	-40	-43
1	RVU Central Balanced, heat (negative=saving)	0	0%	-1	-8	-16	-29	-43	-55	-63	-70	-76	-83
1	RVU Local Balanced, heat (negative=saving)	0	0%	0	-1	-2	-4	-7	-10	-14	-17	-21	-24
	Total VU (heat saving vs. natural ventilation)			**-153**	**-678**	**-812**	**-928**	**-1026**	**-1107**	**-1188**	**-1268**	**-1350**	**-1433**
	TOTAL VENTILATION (extra heat saving vs. BAU; BAU heat saving already included in space heating energy, so here =0)			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL LIGHTING			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL COOKING			**49**	**39**	**37**	**35**	**33**	**31**	**30**	**29**	**27**	**26**
	TOTAL CLEANING			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ENERGY SECTOR			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1			299	262	239	244	247	221	191	162	139	129
	TYRE van replacement tyres C2			119	99	89	91	91	79	67	56	51	48
	TYRE truck replacement tyres C3			179	131	108	115	110	104	95	85	75	66
	TYRE Replacement Tyres			597	492	436	450	448	405	353	303	265	243
	TOTAL TRANSPORT SECTOR			**597**	**492**	**436**	**450**	**448**	**405**	**353**	**303**	**265**	**243**
	GENERAL TOTAL in TWh electric			**4093**	**3630**	**3396**	**3271**	**3158**	**3080**	**2998**	**2905**	**2792**	**2668**
	GENERAL TOTAL in mtoe final demand electric			352	312	292	281	272	265	258	250	240	229

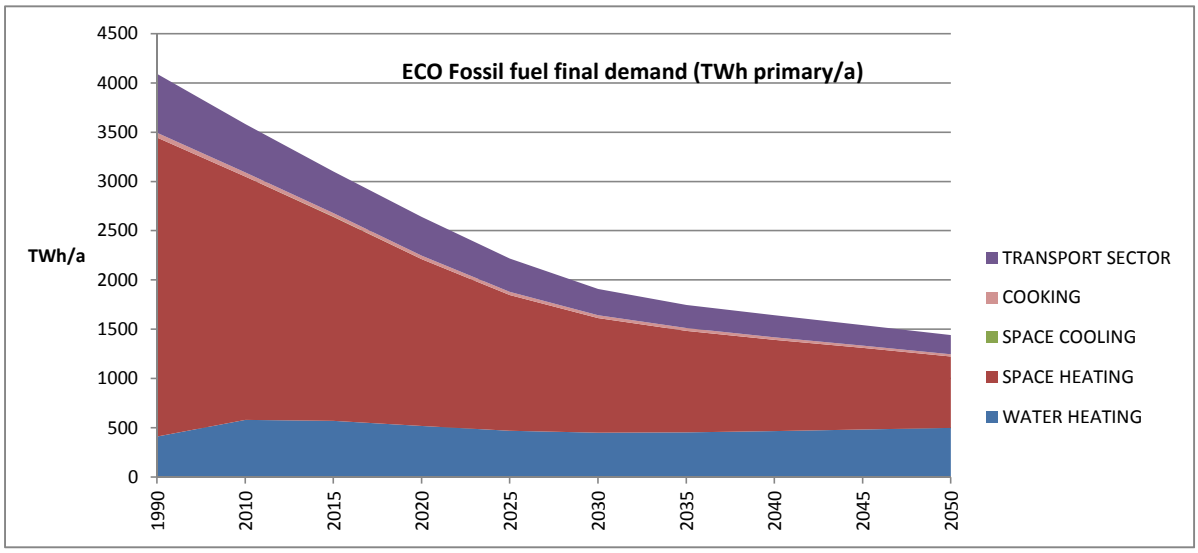
db	BAU Fossil Fuel (in TWh NCV)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING			413	584	612	632	656	685	722	766	814	864
	SPACE HEATING			3033	2515	2310	2153	2020	1958	1892	1806	1685	1536
	SPACE COOLING			0	0	0	0	0	0	0	0	0	0
	VENTILATION			0	0	0	0	0	0	0	0	0	0
	LIGHTING			0	0	0	0	0	0	0	0	0	0
	ELECTRONICS			0	0	0	0	0	0	0	0	0	0
	FOOD PRESERVATION			0	0	0	0	0	0	0	0	0	0
	COOKING			49	39	37	35	33	31	30	29	27	26
	CLEANING			0	0	0	0	0	0	0	0	0	0
	INDUSTRY COMPONENTS			0	0	0	0	0	0	0	0	0	0
	ENERGY SECTOR			0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR			597	492	436	450	448	405	353	303	265	243
	TOTAL in TWh primary			**4093**	**3630**	**3396**	**3271**	**3158**	**3080**	**2998**	**2905**	**2792**	**2668**
	TOTAL in mtoe final (11.63 TWh/mtoe)			352	312	292	281	272	265	258	250	240	229
	Total PJ primary			14735	13068	12224	11774	11368	11089	10791	10457	10053	9605



.

db	ECO Fossil Fuel (in TWh NCV)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**159**	**176**	**162**	**142**	**125**	**118**	**117**	**121**	**127**	**133**
	Total CH Central Heating combi, water heat	0	**2%**	**254**	**408**	**412**	**379**	**347**	**333**	**337**	**347**	**357**	**366**
	TOTAL WATER HEATING			**413**	**584**	**574**	**521**	**472**	**451**	**455**	**469**	**484**	**500**
	CH non-electric	0		2213	1957	1569	1206	916	738	626	530	431	323
	Total CH Central Heating boiler, space heat	0		**2213**	**1957**	**1569**	**1206**	**916**	**738**	**626**	**530**	**431**	**323**
	SFB Wood Manual	0		345	90	70	49	31	17	9	6	5	5
	SFB Wood Direct Draft	0		2	24	44	62	73	71	71	76	87	101
	SFB Coal	0		107	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		0	9	16	23	28	31	31	31	32	34
	SFB Wood chips	0		0	15	18	20	18	17	18	20	21	22
	Total Solid Fuel Boiler			**454**	**168**	**168**	**167**	**157**	**138**	**131**	**134**	**146**	**162**
	CHF	0	5%	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	ACF	0	5%	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SubTotal AHC central Air Cooling			**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**
	AC rooftop (rev)	1	100%	0	0	0	0	0	0	0	0	0	0
	AC splits (rev)	1	100%	0	0	0	0	0	0	0	0	0	0
	AC VRF (rev)	1	100%	0	0	0	0	0	0	0	0	0	0
	ACF (rev)	0	5%	0	0	0	0	1	1	1	1	1	1
	AHF	0	5%	215	161	136	114	94	78	67	59	53	47
	AHE	1	100%	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Heating			**215**	**161**	**137**	**115**	**95**	**79**	**68**	**60**	**53**	**47**
	Total AHC central Air Heating & Cooling			**215**	**161**	**137**	**115**	**95**	**79**	**68**	**60**	**54**	**48**
										0			
	LH open fireplace	0	0%	14	18	19	19	18	17	15	14	14	13
	LH closed fireplace/inset	0	0%	18	41	49	55	58	60	60	58	56	55
	LH wood stove	0	0%	39	38	38	38	37	36	35	34	33	32
	LH coal stove	0	0%	27	15	13	11	10	8	6	5	4	3
	LH cooker	0	0%	7	11	12	14	15	15	15	14	14	14
	LH SHR stove	0	0%	17	21	23	25	27	30	33	35	36	36
	LH pellet stove	0	0%	0	8	11	14	16	17	18	18	18	17
	LH open fire gas	0	0%	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	0%	14	13	12	12	11	10	9	9	9	9
	LH flueless fuel heater	0	0%	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.portable	1	100%	0	0	0	0	0	0	0	0	0	0
	LH elec.convector	1	100%	0	0	0	0	0	0	0	0	0	0
	LH elec.storage	1	100%	0	0	0	0	0	0	0	0	0	0
	LH elec.underfloor	1	100%	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters	0	0%	5	5	5	5	5	4	4	4	4	4
	LH tube heaters	0	0%	12	12	12	11	11	10	10	9	9	9
	Total LH Local Heaters			**152**	**182**	**195**	**205**	**208**	**208**	**206**	**201**	**196**	**193**
	Total RAC Room Air Conditioner			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	100%	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING			**3033**	**2468**	**2069**	**1692**	**1376**	**1163**	**1030**	**925**	**827**	**725**
	TOTAL SPACE COOLING			**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**
1	NRVU heat (negative=saving vs. natural ventilation)	0	0%	-136	-636	-777	-925	-1054	-1157	-1228	-1291	-1354	-1417
1	RVU Central Unidir., heat (negative=saving)	0	0%	-16	-32	-46	-61	-75	-88	-93	-99	-106	-113
1	RVU Central Balanced, heat (negative=saving)	0	0%	-1	-8	-17	-31	-46	-60	-69	-76	-83	-90
1	RVU Local Balanced, heat (negative=saving)	0	0%	0	-1	-2	-5	-8	-13	-17	-21	-26	-30
	Total VU (heat saving vs. natural ventilation)			**-153**	**-678**	**-843**	**-1022**	**-1184**	**-1317**	**-1406**	**-1487**	**-1569**	**-1650**
	TOTAL VENTILATION (extra heat saving vs. BAU; BAU heat saving already included in space heating energy, so only difference ECO-BAU considered here)			**0**	**0**	**-31**	**-89**	**-127**	**-149**	**-144**	**-136**	**-129**	**-122**
	TOTAL LIGHTING			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL COOKING			**49**	**39**	**37**	**35**	**32**	**30**	**28**	**26**	**25**	**24**
	TOTAL CLEANING			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ENERGY SECTOR			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1			299	262	233	215	191	144	124	117	109	102
	TYRE van replacement tyres C2			119	99	85	75	61	51	48	46	43	40
	TYRE truck replacement tyres C3			179	131	105	102	86	71	63	60	56	52
	TYRE Replacement Tyres			597	492	423	392	339	266	236	222	208	195
	TOTAL TRANSPORT SECTOR			**597**	**492**	**423**	**392**	**339**	**266**	**236**	**222**	**208**	**195**
	GENERAL TOTAL in TWh fossil fuel (=primary)			**4093**	**3583**	**3072**	**2551**	**2093**	**1761**	**1605**	**1507**	**1416**	**1321**
	GENERAL TOTAL in mtoe final			352	308	264	219	180	151	138	130	122	114

db	ECO Fossil Fuel (in TWh NCV)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING			413	584	574	521	472	451	455	469	484	500
	SPACE HEATING			3033	2468	2069	1692	1376	1163	1030	925	827	725
	SPACE COOLING			0	0	0	0	0	0	0	0	0	0
	VENTILATION			0	0	-31	-89	-127	-149	-144	-136	-129	-122
	LIGHTING			0	0	0	0	0	0	0	0	0	0
	ELECTRONICS			0	0	0	0	0	0	0	0	0	0
	FOOD PRESERVATION			0	0	0	0	0	0	0	0	0	0
	COOKING			49	39	37	35	32	30	28	26	25	24
	CLEANING			0	0	0	0	0	0	0	0	0	0
	INDUSTRY COMPONENTS			0	0	0	0	0	0	0	0	0	0
	ENERGY SECTOR			0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR			597	492	423	392	339	266	236	222	208	195
	TOTAL in TWh fossil fuel (=primary)			**4093**	**3583**	**3072**	**2551**	**2093**	**1761**	**1605**	**1507**	**1416**	**1321**
	TOTAL in mtoe final (11.63 TWh/mtoe)			352	308	264	219	180	151	138	130	122	114



Emission rates			constants	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
GWP (Global Warming Potential)													
All greenhouse gas emissions in GWP-100, CO_2 equivalent													
variable			kg CO_2/kWh										
GWPel	**electricity**	kg CO_2/kWh		0.500	0.410	0.395	0.380	0.360	0.340	0.320	0.300	0.280	0.260
heating fuels													
GWPgas	nat.gas	kg CO_2/kWh	0.198										
GWPoil	gas oil heating	kg CO_2/kWh	0.270										
GWPfossil	80/20 gas/oil	kg CO_2/kWh	0.212										
GWPwood	wood logs	kg CO_2/kWh	0.0216										
GWPpellets	pellets	kg CO_2/kWh	0.040										
GWPcoal	coal	kg CO_2/kWh	0.3924										
GWPwoodchip	wood chips	kg CO_2/kWh	0.0144										
automotive fuels													
GWPpetrol	petrol	kg CO_2/kWh	0.267										
GWPdiesel	diesel	kg CO_2/kWh	0.264										

refrigerant (leakage & EoL not recovered loss)*

variable	avg. refrigerant mix (source: prep. study or IA)		GWP kg CO_2 /kg	charge in kg	loss in %/a	loss EoL kg	total loss kg/a	kg CO_2/ a /unit
GWPRAC [ca.3.5 kW]	avg. RAC (Lot 10)	kgCO_2/a	1934	1.05	3.0%			69
GWPCHAS [44 kW]	CHAS (Lot 21_6)	kgCO_2/a	1922	27	3.9%			2029
GWPCHAL [714 kW]	CHAL (Lot 21_6)	kgCO_2/a	1423	100	3.9%			5564
GWPCHWS [61 kW]	CHWS (Lot 21_6)	kgCO_2/a	1783	15	3.9%			1046
GWPCHWL [894 kW]	CHWL (Lot 21_6)	kgCO_2/a	1423	180	3.9%			10015
GWPACroof [80 kW]	ACroof (Lot 21_6)	kgCO_2/a	2025	20	7.0%			2835
GWPACsplit [14 kW]	ACsplit (Lot 21_6)	kgCO_2/a	2025	5.6	7.0%			794
GWPACVRF [50 kW]	AC VRF (Lot 21_6)	kgCO_2/a	2025	25	7.0%			3544
LOT ENER 12	**Commercial Refrigeration**							
GWPCF1	CF vertical chilled	kgCO_2/a	2280	20	8.5%			3876
GWPCF2	CF horizontal frozen	kgCO_2/a	2280	20	8.5%			3876
GWPCF3	CF beverage cooler	kgCO_2/a	1300	0.318	4.5%			19
GWPCF4	CF ice cream freezer	kgCO_2/a	2550	0.22	4.5%			25
GWPCF5	CF vending machine	kgCO_2/a	1300	0.546	4.0%			28
Lot ENTR 01, PF	**Storage cabinets**							
GWPPFCV	Vertical Chilled	kgCO_2/a	1430	0.5	1.0%	0.13	0.019	28
GWPPFFV	Vertical frozen	kgCO_2/a	3922	0.7	1.0%	0.18	0.027	106
GWPPFCH	Counter chilled	kgCO_2/a	1430	0.3	1.0%	0.08	0.012	17
GWPPFFH	Counter frozen	kgCO_2/a	3922	0.3	1.0%	0.08	0.012	47
GWPPFAVG	average all types	kgCO_2/a	2280	0.5	1.0%	0.13	0.019	44
	Process Chillers							
GWPCHACMTS	PTCH AC-mt-S	kgCO_2/a	2280	65	1.0%	5	0.98	2242
GWPCHACMTL	PTCH AC-mt-L	kgCO_2/a	2280	140	1.0%	5	1.73	3952
GWPCHACLTS	PTCH AC-lt-S	kgCO_2/a	2280	60	1.0%	5	0.93	2128
GWPCHACLTL	PTCH AC-lt-L	kgCO_2/a	2280	200	1.0%	5	2.33	5320
GWPCHWCMTS	PTCH WC-mt-S	kgCO_2/a	2280	45	1.0%	5	0.78	1786
GWPCHWCMTL	PTCH WC-mt-l	kgCO_2/a	2280	80	1.0%	5	1.13	2584
GWPCHWCLTS	PTCH WC-lt-S	kgCO_2/a	2280	35	1.0%	5	0.68	1558
GWPCHWCLTL	PTCH WC-lt-L	kgCO_2/a	2280	100	1.0%	5	1.33	3040
GWPCHAVG	average all types	kgCO_2/a	2280	78	1.0%	5	1.11	2538
	Condensing Units							
GWPCUMTS	CU-mt [0.2 -1 kW]	kgCO_2/a	2280	1	10%	0.2	0.13	285
GWPCUMTM	CU-mt [1 - 5 kW]	kgCO_2/a	2280	3	10%	0.2	0.33	741
GWPCUMTL	CU-mt [5 - 20 kW]	kgCO_2/a	2280	10	10%	0.2	1.03	2337
GWPCUMTXL	CU-mt [20-50 kW]	kgCO_2/a	2280	25	10%	0.2	2.53	5757
GWPCULTS	CU-lt [0.1 -0.4 kW]	kgCO_2/a	2280	1	10%	0.2	0.13	285
GWPCULTM	CU-lt [0.4 - 2kW]	kgCO_2/a	2280	3	10%	0.2	0.33	741
GWPCULTL	CU-lt [2 - 8 kW]	kgCO_2/a	2280	10	10%	0.2	1.03	2337
GWPCULTXL	CU-lt [8 - 20 kW]	kgCO_2/a	2280	25	10%	0.2	2.53	5757
GWPCUAVG	average all types	kgCO_2/a	2280	4.51	10%	0.2	0.48	1085

*the main instrument for regulating F-gases is the F-gas directive, but --as some extra bonus is given for low GWP refrigerants in Ecodesign regulations-- this topic is included here. No differentiation is made between BAU and ECO scenario for this specific item. Note that it does not apply to household refrigeration appliances (low-GWP, negligible loss). For professional refrigeration CR 2015/1095 foresees a bonus for the use of refrigerants with GWP < 150 kg CO2 eq/kg refrigerant for process chillers and for condensing units (not for storage cabinets) but the effects of this bonus could not be quantified in the IA. The topic will be further addressed during the review of the CR. GWP data presented in EIA are preliminary best estimates based on data from the IA-study. Refrigerant data are the same for the BAU and ECO scenario, no savings accounted.

NO_x, CO, OGC and PM-emissions

CH boilers (lot 1) & WH (Lot 2), fossil fuel fired*, NO_x emissions			1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NO_xBAU	BAU stock	mg/kWh NCV	190	190	190	190	190	190	190	190	190	190
	limits ED (sales)	mg/kWh NCV	190	190	133	75	75	75	75	75	75	75
NO_xECO	ECO stock	mg/kWh NCV	190	190	179	133	97	75	75	75	75	75

*=ED regulations prescribes max. 56 (gas) and 120 (oil) mg/kWh GCV. At a 80/20 gas-oil share this translates into 75 mg/kWh NCV starting from 26.9.2018.
The IA report mentions currently an average of 175 mg/kWh NCV (190 mg/kWh NCV). Share of CHP and fossil-fuel fired heat pumps neglected.

Solid Fuel Boilers (SFB, Lot 15), NOx, CO, OGC and PM emissions

CR 2015/1189 sets emissions limits for NOx (nitrogen oxides), CO (carbon monoxide), OGC (organic gaseous carbon) and PM (particulate matter). For NOx insufficient data were available in IA for a quantitifcation of emissions in EIA and hence no NOx data are reported here for SFB. EIA data are based on the Impact Assessment report and underlying Excel files.

For each emission type, EIA computes (total emissions of the stock) = (average emission rate of the stock in g/GJ fuel input) * (fuel consumption by the stock as reported on FUELBAU or FUELECO in TWh/a, but *1000*3600 to convert to GJ/a). This result in g/a is then divided by 1E9 to convert to kton/a.

The sheet EMISSRATES reports the (average emission rate of the stock in g/GJ fuel input). However, the original emission rates in the studies, and the limits set in the CR, are expressed in mg/m3 flue gas. The conversion factor from mg/m3 to g/GJ is not a simple constant, but depends on the energy efficiency, and thus differs per product and changes with the years. In addition, the converted emission rates are first obtained as averages for new sold products. In a next step, this has to be converted to average values for the installed stock of products (in the same way as is done for the energy efficiencies, see sheets EFN and EFS). The conversion of original sales-average emission rates in mg/m3 to stock-average emision rates in g/GJ is not shown in this EIA file, but available on request in a separate file.

Solid Fuel Boilers (SFB, Lot 15), CO emission rates

BAU	mg/m3 in 2010	CO-emission rates in g/GJ, average of stock									
	sales average	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	4000	7202	3992.8	3739	3628	3614	3598	3580	3567	3562	3562
SFB Wood Direct Draft	200	275	187	184	183	182	181	180	180	180	180
SFB Coal	200	351	226	214	207	205	204	202	202	201	201
SFB Pellets	350	381	316	309	306	305	304	302	302	301	301
SFB Wood chips	350	376	309	306	303	301	299	298	297	297	297

ECO	mg/m3 in 2020	CO-emission rates in g/GJ, average of stock									
	limits from CR	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	700	7202	3992.8	3739	3364	2875	2023	804	612	611	611
SFB Wood Direct Draft	500	275	187	184	183	181	179	177	176	175	175
SFB Coal	500	351	226	214	207	205	203	199	197	196	196
SFB Pellets	500	381	316	309	306	304	300	297	295	294	294
SFB Wood chips	500	376	309	306	303	301	299	298	297	297	297

Solid Fuel Boilers (SFB, Lot 15), OGC emission rates

BAU	mg/m3 in 2010	OGC-emission rates in g/GJ, average of stock									
	sales average	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	350	630	349	327	317	316	315	313	312	312	312
SFB Wood Direct Draft	10	14	9	9	9	9	9	9	9	9	9
SFB Coal	10	18	11	11	10	10	10	10	10	10	10
SFB Pellets	50	54	45	44	44	44	43	43	43	43	43
SFB Wood chips	10	11	9	9	9	9	9	9	8	8	8

ECO	mg/m3 in 2020	OGC-emission rates in g/GJ, average of stock									
	limits from CR	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	30	630	349	327	292	245	162	44	26	26	26
SFB Wood Direct Draft	20	14	9	9	9	9	9	9	9	9	9
SFB Coal	20	18	11	11	10	10	10	10	10	10	10
SFB Pellets	20	54	45	44	38	31	26	20	17	17	17
SFB Wood chips	20	11	9	9	9	9	9	9	8	8	8

Solid Fuel Boilers (SFB, Lot 15), PM emission rates

BAU	mg/m3 in 2010	PM-emission rates in g/GJ, average of stock									
	sales average	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	180	324	180	168	163	163	162	161	161	160	160
SFB Wood Direct Draft	50	69	47	46	46	46	45	45	45	45	45
SFB Coal	50	88	57	54	52	51	51	51	50	50	50
SFB Pellets	50	54	45	44	44	44	43	43	43	43	43
SFB Wood chips	50	54	44	44	43	43	43	43	42	42	42

ECO	mg/m3 in 2020	PM-emission rates in g/GJ, average of stock									
	limits from CR	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	60	324	180	168	154	136	105	60	52	52	52
SFB Wood Direct Draft	40	69	47	46	44	41	39	36	35	35	35
SFB Coal	40	88	57	54	52	50	47	41	40	39	39
SFB Pellets	40	54	45	44	42	39	37	35	34	34	34
SFB Wood chips	40	54	44	44	42	40	37	35	34	34	34

Local Space Heaters (LSH, Lot 20), NOx, CO, OGC and PM emissions

CR 2015/1185 (solid fuel LSH) sets emissions limits for NOx (nitrogen oxides), CO (carbon monoxide), OGC (organic gaseous carbon) and PM (particulate matter). CR 2015/1188 (liquid and gaseous fuel LSH) sets emissions limits for NOx. For NOx emissions limited data were available in the Impact Assessment report and underlying Excel sheet. Consequently NOx data are reported in EIA only for LSH using liquid or gaseous fuel and even these data are to be considered indicative only. EIA data are based on the Impact Assessment report and underlying Excel files.

As regards the computation method in EIA the same explanation applies as for Solid Fuel Boilers (see further above).

Local Space Heaters (LSH, Lot 20), CO emission rates

BAU	mg/m3 in 2010 sales average	CO-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	3600	3834	2751.2	2517	2301	2097	1902	1732	1601	1511	1459
LH closed fireplace/inset	3600	3747	2675	2451	2245	2056	1874	1717	1596	1509	1459
LH wood stove	3600	3866	2779	2534	2298	2081	1881	1717	1596	1509	1459
LH coal stove	3600	4605	3303	3011	2743	2503	2293	2105	1934	1792	1704
LH cooker	3600	3569	2518	2291	2077	1881	1697	1552	1468	1445	1445
LH SHR stove	3600	3191	2572	2411	2247	2086	1932	1810	1722	1659	1620
LH pellet stove	600	1072	546	396	251	151	98	87	87	87	87

ECO	mg/m3 in 2022 limits from CR	CO-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	2000	3834	2751.2	2517	2244	1835	1472	1146	857	658	648
LH closed fireplace/inset	1500	3747	2675	2451	2184	1793	1476	1203	965	799	790
LH wood stove	1500	3866	2779	2534	2245	1833	1488	1205	965	799	790
LH coal stove	1500	4605	3303	3011	2698	2300	1956	1620	1250	937	920
LH cooker	1500	3569	2518	2291	1978	1452	1030	742	726	726	726
LH SHR stove	1500	3191	2572	2411	2185	1805	1497	1260	1069	935	928
LH pellet stove	300	1072	546	396	250	149	97	87	87	87	87

Local Space Heaters (LSH, Lot 20), OGC emission rates

BAU	mg/m3 in 2010 sales average	OGC-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	180	364	194	157	123	91	64	43	28	19	17
LH closed fireplace/inset	180	350	182	147	114	84	60	41	27	19	17
LH wood stove	180	369	198	159	123	88	61	41	27	19	17
LH coal stove	180	446	241	195	153	116	85	60	39	24	20
LH cooker	180	322	157	121	88	57	34	21	17	17	17
LH SHR stove	180	304	180	148	115	83	57	40	28	21	19
LH pellet stove	150	214	111	97	90	89	88	87	87	87	87

ECO	mg/m3 in 2022 limits from CR	OGC-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	120	364	194	157	123	91	64	43	28	19	17
LH closed fireplace/inset	120	350	182	147	114	84	60	41	27	19	17
LH wood stove	120	369	198	159	123	88	61	41	27	19	17
LH coal stove	120	446	241	195	153	116	85	60	39	24	20
LH cooker	120	322	157	121	88	57	34	21	17	17	17
LH SHR stove	120	304	180	148	115	83	57	40	28	21	19
LH pellet stove	60	214	111	97	85	65	48	36	35	35	35

Local Space Heaters (LSH, Lot 20), PM emission rates

BAU	mg/m3 in 2010 sales average	PM-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	910	794	638	587	503	429	362	299	256	252	251
LH closed fireplace/inset	210	264	169	148	127	111	95	82	72	67	62
LH wood stove	210	274	178	156	132	113	96	82	72	67	62
LH coal stove	210	329	214	187	161	139	120	103	89	81	73
LH cooker	235	266	172	147	118	98	85	81	77	75	75
LH SHR stove	160	195	133	117	101	85	69	57	48	42	38
LH pellet stove	85	125	71	55	40	25	15	10	9	9	9

ECO	mg/m3 in 2022 limits from CR	PM-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	50	794	638	587	490	369	256	147	57	18	16
LH closed fireplace/inset	40	264	169	148	123	93	69	48	31	22	21
LH wood stove	40	274	178	156	129	96	70	48	31	22	21
LH coal stove	40	329	214	187	158	125	98	71	44	26	25
LH cooker	40	266	172	147	111	68	37	20	19	19	19
LH SHR stove	40	195	133	117	98	74	55	42	32	25	25
LH pellet stove	20	125	71	55	40	25	15	10	9	9	9

Local Space Heaters (LSH, Lot 20), NOx emission rates

BAU	mg/kWh in 2012 sales average	NOx-emission rates in mg/kWh, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fire gas	300	361	322	312	302	292	282	274	269	265	264
LH closed fire gas	200	263	223	213	203	193	183	174	168	165	164
LH luminous heaters	100	100	100	100	100	100	100	100	100	100	100
LH tube heaters	230	292	252	242	233	223	213	205	199	195	194

ECO	mg/kWh in 2018	NOx-emission rates in mg/kWh, average of stock									
	limits from CR	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fire gas	130	361	322	312	266	218	176	138	130	130	130
LH closed fire gas	130	263	223	213	191	169	149	133	130	130	130
LH luminous heaters	200	100	100	100	100	100	100	100	100	100	100
LH tube heaters	200	292	252	242	229	218	208	199	196	195	194

Air Heaters and Coolers (AHC, ENER Lot 21 / ENTR Lot 6), NOx emissions

The draft regulation (WD of 2015) sets emissions limits for NOx (nitrogen oxides) for warm air heaters, heat pumps, confort chillers, high temperature chillers and air conditioners working on gaseous or liquid fuels. The first proposed tier is in September 2018; for warm air heaters a second tier with lower emission limits is proposed for January 2021. EIA data are based on the Impact Assessment report and underlying Excel files. However, in the IA the same emission limits were used for the BAU and ECO scenarios, meaning that emission savings derive only from reduced fuel consumption. In EIA the (reduced) emission limits of the 2015 WD are used for the ECO scenario, leading to lower ECO-emissions and to higher emission savings than in the IA.

As regards the computation method in EIA the same explanation applies as for Solid Fuel Boilers (see further above).

BAU	mg/kWh in 2012	NOx-emission rates in mg/kWh, average of stock									
	sales average	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CHF	900	900	900	900	900	900	900	900	900	900	900
ACF	900	900	900	900	900	900	900	900	900	900	900
ACF (rev)	900	900	900	900	900	900	900	900	900	900	900
AHF	275	275	275	275	275	275	275	275	275	275	275

ECO	mg/kWh in 2018	mg/kWh in 2021	NOx-emission rates in mg/kWh, average of stock									
	limits from WD	limits from WD	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CHF	240	240	900	900	882	656	435	265	240	240	240	240
ACF	240	240	900	900	882	656	435	265	240	240	240	240
ACF (rev)	240	240	900	900	882	656	435	265	240	240	240	240
AHF	100	70	275	275	272	224	156	88	70	70	70	70

NOISE

Heat pump space heaters, heat pump combination heaters (Lot 1) and heat pump water heaters (Lot 2), max. sound power level (LWA) (from 26.9.2015)

		max. dB(A)
Rated heat output ≤ 6 kW	indoors	60
	outdoors	65
Rated heat output > 6 kW and ≤ 12 kW	indoors	65
	outdoors	70
Rated heat output > 12 kW and ≤ 30 kW	indoors	70
	outdoors	78
Rated heat output > 30 kW and ≤ 70 kW	indoors	80
	outdoors	88

RAC, Lot 10 (applicable max. sound power levels, from 1.1.2013)

Rated capacity ≤ 6 kW	indoors	60
	outdoors	65
6 < Rated capacity ≤12 kW	indoors	65
	outdoors	70

Vacuum cleaners, Lot 17 (from 1.9.2017)

Sound power level shall be less than or equal to 80 dB(A),

Tyres (Tyre regulation): Rolling Noise requirements

Tyre class	max dB(A)
C1A	70
C1B	71
C1C	71
C1D	72
C1E	74
C2 normal	72
C2 traction	73
C3 normal	73
C3 traction	75

For C1 snow tyres limits +1 dB(A)
For C2 traction snow tyres limits +2 dB(A)
For C3 and other C2 snow tyres limits +2 dB(A)

---

db	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also other emissions at bottom of Table										
	Total WH dedicated Water Heater	**146**	**140**	**138**	**136**	**132**	**127**	**123**	**121**	**122**	**122**
	Total CH Central Heating combi, water heat	**55**	**88**	**93**	**97**	**102**	**108**	**116**	**124**	**132**	**140**
	TOTAL WATER HEATING	**201**	**228**	**232**	**233**	**234**	**235**	**238**	**245**	**254**	**262**
	Total CH Central Heating boiler, space heat	**521**	**477**	**434**	**398**	**369**	**359**	**345**	**325**	**296**	**261**
	SFB Wood Manual	7.4	2.0	1.5	1.1	0.8	0.5	0.3	0.2	0.2	0.1
	SFB Wood Direct Draft	0.1	0.5	1.0	1.3	1.6	1.6	1.6	1.7	1.9	2.2
	SFB Coal	42.0	11.7	8.0	5.0	2.7	1.0	0.5	0.4	0.3	0.3
	SFB Pellets	0.0	0.4	0.7	0.9	1.1	1.2	1.2	1.2	1.3	1.4
	SFB Wood chips	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Total Solid Fuel Boiler	**49**	**15**	**11**	**9**	**6**	**5**	**4**	**4**	**4**	**4**
	CHAE-S (≤ 400 kW)	2.5	6.8	7.8	8.4	8.5	8.7	8.6	7.6	5.8	3.7
	CHAE-L (> 400 kW)	3.2	6.5	7.0	7.1	6.7	6.0	5.4	4.9	4.5	4.2
	CHWE-S (≤ 400 kW)	0.2	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.7	1.5	1.6	1.6	1.5	1.4	1.2	1.1	1.0	1.0
	CHWE-L (> 1500 kW)	0.5	0.9	1.0	1.0	1.0	0.9	0.8	0.7	0.7	0.6
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	11.6	14.9	15.7	16.2	15.9	15.3	14.6	13.8	13.1	12.3
	HT PCH-AE-L	11.1	14.2	15.0	15.3	15.0	14.4	13.7	12.9	12.2	11.5
	HT PCH-WE-S	2.4	3.1	3.3	3.4	3.4	3.2	3.1	2.9	2.7	2.6
	HT PCH-WE-M	4.7	6.1	6.5	6.7	6.6	6.3	6.1	5.8	5.4	5.1
	HT PCH-WE-L	0.9	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.1	1.1
	AC rooftop	1.8	3.9	3.8	3.3	2.4	1.5	0.7	0.3	0.2	0.2
	AC splits	2.7	7.1	6.9	6.5	5.9	5.3	4.7	4.2	3.7	3.3
	AC VRF	0.0	2.6	3.8	5.5	6.8	8.5	10.0	11.2	12.2	13.0
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC central Air Cooling	**42**	**70**	**74**	**77**	**76**	**73**	**71**	**67**	**63**	**59**
	AC rooftop (rev)	2.3	5.8	5.7	4.9	3.6	2.2	1.0	0.3	0.0	0.0
	AC splits (rev)	4.3	11.3	11.3	10.7	9.7	8.4	7.2	6.2	5.3	4.6
	AC VRF (rev)	0.0	4.4	6.4	8.7	10.6	12.6	14.0	14.5	14.5	14.1
	ACF (rev)	0	0	0	0	0	0	0	0	0	0
	AHF	48	35	30	26	23	20	18	16	14	12
	AHE	0.6	1.2	0.9	0.6	0.5	0.4	0.4	0.3	0.3	0.3
	SubTotal AHC central Air Heating	**55**	**58**	**54**	**51**	**47**	**44**	**40**	**37**	**34**	**31**
	Total AHC central Air Heating & Cooling	**97**	**128**	**129**	**128**	**123**	**117**	**111**	**104**	**98**	**90**
	LH open fireplace	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4
	LH closed fireplace/inset	0.4	0.9	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4
	LH wood stove	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	LH coal stove	10.4	5.7	5.0	4.5	3.9	3.3	2.7	2.1	1.7	1.4
	LH cooker	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH SHR stove	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.8
	LH pellet stove	0.0	0.3	0.4	0.6	0.6	0.7	0.7	0.7	0.7	0.7
	LH open fire gas	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH closed fire gas	2.7	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2
	LH flueless fuel heater	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	LH elec.portable	14.1	11.4	10.9	10.4	9.8	9.2	8.6	7.9	7.2	6.5
	LH elec.convector	58.2	47.3	45.3	43.0	40.4	38.1	35.7	32.9	29.9	27.1
	LH elec.storage	4.3	3.5	3.4	3.2	3.0	2.8	2.7	2.5	2.3	2.0
	LH elec.underfloor	8.0	6.7	6.4	6.1	5.8	5.4	5.1	4.7	4.3	4.0
	LH luminous heaters	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9
	LH tube heaters	2.5	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.0
	LH total	**104**	**84**	**81**	**77**	**73**	**69**	**65**	**60**	**55**	**51**
	RAC (cooling demand), all types <12 kW	1.4	9.3	10.9	12.5	14.6	15.6	15.7	15.5	15.2	14.8
	RAC (heating demand), reversible <12kW	1.1	10.8	14.6	18.3	21.7	22.1	21.0	19.6	18.1	16.7
	Total RAC Room Air Conditioner	**2**	**20**	**25**	**31**	**36**	**38**	**37**	**35**	**33**	**32**
1	**CIRC Circulator pumps <2.5 kW, net load**	**8.1**	**8.6**	**8.5**	**8.4**	**8.2**	**8.1**	**7.7**	**6.9**	**6.1**	**5.3**
	TOTAL SPACE HEATING	**730**	**645**	**595**	**553**	**518**	**498**	**475**	**446**	**408**	**364**
	TOTAL SPACE COOLING	**44**	**79**	**85**	**89**	**90**	**89**	**86**	**83**	**79**	**74**
	NRVU electricity	9.5	25.0	27.3	28.3	27.6	26.4	25.3	24.3	23.4	22.6
1	NRVU heat (negative=saving vs. natural ventilation)	-29.0	-135.1	-160.9	-182.5	-200.2	-214.2	-228.5	-242.9	-257.6	-272.5
	RVU Central Unidir. VU ≤125W/fan (1 fan)	3.9	6.3	6.9	6.5	5.9	5.5	5.4	5.4	5.4	5.3
	RVU Central Balanced VU ≤125W/fan (2 fans)	0.0	0.4	0.8	1.4	2.0	2.4	2.6	2.7	2.8	2.8
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.7	0.8
1	RVU Central Unidir., heat (negative=saving)	-3.5	-6.8	-7.7	-7.6	-7.2	-7.2	-7.5	-8.0	-8.6	-9.1
1	RVU Central Balanced, heat (negative=saving)	-0.1	-1.8	-3.5	-6.1	-9.0	-11.6	-13.3	-14.8	-16.2	-17.6
1	RVU Local Balanced, heat (negative=saving)	0.0	-0.2	-0.5	-0.9	-1.5	-2.2	-2.9	-3.7	-4.4	-5.2
	Total VU Ventilation Units	**-19**	**-112**	**-137**	**-161**	**-182**	**-200**	**-218**	**-236**	**-254**	**-273**
	TOTAL VENTILATION (electricity)	**13**	**32**	**35**	**36**	**36**	**35**	**34**	**33**	**32**	**32**

db	BAU Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL Linear Fluorescent	40.5	51.4	54.3	50.7	46.7	42.2	37.8	33.4	29.7	26.2
	CFL Compact Fluorescent	1.9	11.0	14.2	12.5	8.0	5.9	4.9	4.1	3.4	2.8
	Tungsten	4.5	21.5	21.8	20.7	13.3	9.0	6.2	4.1	2.9	2.4
	GLS GeneralLighting Service (incandescent)	42.0	25.1	18.3	12.8	7.4	2.3	0.5	0.0	0.0	0.0
	HID High Intensity Discharge	17.8	30.8	26.9	23.0	20.4	19.3	18.1	17.0	15.9	14.7
	LED Light Emitting Diode	0.0	0.1	0.4	2.0	4.6	7.3	8.7	9.3	9.3	9.1
	SP Special Purpose (exempt)	20.0	24.8	20.8	17.0	13.2	10.3	9.7	9.1	8.5	7.9
	lighting controls & sb	5.6	7.0	5.8	4.8	3.7	2.9	2.7	2.6	2.4	2.2
	TOTAL LIGHTING (incl. SPL, ctrl & sb)	**132**	**172**	**162**	**143**	**117**	**99**	**89**	**80**	**72**	**65**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	**107**	**140**	**136**	**122**	**101**	**86**	**76**	**68**	**61**	**55**
	DP TV, on mode	13.6	34.8	27.0	16.7	16.8	17.1	15.5	12.5	8.8	7.8
	DP Monitor, on mode	0.5	4.6	3.4	2.6	2.5	2.2	1.7	1.1	0.5	0.3
	DP TV , sb mode	1.9	2.1	1.9	4.3	5.1	5.2	5.1	4.8	4.2	3.5
	DP Monitor, sb mode	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Total electronic DisPlays	**16**	**42**	**32**	**24**	**24**	**24**	**22**	**18**	**14**	**12**
	SSTB	0.0	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	2.9	6.8	7.3	7.1	6.5	6.4	6.5	6.6	6.5
	Total STB set top boxes (Complex & Simple)	**0**	**4**	**7**	**7**	**7**	**6**	**6**	**7**	**7**	**7**
	VIDEO players/recorders	0.0	0.9	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	0.0	0.9	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	0.0	1.9	3.2	4.2	4.8	4.8	4.5	4.2	3.9	3.7
	Total VIDEO	**0**	**4**	**5**	**5**	**5**	**5**	**4**	**4**	**4**	**4**
	ES Rack servers	0.3	7.6	8.5	9.1	10.3	12.1	13.7	12.5	11.7	10.9
	ES Blade servers	0.1	1.8	1.9	1.8	2.0	2.3	2.6	2.3	2.1	2.0
	ES Storage	0.1	0.7	0.8	0.9	0.9	0.9	1.0	0.8	0.8	0.7
	Total ES Enterprise Servers	**0**	**10**	**11**	**12**	**13**	**15**	**17**	**16**	**15**	**14**
	PC Desktop	7.2	8.8	5.0	1.8	1.0	1.0	0.9	0.9	0.8	0.7
	PC Notebook	0.0	3.0	1.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2
	PC Tablet/slate	0.0	0.0	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6
	PC Thin client	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total PC, electricity	**7**	**13**	**8**	**3**	**2**	**2**	**2**	**2**	**2**	**2**
	EP-Copier mono	5.2	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	0.0	0.1	0.3	0.6	0.6	0.6	0.7	0.7	0.7	0.7
	EP-printer mono	4.7	1.1	0.9	0.6	0.5	0.4	0.4	0.3	0.2	0.2
	EP-printer colour	0.0	0.6	0.7	1.0	1.1	1.2	1.3	1.4	1.4	1.5
	IJ SFD printer	0.6	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	IJ MFD printer	0.7	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	Total imaging equipment, electricity	**13**	**4**	**4**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
	incl. paper	*1*	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
	SB Home Gateway, on-mode hours	0.0	1.7	1.9	2.1	2.0	1.9	1.7	1.4	1.1	0.7
	SB Home NAS, on-mode hours	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	SB Home Phones (fixed), on-mode hours	0.0	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0
	SB Office Phones (fixed), on-mode hours	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0
	SB Home Gateway, standby hours	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1
	SB Home Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	0.0	1.7	2.9	4.2	4.1	3.9	3.4	2.9	2.2	1.4
	SB Home NAS, idle hours	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	SB Home Phones (fixed), idle hours	0.3	1.6	1.7	1.7	1.4	1.1	0.9	0.7	0.5	0.3
	SB Office Phones (fixed), idle hours	0.4	1.1	1.0	0.9	0.8	0.7	0.6	0.4	0.3	0.2
	Total SB (networked) StandBy (rest)	**1**	**8**	**9**	**10**	**9**	**9**	**7**	**6**	**5**	**3**
	Total BC Battery Charged devices	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	UPS below 1.5 kVA	0.4	0.6	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9
	UPS 1.5 to 5 kVA	1.3	2.4	2.5	2.6	3.0	3.3	3.5	3.7	3.7	3.7
	UPS 5 to 10 kVA	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5
	UPS 10 to 200 kVA	0.9	1.7	1.8	1.7	1.8	2.0	2.1	2.3	2.3	2.3
	Total UPS - Uninterrupted Power Supplies	**3**	**5**	**5**	**5**	**6**	**7**	**7**	**7**	**7**	**7**
	TOTAL ELECTRONICS	**40**	**91**	**83**	**72**	**73**	**74**	**72**	**66**	**58**	**53**
	Total RF household Refrigerators & Freezers	**69**	**57**	**55**	**53**	**50**	**47**	**44**	**41**	**39**	**36**
	CF open vertical chilled multi deck (RVC2)	10.2	9.3	8.8	8.2	7.8	7.6	7.4	7.2	7.1	7.0
	CF open horizontal frozen island (RHF4)	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7
	CF other supermarket display (non-BCs)	23.9	24.2	24.7	24.8	25.0	25.4	25.7	26.1	26.4	26.7
	CF Plug in one door beverage cooler	9.3	7.5	6.8	6.1	5.7	5.4	5.2	5.0	4.8	4.7
	CF Plug in horizontal ice cream freezer	2.2	1.8	1.6	1.4	1.4	1.3	1.3	1.2	1.2	1.1
	CF Spiral vending machine	1.7	1.3	0.9	0.6	0.6	0.6	0.6	0.5	0.5	0.5
	Total CF Commercial Refrigeration	**48**	**45**	**44**	**42**	**41**	**41**	**41**	**41**	**41**	**41**
	o/w due to refrigerant leakage	14	17	19	19	20	21	21	22	23	23
	PF Storage cabinet Chilled Vertical (CV)	0.9	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0
	PF Storage cabinet Frozen Vertical (FV)	1.1	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2
	PF Storage cabinet Chilled Horizontal (CH)	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7
	PF Storage cabinet Frozen Horizontal (FH)	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
	PF Storage cabinets All types	**3.2**	**3.6**	**3.7**	**3.7**	**3.6**	**3.6**	**3.6**	**3.5**	**3.4**	**3.3**

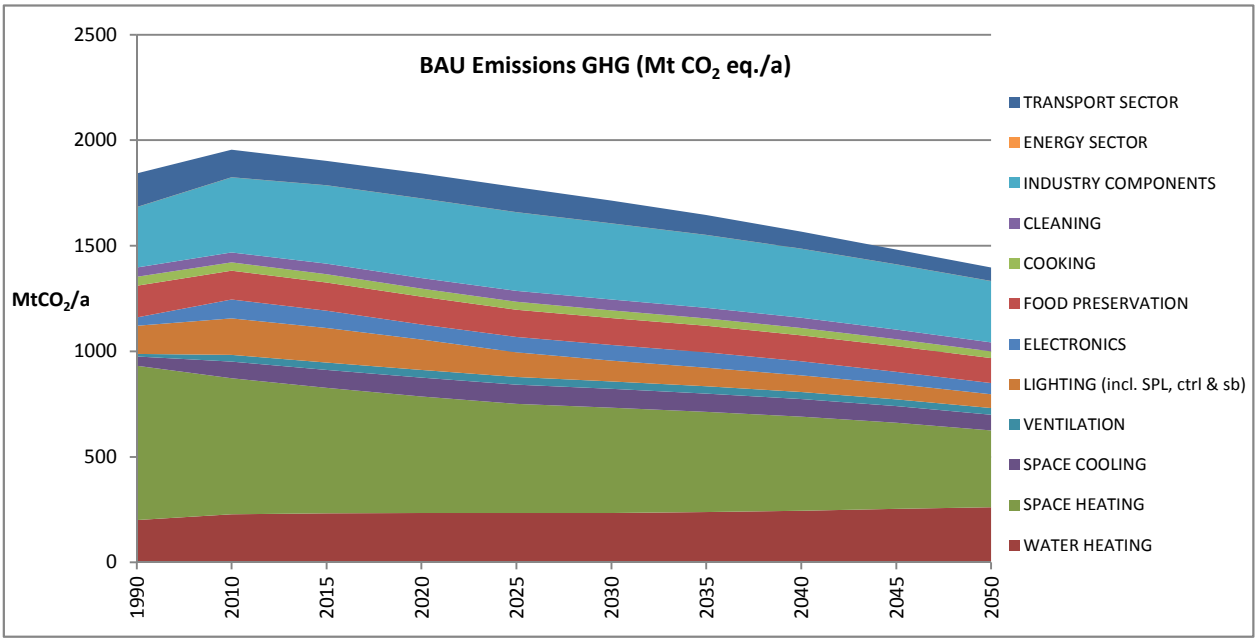
db	BAU Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	1.6	2.9	3.3	3.6	3.9	4.0	4.2	4.3	4.3	4.3
	PF Process Chiller AC MT L > 300 kW	1.6	2.8	3.2	3.5	3.7	3.8	4.0	4.0	4.1	4.1
	PF Process Chiller AC LT S ≤ 200 kW	1.6	2.9	3.3	3.6	3.9	4.0	4.1	4.2	4.3	4.3
	PF Process Chiller AC LT L > 200 kW	1.7	3.0	3.4	3.8	4.0	4.1	4.3	4.4	4.4	4.4
	PF Process Chiller WC MT S ≤ 300 kW	0.5	0.8	0.9	1.0	1.1	1.1	1.2	1.2	1.2	1.2
	PF Process Chiller WC MT L > 300 kW	0.7	1.2	1.3	1.5	1.6	1.6	1.7	1.7	1.7	1.7
	PF Process Chiller WC LT S ≤ 200 kW	0.6	1.0	1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.5
	PF Process Chiller WC LT L > 200 kW	0.7	1.3	1.5	1.6	1.7	1.8	1.9	1.9	1.9	1.9
	PF Process Chiller All MT&LT	**9**	**16**	**18**	**20**	**21**	**22**	**23**	**23**	**23**	**23**
	PF Condensing Unit MT S 0.2-1 kW	4.0	2.8	2.6	2.6	2.7	2.8	2.9	2.9	3.0	3.1
	PF Condensing Unit MT M 1-5 kW	9.5	6.4	6.0	6.0	6.2	6.4	6.5	6.7	6.8	6.9
	PF Condensing Unit MT L 5-20 kW	12.1	8.2	7.6	7.7	8.0	8.2	8.4	8.7	8.8	9.0
	PF Condensing Unit MT XL 20-50 kW	11.7	7.9	7.4	7.4	7.6	7.9	8.1	8.2	8.4	8.6
	PF Condensing Unit LT S 0.1-0.4 kW	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	PF Condensing Unit LT M 0.4-2 kW	1.9	1.3	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5
	PF Condensing Unit LT L 2-8 kW	3.1	2.1	2.0	2.0	2.1	2.2	2.2	2.3	2.4	2.4
	PF Condensing Unit LT XL 8-20 kW	8.6	5.8	5.4	5.4	5.6	5.7	5.8	5.9	6.0	6.1
0.6	**PF Condensing Unit, All MT&LT**	**52**	**35**	**32**	**33**	**34**	**35**	**36**	**37**	**37**	**38**
	PF Professional Refrigeration, Total	**33**	**34**	**35**	**37**	**38**	**40**	**41**	**41**	**42**	**42**
	TOTAL FOOD PRESERVATION	**150**	**135**	**133**	**132**	**129**	**128**	**126**	**124**	**121**	**118**
	CA El. Hobs	10.1	12.9	13.7	14.3	14.6	14.6	14.5	14.2	13.9	13.4
	CA El. Ovens	11.7	9.6	8.7	7.9	7.3	7.1	6.8	6.4	6.1	5.7
	CA Gas Hobs	7.0	5.8	5.5	5.3	5.1	4.8	4.6	4.3	4.1	3.9
	CA Gas Ovens	2.8	2.0	1.8	1.6	1.5	1.4	1.4	1.3	1.3	1.2
	CA Range Hoods	5.0	5.0	5.1	5.2	5.1	5.1	5.1	5.0	4.9	4.7
	Total CA Cooking Appliances	**37**	**35**	**35**	**34**	**34**	**33**	**32**	**31**	**30**	**29**
	CM Dripfilter (glass)	3.1	1.8	1.5	1.2	1.0	1.0	0.9	0.9	0.8	0.7
	CM Dripfilter (thermos)	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
	CM Dripfilter (full automatic)	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CM Pad filter	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CM Hard cap espresso	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	CM Semi-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (glass), standby/keep warm	2.2	1.2	1.1	0.8	0.7	0.7	0.6	0.6	0.6	0.5
	CM Dripfilter (thermos), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CM Hard cap espresso, standby/keep warm	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1
	CM Semi-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CM household Coffee Makers	**6**	**4**	**4**	**4**	**3**	**3**	**3**	**3**	**3**	**3**
	TOTAL COOKING	**42**	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**
	Total WM household Washing Machine	**26**	**18**	**17**	**15**	**13**	**11**	**10**	**9**	**7**	**6**
	Total DW household Dishwasher	**6**	**9**	**11**	**12**	**12**	**13**	**13**	**13**	**13**	**12**
	LD vented el.	4	5	5	4	4	4	3	3	3	3
	LD condens el.	1	6	7	8	8	8	8	7	7	6
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**5**	**10**	**12**	**12**	**12**	**12**	**11**	**10**	**10**	**9**
	VC dom	5.1	6.9	8.9	8.9	12.2	13.2	13.9	14.1	13.8	13.1
	VC nondom	1.5	1.9	2.1	2.3	2.4	2.3	2.3	2.3	2.2	2.1
	Total VC Vacuum Cleaner	**7**	**9**	**11**	**11**	**15**	**16**	**16**	**16**	**16**	**15**
	TOTAL CLEANING	**44**	**47**	**50**	**50**	**52**	**52**	**50**	**48**	**46**	**43**
0.5	FAN Axial<300Pa (all FAN types >125W)	9.6	21.7	24.5	26.3	27.4	27.4	26.2	24.5	22.9	21.3
0.5	FAN Axial>300Pa	16.4	39.7	43.8	44.6	44.1	42.6	40.4	37.8	35.3	32.8
0.5	FAN Centr.FC	4.1	7.0	8.2	8.8	9.1	9.1	8.7	8.1	7.6	7.1
0.5	FAN Centr.BC-free	10.7	18.2	20.8	22.0	22.9	23.6	23.5	22.7	21.6	20.4
0.5	FAN Centr.BC	11.1	20.5	23.7	25.0	26.1	27.1	27.5	27.6	28.0	28.2
0.5	FAN Cross-flow	0.7	1.0	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.5
	Total FAN, industrial (excl. box & roof fans)	**26**	**54**	**61**	**64**	**65**	**66**	**64**	**61**	**58**	**56**
0.5	**Total MT Motors 0.75-375 kW**	**409**	**461**	**473**	**478**	**466**	**444**	**415**	**387**	**359**	**331**
	Total WP Water Pumps	**44**	**49**	**50**	**52**	**53**	**54**	**54**	**54**	**53**	**53**
	CP Fixed Speed 5-1280 l/s	11.9	19.9	16.2	13.5	12.5	12.1	11.7	11.3	10.8	10.3
	CP Variable speed 5-1280 l/s	0.0	3.7	6.2	7.7	8.0	7.8	7.5	7.2	6.8	6.5
	CP Pistons 2-64 l/s	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4
	Total CP Standard Air Compressors	**13**	**24**	**23**	**22**	**21**	**20**	**20**	**19**	**18**	**17**
	TOTAL INDUSTRY COMPONENTS	287	357	371	377	373	362	345	328	310	291

db	BAU Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	6.0	8.2	8.9	9.5	9.9	10.2	10.4	10.6	10.6	10.5
	TRAFO Industry oil	4.5	6.4	6.9	7.3	7.6	7.7	7.8	7.8	7.8	7.7
	TRAFO Industry dry	1.4	2.0	2.2	2.3	2.4	2.4	2.5	2.5	2.5	2.4
	TRAFO Power	17.2	21.9	23.6	25.1	26.1	26.8	27.2	27.4	27.4	27.2
	TRAFO DER oil	0.0	0.2	0.3	0.6	0.9	1.4	2.1	3.0	3.9	4.9
	TRAFO DER dry	0.0	0.8	1.4	2.4	3.8	5.9	8.9	12.6	16.6	20.6
	TRAFO Small	1.0	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5
	Total TRAFO Utility Transformers	**30**	**40**	**44**	**48**	**51**	**55**	**60**	**64**	**69**	**74**
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	79	70	64	65	66	59	51	43	37	34
	TYRE van replacement tyres C2	31	26	24	24	24	21	18	15	14	13
	TYRE truck replacement tyres C3	47	34	28	30	29	28	25	22	20	17
	TYRE Replacement Tyres	**158**	**130**	**115**	**119**	**119**	**107**	**93**	**80**	**70**	**64**
	TRANSPORT SECTOR	**158**	**130**	**115**	**119**	**119**	**107**	**93**	**80**	**70**	**64**
	GENERAL TOTAL (in Mt CO_2)	**1843**	**1955**	**1902**	**1843**	**1778**	**1714**	**1645**	**1566**	**1482**	**1398**

BAU Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	201	228	232	233	234	235	238	245	254	262
SPACE HEATING	730	645	595	553	518	498	475	446	408	364
SPACE COOLING	44	79	85	89	90	89	86	83	79	74
VENTILATION	13	32	35	36	36	35	34	33	32	32
LIGHTING (incl. SPL, ctrl & sb)	132	172	162	143	117	99	89	80	72	65
ELECTRONICS	40	91	83	72	73	74	72	66	58	53
FOOD PRESERVATION	150	135	133	132	129	128	126	124	121	118
COOKING	42	40	39	38	37	36	35	34	33	32
CLEANING	44	47	50	50	52	52	50	48	46	43
INDUSTRY COMPONENTS	287	357	371	377	373	362	345	328	310	291
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	158	130	115	119	119	107	93	80	70	64
TOTAL in Mt CO_2	**1843**	**1955**	**1902**	**1843**	**1778**	**1714**	**1645**	**1566**	**1482**	**1398**

Compare: The EU total emissions of greenhouse gases in 2007 amounts to 5054 Mt CO_2 equivalent (CO_2 4187 + CH_4 416 + N_2O 374 + HFCs 63 + PFCs 4 + SF_6 10). The above is around 36% of the EU GHG-total (1870/5054) and 45% of the combustion related CO_2, in 2007.

Source: European Environmental Agency (EEA), Annual European Community greenhouse gas inventory 1990–2007 and inventory report 2009, Submission to the UNFCCC Secretariat, 2009. Total without LULUCF (Land-Use, Land-Use Change & Forestry)



db	BAU direct emissions NO_x (in kt NO_x/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**30**	**33**	**34**	**34**	**35**	**35**	**35**	**36**	**38**	**40**
	Total CH Central Heating combi, water heat	**48**	**77**	**82**	**86**	**90**	**96**	**102**	**109**	**117**	**124**
	Total CH Central Heating boiler, space heat	**420**	**381**	**344**	**315**	**292**	**284**	**275**	**260**	**237**	**208**
	LH open fire gas	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH closed fire gas	3.6	2.8	2.7	2.5	2.3	2.2	2.0	1.9	1.9	1.8
	LH luminous heaters	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
	LH tube heaters	3.5	3.0	2.9	2.7	2.5	2.3	2.1	2.0	1.9	1.8
	Local Space Heaters, total direct NOx-emission	**8**	**7**	**6**	**6**	**6**	**5**	**5**	**5**	**4**	**4**
	CHF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ACF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ACF (rev)	0.0	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	AHF	59	44	38	32	28	25	22	20	17	15
	Air Heaters & Coolers, total direct Nox emission	**59**	**44**	**38**	**33**	**29**	**26**	**23**	**21**	**18**	**16**
	Total direct NO_x BAU in kt NO_x	**566**	**543**	**504**	**474**	**451**	**446**	**440**	**431**	**415**	**393**
	Direct NO_x BAU in kt SO_2 eq.(=0.7*NO_x)	**396**	**380**	**353**	**332**	**316**	**312**	**308**	**301**	**290**	**275**

Compare: The EU total emissions of acidifying agents in 2007 is 22 432 kt SO_2 equivalent (NO_x 11 151 + SO_x 7339 + NH_3 3 876). The above is around 1.7% of that EU total. Note that Ecodesign and Energy Labelling affects NO_x emissions also through energy saving for product groups without explicit direct NO_x emission-limits and indirectly through electricity savings (NO_x from power plants).

Source for EU-total: European Environmental Agency (EEA), National emissions reported to the Convention on Long-range Transboundary Air Pollution (LRTAP Convention), EU-27 (national territory), 2007.

NOx emission data are incomplete: insufficient data were available to quantify NOx emissions for Solid Fuel Boilers and for a part of the Local Space Heaters.

db	BAU direct CO-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	SFB Wood Manual	8939	1298	942	681	459	271	163	113	92	78
	SFB Wood Direct Draft	2	16	29	41	48	47	47	50	58	67
	SFB Coal	135	24	16	9	5	2	1	1	1	1
	SFB Pellets	0	11	18	25	31	34	34	34	35	37
	SFB Wood chips	0	16	19	22	20	19	20	21	22	24
	Solid Fuel Boilers, total CO-emission	**9076**	**1365**	**1025**	**778**	**562**	**373**	**265**	**220**	**209**	**205**
	LH open fireplace	189	180	175	167	156	143	130	120	112	108
	LH closed fireplace/inset	247	396	430	452	456	440	411	380	353	332
	LH wood stove	539	377	343	315	290	264	243	224	208	196
	LH coal stove	440	173	139	112	90	69	51	38	28	22
	LH cooker	85	98	101	104	104	98	90	83	80	78
	LH SHR stove	191	194	197	202	208	212	216	217	214	209
	LH pellet stove	0	15	16	13	9	6	6	6	6	5
	Local Space Heaters, total CO-emission	**1689**	**1434**	**1401**	**1365**	**1312**	**1233**	**1146**	**1068**	**1000**	**951**
	Total direct CO-emissions, BAU, in kt/a	**10765**	**2799**	**2426**	**2143**	**1875**	**1606**	**1411**	**1288**	**1209**	**1156**

Compare: the total CO-emissions for Europe (OECD-Europe+Central-Europe, excl. Turkey, covering all sectors of activity including transport) were 68500 kton in 1990 and 27500 kton in 2008. The 2799 kton found above for year 2010 are approximately 10% of this total. Source for data: European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.2. http://edgar.jrc.ec.europa.eu/datasets_list.php?v=42

db	BAU direct OGC-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	SFB Wood Manual	782	114	82	60	40	24	14	10	8	7
	SFB Wood Direct Draft	0	1	1	2	2	2	2	3	3	3
	SFB Coal	7	1	1	0	0	0	0	0	0	0
	SFB Pellets	0	2	3	4	4	5	5	5	5	5
	SFB Wood chips	0	0	1	1	1	1	1	1	1	1
	Solid Fuel Boilers, total OGC-emission	**789**	**118**	**88**	**66**	**48**	**32**	**22**	**18**	**17**	**16**
	LH open fireplace	18	13	11	9	7	5	3	2	1	1
	LH closed fireplace/inset	23	27	26	23	19	14	10	7	5	4
	LH wood stove	51	27	22	17	12	9	6	4	3	2
	LH coal stove	43	13	9	6	4	3	1	1	0	0
	LH cooker	8	6	5	4	3	2	1	1	1	1
	LH SHR stove	18	14	12	10	8	6	5	4	3	2
	LH pellet stove	0	3	4	5	5	6	6	6	6	5
	Local Space Heaters, total OGC-emission	**161**	**102**	**89**	**74**	**59**	**44**	**32**	**23**	**18**	**16**
	Total direct OGC-emissions, BAU, in kt/a	**950**	**219**	**176**	**141**	**106**	**75**	**54**	**41**	**35**	**33**

No statistical reference values for total OGC (organic gaseous carbon) emissions in Europe could be found. However such statistics are available for NMVOC (non-methane volatile organic compound), which is the same as OGC but without the methane contribution.

Compare (1): the total NMVOC-emissions for Europe (OECD-Europe+Central-Europe, excl. Turkey, covering all sectors of activity including transport) were 23100 kton in 1990 and 12500 kton in 2008. The 219 kton found above for year 2010 are approximately 1.7% of this total. Source for data: European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.2. http://edgar.jrc.ec.europa.eu/datasets_list.php

Compare (2): the NMVOC-emissions from the domestic sector in 2005 are estimated in 1134 kton (8% of EU-total) Source for data: Janusz Cofala, Zbigniew Klimont, "Emissions from households and other small combustion sources and their reduction potential", TSAP Report #5 Version 1.0, IIASA, June 2012 (Service Contract on Monitoring and Assessment of Sectorial Implementation Actions (ENV.C.3/SER/2011/0009))

db	**BAU direct PM-emissions (in kt/a)**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
	SFB Wood Manual	402	58	42	31	21	12	7	5	4	3
	SFB Wood Direct Draft	1	4	7	10	12	12	12	13	14	17
	SFB Coal	34	6	4	2	1	0	0	0	0	0
	SFB Pellets	0	2	3	4	4	5	5	5	5	5
	SFB Wood chips	0	2	3	3	3	3	3	3	3	3
	Solid Fuel Boilers, total PM-emission	**437**	**72**	**59**	**50**	**41**	**32**	**27**	**26**	**27**	**29**
	LH open fireplace	39	42	41	36	32	27	22	19	19	19
	LH closed fireplace/inset	17	25	26	26	25	22	20	17	16	14
	LH wood stove	38	24	21	18	16	13	12	10	9	8
	LH coal stove	31	11	9	7	5	4	3	2	1	1
	LH cooker	6	7	7	6	5	5	5	4	4	4
	LH SHR stove	12	10	10	9	8	8	7	6	5	5
	LH pellet stove	0	2	2	2	1	1	1	1	1	1
	Local Space Heaters, total PM-emission	**144**	**121**	**115**	**104**	**93**	**80**	**68**	**59**	**55**	**52**
	Total direct PM-emissions, BAU, in kt/a	**581**	**193**	**174**	**154**	**134**	**112**	**95**	**85**	**82**	**81**

Compare (1): the total PM10-emissions for Europe (OECD-Europe+Central-Europe, excl. Turkey, covering all sectors of activity including transport) were 6990 kton in 1990 and 2750 kton in 2008. The 193 kton found above for year 2010 are approximately 7% of this total. Source for data: European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.2. http://edgar.jrc.ec.europa.eu/datasets_list.php

Compare (2): the PM-emissions from the domestic sector in 2005 are estimated in 616 kton PM2.5 (34% of EU-total) and 648 kton PM10 (25% of EU-total) Source for data: Janusz Cofala, Zbigniew Klimont, "Emissions from households and other small combustion sources and their reduction potential", TSAP Report #5 Version 1.0, IIASA, June 2012 (Service Contract on Monitoring and Assessment of Sectorial Implementation Actions (ENV.C.3/SER/2011/0009))

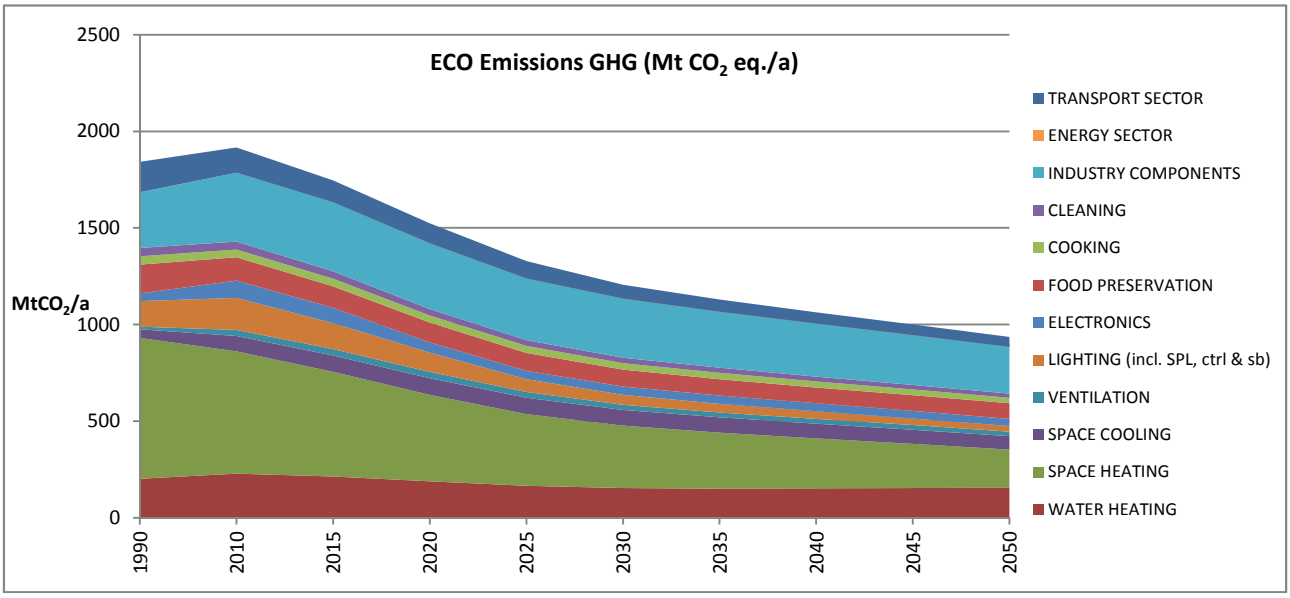
db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also other emissions at bottom of Table										
	Total WH dedicated Water Heater	**146**	**140**	**125**	**107**	**90**	**82**	**78**	**77**	**78**	**78**
	Total CH Central Heating combi, water heat	**55**	**88**	**89**	**82**	**75**	**72**	**73**	**75**	**77**	**79**
	TOTAL WATER HEATING	**201**	**228**	**214**	**189**	**165**	**154**	**151**	**152**	**154**	**156**
	Total CH Central Heating boiler, space heat	**521**	**466**	**381**	**300**	**235**	**196**	**171**	**150**	**127**	**102**
	SFB Wood Manual	7.4	2.0	1.5	1.1	0.7	0.4	0.2	0.1	0.1	0.1
	SFB Wood Direct Draft	0.1	0.5	1.0	1.3	1.6	1.5	1.5	1.6	1.9	2.2
	SFB Coal	42.0	11.7	8.0	5.0	2.6	1.0	0.4	0.4	0.3	0.3
	SFB Pellets	0.0	0.4	0.7	0.9	1.1	1.2	1.2	1.2	1.3	1.3
	SFB Wood chips	0.0	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
	Total Solid Fuel Boiler	**49**	**15**	**11**	**9**	**6**	**4**	**4**	**4**	**4**	**4**
	CHAE-S (≤ 400 kW)	2.5	6.8	7.8	8.4	8.4	8.5	8.3	7.4	5.6	3.6
	CHAE-L (> 400 kW)	3.2	6.5	7.0	7.0	6.4	5.7	5.1	4.6	4.2	3.9
	CHWE-S (≤ 400 kW)	0.2	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.7	1.5	1.6	1.6	1.5	1.3	1.2	1.1	1.0	1.0
	CHWE-L (> 1500 kW)	0.5	0.9	1.0	1.0	0.9	0.8	0.8	0.7	0.6	0.6
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	11.6	14.9	15.7	15.7	14.9	13.9	13.2	12.7	12.1	11.5
	HT PCH-AE-L	11.1	14.2	14.9	14.9	13.9	12.7	11.7	11.1	10.6	10.1
	HT PCH-WE-S	2.4	3.1	3.3	3.4	3.2	3.1	2.9	2.8	2.7	2.6
	HT PCH-WE-M	4.7	6.1	6.5	6.6	6.4	6.1	5.9	5.7	5.4	5.1
	HT PCH-WE-L	0.9	1.2	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.0
	AC rooftop	1.8	3.9	3.7	3.2	2.4	1.5	0.7	0.3	0.2	0.2
	AC splits	2.7	7.1	6.9	6.3	5.6	4.9	4.4	3.9	3.5	3.2
	AC VRF	0.0	2.6	3.8	5.4	6.6	8.2	9.6	10.8	11.9	12.7
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC central Air Cooling	**42**	**70**	**74**	**76**	**72**	**69**	**66**	**63**	**60**	**56**
	AC rooftop (rev)	2.3	5.8	5.6	4.7	3.3	1.9	0.8	0.2	0.0	0.0
	AC splits (rev)	4.3	11.3	11.3	10.5	9.3	7.9	6.8	5.9	5.1	4.4
	AC VRF (rev)	0.0	4.4	6.4	8.7	10.4	12.3	13.6	14.1	14.2	13.9
	ACF (rev)	0	0	0	0	0	0	0	0	0	0
	AHF	48	35	30	25	21	17	15	13	11	10
	AHE	0.6	1.2	0.9	0.5	0.5	0.4	0.4	0.3	0.3	0.2
	SubTotal AHC central Air Heating	**55**	**58**	**54**	**50**	**44**	**40**	**36**	**34**	**31**	**29**
	Total AHC central Air Heating & Cooling	**97**	**128**	**129**	**125**	**117**	**108**	**102**	**97**	**91**	**85**
	LH open fireplace	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	LH closed fireplace/inset	0.4	0.9	1.1	1.2	1.3	1.3	1.3	1.3	1.2	1.2
	LH wood stove	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7
	LH coal stove	10.4	5.7	5.0	4.4	3.8	3.1	2.4	1.9	1.5	1.2
	LH cooker	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH SHR stove	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.8
	LH pellet stove	0.0	0.3	0.4	0.6	0.6	0.7	0.7	0.7	0.7	0.7
	LH open fire gas	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH closed fire gas	2.7	2.5	2.5	2.4	2.2	2.0	1.9	1.8	1.7	1.7
	LH flueless fuel heater	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	LH elec.portable	14.1	11.4	10.7	9.4	8.4	8.1	7.7	7.1	6.4	5.8
	LH elec.convector	58.2	47.3	44.7	40.4	37.0	35.4	33.6	31.0	28.3	25.6
	LH elec.storage	4.3	3.5	3.3	2.9	2.6	2.3	2.2	2.0	1.9	1.7
	LH elec.underfloor	8.0	6.7	6.3	5.8	5.3	4.8	4.4	4.0	3.6	3.3
	LH luminous heaters	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.9	0.8	0.8
	LH tube heaters	2.5	2.5	2.5	2.4	2.3	2.2	2.0	2.0	1.9	1.9
	LH total	**104**	**84**	**80**	**73**	**67**	**63**	**59**	**55**	**50**	**46**
	RAC (cooling demand), all types <12 kW	1.4	9.3	10.3	11.0	12.5	13.3	13.4	13.3	13.0	12.8
	RAC (heating demand), reversible <12kW	1.1	10.8	13.8	16.4	19.0	19.4	18.5	17.3	16.1	14.9
	Total RAC Room Air Conditioner	**2**	**20**	**24**	**27**	**31**	**33**	**32**	**31**	**29**	**28**
1	**CIRC Circulator pumps <2.5 kW, net load**	8.1	8.3	5.6	4.1	3.7	3.6	3.5	3.2	2.8	2.5
	TOTAL SPACE HEATING	**730**	**634**	**540**	**447**	**371**	**323**	**289**	**259**	**229**	**196**
	TOTAL SPACE COOLING	**44**	**79**	**85**	**87**	**85**	**82**	**79**	**76**	**73**	**69**
	NRVU electricity	9.5	25.0	26.6	26.0	23.9	21.7	20.6	19.9	19.3	18.7
1	NRVU heat (negative=saving vs. natural ventilation)	-29.0	-135.1	-165.1	-196.5	-223.8	-245.7	-260.8	-274.1	-287.5	-300.9
	RVU Central Unidir. VU ≤125W/fan (1 fan)	3.9	6.3	6.3	5.2	3.8	3.0	2.9	2.9	2.9	2.9
	RVU Central Balanced VU ≤125W/fan (2 fans)	0.0	0.4	0.7	0.9	1.1	1.2	1.3	1.3	1.4	1.4
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5
1	RVU Central Unidir., heat (negative=saving)	-3.5	-6.8	-9.8	-13.0	-16.0	-18.7	-19.7	-21.1	-22.5	-24.0
1	RVU Central Balanced, heat (negative=saving)	-0.1	-1.8	-3.7	-6.6	-9.8	-12.7	-14.6	-16.1	-17.7	-19.2
1	RVU Local Balanced, heat (negative=saving)	0.0	-0.2	-0.5	-1.0	-1.8	-2.7	-3.6	-4.5	-5.5	-6.4
	Total VU Ventilation Units	**-19**	**-112**	**-145**	**-185**	**-222**	**-254**	**-274**	**-291**	**-309**	**-327**
	TOTAL VENTILATION (electricity)	**13**	**32**	**34**	**32**	**29**	**26**	**25**	**25**	**24**	**23**

db	ECO Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL Linear Fluorescent	40.5	51.4	52.7	41.6	26.1	14.7	9.6	6.1	3.1	1.0
	CFL Compact Fluorescent	1.9	11.0	12.5	9.7	3.0	0.7	0.1	0.0	0.0	0.0
	Tungsten	4.5	21.7	20.3	8.6	1.0	0.2	0.2	0.1	0.1	0.1
	GLS GeneralLighting Service (incandescent)	42.0	18.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	17.8	31.0	19.1	10.3	5.4	3.0	2.9	2.8	2.6	2.5
	LED Light Emitting Diode	0.0	0.1	1.5	8.2	14.5	19.1	19.6	18.3	17.1	16.5
	SP Special Purpose (exempt)	20.0	24.8	20.8	17.0	13.2	10.3	9.7	9.1	8.5	7.9
	lighting controls & sb	5.6	7.0	5.8	4.8	3.7	2.9	2.7	2.6	2.4	2.2
	TOTAL LIGHTING (incl. SPL, ctrl & sb)	**132**	**165**	**134**	**100**	**67**	**51**	**45**	**39**	**34**	**30**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	**107**	**133**	**107**	**78**	**50**	**38**	**32**	**27**	**23**	**20**
	DP TV, on mode	13.6	34.9	26.2	8.9	4.4	4.2	4.2	4.8	5.3	5.8
	DP Monitor, on mode	0.5	4.6	3.1	0.6	0.2	0.2	0.2	0.2	0.2	0.2
	DP TV , sb mode	1.9	2.1	2.4	3.9	2.9	3.0	3.1	3.1	3.1	3.1
	DP Monitor, sb mode	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Total electronic DisPlays	**16**	**42**	**32**	**13**	**7**	**7**	**8**	**8**	**9**	**9**
	SSTB	0.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	2.9	5.9	5.6	5.4	5.0	4.9	5.0	5.0	5.0
	Total STB set top boxes (Complex & Simple)	**0**	**4**	**7**	**6**	**5**	**5**	**5**	**5**	**5**	**5**
	VIDEO players/recorders	0.0	0.9	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	0.0	0.9	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	0.0	1.9	3.0	3.7	4.4	4.4	4.2	3.9	3.6	3.4
	Total VIDEO	**0**	**4**	**5**	**4**	**5**	**4**	**4**	**4**	**4**	**3**
	ES Rack servers	0.3	7.6	8.5	8.0	7.5	8.6	9.7	8.9	8.3	7.7
	ES Blade servers	0.1	1.8	1.9	1.6	1.5	1.6	1.8	1.6	1.5	1.4
	ES Storage	0.1	0.7	0.8	0.6	0.5	0.6	0.6	0.5	0.5	0.4
	Total ES Enterprise Servers	**0**	**10**	**11**	**10**	**10**	**11**	**12**	**11**	**10**	**10**
	PC Desktop	7.2	8.8	5.0	1.8	1.0	1.0	0.9	0.9	0.8	0.7
	PC Notebook	0.0	3.0	1.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2
	PC Tablet/slate	0.0	0.0	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6
	PC Thin client	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total PC, electricity	**7**	**13**	**8**	**3**	**2**	**2**	**2**	**2**	**2**	**2**
	EP-Copier mono	5.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	EP-printer mono	4.7	0.8	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	EP-printer colour	0.0	0.5	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
	IJ SFD printer	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	IJ MFD printer	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total imaging equipment, electricity	**13**	**4**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**
	incl. paper	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*2*	*2*	*2*
	SB Home Gateway, on-mode hours	0.0	1.7	1.9	2.1	2.0	1.9	1.7	1.4	1.1	0.7
	SB Home NAS, on-mode hours	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	SB Home Phones (fixed), on-mode hours	0.0	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0
	SB Office Phones (fixed), on-mode hours	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0
	SB Home Gateway, standby hours	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1
	SB Home Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	0.0	1.7	2.9	4.0	4.1	3.9	3.4	2.9	2.2	1.4
	SB Home NAS, idle hours	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Phones (fixed), idle hours	0.3	1.6	1.7	1.7	1.4	1.1	0.9	0.7	0.5	0.3
	SB Office Phones (fixed), idle hours	0.4	1.1	1.0	0.9	0.8	0.7	0.6	0.4	0.3	0.2
	Total SB (networked) StandBy (rest)	**1**	**8**	**9**	**10**	**9**	**8**	**7**	**6**	**5**	**3**
	Total BC Battery Charged devices	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	UPS below 1.5 kVA	0.4	0.6	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	UPS 1.5 to 5 kVA	1.3	2.4	2.5	1.6	0.5	0.4	0.4	0.4	0.4	0.4
	UPS 5 to 10 kVA	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	UPS 10 to 200 kVA	0.9	1.7	1.8	1.6	1.3	1.2	1.3	1.4	1.5	1.4
	Total UPS - Uninterrupted Power Supplies	**3**	**5**	**5**	**4**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL ELECTRONICS	**40**	**89**	**79**	**53**	**44**	**43**	**43**	**41**	**39**	**37**
	Total RF household Refrigerators & Freezers	**69**	**43**	**34**	**27**	**22**	**18**	**14**	**10**	**8**	**7**
	CF open vertical chilled multi deck (RVC2)	10.2	9.3	8.7	7.6	6.3	5.8	5.8	5.7	5.7	5.6
	CF open horizontal frozen island (RHF4)	0.9	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6
	CF other supermarket display (non-BCs)	23.9	24.2	24.6	24.0	23.2	23.2	23.5	23.8	24.3	24.7
	CF Plug in one door beverage cooler	9.3	7.5	6.7	5.2	3.9	3.4	3.3	3.2	3.1	3.0
	CF Plug in horizontal ice cream freezer	2.2	1.8	1.6	1.4	1.3	1.3	1.2	1.2	1.2	1.1
	CF Spiral vending machine	1.7	1.3	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration	**48**	**45**	**43**	**40**	**36**	**35**	**35**	**35**	**35**	**35**
	o/w due to refrigerant leakage	14	17	19	19	20	21	21	22	23	23
	PF Storage cabinet Chilled Vertical (CV)	0.9	1.1	1.1	0.9	0.7	0.6	0.6	0.6	0.6	0.6
	PF Storage cabinet Frozen Vertical (FV)	1.1	1.3	1.3	1.1	0.8	0.8	0.8	0.8	0.7	0.7
	PF Storage cabinet Chilled Horizontal (CH)	0.7	0.8	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.4
	PF Storage cabinet Frozen Horizontal (FH)	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3
	PF Storage cabinets All types	**3.2**	**3.6**	**3.7**	**3.2**	**2.4**	**2.2**	**2.2**	**2.1**	**2.1**	**2.0**

db	ECO Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	1.6	2.9	3.3	3.6	3.7	3.7	3.8	3.9	4.0	4.0
	PF Process Chiller AC MT L > 300 kW	1.6	2.8	3.2	3.4	3.5	3.6	3.7	3.8	3.8	3.8
	PF Process Chiller AC LT S ≤ 200 kW	1.6	2.9	3.3	3.6	3.7	3.8	3.9	3.9	4.0	4.0
	PF Process Chiller AC LT L > 200 kW	1.7	3.0	3.4	3.7	3.8	3.9	4.0	4.1	4.1	4.1
	PF Process Chiller WC MT S ≤ 300 kW	0.5	0.8	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1
	PF Process Chiller WC MT L > 300 kW	0.7	1.2	1.3	1.5	1.5	1.5	1.6	1.6	1.6	1.6
	PF Process Chiller WC LT S ≤ 200 kW	0.6	1.0	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4
	PF Process Chiller WC LT L > 200 kW	0.7	1.3	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.8
	PF Process Chiller All MT&LT	**9**	**16**	**18**	**20**	**20**	**20**	**21**	**22**	**22**	**22**
	PF Condensing Unit MT S 0.2-1 kW	4.0	2.8	2.6	2.5	2.5	2.6	2.7	2.7	2.8	2.9
	PF Condensing Unit MT M 1-5 kW	9.5	6.4	6.0	5.8	5.8	6.0	6.2	6.3	6.4	6.5
	PF Condensing Unit MT L 5-20 kW	12.1	8.2	7.6	7.5	7.4	7.7	7.9	8.1	8.3	8.5
	PF Condensing Unit MT XL 20-50 kW	11.7	7.9	7.4	7.2	7.2	7.4	7.6	7.7	7.9	8.0
	PF Condensing Unit LT S 0.1-0.4 kW	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	PF Condensing Unit LT M 0.4-2 kW	1.9	1.3	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4
	PF Condensing Unit LT L 2-8 kW	3.1	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.2
	PF Condensing Unit LT XL 8-20 kW	8.6	5.8	5.4	5.1	5.1	5.2	5.3	5.4	5.5	5.6
0.6	**PF Condensing Unit, All MT&LT**	**52**	**35**	**32**	**32**	**31**	**32**	**33**	**34**	**35**	**35**
	PF Professional Refrigeration, Total	**33**	**34**	**35**	**35**	**35**	**36**	**37**	**37**	**38**	**38**
	TOTAL FOOD PRESERVATION	**150**	**121**	**112**	**102**	**93**	**88**	**85**	**82**	**81**	**80**
	CA El. Hobs	10.1	12.9	13.7	14.3	14.5	14.6	14.4	14.2	13.8	13.4
	CA El. Ovens	11.7	9.6	8.7	7.8	7.0	6.5	6.1	5.8	5.4	5.0
	CA Gas Hobs	7.0	5.8	5.5	5.3	5.0	4.7	4.5	4.2	4.0	3.8
	CA Gas Ovens	2.8	2.0	1.8	1.6	1.4	1.2	1.1	1.0	1.0	0.9
	CA Range Hoods	5.0	5.0	5.1	4.9	4.5	4.0	3.7	3.5	3.4	3.3
	Total CA Cooking Appliances	**37**	**35**	**35**	**34**	**32**	**31**	**30**	**29**	**28**	**26**
	CM Dripfilter (glass)	3.1	1.8	1.5	1.2	1.0	1.0	0.9	0.9	0.8	0.7
	CM Dripfilter (thermos)	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
	CM Dripfilter (full automatic)	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CM Pad filter	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CM Hard cap espresso	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	CM Semi-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (glass), standby/keep warm	2.2	1.2	0.9	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	CM Dripfilter (thermos), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CM Hard cap espresso, standby/keep warm	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CM Semi-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CM household Coffee Makers	**6**	**4**	**4**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
	TOTAL COOKING	**42**	**40**	**39**	**37**	**35**	**34**	**32**	**31**	**30**	**29**
	Total WM household Washing Machine	**26**	**14**	**11**	**9**	**7**	**6**	**5**	**5**	**4**	**4**
	Total DW household Dishwasher	**6**	**8**	**8**	**8**	**8**	**9**	**9**	**8**	**8**	**8**
	LD vented el.	4	5	5	4	4	3	3	3	3	3
	LD condens el.	1	6	7	7	6	5	5	4	4	4
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**5**	**10**	**11**	**11**	**10**	**9**	**8**	**7**	**7**	**6**
	VC dom	5.1	6.9	7.2	3.8	4.5	4.1	3.7	3.3	2.9	2.4
	VC nondom	1.5	1.9	1.9	1.5	1.4	1.4	1.3	1.3	1.2	1.1
	Total VC Vacuum Cleaner	**7**	**9**	**9**	**5**	**6**	**5**	**5**	**5**	**4**	**4**
	TOTAL CLEANING	**44**	**41**	**39**	**34**	**31**	**29**	**27**	**25**	**23**	**22**
0.5	FAN Axial<300Pa (all FAN types >125W)	9.6	21.7	23.6	23.6	22.9	22.0	20.7	19.4	18.2	16.9
0.5	FAN Axial>300Pa	16.4	39.7	43.0	41.8	39.0	36.4	34.0	31.9	29.8	27.6
0.5	FAN Centr.FC	4.1	7.0	7.9	7.6	7.0	6.5	6.1	5.7	5.4	5.0
0.5	FAN Centr.BC-free	10.7	18.2	20.1	20.0	19.7	19.9	19.8	19.1	18.2	17.2
0.5	FAN Centr.BC	11.1	20.5	22.7	22.5	22.2	22.5	22.8	22.9	23.2	23.4
0.5	FAN Cross-flow	0.7	1.0	0.9	0.7	0.6	0.5	0.5	0.5	0.5	0.5
	Total FAN, industrial	**26**	**54**	**59**	**58**	**56**	**54**	**52**	**50**	**48**	**45**
0.5	**Total MT Motors 0.75-375 kW**	**409**	**460**	**453**	**425**	**392**	**373**	**350**	**328**	**307**	**285**
	Total WP Water Pumps	**44**	**48**	**50**	**51**	**51**	**52**	**53**	**52**	**52**	**51**
	CP Fixed Speed 5-1280 l/s	11.9	19.9	16.1	13.3	12.2	11.8	11.4	11.0	10.6	10.1
	CP Variable speed 5-1280 l/s	0.0	3.7	6.2	7.6	7.8	7.6	7.4	7.1	6.8	6.4
	CP Pistons 2-64 l/s	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4
	Total CP Standard Air Compressors	**13**	**24**	**23**	**21**	**20**	**20**	**19**	**19**	**18**	**17**
	TOTAL INDUSTRY COMPONENTS	287	357	358	343	324	312	299	285	271	256

db	ECO Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	6.0	8.2	8.6	8.7	8.5	8.4	8.1	7.8	7.4	7.0
	TRAFO Industry oil	4.5	6.4	6.6	6.3	5.9	5.4	4.8	4.5	4.5	4.5
	TRAFO Industry dry	1.4	2.0	2.1	2.1	2.1	2.0	1.9	1.8	1.8	1.8
	TRAFO Power	17.2	21.9	23.6	25.1	26.1	26.8	27.2	27.4	27.4	27.2
	TRAFO DER oil	0.0	0.2	0.3	0.4	0.6	0.9	1.3	1.8	2.4	2.9
	TRAFO DER dry	0.0	0.8	1.4	2.1	3.1	4.6	6.8	9.5	12.5	15.5
	TRAFO Small	1.0	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5
	Total TRAFO Utility Transformers	**30**	**40**	**43**	**45**	**47**	**49**	**51**	**53**	**57**	**59**
	TOTAL ENERGY SECTOR (only improvement over BAU)	**0**	**0**	**-1**	**-2**	**-4**	**-6**	**-9**	**-11**	**-13**	**-14**
	TYRE car replacement tyres C1	79	70	62	57	51	38	33	31	29	27
	TYRE van replacement tyres C2	31	26	22	20	16	13	13	12	11	11
	TYRE truck replacement tyres C3	47	34	28	27	23	19	17	16	15	14
	TYRE Replacement Tyres	**158**	**130**	**112**	**104**	**90**	**70**	**62**	**59**	**55**	**52**
	TRANSPORT SECTOR	**158**	**130**	**112**	**104**	**90**	**70**	**62**	**59**	**55**	**52**
	GENERAL TOTAL (in Mt CO_2)	**1843**	**1916**	**1745**	**1525**	**1329**	**1205**	**1129**	**1064**	**1000**	**936**

ECO Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	201	228	214	189	165	154	151	152	154	156
SPACE HEATING	730	634	540	447	371	323	289	259	229	196
SPACE COOLING	44	79	85	87	85	82	79	76	73	69
VENTILATION	13	32	34	32	29	26	25	25	24	23
LIGHTING (incl. SPL, ctrl & sb)	132	165	134	100	67	51	45	39	34	30
ELECTRONICS	40	89	79	53	44	43	43	41	39	37
FOOD PRESERVATION	150	121	112	102	93	88	85	82	81	80
COOKING	42	40	39	37	35	34	32	31	30	29
CLEANING	44	41	39	34	31	29	27	25	23	22
INDUSTRY COMPONENTS	287	357	358	343	324	312	299	285	271	256
ENERGY SECTOR	0	0	-1	-2	-4	-6	-9	-11	-13	-14
TRANSPORT SECTOR	158	130	112	104	90	70	62	59	55	52
TOTAL in Mt CO_2	**1843**	**1916**	**1745**	**1525**	**1329**	**1205**	**1129**	**1064**	**1000**	**936**



db	ECO direct emissions NO_x (in kt NO_x/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**30**	**33**	**29**	**19**	**12**	**9**	**9**	**9**	**10**	**10**
	Total CH Central Heating combi, water heat	**48**	**77**	**74**	**50**	**33**	**25**	**25**	**26**	**27**	**27**
	Total CH Central Heating boiler, space heat	**420**	**372**	**281**	**160**	**88**	**55**	**47**	**40**	**32**	**24**
	LH open fire gas	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	4	3	3	2	2	2	1	1	1	1
	LH flueless fuel heater	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters	1	1	1	0	0	0	0	0	0	0
	LH tube heaters	3	3	3	3	2	2	2	2	2	2
	Local Space Heaters, total NOx-emission	**8**	**7**	**6**	**6**	**5**	**4**	**4**	**3**	**3**	**3**
	CHF	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	ACF	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	ACF (rev)	0.0	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	AHF	59	44	37	26	15	7	5	4	4	3
	Air Heaters & Coolers, total direct Nox emission	**59**	**44**	**38**	**26**	**15**	**7**	**5**	**4**	**4**	**4**
	Total direct NO_x ECO in kt NOx	**566**	**534**	**428**	**260**	**154**	**100**	**90**	**83**	**76**	**69**
	Direct NOx ECO in kt SO2 eq.(=0.7*NOx)	**396**	**374**	**300**	**182**	**108**	**70**	**63**	**58**	**53**	**48**

	ECO direct CO-emissions (in kt/a)	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
	SFB Wood Manual	8939	1298	936	598	324	122	27	14	12	10
	SFB Wood Direct Draft	2	16	29	41	48	46	45	48	55	64
	SFB Coal	135	24	16	9	5	2	1	1	1	0
	SFB Pellets	0	11	18	25	30	33	33	33	34	36
	SFB Wood chips	0	16	19	21	20	19	20	21	22	23
	Solid Fuel Boilers, total CO-emission	**9076**	**1365**	**1019**	**696**	**427**	**221**	**126**	**117**	**124**	**134**
	LH open fireplace	189	180	175	156	119	89	64	44	32	31
	LH closed fireplace/inset	247	396	430	432	376	318	258	201	161	156
	LH wood stove	539	377	343	303	242	192	152	119	95	92
	LH coal stove	440	173	139	109	79	55	36	22	13	10
	LH cooker	85	98	101	98	76	55	39	38	37	36
	LH SHR stove	191	194	197	196	178	163	149	134	120	120
	LH pellet stove	0	15	16	13	9	6	6	6	6	5
	Local Space Heaters, total CO-emission	**1689**	**1434**	**1401**	**1307**	**1078**	**877**	**704**	**562**	**463**	**450**
	Total direct CO-emissions, ECO, in kt/a	**10765**	**2799**	**2420**	**2002**	**1505**	**1098**	**830**	**679**	**587**	**584**

	ECO direct OGC-emissions (in kt/a)	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
	SFB Wood Manual	782	114	82	52	28	10	1	1	1	0
	SFB Wood Direct Draft	0	1	1	2	2	2	2	2	3	3
	SFB Coal	7	1	1	0	0	0	0	0	0	0
	SFB Pellets	0	2	3	3	3	3	2	2	2	2
	SFB Wood chips	0	0	1	1	1	1	1	1	1	1
	Solid Fuel Boilers, total OGC-emission	**789**	**118**	**87**	**58**	**34**	**16**	**7**	**6**	**6**	**6**
	LH open fireplace	18	13	11	9	6	4	2	1	1	1
	LH closed fireplace/inset	23	27	26	23	18	13	9	6	4	3
	LH wood stove	51	27	22	17	12	8	5	3	2	2
	LH coal stove	43	13	9	6	4	2	1	1	0	0
	LH cooker	8	6	5	4	3	2	1	1	1	1
	LH SHR stove	18	14	12	10	8	6	5	3	3	2
	LH pellet stove	0	3	4	4	4	3	2	2	2	2
	Local Space Heaters, total OGC-emission	**161**	**102**	**89**	**73**	**54**	**38**	**26**	**18**	**13**	**12**
	Total direct OGC-emissions, ECO, in kt/a	**950**	**219**	**176**	**131**	**88**	**53**	**32**	**23**	**19**	**18**

	ECO direct PM-emissions (in kt/a)	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
	SFB Wood Manual	402	58	42	27	15	6	2	1	1	1
	SFB Wood Direct Draft	1	4	7	10	11	10	9	10	11	13
	SFB Coal	34	6	4	2	1	0	0	0	0	0
	SFB Pellets	0	2	3	3	4	4	4	4	4	4
	SFB Wood chips	0	2	3	3	3	2	2	2	3	3
	Solid Fuel Boilers, total PM-emission	**437**	**72**	**59**	**46**	**34**	**23**	**18**	**17**	**19**	**21**
	LH open fireplace	39	42	41	34	24	15	8	3	1	1
	LH closed fireplace/inset	17	25	26	24	19	15	10	7	4	4
	LH wood stove	38	24	21	17	13	9	6	4	3	2
	LH coal stove	31	11	9	6	4	3	2	1	0	0
	LH cooker	6	7	7	6	4	2	1	1	1	1
	LH SHR stove	12	10	10	9	7	6	5	4	3	3
	LH pellet stove	0	2	2	2	1	1	1	1	1	1
	Local Space Heaters, total PM-emission	**144**	**121**	**115**	**98**	**73**	**51**	**33**	**20**	**13**	**12**
	Total direct PM-emissions, ECO, in kt/a	**581**	**193**	**173**	**144**	**107**	**74**	**50**	**37**	**32**	**33**

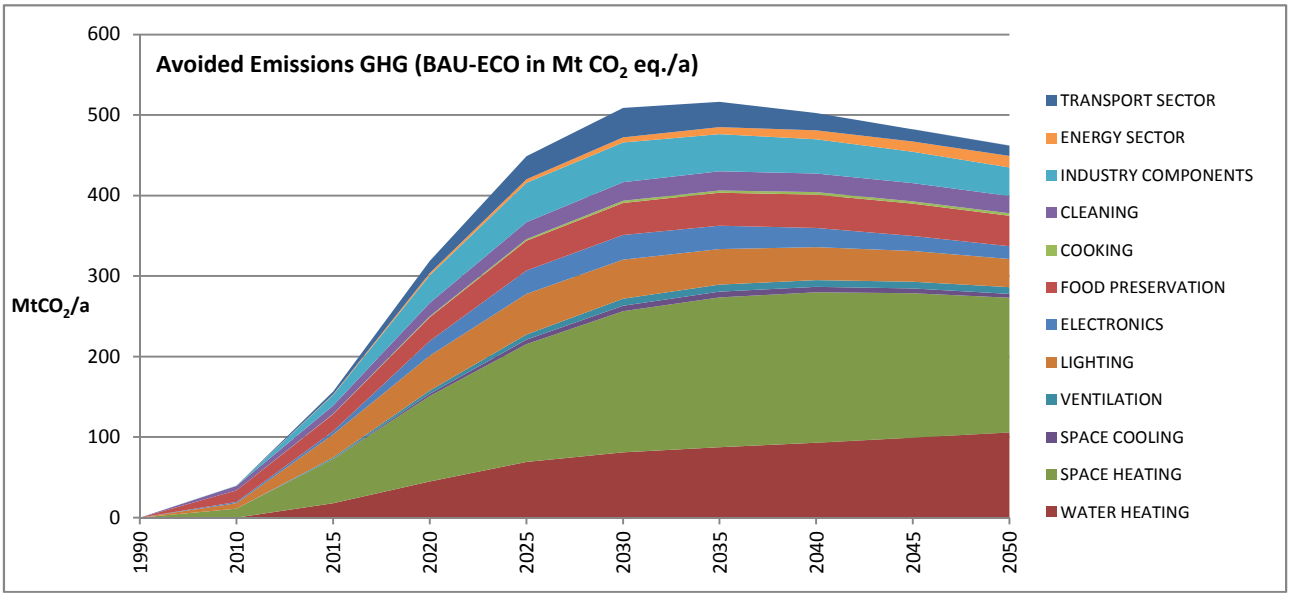
db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also other emissions at bottom of Table										
	Total WH dedicated Water Heater	**0**	**0**	**13**	**29**	**42**	**45**	**45**	**44**	**44**	**44**
	Total CH Central Heating combi, water heat	**0**	**0**	**5**	**16**	**27**	**37**	**43**	**49**	**55**	**62**
	TOTAL WATER HEATING	**0**	**0**	**18**	**45**	**69**	**81**	**88**	**93**	**99**	**106**
	Total CH Central Heating boiler, space heat	**0**	**11**	**53**	**98**	**134**	**162**	**174**	**176**	**169**	**158**
	SFB Wood Manual	0.00	0.00	0.01	0.06	0.09	0.09	0.08	0.05	0.04	0.03
	SFB Wood Direct Draft	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.03	0.04	0.04
	SFB Coal	0.00	0.00	0.00	0.01	0.03	0.04	0.04	0.04	0.03	0.03
	SFB Pellets	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
	SFB Wood chips	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
	Total Solid Fuel Boiler	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**
	CHAE-S (≤ 400 kW)	0.00	0.00	0.00	0.04	0.13	0.22	0.26	0.25	0.18	0.10
	CHAE-L (> 400 kW)	0.00	0.00	0.00	0.09	0.26	0.32	0.34	0.33	0.29	0.21
	CHWE-S (≤ 400 kW)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
	CHWE-L (> 1500 kW)	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.01	0.01	0.00
	CHF	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01
	HT PCH-AE-S	0.00	0.00	0.02	0.41	0.95	1.33	1.35	1.15	0.93	0.72
	HT PCH-AE-L	0.00	0.00	0.02	0.46	1.12	1.70	1.92	1.83	1.63	1.39
	HT PCH-WE-S	0.00	0.00	0.00	0.05	0.10	0.14	0.12	0.08	0.05	0.02
	HT PCH-WE-M	0.00	0.00	0.00	0.07	0.16	0.20	0.15	0.07	0.02	0.00
	HT PCH-WE-L	0.00	0.00	0.00	0.02	0.05	0.07	0.08	0.07	0.06	0.04
	AC rooftop	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.00	0.00
	AC splits	0.00	0.00	0.01	0.16	0.30	0.37	0.32	0.24	0.18	0.13
	AC VRF	0.00	0.00	0.00	0.06	0.16	0.28	0.35	0.35	0.32	0.26
	ACF	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02
	SubTotal AHC central Air Cooling	**0.0**	**0.0**	**0.1**	**1.4**	**3.3**	**4.7**	**5.0**	**4.4**	**3.7**	**2.9**
	AC rooftop (rev)	0.00	0.00	0.01	0.17	0.29	0.28	0.15	0.04	0.00	0.00
	AC splits (rev)	0.00	0.00	0.01	0.24	0.45	0.54	0.45	0.33	0.23	0.15
	AC VRF (rev)	0.00	0.00	0.00	0.03	0.15	0.31	0.43	0.42	0.32	0.21
	ACF (rev)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AHF	0.00	0.00	0.05	0.87	2.00	2.80	2.90	2.59	2.24	1.91
	AHE	0.00	0.00	0.00	0.00	0.02	0.03	0.03	0.02	0.02	0.01
	SubTotal AHC central Air Heating	**0.0**	**0.0**	**0.1**	**1.3**	**2.9**	**4.0**	**4.0**	**3.4**	**2.8**	**2.3**
	Total AHC central Air Heating & Cooling	**0.0**	**0.0**	**0.1**	**2.7**	**6.2**	**8.7**	**8.9**	**7.8**	**6.5**	**5.2**
	LH open fireplace	0.00	0.00	0.00	0.02	0.06	0.09	0.12	0.14	0.15	0.15
	LH closed fireplace/inset	0.00	0.00	0.00	0.02	0.07	0.12	0.15	0.18	0.19	0.18
	LH wood stove	0.00	0.00	0.00	0.01	0.04	0.07	0.09	0.11	0.11	0.11
	LH coal stove	0.00	0.00	0.00	0.05	0.15	0.20	0.23	0.25	0.24	0.19
	LH cooker	0.00	0.00	0.00	0.00	0.02	0.03	0.03	0.03	0.03	0.03
	LH SHR stove	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00
	LH pellet stove	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.01
	LH open fire gas	0.00	0.00	0.00	0.01	0.03	0.05	0.06	0.07	0.07	0.07
	LH closed fire gas	0.00	0.00	0.00	0.07	0.23	0.35	0.45	0.50	0.49	0.47
	LH flueless fuel heater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH elec.portable	0.00	0.00	0.22	1.00	1.32	1.12	0.96	0.86	0.79	0.71
	LH elec.convector	0.00	0.00	0.57	2.66	3.45	2.67	2.09	1.85	1.68	1.52
	LH elec.storage	0.00	0.00	0.06	0.28	0.45	0.51	0.46	0.41	0.37	0.34
	LH elec.underfloor	0.00	0.00	0.06	0.29	0.47	0.58	0.66	0.70	0.71	0.64
	LH luminous heaters	0.00	0.00	0.00	0.03	0.06	0.08	0.07	0.06	0.06	0.06
	LH tube heaters	0.00	0.00	0.00	0.06	0.11	0.14	0.16	0.15	0.13	0.13
	LH total	**0.0**	**0.0**	**0.9**	**4.5**	**6.5**	**6.0**	**5.6**	**5.3**	**5.0**	**4.6**
	RAC (cooling demand), all types <12 kW	0.0	0.0	0.6	1.5	2.2	2.3	2.3	2.2	2.1	2.0
	RAC (heating demand), reversible <12kW	0.0	0.0	0.8	1.9	2.7	2.7	2.5	2.3	2.1	1.8
	Total RAC Room Air Conditioner	**0**	**0**	**1**	**3**	**5**	**5**	**5**	**5**	**4**	**4**
1	**CIRC Circulator pumps <2.5 kW, net load**	**0**	**0**	**3**	**4**	**4**	**4**	**4**	**4**	**3**	**3**
	TOTAL SPACE HEATING	**0**	**11**	**55**	**106**	**146**	**175**	**186**	**187**	**179**	**167**
	TOTAL SPACE COOLING	**0**	**0**	**1**	**3**	**5**	**7**	**7**	**7**	**6**	**5**
	NRVU electricity	0.0	0.0	0.7	2.2	3.7	4.8	4.8	4.4	4.1	3.9
1	NRVU heat (negative=saving vs. natural ventilation)	0.0	0.0	4.2	14.0	23.7	31.4	32.2	31.2	29.9	28.4
	RVU Central Unidir. VU ≤125W/fan (1 fan)	0.0	0.0	0.5	1.3	2.0	2.5	2.5	2.5	2.5	2.5
	RVU Central Balanced VU ≤125W/fan (2 fans)	0.0	0.0	0.2	0.5	0.9	1.2	1.3	1.4	1.4	1.4
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
1	RVU Central Unidir., heat (negative=saving)	0.0	0.0	2.1	5.4	8.8	11.6	12.2	13.1	14.0	14.9
1	RVU Central Balanced, heat (negative=saving)	0.0	0.0	0.2	0.5	0.8	1.1	1.2	1.4	1.5	1.6
1	RVU Local Balanced, heat (negative=saving)	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.0	1.2
	Total VU Ventilation Units	**0**	**0**	**8**	**24**	**40**	**53**	**55**	**55**	**55**	**54**
	TOTAL VENTILATION (electricity)	**0**	**0**	**1**	**4**	**7**	**9**	**9**	**9**	**8**	**8**

db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL Linear Fluorescent	0.0	0.0	1.6	9.1	20.6	27.6	28.1	27.3	26.6	25.2
	CFL Compact Fluorescent	0.0	-0.1	1.7	2.8	5.0	5.3	4.8	4.0	3.4	2.8
	Tungsten	0.0	-0.2	1.4	12.2	12.3	8.8	6.1	4.0	2.8	2.3
	GLS GeneralLighting Service (incandescent)	0.0	7.1	17.1	12.8	7.4	2.3	0.5	0.0	0.0	0.0
	HID High Intensity Discharge	0.0	-0.2	7.8	12.7	15.0	16.2	15.3	14.2	13.2	12.2
	LED Light Emitting Diode	0.0	0.0	-1.1	-6.2	-9.9	-11.8	-10.9	-9.0	-7.7	-7.4
	SP Special Purpose (exempt)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	lighting controls & sb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING (incl. SPL, ctrl & sb)	**0**	**7**	**29**	**43**	**51**	**48**	**44**	**41**	**38**	**35**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	**0**	**7**	**29**	**43**	**51**	**48**	**44**	**41**	**38**	**35**
	DP TV, on mode	0.0	-0.1	0.8	7.9	12.4	12.9	11.2	7.7	3.4	2.0
	DP Monitor, on mode	0.0	0.0	0.3	2.0	2.3	2.0	1.4	0.9	0.3	0.1
	DP TV , sb mode	0.0	0.0	-0.5	0.4	2.2	2.2	2.0	1.6	1.1	0.4
	DP Monitor, sb mode	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Total electronic DisPlays	**0**	**0**	**1**	**10**	**17**	**17**	**15**	**10**	**5**	**2**
	SSTB	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	0.0	0.8	1.7	1.6	1.5	1.5	1.5	1.5	1.5
	Total STB set top boxes (Complex & Simple)	**0**	**1**	**1**	**2**	**2**	**2**	**1**	**2**	**2**	**2**
	VIDEO players/recorders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	0.0	0.0	0.2	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	Total VIDEO	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	0.0	0.0	0.0	1.1	2.8	3.5	4.0	3.6	3.4	3.1
	ES Blade servers	0.0	0.0	0.0	0.2	0.5	0.7	0.7	0.7	0.6	0.6
	ES Storage	0.0	0.0	0.0	0.2	0.4	0.4	0.4	0.3	0.3	0.3
	Total ES Enterprise Servers	**0**	**0**	**0**	**1**	**4**	**5**	**5**	**5**	**4**	**4**
	PC Desktop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	EP-Copier mono	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	0.0	0.0	0.2	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	EP-printer mono	0.0	0.2	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1
	EP-printer colour	0.0	0.0	0.5	0.7	0.8	0.8	0.9	1.0	1.0	1.0
	IJ SFD printer	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	IJ MFD printer	0.0	0.2	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5
	Total imaging equipment, electricity	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	incl. paper	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	SB Home Gateway, on-mode hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, on-mode hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Phones (fixed), on-mode hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), on-mode hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, idle hours	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	SB Home Phones (fixed), idle hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), idle hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total SB (networked) StandBy (rest)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total BC Battery Charged devices	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	UPS below 1.5 kVA	0.0	0.0	0.0	0.5	0.7	0.8	0.8	0.8	0.9	0.8
	UPS 1.5 to 5 kVA	0.0	0.0	0.0	1.0	2.5	2.9	3.1	3.2	3.3	3.2
	UPS 5 to 10 kVA	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
	UPS 10 to 200 kVA	0.0	0.0	0.0	0.1	0.4	0.7	0.8	0.8	0.9	0.9
	Total UPS - Uninterrupted Power Supplies	**0**	**0**	**0**	**2**	**4**	**5**	**5**	**5**	**5**	**5**
	TOTAL ELECTRONICS	**0**	**2**	**4**	**18**	**29**	**31**	**29**	**24**	**19**	**16**
	Total RF household Refrigerators & Freezers	**0**	**14**	**21**	**26**	**28**	**30**	**31**	**31**	**30**	**29**
	CF open vertical chilled multi deck (RVC2)	0	0	0.1	0.6	1.5	1.8	1.6	1.5	1.4	1.4
	CF open horizontal frozen island (RHF4)	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CF other supermarket display (non-BCs)	0	0	0.1	0.8	1.8	2.2	2.3	2.2	2.2	2.1
	CF Plug in one door beverage cooler	0	0	0.0	0.8	1.9	2.0	1.9	1.8	1.7	1.7
	CF Plug in horizontal ice cream freezer	0	0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	CF Spiral vending machine	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Total CF Commercial Refrigeration	**0**	**0**	**0**	**2**	**6**	**6**	**6**	**6**	**6**	**5**
	PF Storage cabinet Chilled Vertical (CV)	0	0	0	0.1	0.4	0.4	0.4	0.4	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	0	0	0	0.2	0.4	0.5	0.5	0.5	0.5	0.4
	PF Storage cabinet Chilled Horizontal (CH)	0	0	0	0.1	0.3	0.3	0.3	0.3	0.3	0.3
	PF Storage cabinet Frozen Horizontal (FH)	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinets All types	**0**	**0**	**0**	**0.5**	**1.2**	**1.4**	**1.4**	**1.3**	**1.3**	**1.3**

db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Process Chiller AC MT L > 300 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Process Chiller AC LT L > 200 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT L > 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT S ≤ 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT L > 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	**0**	**0**	**0**	**0.4**	**1.0**	**1.5**	**1.6**	**1.7**	**1.7**	**1.7**
	PF Condensing Unit MT S 0.2-1 kW	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	0	0	0	0.2	0.4	0.4	0.4	0.4	0.4	0.4
	PF Condensing Unit MT L 5-20 kW	0	0	0	0.3	0.5	0.5	0.5	0.6	0.6	0.6
	PF Condensing Unit MT XL 20-50 kW	0	0	0	0.3	0.5	0.5	0.5	0.5	0.5	0.5
	PF Condensing Unit LT S 0.1-0.4 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	0	0	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	0	0	0	0.3	0.5	0.5	0.5	0.5	0.5	0.5
0.6	**PF Condensing Unit, All MT&LT**	**0**	**0**	**0**	**1.3**	**2.4**	**2.4**	**2.5**	**2.5**	**2.5**	**2.5**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**1.4**	**3.2**	**3.9**	**4.0**	**4.0**	**4.0**	**4.0**
	TOTAL FOOD PRESERVATION	**0**	**14**	**21**	**29**	**37**	**40**	**41**	**41**	**40**	**38**
	CA El. Hobs	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CA El. Ovens	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.7	0.6	0.6
	CA Gas Hobs	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CA Gas Ovens	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	CA Range Hoods	0.0	0.0	0.0	0.3	0.7	1.1	1.4	1.4	1.4	1.4
	Total CA Cooking Appliances	**0**	**0**	**0**	**1**	**1**	**2**	**3**	**3**	**3**	**2**
	CM Dripfilter (glass)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (thermos)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Hard cap espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Semi-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (glass), standby/keep warm	0.0	0.0	0.1	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	CM Dripfilter (thermos), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CM Hard cap espresso, standby/keep warm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CM Semi-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CM household Coffee Makers	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**0**
	TOTAL COOKING	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**3**	**3**	**3**
	Total WM household Washing Machine	**0**	**4**	**6**	**6**	**6**	**6**	**5**	**4**	**3**	**2**
	Total DW household Dishwasher	**0**	**2**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**5**
	LD vented el.	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LD condens el.	0.0	0.0	0.3	1.2	2.2	2.8	2.9	2.8	2.7	2.6
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**3**	**3**	**3**
	VC dom	0.0	0.0	1.7	5.1	7.8	9.1	10.2	10.8	11.0	10.7
	VC nondom	0.0	0.0	0.2	0.8	1.0	1.0	1.0	1.0	1.0	1.0
	Total VC Vacuum Cleaner	**0**	**0**	**2**	**6**	**9**	**10**	**11**	**12**	**12**	**12**
	TOTAL CLEANING	**-**	**6**	**11**	**17**	**21**	**23**	**24**	**23**	**23**	**21**
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.9	2.7	4.5	5.4	5.4	5.1	4.8	4.4
0.5	FAN Axial>300Pa	0.0	0.0	0.9	2.8	5.0	6.2	6.4	6.0	5.6	5.2
0.5	FAN Centr.FC	0.0	0.0	0.3	1.2	2.1	2.5	2.5	2.4	2.2	2.1
0.5	FAN Centr.BC-free	0.0	0.0	0.8	2.0	3.2	3.7	3.7	3.6	3.4	3.2
0.5	FAN Centr.BC	0.0	0.0	1.0	2.5	3.9	4.6	4.7	4.7	4.8	4.8
0.5	FAN Cross-flow	0.0	0.0	0.2	0.6	0.8	0.9	0.9	0.9	1.0	1.0
	Total FAN, industrial	**-**	**-**	**2**	**6**	**10**	**12**	**12**	**11**	**11**	**10**
0.5	**Total MT Motors 0.75-375 kW**	**0**	**1**	**21**	**54**	**74**	**71**	**65**	**59**	**53**	**47**
	Total WP Water Pumps	**0**	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**
	CP Fixed Speed 5-1280 l/s	0.00	0.00	0.06	0.23	0.37	0.37	0.32	0.28	0.23	0.19
	CP Variable speed 5-1280 l/s	0.00	0.00	0.02	0.08	0.16	0.18	0.15	0.11	0.07	0.04
	CP Pistons 2-64 l/s	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01	0.01
	Total CP Standard Air Compressors	**0.0**	**0.0**	**0.1**	**0.3**	**0.5**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**
	TOTAL INDUSTRY COMPONENTS	**0**	**0**	**13**	**34**	**49**	**49**	**46**	**43**	**39**	**35**

db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	0.0	0.0	0.2	0.8	1.3	1.8	2.3	2.8	3.2	3.5
	TRAFO Industry oil	0.0	0.0	0.3	1.0	1.7	2.3	3.0	3.3	3.3	3.3
	TRAFO Industry dry	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7
	TRAFO Power	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TRAFO DER oil	0.0	0.0	0.0	0.1	0.3	0.5	0.8	1.2	1.6	1.9
	TRAFO DER dry	0.0	0.0	0.1	0.3	0.7	1.3	2.1	3.1	4.1	5.0
	TRAFO Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers	**0**	**0**	**1**	**2**	**4**	**6**	**9**	**11**	**13**	**14**
	TOTAL ENERGY SECTOR	**0**	**0**	**1**	**2**	**4**	**6**	**9**	**11**	**13**	**14**
	TYRE car replacement tyres C1	0.0	0.0	1.6	7.6	14.7	20.5	17.8	12.2	7.7	7.0
	TYRE van replacement tyres C2	0.0	0.0	1.1	4.2	7.8	7.4	5.0	2.8	2.3	2.1
	TYRE truck replacement tyres C3	0.0	0.0	0.8	3.5	6.2	8.9	8.3	6.6	5.0	3.6
	TYRE Replacement Tyres	**0**	**0**	**4**	**15**	**29**	**37**	**31**	**22**	**15**	**13**
	TRANSPORT SECTOR	**0**	**0**	**4**	**15**	**29**	**37**	**31**	**22**	**15**	**13**
	Avoided GENERAL TOTAL (GHG in Mt CO_2)	**0**	**40**	**157**	**319**	**449**	**509**	**516**	**503**	**482**	**462**

Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	18	45	69	81	88	93	99	106
SPACE HEATING	0	11	55	106	146	175	186	187	179	167
SPACE COOLING	0	0	1	3	5	7	7	7	6	5
VENTILATION	0	0	1	4	7	9	9	9	8	8
LIGHTING	0	7	29	43	51	48	44	41	38	35
ELECTRONICS	0	2	4	18	29	31	29	24	19	16
FOOD PRESERVATION	0	14	21	29	37	40	41	41	40	38
COOKING	0	0	0	1	2	3	3	3	3	3
CLEANING	-	6	11	17	21	23	24	23	23	21
INDUSTRY COMPONENTS	0	0	13	34	49	49	46	43	39	35
ENERGY SECTOR	0	0	1	2	4	6	9	11	13	14
TRANSPORT SECTOR	0	0	4	15	29	37	31	22	15	13
TOTAL in Mt CO_2	**0**	**40**	**157**	**319**	**449**	**509**	**516**	**503**	**482**	**462**
Saving in % versus BAU (from 1990=0)	0.0%	2.0%	8.2%	17.3%	25.2%	29.7%	31.4%	32.1%	32.5%	33.1%
Saving In % versus BAU (from 2010=0)	-2.2%	0.0%	6.1%	15.1%	23.0%	27.4%	29.0%	29.6%	29.9%	30.2%



Avoided direct emissions NO_x (BAU-ECO, in kt NO_x/a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	**0**	**0**	**5**	**16**	**23**	**26**	**26**	**27**	**28**	**30**
Total CH Central Heating combi, water heat	**0**	**0**	**8**	**35**	**57**	**71**	**77**	**83**	**90**	**97**
Total CH Central Heating boiler, space heat	**0**	**9**	**63**	**155**	**203**	**229**	**228**	**220**	**205**	**184**
LH open fire gas	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
LH closed fire gas	0	0	0	0.2	0.5	0.7	0.8	0.8	0.7	0.7
LH flueless fuel heater	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH luminous heaters	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH tube heaters	0	0	0	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Local Space Heaters, avoided NOx-emission	**0.0**	**0.0**	**0.0**	**0.4**	**0.8**	**1.0**	**1.2**	**1.2**	**1.1**	**1.0**
CHF	0	0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
ACF	0	0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
ACF (rev)	0	0	0.0	0.1	0.3	0.4	0.4	0.5	0.5	0.5
AHF	0	0	0.4	6.9	13.7	18.1	17.4	15.4	13.6	12.0
Air Heaters & Coolers, avoided NOx emission	**0**	**0**	**0**	**7**	**14**	**19**	**18**	**16**	**14**	**13**
Direct NO_x Avoided (BAU-ECO) in kt NOx	**0**	**9**	**76**	**206**	**283**	**326**	**332**	**332**	**324**	**311**
Direct NOx Avoided (BAU-ECO) in kt SO2 eq.	**0**	**6**	**53**	**144**	**198**	**229**	**233**	**232**	**227**	**218**

Avoided direct CO-emissions (BAU-ECO in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	0	0	6	82	135	150	136	99	81	67
SFB Wood Direct Draft	0	0	0	0	0	1	2	2	2	3
SFB Coal	0	0	0	0	0	0	0	0	0	0
SFB Pellets	0	0	0	0	0	1	1	1	1	1
SFB Wood chips	0	0	0	0	0	0	0	0	0	0
Solid Fuel Boilers, total avoided CO-emission	**0**	**0**	**6**	**82**	**136**	**152**	**139**	**103**	**85**	**72**
LH open fireplace	0	0	0	10	37	55	67	76	80	77
LH closed fireplace/inset	0	0	0	20	80	122	153	179	192	176
LH wood stove	0	0	0	12	48	72	90	106	113	104
LH coal stove	0	0	0	3	10	14	15	16	15	12
LH cooker	0	0	0	7	28	43	51	45	43	42
LH SHR stove	0	0	0	6	30	50	67	83	94	90
LH pellet stove	0	0	0	0	0	0	0	0	0	0
Local Space Heaters, total avoided CO-emission	**0**	**0**	**0**	**59**	**234**	**355**	**442**	**506**	**537**	**500**
Total avoided direct CO-emissions, BAU-ECO, in kt/a	**0**	**0**	**6**	**141**	**370**	**507**	**582**	**608**	**622**	**572**

Avoided direct OGC-emissions (BAU-ECO in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	0	0	1	8	13	14	13	9	8	6
SFB Wood Direct Draft	0	0	0	0	0	0	0	0	0	0
SFB Coal	0	0	0	0	0	0	0	0	0	0
SFB Pellets	0	0	0	0	1	2	3	3	3	3
SFB Wood chips	0	0	0	0	0	0	0	0	0	0
Solid Fuel Boilers, total OGC-emission	**0**	**0**	**1**	**8**	**14**	**16**	**16**	**12**	**11**	**10**
LH open fireplace	0	0	0	0	1	1	1	1	0	0
LH closed fireplace/inset	0	0	0	0	1	1	1	1	1	1
LH wood stove	0	0	0	0	1	1	1	0	0	0
LH coal stove	0	0	0	0	0	0	0	0	0	0
LH cooker	0	0	0	0	0	0	0	0	0	0
LH SHR stove	0	0	0	0	0	0	0	0	0	0
LH pellet stove	0	0	0	0	1	3	3	3	3	3
Local Space Heaters, total OGC-emission	**0**	**0**	**0**	**1**	**4**	**6**	**6**	**6**	**5**	**5**
Total avoided direct OGC-emissions, BAU-ECO, in kt/	**0**	**0**	**1**	**10**	**18**	**22**	**22**	**18**	**16**	**14**

Avoided direct PM-emissions (BAU-ECO in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	0	0	0	3	5	6	5	4	3	3
SFB Wood Direct Draft	0	0	0	0	1	2	3	3	3	4
SFB Coal	0	0	0	0	0	0	0	0	0	0
SFB Pellets	0	0	0	0	0	1	1	1	1	1
SFB Wood chips	0	0	0	0	0	0	1	1	1	1
Solid Fuel Boilers, total PM-emission	**0**	**0**	**0**	**4**	**7**	**9**	**9**	**9**	**8**	**8**
LH open fireplace	0	0	0	2	8	12	14	16	18	18
LH closed fireplace/inset	0	0	0	1	5	8	9	11	11	10
LH wood stove	0	0	0	1	3	4	5	6	7	6
LH coal stove	0	0	0	0	1	1	1	1	1	1
LH cooker	0	0	0	0	2	3	4	3	3	3
LH SHR stove	0	0	0	0	1	2	2	2	2	2
LH pellet stove	0	0	0	0	0	0	0	0	0	0
Local Space Heaters, total PM-emission	**0**	**0**	**0**	**5**	**20**	**29**	**35**	**40**	**42**	**39**
Total avoided direct PM-emissions, BAU-ECO, in kt/a	**0**	**0**	**0**	**9**	**27**	**38**	**45**	**48**	**50**	**48**

UNIT PRICE ECO (in euro 2010)	var	BC	BC	mid	mid	BAT	BAT	dec	inc	PriceDec
		€	EF	€	EF	€	EF	€/EF	€/EF	%
		€	%	€	%	€	%	€ct/%	€ct/%	
WH dedicated Water Heater	%	497	31%	885	47%	2197	102%	2381	2381	0.7%
		€	%	€	%	€	%	€ct/%	€ct/%	
CH Central Heating combi, water heat [24 kW]	%	994	46%	2750	93%	4343	135%	3779	3779	0.6%
		€	%	€	%	€	%	€ct/%	€ct/%	
CH Central Heating boiler, space heat [24 kW]	%	3881	68%	5457	84%	12416	128%	9723	16094	0.7%
		€	%	€	%	€	%	€ct/%	€ct/%	
SFB Wood Manual [18 kW]	%	4500	51%	7806	63%	9318	75%	27210	12444	0.7%
SFB Wood Direct Draft [20 kW]	%	6500	73%	7010	74%	7801	75%	44313	68843	0.8%
SFB Coal [25 kW]	%	5500	67%	5500	70%	5500	72%	0	0	0.7%
SFB Pellets [25 kW]	%	8000	73%	8701	76%	9316	78%	28053	24587	0.8%
SFB Wood chips [160 kW]	%	33500	73%	37911	75%	39083	77%	220542	58625	0.9%
Air Cooling:		€	%	€	%	€	%	€ct/%	€ct/%	
CHAE-S (≤ 400 kW)	%	17302	136%	18058	161%	18846	186%	3021	3153	1.0%
CHAE-L (> 400 kW)	%	42111	140%	45574	180%	49322	219%	8768	9489	1.0%
CHWE-S (≤ 400 kW)	%	13980	186%	14520	216%	15080	245%	1829	1900	1.0%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	61627	217%	69122	288%	77529	358%	10631	11924	1.0%
CHWE-L (> 1500 kW)	%	110339	217%	123758	288%	138809	358%	19035	21350	1.0%
CHF	%	15098	103%	17437	139%	20138	175%	6496	7502	1.0%
HT PCH-AE-S	%	18910	470%	20633	598%	22512	725%	1351	1474	1.0%
HT PCH-AE-L	%	47864	510%	53754	655%	60369	800%	4062	4562	1.0%
HT PCH-WE-S	%	16018	730%	17279	878%	18639	1025%	855	922	1.0%
HT PCH-WE-M	%	75290	850%	85763	1050%	97693	1250%	5236	5965	1.0%
HT PCH-WE-L	%	160543	850%	185877	1075%	215208	1300%	11259	13036	1.0%
AC rooftop	%	19201	120%	19477	153%	19757	185%	849	861	1.0%
AC splits	%	3284	156%	3666	214%	4093	272%	659	735	1.0%
AC VRF	%	30771	165%	31473	191%	32192	217%	2701	2763	1.0%
ACF	%	15098	103%	17437	139%	20138	175%	6496	7502	1.0%
Air Heating:										
AC rooftop (rev)	%	19023	99%	19272	128%	19524	158%	841	852	1.0%
AC splits (rev)	%	3050	117%	3306	160%	3584	202%	603	653	1.0%
AC VRF (rev)	%	29845	130%	30291	147%	30744	164%	2610	2649	1.0%
ACF (rev)	%	16755	129%	18368	152%	20138	175%	7020	7696	1.0%
AHF	%	5176	63%	6041	74%	7051	84%	8397	9800	1.0%
AHE	%	500	30%	500	34%	500	38%	0	0	1.0%
		€	%	€	%	€	%	€ct/%	€ct/%	
LH open fireplace [8 kW]	%	2650	30%	3772	45%	5540	60%	7406	11668	0.7%
LH closed fireplace/inset [8 kW]	%	2717	69%	3037	75%	3408	80%	5977	6924	0.7%
LH wood stove [8 kW]	%	2517	69%	2837	75%	3208	80%	5977	6924	0.8%
LH coal stove [8 kW]	%	1845	69%	2058	75%	2305	80%	3984	4616	0.7%
LH cooker [10 kW]	%	2847	64%	3411	72%	4110	80%	7203	8932	0.8%
LH SHR stove [8 kW]	%	7956	80%	8146	83%	8349	85%	7625	8117	0.4%
LH pellet stove [8 kW]	%	3369	85%	3475	88%	3586	90%	4383	4546	0.9%
LH open fire gas, NCV [4.2 kW]	%	856	42%	985	61%	1140	80%	668	810	0.7%
LH closed fire gas, NCV [4.2 kW]	%	821	64%	867	72%	918	80%	594	642	0.7%
LH flueless fuel heater, NCV [1.5 kW]	%	272	100%	272	100%	272	100%	0	0	1.0%
LH elec.portable [1 kW]	%	27	74%	28	87%	30	100%	11	12	1.0%
LH elec.convector [1 kW]	%	155	74%	160	87%	165	100%	38	40	0.8%
LH elec.storage [2.75 kW]	%	572	74%	685	87%	823	100%	874	1074	0.9%
LH elec.underfloor [0.62 kW]	%	381	74%	406	87%	433	100%	191	211	0.6%
LH luminous heaters [20 kW]	%	1293	81%	1591	90%	1975	99%	3418	4397	0.8%
LH tube heaters [30 kW]	%	1284	71%	1681	83%	2230	95%	3302	4568	0.8%
		€	%	€	%	€	%	€ct/%	€ct/%	
RAC cooling [nom. avg. 3.8 kW]	%	1674	301%	1958	474%	2115	531%	164	275	0.5%
RAC heating (reversible)	%	1674	262%	1958	366%	2115	400%	273	462	0.5%
		€	%	€	%	€	%	€ct/%	€ct/%	
CIRC Circulator pumps <2.5 kW (efficiency, incl. ctrl)		211	100%	281	215%	291	232%	61	61	1.0%
			kWh prim		kWh prim		kWh prim	€/kWh	€/kWh	
NRVU avg (sales wt.)	kWh	129561.4	74950.95	133732	45424.34	140300.6	36382	0.141	0.726	0.4%
prices incl VAT			kWh prim		kWh prim		kWh prim	€/kWh	€/kWh	
RVU Central Unidir. VU (1 fan)	kWh	1264	4980	1696	4139	2,128	3299	0.51	0.51	0.6%
RVU Central Balanced VU (2 fans)	kWh	4275	1897	4802	1422	5,330	947	1.11	1.11	0.7%
RVU Local Balanced VU (2 fans)	kWh	1218	2209	1334	1515	1,449	820	0.17	0.17	0.9%
LS Light Sources in Euro/unit										
LFL		8.37								
CFL		5.00								
Tungsten		5.69								
GLS		0.85								
HID		25.85								
LED ECO		see table								
GLS stock		0.85								
Tungsten stock		5.69								

UNIT PRICE (in euro 2010)	var	BC	BC	mid	mid	BAT	BAT	dec	inc	PriceDec
		€	EF	€	EF	€	EF	€/EF	€/EF	%
DP TV standard		450								1.0%
DP TV LoNA		450								1.0%
DP TV Smart		450								1.0%
DP Monitor		170								1.0%
		€	kWh/a		kWh/a		kWh/a	€/kWh	€/kWh	
SSTB	kWh	50	19	52	17	59	4	0.6	0.6	1%
CSTB	kWh	150	88	184	31	192	18	0.6	0.6	1%
		€								
VIDEO players/recorders		100								1.0%
VIDEO projectors		1300								1.0%
VIDEO game consoles		360								1.0%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
ES Rack servers	kWh	2500	1661	2500	1347	2554	1180	0.00	0.32	0%
ES Blade servers	kWh	65000	13286	65000	10779	65280	9443	0.00	0.21	0%
ES Storage	kWh	23000	3279	25300	2192	25660	1965	2.12	1.59	0%
PC Desktop		500								1.0%
PC Notebook		700								1.0%
PC Tablet/slate		450								1.0%
PC Thin client		400								1.0%
PC Workstation		2500								1.0%
		€								
EP-Copier mono		1500								1.0%
EP-Copier colour		2500								1.0%
EP-printer mono		200								1.0%
EP-printer colour		500								1.0%
IJ SFD printer		100								1.0%
IJ MFD printer		150								1.0%
paper (2.5 euro/kg paper (6.25 euro/pack)										
		€								
SB Home Gateway, on-mode power		200								1.0%
SB Home NAS, on-mode power		200								1.0%
SB Home Phones (fixed), on-mode power		100								1.0%
SB Office Phones (fixed), on-mode power		100								1.0%
BC_EPS Mobile phones etc.		na								
UPS below 1.5 kVA	%	180	88.1%	180	93.5%	180	98.9%	0	0	1.0%
UPS 1.5 to 5 kVA	%	951	89.8%	951	94.2%	951	98.7%	0	0	1.0%
UPS 5 to 10 kVA	%	4005	92.3%	4005	93.6%	4005	94.9%	0	0	1.0%
UPS 10 to 200 kVA	%	30020	92.7%	30020	94.4%	30020	96.1%	0	0	1.0%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
RF Household refrigerator and freezer	kWh	421	430	487	242	706	76	0.35	1.32	1%
		€	BC EEI	€	MID EEI	€	BAT EEI	€/EEI	€/EEI	
CF open vertical chilled multi deck (RVC2)	EEI	3850	78	4878	58	5906	39	54	54	1.0%
CF open horizontal frozen island (RHF4)	EEI	4400	77	4707	60	5014	44	19	19	1.0%
CF other supermarket display (non-BCs)	EEI	2383	78	2626	65	2869	53	20	20	1.0%
CF Plug in one door beverage cooler	EEI	830	80	935	62	1039	44	6	6	1.0%
CF Plug in horizontal ice cream freezer	EEI	800	79	819	74	838	68	3	3	1.0%
CF Spiral vending machine	EEI	3500	81	3741	63	3982	45	13	13	1.0%
		€	var BC	€	var MID	€	var BAT	€/var	€/var	
PF Storage cabinet Chilled Vertical (CV)	EEI	1460	96	1606	73	1752	57	6.2	9.2	1%
PF Storage cabinet Frozen Vertical (FV)	EEI	1724	91	1896	75	2069	53	10.6	7.9	1%
PF Storage cabinet Chilled Horizontal (CH)	EEI	700	109	770	72	840	65	1.9	10.4	1%
PF Storage cabinet Frozen Horizontal (FH)	EEI	1200	106	1320	86	1440	61	6.0	4.7	1%
PF Storage cabinets All types	**EEI**	**1335**	**98**	**1468**	**74**	**1602**	**58**	**5.6**	**8.3**	**1%**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	28000	2.70	28840	2.76	32200	2.93	14000	19765	1%
PF Process Chiller AC MT L > 300 kW	SEPR	90000	3.00	90900	3.03	99000	3.24	30000	38571	1%
PF Process Chiller AC LT S ≤ 200 kW	SEPR	31000	1.59	31930	1.60	35650	1.71	93000	33818	1%
PF Process Chiller AC LT L > 200 kW	SEPR	94000	1.70	94940	1.71	103400	1.83	94000	70500	1%
PF Process Chiller WC MT S ≤ 300 kW	SEPR	42000	3.60	43260	3.69	48300	3.91	14000	22909	1%
PF Process Chiller WC MT L > 300 kW	SEPR	135000	3.90	136350	3.91	148500	4.20	135000	41897	1%
PF Process Chiller WC LT S ≤ 200 kW	SEPR	46500	2.00	47895	2.02	53475	2.16	69750	39857	1%
PF Process Chiller WC LT L > 200 kW	SEPR	141000	2.25	142410	2.27	155100	2.43	70500	79312	1%
PF Process Chiller All MT&LT	SEPR	**51367**	**2.41**	**52374**	**2.44**	**57735**	**2.61**	**36028**	**32475**	**1%**
PF Condensing Unit MT S 0.2-1 kW	COP	500	1.42	510	1.43	575	1.57	1000	464	1%
PF Condensing Unit MT M 1-5 kW	COP	1800	1.64	1836	1.66	2052	1.76	1800	2160	1%
PF Condensing Unit MT L 5-20 kW	SEPR	3700	2.64	3774	2.73	4366	2.88	822	3947	1%
PF Condensing Unit MT XL 20-50 kW	SEPR	8500	2.71	8670	2.81	10030	2.94	1700	10462	1%
PF Condensing Unit LT S 0.1-0.4 kW	COP	600	0.80	600	0.85	690	0.87	0	4500	1%
PF Condensing Unit LT M 0.4-2 kW	COP	800	0.95	800	1.04	912	1.07	0	3733	1%
PF Condensing Unit LT L 2-8 kW	SEPR	4300	1.46	4300	1.68	5074	1.72	0	19350	1%
PF Condensing Unit LT XL 8-20 kW	SEPR	7500	1.61	7500	1.73	8850	1.78	0	27000	1%
PF Condensing Unit, All MT&LT	comb	**1836**	**2.05**	**1864**	**2.14**	**2139**	**2.24**	**331**	**2564**	**1%**

UNIT PRICE (in euro 2010)	var	BC €	BC EF	mid €	mid EF	BAT €	BAT EF	dec €/EF	inc €/EF	PriceDec %
		€	eff	€	eff	€	eff	€/eff	€/eff	
COOK El. Hobs, Wh/ltr	Wh	145	205	428	190	859	174	18.9	26.9	1%
COOK El. Ovens, kWh/a	kWh	523	107	612	88.15	671	69	4.77	3.10	1%
COOK Gas Hobs, % efficiency NCV	%	254	58%	323	64%	435	73%	1253	1163	1%
COOK Gas Ovens, kWh prim, NCV	kWh	265	231	376	190	525	145	2.73	3.29	1%
COOK Range Hoods, kWh elec	kWh	212	130	259	120	293	110	4.66	3.39	1%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
COFFEE Dripfilter (glass)	kWh	20	93	25	74	30	55	0.26	0.26	1%
COFFEE Dripfilter (thermos)	kWh	30	48	30	48	30	48	0	0	1%
COFFEE Dripfilter (full automatic)	kWh	100	49	100	49	100	49	0	0	1%
COFFEE Pad filter	kWh	81	37	81	30	81	27	0	0	1%
COFFEE Hard cap espresso	kWh	156	37	156	30	156	27	0	0	1%
COFFEE Semi-auto espresso	kWh	103	37	103	30	103	27	0	0	1%
COFFEE Fully-auto espresso	kWh	595	37	595	30	595	27	0	0	1%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
WM Household Washing Machine	kWh	449	207	541	130	630	87	0.87	2.07	1%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
DW Household Dishwasher	kWh	541	269	652	224.5	763	180	2.49	2.49	1%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
LD Household Laundry Drier vented el.	kWh	400	432	425	403	450	374	0.87	0.87	1%
LD Household Laundry Drier condens el.	kWh	554	447	677	339	800	231	1.14	1.14	1%
LD Household Laundry Drier vented gas	kWh	750	452	750	452	750	452	0.00	0.00	1%
		€	W	€	W	€	W	€/W	€/W	
VC dom. Vacuum Cleaner	W	220	1739	245	1000	278	650	0.034	0.094	1%
VC nondom Vacuum Cleaner	W	600	1293	660	1000	740	650	0.205	0.229	1%
		€	%	€	%	€	%	€ct/%	€ct/%	
FAN Axial<300Pa [247 W flow out]	%	250	31%	323	35%	396	40%	1602	1602	0.9%
FAN Axial>300Pa [489 W fluid-dyn out]	%	325	37%	358	42%	390	47%	659	659	0.9%
FAN Centr.FC [141 W flow out]	%	400	32%	508	37%	617	42%	2184	2184	0.9%
FAN Centr.BC-free [2120 W flow out]	%	770	56%	937	63%	1105	70%	2458	2458	0.9%
FAN Centr.BC [2052 W flow out]	%	1650	54%	2201	60%	2751	67%	8289	8289	0.9%
FAN Cross-flow [31 W flow out]	%	325	7%	413	9%	500	10%	6430	6430	0.9%
		€	%	€	%	€	%	€ct/%	€ct/%	Dec
MT Industrial motors, motor only	%	242	79.1%	273	80.1%	459	86.1%	3100	3100	1%
MT Industrial motors, VSD drive effect	%	0	0%	155	5%	310	10%	3100	3100	1%
MT Industrial motors, avg. 3 kW	%	242	79.1%	273	80.1%	769	96.1%	3100	3100	1%
WP Water pumps (load) [%]	%	1431	66.5%	1434	68.6%	1477	69.7%	143	3909	0.7%
CP Fixed Speed 5-1280 l/s	%	7746	63.2%	8902	66.9%	9137	75.1%	31393	2859.309	0%
CP Variable speed 5-1280 l/s	%	17257	64.6%	19046	68.1%	22147	74.3%	50491	49958.83	0%
CP Pistons 2-64 l/s	%	1656	46.8%	3085	52.1%	5628	62.0%	26849	25546.88	0%
		€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
TRAFO Distribution, kWh/a	kWh	7727	7859	8636	6457	9545	5056	0.65	0.65	
TRAFO Industry oil	kWh	13330	27168	16862	21400	20395	15631	0.61	0.61	
TRAFO Industry dry	kWh	33401	39727	39278	34178	45155	28629	1.06	1.06	
TRAFO Power	kWh	907541	724886	907541	724886	907541	724886	0.00	0.00	
TRAFO DER oil	kWh	22263	59094	29832	47304	37402	35515	0.64	0.64	
TRAFO DER dry	kWh	34393	62415	39724	54762	45055	47109	0.70	0.70	
TRAFO Small	kWh	1407	2523	1407	2523	1407	2523	0.00	0.00	
TYRE in m units		€/ tyre	RRC kg/t	€/ tyre	RRC kg/t	€/ tyre	RRC kg/t	€/(kg/t)	€/(kg/t)	
TYRE car replacement tyres C1	RRC	70.44	11.34	73.29	9.83	77.88	8.38	1.88	3.17	1%
TYRE van replacement tyres C2	RRC	100.69	10.95	103.68	9.25	108.33	7.39	1.75	2.50	1%
TYRE truck replacement tyres C3	RRC	470.28	9.51	528.50	8.68	628.45	7.43	69.73	80.28	1%

Table with LED unit prices for BAU and ECO scenarios (same €/lm, but different lm)

year	BAU	ECO	year	BAU	ECO	year	BAU	ECO
2010	27.7	28.0	**2020**	4.9	6.3	**2030**	3.5	5.1
2011	24.2	26.0	**2021**	4.8	6.2	**2031**	4.0	5.2
2012	19.5	21.0	**2022**	4.6	6.1	**2032**	4.3	5.4
2013	11.5	13.4	**2023**	4.5	6.0	**2033**	4.4	5.5
2014	10.3	14.3	**2024**	4.3	5.8	**2034**	4.4	5.7
2015	9.6	13.8	**2025**	4.2	5.6	**2035**	4.4	5.8
2016	8.8	12.3	**2026**	4.1	5.5	**2036**	4.4	6.0
2017	7.8	10.5	**2027**	3.9	5.5	**2037**	4.5	6.1
2018	6.8	8.9	**2028**	3.8	5.3	**2038**	4.6	6.3
2019	5.7	7.1	**2029**	3.6	5.3	**2039**	4.6	6.4

UNIT PRICE SPLIT (in euro 2010)	**unit**	**kit**	**install**	**ErP**	**maint**	share	avg VAT	**split-up materials price by party**			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
	unit	excl. kit	install		maint/a						
WH dedicated Water Heater	0.67		0.33		44	90%	18%	0.15	0.14	0.16	0.55
	unit	excl. kit	install		maint/a						
CH Central Heating combi, water heat [24 kW]	0.64		0.36		33	70%	14%	0.12	0.15	0.16	0.57
	unit	excl. kit	install	excl. tank	maint/a						
CH Central Heating boiler, space heat [24 kW]	0.65		0.35		199	70%	14%	0.12	0.15	0.16	0.57
	unit	excl. kit	install	excl. store	maint/a						
SFB Wood Manual [18 kW]	0.67		0.33		48	90%	18%	0.15	0.03	0.03	0.79
SFB Wood Direct Draft [20 kW]	0.77		0.23		48	90%	18%	0.15	0.03	0.03	0.79
SFB Coal [25 kW]	0.73		0.27		43	90%	18%	0.15	0.03	0.03	0.79
SFB Pellets [25 kW]	0.75		0.25		43	70%	14%	0.12	0.03	0.03	0.81
SFB Wood chips [160 kW]	0.90		0.10		55	0%	0%	0.00	0.04	0.04	0.93
Cooling:	unit	kit	install	cooler	maint/a						
CHAE-S (≤ 400 kW)	0.60	0.14	0.27		755	0%	0%	0.00	0.10	0.10	0.80
CHAE-L (> 400 kW)	0.60	0.14	0.27		1864	0%	0%	0.00	0.10	0.10	0.80
CHWE-S (≤ 400 kW)	0.43	0.10	0.19	0.28	630	0%	0%	0.00	0.10	0.10	0.80
CHWE-M (> 400 kW; ≤ 1500 kW)	0.31	0.10	0.19	0.40	2936	0%	0%	0.00	0.10	0.10	0.80
CHWE-L (> 1500 kW)	0.28	0.06	0.13	0.53	4404	0%	0%	0.00	0.10	0.10	0.80
CHF	0.60	0.14	0.27		2880	0%	0%	0.00	0.10	0.10	0.80
HT PCH-AE-S	0.60	0.14	0.27		1007	0%	0%	0.00	0.10	0.10	0.80
HT PCH-AE-L	0.60	0.14	0.27		3107	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-S	0.60	0.14	0.27		840	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-M	0.71	0.10	0.19		4893	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-L	0.81	0.06	0.13		5505	0%	0%	0.00	0.10	0.10	0.80
AC rooftop	0.56	0.02	0.42		860	0%	0%	0.00	0.10	0.10	0.80
AC splits	0.66	0.04	0.30		213	0%	0%	0.00	0.10	0.10	0.80
AC VRF	0.54	0.09	0.38		1440	0%	0%	0.00	0.10	0.10	0.80
ACF	0.60	0.14	0.27		1007	0%	0%	0.00	0.10	0.10	0.80
Heating:											
AC rooftop (rev)	0.56	0.02	0.42		860	0%	0%	0.00	0.10	0.10	0.80
AC splits (rev)	0.66	0.04	0.30		213	0%	0%	0.00	0.10	0.10	0.80
AC VRF (rev)	0.54	0.09	0.38		1440	0%	0%	0.00	0.10	0.10	0.80
ACF (rev)	0.59	0.14	0.27		1007	0%	0%	0.00	0.10	0.10	0.80
AHF	0.60	0.00	0.40		63	0%	0%	0.00	0.10	0.10	0.80
AHE	0.86	0.00	0.14		20	0%	0%	0.00	0.10	0.10	0.80
	unit	excl. kit	install	excl. store	maint/a						
LH open fireplace [8 kW]	0.74		0.26		16.7	100%	20%	0.17	0.11	0.09	0.63
LH closed fireplace/inset [8 kW]	0.74		0.26		18.7	100%	20%	0.17	0.11	0.09	0.63
LH wood stove [8 kW]	0.80		0.20		16.1	100%	20%	0.17	0.11	0.09	0.63
LH coal stove [8 kW]	0.73		0.27		16.1	100%	20%	0.17	0.11	0.09	0.63
LH cooker [10 kW]	0.82		0.18		56.8	100%	20%	0.17	0.11	0.09	0.63
LH SHR stove [8 kW]	0.37		0.63		15.2	100%	20%	0.17	0.11	0.09	0.63
LH pellet stove [8 kW]	0.85		0.15		33.0	100%	20%	0.17	0.11	0.09	0.63
LH open fire gas, NCV [4.2 kW]	0.71		0.29		21.5	100%	20%	0.17	0.11	0.09	0.63
LH closed fire gas, NCV [4.2 kW]	0.70		0.30		21.5	100%	20%	0.17	0.11	0.09	0.63
LH flueless fuel heater, NCV [1.5 kW]	1.00		0.00		0.0	100%	20%	0.17	0.11	0.09	0.63
LH elec.portable [1 kW]	1.00		0.00		0.0	100%	20%	0.17	0.11	0.09	0.63
LH elec.convector [1 kW]	0.81		0.19		0.0	100%	20%	0.17	0.11	0.09	0.63
LH elec.storage [2.75 kW]	0.86		0.14		0.0	100%	20%	0.17	0.11	0.09	0.63
LH elec.underfloor [0.62 kW]	0.59		0.41		0.0	100%	20%	0.17	0.11	0.09	0.63
LH luminous heaters [20 kW]	0.81		0.19		101.3	0%	0%	0.00	0.10	0.10	0.80
LH tube heaters [30 kW]	0.81		0.19		76.0	0%	0%	0.00	0.10	0.10	0.80
	unit		install+kit		maint €/a						
RAC cooling [nom. avg. 3.8 kW]	0.51		0.49		20	66%	13%	0.12	0.15	0.16	0.57
RAC heating (reversible)	0.51		0.49		20	66%	13%	0.12	0.15	0.16	0.57
CIRC Circulator pumps <2.5 kW (incl. ctrl)	100%		0%		0	20%	4%	0.04	0.06	0.15	0.75
	unit	kit	install		maint/a						
NRVU avg (sales wt.)	0.08	0.34	0.57		390	0%	0%	0.00	0.10	0.10	0.80
prices incl VAT	unit	kit	install		maint/a						
RVU Central Unidir. VU (1 fan)	0.22	0.39	0.38		9	100%	20%	0.17	0.17	0.16	0.50
RVU Central Balanced VU (2 fans)	0.51	0.15	0.35		48	100%	20%	0.17	0.17	0.16	0.50
RVU Local Balanced VU (2 fans)	0.86	0.07	0.08		20	100%	20%	0.17	0.17	0.16	0.50
LS Light Sources in Euro/unit	unit	kit	install								
LFL	1					5%	1%	0.01	0.10	0.10	0.79
CFL	1					70%	14%	0.12	0.43	0.05	0.40
Tungsten	1					70%	14%	0.12	0.43	0.05	0.40
GLS	1					70%	14%	0.12	0.43	0.05	0.40
HID	1					0%	0%	0.00	0.10	0.10	0.80
LED BAU	1					50%	10%	0.09	0.43	0.05	0.43
LED ECO	1					40%	8%	0.07	0.45	0.05	0.43

UNIT PRICE SPLIT (in euro 2010)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
DP TV standard	1					90%	18%	0.15	0.40	0.05	0.40
DP TV LoNA	1					90%	18%	0.15	0.40	0.05	0.40
DP TV Smart	1					90%	18%	0.15	0.40	0.05	0.40
DP Monitor	1					90%	18%	0.15	0.40	0.05	0.40
SSTB	1					90%	18%	0.15	0.05	0.25	0.55
CSTB	1					90%	18%	0.15	0.05	0.25	0.55
VIDEO players/recorders	1					90%	18%	0.15	0.40	0.05	0.40
VIDEO projectors	1					10%	2%	0.02	0.10	0.30	0.58
VIDEO game consoles	1					100%	20%	0.17	0.39	0.05	0.39
ES Rack servers	0.90		0.10		10	0%	0%	0.00	0.20	0.10	0.70
ES Blade servers	0.92		0.08		10	0%	0%	0.00	0.20	0.10	0.70
ES Storage	0.94		0.06		10	0%	0%	0.00	0.20	0.10	0.70
PC Desktop	1					66%	13.20%	0.12	0.43	0.05	0.40
PC Notebook	1					66%	13%	0.12	0.43	0.05	0.40
PC Tablet/slate	1					90%	18%	0.15	0.40	0.05	0.40
PC Thin client	1					0%	0%	0.00	0.20	0.25	0.55
PC Workstation	1					10%	2%	0.02	0.20	0.23	0.55
EP-Copier mono	1					0%	0%	0.00	0.20	0.10	0.70
EP-Copier colour	1					0%	0%	0.00	0.20	0.10	0.70
EP-printer mono	1					40%	8%	0.07	0.20	0.10	0.63
EP-printer colour	1					5%	1%	0.01	0.20	0.10	0.69
IJ SFD printer	1					100%	20%	0.17	0.40	0.03	0.40
IJ MFD printer	1					100%	20%	0.17	0.40	0.03	0.40
paper (2.5 euro/kg paper (6.25 euro/pack)	1										
SB Home Gateway, on-mode power	1					100%	20%	0.17	0.10	0.25	0.48
SB Home NAS, on-mode power	1					100%	20%	0.17	0.05	0.25	0.53
SB Home Phones (fixed), on-mode power	1					100%	20%	0.17	0.40	0.03	0.40
SB Office Phones (fixed), on-mode power	1					0%	0%	0.00	0.30	0.20	0.50
BC_EPS Mobile phones etc.	1										
	1										
UPS below 1.5 kVA	1.00		0.00		0	0%	0%	0.00	0.40	0.10	0.50
UPS 1.5 to 5 kVA	0.68		0.32		30	0%	0%	0.00	0.35	0.00	0.65
UPS 5 to 10 kVA	0.87		0.13		114	0%	0%	0.00	0.35	0.00	0.65
UPS 10 to 200 kVA	0.96		0.04		3828	0%	0%	0.00	0.35	0.00	0.65
RF Household refrigerator and freezer	1					100%	20%	0.17	0.40	0.03	0.40
	unit		install+kit		maint						
CF open vertical chilled multi deck (RVC2)	0.91		0.09		240	0%	0%	0.00	0.00	0.30	0.70
CF open horizontal frozen island (RHF4)	0.91		0.09		260	0%	0%	0.00	0.00	0.30	0.70
CF other supermarket display (non-BCs)	0.87		0.13		200	0%	0%	0.00	0.00	0.30	0.70
CF Plug in one door beverage cooler	1.00		0.00		28	0%	0%	0.00	0.00	0.30	0.70
CF Plug in horizontal ice cream freezer	1.00		0.00		21	0%	0%	0.00	0.00	0.30	0.70
CF Spiral vending machine	1.00		0.00		47	0%	0%	0.00	0.00	0.30	0.70
	unit		install+kit		maint						
PF Storage cabinet Chilled Vertical (CV)	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinet Frozen Vertical (FV)	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinet Chilled Horizontal (CH)	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinet Frozen Horizontal (FH)	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinets All types	**1.0**		**0.0**		**0**	**0%**	**0%**	**0.00**	**0.10**	**0.20**	**0.70**
PF Process Chiller AC MT S ≤ 300 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller AC MT L > 300 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller AC LT S ≤ 200 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller AC LT L > 200 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC MT S ≤ 300 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC MT L > 300 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC LT S ≤ 200 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC LT L > 200 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller All MT&LT	**1.0**		**0.0**		**0**	**0%**	**0%**	**0.00**	**0.10**	**0.20**	**0.70**
PF Condensing Unit MT S 0.2-1 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit MT M 1-5 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit MT L 5-20 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit MT XL 20-50 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT S 0.1-0.4 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT M 0.4-2 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT L 2-8 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT XL 8-20 kW	1.0		0.0		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit, All MT&LT	**1.0**		**0.0**		**0**	**0%**	**0%**	**0.00**	**0.10**	**0.20**	**0.70**

UNIT PRICE SPLIT (in euro 2010)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
COOK El. Hobs, Wh/ltr	1					100%	20%	0.17	0.40	0.03	0.40
COOK El. Ovens, kWh/a	1					80%	16%	0.14	0.40	0.03	0.43
COOK Gas Hobs, % efficiency NCV	1					80%	16%	0.14	0.40	0.03	0.43
COOK Gas Ovens, kWh prim, NCV	1					90%	18%	0.15	0.40	0.03	0.42
COOK Range Hoods, kWh elec	1					80%	16%	0.14	0.40	0.03	0.43
COFFEE Dripfilter (glass)	1					100%	20%	0.17	0.40	0.03	0.40
COFFEE Dripfilter (thermos)	1					100%	20%	0.17	0.40	0.03	0.40
COFFEE Dripfilter (full automatic)	1					100%	20%	0.17	0.40	0.03	0.40
COFFEE Pad filter	1					100%	20%	0.17	0.40	0.03	0.40
COFFEE Hard cap espresso	1					100%	20%	0.17	0.40	0.03	0.40
COFFEE Semi-auto espresso	1					100%	20%	0.17	0.40	0.03	0.40
COFFEE Fully-auto espresso	1					100%	20%	0.17	0.40	0.03	0.40
WM Household Washing Machine	1					100%	20%	0.17	0.40	0.03	0.40
DW Household Dishwasher	1					100%	20%	0.17	0.40	0.03	0.40
LD Household Laundry Drier vented el.	1					100%	20%	0.17	0.40	0.03	0.40
LD Household Laundry Drier condens el.	1					100%	20%	0.17	0.40	0.03	0.40
LD Household Laundry Drier vented gas	1					100%	20%	0.17	0.40	0.03	0.40
VC dom. Vacuum Cleaner	1					100%	20%	0.17	0.40	0.03	0.40
VC nondom Vacuum Cleaner	1					0%	0%	0.00	0.15	0.20	0.65
FAN Axial<300Pa [247 W flow out]	0.90		0.10		6	0%	0%	0.00	0.10	0.23	0.67
FAN Axial>300Pa [489 W fluid-dyn out]	0.92		0.08		8	0%	0%	0.00	0.10	0.23	0.67
FAN Centr.FC [141 W flow out]	0.94		0.06		10	0%	0%	0.00	0.10	0.23	0.67
FAN Centr.BC-free [2120 W flow out]	0.91		0.09		19	0%	0%	0.00	0.10	0.23	0.67
FAN Centr.BC [2052 W flow out]	0.91		0.09		33	0%	0%	0.00	0.10	0.23	0.67
FAN Cross-flow [31 W flow out]	0.92		0.08		8	0%	0%	0.00	0.10	0.23	0.67
MT Industrial motors, motor only	1.00		0.00			0%	0%	0.00	0.10	0.23	0.67
MT Industrial motors, VSD drive effect	0.63		0.38			0%	0%	0.00	0.10	0.23	0.67
MT Industrial motors, avg. 3 kW	1.00		0.00			0%	0%	0.00	0.10	0.23	0.67
	unit	kit	install		maint						
WP Water pumps (load) [%]	0.69		0.31		82	0%	0%	0.00	0.10	0.23	0.67
CP Fixed Speed 5-1280 l/s	0.96		0.04		1179	0%	0%	0.00	0.00	0.00	1.00
CP Variable speed 5-1280 l/s	0.96		0.04		1753	0%	0%	0.00	0.00	0.00	1.00
CP Pistons 2-64 l/s	0.94		0.06		212	0%	0%	0.00	0.00	0.00	1.00
TRAFO Distribution, kWh/a	1					0%	0%	0.00	0.10	0.10	0.80
TRAFO Industry oil	1					0%	0%	0.00	0.10	0.10	0.80
TRAFO Industry dry	1					0%	0%	0.00	0.10	0.10	0.80
TRAFO Power	1					0%	0%	0.00	0.10	0.10	0.80
TRAFO DER oil	1					0%	0%	0.00	0.10	0.10	0.80
TRAFO DER dry	1					0%	0%	0.00	0.10	0.10	0.80
TRAFO Small	1					0%	0%	0.00	0.10	0.10	0.80
TYRE car replacement tyres C1	1					80%	16%	0.14	0.20	0.20	0.46
TYRE van replacement tyres C2	1					0%	0%	0.00	0.20	0.20	0.60
TYRE truck replacement tyres C3	1					0%	0%	0.00	0.20	0.20	0.60

UNIT PRICE BAU (in euro 2010, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WH dedicated Water Heater	497	545	528	556	604	597	577	558	540	522
CH Central Heating combi, water heat [24 kW]	994	1035	1041	1085	1051	1018	994	994	994	994
CH Central Heating boiler, space heat [24 kW]	3881	3881	3881	3881	3881	3881	3881	3881	3881	3881
SFB Wood Manual [18 kW]	4500	4500	4692	4875	5049	5215	5372	5522	5664	5799
SFB Wood Direct Draft [20 kW]	6500	6500	6647	6936	7252	7429	7150	6881	6622	6500
SFB Coal [25 kW]	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
SFB Pellets [25 kW]	8000	8000	8004	8002	8000	8000	8000	8000	8000	8000
SFB Wood chips [160 kW]	33500	33500	33585	33615	33500	33500	33500	33500	33500	33500
Cooling:										
CHAE-S (≤ 400 kW)	17302	17308	17302	17302	17302	17302	17302	17302	17302	17302
CHAE-L (> 400 kW)	42111	42128	42111	42111	42111	42111	42111	42111	42111	42111
CHWE-S (≤ 400 kW)	13980	13980	13980	13980	13980	13980	13980	13980	13980	13980
CHWE-M (> 400 kW; ≤ 1500 kW)	61627	61670	61627	61627	61627	61627	61627	61627	61627	61627
CHWE-L (> 1500 kW)	110339	110415	110339	110339	110339	110339	110339	110339	110339	110339
CHF	15098	15098	15098	15098	15098	15098	15098	15098	15098	15098
HT PCH-AE-S	18910	18910	18910	18910	18910	18910	18910	18910	18910	18910
HT PCH-AE-L	47864	47864	47864	47864	47864	47864	47864	47864	47864	47864
HT PCH-WE-S	16018	16018	16018	16018	16018	16018	16018	16018	16018	16018
HT PCH-WE-M	75290	75290	75290	75290	75290	75290	75290	75290	75290	75290
HT PCH-WE-L	160543	160543	160543	160543	160543	160543	160543	160543	160543	160543
AC rooftop	19201	19201	19201	19201	19201	19201	19201	19201	19201	19201
AC splits	3284	3284	3284	3284	3284	3284	3284	3284	3284	3284
AC VRF	30771	30771	30771	30771	30771	30771	30771	30771	30771	30771
ACF	15098	15098	15098	15098	15098	15098	15098	15098	15098	15098
Heating:										
AC rooftop (rev)	19023	19023	19023	19023	19023	19023	19023	19023	19023	19023
AC splits (rev)	3050	3050	3050	3050	3050	3050	3050	3050	3050	3050
AC VRF (rev)	29845	29845	29845	29845	29845	29845	29845	29845	29845	29845
ACF (rev)	16755	16755	16755	16755	16755	16755	16755	16755	16755	16755
AHF	5176	5176	5176	5176	5176	5176	5176	5176	5176	5176
AHE	500	500	500	500	500	500	500	500	500	500
LH open fireplace [8 kW]	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
LH closed fireplace/inset [8 kW]	2717	2717	2717	2717	2717	2717	2717	2717	2717	2717
LH wood stove [8 kW]	2517	2517	2517	2517	2517	2517	2517	2517	2517	2517
LH coal stove [8 kW]	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845
LH cooker [10 kW]	2847	2847	2847	2847	2847	2847	2847	2847	2847	2847
LH SHR stove [8 kW]	7956	7956	7956	7956	7956	7956	7956	7956	7956	7956
LH pellet stove [8 kW]	3369	3369	3369	3369	3369	3369	3369	3369	3369	3369
LH open fire gas, NCV [4.2 kW]	856	856	856	856	856	856	856	856	856	856
LH closed fire gas, NCV [4.2 kW]	821	821	821	821	821	821	821	821	821	821
LH flueless fuel heater, NCV [1.5 kW]	272	272	272	272	272	272	272	272	272	272
LH elec.portable [1 kW]	27	27	27	27	27	27	27	27	27	27
LH elec.convector [1 kW]	155	155	155	155	155	155	155	155	155	155
LH elec.storage [2.75 kW]	572	572	572	572	572	572	572	572	572	572
LH elec.underfloor [0.62 kW]	381	381	381	381	381	381	381	381	381	381
LH luminous heaters [20 kW]	1293	1293	1293	1293	1293	1293	1293	1293	1293	1293
LH tube heaters [30 kW]	1284	1284	1284	1284	1284	1284	1284	1284	1284	1284
RAC cooling [nom. avg. 3.8 kW]	1674	1750	1764	1757	1734	1697	1674	1674	1674	1674
RAC heating (reversible)	1674	1752	1766	1761	1740	1703	1674	1674	1674	1674
CIRC Circulator pumps <2.5 kW (efficiency, incl. ctrl)	211	212	211	211	211	211	211	211	211	211
NRVU avg (sales wt.)	129561	130456	129561	129561	129561	129561	129561	129561	129561	129561
RVU Central Unidir. VU (1 fan)	1446	1446	1402	1360	1318	1279	1264	1264	1264	1264
RVU Central Balanced VU (2 fans)	4349	4349	4275	4275	4275	4275	4275	4275	4275	4275
RVU Local Balanced VU (2 fans)	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218
LS Light Sources in Euro/unit										
LFL	8	8	8	8	8	8	8	8	8	8
CFL	5	5	5	5	5	5	5	5	5	5
Tungsten	6	6	6	6	6	6	6	6	6	6
GLS	1	1	1	1	1	1	1	1	1	1
HID	26	26	26	26	26	26	26	26	26	26
LED BAU		27.7	9.6	4.9	4.2	3.5	4.4	4.7	4.9	5.5
LED ECO		28.0	13.8	6.3	5.6	5.1	5.8	6.6	7.3	8.1

UNIT PRICE BAU (in euro 2010, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	450	450	450	450	450	450	450	450	450	450
DP TV LoNA	450	450	450	450	450	450	450	450	450	450
DP TV Smart	450	450	450	450	450	450	450	450	450	450
DP Monitor	170	170	170	170	170	170	170	170	170	170
SSTB	50	50	50	50	50	50	50	50	50	50
CSTB	150	150	150	150	150	150	150	150	150	150
VIDEO players/recorders	100	100	100	100	100	100	100	100	100	100
VIDEO projectors	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
VIDEO game consoles	360	360	360	360	360	360	360	360	360	360
ES Rack servers	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
ES Blade servers	65000	65000	65000	65000	65000	65000	65000	65000	65000	65000
ES Storage	23000	23000	23000	23000	23000	23000	23000	23000	23000	23000
PC Desktop	500	500	500	500	500	500	500	500	500	500
PC Notebook	700	700	700	700	700	700	700	700	700	700
PC Tablet/slate	450	450	450	450	450	450	450	450	450	450
PC Thin client	400	400	400	400	400	400	400	400	400	400
PC Workstation	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
EP-Copier mono	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
EP-Copier colour	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
EP-printer mono	200	200	200	200	200	200	200	200	200	200
EP-printer colour	500	500	500	500	500	500	500	500	500	500
IJ SFD printer	100	100	100	100	100	100	100	100	100	100
IJ MFD printer	150	150	150	150	150	150	150	150	150	150
paper (2.5 euro/kg paper (6.25 euro/pack)										
SB Home Gateway	200	200	200	200	200	200	200	200	200	200
SB Home NAS	200	200	200	200	200	200	200	200	200	200
SB Home Phones (fixed)	100	100	100	100	100	100	100	100	100	100
SB Office Phones (fixed)	100	100	100	100	100	100	100	100	100	100
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	180	180	180	180	180	180	180	180	180	180
UPS 1.5 to 5 kVA	951	951	951	951	951	951	951	951	951	951
UPS 5 to 10 kVA	4005	4005	4005	4005	4005	4005	4005	4005	4005	4005
UPS 10 to 200 kVA	30020	30020	30020	30020	30020	30020	30020	30020	30020	30020
RF Household refrigerator and freezer	421	421	421	421	421	421	421	421	421	421
CF open vertical chilled multi deck (RCV2)	3850	3850	3850	3850	3850	3850	3850	3850	3850	3850
CF open horizontal frozen island (RHF4)	4400	4400	4400	4400	4400	4400	4400	4400	4400	4400
CF other supermarket display (non-BCs)	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383
CF Plug in one door beverage cooler	830	830	830	830	830	830	830	830	830	830
CF Plug in horizontal ice cream freezer	800	800	800	800	800	800	800	800	800	800
CF Spiral vending machine	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
PF Storage cabinet Chilled Vertical (CV)	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460
PF Storage cabinet Frozen Vertical (FV)	1724	1724	1724	1724	1724	1724	1724	1724	1724	1724
PF Storage cabinet Chilled Horizontal (CH)	700	700	700	700	700	700	700	700	700	700
PF Storage cabinet Frozen Horizontal (FH)	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
PF Storage cabinets All types	**1335**	**1335**	**1335**	**1335**	**1335**	**1335**	**1335**	**1335**	**1335**	**1335**
PF Process Chiller AC MT S ≤ 300 kW	28000	28000	28000	28000	28000	28000	28000	28000	28000	28000
PF Process Chiller AC MT L > 300 kW	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000
PF Process Chiller AC LT S ≤ 200 kW	31000	31000	31000	31000	31000	31000	31000	31000	31000	31000
PF Process Chiller AC LT L > 200 kW	94000	94000	94000	94000	94000	94000	94000	94000	94000	94000
PF Process Chiller WC MT S ≤ 300 kW	42000	42000	42000	42000	42000	42000	42000	42000	42000	42000
PF Process Chiller WC MT L > 300 kW	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000
PF Process Chiller WC LT S ≤ 200 kW	46500	46500	46500	46500	46500	46500	46500	46500	46500	46500
PF Process Chiller WC LT L > 200 kW	141000	141000	141000	141000	141000	141000	141000	141000	141000	141000
PF Process Chiller All MT&LT	**51367**	**51367**	**51367**	**51367**	**51367**	**51367**	**51367**	**51367**	**51367**	**51367**
PF Condensing Unit MT S 0.2-1 kW	500	500	500	500	500	500	500	500	500	500
PF Condensing Unit MT M 1-5 kW	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
PF Condensing Unit MT L 5-20 kW	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
PF Condensing Unit MT XL 20-50 kW	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
PF Condensing Unit LT S 0.1-0.4 kW	600	600	600	600	600	600	600	600	600	600
PF Condensing Unit LT M 0.4-2 kW	800	800	800	800	800	800	800	800	800	800
PF Condensing Unit LT L 2-8 kW	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300
PF Condensing Unit LT XL 8-20 kW	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
PF Condensing Unit, All MT&LT	**1836**	**1836**	**1836**	**1836**	**1836**	**1836**	**1836**	**1836**	**1836**	**1836**

UNIT PRICE BAU (in euro 2010, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
COOK El. Hobs, Wh/ltr	352	506	499	498	495	492	488	484	478	472
COOK El. Ovens, kWh/a	523	570	576	550	525	523	523	523	523	523
COOK Gas Hobs, % efficiency NCV	365	358	339	321	304	288	272	258	254	254
COOK Gas Ovens, kWh prim, NCV	265	343	347	339	334	328	322	315	309	302
COOK Range Hoods, kWh elec	212	212	212	212	212	212	212	212	212	212
COFFEE Dripfilter (glass)	20	20	20	20	20	20	20	20	20	20
COFFEE Dripfilter (thermos)	30	30	30	30	30	30	30	30	30	30
COFFEE Dripfilter (full automatic)	100	100	100	100	100	100	100	100	100	100
COFFEE Pad filter	81	81	81	81	81	81	81	81	81	81
COFFEE Hard cap espresso	156	156	156	156	156	156	156	156	156	156
COFFEE Semi-auto espresso	103	103	103	103	103	103	103	103	103	103
COFFEE Fully-auto espresso	595	595	595	595	595	595	595	595	595	595
WM Household Washing Machine	449	474	466	459	449	449	449	449	449	449
DW Household Dishwasher	541	541	541	541	541	541	541	541	541	541
LD Household Laundry Drier vented el.	426	400	400	400	400	400	400	400	400	400
LD Household Laundry Drier condens el.	560	554	554	554	554	554	554	554	554	554
LD Household Laundry Drier vented gas	750	750	750	750	750	750	750	750	750	750
VC dom. Vacuum Cleaner	236	220	220	220	220	220	220	220	220	220
VC nondom Vacuum Cleaner	676	600	600	600	600	600	600	600	600	600
FAN Axial<300Pa [247 W flow out]	250	250	250	250	250	250	250	250	250	250
FAN Axial>300Pa [489 W fluid-dyn out]	325	325	325	325	325	325	325	325	325	325
FAN Centr.FC [141 W flow out]	400	400	400	400	400	400	400	400	400	400
FAN Centr.BC-free [2120 W flow out]	770	770	770	770	770	770	770	770	770	770
FAN Centr.BC [2052 W flow out]	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
FAN Cross-flow [31 W flow out]	325	325	325	325	325	325	325	325	325	325
MT Industrial motors, motor only	242	242	245	247	248	249	249	248	247	246
MT Industrial motors, VSD drive effect	0	0	0	0	0	0	0	0	0	0
MT Industrial motors, avg. 3 kW	242	242	245	247	248	249	249	248	247	246
WP Water pumps (load) [%]	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431
CP Fixed Speed 5-1280 l/s	7746	7746	7855	8008	8125	8218	8305	8393	8481	8569
CP Variable speed 5-1280 l/s	17257	17392	17257	17434	17656	17809	17954	18099	18245	18392
CP Pistons 2-64 l/s	1656	1725	1842	1935	2011	2073	2131	2191	2250	2309
TRAFO Distribution, kWh/a	7727	7727	7727	7727	7727	7727	7727	7727	7727	7727
TRAFO Industry oil	13330	13330	13330	13330	13330	13330	13330	13330	13330	13330
TRAFO Industry dry	33401	33401	33401	33401	33401	33401	33401	33401	33401	33401
TRAFO Power	907541	907541	907541	907541	907541	907541	907541	907541	907541	907541
TRAFO DER oil	22263	22263	22263	22263	22263	22263	22263	22263	22263	22263
TRAFO DER dry	34393	34393	34393	34393	34393	34393	34393	34393	34393	34393
TRAFO Small	1407	1407	1407	1407	1407	1407	1407	1407	1407	1407
TYRE car replacement tyres C1	70	70	70	70	70	70	70	70	70	70
TYRE van replacement tyres C2	101	101	101	101	101	101	101	101	101	101
TYRE truck replacement tyres C3	470	470	476	478	483	486	488	488	487	485

UNIT PRICE ECO (in euro 2010, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WH dedicated Water Heater	497	545	857	965	1087	1052	1017	984	952	921
CH Central Heating combi, water heat [24 kW]	994	1035	1477	1966	2015	2059	2099	2133	2164	2190
CH Central Heating boiler, space heat [24 kW]	3881	4026	6631	7998	9139	9579	10098	10616	11131	11646
SFB Wood Manual [18 kW]	4500	4500	6302	8684	8738	8453	8176	7909	7651	7401
SFB Wood Direct Draft [20 kW]	6500	6500	6667	7035	8611	8287	7976	7676	7388	7110
SFB Coal [25 kW]	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
SFB Pellets [25 kW]	8000	8000	8004	8002	8328	8023	8000	8000	8000	8000
SFB Wood chips [160 kW]	33500	33500	35111	35750	34191	33500	33500	33500	33500	33500
Cooling:										
CHAE-S (≤ 400 kW)	17302	17308	17302	17302	17302	17302	17302	17302	17302	17302
CHAE-L (> 400 kW)	42111	42128	42111	42111	42111	42111	42111	42111	42111	42111
CHWE-S (≤ 400 kW)	13980	13980	13980	13980	13980	13980	13980	13980	13980	13980
CHWE-M (> 400 kW; ≤ 1500 kW)	61627	61670	61627	61627	61627	61627	61627	61627	61627	61627
CHWE-L (> 1500 kW)	110339	110415	110339	110339	110339	110339	110339	110339	110339	110339
CHF	15098	15098	15293	17461	16958	16288	15581	15098	15098	15098
HT PCH-AE-S	18910	18910	18910	18910	18910	18910	18910	18910	18910	18910
HT PCH-AE-L	47864	47864	47864	47864	47864	47864	47864	47864	47864	47864
HT PCH-WE-S	16018	16018	16018	16018	16018	16018	16018	16018	16018	16018
HT PCH-WE-M	75290	75290	75290	75290	75290	75290	75290	75290	75290	75290
HT PCH-WE-L	160543	160543	160543	160543	160543	160543	160543	160543	160543	160543
AC rooftop	19201	19201	19201	19201	19201	19201	19201	19201	19201	19201
AC splits	3284	3284	3284	3284	3284	3284	3284	3284	3284	3284
AC VRF	30771	30771	30771	30771	30771	30771	30771	30771	30771	30771
ACF	15098	15098	15293	17461	17101	16596	15874	15185	15098	15098
Heating:										
AC rooftop (rev)	19023	19023	19023	19023	19023	19023	19023	19023	19023	19023
AC splits (rev)	3050	3050	3050	3050	3050	3050	3050	3050	3050	3050
AC VRF (rev)	29845	29845	29845	29845	29845	29845	29845	29845	29845	29845
ACF (rev)	16755	16755	16755	16755	16755	16755	16755	16755	16755	16755
AHF	5176	5176	5176	5673	5717	5618	5371	5176	5176	5176
AHE	500	500	500	500	500	500	500	500	500	500
LH open fireplace [8 kW]	2650	2650	2650	3268	3604	3474	3349	3229	3112	3000
LH closed fireplace/inset [8 kW]	2717	2717	2717	3229	3421	3297	3178	3062	2951	2844
LH wood stove [8 kW]	2517	2517	2517	3025	3214	3088	2968	2851	2740	2633
LH coal stove [8 kW]	1845	1845	1845	2186	2315	2233	2153	2076	2002	1931
LH cooker [10 kW]	2847	2847	2847	3127	3239	3109	2984	2864	2847	2847
LH SHR stove [8 kW]	7956	7956	7956	8001	7974	7956	7956	7956	7956	7956
LH pellet stove [8 kW]	3369	3369	3369	3371	3369	3369	3369	3369	3369	3369
LH open fire gas, NCV [4.2 kW]	856	856	856	897	916	885	856	856	856	856
LH closed fire gas, NCV [4.2 kW]	821	821	821	860	873	844	821	821	821	821
LH flueless fuel heater, NCV [1.5 kW]	272	272	272	272	272	272	272	272	272	272
LH elec.portable [1 kW]	27	27	27	27	27	27	27	27	27	27
LH elec.convector [1 kW]	155	155	155	155	155	155	155	155	155	155
LH elec.storage [2.75 kW]	572	572	643	718	688	659	632	605	580	572
LH elec.underfloor [0.62 kW]	381	381	390	398	387	381	381	381	381	381
LH luminous heaters [20 kW]	1293	1293	1329	1608	1545	1484	1426	1369	1316	1293
LH tube heaters [30 kW]	1284	1284	1302	1489	1430	1374	1320	1284	1284	1284
RAC cooling [nom. avg. 3.8 kW]	1674	1750	1908	1946	1946	1911	1863	1817	1771	1727
RAC heating (reversible)	1674	1752	1906	1948	1943	1909	1861	1814	1769	1724
CIRC Circulator pumps <2.5 kW (efficiency, incl. ctrl)	211	229	275	263	251	239	227	216	211	211
NRVU avg (sales wt.)	129561	130456	130029	129561	129561	129561	129561	129561	129561	129561
RVU Central Unidir. VU (1 fan)	1446	1446	2439	2365	2293	2224	2156	2091	2028	1966
RVU Central Balanced VU (2 fans)	4349	4349	5278	5108	4945	4786	4633	4484	4340	4275
RVU Local Balanced VU (2 fans)	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218
LS Light Sources in Euro/unit										
LFL	8.37	8.37	8.37	8.37	8.37	8.37	8.37	8.37	8.37	8.37
CFL	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Tungsten	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69
GLS	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
HID	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85
LED ECO		28.05	13.78	6.26	5.65	5.09	5.84	6.59	7.34	8.09
GLS stock	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Tungsten stock	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69

UNIT PRICE ECO (in euro 2010, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	450	450	450	450	450	450	450	450	450	450
DP TV LoNA	450	450	450	450	450	450	450	450	450	450
DP TV Smart	450	450	450	450	450	450	450	450	450	450
DP Monitor	170	170	170	170	170	170	170	170	170	170
SSTB	50	50	50	50	50	50	50	50	50	50
CSTB	150	150	154	150	150	150	150	150	150	150
VIDEO players/recorders	100	100	100	100	100	100	100	100	100	100
VIDEO projectors	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
VIDEO game consoles	360	360	360	360	360	360	360	360	360	360
ES Rack servers	2500	2500	2500	2500	2554	2554	2554	2554	2554	2554
ES Blade servers	65000	65000	65000	65000	65280	65280	65280	65280	65280	65280
ES Storage	23000	23000	23000	25300	25660	25660	25660	25660	25660	25660
PC Desktop	500	500	500	500	500	500	500	500	500	500
PC Notebook	700	700	700	700	700	700	700	700	700	700
PC Tablet/slate	450	450	450	450	450	450	450	450	450	450
PC Thin client	400	400	400	400	400	400	400	400	400	400
PC Workstation	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
EP-Copier mono	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
EP-Copier colour	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
EP-printer mono	200	200	200	200	200	200	200	200	200	200
EP-printer colour	500	500	500	500	500	500	500	500	500	500
IJ SFD printer	100	100	100	100	100	100	100	100	100	100
IJ MFD printer	150	150	150	150	150	150	150	150	150	150
paper (2.5 euro/kg paper (6.25 euro/pack)										
SB Home Gateway, on-mode power	200	200	200	200	200	200	200	200	200	200
SB Home NAS, on-mode power	200	200	200	200	200	200	200	200	200	200
SB Home Phones (fixed), on-mode power	100	100	100	100	100	100	100	100	100	100
SB Office Phones (fixed), on-mode power	100	100	100	100	100	100	100	100	100	100
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	180	180	180	180	180	180	180	180	180	180
UPS 1.5 to 5 kVA	951	951	951	951	951	951	951	951	951	951
UPS 5 to 10 kVA	4005	4005	4005	4005	4005	4005	4005	4005	4005	4005
UPS 10 to 200 kVA	30020	30020	30020	30020	30020	30020	30020	30020	30020	30020
RF Household refrigerator and freezer	421	487	522	533	537	534	551	524	498	474
CF open vertical chilled multi deck (RCV2)	3850	3850	4049	5135	5087	4840	4605	4382	4169	3967
CF open horizontal frozen island (RHF4)	4400	4400	4400	4539	4400	4400	4400	4400	4400	4400
CF other supermarket display (non-BCs)	2383	2383	2398	2547	2448	2383	2383	2383	2383	2383
CF Plug in one door beverage cooler	830	830	830	909	895	852	830	830	830	830
CF Plug in horizontal ice cream freezer	800	800	800	800	800	800	800	800	800	800
CF Spiral vending machine	3500	3500	3521	3544	3500	3500	3500	3500	3500	3500
PF Storage cabinet Chilled Vertical (CV)	1460	1460	1460	1586	1509	1460	1460	1460	1460	1460
PF Storage cabinet Frozen Vertical (FV)	1724	1724	1724	1873	1782	1724	1724	1724	1724	1724
PF Storage cabinet Chilled Horizontal (CH)	700	700	700	760	724	700	700	700	700	700
PF Storage cabinet Frozen Horizontal (FH)	1200	1200	1200	1304	1240	1200	1200	1200	1200	1200
PF Storage cabinets All types	**1335**	**1335**	**1335**	**1450**	**1380**	**1335**	**1335**	**1335**	**1335**	**1335**
PF Process Chiller AC MT S ≤ 300 kW	28000	28000	28000	29150	28000	28000	28000	28000	28000	28000
PF Process Chiller AC MT L > 300 kW	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000
PF Process Chiller AC LT S ≤ 200 kW	31000	31000	31000	32273	31000	31000	31000	31000	31000	31000
PF Process Chiller AC LT L > 200 kW	94000	94000	94000	94000	94000	94000	94000	94000	94000	94000
PF Process Chiller WC MT S ≤ 300 kW	42000	42000	42000	43725	42000	42000	42000	42000	42000	42000
PF Process Chiller WC MT L > 300 kW	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000
PF Process Chiller WC LT S ≤ 200 kW	46500	46500	46500	48410	46500	46500	46500	46500	46500	46500
PF Process Chiller WC LT L > 200 kW	141000	141000	141000	141000	141000	141000	141000	141000	141000	141000
PF Process Chiller All MT&LT	**51367**	**51367**	**51367**	**52261**	**51367**	**51367**	**51367**	**51367**	**51367**	**51367**
PF Condensing Unit MT S 0.2-1 kW	500	500	500	521	500	500	500	500	500	500
PF Condensing Unit MT M 1-5 kW	1800	1800	1800	1858	1800	1800	1800	1800	1800	1800
PF Condensing Unit MT L 5-20 kW	3700	3700	3700	3952	3761	3700	3700	3700	3700	3700
PF Condensing Unit MT XL 20-50 kW	8500	8500	8500	9080	8639	8500	8500	8500	8500	8500
PF Condensing Unit LT S 0.1-0.4 kW	600	600	600	625	600	600	600	600	600	600
PF Condensing Unit LT M 0.4-2 kW	800	800	800	826	800	800	800	800	800	800
PF Condensing Unit LT L 2-8 kW	4300	4300	4300	4593	4370	4300	4300	4300	4300	4300
PF Condensing Unit LT XL 8-20 kW	7500	7500	7500	8012	7623	7500	7500	7500	7500	7500
PF Condensing Unit, All MT&LT	**1836**	**1836**	**1836**	**1939**	**1848**	**1836**	**1836**	**1836**	**1836**	**1836**

UNIT PRICE ECO (in euro 2010, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
COOK El. Hobs, Wh/ltr	352	506	499	518	515	511	506	501	494	488
COOK El. Ovens, kWh/a	523	570	583	578	551	526	523	523	523	523
COOK Gas Hobs, % efficiency NCV	365	358	339	307	291	275	261	254	254	254
COOK Gas Ovens, kWh prim, NCV	265	343	368	469	457	445	433	422	410	398
COOK Range Hoods, kWh elec	212	212	212	264	292	281	269	258	248	238
COFFEE Dripfilter (glass)	20	20	23	23	22	20	20	20	20	20
COFFEE Dripfilter (thermos)	30	30	30	30	30	30	30	30	30	30
COFFEE Dripfilter (full automatic)	100	100	100	100	100	100	100	100	100	100
COFFEE Pad filter	81	81	81	81	81	81	81	81	81	81
COFFEE Hard cap espresso	156	156	156	156	156	156	156	156	156	156
COFFEE Semi-auto espresso	103	103	103	103	103	103	103	103	103	103
COFFEE Fully-auto espresso	595	595	595	595	595	595	595	595	595	595
WM Household Washing Machine	449	541	559	574	565	537	511	486	463	449
DW Household Dishwasher	541	718	719	704	686	667	649	631	614	596
LD Household Laundry Drier vented el.	426	400	400	400	400	400	400	400	400	400
LD Household Laundry Drier condens el.	560	554	602	638	636	619	599	579	560	554
LD Household Laundry Drier vented gas	750	750	750	750	750	750	750	750	750	750
VC dom. Vacuum Cleaner	236	220	227	226	220	220	220	220	220	220
VC nondom Vacuum Cleaner	676	600	614	617	600	600	600	600	600	600
FAN Axial<300Pa [247 W flow out]	250	250	312	347	332	317	303	290	277	265
FAN Axial>300Pa [489 W fluid-dyn out]	325	325	325	338	325	325	325	325	325	325
FAN Centr.FC [141 W flow out]	400	400	516	630	601	573	547	522	499	476
FAN Centr.BC-free [2120 W flow out]	770	770	941	942	900	860	822	786	770	770
FAN Centr.BC [2052 W flow out]	1650	1650	2305	2347	2243	2144	2049	1958	1872	1789
FAN Cross-flow [31 W flow out]	325	325	932	1101	1052	1005	960	916	875	836
MT Industrial motors, motor only	242	274	407	401	395	376	358	340	324	308
MT Industrial motors, VSD drive effect	0	0	295	281	267	254	242	230	219	208
MT Industrial motors, avg. 3 kW	242	274	702	682	662	630	599	570	543	516
WP Water pumps (load) [%]	1431	1432	1431	1431	1431	1431	1431	1431	1431	1431
CP Fixed Speed 5-1280 l/s	7746	7746	8227	8677	8766	8791	8815	8839	8863	8868
CP Variable speed 5-1280 l/s	17257	17392	17387	18267	18464	18455	18445	18436	18427	18418
CP Pistons 2-64 l/s	1656	1725	2106	2454	2510	2509	2508	2506	2505	2504
TRAFO Distribution, kWh/a	7727	7727	9545	9545	9545	9545	9545	9545	9545	9545
TRAFO Industry oil	13330	13330	20395	20395	20395	20395	20395	20395	20395	20395
TRAFO Industry dry	33401	33401	45155	45155	45155	45155	45155	45155	45155	45155
TRAFO Power	907541	907541	907541	907541	907541	907541	907541	907541	907541	907541
TRAFO DER oil	22263	22263	37402	37402	37402	37402	37402	37402	37402	37402
TRAFO DER dry	34393	34393	45055	45055	45055	45055	45055	45055	45055	45055
TRAFO Small	1407	1407	1407	1407	1407	1407	1407	1407	1407	1407
TYRE car replacement tyres C1	70	70	70	71	72	72	70	70	70	70
TYRE van replacement tyres C2	101	101	101	101	101	101	101	101	101	101
TYRE truck replacement tyres C3	470	470	508	569	623	670	638	607	578	549

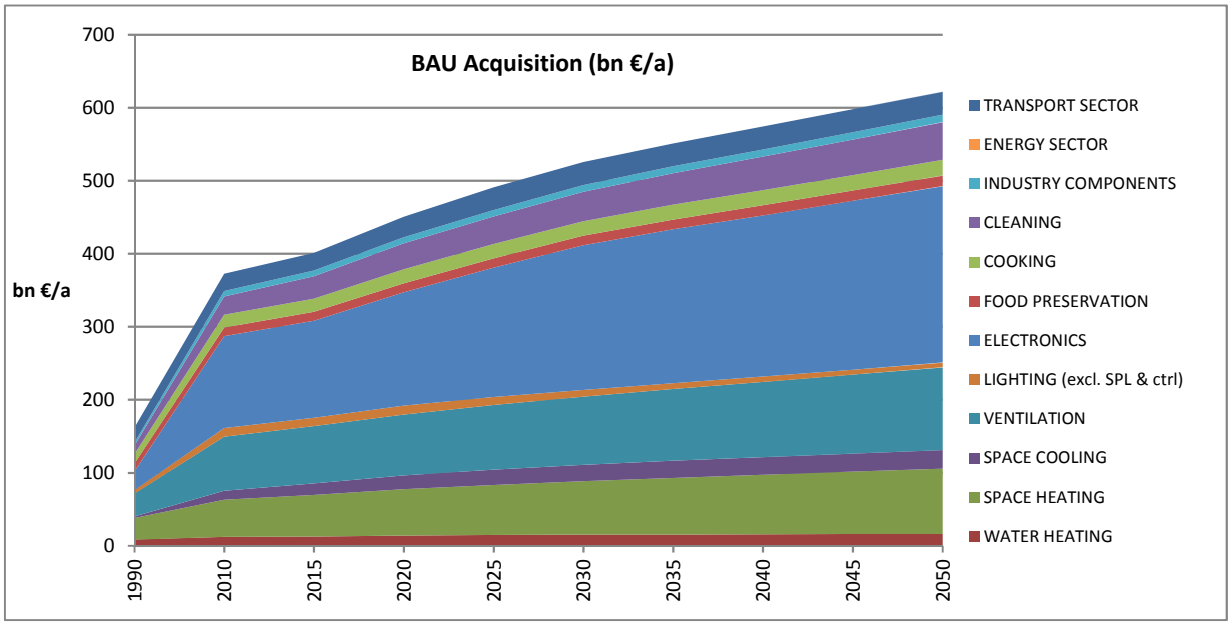
db	BAU Acquisition (in bn euros 2010, incl VAT & install	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**5**	**6**	**6**	**6**	**7**	**7**	**7**	**7**	**7**	**7**
	Total CH Central Heating combi, water heat	bn €	**4**	**6**	**7**	**8**	**8**	**8**	**8**	**9**	**9**	**10**
	TOTAL WATER HEATING		**8**	**12**	**13**	**14**	**15**	**15**	**15**	**16**	**16**	**16**
	Total CH Central Heating boiler, space heat	bn €	**19**	**27**	**29**	**31**	**34**	**37**	**40**	**43**	**46**	**49**
	SFB Wood Manual	bn €	1.0	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	SFB Wood Direct Draft	bn €	0.0	1.5	1.5	1.6	1.5	1.9	2.2	2.6	3.0	3.6
	SFB Coal	bn €	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SFB Pellets	bn €	0.0	0.4	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.9
	SFB Wood chips	bn €	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	Total Solid Fuel Boiler		**1**	**3**	**3**	**3**	**2**	**3**	**3**	**4**	**4**	**5**
	CHAE-S (≤ 400 kW)	bn €	0.4	1.5	1.7	1.9	2.1	2.2	1.9	1.0	0.3	0.0
	CHAE-L (> 400 kW)	bn €	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CHWE-S (≤ 400 kW)	bn €	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CHWE-L (> 1500 kW)	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	bn €	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	HT PCH-AE-L	bn €	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	bn €	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	AC rooftop	bn €	0.2	0.7	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	AC splits	bn €	0.3	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9
	AC VRF	bn €	0.0	2.8	3.6	5.3	6.7	8.1	9.4	10.6	11.7	12.4
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling		**2**	**8**	**9**	**10**	**12**	**13**	**14**	**15**	**15**	**15**
	AC rooftop (rev)	bn €	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	AC splits (rev)	bn €	0.2	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	AC VRF (rev)	bn €	0.0	2.4	3.0	4.5	5.5	6.3	7.0	7.5	7.8	7.9
	ACF (rev)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	bn €	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	AHE	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)		**1**	**4**	**5**	**6**	**7**	**7**	**8**	**8**	**9**	**9**
	Total AHC Heating & Cooling		**2**	**8**	**9**	**11**	**12**	**14**	**15**	**15**	**15**	**16**
	LH open fireplace	bn €	1.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	LH closed fireplace/inset	bn €	0.9	2.3	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	LH wood stove	bn €	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3
	LH coal stove	bn €	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH cooker	bn €	0.7	1.4	1.7	2.0	2.1	2.1	2.1	2.1	2.1	2.1
	LH SHR stove	bn €	1.7	2.4	3.0	3.6	4.0	4.4	4.5	4.5	4.5	4.5
	LH pellet stove	bn €	0.0	0.8	1.0	1.2	1.3	1.4	1.4	1.4	1.4	1.4
	LH open fire gas	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH closed fire gas	bn €	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH flueless fuel heater	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH elec.portable	bn €	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.convector	bn €	1.4	1.8	1.8	1.9	2.0	2.1	2.1	2.1	2.1	2.1
	LH elec.storage	bn €	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.underfloor	bn €	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	LH luminous heaters	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH tube heaters	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH total	bn €	**8.4**	**13.4**	**14.9**	**16.5**	**17.2**	**17.8**	**18.0**	**18.0**	**18.0**	**18.0**
	RAC (cooling demand), all types <12 kW	bn €	1	5	7	8	9	9	9	10	10	10
	RAC (heating demand), reversible <12kW	bn €	0	4	6	8	8	8	8	8	9	9
	Total RAC Room Air Conditioner	bn €	**1**	**8**	**13**	**16**	**17**	**18**	**18**	**18**	**18**	**19**
	CIRC Circulator pumps <2.5 kW, net load	bn €	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL SPACE HEATING (incl. rev AC)	bn €	**30**	**51**	**57**	**63**	**68**	**73**	**77**	**82**	**86**	**90**
	TOTAL SPACE COOLING	bn €	**2**	**12**	**15**	**19**	**21**	**23**	**24**	**24**	**25**	**25**
	NRVU Ventilation units	bn €	30	70	73	77	81	85	90	94	98	102
	RVU Central Unidir.	bn €	2	3	3	3	3	3	3	3	3	4
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0	1	3	3	4	4	5	5	6	6
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0	0	0	0	1	1	1	1	1	1
	Total VU Ventilation Units		**31**	**74**	**79**	**83**	**88**	**93**	**98**	**103**	**108**	**113**
	TOTAL VENTILATION (electricity)	bn €	**31**	**74**	**79**	**83**	**88**	**93**	**98**	**103**	**108**	**113**
	LS Light Sources											
	LFL Linear Fluorescent	bn €	2.3	3.3	2.9	2.9	2.7	2.5	2.3	2.1	1.9	1.8
	CFL Compact Fluorescent	bn €	0.3	2.4	2.0	1.7	1.5	1.4	1.2	1.1	1.0	0.9
	Tungsten	bn €	0.5	3.6	4.1	4.3	3.3	2.3	1.7	1.2	0.9	0.8
	GLS GeneralLighting Service (incandescent)	bn €	1.4	1.0	0.8	0.5	0.3	0.1	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	bn €	0.4	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	LED Light Emitting Diode	bn €	0.0	0.3	0.6	1.7	2.3	1.8	2.0	2.1	2.1	2.1
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	bn €	**4.9**	**11.5**	**11.4**	**12.1**	**11.0**	**8.9**	**8.1**	**7.3**	**6.8**	**6.5**

db	BAU Acquisition (in bn euros 2010, incl VAT & install	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	bn €	11.8	27.1	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV LoNA	bn €	0.0	3.7	13.1	16.4	14.4	11.7	8.9	6.1	3.3	0.4
	DP TV Smart	bn €	0.0	0.0	7.9	16.4	21.5	27.4	33.6	39.8	46.1	52.3
	DP Monitor	bn €	1.7	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	Total Electronic Displays	**bn €**	**13.5**	**35.0**	**28.7**	**35.3**	**38.3**	**41.5**	**44.9**	**48.3**	**51.7**	**55.1**
	SSTB	bn €	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	5.0	6.1	6.6	6.7	6.5	7.1	7.7	8.2	8.8
	Total STB set top boxes (Complex & Simple)	**bn €**	**0.0**	**6.3**	**6.4**	**6.6**	**6.7**	**6.5**	**7.1**	**7.7**	**8.2**	**8.8**
	VIDEO players/recorders	bn €	0.0	3.5	3.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	2.7	2.3	0.9	0.4	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	6.4	5.4	4.1	4.9	4.9	4.9	4.9	4.9	4.9
	Total VIDEO	**bn €**	**0.0**	**12.7**	**10.8**	**5.5**	**5.3**	**4.9**	**4.9**	**4.9**	**4.9**	**4.9**
	ES Rack servers	bn €	0.2	6.0	6.7	7.7	9.3	11.8	12.8	12.6	12.6	12.6
	ES Blade servers	bn €	0.4	4.4	4.5	4.9	5.8	7.1	7.7	7.4	7.4	7.4
	ES Storage	bn €	0.3	3.2	3.7	4.1	4.5	4.9	5.1	4.9	4.9	4.9
	Total ES Enterprise Servers	**bn €**	**0.9**	**13.6**	**14.8**	**16.7**	**19.6**	**23.8**	**25.6**	**24.9**	**24.9**	**24.9**
	PC Desktop	bn €	3.3	11.1	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	PC Notebook	bn €	0.4	25.3	11.6	10.9	10.9	10.9	10.9	10.9	10.9	10.9
	PC Tablet/slate	bn €	0.0	1.7	27.1	44.1	57.0	67.8	71.2	74.6	78.0	81.4
	PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	PC Workstation	bn €	0.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Total PC, electricity		**3.9**	**40.6**	**49.5**	**65.0**	**77.9**	**88.8**	**92.2**	**95.6**	**98.9**	**102.3**
	EP-Copier mono	bn €	3.5	1.4	0.8	0.4	0.3	0.2	0.1	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.5	2.1	3.1	3.5	3.8	4.1	4.5	4.8	5.1
	EP-printer mono	bn €	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
	EP-printer colour	bn €	0.0	0.7	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.8
	IJ SFD printer	bn €	0.6	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1
	IJ MFD printer	bn €	0.7	2.4	3.3	3.8	4.2	4.6	5.0	5.4	5.7	6.1
	Total imaging equipment, electricity		**5.6**	**6.6**	**8.5**	**9.5**	**10.3**	**11.1**	**11.8**	**12.6**	**13.4**	**14.2**
	SB Home Gateway	bn €	0.0	6.2	8.0	9.8	11.5	13.3	15.1	16.9	18.7	20.5
	SB Home NAS	bn €	0.0	0.6	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
	SB Home Phones (fixed)	bn €	0.5	2.3	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	SB Office Phones (fixed)	bn €	0.6	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7
	Total SB (networked) StandBy (rest)		**1.0**	**10**	**13**	**15**	**18**	**20**	**22**	**24**	**27**	**29**
	Total BC Battery Charged devices	bn €	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
	UPS below 1.5 kVA	bn €	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
	UPS 1.5 to 5 kVA	bn €	0.2	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9
	UPS 5 to 10 kVA	bn €	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	UPS 10 to 200 kVA	bn €	0.2	0.4	0.4	0.5	0.6	0.7	0.8	0.8	0.9	0.9
	Total UPS - Uninterrupted Power Supplies	**bn €**	**0.5**	**1.1**	**1.1**	**1.3**	**1.6**	**1.8**	**2.0**	**2.2**	**2.4**	**2.5**
	TOTAL ELECTRONICS		**25**	**126**	**133**	**155**	**177**	**198**	**211**	**221**	**231**	**242**
	Total RF household Refrigerators & Freezers	bn €	**7.4**	**8.1**	**8.2**	**8.3**	**8.5**	**8.6**	**8.7**	**8.8**	**9.0**	**9.1**
	CF open vertical chilled multi deck (RVC2)	bn €	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	CF open horizontal frozen island (RHF4)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	bn €	0.7	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2
	CF Plug in one door beverage cooler	bn €	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9
	CF Plug in horizontal ice cream freezer	bn €	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CF Spiral vending machine	bn €	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration		**2.3**	**2.5**	**2.5**	**2.6**	**2.7**	**2.8**	**2.8**	**2.9**	**3.0**	**3.1**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**bn €**	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	bn €	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller WC MT L > 300 kW	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	PF Process Chiller WC LT L > 200 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	**bn €**	**0.2**	**0.3**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**

db	BAU Acquisition (in bn euros 2010, incl VAT & install	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	bn €	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	bn €	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
	PF Condensing Unit MT L 5-20 kW	bn €	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	PF Condensing Unit MT XL 20-50 kW	bn €	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**1.5**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.8**	**1.9**	**2.0**
	PF Professional Refrigeration, Total	**bn €**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**2.0**	**2.1**	**2.2**
	TOTAL FOOD PRESERVATION		**11**	**12**	**12**	**12**	**13**	**13**	**13**	**14**	**14**	**14**
	CA El. Hobs	bn €	2.3	5.3	5.6	6.1	6.4	6.7	7.0	7.3	7.5	7.8
	CA El. Ovens	bn €	5.0	6.0	6.3	6.9	6.6	6.7	6.8	6.9	6.9	7.0
	CA Gas Hobs	bn €	2.7	2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.1	1.0
	CA Gas Ovens	bn €	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6
	CA Range Hoods	bn €	1.2	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.2
	Total CA Cooking Appliances		**12**	**16**	**16**	**17**	**17**	**17**	**18**	**18**	**18**	**19**
	COFFEE Dripfilter (glass)	bn €	0.37	0.25	0.22	0.18	0.17	0.17	0.17	0.17	0.17	0.17
	COFFEE Dripfilter (thermos)	bn €	0.07	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.35	0.38
	COFFEE Pad filter	bn €	0.00	0.43	0.47	0.51	0.55	0.59	0.63	0.67	0.71	0.74
	COFFEE Hard cap espresso	bn €	0.05	0.22	0.48	0.72	0.75	0.75	0.75	0.75	0.75	0.75
	COFFEE Semi-auto espresso	bn €	0.06	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04
	COFFEE Fully-auto espresso	bn €	0.34	0.39	0.45	0.52	0.58	0.64	0.71	0.77	0.83	0.89
	Total CM household Coffee Makers		**0.9**	**1.7**	**2.0**	**2.3**	**2.5**	**2.6**	**2.7**	**2.8**	**3.0**	**3.1**
	TOTAL COOKING		**13**	**17**	**18**	**19**	**20**	**20**	**20**	**21**	**21**	**22**
	Total WM household Washing Machine	bn €	**4.1**	**6.2**	**6.1**	**6.5**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**
	Total DW household Dishwasher	bn €	**1.7**	**3.8**	**4.4**	**5.0**	**5.6**	**6.2**	**6.8**	**7.4**	**8.1**	**8.7**
	LD vented el.	bn €	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	LD condens el.	bn €	0.5	1.8	2.0	2.3	2.3	2.4	2.4	2.4	2.4	2.4
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**1.3**	**2.6**	**2.9**	**3.0**	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**	**3.2**
	VC dom	bn €	3.9	11.7	16.4	19.9	22.0	24.1	26.2	28.2	30.3	32.4
	VC nondom	bn €	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1
	Total VC Vacuum Cleaner		**4.7**	**12.5**	**17.2**	**20.8**	**22.9**	**25.0**	**27.2**	**29.3**	**31.4**	**33.5**
	TOTAL CLEANING		**12**	**25**	**31**	**35**	**38**	**40**	**43**	**46**	**49**	**51**
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	0.4	1.3	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
0.5	FAN Axial>300Pa	bn €	0.5	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
0.5	FAN Centr.FC	bn €	0.3	0.8	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
0.5	FAN Centr.BC-free	bn €	0.2	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	bn €	0.4	1.1	1.3	1.5	1.6	1.7	1.8	2.0	2.2	2.3
0.5	FAN Cross-flow	bn €	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	Total FAN, industrial (excl. box & roof fans)		**1.0**	**2.9**	**3.2**	**3.6**	**3.7**	**3.7**	**3.8**	**3.9**	**4.0**	**4.1**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**1.6**	**2.4**	**2.6**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**
	Total WP Water Pumps	bn €	**1.8**	**2.4**	**2.6**	**2.8**	**3.0**	**3.2**	**3.4**	**3.6**	**3.8**	**4.0**
	CP Fixed Speed 5-1280 l/s	bn €	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	CP Variable speed 5-1280 l/s	bn €	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CP Pistons 2-64 l/s	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	Total CP Standard Air Compressors	**bn €**	**0.5**	**0.6**	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**
	TOTAL INDUSTRY COMPONENTS		4.0	7.1	7.7	8.4	8.8	9.0	9.4	9.7	10.1	10.4
	TRAFO Distribution	bn €	0.5	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3
	TRAFO Industry oil	bn €	0.2	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	TRAFO Industry dry	bn €	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	TRAFO Power	bn €	1.9	3.0	3.3	3.5	3.8	4.0	4.3	4.6	4.9	5.2
	TRAFO DER oil	bn €	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	TRAFO DER dry	bn €	0.0	0.1	0.2	0.4	0.6	1.0	1.5	1.9	2.4	2.9
	TRAFO Small	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers		**2.8**	**4.6**	**5.0**	**5.5**	**6.1**	**7.0**	**8.0**	**8.9**	**9.9**	**10.8**
	TOTAL ENERGY SECTOR (costs already assumed to be in electricity rates: use BAU=0 as reference)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	bn €	13	16	16	18	20	20	20	20	20	20
	TYRE van replacement tyres C2	bn €	5	6	6	6	7	7	7	7	7	7
	TYRE truck replacement tyres C3	bn €	3	3	3	3	4	4	4	4	4	4
	TYRE Replacement Tyres	bn €	**20**	**24**	**24**	**28**	**31**	**31**	**31**	**31**	**31**	**31**
	TRANSPORT SECTOR	bn €	**20**	**24**	**24**	**28**	**31**	**31**	**31**	**31**	**31**	**31**
	GENERAL TOTAL (in bn euros)		**162**	**373**	**401**	**450**	**491**	**525**	**551**	**574**	**598**	**622**

db	BAU Acquisition (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	bn €	8	12	13	14	15	15	15	16	16	16
	SPACE HEATING	bn €	30	51	57	63	68	73	77	82	86	90
	SPACE COOLING	bn €	2	12	15	19	21	23	24	24	25	25
	VENTILATION	bn €	31	74	79	83	88	93	98	103	108	113
	LIGHTING (excl. SPL & ctrl)	bn €	5	12	11	12	11	9	8	7	7	7
	ELECTRONICS	bn €	25	126	133	155	177	198	211	221	231	242
	FOOD PRESERVATION	bn €	11	12	12	12	13	13	13	14	14	14
	COOKING	bn €	13	17	18	19	20	20	20	21	21	22
	CLEANING	bn €	12	25	31	35	38	40	43	46	49	51
	INDUSTRY COMPONENTS	bn €	4	7	8	8	9	9	9	10	10	10
	ENERGY SECTOR	bn €	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR	bn €	20	24	24	28	31	31	31	31	31	31
	TOTAL in bn euros		**162**	**373**	**401**	**450**	**491**	**525**	**551**	**574**	**598**	**622**

(in bn euros 2010, incl VAT & install)



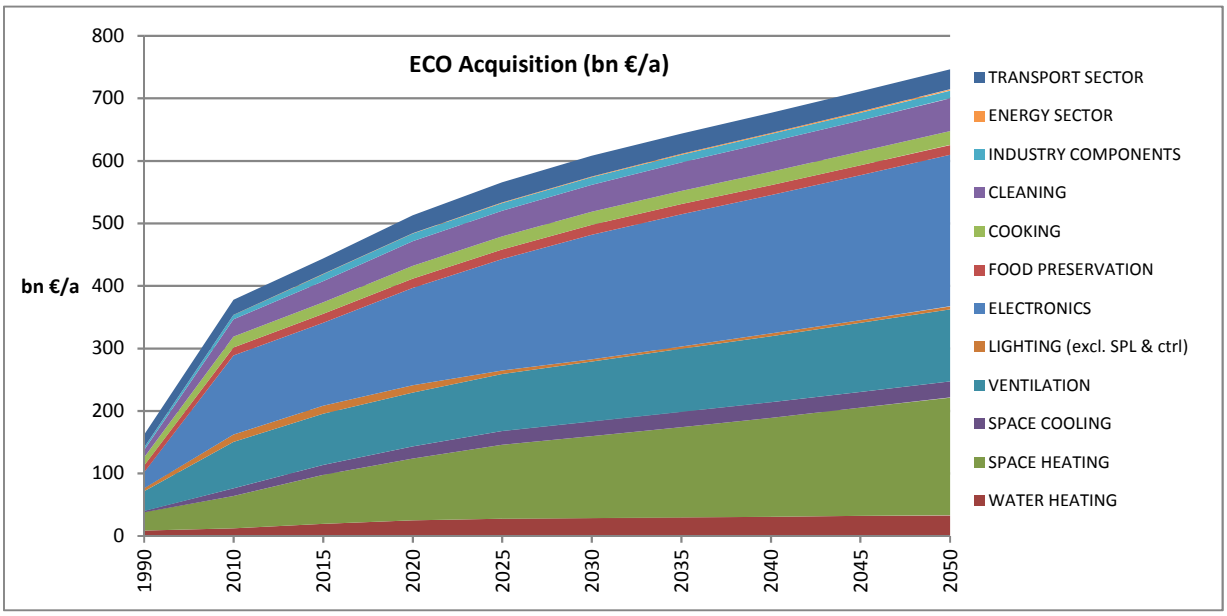
db	ECO Acquisition (in bn euros2010, incl VAT & install)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**5**	**6**	**10**	**11**	**13**	**12**	**12**	**12**	**12**	**12**
	Total CH Central Heating combi, water heat	bn €	**4**	**6**	**10**	**14**	**15**	**16**	**17**	**19**	**20**	**21**
	TOTAL WATER HEATING		**8**	**12**	**19**	**25**	**28**	**29**	**30**	**31**	**32**	**33**
	Total CH Central Heating boiler, space heat	bn €	**19**	**28**	**50**	**64**	**80**	**91**	**104**	**117**	**132**	**147**
	SFB Wood Manual	bn €	1.0	0.6	0.6	0.4	0.2	0.2	0.2	0.2	0.1	0.1
	SFB Wood Direct Draft	bn €	0.0	1.5	1.5	1.6	1.8	2.1	2.4	2.8	3.3	3.9
	SFB Coal	bn €	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SFB Pellets	bn €	0.0	0.4	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.9
	SFB Wood chips	bn €	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	Total Solid Fuel Boiler		**1**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**5**	**5**
	CHAE-S (≤ 400 kW)	bn €	0.4	1.5	1.7	1.9	2.1	2.2	1.9	1.0	0.3	0.0
	CHAE-L (> 400 kW)	bn €	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CHWE-S (≤ 400 kW)	bn €	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CHWE-L (> 1500 kW)	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	bn €	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	HT PCH-AE-L	bn €	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	bn €	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	AC rooftop	bn €	0.2	0.7	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	AC splits	bn €	0.3	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9
	AC VRF	bn €	0.0	2.8	3.6	5.3	6.7	8.1	9.4	10.6	11.7	12.4
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling		**2**	**8**	**9**	**10**	**12**	**13**	**14**	**15**	**15**	**15**
	AC rooftop (rev)	bn €	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	AC splits (rev)	bn €	0.2	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	AC VRF (rev)	bn €	0.0	2.4	3.0	4.5	5.5	6.3	7.0	7.5	7.8	7.9
	ACF (rev)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	bn €	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	AHE	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)		**1**	**4**	**5**	**6**	**7**	**7**	**8**	**8**	**9**	**9**
	Total AHC Heating & Cooling		**2**	**8**	**9**	**11**	**12**	**14**	**15**	**15**	**15**	**16**
	LH open fireplace	bn €	1.4	2.0	2.0	2.5	2.7	2.6	2.5	2.4	2.3	2.3
	LH closed fireplace/inset	bn €	0.9	2.3	2.6	3.4	3.6	3.6	3.4	3.3	3.2	3.1
	LH wood stove	bn €	0.9	1.0	1.1	1.5	1.6	1.6	1.5	1.4	1.4	1.3
	LH coal stove	bn €	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH cooker	bn €	0.7	1.4	1.7	2.2	2.4	2.3	2.2	2.2	2.1	2.1
	LH SHR stove	bn €	1.7	2.4	3.0	3.6	4.0	4.4	4.5	4.5	4.5	4.5
	LH pellet stove	bn €	0.0	0.8	1.0	1.2	1.3	1.4	1.4	1.4	1.4	1.4
	LH open fire gas	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH closed fire gas	bn €	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH flueless fuel heater	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH elec.portable	bn €	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.convector	bn €	1.4	1.8	1.8	1.9	2.0	2.1	2.1	2.1	2.1	2.1
	LH elec.storage	bn €	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	LH elec.underfloor	bn €	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	LH luminous heaters	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH tube heaters	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH total	bn €	**8.4**	**13.4**	**15.0**	**18.1**	**19.4**	**19.6**	**19.4**	**19.0**	**18.7**	**18.4**
	RAC (cooling demand), all types <12 kW	bn €	1	5	7	9	10	10	10	10	10	10
	RAC (heating demand), reversible <12kW	bn €	0	4	6	8	9	9	9	9	9	9
	Total RAC Room Air Conditioner	bn €	**1**	**8**	**14**	**18**	**20**	**20**	**20**	**19**	**19**	**19**
	CIRC Circulator pumps <2.5 kW, net load	bn €	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL SPACE HEATING (incl. rev AC)	bn €	**30**	**52**	**78**	**99**	**118**	**131**	**144**	**158**	**173**	**189**
	TOTAL SPACE COOLING	bn €	**2**	**12**	**16**	**20**	**22**	**24**	**25**	**25**	**25**	**26**
	NRVU Ventilation units	bn €	30	70	73	77	81	85	90	94	98	102
	RVU Central Unidir.	bn €	2	3	5	5	5	5	5	5	6	6
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0	1	3	4	5	5	5	5	6	6
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0	0	0	0	1	1	1	1	1	1
	Total VU Ventilation Units		**31**	**74**	**82**	**86**	**91**	**96**	**101**	**106**	**111**	**115**
	TOTAL VENTILATION (electricity)	bn €	**31**	**74**	**82**	**86**	**91**	**96**	**101**	**106**	**111**	**115**
	LS Light Sources											
	LFL Linear Fluorescent	bn €	2.3	3.3	2.5	2.1	1.1	0.7	0.5	0.3	0.1	0.0
	CFL Compact Fluorescent	bn €	0.3	2.8	1.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	Tungsten	bn €	0.5	3.7	4.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0
	GLS GeneralLighting Service (incandescent)	bn €	1.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	bn €	0.4	1.1	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2
	LED Light Emitting Diode	bn €	0.0	0.2	4.3	7.3	4.4	2.7	2.9	3.6	3.8	4.4
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	bn €	**4.9**	**11.8**	**12.8**	**11.3**	**5.9**	**3.7**	**3.7**	**4.1**	**4.2**	**4.7**

db	ECO Acquisition (in bn euros2010, incl VAT & install)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	bn €	11.8	27.1	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV LoNA	bn €	0.0	3.7	13.1	16.4	14.4	11.7	8.9	6.1	3.3	0.4
	DP TV Smart	bn €	0.0	0.0	7.9	16.4	21.5	27.4	33.6	39.8	46.1	52.3
	DP Monitor	bn €	1.7	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	Total Electronic Displays	**bn €**	**13.5**	**35.0**	**28.7**	**35.3**	**38.3**	**41.5**	**44.9**	**48.3**	**51.7**	**55.1**
	SSTB	bn €	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	5.0	6.3	6.6	6.7	6.5	7.1	7.7	8.2	8.8
	Total STB set top boxes (Complex & Simple)	**bn €**	**0.0**	**6.3**	**6.6**	**6.6**	**6.7**	**6.5**	**7.1**	**7.7**	**8.2**	**8.8**
	VIDEO players/recorders	bn €	0.0	3.5	3.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	2.7	2.3	0.9	0.4	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	6.4	5.4	4.1	4.9	4.9	4.9	4.9	4.9	4.9
	Total VIDEO	**bn €**	**0.0**	**12.7**	**10.8**	**5.5**	**5.3**	**4.9**	**4.9**	**4.9**	**4.9**	**4.9**
	ES Rack servers	bn €	0.2	6.0	6.7	7.7	9.5	12.1	13.1	12.8	12.8	12.8
	ES Blade servers	bn €	0.4	4.4	4.5	4.9	5.8	7.2	7.7	7.5	7.5	7.5
	ES Storage	bn €	0.3	3.2	3.7	4.5	5.0	5.4	5.7	5.5	5.5	5.5
	Total ES Enterprise Servers	**bn €**	**0.9**	**13.6**	**14.8**	**17.1**	**20.4**	**24.6**	**26.5**	**25.8**	**25.8**	**25.8**
	PC Desktop	bn €	3.3	11.1	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	PC Notebook	bn €	0.4	25.3	11.6	10.9	10.9	10.9	10.9	10.9	10.9	10.9
	PC Tablet/slate	bn €	0.0	1.7	27.1	44.1	57.0	67.8	71.2	74.6	78.0	81.4
	PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	PC Workstation	bn €	0.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Total PC, electricity		**3.9**	**40.6**	**49.5**	**65.0**	**77.9**	**88.8**	**92.2**	**95.6**	**98.9**	**102.3**
	EP-Copier mono	bn €	3.5	1.4	0.8	0.4	0.3	0.2	0.1	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.5	2.1	3.1	3.5	3.8	4.1	4.5	4.8	5.1
	EP-printer mono	bn €	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
	EP-printer colour	bn €	0.0	0.7	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.8
	IJ SFD printer	bn €	0.6	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1
	IJ MFD printer	bn €	0.7	2.4	3.3	3.8	4.2	4.6	5.0	5.4	5.7	6.1
	Total imaging equipment, electricity		**5.6**	**6.6**	**8.5**	**9.5**	**10.3**	**11.1**	**11.8**	**12.6**	**13.4**	**14.2**
	SB Home Gateway	bn €	0.0	6.2	8.0	9.8	11.5	13.3	15.1	16.9	18.7	20.5
	SB Home NAS	bn €	0.0	0.6	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
	SB Home Phones (fixed)	bn €	0.5	2.3	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	SB Office Phones (fixed)	bn €	0.6	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7
	Total SB (networked) StandBy (rest)		**1.0**	**10**	**13**	**15**	**18**	**20**	**22**	**24**	**27**	**29**
	Total BC Battery Charged devices	bn €	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
	UPS below 1.5 kVA	bn €	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
	UPS 1.5 to 5 kVA	bn €	0.2	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9
	UPS 5 to 10 kVA	bn €	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	UPS 10 to 200 kVA	bn €	0.2	0.4	0.4	0.5	0.6	0.7	0.8	0.8	0.9	0.9
	Total UPS - Uninterrupted Power Supplies	**bn €**	**0.5**	**1.1**	**1.1**	**1.3**	**1.6**	**1.8**	**2.0**	**2.2**	**2.4**	**2.5**
	TOTAL ELECTRONICS		**25**	**126**	**133**	**156**	**178**	**199**	**212**	**221**	**232**	**243**
	Total RF household Refrigerators & Freezers	bn €	**7.4**	**9.3**	**10.2**	**10.6**	**10.8**	**10.9**	**11.4**	**11.0**	**10.6**	**10.2**
	CF open vertical chilled multi deck (RVC2)	bn €	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4
	CF open horizontal frozen island (RHF4)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	bn €	0.7	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2
	CF Plug in one door beverage cooler	bn €	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9
	CF Plug in horizontal ice cream freezer	bn €	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CF Spiral vending machine	bn €	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration		**2.3**	**2.5**	**2.5**	**2.8**	**2.9**	**2.9**	**2.9**	**3.0**	**3.1**	**3.1**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**bn €**	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	bn €	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	bn €	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller WC MT L > 300 kW	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	PF Process Chiller WC LT L > 200 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	**bn €**	**0.2**	**0.3**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**

db	ECO Acquisition (in bn euros2010, incl VAT & install)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	bn €	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	bn €	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
	PF Condensing Unit MT L 5-20 kW	bn €	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	PF Condensing Unit MT XL 20-50 kW	bn €	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**1.5**	**1.2**	**1.2**	**1.4**	**1.4**	**1.5**	**1.6**	**1.8**	**1.9**	**2.0**
	PF Professional Refrigeration, Total	**bn €**	**1.2**	**1.3**	**1.4**	**1.6**	**1.6**	**1.7**	**1.8**	**2.0**	**2.1**	**2.2**
	TOTAL FOOD PRESERVATION		**11**	**13**	**14**	**15**	**15**	**15**	**16**	**16**	**16**	**16**
	CA El. Hobs	bn €	2.3	5.3	5.6	6.3	6.7	7.0	7.3	7.5	7.8	8.0
	CA El. Ovens	bn €	5.0	6.0	6.4	7.2	7.0	6.7	6.8	6.9	6.9	7.0
	CA Gas Hobs	bn €	2.7	2.2	2.0	1.7	1.6	1.4	1.3	1.2	1.1	1.0
	CA Gas Ovens	bn €	0.7	0.7	0.7	0.9	0.9	0.9	0.8	0.8	0.8	0.7
	CA Range Hoods	bn €	1.2	1.5	1.6	2.1	2.4	2.4	2.4	2.4	2.4	2.4
	Total CA Cooking Appliances		**12**	**16**	**16**	**18**	**18**	**18**	**19**	**19**	**19**	**19**
	COFFEE Dripfilter (glass)	bn €	0.37	0.25	0.24	0.20	0.19	0.18	0.17	0.17	0.17	0.17
	COFFEE Dripfilter (thermos)	bn €	0.07	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.35	0.38
	COFFEE Pad filter	bn €	0.00	0.43	0.47	0.51	0.55	0.59	0.63	0.67	0.71	0.74
	COFFEE Hard cap espresso	bn €	0.05	0.22	0.48	0.72	0.75	0.75	0.75	0.75	0.75	0.75
	COFFEE Semi-auto espresso	bn €	0.06	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04
	COFFEE Fully-auto espresso	bn €	0.34	0.39	0.45	0.52	0.58	0.64	0.71	0.77	0.83	0.89
	Total CM household Coffee Makers		**0.9**	**1.7**	**2.0**	**2.3**	**2.5**	**2.6**	**2.7**	**2.8**	**3.0**	**3.1**
	TOTAL COOKING		**13**	**17**	**18**	**21**	**21**	**21**	**21**	**22**	**22**	**22**
	Total WM household Washing Machine	bn €	**4.1**	**7.1**	**7.4**	**8.1**	**7.7**	**7.3**	**6.9**	**6.6**	**6.3**	**6.1**
	Total DW household Dishwasher	bn €	**1.7**	**5.1**	**5.9**	**6.5**	**7.1**	**7.7**	**8.2**	**8.7**	**9.1**	**9.5**
	LD vented el.	bn €	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	LD condens el.	bn €	0.5	1.8	2.2	2.6	2.7	2.6	2.6	2.5	2.4	2.4
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**1.3**	**2.6**	**3.0**	**3.4**	**3.4**	**3.4**	**3.3**	**3.3**	**3.2**	**3.2**
	VC dom	bn €	3.9	11.7	16.9	20.5	22.0	24.1	26.2	28.2	30.3	32.4
	VC nondom	bn €	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1
	Total VC Vacuum Cleaner		**4.7**	**12.5**	**17.7**	**21.4**	**22.9**	**25.0**	**27.2**	**29.3**	**31.4**	**33.5**
	TOTAL CLEANING		**12**	**27**	**34**	**39**	**41**	**43**	**46**	**48**	**50**	**52**
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	0.4	1.3	1.9	2.4	2.3	2.2	2.1	2.0	1.9	1.8
0.5	FAN Axial>300Pa	bn €	0.5	1.9	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1
0.5	FAN Centr.FC	bn €	0.3	0.8	1.2	1.7	1.6	1.6	1.5	1.4	1.4	1.3
0.5	FAN Centr.BC-free	bn €	0.2	0.5	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	bn €	0.4	1.1	1.8	2.1	2.2	2.2	2.3	2.4	2.4	2.5
0.5	FAN Cross-flow	bn €	0.1	0.2	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.9
	Total FAN, industrial (excl. box & roof fans)		**1.0**	**2.9**	**4.1**	**4.9**	**4.9**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**1.6**	**2.7**	**7.3**	**7.4**	**7.2**	**6.9**	**6.5**	**6.2**	**5.9**	**5.6**
	Total WP Water Pumps	bn €	**1.8**	**2.4**	**2.6**	**2.8**	**3.0**	**3.2**	**3.4**	**3.6**	**3.8**	**4.0**
	CP Fixed Speed 5-1280 l/s	bn €	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5
	CP Variable speed 5-1280 l/s	bn €	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CP Pistons 2-64 l/s	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	Total CP Standard Air Compressors	**bn €**	**0.5**	**0.6**	**0.7**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**
	TOTAL INDUSTRY COMPONENTS		**4.0**	**7.2**	**11.0**	**12.2**	**12.3**	**12.2**	**12.2**	**12.3**	**12.4**	**12.4**
	TRAFO Distribution	bn €	0.5	0.7	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6
	TRAFO Industry oil	bn €	0.2	0.4	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0
	TRAFO Industry dry	bn €	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	TRAFO Power	bn €	1.9	3.0	3.3	3.5	3.8	4.0	4.3	4.6	4.9	5.2
	TRAFO DER oil	bn €	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.8
	TRAFO DER dry	bn €	0.0	0.1	0.3	0.5	0.8	1.3	1.9	2.5	3.1	3.8
	TRAFO Small	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers		**2.8**	**4.6**	**5.6**	**6.2**	**6.9**	**8.0**	**9.2**	**10.4**	**11.6**	**12.8**
	TOTAL ENERGY SECTOR (only improvement over BAU)		**0.0**	**0.0**	**0.6**	**0.7**	**0.8**	**1.0**	**1.2**	**1.5**	**1.7**	**2.0**
	TYRE car replacement tyres C1	bn €	13	16	16	18	21	21	20	20	20	20
	TYRE van replacement tyres C2	bn €	5	6	6	6	7	7	7	7	7	7
	TYRE truck replacement tyres C3	bn €	3	3	3	4	5	5	5	5	4	4
	TYRE Replacement Tyres	bn €	**20**	**24**	**25**	**29**	**33**	**33**	**33**	**32**	**32**	**32**
	TRANSPORT SECTOR	bn €	**20**	**24**	**25**	**29**	**33**	**33**	**33**	**32**	**32**	**32**
	GENERAL TOTAL (in bn €)		**162**	**378**	**444**	**513**	**566**	**608**	**644**	**677**	**711**	**746**

db	ECO Acquisition (summary table)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	bn €	8	12	19	25	28	29	30	31	32	33
	SPACE HEATING	bn €	30	52	78	99	118	131	144	158	173	189
	SPACE COOLING	bn €	2	12	16	20	22	24	25	25	25	26
	VENTILATION	bn €	31	74	82	86	91	96	101	106	111	115
	LIGHTING (excl. SPL & ctrl)	bn €	5	12	13	11	6	4	4	4	4	5
	ELECTRONICS	bn €	25	126	133	156	178	199	212	221	232	243
	FOOD PRESERVATION	bn €	11	13	14	15	15	15	16	16	16	16
	COOKING	bn €	13	17	18	21	21	21	21	22	22	22
	CLEANING	bn €	12	27	34	39	41	43	46	48	50	52
	INDUSTRY COMPONENTS	bn €	4	7	11	12	12	12	12	12	12	12
	ENERGY SECTOR	bn €	0	0	1	1	1	1	1	1	2	2
	TRANSPORT SECTOR	bn €	20	24	25	29	33	33	33	32	32	32
	TOTAL in bn euros		**162**	**378**	**444**	**513**	**566**	**608**	**644**	**677**	**711**	**746**

(in bn euros 2010, incl VAT & install)



Notes:

The increase of ELECTRONICS is due to the increase in the number of products in use. The prices are kept constant (at 2010 level). This is probably not realistic in terms of absolute values, i.e. it is likely that there will be price ersosion, as was observed in past years. But taking into account this price ersosion (because of competition, crisis, lack of consumer confidence, etc.) would distort the clear picture of the relative values, i.e. that there is no price effect of efficiency improvements for the average electronics product.

After the ELECTRONICS, the VENTILATION units show the highest absolute value. This is mainly due to the non-residential ventilation and to the fact that the installation (ductwork etc.) is very costly. The unit price, which is the one that is being regulated, is on average only 8% of the total. This also explains why the relative cost increase for ventilation products is modest.

Furthermore, ventilation is not a mature market; it is growing at a faster pace than most other sectors (except electronics)

SPACE HEATING is the product group with the highest cost increase. This is due mostly to the evolutionary replacement of traditional boilers by heat pumps and hybrids, which is a trend in new housing/buildings and in larger renovations. For replacement market, more hybrids (traditional boiler+part heat pump) can be expected. Similar developments apply to WATER HEATING

LIGHTING shows a negative price trend for 2025 onwards, i.e. the ECO scenario products are cheaper than at BAU. This is due to the long life of the LEDs, coupled with current industry projections for the ever decreasing costs of the product.

Added Acquisition Cost (ECO-BAU, summary table)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	0.0	0.0	6.5	10.8	12.8	13.6	14.5	15.2	15.9	16.6
SPACE HEATING	bn €	0.0	1.0	21.2	35.4	49.6	57.3	66.6	76.6	87.5	99.1
SPACE COOLING	bn €	0.0	0.0	0.5	0.9	1.1	1.1	1.1	0.8	0.6	0.3
VENTILATION	bn €	0.0	0.0	3.0	2.6	2.7	2.7	2.6	2.4	2.2	2.0
LIGHTING (excl. SPL & ctrl)	bn €	0.0	0.2	1.5	-0.7	-5.1	-5.3	-4.4	-3.2	-2.6	-1.8
ELECTRONICS	bn €	0.0	0.0	0.2	0.4	0.7	0.8	0.9	0.9	0.9	0.9
FOOD PRESERVATION	bn €	0.0	1.3	2.0	2.6	2.5	2.4	2.8	2.2	1.7	1.2
COOKING	bn €	0.0	0.0	0.2	1.2	1.4	1.1	0.9	0.9	0.8	0.7
CLEANING	bn €	0.0	2.1	3.4	4.1	3.4	2.9	2.4	1.9	1.3	0.9
INDUSTRY COMPONENTS	bn €	0.0	0.2	3.2	3.8	3.5	3.2	2.9	2.6	2.3	2.0
ENERGY SECTOR	bn €	0.0	0.0	0.6	0.7	0.8	1.0	1.2	1.5	1.7	2.0
TRANSPORT SECTOR	bn €	0.0	0.0	0.2	0.6	1.4	2.0	1.2	0.9	0.7	0.5
Added Acquisition Total in bn euros 2010		**0**	**5**	**43**	**62**	**75**	**83**	**93**	**103**	**113**	**124**

(incl VAT & install)

NOMINAL Energy & consumables rates			1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
(Rel in €/kwh elec, other energy in €/kwh NCV)														
R=residential (incl. VAT); NR=industry (excl. VAT, tariff Ie)														
inf	inflation index (2010=1, inflation 2%)		0.67	0.74	0.82	0.91	0.92	0.94	0.96	0.98	1.00	1.02	1.04	1.06
			Nominal											
Rel1	electricity R	€/kwh elec	0.12	0.13	0.13	0.14	0.15	0.16	0.16	0.16	0.17	0.18	0.19	0.20
Rel2	electricity NR	€/kwh elec	0.08	0.08	0.07	0.08	0.09	0.09	0.10	0.10	0.10	0.11	0.12	0.12
heating fuels														
Rgas1	nat.gas R	€/ kWh	0.04	0.04	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07
Rgas2	nat.gas NR	€/ kWh	0.02	0.02	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05
Roil1	gas oil heating R	€/ kWh	0.02	0.03	0.04	0.05	0.06	0.06	0.08	0.05	0.06	0.08	0.10	0.10
Roil2	gas oil heating NR	€/ kWh	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.04	0.05	0.07	0.08	0.08
Rfossil1	80/20 Rgas1/Roil1	€/ kWh												
Rfossil2	80/20 Rgas2/Roil2	€/ kWh												
RLPG1	LPG/propane R	€/ kWh	0.04	0.05	0.07	0.08	0.10	0.09	0.10	0.09	0.09	0.11	0.11	0.13
RLPG2	LPG/propane NR	€/ kWh	0.03	0.05	0.06	0.07	0.08	0.08	0.09	0.07	0.08	0.10	0.10	0.11
Rwood1	wood logs R	€/ kWh	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04		
Rpellets1	pellets R	€/ kWh	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.05	0.05		
Rcoal1	coal R	€/ kWh	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04		
Rwoodchip2	wood chips NR	€/ kWh	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03		
automotive fuels														
Rpetrol1	petrol R	€/ kWh	0.07	0.08	0.10	0.12	0.13	0.13	0.15	0.11	0.14	0.16	0.18	0.18
Rpetrol2	petrol NR	€/ kWh	0.06	0.07	0.08	0.10	0.11	0.11	0.12	0.10	0.12	0.13	0.15	0.15
Rdiesel1	diesel R	€/ kWh	0.04	0.06	0.07	0.09	0.10	0.10	0.12	0.10	0.11	0.13	0.15	0.15
Rdiesel2	diesel NR	€/ kWh	0.04	0.05	0.06	0.08	0.09	0.08	0.10	0.08	0.09	0.11	0.12	0.12
other														
Rwater1	water & sewage R	€/m³	1.44	1.84	2.35	3.00	3.16	3.32	3.48	3.66	3.84			
Rtoner	copier/printer R & NR	€/page	0.04	0.044	0.048	0.053	0.055	0.056	0.057	0.058	0.059			
Rpaper	copier/printer R& NR	€/page	0.008	0.009	0.01	0.011	0.011	0.011	0.012	0.012	0.012			
Rdishw1	dishwasher det. R	€/cycle	0.061	0.067	0.074	0.082	0.083	0.085	0.087	0.088	0.09			
Rwash1	washing mach. det. R	€/cycle	0.10	0.11	0.12	0.14	0.14	0.14	0.14	0.15	0.15			
Rbags1	vacuum cl. bags R	€/year(50h)	4.711	5.201	5.742	6.34	6.467	6.596	6.728	6.863	7.00			

Table . Water rates of selected EU countries (ca. 2010)

Nr	Country	sewage & wastewater €/m³	drinking water €/m³	total €/m³	note
1 (metered)	England and Wales	2.54	1.76	4.30	[1]
2	Scotland	3.50	3.02	6.52	
3	Netherlands	2.97	1.43	4.40	[2]
4	France	1.54	1.55	3.09	
5	Germany	2.36	2.47	4.83	[3]
6	Slovenia	1.25	0.84	2.09	[4]
7	Spain	0.56	0.85	1.41	
8	Italy	0.77	0.85	1.62	[5]
9	Denmark	na	na	6.32	

Note 1: Linear average of the above is € 3.84/m³. For a real weighted average there is not enough data

Note 2: Estimated average annual increase 5%/a (nominal), 3% real (inflation corrected for 2010=1 at an inflation rate of 2%)

[1]= fixed sewage (€75.5/a) and water costs (€35.5/a) calculated at 80 m³/a
[2]=fixed costs €310 for sewage calculated at 105 m³/a, drinking water tariff net of
[3]=fixed sewage costs 65.6 calculated at 80 m³/a
[4]=median value of €0.089 and €2.45
[5]=split in fixed (7%), water (53%), sewage(13%), purification(27%)

sources:
Country No. 1-7. European Environmental Agency, Assessment of cost recovery through

Italy: L'Italia dell'acqua ha i prezzi a geografia variabile.., Il Sole 24 Ore, 10 maggio 2013 [article based on research of Federconsumatori-Creef regarding 2012 rates]
Denmark: DANVA 2010 rates.
Overall: VHK, MEEuP 2005.

NOMINAL Energy & consumables rates	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013

Table . Other consumables (indicative, price increase with inflation)

Copier/printer toner costs			**€/page**	**share**
IJ	BW	€	0.04	7%
IJ	Colour	€	0.10	7%
EP	BW	€	0.02	60%
EP	Colour	€	0.08	26%
Average toner costs		€	0.040	
Average printer paper costs		€	0.012	

Detergent (inc. salt, rinsing agent, etc.) costs/cycle			**€/cycle**
	Household dishwashers	€	0.09
	Household washing machi	€	0.15

Vacuum cleaner bags and filters		**€/year(57h)**
	Average household VC (1/3 bagless, 2/3 bags & filter at €12/a)	€ 7.00

Note: The bag price is for 57 h operation. This is 1 year for a household with a single vacuum cleaner. For households with multiple VCs the bag costs per VC are less. For professional VCs the bag costs are more (proportional to the number of hours operation)

REAL Energy & consumables rates			Inc %/a	1990 Real	2010	2015	2020	2025	2030	2035	2040	2045	2050
(Rel in €/kwh elec, other energy in €/kwh NCV)													
R=residential (incl. VAT); NR=industry (excl. VAT, tariff Ie)													
REAL rates (in Euro 2010, inflation corrected)													
Rel1	electricity R	€/kwh elec	4%	0.178	0.170	0.205	0.249	0.303	0.369	0.448	0.546	0.664	0.808
Rel2	electricity NR	€/kwh elec	4%	0.119	0.105	0.122	0.149	0.181	0.220	0.268	0.326	0.397	0.483
heating fuels													
Rgas1	nat.gas R	€/ kWh	4%	0.055	0.060	0.074	0.090	0.110	0.134	0.163	0.198	0.241	0.293
Rgas2	nat.gas NR	€/ kWh	4%	0.026	0.036	0.047	0.057	0.069	0.084	0.102	0.124	0.151	0.184
Roil1	gas oil heating R	€/ kWh	4%	0.032	0.065	0.098	0.119	0.145	0.176	0.215	0.261	0.318	0.386
Roil2	gas oil heating NR	€/ kWh	4%	0.027	0.054	0.082	0.099	0.121	0.147	0.179	0.218	0.265	0.322
Rfossil1	80/20 Rgas1/Roil1	€/ kWh	4%	0.050	0.061	0.079	0.096	0.117	0.142	0.173	0.211	0.256	0.312
Rfossil2	80/20 Rgas2/Roil2	€/ kWh	4%	0.026	0.040	0.054	0.065	0.079	0.097	0.118	0.143	0.174	0.212
RLPG1	LPG/propane R	€/ kWh	4%	0.058	0.094	0.132	0.161	0.196	0.238	0.290	0.353	0.429	0.522
RLPG2	LPG/propane NR	€/ kWh	4%	0.049	0.079	0.110	0.134	0.163	0.199	0.242	0.294	0.358	0.435
Rwood1	wood logs R	€/ kWh	4%	0.022	0.030	0.044	0.053	0.065	0.079	0.096	0.117	0.142	0.173
Rpellets1	pellets R	€/ kWh	4%	0.029	0.047	0.057	0.069	0.084	0.102	0.124	0.151	0.184	0.224
Rcoal1	coal R	€/ kWh	4%	0.021	0.029	0.042	0.051	0.062	0.075	0.092	0.112	0.136	0.165
Rwoodchip2	wood chips NR	€/ kWh	4%	0.017	0.023	0.034	0.041	0.050	0.061	0.074	0.091	0.110	0.134
automotive fuels													
Rpetrol1	petrol R	€/ kWh	4%	0.098	0.140	0.181	0.221	0.268	0.327	0.397	0.483	0.588	0.716
Rpetrol2	petrol NR	€/ kWh	4%	0.084	0.117	0.151	0.184	0.224	0.272	0.331	0.403	0.490	0.596
Rdiesel1	diesel R	€/ kWh	4%	0.061	0.106	0.148	0.180	0.219	0.266	0.324	0.394	0.479	0.583
Rdiesel2	diesel NR	€/ kWh	4%	0.052	0.089	0.123	0.150	0.182	0.222	0.270	0.328	0.400	0.486
other													
Rwater1	water & sewage R	€/m³	3%	2.13	3.84	4.45	5.16	5.98	6.94	8.04	9.32	10.81	12.53
Rtoner	copier/printer R & NR	€/page	0%	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Rpaper	copier/printer R& NR	€/page	0%	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Rdishw1	dishwasher det. R	€/cycle	0%	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Rwash1	washing mach. det. R	€/cycle	0%	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Rbags1	vacuum cl. bags R	€/year(57h)	0%	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00

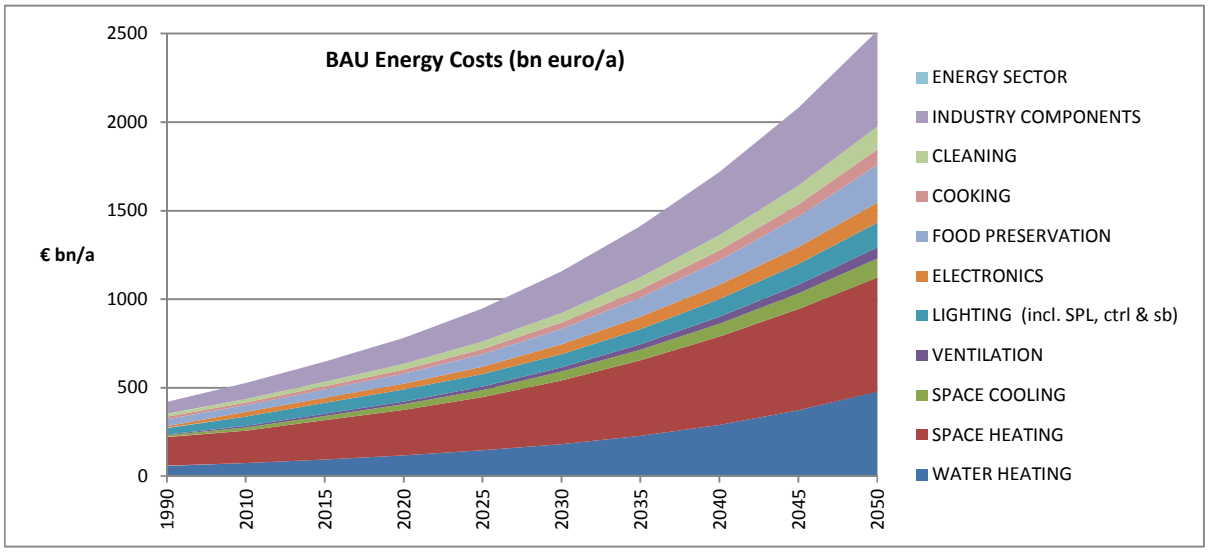
db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**47**	**51**	**63**	**77**	**95**	**115**	**141**	**178**	**227**	**289**
	Total CH Central Heating combi, water heat	**11**	**23**	**32**	**40**	**51**	**66**	**86**	**112**	**145**	**188**
	TOTAL WATER HEATING	**58**	**74**	**94**	**117**	**146**	**181**	**227**	**290**	**372**	**478**
	Total CH Central Heating boiler, space heat	**111**	**128**	**152**	**171**	**194**	**231**	**273**	**316**	**354**	**385**
	SFB Wood Manual	7.7	2.7	3.1	2.8	2.3	1.7	1.2	1.0	1.0	1.0
	SFB Wood Direct Draft	0.1	0.7	1.9	3.3	4.8	5.7	7.0	9.1	12.7	17.8
	SFB Coal	2.3	0.9	0.9	0.6	0.4	0.2	0.1	0.1	0.1	0.1
	SFB Pellets	0.0	0.4	0.9	1.6	2.3	3.1	3.9	4.8	6.0	7.7
	SFB Wood chips	0.0	0.3	0.6	0.8	0.9	1.1	1.4	1.8	2.3	3.0
	Total Solid Fuel Boiler	**10**	**5**	**7**	**9**	**11**	**12**	**14**	**17**	**22**	**30**
	CHAE-S (≤ 400 kW)	0.5	1.1	1.5	1.9	2.3	2.8	3.3	3.5	3.2	2.4
	CHAE-L (> 400 kW)	0.7	1.5	1.9	2.5	2.9	3.3	3.7	4.3	4.9	5.7
	CHWE-S (≤ 400 kW)	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2
	CHWE-L (> 1500 kW)	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	2.8	3.8	4.9	6.3	8.0	9.9	12.2	15.0	18.5	22.8
	HT PCH-AE-L	2.6	3.6	4.6	6.0	7.5	9.3	11.4	14.1	17.3	21.3
	HT PCH-WE-S	0.6	0.8	1.0	1.3	1.7	2.1	2.6	3.2	3.9	4.8
	HT PCH-WE-M	1.1	1.6	2.0	2.6	3.3	4.1	5.1	6.3	7.7	9.5
	HT PCH-WE-L	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.3	1.6	2.0
	AC rooftop	0.4	0.8	0.9	1.0	0.9	0.7	0.4	0.2	0.2	0.2
	AC splits	0.5	1.3	1.5	1.7	2.0	2.2	2.3	2.5	2.8	3.0
	AC VRF	0.0	0.3	0.6	0.9	1.4	2.1	2.9	3.8	4.9	6.2
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**10**	**16**	**20**	**26**	**32**	**39**	**47**	**56**	**67**	**81**
	AC rooftop (rev)	0.5	1.4	1.6	1.7	1.6	1.2	0.7	0.3	0.0	0.0
	AC splits (rev)	1.0	2.6	3.1	3.7	4.2	4.6	5.0	5.4	5.8	6.3
	AC VRF (rev)	0.0	0.8	1.4	2.4	3.6	5.3	7.3	9.3	11.4	13.5
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
	AHF	6.1	6.7	7.7	8.1	8.6	9.2	9.9	10.7	11.5	12.3
	AHE	0.1	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Heating	**8**	**12**	**14**	**16**	**18**	**21**	**23**	**26**	**29**	**33**
	Total AHC Heating & Cooling	**17**	**28**	**34**	**42**	**50**	**59**	**70**	**82**	**97**	**113**
	LH open fireplace	0.3	0.6	0.8	1.1	1.3	1.7	2.0	2.4	2.9	3.6
	LH closed fireplace/inset	0.4	1.2	2.1	3.0	4.0	5.2	6.4	7.8	9.2	11.0
	LH wood stove	0.9	1.1	1.7	2.0	2.5	3.1	3.8	4.6	5.5	6.5
	LH coal stove	0.6	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	LH cooker	0.1	0.3	0.5	0.7	1.0	1.3	1.5	1.8	2.2	2.6
	LH SHR stove	0.4	0.6	1.0	1.3	1.8	2.4	3.2	4.1	5.1	6.2
	LH pellet stove	0.0	0.4	0.6	1.0	1.4	1.8	2.2	2.7	3.3	3.9
	LH open fire gas	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3
	LH closed fire gas	0.8	0.8	0.9	1.1	1.3	1.6	1.9	2.3	2.7	3.2
	LH flueless fuel heater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	LH elec.portable	5.0	4.8	5.7	6.8	8.2	10.0	12.1	14.4	17.1	20.3
	LH elec.convector	20.8	19.7	23.5	28.2	34.0	41.3	50.0	59.8	71.0	84.2
	LH elec.storage	1.5	1.5	1.7	2.1	2.5	3.1	3.7	4.5	5.3	6.3
	LH elec.underfloor	2.8	2.8	3.3	4.0	4.9	5.9	7.1	8.6	10.3	12.3
	LH luminous heaters	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.8
	LH tube heaters	0.3	0.4	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.7
	LH total	**34**	**35**	**43**	**53**	**65**	**79**	**96**	**116**	**138**	**164**
	RAC (cooling demand), all types <12 kW	0	3	4	5	8	11	14	17	22	28
	RAC (heating demand), reversible <12kW	0	3	6	9	13	17	20	24	28	33
	Total RAC Room Air Conditioner	**1**	**6**	**9**	**14**	**21**	**28**	**34**	**41**	**50**	**60**
1	**CIRC Circulator pumps <2.5 kW, net load**	2	2	3	4	5	6	7	8	10	11
	TOTAL SPACE HEATING	**163**	**183**	**222**	**258**	**301**	**360**	**427**	**498**	**571**	**644**
	TOTAL SPACE COOLING	**10**	**19**	**24**	**31**	**40**	**49**	**60**	**74**	**89**	**108**
	NRVU electricity	2	6	8	11	14	17	21	26	33	42
1	NRVU heat (negative=saving vs. natural ventilation)	0	0	0	0	0	0	0	0	0	0
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	2	2	3	3	4	5	6	8	10
	RVU Central Balanced VU ≤125W/fan (2 fans)	0	0	0	1	2	3	4	5	7	9
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0	0	0	0	0	0	1	1	2	3
1	RVU Central Unidir., heat (negative=saving)	0	0	0	0	0	0	0	0	0	0
1	RVU Central Balanced, heat (negative=saving)	0	0	0	0	0	0	0	0	0	0
1	RVU Local Balanced, heat (negative=saving)	0	0	0	0	0	0	0	0	0	0
	Total VU Ventilation Units	**3**	**8**	**11**	**15**	**19**	**24**	**30**	**38**	**49**	**63**
	TOTAL VENTILATION (electricity)	**3**	**8**	**11**	**15**	**19**	**24**	**30**	**38**	**49**	**63**

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources BAU										
	LFL Linear Fluorescent	9.9	13.5	17.4	20.5	24.3	28.3	32.7	37.6	43.5	50.3
	CFL Compact Fluorescent	0.6	4.0	6.5	7.2	5.9	5.6	6.0	6.5	7.1	7.7
	Tungsten	1.4	7.9	9.9	11.9	9.9	8.5	7.6	6.6	6.0	6.6
	GLS GeneralLighting Service (incandescent)	13.5	9.2	8.3	7.3	5.5	2.2	0.6	0.1	0.0	0.0
	HID High Intensity Discharge	4.2	7.9	8.3	9.0	10.3	12.5	15.2	18.5	22.5	27.4
	LED Light Emitting Diode	0.0	0.0	0.1	1.0	3.1	6.3	9.7	13.5	17.7	22.5
	SP Special Purpose (exempt)	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
	lighting controls & sb	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
	TOTAL LIGHTING (incl. SPL, ctrl & sb)	**37**	**53**	**62**	**68**	**70**	**75**	**86**	**100**	**117**	**140**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	**30**	**43**	**51**	**57**	**59**	**64**	**72**	**83**	**97**	**115**
	DP TV, on mode	3.2	8.9	8.4	7	8.4	11.1	13.0	13.6	12.4	14.6
	DP Monitor, on mode	0.1	1.2	1.0	1	1.3	1.4	1.4	1.2	0.7	0.6
	DP TV , sb mode	0.7	0.8	1.0	3	4.1	5.4	6.8	8.3	9.6	10.6
	DP Monitor, sb mode	0.0	0.1	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Total electronic DisPlays	**4**	**11**	**10**	**10**	**14**	**18**	**21**	**23**	**23**	**26**
	SSTB	0.0	0.5	0.3	0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	1.2	3.4	5	5.7	6.7	8.7	11.4	14.9	19.5
	Total STB set top boxes (Complex & Simple)	**0**	**2**	**4**	**5**	**6**	**7**	**9**	**11**	**15**	**19**
	VIDEO players/recorders	0.0	0.4	0.5	0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	0.0	0.2	0.2	0	0.1	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	0.0	0.8	1.7	3	4.1	5.2	6.3	7.7	9.3	11.4
	Total VIDEO	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**8**	**9**	**11**
	ES Rack servers	0.1	1.9	2.6	3.6	5.2	7.8	11.5	13.6	16.6	20.2
	ES Blade servers	0.0	0.5	0.6	0.7	1.0	1.5	2.1	2.5	3.0	3.7
	ES Storage	0.0	0.2	0.3	0.3	0.5	0.6	0.8	0.9	1.1	1.4
	Total ES Enterprise Servers	**0**	**3**	**3**	**5**	**7**	**10**	**14**	**17**	**21**	**25**
	PC Desktop	2.3	3.2	2.2	1	0.7	0.9	1.1	1.3	1.6	2.0
	PC Notebook	0.0	1.1	0.7	0	0.2	0.2	0.2	0.3	0.4	0.4
	PC Tablet/slate	0.0	0.0	0.4	0	0.4	0.6	0.8	1.0	1.3	1.6
	PC Thin client	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.1	0.1	0	0.0	0.1	0.1	0.1	0.1	0.1
	Total PC, electricity	**2**	**4**	**3**	**2**	**1**	**2**	**2**	**3**	**3**	**4**
	EP-Copier mono	1.2	0.1	0.1	0	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	0.0	0.0	0.1	0	0.3	0.4	0.5	0.7	0.9	1.2
	EP-printer mono	1.3	0.3	0.3	0	0.3	0.4	0.4	0.4	0.4	0.4
	EP-printer colour	0.0	0.1	0.2	0	0.6	0.8	1.1	1.6	2.1	2.8
	IJ SFD printer	0.2	0.1	0.1	0	0.1	0.1	0.1	0.0	0.0	0.0
	IJ MFD printer	0.2	0.2	0.3	0	0.6	0.8	1.0	1.3	1.7	2.3
	Total imaging equipment, electricity	**3**	**1**	**1**	**1**	**2**	**2**	**3**	**4**	**5**	**7**
	SB Home Gateway, on-mode hours	0.0	0.7	1.0	1	1.7	2.1	2.4	2.6	2.6	2.2
	SB Home NAS, on-mode hours	0.0	0.0	0.1	0	0.2	0.2	0.3	0.3	0.3	0.3
	SB Home Phones (fixed), on-mode hours	0.0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
	SB Office Phones (fixed), on-mode hours	0.0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
	SB Home Gateway, standby hours	0.0	0.2	0.1	0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	0.0	0.0	0.1	0	0.2	0.2	0.3	0.3	0.3	0.3
	SB Home Phones (fixed), standby hours	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	0.0	0.4	0.9	2	2.1	2.5	2.9	3.1	3.1	2.7
	SB Home NAS, idle hours	0.0	0.0	0.0	0	0.1	0.1	0.1	0.1	0.1	0.1
	SB Home Phones (fixed), idle hours	0.1	0.4	0.5	1	0.7	0.7	0.7	0.7	0.6	0.5
	SB Office Phones (fixed), idle hours	0.1	0.3	0.3	0	0.4	0.4	0.5	0.5	0.4	0.4
	Total SB (networked) StandBy (rest)	**0**	**2**	**3**	**4**	**6**	**7**	**7**	**8**	**8**	**7**
	Total BC Battery Charged devices	**0.0**	**0.4**	**0.4**	**0**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**
	UPS below 1.5 kVA	0.1	0.2	0.2	0	0.4	0.5	0.8	1.0	1.3	1.7
	UPS 1.5 to 5 kVA	0.3	0.6	0.8	1	1.5	2.1	3.0	4.0	5.3	6.8
	UPS 5 to 10 kVA	0.0	0.1	0.1	0	0.2	0.3	0.4	0.5	0.7	0.9
	UPS 10 to 200 kVA	0.2	0.4	0.6	1	0.9	1.3	1.8	2.5	3.3	4.3
	Total UPS - Uninterrupted Power Supplies	**0.7**	**1.3**	**1.6**	**2**	**3.0**	**4.2**	**5.9**	**8.0**	**10.5**	**13.6**
	TOTAL ELECTRONICS	**10**	**26**	**30**	**33**	**43**	**55**	**70**	**83**	**96**	**114**
	Total RF household Refrigerators & Freezers	**25**	**24**	**29**	**35**	**42**	**51**	**62**	**75**	**91**	**111**
	CF open vertical chilled multi deck (RVC2)	1.8	1.5	1.7	1.9	2.2	2.6	3.2	3.9	4.8	6.0
	CF open horizontal frozen island (RHF4)	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5
	CF other supermarket display (non-BCs)	3.1	2.8	3.2	3.8	4.6	5.8	7.3	9.2	11.5	14.5
	CF Plug in one door beverage cooler	2.2	1.9	2.1	2.3	2.8	3.4	4.2	5.3	6.6	8.3
	CF Plug in horizontal ice cream freezer	0.5	0.4	0.5	0.5	0.6	0.8	1.0	1.2	1.5	1.9
	CF Spiral vending machine	0.4	0.3	0.3	0.2	0.3	0.4	0.5	0.6	0.7	0.9
	Total CF Commercial Refrigeration	**8**	**7**	**8**	**9**	**11**	**13**	**16**	**20**	**26**	**32**
	PF Storage cabinet Chilled Vertical (CV)	0.2	0.3	0.3	0.4	0.5	0.7	0.8	1.1	1.3	1.7
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.6	2.0
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.3
	PF Storage cabinet Frozen Horizontal (FH)	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.8
	PF Storage cabinets All types	**0.7**	**0.9**	**1.1**	**1.4**	**1.7**	**2.2**	**2.8**	**3.6**	**4.6**	**5.8**

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	1.0	1.4	1.9	2.5	3.4	4.5	5.9	7.8
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	1.0	1.3	1.8	2.5	3.3	4.3	5.7	7.5
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	1.0	1.4	1.9	2.6	3.4	4.5	6.0	7.8
	PF Process Chiller AC LT L > 200 kW	0.4	0.8	1.0	1.5	2.0	2.6	3.5	4.7	6.2	8.1
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.3	1.7	2.2
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.6	0.8	1.1	1.4	1.9	2.4	3.2
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.4	0.5	0.7	0.9	1.2	1.6	2.1	2.8
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.5	0.6	0.9	1.2	1.5	2.0	2.7	3.5
	PF Process Chiller All MT&LT	**2**	**4**	**6**	**8**	**10**	**14**	**19**	**25**	**33**	**43**
	PF Condensing Unit MT S 0.2-1 kW	0.8	0.5	0.6	0.8	1.0	1.3	1.8	2.3	3.0	4.0
	PF Condensing Unit MT M 1-5 kW	2.0	1.4	1.6	2.0	2.6	3.4	4.5	5.8	7.7	10.0
	PF Condensing Unit MT L 5-20 kW	2.4	1.7	1.9	2.4	3.2	4.2	5.5	7.2	9.4	12.3
	PF Condensing Unit MT XL 20-50 kW	2.4	1.7	1.9	2.4	3.2	4.2	5.4	7.1	9.4	12.3
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	PF Condensing Unit LT M 0.4-2 kW	0.4	0.3	0.3	0.4	0.5	0.6	0.8	1.1	1.4	1.9
	PF Condensing Unit LT L 2-8 kW	0.6	0.4	0.5	0.6	0.8	1.0	1.4	1.8	2.3	3.1
	PF Condensing Unit LT XL 8-20 kW	1.9	1.3	1.5	1.9	2.5	3.2	4.2	5.6	7.3	9.5
0.6	**PF Condensing Unit, All MT&LT**	**11**	**7**	**8**	**11**	**14**	**18**	**24**	**31**	**41**	**54**
	PF Professional Refrigeration, Total	**7**	**8**	**10**	**13**	**18**	**24**	**31**	**41**	**54**	**70**
	TOTAL FOOD PRESERVATION	40	39	46	57	71	88	110	137	171	213
	CA El. Hobs	4	5	7	9	12	16	20	26	33	42
	CA El. Ovens	4	4	4	5	6	7	9	11	13	16
	CA Gas Hobs	2	2	2	2	3	3	3	4	5	5
	CA Gas Ovens	1	1	1	1	1	1	1	1	1	2
	CA Range Hoods	2	2	2	3	4	5	7	8	11	13
	Total CA Cooking Appliances	**12**	**13**	**16**	**20**	**25**	**32**	**40**	**50**	**63**	**78**
	CM Dripfilter (glass)	1	1	1	1	1	1	1	2	2	2
	CM Dripfilter (thermos)	0	0	0	0	0	0	1	1	1	1
	CM Dripfilter (full automatic)	0	0	0	0	0	0	0	1	1	1
	CM Pad filter	0	0	0	0	0	0	0	0	1	1
	CM Hard cap espresso	0	0	0	0	0	0	0	0	0	0
	CM Semi-auto espresso	0	0	0	0	0	0	0	0	0	0
	CM Fully-auto espresso	0	0	0	0	0	0	0	0	0	0
	CM Dripfilter (glass), standby/keep warm	1	1	1	1	1	1	1	1	1	2
	CM Dripfilter (thermos), standby/keep warm	0	0	0	0	0	0	0	0	0	0
	CM Dripfilter (full automatic), standby/keep warm	0	0	0	0	0	0	0	0	0	0
	CM Pad filter, standby/keep warm	0	0	0	0	0	0	0	0	1	1
	CM Hard cap espresso, standby/keep warm	0	0	0	0	0	0	0	0	0	0
	CM Semi-auto espresso, standby/keep warm	0	0	0	0	0	0	0	0	0	0
	CM Fully-auto espresso, standby/keep warm	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	**2**	**2**	**2**	**2**	**3**	**4**	**4**	**6**	**7**	**9**
	TOTAL COOKING	14	15	18	23	28	36	45	56	70	87
	Total WM household Washing Machine	**9**	**8**	**9**	**10**	**11**	**12**	**14**	**16**	**18**	**20**
	Total DW household Dishwasher	**2**	**4**	**5**	**8**	**10**	**14**	**18**	**23**	**30**	**38**
	LD vented el.	2	2	2	3	3	4	5	6	7	9
	LD condens el.	0	2	4	5	7	9	11	13	16	19
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**2**	**4**	**6**	**8**	**10**	**13**	**16**	**19**	**23**	**28**
	VC dom	2	3	5	6	10	14	19	26	33	41
	VC nondom	0	0	1	1	1	2	2	2	3	4
	Total VC Vacuum Cleaner	**2**	**3**	**5**	**7**	**11**	**16**	**21**	**28**	**36**	**45**
	TOTAL CLEANING	16	19	25	32	43	55	69	86	107	131
0.5	FAN Axial<300Pa (all FAN types >125W)	2	6	8	10	14	18	22	27	32	40
0.5	FAN Axial>300Pa	4	10	14	17	22	28	34	41	50	61
0.5	FAN Centr.FC	1	2	3	3	5	6	7	9	11	13
0.5	FAN Centr.BC-free	3	5	6	9	12	15	20	25	31	38
0.5	FAN Centr.BC	3	5	7	10	13	18	23	30	40	52
0.5	FAN Cross-flow	0	0	0	0	1	1	1	2	2	3
	Total FAN, industrial (excl. box & roof fans)	**6**	**14**	**19**	**25**	**33**	**43**	**53**	**66**	**83**	**103**
0.5	**Total MT Motors 0.75-375 kW**	**97**	**118**	**147**	**187**	**235**	**288**	**348**	**421**	**509**	**616**
	Total WP Water Pumps	**10**	**12**	**16**	**20**	**27**	**35**	**45**	**59**	**76**	**98**
	CP Fixed Speed 5-1280 l/s	3	5	5	5	6	8	10	12	15	19
	CP Variable speed 5-1280 l/s	0	1	2	3	4	5	6	8	10	12
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	1	1	1
	Total CP Standard Air Compressors	**3**	**6**	**7**	**9**	**11**	**13**	**17**	**21**	**26**	**32**
	TOTAL INDUSTRY COMPONENTS	68	91	115	148	188	234	289	356	439	541

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
1	TRAFO Distribution	1	2	3	4	5	7	9	12	15	20
1	TRAFO Industry oil	1	2	2	3	4	5	7	9	11	14
1	TRAFO Industry dry	0	1	1	1	1	2	2	3	4	5
1	TRAFO Power	4	6	7	10	13	17	23	30	39	51
1	TRAFO DER oil	0	0	0	0	0	1	2	3	6	9
1	TRAFO DER dry	0	0	0	1	2	4	7	14	24	38
1	TRAFO Small	0	0	0	0	0	0	1	1	1	1
	Total TRAFO Utility Transformers	**7**	**10**	**14**	**19**	**26**	**36**	**50**	**70**	**98**	**137**
	TOTAL ENERGY SECTOR (energy already included in power generation factor, so reference=0)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	23	31	38	47	58	63	66	69	72	81
	TYRE van replacement tyres C2	6	9	11	14	17	18	18	18	21	23
	TYRE truck replacement tyres C3	9	12	13	17	20	23	26	28	30	32
	TYRE Replacement Tyres	**39**	**52**	**62**	**78**	**95**	**104**	**110**	**115**	**122**	**136**
	TOTAL TRANSPORT SECTOR	**39**	**52**	**62**	**78**	**95**	**104**	**110**	**115**	**122**	**136**
	GENERAL TOTAL in bn euros	**458**	**578**	**710**	**860**	**1043**	**1261**	**1523**	**1833**	**2203**	**2654**

db	BAU Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	**58**	**74**	**94**	**117**	**146**	**181**	**227**	**290**	**372**	**478**
	SPACE HEATING	**163**	**183**	**222**	**258**	**301**	**360**	**427**	**498**	**571**	**644**
	SPACE COOLING	**10**	**19**	**24**	**31**	**40**	**49**	**60**	**74**	**89**	**108**
	VENTILATION	**3**	**8**	**11**	**15**	**19**	**24**	**30**	**38**	**49**	**63**
	LIGHTING (incl. SPL, ctrl & sb)	**37**	**53**	**62**	**68**	**70**	**75**	**86**	**100**	**117**	**140**
	ELECTRONICS	**10**	**26**	**30**	**33**	**43**	**55**	**70**	**83**	**96**	**114**
	FOOD PRESERVATION	**40**	**39**	**46**	**57**	**71**	**88**	**110**	**137**	**171**	**213**
	COOKING	**14**	**15**	**18**	**23**	**28**	**36**	**45**	**56**	**70**	**87**
	CLEANING	**16**	**19**	**25**	**32**	**43**	**55**	**69**	**86**	**107**	**131**
	INDUSTRY COMPONENTS	**68**	**91**	**115**	**148**	**188**	**234**	**289**	**356**	**439**	**541**
	ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**39**	**52**	**62**	**78**	**95**	**104**	**110**	**115**	**122**	**136**
	TOTAL in bn euros	**458**	**578**	**710**	**860**	**1043**	**1261**	**1523**	**1833**	**2203**	**2654**



Compare (Eurostat 2011)

In 2008, the European electricity market was worth around 620 billion Euros. This figure represents 5% of EU GDP.

In 2007, the total number of employees in the energy sector was 1.6 million, representing 1.3% of the EU economy.

This represents highly qualified jobs (average personnel costs per employee in the energy sector were 40% above the average).

Energy costs represent 1% to 10 % of industrial production costs (excluding personnel costs).

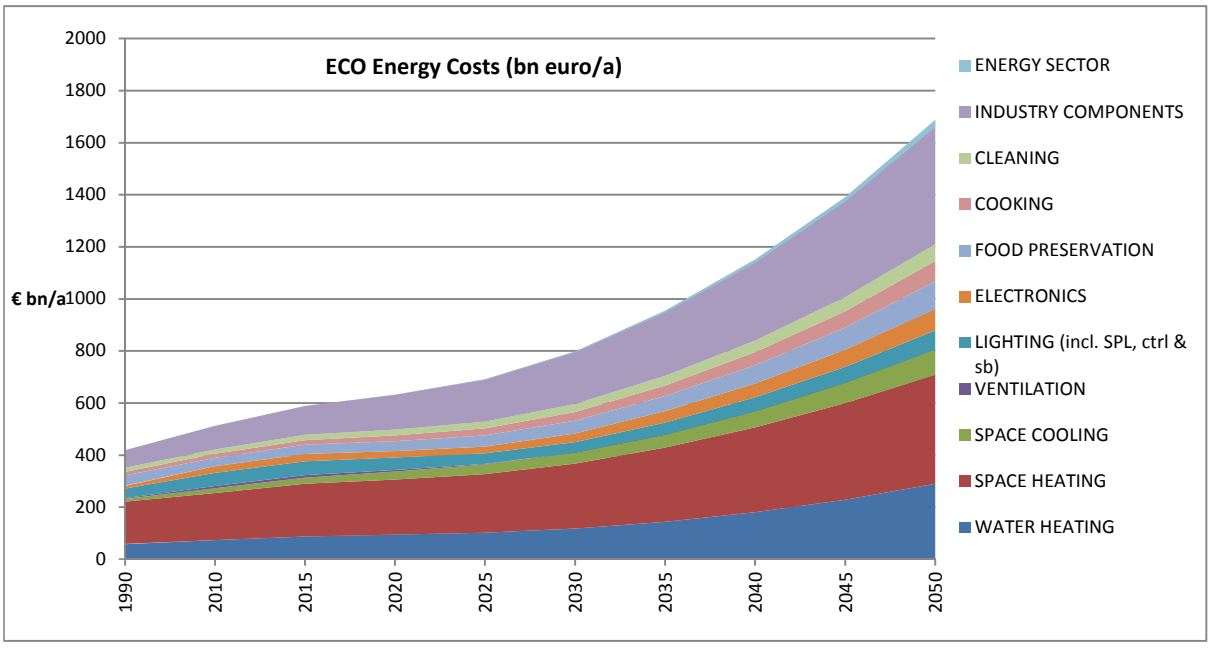
db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**47**	**51**	**57**	**61**	**65**	**74**	**90**	**113**	**145**	**184**
	Total CH Central Heating combi, water heat	**11**	**23**	**30**	**34**	**37**	**44**	**54**	**68**	**84**	**105**
	TOTAL WATER HEATING	**58**	**74**	**87**	**94**	**102**	**118**	**144**	**181**	**229**	**290**
	Total CH Central Heating boiler, space heat	**111**	**125**	**134**	**130**	**127**	**133**	**145**	**160**	**174**	**183**
	SFB Wood Manual	7.7	2.7	3.1	2.6	2.0	1.3	0.9	0.8	0.8	0.8
	SFB Wood Direct Draft	0.1	0.7	1.9	3.3	4.8	5.6	6.8	8.9	12.4	17.5
	SFB Coal	2.3	0.9	0.9	0.6	0.4	0.2	0.1	0.1	0.1	0.1
	SFB Pellets	0.0	0.4	0.9	1.6	2.3	3.1	3.8	4.7	5.9	7.6
	SFB Wood chips	0.0	0.3	0.6	0.8	0.9	1.1	1.4	1.8	2.3	2.9
	Total Solid Fuel Boiler	**10**	**5**	**7**	**9**	**10**	**11**	**13**	**16**	**22**	**29**
	CHAE-S (≤ 400 kW)	0.5	1.1	1.5	1.9	2.2	2.6	3.0	3.2	2.9	2.2
	CHAE-L (> 400 kW)	0.7	1.5	1.9	2.4	2.8	3.1	3.5	3.9	4.5	5.4
	CHWE-S (≤ 400 kW)	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2
	CHWE-L (> 1500 kW)	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	2.8	3.8	4.9	6.2	7.5	9.0	11.1	13.8	17.2	21.4
	HT PCH-AE-L	2.6	3.6	4.6	5.8	7.0	8.2	9.8	12.1	15.0	18.7
	HT PCH-WE-S	0.6	0.8	1.0	1.3	1.6	2.0	2.5	3.1	3.8	4.8
	HT PCH-WE-M	1.1	1.6	2.0	2.6	3.2	4.0	5.0	6.2	7.7	9.5
	HT PCH-WE-L	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.5	1.9
	AC rooftop	0.4	0.8	0.9	1.0	0.9	0.7	0.4	0.2	0.2	0.2
	AC splits	0.5	1.3	1.5	1.7	1.8	1.9	2.1	2.3	2.5	2.7
	AC VRF	0.0	0.3	0.6	0.9	1.3	1.9	2.6	3.4	4.5	5.7
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**10**	**16**	**20**	**25**	**30**	**36**	**42**	**51**	**62**	**75**
	AC rooftop (rev)	0.5	1.4	1.6	1.7	1.5	1.1	0.6	0.2	0.0	0.0
	AC splits (rev)	1.0	2.6	3.1	3.6	4.0	4.2	4.6	5.0	5.5	6.1
	AC VRF (rev)	0.0	0.8	1.4	2.4	3.5	5.1	6.9	8.8	10.9	13.2
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
	AHF	6.1	6.7	7.7	7.8	7.8	7.9	8.3	8.9	9.6	10.4
	AHE	0.1	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Heating	**8**	**12**	**14**	**16**	**17**	**19**	**21**	**23**	**27**	**30**
	Total AHC Heating & Cooling	**17**	**28**	**34**	**41**	**47**	**54**	**63**	**75**	**89**	**105**
	LH open fireplace	0.3	0.6	0.8	1.0	1.2	1.3	1.5	1.7	1.9	2.3
	LH closed fireplace/inset	0.4	1.2	2.1	2.9	3.8	4.7	5.7	6.8	8.0	9.5
	LH wood stove	0.9	1.1	1.7	2.0	2.4	2.8	3.4	4.0	4.7	5.6
	LH coal stove	0.6	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5
	LH cooker	0.1	0.3	0.5	0.7	0.9	1.2	1.4	1.7	2.0	2.4
	LH SHR stove	0.4	0.6	1.0	1.3	1.8	2.4	3.2	4.1	5.1	6.2
	LH pellet stove	0.0	0.4	0.6	1.0	1.3	1.7	2.2	2.7	3.2	3.8
	LH open fire gas	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	LH closed fire gas	0.8	0.8	0.9	1.1	1.2	1.3	1.5	1.8	2.1	2.5
	LH flueless fuel heater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	LH elec.portable	5.0	4.8	5.6	6.2	7.1	8.8	10.8	12.9	15.3	18.1
	LH elec.convector	20.8	19.7	23.2	26.5	31.1	38.4	47.1	56.4	67.0	79.5
	LH elec.storage	1.5	1.5	1.7	1.9	2.2	2.5	3.1	3.7	4.4	5.3
	LH elec.underfloor	2.8	2.8	3.3	3.8	4.5	5.2	6.2	7.3	8.6	10.4
	LH luminous heaters	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7
	LH tube heaters	0.3	0.4	0.6	0.6	0.7	0.9	1.0	1.2	1.4	1.6
	LH total	**34**	**35**	**43**	**50**	**59**	**72**	**88**	**105**	**125**	**149**
	RAC (cooling demand), all types <12 kW	0	3	4	5	6	9	11	14	18	22
	RAC (heating demand), reversible <12kW	0	3	5	8	11	14	17	20	24	28
	Total RAC Room Air Conditioner	**1**	**6**	**9**	**12**	**18**	**23**	**28**	**34**	**41**	**50**
1	**CIRC Circulator pumps <2.5 kW, net load**	2	2	2	2	2	3	3	4	5	5
	TOTAL SPACE HEATING	**163**	**180**	**203**	**212**	**225**	**250**	**285**	**325**	**371**	**419**
	TOTAL SPACE COOLING	**10**	**19**	**24**	**30**	**37**	**44**	**54**	**65**	**80**	**97**
	NRVU electricity	2	6	8	10	12	14	17	22	27	35
1	NRVU heat (negative=saving vs. natural ventilation)	0	0	-1	-4	-9	-14	-18	-21	-25	-28
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	2	2	2	2	2	2	3	4	5
	RVU Central Balanced VU ≤125W/fan (2 fans)	0	0	0	1	1	1	2	2	3	4
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0	0	0	0	0	0	0	1	1	2
1	RVU Central Unidir., heat (negative=saving)	0	0	-1	-2	-3	-5	-7	-9	-11	-15
1	RVU Central Balanced, heat (negative=saving)	0	0	0	0	0	0	-1	-1	-1	-2
1	RVU Local Balanced, heat (negative=saving)	0	0	0	0	0	0	0	-1	-1	-1
	Total VU Ventilation Units	**3**	**8**	**9**	**7**	**3**	**-3**	**-4**	**-3**	**-2**	**0**
	TOTAL VENTILATION (electricity & extra heat saved)	**3**	**8**	**9**	**7**	**3**	**-3**	**-4**	**-3**	**-2**	**-0**

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources ECO										
	LFL Linear Fluorescent	9.9	13.5	16.9	16.9	13.6	9.8	8.3	6.9	4.5	2.0
	CFL Compact Fluorescent	0.6	4.1	5.7	5.6	2.2	0.6	0.1	0.1	0.1	0.1
	Tungsten	1.4	8.0	9.3	4.9	0.7	0.2	0.2	0.2	0.3	0.3
	GLS GeneralLighting Service (incandescent)	13.5	6.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	4.2	7.9	5.9	4.0	2.7	2.0	2.4	3.0	3.7	4.7
	LED Light Emitting Diode	0.0	0.0	0.6	4.3	9.8	16.5	21.9	26.5	32.3	40.9
	SP Special Purpose (exempt)	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
	lighting controls & sb	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
	GLS stock	0.0	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tungsten stock	0.0	0.0	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING (incl. SPL, ctrl & sb)	**37**	**51**	**53**	**47**	**40**	**41**	**47**	**54**	**61**	**73**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	**30**	**41**	**42**	**36**	**29**	**29**	**33**	**37**	**41**	**48**
	DP TV, on mode	3.2	8.9	8.1	3.5	2.2	2.7	3.6	5.2	7.6	10.8
	DP Monitor, on mode	0.1	1.2	1.0	0.2	0.1	0.1	0.2	0.3	0.3	0.5
	DP TV , sb mode	0.7	0.8	1.2	2.4	2.3	3.1	4.1	5.4	7.1	9.3
	DP Monitor, sb mode	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Total electronic DisPlays	**4**	**11.0**	**10**	**6**	**5**	**6**	**8**	**11**	**15**	**21**
	SSTB	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	1.2	3.0	3.5	4.4	5.2	6.7	8.8	11.5	14.9
	Total STB set top boxes (Complex & Simple)	**0**	**1.5**	**3**	**4**	**4**	**5**	**7**	**9**	**11**	**15**
	VIDEO players/recorders	0.0	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	0.0	0.8	1.5	2.5	3.7	4.8	5.8	7.1	8.6	10.5
	Total VIDEO	**0**	**1.37**	**2.30**	**2.78**	**3.82**	**4.81**	**5.83**	**7.09**	**8.63**	**10.50**
	ES Rack servers	0.1	1.9	2.6	3.1	3.8	5.6	8.1	9.7	11.8	14.3
	ES Blade servers	0.0	0.5	0.6	0.6	0.7	1.0	1.5	1.8	2.1	2.6
	ES Storage	0.0	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.7	0.8
	Total ES Enterprise Servers	**0**	**3**	**3**	**4**	**5**	**7**	**10**	**12**	**15**	**18**
	PC Desktop	2.3	3.2	2.2	1.0	0.7	0.9	1.1	1.3	1.6	2.0
	PC Notebook	0.0	1.1	0.7	0.2	0.2	0.2	0.2	0.3	0.4	0.4
	PC Tablet/slate	0.0	0.0	0.4	0.4	0.4	0.6	0.8	1.0	1.3	1.6
	PC Thin client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
	Total PC, electricity	**2**	**4.5**	**3**	**2**	**1**	**2**	**2**	**3**	**3**	**4**
	EP-Copier mono	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4
	EP-printer mono	1.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	EP-printer colour	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.9
	IJ SFD printer	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	IJ MFD printer	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.6
	Total imaging equipment, electricity	**3**	**0.7**	**0**	**0**	**1**	**1**	**1**	**1**	**2**	**2**
	SB Home Gateway, on-mode hours	0.0	0.7	1.0	1.3	1.7	2.1	2.4	2.6	2.6	2.2
	SB Home NAS, on-mode hours	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	SB Home Phones (fixed), on-mode hours	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Office Phones (fixed), on-mode hours	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Home Gateway, standby hours	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS, standby hours	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	SB Home Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed), standby hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home Gateway, idle hours	0.0	0.4	0.9	1.6	2.1	2.5	2.9	3.1	3.1	2.7
	SB Home NAS, idle hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	SB Home Phones (fixed), idle hours	0.1	0.4	0.5	0.7	0.7	0.7	0.7	0.7	0.6	0.5
	SB Office Phones (fixed), idle hours	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4
	Total SB (networked) StandBy (rest)	**0**	**2.3**	**3**	**4**	**5**	**6**	**7**	**8**	**8**	**7**
	Total BC Battery Charged devices	**0.0**	**0.3**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.9**	**1.0**	**1.1**
	UPS below 1.5 kVA	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1
	UPS 1.5 to 5 kVA	0.3	0.6	0.8	0.6	0.2	0.2	0.3	0.5	0.6	0.8
	UPS 5 to 10 kVA	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.6
	UPS 10 to 200 kVA	0.2	0.4	0.6	0.6	0.7	0.8	1.1	1.5	2.1	2.7
	Total UPS - Uninterrupted Power Supplies	**0.7**	**1.3**	**1.6**	**1.5**	**1.1**	**1.3**	**1.8**	**2.4**	**3.2**	**4.2**
	TOTAL ELECTRONICS	**10**	**25**	**28**	**25**	**27**	**34**	**43**	**54**	**67**	**82**
	Total RF household Refrigerators & Freezers	**25**	**18**	**18**	**18**	**18**	**19**	**19**	**19**	**19**	**22**
	CF open vertical chilled multi deck (RVC2)	1.8	1.5	1.6	1.6	1.4	1.5	1.8	2.2	2.8	3.4
	CF open horizontal frozen island (RHF4)	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3
	CF other supermarket display (non-BCs)	3.1	2.8	3.1	3.4	3.7	4.3	5.4	6.7	8.5	10.7
	CF Plug in one door beverage cooler	2.2	1.9	2.0	2.0	1.9	2.1	2.7	3.3	4.2	5.3
	CF Plug in horizontal ice cream freezer	0.5	0.4	0.5	0.5	0.6	0.8	1.0	1.2	1.5	1.9
	CF Spiral vending machine	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.5
	Total CF Commercial Refrigeration	**8**	**7**	**8**	**8**	**8**	**9**	**11**	**14**	**18**	**22**
	PF Storage cabinet Chilled Vertical (CV)	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.8	1.0
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.3	0.4	0.4	0.4	0.4	0.6	0.7	0.9	1.2
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.8
	PF Storage cabinet Frozen Horizontal (FH)	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.4	0.5
	PF Storage cabinets All types	**0.7**	**0.9**	**1.1**	**1.2**	**1.1**	**1.3**	**1.7**	**2.1**	**2.7**	**3.4**

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	1.0	1.4	1.8	2.4	3.1	4.1	5.5	7.1
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	1.0	1.3	1.7	2.3	3.0	4.0	5.3	6.9
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	1.0	1.4	1.8	2.4	3.2	4.2	5.5	7.2
	PF Process Chiller AC LT L > 200 kW	0.4	0.8	1.0	1.4	1.9	2.5	3.3	4.3	5.7	7.5
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2	1.5	2.0
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.6	0.7	1.0	1.3	1.7	2.3	3.0
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.4	0.5	0.6	0.8	1.1	1.5	2.0	2.6
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.5	0.6	0.8	1.1	1.4	1.9	2.5	3.3
	PF Process Chiller All MT&LT	**2**	**4**	**6**	**8**	**10**	**13**	**17**	**23**	**30**	**40**
	PF Condensing Unit MT S 0.2-1 kW	0.8	0.5	0.6	0.7	0.9	1.2	1.6	2.1	2.7	3.6
	PF Condensing Unit MT M 1-5 kW	2.0	1.4	1.6	1.9	2.4	3.2	4.2	5.4	7.1	9.4
	PF Condensing Unit MT L 5-20 kW	2.4	1.7	1.9	2.3	2.9	3.8	5.0	6.6	8.6	11.3
	PF Condensing Unit MT XL 20-50 kW	2.4	1.7	1.9	2.3	2.9	3.8	5.0	6.6	8.6	11.3
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	PF Condensing Unit LT M 0.4-2 kW	0.4	0.3	0.3	0.3	0.4	0.6	0.7	1.0	1.3	1.7
	PF Condensing Unit LT L 2-8 kW	0.6	0.4	0.5	0.5	0.7	0.9	1.2	1.5	2.0	2.6
	PF Condensing Unit LT XL 8-20 kW	1.9	1.3	1.5	1.8	2.2	2.9	3.8	5.0	6.6	8.6
0.6	**PF Condensing Unit, All MT&LT**	**11**	**7**	**8**	**10**	**13**	**17**	**22**	**28**	**37**	**49**
	PF Professional Refrigeration, Total	**7**	**8**	**10**	**13**	**16**	**21**	**28**	**37**	**48**	**63**
	TOTAL FOOD PRESERVATION	**40**	**33**	**35**	**39**	**42**	**49**	**58**	**69**	**85**	**106**
	CA El. Hobs	4	5	7	9	12	16	20	26	33	41
	CA El. Ovens	4	4	4	5	5	6	8	10	12	14
	CA Gas Hobs	2	2	2	2	3	3	3	4	5	5
	CA Gas Ovens	1	1	1	1	1	1	1	1	1	1
	CA Range Hoods	2	2	2	3	3	4	5	6	7	9
	Total CA Cooking Appliances	**12**	**13**	**16**	**20**	**24**	**30**	**37**	**46**	**58**	**72**
	CM Dripfilter (glass)	1.1	0.7	0.8	0.8	0.9	1.1	1.3	1.6	1.9	2.3
	CM Dripfilter (thermos)	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	CM Dripfilter (full automatic)	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.9
	CM Pad filter	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.8
	CM Hard cap espresso	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.4
	CM Semi-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	CM Dripfilter (glass), standby/keep warm	0.8	0.5	0.5	0.3	0.3	0.4	0.4	0.5	0.7	0.8
	CM Dripfilter (thermos), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Dripfilter (full automatic), standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Pad filter, standby/keep warm	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4
	CM Hard cap espresso, standby/keep warm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	CM Semi-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CM Fully-auto espresso, standby/keep warm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	Total CM household Coffee Makers	**2**	**2**	**2**	**2**	**2**	**3**	**4**	**5**	**6**	**7**
	TOTAL COOKING	**14**	**15**	**18**	**22**	**27**	**33**	**41**	**51**	**63**	**79**
	Total WM household Washing Machine	**9**	**6**	**6**	**6**	**6**	**6**	**7**	**8**	**10**	**12**
	Total DW household Dishwasher	**2**	**3**	**4**	**5**	**7**	**9**	**12**	**15**	**20**	**24**
	LD vented el.	2	2	2	3	3	4	5	6	7	8
	LD condens el.	0	2	3	4	5	6	7	8	9	11
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**2**	**4**	**6**	**7**	**8**	**10**	**11**	**14**	**16**	**19**
	VC dom	2	3	4	2	4	4	5	6	7	8
	VC nondom	0	0	1	1	1	1	1	1	2	2
	Total VC Vacuum Cleaner	**2**	**3**	**4**	**3**	**4**	**5**	**6**	**7**	**8**	**10**
	TOTAL CLEANING	**16**	**17**	**20**	**22**	**26**	**30**	**37**	**45**	**54**	**66**
0.5	FAN Axial<300Pa (all FAN types >125W)	2	6	7	9	12	14	17	21	26	31
0.5	FAN Axial>300Pa	4	10	13	16	20	24	28	35	42	51
0.5	FAN Centr.FC	1	2	2	3	4	4	5	6	8	9
0.5	FAN Centr.BC-free	3	5	6	8	10	13	17	21	26	32
0.5	FAN Centr.BC	3	5	7	9	11	15	19	25	33	43
0.5	FAN Cross-flow	0	0	0	0	0	0	0	1	1	1
	Total FAN, industrial (excl. box & roof fans)	**6**	**14**	**18**	**23**	**28**	**35**	**44**	**54**	**67**	**84**
0.5	**Total MT Motors 0.75-375 kW**	**97**	**117**	**140**	**166**	**197**	**242**	**294**	**357**	**435**	**529**
	Total WP Water Pumps	**10**	**12**	**15**	**20**	**26**	**34**	**44**	**57**	**74**	**95**
	CP Fixed Speed 5-1280 l/s	3	5	5	5	6	8	10	12	15	19
	CP Variable speed 5-1280 l/s	0	1	2	3	4	5	6	8	10	12
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	1	1	1
	Total CP Standard Air Compressors	**3**	**6**	**7**	**8**	**10**	**13**	**16**	**20**	**25**	**31**
	TOTAL INDUSTRY COMPONENTS	68	91	111	134	163	202	251	310	384	475

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
1	TRAFO Distribution	1	2	3	3	4	5	7	8	11	13
1	TRAFO Industry oil	1	2	2	2	3	3	4	5	6	8
1	TRAFO Industry dry	0	1	1	1	1	1	2	2	3	3
1	TRAFO Power	4	6	7	10	13	17	23	30	39	51
1	TRAFO DER oil	0	0	0	0	0	1	1	2	3	5
1	TRAFO DER dry	0	0	0	1	2	3	6	10	18	29
1	TRAFO Small	0	0	0	0	0	0	1	1	1	1
	Total TRAFO Utility Transformers	**7**	**10**	**13**	**18**	**24**	**32**	**43**	**58**	**80**	**110**
	TOTAL ENERGY SECTOR (only improvement over BAU)	**0**	**0**	**0**	**-1**	**-2**	**-4**	**-7**	**-12**	**-18**	**-27**
	TYRE car replacement tyres C1	23	31	37	42	45	41	43	49	56	64
	TYRE van replacement tyres C2	6	9	10	11	11	11	13	15	17	19
	TYRE truck replacement tyres C3	9	12	13	15	16	16	17	20	22	25
	TYRE Replacement Tyres	**39**	**52**	**60**	**68**	**72**	**68**	**73**	**84**	**96**	**109**
	TOTAL TRANSPORT SECTOR	**39**	**52**	**60**	**68**	**72**	**68**	**73**	**84**	**96**	**109**
	GENERAL TOTAL in bn euros	**458**	**565**	**649**	**699**	**761**	**863**	**1021**	**1222**	**1469**	**1768**

ECO Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	58	74	87	94	102	118	144	181	229	290
SPACE HEATING	163	180	203	212	225	250	285	325	371	419
SPACE COOLING	10	19	24	30	37	44	54	65	80	97
VENTILATION	3	8	9	7	3	-3	-4	-3	-2	0
LIGHTING (incl. SPL, ctrl & sb)	37	51	53	47	40	41	47	54	61	73
ELECTRONICS	10	25	28	25	27	34	43	54	67	82
FOOD PRESERVATION	40	33	35	39	42	49	58	69	85	106
COOKING	14	15	18	22	27	33	41	51	63	79
CLEANING	16	17	20	22	26	30	37	45	54	66
INDUSTRY COMPONENTS	68	91	111	134	163	202	251	310	384	475
ENERGY SECTOR	0	0	0	-1	-2	-4	-7	-12	-18	-27
TRANSPORT SECTOR	39	52	60	68	72	68	73	84	96	109
TOTAL in € bn	**458**	**565**	**649**	**699**	**761**	**863**	**1021**	**1222**	**1469**	**1768**



db	MAINTENANCE incl. VAT (bn euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	bn€	6.0	7.0	7.2	7.3	7.5	7.6	7.8	8.0	8.1	8
	CH Central Heating combi, water heat [24 kW]	bn€	1.4	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4
	TOTAL WATER HEATING		**7.4**	**9.7**	**10.2**	**10.5**	**10.9**	**11.2**	**11.6**	**12.0**	**12.4**	**13**
	CH Central Heating boiler, space heat [24 kW]	**bn€**	13.8	22.2	23.9	25.6	27.4	29.6	32.1	34.8	37.6	40
	SFB Wood Manual [18 kW]	bn€	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	SFB Wood Direct Draft [20 kW]	bn€	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	SFB Coal [25 kW]	bn€	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SFB Pellets [25 kW]	bn€	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	SFB Wood chips [160 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Solid Fuel Boiler	**bn€**	**0.4**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.5**
	CHAE-S (≤ 400 kW)	bn€	0.2	0.9	1.2	1.4	1.5	1.6	1.8	1.7	1.3	0.9
	CHAE-L (> 400 kW)	bn€	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CHWE-S (≤ 400 kW)	bn€	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn€	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	CHWE-L (> 1500 kW)	bn€	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	bn€	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-AE-L	bn€	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	bn€	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	bn€	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC rooftop	bn€	0.1	0.4	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.1
	AC splits	bn€	0.2	1.0	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9
	AC VRF	bn€	0.0	1.0	1.6	2.5	3.3	4.3	5.3	6.2	7.1	7.9
	ACF	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**bn€**	**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**11**	**12**
	AC rooftop (rev)	bn€	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	bn€	0.2	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.6
	AC VRF (rev)	bn€	0.0	0.9	1.4	2.1	2.8	3.6	4.3	4.8	5.3	5.5
	ACF (rev)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	bn€	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	AHE	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)	**bn€**	**0**	**2**	**3**	**3**	**4**	**5**	**5**	**6**	**6**	**6**
	Total AHC Heating & Cooling		**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**11**	**12**
	LH open fireplace [8 kW]	bn€	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH closed fireplace/inset [8 kW]	bn€	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	LH wood stove [8 kW]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH coal stove [8 kW]	bn€	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker [10 kW]	bn€	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	LH SHR stove [8 kW]	bn€	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	LH pellet stove [8 kW]	bn€	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH open fire gas, NCV [4.2 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH closed fire gas, NCV [4.2 kW]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH flueless fuel heater, NCV [1.5 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.portable [1 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.convector [1 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.storage [2.75 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.underfloor [0.62 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH luminous heaters [20 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH tube heaters [30 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH total	**bn€**	**0.9**	**1.4**	**1.7**	**1.9**	**2.1**	**2.2**	**2.3**	**2.4**	**2.4**	**2.4**
	RAC (cooling demand), all types <12 kW	bn€	0.1	0.6	0.8	0.9	1.1	1.2	1.3	1.3	1.4	1.4
	RAC (heating demand), reversible <12kW	bn€	0.0	0.4	0.5	0.7	1.0	1.1	1.2	1.2	1.2	1.2
	Total RAC Room Air Conditioner	**bn€**	**0.1**	**1.0**	**1.3**	**1.7**	**2.1**	**2.4**	**2.5**	**2.5**	**2.6**	**2.6**
1	**CIRC Circulator pumps <2.5 kW**	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	TOTAL SPACE HEATING		**16**	**26**	**29**	**32**	**35**	**38**	**41**	**44**	**48**	**51**
	TOTAL SPACE COOLING		**1**	**5**	**6**	**8**	**9**	**10**	**11**	**12**	**13**	**13**
	NRVU avg (sales wt.)	**bn€**	0.8	2.7	3.2	3.5	3.8	4.0	4.2	4.5	4.7	5
	RVU Central Unidir. VU (1 fan)	bn€	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0
	RVU Central Balanced VU (2 fans)	bn€	0.0	0.1	0.2	0.4	0.5	0.7	0.8	0.9	0.9	1
	RVU Local Balanced VU (2 fans)	bn€	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0
	TOTAL VENTILATION		**1**	**3**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**7**
	LS Light Sources											
	LFL	bn€	0	0	0	0	0	0	0	0	0	0
	CFL	bn€	0	0	0	0	0	0	0	0	0	0
	Tungsten	bn€	0	0	0	0	0	0	0	0	0	0
	GLS	bn€	0	0	0	0	0	0	0	0	0	0
	HID	bn€	0	0	0	0	0	0	0	0	0	0
	LED	bn€	0	0	0	0	0	0	0	0	0	0
	SP special purpose	bn€	0	0	0	0	0	0	0	0	0	0
	lighting controls	bn€	0	0	0	0	0	0	0	0	0	0
	GLS stock	bn€	0	0	0	0	0	0	0	0	0	0
	Tungsten stock	bn€	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	MAINTENANCE incl. VAT (bn euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	bn€	0	0	0	0	0	0	0	0	0	0
	DP TV LoNA	bn€	0	0	0	0	0	0	0	0	0	0
	DP TV Smart	bn€	0	0	0	0	0	0	0	0	0	0
	DP Monitor	bn€	0	0	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SSTB	bn€	0	0	0	0	0	0	0	0	0	0
	CSTB	bn€	0	0	0	0	0	0	0	0	0	0
	Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VIDEO players/recorders	bn€	0	0	0	0	0	0	0	0	0	0
	VIDEO projectors	bn€	0	0	0	0	0	0	0	0	0	0
	VIDEO game consoles	bn€	0	0	0	0	0	0	0	0	0	0
	Total VIDEO	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	bn€	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	ES Blade servers	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES Storage	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total ES Enterprise Servers	**bn€**	**0.0**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**
	PC Desktop	bn€	0	0	0	0	0	0	0	0	0	0
	PC Notebook	bn€	0	0	0	0	0	0	0	0	0	0
	PC Tablet/slate	bn€	0	0	0	0	0	0	0	0	0	0
	PC Thin client	bn€	0	0	0	0	0	0	0	0	0	0
	PC Workstation	bn€	0	0	0	0	0	0	0	0	0	0
	Total PC, electricity	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	EP-Copier mono	bn€	0	0	0	0	0	0	0	0	0	0
	EP-Copier colour	bn€	0	0	0	0	0	0	0	0	0	0
	EP-printer mono	bn€	0	0	0	0	0	0	0	0	0	0
	EP-printer colour	bn€	0	0	0	0	0	0	0	0	0	0
	IJ SFD printer	bn€	0	0	0	0	0	0	0	0	0	0
	IJ MFD printer	bn€	0	0	0	0	0	0	0	0	0	0
	paper (2.5 euro/kg paper (6.25 euro/500pack)	bn€										
	Total imaging equipment, electricity	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SB Home Gateway, on-mode power	bn€	0	0	0	0	0	0	0	0	0	0
	SB Home NAS, on-mode power	bn€	0	0	0	0	0	0	0	0	0	0
	SB Home Phones (fixed), on-mode power	bn€	0	0	0	0	0	0	0	0	0	0
	SB Office Phones (fixed), on-mode power	bn€	0	0	0	0	0	0	0	0	0	0
	Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	BC_EPS Mobile phones etc.	**bn€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
	UPS below 1.5 kVA	bn€	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	UPS 1.5 to 5 kVA	bn€	0.04	0.09	0.10	0.11	0.13	0.15	0.17	0.19	0.21	0.22
	UPS 5 to 10 kVA	bn€	0.01	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.07
	UPS 10 to 200 kVA	bn€	0.24	0.54	0.60	0.65	0.76	0.89	1.03	1.15	1.26	1.35
	Total UPS - Uninterrupted Power Supplies	**bn€**	**0.3**	**0.7**	**0.7**	**0.8**	**0.9**	**1.1**	**1.2**	**1.4**	**1.5**	**1.6**
	TOTAL ELECTRONICS		**0.3**	**0.8**	**0.9**	**0.9**	**1.1**	**1.3**	**1.5**	**1.7**	**1.8**	**1.9**
	RF Household refrigerator and freezer	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	bn€	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF open horizontal frozen island (RHF4)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	bn€	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0
	CF Plug in one door beverage cooler	bn€	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	CF Plug in horizontal ice cream freezer	bn€	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CF Spiral vending machine	bn€	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CF Commercial Refrigeration		**1.0**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
	PF Storage cabinet Chilled Vertical (CV)	bn€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Vertical (FV)	bn€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Chilled Horizontal (CH)	bn€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Horizontal (FH)	bn€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinets All types	bn€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Process Chiller AC MT S ≤ 300 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC MT L > 300 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT S ≤ 200 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT L > 200 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT S ≤ 300 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT L > 300 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT S ≤ 200 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT L > 200 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller All MT&LT	bn€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	MAINTENANCE incl. VAT (bn euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT M 1-5 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT L 5-20 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT XL 20-50 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT S 0.1-0.4 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT M 0.4-2 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT L 2-8 kW	bn€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT XL 8-20 kW	bn€	0	0	0	0	0	0	0	0	0	0
0.6	**PF Condensing Unit, All MT&LT**	bn€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Professional Refrigeration, Total	bn€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**1.0**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
	COOK El. Hobs, Wh/ltr	bn€	0	0	0	0	0	0	0	0	0	0
	COOK El. Ovens, kWh/a	bn€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Hobs, % efficiency NCV	bn€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Ovens, kWh prim, NCV	bn€	0	0	0	0	0	0	0	0	0	0
	COOK Range Hoods, kWh elec	bn€	0	0	0	0	0	0	0	0	0	0
	Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	COFFEE Dripfilter (glass)	bn€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (thermos)	bn€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (full automatic)	bn€	0	0	0	0	0	0	0	0	0	0
	COFFEE Pad filter	bn€	0	0	0	0	0	0	0	0	0	0
	COFFEE Hard cap espresso	bn€	0	0	0	0	0	0	0	0	0	0
	COFFEE Semi-auto espresso	bn€	0	0	0	0	0	0	0	0	0	0
	COFFEE Fully-auto espresso	bn€	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL COOKING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WM Household Washing Machine	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	DW Household Dishwasher	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LD Household Laundry Drier vented el.	bn€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	bn€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	bn€	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	bn€	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	bn€	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.5	FAN Axial<300Pa [247 W flow out]	bn€	0.1	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	1
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	bn€	0.2	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	1
0.5	FAN Centr.FC [141 W flow out]	bn€	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0
0.5	FAN Centr.BC-free [2120 W flow out]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0
0.5	FAN Centr.BC [2052 W flow out]	bn€	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	1
0.5	FAN Cross-flow [31 W flow out]	bn€	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
	Total FAN, industrial (excl. box & roof fans)	**bn€**	**0.3**	**0.9**	**1.0**	**1.1**	**1.2**	**1.3**	**1.3**	**1.3**	**1.4**	**1.4**
0.5	**Total MT Motors 0.75-375 kW**	**bn€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**bn€**	**1.0**	**1.4**	**1.5**	**1.6**	**1.7**	**1.9**	**2.0**	**2.1**	**2.3**	**2**
	CP Fixed Speed 5-1280 l/s	bn€	0.3	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7
	CP Variable speed 5-1280 l/s	bn€	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CP Pistons 2-64 l/s	bn€	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total CP Standard Air Compressors	**bn€**	**0.4**	**0.9**	**0.9**	**1.0**	**1.0**	**1.0**	**1.1**	**1.1**	**1.1**	**1.2**
	TOTAL INDUSTRY COMPONENTS		**1.8**	**3.2**	**3.5**	**3.7**	**4.0**	**4.2**	**4.4**	**4.6**	**4.8**	**5.0**
	TRAFO Distribution, kWh/a	bn€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	bn€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	bn€	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	bn€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	bn€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	bn€	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	bn€	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	bn€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	bn€	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	bn€	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	bn€	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in bn euro 2010)		**28**	**49**	**55**	**60**	**66**	**71**	**77**	**82**	**87**	**92**

SUMMARY

MAINTENANCE incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	7	10	10	10	11	11	12	12	12	13
SPACE HEATING	16	26	29	32	35	38	41	44	48	51
SPACE COOLING	1	5	6	8	9	10	11	12	13	13
VENTILATION	1	3	4	4	5	5	6	6	6	7
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	1	1	1	1	1	2	2	2	2
FOOD PRESERVATION	1	1	1	1	1	1	1	2	2	2
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	2	3	3	4	4	4	4	5	5	5
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0
TOTAL in bn euro 2010	28	49	55	60	66	71	77	82	87	92

CONSUMABLE RESOURCES incl. VAT (bn euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total imaging equipment											
images per year	bn	711	755	801	843	875	918	960	1003	1051	1101
toner costs (€0.04 per image, at 15% N-print)	bn€	24	26	27	29	30	31	33	34	36	38
duplexing is addressed in VA and impact assessment (toner only in terms of recycling, therefore not given)											
BAU paper use (at given duplex 65%)	Mt/a	2.2	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4
ECO paper use (at improved ECO duplex)	Mt/a	2.2	2.3	2.2	2.2	2.3	2.4	2.5	2.6	2.8	2.9
BAU paper costs (200 pages/kg; 1 kg=€2.5)	bn€	5.3	5.7	6.0	6.3	6.6	6.9	7.2	7.5	7.9	8.2
ECO paper costs (200 pages/kg; 1 kg=€2.5)	bn€	5.3	5.5	5.3	5.3	5.5	5.8	6.1	6.4	6.7	7.0
BAU paper indirect energy (40 MJ=11.1 kWh/kg)	TWh	24.6	26.2	27.8	29.2	30.3	31.8	33.3	34.7	36.4	38.2
ECO paper indirect energy (40 MJ=11.1 kWh/kg)	TWh	24.6	25.3	24.4	24.7	25.7	26.9	28.1	29.4	30.8	32.3
BAU paper CO_2 (1 kg= 0.6 kg CO_2 eq.)	$MtCO_2$	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.1
ECO paper CO_2 (1 kg= 0.6 kg CO_2 eq.)	$MtCO_2$	1.3	1.4	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7
BAU total toner and paper costs	**bn€**	**29.6**	**31.4**	**33.3**	**35.0**	**36.4**	**38.2**	**39.9**	**41.7**	**43.7**	**45.8**
ECO total toner and paper costs	**bn€**	**29.6**	**31.2**	**32.6**	**34.1**	**35.4**	**37.1**	**38.8**	**40.5**	**42.5**	**44.5**
TOTAL ELECTRONICS (BAU)		**30**	**31**	**33**	**35**	**36**	**38**	**40**	**42**	**44**	**46**
TOTAL ELECTRONICS (ECO)		**30**	**31**	**33**	**34**	**35**	**37**	**39**	**41**	**42**	**45**
WM Household Washing Machine (water is addressed in legislation; detergent costs are added to complete the economics)											
WM detergent (€ 0.15/cycle)	bn€	4.3	5.3	5.4	5.3	5.3	5.4	5.3	5.3	5.3	5.3
BAU/FREEZE water consumption											
Water stock ltr./cycle	ltr/cyc	94	75	75	75	75	75	75	75	75	75
Water stock m^3/a per unit	m^3/a	22	17	17	17	17	17	17	17	17	17
Water stock M m^3/a	M m^3/a	2692	3206	3395	3464	3496	3549	3535	3515	3515	3515
Water costs	bn€	5.7	12.3	15.1	17.9	20.9	24.6	28.4	32.8	38.0	44.0
ECO water consumption											
Water stock ltr./cycle	ltr/cyc	94	49	41	36	32	30	30	30	30	30
Water stock m^3/a per unit	m^3/a	22	9	8	6	6	5	5	5	5	5
Water stock M m^3/a	M m^3/a	2692	1724	1489	1257	1134	1084	1079	1073	1073	1073
Water costs	bn€	5.7	6.6	6.6	6.5	6.8	7.5	8.7	10.0	11.6	13.4
WM detergent & water costs BAU	**bn€**	**10.0**	**17.6**	**20.5**	**23.1**	**26.2**	**30.0**	**33.8**	**38.1**	**43.3**	**49.3**
WM detergent & water costs ECO	**bn€**	**10.0**	**11.9**	**12.0**	**11.7**	**12.1**	**12.9**	**14.0**	**15.3**	**16.9**	**18.8**
DW Household Dishwasher (water is addressed in legislation; detergent costs are added to complete the economics)											
DW detergent (€ 0.09/cycle)	bn€	0.7	1.6	1.9	2.2	2.5	2.8	3.1	3.5	3.8	4.1
BAU/FREEZE water consumption											
Water stock ltr./cycle	ltr/cyc	30	24	24	24	24	24	24	24	24	24
Water stock m^3/a per unit	m^3/a	6.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Water stock M m^3/a	M m^3/a	236	419	498	583	668	752	837	922	1007	1092
Water costs	bn€	0.5	1.6	2.2	3.0	4.0	5.2	6.7	8.6	10.9	13.7
ECO water consumption											
Water stock ltr./cycle	ltr/cyc	30	15	12	10	9	9	9	9	9	9
Water stock m^3/a per unit	m^3/a	6.4	3.1	2.5	2.1	1.9	1.9	1.9	1.9	1.9	1.9
Water stock M m^3/a	M m^3/a	236	254	244	245	255	276	307	338	370	401
Water costs	bn€	0.5	1.0	1.1	1.3	1.5	1.9	2.5	3.2	4.0	5.0
DW detergent & water costs BAU	**bn€**	**1.2**	**3.2**	**4.1**	**5.2**	**6.5**	**8.0**	**9.9**	**12.1**	**14.7**	**17.8**
DW detergent & water costs ECO	**bn€**	**1.2**	**2.5**	**3.0**	**3.4**	**4.0**	**4.7**	**5.6**	**6.6**	**7.8**	**9.1**
VC dom. Vacuum Cleaner	bn€	1.1	1.4	1.5	1.6	1.6	1.7	1.6	1.6	1.5	1.4
VC nondom Vacuum Cleaner	bn€	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
Total VC Vacuum Cleaner	**bn€**	**1.5**	**1.9**	**2.0**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.1**	**2.1**
TOTAL CLEANING (BAU)		**13**	**23**	**27**	**30**	**35**	**40**	**46**	**52**	**60**	**69**
TOTAL CLEANING (ECO)		**13**	**16**	**17**	**17**	**18**	**20**	**22**	**24**	**27**	**30**

TOTAL BAU (in bn euro 2010)		**42**	**54**	**60**	**65**	**71**	**78**	**86**	**94**	**104**	**115**
TOTAL ECO (in bn euro 2010)		**42**	**48**	**50**	**51**	**54**	**57**	**61**	**65**	**69**	**74**

SUMMARY

RESOURCES BAU incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS	**30**	**31**	**33**	**35**	**36**	**38**	**40**	**42**	**44**	**46**
CLEANING	**13**	**23**	**27**	**30**	**35**	**40**	**46**	**52**	**60**	**69**
TOTAL in bn euro 2010	**42**	**54**	**60**	**65**	**71**	**78**	**86**	**94**	**104**	**115**

SUMMARY

RESOURCES ECO incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS	**30**	**31**	**33**	**34**	**35**	**37**	**39**	**41**	**42**	**45**
CLEANING	**13**	**16**	**17**	**17**	**18**	**20**	**22**	**24**	**27**	**30**
TOTAL in bn euro 2010	**42**	**48**	**50**	**51**	**54**	**57**	**61**	**65**	**69**	**74**

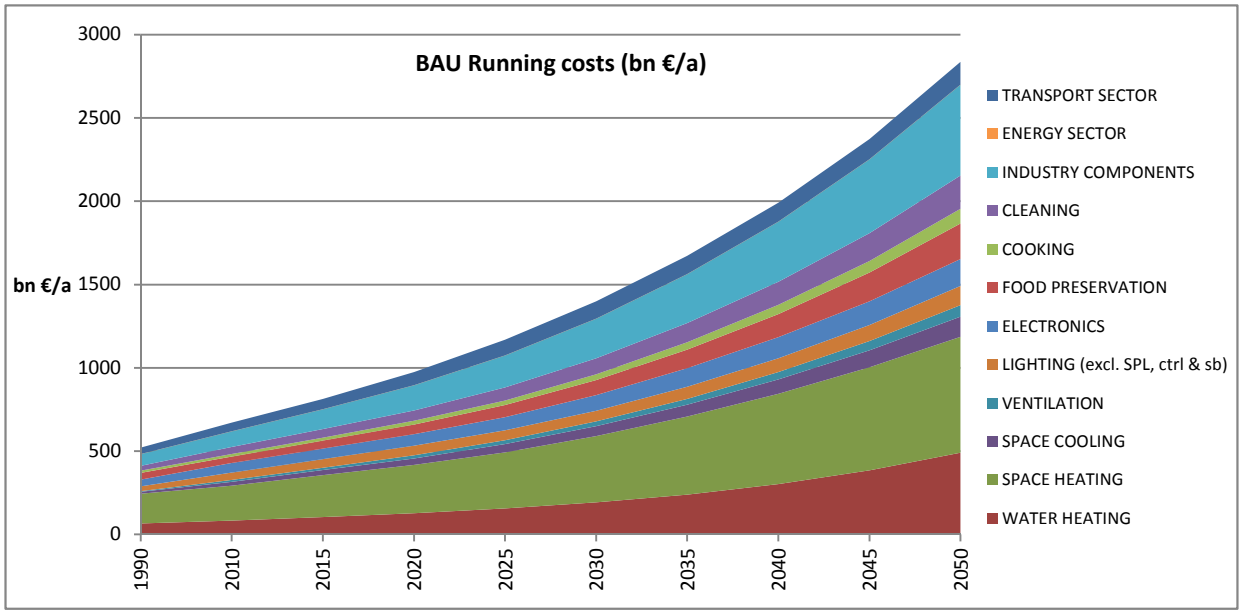
db	BAU Running costs (in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**53**	**58**	**70**	**85**	**102**	**123**	**149**	**186**	**235**	**298**
	Total CH Central Heating combi, water heat	bn €	**13**	**25**	**35**	**43**	**55**	**70**	**90**	**116**	**150**	**193**
	TOTAL WATER HEATING		**66**	**84**	**105**	**128**	**157**	**192**	**239**	**302**	**385**	**490**
	Total CH Central Heating boiler, space heat	bn €	**125**	**150**	**176**	**196**	**222**	**261**	**305**	**351**	**392**	**426**
	SFB Wood Manual	bn €	8.0	2.9	3.2	2.9	2.4	1.7	1.2	1.1	1.0	1.1
	SFB Wood Direct Draft	bn €	0.1	0.8	2.0	3.5	5.0	5.9	7.2	9.3	12.9	18.2
	SFB Coal	bn €	2.4	0.9	0.9	0.7	0.4	0.2	0.1	0.1	0.1	0.1
	SFB Pellets	bn €	0.0	0.5	1.0	1.6	2.4	3.2	3.9	4.8	6.1	7.8
	SFB Wood chips	bn €	0.0	0.3	0.6	0.8	0.9	1.1	1.4	1.8	2.3	3.0
	Total Solid Fuel Boiler		**10**	**5**	**8**	**9**	**11**	**12**	**14**	**17**	**23**	**30**
	CHAE-S (≤ 400 kW)	bn €	0.7	2.0	2.6	3.2	3.8	4.4	5.0	5.1	4.5	3.3
	CHAE-L (> 400 kW)	bn €	0.8	1.7	2.2	2.7	3.2	3.6	4.1	4.6	5.3	6.1
	CHWE-S (≤ 400 kW)	bn €	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.2	0.4	0.5	0.7	0.8	0.8	0.9	1.1	1.2	1.4
	CHWE-L (> 1500 kW)	bn €	0.1	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.9
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	HT PCH-AE-S	bn €	2.9	4.0	5.1	6.6	8.2	10.2	12.5	15.3	18.8	23.1
	HT PCH-AE-L	bn €	2.7	3.8	4.8	6.2	7.8	9.6	11.7	14.4	17.6	21.6
	HT PCH-WE-S	bn €	0.6	0.8	1.1	1.4	1.7	2.1	2.6	3.2	4.0	4.9
	HT PCH-WE-M	bn €	1.2	1.7	2.2	2.8	3.6	4.4	5.3	6.5	8.0	9.8
	HT PCH-WE-L	bn €	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	2.0
	AC rooftop	bn €	0.5	1.2	1.4	1.4	1.3	0.9	0.6	0.3	0.2	0.3
	AC splits	bn €	0.8	2.3	2.6	2.8	3.0	3.2	3.4	3.5	3.7	3.9
	AC VRF	bn €	0.0	1.4	2.2	3.4	4.7	6.4	8.2	10.1	12.0	14.0
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	SubTotal AHC Air Cooling		**11**	**20**	**26**	**33**	**40**	**48**	**57**	**67**	**79**	**92**
	AC rooftop (rev)	bn €	0.6	1.6	1.9	2.0	1.9	1.4	0.8	0.3	0.0	0.0
	AC splits (rev)	bn €	1.1	3.2	3.8	4.4	4.9	5.3	5.7	6.1	6.5	7.0
	AC VRF (rev)	bn €	0.0	1.7	2.9	4.5	6.4	8.9	11.6	14.1	16.6	19.1
	ACF (rev)	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	AHF	bn €	6.2	6.8	7.8	8.2	8.7	9.3	10.0	10.7	11.5	12.4
	AHE	bn €	0.1	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Air Heating		**8**	**14**	**17**	**19**	**22**	**25**	**29**	**32**	**35**	**39**
	Total AHC Air Heating & Cooling		**19**	**32**	**40**	**49**	**58**	**68**	**80**	**93**	**108**	**125**
	LH open fireplace	bn €	0.5	0.8	1.1	1.4	1.7	2.0	2.3	2.7	3.3	3.9
	LH closed fireplace/inset	bn €	0.5	1.5	2.4	3.3	4.4	5.6	6.9	8.2	9.8	11.5
	LH wood stove	bn €	1.0	1.3	1.8	2.2	2.7	3.3	4.0	4.8	5.7	6.7
	LH coal stove	bn €	0.6	0.5	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6
	LH cooker	bn €	0.3	0.7	0.9	1.2	1.6	1.9	2.2	2.5	2.8	3.2
	LH SHR stove	bn €	0.4	0.7	1.1	1.5	1.9	2.6	3.4	4.3	5.3	6.4
	LH pellet stove	bn €	0.0	0.4	0.7	1.1	1.5	2.0	2.4	2.9	3.5	4.1
	LH open fire gas	bn €	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4
	LH closed fire gas	bn €	0.9	0.9	1.1	1.3	1.5	1.8	2.1	2.4	2.9	3.4
	LH flueless fuel heater	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	LH elec.portable	bn €	5.0	4.8	5.7	6.8	8.2	10.0	12.1	14.4	17.1	20.3
	LH elec.convector	bn €	20.8	19.7	23.5	28.2	34.0	41.3	50.0	59.8	71.0	84.2
	LH elec.storage	bn €	1.5	1.5	1.7	2.1	2.5	3.1	3.7	4.5	5.3	6.3
	LH elec.underfloor	bn €	2.8	2.8	3.3	4.0	4.9	5.9	7.1	8.6	10.3	12.3
	LH luminous heaters	bn €	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8
	LH tube heaters	bn €	0.3	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.8
	LH total	bn €	**35**	**36**	**45**	**55**	**67**	**82**	**99**	**118**	**140**	**166**
	RAC (cooling demand), all types <12 kW	bn €	0.5	3.4	4.6	6.3	9.1	12.1	15.2	18.8	23.3	29.0
	RAC (heating demand), reversible <12kW	bn €	0.3	3.6	6.0	9.5	14.1	18.0	21.4	25.1	29.2	34.0
	Total RAC Room Air Conditioner	bn €	**1**	**7**	**11**	**16**	**23**	**30**	**37**	**44**	**53**	**63**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**2**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**
	TOTAL SPACE HEATING	bn €	**178**	**209**	**251**	**289**	**336**	**398**	**468**	**543**	**619**	**695**
	TOTAL SPACE COOLING	bn €	**11**	**24**	**30**	**39**	**49**	**60**	**72**	**86**	**102**	**121**
	NRVU Ventilation units	bn €	3.1	9.1	11.6	14.6	17.7	21.2	25.5	30.9	37.9	46.9
	RVU Central Unidir.	bn €	1.1	1.9	2.5	2.9	3.3	3.9	4.8	6.2	8.0	10.3
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0.0	0.3	0.6	1.3	2.2	3.3	4.4	5.8	7.5	9.7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.0	0.1	0.2	0.3	0.6	0.9	1.4	2.0	2.8
	Total VU Ventilation Units		**4**	**11**	**15**	**19**	**24**	**29**	**36**	**44**	**55**	**70**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**4**	**11**	**15**	**19**	**24**	**29**	**36**	**44**	**55**	**70**

db	BAU Running costs (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources											
	LFL Linear Fluorescent	bn €	9.9	13.5	17.4	20.5	24.3	28.3	32.7	37.6	43.5	50.3
	CFL Compact Fluorescent	bn €	0.6	4.0	6.5	7.2	5.9	5.6	6.0	6.5	7.1	7.7
	Tungsten	bn €	1.4	7.9	9.9	11.9	9.9	8.5	7.6	6.6	6.0	6.6
	GLS GeneralLighting Service (incandescent)	bn €	13.5	9.2	8.3	7.3	5.5	2.2	0.6	0.1	0.0	0.0
	HID High Intensity Discharge	bn €	4.2	7.9	8.3	9.0	10.3	12.5	15.2	18.5	22.5	27.4
	LED Light Emitting Diode	bn €	0.0	0.0	0.1	1.0	3.1	6.3	9.7	13.5	17.7	22.5
	SP Special Purpose (exempt)	bn €	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
	lighting controls & sb	bn €	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
	TOTAL LIGHTING (incl. SPL, ctrl & sb)		**37**	**53**	**62**	**68**	**70**	**75**	**86**	**100**	**117**	**140**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)		**30**	**43**	**51**	**57**	**59**	**64**	**72**	**83**	**97**	**115**
	DP TV, on mode	bn €	3.2	8.9	8.4	6.5	8.4	11.1	13.0	13.6	12.4	14.6
	DP Monitor, on mode	bn €	0.1	1.2	1.0	1.0	1.3	1.4	1.4	1.2	0.7	0.6
	DP TV , sb mode	bn €	0.7	0.8	1.0	2.7	4.1	5.4	6.8	8.3	9.6	10.6
	DP Monitor, sb mode	bn €	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Electronic Displays	**bn €**	**4**	**11**	**10**	**10**	**14**	**18**	**21**	**23**	**23**	**26**
	SSTB	bn €	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	1.2	3.4	4.6	5.7	6.7	8.7	11.4	14.9	19.5
	Total STB set top boxes (Complex & Simple)		**0**	**2**	**4**	**5**	**6**	**7**	**9**	**11**	**15**	**19**
	VIDEO players/recorders	bn €	0.0	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	0.8	1.7	2.7	4.1	5.2	6.3	7.7	9.3	11.4
	Total VIDEO		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**8**	**9**	**11**
	ES Rack servers	bn €	0.1	2.1	2.8	3.7	5.4	8.1	11.7	13.9	16.8	20.4
	ES Blade servers	bn €	0.0	0.5	0.6	0.7	1.0	1.5	2.1	2.5	3.0	3.7
	ES Storage	bn €	0.0	0.2	0.3	0.3	0.5	0.6	0.8	0.9	1.1	1.4
	Total ES Enterprise Servers		**0**	**3**	**4**	**5**	**7**	**10**	**15**	**17**	**21**	**25**
	PC Desktop	bn €	2.3	3.2	2.2	1.0	0.7	0.9	1.1	1.3	1.6	2.0
	PC Notebook	bn €	0.0	1.1	0.7	0.2	0.2	0.2	0.2	0.3	0.4	0.4
	PC Tablet/slate	bn €	0.0	0.0	0.4	0.4	0.4	0.6	0.8	1.0	1.3	1.6
	PC Thin client	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	bn €	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
	Total PC, electricity		**2**	**4**	**3**	**2**	**1**	**2**	**2**	**3**	**3**	**4**
	EP-Copier mono	bn €	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2
	EP-printer mono	bn €	1.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	EP-printer colour	bn €	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.6	2.1	2.8
	IJ SFD printer	bn €	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	IJ MFD printer	bn €	0.2	0.2	0.3	0.4	0.6	0.8	1.0	1.3	1.7	2.3
	Total imaging equipment, electricity and		**33**	**32**	**34**	**37**	**38**	**41**	**43**	**46**	**49**	**52**
	this total includes following toner and paper costs:		*30*	*31*	*33*	*35*	*36*	*38*	*40*	*42*	*44*	*46*
	SB Home Gateway	bn €	0.0	1.4	2.0	3.0	3.8	4.6	5.2	5.7	5.6	4.9
	SB Home NAS	bn €	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.6
	SB Home Phones (fixed)	bn €	0.1	0.5	0.6	0.8	0.9	0.9	0.9	0.9	0.8	0.6
	SB Office Phones (fixed)	bn €	0.1	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5
	Total SB (networked) StandBy (rest)		**0.2**	**2**	**3**	**4**	**6**	**7**	**7**	**8**	**8**	**7**
	Total BC Battery Charged devices	**bn €**	**0.0**	**0.4**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**
	UPS below 1.5 kVA	bn €	0.1	0.2	0.2	0.3	0.4	0.5	0.8	1.0	1.3	1.7
	UPS 1.5 to 5 kVA	bn €	0.4	0.7	0.9	1.1	1.6	2.3	3.1	4.2	5.5	7.0
	UPS 5 to 10 kVA	bn €	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9
	UPS 10 to 200 kVA	bn €	0.5	1.0	1.2	1.3	1.7	2.2	2.8	3.6	4.5	5.6
	Total UPS - Uninterrupted Power Supplies	**bn €**	**1**	**2**	**2**	**3**	**4**	**5**	**7**	**9**	**12**	**15**
	TOTAL ELECTRONICS		**40**	**58**	**64**	**69**	**80**	**95**	**111**	**126**	**141**	**162**
	Total RF household Refrigerators & Freezers	bn €	**25**	**24**	**29**	**35**	**42**	**51**	**62**	**75**	**91**	**111**
	CF open vertical chilled multi deck (RVC2)	bn €	1.9	1.7	1.9	2.1	2.4	2.8	3.4	4.1	5.1	6.2
	CF open horizontal frozen island (RHF4)	bn €	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
	CF other supermarket display (non-BCs)	bn €	3.7	3.5	3.9	4.5	5.4	6.6	8.2	10.1	12.5	15.5
	CF Plug in one door beverage cooler	bn €	2.3	2.1	2.3	2.5	3.0	3.6	4.4	5.5	6.9	8.6
	CF Plug in horizontal ice cream freezer	bn €	0.6	0.5	0.5	0.6	0.7	0.9	1.1	1.3	1.6	2.0
	CF Spiral vending machine	bn €	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.8	1.0
	Total CF Commercial Refrigeration		**9**	**8**	**9**	**10**	**12**	**15**	**18**	**22**	**27**	**34**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.2	0.3	0.3	0.4	0.5	0.7	0.8	1.1	1.3	1.7
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.6	2.0
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.3
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.8
	PF Storage cabinets All types	**bn €**	**0.7**	**0.9**	**1.1**	**1.4**	**1.7**	**2.2**	**2.8**	**3.6**	**4.6**	**5.8**

db	BAU Running costs (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.4	0.7	1.0	1.4	1.9	2.5	3.4	4.5	5.9	7.8
	PF Process Chiller AC MT L > 300 kW	bn €	0.4	0.7	1.0	1.3	1.8	2.5	3.3	4.3	5.7	7.5
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.4	0.7	1.0	1.4	1.9	2.6	3.4	4.5	6.0	7.8
	PF Process Chiller AC LT L > 200 kW	bn €	0.4	0.8	1.0	1.5	2.0	2.6	3.5	4.7	6.2	8.1
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.3	1.7	2.2
	PF Process Chiller WC MT L > 300 kW	bn €	0.2	0.3	0.4	0.6	0.8	1.1	1.4	1.9	2.4	3.2
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.1	0.3	0.4	0.5	0.7	0.9	1.2	1.6	2.1	2.8
	PF Process Chiller WC LT L > 200 kW	bn €	0.2	0.3	0.5	0.6	0.9	1.2	1.5	2.0	2.7	3.5
	PF Process Chiller All MT&LT	**bn €**	**2**	**4**	**6**	**8**	**10**	**14**	**19**	**25**	**33**	**43**
	PF Condensing Unit MT S 0.2-1 kW	bn €	0.8	0.5	0.6	0.8	1.0	1.3	1.8	2.3	3.0	4.0
	PF Condensing Unit MT M 1-5 kW	bn €	2.0	1.4	1.6	2.0	2.6	3.4	4.5	5.8	7.7	10.0
	PF Condensing Unit MT L 5-20 kW	bn €	2.4	1.7	1.9	2.4	3.2	4.2	5.5	7.2	9.4	12.3
	PF Condensing Unit MT XL 20-50 kW	bn €	2.4	1.7	1.9	2.4	3.2	4.2	5.4	7.1	9.4	12.3
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	PF Condensing Unit LT M 0.4-2 kW	bn €	0.4	0.3	0.3	0.4	0.5	0.6	0.8	1.1	1.4	1.9
	PF Condensing Unit LT L 2-8 kW	bn €	0.6	0.4	0.5	0.6	0.8	1.0	1.4	1.8	2.3	3.1
	PF Condensing Unit LT XL 8-20 kW	bn €	1.9	1.3	1.5	1.9	2.5	3.2	4.2	5.6	7.3	9.5
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**11**	**7**	**8**	**11**	**14**	**18**	**24**	**31**	**41**	**54**
	PF Professional Refrigeration, Total	**bn €**	**7**	**8**	**10**	**13**	**18**	**24**	**31**	**41**	**54**	**70**
	TOTAL FOOD PRESERVATION		**41**	**40**	**48**	**58**	**72**	**89**	**111**	**138**	**172**	**215**
	CA El. Hobs	bn €	3.6	5.3	7.1	9.4	12.3	15.9	20.3	25.9	32.9	41.7
	CA El. Ovens	bn €	3.9	3.7	4.2	4.8	5.7	7.0	8.8	10.8	13.2	16.2
	CA Gas Hobs	bn €	1.7	1.6	1.9	2.2	2.6	3.0	3.5	4.0	4.6	5.3
	CA Gas Ovens	bn €	0.7	0.6	0.7	0.7	0.8	0.9	1.1	1.3	1.5	1.8
	CA Range Hoods	bn €	1.7	1.9	2.4	3.1	4.0	5.1	6.5	8.3	10.6	13.5
	Total CA Cooking Appliances		**12**	**13**	**16**	**20**	**25**	**32**	**40**	**50**	**63**	**78**
	COFFEE Dripfilter (glass)	bn €	1.89	1.26	1.35	1.36	1.48	1.79	2.18	2.65	3.22	3.92
	COFFEE Dripfilter (thermos)	bn €	0.06	0.18	0.22	0.27	0.34	0.41	0.51	0.62	0.77	0.94
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.08	0.12	0.16	0.22	0.29	0.39	0.51	0.67	0.87
	COFFEE Pad filter	bn €	0.00	0.18	0.25	0.33	0.44	0.57	0.74	0.96	1.25	1.60
	COFFEE Hard cap espresso	bn €	0.00	0.05	0.10	0.21	0.32	0.39	0.48	0.58	0.71	0.86
	COFFEE Semi-auto espresso	bn €	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	COFFEE Fully-auto espresso	bn €	0.02	0.02	0.03	0.05	0.06	0.08	0.11	0.15	0.20	0.26
	Total CM household Coffee Makers		**2.0**	**1.8**	**2.1**	**2.4**	**2.9**	**3.6**	**4.5**	**5.5**	**6.9**	**8.5**
	TOTAL COOKING		**14**	**15**	**18**	**23**	**28**	**36**	**45**	**56**	**70**	**87**
	Total WM household Washing Machine	bn €	**19**	**25**	**29**	**33**	**37**	**42**	**48**	**54**	**61**	**69**
	including detergent and water costs	*bn €*	*10*	*18*	*21*	*23*	*26*	*30*	*34*	*38*	*43*	*49*
	Total DW household Dishwasher	bn €	**3**	**7**	**10**	**13**	**17**	**22**	**28**	**35**	**45**	**56**
	including detergent and water costs	*bn €*	*1*	*3*	*4*	*5*	*6*	*8*	*10*	*12*	*15*	*18*
	LD vented el.	bn €	1.5	1.9	2.4	2.8	3.3	3.9	4.8	5.9	7.2	8.9
	LD condens el.	bn €	0.3	2.4	3.6	5.2	7.1	8.9	10.8	13.0	15.7	19.0
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**2**	**4**	**6**	**8**	**10**	**13**	**16**	**19**	**23**	**28**
	VC dom	bn €	1.8	2.9	4.6	5.9	10.3	14.3	19.5	25.6	32.8	40.8
	VC nondom	bn €	0.4	0.5	0.7	0.9	1.2	1.5	1.9	2.5	3.1	4.0
	Total VC Vacuum Cleaner	bn €	**4**	**5**	**7**	**9**	**14**	**18**	**24**	**30**	**38**	**47**
	including costs of bags & filters	bn €	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
	TOTAL CLEANING		**28**	**42**	**52**	**63**	**78**	**95**	**115**	**138**	**167**	**200**
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	2.4	5.9	8.1	10.8	14.4	18.4	22.6	27.3	33.1	40.1
0.5	FAN Axial>300Pa	bn €	4.1	10.7	14.3	18.2	22.9	28.4	34.6	41.9	50.8	61.7
0.5	FAN Centr.FC	bn €	1.1	2.1	2.9	3.8	4.9	6.3	7.7	9.3	11.2	13.5
0.5	FAN Centr.BC-free	bn €	2.6	4.8	6.6	8.8	11.7	15.5	19.9	24.9	30.9	38.2
0.5	FAN Centr.BC	bn €	2.8	5.5	7.7	10.2	13.6	18.0	23.5	30.6	40.3	53.1
0.5	FAN Cross-flow	bn €	0.2	0.3	0.4	0.6	0.8	1.0	1.3	1.7	2.2	2.8
	Total FAN, industrial (excl. box & roof fans)		**7**	**15**	**20**	**26**	**34**	**44**	**55**	**68**	**84**	**105**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**97**	**118**	**147**	**187**	**235**	**288**	**348**	**421**	**509**	**616**
	Total WP Water Pumps	bn €	**12**	**14**	**17**	**22**	**28**	**37**	**47**	**61**	**78**	**100**
	CP Fixed Speed 5-1280 l/s	bn €	3.2	5.8	5.7	5.9	6.9	8.5	10.5	12.9	16.0	19.8
	CP Variable speed 5-1280 l/s	bn €	0.0	1.0	2.1	3.3	4.3	5.4	6.6	8.1	10.0	12.3
	CP Pistons 2-64 l/s	bn €	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.8	0.9
	Total CP Standard Air Compressors	**bn €**	**3**	**7**	**8**	**9**	**12**	**14**	**18**	**22**	**27**	**33**
	TOTAL INDUSTRY COMPONENTS		70	94	118	151	191	239	294	361	444	546

db	BAU Running costs (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	bn €	1.4	2.1	2.7	3.7	5.0	6.6	8.8	11.5	15.0	19.6
	TRAFO Industry oil	bn €	1.1	1.6	2.1	2.9	3.8	5.0	6.5	8.5	11.1	14.4
	TRAFO Industry dry	bn €	0.3	0.5	0.7	0.9	1.2	1.6	2.1	2.7	3.5	4.5
	TRAFO Power	bn €	4.1	5.6	7.3	9.8	13.1	17.4	22.8	29.8	38.9	50.6
	TRAFO DER oil	bn €	0.0	0.0	0.1	0.2	0.4	0.9	1.8	3.2	5.6	9.0
	TRAFO DER dry	bn €	0.0	0.2	0.4	0.9	1.9	3.8	7.4	13.7	23.5	38.2
	TRAFO Small	bn €	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	Total TRAFO Utility Transformers		**7**	**10**	**14**	**19**	**26**	**36**	**50**	**70**	**98**	**137**
	TOTAL ENERGY SECTOR (energy already included in power generation factor, so reference=0)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	bn €	23.1	31.2	38.1	47.2	58.2	63.4	66.5	68.9	71.5	80.8
	TYRE van replacement tyres C2	bn €	6.2	8.8	11.0	13.6	16.5	17.6	18.2	18.4	20.5	23.3
	TYRE truck replacement tyres C3	bn €	9.4	11.6	13.3	17.3	20.0	23.1	25.6	27.8	30.0	32.0
	TYRE Replacement Tyres	bn €	**39**	**52**	**62**	**78**	**95**	**104**	**110**	**115**	**122**	**136**
	TRANSPORT SECTOR	bn €	**39**	**52**	**62**	**78**	**95**	**104**	**110**	**115**	**122**	**136**
	GENERAL TOTAL (in bn euros)		**521**	**671**	**814**	**974**	**1169**	**1400**	**1672**	**1992**	**2373**	**2836**

BAU Running costs (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	66	84	105	128	157	192	239	302	385	490
SPACE HEATING	bn €	178	209	251	289	336	398	468	543	619	695
SPACE COOLING	bn €	11	24	30	39	49	60	72	86	102	121
VENTILATION	bn €	4	11	15	19	24	29	36	44	55	70
LIGHTING (excl. SPL, ctrl & sb)	bn €	30	43	51	57	59	64	72	83	97	115
ELECTRONICS	bn €	40	58	64	69	80	95	111	126	141	162
FOOD PRESERVATION	bn €	41	40	48	58	72	89	111	138	172	215
COOKING	bn €	14	15	18	23	28	36	45	56	70	87
CLEANING	bn €	28	42	52	63	78	95	115	138	167	200
INDUSTRY COMPONENTS	bn €	70	94	118	151	191	239	294	361	444	546
ENERGY SECTOR	bn €	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	bn €	39	52	62	78	95	104	110	115	122	136
TOTAL in bn euros		**521**	**671**	**814**	**974**	**1169**	**1400**	**1672**	**1992**	**2373**	**2836**



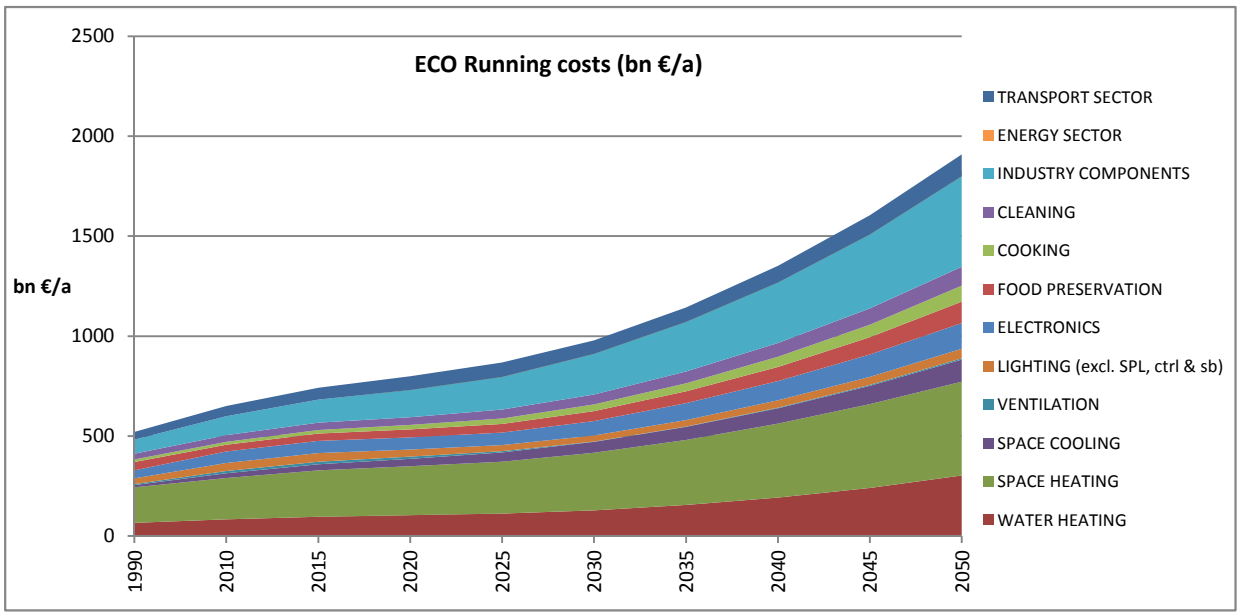
db	ECO Running costs (in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**53**	**58**	**64**	**68**	**72**	**82**	**98**	**121**	**153**	**193**
	Total CH Central Heating combi, water heat	bn €	**13**	**25**	**33**	**37**	**41**	**47**	**58**	**72**	**89**	**110**
	TOTAL WATER HEATING		**66**	**84**	**97**	**105**	**113**	**129**	**156**	**193**	**241**	**303**
	Total CH Central Heating boiler, space heat	bn €	**125**	**148**	**158**	**156**	**154**	**162**	**178**	**195**	**211**	**223**
	SFB Wood Manual	bn €	8	3	3	3	2	1	1	1	1	1
	SFB Wood Direct Draft	bn €	0	1	2	3	5	6	7	9	13	18
	SFB Coal	bn €	2	1	1	1	0	0	0	0	0	0
	SFB Pellets	bn €	0	0	1	2	2	3	4	5	6	8
	SFB Wood chips	bn €	0	0	1	1	1	1	1	2	2	3
	Total Solid Fuel Boiler		**10**	**5**	**8**	**9**	**11**	**12**	**13**	**17**	**22**	**29**
	CHAE-S (≤ 400 kW)	bn €	0.7	2.0	2.6	3.2	3.7	4.3	4.8	4.8	4.3	3.1
	CHAE-L (> 400 kW)	bn €	0.8	1.7	2.2	2.7	3.1	3.4	3.8	4.2	4.9	5.7
	CHWE-S (≤ 400 kW)	bn €	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.2	0.4	0.5	0.7	0.8	0.8	0.9	1.1	1.2	1.4
	CHWE-L (> 1500 kW)	bn €	0.1	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.9
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	HT PCH-AE-S	bn €	2.9	4.0	5.1	6.4	7.8	9.3	11.3	14.1	17.5	21.7
	HT PCH-AE-L	bn €	2.7	3.8	4.8	6.1	7.2	8.5	10.1	12.4	15.3	19.0
	HT PCH-WE-S	bn €	0.6	0.8	1.1	1.4	1.7	2.1	2.5	3.1	3.9	4.8
	HT PCH-WE-M	bn €	1.2	1.7	2.2	2.8	3.5	4.2	5.2	6.5	8.0	9.8
	HT PCH-WE-L	bn €	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.5	1.9
	AC rooftop	bn €	0.5	1.2	1.4	1.4	1.3	0.9	0.5	0.3	0.2	0.3
	AC splits	bn €	0.8	2.3	2.6	2.8	2.9	3.0	3.1	3.3	3.4	3.6
	AC VRF	bn €	0.0	1.4	2.2	3.4	4.6	6.2	7.9	9.7	11.6	13.5
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Cooling		**11**	**20**	**26**	**32**	**38**	**44**	**52**	**62**	**73**	**87**
	AC rooftop (rev)	bn €	0.6	1.6	1.9	1.9	1.7	1.2	0.7	0.2	0.0	0.0
	AC splits (rev)	bn €	1.1	3.2	3.8	4.3	4.7	5.0	5.3	5.7	6.2	6.7
	AC VRF (rev)	bn €	0.0	1.7	2.9	4.5	6.3	8.7	11.3	13.7	16.2	18.7
	ACF (rev)	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	AHF	bn €	6.2	6.8	7.8	7.9	7.9	8.0	8.4	9.0	9.7	10.4
	AHE	bn €	0.1	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Air Heating		**8**	**14**	**17**	**19**	**21**	**23**	**26**	**29**	**33**	**36**
	Total AHC Air Heating & Cooling		**19**	**32**	**40**	**48**	**55**	**63**	**73**	**85**	**100**	**117**
	LH open fireplace	bn €	0	1	1	1	1	2	2	2	2	3
	LH closed fireplace/inset	bn €	0	1	2	3	4	5	6	7	8	10
	LH wood stove	bn €	1	1	2	2	3	3	4	4	5	6
	LH coal stove	bn €	1	0	1	1	1	1	1	1	1	1
	LH cooker	bn €	0	1	1	1	2	2	2	2	3	3
	LH SHR stove	bn €	0	1	1	1	2	3	3	4	5	6
	LH pellet stove	bn €	0	0	1	1	1	2	2	3	3	4
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	1	1	1	1	1	2	2	2	2	3
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	5	5	6	6	7	9	11	13	15	18
	LH elec.convector	bn €	21	20	23	26	31	38	47	56	67	79
	LH elec.storage	bn €	2	1	2	2	2	3	3	4	4	5
	LH elec.underfloor	bn €	3	3	3	4	4	5	6	7	9	10
	LH luminous heaters	bn €	0	0	0	0	0	0	0	1	1	1
	LH tube heaters	bn €	0	0	1	1	1	1	1	1	1	2
	LH total	bn €	**35**	**36**	**45**	**52**	**61**	**75**	**90**	**108**	**127**	**151**
	RAC (cooling demand), all types <12 kW	bn €	0	3	4	5	8	10	12	15	19	24
	RAC (heating demand), reversible <12kW	bn €	0	4	6	8	12	15	18	21	25	29
	Total RAC Room Air Conditioner	bn €	**1**	**7**	**10**	**14**	**20**	**25**	**31**	**37**	**44**	**53**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**4**	**5**	**5**
	TOTAL SPACE HEATING	bn €	**178**	**206**	**232**	**244**	**259**	**287**	**326**	**370**	**418**	**469**
	TOTAL SPACE COOLING	bn €	**11**	**24**	**30**	**38**	**46**	**54**	**65**	**77**	**92**	**110**
	NRVU Ventilation units	bn €	3.1	9.1	10.4	9.4	7.0	3.8	3.6	5.1	7.5	11.3
	RVU Central Unidir.	bn €	1.1	1.9	1.8	0.7	-1.0	-3.0	-4.0	-5.3	-7.0	-9.1
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0.0	0.3	0.5	0.8	1.2	1.5	1.9	2.4	2.9	3.7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6
	Total VU Ventilation Units		**4**	**11**	**13**	**11**	**7**	**2**	**2**	**3**	**4**	**6**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**4**	**11**	**13**	**11**	**7**	**2**	**2**	**3**	**4**	**6**

db	ECO Running costs (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS Light Sources											
	LFL Linear Fluorescent	bn €	9.9	13.5	16.9	16.9	13.6	9.8	8.3	6.9	4.5	2.0
	CFL Compact Fluorescent	bn €	0.6	4.1	5.7	5.6	2.2	0.6	0.1	0.1	0.1	0.1
	Tungsten	bn €	1.4	8.0	9.3	4.9	0.7	0.2	0.2	0.2	0.3	0.3
	GLS GeneralLighting Service (incandescent)	bn €	13.5	6.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	bn €	4.2	7.9	5.9	4.0	2.7	2.0	2.4	3.0	3.7	4.7
	LED Light Emitting Diode	bn €	0.0	0.0	0.6	4.3	9.8	16.5	21.9	26.5	32.3	40.9
	SP Special Purpose (exempt)	bn €	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
	lighting controls & sb	bn €	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
	GLS stock	bn €	0.0	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tungsten stock	bn €	0.0	0.0	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING (incl. SPL, ctrl & sb)		**37**	**51**	**53**	**47**	**40**	**41**	**47**	**54**	**61**	**73**
	TOTAL LIGHTING (excl. SPL, ctrl & sb)		**30**	**41**	**42**	**36**	**29**	**29**	**33**	**37**	**41**	**48**
	DP TV, on mode	bn €	3.2	8.9	8.1	3.5	2.2	2.7	3.6	5.2	7.6	10.8
	DP Monitor, on mode	bn €	0.1	1.2	1.0	0.2	0.1	0.1	0.2	0.3	0.3	0.5
	DP TV , sb mode	bn €	0.7	0.8	1.2	2.4	2.3	3.1	4.1	5.4	7.1	9.3
	DP Monitor, sb mode	bn €	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Electronic Displays	**bn €**	**4**	**11**	**10**	**6**	**5**	**6**	**8**	**11**	**15**	**21**
	SSTB	bn €	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	1.2	3.0	3.5	4.4	5.2	6.7	8.8	11.5	14.9
	Total STB set top boxes (Complex & Simple)		**0**	**1**	**3**	**4**	**4**	**5**	**7**	**9**	**11**	**15**
	VIDEO players/recorders	bn €	0.0	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	0.8	1.5	2.5	3.7	4.8	5.8	7.1	8.6	10.5
	Total VIDEO		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**10**
	ES Rack servers	bn €	0.1	2.1	2.8	3.3	4.0	5.8	8.4	9.9	12.0	14.6
	ES Blade servers	bn €	0.0	0.5	0.6	0.6	0.7	1.0	1.5	1.8	2.2	2.6
	ES Storage	bn €	0.0	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8
	Total ES Enterprise Servers		**0**	**3**	**4**	**4**	**5**	**7**	**10**	**12**	**15**	**18**
	PC Desktop	bn €	2.3	3.2	2.2	1.0	0.7	0.9	1.1	1.3	1.6	2.0
	PC Notebook	bn €	0.0	1.1	0.7	0.2	0.2	0.2	0.2	0.3	0.4	0.4
	PC Tablet/slate	bn €	0.0	0.0	0.4	0.4	0.4	0.6	0.8	1.0	1.3	1.6
	PC Thin client	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	bn €	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
	Total PC, electricity		**2**	**4**	**3**	**2**	**1**	**2**	**2**	**3**	**3**	**4**
	EP-Copier mono	bn €	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4
	EP-printer mono	bn €	1.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	EP-printer colour	bn €	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.9
	IJ SFD printer	bn €	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	IJ MFD printer	bn €	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.6
	Total imaging equipment, electricity and	**bn €**	**33**	**32**	**33**	**35**	**36**	**38**	**40**	**42**	**44**	**47**
	including the following toner and paper costs:	bn €	*30*	*31*	*33*	*34*	*35*	*37*	*39*	*41*	*42*	*45*
	SB Home Gateway	bn €	0.0	1.4	2.0	2.9	3.8	4.6	5.2	5.7	5.6	4.9
	SB Home NAS	bn €	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.6
	SB Home Phones (fixed)	bn €	0.1	0.5	0.6	0.8	0.9	0.9	0.9	0.9	0.8	0.6
	SB Office Phones (fixed)	bn €	0.1	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5
	Total SB (networked) StandBy (rest)	**bn €**	**0**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**8**	**7**
	Total BC Battery Charged devices	**bn €**	**0.0**	**0.3**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.9**	**1.0**	**1.1**
	UPS below 1.5 kVA	bn €	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1
	UPS 1.5 to 5 kVA	bn €	0.4	0.7	0.9	0.8	0.4	0.4	0.5	0.7	0.8	1.0
	UPS 5 to 10 kVA	bn €	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6
	UPS 10 to 200 kVA	bn €	0.5	1.0	1.2	1.3	1.4	1.7	2.2	2.7	3.3	4.0
	Total UPS - Uninterrupted Power Supplies	**bn €**	**1.0**	**1.9**	**2.3**	**2.3**	**2.0**	**2.4**	**3.0**	**3.8**	**4.8**	**5.8**
	TOTAL ELECTRONICS		**40**	**57**	**62**	**60**	**63**	**72**	**84**	**96**	**111**	**128**
	Total RF household Refrigerators & Freezers	bn €	**25**	**18**	**18**	**18**	**18**	**19**	**19**	**19**	**19**	**22**
	CF open vertical chilled multi deck (RVC2)	bn €	1.9	1.7	1.8	1.8	1.6	1.7	2.0	2.5	3.0	3.7
	CF open horizontal frozen island (RHF4)	bn €	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4
	CF other supermarket display (non-BCs)	bn €	3.7	3.5	3.9	4.2	4.5	5.2	6.3	7.7	9.4	11.7
	CF Plug in one door beverage cooler	bn €	2.3	2.1	2.3	2.2	2.1	2.3	2.9	3.6	4.4	5.5
	CF Plug in horizontal ice cream freezer	bn €	0.6	0.5	0.5	0.6	0.7	0.8	1.0	1.3	1.6	2.0
	CF Spiral vending machine	bn €	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.5
	Total CF Commercial Refrigeration		**9**	**8**	**9**	**9**	**9**	**10**	**13**	**16**	**19**	**24**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.8	1.0
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.3	0.3	0.4	0.4	0.4	0.4	0.6	0.7	0.9	1.2
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.8
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.4	0.5
	PF Storage cabinets All types	**bn €**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**3**	**3**

db	ECO Running costs (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.4	0.7	1.0	1.4	1.8	2.4	3.1	4.1	5.5	7.1
	PF Process Chiller AC MT L > 300 kW	bn €	0.4	0.7	1.0	1.3	1.7	2.3	3.0	4.0	5.3	6.9
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.4	0.7	1.0	1.4	1.8	2.4	3.2	4.2	5.5	7.2
	PF Process Chiller AC LT L > 200 kW	bn €	0.4	0.8	1.0	1.4	1.9	2.5	3.3	4.3	5.7	7.5
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2	1.5	2.0
	PF Process Chiller WC MT L > 300 kW	bn €	0.2	0.3	0.4	0.6	0.7	1.0	1.3	1.7	2.3	3.0
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.1	0.3	0.4	0.5	0.6	0.8	1.1	1.5	2.0	2.6
	PF Process Chiller WC LT L > 200 kW	bn €	0.2	0.3	0.5	0.6	0.8	1.1	1.4	1.9	2.5	3.3
	PF Process Chiller All MT&LT	**bn €**	**2**	**4**	**6**	**8**	**10**	**13**	**17**	**23**	**30**	**40**
	PF Condensing Unit MT S 0.2-1 kW	bn €	0.8	0.5	0.6	0.7	0.9	1.2	1.6	2.1	2.7	3.6
	PF Condensing Unit MT M 1-5 kW	bn €	2.0	1.4	1.6	1.9	2.4	3.2	4.2	5.4	7.1	9.4
	PF Condensing Unit MT L 5-20 kW	bn €	2.4	1.7	1.9	2.3	2.9	3.8	5.0	6.6	8.6	11.3
	PF Condensing Unit MT XL 20-50 kW	bn €	2.4	1.7	1.9	2.3	2.9	3.8	5.0	6.6	8.6	11.3
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	PF Condensing Unit LT M 0.4-2 kW	bn €	0.4	0.3	0.3	0.3	0.4	0.6	0.7	1.0	1.3	1.7
	PF Condensing Unit LT L 2-8 kW	bn €	0.6	0.4	0.5	0.5	0.7	0.9	1.2	1.5	2.0	2.6
	PF Condensing Unit LT XL 8-20 kW	bn €	1.9	1.3	1.5	1.8	2.2	2.9	3.8	5.0	6.6	8.6
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**11**	**7**	**8**	**10**	**13**	**17**	**22**	**28**	**37**	**49**
	PF Professional Refrigeration, Total	**bn €**	**7**	**8**	**10**	**13**	**16**	**21**	**28**	**37**	**48**	**63**
	TOTAL FOOD PRESERVATION		41	34	37	40	44	50	59	71	86	108
	CA El. Hobs	bn €	3.6	5.3	7.1	9.4	12.2	15.8	20.2	25.8	32.7	41.5
	CA El. Ovens	bn €	3.9	3.7	4.2	4.7	5.4	6.5	7.9	9.6	11.8	14.4
	CA Gas Hobs	bn €	1.7	1.6	1.9	2.2	2.6	3.0	3.4	3.9	4.5	5.2
	CA Gas Ovens	bn €	0.7	0.6	0.7	0.7	0.7	0.8	0.8	1.0	1.1	1.3
	CA Range Hoods	bn €	1.7	1.9	2.4	3.0	3.4	4.0	4.7	5.9	7.5	9.4
	Total CA Cooking Appliances	**bn €**	**12**	**13**	**16**	**20**	**24**	**30**	**37**	**46**	**58**	**72**
	COFFEE Dripfilter (glass)	bn €	1.89	1.26	1.29	1.10	1.18	1.43	1.73	2.11	2.57	3.12
	COFFEE Dripfilter (thermos)	bn €	0.06	0.18	0.22	0.27	0.34	0.41	0.51	0.62	0.77	0.94
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.08	0.12	0.16	0.22	0.29	0.39	0.51	0.67	0.87
	COFFEE Pad filter	bn €	0.00	0.18	0.23	0.25	0.32	0.42	0.55	0.71	0.92	1.19
	COFFEE Hard cap espresso	bn €	0.00	0.05	0.09	0.16	0.24	0.29	0.35	0.43	0.52	0.64
	COFFEE Semi-auto espresso	bn €	0.02	0.02	0.03	0.02	0.03	0.03	0.04	0.04	0.04	0.05
	COFFEE Fully-auto espresso	bn €	0.02	0.02	0.03	0.03	0.05	0.06	0.08	0.11	0.15	0.19
	Total CM household Coffee Makers	**bn €**	**2**	**2**	**2**	**2**	**2**	**3**	**4**	**5**	**6**	**7**
	TOTAL COOKING		14	15	18	22	27	33	41	51	63	79
	Total WM household Washing Machine	bn €	**19**	**18**	**18**	**18**	**18**	**19**	**21**	**24**	**27**	**31**
	including detergent and water costs	*bn €*	*10*	*12*	*12*	*12*	*12*	*13*	*14*	*15*	*17*	*19*
	Total DW household Dishwasher	bn €	**3**	**6**	**7**	**9**	**11**	**14**	**18**	**22**	**27**	**34**
	including detergent and water costs	*bn €*	*1*	*3*	*3*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
	LD vented el.	bn €	1.5	1.9	2.3	2.8	3.2	3.7	4.5	5.5	6.8	8.4
	LD condens el.	bn €	0.3	2.4	3.5	4.4	5.2	5.9	6.8	8.0	9.3	10.9
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**2**	**4**	**6**	**7**	**8**	**10**	**11**	**14**	**16**	**19**
	VC dom	bn €	1.8	2.9	3.7	2.5	3.8	4.4	5.2	6.0	6.8	7.5
	VC nondom	bn €	0.4	0.5	0.6	0.6	0.7	0.9	1.1	1.4	1.7	2.1
	Total VC Vacuum Cleaner	bn €	**4**	**5**	**6**	**5**	**7**	**8**	**9**	**10**	**11**	**12**
	including costs of bags & filters	bn €	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
	TOTAL CLEANING		28	33	37	39	44	50	58	69	81	96
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	2.4	5.9	7.8	9.8	12.1	14.9	18.0	21.8	26.4	31.9
0.5	FAN Axial>300Pa	bn €	4.1	10.7	14.0	17.1	20.4	24.4	29.3	35.4	42.9	52.1
0.5	FAN Centr.FC	bn €	1.1	2.1	2.8	3.3	3.9	4.6	5.6	6.7	8.0	9.7
0.5	FAN Centr.BC-free	bn €	2.6	4.8	6.4	8.0	10.1	13.1	16.8	21.0	26.0	32.2
0.5	FAN Centr.BC	bn €	2.8	5.5	7.4	9.2	11.6	15.1	19.6	25.5	33.5	44.1
0.5	FAN Cross-flow	bn €	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.8	1.1
	Total FAN, industrial (excl. box & roof fans)		**7**	**15**	**19**	**24**	**29**	**36**	**45**	**55**	**69**	**86**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**97**	**117**	**140**	**166**	**197**	**242**	**294**	**357**	**435**	**529**
	Total WP Water Pumps	bn €	**12**	**14**	**17**	**22**	**28**	**36**	**46**	**59**	**76**	**97**
	CP Fixed Speed 5-1280 l/s	bn €	3.2	5.8	5.7	5.8	6.7	8.2	10.2	12.6	15.7	19.5
	CP Variable speed 5-1280 l/s	bn €	0.0	1.0	2.1	3.2	4.2	5.3	6.5	8.0	9.9	12.3
	CP Pistons 2-64 l/s	bn €	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.8	0.9
	Total CP Standard Air Compressors	**bn €**	**3**	**7**	**8**	**9**	**11**	**14**	**17**	**21**	**26**	**33**
	TOTAL INDUSTRY COMPONENTS		70	94	114	138	167	207	255	315	388	480

db	ECO Running costs (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	bn €	1.4	2.1	2.7	3.4	4.3	5.4	6.8	8.5	10.5	13.0
	TRAFO Industry oil	bn €	1.1	1.6	2.0	2.5	3.0	3.5	4.0	4.9	6.4	8.3
	TRAFO Industry dry	bn €	0.3	0.5	0.7	0.8	1.0	1.3	1.6	2.0	2.5	3.3
	TRAFO Power	bn €	4.1	5.6	7.3	9.8	13.1	17.4	22.8	29.8	38.9	50.6
	TRAFO DER oil	bn €	0.0	0.0	0.1	0.2	0.3	0.6	1.1	1.9	3.3	5.4
	TRAFO DER dry	bn €	0.0	0.2	0.4	0.8	1.5	3.0	5.7	10.3	17.8	28.8
	TRAFO Small	bn €	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	Total TRAFO Utility Transformers		**7**	**10**	**13**	**18**	**24**	**32**	**43**	**58**	**80**	**110**
	TOTAL ENERGY SECTOR (only improvement over BAU)		**0**	**0**	**0**	**-1**	**-2**	**-4**	**-7**	**-12**	**-18**	**-27**
	TYRE car replacement tyres C1	bn €	23.1	31.2	37.1	41.6	45.1	41.2	43.1	49.4	56.4	64.2
	TYRE van replacement tyres C2	bn €	6.2	8.8	10.5	11.2	11.2	11.3	13.0	14.9	17.1	19.4
	TYRE truck replacement tyres C3	bn €	9.4	11.6	12.9	15.3	15.8	15.7	17.1	19.6	22.4	25.5
	TYRE Replacement Tyres	bn €	**39**	**52**	**60**	**68**	**72**	**68**	**73**	**84**	**96**	**109**
	TRANSPORT SECTOR	bn €	**39**	**52**	**60**	**68**	**72**	**68**	**73**	**84**	**96**	**109**
	GENERAL TOTAL (in bn euros)		**521**	**651**	**742**	**799**	**869**	**979**	**1144**	**1352**	**1605**	**1909**

ECO Running costs (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	66	84	97	105	113	129	156	193	241	303
SPACE HEATING	bn €	178	206	232	244	259	287	326	370	418	469
SPACE COOLING	bn €	11	24	30	38	46	54	65	77	92	110
VENTILATION	bn €	4	11	13	11	7	2	2	3	4	6
LIGHTING (excl. SPL, ctrl & sb)	bn €	30	41	42	36	29	29	33	37	41	48
ELECTRONICS	bn €	40	57	62	60	63	72	84	96	111	128
FOOD PRESERVATION	bn €	41	34	37	40	44	50	59	71	86	108
COOKING	bn €	14	15	18	22	27	33	41	51	63	79
CLEANING	bn €	28	33	37	39	44	50	58	69	81	96
INDUSTRY COMPONENTS	bn €	70	94	114	138	167	207	255	315	388	480
ENERGY SECTOR	bn €	0	0	0	-1	-2	-4	-7	-12	-18	-27
TRANSPORT SECTOR	bn €	39	52	60	68	72	68	73	84	96	109
TOTAL in bn euros		**521**	**651**	**742**	**799**	**869**	**979**	**1144**	**1352**	**1605**	**1909**



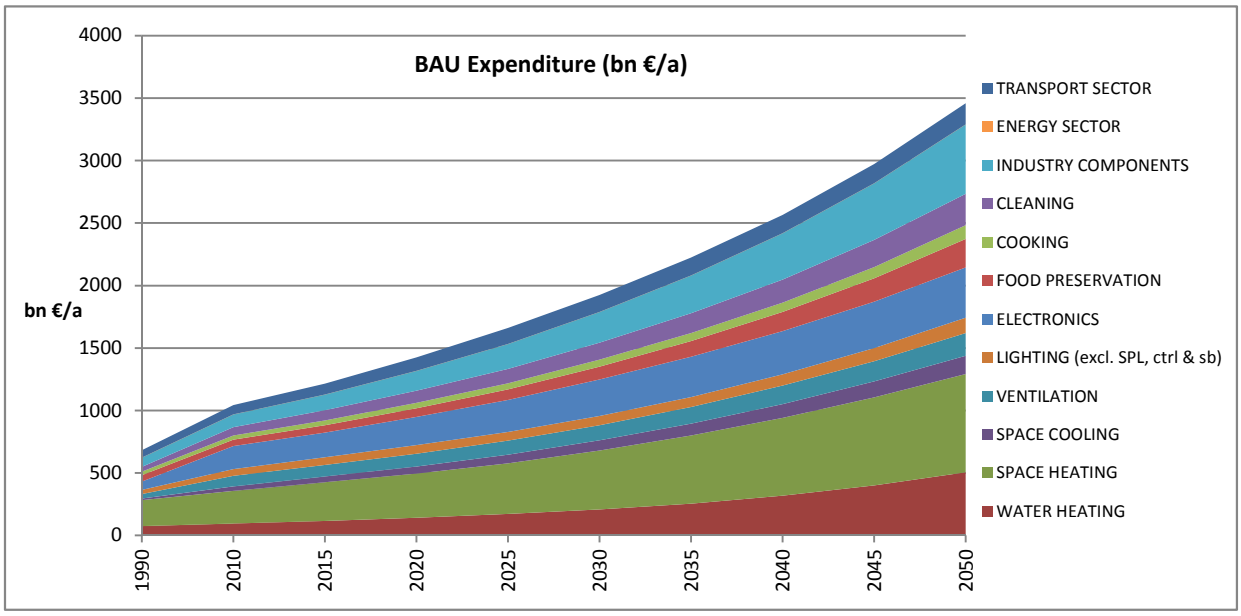
Running costs saving ECO vs. BAU		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	0	0	8	23	44	63	83	109	143	188
SPACE HEATING	bn €	0	3	19	45	77	111	142	173	201	225
SPACE COOLING	bn €	0	0	0	1	3	5	7	8	10	11
VENTILATION	bn €	0	0	2	8	16	27	34	42	51	63
LIGHTING	bn €	0	2	8	21	30	34	39	46	56	67
ELECTRONICS	bn €	0	1	2	9	17	23	28	30	30	33
FOOD PRESERVATION	bn €	0	6	11	18	28	39	52	67	86	107
COOKING	bn €	0	0	0	1	1	3	4	5	6	8
CLEANING	bn €	0	9	15	24	34	45	56	70	86	104
INDUSTRY COMPONENTS	bn €	0	0	4	13	25	32	39	46	55	66
ENERGY SECTOR	bn €	0	0	0	1	2	4	7	12	18	27
TRANSPORT SECTOR	bn €	0	0	2	10	23	36	37	31	26	27
TOTAL in bn euros		**0**	**20**	**72**	**175**	**300**	**420**	**528**	**639**	**769**	**926**
Saving in % versus BAU (from 1990=0)		0.0%	3.0%	8.8%	17.9%	25.7%	30.0%	31.6%	32.1%	32.4%	32.7%
Saving In % versus BAU (from 2010=0)		-3.9%	0.0%	6.3%	15.9%	23.9%	28.6%	30.4%	31.1%	31.5%	31.9%

db	BAU Expenditure (in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**58**	**64**	**76**	**91**	**109**	**130**	**156**	**193**	**242**	**304**
	Total CH Central Heating combi, water heat	bn €	**16**	**32**	**41**	**51**	**62**	**78**	**98**	**125**	**159**	**202**
	TOTAL WATER HEATING		**74**	**96**	**117**	**142**	**171**	**207**	**254**	**317**	**401**	**507**
	Total CH Central Heating boiler, space heat	bn €	**143**	**178**	**205**	**227**	**256**	**298**	**345**	**394**	**438**	**475**
	SFB Wood Manual	bn €	9.0	3.5	3.6	3.1	2.5	1.8	1.4	1.2	1.2	1.2
	SFB Wood Direct Draft	bn €	0.1	2.2	3.6	5.1	6.5	7.7	9.4	11.9	15.9	21.7
	SFB Coal	bn €	2.7	1.1	0.9	0.7	0.4	0.2	0.1	0.1	0.1	0.1
	SFB Pellets	bn €	0.0	0.8	1.5	2.2	3.0	3.8	4.6	5.6	6.9	8.7
	SFB Wood chips	bn €	0.0	0.5	0.8	1.0	1.2	1.3	1.7	2.1	2.7	3.4
	Total Solid Fuel Boiler		**12**	**8**	**10**	**12**	**14**	**15**	**17**	**21**	**27**	**35**
	CHAE-S (≤ 400 kW)	bn €	1.0	3.5	4.3	5.1	5.8	6.6	6.9	6.1	4.8	3.3
	CHAE-L (> 400 kW)	bn €	0.9	2.0	2.5	3.0	3.5	3.9	4.4	4.9	5.6	6.4
	CHWE-S (≤ 400 kW)	bn €	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.2	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5
	CHWE-L (> 1500 kW)	bn €	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	1.0
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	HT PCH-AE-S	bn €	3.0	4.3	5.4	6.9	8.6	10.5	12.8	15.7	19.2	23.5
	HT PCH-AE-L	bn €	2.9	4.0	5.1	6.5	8.1	9.9	12.0	14.7	17.9	22.0
	HT PCH-WE-S	bn €	0.6	0.9	1.1	1.5	1.8	2.2	2.7	3.3	4.0	4.9
	HT PCH-WE-M	bn €	1.4	2.0	2.5	3.1	3.8	4.6	5.6	6.8	8.3	10.1
	HT PCH-WE-L	bn €	0.2	0.4	0.5	0.6	0.8	0.9	1.1	1.4	1.7	2.1
	AC rooftop	bn €	0.7	1.9	2.1	2.0	1.6	1.0	0.6	0.4	0.3	0.3
	AC splits	bn €	1.1	3.4	3.7	3.9	4.1	4.2	4.3	4.5	4.6	4.8
	AC VRF	bn €	0.0	4.2	5.9	8.7	11.4	14.5	17.6	20.7	23.7	26.4
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	SubTotal AHC Air Cooling		**12**	**28**	**34**	**43**	**52**	**61**	**71**	**81**	**93**	**108**
	AC rooftop (rev)	bn €	0.7	2.1	2.3	2.3	2.1	1.5	0.8	0.3	0.0	0.0
	AC splits (rev)	bn €	1.3	3.9	4.6	5.1	5.6	6.0	6.3	6.7	7.1	7.5
	AC VRF (rev)	bn €	0.0	4.1	5.8	9.0	11.9	15.2	18.6	21.6	24.5	27.0
	ACF (rev)	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	AHF	bn €	6.9	7.3	8.2	8.6	9.1	9.7	10.3	11.1	11.8	12.6
	AHE	bn €	0.1	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Air Heating	bn €	**9**	**18**	**21**	**25**	**29**	**33**	**37**	**40**	**44**	**48**
	Total AHC Air Heating & Cooling		**21**	**40**	**49**	**60**	**70**	**82**	**94**	**108**	**123**	**141**
	LH open fireplace	bn €	1.8	2.8	3.1	3.4	3.7	4.0	4.3	4.7	5.3	5.9
	LH closed fireplace/inset	bn €	1.4	3.8	5.0	6.2	7.3	8.5	9.8	11.2	12.7	14.4
	LH wood stove	bn €	1.8	2.3	2.9	3.4	3.9	4.5	5.2	6.0	6.9	7.9
	LH coal stove	bn €	0.9	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7
	LH cooker	bn €	1.0	2.1	2.7	3.3	3.6	4.0	4.3	4.6	5.0	5.4
	LH SHR stove	bn €	2.2	3.1	4.1	5.0	5.9	7.0	7.9	8.8	9.8	10.9
	LH pellet stove	bn €	0.0	1.2	1.7	2.3	2.8	3.3	3.8	4.3	4.8	5.5
	LH open fire gas	bn €	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
	LH closed fire gas	bn €	1.1	1.2	1.4	1.6	1.8	2.1	2.4	2.8	3.2	3.7
	LH flueless fuel heater	bn €	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
	LH elec.portable	bn €	5.2	4.9	5.9	7.0	8.4	10.2	12.3	14.7	17.4	20.6
	LH elec.convector	bn €	22.2	21.4	25.3	30.1	36.0	43.4	52.1	61.9	73.0	86.3
	LH elec.storage	bn €	1.7	1.6	1.9	2.3	2.7	3.3	3.9	4.7	5.6	6.6
	LH elec.underfloor	bn €	3.3	3.3	3.8	4.5	5.4	6.5	7.7	9.1	10.9	12.9
	LH luminous heaters	bn €	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8
	LH tube heaters	bn €	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.3	1.5	1.8
	LH total	bn €	**43**	**50**	**60**	**71**	**84**	**99**	**117**	**136**	**158**	**184**
	RAC (cooling demand), all types <12 kW	bn €	1.0	8.1	11.4	14.8	18.4	21.4	24.5	28.3	33.0	38.8
	RAC (heating demand), reversible <12kW	bn €	0.4	7.2	12.0	17.0	22.3	26.3	29.7	33.5	37.8	42.7
	Total RAC Room Air Conditioner	bn €	**1**	**15**	**23**	**32**	**41**	**48**	**54**	**62**	**71**	**82**
	CIRC Circulator pumps <2.5 kW, net load	bn €	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**13**
	TOTAL SPACE HEATING	bn €	**208**	**260**	**308**	**353**	**405**	**471**	**545**	**624**	**705**	**784**
	TOTAL SPACE COOLING	bn €	**13**	**36**	**46**	**58**	**70**	**82**	**95**	**110**	**126**	**146**
	NRVU Ventilation units	bn €	32.9	78.8	84.5	91.5	98.8	106.5	115.1	124.8	136.0	149.2
	RVU Central Unidir.	bn €	2.6	5.3	5.4	5.5	6.0	6.8	7.9	9.5	11.5	14.0
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0.2	1.4	3.4	4.8	6.1	7.7	9.2	11.0	13.2	15.8
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.1	0.3	0.5	0.9	1.3	1.8	2.4	3.1	4.0
	Total VU Ventilation Units		**36**	**86**	**94**	**102**	**112**	**122**	**134**	**148**	**164**	**183**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**36**	**86**	**94**	**102**	**112**	**122**	**134**	**148**	**164**	**183**
	LS Light Sources											
	LFL Linear Fluorescent	bn €	12.1	16.8	20.3	23.5	27.0	30.8	35.0	39.7	45.4	52.1
	CFL Compact Fluorescent	bn €	0.9	6.4	8.5	8.9	7.5	7.0	7.2	7.6	8.1	8.6
	Tungsten	bn €	1.9	11.5	14.0	16.2	13.1	10.9	9.4	7.8	7.0	7.5
	GLS GeneralLighting Service (incandescent)	bn €	14.9	10.2	9.1	7.9	5.8	2.3	0.6	0.1	0.0	0.0
	HID High Intensity Discharge	bn €	4.7	8.9	9.3	9.9	11.1	13.4	16.1	19.3	23.4	28.2
	LED Light Emitting Diode	bn €	0.0	0.3	0.8	2.7	5.4	8.1	11.7	15.6	19.7	24.6
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	bn €	**35**	**54**	**62**	**69**	**70**	**72**	**80**	**90**	**104**	**121**

db	BAU Expenditure (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV	bn €	15.7	40.5	35.6	42.2	48.4	55.6	62.3	67.8	71.3	77.8
	DP Monitor	bn €	1.9	5.5	3.5	3.4	3.7	3.8	3.8	3.6	3.1	3.0
	Total Electronic Displays	**bn €**	**18**	**46**	**39**	**46**	**52**	**59**	**66**	**71**	**74**	**81**
	SSTB	bn €	0.0	1.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	6.2	9.5	11.2	12.4	13.3	15.8	19.1	23.2	28.2
	Total STB set top boxes (Complex & Simple)		**0**	**8**	**10**	**11**	**12**	**13**	**16**	**19**	**23**	**28**
	VIDEO players/recorders	bn €	0.0	3.9	3.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	3.0	2.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	7.2	7.1	6.9	9.0	10.1	11.2	12.6	14.2	16.3
	Total VIDEO		**0**	**14**	**13**	**9**	**9**	**10**	**11**	**13**	**14**	**16**
	ES Rack servers	bn €	0.3	8.0	9.4	11.4	14.7	19.9	24.5	26.4	29.4	33.0
	ES Blade servers	bn €	0.4	4.8	5.0	5.6	6.8	8.6	9.9	9.9	10.5	11.1
	ES Storage	bn €	0.3	3.4	4.0	4.4	5.0	5.5	5.9	5.8	6.0	6.3
	Total ES Enterprise Servers		**1**	**16**	**18**	**21**	**26**	**34**	**40**	**42**	**46**	**50**
	PC Desktop	bn €	5.6	14.3	10.5	8.6	8.3	8.4	8.6	8.9	9.2	9.5
	PC Notebook	bn €	0.4	26.4	12.3	11.1	11.1	11.1	11.1	11.2	11.3	11.3
	PC Tablet/slate	bn €	0.0	1.7	27.5	44.5	57.4	68.5	72.0	75.6	79.3	83.1
	PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	PC Workstation	bn €	0.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	Total PC, electricity		**6**	**45**	**53**	**67**	**79**	**91**	**94**	**98**	**102**	**107**
	EP-Copier mono	bn €	4.8	1.6	0.9	0.4	0.3	0.2	0.1	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.5	2.2	3.3	3.8	4.2	4.7	5.2	5.7	6.3
	EP-printer mono	bn €	2.1	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.5
	EP-printer colour	bn €	0.0	0.8	1.2	1.7	2.1	2.6	3.2	3.9	4.7	5.7
	IJ SFD printer	bn €	0.8	1.1	0.8	0.5	0.4	0.4	0.3	0.2	0.2	0.1
	IJ MFD printer	bn €	1.0	2.6	3.6	4.3	4.8	5.4	6.0	6.7	7.5	8.4
	Total imaging equipment, electricity and		**38**	**39**	**43**	**46**	**49**	**52**	**55**	**58**	**62**	**67**
	this total includes following toner and paper costs:		*30*	*31*	*33*	*35*	*36*	*38*	*40*	*42*	*44*	*46*
	SB Home Gateway	bn €	0.0	7.5	10.0	12.7	15.3	17.9	20.4	22.6	24.4	25.3
	SB Home NAS	bn €	0.0	0.6	1.1	1.7	2.2	2.7	3.2	3.7	4.1	4.4
	SB Home Phones (fixed)	bn €	0.5	2.8	3.4	3.7	3.8	3.8	3.8	3.8	3.7	3.5
	SB Office Phones (fixed)	bn €	0.7	1.5	1.6	1.7	1.8	2.0	2.1	2.1	2.2	2.1
	Total SB (networked) StandBy (rest)		**1**	**12**	**16**	**20**	**23**	**26**	**29**	**32**	**34**	**35**
	Total BC Battery Charged devices	**bn €**	**0.0**	**0.4**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**
	UPS below 1.5 kVA	bn €	0.2	0.3	0.4	0.5	0.7	0.9	1.1	1.4	1.7	2.1
	UPS 1.5 to 5 kVA	bn €	0.6	1.1	1.3	1.6	2.2	2.9	3.9	5.0	6.3	7.9
	UPS 5 to 10 kVA	bn €	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.2
	UPS 10 to 200 kVA	bn €	0.7	1.4	1.6	1.8	2.3	2.9	3.6	4.4	5.4	6.5
	Total UPS - Uninterrupted Power Supplies	**bn €**	**1**	**3**	**3**	**4**	**5**	**7**	**9**	**12**	**14**	**18**
	TOTAL ELECTRONICS		**66**	**184**	**197**	**224**	**258**	**293**	**322**	**347**	**372**	**403**
	Total RF household Refrigerators & Freezers	bn €	**32**	**32**	**37**	**43**	**51**	**60**	**71**	**84**	**100**	**120**
	CF open vertical chilled multi deck (RVC2)	bn €	2.2	2.1	2.2	2.4	2.7	3.2	3.8	4.5	5.4	6.6
	CF open horizontal frozen island (RHF4)	bn €	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.6
	CF other supermarket display (non-BCs)	bn €	4.4	4.3	4.9	5.5	6.4	7.7	9.2	11.2	13.6	16.7
	CF Plug in one door beverage cooler	bn €	2.9	2.8	2.9	3.2	3.7	4.4	5.2	6.3	7.7	9.5
	CF Plug in horizontal ice cream freezer	bn €	0.8	0.8	0.8	0.9	1.0	1.2	1.4	1.6	2.0	2.4
	CF Spiral vending machine	bn €	0.8	0.7	0.5	0.5	0.6	0.6	0.8	0.9	1.0	1.2
	Total CF Commercial Refrigeration		**11**	**11**	**12**	**13**	**15**	**17**	**21**	**25**	**30**	**37**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.4	1.7	2.1
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.4	0.4	0.5	0.6	0.8	0.9	1.1	1.4	1.8	2.2
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.1	1.4
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.7	0.8
	PF Storage cabinets All types	**bn €**	**1.1**	**1.4**	**1.6**	**1.9**	**2.3**	**2.8**	**3.5**	**4.3**	**5.2**	**6.5**
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.4	0.8	1.1	1.5	2.0	2.6	3.5	4.6	6.0	7.9
	PF Process Chiller AC MT L > 300 kW	bn €	0.4	0.8	1.0	1.4	1.9	2.5	3.4	4.4	5.8	7.6
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.4	0.8	1.1	1.5	2.0	2.6	3.5	4.6	6.0	7.9
	PF Process Chiller AC LT L > 200 kW	bn €	0.4	0.8	1.1	1.5	2.0	2.7	3.6	4.8	6.2	8.2
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.1	0.2	0.3	0.4	0.6	0.7	1.0	1.3	1.7	2.2
	PF Process Chiller WC MT L > 300 kW	bn €	0.2	0.3	0.5	0.6	0.8	1.1	1.5	1.9	2.5	3.3
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.1	0.3	0.4	0.5	0.7	1.0	1.3	1.7	2.2	2.8
	PF Process Chiller WC LT L > 200 kW	bn €	0.2	0.4	0.5	0.7	0.9	1.2	1.6	2.1	2.7	3.6
	PF Process Chiller All MT&LT	**bn €**	**2**	**4**	**6**	**8**	**11**	**15**	**19**	**25**	**33**	**43**

db	BAU Expenditure (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	bn €	0.9	0.7	0.7	0.9	1.2	1.5	1.9	2.5	3.2	4.2
	PF Condensing Unit MT M 1-5 kW	bn €	2.3	1.7	1.8	2.3	2.9	3.8	4.8	6.3	8.1	10.5
	PF Condensing Unit MT L 5-20 kW	bn €	2.8	2.0	2.2	2.8	3.5	4.5	5.9	7.6	9.9	12.8
	PF Condensing Unit MT XL 20-50 kW	bn €	2.7	1.9	2.1	2.7	3.4	4.4	5.8	7.5	9.7	12.6
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5
	PF Condensing Unit LT M 0.4-2 kW	bn €	0.4	0.3	0.3	0.4	0.5	0.7	0.9	1.2	1.5	2.0
	PF Condensing Unit LT L 2-8 kW	bn €	0.7	0.5	0.6	0.7	0.9	1.2	1.5	1.9	2.5	3.2
	PF Condensing Unit LT XL 8-20 kW	bn €	2.0	1.4	1.6	2.0	2.6	3.4	4.4	5.7	7.4	9.7
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**12**	**9**	**10**	**12**	**15**	**20**	**25**	**33**	**43**	**56**
	PF Professional Refrigeration, Total	**bn €**	**8**	**9**	**11**	**15**	**19**	**25**	**33**	**43**	**56**	**72**
	TOTAL FOOD PRESERVATION		**52**	**52**	**60**	**71**	**85**	**102**	**124**	**152**	**186**	**229**
	CA El. Hobs	bn €	5.9	10.6	12.7	15.5	18.7	22.6	27.3	33.2	40.4	49.4
	CA El. Ovens	bn €	9.0	9.7	10.5	11.6	12.3	13.7	15.5	17.6	20.1	23.2
	CA Gas Hobs	bn €	4.4	3.8	3.9	4.1	4.2	4.5	4.8	5.2	5.7	6.3
	CA Gas Ovens	bn €	1.4	1.3	1.3	1.4	1.5	1.6	1.7	1.9	2.1	2.3
	CA Range Hoods	bn €	2.9	3.4	4.0	4.8	5.7	6.9	8.4	10.3	12.7	15.6
	Total CA Cooking Appliances		**24**	**29**	**33**	**37**	**42**	**49**	**58**	**68**	**81**	**97**
	COFFEE Dripfilter (glass)	bn €	2.26	1.52	1.57	1.54	1.65	1.96	2.35	2.82	3.39	4.09
	COFFEE Dripfilter (thermos)	bn €	0.13	0.29	0.33	0.39	0.45	0.53	0.63	0.74	0.89	1.06
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.27	0.33	0.39	0.47	0.57	0.69	0.84	1.02	1.25
	COFFEE Pad filter	bn €	0.00	0.61	0.72	0.84	0.98	1.16	1.37	1.63	1.95	2.35
	COFFEE Hard cap espresso	bn €	0.06	0.27	0.58	0.93	1.07	1.14	1.23	1.33	1.46	1.61
	COFFEE Semi-auto espresso	bn €	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10
	COFFEE Fully-auto espresso	bn €	0.36	0.42	0.49	0.56	0.64	0.73	0.82	0.92	1.03	1.15
	Total CM household Coffee Makers		**3**	**3**	**4**	**5**	**5**	**6**	**7**	**8**	**10**	**12**
	TOTAL COOKING		**27**	**32**	**37**	**42**	**48**	**55**	**65**	**77**	**91**	**109**
	Total WM household Washing Machine	bn €	**24**	**31**	**35**	**39**	**43**	**49**	**54**	**60**	**67**	**75**
	including detergent and water costs	*bn €*	*10*	*18*	*21*	*23*	*26*	*30*	*34*	*38*	*43*	*49*
	Total DW household Dishwasher	bn €	**5**	**11**	**14**	**18**	**22**	**28**	**35**	**43**	**53**	**65**
	including detergent and water costs	*bn €*	*1*	*3*	*4*	*5*	*6*	*8*	*10*	*12*	*15*	*18*
	LD vented el.	bn €	2.3	2.7	3.2	3.5	4.0	4.6	5.5	6.6	8.0	9.6
	LD condens el.	bn €	0.8	4.2	5.7	7.5	9.4	11.3	13.2	15.4	18.2	21.4
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**3**	**7**	**9**	**11**	**14**	**16**	**19**	**22**	**26**	**31**
	VC dom	bn €	5.8	14.6	21.0	25.8	32.3	38.4	45.6	53.9	63.1	73.2
	VC nondom	bn €	1.1	1.3	1.5	1.8	2.1	2.5	2.9	3.5	4.2	5.1
	Total VC Vacuum Cleaner	bn €	**8**	**18**	**24**	**30**	**37**	**43**	**51**	**60**	**69**	**80**
	including costs of bags & filters	bn €	*1.5*	*1.9*	*2.0*	*2.1*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.1*
	TOTAL CLEANING		**40**	**67**	**83**	**98**	**116**	**136**	**158**	**184**	**216**	**252**
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	2.8	7.2	9.6	12.5	16.1	20.1	24.3	29.0	34.8	41.8
0.5	FAN Axial>300Pa	bn €	4.6	12.6	16.2	20.3	25.0	30.4	36.7	44.0	52.9	63.8
0.5	FAN Centr.FC	bn €	1.4	2.9	3.8	4.9	6.0	7.4	8.8	10.4	12.3	14.6
0.5	FAN Centr.BC-free	bn €	2.8	5.3	7.2	9.4	12.4	16.2	20.6	25.6	31.6	38.9
0.5	FAN Centr.BC	bn €	3.2	6.6	9.0	11.7	15.2	19.7	25.4	32.6	42.5	55.4
0.5	FAN Cross-flow	bn €	0.3	0.5	0.6	0.8	1.0	1.3	1.6	2.0	2.5	3.2
	Total FAN, industrial (excl. box & roof fans)		**8**	**18**	**23**	**30**	**38**	**48**	**59**	**72**	**88**	**109**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**99**	**120**	**149**	**190**	**237**	**290**	**351**	**424**	**512**	**618**
	Total WP Water Pumps	bn €	**13**	**16**	**20**	**25**	**31**	**40**	**51**	**64**	**82**	**104**
	CP Fixed Speed 5-1280 l/s	bn €	3.6	6.2	6.0	6.2	7.3	8.9	10.9	13.4	16.4	20.2
	CP Variable speed 5-1280 l/s	bn €	0.0	1.2	2.3	3.5	4.6	5.6	6.9	8.4	10.3	12.7
	CP Pistons 2-64 l/s	bn €	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1
	Total CP Standard Air Compressors	**bn €**	**4**	**8**	**9**	**10**	**12**	**15**	**18**	**23**	**28**	**34**
	TOTAL INDUSTRY COMPONENTS		74	101	126	160	200	248	303	371	454	556
	TRAFO Distribution	bn €	1.9	2.8	3.5	4.6	5.9	7.6	9.8	12.6	16.2	20.8
	TRAFO Industry oil	bn €	1.3	2.0	2.6	3.3	4.3	5.5	7.1	9.1	11.7	15.0
	TRAFO Industry dry	bn €	0.5	0.7	0.9	1.1	1.4	1.8	2.3	3.0	3.8	4.9
	TRAFO Power	bn €	6.0	8.6	10.6	13.3	16.9	21.4	27.2	34.4	43.8	55.8
	TRAFO DER oil	bn €	0.0	0.1	0.1	0.3	0.5	1.1	2.0	3.5	6.0	9.5
	TRAFO DER dry	bn €	0.0	0.3	0.7	1.3	2.5	4.8	8.9	15.6	25.9	41.1
	TRAFO Small	bn €	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0
	Total TRAFO Utility Transformers		**10**	**15**	**19**	**24**	**32**	**43**	**58**	**79**	**108**	**148**
	TOTAL ENERGY SECTOR (BAU=0 as reference)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	bn €	35.8	46.9	53.6	65.3	78.6	83.8	86.9	89.3	91.9	101.2
	TYRE van replacement tyres C2	bn €	10.8	14.4	16.5	20.1	23.8	24.9	25.4	25.7	27.8	30.6
	TYRE truck replacement tyres C3	bn €	12.3	14.3	16.4	20.6	23.6	26.9	29.4	31.6	33.7	35.8
	TYRE Replacement Tyres	bn €	**59**	**76**	**87**	**106**	**126**	**136**	**142**	**147**	**153**	**168**
	TRANSPORT SECTOR	bn €	**59**	**76**	**87**	**106**	**126**	**136**	**142**	**147**	**153**	**168**
	GENERAL TOTAL (in bn euros)		**683**	**1044**	**1215**	**1424**	**1660**	**1925**	**2223**	**2566**	**2971**	**3457**

BAU Expenditure (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	74	96	117	142	171	207	254	317	401	507
SPACE HEATING	bn €	208	260	308	353	405	471	545	624	705	784
SPACE COOLING	bn €	13	36	46	58	70	82	95	110	126	146
VENTILATION	bn €	36	86	94	102	112	122	134	148	164	183
LIGHTING (excl. SPL, ctrl & sb)	bn €	35	54	62	69	70	72	80	90	104	121
ELECTRONICS	bn €	66	184	197	224	258	293	322	347	372	403
FOOD PRESERVATION	bn €	52	52	60	71	85	102	124	152	186	229
COOKING	bn €	27	32	37	42	48	55	65	77	91	109
CLEANING	bn €	40	67	83	98	116	136	158	184	216	252
INDUSTRY COMPONENTS	bn €	74	101	126	160	200	248	303	371	454	556
ENERGY SECTOR	bn €	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	bn €	59	76	87	106	126	136	142	147	153	168
TOTAL in bn euros		683	1044	1215	1424	1660	1925	2223	2566	2971	3457

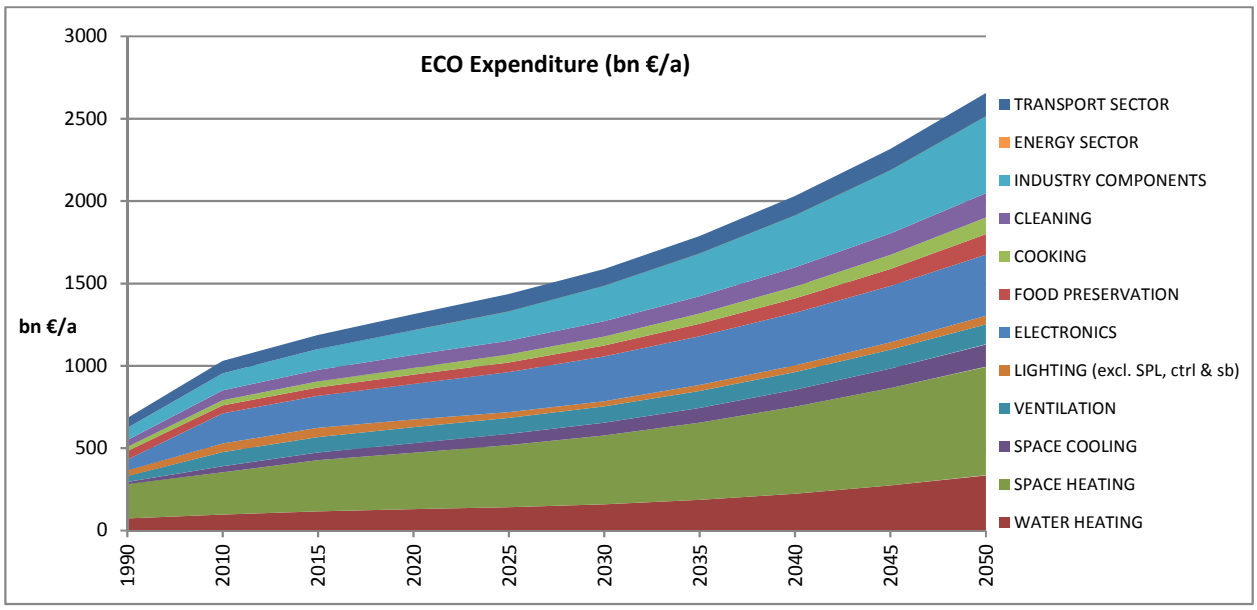


db	ECO Expenditure (in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**58**	**64**	**73**	**79**	**85**	**94**	**110**	**133**	**165**	**205**
	Total CH Central Heating combi, water heat	bn €	**16**	**32**	**43**	**50**	**56**	**63**	**75**	**90**	**108**	**131**
	TOTAL WATER HEATING		**74**	**96**	**116**	**129**	**141**	**158**	**185**	**224**	**273**	**335**
	Total CH Central Heating boiler, space heat	bn €	**143**	**176**	**207**	**219**	**234**	**253**	**281**	**313**	**343**	**370**
	SFB Wood Manual	bn €	9	3	4	3	2	2	1	1	1	1
	SFB Wood Direct Draft	bn €	0	2	4	5	7	8	9	12	16	22
	SFB Coal	bn €	3	1	1	1	0	0	0	0	0	0
	SFB Pellets	bn €	0	1	2	2	3	4	5	6	7	9
	SFB Wood chips	bn €	0	1	1	1	1	1	2	2	3	3
	Total Solid Fuel Boiler		**12**	**8**	**11**	**12**	**14**	**15**	**17**	**21**	**27**	**35**
	CHAE-S (≤ 400 kW)	bn €	1.0	3.5	4.3	5.1	5.8	6.5	6.7	5.8	4.5	3.2
	CHAE-L (> 400 kW)	bn €	0.9	2.0	2.4	3.0	3.4	3.7	4.1	4.6	5.2	6.1
	CHWE-S (≤ 400 kW)	bn €	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.2	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.5
	CHWE-L (> 1500 kW)	bn €	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	HT PCH-AE-S	bn €	3.0	4.3	5.4	6.7	8.1	9.7	11.7	14.4	17.9	22.2
	HT PCH-AE-L	bn €	2.9	4.0	5.1	6.3	7.5	8.7	10.4	12.7	15.6	19.4
	HT PCH-WE-S	bn €	0.6	0.9	1.1	1.4	1.8	2.1	2.6	3.2	4.0	4.9
	HT PCH-WE-M	bn €	1.4	2.0	2.5	3.1	3.7	4.5	5.5	6.8	8.3	10.1
	HT PCH-WE-L	bn €	0.2	0.4	0.5	0.6	0.7	0.9	1.1	1.3	1.6	2.0
	AC rooftop	bn €	0.7	1.9	2.1	2.0	1.6	1.0	0.6	0.4	0.3	0.3
	AC splits	bn €	1.1	3.4	3.7	3.9	4.0	4.0	4.1	4.2	4.4	4.5
	AC VRF	bn €	0.0	4.2	5.9	8.7	11.3	14.3	17.3	20.3	23.2	25.9
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	SubTotal AHC Air Cooling		**12**	**28**	**34**	**43**	**50**	**58**	**67**	**77**	**88**	**102**
	AC rooftop (rev)	bn €	0.7	2.1	2.3	2.3	1.9	1.3	0.7	0.2	0.0	0.0
	AC splits (rev)	bn €	1.3	3.9	4.6	5.0	5.4	5.6	5.9	6.3	6.8	7.3
	AC VRF (rev)	bn €	0.0	4.1	5.8	9.0	11.8	15.0	18.3	21.2	24.0	26.6
	ACF (rev)	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	AHF	bn €	6.9	7.3	8.2	8.3	8.3	8.4	8.7	9.3	10.0	10.7
	AHE	bn €	0.1	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Air Heating		**9**	**18**	**21**	**25**	**28**	**31**	**34**	**38**	**41**	**45**
	Total AHC Air Heating & Cooling		**21**	**40**	**49**	**59**	**67**	**77**	**88**	**100**	**115**	**133**
	LH open fireplace	bn €	1.8	2.8	3.1	3.8	4.2	4.3	4.3	4.4	4.6	4.9
	LH closed fireplace/inset	bn €	1.4	3.8	5.0	6.7	7.8	8.7	9.6	10.6	11.7	13.1
	LH wood stove	bn €	1.8	2.3	2.9	3.7	4.1	4.6	5.1	5.6	6.3	7.1
	LH coal stove	bn €	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6
	LH cooker	bn €	1.0	2.1	2.7	3.4	3.9	4.1	4.3	4.5	4.8	5.2
	LH SHR stove	bn €	2.2	3.1	4.1	5.0	5.9	6.9	7.8	8.7	9.8	10.9
	LH pellet stove	bn €	0.0	1.2	1.7	2.3	2.8	3.3	3.8	4.3	4.8	5.4
	LH open fire gas	bn €	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4
	LH closed fire gas	bn €	1.1	1.2	1.4	1.6	1.7	1.9	2.0	2.3	2.6	3.0
	LH flueless fuel heater	bn €	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
	LH elec.portable	bn €	5.2	4.9	5.8	6.4	7.3	9.0	11.0	13.1	15.5	18.4
	LH elec.convector	bn €	22.2	21.4	25.0	28.3	33.1	40.5	49.2	58.5	69.0	81.5
	LH elec.storage	bn €	1.7	1.6	1.9	2.2	2.4	2.8	3.3	4.0	4.7	5.5
	LH elec.underfloor	bn €	3.3	3.3	3.8	4.4	5.0	5.8	6.8	7.9	9.2	10.9
	LH luminous heaters	bn €	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8
	LH tube heaters	bn €	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.7
	LH total	bn €	**43**	**50**	**60**	**70**	**81**	**94**	**110**	**127**	**146**	**170**
	RAC (cooling demand), all types <12 kW	bn €	1.0	8.1	11.7	14.9	17.9	20.4	22.8	25.6	29.2	33.6
	RAC (heating demand), reversible <12kW	bn €	0.4	7.2	12.2	16.8	21.3	24.7	27.6	30.6	34.1	38.0
	Total RAC Room Air Conditioner	bn €	**1**	**15**	**24**	**32**	**39**	**45**	**50**	**56**	**63**	**72**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**3**	**4**	**4**	**4**	**5**	**5**	**5**	**6**	**6**	**7**
	TOTAL SPACE HEATING	bn €	**208**	**258**	**311**	**343**	**378**	**418**	**470**	**528**	**591**	**658**
	TOTAL SPACE COOLING	bn €	**13**	**36**	**46**	**57**	**68**	**78**	**89**	**102**	**117**	**136**
	NRVU Ventilation units	bn €	32.9	78.8	83.5	86.3	88.1	89.1	93.2	99.0	105.6	113.6
	RVU Central Unidir.	bn €	2.6	5.3	6.8	5.3	3.8	2.0	1.2	0.1	-1.4	-3.4
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0.2	1.4	3.9	5.0	5.7	6.4	7.1	7.8	8.7	9.8
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.1	0.3	0.5	0.7	0.8	1.1	1.3	1.6	1.9
	Total VU Ventilation Units		**36**	**86**	**94**	**97**	**98**	**98**	**103**	**108**	**114**	**122**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**36**	**86**	**94**	**97**	**98**	**98**	**103**	**108**	**114**	**122**
	LS Light Sources											
	LFL Linear Fluorescent	bn €	12.1	16.8	19.3	19.0	14.7	10.6	8.9	7.2	4.6	2.0
	CFL Compact Fluorescent	bn €	0.9	6.9	6.8	6.1	2.2	0.6	0.1	0.1	0.1	0.1
	Tungsten	bn €	1.9	11.7	13.5	5.9	0.8	0.2	0.2	0.2	0.3	0.4
	GLS GeneralLighting Service (incandescent)	bn €	14.9	7.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	bn €	4.7	9.0	6.6	4.4	3.0	2.1	2.5	3.1	3.9	4.9
	LED Light Emitting Diode	bn €	0.0	0.3	4.9	11.5	14.2	19.2	24.8	30.1	36.1	45.3
	GLS stock	bn €	0.0	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tungsten stock	bn €	0.0	0.0	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	bn €	**35**	**52**	**55**	**47**	**35**	**33**	**37**	**41**	**45**	**53**

db	ECO Expenditure (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV	bn €	15.7	40.5	35.6	38.8	40.4	45.0	50.2	56.6	64.0	72.8
	DP Monitor	bn €	1.9	5.5	3.4	2.6	2.5	2.5	2.6	2.7	2.7	2.9
	Total Electronic Displays	**bn €**	**18**	**46**	**39**	**41**	**43**	**48**	**53**	**59**	**67**	**76**
	SSTB	bn €	0.0	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	6.2	9.3	10.1	11.1	11.7	13.7	16.4	19.7	23.7
	Total STB set top boxes (Complex & Simple)		**0**	**8**	**10**	**10**	**11**	**12**	**14**	**16**	**20**	**24**
	VIDEO players/recorders	bn €	0.0	3.9	3.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	3.0	2.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	7.2	6.9	6.6	8.6	9.7	10.7	12.0	13.5	15.4
	Total VIDEO		**0**	**14**	**13**	**8**	**9**	**10**	**11**	**12**	**14**	**15**
	ES Rack servers	bn €	0.3	8.0	9.4	11.0	13.5	17.8	21.5	22.8	24.9	27.4
	ES Blade servers	bn €	0.4	4.8	5.0	5.5	6.6	8.2	9.3	9.3	9.6	10.1
	ES Storage	bn €	0.3	3.4	4.0	4.7	5.3	5.8	6.2	6.1	6.2	6.3
	Total ES Enterprise Servers		**1**	**16**	**18**	**21**	**25**	**32**	**37**	**38**	**41**	**44**
	PC Desktop	bn €	5.6	14.3	10.5	8.6	8.3	8.4	8.6	8.9	9.2	9.5
	PC Notebook	bn €	0.4	26.4	12.3	11.1	11.1	11.1	11.1	11.2	11.3	11.3
	PC Tablet/slate	bn €	0.0	1.7	27.5	44.5	57.4	68.5	72.0	75.6	79.3	83.1
	PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	PC Workstation	bn €	0.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	Total PC, electricity		**6**	**45**	**53**	**67**	**79**	**91**	**94**	**98**	**102**	**107**
	EP-Copier mono	bn €	4.8	1.5	0.9	0.4	0.3	0.2	0.1	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.5	2.1	3.2	3.6	4.0	4.3	4.7	5.1	5.5
	EP-printer mono	bn €	2.1	0.9	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3
	EP-printer colour	bn €	0.0	0.8	1.0	1.4	1.7	2.1	2.4	2.8	3.2	3.7
	IJ SFD printer	bn €	0.8	1.0	0.7	0.5	0.4	0.3	0.3	0.2	0.1	0.1
	IJ MFD printer	bn €	1.0	2.5	3.4	4.0	4.4	4.8	5.2	5.7	6.2	6.7
	Total imaging equipment, electricity and		**38**	**38**	**41**	**44**	**46**	**49**	**52**	**54**	**57**	**61**
	this total includes following toner and paper costs:		*30*	*31*	*33*	*34*	*35*	*37*	*39*	*41*	*42*	*45*
	SB Home Gateway	bn €	0.0	7.5	10.0	12.7	15.3	17.9	20.4	22.6	24.4	25.3
	SB Home NAS	bn €	0.0	0.6	1.1	1.6	2.1	2.6	3.1	3.6	4.1	4.4
	SB Home Phones (fixed)	bn €	0.5	2.8	3.4	3.7	3.8	3.8	3.8	3.8	3.7	3.5
	SB Office Phones (fixed)	bn €	0.7	1.5	1.6	1.7	1.8	2.0	2.1	2.1	2.2	2.1
	Total SB (networked) StandBy (rest)		**1**	**12**	**16**	**20**	**23**	**26**	**29**	**32**	**34**	**35**
	Total BC Battery Charged devices	bn €	0.0	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1
	UPS below 1.5 kVA	bn €	0.2	0.3	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.6
	UPS 1.5 to 5 kVA	bn €	0.6	1.1	1.3	1.2	0.9	1.1	1.2	1.5	1.7	1.9
	UPS 5 to 10 kVA	bn €	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.9
	UPS 10 to 200 kVA	bn €	0.7	1.4	1.6	1.8	2.0	2.4	2.9	3.5	4.2	4.9
	Total UPS - Uninterrupted Power Supplies	**bn €**	**1**	**3**	**3**	**4**	**4**	**4**	**5**	**6**	**7**	**8**
	TOTAL ELECTRONICS		**66**	**183**	**195**	**216**	**241**	**271**	**295**	**317**	**343**	**371**
	Total RF household Refrigerators & Freezers	bn €	**32**	**27**	**28**	**28**	**29**	**30**	**30**	**30**	**30**	**32**
	CF open vertical chilled multi deck (RVC2)	bn €	2.2	2.1	2.2	2.3	2.1	2.1	2.5	2.9	3.4	4.0
	CF open horizontal frozen island (RHF4)	bn €	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
	CF other supermarket display (non-BCs)	bn €	4.4	4.3	4.8	5.3	5.5	6.2	7.3	8.8	10.6	12.9
	CF Plug in one door beverage cooler	bn €	2.9	2.8	2.9	3.0	2.9	3.1	3.7	4.4	5.3	6.4
	CF Plug in horizontal ice cream freezer	bn €	0.8	0.8	0.8	0.9	1.0	1.1	1.3	1.6	1.9	2.3
	CF Spiral vending machine	bn €	0.8	0.7	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8
	Total CF Commercial Refrigeration		**11**	**11**	**12**	**12**	**12**	**13**	**16**	**19**	**22**	**27**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.4	0.5	0.6	0.7	0.7	0.7	0.8	1.0	1.2	1.4
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.4	0.4	0.5	0.6	0.5	0.6	0.7	0.9	1.1	1.4
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.9
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5
	PF Storage cabinets All types	**bn €**	**1.1**	**1.4**	**1.6**	**1.8**	**1.7**	**1.9**	**2.3**	**2.8**	**3.4**	**4.1**
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.4	0.8	1.1	1.4	1.9	2.4	3.2	4.3	5.6	7.3
	PF Process Chiller AC MT L > 300 kW	bn €	0.4	0.8	1.0	1.4	1.8	2.4	3.1	4.1	5.4	7.0
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.4	0.8	1.1	1.4	1.9	2.5	3.3	4.3	5.6	7.3
	PF Process Chiller AC LT L > 200 kW	bn €	0.4	0.8	1.1	1.5	1.9	2.5	3.4	4.4	5.8	7.6
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2	1.6	2.0
	PF Process Chiller WC MT L > 300 kW	bn €	0.2	0.3	0.5	0.6	0.8	1.0	1.4	1.8	2.3	3.1
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.1	0.3	0.4	0.5	0.7	0.9	1.2	1.5	2.0	2.6
	PF Process Chiller WC LT L > 200 kW	bn €	0.2	0.4	0.5	0.7	0.9	1.1	1.5	1.9	2.5	3.3
	PF Process Chiller All MT&LT	**bn €**	**2**	**4**	**6**	**8**	**10**	**14**	**18**	**24**	**31**	**40**

db	ECO Expenditure (in bn euros), c'td	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	bn €	0.9	0.7	0.7	0.9	1.1	1.4	1.8	2.3	2.9	3.8
	PF Condensing Unit MT M 1-5 kW	bn €	2.3	1.7	1.8	2.2	2.8	3.5	4.5	5.9	7.6	9.8
	PF Condensing Unit MT L 5-20 kW	bn €	2.8	2.0	2.2	2.7	3.3	4.2	5.4	7.0	9.1	11.8
	PF Condensing Unit MT XL 20-50 kW	bn €	2.7	1.9	2.1	2.6	3.2	4.1	5.3	6.9	9.0	11.7
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	PF Condensing Unit LT M 0.4-2 kW	bn €	0.4	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.7
	PF Condensing Unit LT L 2-8 kW	bn €	0.7	0.5	0.6	0.7	0.8	1.0	1.3	1.7	2.2	2.8
	PF Condensing Unit LT XL 8-20 kW	bn €	2.0	1.4	1.6	1.9	2.3	3.0	4.0	5.2	6.7	8.8
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**12**	**9**	**10**	**11**	**14**	**18**	**23**	**30**	**39**	**51**
	PF Professional Refrigeration, Total	**bn €**	**8**	**9**	**11**	**14**	**18**	**23**	**30**	**38**	**50**	**65**
	TOTAL FOOD PRESERVATION		**52**	**47**	**51**	**55**	**59**	**66**	**76**	**87**	**102**	**124**
	CA El. Hobs	bn €	5.9	10.6	12.7	15.7	18.9	22.8	27.5	33.3	40.5	49.5
	CA El. Ovens	bn €	9.0	9.7	10.6	11.9	12.4	13.2	14.6	16.5	18.7	21.5
	CA Gas Hobs	bn €	4.4	3.8	3.9	4.0	4.1	4.4	4.7	5.1	5.6	6.2
	CA Gas Ovens	bn €	1.4	1.3	1.4	1.6	1.6	1.6	1.7	1.8	1.9	2.1
	CA Range Hoods	bn €	2.9	3.4	4.0	5.0	5.8	6.4	7.2	8.4	9.9	11.9
	Total CA Cooking Appliances		**24**	**29**	**33**	**38**	**43**	**48**	**56**	**65**	**77**	**91**
	COFFEE Dripfilter (glass)	bn €	2.26	1.52	1.53	1.30	1.37	1.60	1.91	2.28	2.74	3.30
	COFFEE Dripfilter (thermos)	bn €	0.13	0.29	0.33	0.39	0.45	0.53	0.63	0.74	0.89	1.06
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.27	0.33	0.39	0.47	0.57	0.69	0.84	1.02	1.25
	COFFEE Pad filter	bn €	0.00	0.61	0.70	0.75	0.87	1.01	1.18	1.38	1.63	1.93
	COFFEE Hard cap espresso	bn €	0.06	0.27	0.57	0.88	0.99	1.04	1.10	1.18	1.27	1.39
	COFFEE Semi-auto espresso	bn €	0.08	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	COFFEE Fully-auto espresso	bn €	0.36	0.42	0.48	0.55	0.63	0.70	0.79	0.88	0.98	1.09
	Total CM household Coffee Makers		**3**	**3**	**4**	**4**	**5**	**6**	**6**	**7**	**9**	**10**
	TOTAL COOKING		**27**	**32**	**37**	**43**	**48**	**54**	**62**	**72**	**85**	**101**
	Total WM household Washing Machine	bn €	**24**	**25**	**25**	**26**	**26**	**26**	**28**	**30**	**33**	**37**
	including detergent and water costs	*bn €*	*10*	*12*	*12*	*12*	*12*	*13*	*14*	*15*	*17*	*19*
	Total DW household Dishwasher	bn €	**5**	**11**	**13**	**15**	**18**	**22**	**26**	**31**	**36**	**43**
	including detergent and water costs	*bn €*	*1*	*3*	*3*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
	LD vented el.	bn €	2.3	2.7	3.1	3.5	3.9	4.4	5.2	6.3	7.6	9.2
	LD condens el.	bn €	0.8	4.2	5.7	7.1	7.9	8.6	9.4	10.5	11.7	13.3
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**3**	**7**	**9**	**11**	**12**	**13**	**15**	**17**	**19**	**22**
	VC dom	bn €	5.8	14.6	20.6	23.0	25.8	28.5	31.4	34.3	37.1	39.9
	VC nondom	bn €	1.1	1.3	1.4	1.5	1.6	1.8	2.1	2.4	2.8	3.2
	Total VC Vacuum Cleaner	bn €	**8**	**18**	**24**	**27**	**30**	**33**	**36**	**39**	**42**	**45**
	including costs of bags & filters	bn €	*1.5*	*1.9*	*2.0*	*2.1*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.1*
	TOTAL CLEANING		**40**	**60**	**71**	**78**	**85**	**94**	**104**	**117**	**131**	**148**
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	2.8	7.2	9.7	12.1	14.4	17.0	20.1	23.7	28.2	33.7
0.5	FAN Axial>300Pa	bn €	4.6	12.6	16.0	19.3	22.5	26.4	31.3	37.5	45.0	54.2
0.5	FAN Centr.FC	bn €	1.4	2.9	4.0	5.1	5.6	6.2	7.0	8.1	9.4	11.0
0.5	FAN Centr.BC-free	bn €	2.8	5.3	7.0	8.8	10.9	13.9	17.5	21.7	26.7	32.9
0.5	FAN Centr.BC	bn €	3.2	6.6	9.2	11.3	13.8	17.2	21.9	27.8	35.9	46.6
0.5	FAN Cross-flow	bn €	0.3	0.5	0.9	1.1	1.2	1.2	1.3	1.5	1.7	1.9
	Total FAN, industrial (excl. box & roof fans)		**8**	**18**	**23**	**29**	**34**	**41**	**50**	**60**	**74**	**90**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**99**	**120**	**148**	**174**	**204**	**248**	**300**	**363**	**441**	**534**
	Total WP Water Pumps	bn €	**13**	**16**	**19**	**24**	**31**	**39**	**49**	**63**	**80**	**101**
	CP Fixed Speed 5-1280 l/s	bn €	3.6	6.2	6.0	6.2	7.1	8.6	10.6	13.1	16.1	19.9
	CP Variable speed 5-1280 l/s	bn €	0.0	1.2	2.3	3.5	4.5	5.5	6.8	8.3	10.2	12.6
	CP Pistons 2-64 l/s	bn €	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1
	Total CP Standard Air Compressors	**bn €**	**4**	**8**	**9**	**10**	**12**	**15**	**18**	**22**	**27**	**34**
	TOTAL INDUSTRY COMPONENTS		**74**	**101**	**125**	**150**	**179**	**219**	**267**	**327**	**401**	**492**
	TRAFO Distribution	bn €	1.9	2.8	3.7	4.5	5.4	6.6	8.1	9.9	12.0	14.5
	TRAFO Industry oil	bn €	1.3	2.0	2.7	3.2	3.7	4.3	4.9	5.8	7.3	9.3
	TRAFO Industry dry	bn €	0.5	0.7	0.9	1.1	1.4	1.6	2.0	2.4	2.9	3.7
	TRAFO Power	bn €	6.0	8.6	10.6	13.3	16.9	21.4	27.2	34.4	43.8	55.8
	TRAFO DER oil	bn €	0.0	0.1	0.2	0.3	0.5	0.8	1.5	2.5	4.0	6.2
	TRAFO DER dry	bn €	0.0	0.3	0.7	1.3	2.3	4.3	7.6	12.8	20.9	32.6
	TRAFO Small	bn €	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0
	Total TRAFO Utility Transformers		**10**	**15**	**19**	**24**	**31**	**40**	**52**	**68**	**92**	**123**
	TOTAL ENERGY SECTOR (only improvement over BAU)		**0**	**0**	**0**	**0**	**-1**	**-3**	**-6**	**-10**	**-16**	**-25**
	TYRE car replacement tyres C1	bn €	35.8	46.9	52.7	59.7	65.8	62.2	63.5	69.8	76.8	84.6
	TYRE van replacement tyres C2	bn €	10.8	14.4	16.0	17.7	18.5	18.6	20.3	22.2	24.3	26.7
	TYRE truck replacement tyres C3	bn €	12.3	14.3	16.3	19.2	20.3	20.8	22.0	24.3	26.8	29.7
	TYRE Replacement Tyres	bn €	**59**	**76**	**85**	**97**	**105**	**102**	**106**	**116**	**128**	**141**
	TRANSPORT SECTOR	bn €	**59**	**76**	**85**	**97**	**105**	**102**	**106**	**116**	**128**	**141**
	GENERAL TOTAL (in bn euros)		**683**	**1028**	**1186**	**1312**	**1435**	**1588**	**1788**	**2029**	**2315**	**2656**

ECO Expenditure (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	74	96	116	129	141	158	185	224	273	335
SPACE HEATING	bn €	208	258	311	343	378	418	470	528	591	658
SPACE COOLING	bn €	13	36	46	57	68	78	89	102	117	136
VENTILATION	bn €	36	86	94	97	98	98	103	108	114	122
LIGHTING (excl. SPL, ctrl & sb)	bn €	35	52	55	47	35	33	37	41	45	53
ELECTRONICS	bn €	66	183	195	216	241	271	295	317	343	371
FOOD PRESERVATION	bn €	52	47	51	55	59	66	76	87	102	124
COOKING	bn €	27	32	37	43	48	54	62	72	85	101
CLEANING	bn €	40	60	71	78	85	94	104	117	131	148
INDUSTRY COMPONENTS	bn €	74	101	125	150	179	219	267	327	401	492
ENERGY SECTOR	bn €	0	0	0	0	-1	-3	-6	-10	-16	-25
TRANSPORT SECTOR	bn €	59	76	85	97	105	102	106	116	128	141
TOTAL in bn euros		**683**	**1028**	**1186**	**1312**	**1435**	**1588**	**1788**	**2029**	**2315**	**2656**

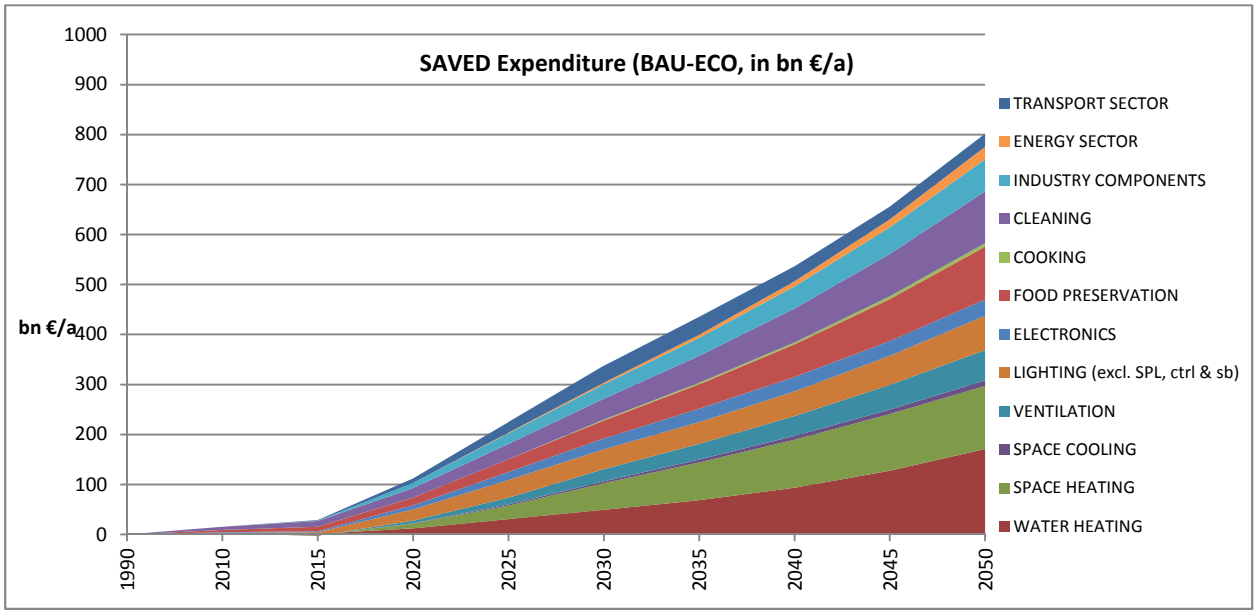


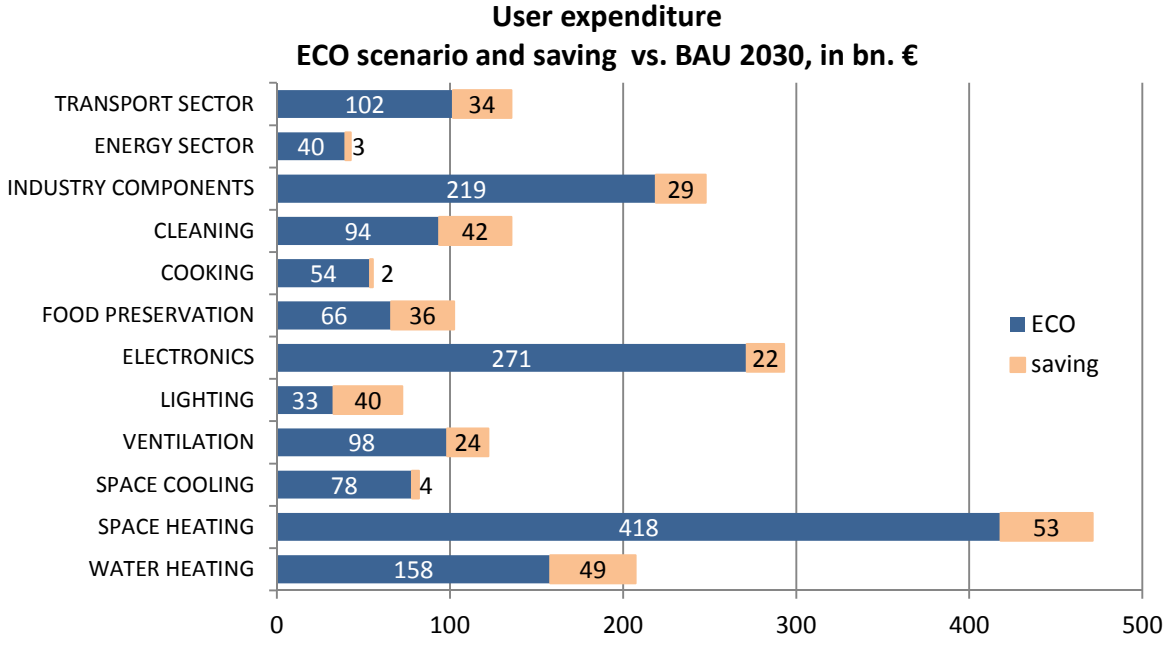
db	SAVED Expenditure (BAU-ECO, in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**0**	**0**	**2**	**12**	**24**	**35**	**46**	**59**	**77**	**100**
	Total CH Central Heating combi, water heat	bn €	**0**	**0**	**-1**	**0**	**7**	**14**	**23**	**34**	**50**	**71**
	TOTAL WATER HEATING		**0**	**0**	**1**	**12**	**31**	**49**	**69**	**94**	**127**	**171**
	Total CH Central Heating boiler, space heat	bn €	**0**	**2**	**-3**	**8**	**22**	**44**	**64**	**81**	**95**	**104**
	SFB Wood Manual	bn €	0.0	0.0	-0.1	0.0	0.2	0.3	0.3	0.2	0.2	0.2
	SFB Wood Direct Draft	bn €	0.0	0.0	0.0	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	0.0
	SFB Coal	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SFB Pellets	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	SFB Wood chips	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Solid Fuel Boiler		**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**
	CHAE-S (≤ 400 kW)	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2
	CHAE-L (> 400 kW)	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4
	CHWE-S (≤ 400 kW)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-M (> 400 kW; ≤ 1500 kW)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-L (> 1500 kW)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	bn €	0.0	0.0	0.0	0.2	0.5	0.9	1.1	1.2	1.3	1.3
	HT PCH-AE-L	bn €	0.0	0.0	0.0	0.2	0.6	1.1	1.6	2.0	2.3	2.6
	HT PCH-WE-S	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
	HT PCH-WE-M	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
	HT PCH-WE-L	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	AC rooftop	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC splits	bn €	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.2
	AC VRF	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5
	ACF	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Cooling		**0.0**	**0.0**	**0.0**	**0.5**	**1.7**	**3.0**	**4.1**	**4.8**	**5.2**	**5.4**
	AC rooftop (rev)	bn €	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	bn €	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.3	0.3
	AC VRF (rev)	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.4
	ACF (rev)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	bn €	0.0	0.0	0.0	0.2	0.7	1.3	1.6	1.8	1.9	1.9
	AHE	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Heating		**0.0**	**0.0**	**0.0**	**0.4**	**1.2**	**2.0**	**2.5**	**2.7**	**2.7**	**2.6**
	Total AHC Air Heating & Cooling		**0.0**	**0.0**	**0.0**	**0.9**	**2.8**	**5.1**	**6.7**	**7.5**	**7.9**	**8.0**
	LH open fireplace	bn €	0.0	0.0	0.0	-0.4	-0.5	-0.3	0.0	0.3	0.7	1.0
	LH closed fireplace/inset	bn €	0.0	0.0	0.0	-0.5	-0.5	-0.2	0.2	0.6	1.0	1.3
	LH wood stove	bn €	0.0	0.0	0.0	-0.2	-0.2	0.0	0.2	0.4	0.6	0.8
	LH coal stove	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	LH cooker	bn €	0.0	0.0	0.0	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.2
	LH SHR stove	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH pellet stove	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	LH open fire gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	LH closed fire gas	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.6	0.7
	LH flueless fuel heater	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.portable	bn €	0.0	0.0	0.1	0.7	1.1	1.2	1.3	1.6	1.9	2.2
	LH elec.convector	bn €	0.0	0.0	0.3	1.7	2.9	2.9	2.9	3.4	4.0	4.7
	LH elec.storage	bn €	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.7	0.9	1.1
	LH elec.underfloor	bn €	0.0	0.0	0.0	0.2	0.4	0.6	0.9	1.3	1.7	2.0
	LH luminous heaters	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH tube heaters	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	LH total	bn €	**0.0**	**0.0**	**0.4**	**1.4**	**3.4**	**5.1**	**6.8**	**9.2**	**11.9**	**14.4**
	RAC (cooling demand), all types <12 kW	bn €	0.0	0.0	-0.3	-0.1	0.5	1.0	1.7	2.7	3.8	5.2
	RAC (heating demand), reversible <12kW	bn €	0.0	0.0	-0.1	0.3	1.0	1.5	2.1	2.9	3.7	4.7
	Total RAC Room Air Conditioner	bn €	**0.0**	**0.0**	**-0.4**	**0.2**	**1.4**	**2.5**	**3.8**	**5.6**	**7.5**	**9.8**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**0.0**	**-0.1**	**0.5**	**1.4**	**2.2**	**3.0**	**3.8**	**4.5**	**5.2**	**5.8**
	TOTAL SPACE HEATING	bn €	**0**	**2**	**-2**	**10**	**27**	**53**	**75**	**96**	**113**	**126**
	TOTAL SPACE COOLING	bn €	**0**	**0**	**0**	**0**	**2**	**4**	**6**	**7**	**9**	**11**
	NRVU Ventilation units	bn €	0.0	0.0	1.0	5.2	10.7	17.4	21.8	25.8	30.4	35.6
	RVU Central Unidir.	bn €	0.0	0.0	-1.4	0.2	2.2	4.7	6.7	9.4	12.9	17.4
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0.0	0.0	-0.5	-0.2	0.4	1.3	2.1	3.2	4.5	6.0
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.0	0.0	0.1	0.2	0.4	0.7	1.0	1.5	2.2
	Total VU Ventilation Units		**0**	**0**	**-1**	**5**	**14**	**24**	**31**	**39**	**49**	**61**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**0**	**0**	**-1**	**5**	**14**	**24**	**31**	**39**	**49**	**61**
	LS Light Sources											
	LFL Linear Fluorescent	bn €	0.0	0.0	0.9	4.5	12.3	20.2	26.1	32.5	40.8	50.1
	CFL Compact Fluorescent	bn €	0.0	-0.5	1.7	2.8	5.2	6.4	7.1	7.6	8.0	8.5
	Tungsten	bn €	0.0	-0.2	0.5	10.3	12.3	10.7	9.1	7.5	6.7	7.1
	GLS GeneralLighting Service (incandescent)	bn €	0.0	3.0	8.5	7.8	5.8	2.3	0.6	0.0	0.0	0.0
	HID High Intensity Discharge	bn €	0.0	-0.1	2.7	5.5	8.2	11.2	13.5	16.2	19.4	23.4
	LED Light Emitting Diode	bn €	0.0	0.0	-4.1	-8.8	-8.8	-11.1	-13.1	-14.6	-16.4	-20.7
	GLS stock	bn €	0.0	-0.6	-2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tungsten stock	bn €	0.0	0.0	-1.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING (excl. SPL, ctrl & sb)	bn €	**0**	**2**	**7**	**22**	**35**	**40**	**43**	**49**	**58**	**68**

db	SAVED Expenditure (BAU-ECO, in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV	bn €	0.0	0.0	0.0	3.4	8.0	10.6	12.1	11.2	7.3	5.0
	DP Monitor	bn €	0.0	0.0	0.1	0.8	1.2	1.3	1.2	0.9	0.4	0.1
	Total Electronic Displays	**bn €**	**0.0**	**0.0**	**0.1**	**4.1**	**9.2**	**11.9**	**13.3**	**12.2**	**7.7**	**5.1**
	SSTB	bn €	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	bn €	0.0	0.0	0.2	1.1	1.3	1.6	2.0	2.7	3.5	4.5
	Total STB set top boxes (Complex & Simple)		**0.0**	**0.2**	**0.2**	**1.1**	**1.3**	**1.6**	**2.0**	**2.7**	**3.5**	**4.5**
	VIDEO players/recorders	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO projectors	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VIDEO game consoles	bn €	0.0	0.0	0.1	0.3	0.4	0.4	0.5	0.6	0.7	0.9
	Total VIDEO		**0.0**	**0.0**	**0.1**	**0.3**	**0.4**	**0.4**	**0.5**	**0.6**	**0.7**	**0.9**
	ES Rack servers	bn €	0.0	0.0	0.0	0.4	1.2	2.0	3.0	3.7	4.5	5.6
	ES Blade servers	bn €	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.7	0.8	1.0
	ES Storage	bn €	0.0	0.0	0.0	-0.3	-0.3	-0.3	-0.3	-0.2	-0.1	0.0
	Total ES Enterprise Servers		**0.0**	**0.0**	**0.0**	**0.2**	**1.1**	**2.1**	**3.4**	**4.2**	**5.2**	**6.6**
	PC Desktop	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	EP-Copier mono	bn €	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP-Copier colour	bn €	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8
	EP-printer mono	bn €	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	EP-printer colour	bn €	0.0	0.0	0.2	0.3	0.4	0.6	0.8	1.1	1.5	2.0
	IJ SFD printer	bn €	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	IJ MFD printer	bn €	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.0	1.3	1.7
	Total imaging equipment, electricity and		**0.0**	**0.5**	**1.5**	**2.0**	**2.3**	**2.7**	**3.3**	**4.0**	**4.9**	**6.0**
	this total includes following toner and paper costs:		*0.0*	*0.2*	*0.7*	*1.0*	*1.0*	*1.1*	*1.1*	*1.2*	*1.2*	*1.3*
	SB Home Gateway	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home NAS	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
	SB Home Phones (fixed)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Office Phones (fixed)	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total SB (networked) StandBy (rest)		**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**
	Total BC Battery Charged devices	bn €	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	UPS below 1.5 kVA	bn €	0.0	0.0	0.0	0.2	0.4	0.5	0.7	0.9	1.2	1.5
	UPS 1.5 to 5 kVA	bn €	0.0	0.0	0.0	0.4	1.3	1.9	2.6	3.5	4.6	6.0
	UPS 5 to 10 kVA	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
	UPS 10 to 200 kVA	bn €	0.0	0.0	0.0	0.1	0.2	0.5	0.7	0.9	1.2	1.6
	Total UPS - Uninterrupted Power Supplies	**bn €**	**0.0**	**0.0**	**0.0**	**0.7**	**1.9**	**3.0**	**4.1**	**5.5**	**7.3**	**9.4**
	TOTAL ELECTRONICS		**0**	**1**	**2**	**8**	**16**	**22**	**27**	**29**	**29**	**33**
	Total RF household Refrigerators & Freezers	bn €	**0**	**5**	**9**	**15**	**21**	**30**	**40**	**54**	**71**	**88**
	CF open vertical chilled multi deck (RVC2)	bn €	0.0	0.0	0.0	0.1	0.6	1.1	1.3	1.6	2.0	2.5
	CF open horizontal frozen island (RHF4)	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2
	CF other supermarket display (non-BCs)	bn €	0.0	0.0	0.0	0.3	0.9	1.4	1.9	2.4	3.1	3.8
	CF Plug in one door beverage cooler	bn €	0.0	0.0	0.0	0.3	0.9	1.3	1.6	1.9	2.4	3.1
	CF Plug in horizontal ice cream freezer	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	CF Spiral vending machine	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.4
	Total CF Commercial Refrigeration		**0.0**	**0.0**	**0.0**	**0.7**	**2.6**	**4.0**	**5.1**	**6.4**	**8.0**	**10.1**
	PF Storage cabinet Chilled Vertical (CV)	bn €	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.4	0.5	0.7
	PF Storage cabinet Frozen Vertical (FV)	bn €	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8
	PF Storage cabinet Chilled Horizontal (CH)	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.5
	PF Storage cabinet Frozen Horizontal (FH)	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3
	PF Storage cabinets All types	**bn €**	**0.0**	**0.0**	**0.0**	**0.1**	**0.6**	**0.9**	**1.2**	**1.5**	**1.9**	**2.3**
	PF Process Chiller AC MT S ≤ 300 kW	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.6
	PF Process Chiller AC MT L > 300 kW	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6
	PF Process Chiller AC LT S ≤ 200 kW	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.5
	PF Process Chiller AC LT L > 200 kW	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.6
	PF Process Chiller WC MT S ≤ 300 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
	PF Process Chiller WC MT L > 300 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller WC LT S ≤ 200 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller WC LT L > 200 kW	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3
	PF Process Chiller All MT&LT	**bn €**	**0.0**	**0.0**	**0.0**	**0.2**	**0.5**	**1.0**	**1.4**	**1.8**	**2.4**	**3.1**

db	SAVED Expenditure (BAU-ECO, in bn euros 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	bn €	0	0	0	0.0	0.1	0.1	0.2	0.2	0.3	0.4
	PF Condensing Unit MT M 1-5 kW	bn €	0	0	0	0.1	0.2	0.2	0.3	0.4	0.5	0.7
	PF Condensing Unit MT L 5-20 kW	bn €	0	0	0	0.1	0.3	0.3	0.5	0.6	0.8	1.0
	PF Condensing Unit MT XL 20-50 kW	bn €	0	0	0	0.1	0.2	0.3	0.4	0.6	0.7	1.0
	PF Condensing Unit LT S 0.1-0.4 kW	bn €	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	bn €	0	0	0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Condensing Unit LT L 2-8 kW	bn €	0	0	0	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	PF Condensing Unit LT XL 8-20 kW	bn €	0	0	0	0.1	0.2	0.3	0.4	0.5	0.7	0.9
0.6	**PF Condensing Unit, All MT&LT**	**bn €**	**0**	**0**	**0**	**0.4**	**1.2**	**1.6**	**2.1**	**2.7**	**3.6**	**4.7**
	PF Professional Refrigeration, Total	**bn €**	**0**	**0**	**0**	**0.5**	**1.6**	**2.5**	**3.4**	**4.4**	**5.7**	**7.4**
	TOTAL FOOD PRESERVATION		**0**	**5**	**9**	**16**	**26**	**36**	**49**	**65**	**84**	**105**
	CA El. Hobs	bn €	0.0	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
	CA El. Ovens	bn €	0.0	0.0	-0.1	-0.2	0.0	0.5	0.9	1.1	1.4	1.7
	CA Gas Hobs	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CA Gas Ovens	bn €	0.0	0.0	0.0	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.3
	CA Range Hoods	bn €	0.0	0.0	0.0	-0.2	-0.1	0.5	1.3	1.9	2.7	3.8
	Total CA Cooking Appliances		**0.0**	**0.0**	**-0.1**	**-0.9**	**-0.4**	**0.9**	**2.2**	**3.2**	**4.3**	**5.8**
	COFFEE Dripfilter (glass)	bn €	0.00	0.00	0.04	0.24	0.29	0.36	0.44	0.54	0.65	0.79
	COFFEE Dripfilter (thermos)	bn €	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COFFEE Pad filter	bn €	0.00	0.00	0.02	0.08	0.11	0.15	0.19	0.25	0.32	0.42
	COFFEE Hard cap espresso	bn €	0.00	0.00	0.01	0.05	0.08	0.10	0.12	0.15	0.18	0.22
	COFFEE Semi-auto espresso	bn €	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02
	COFFEE Fully-auto espresso	bn €	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.07
	Total CM household Coffee Makers		**0.0**	**0.0**	**0.1**	**0.4**	**0.5**	**0.6**	**0.8**	**1.0**	**1.2**	**1.5**
	TOTAL COOKING		**0.0**	**0.0**	**0.0**	**-0.5**	**0.1**	**1.6**	**3.0**	**4.1**	**5.6**	**7.3**
	Total WM household Washing Machine	bn €	**0.0**	**6.4**	**10.1**	**13.8**	**17.7**	**22.1**	**26.0**	**29.7**	**33.8**	**38.1**
	including detergent and water savings	*bn €*	*0.0*	*5.7*	*8.5*	*11.4*	*14.1*	*17.1*	*19.7*	*22.8*	*26.4*	*30.6*
	Total DW household Dishwasher	bn €	**0.0**	**0.2**	**1.1**	**2.4**	**4.1**	**6.2**	**8.8**	**12.2**	**16.4**	**21.8**
	including detergent and water savings	*bn €*	*0.0*	*0.6*	*1.1*	*1.7*	*2.5*	*3.3*	*4.3*	*5.4*	*6.9*	*8.7*
	LD vented el.	bn €	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.5
	LD condens el.	bn €	0.0	0.0	0.0	0.4	1.5	2.7	3.8	5.0	6.4	8.1
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**0.0**	**0.0**	**0.0**	**0.5**	**1.7**	**2.9**	**4.1**	**5.3**	**6.8**	**8.6**
	VC dom	bn €	0.0	0.0	0.4	2.8	6.5	9.9	14.2	19.6	26.0	33.2
	VC nondom	bn €	0.0	0.0	0.0	0.3	0.5	0.6	0.8	1.1	1.4	1.9
	Total VC Vacuum Cleaner	bn €	**0.0**	**0.0**	**0.4**	**3.1**	**7.0**	**10.5**	**15.1**	**20.7**	**27.4**	**35.1**
	including costs of bags & filters	bn €	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	TOTAL CLEANING		**-**	**7**	**12**	**20**	**31**	**42**	**54**	**68**	**84**	**104**
0.5	FAN Axial<300Pa (all FAN types >125W)	bn €	0.0	0.0	-0.1	0.4	1.7	3.0	4.2	5.3	6.6	8.1
0.5	FAN Axial>300Pa	bn €	0.0	0.0	0.3	1.0	2.5	4.0	5.3	6.5	7.9	9.6
0.5	FAN Centr.FC	bn €	0.0	0.0	-0.2	-0.2	0.5	1.2	1.7	2.3	2.9	3.6
0.5	FAN Centr.BC-free	bn €	0.0	0.0	0.1	0.6	1.5	2.3	3.1	3.9	4.9	6.0
0.5	FAN Centr.BC	bn €	0.0	0.0	-0.2	0.4	1.4	2.5	3.5	4.8	6.5	8.8
0.5	FAN Cross-flow	bn €	0.0	0.0	-0.3	-0.3	-0.1	0.1	0.3	0.5	0.8	1.2
	Total FAN, industrial (excl. box & roof fans)		**0.0**	**0.0**	**-0.2**	**1.0**	**3.7**	**6.5**	**9.0**	**11.6**	**14.7**	**18.7**
0.5	**Total MT Motors 0.75-375 kW**	bn €	**0**	**0**	**2**	**16**	**33**	**42**	**51**	**60**	**71**	**84**
	Total WP Water Pumps	bn €	**0.0**	**0.0**	**0.2**	**0.5**	**0.8**	**1.0**	**1.3**	**1.7**	**2.2**	**2.8**
	CP Fixed Speed 5-1280 l/s	bn €	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3
	CP Variable speed 5-1280 l/s	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CP Pistons 2-64 l/s	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CP Standard Air Compressors	**bn €**	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**
	TOTAL INDUSTRY COMPONENTS		0	0	1	10	21	29	36	44	53	64
	TRAFO Distribution	bn €	0.0	0.0	-0.1	0.1	0.5	1.0	1.7	2.8	4.2	6.3
	TRAFO Industry oil	bn €	0.0	0.0	-0.1	0.2	0.6	1.2	2.2	3.3	4.4	5.7
	TRAFO Industry dry	bn €	0.0	0.0	-0.1	0.0	0.1	0.2	0.4	0.6	0.9	1.2
	TRAFO Power	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TRAFO DER oil	bn €	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.1	2.0	3.3
	TRAFO DER dry	bn €	0.0	0.0	0.0	0.0	0.2	0.5	1.3	2.8	5.0	8.5
	TRAFO Small	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers		**0.0**	**0.0**	**-0.4**	**0.3**	**1.4**	**3.1**	**6.1**	**10.5**	**16.5**	**25.0**
	TOTAL ENERGY SECTOR		**0**	**0**	**0**	**0**	**1**	**3**	**6**	**10**	**16**	**25**
	TYRE car replacement tyres C1	bn €	0.0	0.0	1.0	5.6	12.7	21.6	23.3	19.4	15.1	16.6
	TYRE van replacement tyres C2	bn €	0.0	0.0	0.5	2.4	5.4	6.3	5.1	3.5	3.4	3.9
	TYRE truck replacement tyres C3	bn €	0.0	0.0	0.2	1.4	3.3	6.0	7.4	7.3	6.9	6.1
	TYRE Replacement Tyres	bn €	**0.0**	**0.0**	**1.6**	**9.3**	**21.4**	**33.9**	**35.8**	**30.2**	**25.4**	**26.6**
	TRANSPORT SECTOR	bn €	**0.0**	**0.0**	**1.6**	**9.3**	**21.4**	**33.9**	**35.8**	**30.2**	**25.4**	**26.6**
	SAVED GENERAL TOTAL (in bn euros)		**0**	**15**	**29**	**112**	**225**	**338**	**435**	**537**	**656**	**802**

SAVED Expenditure (BAU-ECO, in bn €), summary		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	0	0	1	12	31	49	69	94	127	171
SPACE HEATING	bn €	0	2	-2	10	27	53	75	96	113	126
SPACE COOLING	bn €	0	0	0	0	2	4	6	7	9	11
VENTILATION	bn €	0	0	-1	5	14	24	31	39	49	61
LIGHTING (excl. SPL, ctrl & sb)	bn €	0	2	7	22	35	40	43	49	58	68
ELECTRONICS	bn €	0	1	2	8	16	22	27	29	29	33
FOOD PRESERVATION	bn €	0	5	9	16	26	36	49	65	84	105
COOKING	bn €	0	0	0	0	0	2	3	4	6	7
CLEANING	bn €	0	7	12	20	31	42	54	68	84	104
INDUSTRY COMPONENTS	bn €	0	0	1	10	21	29	36	44	53	64
ENERGY SECTOR	bn €	0	0	0	0	1	3	6	10	16	25
TRANSPORT SECTOR	bn €	0	0	2	9	21	34	36	30	25	27
TOTAL in bn euros 2010		**0**	**15**	**29**	**112**	**225**	**338**	**435**	**537**	**656**	**802**
Saving in % versus BAU (from 1990=0)		0.0%	1.5%	2.4%	7.9%	13.6%	17.5%	19.6%	20.9%	22.1%	23.2%
Saving In % versus BAU (from 2010=0)		-2.3%	0.0%	1.1%	6.8%	12.6%	16.7%	18.9%	20.3%	21.6%	22.7%





db	REVENUE INDUSTRY BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1787	2173	2149	2312	2564	2587	2553	2518	2483	2448
	CH Central Heating combi, water heat [24 kW]	m€	1316	2294	2476	2755	2837	2911	3002	3162	3322	3482
	TOTAL WATER HEATING	**m€**	**3103**	**4467**	**4625**	**5067**	**5401**	**5497**	**5555**	**5680**	**5805**	**5930**
		m€	**6870**	**9996**	**10686**	**11375**	**12490**	**13604**	**14719**	**15833**	**16947**	**18062**
	CH Central Heating boiler, space heat [24 kW]											
	SFB Wood Manual [18 kW]	m€	533	322	216	127	75	70	65	61	56	52
	SFB Wood Direct Draft [20 kW]	m€	20	877	913	972	904	1127	1319	1545	1809	2160
	SFB Coal [25 kW]	m€	200	87	11	10	9	8	7	6	6	5
	SFB Pellets [25 kW]	m€	0	224	348	348	348	384	424	468	517	571
	SFB Wood chips [160 kW]	m€	0	140	140	168	196	216	239	264	291	321
	Total Solid Fuel Boiler	**m€**	**753**	**1651**	**1629**	**1626**	**1532**	**1805**	**2055**	**2344**	**2679**	**3110**
	CHAE-S (≤ 400 kW)	m€	214	894	983	1086	1201	1315	1095	561	168	28
	CHAE-L (> 400 kW)	m€	47	154	158	163	171	177	184	191	197	204
	CHWE-S (≤ 400 kW)	m€	19	80	88	97	107	117	127	137	147	156
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	21	72	75	78	81	84	87	91	94	98
	CHWE-L (> 1500 kW)	m€	14	46	48	50	52	54	56	59	61	63
	CHF	m€	0	3	4	5	6	8	9	10	11	11
	HT PCH-AE-S	m€	104	169	181	191	199	207	216	224	232	240
	HT PCH-AE-L	m€	83	135	145	153	159	166	172	179	186	192
	HT PCH-WE-S	m€	23	37	39	42	43	45	47	49	51	52
	HT PCH-WE-M	m€	90	146	156	165	172	179	186	193	200	207
	HT PCH-WE-L	m€	17	27	29	31	32	34	35	36	38	39
	AC rooftop	m€	97	316	319	244	142	37	37	37	37	37
	AC splits	m€	169	615	643	621	599	575	553	532	510	489
	AC VRF	m€	1	1394	1820	2651	3353	4048	4708	5316	5826	6194
	ACF	m€	0	3	4	5	6	8	9	10	11	11
	SubTotal AHC Air Cooling	**m€**	**897**	**4091**	**4693**	**5582**	**6324**	**7054**	**7523**	**7625**	**7767**	**8021**
	AC rooftop (rev)	m€	60	194	186	150	84	21	0	0	0	0
	AC splits (rev)	m€	114	394	412	398	385	370	356	342	328	314
	AC VRF (rev)	m€	0	1190	1478	2263	2750	3159	3496	3756	3916	3962
	ACF (rev)	m€	0	7	10	12	14	17	19	21	23	25
	AHF	m€	332	218	204	192	182	172	161	151	141	132
	AHE	m€	1	2	2	2	2	2	2	2	2	2
	SubTotal AHC Air Heating (rev double)		**507**	**2005**	**2292**	**3017**	**3417**	**3739**	**4034**	**4272**	**4410**	**4434**
	Total AHC Air Heating & Cooling		**1230**	**4312**	**4900**	**5776**	**6509**	**7229**	**7688**	**7780**	**7913**	**8157**
	LH open fireplace [8 kW]	m€	638	931	937	943	937	931	930	930	930	930
	LH closed fireplace/inset [8 kW]	m€	403	1091	1218	1344	1362	1379	1383	1383	1383	1383
	LH wood stove [8 kW]	m€	436	514	569	625	634	642	644	644	644	644
	LH coal stove [8 kW]	m€	133	103	94	86	64	43	39	39	39	39
	LH cooker [10 kW]	m€	372	747	902	1058	1085	1112	1117	1117	1117	1117
	LH SHR stove [8 kW]	m€	404	564	701	837	936	1035	1055	1055	1055	1055
	LH pellet stove [8 kW]	m€	0	420	530	639	685	730	740	740	740	740
	LH open fire gas, NCV [4.2 kW]	m€	24	35	39	42	42	42	42	42	42	42
	LH closed fire gas, NCV [4.2 kW]	m€	117	132	136	140	144	147	148	148	148	148
	LH flueless fuel heater, NCV [1.5 kW]	m€	43	87	82	78	69	61	59	59	59	59
	LH elec.portable [1 kW]	m€	101	123	127	131	137	143	144	144	144	144
	LH elec.convector [1 kW]	m€	740	903	932	961	1004	1048	1056	1056	1056	1056
	LH elec.storage [2.75 kW]	m€	85	103	107	110	115	120	121	121	121	121
	LH elec.underfloor [0.62 kW]	m€	154	187	193	199	208	217	219	219	219	219
	LH luminous heaters [20 kW]	m€	16	20	20	20	20	20	20	20	20	20
	LH tube heaters [30 kW]	m€	16	20	20	20	20	20	20	20	20	20
	LH total	**m€**	**3684**	**5981**	**6608**	**7234**	**7462**	**7690**	**7736**	**7736**	**7736**	**7736**
	RAC (cooling demand), all types <12 kW	m€	150	1380	1978	2478	2700	2728	2727	2773	2819	2864
	RAC (heating demand), reversible <12kW	m€	42	1024	1744	2191	2390	2417	2418	2461	2503	2546
	Total Room Air Conditioner	**m€**	**192**	**2404**	**3722**	**4669**	**5091**	**5144**	**5146**	**5234**	**5322**	**5410**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**873**	**1286**	**1363**	**1446**	**1530**	**1513**	**1430**	**1346**	**1262**	**1179**
	TOTAL SPACE HEATING (incl. rev.AC)	**m€**	**11856**	**20658**	**22959**	**25443**	**27290**	**29255**	**30962**	**32646**	**34276**	**35887**
	TOTAL SPACE COOLING	**m€**	**1047**	**5471**	**6672**	**8060**	**9024**	**9782**	**10250**	**10398**	**10586**	**10885**
	NRVU avg (sales wt.)	m€	10132	23706	24797	26143	27588	29033	30478	31923	33369	34814
	RVU Central Unidir. VU (1 fan)	m€	468	1049	903	823	863	901	953	1016	1079	1141
	RVU Central Balanced VU (2 fans)	m€	52	368	895	1148	1290	1433	1575	1717	1859	2001
	RVU Local Balanced VU (2 fans)	m€	4	48	105	171	240	309	379	448	517	586
	TOTAL VENTILATION (electricity)	**m€**	**10657**	**25170**	**26700**	**28285**	**29982**	**31676**	**33385**	**35104**	**36823**	**38542**
	LS Light Sources											
	LFL	m€	1789	2579	2289	2306	2140	1974	1808	1650	1517	1384
	CFL	m€	101	939	810	680	610	540	479	439	399	359
	Tungsten	m€	199	1419	1623	1704	1295	931	677	472	359	336
	GLS	m€	573	395	303	217	128	35	9	0	0	0
	HID	m€	343	855	757	730	696	696	696	696	696	696
	LED BAU	m€	0	120	278	720	990	763	861	898	885	922
	TOTAL LIGHTING	**m€**	**3005**	**6307**	**6059**	**6357**	**5859**	**4939**	**4529**	**4155**	**3856**	**3697**

db	REVENUE INDUSTRY BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	4674	10756	2088	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	1467	5220	6535	5704	4668	3543	2417	1292	166
	DP TV Smart	m€	0	0	3132	6535	8557	10893	13364	15835	18306	20777
	DP Monitor	m€	679	1698	951	951	951	951	951	951	951	951
	DP Total electronic DisPlays	**m€**	**5353**	**13921**	**11391**	**14020**	**15212**	**16512**	**17857**	**19203**	**20549**	**21894**
	SSTB	m€	0	729	165	0	0	0	0	0	0	0
	CSTB	m€	0	2744	3362	3623	3665	3572	3881	4190	4499	4808
	Total STB set top boxes (Complex & Simple)		**0**	**3473**	**3527**	**3623**	**3665**	**3572**	**3881**	**4190**	**4499**	**4808**
	VIDEO players/recorders	m€	2	1407	1212	159	0	0	0	0	0	0
	VIDEO projectors	m€	23	1584	1344	547	236	0	0	0	0	0
	VIDEO game consoles	m€	0	2513	2124	1628	1929	1929	1929	1929	1929	1929
	Total VIDEO	**m€**	**24**	**5505**	**4680**	**2334**	**2165**	**1929**	**1929**	**1929**	**1929**	**1929**
	ES Rack servers	m€	142	3751	4195	4867	5857	7440	8073	7914	7914	7914
	ES Blade servers	m€	253	2828	2878	3166	3757	4601	4981	4812	4812	4812
	ES Storage	m€	167	2124	2427	2672	2958	3186	3337	3231	3231	3231
	Total ES Enterprise Servers	**m€**	**563**	**8703**	**9500**	**10705**	**12571**	**15226**	**16391**	**15957**	**15957**	**15957**
	PC Desktop	m€	1345	4482	3345	3041	3041	3041	3041	3041	3041	3041
	PC Notebook	m€	142	10216	4682	4399	4399	4399	4399	4399	4399	4399
	PC Tablet/slate	m€	0	682	10785	17526	22649	26963	28311	29659	31007	32355
	PC Thin client	m€	22	265	265	265	265	265	265	265	265	265
	PC Workstation	m€	111	1106	1106	1106	1106	1106	1106	1106	1106	1106
	Total PC, electricity	**m€**	**1619**	**16752**	**20184**	**26337**	**31459**	**35773**	**37122**	**38470**	**39818**	**41166**
	EP-Copier mono	m€	2466	990	593	251	185	119	53	0	0	0
	EP-Copier colour	m€	0	331	1441	2160	2462	2682	2902	3122	3342	3561
	EP-printer mono	m€	445	421	369	301	258	230	198	167	135	104
	EP-printer colour	m€	0	449	666	896	1075	1248	1422	1595	1769	1942
	IJ SFD printer	m€	246	391	273	193	142	122	96	71	46	20
	IJ MFD printer	m€	302	979	1343	1550	1702	1854	2006	2158	2310	2463
	Total imaging equipment, electricity	**m€**	**3460**	**3561**	**4683**	**5351**	**5824**	**6255**	**6677**	**7113**	**7602**	**8090**
	SB Home Gateway, on-mode power	m€	0	2988	3853	4718	5582	6447	7312	8176	9041	9905
	SB Home NAS, on-mode power	m€	0	300	515	729	943	1158	1372	1587	1801	2015
	SB Home Phones (fixed), on-mode power	m€	186	928	1113	1187	1187	1187	1187	1187	1187	1187
	SB Office Phones (fixed), on-mode power	m€	293	560	596	632	668	704	739	775	811	847
	Total SB (networked) StandBy (rest)		**479**	**4776**	**6076**	**7265**	**8380**	**9495**	**10610**	**11725**	**12840**	**13955**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	45	90	94	114	134	154	172	188	201	209
	UPS 1.5 to 5 kVA	m€	85	168	175	213	250	287	322	352	375	391
	UPS 5 to 10 kVA	m€	30	58	61	74	87	100	112	122	131	136
	UPS 10 to 200 kVA	m€	125	248	259	314	370	425	476	520	555	578
	Total UPS - Uninterrupted Power Supplies	**m€**	**285**	**565**	**588**	**714**	**841**	**966**	**1082**	**1183**	**1262**	**1313**
	TOTAL ELECTRONICS	**m€**	**11783**	**57255**	**60629**	**70350**	**80118**	**89728**	**95549**	**99770**	**104455**	**109113**
	RF Household refrigerator and freezer	**m€**	**2986**	**3259**	**3311**	**3362**	**3413**	**3464**	**3515**	**3567**	**3618**	**3669**
	CF open vertical chilled multi deck (RVC2)	m€	200	218	216	219	223	226	230	234	237	241
	CF open horizontal frozen island (RHF4)	m€	24	26	26	26	27	27	27	28	28	29
	CF other supermarket display (non-BCs)	m€	458	542	573	595	617	639	661	685	709	733
	CF Plug in one door beverage cooler	m€	392	478	476	493	510	527	544	562	581	600
	CF Plug in horizontal ice cream freezer	m€	162	198	196	203	211	218	225	232	240	248
	CF Spiral vending machine	m€	258	195	159	165	172	178	185	192	199	207
	Total CF Commercial Refrigeration		**1494**	**1657**	**1645**	**1702**	**1758**	**1815**	**1873**	**1932**	**1994**	**2058**
	PF Storage cabinet Chilled Vertical (CV)	m€	147	191	200	207	217	227	237	247	257	267
	PF Storage cabinet Frozen Vertical (FV)	m€	77	100	104	108	114	119	124	129	134	140
	PF Storage cabinet Chilled Horizontal (CH)	m€	30	39	41	43	45	47	49	51	53	55
	PF Storage cabinet Frozen Horizontal (FH)	m€	23	30	31	32	34	35	37	39	40	42
	PF Storage cabinets All types	**m€**	**278**	**360**	**376**	**390**	**409**	**428**	**447**	**466**	**484**	**503**
	PF Process Chiller AC MT S ≤ 300 kW	m€	21	43	47	52	57	62	68	73	79	84
	PF Process Chiller AC MT L > 300 kW	m€	20	40	45	49	54	59	64	69	75	80
	PF Process Chiller AC LT S ≤ 200 kW	m€	17	34	38	42	46	51	55	59	64	68
	PF Process Chiller AC LT L > 200 kW	m€	16	33	36	39	44	48	52	56	60	64
	PF Process Chiller WC MT S ≤ 300 kW	m€	9	19	21	23	26	28	30	33	35	38
	PF Process Chiller WC MT L > 300 kW	m€	14	28	31	34	38	42	45	49	52	56
	PF Process Chiller WC LT S ≤ 200 kW	m€	9	18	20	22	25	27	29	32	34	36
	PF Process Chiller WC LT L > 200 kW	m€	11	23	25	28	31	34	37	40	43	46
	PF Process Chiller All MT&LT	m€	**118**	**239**	**264**	**290**	**320**	**351**	**381**	**411**	**441**	**471**
	PF Condensing Unit MT S 0.2-1 kW	m€	114	91	93	100	108	116	125	135	145	156
	PF Condensing Unit MT M 1-5 kW	m€	246	196	200	216	233	250	270	291	313	337
	PF Condensing Unit MT L 5-20 kW	m€	253	201	206	222	239	257	277	299	322	347
	PF Condensing Unit MT XL 20-50 kW	m€	194	154	158	170	183	197	212	229	246	266
	PF Condensing Unit LT S 0.1-0.4 kW	m€	20	16	16	17	19	20	22	23	25	27
	PF Condensing Unit LT M 0.4-2 kW	m€	35	28	28	31	33	36	38	41	45	48
	PF Condensing Unit LT L 2-8 kW	m€	94	75	77	82	89	96	103	111	120	129
	PF Condensing Unit LT XL 8-20 kW	m€	82	65	67	72	77	83	90	97	104	112
0.6	**PF Condensing Unit, All MT&LT**	m€	**1037**	**826**	**844**	**910**	**980**	**1056**	**1137**	**1225**	**1320**	**1422**
	PF Professional Refrigeration, Total	m€	**811**	**930**	**978**	**1044**	**1122**	**1201**	**1282**	**1367**	**1453**	**1543**
	TOTAL FOOD PRESERVATION	**m€**	**5291**	**5846**	**5934**	**6108**	**6293**	**6480**	**6670**	**6866**	**7066**	**7270**

db	REVENUE INDUSTRY BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	933	2121	2274	2454	2588	2710	2825	2933	3034	3128
	COOK El. Ovens, kWh/a	m€	2181	2592	2733	2965	2868	2889	2926	2962	3000	3037
	COOK Gas Hobs, % efficiency NCV	m€	1169	963	868	781	703	634	570	511	476	447
	COOK Gas Ovens, kWh prim, NCV	m€	297	303	288	281	273	264	256	248	240	232
	COOK Range Hoods, kWh elec	m€	529	647	681	715	752	790	828	867	905	943
	Total CA Cooking Appliances		**5109**	**6626**	**6843**	**7196**	**7184**	**7288**	**7405**	**7521**	**7654**	**7788**
	COFFEE Dripfilter (glass)	m€	148	103	87	72	70	70	70	70	70	70
	COFFEE Dripfilter (thermos)	m€	28	45	45	46	47	48	48	48	49	49
	COFFEE Dripfilter (full automatic)	m€	0	74	84	94	104	113	123	133	143	153
	COFFEE Pad filter	m€	0	172	188	204	220	236	252	268	284	300
	COFFEE Hard cap espresso	m€	21	90	192	289	302	302	302	302	302	302
	COFFEE Semi-auto espresso	m€	24	27	26	24	22	21	19	18	16	14
	COFFEE Fully-auto espresso	m€	138	158	183	208	234	259	284	310	335	360
	Total CM household Coffee Makers	**m€**	**359**	**668**	**806**	**938**	**999**	**1049**	**1099**	**1149**	**1199**	**1249**
	TOTAL COOKING	**m€**	**5468**	**7295**	**7649**	**8134**	**8183**	**8337**	**8504**	**8670**	**8853**	**9037**
	WM Household Washing Machine	**m€**	**1636**	**2516**	**2474**	**2619**	**2458**	**2458**	**2458**	**2458**	**2458**	**2458**
	DW Household Dishwasher	**m€**	**702**	**1535**	**1780**	**2025**	**2270**	**2515**	**2759**	**3004**	**3249**	**3494**
	LD Household Laundry Drier vented el.	m€	333	337	318	283	288	291	292	294	296	297
	LD Household Laundry Drier condens el.	m€	189	706	826	928	946	954	960	965	970	976
	LD Household Laundry Drier vented gas	m€	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**525**	**1049**	**1151**	**1219**	**1243**	**1254**	**1261**	**1268**	**1275**	**1282**
	VC dom. Vacuum Cleaner	m€	1592	4714	6611	8043	8880	9718	10555	11392	12229	13066
	VC nondom Vacuum Cleaner	m€	488	503	528	555	584	612	640	669	697	725
	Total VC Vacuum Cleaner	**m€**	**2080**	**5216**	**7139**	**8598**	**9464**	**10329**	**11195**	**12060**	**12926**	**13791**
	TOTAL CLEANING	**m€**	**4942**	**10316**	**12544**	**14461**	**15435**	**16555**	**17673**	**18790**	**19907**	**21025**
0.5	FAN Axial<300Pa [247 W flow out]	m€	242	793	910	1027	1027	1027	1027	1027	1027	1027
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	334	1154	1218	1281	1281	1281	1281	1281	1281	1281
0.5	FAN Centr.FC [141 W flow out]	m€	207	526	607	688	688	688	688	688	688	688
0.5	FAN Centr.BC-free [2120 W flow out]	m€	119	289	328	368	407	415	423	431	439	446
0.5	FAN Centr.BC [2052 W flow out]	m€	259	688	789	889	989	1009	1110	1210	1310	1411
0.5	FAN Cross-flow [31 W flow out]	m€	48	107	121	136	151	154	169	184	199	213
	Total FAN, industrial (excl. box & roof fans)	**m€**	**604**	**1779**	**1987**	**2195**	**2272**	**2288**	**2349**	**2411**	**2472**	**2534**
	MT motor industry only	m€	1095	1613	1712	1803	1813	1817	1818	1813	1805	1794
	MT extra revenu drive industry (ref=0)	m€	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**1095**	**1613**	**1712**	**1803**	**1813**	**1817**	**1818**	**1813**	**1805**	**1794**
	WP Water pumps	**m€**	**810**	**1101**	**1183**	**1272**	**1367**	**1463**	**1558**	**1654**	**1749**	**1844**
	CP Fixed Speed 5-1280 l/s	m€	383	338	319	333	350	366	382	397	414	431
	CP Variable speed 5-1280 l/s	m€	0	144	217	237	248	259	269	280	291	302
	CP Pistons 2-64 l/s	m€	77	85	93	101	109	116	123	130	138	146
	Total CP Standard Air Compressors	**m€**	**460**	**567**	**629**	**671**	**707**	**742**	**774**	**807**	**842**	**878**
	TOTAL INDUSTRY COMPONENTS		2422	4252	4654	5039	5253	5401	5590	5778	5966	6153
	TRAFO Distribution, kWh/a	m€	376	591	635	682	732	786	842	897	953	1009
	TRAFO Industry oil	m€	196	315	339	364	391	420	449	479	509	539
	TRAFO Industry dry	m€	93	148	159	170	183	196	209	223	236	250
	TRAFO Power	m€	1510	2421	2603	2799	3010	3236	3469	3703	3936	4169
	TRAFO DER oil	m€	0	17	28	47	77	128	189	250	311	372
	TRAFO DER dry	m€	0	106	175	290	478	789	1166	1543	1919	2296
	TRAFO Small	m€	42	42	42	42	42	42	42	42	42	42
	TOTAL ENERGY SECTOR	**m€**	**2216**	**3642**	**3982**	**4394**	**4913**	**5598**	**6367**	**7137**	**7906**	**8676**
	TYRE car replacement tyres C1	m€	5862	7227	7174	8317	9379	9379	9379	9379	9379	9379
	TYRE van replacement tyres C2	m€	2732	3369	3344	3877	4372	4372	4372	4372	4372	4372
	TYRE truck replacement tyres C3	m€	1794	1661	1889	1995	2118	2240	2247	2249	2245	2236
	TRANSPORT SECTOR	**m€**	**10388**	**12257**	**12407**	**14189**	**15868**	**15991**	**15998**	**16000**	**15996**	**15987**
	GENERAL TOTAL (in m euro 2010)		**72179**	**162937**	**174813**	**195885**	**213619**	**229238**	**241032**	**250993**	**261496**	**272202**
	GENERAL TOTAL (in bn euro 2010)		72	163	175	196	214	229	241	251	261	272

SUMMARY BAU

Industry revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3.1	4.5	4.6	5.1	5.4	5.5	5.6	5.7	5.8	5.9
SPACE HEATING	11.9	20.7	23.0	25.4	27.3	29.3	31.0	32.6	34.3	35.9
SPACE COOLING	1.0	5.5	6.7	8.1	9.0	9.8	10.3	10.4	10.6	10.9
VENTILATION	10.7	25.2	26.7	28.3	30.0	31.7	33.4	35.1	36.8	38.5
LIGHTING	3.0	6.3	6.1	6.4	5.9	4.9	4.5	4.2	3.9	3.7
ELECTRONICS	11.8	57.3	60.6	70.3	80.1	89.7	95.5	99.8	104.5	109.1
FOOD PRESERVATION	5.3	5.8	5.9	6.1	6.3	6.5	6.7	6.9	7.1	7.3
COOKING	5.5	7.3	7.6	8.1	8.2	8.3	8.5	8.7	8.9	9.0
CLEANING	4.9	10.3	12.5	14.5	15.4	16.6	17.7	18.8	19.9	21.0
INDUSTRY COMPONENTS	2.4	4.3	4.7	5.0	5.3	5.4	5.6	5.8	6.0	6.2
ENERGY SECTOR	2.2	3.6	4.0	4.4	4.9	5.6	6.4	7.1	7.9	8.7
TRANSPORT SECTOR	10.4	12.3	12.4	14.2	15.9	16.0	16.0	16.0	16.0	16.0
TOTAL in bn euro 2010	**72**	**163**	**175**	**196**	**214**	**229**	**241**	**251**	**261**	**272**

db	REVENUE INDUSTRY ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1787	2173	3488	4014	4618	4560	4500	4439	4377	4315
	CH Central Heating combi, water heat [24 kW]	m€	1316	2294	3511	4992	5441	5891	6341	6789	7234	7675
	TOTAL WATER HEATING	**m€**	**3103**	**4467**	**6999**	**9006**	**10059**	**10451**	**10841**	**11228**	**11612**	**11990**
		m€	**6870**	**10370**	**18259**	**23444**	**29411**	**33578**	**38299**	**43310**	**48611**	**54200**
	CH Central Heating boiler, space heat [24 kW]											
	SFB Wood Manual [18 kW]	m€	533	322	290	227	130	114	99	87	76	66
	SFB Wood Direct Draft [20 kW]	m€	20	877	916	986	1073	1257	1472	1723	2018	2363
	SFB Coal [25 kW]	m€	200	87	11	10	9	8	7	6	6	5
	SFB Pellets [25 kW]	m€	0	224	348	348	362	385	424	468	517	571
	SFB Wood chips [160 kW]	m€	0	140	147	179	200	216	239	264	291	321
	Total Solid Fuel Boiler	**m€**	**753**	**1651**	**1712**	**1750**	**1774**	**1980**	**2241**	**2549**	**2908**	**3327**
	CHAE-S (≤ 400 kW)	m€	214	894	983	1086	1201	1315	1095	561	168	28
	CHAE-L (> 400 kW)	m€	47	154	158	163	171	177	184	191	197	204
	CHWE-S (≤ 400 kW)	m€	19	80	88	97	107	117	127	137	147	156
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	21	72	75	78	81	84	87	91	94	98
	CHWE-L (> 1500 kW)	m€	14	46	48	50	52	54	56	59	61	63
	CHF	m€	0	3	4	6	7	8	9	10	11	11
	HT PCH-AE-S	m€	104	169	181	191	199	207	216	224	232	240
	HT PCH-AE-L	m€	83	135	145	153	159	166	172	179	186	192
	HT PCH-WE-S	m€	23	37	39	42	43	45	47	49	51	52
	HT PCH-WE-M	m€	90	146	156	165	172	179	186	193	200	207
	HT PCH-WE-L	m€	17	27	29	31	32	34	35	36	38	39
	AC rooftop	m€	97	316	319	244	142	37	37	37	37	37
	AC splits	m€	169	615	643	621	599	575	553	532	510	489
	AC VRF	m€	1	1394	1820	2651	3353	4048	4708	5316	5826	6194
	ACF	m€	0	3	4	6	7	8	9	10	11	11
	SubTotal AHC Air Cooling	**m€**	**897**	**4091**	**4693**	**5583**	**6325**	**7055**	**7523**	**7625**	**7767**	**8021**
	AC rooftop (rev)	m€	60	194	186	150	84	21	0	0	0	0
	AC splits (rev)	m€	114	394	412	398	385	370	356	342	328	314
	AC VRF (rev)	m€	0	1190	1478	2263	2750	3159	3496	3756	3916	3962
	ACF (rev)	m€	0	7	10	12	14	17	19	21	23	25
	AHF	m€	332	218	204	210	201	186	167	151	141	132
	AHE	m€	1	2	2	2	2	2	2	2	2	2
	SubTotal AHC Air Heating (rev double)	**m€**	**507**	**2005**	**2292**	**3035**	**3436**	**3754**	**4040**	**4272**	**4410**	**4434**
	Total AHC Air Heating & Cooling	**m€**	**1230**	**4312**	**4900**	**5795**	**6528**	**7244**	**7694**	**7780**	**7913**	**8157**
	LH open fireplace [8 kW]	m€	638	931	937	1163	1274	1220	1175	1133	1092	1053
	LH closed fireplace/inset [8 kW]	m€	403	1091	1218	1597	1715	1673	1617	1558	1501	1447
	LH wood stove [8 kW]	m€	436	514	569	751	809	788	759	729	701	673
	LH coal stove [8 kW]	m€	133	103	94	101	81	52	45	44	42	41
	LH cooker [10 kW]	m€	372	747	902	1162	1234	1214	1170	1123	1117	1117
	LH SHR stove [8 kW]	m€	404	564	701	842	938	1035	1055	1055	1055	1055
	LH pellet stove [8 kW]	m€	0	420	530	639	685	730	740	740	740	740
	LH open fire gas, NCV [4.2 kW]	m€	24	35	39	44	45	44	42	42	42	42
	LH closed fire gas, NCV [4.2 kW]	m€	117	132	136	147	153	151	148	148	148	148
	LH flueless fuel heater, NCV [1.5 kW]	m€	43	87	82	78	69	61	59	59	59	59
	LH elec.portable [1 kW]	m€	101	123	127	131	137	143	144	144	144	144
	LH elec.convector [1 kW]	m€	740	903	932	961	1004	1048	1056	1056	1056	1056
	LH elec.storage [2.75 kW]	m€	85	103	120	138	138	138	133	128	123	121
	LH elec.underfloor [0.62 kW]	m€	154	187	198	208	211	217	219	219	219	219
	LH luminous heaters [20 kW]	m€	16	20	21	25	24	23	22	21	20	20
	LH tube heaters [30 kW]	m€	16	20	20	23	22	21	21	20	20	20
	LH total	**m€**	**3684**	**5981**	**6626**	**8012**	**8540**	**8558**	**8406**	**8219**	**8079**	**7955**
	RAC (cooling demand), all types <12 kW	**m€**	**150**	**1380**	**2138**	**2741**	**3021**	**3062**	**3036**	**3009**	**2982**	**2954**
	RAC (heating demand), reversible <12kW	m€	42	1024	1884	2424	2674	2713	2692	2671	2648	2626
	Total Room Air Conditioner	**m€**	**192**	**2404**	**4022**	**5165**	**5695**	**5774**	**5728**	**5680**	**5630**	**5580**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**873**	**1391**	**1775**	**1801**	**1822**	**1713**	**1540**	**1379**	**1262**	**1179**
	TOTAL SPACE HEATING (incl. rev.AC)	**m€**	**11856**	**21031**	**30774**	**38664**	**45834**	**50582**	**55678**	**61021**	**66657**	**72542**
	TOTAL SPACE COOLING	**m€**	**1047**	**5471**	**6831**	**8325**	**9346**	**10117**	**10559**	**10634**	**10749**	**10975**
	NRVU avg (sales wt.)	**m€**	10132	23706	24887	26143	27588	29033	30478	31923	33369	34814
	RVU Central Unidir. VU (1 fan)	m€	468	1049	1570	1431	1502	1567	1626	1681	1731	1776
	RVU Central Balanced VU (2 fans)	m€	52	368	1105	1372	1493	1604	1706	1801	1887	2001
	RVU Local Balanced VU (2 fans)	m€	4	48	105	171	240	309	379	448	517	586
	TOTAL VENTILATION (electricity)	**m€**	**10657**	**25170**	**27667**	**29117**	**30823**	**32513**	**34190**	**35853**	**37504**	**39177**
	LS Light Sources											
	LFL	m€	1789	2595	1954	1681	889	590	425	259	93	28
	CFL	m€	101	1131	458	204	5	4	4	4	4	4
	Tungsten	m€	199	1475	1677	385	25	9	9	9	9	9
	GLS	m€	573	236	13	23	14	13	13	13	13	13
	HID	m€	343	867	517	333	187	125	125	125	125	125
	LED ECO	m€	0	102	1837	3090	1890	1148	1239	1526	1634	1892
	TOTAL LIGHTING	**m€**	**3005**	**6406**	**6456**	**5715**	**3009**	**1889**	**1815**	**1936**	**1878**	**2070**

db	REVENUE INDUSTRY ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	4674	10756	2088	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	1467	5220	6535	5704	4668	3543	2417	1292	166
	DP TV Smart	m€	0	0	3132	6535	8557	10893	13364	15835	18306	20777
	DP Monitor	m€	679	1698	951	951	951	951	951	951	951	951
	DP Total electronic DisPlays	**m€**	**5353**	**13921**	**11391**	**14020**	**15212**	**16512**	**17857**	**19203**	**20549**	**21894**
	SSTB	m€	0	729	165	0	0	0	0	0	0	0
	CSTB	m€	0	2744	3461	3623	3665	3572	3881	4190	4499	4808
	Total STB set top boxes (Complex & Simple)		**0**	**3473**	**3626**	**3623**	**3665**	**3572**	**3881**	**4190**	**4499**	**4808**
	VIDEO players/recorders	m€	2	1407	1212	159	0	0	0	0	0	0
	VIDEO projectors	m€	23	1584	1344	547	236	0	0	0	0	0
	VIDEO game consoles	m€	0	2513	2124	1628	1929	1929	1929	1929	1929	1929
	Total VIDEO	**m€**	**24**	**5505**	**4680**	**2334**	**2165**	**1929**	**1929**	**1929**	**1929**	**1929**
	ES Rack servers	m€	142	3751	4195	4867	5983	7600	8247	8085	8085	8085
	ES Blade servers	m€	253	2828	2878	3166	3773	4621	5002	4833	4833	4833
	ES Storage	m€	167	2124	2427	2939	3300	3554	3723	3605	3605	3605
	Total ES Enterprise Servers	**m€**	**563**	**8703**	**9500**	**10972**	**13056**	**15775**	**16972**	**16523**	**16523**	**16523**
	PC Desktop	m€	1345	4482	3345	3041	3041	3041	3041	3041	3041	3041
	PC Notebook	m€	142	10216	4682	4399	4399	4399	4399	4399	4399	4399
	PC Tablet/slate	m€	0	682	10785	17526	22649	26963	28311	29659	31007	32355
	PC Thin client	m€	22	265	265	265	265	265	265	265	265	265
	PC Workstation	m€	111	1106	1106	1106	1106	1106	1106	1106	1106	1106
	Total PC, electricity	**m€**	**1619**	**16752**	**20184**	**26337**	**31459**	**35773**	**37122**	**38470**	**39818**	**41166**
	EP-Copier mono	m€	2466	990	593	251	185	119	53	0	0	0
	EP-Copier colour	m€	0	331	1441	2160	2462	2682	2902	3122	3342	3561
	EP-printer mono	m€	445	421	369	301	258	230	198	167	135	104
	EP-printer colour	m€	0	449	666	896	1075	1248	1422	1595	1769	1942
	IJ SFD printer	m€	246	391	273	193	142	122	96	71	46	20
	IJ MFD printer	m€	302	979	1343	1550	1702	1854	2006	2158	2310	2463
	Total imaging equipment, electricity	**m€**	**3460**	**3561**	**4683**	**5351**	**5824**	**6255**	**6677**	**7113**	**7602**	**8090**
	SB Home Gateway, on-mode power	m€	0	2988	3853	4718	5582	6447	7312	8176	9041	9905
	SB Home NAS, on-mode power	m€	0	300	515	729	943	1158	1372	1587	1801	2015
	SB Home Phones (fixed), on-mode power	m€	186	928	1113	1187	1187	1187	1187	1187	1187	1187
	SB Office Phones (fixed), on-mode power	m€	293	560	596	632	668	704	739	775	811	847
	Total SB (networked) StandBy (rest)		**479**	**4776**	**6076**	**7265**	**8380**	**9495**	**10610**	**11725**	**12840**	**13955**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	45	90	94	114	134	154	172	188	201	209
	UPS 1.5 to 5 kVA	m€	85	168	175	213	250	287	322	352	375	391
	UPS 5 to 10 kVA	m€	30	58	61	74	87	100	112	122	131	136
	UPS 10 to 200 kVA	m€	125	248	259	314	370	425	476	520	555	578
	Total UPS - Uninterrupted Power Supplies	**m€**	**285**	**565**	**588**	**714**	**841**	**966**	**1082**	**1183**	**1262**	**1313**
	TOTAL ELECTRONICS	**m€**	**11783**	**57255**	**60728**	**70617**	**80603**	**90277**	**96131**	**100335**	**105021**	**109678**
	RF Household refrigerator and freezer	**m€**	**2986**	**3770**	**4102**	**4257**	**4351**	**4395**	**4598**	**4438**	**4283**	**4133**
	CF open vertical chilled multi deck (RVC2)	m€	200	218	227	293	295	285	275	266	257	248
	CF open horizontal frozen island (RHF4)	m€	24	26	26	27	27	27	27	28	28	29
	CF other supermarket display (non-BCs)	m€	458	542	577	636	634	639	661	685	709	733
	CF Plug in one door beverage cooler	m€	392	478	476	540	550	541	544	562	581	600
	CF Plug in horizontal ice cream freezer	m€	162	198	196	203	211	218	225	232	240	248
	CF Spiral vending machine	m€	258	195	160	167	172	178	185	192	199	207
	Total CF Commercial Refrigeration		**1494**	**1657**	**1661**	**1866**	**1886**	**1887**	**1918**	**1965**	**2014**	**2065**
	PF Storage cabinet Chilled Vertical (CV)	m€	147	191	200	225	224	227	237	247	257	267
	PF Storage cabinet Frozen Vertical (FV)	m€	77	100	104	118	117	119	124	129	134	140
	PF Storage cabinet Chilled Horizontal (CH)	m€	30	39	41	46	46	47	49	51	53	55
	PF Storage cabinet Frozen Horizontal (FH)	m€	23	30	31	35	35	35	37	39	40	42
	PF Storage cabinets All types	**m€**	**278**	**360**	**376**	**424**	**423**	**428**	**447**	**466**	**484**	**503**
	PF Process Chiller AC MT S ≤ 300 kW	m€	21	43	47	54	57	62	68	73	79	84
	PF Process Chiller AC MT L > 300 kW	m€	20	40	45	49	54	59	64	69	75	80
	PF Process Chiller AC LT S ≤ 200 kW	m€	17	34	38	44	46	51	55	59	64	68
	PF Process Chiller AC LT L > 200 kW	m€	16	33	36	39	44	48	52	56	60	64
	PF Process Chiller WC MT S ≤ 300 kW	m€	9	19	21	24	26	28	30	33	35	38
	PF Process Chiller WC MT L > 300 kW	m€	14	28	31	34	38	42	45	49	52	56
	PF Process Chiller WC LT S ≤ 200 kW	m€	9	18	20	23	25	27	29	32	34	36
	PF Process Chiller WC LT L > 200 kW	m€	11	23	25	28	31	34	37	40	43	46
	PF Process Chiller All MT&LT	m€	**118**	**239**	**264**	**295**	**320**	**351**	**381**	**411**	**441**	**471**
	PF Condensing Unit MT S 0.2-1 kW	m€	114	91	93	104	108	116	125	135	145	156
	PF Condensing Unit MT M 1-5 kW	m€	246	196	200	223	233	250	270	291	313	337
	PF Condensing Unit MT L 5-20 kW	m€	253	201	206	237	243	257	277	299	322	347
	PF Condensing Unit MT XL 20-50 kW	m€	194	154	158	181	186	197	212	229	246	266
	PF Condensing Unit LT S 0.1-0.4 kW	m€	20	16	16	18	19	20	22	23	25	27
	PF Condensing Unit LT M 0.4-2 kW	m€	35	28	28	32	33	36	38	41	45	48
	PF Condensing Unit LT L 2-8 kW	m€	94	75	77	88	90	96	103	111	120	129
	PF Condensing Unit LT XL 8-20 kW	m€	82	65	67	77	79	83	90	97	104	112
0.6	**PF Condensing Unit, All MT&LT**	m€	**1037**	**826**	**844**	**961**	**987**	**1056**	**1137**	**1225**	**1320**	**1422**
	PF Professional Refrigeration, Total	m€	**811**	**930**	**978**	**1104**	**1138**	**1201**	**1282**	**1367**	**1453**	**1543**
	TOTAL FOOD PRESERVATION	**m€**	**5291**	**6357**	**6741**	**7227**	**7375**	**7483**	**7798**	**7770**	**7751**	**7742**

db	REVENUE INDUSTRY ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	933	2121	2274	2557	2692	2814	2929	3036	3137	3230
	COOK El. Ovens, kWh/a	m€	2181	2592	2770	3116	3010	2907	2926	2962	3000	3037
	COOK Gas Hobs, % efficiency NCV	m€	1169	963	868	747	673	606	545	504	476	447
	COOK Gas Ovens, kWh prim, NCV	m€	297	303	306	388	373	359	345	332	319	306
	COOK Range Hoods, kWh elec	m€	529	647	681	889	1036	1045	1052	1056	1057	1057
	Total CA Cooking Appliances		**5109**	**6626**	**6898**	**7697**	**7784**	**7731**	**7796**	**7890**	**7988**	**8078**
	COFFEE Dripfilter (glass)	m€	148	103	98	82	75	72	70	70	70	70
	COFFEE Dripfilter (thermos)	m€	28	45	45	46	47	48	48	48	49	49
	COFFEE Dripfilter (full automatic)	m€	0	74	84	94	104	113	123	133	143	153
	COFFEE Pad filter	m€	0	172	188	204	220	236	252	268	284	300
	COFFEE Hard cap espresso	m€	21	90	192	289	302	302	302	302	302	302
	COFFEE Semi-auto espresso	m€	24	27	26	24	22	21	19	18	16	14
	COFFEE Fully-auto espresso	m€	138	158	183	208	234	259	284	310	335	360
	Total CM household Coffee Makers	**m€**	**359**	**668**	**817**	**947**	**1004**	**1051**	**1099**	**1149**	**1199**	**1249**
	TOTAL COOKING	**m€**	**5468**	**7295**	**7714**	**8644**	**8789**	**8782**	**8895**	**9039**	**9187**	**9327**
	WM Household Washing Machine	**m€**	**1636**	**2872**	**2967**	**3274**	**3093**	**2943**	**2800**	**2665**	**2535**	**2458**
	DW Household Dishwasher	**m€**	**702**	**2038**	**2365**	**2634**	**2876**	**3102**	**3312**	**3507**	**3686**	**3851**
	LD Household Laundry Drier vented el.	m€	333	337	318	283	288	291	292	294	296	297
	LD Household Laundry Drier condens el.	m€	189	706	897	1069	1087	1066	1037	1009	981	976
	LD Household Laundry Drier vented gas	m€	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**525**	**1049**	**1222**	**1360**	**1383**	**1365**	**1339**	**1312**	**1286**	**1282**
	VC dom. Vacuum Cleaner	m€	1592	4714	6819	8271	8880	9718	10555	11392	12229	13066
	VC nondom Vacuum Cleaner	m€	488	503	541	571	584	612	640	669	697	725
	Total VC Vacuum Cleaner	**m€**	**2080**	**5216**	**7360**	**8842**	**9464**	**10329**	**11195**	**12060**	**12926**	**13791**
	TOTAL CLEANING	**m€**	**4942**	**11175**	**13913**	**16110**	**16817**	**17740**	**18646**	**19544**	**20433**	**21382**
0.5	FAN Axial<300Pa [247 W flow out]	m€	242	793	1134	1426	1364	1304	1247	1192	1140	1090
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	334	1154	1218	1333	1281	1281	1281	1281	1281	1281
0.5	FAN Centr.FC [141 W flow out]	m€	207	526	783	1083	1034	987	942	899	858	819
0.5	FAN Centr.BC-free [2120 W flow out]	m€	119	289	401	450	476	464	451	439	439	446
0.5	FAN Centr.BC [2052 W flow out]	m€	259	688	1102	1264	1345	1311	1378	1436	1486	1529
0.5	FAN Cross-flow [31 W flow out]	m€	48	107	348	462	489	476	499	518	535	549
	Total FAN, industrial (excl. box & roof fans)	**m€**	**604**	**1779**	**2493**	**3009**	**2994**	**2912**	**2899**	**2883**	**2869**	**2857**
	MT motor industry only	m€	1095	1824	2848	2931	2886	2746	2613	2486	2365	2251
	MT extra revenu drive industry (ref=0)	m€	0	0	1291	1282	1220	1160	1104	1050	1000	951
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**1095**	**1824**	**4138**	**4213**	**4106**	**3907**	**3717**	**3537**	**3365**	**3202**
	WP Water pumps	**m€**	**810**	**1101**	**1183**	**1272**	**1367**	**1463**	**1558**	**1654**	**1749**	**1844**
	CP Fixed Speed 5-1280 l/s	m€	383	338	334	361	378	392	405	418	432	446
	CP Variable speed 5-1280 l/s	m€	0	144	219	248	260	269	277	285	293	302
	CP Pistons 2-64 l/s	m€	77	85	106	128	136	140	145	149	153	158
	Total CP Standard Air Compressors	**m€**	**460**	**567**	**659**	**737**	**773**	**801**	**826**	**852**	**879**	**906**
	TOTAL INDUSTRY COMPONENTS		2422	4358	6404	7124	7188	7129	7142	7157	7180	7208
	TRAFO Distribution, kWh/a	m€	376	591	784	842	904	971	1040	1109	1177	1246
	TRAFO Industry oil	m€	196	315	518	557	598	642	688	733	779	824
	TRAFO Industry dry	m€	93	148	215	230	247	265	283	301	320	338
	TRAFO Power	m€	1510	2421	2603	2799	3010	3236	3469	3703	3936	4169
	TRAFO DER oil	m€	0	17	48	79	130	215	317	419	522	624
	TRAFO DER dry	m€	0	106	230	379	626	1034	1528	2021	2514	3008
	TRAFO Small	m€	42	42	42	42	42	42	42	42	42	42
	TOTAL ENERGY SECTOR	**m€**	**2216**	**3642**	**4440**	**4929**	**5558**	**6405**	**7367**	**8328**	**9290**	**10251**
	TYRE car replacement tyres C1	m€	5862	7227	7174	8324	9533	9643	9379	9379	9379	9379
	TYRE van replacement tyres C2	m€	2732	3369	3344	3877	4372	4372	4372	4372	4372	4372
	TYRE truck replacement tyres C3	m€	1794	1661	2014	2373	2731	3089	2939	2796	2661	2531
	TRANSPORT SECTOR	**m€**	**10388**	**12257**	**12533**	**14573**	**16636**	**17104**	**16690**	**16547**	**16411**	**16282**
	GENERAL TOTAL (in m euro 2010)		**72179**	**164885**	**191200**	**220052**	**242036**	**260471**	**275751**	**289392**	**303672**	**318625**
	GENERAL TOTAL (in bn euro 2010)		72	165	191	220	242	260	276	289	304	319

SUMMARY ECO

Industry revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3.1	4.5	7.0	9.0	10.1	10.5	10.8	11.2	11.6	12.0
SPACE HEATING	11.9	21.0	30.8	38.7	45.8	50.6	55.7	61.0	66.7	72.5
SPACE COOLING	1.0	5.5	6.8	8.3	9.3	10.1	10.6	10.6	10.7	11.0
VENTILATION	10.7	25.2	27.7	29.1	30.8	32.5	34.2	35.9	37.5	39.2
LIGHTING	3.0	6.4	6.5	5.7	3.0	1.9	1.8	1.9	1.9	2.1
ELECTRONICS	11.8	57.3	60.7	70.6	80.6	90.3	96.1	100.3	105.0	109.7
FOOD PRESERVATION	5.3	6.4	6.7	7.2	7.4	7.5	7.8	7.8	7.8	7.7
COOKING	5.5	7.3	7.7	8.6	8.8	8.8	8.9	9.0	9.2	9.3
CLEANING	4.9	11.2	13.9	16.1	16.8	17.7	18.6	19.5	20.4	21.4
INDUSTRY COMPONENTS	2.4	4.4	6.4	7.1	7.2	7.1	7.1	7.2	7.2	7.2
ENERGY SECTOR	2.2	3.6	4.4	4.9	5.6	6.4	7.4	8.3	9.3	10.3
TRANSPORT SECTOR	10.4	12.3	12.5	14.6	16.6	17.1	16.7	16.5	16.4	16.3
TOTAL in bn euro 2010	**72**	**165**	**191**	**220**	**242**	**260**	**276**	**289**	**304**	**319**

db	REVENUE RETAIL BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	457	556	549	591	656	661	653	644	635	626
	CH Central Heating combi, water heat [24 kW]	m€	348	607	655	729	750	770	794	836	879	921
	TOTAL WATER HEATING	**m€**	**805**	**1162**	**1204**	**1320**	**1406**	**1431**	**1447**	**1480**	**1514**	**1547**
	CH Central Heating boiler, space heat [24 kW]	**m€**	**1817**	**2644**	**2826**	**3008**	**3303**	**3598**	**3892**	**4187**	**4482**	**4777**
	SFB Wood Manual [18 kW]	m€	21	12	8	5	3	3	3	2	2	2
	SFB Wood Direct Draft [20 kW]	m€	1	34	35	38	35	44	51	60	70	84
	SFB Coal [25 kW]	m€	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	m€	0	9	13	13	13	15	16	18	20	22
	SFB Wood chips [160 kW]	m€	0	5	5	7	8	8	9	10	11	12
	Total Solid Fuel Boiler	**m€**	**29**	**64**	**63**	**63**	**59**	**70**	**79**	**91**	**104**	**120**
	CHAE-S (≤ 400 kW)	m€	27	112	123	136	150	164	137	70	21	3
	CHAE-L (> 400 kW)	m€	6	19	20	20	21	22	23	24	25	25
	CHWE-S (≤ 400 kW)	m€	2	10	11	12	13	15	16	17	18	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	3	9	9	10	10	11	11	11	12	12
	CHWE-L (> 1500 kW)	m€	2	6	6	6	7	7	7	7	8	8
	CHF	m€	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	m€	13	21	23	24	25	26	27	28	29	30
	HT PCH-AE-L	m€	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-S	m€	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	m€	11	18	20	21	22	22	23	24	25	26
	HT PCH-WE-L	m€	2	3	4	4	4	4	4	5	5	5
	AC rooftop	m€	12	39	40	30	18	5	5	5	5	5
	AC splits	m€	21	77	80	78	75	72	69	66	64	61
	AC VRF	m€	0	174	228	331	419	506	589	665	728	774
	ACF	m€	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**m€**	**112**	**511**	**587**	**698**	**790**	**882**	**940**	**953**	**971**	**1003**
	AC rooftop (rev)	m€	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	m€	14	49	51	50	48	46	44	43	41	39
	AC VRF (rev)	m€	0	149	185	283	344	395	437	469	489	495
	ACF (rev)	m€	0	1	1	1	2	2	2	3	3	3
	AHF	m€	41	27	26	24	23	21	20	19	18	16
	AHE	m€	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**m€**	**63**	**251**	**287**	**377**	**427**	**467**	**504**	**534**	**551**	**554**
	Total AHC Air Heating & Cooling	**m€**	**154**	**539**	**613**	**722**	**814**	**904**	**961**	**972**	**989**	**1020**
	LH open fireplace [8 kW]	m€	109	159	160	161	160	159	159	159	159	159
	LH closed fireplace/inset [8 kW]	m€	69	187	208	230	233	236	236	236	236	236
	LH wood stove [8 kW]	m€	75	88	97	107	108	110	110	110	110	110
	LH coal stove [8 kW]	m€	23	18	16	15	11	7	7	7	7	7
	LH cooker [10 kW]	m€	64	128	154	181	186	190	191	191	191	191
	LH SHR stove [8 kW]	m€	69	97	120	143	160	177	180	180	180	180
	LH pellet stove [8 kW]	m€	0	72	91	109	117	125	127	127	127	127
	LH open fire gas, NCV [4.2 kW]	m€	4	6	7	7	7	7	7	7	7	7
	LH closed fire gas, NCV [4.2 kW]	m€	20	23	23	24	25	25	25	25	25	25
	LH flueless fuel heater, NCV [1.5 kW]	m€	7	15	14	13	12	10	10	10	10	10
	LH elec.portable [1 kW]	m€	17	21	22	22	23	24	25	25	25	25
	LH elec.convector [1 kW]	m€	127	155	159	164	172	179	181	181	181	181
	LH elec.storage [2.75 kW]	m€	14	18	18	19	20	21	21	21	21	21
	LH elec.underfloor [0.62 kW]	m€	26	32	33	34	36	37	37	37	37	37
	LH luminous heaters [20 kW]	m€	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	m€	2	2	2	2	2	2	2	2	2	2
	LH total	**m€**	**629**	**1021**	**1128**	**1236**	**1275**	**1313**	**1321**	**1321**	**1321**	**1321**
	RAC (cooling demand), all types <12 kW	m€	39	361	518	648	706	714	713	725	737	749
	RAC (heating demand), reversible <12kW	m€	11	268	456	573	625	632	633	644	655	666
	Total Room Air Conditioner	**m€**	**50**	**629**	**974**	**1221**	**1332**	**1346**	**1346**	**1369**	**1392**	**1415**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**70**	**103**	**109**	**115**	**122**	**121**	**114**	**107**	**101**	**94**
	TOTAL SPACE HEATING (incl. rev.AC)	**m€**	**2549**	**4247**	**4760**	**5257**	**5689**	**6081**	**6430**	**6777**	**7113**	**7439**
	TOTAL SPACE COOLING	**m€**	**151**	**872**	**1104**	**1346**	**1497**	**1595**	**1654**	**1678**	**1708**	**1752**
	NRVU avg (sales wt.)	m€	1267	2963	3100	3268	3449	3629	3810	3990	4171	4352
	RVU Central Unidir. VU (1 fan)	m€	158	354	305	278	292	304	322	343	364	386
	RVU Central Balanced VU (2 fans)	m€	18	124	302	388	436	484	532	580	628	676
	RVU Local Balanced VU (2 fans)	m€	1	16	36	58	81	105	128	151	175	198
	TOTAL VENTILATION (electricity)	**m€**	**1444**	**3458**	**3742**	**3991**	**4257**	**4522**	**4791**	**5065**	**5338**	**5611**
	LS Light Sources											
	LFL	m€	226	326	290	292	271	250	229	209	192	175
	CFL	m€	109	1017	876	736	660	585	519	475	432	389
	Tungsten	m€	216	1536	1757	1845	1402	1008	733	511	388	364
	GLS	m€	620	428	328	234	138	37	10	0	0	0
	HID	m€	43	107	95	91	87	87	87	87	87	87
	LED BAU	m€	0	120	278	721	992	765	863	900	887	924
	TOTAL LIGHTING	**m€**	**1214**	**3534**	**3624**	**3920**	**3551**	**2732**	**2439**	**2182**	**1987**	**1939**

db	REVENUE RETAIL BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	4703	10825	2101	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	1476	5253	6577	5741	4698	3565	2433	1300	167
	DP TV Smart	m€	0	0	3152	6577	8611	10962	13449	15936	18423	20910
	DP Monitor	m€	683	1709	957	957	957	957	957	957	957	957
	DP Total electronic DisPlays	**m€**	**5387**	**14010**	**11463**	**14110**	**15309**	**16617**	**17972**	**19326**	**20680**	**22034**
	SSTB	m€	0	67	15	0	0	0	0	0	0	0
	CSTB	m€	0	251	307	331	335	326	354	383	411	439
	Total STB set top boxes (Complex & Simple)		**0**	**317**	**322**	**331**	**335**	**326**	**354**	**383**	**411**	**439**
	VIDEO players/recorders	m€	2	1416	1220	160	0	0	0	0	0	0
	VIDEO projectors	m€	4	273	232	94	41	0	0	0	0	0
	VIDEO game consoles	m€	0	2492	2106	1615	1913	1913	1913	1913	1913	1913
	Total VIDEO	**m€**	**5**	**4181**	**3558**	**1869**	**1953**	**1913**	**1913**	**1913**	**1913**	**1913**
	ES Rack servers	m€	41	1072	1198	1391	1673	2126	2306	2261	2261	2261
	ES Blade servers	m€	72	808	822	905	1073	1315	1423	1375	1375	1375
	ES Storage	m€	48	607	693	763	845	910	953	923	923	923
	Total ES Enterprise Servers	**m€**	**161**	**2487**	**2714**	**3059**	**3592**	**4350**	**4683**	**4559**	**4559**	**4559**
	PC Desktop	m€	1433	4777	3565	3241	3241	3241	3241	3241	3241	3241
	PC Notebook	m€	151	10890	4991	4689	4689	4689	4689	4689	4689	4689
	PC Tablet/slate	m€	0	687	10854	17638	22793	27135	28492	29849	31205	32562
	PC Thin client	m€	8	96	96	96	96	96	96	96	96	96
	PC Workstation	m€	40	402	402	402	402	402	402	402	402	402
	Total PC, electricity	**m€**	**1633**	**16853**	**19909**	**26066**	**31222**	**35563**	**36920**	**38277**	**39634**	**40990**
	EP-Copier mono	m€	705	283	170	72	53	34	15	0	0	0
	EP-Copier colour	m€	0	95	412	617	704	766	829	892	955	1018
	EP-printer mono	m€	142	135	118	96	82	73	63	53	43	33
	EP-printer colour	m€	0	130	193	260	312	362	412	462	513	563
	IJ SFD printer	m€	244	388	270	191	141	121	95	70	45	20
	IJ MFD printer	m€	300	970	1331	1538	1688	1839	1990	2141	2291	2442
	Total imaging equipment, electricity	**m€**	**1391**	**2001**	**2494**	**2773**	**2979**	**3195**	**3405**	**3619**	**3847**	**4076**
	SB Home Gateway, on-mode power	m€	0	618	797	976	1155	1334	1513	1692	1871	2049
	SB Home NAS, on-mode power	m€	0	28	48	68	88	109	129	149	169	189
	SB Home Phones (fixed), on-mode power	m€	185	920	1104	1177	1177	1177	1177	1177	1177	1177
	SB Office Phones (fixed), on-mode power	m€	176	336	357	379	401	422	444	465	487	508
	Total SB (networked) StandBy (rest)		**361**	**1902**	**2307**	**2601**	**2821**	**3042**	**3262**	**3483**	**3703**	**3924**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	36	72	75	91	107	123	138	151	161	167
	UPS 1.5 to 5 kVA	m€	46	91	94	114	135	155	173	189	202	210
	UPS 5 to 10 kVA	m€	16	31	33	40	47	54	60	66	70	73
	UPS 10 to 200 kVA	m€	68	134	139	169	199	229	256	280	299	311
	Total UPS - Uninterrupted Power Supplies	**m€**	**165**	**328**	**341**	**414**	**488**	**560**	**628**	**686**	**732**	**762**
	TOTAL ELECTRONICS	**m€**	**9103**	**42078**	**43108**	**51223**	**58699**	**65567**	**69137**	**72245**	**75479**	**78697**
	RF Household refrigerator and freezer	**m€**	**2962**	**3233**	**3283**	**3334**	**3385**	**3436**	**3486**	**3537**	**3588**	**3639**
	CF open vertical chilled multi deck (RVC2)	m€	0	0	0	0	0	0	0	0	0	0
	CF open horizontal frozen island (RHF4)	m€	0	0	0	0	0	0	0	0	0	0
	CF other supermarket display (non-BCs)	m€	0	0	0	0	0	0	0	0	0	0
	CF Plug in one door beverage cooler	m€	0	0	0	0	0	0	0	0	0	0
	CF Plug in horizontal ice cream freezer	m€	0	0	0	0	0	0	0	0	0	0
	CF Spiral vending machine	m€	0	0	0	0	0	0	0	0	0	0
	Total CF Commercial Refrigeration		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Storage cabinet Chilled Vertical (CV)	m€	21	27	29	30	31	32	34	35	37	38
	PF Storage cabinet Frozen Vertical (FV)	m€	11	14	15	15	16	17	18	18	19	20
	PF Storage cabinet Chilled Horizontal (CH)	m€	4	6	6	6	6	7	7	7	8	8
	PF Storage cabinet Frozen Horizontal (FH)	m€	3	4	4	5	5	5	5	6	6	6
	PF Storage cabinets All types	**m€**	**40**	**51**	**54**	**56**	**58**	**61**	**64**	**67**	**69**	**72**
	PF Process Chiller AC MT S ≤ 300 kW	m€	3	6	7	7	8	9	10	10	11	12
	PF Process Chiller AC MT L > 300 kW	m€	3	6	6	7	8	8	9	10	11	11
	PF Process Chiller AC LT S ≤ 200 kW	m€	2	5	5	6	7	7	8	8	9	10
	PF Process Chiller AC LT L > 200 kW	m€	2	5	5	6	6	7	7	8	9	9
	PF Process Chiller WC MT S ≤ 300 kW	m€	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC MT L > 300 kW	m€	2	4	4	5	5	6	6	7	7	8
	PF Process Chiller WC LT S ≤ 200 kW	m€	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC LT L > 200 kW	m€	2	3	4	4	4	5	5	6	6	7
	PF Process Chiller All MT&LT	m€	**17**	**34**	**38**	**41**	**46**	**50**	**54**	**59**	**63**	**67**
	PF Condensing Unit MT S 0.2-1 kW	m€	16	13	13	14	15	17	18	19	21	22
	PF Condensing Unit MT M 1-5 kW	m€	35	28	29	31	33	36	39	42	45	48
	PF Condensing Unit MT L 5-20 kW	m€	36	29	29	32	34	37	40	43	46	50
	PF Condensing Unit MT XL 20-50 kW	m€	28	22	23	24	26	28	30	33	35	38
	PF Condensing Unit LT S 0.1-0.4 kW	m€	3	2	2	2	3	3	3	3	4	4
	PF Condensing Unit LT M 0.4-2 kW	m€	5	4	4	4	5	5	5	6	6	7
	PF Condensing Unit LT L 2-8 kW	m€	13	11	11	12	13	14	15	16	17	18
	PF Condensing Unit LT XL 8-20 kW	m€	12	9	10	10	11	12	13	14	15	16
0.6	**PF Condensing Unit, All MT&LT**	m€	**148**	**118**	**121**	**130**	**140**	**151**	**162**	**175**	**189**	**203**
	PF Professional Refrigeration, Total	m€	**116**	**133**	**140**	**149**	**160**	**172**	**183**	**195**	**208**	**220**
	TOTAL FOOD PRESERVATION	**m€**	**3078**	**3365**	**3423**	**3483**	**3545**	**3607**	**3670**	**3732**	**3796**	**3859**

db	REVENUE RETAIL BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	925	2103	2255	2434	2567	2688	2802	2909	3009	3102
	COOK El. Ovens, kWh/a	m€	2019	2400	2530	2745	2655	2675	2708	2742	2777	2812
	COOK Gas Hobs, % efficiency NCV	m€	1082	891	803	723	651	587	528	473	440	414
	COOK Gas Ovens, kWh prim, NCV	m€	285	291	276	269	261	253	246	238	230	222
	COOK Range Hoods, kWh elec	m€	490	599	630	662	696	731	767	802	838	873
	Total CA Cooking Appliances		**4801**	**6284**	**6495**	**6833**	**6831**	**6934**	**7050**	**7164**	**7294**	**7424**
	COFFEE Dripfilter (glass)	m€	146	102	86	72	70	70	70	70	70	70
	COFFEE Dripfilter (thermos)	m€	28	44	45	46	46	47	48	48	48	49
	COFFEE Dripfilter (full automatic)	m€	0	74	83	93	103	112	122	132	142	151
	COFFEE Pad filter	m€	0	170	186	202	218	234	250	266	282	298
	COFFEE Hard cap espresso	m€	21	89	191	286	300	300	300	300	300	300
	COFFEE Semi-auto espresso	m€	24	27	25	24	22	21	19	17	16	14
	COFFEE Fully-auto espresso	m€	137	157	182	207	232	257	282	307	332	357
	Total CM household Coffee Makers	**m€**	**356**	**663**	**799**	**930**	**991**	**1041**	**1090**	**1140**	**1189**	**1239**
	TOTAL COOKING	**m€**	**5157**	**6947**	**7293**	**7763**	**7821**	**7975**	**8140**	**8304**	**8483**	**8662**
	WM Household Washing Machine	**m€**	**1623**	**2495**	**2453**	**2597**	**2437**	**2437**	**2437**	**2437**	**2437**	**2437**
	DW Household Dishwasher	**m€**	**696**	**1523**	**1765**	**2008**	**2251**	**2494**	**2737**	**2979**	**3222**	**3465**
	LD Household Laundry Drier vented el.	m€	330	334	315	280	286	288	290	292	293	295
	LD Household Laundry Drier condens el.	m€	187	700	819	920	939	947	952	957	962	968
	LD Household Laundry Drier vented gas	m€	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**520**	**1040**	**1141**	**1209**	**1233**	**1243**	**1250**	**1257**	**1264**	**1271**
	VC dom. Vacuum Cleaner	m€	1579	4675	6556	7977	8807	9637	10467	11298	12128	12958
	VC nondom Vacuum Cleaner	m€	113	116	122	128	135	141	148	154	161	167
	Total VC Vacuum Cleaner	**m€**	**1691**	**4791**	**6678**	**8105**	**8942**	**9778**	**10615**	**11452**	**12289**	**13125**
	TOTAL CLEANING	**m€**	**4530**	**9849**	**12038**	**13919**	**14863**	**15953**	**17039**	**18126**	**19212**	**20299**
0.5	FAN Axial<300Pa [247 W flow out]	m€	36	118	136	153	153	153	153	153	153	153
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	50	172	182	191	191	191	191	191	191	191
0.5	FAN Centr.FC [141 W flow out]	m€	31	79	91	103	103	103	103	103	103	103
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	43	49	55	61	62	63	64	65	67
0.5	FAN Centr.BC [2052 W flow out]	m€	39	103	118	133	148	151	166	181	196	211
0.5	FAN Cross-flow [31 W flow out]	m€	7	16	18	20	23	23	25	27	30	32
	Total FAN, industrial (excl. box & roof fans)	**m€**	**90**	**265**	**297**	**328**	**339**	**341**	**351**	**360**	**369**	**378**
	MT motor industry only	m€	163	241	255	269	271	271	271	271	269	268
	MT extra drive sales revenu	m€	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**163**	**241**	**255**	**269**	**271**	**271**	**271**	**271**	**269**	**268**
	WP Water pumps	**m€**	**121**	**164**	**177**	**190**	**204**	**218**	**233**	**247**	**261**	**275**
	CP Fixed Speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	m€	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS		293	550	601	652	678	695	719	742	765	787
	TRAFO Distribution, kWh/a	m€	47	74	79	85	92	98	105	112	119	126
	TRAFO Industry oil	m€	24	39	42	45	49	52	56	60	64	67
	TRAFO Industry dry	m€	12	19	20	21	23	24	26	28	30	31
	TRAFO Power	m€	189	303	325	350	376	405	434	463	492	521
	TRAFO DER oil	m€	0	2	4	6	10	16	24	31	39	46
	TRAFO DER dry	m€	0	13	22	36	60	99	146	193	240	287
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**277**	**455**	**498**	**549**	**614**	**700**	**796**	**892**	**988**	**1084**
	TYRE car replacement tyres C1	m€	2549	3142	3119	3616	4078	4078	4078	4078	4078	4078
	TYRE van replacement tyres C2	m€	911	1123	1115	1292	1457	1457	1457	1457	1457	1457
	TYRE truck replacement tyres C3	m€	598	554	630	665	706	747	749	750	748	745
	TRANSPORT SECTOR	**m€**	**4057**	**4819**	**4864**	**5573**	**6241**	**6282**	**6284**	**6285**	**6283**	**6280**
	GENERAL TOTAL (in m euro 2010)		**32659**	**81337**	**86259**	**98996**	**108862**	**117139**	**122546**	**127508**	**132666**	**137957**
	GENERAL TOTAL (in bn euro 2010)		33	81	86	99	109	117	123	128	133	138

SUMMARY BAU

retail revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.8**	**1.2**	**1.2**	**1.3**	**1.4**	**1.4**	**1.4**	**1.5**	**1.5**	**1.5**
SPACE HEATING	**2.5**	**4.2**	**4.8**	**5.3**	**5.7**	**6.1**	**6.4**	**6.8**	**7.1**	**7.4**
SPACE COOLING	**0.2**	**0.9**	**1.1**	**1.3**	**1.5**	**1.6**	**1.7**	**1.7**	**1.7**	**1.8**
VENTILATION	**1.4**	**3.5**	**3.7**	**4.0**	**4.3**	**4.5**	**4.8**	**5.1**	**5.3**	**5.6**
LIGHTING	**1.2**	**3.5**	**3.6**	**3.9**	**3.6**	**2.7**	**2.4**	**2.2**	**2.0**	**1.9**
ELECTRONICS	**9.1**	**42.1**	**43.1**	**51.2**	**58.7**	**65.6**	**69.1**	**72.2**	**75.5**	**78.7**
FOOD PRESERVATION	**3.1**	**3.4**	**3.4**	**3.5**	**3.5**	**3.6**	**3.7**	**3.7**	**3.8**	**3.9**
COOKING	**5.2**	**6.9**	**7.3**	**7.8**	**7.8**	**8.0**	**8.1**	**8.3**	**8.5**	**8.7**
CLEANING	**4.5**	**9.8**	**12.0**	**13.9**	**14.9**	**16.0**	**17.0**	**18.1**	**19.2**	**20.3**
INDUSTRY COMPONENTS	**0.3**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**
ENERGY SECTOR	**0.3**	**0.5**	**0.5**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**
TRANSPORT SECTOR	**4.1**	**4.8**	**4.9**	**5.6**	**6.2**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**
TOTAL in bn euro 2010	**33**	**81**	**86**	**99**	**109**	**117**	**123**	**128**	**133**	**138**

db	REVENUE RETAIL ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	457	556	892	1026	1181	1166	1151	1135	1119	1103
	CH Central Heating combi, water heat [24 kW]	m€	348	607	929	1320	1439	1558	1677	1796	1913	2030
	TOTAL WATER HEATING	**m€**	**805**	**1162**	**1821**	**2347**	**2620**	**2724**	**2828**	**2931**	**3033**	**3133**
		m€	**1817**	**2742**	**4829**	**6200**	**7778**	**8880**	**10129**	**11454**	**12856**	**14334**
	CH Central Heating boiler, space heat [24 kW]											
	SFB Wood Manual [18 kW]	m€	21	12	11	9	5	4	4	3	3	3
	SFB Wood Direct Draft [20 kW]	m€	1	34	35	38	42	49	57	67	78	91
	SFB Coal [25 kW]	m€	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	m€	0	9	13	13	14	15	16	18	20	22
	SFB Wood chips [160 kW]	m€	0	5	6	7	8	8	9	10	11	12
	Total Solid Fuel Boiler	**m€**	**29**	**64**	**66**	**68**	**69**	**77**	**87**	**99**	**112**	**129**
	CHAE-S (≤ 400 kW)	m€	27	112	123	136	150	164	137	70	21	3
	CHAE-L (> 400 kW)	m€	6	19	20	20	21	22	23	24	25	25
	CHWE-S (≤ 400 kW)	m€	2	10	11	12	13	15	16	17	18	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	3	9	9	10	10	11	11	11	12	12
	CHWE-L (> 1500 kW)	m€	2	6	6	6	7	7	7	7	8	8
	CHF	m€	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	m€	13	21	23	24	25	26	27	28	29	30
	HT PCH-AE-L	m€	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-S	m€	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	m€	11	18	20	21	22	22	23	24	25	26
	HT PCH-WE-L	m€	2	3	4	4	4	4	4	5	5	5
	AC rooftop	m€	12	39	40	30	18	5	5	5	5	5
	AC splits	m€	21	77	80	78	75	72	69	66	64	61
	AC VRF	m€	0	174	228	331	419	506	589	665	728	774
	ACF	m€	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**m€**	**112**	**511**	**587**	**698**	**791**	**882**	**940**	**953**	**971**	**1003**
	AC rooftop (rev)	m€	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	m€	14	49	51	50	48	46	44	43	41	39
	AC VRF (rev)	m€	0	149	185	283	344	395	437	469	489	495
	ACF (rev)	m€	0	1	1	1	2	2	2	3	3	3
	AHF	m€	41	27	26	26	25	23	21	19	18	16
	AHE	m€	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**m€**	**63**	**251**	**287**	**379**	**429**	**469**	**505**	**534**	**551**	**554**
	Total AHC Air Heating & Cooling	**m€**	**154**	**539**	**613**	**724**	**816**	**905**	**962**	**972**	**989**	**1020**
	LH open fireplace [8 kW]	m€	109	159	160	199	218	209	201	194	187	180
	LH closed fireplace/inset [8 kW]	m€	69	187	208	273	293	286	277	266	257	247
	LH wood stove [8 kW]	m€	75	88	97	129	138	135	130	125	120	115
	LH coal stove [8 kW]	m€	23	18	16	17	14	9	8	7	7	7
	LH cooker [10 kW]	m€	64	128	154	199	211	208	200	192	191	191
	LH SHR stove [8 kW]	m€	69	97	120	144	160	177	180	180	180	180
	LH pellet stove [8 kW]	m€	0	72	91	109	117	125	127	127	127	127
	LH open fire gas, NCV [4.2 kW]	m€	4	6	7	8	8	8	7	7	7	7
	LH closed fire gas, NCV [4.2 kW]	m€	20	23	23	25	26	26	25	25	25	25
	LH flueless fuel heater, NCV [1.5 kW]	m€	7	15	14	13	12	10	10	10	10	10
	LH elec.portable [1 kW]	m€	17	21	22	22	23	24	25	25	25	25
	LH elec.convector [1 kW]	m€	127	155	159	164	172	179	181	181	181	181
	LH elec.storage [2.75 kW]	m€	14	18	21	24	24	24	23	22	21	21
	LH elec.underfloor [0.62 kW]	m€	26	32	34	36	36	37	37	37	37	37
	LH luminous heaters [20 kW]	m€	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	m€	2	2	3	3	3	3	3	2	2	2
	LH total	**m€**	**629**	**1021**	**1132**	**1368**	**1459**	**1462**	**1436**	**1404**	**1380**	**1359**
	RAC (cooling demand), all types <12 kW	m€	39	361	559	717	790	801	794	787	780	773
	RAC (heating demand), reversible <12kW	m€	11	268	493	634	700	710	704	699	693	687
	Total Room Air Conditioner	**m€**	**50**	**629**	**1052**	**1351**	**1490**	**1511**	**1498**	**1486**	**1473**	**1460**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**70**	**111**	**142**	**144**	**145**	**137**	**123**	**110**	**101**	**94**
	TOTAL SPACE HEATING (incl. rev.AC)	**m€**	**2549**	**4346**	**6806**	**8649**	**10434**	**11597**	**12860**	**14189**	**15592**	**17063**
	TOTAL SPACE COOLING	**m€**	**151**	**872**	**1146**	**1415**	**1581**	**1683**	**1735**	**1740**	**1751**	**1775**
	NRVU avg (sales wt.)	m€	1267	2963	3111	3268	3449	3629	3810	3990	4171	4352
	RVU Central Unidir. VU (1 fan)	m€	158	354	530	483	507	529	549	568	585	600
	RVU Central Balanced VU (2 fans)	m€	18	124	373	463	504	542	576	608	637	676
	RVU Local Balanced VU (2 fans)	m€	1	16	36	58	81	105	128	151	175	198
	TOTAL VENTILATION (electricity)	**m€**	**1444**	**3458**	**4050**	**4272**	**4541**	**4804**	**5063**	**5318**	**5568**	**5825**
	LS Light Sources											
	LFL	m€	226	328	247	213	113	75	54	33	12	4
	CFL	m€	109	1224	496	221	5	4	4	4	4	4
	Tungsten	m€	216	1597	1815	416	27	10	10	10	10	10
	GLS	m€	620	256	14	25	15	14	14	14	14	14
	HID	m€	43	108	65	42	23	16	16	16	16	16
	LED ECO	m€	0	107	1941	3265	1997	1213	1309	1612	1726	1998
	TOTAL LIGHTING	**m€**	**1214**	**3622**	**4578**	**4181**	**2180**	**1331**	**1407**	**1689**	**1782**	**2046**

db	REVENUE RETAIL ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	4703	10825	2101	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	1476	5253	6577	5741	4698	3565	2433	1300	167
	DP TV Smart	m€	0	0	3152	6577	8611	10962	13449	15936	18423	20910
	DP Monitor	m€	683	1709	957	957	957	957	957	957	957	957
	DP Total electronic DisPlays	**m€**	**5387**	**14010**	**11463**	**14110**	**15309**	**16617**	**17972**	**19326**	**20680**	**22034**
	SSTB	m€	0	67	15	0	0	0	0	0	0	0
	CSTB	m€	0	251	316	331	335	326	354	383	411	439
	Total STB set top boxes		**0**	**317**	**331**	**331**	**335**	**326**	**354**	**383**	**411**	**439**
	VIDEO players/recorders	m€	2	1416	1220	160	0	0	0	0	0	0
	VIDEO projectors	m€	4	273	232	94	41	0	0	0	0	0
	VIDEO game consoles	m€	0	2492	2106	1615	1913	1913	1913	1913	1913	1913
	Total VIDEO	**m€**	**5**	**4181**	**3558**	**1869**	**1953**	**1913**	**1913**	**1913**	**1913**	**1913**
	ES Rack servers	m€	41	1072	1198	1391	1709	2171	2356	2310	2310	2310
	ES Blade servers	m€	72	808	822	905	1078	1320	1429	1381	1381	1381
	ES Storage	m€	48	607	693	840	943	1015	1064	1030	1030	1030
	Total ES Enterprise Servers	**m€**	**161**	**2487**	**2714**	**3135**	**3730**	**4507**	**4849**	**4721**	**4721**	**4721**
	PC Desktop	m€	1433	4777	3565	3241	3241	3241	3241	3241	3241	3241
	PC Notebook	m€	151	10890	4991	4689	4689	4689	4689	4689	4689	4689
	PC Tablet/slate	m€	0	687	10854	17638	22793	27135	28492	29849	31205	32562
	PC Thin client	m€	8	96	96	96	96	96	96	96	96	96
	PC Workstation	m€	40	402	402	402	402	402	402	402	402	402
	Total PC, electricity	**m€**	**1633**	**16853**	**19909**	**26066**	**31222**	**35563**	**36920**	**38277**	**39634**	**40990**
	EP-Copier mono	m€	705	283	170	72	53	34	15	0	0	0
	EP-Copier colour	m€	0	95	412	617	704	766	829	892	955	1018
	EP-printer mono	m€	142	135	118	96	82	73	63	53	43	33
	EP-printer colour	m€	0	130	193	260	312	362	412	462	513	563
	IJ SFD printer	m€	244	388	270	191	141	121	95	70	45	20
	IJ MFD printer	m€	300	970	1331	1538	1688	1839	1990	2141	2291	2442
	Total imaging equipment, electricity	**m€**	**1391**	**2001**	**2494**	**2773**	**2979**	**3195**	**3405**	**3619**	**3847**	**4076**
	SB Home Gateway, on-mode power	m€	0	618	797	976	1155	1334	1513	1692	1871	2049
	SB Home NAS, on-mode power	m€	0	28	48	68	88	109	129	149	169	189
	SB Home Phones (fixed), on-mode power	m€	185	920	1104	1177	1177	1177	1177	1177	1177	1177
	SB Office Phones (fixed), on-mode power	m€	176	336	357	379	401	422	444	465	487	508
	Total SB (networked) StandBy (rest)		**361**	**1902**	**2307**	**2601**	**2821**	**3042**	**3262**	**3483**	**3703**	**3924**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	36	72	75	91	107	123	138	151	161	167
	UPS 1.5 to 5 kVA	m€	46	91	94	114	135	155	173	189	202	210
	UPS 5 to 10 kVA	m€	16	31	33	40	47	54	60	66	70	73
	UPS 10 to 200 kVA	m€	68	134	139	169	199	229	256	280	299	311
	Total UPS - Uninterrupted Power Supplies	**m€**	**165**	**328**	**341**	**414**	**488**	**560**	**628**	**686**	**732**	**762**
	TOTAL ELECTRONICS	**m€**	**9103**	**42078**	**43117**	**51299**	**58838**	**65724**	**69303**	**72406**	**75641**	**78859**
	RF Household refrigerator and freezer	**m€**	**2962**	**3739**	**4068**	**4222**	**4315**	**4359**	**4560**	**4402**	**4248**	**4099**
	CF open vertical chilled multi deck (RVC2)	m€	0	0	0	0	0	0	0	0	0	0
	CF open horizontal frozen island (RHF4)	m€	0	0	0	0	0	0	0	0	0	0
	CF other supermarket display (non-BCs)	m€	0	0	0	0	0	0	0	0	0	0
	CF Plug in one door beverage cooler	m€	0	0	0	0	0	0	0	0	0	0
	CF Plug in horizontal ice cream freezer	m€	0	0	0	0	0	0	0	0	0	0
	CF Spiral vending machine	m€	0	0	0	0	0	0	0	0	0	0
	Total CF Commercial Refrigeration		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Storage cabinet Chilled Vertical (CV)	m€	21	27	29	32	32	32	34	35	37	38
	PF Storage cabinet Frozen Vertical (FV)	m€	11	14	15	17	17	17	18	18	19	20
	PF Storage cabinet Chilled Horizontal (CH)	m€	4	6	6	7	7	7	7	7	8	8
	PF Storage cabinet Frozen Horizontal (FH)	m€	3	4	4	5	5	5	5	6	6	6
	PF Storage cabinets All types	**m€**	**40**	**51**	**54**	**61**	**60**	**61**	**64**	**67**	**69**	**72**
	PF Process Chiller AC MT S ≤ 300 kW	m€	3	6	7	8	8	9	10	10	11	12
	PF Process Chiller AC MT L > 300 kW	m€	3	6	6	7	8	8	9	10	11	11
	PF Process Chiller AC LT S ≤ 200 kW	m€	2	5	5	6	7	7	8	8	9	10
	PF Process Chiller AC LT L > 200 kW	m€	2	5	5	6	6	7	7	8	9	9
	PF Process Chiller WC MT S ≤ 300 kW	m€	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC MT L > 300 kW	m€	2	4	4	5	5	6	6	7	7	8
	PF Process Chiller WC LT S ≤ 200 kW	m€	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC LT L > 200 kW	m€	2	3	4	4	4	5	5	6	6	7
	PF Process Chiller All MT&LT	m€	**17**	**34**	**38**	**42**	**46**	**50**	**54**	**59**	**63**	**67**
	PF Condensing Unit MT S 0.2-1 kW	m€	16	13	13	15	15	17	18	19	21	22
	PF Condensing Unit MT M 1-5 kW	m€	35	28	29	32	33	36	39	42	45	48
	PF Condensing Unit MT L 5-20 kW	m€	36	29	29	34	35	37	40	43	46	50
	PF Condensing Unit MT XL 20-50 kW	m€	28	22	23	26	27	28	30	33	35	38
	PF Condensing Unit LT S 0.1-0.4 kW	m€	3	2	2	3	3	3	3	3	4	4
	PF Condensing Unit LT M 0.4-2 kW	m€	5	4	4	5	5	5	5	6	6	7
	PF Condensing Unit LT L 2-8 kW	m€	13	11	11	13	13	14	15	16	17	18
	PF Condensing Unit LT XL 8-20 kW	m€	12	9	10	11	11	12	13	14	15	16
0.6	**PF Condensing Unit, All MT&LT**	m€	**148**	**118**	**121**	**137**	**141**	**151**	**162**	**175**	**189**	**203**
	PF Professional Refrigeration, Total	m€	**116**	**133**	**140**	**158**	**163**	**172**	**183**	**195**	**208**	**220**
	TOTAL FOOD PRESERVATION	**m€**	**3078**	**3872**	**4208**	**4380**	**4477**	**4530**	**4743**	**4597**	**4456**	**4320**

db	REVENUE RETAIL ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	925	2103	2255	2535	2670	2790	2904	3011	3111	3203
	COOK El. Ovens, kWh/a	m€	2019	2400	2564	2885	2786	2691	2708	2742	2777	2812
	COOK Gas Hobs, % efficiency NCV	m€	1082	891	803	692	623	561	504	466	440	414
	COOK Gas Ovens, kWh prim, NCV	m€	285	291	293	372	358	344	331	318	305	293
	COOK Range Hoods, kWh elec	m€	490	599	630	823	959	968	974	977	979	979
	Total CA Cooking Appliances		**4801**	**6284**	**6545**	**7307**	**7396**	**7355**	**7422**	**7515**	**7612**	**7701**
	COFFEE Dripfilter (glass)	m€	146	102	97	81	75	71	70	70	70	70
	COFFEE Dripfilter (thermos)	m€	28	44	45	46	46	47	48	48	48	49
	COFFEE Dripfilter (full automatic)	m€	0	74	83	93	103	112	122	132	142	151
	COFFEE Pad filter	m€	0	170	186	202	218	234	250	266	282	298
	COFFEE Hard cap espresso	m€	21	89	191	286	300	300	300	300	300	300
	COFFEE Semi-auto espresso	m€	24	27	25	24	22	21	19	17	16	14
	COFFEE Fully-auto espresso	m€	137	157	182	207	232	257	282	307	332	357
	Total CM household Coffee Makers	**m€**	**356**	**663**	**810**	**939**	**996**	**1042**	**1090**	**1140**	**1189**	**1239**
	TOTAL COOKING	**m€**	**5157**	**6947**	**7356**	**8246**	**8392**	**8397**	**8512**	**8655**	**8801**	**8940**
	WM Household Washing Machine	**m€**	**1623**	**2848**	**2943**	**3247**	**3068**	**2919**	**2777**	**2643**	**2514**	**2437**
	DW Household Dishwasher	**m€**	**696**	**2021**	**2345**	**2613**	**2853**	**3076**	**3285**	**3478**	**3656**	**3820**
	LD Household Laundry Drier vented el.	m€	330	334	315	280	286	288	290	292	293	295
	LD Household Laundry Drier condens el.	m€	187	700	890	1060	1078	1057	1029	1001	973	968
	LD Household Laundry Drier vented gas	m€	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**520**	**1040**	**1212**	**1348**	**1372**	**1354**	**1327**	**1301**	**1275**	**1271**
	VC dom. Vacuum Cleaner	m€	1579	4675	6763	8203	8807	9637	10467	11298	12128	12958
	VC nondom Vacuum Cleaner	m€	113	116	125	132	135	141	148	154	161	167
	Total VC Vacuum Cleaner	**m€**	**1691**	**4791**	**6887**	**8334**	**8942**	**9778**	**10615**	**11452**	**12289**	**13125**
	TOTAL CLEANING	**m€**	**4530**	**10700**	**13387**	**15543**	**16234**	**17128**	**18005**	**18873**	**19734**	**20654**
0.5	FAN Axial<300Pa [247 W flow out]	m€	36	118	169	213	204	195	186	178	170	163
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	50	172	182	199	191	191	191	191	191	191
0.5	FAN Centr.FC [141 W flow out]	m€	31	79	117	162	154	147	141	134	128	122
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	43	60	67	71	69	67	66	65	67
0.5	FAN Centr.BC [2052 W flow out]	m€	39	103	164	189	201	196	206	214	222	228
0.5	FAN Cross-flow [31 W flow out]	m€	7	16	52	69	73	71	74	77	80	82
	Total FAN, industrial (excl. box & roof fans)	**m€**	**90**	**265**	**372**	**449**	**447**	**435**	**433**	**430**	**428**	**426**
	MT motor industry only	m€	163	272	425	437	431	410	390	371	353	336
	MT extra drive sales revenu	m€	0	0	193	191	182	173	165	157	149	142
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**163**	**272**	**618**	**629**	**613**	**583**	**555**	**528**	**502**	**478**
	WP Water pumps	**m€**	**121**	**164**	**177**	**190**	**204**	**218**	**233**	**247**	**261**	**275**
	CP Fixed Speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	m€	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS		293	566	858	953	957	944	943	941	940	941
	TRAFO Distribution, kWh/a	m€	47	74	98	105	113	121	130	139	147	156
	TRAFO Industry oil	m€	24	39	65	70	75	80	86	92	97	103
	TRAFO Industry dry	m€	12	19	27	29	31	33	35	38	40	42
	TRAFO Power	m€	189	303	325	350	376	405	434	463	492	521
	TRAFO DER oil	m€	0	2	6	10	16	27	40	52	65	78
	TRAFO DER dry	m€	0	13	29	47	78	129	191	253	314	376
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**277**	**455**	**555**	**616**	**695**	**801**	**921**	**1041**	**1161**	**1281**
	TYRE car replacement tyres C1	m€	2549	3142	3119	3619	4145	4193	4078	4078	4078	4078
	TYRE van replacement tyres C2	m€	911	1123	1115	1292	1457	1457	1457	1457	1457	1457
	TYRE truck replacement tyres C3	m€	598	554	671	791	910	1030	980	932	887	844
	TRANSPORT SECTOR	**m€**	**4057**	**4819**	**4905**	**5702**	**6512**	**6679**	**6515**	**6467**	**6422**	**6379**
	GENERAL TOTAL (in m euro 2010)		**32659**	**82897**	**92785**	**107604**	**117461**	**126343**	**132833**	**138847**	**144881**	**151215**
	GENERAL TOTAL (in bn euro 2010)		33	83	93	108	117	126	133	139	145	151

SUMMARY ECO

Retail revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.8**	**1.2**	**1.8**	**2.3**	**2.6**	**2.7**	**2.8**	**2.9**	**3.0**	**3.1**
SPACE HEATING	**2.5**	**4.3**	**6.8**	**8.6**	**10.4**	**11.6**	**12.9**	**14.2**	**15.6**	**17.1**
SPACE COOLING	**0.2**	**0.9**	**1.1**	**1.4**	**1.6**	**1.7**	**1.7**	**1.7**	**1.8**	**1.8**
VENTILATION	**1.4**	**3.5**	**4.0**	**4.3**	**4.5**	**4.8**	**5.1**	**5.3**	**5.6**	**5.8**
LIGHTING	**1.2**	**3.6**	**4.6**	**4.2**	**2.2**	**1.3**	**1.4**	**1.7**	**1.8**	**2.0**
ELECTRONICS	**9.1**	**42.1**	**43.1**	**51.3**	**58.8**	**65.7**	**69.3**	**72.4**	**75.6**	**78.9**
FOOD PRESERVATION	**3.1**	**3.9**	**4.2**	**4.4**	**4.5**	**4.5**	**4.7**	**4.6**	**4.5**	**4.3**
COOKING	**5.2**	**6.9**	**7.4**	**8.2**	**8.4**	**8.4**	**8.5**	**8.7**	**8.8**	**8.9**
CLEANING	**4.5**	**10.7**	**13.4**	**15.5**	**16.2**	**17.1**	**18.0**	**18.9**	**19.7**	**20.7**
INDUSTRY COMPONENTS	**0.3**	**0.6**	**0.9**	**1.0**	**1.0**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**
ENERGY SECTOR	**0.3**	**0.5**	**0.6**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.2**	**1.3**
TRANSPORT SECTOR	**4.1**	**4.8**	**4.9**	**5.7**	**6.5**	**6.7**	**6.5**	**6.5**	**6.4**	**6.4**
TOTAL in bn euro 2010	**33**	**83**	**93**	**108**	**117**	**126**	**133**	**139**	**145**	**151**

Retail revenue ECO-BAU (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	-	-	0.6	1.0	1.2	1.3	1.4	1.5	1.5	1.6
SPACE HEATING	-	0.1	2.0	3.4	4.7	5.5	6.4	7.4	8.5	9.6
SPACE COOLING	-	-	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
VENTILATION	-	-	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
LIGHTING	-	0.1	1.0	0.3	1.4	1.4	1.0	0.5	0.2	0.1
ELECTRONICS	-	-	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2
FOOD PRESERVATION	-	0.5	0.8	0.9	0.9	0.9	1.1	0.9	0.7	0.5
COOKING	-	-	0.1	0.5	0.6	0.4	0.4	0.4	0.3	0.3
CLEANING	-	0.9	1.3	1.6	1.4	1.2	1.0	0.7	0.5	0.4
INDUSTRY COMPONENTS	-	0.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
ENERGY SECTOR	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
TRANSPORT SECTOR	-	-	0.0	0.1	0.3	0.4	0.2	0.2	0.1	0.1
TOTAL in bn euro 2010	0.0	1.6	6.5	8.6	8.6	9.2	10.3	11.3	12.2	13.3

db	REVENUE WHOLESALE BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	522	635	628	676	749	756	746	736	726	715
	CH Central Heating combi, water heat [24 kW]	m€	371	647	699	777	800	821	847	892	937	982
	TOTAL WATER HEATING	**m€**	**894**	**1282**	**1326**	**1453**	**1550**	**1577**	**1593**	**1628**	**1663**	**1698**
	CH Central Heating boiler, space heat [24 kW]	**m€**	**1938**	**2820**	**3014**	**3209**	**3523**	**3838**	**4152**	**4466**	**4781**	**5095**
	SFB Wood Manual [18 kW]	m€	21	12	8	5	3	3	3	2	2	2
	SFB Wood Direct Draft [20 kW]	m€	1	34	35	38	35	44	51	60	70	84
	SFB Coal [25 kW]	m€	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	m€	0	9	13	13	13	15	16	18	20	22
	SFB Wood chips [160 kW]	m€	0	5	5	7	8	8	9	10	11	12
	Total Solid Fuel Boiler	**m€**	**29**	**64**	**63**	**63**	**59**	**70**	**79**	**91**	**104**	**120**
	CHAE-S (≤ 400 kW)	m€	27	112	123	136	150	164	137	70	21	3
	CHAE-L (> 400 kW)	m€	6	19	20	20	21	22	23	24	25	25
	CHWE-S (≤ 400 kW)	m€	2	10	11	12	13	15	16	17	18	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	3	9	9	10	10	11	11	11	12	12
	CHWE-L (> 1500 kW)	m€	2	6	6	6	7	7	7	7	8	8
	CHF	m€	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	m€	13	21	23	24	25	26	27	28	29	30
	HT PCH-AE-L	m€	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-S	m€	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	m€	11	18	20	21	22	22	23	24	25	26
	HT PCH-WE-L	m€	2	3	4	4	4	4	4	5	5	5
	AC rooftop	m€	12	39	40	30	18	5	5	5	5	5
	AC splits	m€	21	77	80	78	75	72	69	66	64	61
	AC VRF	m€	0	174	228	331	419	506	589	665	728	774
	ACF	m€	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**m€**	**112**	**511**	**587**	**698**	**790**	**882**	**940**	**953**	**971**	**1003**
	AC rooftop (rev)	m€	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	m€	14	49	51	50	48	46	44	43	41	39
	AC VRF (rev)	m€	0	149	185	283	344	395	437	469	489	495
	ACF (rev)	m€	0	1	1	1	2	2	2	3	3	3
	AHF	m€	41	27	26	24	23	21	20	19	18	16
	AHE	m€	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**m€**	**63**	**251**	**287**	**377**	**427**	**467**	**504**	**534**	**551**	**554**
	Total AHC Air Heating & Cooling	**m€**	**154**	**539**	**613**	**722**	**814**	**904**	**961**	**972**	**989**	**1020**
	LH open fireplace [8 kW]	m€	92	135	136	137	136	135	135	135	135	135
	LH closed fireplace/inset [8 kW]	m€	58	158	176	195	197	200	200	200	200	200
	LH wood stove [8 kW]	m€	63	74	82	91	92	93	93	93	93	93
	LH coal stove [8 kW]	m€	19	15	14	12	9	6	6	6	6	6
	LH cooker [10 kW]	m€	54	108	131	153	157	161	162	162	162	162
	LH SHR stove [8 kW]	m€	59	82	101	121	135	150	153	153	153	153
	LH pellet stove [8 kW]	m€	0	61	77	93	99	106	107	107	107	107
	LH open fire gas, NCV [4.2 kW]	m€	4	5	6	6	6	6	6	6	6	6
	LH closed fire gas, NCV [4.2 kW]	m€	17	19	20	20	21	21	21	21	21	21
	LH flueless fuel heater, NCV [1.5 kW]	m€	6	13	12	11	10	9	9	9	9	9
	LH elec.portable [1 kW]	m€	15	18	18	19	20	21	21	21	21	21
	LH elec.convector [1 kW]	m€	107	131	135	139	145	152	153	153	153	153
	LH elec.storage [2.75 kW]	m€	12	15	15	16	17	17	17	17	17	17
	LH elec.underfloor [0.62 kW]	m€	22	27	28	29	30	31	32	32	32	32
	LH luminous heaters [20 kW]	m€	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	m€	2	2	2	2	2	2	2	2	2	2
	LH total	**m€**	**533**	**865**	**956**	**1046**	**1079**	**1112**	**1119**	**1119**	**1119**	**1119**
	RAC (cooling demand), all types <12 kW	m€	42	385	552	692	754	761	761	774	786	799
	RAC (heating demand), reversible <12kW	m€	12	286	487	611	667	674	675	687	699	710
	Total Room Air Conditioner	**m€**	**54**	**671**	**1039**	**1303**	**1421**	**1435**	**1436**	**1460**	**1485**	**1510**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**174**	**257**	**272**	**289**	**305**	**302**	**285**	**269**	**252**	**235**
	TOTAL SPACE HEATING (incl. rev.AC)	**m€**	**2575**	**4285**	**4806**	**5307**	**5756**	**6161**	**6529**	**6897**	**7253**	**7599**
	TOTAL SPACE COOLING	**m€**	**154**	**897**	**1139**	**1389**	**1544**	**1643**	**1701**	**1727**	**1757**	**1802**
	NRVU avg (sales wt.)	m€	1267	2963	3100	3268	3449	3629	3810	3990	4171	4352
	RVU Central Unidir. VU (1 fan)	m€	149	333	287	262	274	286	303	323	343	363
	RVU Central Balanced VU (2 fans)	m€	17	117	284	365	410	455	501	546	591	636
	RVU Local Balanced VU (2 fans)	m€	1	15	34	54	76	98	120	142	164	186
	TOTAL VENTILATION (electricity)	**m€**	**1433**	**3429**	**3704**	**3949**	**4210**	**4469**	**4734**	**5001**	**5269**	**5537**
	LS Light Sources											
	LFL	m€	226	326	290	292	271	250	229	209	192	175
	CFL	m€	13	118	102	86	77	68	60	55	50	45
	Tungsten	m€	25	179	204	215	163	117	85	59	45	42
	GLS	m€	72	50	38	27	16	4	1	0	0	0
	HID	m€	43	107	95	91	87	87	87	87	87	87
	LED BAU	m€	0	14	32	84	115	89	100	105	103	107
	TOTAL LIGHTING	**m€**	**379**	**794**	**761**	**794**	**729**	**615**	**563**	**515**	**478**	**457**

db	REVENUE WHOLESALE BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	588	1353	263	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	185	657	822	718	587	446	304	163	21
	DP TV Smart	m€	0	0	394	822	1076	1370	1681	1992	2303	2614
	DP Monitor	m€	85	214	120	120	120	120	120	120	120	120
	DP Total electronic DisPlays	**m€**	**673**	**1751**	**1433**	**1764**	**1914**	**2077**	**2246**	**2416**	**2585**	**2754**
	SSTB	m€	0	333	75	0	0	0	0	0	0	0
	CSTB	m€	0	1253	1535	1654	1673	1631	1772	1913	2055	2196
	Total STB set top boxes (Complex & Simple)		**0**	**1586**	**1611**	**1654**	**1673**	**1631**	**1772**	**1913**	**2055**	**2196**
	VIDEO players/recorders	m€	0	177	153	20	0	0	0	0	0	0
	VIDEO projectors	m€	12	819	695	283	122	0	0	0	0	0
	VIDEO game consoles	m€	0	319	270	207	245	245	245	245	245	245
	Total VIDEO	**m€**	**12**	**1315**	**1117**	**510**	**367**	**245**	**245**	**245**	**245**	**245**
	ES Rack servers	m€	20	536	599	695	837	1063	1153	1131	1131	1131
	ES Blade servers	m€	36	404	411	452	537	657	712	687	687	687
	ES Storage	m€	24	303	347	382	423	455	477	462	462	462
	Total ES Enterprise Servers	**m€**	**80**	**1243**	**1357**	**1529**	**1796**	**2175**	**2342**	**2280**	**2280**	**2280**
	PC Desktop	m€	167	556	415	377	377	377	377	377	377	377
	PC Notebook	m€	18	1266	580	545	545	545	545	545	545	545
	PC Tablet/slate	m€	0	86	1357	2205	2849	3392	3561	3731	3901	4070
	PC Thin client	m€	10	121	121	121	121	121	121	121	121	121
	PC Workstation	m€	46	462	462	462	462	462	462	462	462	462
	Total PC, electricity	**m€**	**241**	**2491**	**2935**	**3710**	**4354**	**4897**	**5066**	**5236**	**5406**	**5575**
	EP-Copier mono	m€	352	141	85	36	26	17	8	0	0	0
	EP-Copier colour	m€	0	47	206	309	352	383	415	446	477	509
	EP-printer mono	m€	71	67	59	48	41	37	32	27	22	17
	EP-printer colour	m€	0	65	96	130	156	181	206	231	256	281
	IJ SFD printer	m€	18	29	20	14	11	9	7	5	3	2
	IJ MFD printer	m€	22	73	100	115	127	138	149	161	172	183
	Total imaging equipment, electricity	**m€**	**464**	**423**	**566**	**652**	**712**	**765**	**816**	**870**	**931**	**991**
	SB Home Gateway, on-mode power	m€	0	1546	1993	2440	2887	3335	3782	4229	4676	5123
	SB Home NAS, on-mode power	m€	0	141	241	342	442	543	643	744	844	945
	SB Home Phones (fixed), on-mode power	m€	14	69	83	88	88	88	88	88	88	88
	SB Office Phones (fixed), on-mode power	m€	117	224	238	253	267	281	296	310	324	339
	Total SB (networked) StandBy (rest)		**131**	**1979**	**2555**	**3123**	**3685**	**4247**	**4809**	**5371**	**5933**	**6495**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	9	18	19	23	27	31	34	38	40	42
	UPS 1.5 to 5 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 5 to 10 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 10 to 200 kVA	m€	0	0	0	0	0	0	0	0	0	0
	Total UPS - Uninterrupted Power Supplies	**m€**	**9**	**18**	**19**	**23**	**27**	**31**	**34**	**38**	**40**	**42**
	TOTAL ELECTRONICS	**m€**	**1610**	**10807**	**11593**	**12964**	**14529**	**16068**	**17332**	**18368**	**19474**	**20579**
	RF Household refrigerator and freezer	**m€**	**222**	**242**	**246**	**250**	**254**	**258**	**261**	**265**	**269**	**273**
	CF open vertical chilled multi deck (RVC2)	m€	86	94	93	94	96	97	99	100	102	103
	CF open horizontal frozen island (RHF4)	m€	10	11	11	11	11	12	12	12	12	12
	CF other supermarket display (non-BCs)	m€	196	232	246	255	264	274	283	293	304	314
	CF Plug in one door beverage cooler	m€	168	205	204	211	218	226	233	241	249	257
	CF Plug in horizontal ice cream freezer	m€	69	85	84	87	90	93	96	100	103	106
	CF Spiral vending machine	m€	111	84	68	71	74	76	79	82	85	89
	Total CF Commercial Refrigeration		**640**	**710**	**705**	**729**	**753**	**778**	**803**	**828**	**855**	**882**
	PF Storage cabinet Chilled Vertical (CV)	m€	42	55	57	59	62	65	68	71	73	76
	PF Storage cabinet Frozen Vertical (FV)	m€	22	29	30	31	32	34	35	37	38	40
	PF Storage cabinet Chilled Horizontal (CH)	m€	9	11	12	12	13	13	14	15	15	16
	PF Storage cabinet Frozen Horizontal (FH)	m€	7	9	9	9	10	10	11	11	11	12
	PF Storage cabinets All types	**m€**	**79**	**103**	**108**	**112**	**117**	**122**	**128**	**133**	**138**	**144**
	PF Process Chiller AC MT S ≤ 300 kW	m€	6	12	13	15	16	18	19	21	22	24
	PF Process Chiller AC MT L > 300 kW	m€	6	12	13	14	15	17	18	20	21	23
	PF Process Chiller AC LT S ≤ 200 kW	m€	5	10	11	12	13	14	16	17	18	19
	PF Process Chiller AC LT L > 200 kW	m€	5	9	10	11	12	14	15	16	17	18
	PF Process Chiller WC MT S ≤ 300 kW	m€	3	5	6	7	7	8	9	9	10	11
	PF Process Chiller WC MT L > 300 kW	m€	4	8	9	10	11	12	13	14	15	16
	PF Process Chiller WC LT S ≤ 200 kW	m€	3	5	6	6	7	8	8	9	10	10
	PF Process Chiller WC LT L > 200 kW	m€	3	7	7	8	9	10	11	11	12	13
	PF Process Chiller All MT&LT	m€	**34**	**68**	**75**	**83**	**92**	**100**	**109**	**117**	**126**	**135**
	PF Condensing Unit MT S 0.2-1 kW	m€	33	26	27	29	31	33	36	38	41	45
	PF Condensing Unit MT M 1-5 kW	m€	70	56	57	62	66	72	77	83	89	96
	PF Condensing Unit MT L 5-20 kW	m€	72	58	59	63	68	74	79	85	92	99
	PF Condensing Unit MT XL 20-50 kW	m€	55	44	45	49	52	56	61	65	70	76
	PF Condensing Unit LT S 0.1-0.4 kW	m€	6	4	5	5	5	6	6	7	7	8
	PF Condensing Unit LT M 0.4-2 kW	m€	10	8	8	9	9	10	11	12	13	14
	PF Condensing Unit LT L 2-8 kW	m€	27	21	22	24	25	27	29	32	34	37
	PF Condensing Unit LT XL 8-20 kW	m€	23	19	19	21	22	24	26	28	30	32
0.6	**PF Condensing Unit, All MT&LT**	m€	**296**	**236**	**241**	**260**	**280**	**302**	**325**	**350**	**377**	**406**
	PF Professional Refrigeration, Total	m€	**232**	**266**	**279**	**298**	**320**	**343**	**366**	**390**	**415**	**441**
	TOTAL FOOD PRESERVATION	**m€**	**1094**	**1218**	**1231**	**1278**	**1328**	**1379**	**1430**	**1484**	**1539**	**1596**

db	REVENUE WHOLESALE BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	69	158	169	183	193	202	210	218	226	233
	COOK El. Ovens, kWh/a	m€	151	180	190	206	199	201	203	206	208	211
	COOK Gas Hobs, % efficiency NCV	m€	81	67	60	54	49	44	40	35	33	31
	COOK Gas Ovens, kWh prim, NCV	m€	21	22	21	20	20	19	18	18	17	17
	COOK Range Hoods, kWh elec	m€	37	45	47	50	52	55	58	60	63	66
	Total CA Cooking Appliances		**360**	**471**	**487**	**512**	**512**	**520**	**529**	**537**	**547**	**557**
	COFFEE Dripfilter (glass)	m€	11	8	6	5	5	5	5	5	5	5
	COFFEE Dripfilter (thermos)	m€	2	3	3	3	3	4	4	4	4	4
	COFFEE Dripfilter (full automatic)	m€	0	6	6	7	8	8	9	10	11	11
	COFFEE Pad filter	m€	0	13	14	15	16	18	19	20	21	22
	COFFEE Hard cap espresso	m€	2	7	14	21	22	22	22	22	22	22
	COFFEE Semi-auto espresso	m€	2	2	2	2	2	2	1	1	1	1
	COFFEE Fully-auto espresso	m€	10	12	14	16	17	19	21	23	25	27
	Total CM household Coffee Makers	**m€**	**27**	**50**	**60**	**70**	**74**	**78**	**82**	**85**	**89**	**93**
	TOTAL COOKING	**m€**	**387**	**521**	**547**	**582**	**587**	**598**	**611**	**623**	**636**	**650**
	WM Household Washing Machine	**m€**	**122**	**187**	**184**	**195**	**183**	**183**	**183**	**183**	**183**	**183**
	DW Household Dishwasher	**m€**	**52**	**114**	**132**	**151**	**169**	**187**	**205**	**223**	**242**	**260**
	LD Household Laundry Drier vented el.	m€	25	25	24	21	21	22	22	22	22	22
	LD Household Laundry Drier condens el.	m€	14	53	61	69	70	71	71	72	72	73
	LD Household Laundry Drier vented gas	m€	0	0	1	1	1	1	1	1	1	1
	Total LD household Laundry Drier	**m€**	**39**	**78**	**86**	**91**	**92**	**93**	**94**	**94**	**95**	**95**
	VC dom. Vacuum Cleaner	m€	118	351	492	598	661	723	785	847	910	972
	VC nondom Vacuum Cleaner	m€	150	155	163	171	180	188	197	206	214	223
	Total VC Vacuum Cleaner	**m€**	**269**	**505**	**654**	**769**	**840**	**911**	**982**	**1053**	**1124**	**1195**
	TOTAL CLEANING	**m€**	**481**	**885**	**1056**	**1205**	**1284**	**1374**	**1464**	**1554**	**1643**	**1733**
0.5	FAN Axial<300Pa [247 W flow out]	m€	83	272	312	353	353	353	353	353	353	353
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	115	396	418	440	440	440	440	440	440	440
0.5	FAN Centr.FC [141 W flow out]	m€	71	181	208	236	236	236	236	236	236	236
0.5	FAN Centr.BC-free [2120 W flow out]	m€	41	99	113	126	140	142	145	148	151	153
0.5	FAN Centr.BC [2052 W flow out]	m€	89	236	271	305	340	346	381	415	450	484
0.5	FAN Cross-flow [31 W flow out]	m€	16	37	42	47	52	53	58	63	68	73
	Total FAN, industrial (excl. box & roof fans)	**m€**	**207**	**611**	**682**	**753**	**780**	**785**	**806**	**828**	**849**	**870**
	MT motor industry only	m€	376	554	588	619	622	624	624	622	620	616
	MT extra drive sales revenu	m€	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**376**	**554**	**588**	**619**	**622**	**624**	**624**	**622**	**620**	**616**
	WP Water pumps	**m€**	**278**	**378**	**406**	**437**	**469**	**502**	**535**	**568**	**600**	**633**
	CP Fixed Speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	m€	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS		673	1265	1382	1500	1561	1599	1653	1706	1759	1811
	TRAFO Distribution, kWh/a	m€	47	74	79	85	92	98	105	112	119	126
	TRAFO Industry oil	m€	24	39	42	45	49	52	56	60	64	67
	TRAFO Industry dry	m€	12	19	20	21	23	24	26	28	30	31
	TRAFO Power	m€	189	303	325	350	376	405	434	463	492	521
	TRAFO DER oil	m€	0	2	4	6	10	16	24	31	39	46
	TRAFO DER dry	m€	0	13	22	36	60	99	146	193	240	287
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**277**	**455**	**498**	**549**	**614**	**700**	**796**	**892**	**988**	**1084**
	TYRE car replacement tyres C1	m€	2549	3142	3119	3616	4078	4078	4078	4078	4078	4078
	TYRE van replacement tyres C2	m€	911	1123	1115	1292	1457	1457	1457	1457	1457	1457
	TYRE truck replacement tyres C3	m€	598	554	630	665	706	747	749	750	748	745
	TRANSPORT SECTOR	**m€**	**4057**	**4819**	**4864**	**5573**	**6241**	**6282**	**6284**	**6285**	**6283**	**6280**
	GENERAL TOTAL (in m euro 2010)		**14015**	**30656**	**32907**	**36543**	**39931**	**42465**	**44690**	**46680**	**48743**	**50825**
	GENERAL TOTAL (in bn euro 2010)		14	31	33	37	40	42	45	47	49	51

SUMMARY BAU

Wholesale revenue BAU (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.9**	**1.3**	**1.3**	**1.5**	**1.5**	**1.6**	**1.6**	**1.6**	**1.7**	**1.7**
SPACE HEATING	**2.6**	**4.3**	**4.8**	**5.3**	**5.8**	**6.2**	**6.5**	**6.9**	**7.3**	**7.6**
SPACE COOLING	**0.2**	**0.9**	**1.1**	**1.4**	**1.5**	**1.6**	**1.7**	**1.7**	**1.8**	**1.8**
VENTILATION	**1.4**	**3.4**	**3.7**	**3.9**	**4.2**	**4.5**	**4.7**	**5.0**	**5.3**	**5.5**
LIGHTING	**0.4**	**0.8**	**0.8**	**0.8**	**0.7**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**
ELECTRONICS	**1.6**	**10.8**	**11.6**	**13.0**	**14.5**	**16.1**	**17.3**	**18.4**	**19.5**	**20.6**
FOOD PRESERVATION	**1.1**	**1.2**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**
COOKING	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
CLEANING	**0.5**	**0.9**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.6**	**1.7**
INDUSTRY COMPONENTS	**0.7**	**1.3**	**1.4**	**1.5**	**1.6**	**1.6**	**1.7**	**1.7**	**1.8**	**1.8**
ENERGY SECTOR	**0.3**	**0.5**	**0.5**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**
TRANSPORT SECTOR	**4.1**	**4.8**	**4.9**	**5.6**	**6.2**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**
TOTAL in bn euro 2010	**14**	**31**	**33**	**37**	**40**	**42**	**45**	**47**	**49**	**51**

db	REVENUE WHOLESALE ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	522	635	1019	1173	1350	1333	1315	1297	1279	1261
	CH Central Heating combi, water heat [24 kW]	m€	371	647	990	1408	1535	1662	1789	1915	2041	2165
	TOTAL WATER HEATING	**m€**	**894**	**1282**	**2010**	**2581**	**2885**	**2994**	**3104**	**3213**	**3320**	**3426**
	CH Central Heating boiler, space heat [24 kW]	**m€**	**1938**	**2925**	**5151**	**6613**	**8297**	**9472**	**10804**	**12217**	**13713**	**15289**
	SFB Wood Manual [18 kW]	m€	21	12	11	9	5	4	4	3	3	3
	SFB Wood Direct Draft [20 kW]	m€	1	34	35	38	42	49	57	67	78	91
	SFB Coal [25 kW]	m€	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	m€	0	9	13	13	14	15	16	18	20	22
	SFB Wood chips [160 kW]	m€	0	5	6	7	8	8	9	10	11	12
	Total Solid Fuel Boiler	**m€**	**29**	**64**	**66**	**68**	**69**	**77**	**87**	**99**	**112**	**129**
	CHAE-S (≤ 400 kW)	m€	27	112	123	136	150	164	137	70	21	3
	CHAE-L (> 400 kW)	m€	6	19	20	20	21	22	23	24	25	25
	CHWE-S (≤ 400 kW)	m€	2	10	11	12	13	15	16	17	18	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	3	9	9	10	10	11	11	11	12	12
	CHWE-L (> 1500 kW)	m€	2	6	6	6	7	7	7	7	8	8
	CHF	m€	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	m€	13	21	23	24	25	26	27	28	29	30
	HT PCH-AE-L	m€	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-S	m€	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	m€	11	18	20	21	22	22	23	24	25	26
	HT PCH-WE-L	m€	2	3	4	4	4	4	4	5	5	5
1	AC rooftop	m€	12	39	40	30	18	5	5	5	5	5
1	AC splits	m€	21	77	80	78	75	72	69	66	64	61
1	AC VRF	m€	0	174	228	331	419	506	589	665	728	774
	ACF	m€	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**m€**	**112**	**511**	**587**	**698**	**791**	**882**	**940**	**953**	**971**	**1003**
1	AC rooftop (rev)	m€	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	m€	14	49	51	50	48	46	44	43	41	39
1	AC VRF (rev)	m€	0	149	185	283	344	395	437	469	489	495
1	ACF (rev)	m€	0	1	1	1	2	2	2	3	3	3
1	AHF	m€	41	27	26	26	25	23	21	19	18	16
	AHE	m€	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**m€**	**63**	**251**	**287**	**379**	**429**	**469**	**505**	**534**	**551**	**554**
	Total AHC Air Heating & Cooling	**m€**	**154**	**539**	**613**	**724**	**816**	**905**	**962**	**972**	**989**	**1020**
	LH open fireplace [8 kW]	m€	92	135	136	168	184	177	170	164	158	152
	LH closed fireplace/inset [8 kW]	m€	58	158	176	231	248	242	234	225	217	209
	LH wood stove [8 kW]	m€	63	74	82	109	117	114	110	106	101	97
	LH coal stove [8 kW]	m€	19	15	14	15	12	7	7	6	6	6
	LH cooker [10 kW]	m€	54	108	131	168	179	176	169	163	162	162
	LH SHR stove [8 kW]	m€	59	82	101	122	136	150	153	153	153	153
	LH pellet stove [8 kW]	m€	0	61	77	93	99	106	107	107	107	107
	LH open fire gas, NCV [4.2 kW]	m€	4	5	6	6	7	6	6	6	6	6
	LH closed fire gas, NCV [4.2 kW]	m€	17	19	20	21	22	22	21	21	21	21
	LH flueless fuel heater, NCV [1.5 kW]	m€	6	13	12	11	10	9	9	9	9	9
	LH elec.portable [1 kW]	m€	15	18	18	19	20	21	21	21	21	21
	LH elec.convector [1 kW]	m€	107	131	135	139	145	152	153	153	153	153
	LH elec.storage [2.75 kW]	m€	12	15	17	20	20	20	19	19	18	17
	LH elec.underfloor [0.62 kW]	m€	22	27	29	30	31	31	32	32	32	32
	LH luminous heaters [20 kW]	m€	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	m€	2	2	3	3	3	3	3	2	2	2
	LH total	**m€**	**533**	**865**	**958**	**1159**	**1235**	**1238**	**1216**	**1189**	**1169**	**1151**
	RAC (cooling demand), all types <12 kW	m€	42	385	596	765	843	854	847	840	832	824
	RAC (heating demand), reversible <12kW	m€	12	286	526	676	746	757	751	745	739	733
	Total Room Air Conditioner	**m€**	**54**	**671**	**1122**	**1441**	**1589**	**1611**	**1598**	**1585**	**1571**	**1557**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**174**	**278**	**354**	**360**	**364**	**342**	**307**	**275**	**252**	**235**
	TOTAL SPACE HEATING (incl. rev.AC)	**m€**	**2575**	**4390**	**6987**	**8895**	**10776**	**12013**	**13362**	**14784**	**16284**	**17856**
	TOTAL SPACE COOLING	**m€**	**154**	**897**	**1183**	**1463**	**1634**	**1736**	**1788**	**1793**	**1803**	**1827**
	NRVU avg (sales wt.)	m€	1267	2963	3111	3268	3449	3629	3810	3990	4171	4352
	RVU Central Unidir. VU (1 fan)	m€	149	333	499	455	477	498	517	534	550	565
	RVU Central Balanced VU (2 fans)	m€	17	117	351	436	474	510	542	572	600	636
	RVU Local Balanced VU (2 fans)	m€	1	15	34	54	76	98	120	142	164	186
	TOTAL VENTILATION (electricity)	**m€**	**1433**	**3429**	**3994**	**4213**	**4477**	**4735**	**4990**	**5240**	**5486**	**5739**
	LS Light Sources											
	LFL	m€	226	328	247	213	113	75	54	33	12	4
	CFL	m€	13	142	58	26	1	1	1	1	1	1
	Tungsten	m€	25	186	211	48	3	1	1	1	1	1
	GLS	m€	72	30	2	3	2	2	2	2	2	2
	HID	m€	43	108	65	42	23	16	16	16	16	16
	LED ECO	m€	0	12	216	363	222	135	145	179	192	222
	TOTAL LIGHTING	**m€**	**379**	**807**	**798**	**694**	**363**	**228**	**218**	**231**	**222**	**244**

db	REVENUE WHOLESALE ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	588	1353	263	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	185	657	822	718	587	446	304	163	21
	DP TV Smart	m€	0	0	394	822	1076	1370	1681	1992	2303	2614
	DP Monitor	m€	85	214	120	120	120	120	120	120	120	120
	DP Total electronic DisPlays	**m€**	**673**	**1751**	**1433**	**1764**	**1914**	**2077**	**2246**	**2416**	**2585**	**2754**
	SSTB	m€	0	333	75	0	0	0	0	0	0	0
	CSTB	m€	0	1253	1580	1654	1673	1631	1772	1913	2055	2196
	Total STB set top boxes (Complex & Simple)		**0**	**1586**	**1656**	**1654**	**1673**	**1631**	**1772**	**1913**	**2055**	**2196**
	VIDEO players/recorders	m€	0	177	153	20	0	0	0	0	0	0
	VIDEO projectors	m€	12	819	695	283	122	0	0	0	0	0
	VIDEO game consoles	m€	0	319	270	207	245	245	245	245	245	245
	Total VIDEO	**m€**	**12**	**1315**	**1117**	**510**	**367**	**245**	**245**	**245**	**245**	**245**
	ES Rack servers	m€	20	536	599	695	855	1086	1178	1155	1155	1155
	ES Blade servers	m€	36	404	411	452	539	660	715	690	690	690
	ES Storage	m€	24	303	347	420	471	508	532	515	515	515
	Total ES Enterprise Servers	**m€**	**80**	**1243**	**1357**	**1567**	**1865**	**2254**	**2425**	**2360**	**2360**	**2360**
	PC Desktop	m€	167	556	415	377	377	377	377	377	377	377
	PC Notebook	m€	18	1266	580	545	545	545	545	545	545	545
	PC Tablet/slate	m€	0	86	1357	2205	2849	3392	3561	3731	3901	4070
	PC Thin client	m€	10	121	121	121	121	121	121	121	121	121
	PC Workstation	m€	46	462	462	462	462	462	462	462	462	462
	Total PC, electricity	**m€**	**241**	**2491**	**2935**	**3710**	**4354**	**4897**	**5066**	**5236**	**5406**	**5575**
	EP-Copier mono	m€	352	141	85	36	26	17	8	0	0	0
	EP-Copier colour	m€	0	47	206	309	352	383	415	446	477	509
	EP-printer mono	m€	71	67	59	48	41	37	32	27	22	17
	EP-printer colour	m€	0	65	96	130	156	181	206	231	256	281
	IJ SFD printer	m€	18	29	20	14	11	9	7	5	3	2
	IJ MFD printer	m€	22	73	100	115	127	138	149	161	172	183
	Total imaging equipment, electricity	**m€**	**464**	**423**	**566**	**652**	**712**	**765**	**816**	**870**	**931**	**991**
	SB Home Gateway, on-mode power	m€	0	1546	1993	2440	2887	3335	3782	4229	4676	5123
	SB Home NAS, on-mode power	m€	0	141	241	342	442	543	643	744	844	945
	SB Home Phones (fixed), on-mode power	m€	14	69	83	88	88	88	88	88	88	88
	SB Office Phones (fixed), on-mode power	m€	117	224	238	253	267	281	296	310	324	339
	Total SB (networked) StandBy (rest)		**131**	**1979**	**2555**	**3123**	**3685**	**4247**	**4809**	**5371**	**5933**	**6495**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	9	18	19	23	27	31	34	38	40	42
	UPS 1.5 to 5 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 5 to 10 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 10 to 200 kVA	m€	0	0	0	0	0	0	0	0	0	0
	Total UPS - Uninterrupted Power Supplies	**m€**	**9**	**18**	**19**	**23**	**27**	**31**	**34**	**38**	**40**	**42**
	TOTAL ELECTRONICS	**m€**	**1610**	**10807**	**11638**	**13003**	**14598**	**16146**	**17415**	**18449**	**19555**	**20659**
	RF Household refrigerator and freezer	**m€**	**222**	**280**	**305**	**317**	**324**	**327**	**342**	**330**	**319**	**307**
	CF open vertical chilled multi deck (RVC2)	m€	86	94	97	125	126	122	118	114	110	106
	CF open horizontal frozen island (RHF4)	m€	10	11	11	12	11	12	12	12	12	12
	CF other supermarket display (non-BCs)	m€	196	232	247	273	272	274	283	293	304	314
	CF Plug in one door beverage cooler	m€	168	205	204	231	236	232	233	241	249	257
	CF Plug in horizontal ice cream freezer	m€	69	85	84	87	90	93	96	100	103	106
	CF Spiral vending machine	m€	111	84	69	72	74	76	79	82	85	89
	Total CF Commercial Refrigeration		**640**	**710**	**712**	**800**	**808**	**809**	**822**	**842**	**863**	**885**
	PF Storage cabinet Chilled Vertical (CV)	m€	42	55	57	64	64	65	68	71	73	76
	PF Storage cabinet Frozen Vertical (FV)	m€	22	29	30	34	34	34	35	37	38	40
	PF Storage cabinet Chilled Horizontal (CH)	m€	9	11	12	13	13	13	14	15	15	16
	PF Storage cabinet Frozen Horizontal (FH)	m€	7	9	9	10	10	10	11	11	11	12
	PF Storage cabinets All types	**m€**	**79**	**103**	**108**	**121**	**121**	**122**	**128**	**133**	**138**	**144**
	PF Process Chiller AC MT S ≤ 300 kW	m€	6	12	13	15	16	18	19	21	22	24
	PF Process Chiller AC MT L > 300 kW	m€	6	12	13	14	15	17	18	20	21	23
	PF Process Chiller AC LT S ≤ 200 kW	m€	5	10	11	12	13	14	16	17	18	19
	PF Process Chiller AC LT L > 200 kW	m€	5	9	10	11	12	14	15	16	17	18
	PF Process Chiller WC MT S ≤ 300 kW	m€	3	5	6	7	7	8	9	9	10	11
	PF Process Chiller WC MT L > 300 kW	m€	4	8	9	10	11	12	13	14	15	16
	PF Process Chiller WC LT S ≤ 200 kW	m€	3	5	6	7	7	8	8	9	10	10
	PF Process Chiller WC LT L > 200 kW	m€	3	7	7	8	9	10	11	11	12	13
	PF Process Chiller All MT&LT	m€	**34**	**68**	**75**	**84**	**92**	**100**	**109**	**117**	**126**	**135**
	PF Condensing Unit MT S 0.2-1 kW	m€	33	26	27	30	31	33	36	38	41	45
	PF Condensing Unit MT M 1-5 kW	m€	70	56	57	64	66	72	77	83	89	96
	PF Condensing Unit MT L 5-20 kW	m€	72	58	59	68	69	74	79	85	92	99
	PF Condensing Unit MT XL 20-50 kW	m€	55	44	45	52	53	56	61	65	70	76
	PF Condensing Unit LT S 0.1-0.4 kW	m€	6	4	5	5	5	6	6	7	7	8
	PF Condensing Unit LT M 0.4-2 kW	m€	10	8	8	9	9	10	11	12	13	14
	PF Condensing Unit LT L 2-8 kW	m€	27	21	22	25	26	27	29	32	34	37
	PF Condensing Unit LT XL 8-20 kW	m€	23	19	19	22	22	24	26	28	30	32
0.6	**PF Condensing Unit, All MT&LT**	m€	**296**	**236**	**241**	**275**	**282**	**302**	**325**	**350**	**377**	**406**
	PF Professional Refrigeration, Total	m€	**232**	**266**	**279**	**315**	**325**	**343**	**366**	**390**	**415**	**441**
	TOTAL FOOD PRESERVATION	**m€**	**1094**	**1256**	**1296**	**1432**	**1457**	**1479**	**1530**	**1563**	**1597**	**1634**

db	REVENUE WHOLESALE ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	69	158	169	190	200	209	218	226	233	240
	COOK El. Ovens, kWh/a	m€	151	180	192	216	209	202	203	206	208	211
	COOK Gas Hobs, % efficiency NCV	m€	81	67	60	52	47	42	38	35	33	31
	COOK Gas Ovens, kWh prim, NCV	m€	21	22	22	28	27	26	25	24	23	22
	COOK Range Hoods, kWh elec	m€	37	45	47	62	72	73	73	73	73	73
	Total CA Cooking Appliances		**360**	**471**	**491**	**548**	**555**	**552**	**557**	**564**	**571**	**578**
	COFFEE Dripfilter (glass)	m€	11	8	7	6	6	5	5	5	5	5
	COFFEE Dripfilter (thermos)	m€	2	3	3	3	3	4	4	4	4	4
	COFFEE Dripfilter (full automatic)	m€	0	6	6	7	8	8	9	10	11	11
	COFFEE Pad filter	m€	0	13	14	15	16	18	19	20	21	22
	COFFEE Hard cap espresso	m€	2	7	14	21	22	22	22	22	22	22
	COFFEE Semi-auto espresso	m€	2	2	2	2	2	2	1	1	1	1
	COFFEE Fully-auto espresso	m€	10	12	14	16	17	19	21	23	25	27
	Total CM household Coffee Makers	**m€**	**27**	**50**	**61**	**70**	**75**	**78**	**82**	**85**	**89**	**93**
	TOTAL COOKING	**m€**	**387**	**521**	**552**	**618**	**629**	**630**	**638**	**649**	**660**	**670**
	WM Household Washing Machine	**m€**	**122**	**214**	**221**	**244**	**230**	**219**	**208**	**198**	**189**	**183**
	DW Household Dishwasher	**m€**	**52**	**152**	**176**	**196**	**214**	**231**	**246**	**261**	**274**	**286**
	LD Household Laundry Drier vented el.	m€	25	25	24	21	21	22	22	22	22	22
	LD Household Laundry Drier condens el.	m€	14	53	67	79	81	79	77	75	73	73
	LD Household Laundry Drier vented gas	m€	0	0	1	1	1	1	1	1	1	1
	Total LD household Laundry Drier	**m€**	**39**	**78**	**91**	**101**	**103**	**102**	**100**	**98**	**96**	**95**
	VC dom. Vacuum Cleaner	m€	118	351	507	615	661	723	785	847	910	972
	VC nondom Vacuum Cleaner	m€	150	155	166	176	180	188	197	206	214	223
	Total VC Vacuum Cleaner	**m€**	**269**	**505**	**674**	**791**	**840**	**911**	**982**	**1053**	**1124**	**1195**
	TOTAL CLEANING	**m€**	**481**	**948**	**1161**	**1332**	**1387**	**1462**	**1536**	**1610**	**1682**	**1760**
0.5	FAN Axial<300Pa [247 W flow out]	m€	83	272	389	490	468	448	428	409	391	374
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	115	396	418	458	440	440	440	440	440	440
0.5	FAN Centr.FC [141 W flow out]	m€	71	181	269	372	355	339	323	309	295	281
0.5	FAN Centr.BC-free [2120 W flow out]	m€	41	99	138	154	163	159	155	151	151	153
0.5	FAN Centr.BC [2052 W flow out]	m€	89	236	378	434	462	450	473	493	510	525
0.5	FAN Cross-flow [31 W flow out]	m€	16	37	120	159	168	163	171	178	184	188
	Total FAN, industrial (excl. box & roof fans)	**m€**	**207**	**611**	**856**	**1033**	**1028**	**999**	**995**	**990**	**985**	**981**
	MT motor industry only	m€	376	626	978	1006	991	943	897	853	812	773
	MT extra drive sales revenu	m€	0	0	443	440	419	398	379	361	343	326
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**376**	**626**	**1421**	**1446**	**1409**	**1341**	**1276**	**1214**	**1155**	**1099**
	WP Water pumps	**m€**	**278**	**378**	**406**	**437**	**469**	**502**	**535**	**568**	**600**	**633**
	CP Fixed Speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	m€	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	m€	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS		673	1302	1972	2193	2202	2172	2168	2164	2163	2164
	TRAFO Distribution, kWh/a	m€	47	74	98	105	113	121	130	139	147	156
	TRAFO Industry oil	m€	24	39	65	70	75	80	86	92	97	103
	TRAFO Industry dry	m€	12	19	27	29	31	33	35	38	40	42
	TRAFO Power	m€	189	303	325	350	376	405	434	463	492	521
	TRAFO DER oil	m€	0	2	6	10	16	27	40	52	65	78
	TRAFO DER dry	m€	0	13	29	47	78	129	191	253	314	376
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**277**	**455**	**555**	**616**	**695**	**801**	**921**	**1041**	**1161**	**1281**
	TYRE car replacement tyres C1	m€	2549	3142	3119	3619	4145	4193	4078	4078	4078	4078
	TYRE van replacement tyres C2	m€	911	1123	1115	1292	1457	1457	1457	1457	1457	1457
	TYRE truck replacement tyres C3	m€	598	554	671	791	910	1030	980	932	887	844
	TRANSPORT SECTOR	**m€**	**4057**	**4819**	**4905**	**5702**	**6512**	**6679**	**6515**	**6467**	**6422**	**6379**
	GENERAL TOTAL (in m euro 2010)		**14015**	**30913**	**37052**	**42742**	**47615**	**51076**	**54185**	**57203**	**60355**	**63639**
	GENERAL TOTAL (in bn euro 2010)		14	31	37	43	48	51	54	57	60	64

SUMMARY ECO

Wholesale revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.9**	**1.3**	**2.0**	**2.6**	**2.9**	**3.0**	**3.1**	**3.2**	**3.3**	**3.4**
SPACE HEATING	**2.6**	**4.4**	**7.0**	**8.9**	**10.8**	**12.0**	**13.4**	**14.8**	**16.3**	**17.9**
SPACE COOLING	**0.2**	**0.9**	**1.2**	**1.5**	**1.6**	**1.7**	**1.8**	**1.8**	**1.8**	**1.8**
VENTILATION	**1.4**	**3.4**	**4.0**	**4.2**	**4.5**	**4.7**	**5.0**	**5.2**	**5.5**	**5.7**
LIGHTING	**0.4**	**0.8**	**0.8**	**0.7**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
ELECTRONICS	**1.6**	**10.8**	**11.6**	**13.0**	**14.6**	**16.1**	**17.4**	**18.4**	**19.6**	**20.7**
FOOD PRESERVATION	**1.1**	**1.3**	**1.3**	**1.4**	**1.5**	**1.5**	**1.5**	**1.6**	**1.6**	**1.6**
COOKING	**0.4**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**
CLEANING	**0.5**	**0.9**	**1.2**	**1.3**	**1.4**	**1.5**	**1.5**	**1.6**	**1.7**	**1.8**
INDUSTRY COMPONENTS	**0.7**	**1.3**	**2.0**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
ENERGY SECTOR	**0.3**	**0.5**	**0.6**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.2**	**1.3**
TRANSPORT SECTOR	**4.1**	**4.8**	**4.9**	**5.7**	**6.5**	**6.7**	**6.5**	**6.5**	**6.4**	**6.4**
TOTAL in bn euro 2010	**14**	**31**	**37**	**43**	**48**	**51**	**54**	**57**	**60**	**64**

Wholesale revenue ECO-BAU (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.0	0.0	0.7	1.1	1.3	1.4	1.5	1.6	1.7	1.7
SPACE HEATING	0.0	0.1	2.2	3.6	5.0	5.9	6.8	7.9	9.0	10.3
SPACE COOLING	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
VENTILATION	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
LIGHTING	0.0	0.0	0.0	-0.1	-0.4	-0.4	-0.3	-0.3	-0.3	-0.2
ELECTRONICS	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
FOOD PRESERVATION	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0
COOKING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CLEANING	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
INDUSTRY COMPONENTS	0.0	0.0	0.6	0.7	0.6	0.6	0.5	0.5	0.4	0.4
ENERGY SECTOR	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
TRANSPORT SECTOR	0.0	0.0	0.0	0.1	0.3	0.4	0.2	0.2	0.1	0.1
TOTAL in bn euro 2010	0.0	0.3	4.1	6.2	7.7	8.6	9.5	10.5	11.6	12.8

db	INSTALL excl. VAT BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1383	1682	1663	1790	1984	2002	1976	1949	1922	1895
	CH Central Heating combi, water heat [24 kW]	m€	1123	1957	2113	2351	2421	2484	2562	2698	2835	2971
	TOTAL WATER HEATING		**2506**	**3639**	**3776**	**4140**	**4405**	**4486**	**4538**	**4647**	**4757**	**4866**
		m€	**5721**	**8325**	**8899**	**9473**	**10401**	**11329**	**12257**	**13185**	**14113**	**15041**
	CH Central Heating boiler, space heat [24 kW]											
	SFB Wood Manual [18 kW]	m€	287	173	116	69	40	38	35	33	30	28
	SFB Wood Direct Draft [20 kW]	m€	6	284	295	314	292	364	426	499	585	698
	SFB Coal [25 kW]	m€	81	35	4	4	3	3	3	3	2	2
	SFB Pellets [25 kW]	m€	0	81	125	125	125	138	152	168	186	205
	SFB Wood chips [160 kW]	m€	0	18	18	21	25	27	30	33	37	40
	Total Solid Fuel Boiler	**m€**	**374**	**590**	**559**	**533**	**486**	**570**	**647**	**736**	**840**	**974**
	CHAE-S (≤ 400 kW)	m€	98	411	452	500	552	605	504	258	77	13
	CHAE-L (> 400 kW)	m€	22	71	73	75	79	81	85	88	91	94
	CHWE-S (≤ 400 kW)	m€	6	24	26	29	32	35	38	41	44	47
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	6	22	23	23	24	25	26	27	28	29
	CHWE-L (> 1500 kW)	m€	2	9	9	9	10	10	10	11	11	12
	CHF	m€	0	2	2	2	3	3	4	4	5	5
	HT PCH-AE-S	m€	48	78	83	88	92	95	99	103	107	110
	HT PCH-AE-L	m€	38	62	66	70	73	76	79	82	85	88
	HT PCH-WE-S	m€	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-M	m€	27	44	47	50	52	54	56	58	60	62
	HT PCH-WE-L	m€	3	5	5	6	6	6	6	7	7	7
	AC rooftop	m€	89	289	292	223	130	34	34	34	34	34
	AC splits	m€	91	331	346	334	322	310	298	286	275	263
	AC VRF	m€	0	1050	1371	1997	2526	3049	3546	4004	4388	4665
	ACF	m€	0	2	2	2	3	3	4	4	5	5
	SubTotal AHC Air Cooling	**m€**	**441**	**2415**	**2816**	**3428**	**3923**	**4409**	**4812**	**5031**	**5240**	**5459**
	AC rooftop (rev)	m€	55	178	171	137	77	19	0	0	0	0
	AC splits (rev)	m€	61	212	222	214	207	199	191	184	176	169
	AC VRF (rev)	m€	0	896	1113	1704	2072	2379	2633	2829	2949	2984
	ACF (rev)	m€	0	3	5	5	7	8	9	10	11	12
	AHF	m€	277	182	170	160	152	143	134	126	118	110
	AHE	m€	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**m€**	**393**	**1471**	**1681**	**2222**	**2514**	**2748**	**2968**	**3149**	**3255**	**3274**
	Total AHC Air Heating & Cooling	**m€**	**718**	**2597**	**2987**	**3589**	**4076**	**4553**	**4948**	**5159**	**5360**	**5571**
	LH open fireplace [8 kW]	m€	302	440	443	446	443	440	439	439	439	439
	LH closed fireplace/inset [8 kW]	m€	184	498	556	614	622	630	631	631	631	631
	LH wood stove [8 kW]	m€	142	168	186	204	207	209	210	210	210	210
	LH coal stove [8 kW]	m€	65	50	46	42	31	21	19	19	19	19
	LH cooker [10 kW]	m€	104	209	253	296	304	312	313	313	313	313
	LH SHR stove [8 kW]	m€	900	1256	1560	1863	2083	2303	2348	2348	2348	2348
	LH pellet stove [8 kW]	m€	0	96	121	147	157	168	170	170	170	170
	LH open fire gas, NCV [4.2 kW]	m€	13	19	21	23	23	23	23	23	23	23
	LH closed fire gas, NCV [4.2 kW]	m€	68	76	78	81	83	85	85	85	85	85
	LH flueless fuel heater, NCV [1.5 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	m€	234	285	294	304	317	331	334	334	334	334
	LH elec.storage [2.75 kW]	m€	18	22	23	24	25	26	26	26	26	26
	LH elec.underfloor [0.62 kW]	m€	138	169	174	179	188	196	197	197	197	197
	LH luminous heaters [20 kW]	m€	5	6	6	6	6	6	6	6	6	6
	LH tube heaters [30 kW]	m€	5	6	6	6	6	6	6	6	6	6
	LH total	**m€**	**2178**	**3301**	**3767**	**4234**	**4494**	**4754**	**4807**	**4807**	**4807**	**4807**
	RAC (cooling demand), all types <12 kW	m€	224	2054	2944	3688	4018	4059	4058	4126	4194	4262
	RAC (heating demand), reversible <12kW	m€	63	1524	2595	3260	3557	3596	3599	3662	3725	3788
	Total Room Air Conditioner	**m€**	**286**	**3578**	**5539**	**6948**	**7575**	**7655**	**7657**	**7788**	**7919**	**8050**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING (incl. rev.AC)		**8729**	**15211**	**17501**	**19722**	**21452**	**22998**	**24278**	**25539**	**26740**	**27885**
	TOTAL SPACE COOLING		**665**	**4469**	**5760**	**7116**	**7941**	**8468**	**8870**	**9158**	**9435**	**9721**
	NRVU avg (sales wt.)	m€	17119	40052	41896	44170	46611	49053	51494	53936	56378	58819
	RVU Central Unidir. VU (1 fan)	m€	481	1078	928	846	887	926	980	1044	1109	1173
	RVU Central Balanced VU (2 fans)	m€	46	322	784	1007	1131	1256	1381	1505	1630	1754
	RVU Local Balanced VU (2 fans)	m€	1	6	14	23	32	42	51	61	70	79
	TOTAL VENTILATION (electricity)		**17647**	**41459**	**43622**	**46045**	**48662**	**51276**	**53906**	**56546**	**59186**	**61826**
	LS Light Sources in Euro/unit											
	LFL	m€	0	0	0	0	0	0	0	0	0	0
	CFL	m€	0	0	0	0	0	0	0	0	0	0
	Tungsten	m€	0	0	0	0	0	0	0	0	0	0
	GLS	m€	0	0	0	0	0	0	0	0	0	0
	HID	m€	0	0	0	0	0	0	0	0	0	0
	LED BAU	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	INSTALL excl. VAT BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	0	0	0	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	0	0	0	0	0	0	0	0	0
	DP TV Smart	m€	0	0	0	0	0	0	0	0	0	0
	DP Monitor	m€	0	0	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SSTB	m€	0	0	0	0	0	0	0	0	0	0
	CSTB	m€	0	0	0	0	0	0	0	0	0	0
	Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VIDEO players/recorders	m€	0	0	0	0	0	0	0	0	0	0
	VIDEO projectors	m€	15	1029	873	355	154	0	0	0	0	0
	VIDEO game consoles	m€	0	0	0	0	0	0	0	0	0	0
	Total VIDEO	**m€**	**15**	**1029**	**873**	**355**	**154**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	m€	23	595	666	773	930	1181	1281	1256	1256	1256
	ES Blade servers	m€	30	337	343	377	447	548	593	573	573	573
	ES Storage	m€	16	202	231	254	282	303	318	308	308	308
	Total ES Enterprise Servers	**m€**	**69**	**1134**	**1240**	**1404**	**1659**	**2032**	**2192**	**2137**	**2137**	**2137**
	PC Desktop	m€	0	0	0	0	0	0	0	0	0	0
	PC Notebook	m€	0	0	0	0	0	0	0	0	0	0
	PC Tablet/slate	m€	0	0	0	0	0	0	0	0	0	0
	PC Thin client	m€	0	0	0	0	0	0	0	0	0	0
	PC Workstation	m€	0	0	0	0	0	0	0	0	0	0
	Total PC, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	EP-Copier mono	m€	0	0	0	0	0	0	0	0	0	0
	EP-Copier colour	m€	0	0	0	0	0	0	0	0	0	0
	EP-printer mono	m€	0	0	0	0	0	0	0	0	0	0
	EP-printer colour	m€	0	0	0	0	0	0	0	0	0	0
	IJ SFD printer	m€	0	0	0	0	0	0	0	0	0	0
	IJ MFD printer	m€	0	0	0	0	0	0	0	0	0	0
	Total imaging equipment, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SB Home Gateway, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Home NAS, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Home Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Office Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 1.5 to 5 kVA	m€	63	124	129	157	184	212	237	259	277	288
	UPS 5 to 10 kVA	m€	7	13	13	16	19	22	25	27	29	30
	UPS 10 to 200 kVA	m€	8	16	17	20	24	28	31	34	36	38
	Total UPS - Uninterrupted Power Supplies	**m€**	**77**	**153**	**159**	**193**	**228**	**261**	**293**	**320**	**342**	**356**
	TOTAL ELECTRONICS		**161**	**2317**	**2272**	**1953**	**2040**	**2293**	**2485**	**2457**	**2478**	**2492**
	RF Household refrigerator and freezer	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	m€	29	31	31	31	32	32	33	33	34	34
	CF open horizontal frozen island (RHF4)	m€	3	4	4	4	4	4	4	4	4	4
	CF other supermarket display (non-BCs)	m€	94	112	118	122	127	131	136	141	146	151
	CF Plug in one door beverage cooler	m€	0	0	0	0	0	0	0	0	0	0
	CF Plug in horizontal ice cream freezer	m€	0	0	0	0	0	0	0	0	0	0
	CF Spiral vending machine	m€	0	0	0	0	0	0	0	0	0	0
	Total CF Commercial Refrigeration		**126**	**146**	**152**	**157**	**163**	**168**	**173**	**178**	**184**	**189**
	PF Storage cabinet Chilled Vertical (CV)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Vertical (FV)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Chilled Horizontal (CH)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Horizontal (FH)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinets All types	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Process Chiller AC MT S ≤ 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC MT L > 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT S ≤ 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT L > 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT S ≤ 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT L > 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT S ≤ 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT L > 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller All MT&LT	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Condensing Unit MT S 0.2-1 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT M 1-5 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT L 5-20 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT XL 20-50 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT S 0.1-0.4 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT M 0.4-2 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT L 2-8 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT XL 8-20 kW	m€	0	0	0	0	0	0	0	0	0	0
0.6	**PF Condensing Unit, All MT&LT**	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Professional Refrigeration, Total	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**126**	**146**	**152**	**157**	**163**	**168**	**173**	**178**	**184**	**189**

db	INSTALL excl. VAT BAU (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	0	0	0	0	0	0	0	0	0	0
	COOK El. Ovens, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Hobs, % efficiency NCV	m€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Ovens, kWh prim, NCV	m€	0	0	0	0	0	0	0	0	0	0
	COOK Range Hoods, kWh elec	m€	0	0	0	0	0	0	0	0	0	0
	Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	COFFEE Dripfilter (glass)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (thermos)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (full automatic)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Pad filter	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Hard cap espresso	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Semi-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Fully-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL COOKING		0	0	0	0	0	0	0	0	0	0
	WM Household Washing Machine	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD Household Laundry Drier vented el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	m€	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		0	0	0	0	0	0	0	0	0	0
0.5	FAN Axial<300Pa [247 W flow out]	m€	40	131	151	170	170	170	170	170	170	170
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	42	144	151	159	159	159	159	159	159	159
0.5	FAN Centr.FC [141 W flow out]	m€	21	52	60	68	68	68	68	68	68	68
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	43	49	55	61	62	63	64	65	67
0.5	FAN Centr.BC [2052 W flow out]	m€	39	103	118	133	148	151	166	181	196	211
0.5	FAN Cross-flow [31 W flow out]	m€	6	13	15	17	19	19	21	23	25	27
	Total FAN, industrial (excl. box & roof fans)	**m€**	**82**	**243**	**272**	**301**	**313**	**315**	**324**	**333**	**342**	**351**
	MT motor industry only	m€	0	0	0	0	0	0	0	0	0	0
	MT extra drive installation revenu	m€	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**m€**	**555**	**754**	**810**	**871**	**936**	**1001**	**1067**	**1132**	**1197**	**1263**
	CP Fixed Speed 5-1280 l/s	m€	16	14	13	14	15	15	16	17	17	18
	CP Variable speed 5-1280 l/s	m€	0	6	9	10	10	11	11	12	12	13
	CP Pistons 2-64 l/s	m€	5	5	6	6	7	7	8	8	9	9
	Total CP Standard Air Compressors	**m€**	**21**	**25**	**28**	**30**	**32**	**33**	**35**	**37**	**38**	**40**
	TOTAL INDUSTRY COMPONENTS		658	1022	1111	1202	1281	1350	1426	1501	1577	1653
	TRAFO Distribution, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	m€	0	0	0	0	0	0	0	0	0	0
	TYRE car replacement tyres C1	m€	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	m€	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	m€	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR		0	0	0	0	0	0	0	0	0	0
	GENERAL TOTAL (in m euro 2010)		**30492**	**68264**	**74194**	**80336**	**85943**	**91038**	**95675**	**100026**	**104356**	**108633**
	GENERAL TOTAL (in bn euro 2010)		30	68	74	80	86	91	96	100	104	109

SUMMARY BAU

INSTALL excl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	2.5	3.6	3.8	4.1	4.4	4.5	4.5	4.6	4.8	4.9
SPACE HEATING	8.7	15.2	17.5	19.7	21.5	23.0	24.3	25.5	26.7	27.9
SPACE COOLING	0.7	4.5	5.8	7.1	7.9	8.5	8.9	9.2	9.4	9.7
VENTILATION	17.6	41.5	43.6	46.0	48.7	51.3	53.9	56.5	59.2	61.8
LIGHTING	-	-	-	-	-	-	-	-	-	-
ELECTRONICS	0.2	2.3	2.3	2.0	2.0	2.3	2.5	2.5	2.5	2.5
FOOD PRESERVATION	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	-	-	-	-	-	-	-	-	-	-
INDUSTRY COMPONENTS	0.7	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.7
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euro 2010	**30**	**68**	**74**	**80**	**86**	**91**	**96**	**100**	**104**	**109**

db	INSTALL excl. VAT ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1383	1682	2700	3107	3575	3529	3483	3436	3388	3340
	CH Central Heating combi, water heat [24 kW]	m€	1123	1957	2996	4259	4642	5027	5411	5793	6173	6549
	TOTAL WATER HEATING		2506	3639	5696	7366	8217	8556	8893	9229	9561	9889
		m€	5721	8636	15205	19523	24492	27962	31894	36067	40481	45136
	CH Central Heating boiler, space heat [24 kW]											
	SFB Wood Manual [18 kW]	m€	287	173	156	122	70	61	53	47	41	36
	SFB Wood Direct Draft [20 kW]	m€	6	284	296	319	347	406	476	557	652	764
	SFB Coal [25 kW]	m€	81	35	4	4	3	3	3	3	2	2
	SFB Pellets [25 kW]	m€	0	81	125	125	130	138	152	168	186	205
	SFB Wood chips [160 kW]	m€	0	18	18	23	25	27	30	33	37	40
	Total Solid Fuel Boiler	**m€**	**374**	**590**	**600**	**593**	**576**	**636**	**714**	**808**	**918**	**1047**
	CHAE-S (≤ 400 kW)	m€	98	411	452	500	552	605	504	258	77	13
	CHAE-L (> 400 kW)	m€	22	71	73	75	79	81	85	88	91	94
	CHWE-S (≤ 400 kW)	m€	6	24	26	29	32	35	38	41	44	47
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	6	22	23	23	24	25	26	27	28	29
	CHWE-L (> 1500 kW)	m€	2	9	9	9	10	10	10	11	11	12
	CHF	m€	0	2	2	3	3	4	4	4	5	5
	HT PCH-AE-S	m€	48	78	83	88	92	95	99	103	107	110
	HT PCH-AE-L	m€	38	62	66	70	73	76	79	82	85	88
	HT PCH-WE-S	m€	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-M	m€	27	44	47	50	52	54	56	58	60	62
	HT PCH-WE-L	m€	3	5	5	6	6	6	6	7	7	7
	AC rooftop	m€	89	289	292	223	130	34	34	34	34	34
	AC splits	m€	91	331	346	334	322	310	298	286	275	263
	AC VRF	m€	0	1050	1371	1997	2526	3049	3546	4004	4388	4665
	ACF	m€	0	2	2	3	3	4	4	4	5	5
	SubTotal AHC Air Cooling	**m€**	**441**	**2415**	**2816**	**3429**	**3924**	**4409**	**4812**	**5031**	**5240**	**5459**
	AC rooftop (rev)	m€	55	178	171	137	77	19	0	0	0	0
	AC splits (rev)	m€	61	212	222	214	207	199	191	184	176	169
	AC VRF (rev)	m€	0	896	1113	1704	2072	2379	2633	2829	2949	2984
	ACF (rev)	m€	0	3	5	5	7	8	9	10	11	12
	AHF	m€	277	182	170	175	168	155	140	126	118	110
	AHE	m€	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**m€**	**393**	**1471**	**1681**	**2237**	**2530**	**2761**	**2974**	**3149**	**3255**	**3274**
	Total AHC Air Heating & Cooling	**m€**	**718**	**2597**	**2987**	**3605**	**4091**	**4565**	**4953**	**5159**	**5360**	**5571**
	LH open fireplace [8 kW]	m€	302	440	443	549	602	576	555	535	516	497
	LH closed fireplace/inset [8 kW]	m€	184	498	556	729	783	764	738	711	685	661
	LH wood stove [8 kW]	m€	142	168	186	245	264	257	247	238	228	220
	LH coal stove [8 kW]	m€	65	50	46	50	39	25	22	21	21	20
	LH cooker [10 kW]	m€	104	209	253	326	346	340	328	315	313	313
	LH SHR stove [8 kW]	m€	900	1256	1560	1874	2088	2303	2348	2348	2348	2348
	LH pellet stove [8 kW]	m€	0	96	121	147	157	168	170	170	170	170
	LH open fire gas, NCV [4.2 kW]	m€	13	19	21	24	25	24	23	23	23	23
	LH closed fire gas, NCV [4.2 kW]	m€	68	76	78	84	88	87	85	85	85	85
	LH flueless fuel heater, NCV [1.5 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	m€	234	285	294	304	317	331	334	334	334	334
	LH elec.storage [2.75 kW]	m€	18	22	26	30	30	30	29	27	26	26
	LH elec.underfloor [0.62 kW]	m€	138	169	178	187	190	196	197	197	197	197
	LH luminous heaters [20 kW]	m€	5	6	6	8	7	7	7	6	6	6
	LH tube heaters [30 kW]	m€	5	6	6	7	7	6	6	6	6	6
	LH total	**m€**	**2178**	**3301**	**3775**	**4563**	**4943**	**5114**	**5089**	**5017**	**4959**	**4905**
	RAC (cooling demand), all types <12 kW	m€	224	2054	3181	4079	4495	4556	4517	4478	4437	4396
	RAC (heating demand), reversible <12kW	m€	63	1524	2804	3607	3979	4037	4006	3974	3941	3907
	Total Room Air Conditioner	**m€**	**286**	**3578**	**5985**	**7686**	**8474**	**8592**	**8523**	**8452**	**8378**	**8304**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING (incl. rev.AC)		8729	15523	24065	30522	36519	40509	44676	49014	53553	58270
	TOTAL SPACE COOLING		665	4469	5997	7508	8419	8965	9330	9509	9678	9856
	NRVU avg (sales wt.)	**m€**	17119	40052	42047	44170	46611	49053	51494	53936	56378	58819
	RVU Central Unidir. VU (1 fan)	m€	481	1078	1613	1471	1543	1610	1671	1728	1779	1825
	RVU Central Balanced VU (2 fans)	m€	46	322	968	1203	1309	1406	1496	1579	1655	1754
	RVU Local Balanced VU (2 fans)	m€	1	6	14	23	32	42	51	61	70	79
	TOTAL VENTILATION (electricity)		17647	41459	44643	46867	49496	52111	54713	57303	59881	62478
	LS Light Sources in Euro/unit											
	LFL	m€	0	0	0	0	0	0	0	0	0	0
	CFL	m€	0	0	0	0	0	0	0	0	0	0
	Tungsten	m€	0	0	0	0	0	0	0	0	0	0
	GLS	m€	0	0	0	0	0	0	0	0	0	0
	HID	m€	0	0	0	0	0	0	0	0	0	0
	LED ECO	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	m€	0	0	0	0	0	0	0	0	0	0

db	INSTALL excl. VAT ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	0	0	0	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	0	0	0	0	0	0	0	0	0
	DP TV Smart	m€	0	0	0	0	0	0	0	0	0	0
	DP Monitor	m€	0	0	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SSTB	m€	0	0	0	0	0	0	0	0	0	0
	CSTB	m€	0	0	0	0	0	0	0	0	0	0
	Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VIDEO players/recorders	m€	0	0	0	0	0	0	0	0	0	0
	VIDEO projectors	m€	15	1029	873	355	154	0	0	0	0	0
	VIDEO game consoles	m€	0	0	0	0	0	0	0	0	0	0
	Total VIDEO	**m€**	**15**	**1029**	**873**	**355**	**154**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	m€	23	595	666	773	950	1206	1309	1283	1283	1283
	ES Blade servers	m€	30	337	343	377	449	550	596	575	575	575
	ES Storage	m€	16	202	231	280	314	338	355	343	343	343
	Total ES Enterprise Servers	**m€**	**69**	**1134**	**1240**	**1429**	**1713**	**2095**	**2259**	**2202**	**2202**	**2202**
	PC Desktop	m€	0	0	0	0	0	0	0	0	0	0
	PC Notebook	m€	0	0	0	0	0	0	0	0	0	0
	PC Tablet/slate	m€	0	0	0	0	0	0	0	0	0	0
	PC Thin client	m€	0	0	0	0	0	0	0	0	0	0
	PC Workstation	m€	0	0	0	0	0	0	0	0	0	0
	Total PC, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	EP-Copier mono	m€	0	0	0	0	0	0	0	0	0	0
	EP-Copier colour	m€	0	0	0	0	0	0	0	0	0	0
	EP-printer mono	m€	0	0	0	0	0	0	0	0	0	0
	EP-printer colour	m€	0	0	0	0	0	0	0	0	0	0
	IJ SFD printer	m€	0	0	0	0	0	0	0	0	0	0
	IJ MFD printer	m€	0	0	0	0	0	0	0	0	0	0
	Total imaging equipment, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SB Home Gateway, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Home NAS, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Home Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Office Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 1.5 to 5 kVA	m€	63	124	129	157	184	212	237	259	277	288
	UPS 5 to 10 kVA	m€	7	13	13	16	19	22	25	27	29	30
	UPS 10 to 200 kVA	m€	8	16	17	20	24	28	31	34	36	38
	Total UPS - Uninterrupted Power Supplies	**m€**	**77**	**153**	**159**	**193**	**228**	**261**	**293**	**320**	**342**	**356**
	TOTAL ELECTRONICS		**161**	**2317**	**2272**	**1978**	**2094**	**2356**	**2552**	**2522**	**2544**	**2558**
	RF Household refrigerator and freezer	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	m€	29	31	32	42	42	41	39	38	37	35
	CF open horizontal frozen island (RHF4)	m€	3	4	4	4	4	4	4	4	4	4
	CF other supermarket display (non-BCs)	m€	94	112	119	131	130	131	136	141	146	151
	CF Plug in one door beverage cooler	m€	0	0	0	0	0	0	0	0	0	0
	CF Plug in horizontal ice cream freezer	m€	0	0	0	0	0	0	0	0	0	0
	CF Spiral vending machine	m€	0	0	0	0	0	0	0	0	0	0
	Total CF Commercial Refrigeration		**126**	**146**	**155**	**176**	**176**	**176**	**179**	**183**	**187**	**190**
	PF Storage cabinet Chilled Vertical (CV)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Vertical (FV)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Chilled Horizontal (CH)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Horizontal (FH)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinets All types	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Process Chiller AC MT S ≤ 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC MT L > 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT S ≤ 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT L > 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT S ≤ 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT L > 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT S ≤ 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT L > 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller All MT&LT	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Condensing Unit MT S 0.2-1 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT M 1-5 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT L 5-20 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT XL 20-50 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT S 0.1-0.4 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT M 0.4-2 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT L 2-8 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT XL 8-20 kW	m€	0	0	0	0	0	0	0	0	0	0
0.6	**PF Condensing Unit, All MT&LT**	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Professional Refrigeration, Total	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**126**	**146**	**155**	**176**	**176**	**176**	**179**	**183**	**187**	**190**

db	INSTALL excl. VAT ECO (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	0	0	0	0	0	0	0	0	0	0
	COOK El. Ovens, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Hobs, % efficiency NCV	m€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Ovens, kWh prim, NCV	m€	0	0	0	0	0	0	0	0	0	0
	COOK Range Hoods, kWh elec	m€	0	0	0	0	0	0	0	0	0	0
	Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	COFFEE Dripfilter (glass)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (thermos)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (full automatic)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Pad filter	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Hard cap espresso	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Semi-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Fully-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL COOKING		0	0	0	0	0	0	0	0	0	0
	WM Household Washing Machine	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD Household Laundry Drier vented el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	m€	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		0	0	0	0	0	0	0	0	0	0
0.5	FAN Axial<300Pa [247 W flow out]	m€	40	131	188	237	226	216	207	198	189	181
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	42	144	151	166	159	159	159	159	159	159
0.5	FAN Centr.FC [141 W flow out]	m€	21	52	78	108	103	98	94	89	85	81
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	43	60	67	71	69	67	66	65	67
0.5	FAN Centr.BC [2052 W flow out]	m€	39	103	164	189	201	196	206	214	222	228
0.5	FAN Cross-flow [31 W flow out]	m€	6	13	43	57	61	59	62	64	67	68
	Total FAN, industrial (excl. box & roof fans)	**m€**	**82**	**243**	**343**	**412**	**410**	**399**	**397**	**395**	**394**	**392**
	MT motor industry only	m€	0	0	0	0	0	0	0	0	0	0
	MT extra drive installation revenu	m€	0	0	1156	1148	1092	1039	989	941	895	852
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**0**	**0**	**1156**	**1148**	**1092**	**1039**	**989**	**941**	**895**	**852**
	WP Water pumps (load) [%]	**m€**	**555**	**754**	**810**	**871**	**936**	**1001**	**1067**	**1132**	**1197**	**1263**
	CP Fixed Speed 5-1280 l/s	m€	16	14	14	15	16	16	17	17	18	19
	CP Variable speed 5-1280 l/s	m€	0	6	9	10	11	11	12	12	12	13
	CP Pistons 2-64 l/s	m€	5	5	7	8	9	9	9	10	10	10
	Total CP Standard Air Compressors	**m€**	**21**	**25**	**30**	**34**	**35**	**36**	**38**	**39**	**40**	**41**
	TOTAL INDUSTRY COMPONENTS		658	1023	1760	1890	1928	1956	1996	2037	2079	2122
	TRAFO Distribution, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	m€	0	0	0	0	0	0	0	0	0	0
	TYRE car replacement tyres C1	m€	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	m€	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	m€	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR		0	0	0	0	0	0	0	0	0	0
	GENERAL TOTAL (in m euro 2010)		**30492**	**68575**	**84588**	**96308**	**106849**	**114630**	**122340**	**129797**	**137482**	**145362**
	GENERAL TOTAL (in bn euro 2010)		30	69	85	96	107	115	122	130	137	145

SUMMARY ECO

INSTALL excl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	2.5	3.6	5.7	7.4	8.2	8.6	8.9	9.2	9.6	9.9
SPACE HEATING	8.7	15.5	24.1	30.5	36.5	40.5	44.7	49.0	53.6	58.3
SPACE COOLING	0.7	4.5	6.0	7.5	8.4	9.0	9.3	9.5	9.7	9.9
VENTILATION	17.6	41.5	44.6	46.9	49.5	52.1	54.7	57.3	59.9	62.5
LIGHTING	-	-	-	-	-	-	-	-	-	-
ELECTRONICS	0.2	2.3	2.3	2.0	2.1	2.4	2.6	2.5	2.5	2.6
FOOD PRESERVATION	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	-	-	-	-	-	-	-	-	-	-
INDUSTRY COMPONENTS	0.7	1.0	1.8	1.9	1.9	2.0	2.0	2.0	2.1	2.1
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euro 2010	**30**	**69**	**85**	**96**	**107**	**115**	**122**	**130**	**137**	**145**

INSTALL excl. VAT, ECO-BAU (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	-	-	1.9	3.2	3.8	4.1	4.4	4.6	4.8	5.0
SPACE HEATING	-	0.3	6.6	10.8	15.1	17.5	20.4	23.5	26.8	30.4
SPACE COOLING	-	-	0.2	0.4	0.5	0.5	0.5	0.4	0.2	0.1
VENTILATION	-	-	1.0	0.8	0.8	0.8	0.8	0.8	0.7	0.7
LIGHTING	-	-	-	-	-	-	-	-	-	-
ELECTRONICS	-	-	-	0.0	0.1	0.1	0.1	0.1	0.1	0.1
FOOD PRESERVATION	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	-	-	-	-	-	-	-	-	-	-
INDUSTRY COMPONENTS	-	0.0	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euro 2010	**0**	**0**	**10**	**16**	**21**	**24**	**27**	**30**	**33**	**37**

db	MAINTENANCE excl. VAT (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	5098	5916	6084	6213	6345	6480	6614	6749	6884	7019
	CH Central Heating combi, water heat [24 kW]	m€	1242	2389	2607	2775	2950	3142	3334	3526	3718	3910
	TOTAL WATER HEATING		**6340**	**8306**	**8691**	**8988**	**9295**	**9622**	**9948**	**10275**	**10602**	**10928**
		m€	**12119**	**19443**	**20978**	**22476**	**24059**	**25971**	**28156**	**30569**	**33013**	**35458**
	CH Central Heating boiler, space heat [24 kW]											
	SFB Wood Manual [18 kW]	m€	272	120	102	82	60	38	25	19	17	15
	SFB Wood Direct Draft [20 kW]	m€	3	42	85	127	160	166	177	201	242	295
	SFB Coal [25 kW]	m€	78	33	25	16	9	4	2	2	2	1
	SFB Pellets [25 kW]	m€	0	12	23	34	45	52	56	60	66	73
	SFB Wood chips [160 kW]	m€	0	4	6	7	7	7	8	9	10	10
	Total Solid Fuel Boiler	**m€**	**353**	**211**	**241**	**267**	**280**	**267**	**268**	**290**	**336**	**395**
	CHAE-S (≤ 400 kW)	m€	218	914	1152	1351	1498	1647	1750	1652	1335	887
	CHAE-L (> 400 kW)	m€	53	193	236	272	297	309	319	331	343	355
	CHWE-S (≤ 400 kW)	m€	18	77	97	113	125	138	151	165	179	193
	CHWE-M (> 400 kW; ≤ 1500 kW)	m€	23	87	107	124	136	142	147	153	159	165
	CHWE-L (> 1500 kW)	m€	12	43	53	62	68	71	74	76	79	83
	CHF	m€	0	7	14	19	24	29	35	40	45	50
	HT PCH-AE-S	m€	109	192	216	238	254	267	279	290	301	312
	HT PCH-AE-L	m€	106	188	211	232	248	260	272	283	294	304
	HT PCH-WE-S	m€	23	41	47	51	55	57	60	62	65	67
	HT PCH-WE-M	m€	104	184	207	228	243	256	267	277	288	299
	HT PCH-WE-L	m€	11	21	24	26	29	30	32	33	34	36
	AC rooftop	m€	108	432	473	462	390	264	144	74	54	54
	AC splits	m€	226	961	1052	1085	1087	1058	1017	979	941	904
	AC VRF	m€	1	1019	1645	2483	3285	4303	5316	6236	7104	7860
	ACF	m€	0	3	5	7	8	10	12	14	16	17
	SubTotal AHC Air Cooling	**m€**	**1012**	**4361**	**5538**	**6754**	**7749**	**8841**	**9874**	**10666**	**11238**	**11587**
	AC rooftop (rev)	m€	67	268	291	278	233	156	78	24	2	0
	AC splits (rev)	m€	164	663	726	749	751	732	704	678	652	626
	AC VRF (rev)	m€	1	896	1427	2112	2792	3602	4339	4848	5261	5544
	ACF (rev)	m€	0	5	9	13	17	20	24	28	32	35
	AHF	m€	101	100	91	85	80	75	71	67	63	59
	AHE	m€	0	2	1	1	1	1	1	1	1	1
	SubTotal AHC Air Heating (rev double)	**m€**	**332**	**1933**	**2546**	**3239**	**3874**	**4587**	**5217**	**5646**	**6010**	**6264**
	Total AHC Air Heating & Cooling	**m€**	**1114**	**4463**	**5631**	**6840**	**7830**	**8917**	**9946**	**10734**	**11302**	**11647**
	LH open fireplace [8 kW]	m€	145	212	230	245	256	263	264	264	263	263
	LH closed fireplace/inset [8 kW]	m€	73	199	248	297	342	378	401	414	419	421
	LH wood stove [8 kW]	m€	104	122	129	137	145	153	161	166	168	168
	LH coal stove [8 kW]	m€	71	47	43	41	37	33	27	23	19	16
	LH cooker [10 kW]	m€	141	285	340	404	463	505	524	531	533	533
	LH SHR stove [8 kW]	m€	57	79	88	100	114	131	148	162	171	177
	LH pellet stove [8 kW]	m€	0	54	82	109	132	149	160	166	168	168
	LH open fire gas, NCV [4.2 kW]	m€	18	28	31	33	36	38	39	40	40	40
	LH closed fire gas, NCV [4.2 kW]	m€	109	124	128	132	135	139	142	145	146	147
	LH flueless fuel heater, NCV [1.5 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.storage [2.75 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.underfloor [0.62 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters [20 kW]	m€	28	34	36	36	37	37	37	37	37	37
	LH tube heaters [30 kW]	m€	27	33	35	36	36	37	37	37	37	37
	LH total	**m€**	**773**	**1218**	**1388**	**1570**	**1735**	**1862**	**1940**	**1983**	**2001**	**2006**
	RAC (cooling demand), all types <12 kW	m€	65	554	676	796	985	1104	1158	1182	1202	1222
	RAC (heating demand), reversible <12kW	m€	18	320	480	662	864	977	1026	1048	1067	1085
	Total Room Air Conditioner	**m€**	**84**	**874**	**1156**	**1458**	**1849**	**2081**	**2183**	**2231**	**2269**	**2307**
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING (incl. rev.AC)		**13596**	**23126**	**25632**	**28214**	**30812**	**33663**	**36607**	**39536**	**42427**	**45208**
	TOTAL SPACE COOLING		**1078**	**4915**	**6214**	**7550**	**8734**	**9945**	**11032**	**11848**	**12440**	**12809**
	NRVU avg (sales wt.)	m€	824	2724	3166	3533	3815	4025	4239	4456	4674	4891
	RVU Central Unidir. VU (1 fan)	m€	129	254	286	281	268	266	277	297	318	338
	RVU Central Balanced VU (2 fans)	m€	7	86	170	300	441	568	651	720	789	857
	RVU Local Balanced VU (2 fans)	m€	1	11	22	41	67	100	134	169	203	238
	TOTAL VENTILATION (electricity)		**960**	**3075**	**3644**	**4154**	**4591**	**4958**	**5301**	**5642**	**5983**	**6324**
	LS Light Sources in Euro/unit											
	LFL	m€	0	0	0	0	0	0	0	0	0	0
	CFL	m€	0	0	0	0	0	0	0	0	0	0
	Tungsten	m€	0	0	0	0	0	0	0	0	0	0
	GLS	m€	0	0	0	0	0	0	0	0	0	0
	HID	m€	0	0	0	0	0	0	0	0	0	0
	LED	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	MAINTENANCE excl. VAT (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	0	0	0	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	0	0	0	0	0	0	0	0	0
	DP TV Smart	m€	0	0	0	0	0	0	0	0	0	0
	DP Monitor	m€	0	0	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SSTB	m€	0	0	0	0	0	0	0	0	0	0
	CSTB	m€	0	0	0	0	0	0	0	0	0	0
	Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VIDEO players/recorders	m€	0	0	0	0	0	0	0	0	0	0
	VIDEO projectors	m€	0	0	0	0	0	0	0	0	0	0
	VIDEO game consoles	m€	0	0	0	0	0	0	0	0	0	0
	Total VIDEO	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	m€	4	112	130	144	173	214	257	251	251	251
	ES Blade servers	m€	0	3	4	4	4	5	6	6	6	6
	ES Storage	m€	0	6	6	7	8	8	9	9	9	9
	Total ES Enterprise Servers	**m€**	**4**	**121**	**140**	**154**	**185**	**227**	**272**	**266**	**266**	**266**
	PC Desktop	m€	0	0	0	0	0	0	0	0	0	0
	PC Notebook	m€	0	0	0	0	0	0	0	0	0	0
	PC Tablet/slate	m€	0	0	0	0	0	0	0	0	0	0
	PC Thin client	m€	0	0	0	0	0	0	0	0	0	0
	PC Workstation	m€	0	0	0	0	0	0	0	0	0	0
	Total PC, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	EP-Copier mono	m€	0	0	0	0	0	0	0	0	0	0
	EP-Copier colour	m€	0	0	0	0	0	0	0	0	0	0
	EP-printer mono	m€	0	0	0	0	0	0	0	0	0	0
	EP-printer colour	m€	0	0	0	0	0	0	0	0	0	0
	IJ SFD printer	m€	0	0	0	0	0	0	0	0	0	0
	IJ MFD printer	m€	0	0	0	0	0	0	0	0	0	0
	Total imaging equipment, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SB Home Gateway, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Home NAS, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Home Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	SB Office Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
	Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	m€	0	0	0	0	0	0	0	0	0	0
	UPS 1.5 to 5 kVA	m€	42	90	98	108	129	151	172	191	207	219
	UPS 5 to 10 kVA	m€	12	26	29	32	38	44	50	56	61	65
	UPS 10 to 200 kVA	m€	239	536	595	652	759	893	1027	1152	1261	1347
	Total UPS - Uninterrupted Power Supplies	**m€**	**292**	**652**	**722**	**792**	**926**	**1088**	**1249**	**1399**	**1529**	**1632**
	TOTAL ELECTRONICS		**296**	**773**	**862**	**946**	**1110**	**1316**	**1521**	**1664**	**1795**	**1897**
	RF Household refrigerator and freezer	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	m€	174	207	213	214	215	219	222	226	229	233
	CF open horizontal frozen island (RHF4)	m€	19	23	24	24	24	25	25	25	26	26
	CF other supermarket display (non-BCs)	m€	559	690	747	788	819	849	879	910	942	975
	CF Plug in one door beverage cooler	m€	165	199	206	208	215	223	230	238	245	254
	CF Plug in horizontal ice cream freezer	m€	53	64	66	67	69	72	74	76	79	82
	CF Spiral vending machine	m€	45	55	43	35	35	36	38	39	41	42
	Total CF Commercial Refrigeration		**1015**	**1237**	**1298**	**1336**	**1378**	**1423**	**1468**	**1515**	**1562**	**1612**
	PF Storage cabinet Chilled Vertical (CV)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Vertical (FV)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Chilled Horizontal (CH)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinet Frozen Horizontal (FH)	m€	0	0	0	0	0	0	0	0	0	0
	PF Storage cabinets All types	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Process Chiller AC MT S ≤ 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC MT L > 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT S ≤ 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller AC LT L > 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT S ≤ 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC MT L > 300 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT S ≤ 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller WC LT L > 200 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller All MT&LT	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Condensing Unit MT S 0.2-1 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT M 1-5 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT L 5-20 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit MT XL 20-50 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT S 0.1-0.4 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT M 0.4-2 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT L 2-8 kW	m€	0	0	0	0	0	0	0	0	0	0
	PF Condensing Unit LT XL 8-20 kW	m€	0	0	0	0	0	0	0	0	0	0
0.6	**PF Condensing Unit, All MT&LT**	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PF Professional Refrigeration, Total	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**1015**	**1237**	**1298**	**1336**	**1378**	**1423**	**1468**	**1515**	**1562**	**1612**

db	MAINTENANCE excl. VAT (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	COOK El. Hobs, Wh/ltr	m€	0	0	0	0	0	0	0	0	0	0
	COOK El. Ovens, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Hobs, % efficiency NCV	m€	0	0	0	0	0	0	0	0	0	0
	COOK Gas Ovens, kWh prim, NCV	m€	0	0	0	0	0	0	0	0	0	0
	COOK Range Hoods, kWh elec	m€	0	0	0	0	0	0	0	0	0	0
	Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	COFFEE Dripfilter (glass)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (thermos)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (full automatic)	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Pad filter	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Hard cap espresso	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Semi-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
	COFFEE Fully-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL COOKING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WM Household Washing Machine	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD Household Laundry Drier vented el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	m€	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.5	FAN Axial<300Pa [247 W flow out]	m€	144	396	465	519	571	604	613	613	613	613
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	199	587	673	712	742	760	765	765	765	765
0.5	FAN Centr.FC [141 W flow out]	m€	124	260	316	353	382	404	411	411	411	411
0.5	FAN Centr.BC-free [2120 W flow out]	m€	71	147	175	191	210	229	243	250	255	260
0.5	FAN Centr.BC [2052 W flow out]	m€	129	290	348	383	422	463	499	536	582	632
0.5	FAN Cross-flow [31 W flow out]	m€	29	51	58	68	78	85	91	98	106	115
	Total FAN, industrial (excl. box & roof fans)	**m€**	**348**	**866**	**1018**	**1113**	**1203**	**1273**	**1312**	**1337**	**1366**	**1398**
0.5	**Total MT Motors 0.75-375 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**m€**	**1032**	**1405**	**1513**	**1626**	**1748**	**1876**	**2007**	**2138**	**2269**	**2400**
	CP Fixed Speed 5-1280 l/s	m€	336	726	653	592	593	612	633	653	673	693
	CP Variable speed 5-1280 l/s	m€	0	80	172	254	299	314	325	335	346	356
	CP Pistons 2-64 l/s	m€	85	107	104	105	109	112	116	120	123	127
	Total CP Standard Air Compressors	**m€**	**421**	**914**	**930**	**950**	**1000**	**1039**	**1074**	**1108**	**1142**	**1176**
	TOTAL INDUSTRY COMPONENTS		1380	2271	2531	2739	2951	3149	3319	3475	3636	3798
	TRAFO Distribution, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	m€	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	m€	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	m€	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euro 2010)		**24664**	**43703**	**48872**	**53927**	**58871**	**64076**	**69196**	**73956**	**78445**	**82576**
	GENERAL TOTAL (in bn euro 2010)		25	44	49	54	59	64	69	74	78	83

SUMMARY

MAINTENANCE excl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**6.3**	**8.3**	**8.7**	**9.0**	**9.3**	**9.6**	**9.9**	**10.3**	**10.6**	**10.9**
SPACE HEATING	**13.6**	**23.1**	**25.6**	**28.2**	**30.8**	**33.7**	**36.6**	**39.5**	**42.4**	**45.2**
SPACE COOLING	**1.1**	**4.9**	**6.2**	**7.6**	**8.7**	**9.9**	**11.0**	**11.8**	**12.4**	**12.8**
VENTILATION	**1.0**	**3.1**	**3.6**	**4.2**	**4.6**	**5.0**	**5.3**	**5.6**	**6.0**	**6.3**
LIGHTING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ELECTRONICS	**0.3**	**0.8**	**0.9**	**0.9**	**1.1**	**1.3**	**1.5**	**1.7**	**1.8**	**1.9**
FOOD PRESERVATION	**1.0**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
COOKING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CLEANING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
INDUSTRY COMPONENTS	**1.4**	**2.3**	**2.5**	**2.7**	**3.0**	**3.1**	**3.3**	**3.5**	**3.6**	**3.8**
ENERGY SECTOR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TRANSPORT SECTOR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL in bn euro 2010	**25**	**44**	**49**	**54**	**59**	**64**	**69**	**74**	**78**	**83**

ANNEX B: Status of measures per 1.9.2016

Ecodesign, Energy Labelling, Energy Star & Voluntary Agreements [status 1.9.2016]

Framework Directives		*repealed*	ED	EL	ES	status
	Ecodesign [ED]	Dir 2005/32/EC	Dir 2009/125/EC			rev.
	Energy Labelling [EL]	Dir 92/75/EEC		Dir 2010/30		rev.
	Energy Star [ES]	Dec 2001/469 Reg 2422/2001 Dec 2003/269			Reg 106/2008 Dec 2013/107	

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
Space- and water heating/cooling						
2	WH dedicated Water Heater		CR 814/2013	CDR 812/2013		
1	CH Central Heating boiler (incl. combi)	Dir 92/42/EEC Dir 2004/8 (CHP)	CR 813/2013	CDR 811/2013		
15	SFB Solid Fuel Boilers		CR 2015/1189	CDR 2015/1187		
21 /E6	AHC Air Cooling & Heating (>12 kW)					WD draft 2015 IA draft 2015
20	LH Local Heaters		CR 2015/1185 CR 2015/1188	CDR 2015/1186		
10	RAC Room Air Conditioner (<12 kW)	CD 2002/31	CR 206/2012	CDR 626/2011		
11	CIRC Circulator pumps (<2.5 kW)		CR 641/2009, am 622/2012			rev.
E6 /10	VU Ventilation Units		CR 1253/2014			
Lighting						
8 /9 /19	LS Light Sources	CD 98/11	am. 2015/1428	CDR 874/2012		review completed 10/2015
	Tertiary sector (LFL, HID, ballast)	Dir 2000/55 (ballasts, MEPS)	CR 245/2009, am 347/2010			review completed 10/2015
	NDLS Non Directional LS		CR 244/2009, am 859/2009			review completed 10/2015
	DLS Directional LS		CR 1194/2012			review completed 10/2015
37	Lighting Systems					prep. study expected 12/2016
Electronics						
5	DP electronic DisPlays		CR 642/2009, am 801/2013	CDR 1062/2010	Cd 2016/1756* (displays 7.0)	WD draft 2015 IA draft 2015
18	STB set top boxes (Complex & Simple)		CR 107/2009 (SSTB)		VA v4.0 2015 (CSTB) COM 2012 (684)	rev. [SSTB] VA: http://cstb.eu
E3	VIDEO recorders, players, games				VA v1.0 2015 (game consoles) COM 2015 (178)	www.efficientgaming.eu/
E9	Enterprise servers				Cd 2014/202* (ES v2.0)	IA draft 2015
3	PC Personal Computers		CR 617/2013		Cd 2015/1402* (computers 6.1)	
4	EP & IJ imaging equipment				Cd 2014/202* (Im.Eq. v2.0) VA v5.2 2015 (Im.Eq.) COM 2013 (23)	www. eurovaprint.eu
6 /26	SB (networked) Stand-By		CR 1275/2008, am 801/2013			rev.
7	BC Battery Charged devices & Ext.Power		CR 278/2009			WD draft 2015 IA draft 2015
27	UPS Uninterruptable Power Supplies				Cd 2014/202* (UPS v1.0)	prep. study completed 6/2014
Food preservation						
13	RF Household Refrigerators & freezers	CD 2003/66 (label) Dir 96/57 (MEPS)	CR 643/2009	CDR 1060/2010		rev. 2016
12	CF Commercial Refrigeration					WD 2014; IA 2015
E1	PF Professional Refrigeration		CR 2015/1095	CDR 2015/1094		
Cooking						
22 /23	CA Cooking Appliances	CD 2002/40	CR 66/2014	CDR 65/2014		
25	CM household Coffee Makers		in CR 801/2013			

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
Cleaning						
14	WM household Washing Machine	CD 95/12 (WM) CD 96/60 (W-drier)	CR 1015/2010 cor(2010/L 298/p87)	CDR 1061/2010		rev. 2015
14	DW Household Dishwashers	CD 97/17	CR 1016/2010	CDR 1059/2013		rev. 2015
16	LD household Laundry Drier	CD 95/13	CR 932/2012	CDR 392/2012		
17	VC Vacuum Cleaners		CR 666/2013	CDR 665/2013		rev. 2016 on durability
Industrial components						
11	FAN Industrial Fans (>125W)		CR 327/2011			draft IA 2016
11	MT Industrial motors (0.75-375 kW)		CR 640/2009, amendment 4/2014			rev. with Lot 30
30	MT Industrial & Special motors (0.12-1000 kW)					WD draft 9/2014; IA draft 8/2015
11	WP Water pumps		CR 547/2012			rev. 2016, incl. also Lot 28 & 29
28	Wastewater Pumps					rev. 2016
29	Pool- & acquarium pumps					rev. 2016
31	CP Standard Air Compressors					WD draft 10/2014; IA draft 9/2015; additional PS ongoing
Energy sector						
E2	TRAFO Utility Transformers		CR 548/2014			
E8	Power cables					no ED / EL action expected
Transportation sector						
T	TYRE Replacement Tyres			Reg. 1222/2009		rev. 2016
Other (see note)						
24	Professional dishwashers Professional washing machines and driers					Draft WD 2013, Update mandate to CENELEC (2014)
32	Windows					prep. study completed 6/2015
E0	Medical equipment					VA not under ED www.cocir.org
E4	Industrial furnaces and ovens					WD May 2014
E5	Machine tools					WD May 2014, VA?
E7	Steam boilers					no ED / EL action expected
V1	Taps and Shower heads					prep. study to finish in 2015

Source with links and full references on ED and EL: www.eup-network.de
Source with links and full references on ES: http://www.eu-energystar.org/en/254.shtml

Acronyms: Dir=Directive of European Parliament and Council; Reg=Regulation of European Parliament and Council; Dec=Council Decision; CD=Commission Directive; CR=Commission Regulation; CDR=Commission Delegated Regulation; Cd=Commission Decision; cor=Corrigendum; WD=Commission Working Document (draft measure); VA=Voluntary Agreement, under Ecodesign; VA?=draft VA; am=amendment; app=approved by the RegCom;rev=preparations for review ongoing; prep.=preparatory study ongoing; MEPS=Minimum energy Efficiency Performance Standards.

Legislation published in the Official Journal (OJ) before December 2009 has the suffix (for Directives) or prefix (for Commission Regulations) or suffix (for Directives and other) 'EC'. Legislation published after December 2009 ('post Lisbon') has the prefix or suffix 'EU'.

Note:

Medical equipment represents an electricity consumption of 1-2 TWh and a saving potential of 10-20% (VHK estimates based on PE and COCIR analyses for MRI at 15 kWh/patient and 40-50 million patients/procedures per year in the EU). Given this limited possible gain from Ecodesign measures and the delicate nature of this health-related product, the Commission and Member States appear --although not yet officially confirmed-- to be in favour of the self-regulating initiative (SRI) proposed by the manufacturer's association COCIR instead of strict mandatory measures. The SRI comprises MRI, ultrasound, CT, nuclear medicine and X-ray equipment, for which --roughly in this order-- measurement methodologies are and will be prepared to include them in the SRI. Currently (2013) MRI is included, ultrasound is in the pilot-stage and COCIR is preparing for CT. Data quality and availability, through annual SRI status reports, is also increasing. The SRI is currently not endorsed by the Commission in the context of Ecodesign and consequently no data on medical equipment are reported in EIA.

Lot 24 (professional laundry and dishwashing equipment), Lot E4 (industrial furnaces and ovens) and E5 (machine tools) are very heterogenuous product groups that all suffer from deficiencies in terms of reliable, reproducable and accurate test and calculation methods/standards. This has proven to be a barrier in providing coherent preparatory study outcomes and the preparation of measures (reason for which they are not included in the listings of this report). Through additional analysis, seeking collaboration of the related industries and mandates to the European Standardisation Organisations it is hoped to arrive at sensible and effective legislation, but it will still take some time. Self-regulation is also still an option.

ANNEX C: Studies per 1.9.2016

Preparatory studies, IA reports and communications (COM)

Working Programmes (WP) and Methodology studies			WPs	
	1st WP study (--> WP 2009-2011)	EPTA with PE, NTUA, Nov. 2007	COM(2008) 660	
	amended WP study (--> WP 2012-2014)	VHK, Dec. 2011	SWD(2012)434	
	Methodology for EuP (MEEuP, old)	VHK, Nov. 2005		
	Methodology for ErP (MEErP, new)	VHK, Nov. 2011		

Lot	Product	Preparatory study, author(s) and year of publication	EC IA reports	COM, Guide on tests & calculations
Space- and water heating/cooling				
2	WH dedicated Water Heater	VHK with BRGC, Sept. 2007	SWD(2013)295	draft COM 2013
1	CH Central Heating boiler (incl. combi)	VHK with BRGC, Sept. 2007	SWD(2013)297	draft COM 2013
15	SFB Solid Fuel Boilers	BIOIS/AEA, Jan. 2010	SWD(2015)0092 SWD(2015)0093 SEC(2015)0182	
21 /E6	AHC Air Cooling & Heating (>12 kW)	Armines, Sept. 2011 (Lot E6, AC); BIOIS, July 2012 (Lot 21)	Draft IA (2015)	
20	LH Local Heaters	BIOIS, June 2012	SWD(2015)0090 SWD(2015)0091 SEC(2015)0181	
10	RAC Room Air Conditioner (<12 kW) & comfort fans	Armines, March 2009	SWD(2012)35	
11	CIRC Circulator pumps (<2.5 kW)	AEA, Feb. 2008	SEC(2009)1016	
		review study ongoing, expected 2017		
E6 /10	VU Ventilation Units	Armines, Mar.2009 (Lot 10, residential) VHK, June 2012 (Lot E6, non-residential)	SWD(2014)0222 SWD(2014)0223 SEC(2014)0410	
Lighting				
8 /9 /19	LS Light Sources	VHK Oct. 2015 review	Draft IA 2016	
	Tertiary sector (LFL, HID, ballast)	VITO, Jan-April 2007	SEC(2009)324	COM(2010/C 92/04)
	NDLS Non Directional LS	VITO, Oct. 2009	SEC(2009)327	
	DLS Directional LS	VITO, Oct. 2009	SWD(2012)419	
Electronics				
5	DP electronic DisPlays	Fh IZM, Aug. 2007	SEC(2009)1011	Guide 2009
		Aug. 2012 review	Draft IA 2015	
18	STB set top boxes (Complex & Simple)	MVV/BH, Dec.2007 [SSTB]; BIOIS/Fh IZM, Dec. 2008 [CSTB]	SEC(2009)114 SWD(2012)391 (VA)	
E3	VIDEO recorders, players, games	AEA/ Intertek, Nov. 2010	SWD(2015)89 [VA]	
E9	ES Enterprise servers	BIOIS/Fh IZM, June 2015	Draft IA 2015	
3	PC Personal Computers	IVF, Aug. 2007	SWD(2013)219	
4	EP & IJ imaging equipment	Fh IZM, May 2008	SWD(2013)15	
6 /26	SB (networked) Stand-By	Fh IZM, Oct. 2007	SEC(2008)3071	COM(2012/C 394/05)
		VMAS review ongoing, expected 2017		
7	BC Battery Charged devices & Ext.Power	BIOIS/Fh IZM, Jan. 2007	SEC(2009)434	COM(2013/C 130/05)
		VMAS March 2014 review		
27	Uninterruptable Power Supplies (UPS)	Ricardo-AEA, June 2014		
Food preservation				
13	RF Household Refrigerators & freezers	ISIS/ENEA, March 2008	SEC(2009)1020	corr(2010/C 272/08)
		VHK/Armines March 2016 review		
12	CF Commercial Refrigeration	BIOIS, Dec. 2007; update JRC 2014	Draft IA 2015	
E1	PF Professional Refrigeration	BIOIS, July 2011	SWD(2015)0097 SWD(2015)0096 SEC(2015)0196	
Cooking				
22 /23	CA Cooking Appliances	BIOIS/ERA, Aug. 2011 (hobs, ovens); Armines, Mar.2009 (hoods)	SWD(2014)4	
25	CM household Coffee Makers	BIOIS/ARTS, July 2011		
Cleaning				
14	WM household Washing Machine	ENEA/UniBonn, March 2010	SEC(2010)1354	
		JRC Nov. 2015 review		
14	DW Household Dishwashers	ENEA/UniBonn, March 2010	SEC(2010)1356	
		JRC Oct. 2015 review		
16	LD household Laundry Drier	PWC, March 2008	SWD(2012)289	
17	VC Vacuum Cleaners	AEA, Feb. 2009	SWD(2013)240	
		VHK June 2016, review durability		

Lot	Product	Preparatory study, author(s) and year of publication	EC IA reports	COM, Guide on tests & calculations
Industrial components				
11	FAN Industrial Fans (>125W)	Fh ISI, Feb. 2008	SEC(2011)384	
		VHK March 2015 review	Draft IA (2016)	
11	MT Industrial motors (0.75-375 kW)	ISR, Feb. 2008	SEC(2009)1013	
30	MT Industrial & Special motors (0.12-1000 kW)	ISR, Mar. 2014	Draft IA (2015) Draft WD, 2014	
11	WP Water pumps	AEA, Feb. 2008	SWD(2012)178	
28	Wastewater Pumps	BIOIS/ Atkins, Jan/Feb 2014		
29	Pool- & acquarium pumps	BIOIS/ Atkins, Jan/Feb 2014		
		VMAS/VHK 2016 review all pumps		
31	CP Standard Air Compressors	VHK, apr. 2014 VHK, follow-up study ongoing	Draft IA (2015) Draft WD, 2014	
Energy sector				
E2	TRAFO Utility Transformers	VITO/ BIOIS, Jan. 2011	SWD(2014)0162 SWD(2014)0161	
E8	Power cables	VITO, 2015		
Transportation sector				
T	TYRE Replacement Tyres	EPEC, July 2008	SEC(2008)2860	
		review, VMAS 2016		
Other				
E	Medical equipment (SRI not part of ED; therefore not reported in EIA)			
E4	Industrial furnaces and ovens	BIOIS/ ERA, Sept. 2012		
E5	Machine tools	Fh IZM, Aug. 2012		
E7	Steam boilers	PwC/Fh ISI/NTUA, Oct. 2014		
24	Professional dishwashers	BIOIS/Öko/Ö-Q, May 2011		
	Professional washing machines and driers	BIOIS/Öko, May 2011		
32	Windows	ift/VHK/VITO, June 2015		
Ongoing studies				
33	Smart Grid Appliances	VITO et al, ongoing, expected 9/2016		
37	Lighting Systems	VITO et al, ongoing, expected 12/2016		
V1	Taps and shower heads	IPTS, ongoing		

All prep. studies can be downloaded from www.eup-network.de or www.eceee.com
All IA studies can be downloaded from http://ec.europa.eu/smart-regulation/impact
Commission Communications can be found on the European Union Eurlex website

Contractor acronyms (alphabetically)

AEA	AEA Technology, Didcot, UK (now: **Ricardo-AEA**)
ARTS	Association de Recherche, Technologie et Sciences, Paris, FR
Atkins	WS Atkins, UK
BH	Bob Harrison, private consultant, UK
BIOIS	Bio Intelligence Services, Paris, FR (now: **Deloitte**)
BRGC	BRG Consult, London, UK
ENEA	ENEA, Ispra, IT
EPEC	EPEC p/a GHK Consulting, Brussels, BE
EPTA	EPTA, Athens, GR
ERA	ERA Technology, Surrey, UK
Fh ISI	Fraunhofer Institute Systems and Innovation Research, Karlsruhe, DE
Fh IZM	Fraunhofer Institut für Zuverlässigkeit and Mikro-integration, Berlin, DE
ift	ift Rosenheim, DE
Intertek	Intertek, UK
IPTS	EC, JRC, IPTS, Seville, ES
ISIS	ISIS, Rome, IT
ISR	ISR-University of Coimbra, PO
NTUA	University of Athens, GR
Öko	Öko-Institut e.V., Freiburg, DE
Ö-Q	Büro Q-quadrat, DE
PE	PE International, DE
PWC	Price Waterhouse Coopers, Neuilly-sur-Seine, FR
VHK	Van Holsteijn en Kemna, Delft, NL
VITO	VITO, Mol, BE
VMAS	Viegand Maagøe, Copenhagen, DK
WI	Wuppertal Institute, Wuppertal, DE

ANNEX D: Product groups and defined base cases per 1.9.2016

Lot nr.	acronym	
1	CHC	**Boilers and combiboilers** (Regulation)
		Space heating CH boilers (rated heat output ≤ 400 kW)
		Combi-boiler instantaneous, (water heating side)
		Combi-boiler with Cylinder (water heating side)
2	WH	**Dedicated water heaters (WH)** (Regulation)
		Total dedicated WHs (aggregate from:)
		ESWH (Electric Storage Water Heater)
		EIWH (Electric Instantaneous Water Heater
		HP (Heat pump water heater, electric)
		GIWH (Gas- or oil fired Instantaneous Water Heater)
		GSWH (Gas- or oil fired Storage Water Heater)
		SOL (Solar water heater, with electric back-up)
		storage tank standing loss
3	PC	**Computers, Lot 3** (Regulation under review 2013, Energy Star)
		Desktops
		Laptops
		Tablets
		Thin clients
		Workstations
4	EI	**Imaging equipment, Lot 4** (Voluntary Agreement, Energy Star)
		EP-Copier mono (Electro Photographic a.k.a. 'laser')
		EP-Copier colour
		EP-printer mono (including Multi-Functional Devices MFDs)
		EP-printer colour (including MFD)
		IJ SFD printer (Inkjet, Single Functional Device)
		IJ MFD printer
5	DP	**Electronic Displays, TV Lot 5** (TV Regulation, under review 2013: now with monitors)
		Standard TV
		TV with low network availability (LoNA)
		Smart TV (MeNA)
		Computer monitors
6	SB	**Standby and off-mode losses of EuPs, Lot 6** (Regulation, under review 2013)
		Total (aggregate from)
		EPS (mobile phone)
		Lighting
		Radio
		Electric toothbrush
		Oven
		Cordless phone
		TV+ (included in Lot 5)
		Washing machine
		DVD
		Audio minisystem
		Fax machine
		PC+ (office) (included in Lot 3?)
		PC+ (home) (included in Lot 3?)
		Laser printer (included in Lot 4 duty cycle)
		Inkjet printer (included in Lot 4)

7 BC Battery chargers and external power supplies, Lot 7 (Regulation under review 2013)

- Total (scaled from external power supplies for top 6 products below)
- Mobile Phones
- Notebooks
- Smartphones
- Video Game Consoles (included in ENTR Lot 3?)
- LAN Equipment (routers, modems standby included in Lot 26?)
- Answering Machines

8/9 LS Tertiary Lighting, Lot 8–9 (Regulation, omnibus review 2013)

- LFL (Linear Fluorescent Lamps, incl. ballasts)
- HID (High Intensity Discharge lamps, incl. gear)

10 RAC Room air conditioning appliances (RAC), Lot 10 (Regulation)

- RAC split packages avg. 3.5 kW
- RAC split packages avg. 7.1 kW
- RAC window/wall
- RAC double ducts
- RAC single ducts

Residential ventilation and kitchen hoods Lot 10 (now in ENTR Lot 6 Ventilation for ventilation; in Lot 22/23 for hoods)

11 MT Electric industrial motors (0.75-375 kW), Lot 11 (Regulation) (see also Lot 30)

- Medium 3-phase Induction Motors (S) 0.75-7.5 kW
- Medium 3-phase Induction Motors (M) 7.5-75 kW
- Medium 3-phase Induction Motors (L) 75-375 kW

11 FAN Industrial fans, Lot 11 (Regulation)

- Axial fan <300Pa
- Axial fan>300Pa
- Centrifugal FC (Forward Curved) fan
- Centrifugal BC (Backward Curved) fan, freestanding
- Centrifugal BC fan
- Cross-flow fan
- (jet-fan)

11 CIRC Circulators, Lot 11 (Regulation)

- Small stand-alone circulators
- Large stand-alone circulators
- Integrated boiler circulators
- Drinking water circulators

11 WP Electric water pumps , Lot 11 (Regulation) (see also Lot 28/29)

- End Suction Own Bearings (ESOB), Small
- End Suction Own Bearings (ESOB), Large
- End Suction Close Coupled (ESCC), Small
- End Suction Close Coupled (ESCC), Large
- End Suction Close Coupled, Inline, (ESCCi), Small
- End Suction Close Coupled, Inline, (ESCCi), Large
- Submersible Multistage (MSS), Small
- Submersible Multistage (MSS), Large
- Vertical Multistage(MS), Small
- Vertical Multistage(MS), Large

12 CF Commercial refrigerators and freezers, Lot 12 (JRC study, draft WD 2014)

- Remote open vertical chilled multi deck (RVC2)
- Remote open horizontal frozen island (RHF4)
- Other supermarket display cabinets (non-base cases)
- Plug-in one door beverage cooler
- Plug in horizontal ice cream freezer
- Spiral vending machine

13 RF Domestic refrigerators and freezers, Lot 13 (Regulation, omnibus review 2013)

- Total (aggregate from)
- Domestic Refrigerators (incl. fridge-freezers)
- Domestic Freezers

14 WM Domestic washing machines, Lot 14 (Regulation, omnibus review 2013)

- Domestic washing machines

14 DW Domestic dishwashers, Lot 14 (Regulation, omnibus review 2013)

- Domestic dishwashers

15 SFB Solid fuel small combustion installations, Lot 15 (Regulation)

- Small domestic man. Boiler (Wood logs): WOODMANB
- Small domestic DD (DownDraft) gasifying boiler (Wood) WOODDDB
- Retort boiler (Coal) COALB
- Pellet boiler (Pellets) PELLB
- Non-domestic chip boiler (Wood chips) CHIPB

16 LD Domestic laundry driers (LD), Lot 16 (Regulation)

- LD electric vented
- LD electric condensing
- LD gas electric condensing
- LD gas

17 VC Vacuum cleaners (VC), Lot 17 (Regulation)

- Domestic VCs
- Non-domestic (dry vac) VCs

18 STB Complex set-top boxes (CSTB), Lot 18 (Voluntary Agreement)

- Basic CSTB with SD (Standard Definition signal)
- CSTB with SD, HDD (Hard Disk Drive)
- CSTB with SD, HDD, second tuner, return path
- Basic CSTB with HD (High Definition signal)
- CSTB with HD, HDD
- CSTB with HD, HDD second tuner, return path
- Triple play box

18 STB Simple set-top boxes (SSTB), Lot 18a (Regulation, omnibus review 2013)

- SSTB
- SSTB /PVR (Personal Video Recorder)

19 LS Domestic Non-Directional Light Sources (NDLS), Lot 19 part 1 (Regulation, review 2015)

- GLS (General Lighting Service incandescent lamp)
- MV-HL (Mains Voltage Halogen)
- LV-HL (Low Voltage Halogen)
- CFL (Compact Fluorescent)
- LED (Light Emitting Diode)

19 LS Directional Light Sources (DLS) Lot 19 part 2 (Regulation, review 2015)

- GLS (General Lighting Service incandescent lamp)
- MV-HL (Mains Voltage Halogen)
- LV-HL (Low Voltage Halogen)
- CFL (Compact Fluorescent)
- HID (High Intensity Discharge)
- LED (Light Emitting Diode)

20 LH Local room heating products, Lot 20 (Regulation)

Open fireplace (Wood)
Closed fireplace/inset (Wood)
Wood stove
Coal stove
Cooker
SHR (Slow Heat Release) stove
Pellet stove
Open fire gas
Closed fire gas
Flueless fuel heater
Elec.portable
Elec.convector
Elec.storage
Elec.underfloor
Luminous heaters
Tube heaters

21 AHC Air heating & AC products, Lot 21 (+ENTR Lot 6 AC + ENTR Lot1 HT Chillers) (draft WD, draft IA)

Cooling:

Chiller, Air to water, Electric, Small (CHAE-S (≤ 400 kW))
Chiller, Air to water, Electric, Large (CHAE-L (> 400 kW))
Chiller, Water to water, Electric, Small (CHWE-S (≤ 400 kW))
Chiller, Water to water, Electric, Medium (CHWE-M (> 400; ≤ 1500 kW))
Chiller, Water to water, Electric, Large (CHWE-L (≥ 1500 kW))
Chiller, Fuel (CHF)
Air conditioner [splits] (AC splits)
Air conditioner [VRF] (AC VRF)
Air conditioner [rooftop] (AC rooftop)
Air conditioner, Fuel (ACF)
High Temperature Process Chiller, Air to water, Electric, Small (HT PCH-AE-S)
High Temperature Process Chiller, Air to water, Electric, Large (HT PCH-AE-L)
High Temperature Process Chiller, Water to water, Electric, Small (HT PCH-WE-S)
High Temperature Process Chiller, Water to water, Electric, Medium (HT PCH-WE-M)
High Temperature Process Chiller, Water to water, Electric, Large (HT PCH-WE-L)

Heating:

Air conditioner [splits, reversible] (AC splits (rev))
Air conditioner [VRF,reversible] (AC VRF (rev))
Air conditioner [rooftop, reversible] (AC rooftop (rev))
Air conditioner, Fuel [reversible] (ACF (rev))
Air Heater, Fuel (AHF)
Air Heater, Electric (AHE)

22 CA Domestic and commercial ovens, Lot 22 (with Lot 23 and hoods from Lot 10)

23 CA Domestic and commercial hobs and grills, Lot 23 (with Lot 22 and hoods from Lot 10) (RegCom approved draft)

Electric hobs
Gas hobs
Electric ovens
Gas ovens
Range hoods

24 PW Professional washing machines (WM), dishwashers (DW) and driers (LD), Lot 24 (draft WD, limited IA)

(currently 20 basecase in IA, but probably to reduce to 9 below)
WM Washer extractors
WM Tunnel washers
DW Water-change ware washer
DW One tank ware washers
DW Multiple tank ware washers
LD Condensing tumble drier
LD Air vented tumble drier
LD Cabinet drier
LD Pass-through drier

25 CM Household coffee machines, Lot 25 (only measures under the new generic standby regulation)

Dripfilter coffeemaker
Pad filter coffeemaker
Hard cap coffeemaker
Semi-auto coffeemaker
Fully-auto coffeemaker

26 SB Networked standby losses, Lot 26 (draft WD, for TVs the networked losses are in Electronic Displays)

Total (aggregate from)
Complex TV (now included Lot 5)
Home Gateway
Compl. Player/Recorder (discussed/included? In ENTR Lot 3 or Lot 18 or 18a?)
Game Consoles (included in ENTR Lot 3)
Complex Set Top Box (included in Lot 18?)
Home Notebook (included in Lot 3?)
Home NAS (Networked Attached Storage)
Home Desktop PC (included in Lot 3?)
Home Phones
Office Notebook (included in Lot 3?)
Home Display (now included Lot 5)
Office Desktop PC (included in Lot 3?)
Office Display (now included Lot 5)
Office IJ Printer/MFD (now included Lot 4?)
Home EP Printer (now included Lot 4?)
Office EP Printer (now included Lot 4?)
Office Phones
Home inkjet Printer (now included Lot 4?)
Simple Set Top Box (discussed/included in Lot 18a?)
Simple TV (now included Lot 5)
Simple Player/Recorder (discussed/included? In ENTR Lot 3)

27 UPS Uninterruptible power supplies (UPS), Lot 27

UPS below 1.5 kVA (BC1)
UPS 1.5 to 5 kVA (BC2)
UPS 5.1 to 10 kVA (BC3)
UPS 10.1 to 200 kVA (BC4)

28 WWP Pumps for waste waters, Lot 28 (prep. study ongoing, data incomplete)

Centrifugal Submersible: Mixed flow & Axial pumps (BC2)
Centrifugal Submersible pump – Once a day operation (BC3)
Centrifugal Submersible domestic drainage pump<40mm passage (BC4)
Submersible dewatering pumps (BC5)
Centrifugal dry well pump (BC6)
Slurry pumps: Light duty (BC7A)
Slurry pumps: Heavy duty (BC7B)

29 PP Large pumps and pumps for pools, fountains, aquariums, Lot 29 (prep. study ongoing, incomplete)

Swimming Pool pumps(integrated motor+pump)
Fountain, pond, aquarium, spa and counter-current pumps
End Suction water pumps(over 150kW-P2)
Submersible bore-hole pumps
Vertical multi-stage pumps

30 SMT Special motors, Lot 30 (prep.study completed, draft WD sept. 2014; draft IA aug. 2015)

Medium 3-phase Induction motor (S) 0.75-7.5 kW no VSD (also considered in Lot 11)
Medium 3-phase Induction motor (M) 7.5-75 kW no VSD (also considered in Lot 11)
Medium 3-phase Induction motor (L) 75-375 kW no VSD (also considered in Lot 11)
Medium 3-phase Induction motor (S) 0.75-7.5 kW with VSD (also considered in Lot 11)
Medium 3-phase Induction motor (M) 7.5-75 kW with VSD (also considered in Lot 11)
Medium 3-phase Induction motor (L) 75-375 kW with VSD (also considered in Lot 11)
Small 1-phase Induction motor 0.12-0.75 kW no VSD
Small 3-phase Induction motor 0.12-0.75 kW no VSD
Small 1- or 3-phase Induction motor 0.12-0.75 kW with VSD
Large 3-phase Induction motor, < 1000 V, 375-1000kW no VSD
Large 3-phase Induction motor, < 1000 V, 375-1000kW with VSD
Explosion medium 3-phase Induction motor (S) 0.75-7.5 kW
Explosion medium 3-phase Induction motor (M) 7.5-75 kW
Explosion medium 3-phase Induction motor (L) 75-375 kW
Brake medium 3-phase Induction motor (S) 0.75-7.5 kW
Brake medium 3-phase Induction motor (M) 7.5-75 kW
Brake medium 3-phase Induction motor (L) 75-375 kW
8-pole medium 3-phase Induction motor (S) 0.75-7.5 kW
8-pole medium 3-phase Induction motor (M) 7.5-75 kW
8-pole medium 3-phase Induction motor (L) 75-375 kW
Single phase Induction motor > 0.75 kW
Variable Speed Drives (VSD) for the above motors
Medium Voltage Induction motor, > 1000 V, 375-1000 kW (out of scope of draft WD)
Submersible borehole Induction motor 0.22 -22 kW (out of scope of draft WD)
Submersible borehole Induction motor 22 -550 kW (out of scope of draft WD)
Soft starters (out of scope of draft WD)

31 CP Compressors, Lot 31 (prep. study completed, draft WD and IA)

Rotary Fixed Speed 5-1280 l/s
Rotary Variable speed 5-1280 l/s
Pistons 2-64 l/s

32 WD Windows, Lot 32 (prep. study completed)

without (a)/ with (b) shutters (or other window covering, shading devices):
Single (1a/1b)
Double IGU, standard (2a/2b)
Double IGU, lowE, argon (3a/3b)
Double IGU, lowE, argon, impr. (4a/4b)
Triple IGU, lowE, argon (5a/5b)
Triple IGU, lowE, argon, impr. (6a/6b)
Coupled (7a/7b)
Quadruple (8a/8b)
as 2a/2b, with solar control glazing (9a/9b)
as 4a/4b, with solar control glazing (10a/10b)
as 6a/6b, with solar control glazing (11a/11b)

E1 PF Refrigerating and freezing equipment, ENTR Lot 1 (HT Chillers now in Lot 21_6)

Professional refrigerated storage cabinets:
PF Storage cabinet Chilled Vertical (CV, 600 litres net volume)
PF Storage cabinet Frozen Vertical (FV, 600 litres net volume)
PF Storage cabinet Chilled Horizontal (CH, 300 litres net volume)
PF Storage cabinet Frozen Horizontal (FH, 200 litres net volume)

Blast cabinets (only information requirements in CR 2015/1095, no energy efficiency effects: not included in EIA)

Walk in cold rooms (not in scope of CR 2015/1095: not included in EIA)

Process chillers (only Low- and Medium-Temperature; HT chillers moved to Lot 21):

PF Process Chiller AC MT S ≤ 300 kW (AC=Air-Cooled)
PF Process Chiller AC MT L > 300 kW
PF Process Chiller AC LT S ≤ 200 kW
PF Process Chiller AC LT L > 200 kW
PF Process Chiller WC MT S ≤ 300 kW (WC=Water-Cooled)
PF Process Chiller WC MT L > 300 kW
PF Process Chiller WC LT S ≤ 200 kW
PF Process Chiller WC LT L > 200 kW

Condensing Units (only Low- and Medium-Temperature in scope of CR 2015/1095):

PF Condensing Unit MT S 0.2-1 kW
PF Condensing Unit MT M 1-5 kW
PF Condensing Unit MT L 5-20 kW
PF Condensing Unit MT XL 20-50 kW
PF Condensing Unit LT S 0.1-0.4 kW
PF Condensing Unit LT M 0.4-2 kW
PF Condensing Unit LT L 2-8 kW
PF Condensing Unit LT XL 8-20 kW

LT & MT Condensing Units:
Partial double counting with other refrigeration products considered in EIA

E2 TRAFO Distribution and power transformers, ENTR Lot 2 (ongoing, some IA data)

Distrib.trafo 400 kVA, P0 750W, Pk 4600 W (BC1)
Industry trafo 1 MVA, P01700W, Pk 10500W (BC2)
Industry trafo 1.25 MVA, P0 2800W, Pk 13100W (BC3)
Power trafo 100 MVA, P0 40.5 kW, Pk 326 kW, prim. 132 kV, sec. 33 kV (BC4)
DER (Distributed Energy Resources) trafo (oil) 2 MVA, P0 3.1 kW, Pk 21 kW (BC5)
DER trafo (dry) 2 Mva, P0 4 kW, Pk 18 kW (BC6)
Separation trafo 16 kVA, P0 110 W, Pk 750 W (BC7)

E3 VIDEO Sound and imaging equipment, ENTR Lot 3 (VA for game controles)

Game consoles
Video (DVD or Blu-ray) players with or without HDD (VP)
Video (DVD or Blu-ray) recorders with or without HDD (VR)
Video projectors

E4 IO Industrial ovens, ENTR Lot 4 (prep.study complete, incomplete IA data, status?)

Laboratory ovens (BC1)
Industrial Batch Oven – Medium-sized-electric, MIBOe (BC2a)
Industrial Batch Oven– Medium-sized – gas, MIBOg (BC2b)
Industrial Continuous Oven– Medium-sized – electric, MICOe (BC3a)
Industrial Continuous Oven – Medium-sized – gas, MICOg (BC3b)
Industrial Batch Furnace –Medium-sized – electric, MIBFe (BC4a)
Industrial Batch Furnace – Medium-sized– gas, MIBFg (BC4b)
Industrial Continuous Furnace – Medium-sized– electric, MICFe (BC5a)
Industrial Continuous Furnace – Medium-sized-gas, MICFg (BC5b)
Large industrial furnace (large continuous brick kiln) (BC6)
Large industrial oven (large continuous drying oven for wet clay bricks and roof tiles) (BC7)

E5 TOOL Machine tools, ENTR Lot 5 (prep study complete, IA data incomplete)

Numerically controlled machining centre, (BC1)
Numerically controlled deep drawing or bending machine tool, (BC2)
Laser cutting machine tool, (BC3)
Non-numerically controlled metal working drilling machine, (BC4)
Machine tool for woodworking, light stationary table saw, (BC5)
Machine tool for woodworking, horizontal panel saw, (BC6)
Machine tool for woodworking, throughfeed edge banding machine, (BC7)
Machine tool for woodworking, CNC machining centre (BC8)
Transportable welding equipment (BC9)

E6 VU Ventilation units, ENTR Lot 6 (ACs incorporated in Lot 21; Ventilation with Lot 10. IA complete)

Residential (R) and Non-Residential (NR) Ventilation Units (VU):

RVU local exhaust with heat recovery (>30W)
RVU central exhaust

RVU central heat recovery
RVU local heat recovery
NRVU central exhaust (CEXH)
NRVU central heat recovery (CHRV)
NRVU Air Handling Unit, Small (AHU-S)
NRVU Air Handling Unit, Medium (AHU-M)
NRVU Air Handling Unit, Large (AHU-L)

E7 STB Steam Boilers, ENTR Lot 7 (prep.study completed 2014)

Very small sized industrial steam boiler fired with natural gas, medium pressure (2.5 MWth) (BC1)
Very small sized industrial steam boiler fired with natural gas, high pressure (2.5 MWth) (BC2)
Small sized industrial steam boiler fired with natural gas, medium pressure (7 MWth) (BC3)
Small sized industrial steam boiler fired with natural gas, high pressure (7 MWth) (BC4)
Medium sized industrial steam boiler fired with natural gas, medium pressure (20 MWth) (BC5)
Medium sized industrial steam boiler fired with natural gas, high pressure (20 MWth) (BC6)
Large sized industrial steam boiler fired with natural gas, medium pressure (35 MWth) (BC7)
Large sized industrial steam boiler fired with natural gas, high pressure (35 MWth) (BC8)
Large sized industrial steam boiler, natural gas, medium pressure, water tube design (35 MWth) (BC9)
Large sized industrial steam boiler, natural gas, high pressure, water tube design (35 MWth) (BC10)

E8 CAB Power Cables, ENTR Lot 8 (prep.study completed 2015)

The base cases from the prep. study represent typical electric circuits in line with the market structure:
distribution circuit in the services sector (BC1)
lighting circuit in the services sector (BC2)
socket-outlet circuit in the services sector (BC3)
dedicated circuit in the services sector (BC4)
distribution circuit in the industry sector (BC5)
lighting circuit in the industry sector (BC6)
socket-outlet circuit in the industry sector (BC7)
dedicated circuit in the industry sector (BC8, copper conductors)
dedicated circuit in the industry sector (BC9, aluminium conductors)

E9 ES Enterprise Servers, ENTR Lot 9 (prep.study completed june 2015, IA ongoing)

ES Rack servers
ES Blade servers
ES Storage

E0 MED Medical imaging equipment ENTR (Voluntary agreement, not officially part of Ecodesign; not in EIA)

MR scanner
CT scanner
X-ray Angio

V1 TAP Water taps and shower heads, Lot ENV 1 (Prep. Study projected to complete in 2015)

typical tap made of brass (average weight) used in domestic applications (BC1)
typical tap made of brass (average weight) used in non-domestic applications (BC2)
typical shower system (shower valve + shower outlet, average weight), domestic applications (BC3)
typical shower system (shower valve + shower outlet, average weight), non-domestic applications (BC4)

V2 TOIL Toilets, Lot ENV 2 (pilot project aiming at Eco label and GPP criteria. Preliminary report with Key Findings, Jan. 2014, JRC/IPTS, http://susproc.jrc.ec.europa.eu/toilets)

NO DATA

33 SGA Smart grid appliances, Lot 33 (ongoing, expected September 2016)
34 void
35 POW Selected power generation equipment, Lot 35
36 INS Thermal insulation, Lot 36 (Exploratory study completed Feb. 2014; WD for CF may 2014: not to be considered for ecodesign study. Plan to launch in June 2014 a three-year pilot study to develop Product Environmental Footprint Category Rules (PEFCR) for thermal insulation)

ANNEX E: Ecodesign Impacts Accounting by Product Group (Key Facts)

Summary of Key Facts, quantitative data derived from impacts per parameter (Annex A) with explanatory texts added.

Dedicated Water Heaters

The scope of the Ecodesign measures is water heaters with a rated heat output smaller than 400 kW, and hot water storage tanks with a storage volume smaller than 2000 litres, including those integrated in packages of water heater and solar devices. This includes electric storage (ESWH) and instantaneous (EIWH) water heaters, gas- and oil fired storage (GSWH) and instantaneous (GIWH) water heaters as well as solar-assisted water heaters (SOLWH). For efficiency and NO_x emission limits there is a category below 70 kW and above 70 kW.

Excluded are all combi water heaters and dedicated water heaters using gaseous or liquid biomass and solid fuels. Water heaters covered by the Industrial Emissions Directive 2010/75/EU, water heaters which do not meet at least the load profile with the smallest reference energy in the regulation, water heaters designed for making hot drinks and/or food only as well as certain replacement heat generators or their housing are also excluded. The scope of Energy Label regulation covers the same scope as the Ecodesign regulation but is limited to a rated heat output smaller than 70 kW and hot water storage tanks with a storage volume smaller than 2000 litres.

Design options for dedicated water heaters include improved insulation (storage WH), smart temperature control (anticipating user behaviour; e.g. storage WH), electronic ignition (electricity or water-pressure driven, for instantaneous gas WHs instead of pilot-flame), electronic instead of hydraulic temperature control for instantaneous electric WHs, heat pump storage WHs (ventilation exhaust air and/or outdoor air source; possibly with refrigerants like CO_2), solar assisted WHs.

WH dedicated Water Heater	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales volume	'000	9,855	10,918			11,398			11,878		
Stock of units in use	'000	136,218	158,079			166,018			173,129		
Effective heat output per unit	kWh/a	1,392	1,524			1,629			1,735		
EU effective heat output	TWh heat/a	190	241			270			300		
EU hot water (60 °C) use	M m^3/a	3,251	4,130			4,636			5,150		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	722	801	801	0	825	647	-177	828	535	-293
o/w electricity	TWh elec/a	225	250	250	0	257	202	-55	258	167	-91
o/w fuel	TWh fuel/a	159	176	176	0	181	142	-39	182	118	-64
GWP emissions	$MtCO_2$/a	146	140	140	0	136	107	-29	127	82	-45
Acquisition costs (incl. install)	bn €	5	6	6	0	6	11	5	7	12	5
Energy costs	bn €	47	51	51	0	77	61	-17	115	74	-41
Maintenance costs	bn €	6	7	7	0	7	7	0	8	8	0
Total running costs	bn €	53	58	58	0	85	68	-17	123	82	-41
Total expenditure	bn €	58	64	64	0	91	79	-12	130	94	-35
Revenue Industry	m €	1787	2173	2173	0	2312	4014	1702	2587	4560	1973
Revenue Wholesale	m €	522	635	635	0	676	1173	497	756	1333	577
Revenue Retail	m €	457	556	556	0	591	1026	435	661	1166	505
Revenue Installation	m €	1383	1682	1682	0	1790	3107	1317	2002	3529	1527
Revenue Maintenance (excl. VAT)	m €	5098	5916	5916	0	6213	6213	0	6480	6480	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	36	43	43	0	46	80	34	52	91	39
Jobs Wholesale	'000 jobs	2	3	3	0	3	5	2	3	5	2
Jobs Retail/ installation/ maintenance	'000 jobs	72	85	85	0	90	110	20	96	120	24
Jobs Total	'000 jobs	110	131	131	0	139	195	56	151	216	65

(Combi) Boilers

The scope of the Ecodesign measures is space heaters and combination heaters with a rated heat output smaller than 400 kW, including those integrated in packages of space heater, temperature control and solar device or packages of combination heater, temperature control and solar devices. This includes gas- and oil fired central heating boilers, electric resistance boilers, heat pump boilers (electric and gas-fired) and micro-cogeneration boilers smaller than 50 kW all intended for space heating ('solo') or space- and water heating ('combi').

For seasonal efficiency and NO_x emission limits there is a category below 70 kW (with an unconditional exemption for solo-boilers to 10 kW and combi-boilers to 30 kW) and above 70 kW.

Excluded are boilers for gaseous or liquid biomass, solid fuel boilers, certain replacement heat generators or their housing, micro-cogeneration boilers with a maximum electrical capacity of 50 kW or above, dedicated water heaters, air or steam heaters as well as heaters covered by the Industrial Emissions Directive 2010/75/EU.

The scope of Energy Label regulation covers the same scope as the Ecodesign regulation but is limited to a rated heat output smaller than 70 kW.

Design options for more efficient space heating with central heating boilers include condensing technology (secondary heat exchanger to extract extra heat from flue gases), pre-mix or otherwise fan-assisted burners, improved combustion control (e.g. O_2 sensors), lower radiation losses of the housing, improved efficiency and control of the integrated circulation pump, lower auxiliary electricity for the gas valves, CPU and a possible combustion fan, weather dependent boiler temperature control, temperature control with local emitters sensors/actuators ('smart home' systems), solar assistance, hybrid solutions with traditional boilers and electric heat pumps, full electric air/water/ground source heat pumps, gas-fired (ab)sorption heat pumps, fuel cells, efficient micro-cogeneration.

Design options for water heating with combi boilers are similar to those for dedicated water heaters but also include passive flue heat recovery devices (PFHRD), where the cold sanitary water temperature (colder than returning central heating water) allows to extract (and store) more heat from flue gases both during water- and space heating.

CHC Central Heating combi, water heating	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	3,624	6,065			6,946			7,826		
Stock	'000	42,753	82,237			95,497			108,145		
Effective heat output per unit	kWh/a	2,492	2,293			2,340			2,400		
EU effective heat output	TWh heat/a	107	189			223			260		
EU hot water (60 °C) use	M m^3/a	1,826	3,233			3,831			4,450		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	259	416	416	0	460	387	-74	514	340	-173
o/w electricity	TWh elec/a	2	3	3	0	4	3	-1	4	3	-1
o/w fuel	TWh fuel/a	254	408	408	0	451	379	-72	503	333	-170
GWP emissions	$MtCO_2$/a	55	88	88	0	97	82	-16	108	72	-37
Acquisition costs (incl. install)	bn €	4	6	6	0	8	14	6	8	16	8
Energy costs	bn €	11	23	23	0	40	34	-6	66	44	-22
Maintenance costs (incl. VAT)	bn €	1	3	3	0	3	3	0	4	4	0
Total running costs	bn €	13	25	25	0	43	37	-6	70	47	-22
Total expenditure	bn €	16	32	32	0	51	50	0	78	63	-14
Revenue Industry	m €	1316	2294	2294	0	2755	4992	2237	2911	5891	2980
Revenue Wholesale	m €	371	647	647	0	777	1408	631	821	1662	841
Revenue Retail	m €	348	607	607	0	729	1320	592	770	1558	788
Revenue Installation	m €	1123	1957	1957	0	2351	4259	1909	2484	5027	2543
Revenue Maintenance (excl. VAT)	m €	1242	2389	2389	0	2775	2775	0	3142	3142	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	26	46	46	0	55	100	45	58	118	60
Jobs Wholesale	'000 jobs	1	3	3	0	3	6	3	3	7	3
Jobs Retail/ installation/ maintenance	'000 jobs	29	54	54	0	63	92	29	69	108	39
Jobs Total	'000 jobs	57	102	102	0	122	198	76	131	232	102

CH Central Heating boiler, space heating	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	4,802	6,987			7,951			9,508		
Stock	'000	69,520	111,531			128,929			148,980		
Effective heat output per unit	kWh/a	16,830	11,760			9,188			7,301		
EU effective heat output	TWh heat/a	1,170	1,312			1,185			1,088		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2467	2318	2265	-53	1960	1492	-467	1796	1030	-766
o/w electricity	TWh elec/a	102	126	123	-3	121	115	-7	120	117	-3
o/w fuel	TWh fuel/a	2213	2004	1957	-47	1656	1206	-450	1496	738	-759
GWP emissions	$MtCO_2$/a	521	477	466	-11	398	300	-98	359	196	-162
Acquisition costs (incl. install)	bn €	19	27	28	1	31	64	33	37	91	54
Energy costs	bn €	111	128	125	-3	171	130	-41	231	133	-99
Maintenance costs (incl. VAT)	bn €	14	22	22	0	26	26	0	30	30	0
Total running costs	bn €	125	150	148	-3	196	156	-41	261	162	-99
Total expenditure	bn €	143	178	176	-2	227	219	-8	298	253	-44
Revenue Industry	m €	6870	9996	10370	374	11375	23444	12068	13604	33578	19973
Revenue Wholesale	m €	1938	2820	2925	105	3209	6613	3404	3838	9472	5634
Revenue Retail	m €	1817	2644	2742	99	3008	6200	3192	3598	8880	5282
Revenue Installation	m €	5721	8325	8636	311	9473	19523	10050	11329	27962	16633
Revenue Maintenance (excl. VAT)	m €	12119	19443	19443	0	22476	22476	0	25971	25971	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	137	200	207	7	228	469	241	272	672	399
Jobs Wholesale	'000 jobs	8	11	12	0	13	26	14	15	38	23
Jobs Retail/ installation/ maintenance	'000 jobs	209	322	326	5	370	523	154	433	687	254
Jobs Total	'000 jobs	354	533	546	13	610	1019	409	720	1397	676

Solid Fuel Boilers

CR (EU) 2015/1189 regards ecodesign requirements for SFB and applies to solid fuel boilers with a rated heat output of 500 kilowatt ('kW') or less, including those integrated in packages of a solid fuel boiler, supplementary heaters, temperature controls and solar devices as defined in Article 2 of Delegated Regulation (EU) 2015/1187. The regulation does NOT apply to boilers generating heat exclusively for providing hot drinking or sanitary water; boilers for heating and distributing gaseous heat transfer media such as vapour or air; solid fuel cogeneration boilers with a maximum electrical capacity of 50 kW or more; non-woody biomass boilers. Minimum efficiency requirements apply from January 2015 and are expressed in terms of seasonal space heating energy efficiency, as defined more in detail in annex III of the regulation. The regulation also limits the emissions of particulate matter, organic gaseous compounds, carbon monoxide, and nitrogen oxides, but these emissions are currently not being accounted in EIA.

CDR (EU) 2015/1187 regards the energy labelling for SFB. It applies to solid fuel boilers with a rated heat output of 70 kW or less and packages of a solid fuel boiler with a rated heat output of 70 kW or less, supplementary heaters, temperature controls and solar devices. The exemptions are the same as listed above for the ecodesign regulation. Energy labels shall be applied from April 2017. Annex II of the regulation defines energy efficiency classes in terms of EEI. The EEI is defined in annex IX of the regulation and is similar to the seasonal space heating energy efficiency but with an additional (bonus) factor of 1.45 for biomass boilers.

SFB Solid Fuel Boilers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	294	438			362			365		
Stock	'000	8,906	5,292			6,633			6,636		
Effective heat output per unit	kWh/a	15,978	17,973			16,882			15,576		
EU effective heat output	TWh heat/a	142	95			112			103		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	454	168	168	0	170	167	-3	144	138	-6
o/w electricity	TWh elec/a	0	0	0	0	0	0	0	0	0	0
o/w fuel	TWh fuel/a	454	168	168	0	170	167	-3	144	138	-6
GWP emissions	$MtCO_2/a$	49	15	15	0	9	9	0	5	4	0
Acquisition costs (incl. install)	bn €	1	3	3	0	3	3	0	3	3	0
Energy costs	bn €	10	5	5	0	9	9	0	12	11	0
Maintenance costs (incl. VAT)	bn €	0	0	0	0	0	0	0	0	0	0
Total running costs	bn €	10	5	5	0	9	9	0	12	12	0
Total expenditure	bn €	12	8	8	0	12	12	0	15	15	0
Revenue Industry	m €	753	1651	1651	0	1626	1750	124	1805	1980	175
Revenue Wholesale	m €	29	64	64	0	63	68	5	70	77	7
Revenue Retail	m €	29	64	64	0	63	68	5	70	77	7
Revenue Installation	m €	374	590	590	0	533	593	59	570	636	66
Revenue Maintenance (excl. VAT)	m €	353	211	211	0	267	267	0	267	267	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	15	33	33	0	33	35	2	36	40	3
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	8	9	9	0	9	10	1	10	10	1
Jobs Total	'000 jobs	23	42	42	0	42	45	3	46	50	4

Air Heating & Cooling

The draft regulation of September 2015 (not approved yet) regards air heating products with a rated heating capacity not exceeding 1 MW; cooling products with a rated cooling capacity not exceeding 2 MW; fan coil units; and high temperature process chillers.

The draft regulation does NOT apply to: products covered by CR (EU) 2015/1185 (Local Space Heaters); products covered by CR (EU) No 206/2012 (air conditioners and comfort fans); comfort chillers and high temperature process chillers (HTPCH) leaving chilled water temperatures of less than + 2 ºC; products designed for using predominantly biomass fuels; products using solid fuels; products that supply heat or cold in combination with electric power ('cogeneration') by means of a fuel combustion or conversion process; products covered by Directive 2010/75/EU (industrial emissions - integrated pollution prevention and control); HTPCH that operate using exclusively evaporative condensing; custom-made HTPCH assembled on site and made on a one-off basis; HTPCH in which refrigeration is effected by an absorption process that uses heat as the energy source; and air heating and/or cooling products of which the primary function is the purpose of storing and merchandising perishable materials at specified temperatures by commercial, institutional or industrial facilities and of which space heating and/or space cooling is a secondary function.

The regulation sets minimum energy efficiency requirements starting from January 2018 (tier 1), with more stringent requirements applying from January 2021 (tier 2). These requirements are formulated in terms of minimum seasonal space heating energy efficiency and useful efficiencies for air heating and air cooling products (refer to primary energy), and in terms of seasonal energy performance ratio (SEPR) for high temperature process chillers (refers to electricity). For cooling products, lower efficiencies are allowed if the refrigerants used have a low Global Warming Potential (refrigerant leakage problem). The current EIA version takes into account the higher required energy efficiencies (for refrigerants with GWP > 150), and CO_2 emission accounting includes both the effects of energy related emissions and equivalent emissions due to refrigerant leakage or release at end-of-life. In addition the draft regulation sets limits on NOx emissions, but these are currently not accounted in EIA.

The data in EIA are based on the draft Impact Assessment of June 2015 and on the draft regulation of September 2015.

AHC central Air Cooling	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales, Total Central Air Cooling	'000	146	595			697			769		
o/w CH, comfort chillers	*'000*	*26*	*106*			*128*			*154*		
o/w AC, air conditioners	*'000*	*103*	*461*			*539*			*582*		
o/w HT PCH, high temp. process chillers	*'000*	*17*	*27*			*31*			*34*		
Stock comfort chillers & reversibles	'000	1,735	7,538			9,957			11,380		
o/w CH, comfort chillers	*'000*	*356*	*1,478*			*2,179*			*2,640*		
o/w AC, air conditioners	*'000*	*1,186*	*5,718*			*7,355*			*8,265*		
o/w HT PCH, high temp. process chillers	*'000*	*193*	*342*			*423*			*475*		
Effective cooling output per unit, CH+AC	kWh cooling/a	34,291	25,463			24,113			21,754		
Effective cooling output per unit, HT PCH	kWh cooling/a	1,569,859	1,572,985			1,573,218			1,574,639		
EU effective cooling output, CH+AC	TWh cooling/a	53	183			230			237		
EU effective cooling output, HT PCH	TWh cooling/a	303	538			666			748		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	204	380	380	0	435	426	-9	438	404	-34
o/w electricity	*TWh elec/a*	*82*	*152*	*152*	*0*	*174*	*170*	*-4*	*175*	*162*	*-14*
o/w fuel	*TWh fuel/a*	*0.0*	*0.1*	*0.1*	*0.0*	*0.3*	*0.2*	*0.0*	*0.3*	*0.2*	*-0.1*
GWP emissions from energy & refrig. loss	$MtCO_2$/a	42	70	70	0	77	76	-1	73	69	-5
o/w GWP emissions from energy	*$MtCO_2$/a*	*40*	*59*	*59*	*0*	*60*	*59*	*-1*	*52*	*47*	*-5*
o/w GWP emissions refrigerant loss	*$MtCO_2$/a*	*2*	*11*	*11*	*0*	*17*	*17*	*0*	*21*	*21*	*0*
Acquisition costs (incl. install)	bn €	2	8	8	0	10	10	0	13	13	0
Energy costs	bn €	10	16	16	0	26	25	-1	39	36	-3
Maintenance costs (incl. VAT)	bn €	1	4	4	0	7	7	0	9	9	0
Total running costs	bn €	11	20	20	0	33	32	-1	48	44	-3
Total expenditure	bn €	12	28	28	0	43	43	-1	61	58	-3
Revenue Industry	m €	897	4091	4091	0	5582	5583	2	7054	7055	1
Revenue Wholesale	m €	112	511	511	0	698	698	0	882	882	0
Revenue Retail	m €	112	511	511	0	698	698	0	882	882	0
Revenue Installation	m €	441	2415	2415	0	3428	3429	1	4409	4409	1
Revenue Maintenance (excl. VAT)	m €	1012	4361	4361	0	6754	6754	0	8841	8841	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	18	82	82	0	112	112	0	141	141	0
Jobs Wholesale	'000 jobs	0	2	2	0	3	3	0	4	4	0
Jobs Retail/ installation/ maintenance	'000 jobs	16	76	76	0	113	113	0	147	147	0
Jobs Total	'000 jobs	35	160	160	0	228	228	0	292	292	0

AHC central Air Heating	unit	1990	2010			2020			2030		
Sales air heaters & reversible AC's	'000	210	426			486			507		
o/w reversible AC (double with cooling)	*'000*	*74*			*334*			*404*			*433*
Stock	'000	2,459	5,706			6,710			7,373		
o/w reversible AC (double with cooling)	*'000*	*846*			*4,048*			*5,315*			*6,133*
Effective heat output per unit	kWh heat/a	69,049	42,356			36,271			31,446		
EU effective heat output	TWh heat/a	170	242			243			232		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	260	291	291	0	259	252	-7	226	204	-22
o/w electricity	TWh elec/a	18	52	52	0	56	55	-1	54	50	-4
o/w fuel	TWh fuel/a	215	161	161	0	119	115	-4	92	79	-13
GWP emissions from energy	$MtCO_2/a$	55	58	58	0	51	50	-1	44	40	-4
Acquisition costs (incl. install, excl. rev.AC)	bn €	0.7	0.5	0.5	0.0	0.4	0.4	0.0	0.4	0.4	0.0
Energy costs	bn €	8	12	12	0	16	16	0	21	19	-2
Maintenance costs (incl. VAT, excl. rev.AC)	bn €	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Total running costs (excl. maint. rev AC)	bn €	8	12	12	0	16	16	0	21	19	-2
Total expenditure (excl. acq & maint rev AC)	bn €	8	12	12	0	17	16	0	21	19	-2
Revenue Industry (excl. rev. AC)	m €	333	220	220	0	194	212	18	173	188	15
Revenue Wholesale (")	m €	42	27	27	0	24	27	2	22	23	2
Revenue Retail (")	m €	42	27	27	0	24	27	2	22	23	2
Revenue Installation (")	m €	277	182	182	0	160	176	15	143	156	12
Revenue Maintenance (", excl. VAT)	m €	101	101	101	0	86	86	0	76	76	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	7	4	4	0	4	4	0	3	4	0
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	4	3	3	0	3	3	0	3	3	0
Jobs Total	'000 jobs	11	8	8	0	7	7	1	6	7	0

Local Space Heaters

CR (EU) 2015/1185 provides ecodesign requirements for solid fuel local space heaters with a nominal heat output of 50 kW or less. Exemptions include non-woody biomess, outdoor use only, direct heat output less than 6% of combined direct and indirect heat output, not factory assembled, air heating products, sauna stoves. Minimum efficiency requirements under this regulation apply from January 2022 and are expressed in terms of seasonal space heating energy efficiency as further defined in Annex III of the regulation. The seasonal efficiency is the useful efficiency at nominal heat output (based on NCV, application of factor CC=2.5 for electricity) negatively corrected by -10% and for auxiliary electricity consumption and permanent pilot flames, and postively corrected for the effects of controls. The regulation also limits the emission of particulate matter (PM), organic gaseous compunds (OGCs), carbon monxide (CO), and of nitrogen oxides (NOx), but these emissions are currently NOT accounted in the EIA.

CR (EU) 2015/1188 provides ecodesign requirements for domestic LSH with a nominal heat output of 50 kW or less and for commercial LSH (luminous or tube heater) with 120 kW or less that convert electricity or gaseous or liquid fuels directly into heat. Exemptions include vapour compression cycle, sorption cycle, purposes other than indoor space heating for human comfort, outdoor-use only, air heating products, sauna stoves, slave heaters. Minimum efficiency requirements under this regulation apply from January 2018 and are expressed in terms of seasonal space heating energy efficiency as further defined in Annex III of the regulation. The seasonal efficiency is the useful efficiency at nominal heat output (based on NCV, application of factor CC=2.5 for electricity, based on GCV for commercial LSH), negatively corrected by -10% and for auxiliary electricity consumption and permanent pilot flames, and postively corrected for the effects of controls and heat storage. For commercial LSH, the emission efficiency is also taken into account. The regulation also limits the emission of nitrogen oxides (NOx), but these emissions are currently NOT accounted in the EIA.

CDR (EU) 2015/1186 regards energy labelling for LSH with a nominal heat output of 50 kW or less. Exemptions include electric LSH, vapour compression cycle, sorption cycle, non-woody biomass, other than indoor heating for human comfort, outdoor-use only, LSH for which the direct heat output is less than 6 % of the combined direct and indirect heat output at nominal heat output (note: they will usually be regulated as 'boilers'), not factory assembled, luminous LSH, tube LSH, air heating products, sauna stoves. Energy labels shall be applied from January 2022 for solid fuel LSH and from January 2018 for other LSH (same dates as ecodesign). Energy efficiency classes are defined in annex II of the regulation in terms of EEI. The EEI are defined in annex VIII. They are similar to the seasonal space heating efficiency (with similar correction factors), but with application of a biomass label factor 1.45 for biomass LSH.

Design options mentioned in preparatory study at product level are: Closing combustion (glass front), balanced flue, premix, electric ignition (eliminating pilot flame), mechanical draft, single split reversible heat pump (substitute for electric convector), modulating (or 2 stage) power control. At component level they include: PI controller, programmable thermostat with setback functionality, absence detection, open window detection, automatic (electromechanical, electronic) charge control (for static storage heaters)

LH Local Heaters	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	19,103	24,464			26,492			28,534		
Stock	'000	208,872	267,511			300,212			331,013		
Effective heat output per unit	kWh/a	955	891			886			870		
EU effective heat output	TWh heat/a	199	238			266			288		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	575	603	603	0	622	590	-32	635	581	-54
o/w electricity	TWh elec/a	169	168	168	0	165	154	-11	163	149	-14
o/w fuel	TWh fuel/a	152	182	182	0	209	205	-4	226	208	-18
GWP emissions from energy	$MtCO_2/a$	104	84	84	0	77	73	-5	69	63	-6
Acquisition costs (incl. install)	bn €	8	13	13	0	16	18	2	18	20	2
Energy costs	bn €	34	35	35	0	53	50	-3	79	72	-7
Maintenance costs (incl. VAT)	bn €	1	1	1	0	2	2	0	2	2	0
Total running costs	bn €	35	36	36	0	55	52	-3	82	75	-7
Total expenditure	bn €	43	50	50	0	71	70	-1	99	94	-5
Revenue Industry	m €	3684	5981	5981	0	7234	8012	777	7690	8558	869
Revenue Wholesale	m €	533	865	865	0	1046	1159	112	1112	1238	126
Revenue Retail	m €	629	1021	1021	0	1236	1368	133	1313	1462	148
Revenue Installation	m €	2178	3301	3301	0	4234	4563	329	4754	5114	360
Revenue Maintenance (excl. VAT)	m €	773	1218	1218	0	1570	1570	0	1862	1862	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	74	120	120	0	145	160	16	154	171	17
Jobs Wholesale	'000 jobs	2	3	3	0	4	5	0	4	5	1
Jobs Retail/ installation/ maintenance	'000 jobs	40	62	62	0	79	84	6	88	94	6
Jobs Total	'000 jobs	116	185	185	0	227	249	21	246	270	24

Room Air Conditioners

The ED and EL measures relate to electric mains-operated air conditioners with a rated capacity of <= 12 kW for cooling, or heating if the product has no cooling function, and comfort fans with an electric fan power input <= 125W. Excluded are appliances that use non-electric energy sources and air conditioners of which the condenser-side or evaporator- side, or both, do not use air for heat transfer medium.

Design options for room air conditioners include inverter driven variable speed drives to to adjust the performance of the appliance depending on (changing) operating conditions (outdoor and indoor air temperature), reduction of energy consumption of auxiliary functions like, standby, off-mode, reactivation function and use of refrigerants with lower Global Warming Potential.

RAC Room Air Conditioner	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	394	4,705			9,089			10,359		
o/w reversible (also heat)	'000	111	3,491			8,036			9,178		
Stock	'000	4,730	49,470			82,524			117,785		
o/w reversible	'000	1,327	28,633			68,618			104,245		
Effective cooling output per unit	kWh cool/a	1,086	1,133			1,172			1,207		
Effective heat output per reversible unit	kWh heat/a	2,683	2,065			1,858			1,701		
EU effective cooling output	TWh cool/a	5	56			97			142		
EU effective heat output	TWh heat/a	4	59			128			177		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy total (100% electric)	TWh prim/a	10.8	102	102	0	165	143	-22	217	181	-37
Electricity total	TWh elec/a	4.3	41	41	0	66	57	-9	87	72	-15
o/w electricity cooling	TWh elec/a	2.5	18	18	0	25	21	-4	34	27	-7
o/w electricity heating	TWh elec/a	1.8	22	22	0	41	36	-5	53	45	-8
GWP emissions total	$MtCO_2/a$	2.5	20.1	20.1	0.0	30.8	27.4	-3.4	37.7	32.7	-5.0
o/w GWP emissions electricity cooling	$MtCO_2/a$	1.3	7.6	7.6	0.0	9.6	8.1	-1.5	11.6	9.3	-2.3
o/w GWP emissions electricity heating	$MtCO_2/a$	0.9	9.1	9.1	0.0	15.5	13.6	-1.9	18.0	15.3	-2.7
o/w GWP emissions refrigerant loss	$MtCO_2/a$	0.3	3.4	3.4	0.0	5.7	5.7	0.0	8.1	8.1	0.0
Acquisition costs (incl. install)	bn €	1	8	8	0	16	18	2	18	20	2
Energy costs total	bn €	1	6	6	0	14	12	-2	28	23	-5
o/w energy cooling	bn €	0	3	3	0	5	5	-1	11	9	-2
o/w energy heating	bn €	0	3	3	0	9	8	-1	17	14	-3
Maintenance costs (incl. VAT)	bn €	0	1	1	0	2	2	0	2	2	0
Total running costs	bn €	1	7	7	0	16	14	-2	30	25	-5
Total expenditure	bn €	1	15	15	0	32	32	0	48	45	-3
Revenue Industry	m €	192	2404	2404	0	4669	5165	496	5144	5774	630
Revenue Wholesale	m €	54	671	671	0	1303	1441	138	1435	1611	176
Revenue Retail	m €	50	629	629	0	1221	1351	130	1346	1511	165
Revenue Installation	m €	286	3578	3578	0	6948	7686	738	7655	8592	937
Revenue Maintenance (excl. VAT)	m €	84	874	874	0	1458	1458	0	2081	2081	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	4	48	48	0	93	103	10	103	115	13
Jobs Wholesale	'000 jobs	0	3	3	0	5	6	1	6	6	1
Jobs Retail/ installation/ maintenance	'000 jobs	5	55	55	0	104	114	10	120	132	12
Jobs Total	'000 jobs	9	106	106	0	203	223	20	228	254	25

Circulators <2.5 kW

This Regulation addresses glandless standalone circulators and glandless circulators integrated in products. Excluded, except for certain product information requirements, are drinking water circulators and circulators integrated in products and placed on the market no later than 1 January 2020 as replacement for identical circulators integrated in products and placed on the market no later than 1 August 2015.

Design options for small circulators include more efficient (EC/DC permanent magnet) motors, variable speed drives, improved impeller design with lower hydraulic loss through smoother finish of stainless steel impellers, wider and optimised range of housings, intelligent controls.

CIRC Circulator pumps <2.5 kW	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	5,502	8,065			9,120			9,542		
Stock	'000	50,049	75,601			86,455			95,108		
Load per unit (W=Pa·m³/s; kWh=10³·W·h)	kWh flow/a	300	277			266			261		
EU load (1 TWh=10^{12}·W·h)	TWh flow/a	44	18			8			2		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	40	52	51	-2	55	27	-28	59	27	-33
o/w electricity	TWh elec/a	16	21	20	-1	22	11	-11	24	11	-13
GWP emissions	$MtCO_2$/a	8	9	8	0	8	4	-4	8	4	-4
Acquisition costs (incl. install)	bn €	1	2	2	0	2	2	0	2	2	0
Energy costs	bn €	2	2	2	0	4	2	-2	6	3	-3
Total running costs	bn €	2	2	2	0	4	2	-2	6	3	-3
Total expenditure	bn €	3	4	4	0	6	4	-1	8	5	-3
Revenue Industry	m €	873	1286	1391	104	1446	1801	355	1513	1713	200
Revenue Wholesale	m €	174	257	278	21	289	360	71	302	342	40
Revenue Retail	m €	70	103	111	8	115	144	28	121	137	16
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	17	26	28	2	29	36	7	30	34	4
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	1	2	2	0	2	2	0	2	2	0
Jobs Total	'000 jobs	19	28	31	2	32	40	8	33	38	4

Ventilation Units

VU's provide savings on space heating, as compared to natural ventilation, when they recuperate heat from the outgoing airflow. The line 'o/w fuel' (labelled (4)) gives the corresponding fuel savings as a negative number. This is for 75% space heating efficiency and other conditions explained in LoadNotes. The BAU fuel savings are already considered as LOAD reduction for space heating products and should therefore not be counted again here. Therefore only the additional savings in ECO versus BAU are taken into account, corrected for space heating efficiency different from 75%, see line labelled (5). To obtain these fuel savings on space heating, electricity is consumed, see line labelled (3). The resulting total primary energy is 'fuel+electricity/CC' where CC=40% the efficiency of electricity generation. The primary energy of the line labelled (1) combines electricity (3) with fuel (4); the line labelled (2) combines electricity (3) with fuel (5). For the final savings, without double counting of heat savings already in heating products, consider lines labelled (2), (3) and (5).

VU Ventilation Units (res & nonres)	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	1,315	3,212			3,660			4,492		
Stock	'000	19,456	43,634			56,423			65,933		
EU total mechanical ventilation	T m³/a	30	103			143			167		
o/w non-residential	T m³/a	4	49			75			92		
o/w residential	T m³/a	26	54			68			75		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (incl. saving vs. natural vent)	TWh prim/a (1)	-86	-483	-483		-689	-810		-852	-1125	
(incl. corrected saving vs. BAU)	TWh prim/a (2)	67	194	194	0	239	123	-116	256	43	-213
o/w electricity	TWh elec/a (3)	27	78	78	0	96	85	-11	102	77	-25
o/w fuel (negative= saving vs. natural vent.)	TWh fuel/a (4)	-153	-678	-678		-928	-1022		-1107	-1317	
(negative= corrected saving vs. BAU)	TWh fuel/a (5)	0	0	0	0	0	-89	-89	0	-149	-149
GWP emissions	$MtCO_2$/a	13	32	32	0	36	32	-4	35	26	-9
Acquisition costs (incl. install)	bn €	31	74	74	0	83	86	3	93	96	3
Electricity costs	bn €	3	8	8	0	15	7	-8	24	-3	-27
Heating costs for vent.& infiltr. losses+	bn €	-7	-37	-37	0	-81	-89	-8	-143	-170	-27
Maintenance costs (incl. VAT)	bn €	1	3	3	0	4	4	0	5	5	0
Total running costs	bn €	-2	-26	-26	0	-62	-78	-16	-114	-167	-54
Total expenditure	bn €	29	49	49	0	22	8	-13	-20	-71	-51
Revenue Industry	m €	10657	25170	25170	0	28285	29117	832	31676	32513	837
Revenue Wholesale	m €	1433	3429	3429	0	3949	4213	265	4469	4735	266
Revenue Retail	m €	1444	3458	3458	0	3991	4272	281	4522	4804	283
Revenue Installation	m €	17647	41459	41459	0	46045	46867	821	51276	52111	835
Revenue Maintenance (excl. VAT)	m €	960	3075	3075	0	4154	4154	0	4958	4958	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	213	503	503	0	566	582	17	634	650	17
Jobs Wholesale	'000 jobs	6	14	14	0	16	17	1	18	19	1
Jobs Retail/ installation/ maintenance	'000 jobs	210	503	503	0	569	581	13	638	651	13
Jobs Total	'000 jobs	429	1020	1020	0	1150	1181	31	1289	1320	31

Light Sources

LS Light Sources, mln units BAU	unit	1990	2010			2020			2030		
		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Sales	m	2,122	2,712	2,365	-346	2,464	1,769	-695	1,626	670	-956
Stock	m	5,554	10,255	10,011	-244	12,493	12,136	-357	14,057	13,954	-103
EU output capacity in lm	Tlm	5	10	10	0	13	13	0	14	15	1
EU accumulated operating hours total	Th/a	5	9	9	0	11	11	0	13	13	0
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (incl. SPL, ctrl & sb)	TWh prim/a	661	1047	1017	-29	943	661	-282	729	373	-356
o/w electricity (incl. SPL, ctrl & sb)	TWh elec/a	265	419	407	-12	377	264	-113	292	149	-142
GWP emissions (incl. SPL, ctrl & sb)	$MtCO_2/a$	132	172	165	-7	143	100	-43	99	51	-48
Acquisition costs (incl. install) (excl. SPL, ctrl &	bn €	5	12	12	0	12	11	-1	9	4	-5
Energy costs (incl. SPL, ctrl & sb)	bn €	37	53	51	-2	68	47	-21	75	41	-34
Total running costs (excl. SPL, ctrl & sb)	bn €	30	43	41	-2	57	36	-21	64	29	-34
Total expenditure (excl. SPL, ctrl & sb)	bn €	35	54	52	-2	69	47	-22	72	33	-40
Revenue Industry	m €	3005	6307	6406	99	6357	5715	-642	4939	1889	-3050
Revenue Wholesale	m €	379	794	807	13	794	694	-100	615	228	-387
Revenue Retail	m €	1214	3534	3622	88	3920	4181	261	2732	1331	-1401
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	60	126	128	2	127	114	-13	99	38	-61
Jobs Wholesale	'000 jobs	2	3	3	0	3	3	0	2	1	-2
Jobs Retail/ installation/ maintenance	'000 jobs	20	59	60	1	65	70	4	46	22	-23
Jobs Total	'000 jobs	82	188	192	3	196	187	-9	147	61	-86

Electronic Displays

The existing ED and EL measures address televisions and there are existing EU ENERGY STAR measures for computer monitors. The imminent ED and EL legislation for electronic displays is intended to cover televisions, computer monitors and digital picture frames simultaneously, mainly due to the converging technology of these products in the market. Cathode Tray Tube displays (almost extinct) are excluded from the scope and for plasma televisions the current proposals by the Commission foresee a grace period.

Design options for electronic displays include completion of the substitution of CCFLs by LEDs with a better luminous efficacy (state of the art LED 104 lm/W versus CCFL of typically 60-70 lm/W), further improvement of the luminous efficacy of LEDs (in lm/W, possibly over 200 lm/W), improved LED-backlighting lay-out, especially for the average and larger TVs by using direct LEDs (now 28% of the market share) instead of indirect LEDs (now 53% of the market share), further miniaturisation of integrated circuits (e.g. from 28 nm to a future 14 nm), using more transparent and efficient TFT materials (e.g. Indium-Gallium-Zinc-Oxide IGZO or similar instead of a-Si), using active matrix OLEDs (AMOLED) instead of TFT with LED backlighting for displays with larger screen sizes. AMOLED TVs are expected to be lighter (>40-50% saving on net panel weight), provide more luminance (up to 10 000 cd/m^2), and approximately 1.5 to 2 times more luminous efficacy than LED TVs.

DP electronic DisPlays	unit	1990	2010			2020			2030		
Sales	'000	36,180	93,465			87,144			101,073		
Stock	'000	229,140	570,840			578,337			699,904		
Viewable area per TV	dm^2	10	28			53			72		
Viewable area per monitor	dm^2	5	11			16			20		
EU electronic displays viewable area	km^2	22	131			272			451		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	81	254	255	1	156	88	-68	180	55	-125
o/w electricity	TWh elec/a	32	102	102	0	62	35	-27	72	22	-50
GWP emissions	$MtCO_2/a$	16	42	42	0	24	13	-10	24	7	-17
Acquisition costs (incl. install)	bn €	13	35	35	0	35	35	0	42	42	0
Energy costs	bn €	4	11	11	0	10	6	-4	18	6	-12
Total expenditure	bn €	18	46	46	0	46	41	-4	59	48	-12
Revenue Industry	m €	5353	13921	13921	0	14020	14020	0	16512	16512	0
Revenue Wholesale	m €	673	1751	1751	0	1764	1764	0	2077	2077	0
Revenue Retail	m €	5387	14010	14010	0	14110	14110	0	16617	16617	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	107	278	278	0	280	280	0	330	330	0
Jobs Wholesale	'000 jobs	3	7	7	0	7	7	0	8	8	0
Jobs Retail/ installation/ maintenance	'000 jobs	90	233	233	0	235	235	0	277	277	0
Jobs Total	'000 jobs	200	519	519	0	523	523	0	615	615	0

Set Top Boxes

Simple set-top boxes don't exist anymore and are replaced by complex set-top boxes in all relevant applications, as shown in the Omnibus 2013 study and confirmed by the Commission in the CF of mid-2014. This is a perfectly normal evolution within the ITC market, but the consequence is that they don't contribute to the savings. All savings come from Complex set-top boxes.

STB Set Top Boxes	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	0	60,049			44,117			43,501		
Stock	'000	0	178,589			219,581			216,233		
Unit average hours in 'on' mode per day	h/d	0.0	4.5			4.5			4.5		
EU billion hours in 'on'-mode per year	bn h 'on'/a	0.0	293			361			355		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	0	26	22	-4	48	37	-11	48	37	-11
o/w electricity	TWh elec/a	0	10	9	-1	19	15	-4	19	15	-4
GWP emissions	$MtCO_2/a$	0	4	4	-1	7	6	-2	6	5	-2
Acquisition costs (incl. install)	bn €	0	6	6	0	7	7	0	7	7	0
Energy costs	bn €	0	2	1	0	5	4	-1	7	5	-2
Total expenditure	bn €	0	8	8	0	11	10	-1	13	12	-2
Revenue Industry	m €	0	3473	3473	0	3623	3623	0	3572	3572	0
Revenue Wholesale	m €	0	1586	1586	0	1654	1654	0	1631	1631	0
Revenue Retail	m €	0	317	317	0	331	331	0	326	326	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	0	69	69	0	72	72	0	71	71	0
Jobs Wholesale	'000 jobs	0	6	6	0	7	7	0	7	7	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	5	5	0	6	6	0	5	5	0
Jobs Total	'000 jobs	0	81	81	0	85	85	0	83	83	0

Video players/recorders/projectors games

Design options for game consoles include power management and reduction of power in the various states of standby, inactive/idle and active use as well as increasing hardware flexibility to perform less computationally intensive tasks with some of the processing resources disabled (e.g. media playback is often much higher in game consoles than in standalone media devices), reducing the duration and frequency of auto-wake events, implementing and improving auto power down functionality to enable the console to automatically enter a low power state (normally standby or networked standby) if there is no user input for a predefined time. Design options for video players/recorders include changing the architecture to make the hard disk drive (HDD) external to the product through the USB port (this reduces power consumption and enables sourcing of efficient HDDs), using energy-optimised SoC or similar chip sets (mass market only – not high end, which have multichip configurations), offering energy efficient quick-start modes, and quick-start not enabled as default. Design options for projectors include offering eco mode as standard available feature, using more efficient lighting modules (e.g. Phaser light sources), using optimised lens solutions, using efficient light path beam splitting optics.

The 2015 Voluntary Agreement (Self-Regulatory Initiative, SRI) regards only game-consoles. The SRI sets requirements for the auto-power down (APD) function and for the maximum power during console operation in navigation or media-playback mode. The power in gaming mode is currently not regulated but this will be reviewed in 2017. The SRI text also provides measurement procedures. In addition to the SRI, game consoles are also subject to CR 801/2013 (networked standby) and CR 1275/2008 annex II (standby). In the Impact Assessment, the standby savings are included both in the BAU and in the ECO scenario. EIA copied this approach, and consequently standby savings are not accounted in EIA. In the SRI text the standby savings are 1.1 TWh in 2020, in addition to SRI savings. Video recorders and players and projectors are not regulated in anyway and have zero savings (ECO=BAU).

VIDEO	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	69	55,248			16,225			13,622		
Stock	'000	129	218,055			125,735			82,154		
Unit average hours in 'on' mode per day	h/d	1.5	1.4			1.7			2.0		
EU billion hours in 'on'-mode per year	bn h 'on'/a	0	110			77			60		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	0	22	22	0.0	32	29	-2.7	35	33	-2.7
o/w electricity	TWh elec/a	0	9	9	0.0	13	12	-1.1	14	13	-1.1
o/w fuel	TWh fuel/a	0	0	0	0.0	0	0	0.0	0	0	0.0
GWP emissions	$MtCO_2/a$	0	4	4	0.0	5	4	-0.4	5	4	-0.4
Acquisition costs (incl. install)	bn €	0	13	13	0.0	5	5	0.0	5	5	0.0
Energy costs	bn €	0	1	1	0.0	3	3	-0.3	5	5	-0.4
Total expenditure	bn €	0	14	14	0.0	9	8	-0.3	10	10	-0.4
Revenue Industry	m €	24	5505	5505	0.0	2334	2334	0.0	1929	1929	0.0
Revenue Wholesale	m €	12	1315	1315	0.0	510	510	0.0	245	245	0.0
Revenue Retail	m €	5	4181	4181	0.0	1869	1869	0.0	1913	1913	0.0
Revenue Installation	m€	15	1029	1029	0.0	355	355	0.0	0	0	0.0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0.0	0	0	0.0	0	0	0.0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	0	110	110	0.0	47	47	0.0	39	39	0.0
Jobs Wholesale	'000 jobs	0	5	5	0.0	2	2	0.0	1	1	0.0
Jobs Retail/ installation/ maintenance	'000 jobs	0	80	80	0.0	35	35	0.0	32	32	0.0
Jobs Total	'000 jobs	1	195	195	0	83	83	0	71	71	0

Enterprise Servers

The data in EIA have been derived from those in the preparatory study. No Working Document was available while Impact Assessment just started (September 2015). The ECO-scenario is based on the LLCC2015 scenario from the prep.study. EIA needs to be updated when further steps in the regulatory process have been taken.

EIA considers only the energy consumptions and related emissions due to the Enterprise Servers, NOT those of the entire data centers. This avoids double-counting issues: most cooling and air conditioning equipment is already taken into account in ENER Lot 21/ GROW Lot 6 (airco and HT chillers, measures are now in ISC-stage), UPS are already in ENER Lot 27 (prep. study finished but no measures yet) and distribution transformers are already in GROW Lot 2 (regulation in place). Possibly there is also an overlap with specific cooling solutions (e.g. water-cooled CPUs) in GROW Lot 1 on professional refrigeration.

ES Enterprise Servers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	108	2,590			3,343			5,044		
Stock	'000	413	12,077			15,443			22,735		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2	62	62	0	77	68	-10	112	79	-33
o/w electricity	TWh elec/a	1	25	25	0	31	27	-4	45	32	-13
GWP emissions	$MtCO_2/a$	0	10	10	0	12	10	-1	15	11	-5
Acquisition costs (incl. install)	bn €	1	14	14	0	17	17	0	24	25	1
Energy costs	bn €	0	3	3	0	5	4	-1	10	7	-3
Total expenditure	bn €	1	16	16	0	21	21	0	34	32	-2
Revenue Industry	m€	563	8703	8703	0	10705	10972	267	15226	15775	549
Revenue Wholesale	m€	80	1243	1243	0	1529	1567	38	2175	2254	78
Revenue Retail	m€	161	2487	2487	0	3059	3135	76	4350	4507	157
Revenue Installation	m€	69	1134	1134	0	1404	1429	25	2032	2095	63
Revenue Maintenance (excl. VAT)	m€	4	121	121	0	154	154	0	227	227	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	11	174	174	0	214	219	5	305	315	11
Jobs Wholesale	'000 jobs	0	5	5	0	6	6	0	9	9	0
Jobs Retail/ installation/ maintenance	'000 jobs	3	54	54	0	67	68	2	95	98	3
Jobs Total	'000 jobs	15	233	233	0	287	294	7	408	423	15

Computers

The ED regulation applies to computers that can be powered directly from the mains alternating current (AC) including via an external or internal power supply, which includes desktop computers, integrated desktop computers (AIO, 'All-in-One'), notebook computers (including tablet computers, slate computers and mobile thin clients), desktop thin clients, workstations, mobile workstations, small-scale servers and computer servers.

The regulation does not include blade system and components, server appliances, multi-node servers, computer servers with more than four processor sockets (now addressed in ENTR Lot 27), game consoles (addressed in ENTR Lot 3) and docking stations. Computers are also covered by EU ENERGY STAR measures, with the same scope as above.

Design options to reduce the power consumption of personal computers are Moore's Law (moving towards 14 nm technology in 2016-2017), solid state drives (instead of or in addition to hard-disks), improved power management, efficient power supplies, multi-core processors, adaptive clocks, etc. For notebook and tablet PCs the use of efficient display technology (LED/OLED backlighting, Moore's Law in image control) is relevant.

For PCs (Lot 3) the minimum requirements were based on the prep. study 2007 and for this fast-moving sector were not effective when introduced in 2013. Consequently ECO scenario data have been taken identical to BAU scenario data, and no savings are reported.

PC Personal Computers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	7,350	64,225			130,650			183,413		
Stock	'000	29,570	243,949			485,415			735,158		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	36	76	76	0	20	20	0	14	14	0
o/w electricity	TWh elec/a	15	31	31	0	8	8	0	6	6	0
GWP emissions	$MtCO_2/a$	7	13	13	0	3	3	0	2	2	0
Acquisition costs (incl. install)	bn €	4	41	41	0	65	65	0	89	89	0
Energy costs	bn €	2	4	4	0	2	2	0	2	2	0
Total expenditure	bn €	6	45	45	0	67	67	0	91	91	0
Revenue Industry	m €	1619	16752	16752	0	26337	26337	0	35773	35773	0
Revenue Wholesale	m €	241	2491	2491	0	3710	3710	0	4897	4897	0
Revenue Retail	m €	1633	16853	16853	0	26066	26066	0	35563	35563	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	32	335	335	0	527	527	0	715	715	0
Jobs Wholesale	'000 jobs	1	10	10	0	15	15	0	20	20	0
Jobs Retail/ installation/ maintenance	'000 jobs	27	281	281	0	434	434	0	593	593	0
Jobs Total	'000 jobs	61	626	626	0	976	976	0	1328	1328	0

Imaging Equipment

The Voluntary Agreement on imaging equipment covers Electrophotography (EP), Inkjet (IJ, including high performance IJ) and Solid Ink (SI) copiers, multifunction devices (MFDs), printers and fax machines with a maximum speed of 66 images size A4 per minute (monochrome equipment) or 51 images size A4 per minute (for colour format equipment). This implies that very high speed and speciality equipment is not included, as well as equipment using other marking technologies (e.g. dot matrix).

Design options for imaging equipment include standard duplexing and N-print ability (paper saving), more efficient drying technology (EP), improved ink/ toner (lower melting temperature), reduced standby and ready-mode energy use (time-comfort optimisation), etc..

EP & IJ imaging equipment	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	17,000	31,674			36,876			40,765		
Stock	'000	64,383	123,216			145,858			160,574		
Unit output, images per year (ipy)	ipy	11,217	6,221			5,867			5,804		
EU output, images per year (ipy)	bn ipy	722	767			856			932		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy for electricity	TWh prim/a	56	19	13	-5	20	7	-13	23	7	-16
o/w electricity	TWh elec/a	22	7	5	-2	8	3	-5	9	3	-6
Primary energy for paper (toner negligible)	TWh prim/a	25	26	25	-1	29	25	-4	32	27	-5
GWP emissions	$MtCO_2/a$	13	4	4	-1	5	2	-2	5	2	-2
o/w GWP energy	$MtCO_2/a$	11	3	2	-1	3	1	-2	3	1	-2
o/w GWP paper production	$MtCO_2/a$	1	1	1	0	2	1	0	2	1	0
Paper resources (1 kg=200 sheets)	Mt/a	2.2	2.4	2.3	-0.1	2.6	2.2	-0.4	2.9	2.4	-0.4
Acquisition costs (incl. install)	bn €	6	7	7	0	10	10	0	11	11	0
Energy costs	bn €	3	1	1	0	1	0	-1	2	1	-2
Consumable resources	bn €	30	31	31	0	35	34	-1	38	37	-1
o/w paper	bn €	5	6	5	0	6	5	-1	7	6	-1
o/w toner	bn €	24	26	26	0	29	29	0	31	31	0
Total running costs	bn €	33	32	32	0	37	35	-2	41	38	-3
Total expenditure	bn €	38	39	38	0	46	44	-2	52	49	-3
Revenue Industry	m €	3460	3561	3561	0	5351	5351	0	6255	6255	0
Revenue Wholesale	m €	464	423	423	0	652	652	0	765	765	0
Revenue Retail	m €	1391	2001	2001	0	2773	2773	0	3195	3195	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	69	71	71	0	107	107	0	125	125	0
Jobs Wholesale	'000 jobs	2	2	2	0	3	3	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	23	33	33	0	46	46	0	53	53	0
Jobs Total	'000 jobs	94	106	106	0	156	156	0	181	181	0

Standby

This Regulation establishes ecodesign requirements related to standby and off mode, and networked standby, electric power consumption for the placing on the market of electrical and electronic household and office equipment. This Regulation shall not apply to electrical and electronic household and office equipment placed on the market with a low voltage external power supply to work as intended. Also note that for all equipment where the standby- and off-mode power is subject to specific, separate regulation, the generic standby regulation does not apply. Basically this means that - on the long run - only products like coffee makers, home gateways (modem, router, stand-alone or combined), networked storage (NAS) and DECT phones could be identified in the preparatory studies for which no separate regulation is foreseen.

Design options to reduce standby energy use include (improved) power management of the various standby states, reduction of standby through reduction of sensing frequency (only one check every x milliseconds for an external signal instead of continuous check). Specifically for coffeemakers the relevant design options include the use of a thermos recipient (drip filter) and the limitation of standby or keep warm times.

SB (networked) Stand-By (rest)	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	10,481	67,927			97,703			121,048		
Stock	'000	29,461	363,710			542,212			667,320		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	4	47	47	0	65	63	-1	63	62	-1
o/w electricity	TWh elec/a	2	19	19	0	26	25	-1	25	25	0
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	1	8	8	0	10	10	0	9	8	0
Acquisition costs (incl. install)	bn €	1	10	10	0	15	15	0	20	20	0
Energy costs	bn €	0	2	2	0	4	4	0	7	6	0
Total running costs	bn €	0	2	2	0	4	4	0	7	6	0
Total expenditure	bn €	1	12	12	0	20	20	0	26	26	0
Revenue Industry	m €	479	4776	4776	0	7265	7265	0	9495	9495	0
Revenue Wholesale	m €	131	1979	1979	0	3123	3123	0	4247	4247	0
Revenue Retail	m €	361	1902	1902	0	2601	2601	0	3042	3042	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	10	96	96	0	145	145	0	190	190	0
Jobs Wholesale	'000 jobs	1	8	8	0	12	12	0	17	17	0
Jobs Retail/ installation/ maintenance	'000 jobs	6	32	32	0	43	43	0	51	51	0
Jobs Total	'000 jobs	16	135	135	0	201	201	0	258	258	0

External Power Supplies

The ED regulation addresses the electric power consumption in no-load condition and average active efficiency of external power supplies. It excludes voltage converters, uninterruptible power supplies, battery chargers, halogen lighting converters, external power supplies for medical devices, external power supplies placed on the market no later than 30 June 2015 as a service part or spare part for an identical external power supply which was placed on the market not later than one year after this Regulation has come into force, under the condition that the service part or spare part, or its packaging, clearly indicates the primary load product(s) for which the spare part or service part is intended to be used with.
Note that external power supplies in general are already regulated explicitly (computers) or implicitly (because they are part of the test procedure, also in standby mode) for most electronic products in specific ecodesign regulations. The main products that are not already regulated elsewhere are mobile phones and some personal care appliances (e.g. electric toothbrushes).

Design options for battery chargers include microprocessor controlled ('smart') charging. For external power supplies design options include the use of primary integrated ICs, high-efficiency power supplies (no EI transformers, but toroid or electronic), ultra small form factors.

BC Battery Charged devices	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	24,886	335,000			335,000			335,000		
Stock	'000	61,736	1,005,000			1,005,000			1,005,000		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	1	9	8	-1.0	8	7	-1.5	7	7	-0.8
o/w electricity	TWh elec/a	0	4	3	-0.4	3	3	-0.6	3	3	-0.3
o/w fuel	TWh fuel/a	0	0	0	0.0	0	0	0.0	0	0	0.0
GWP emissions	$MtCO_2/a$	0	1	1	-0.2	1	1	-0.2	1	1	-0.1
Energy costs	bn €	0	0	0	0.0	0	0	-0.1	1	1	-0.1

Uninterruptable Power Supplies (UPS)

The data for UPS in this EIA are based on the preparatory study. No Working Document or Impact Assessment were available (state February 2015). The ECO-scenario has been taken from the prep. study option (2), i.e. the transformerless MEPS scenario, with tier 1 in 2017 and tier 2 in 2019. Efficiencies are from prep.study consolidated final report table 102. This scenario seems to have been agreed with stakeholders but has no official status. EIA will be updated as soon as a regulation is adopted.

Scope: "A UPS is a combination of electronic power converters, switches and energy storage devices (such as batteries) constituting a power system for maintaining the continuity of power to a load in the case of input power failure." The prep. study considered models up to 200 kVA and primarily focused on AC input and AC output UPS, which dominate the market. A system providing electrical power, that supplements or is capable of continuously replacing the main source of grid power, is not a UPS (e.g. an engine or generator system). Portable devices designed to operate using battery power such as laptop computers are excluded. Possible exclusions of the scope mentioned in prep.study: medical applications, non-standard UPS for mission critical applications with high risks for human life/health, UPS which are like for like replacements in the same physical location/installation for existing UPS, where this replacement cannot be achieved without entailing disproportionate costs.

Design options for UPS include the use of improved components to obtain a high flat efficiency (high efficiency also at lower load levels) and/or a transformerless design, extended battery lifetime, management of redundancy (system aspect), multi-mode operation.

As regards energy consumption and related emissions, EIA considers only the energy losses due to UPS, i.e. the difference between electrical input and electrical output.

UPS Total	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	728	1,441			1,823			2,463		
Stock	'000	3,425	7,392			8,840			12,199		
Average Output Load per unit	kW	1.88	1.92			1.94			1.94		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	14	31	31	0	36	25	-11	48	15	-34
o/w electricity	TWh elec/a	6	12	12	0	14	10	-4	19	6	-13
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	2.8	5.0	5.0	0.0	5.4	3.7	-1.7	6.5	2.0	-4.6
Acquisition costs (incl. install)	bn €	0.5	1.1	1.1	0.0	1.3	1.3	0.0	1.8	1.8	0.0
Energy costs	bn €	0.7	1.3	1.3	0.0	2.1	1.5	-0.7	4.2	1.3	-3.0
Maintenance costs (incl. VAT)	bn €	0.3	0.7	0.7	0.0	0.8	0.8	0.0	1.1	1.1	0.0
Total running costs	bn €	1.0	1.9	1.9	0.0	2.9	2.3	-0.7	5.3	2.4	-3.0
Total expenditure	bn €	1.5	3.0	3.0	0.0	4.3	3.6	-0.7	7.1	4.2	-3.0
Revenue Industry	m €	285	565	565	0	714	714	0	966	966	0
Revenue Wholesale	m €	9	18	18	0	23	23	0	31	31	0
Revenue Retail	m €	165	328	328	0	414	414	0	560	560	0
Revenue Installation	m€	77	153	153	0	193	193	0	261	261	0
Revenue Maintenance (excl. VAT)	m€	292	652	652	0	792	792	0	1088	1088	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	6	11	11	0	14	14	0	19	19	0
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	6	14	14	0	17	17	0	23	23	0
Jobs Total	'000 jobs	12	25	25	0	31	31	0	42	42	0

Household Refrigerators & Freezers

EIA calculates the savings of the latest revision ('ECO') versus the BAU at the time that the measures are first introduced (1995-'96 for domestic refrigerators). The Prep. study and IA study of the last revision calculate the incremental savings versus a different 'BAU' scenario, i.e. that already takes into account the impact of earlier/existing measures. Refrigerators have been revised twice (in 2001 and 2009-2010) and the latest prep. study and IA study of 2007-2008 calculates the increment versus the measures in place since 2001. This is much less than those versus the BAU 1995 that are reported in EIA.

RF Household Refrigeration	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	17,588	19,196			19,799			20,402		
Stock	'000	269,340	299,289			309,540			319,188		
Reference SAEC (EEI=100)	kWh/a	468	526			563			602		
EU freezer net volume RF	M m³ @ -18C°	12	17			20			24		
EU refrigerator net volume RF	M m³ @ 5C°	43	60			72			84		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	344	347	260	-87	348	180	-168	347	129	-218
o/w electricity	TWh elec/a	138	139	104	-35	139	72	-67	139	52	-87
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	69	57	43	-14	53	27	-26	47	18	-30
Acquisition costs (incl. install)	bn €	7	8	9	1	8	11	2	9	11	2
Energy costs	bn €	25	24	18	-6	35	18	-17	51	19	-32
Total expenditure	bn €	32	32	27	-5	43	28	-15	60	30	-30
Revenue Industry	m €	2986	3259	3770	511	3362	4257	896	3464	4395	931
Revenue Wholesale	m €	222	242	280	38	250	317	67	258	327	69
Revenue Retail	m €	2962	3233	3739	507	3334	4222	888	3436	4359	923
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	60	65	75	10	67	85	18	69	88	19
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	49	54	62	8	56	70	15	57	73	15
Jobs Total	'000 jobs	110	120	139	19	124	157	33	128	162	34

Commercial Refrigeration

The proposed regulation (WD 2014) applies to electric mains-operated refrigerated commercial display cabinets, including those sold for the refrigeration of items other than foodstuffs. 'Refrigerated commercial display cabinet' means an appliance intended for the functions of storage and display to and/or access to customers, of items at specified temperatures below the ambient temperature, with one or more compartments of chilled and/or frozen items, and are accessible directly through open sides or via one or more doors, and/or drawers. The proposed regulation excludes products covered by CR 2015/1095 (profesional refrigeration cabinets; not for display but for storage) and by CR 643/2009 (household refrigerators). Other exclusions: Cabinets primarily powered by energy sources other than electricity; Cabinets that do not use a compression-type refrigerating cycle; The part of the refrigeration system, typically the condensing unit, placed outside the cabinet in remote cabinets (however the energy of the remote partsis taken into account, see also LoadNotes); Cabinets specifically designed for carrying out food processing ; Cabinets primarily intended for refrigeration and storage of items, and not for display and sales; Cabinets specifically designed for the storage of medicines and scientific samples; Cabinets for the sale and display of live foodstuff; Wine storage appliances; Built-in cabinets; Vertical static-air cabinets; Saladettes. The proposed regulation also foresees energy labelling, with the same scope summarized above for the ecodesign regulation.
In line with the preparatory studies (BIOIS 2007; JRC 2014) and the IA 2015, EIA considers non-supermarket appliances (beverage coolers, ice cream freezers, vending machines) and supermarket display cabinets. Earlier studies only considered the supermarket remote base cases RVC2 and RHF4. However the proposed regulation applies to many other supermarket models as well. The IA presents tables for 'base cases only' (12 TWh/a savings in 2030) and tables 'including non-base cases' (19 TWh/a savings in 2030), showing a significant impact for the non-base cases. Consequently, it was agreed to include the non-base cases in the accounting, estimating some of the missing basic input data. The presented EIA data are based on the IA 2015 scenario 5.

CF Commercial Refrigeration	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	1,474	1,726			1,785			1,908		
Stock	'000	12,960	15,700			16,266			17,376		
EU freezer net volume CF	M m3 @ -18/-15	1.5	1.9			2.0			2.2		
EU refrigerator net volume CF	M m3 @ -1/+7°C	8.3	10.1			10.6			11.2		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	170	168	168	0	149	133	-16	150	102	-47
o/w electricity	TWh elec/a	68	67	67	0	60	53	-6	60	41	-19
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	48	45	45	0	42	40	-2	41	35	-6
Acquisition costs (incl. install)	bn €	2	3	3	0	3	3	0	3	3	0
Energy costs	bn €	8	7	7	0	9	8	-1	13	9	-4
Maintenance costs (incl. VAT)	bn €	1	1	1	0	1	1	0	1	1	0
Total running costs	bn €	9	8	8	0	10	9	-1	15	10	-4
Total expenditure	bn €	11	11	11	0	13	12	-1	17	13	-4
Revenue Industry	m €	1494	1657	1657	0	1702	1866	164	1815	1887	72
Revenue Wholesale	m €	640	710	710	0	729	800	70	778	809	31
Revenue Retail	m €	0	0	0	0	0	0	0	0	0	0
Revenue Installation	m €	126	146	146	0	157	176	19	168	176	8
Revenue Maintenance (excl. VAT)	m €	1015	1237	1237	0	1336	1336	0	1423	1423	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	30	33	33	0	34	37	3	36	38	1
Jobs Wholesale	'000 jobs	3	3	3	0	3	3	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	11	14	14	0	15	15	0	16	16	0
Jobs Total	'000 jobs	44	50	50	0	52	56	4	55	57	2

Professional Refrigeration

CR 2015/1095 (ecodesign) covers professional refrigerated storage cabinets, blast cabinets, process chillers and condensing units. CR 2015/1094 (energy labelling) only applies to professional refrigerated storage cabinets. For blast cabinets the CR only provides information requirements that are assumed to have no energy efficiency effects. Walk-in cold rooms are not explicitly mentioned in the CR and consequently excluded from the scope. Consequently, blast cabinets and walk-in cold rooms are not included in EIA.

Professional refrigerated storage cabinets are for non-household, professional use in e.g. restaurants, canteens and catering applications. This distinguishes them from household refrigeration appliances that are covered by CR 643/2009, lot ENER 13. They are also distinguished from Commercial Refrigeration products (Lot ENER 12, regulation proposed in 2015) that primarily have a display/ sales function with access by customers, while the professional refrigeration (PF) products primarily have a storage function (not display) and are accessed by professionals (not by customers).

CR 2015/1095 excludes from the scope: professional refrigerated storage cabinets that are primarily powered by energy sources other than electricity; professional refrigerated storage cabinets operating with a remote condensing unit; open cabinets, where being open is a fundamental requirement for their primary functionality; cabinets specifically designed for food processing; cabinets specifically designed only for the purpose of thawing frozen foodstuffs in a controlled manner; saladettes; serve-over counters and other similar forms of cabinets primarily intended for display and sale of foodstuffs in addition to refrigeration and storage; cabinets that do not use a vapour compression refrigeration cycle; continuous-process blast equipment; custom-made professional refrigerated storage cabinets; built-in cabinets; roll-in and pass-through cabinets; static air cabinets; chest freezers.

Process chillers are in scope only if they are intended for operation at low-temperature (capable of delivering its rated cooling capacity at an indoor heat exchanger outlet temperature of – 25 °C, at standard rating conditions) or medium-temperature (-8 °C). Excluded from the scope: process chillers intended to operate at high temperature; process chillers exclusively using evaporative condensing; custom-made process chillers assembled on site, made on a one-off basis; absorption chillers Note that high-temperature process chillers are considered separately in EIA under lot ENER 21-ENTR 6.

Condensing units are in scope only if they operate at low-temperature (capable of delivering its rated cooling capacity at a saturated evaporating temperature of – 35 °C;) or medium-temperature (-10 °C). Excluded from the scope: condensing units including an evaporator, which may be an integral evaporator, such as in monobloc units, or a remote evaporator, such as in split units; compressor packs or racks, which do not include a condenser; condensing units of which the condenser-side does not use air as heat transfer medium.

Condensing units (CUs) are not a complete refrigeration product, but a component (they need to be combined with an evaporator and an expansion device). Consequently many CUs are included in other refrigeration products that are also accounted in EIA, introducing the problem of**double counting of the energy consumed by CUs**. A dedicated study revealed that 60% of the CU-energy is double counted with the energy of other CF- and PF-products included in EIA. This double counting has been considered when computing the PF product group totals.

Professional refrigeration products	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	1,108	1,035			1,134			1,289		
Stock	'000	9,173	8,758			9,137			10,349		
EU freezer net volume Storage cabinets	M m³ @ -18C°	0.4	0.5			0.5			0.6		
EU refrigerator net volume Storage cabinets	M m³ @ 5C°	0.9	1.2			1.3			1.4		
EU cooling demand LT&MT process chillers	TWhcool/a	42	93			125			154		
EU cooling demand LT&MT condensing units (60% double counting included)	TWhcool/a	182	145			146			169		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (CU double count excluded)	TWh prim/a	148	188	188	0	224	214	-9	267	238	-28
o/w electricity (CU double count excluded)	TWh elec/a	59	75	75	0	89	86	-4	107	95	-11
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions (CU double count excluded)	$MtCO_2/a$	33	34	34	0	37	35	-1	40	36	-4
o/w due to refrigerant leakage	$MtCO_2/a$	3	3	3	0	3	3	0	3	3	0
Acquisition costs (CU double count excluded)	bn €	1	1	1	0	1	2	0	2	2	0
Energy costs (CU double count excluded)	bn €	7	8	8	0	13	13	-1	24	21	-3
Total expenditure (CU double count excluded	bn €	8	9	9	0	15	14	0	25	23	-3
Revenue Industry	m €	811	930	930	0	1044	1104	59	1201	1201	0
Revenue Wholesale	m €	232	266	266	0	298	315	17	343	343	0
Revenue Retail	m €	116	133	133	0	149	158	8	172	172	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	16	19	19	0	21	22	1	24	24	0
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	2	2	2	0	2	3	0	3	3	0
Jobs Total	'000 jobs	19	22	22	0	25	26	1	28	28	0

Cooking Appliances

Design options for hobs include optimized burner and pot support (gas hobs), switch to more efficient heating technology (electric from solid plate to radiant to induction); mass-reduction (for solid plate electric hobs), use of smart electronic controls (gas, radiant and induction), use of pot sensors (automatic switch off when no pot present) (all types, automatic cooking (all types). Design options for ovens include Improvement of thermal insulation, reduction of thermal mass, optimized door design. For range hoods the design options include change of AC motor to EC motor, improvement of fan design, improvement interior design to lower the pressure drop, improvement of motor and fan control, air pollution, humidity and temperature sensors.

CA Cooking Appliances	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	32,107	36,324			40,126			42,102		
Stock	'000	509,084	562,989			608,154			655,889		
EU load hobs, volume boiled water (food)	Mm^3/a	0.25	0.29			0.31			0.33		
EU load ovens, no. of cycles (=ovendishes)	bn cyc/a	26	26			28			30		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	184	207	207	0	216	212	-3	229	214	-15
o/w electricity	TWh elec/a	54	67	67	0	72	71	-1	79	74	-5
o/w fuel	TWh fuel/a	49	39	39	0	35	35	0	31	30	-2
GWP emissions	$MtCO_2/a$	37	35	35	0	34	34	-1	33	31	-2
Acquisition costs (incl. install)	bn €	12	16	16	0	17	18	1	17	18	1
Energy costs	bn €	12	13	13	0	20	20	0	32	30	-2
Total expenditure	bn €	24	29	29	0	37	38	1	49	48	-1
Revenue Industry	m €	5109	6626	6626	0	7196	7697	501	7288	7731	444
Revenue Wholesale	m €	360	471	471	0	512	548	36	520	552	32
Revenue Retail	m €	4801	6284	6284	0	6833	7307	474	6934	7355	421
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	102	133	133	0	144	154	10	146	155	9
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	80	105	105	0	114	122	8	116	123	7
Jobs Total	'000 jobs	184	239	239	0	260	278	18	263	279	16

Coffee Makers

CM household Coffee Makers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	22,138	26,262			27,365			29,045		
Stock	'000	127,442	156,621			162,465			171,709		
EU cups of coffee drunk in households	bn cups/a	279	343			356			376		
EU volume of coffee drunk in households	Mm^3/a	0.037	0.043			0.042			0.044		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	28	27	27	0	24	20	-4	24	20	-4
o/w electricity	TWh elec/a	11	11	11	0	10	8	-2	10	8	-2
GWP emissions (from direct electricity)	$MtCO_2/a$	6	4	4	0	4	3	-1	3	3	-1
Acquisition costs (incl. install)	bn €	1	2	2	0	2	2	0	3	3	0
Energy costs	bn €	2	2	2	0	2	2	0	4	3	-1
Total running costs (excl. coffee, filters)	bn €	2	2	2	0	2	2	0	4	3	-1
Total expenditure	bn €	3	3	3	0	5	4	0	6	6	-1
Revenue Industry	m €	359	668	668	0	938	947	9	1049	1051	2
Revenue Wholesale	m €	27	50	50	0	70	70	1	78	78	0
Revenue Retail	m €	356	663	663	0	930	939	9	1041	1042	2
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	7	13	13	0	19	19	0	21	21	0
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	6	11	11	0	15	16	0	17	17	0
Jobs Total	'000 jobs	13	25	25	0	35	35	0	39	39	0

Household Washing Machines

Design options for household washing machines include reduction of tub-drum clearances, improved thermal efficiency (lower transmission, radiation and conduction losses), improved motor (Switched Reluctance, DC) and drive (direct drive instead of belt-drive) efficiency, more effective mechanical action (vsd and smart control), optimising time-temperature trade-off, increasing drum load-to-volume ratio, using accurate and smart water level control, optimised programming of water level, rinsing and intermediate spinning, smart water inlet, circulation and application solutions (jet, bypass and recirculation, etc.), soil sensors (bio-sensors, turbidity sensors). Consumer options that have a large influence are the ever decreasing programme temperature and increased loading efficiency.
EIA calculates the savings of the latest revision ('ECO') versus the BAU at the time that the measures are first introduced. Prep. study and IA study of the last revision calculate the incremental savings versus a different 'BAU' scenario, i.e. that already takes into account the impact of earlier/existing measures. Consequently savings reported in EIA will be larger than those reported in the revision studies.

WM household Washing Machine	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	9,045	13,164			14,151			13,585		
Stock	'000	121,605	186,757			201,809			205,768		
EU weight of laundry washed	Mt laundry/a	83	132			140			143		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	132	110	87	-24	99	59	-40	84	42	-42
o/w electricity	TWh elec/a	53	44	35	-9	40	24	-16	34	17	-17
GWP emissions	$MtCO_2/a$	26	18	14	-4	15	9	-6	11	6	-6
Acquisition costs (incl. install)	bn €	4	6	7	1	6	8	2	6	7	1
Energy costs	bn €	9	8	6	-2	10	6	-4	12	6	-6
Consumable resources	bn €	10	18	12	-6	23	12	-11	30	13	-17
Total running costs	bn €	19	25	18	-7	33	18	-15	42	19	-23
Total expenditure	bn €	24	31	25	-6	39	26	-14	49	26	-22
Revenue Industry	m €	1636	2516	2872	356	2619	3274	655	2458	2943	486
Revenue Wholesale	m €	122	187	214	26	195	244	49	183	219	36
Revenue Retail	m €	1623	2495	2848	353	2597	3247	650	2437	2919	482
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	33	50	57	7	52	65	13	49	59	10
Jobs Wholesale	'000 jobs	0	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	27	42	47	6	43	54	11	41	49	8
Jobs Total	'000 jobs	60	93	106	13	96	121	24	91	108	18

Household Dishwashers

Design options for household dishwashers include improved thermal efficiency (less transmission, radiation and conduction losses through insulation, avoiding cold bridges, etc.), better pump efficiency and control (EC/DC motors, vsd), optimised time-temperature trade off, decreased water level (alternating valve already implemented, optimised spray arms), partial reuse of rinsing water (water saving), heat exchangers, drying without additional heat (optimised condensing technology), lower hot rinse temperature, increased program options, hot fill and fuel switch, turbidity and bio sensors (time and intensity optimisation).
EIA calculates the savings of the latest revision ('ECO') versus the BAU at the time that the measures are first introduced. Prep. study and IA study of the last revision calculate the incremental savings versus a different 'BAU' scenario, i.e. that already takes into account the impact of earlier/existing measures. Consequently savings reported in EIA will be larger than those reported in the revision studies.

DW Household Dishwashers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	3,216	7,034			9,280			11,524		
Stock	'000	36,816	83,213			115,611			149,295		
EU place settings (ps) washed	bn ps/a	52	154			225			291		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	32	58	46	-11	76	54	-22	93	63	-30
o/w electricity	TWh elec/a	13	23	19	-5	30	22	-9	37	25	-12
GWP emissions	$MtCO_2/a$	6	9	8	-2	12	8	-3	13	9	-4
Acquisition costs (incl. install)	bn €	2	4	5	1	5	7	2	6	8	1
Energy costs	bn €	2	4	3	-1	8	5	-2	14	9	-4
Consumable resources	bn €	1	3	3	-1	5	3	-2	8	5	-3
Total running costs	bn €	3	7	6	-1	13	9	-4	22	14	-8
Total expenditure	bn €	5	11	11	0	18	15	-2	28	22	-6
Revenue Industry	m €	702	1535	2038	502	2025	2634	610	2515	3102	587
Revenue Wholesale	m €	52	114	152	37	151	196	45	187	231	44
Revenue Retail	m €	696	1523	2021	498	2008	2613	605	2494	3076	583
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	14	31	41	10	40	53	12	50	62	12
Jobs Wholesale	'000 jobs	0	0	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	12	25	34	8	33	44	10	42	51	10
Jobs Total	'000 jobs	26	57	75	18	75	97	22	93	114	22

Household Laundry Driers

Design options for household laundry driers include improved thermal efficiency (less transmission, radiation and conduction losses), optimised time-temperature trade off, optimised airflow-temperature trade-off, reduced drum clearances and optimised drum geometry, drum volume vs. load ratio, partial recirculating and in-/outgoing air heat exchangers (vented driers), humidity sensors/controls (instead of timer-control), improved fan efficiency (EC/DC motors, vsd, optimised impeller), fuel switch to gas-fired driers and last but not least heat pump (condensing) driers.

LD household Laundry Drier	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	2,783	5,268			5,932			6,103		
Stock	'000	23,505	63,037			72,160			78,167		
EU laundry dried	Mt laundry/a	13	47			60			65		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	25	63	63	0	81	72	-9	87	65	-22
o/w electricity	TWh elec/a	10	25	25	0	32	29	-4	35	26	-9
GWP emissions	$MtCO_2/a$	5	10	10	0	12	11	-1	12	9	-3
Acquisition costs (incl. install)	bn €	1	3	3	0	3	3	0	3	3	0
Energy costs	bn €	2	4	4	0	8	7	-1	13	10	-3
Total running costs	bn €	2	4	4	0	8	7	-1	13	10	-3
Total expenditure	bn €	3	7	7	0	11	11	-1	16	13	-3
Revenue Industry	m €	525	1049	1049	0	1219	1360	141	1254	1365	112
Revenue Wholesale	m €	39	78	78	0	91	101	10	93	102	8
Revenue Retail	m €	520	1040	1040	0	1209	1348	140	1243	1354	111
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	10	21	21	0	24	27	3	25	27	2
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	9	17	17	0	20	22	2	21	23	2
Jobs Total	'000 jobs	19	39	39	0	45	50	5	46	50	4

Vacuum Cleaners

Design options for vacuum cleaners include maximising fan and motor efficiency (reduce energy losses in fan/motor/drive from current 60-70% to 45% through improved fan case and impeller design), improving efficiency of airways (reduce energy loss of current 5-10% to the BAT level of 5%), increasing the filtration area surface to lower pressure loss, using better seals to reduce the current 10-20% leakage loss to 5%, improving nozzle design to reduce current pressure loss at the nozzle from current 15-25% to 10%, weight-reduction (may reduce product mass by up to 50%), using best materials options (e.g. foamed plastics), increasing product lifetime by using better and – probably – more materials (this option may counteract with the previous one).

VC Vacuum Cleaners	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	17,856	54,409			92,069			111,083		
Stock	'000	157,518	366,047			421,504			547,904		
EU surface vacumed	1000 km^2/a	913	1,182			1,281			1,381		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	33	54	54	0	74	35	-39	115	40	-74
o/w electricity	TWh elec/a	13	22	22	0	30	14	-16	46	16	-30
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	7	9	9	0	11	5	-6	16	5	-10
Acquisition costs (incl. install)	bn €	4.7	12.5	12.5	0	20.8	21.4	0.6	25.0	25.0	0.0
Energy costs	bn €	2.2	3.4	3.4	0	6.8	3.1	-3.7	15.9	5.3	-10.5
Consumable resources (VC bags)	bn €	1.5	1.9	1.9	0	2.1	2.1	0.0	2.2	2.2	0.0
Total running costs	bn €	3.7	5.3	5.3	0	8.8	5.1	-3.7	18.1	7.6	-10.5
Total expenditure	bn €	8.3	17.7	17.7	0.0	29.6	26.5	-3.1	43.1	32.6	-10.5
Revenue Industry	m €	2080	5216	5216	0	8598	8842	244	10329	10329	0
Revenue Wholesale	m €	269	505	505	0	769	791	22	911	911	0
Revenue Retail	m €	1691	4791	4791	0	8105	8334	230	9778	9778	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	42	104	104	0	172	177	5	207	207	0
Jobs Wholesale	'000 jobs	1	2	2	0	3	3	0	4	4	0
Jobs Retail/ installation/ maintenance	'000 jobs	28	80	80	0	135	139	4	163	163	0
Jobs Total	'000 jobs	71	186	186	0	310	319	9	373	373	0

Industrial Fans

Design options for Industrial fans to reduce energy consumption include improved aerodynamics for the impellers and adequate design for the job (axial, centrifugal, cross-flow), backwards curved instead or forwards curved fans, guide vanes, motor improvements (from AC to EC/DC), better transmission efficiency (direct drive, V-belts instead of flat belts), variable speed drives.

FAN Industrial Fans >125W	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	4,837	14,928			18,275			18,584		
Stock	'000	72,551	188,329			241,065			272,904		
Load per unit	kWh flow/ a	617	582			583			594		
EU load (W=Pa * m³/s ; TWh=10^{12}* W * h)	TWh flow/ a	45	110			141			162		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	131	329	329	0	421	383	-39	482	396	-85
o/w electricity	TWh elec/a	53	132	132	0	168	153	-15	193	159	-34
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2$/a	26	54	54	0	64	58	-6	66	54	-12
Acquisition costs (incl. install)	bn €	1	3	3	0	4	5	1	4	5	1
Energy costs	bn €	6	14	14	0	25	23	-2	43	35	-8
Total expenditure	bn €	8	18	18	0	30	29	-1	48	41	-7
Revenue Industry	m €	604	1779	1779	0	2195	3009	814	2288	2912	624
Revenue Wholesale	m €	207	611	611	0	753	1033	280	785	999	214
Revenue Retail	m €	90	265	265	0	328	449	122	341	435	93
Revenue Installation	m €	82	243	243	0	301	412	110	315	399	84
Revenue Maintenance (excl. VAT)	m €	348	866	866	0	1113	1113	0	1273	1273	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	12	36	36	0	44	60	16	46	58	12
Jobs Wholesale	'000 jobs	1	2	2	0	3	4	1	3	4	1
Jobs Retail/ installation/ maintenance	'000 jobs	6	16	16	0	20	23	3	22	24	2
Jobs Total	'000 jobs	19	54	54	0	67	87	21	70	86	16

Industrial Motors

A first ecodesign preparatory study (Lot 11) was performed in 2008 and led to the existing CR (EC) No 640/2009 of 22 July 2009 (with corresponding Impact Assessment also from 2009). This regulation regards motors, including where integrated in other products. 'Motor' means an electric single speed, three-phase 50 Hz or 50/60 Hz, squirrel cage induction motor that has 2 to 6 poles, a rated voltage Un up to 1 000 V, a rated output PN between 0.75 kW and 375 kW and is rated on the basis of continuous duty operation. It excludes motors designed to operate wholly immersed in a liquid, motors completely integrated into a product (for example gear, pump, fan or compressor) of which the energy performance cannot be tested independently from the product, motors specifically designed to operate at altitudes exceeding 1 000 metres above sea-level, where ambient air temperatures exceed 40 °C, in maximum operating temperature above 400 °C, where ambient air temperatures are less than – 15 °C for any motor or less than 0 °C for a motor with air cooling, where the water coolant temperature at the inlet to a product is less than 5 °C or exceeding 25 °C, in potentially explosive atmospheres as defined in Directive 94/9/EC of the European Parliament and of the Council and brake motors except as regards the information requirements of Annex I, points 2(3) to (6) and (12).

The more recent CR (EU) No 4/2014 of 6 January 2014 amends the 640/2009, in particular as regards the atmospheric conditions for the exempted motors: motors specified to operate exclusively at altitudes exceeding 4 000 metres above sea-level, where ambient air temperatures exceed 60 °C, in maximum operating temperature above 400 °C, where ambient air temperatures are less than – 30 °C for any motor or less than 0 °C for a motor with water cooling, where the water coolant temperature at the inlet to a product is less than 0 °C or exceeding 32 °C.

A second ecodesign preparatory study (Lot 30) deals with special motors but also reconsiders the 'non-special' motors previously handled in the Lot 11 study and in the existing regulation. This second study is from March 2014, led to a Working Document in September 2014, and to a draft Impact Assessment in August 2015.

The proposal in the WD extends the scope of regulation 640/2009 as amended by 4/2014. For example the limitation to 3-phase motors would disappear (including also single phase motors in the scope), the lower power limit is decreased to 0.12 kW (now 0.75 kW), the upper power limit is increased to 1000 kW (now 375 kW), and 8-pole motors are now also included. As regards motors operating in explosive atmospheres and brake motors, the WD is not so clear: on the one hand there are exemptions, but on the other hand there are specific ecodesign requirements for these motors. Medium voltage motors (> 1000 V) and submersible motors would remain excluded.

At the time of EIA revision it was uncertain if the WD proposal will go ahead and lead to a regulation. In addition, more work would be required in particular to clarify the positive effect of the application of variable speed drives, which is beyond the current EIA task. Awaiting future developments it has therefore been preferred to maintain the EIA1 motor data (status: regulation 640/2009) also in the EIA2 revision.

Design options for motor efficiency include reduction of primary and secondary resistances losses (a.k.a. 'Copper losses'), iron losses (dissipation of magnetic energy) and stray losses (dissipation of harmonic energies of the motor under load in the form of energies are dissipated as currents in the copper windings, harmonic flux components in the iron parts, leakage in the laminate core) and mechanical losses (friction motor bearings and cooling fan) mainly through the use of superior materials, larger copper (rather than aluminium) cross sections to reduce electrical resistance, use of brushless/electronically commutating (EC)/ DC permanent magnet technology, use of direct drives (instead of belt drive) and variable speed drives.

MT Motors 0.75-375 kW	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	6,753	9,949			10,904			10,904		
Stock	'000	72,643	107,000			124,553			130,755		
Unit load (W= rad/s * N·m ; kWh=1000W*h)	kWh output/a	8,039	8,039			8,039			8,039		
EU load (TWh=10^{12}*W*h)	TWh output/a	584	860			1,001			1,051		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2044	2810	2807	-3	3147	2794	-353	3263	2740	-523
o/w electricity	TWh elec/a	818	1124	1123	-1	1259	1118	-141	1305	1096	-209
GWP emissions	$MtCO_2$/a	409	461	460	-1	478	425	-54	444	373	-71
Acquisition costs (incl. install)	bn €	2	2	3	0	3	7	5	3	7	4
Energy costs	bn €	97	118	117	0	187	166	-21	288	242	-46
Maintenance costs (incl. VAT)	bn €	0	0	0	0	0	0	0	0	0	0
Total running costs	bn €	97	118	117	0	187	166	-21	288	242	-46
Total expenditure	bn €	99	120	120	0	190	174	-16	290	248	-42
Revenue Industry	m €	1095	1613	1824	210	1803	4213	2410	1817	3907	2089
o/w Revenue Motor Industry	m €	1095	1613	1824	210	1803	2931	1128	1817	2746	929
o/w Extra Revenue VSD-drive Industry	m €	0	0	0	0	0	1282	1282	0	1160	1160
Revenue Wholesale	m €	376	554	626	72	619	1446	827	624	1341	717
Revenue Retail	m €	163	241	272	31	269	629	360	271	583	312
Revenue Installation (of extra VSD only)	m €	0	0	0	0	0	1148	1148	0	1039	1039
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	0	0	0	0	0	26	26	0	23	23
Jobs Wholesale	'000 jobs	2	2	3	0	2	6	3	2	5	3
Jobs Retail/ installation/ maintenance	'000 jobs	3	4	5	1	4	22	17	5	20	16
Jobs Total	'000 jobs	4	6	7	1	7	53	46	7	49	42

Water pumps

Design options for Industrial fans to reduce energy consumption include improved aerodynamics for the impellers and adequate design for the job (axial, centrifugal, cross-flow), backwards curved instead or forwards curved fans, guide vanes, motor improvements (from AC to EC/DC), better transmission efficiency (direct drive, V-belts instead of flat belts), variable speed drives.

WP Water pumps	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	1,233	1,675			1,935			2,225		
Stock	'000	12,589	17,135			19,830			22,884		
Unit load (W=Pa * m³/s ;kWh=1000*W*h)	kWh flow/a	4,593	4,593			4,593			4,593		
EU load (TWh=10^{12}* W * h)	TWh flow/a	58	79			91			105		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (for 100% electricity)	TWh prim/a	220	296	295	0	342	334	-8	395	384	-11
o/w electricity	TWh elec/a	88	118	118	0	137	134	-3	158	153	-5
GWP emissions	$MtCO_2$/a	44	49	48	0	52	51	-1	54	52	-2
Acquisition costs (incl. install)	bn €	2	2	2	0	3	3	0	3	3	0
Energy costs	bn €	10	12	12	0	20	20	0	35	34	-1
Maintenance costs (incl. VAT)	bn €	1	1	1	0	2	2	0	2	2	0
Total running costs	bn €	12	14	14	0	22	22	0	37	36	-1
Total expenditure	bn €	13	16	16	0	25	24	0	40	39	-1
Revenue Industry	m €	810	1101	1101	1	1272	1272	0	1463	1463	0
Revenue Wholesale	m €	278	378	378	0	437	437	0	502	502	0
Revenue Retail	m €	121	164	164	0	190	190	0	218	218	0
Revenue Installation	m €	555	754	754	0	871	871	0	1001	1001	0
Revenue Maintenance (excl. VAT)	m €	1032	1405	1405	0	1626	1626	0	1876	1876	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	16	22	22	0	25	25	0	29	29	0
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	18	24	24	0	28	28	0	32	32	0
Jobs Total	'000 jobs	35	48	48	0	55	55	0	64	64	0

Standard Air Compressors

The data in EIA are based on the draft Working Document (WD) prepared for the C.F. of 23 october 2014 and on the last available version of the Impact Assessment (IA, september 2015). Option A with Averaged replacement scheme of the IA has been used, being most representative on the long term. The scope for regulation proposed in the WD is rotary standard air compressors with a volume flow rate between 5 to 1280 l/s and piston standard air compressors with a volume flow rate between 2 to 64 l/s, when driven by a three-phase electric motor. The proposed regulation does NOT apply to compressors designed to handle gas mixtures (or single constituent gases) other than filtered ambient air, such as hazardous gases; designed specifically to operate in potentially explosive atmospheres; designed to function where ambient temperatures exceed 40°C and/or where average inlet air temperatures are below -15°C or above 100°C.

The WD proposes ecodesign requirements in two tiers: tier 1 from January 2018 and tier 2 from January 2020. The requirements are formulated in terms of minimum isentropic efficiency that depends on volume flow rate (V1) and proportional loss factor (d). A d-value of 0 represents the current average efficiency; a d-value of 100 the theoretical maximum efficiency (not attainable; current BAT has d=30). The required value of 'd' is -5 in tier 1 and 0 in tier 2:

Standard air compressor type	Formula to calculate the minimum isentropic efficiency, depending on flow rate (V_1) and proportional loss factor (d)
Fixed speed rotary standard air compressor	$(-0.928 \ln^2(V_1) + 13.911 \ln(V_1) + 27.110) + (100 - (-0.928 \ln^2(V_1) + 13.911 \ln(V_1) + 27.110) * d/100$
Variable speed rotary standard air compressor	$(-1.549 \ln^2(V_1) + 21.573 \ln(V_1) + 0.905) + (100 - (-1.549 \ln^2(V_1) + 21.573 \ln(V_1) + 0.905) * d/100$
Piston standard air compressor	$(8.931 \ln(V_1) + 31.477) + (100 - (8.931 \ln(V_1) + 31.477) * d/100$

CP Standard Air Compressors	unit	1990	2010			2020			2030		
Sales	'000	101	106			113			121		
Stock	'000	685	1,167			1,141			1,229		
Avg. Unit load (W=Pa*m³/s;kWh=1000*W*h)	kWh flow/a	20,728	31,765			31,854			31,502		
EU load (TWh=10^{12}* W * h)	TWh flow/a	14	37			36			39		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy (for 100% electricity)	TWh prim/a	63	147	147	0	143	141	-2	150	146	-4
o/w electricity	TWh elec/a	25	59	59	0	57	56	-1	60	58	-2
GWP emissions	$MtCO_2$/a	13	24	24	0	22	21	0	20	20	-1
Acquisition costs (incl. install)	bn €	0	1	1	0	1	1	0	1	1	0
Energy costs	bn €	3	6	6	0	9	8	0	13	13	0
Maintenance costs (incl. VAT)	bn €	0	1	1	0	1	1	0	1	1	0
Total running costs	bn €	3	7	7	0	9	9	0	14	14	0
Total expenditure	bn €	4	8	8	0	10	10	0	15	15	0
Revenue Industry	m €	460	567	567	0	671	737	66	742	801	59
Revenue Wholesale	m €	0	0	0	0	0	0	0	0	0	0
Revenue Retail	m €	0	0	0	0	0	0	0	0	0	0
Revenue Installation	m €	21	25	25	0	30	34	3	33	36	3
Revenue Maintenance (excl. VAT)	m €	421	914	914	0	950	950	0	1039	1039	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	9	11	11	0	13	15	0	15	16	0
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	4	9	9	0	10	10	0	11	11	0
Jobs Total	'000 jobs	14	21	21	0	23	25	0	26	27	0

Utility transformers

Utility transformers are used in the distribution of electricity. Consequently their energy consumption is already included in the electric power generation efficiency (CC=40%) and their acquisition costs can be assumed to be already included in some way in the electricity rates. Although the table below reports the full BAU and ECO energies and costs, in the Ecodesign Impact Accounting (for combination of the impacts of transformers with those of other products) the BAU energy and cost are set to zero as a reference and only the improvement over this reference is accounted as ECO impact. The same principle is NOT applied to revenues and jobs, that are accounted in the totals in full.

TRAFO Utility Transformers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	122	177			205			252		
Stock	'000	2,734	4,118			4,998			6,039		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	151	246	246	0	315	299	-16	405	358	-47
o/w electricity	TWh elec/a	60	98	98	0	126	120	-6	162	143	-19
GWP emissions	$MtCO_2/a$	30	40	40	0	48	45	-2	55	49	-6
Acquisition costs (incl. install)	bn €	3	5	5	0	5	6	1	7	8	1
Energy costs	bn €	7	10	10	0	19	18	-1	36	32	-4
Total expenditure	bn €	10	15	15	0	24	24	0	43	40	-3
Revenue Industry	m €	2216	3642	3642	0	4394	4929	535	5598	6405	808
Revenue Wholesale	m €	277	455	455	0	549	616	67	700	801	101
Revenue Retail	m €	277	455	455	0	549	616	67	700	801	101
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	44	73	73	0	88	99	11	112	128	16
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	5	8	8	0	9	10	1	12	13	2
Jobs Total	'000 jobs	50	82	82	0	99	111	12	126	145	18

Replacement tyres

TYRE Replacement Tyres	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	232	285			328			369		
Stock	'000	903	1,085			1,268			1,495		
EU distance travelled with repl. tyres	bn km/a	na	2,797			na			na		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (due to replacement tyres)	TWh prim/a	597	492	492	0	450	392	-58	405	266	-139
o/w fuel	TWh fuel/a	597	492	492	0	450	392	-58	405	266	-139
GWP emissions	$MtCO_2/a$	158	130	130	0	119	104	-15	107	70	-37
Acquisition costs (incl. install)	bn €	20	24	24	0	28	29	1	31	33	2
Energy costs	bn €	39	52	52	0	78	68	-10	104	68	-36
Total expenditure	bn €	59	76	76	0	106	97	-9	136	102	-34
Revenue Industry	m €	10388	12257	12257	0	14189	14573	385	15991	17104	1113
Revenue Wholesale	m €	4057	4819	4819	0	5573	5702	129	6282	6679	398
Revenue Retail	m €	4057	4819	4819	0	5573	5702	129	6282	6679	398
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	208	245	245	0	284	291	8	320	342	22
Jobs Wholesale	'000 jobs	16	19	19	0	22	23	1	25	27	2
Jobs Retail/ installation/ maintenance	'000 jobs	68	80	80	0	93	95	2	105	111	7
Jobs Total	'000 jobs	292	345	345	0	399	409	10	450	480	30

ANNEX F: Business Revenues (summary tables)

Quantitative data summarised from impacts per parameter (Annex A)

REVENUE

Revenue Industry (in m €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1787	2173	2173	0	2312	4014	1702	2587	4560	1973
CHC Central Heating combi, water heating	1316	2294	2294	0	2755	4992	2237	2911	5891	2980
CH Central Heating boiler, space heating	6870	9996	10370	374	11375	23444	12068	13604	33578	19973
SFB Solid Fuel Boilers	753	1651	1651	0	1626	1750	124	1805	1980	175
AHC central Air Cooling	897	4091	4091	0	5582	5583	2	7054	7055	1
AHC central Air Heating (excl. reversible AC)	333	220	220	0	194	212	18	173	188	15
LH Local Heaters	3684	5981	5981	0	7234	8012	777	7690	8558	869
RAC Room Air Conditioner	192	2404	2404	0	4669	5165	496	5144	5774	630
CIRC Circulator pumps <2.5 kW	873	1286	1391	104	1446	1801	355	1513	1713	200
VU Ventilation Units (res & nonres)	10657	25170	25170	0	28285	29117	832	31676	32513	837
LS Light Sources, mln units BAU	3005	6307	6406	99	6357	5715	-642	4939	1889	-3050
DP electronic DisPlays	5353	13921	13921	0	14020	14020	0	16512	16512	0
STB Set Top Boxes	0	3473	3473	0	3623	3623	0	3572	3572	0
VIDEO	24	5505	5505	0	2334	2334	0	1929	1929	0
ES Enterprise Servers	563	8703	8703	0	10705	10972	267	15226	15775	549
PC Personal Computers	1619	16752	16752	0	26337	26337	0	35773	35773	0
EP & IJ imaging equipment	3460	3561	3561	0	5351	5351	0	6255	6255	0
SB (networked) Stand-By (rest)	479	4776	4776	0	7265	7265	0	9495	9495	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	285	565	565	0	714	714	0	966	966	0
RF Household Refrigeration	2986	3259	3770	511	3362	4257	896	3464	4395	931
CF Commercial Refrigeration	1494	1657	1657	0	1702	1866	164	1815	1887	72
PF Professional Refrigeration	811	930	930	0	1044	1104	59	1201	1201	0
CA Cooking Appliances	5109	6626	6626	0	7196	7697	501	7288	7731	444
CM household Coffee Makers	359	668	668	0	938	947	9	1049	1051	2
WM household Washing Machine	1636	2516	2872	356	2619	3274	655	2458	2943	486
DW Household Dishwashers	702	1535	2038	502	2025	2634	610	2515	3102	587
LD household Laundry Drier	525	1049	1049	0	1219	1360	141	1254	1365	112
VC Vacuum Cleaners	2080	5216	5216	0	8598	8842	244	10329	10329	0
FAN Industrial Fans >125W	604	1779	1779	0	2195	3009	814	2288	2912	624
MT Motors 0.75-375 kW	0	0	0	0	0	1282	1282	0	1160	1160
WP Water pumps	810	1101	1101	1	1272	1272	0	1463	1463	0
CP Standard air compressors	460	567	567	0	671	737	66	742	801	59
TRAFO Utility Transformers	2216	3642	3642	0	4394	4929	535	5598	6405	808
TYRE Replacement Tyres	10388	12257	12257	0	14189	14573	385	15991	17104	1113
TOTAL in bn euros	**72**	**162**	**164**	**2**	**194**	**218**	**25**	**226**	**258**	**32**

Revenue Wholesale (in m €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	522	635	635	0	676	1173	497	756	1333	577
CHC Central Heating combi, water heat	371	647	647	0	777	1408	631	821	1662	841
CH Central Heating boiler, space heat	1938	2820	2925	105	3209	6613	3404	3838	9472	5634
SFB Solid Fuel Boilers	29	64	64	0	63	68	5	70	77	7
AHC central Air Cooling	112	511	511	0	698	698	0	882	882	0
AHC central Air Heating (excl. reversible AC)	42	27	27	0	24	27	2	22	23	2
LH Local Heaters	533	865	865	0	1046	1159	112	1112	1238	126
RAC Room Air Conditioner	54	671	671	0	1303	1441	138	1435	1611	176
CIRC Circulator pumps <2.5 kW	174	257	278	21	289	360	71	302	342	40
VU Ventilation Units (res & nonres)	1433	3429	3429	0	3949	4213	265	4469	4735	266
LS Light Sources, in million units BAU	379	794	807	13	794	694	-100	615	228	-387
DP electronic DisPlays	673	1751	1751	0	1764	1764	0	2077	2077	0
STB set top boxes (Complex & Simple)	0	1586	1586	0	1654	1654	0	1631	1631	0
VIDEO	12	1315	1315	0	510	510	0	245	245	0
ES Enterprise Servers	80	1243	1243	0	1529	1567	38	2175	2254	78
PC Personal Computers	241	2491	2491	0	3710	3710	0	4897	4897	0
EP & IJ imaging equipment	464	423	423	0	652	652	0	765	765	0
SB (networked) Stand-By (rest)	131	1979	1979	0	3123	3123	0	4247	4247	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	9	18	18	0	23	23	0	31	31	0
RF Household Refrigerators & freezers	222	242	280	38	250	317	67	258	327	69
Total CF Commercial Refrigeration	640	710	710	0	729	800	70	778	809	31
Total PF Professional Refrigeration (excl.)	232	266	266	0	298	315	17	343	343	0
Total CA Cooking Appliances	360	471	471	0	512	548	36	520	552	32
Total CM household Coffee Makers	27	50	50	0	70	70	1	78	78	0
WM household Washing Machine	122	187	214	26	195	244	49	183	219	36
DW Household Dishwashers	52	114	152	37	151	196	45	187	231	44
LD household Laundry Drier	39	78	78	0	91	101	10	93	102	8
VC Vacuum Cleaners	269	505	505	0	769	791	22	911	911	0
FAN Industrial Fans >125W (excl. box/ roof)	207	611	611	0	753	1033	280	785	999	214
MT Motors 0.75-375 kW	376	554	626	72	619	1446	827	624	1341	717
WP Water pumps	278	378	378	0	437	437	0	502	502	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	277	455	455	0	549	616	67	700	801	101
TYRE Replacement Tyres	4057	4819	4819	0	5573	5702	129	6282	6679	398
TOTAL in bn euros	**14**	**31**	**31**	**0**	**37**	**43**	**7**	**43**	**52**	**9**

Revenue Retail (in m €)

	1990	2010			2020			2030		
product groups	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	457	556	556	0	591	1026	435	661	1166	505
CHC Central Heating combi, water heat	348	607	607	0	729	1320	592	770	1558	788
CH Central Heating boiler, space heat	1817	2644	2742	99	3008	6200	3192	3598	8880	5282
SFB Solid Fuel Boilers	29	64	64	0	63	68	5	70	77	7
AHC central Air Cooling	112	511	511	0	698	698	0	882	882	0
AHC central Air Heating (excl. reversible AC)	42	27	27	0	24	27	2	22	23	2
LH Local Heaters	629	1021	1021	0	1236	1368	133	1313	1462	148
RAC Room Air Conditioner	50	629	629	0	1221	1351	130	1346	1511	165
CIRC Circulator pumps <2.5 kW	70	103	111	8	115	144	28	121	137	16
VU Ventilation Units (res & nonres)	1444	3458	3458	0	3991	4272	281	4522	4804	283
LS Light Sources, in million units BAU	1214	3534	3622	88	3920	4181	261	2732	1331	-1401
DP electronic DisPlays	5387	14010	14010	0	14110	14110	0	16617	16617	0
STB set top boxes (Complex & Simple)	0	317	317	0	331	331	0	326	326	0
VIDEO	5	4181	4181	0	1869	1869	0	1913	1913	0
ES Enterprise Servers	161	2487	2487	0	3059	3135	76	4350	4507	157
PC Personal Computers	1633	16853	16853	0	26066	26066	0	35563	35563	0
EP & IJ imaging equipment	1391	2001	2001	0	2773	2773	0	3195	3195	0
SB (networked) Stand-By (rest)	361	1902	1902	0	2601	2601	0	3042	3042	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	165	328	328	0	414	414	0	560	560	0
RF Household Refrigerators & freezers	2962	3233	3739	507	3334	4222	888	3436	4359	923
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration (excl.)	116	133	133	0	149	158	8	172	172	0
Total CA Cooking Appliances	4801	6284	6284	0	6833	7307	474	6934	7355	421
Total CM household Coffee Makers	356	663	663	0	930	939	9	1041	1042	2
WM household Washing Machine	1623	2495	2848	353	2597	3247	650	2437	2919	482
DW Household Dishwashers	696	1523	2021	498	2008	2613	605	2494	3076	583
LD household Laundry Drier	520	1040	1040	0	1209	1348	140	1243	1354	111
VC Vacuum Cleaners	1691	4791	4791	0	8105	8334	230	9778	9778	0
FAN Industrial Fans >125W (excl. box/ roof)	90	265	265	0	328	449	122	341	435	93
MT Motors 0.75-375 kW	163	241	272	31	269	629	360	271	583	312
WP Water pumps	121	164	164	0	190	190	0	218	218	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	277	455	455	0	549	616	67	700	801	101
TYRE Replacement Tyres	4057	4819	4819	0	5573	5702	129	6282	6679	398
TOTAL in bn euros	**33**	**81**	**83**	**2**	**99**	**108**	**9**	**117**	**126**	**9**

Revenue Installation (in m €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1383	1682	1682	0	1790	3107	1317	2002	3529	1527
CHC Central Heating combi, water heat	1123	1957	1957	0	2351	4259	1909	2484	5027	2543
CH Central Heating boiler, space heat	5721	8325	8636	311	9473	19523	10050	11329	27962	16633
SFB Solid Fuel Boilers	374	590	590	0	533	593	59	570	636	66
AHC central Air Cooling	441	2415	2415	0	3428	3429	1	4409	4409	1
AHC central Air Heating (excl. reversible AC)	277	182	182	0	160	176	15	143	156	12
LH Local Heaters	2178	3301	3301	0	4234	4563	329	4754	5114	360
RAC Room Air Conditioner	286	3578	3578	0	6948	7686	738	7655	8592	937
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	17647	41459	41459	0	46045	46867	821	51276	52111	835
LS Light Sources, in million units BAU	0	0	0	0	0	0	0	0	0	0
DP electronic DisPlays	0	0	0	0	0	0	0	0	0	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO	15	1029	1029	0	355	355	0	0	0	0
ES Enterprise Servers	69	1134	1134	0	1404	1429	25	2032	2095	63
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
EP & IJ imaging equipment	0	0	0	0	0	0	0	0	0	0
SB (networked) Stand-By (rest)	0	0	0	0	0	0	0	0	0	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	77	153	153	0	193	193	0	261	261	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	126	146	146	0	157	176	19	168	176	8
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	0	0	0	0	0	0	0	0	0	0
WM household Washing Machine	0	0	0	0	0	0	0	0	0	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	0	0	0	0	0	0	0	0	0	0
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	82	243	243	0	301	412	110	315	399	84
MT Motors 0.75-375 kW	0	0	0	0	0	1148	1148	0	1039	1039
WP Water pumps	555	754	754	0	871	871	0	1001	1001	0
CP Standard air compressors	21	25	25	0	30	34	3	33	36	3
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in bn euros	**30**	**67**	**67**	**0**	**78**	**95**	**17**	**88**	**113**	**24**

Revenue Maintenance (excl. VAT, in m€)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	5098	5916	5916	0	6213	6213	0	6480	6480	0
CHC Central Heating combi, water heat	1242	2389	2389	0	2775	2775	0	3142	3142	0
CH Central Heating boiler, space heat	12119	19443	19443	0	22476	22476	0	25971	25971	0
SFB Solid Fuel Boilers	353	211	211	0	267	267	0	267	267	0
AHC central Air Cooling	1012	4361	4361	0	6754	6754	0	8841	8841	0
AHC central Air Heating (excl. reversible AC)	101	101	101	0	86	86	0	76	76	0
LH Local Heaters	773	1218	1218	0	1570	1570	0	1862	1862	0
RAC Room Air Conditioner	84	874	874	0	1458	1458	0	2081	2081	0
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	960	3075	3075	0	4154	4154	0	4958	4958	0
LS Light Sources, in million units BAU	0	0	0	0	0	0	0	0	0	0
DP electronic DisPlays	0	0	0	0	0	0	0	0	0	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO	0	0	0	0	0	0	0	0	0	0
ES Enterprise Servers	4	121	121	0	154	154	0	227	227	0
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
EP & IJ imaging equipment	0	0	0	0	0	0	0	0	0	0
SB (networked) Stand-By (rest)	0	0	0	0	0	0	0	0	0	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	292	652	652	0	792	792	0	1088	1088	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	1015	1237	1237	0	1336	1336	0	1423	1423	0
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	0	0	0	0	0	0	0	0	0	0
WM household Washing Machine	0	0	0	0	0	0	0	0	0	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	0	0	0	0	0	0	0	0	0	0
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	348	866	866	0	1113	1113	0	1273	1273	0
MT Motors 0.75-375 kW	0	0	0	0	0	0	0	0	0	0
WP Water pumps	1032	1405	1405	0	1626	1626	0	1876	1876	0
CP Standard air compressors	421	914	914	0	950	950	0	1039	1039	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in bn euros	**25**	**43**	**43**	**0**	**52**	**52**	**0**	**61**	**61**	**0**

Total revenue by product group (in m€)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	9248	10963	10963	0	11582	15534	3952	12486	17067	4581
CHC Central Heating combi, water heat	4401	7893	7893	0	9386	14754	5368	10128	17280	7152
CH Central Heating boiler, space heat	28466	43228	44117	889	49542	78256	28714	58340	105863	47523
SFB Solid Fuel Boilers	1538	2580	2580	0	2552	2745	193	2782	3036	254
AHC central Air Cooling	2575	11890	11890	0	17159	17162	3	22067	22069	2
AHC central Air Heating (excl. reversible AC)	794	558	558	0	489	527	38	436	467	30
LH Local Heaters	7796	12386	12386	0	15320	16671	1352	16731	18233	1503
RAC Room Air Conditioner	667	8156	8156	0	15600	17102	1502	17662	19570	1908
CIRC Circulator pumps <2.5 kW	1116	1646	1779	133	1850	2305	454	1936	2191	255
VU Ventilation Units (res & nonres)	32140	76590	76590	0	86424	88623	2199	96902	99122	2221
LS Light Sources, in million units BAU	4599	10635	10835	199	11071	10590	-481	8286	3448	-4838
DP electronic DisPlays	11413	29682	29682	0	29894	29894	0	35206	35206	0
STB set top boxes (Complex & Simple)	0	5376	5376	0	5608	5608	0	5530	5530	0
VIDEO	56	12030	12030	0	5068	5068	0	4087	4087	0
ES Enterprise Servers	876	13688	13688	0	16851	17258	407	24011	24858	847
PC Personal Computers	3492	36095	36095	0	56112	56112	0	76234	76234	0
EP & IJ imaging equipment	5315	5984	5984	0	8776	8776	0	10215	10215	0
SB (networked) Stand-By (rest)	971	8658	8658	0	12989	12989	0	16784	16784	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	829	1716	1716	0	2137	2137	0	2906	2906	0
RF Household Refrigerators & freezers	6170	6734	7790	1056	6946	8796	1850	7158	9081	1923
Total CF Commercial Refrigeration	3275	3751	3751	0	3924	4178	254	4183	4294	111
Total PF Professional Refrigeration (excl.)	1158	1328	1328	0	1492	1577	85	1715	1715	0
Total CA Cooking Appliances	10270	13382	13382	0	14542	15553	1011	14742	15638	896
Total CM household Coffee Makers	742	1381	1381	0	1937	1956	19	2168	2171	3
WM household Washing Machine	3381	5198	5934	736	5410	6764	1354	5078	6081	1004
DW Household Dishwashers	1450	3172	4210	1038	4184	5443	1260	5195	6409	1214
LD household Laundry Drier	1084	2167	2167	0	2518	2809	292	2591	2821	231
VC Vacuum Cleaners	4040	10512	10512	0	17472	17968	495	21019	21019	0
FAN Industrial Fans >125W (excl. box/ roof)	1331	3763	3763	0	4691	6016	1326	5002	6017	1015
MT Motors 0.75-375 kW	539	795	898	104	888	4505	3617	895	4124	3228
WP Water pumps	2797	3801	3803	1	4395	4395	0	5061	5061	0
CP Standard air compressors	902	1506	1506	0	1651	1721	70	1814	1876	62
TRAFO Utility Transformers	2770	4552	4552	0	5492	6161	669	6997	8007	1010
TYRE Replacement Tyres	18502	21895	21895	0	25335	25978	642	28554	30463	1909
TOTAL in bn euros	**175**	**384**	**388**	**4**	**459**	**516**	**57**	**535**	**609**	**74**

Total revenue by functional group (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	14	19	19	0	21	30	9	23	34	12
SPACE HEATING (excl. reversible AC)	40	64	65	1	78	109	32	89	140	51
SPACE COOLING	3	16	16	0	25	26	1	31	32	1
VENTILATION	32	77	77	0	86	89	2	97	99	2
LIGHTING	5	11	11	0	11	11	0	8	3	-5
ELECTRONICS	23	113	113	0	137	138	0	175	176	1
FOOD PRESERVATION	11	12	13	1	12	15	2	13	15	2
COOKING	11	15	15	0	16	18	1	17	18	1
CLEANING	10	21	23	2	30	33	3	34	36	2
INDUSTRY COMPONENTS	6	10	10	0	12	17	5	13	17	4
ENERGY SECTOR	3	5	5	0	5	6	1	7	8	1
TRANSPORT SECTOR	19	22	22	0	25	26	1	29	30	2
TOTAL in bn euros	**175**	**384**	**388**	**4**	**459**	**516**	**57**	**535**	**609**	**74**

Total revenue by sector (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	72	162	164	2	194	218	25	226	258	32
Wholesale	14	31	31	0	37	43	7	43	52	9
Retail	33	81	83	2	99	108	9	117	126	9
Installation	30	67	67	0	78	95	17	88	113	24
Maintenance	25	43	43	0	52	52	0	61	61	0
TOTAL in bn euros	**175**	**384**	**388**	**4**	**459**	**516**	**57**	**535**	**609**	**74**

ANNEX G: Direct Employment Impacts (summary tables)

Quantitative data are summarised from impacts per parameter (Annex A). Direct employment relates to identifiable jobs in the added-value chain of the product, starting from and including first-level OEMs. It may not fully include small direct impacts from OEMs further upstream or --in as much as they are not included as a levy on the purchase price-- employment impacts in the waste and recycling industry. The possible effect of not including direct employment at this level of detail, for which typically no or very little data is available, is assumed to be small (<10%) .

The employment impact also does not include the indirect employment impacts of employees and companies spending their income on goods, services and taxes. This is a large impact. Depending on the product sector and depending on the methodology employed (input/output analysis, process analysis, etc.) the indirect employment effect may be a factor 3 to 7 higher than the direct employment effect. However, given the lack of consensus on the methodology --both with economists and the European institutions-- the MEEuP or MEErP methodology requires no such assessment, nor have most preparatory and IA studies ventured into this area for other reasons. The only exception is the 'Stage 6 review' of light sources (VHK 2013), where such an assessment by an external stakeholder (trade unions) has been included in the report.

Jobs Industry (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	36	43	43	0	46	80	34	52	91	39
CHC Central Heating combi, water heat	26	46	46	0	55	100	45	58	118	60
CH Central Heating boiler, space heat	137	200	207	7	228	469	241	272	672	399
SFB Solid Fuel Boilers	15	33	33	0	33	35	2	36	40	3
AHC central Air Cooling	18	82	82	0	112	112	0	141	141	0
AHC central Air Heating (excl. AC rev)	7	4	4	0	4	4	0	3	4	0
LH Local Heaters	74	120	120	0	145	160	16	154	171	17
RAC Room Air Conditioner	4	48	48	0	93	103	10	103	115	13
CIRC Circulator pumps <2.5 kW	17	26	28	2	29	36	7	30	34	4
VU Ventilation Units (res & nonres)	213	503	503	0	566	582	17	634	650	17
LS Light Sources	60	126	128	2	127	114	-13	99	38	-61
DP electronic DisPlays	107	278	278	0	280	280	0	330	330	0
STB set top boxes (Complex & Simple)	0	69	69	0	72	72	0	71	71	0
VIDEO	0	110	110	0	47	47	0	39	39	0
ES Enterprise Servers	11	174	174	0	214	219	5	305	315	11
PC Personal Computers	32	335	335	0	527	527	0	715	715	0
EP & IJ imaging equipment	69	71	71	0	107	107	0	125	125	0
SB (networked) Stand-By (rest)	10	96	96	0	145	145	0	190	190	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	6	11	11	0	14	14	0	19	19	0
RF Household Refrigerators & freezers	60	65	75	10	67	85	18	69	88	19
Total CF Commercial Refrigeration	30	33	33	0	34	37	3	36	38	1
Total PF Professional Refrigeration (excl.)	16	19	19	0	21	22	1	24	24	0
Total CA Cooking Appliances	102	133	133	0	144	154	10	146	155	9
Total CM household Coffee Makers	7	13	13	0	19	19	0	21	21	0
WM household Washing Machine	33	50	57	7	52	65	13	49	59	10
DW Household Dishwashers	14	31	41	10	40	53	12	50	62	12
LD household Laundry Drier	10	21	21	0	24	27	3	25	27	2
VC Vacuum Cleaners	42	104	104	0	172	177	5	207	207	0
FAN Industrial Fans >125W (excl. box/ roof)	12	36	36	0	44	60	16	46	58	12
MT Motors 0.75-375 kW	0	0	0	0	0	26	26	0	23	23
WP Water pumps	16	22	22	0	25	25	0	29	29	0
CP Standard air compressors	9	11	11	0	13	15	1	15	16	1
TRAFO Utility Transformers	44	73	73	0	88	99	11	112	128	16
TYRE Replacement Tyres	208	245	245	0	284	291	8	320	342	22
TOTAL in 1000 jobs	**1447**	**3233**	**3272**	**39**	**3872**	**4364**	**492**	**4526**	**5157**	**631**

Jobs Wholesale (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	2	3	3	0	3	5	2	3	5	2
CHC Central Heating combi, water heat	1	3	3	0	3	6	3	3	7	3
CH Central Heating boiler, space heat	8	11	12	0	13	26	14	15	38	23
SFB Solid Fuel Boilers	0	0	0	0	0	0	0	0	0	0
AHC central Air Cooling	0	2	2	0	3	3	0	4	4	0
AHC central Air Heating (excl. AC rev)	0	0	0	0	0	0	0	0	0	0
LH Local Heaters	2	3	3	0	4	5	0	4	5	1
RAC Room Air Conditioner	0	3	3	0	5	6	1	6	6	1
CIRC Circulator pumps <2.5 kW	1	1	1	0	1	1	0	1	1	0
VU Ventilation Units (res & nonres)	6	14	14	0	16	17	1	18	19	1
LS Light Sources, in million units BAU	2	3	3	0	3	3	0	2	1	-2
DP electronic DisPlays	3	7	7	0	7	7	0	8	8	0
STB set top boxes (Complex & Simple)	0	6	6	0	7	7	0	7	7	0
VIDEO	0	5	5	0	2	2	0	1	1	0
ES Enterprise Servers	0	5	5	0	6	6	0	9	9	0
PC Personal Computers	1	10	10	0	15	15	0	20	20	0
EP & IJ imaging equipment	2	2	2	0	3	3	0	3	3	0
SB (networked) Stand-By (rest)	1	8	8	0	12	12	0	17	17	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	1	1	1	0	1	1	0	1	1	0
Total CF Commercial Refrigeration	3	3	3	0	3	3	0	3	3	0
Total PF Professional Refrigeration (excl.)	1	1	1	0	1	1	0	1	1	0
Total CA Cooking Appliances	1	2	2	0	2	2	0	2	2	0
Total CM household Coffee Makers	0	0	0	0	0	0	0	0	0	0
WM household Washing Machine	0	1	1	0	1	1	0	1	1	0
DW Household Dishwashers	0	0	1	0	1	1	0	1	1	0
LD household Laundry Drier	0	0	0	0	0	0	0	0	0	0
VC Vacuum Cleaners	1	2	2	0	3	3	0	4	4	0
FAN Industrial Fans >125W (excl. box/ roof)	1	2	2	0	3	4	1	3	4	1
MT Motors 0.75-375 kW	2	2	3	0	2	6	3	2	5	3
WP Water pumps	1	2	2	0	2	2	0	2	2	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	1	2	2	0	2	2	0	3	3	0
TYRE Replacement Tyres	16	19	19	0	22	23	1	25	27	2
TOTAL in 1000 jobs	**57**	**124**	**125**	**1**	**147**	**174**	**27**	**171**	**207**	**36**

Jobs Retail (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	8	9	9	0	10	17	7	11	19	8
CHC Central Heating combi, water heat	6	10	10	0	12	22	10	13	26	13
CH Central Heating boiler, space heat	30	44	46	2	50	103	53	60	148	88
SFB Solid Fuel Boilers	0	1	1	0	1	1	0	1	1	0
AHC central Air Cooling	2	9	9	0	12	12	0	15	15	0
AHC central Air Heating (excl. AC rev)	1	0	0	0	0	0	0	0	0	0
LH Local Heaters	10	17	17	0	21	23	2	22	24	2
RAC Room Air Conditioner	1	10	10	0	20	23	2	22	25	3
CIRC Circulator pumps <2.5 kW	1	2	2	0	2	2	0	2	2	0
VU Ventilation Units (res & nonres)	24	58	58	0	67	71	5	75	80	5
LS Light Sources, in million units BAU	20	59	60	1	65	70	4	46	22	-23
DP electronic DisPlays	90	233	233	0	235	235	0	277	277	0
STB set top boxes (Complex & Simple)	0	5	5	0	6	6	0	5	5	0
VIDEO	0	70	70	0	31	31	0	32	32	0
ES Enterprise Servers	3	41	41	0	51	52	1	73	75	3
PC Personal Computers	27	281	281	0	434	434	0	593	593	0
EP & IJ imaging equipment	23	33	33	0	46	46	0	53	53	0
SB (networked) Stand-By (rest)	6	32	32	0	43	43	0	51	51	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	3	5	5	0	7	7	0	9	9	0
RF Household Refrigerators & freezers	49	54	62	8	56	70	15	57	73	15
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration (excl.)	2	2	2	0	2	3	0	3	3	0
Total CA Cooking Appliances	80	105	105	0	114	122	8	116	123	7
Total CM household Coffee Makers	6	11	11	0	15	16	0	17	17	0
WM household Washing Machine	27	42	47	6	43	54	11	41	49	8
DW Household Dishwashers	12	25	34	8	33	44	10	42	51	10
LD household Laundry Drier	9	17	17	0	20	22	2	21	23	2
VC Vacuum Cleaners	28	80	80	0	135	139	4	163	163	0
FAN Industrial Fans >125W (excl. box/ roof)	2	4	4	0	5	7	2	6	7	2
MT Motors 0.75-375 kW	3	4	5	1	4	10	6	5	10	5
WP Water pumps	2	3	3	0	3	3	0	4	4	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	5	8	8	0	9	10	1	12	13	2
TYRE Replacement Tyres	68	80	80	0	93	95	2	105	111	7
TOTAL in 1000 jobs	**546**	**1356**	**1382**	**26**	**1648**	**1795**	**147**	**1949**	**2105**	**156**

Jobs Installation (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	14	17	17	0	18	31	13	20	35	15
CHC Central Heating combi, water heat	11	20	20	0	24	43	19	25	50	25
CH Central Heating boiler, space heat	57	83	86	3	95	195	100	113	280	166
SFB Solid Fuel Boilers	4	6	6	0	5	6	1	6	6	1
AHC central Air Cooling	4	24	24	0	34	34	0	44	44	0
AHC central Air Heating (excl. AC rev)	3	2	2	0	2	2	0	1	2	0
LH Local Heaters	22	33	33	0	42	46	3	48	51	4
RAC Room Air Conditioner	3	36	36	0	69	77	7	77	86	9
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	176	415	415	0	460	469	8	513	521	8
LS Light Sources, in million units BAU	0	0	0	0	0	0	0	0	0	0
DP electronic DisPlays	0	0	0	0	0	0	0	0	0	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO	0	10	10	0	4	4	0	0	0	0
ES Enterprise Servers	1	11	11	0	14	14	0	20	21	1
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
EP & IJ imaging equipment	0	0	0	0	0	0	0	0	0	0
SB (networked) Stand-By (rest)	0	0	0	0	0	0	0	0	0	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	1	2	2	0	2	2	0	3	3	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	1	1	1	0	2	2	0	2	2	0
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	0	0	0	0	0	0	0	0	0	0
WM household Washing Machine	0	0	0	0	0	0	0	0	0	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	0	0	0	0	0	0	0	0	0	0
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	1	2	2	0	3	4	1	3	4	1
MT Motors 0.75-375 kW	0	0	0	0	0	11	11	0	10	10
WP Water pumps	6	8	8	0	9	9	0	10	10	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in 1000 jobs	**304**	**670**	**673**	**3**	**783**	**948**	**165**	**884**	**1125**	**241**

Jobs Maintenance (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	51	59	59	0	62	62	0	65	65	0
CHC Central Heating combi, water heat	12	24	24	0	28	28	0	31	31	0
CH Central Heating boiler, space heat	121	194	194	0	225	225	0	260	260	0
SFB Solid Fuel Boilers	4	2	2	0	3	3	0	3	3	0
AHC central Air Cooling	10	44	44	0	68	68	0	88	88	0
AHC central Air Heating (excl. AC rev)	1	1	1	0	1	1	0	1	1	0
LH Local Heaters	8	12	12	0	16	16	0	19	19	0
RAC Room Air Conditioner	1	9	9	0	15	15	0	21	21	0
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	10	31	31	0	42	42	0	50	50	0
LS Light Sources, in million units BAU	0	0	0	0	0	0	0	0	0	0
DP electronic DisPlays	0	0	0	0	0	0	0	0	0	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO	0	0	0	0	0	0	0	0	0	0
ES Enterprise Servers	0	1	1	0	2	2	0	2	2	0
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
EP & IJ imaging equipment	0	0	0	0	0	0	0	0	0	0
SB (networked) Stand-By (rest)	0	0	0	0	0	0	0	0	0	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	3	7	7	0	8	8	0	11	11	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	10	12	12	0	13	13	0	14	14	0
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	0	0	0	0	0	0	0	0	0	0
WM household Washing Machine	0	0	0	0	0	0	0	0	0	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	0	0	0	0	0	0	0	0	0	0
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	3	9	9	0	11	11	0	13	13	0
MT Motors 0.75-375 kW	0	0	0	0	0	0	0	0	0	0
WP Water pumps	10	14	14	0	16	16	0	19	19	0
CP Standard air compressors	4	9	9	0	10	10	0	10	10	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in 1000 jobs	**249**	**428**	**428**	**0**	**517**	**517**	**0**	**606**	**606**	**0**

TOTAL direct jobs by product group (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	110	131	131	0	139	195	56	151	216	65
CHC Central Heating combi, water heat	57	102	102	0	122	198	76	131	232	102
CH Central Heating boiler, space heat	354	533	546	13	610	1019	409	720	1397	676
SFB Solid Fuel Boilers	23	42	42	0	42	45	3	46	50	4
AHC central Air Cooling	35	160	160	0	228	228	0	292	292	0
AHC central Air Heating (excl. AC rev)	11	8	8	0	7	7	1	6	7	0
LH Local Heaters	116	185	185	0	227	249	21	246	270	24
RAC Room Air Conditioner	9	106	106	0	203	223	20	228	254	25
CIRC Circulator pumps <2.5 kW	19	28	31	2	32	40	8	33	38	4
VU Ventilation Units (res & nonres)	429	1020	1020	0	1150	1181	31	1289	1320	31
LS Light Sources, in million units BAU	82	188	192	3	196	187	-9	147	61	-86
DP electronic DisPlays	200	519	519	0	523	523	0	615	615	0
STB set top boxes (Complex & Simple)	0	81	81	0	85	85	0	83	83	0
VIDEO	1	195	195	0	83	83	0	71	71	0
ES Enterprise Servers	15	233	233	0	287	294	7	408	423	15
PC Personal Computers	61	626	626	0	976	976	0	1328	1328	0
EP & IJ imaging equipment	94	106	106	0	156	156	0	181	181	0
SB (networked) Stand-By (rest)	16	135	135	0	201	201	0	258	258	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	12	25	25	0	31	31	0	42	42	0
RF Household Refrigerators & freezers	110	120	139	19	124	157	33	128	162	34
Total CF Commercial Refrigeration	44	50	50	0	52	56	4	55	57	2
Total PF Professional Refrigeration (excl.)	19	22	22	0	25	26	1	28	28	0
Total CA Cooking Appliances	184	239	239	0	260	278	18	263	279	16
Total CM household Coffee Makers	13	25	25	0	35	35	0	39	39	0
WM household Washing Machine	60	93	106	13	96	121	24	91	108	18
DW Household Dishwashers	26	57	75	18	75	97	22	93	114	22
LD household Laundry Drier	19	39	39	0	45	50	5	46	50	4
VC Vacuum Cleaners	71	186	186	0	310	319	9	373	373	0
FAN Industrial Fans >125W (excl. box/ roof)	19	54	54	0	67	87	21	70	86	16
MT Motors 0.75-375 kW	4	6	7	1	7	53	46	7	49	42
WP Water pumps	35	48	48	0	55	55	0	64	64	0
CP Standard air compressors	14	21	21	0	23	25	1	26	27	1
TRAFO Utility Transformers	50	82	82	0	99	111	12	126	145	18
TYRE Replacement Tyres	292	345	345	0	399	409	10	450	480	30
TOTAL in 1000 jobs	**2603**	**5810**	**5879**	**70**	**6968**	**7799**	**831**	**8136**	**9200**	**1064**

TOTAL direct jobs by functional group (in 1000 jobs)

	1990	2010			2020			2030		
Functional group	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	168	233	233	0	260	393	133	281	448	167
SPACE HEATING (excl. reversible AC)	527	850	865	15	1020	1471	452	1166	1889	722
SPACE COOLING	39	213	213	0	329	339	10	406	419	13
VENTILATION	429	1020	1020	0	1150	1181	31	1289	1320	31
LIGHTING	82	188	192	3	196	187	-9	147	61	-86
ELECTRONICS	398	1921	1921	0	2342	2349	7	2988	3002	15
FOOD PRESERVATION	173	192	211	19	200	238	38	211	247	36
COOKING	197	264	264	0	294	313	18	302	318	16
CLEANING	176	374	406	32	526	587	61	602	646	44
INDUSTRY COMPONENTS	72	128	129	1	152	220	68	167	225	59
ENERGY SECTOR	50	82	82	0	99	111	12	126	145	18
TRANSPORT SECTOR	292	345	345	0	399	409	10	450	480	30
TOTAL in 1000 jobs	**2603**	**5810**	**5879**	**70**	**6968**	**7799**	**831**	**8136**	**9200**	**1064**

TOTAL direct jobs by sector (in 1000 jobs)

	1990	2010			2020			2030		
Sector	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry (incl. OEM & business services)	1447	3233	3272	39	3872	4364	492	4526	5157	631
Wholesale	57	124	125	1	147	174	27	171	207	36
Retail	546	1356	1382	26	1648	1795	147	1949	2105	156
Installation	304	670	673	3	783	948	165	884	1125	241
Maintenance	249	428	428	0	517	517	0	606	606	0
TOTAL in 1000 jobs	**2603**	**5810**	**5879**	**70**	**6968**	**7799**	**831**	**8136**	**9200**	**1064**

ANNEX H: References

Commission Regulations (Ecodesign)

COMMISSION REGULATION (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment, OJ L 339, 18.12.2008, p.45
COMMISSION REGULATION (EC) No 107/2009 of 4 February 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for simple set-top boxes, OJ L 36, 5.2.2009, p.8
COMMISSION REGULATION (EC) No 244/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps, OJ L 76, 24.3.2009, p.3
COMMISSION REGULATION (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council, OJ L 76, 24.3.2009, p.17
COMMISSION REGULATION (EC) No 278/2009 of 6 April 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies, OJ L 93, 7.4.2009, p.3
COMMISSION REGULATION (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for electric motors, OJ L 191, 23.7.2009, p.26
COMMISSION REGULATION (EC) No 641/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products, OJ L 191, 23.7.2009, P.35
COMMISSION REGULATION (EC) No 642/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for televisions, OJ L 191, 23.7.2009, p.42
COMMISSION REGULATION (EC) No 859/2009 of 18 September 2009 amending Regulation (EC) No 244/2009 as regards the ecodesign requirements on ultraviolet radiation of non-directional household lamps, OJ L 247, 19.9.2009, p.3
COMMISSION REGULATION (EU) No 347/2010 of 21 April 2010 amending Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, OJ L 104, 24.4.2010, p.20
COMMISSION REGULATION (EU) No 1015/2010 of 10 November 2010 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household washing machines, OJ L 293, 11.11.2010, p.21
COMMISSION REGULATION (EU) No 1016/2010 of 10 November 2010 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household dishwashers, OJ L 293, 11.11.2010, p.31
COMMISSION REGULATION (EU) No 327/2011 of 30 March 2011 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500kW, OJ L 90, 6.4.2011, p.8
COMMISSION REGULATION (EU) No 206/2012 of 6 March 2012implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air conditioners and comfort fans, OJ L 72, 10.3.2012, p.7
COMMISSION REGULATION (EU) No 547/2012 of 25 June 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water pumps, OJ L 165, 26.6.2012, p.28
COMMISSION REGULATION (EU) No 622/2012 of 11 July 2012 amending Regulation (EC) No 641/2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products, OJ L 180, 12.7.2012, p.4
COMMISSION REGULATION (EU) No 932/2012 of 3 October 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household tumble driers, OJ L 278, 12.10.2012, p.1
COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment, OJ L 342, 14.12.2012, p.1
COMMISSION REGULATION (EU) No 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers, OJ L 175, 27.6.2013, p.13
COMMISSION REGULATION (EU) No 666/2013 of 8 July 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners, OJ L 192, 13.7.2013, p.24
COMMISSION REGULATION (EU) No 801/2013 of 22 August 2013 amending Regulation (EC) No 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No 642/2009 with regard to ecodesign requirements for televisions, OJ L 225, 23.8.2013, p.1
COMMISSION REGULATION (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters, OJ L 239, 6.9.2013, p.136
COMMISSION REGULATION (EU) No 814/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks, OJ L 239, 6.9.2013, p.162
COMMISSION REGULATION (EU) No 4/2014 of 6 January 2014 amending Regulation (EC) No 640/2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for electric motors, OJ L 2, 7.1.2014, p.1
COMMISSION REGULATION (EU) No 66/2014 of 14 January 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for domestic ovens, hobs and range hoods, OJ L 29, 31.1.2014, p.33
COMMISSION REGULATION (EU) No 1253/2014 of 7 July 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for ventilation units, OJ L 337, 25.11.2014, p.8
COMMISSION REGULATION (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers, OJ L 177, 8.7.2015, p. 19
COMMISSION REGULATION (EU) 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel local space heaters, OJ L 193, 21.7.2015, p.1

COMMISSION REGULATION (EU) 2015/1188 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for local space heaters, OJ L 193, 21.7.2015, p.76

COMMISSION REGULATION (EU) 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers, OJ L 193, 21.7.2015, p.100

Commission Delegated Regulations (Energy Labelling)

COMMISSION DELEGATED REGULATION (EU) No 1059/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household dishwashers, OJ L 314, 30.11.2010, p.1

COMMISSION DELEGATED REGULATION (EU) No 1060/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household refrigerating appliance, OJ L 314, 30.11.2010, p.17

COMMISSION DELEGATED REGULATION (EU) No 1061/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household washing machines, OJ L 314, 30.11.2010, p.47

COMMISSION DELEGATED REGULATION (EU) No 1062/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of televisions, OJ L 314, 30.11.2010, p.64

COMMISSION DELEGATED REGULATION (EU) No 626/2011 of 4 May 2011 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of air conditioners, OJ L 178, 6.7.2011, p.1

COMMISSION DELEGATED REGULATION (EU) No 392/2012 of 1 March 2012 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household tumble driers, OJ L 123, 9.5.2012, p.1

COMMISSION DELEGATED REGULATION (EU) No 874/2012 of 12 July 2012 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of electrical lamps and luminaires, OJ L 258, 26.9.2012, p.1

COMMISSION DELEGATED REGULATION (EU) No 665/2013 of 3 May 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of vacuum cleaners, OJ L 192, 13.7.2013, p.1

COMMISSION DELEGATED REGULATION (EU) No 811/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device, OJ L 239, 6.9.2013, p.1

COMMISSION DELEGATED REGULATION (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device, O L 239, 6.9.2013, p.83

COMMISSION DELEGATED REGULATION (EU) No 65/2014 of 1 October 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of domestic ovens and range hoods, OJ L 29, 31.1.2014, p.1

Commission Delegated Regulation (EU) 2015/1094 of 5 May 2015 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of professional refrigerated storage cabinets, OJ L 177, 8.7.2015, p. 2

COMMISSION DELEGATED REGULATION (EU) 2015/1186 of 24 April 2015 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of local space heaters, OJ L 193, 21.7.2015, p.20

COMMISSION DELEGATED REGULATION (EU) 2015/1187 of 27 April 2015 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of solid fuel boilers and packages of a solid fuel boiler, supplementary heaters, temperature control and solar devices, OJ L 193, 21.7.2015, p.43

Documents related to Energy Star

Council Decision 2006/1005/EC of 18 December 2006 concerning conclusion of the Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficiency labelling programmes for office equipment, OJ L 381, 28.12.2006, p.24

Regulation (EC) No 106/2008 of the European Parliament and of the Council of 15 January 2008 on a Community energy-efficiency labelling programme for office equipment, OJ L 39, 13.2.2008, p.1

COMMISSION DECISION of 16 June 2009 determining the Community position for a decision of the Management entities under the Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficiency labelling programmes for office equipment on the revision of the computer specifications in Annex C, part VIII, to the Agreement (2009/487/EC), OJ L 161, 24.6.2009, p.16

COMMISSION DECISION of 20 April 2009 determining the Community position for a decision of the management entities under the Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficiency labelling programmes for office equipment on the revision of the imaging equipment specifications in Annex C, part VII, to the Agreement (2009/347/EC), OJ L 106, 27.4.2009, p.25

COMMISSION DECISION of 26 October 2009 determining the Community position for a decision of the management entities under the Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficiency labelling programmes for office equipment on the revision of the computer monitor specifications in Annex C, part II, to the Agreement, OJ L 282, 29.10.2009, p.23

COUNCIL DECISION of 13 November 2012 on the signing and conclusion of the Agreement between the Government of the United States of America and the European Union on the coordination of energy-efficiency labelling programmes for office equipment (2013/107/EU), OJ L 63, 6.3.2013, p.5

AGREEMENT between the Government of the United States of America and the European Union on the coordination of energy-efficiency labelling programs for office equipment, OJ L 63, 6.3.2013, p.7

COMMISSION DECISION of 20 March 2014 determining the European Union position for a decision of the Management entities under the Agreement between the Government of the United States of America and the European Union on the coordination of energy-efficiency labelling programmes for office equipment on adding specifications for computer servers and uninterruptible power supplies to Annex C to the Agreement and on the revision of specifications for displays and imaging equipment included in Annex C to the Agreement (2014/202/EU), OJ L 114, 16.4.2012, p.68

Website: https://www.eu-energystar.org

Documents related to Voluntary Agreements / Self-Regulatory Initiatives
INDUSTRY VOLUNTARY AGREEMENT TO IMPROVE THE ENVIRONMENTAL PERFORMANCE OF IMAGING EQUIPMENT PLACED ON THE EUROPEAN MARKET, VA v.4 – 3 December 2012 (Including style changes based on agreed VA v.3.5 – 15 February 2011)
Voluntary Industry Agreement to improve the energy consumption of Complex Set Top Boxes within the EU Proposal from the industry group, Version 3.0, 2nd September 2011
Energy Efficiency of Games Consoles, Self-regulatory Initiative to further improve the energy efficiency of Games Consoles, version 1.0 - 22 Apri 2015, Sony Computer Entertainment Inc., Microsoft Corporation, Nintendo Co. Ltd.
Self-regulatory websites:
Imaging equipment: www.eurovaprint.eu
Complex set-up boxes: http://cstb.eu
Medical equipment: www.cocir.org
Game consoles: http://www.efficientgaming.eu/
Impact Assessments
Staff working document Impact Assessment report for Tyres, SEC(2008)2860
Staff working document Impact Assessment report for Standby and off-mode electric power consumption of electrical and electronic household and office equipment, SEC(2008)3071
Staff working document Impact Assessment report for Simple set-top boxes, SEC(2009)114
Staff working document Impact Assessment report for Fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, SEC(2009)324
Staff working document Impact Assessment report for Non-directional household lamps, SEC(2009)327
Staff working document Impact Assessment report for No-load condition electric power consumption and average active efficiency of externa power supplies, SEC(2009)434
Staff working document Impact Assessment report for Televisions, SEC(2009)1011
Staff working document Impact Assessment report for Electric motors, SEC(2009)1013
Staff working document Impact Assessment report for Circulator pumps (<2.5kW), SEC(2009)1016
Staff working document Impact Assessment report for Household refrigerating appliances, SEC(2009)1020
Staff working document Impact Assessment report for Household washing machines, SEC(2010)354
Staff working document Impact Assessment report for Household dishwashers, SEC(2010)356
Staff working document Impact Assessment report for Fans within a 125 W to 500 kW power range, SEC(2011)384
Staff working document Impact Assessment report for Room air conditioners, SWD(2012)35
Staff working document Impact Assessment report for Water pumps, SWD(2012)178
Staff working document Impact Assessment report for Household laundry driers, SWD(2012)289
Staff working document Impact Assessment report for Directional lamps, light emitting diode lamps and related equipment, SWD(2012)419
Staff working document for the ecodesign consultation forum on sound and imaging equipment (entr lot 3), 9 November 2012.
Staff working document Impact Assessment report for Imaging Equipment, SWD(2013)15
Staff working document Impact Assessment report for Personal computers, SWD(2013)219
Staff working document Impact Assessment report for Vacuum cleaners, SWD(2013)240
Staff working document Impact Assessment report for Water heaters and hot water storage tanks, SWD(2013)295
Staff working document Impact Assessment report for Space heaters and combination heaters, SWD(2013)297
Staff working document Impact Assessment report for Domestic cooking appliances (hobs, ovens and range hoods), SWD(2014)4
Staff working document Impact Assessment report for small, medium and large power transformers, SWD(2014)0162
Staff working document Impact Assessment report for Ventilation Units, SWD(2014)0222
Staff working document Impact Assessment report for Games Consoles, SWD(2015)0089
Staff working document Impact Assessment report for Local Space Heaters, SWD(2015)0090
Staff working document Impact Assessment report for Solid Fuel Boilers, SWD(2015)0092
Staff working document Impact Assessment report for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers, SWD(2015)0097
Ecodesign Framework and Methodology
DIRECTIVE 2005/32/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, OJ L 191, 22.7.2005, p.29

DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products, OJ L 285, 31.10.2009, p.10

Methodology for the Ecodesign of Energy-related Products, MEErP, Methodology Report Part 1: Methods, VHK, Brussels/ Delft, 28.11.2011

Methodology for the Ecodesign of Energy-related Products, MEErP, Methodology Report Part 2: Environmental policies & data, VHK, Brussels/ Delft, 28.11.2011

Methodology for the Ecodesign of Energy-related Products, MEErP, Project report, VHK, Brussels/ Delft, 28.11.2011

Methodology Study Eco-design of Energy-using Products, MEEuP, VHK, Delft, 28.11.2005

Energy Labelling Framework

COUNCIL DIRECTIVE 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances, OJ L 297, 13.10.92, p.16

DIRECTIVE 2010/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products (recast), OJ L 153, 18.6.2010, p.1

Ecodesign Working Plans

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT, COM(2008) 660 final, Establishment of the working plan for 2009-2011 under the Ecodesign Directive, Brussels, 21.10.2008

COMMISSION STAFF WORKING DOCUMENT, SWD(2012) 434 final, Establishment of the Working Plan 2012-2014 under the Ecodesign Directive, Brussels, 7.12.2012

Website for study on Ecodesign working plan 2015-2017: http://www.ecodesign-wp3.eu/

Other Documents

COUNCIL DIRECTIVE 92/42/EEC on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels, OJ L 167, 22.6.92, p. 17

COMMISSION WORKING DOCUMENT implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air heating products, cooling products and high temperature chillers

COMMISSION WORKING DOCUMENT implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for compressors for standard air applicatior

COMMISSION WORKING DOCUMENT implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for electric motors and variable speed drives and repealing Regulation 640/2009

WORKING DOCUMENT In the framework of the implementation of Commission Regulation (EU) No…/…implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for refrigerated commercial display cabinets (2014/2015)

WORKING DOCUMENT COMMISSION DELEGATED REGULATION (EU) NO …/.. of XXX supplementing Directive 2010/30/EU of the European Parliament and of the Council with regards to the energy labelling of refrigerated commercial display cabinets (2015/2015)

DRAFT COMMUNICATION FROM COMMISSION REGULATION (EU) No …/.. of XXX implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers

DRAFT COMMUNICATION FROM COMMISSION REGULATION (EU) No …/.. of XXX implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional storage cabinets, blast cabinets, condensing units and process chillers

DRAFT COMMUNICATION FROM COMMISSION REGULATION (EU) No …/.. of XXX implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel local space heaters

DRAFT COMMUNICATION FROM COMMISSION REGULATION (EU) No …/.. of XXX laying down ecodesign requirements for ventilation units

REGULATION (EC) No 661/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor, OJ L 200, 31.7.2009, p.1

Omnibus Review Study on Cold Appliances, Washing Machines, Dishwashers, Washer-Driers, Lighting, Set-top Boxes and Pumps, March 2014, VHK