Report

ECODESIGN IMPACT ACCOUNTING

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Client:

European Commission
Directorate General Energy, Unit C.3
Rue de Mot 24,
Brussels.
Policy officer: Juan Moreno-Acedo

Authors:

René Kemna, Leo Wierda (VHK)

Van Holsteijn en Kemna B.V. (VHK)
Elektronicaweg 14
2628 XG Delft
The Netherlands
www.vhk.nl

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Acronyms & accounting units

../a	.. per annum (year)
€	Euro
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_2	Carbon Dioxide
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
EL	Energy Labelling
EP	Electrophotographic ('laser')
ES	Energy Star; Enterprise Servers
FC	Forward curved (fan)
GCV	Gross calorific value
GHG	Greenhouse gas emissions
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
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
ltr	Litres
m	million
m €	million euro
max.	maximum
MeNA	Medium network availability
MFD	Multi function device
mg	milligrams (0.001 gram)
min.	minimum
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
NOx	Nitrogen Oxides (emission)
NRVU	Non-residential VU
PC	Personal computer
PF	Professional refrigeration products
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	Typical 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.

The accounting method developed in this study provides a practical tool to achieve those goals. Specific details of the method are given on the following page. The largest part of the assignment concerns, however, the application of the accounting method to the existing Ecodesign preparatory studies and impact assessment reports. The first issue of this report (Part 1, May 2014) took into account the information available on 1 November 2013; the current revision extends this to 1 May 2015 and marks the end of the contract.

The accounting covers projections for the period 2010-2050, with inputs going as far back as 1990 and earlier. Studies of 33 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 come closest to the measure taken.

In 2010 the products included in the accounting represent approximately 38 000 PJ (910 Mtoe) of direct and indirect primary energy consumption. This is 51% 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 6800 PJ (162 mtoe, 1890 TWh) primary energy saving, i.e. a saving of 18% for the average product;
- Of this, 4220 PJ (100 mtoe, 1173 TWh) is primary energy saving due to saving 469 TWh (40 mtoe) of electricity, and 2580 PJ (62 mtoe, 717 TWh) is direct fuel saving. The sum of electricity saving and direct fuel saving is 1186 TWh (102 mtoe).
- 314 Mt CO2 equivalent (7% of 2010 EU-total) less greenhouse gas emissions;
- 336 million m³ drinking water and 0.4 Mt printer paper saving; 205 kt less NOx emissions;
- € 111 bn net saving on consumer expenditure (€ 173 bn gross saving, € 62 bn extra acquisition) [1];
- € 55 bn extra revenue for industry, wholesale, retail and installation sector;
- 0.8 million extra direct jobs for industry, wholesale, retail and installation sector.[2]

For 2030 these results increase approximately by over 50%. The monetary consumer savings on expenditure were 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.

[1] In EIA part 1, € 110 bn net saving was reported, but this should have been € 117 bn. Errors underlying the € 110 bn figure were found during the revision and have been corrected.

[2] 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.

The 2020 savings represent approximately 9% of the current EU energy consumption total and 7% of the carbon emission total. 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 2.3% (in 2030) of the current GDP of the European Union.

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. For possible building-related measures influencing heating 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.

CONTENT

Annexes

A Ecodesign impact accounting by parameter (147 p.)

B Status of measures per 1.11.2013 (2 p.)

C Studies per 1.11. 2013 (2 p.)

D Product groups and defined base cases per 1.11.2013 (8 p.)

E Ecodesign impact accounting by product group (22 p.)

F Stakeholder revenues, summary (6 p.)

G Direct employment impacts, summary (6 p.)

H References (4 p.)

MS Excel files:

EIA Masterfile (16 Mb), complete dataset and equations, 1-year time step;

EIA Printerfile (1.8 Mb), containing values only, 5-year intervals 1990-2050.

1. INTRODUCTION

1.1. Background

This study on the "Assessments of impacts of Ecodesign, Energy labelling and Tyre Labelling legislation" is part of the framework services contract for impact assessment studies of possible implementing measures under the Eco-design 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.

Furthermore, the following parallel activities of the Commission are relevant:

- Based on the current PRIMES model DG ENER, in cooperation with JRC IPTS, is in the process of developing a new partial equilibrium model for the energy market (POTENCIA). POTENCIA will use a top-down approach modelling all relevant energy aspects at the level of the economy, including the impact of product policy measures. Inter alia, POTENCIA will take into account the rebound effect and product energy efficiency improvements achieved by means other than ecodesign/labelling implementing measures. Input from product policy tools into POTENCIA should be compatible with the scenario analysis carried out at product level according to the Methodology for the ED of Energy-related Products (MEErP).
- Service contract EACI/IEE/2013/002 develops and manages a European database on energy efficiency and other relevant environmental aspects of selected product groups made available on the EU market.

– 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 [3].

1.2. Tasks

The following tasks are performed for the assessment of all relevant measures over time:

1. Develop an accounting methodology for monitoring, reporting and forecasting the impacts of product implementing measures and other actions such as voluntary agreements

2. Apply the accounting methodology to an inventory of product groups for which Ecodesign preparatory studies and impact assessments were concluded at the reference date and present the results over the period 2010-2050 (in 5 year periods)[4] for:

   – Energy impacts
   – Other environmental impacts (water use, noise, air pollution)
   – Socio-economic impacts (jobs)
   – Impacts on technology development & 'regulatory spillover' to other legislation
   – Impacts on industrial competitiveness (revenues)
   – Other relevant factors

3. Liaise with JRC IPTS to make results compatible with POTENCIA. Liaise with other parallel activities, in consultation with the Commission policy officer, where appropriate.

1.3. Deliverables required

The deliverables of the contract include two impact assessment reports (IARs) [5] of product groups where (updated) projections are available, to be delivered to the EC on:

- 8 months after starting date (1 June 2015): Part 1 (EIA1), including tasks 1, 2 and 3;
- 26 months after starting date (1 Nov. 2015): Part 2 (EIA2), update task 2.

Additional to the IAR, fact sheets for the product groups treated including updates (when existing) need to be delivered. A modelling tool (Excel) and instructions, presentations (PowerPoint) with the main conclusions of each IAR need to be ready at the 2nd of Nov. 2015.

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[3] '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

[4] The assignment allows 10 year periods for non-energy impacts, but –given that the calculation time step for all impacts is 1 year—all parameters are presented in this report at 5 year intervals. In the spreadsheets a 1 year (Masterfile) or 5 year interval (Printfile) is used.

[5] The original contract foresaw three IARs. In agreement with the EC, Parts 2 & 3 have later been integrated in a single update task, as reflected in the current issue of the report. Contract amendment no. 1 of March 2015 extends the duration of the tasks to maximum 26 months (2 November 2015).

1.4. Planning

The European Commission sent out a Request for services, ENER.C.3.dir(2013)2518456, on 1 July 2013. At that time the estimated starting date was 1 August 2013.
VHK's proposal for services was sent in 8 July 2013 with a planned starting date of 1 Aug. 2013. The actual signature date and start of contract was 2 Sept. 2013.
Contract amendment no. 1 of March 2015 extended the duration of the tasks to maximum 26 months (2 November 2015). In agreement with the EC, the number of intermediate reports was reduced from the original three to two (previous paragraph and note [5]).
The planning below corrects for the three months starting delay and for the contractual changes.

Planning milestones:

- Project start: 2 Sept. 2013
- Kick-off meeting within 2 weeks after start, amongst others discussing where and when the accounting is relevant for other Commission activities:
    - POTENCIA (JRC IPTS): First presentation of model, End of Jan. 2014 (inputs required end of Dec. 2013)
    - Commission conference: ca. 20 Feb. 2014 (possibly presentation of draft results)
    - Energy Label review: Preparatory report in spring 2014, impact assessment 2nd half of 2014
- Reference date Part 1 for the status of preparatory and impact assessment studies: 1 Nov. 2013.
- Delivery of Part 1 (EIA1): 1 June 2014 (8 months after starting date);
- Reference date Part 2 for the status of preparatory and impact assessment studies: 1 May 2015.
- Delivery of Part 2 (EIA2): 1 November 2015 (26 months after starting date).
- Project end: 1 November 2015 (duration of contract 26 months)

1.5. Activities realised for Part 1

Overall, the activities of the contractor followed the (updated) planning.

The development of the accounting method (Task 1), in consultation with the policy officer(s), did not pose specific problems. The consultation with the Commission entailed the kick-off meeting, several personal meetings with policy officers, e-mail and phone correspondence and an initial training session for the unit (14 January), for which a set of powerpoint slides was prepared. The slides were delivered to the policy officer (not a required part of the deliverables).

One of the results of this training session was that, informally (not part of the assignment), the first aggregated results for the residential sector showed a surprisingly good compatibility with the results from the Eurostat Energy Balance for the historical period 1990-2010. Furthermore, following discussion, the Commission deemed that the 'Impacts on technology development & regulatory spillover to other legislation' was not a priority, because it is part of other ongoing studies for the Commission.

The provision of early drafts of actual accounting of Ecodesign, for the benefit of JRC IPTS (POTENCIA model) and other Commission activities mentioned in the previous paragraphs, was the most time-

critical part of the assignment. To this end, the contractor delivered information material in two stages: In the months November, December and early January 2013 each product group was tackled consecutively and –immediately after finishing this first draft of a product group—the results were communicated to the Commission and JRC IPTS. The last set of the product-specific MS Excel files was delivered on the 5th of January.

In a second stage, January to April 2014, the data was refined and further structured according to the accounting method, also following feedback of the Commission policy officer. In the month of May 2014 the reporting on Part 1 was finalised.

As for Task 3, the liaison with JRC-IPTS in Sevilla took place over the whole study-period and consisted of phone- and e-mail correspondence, a video conference and a personal meeting.

In as much as was possible within the specific constraints of each individual project, a concerted effort was made to optimise compatibility between the underlying impact accounting and JRC's POTENCIA project. Apart from JRC-IPTS, the contractor also supplied relevant data files to the study team dealing with the preparatory study for the energy label review (Ecofys). As regards the service contract EACI/IEE/2013/002 on EU product databases, the contractor provided some written feedback on the first results, but interaction was limited because the database-study had just started.

1.6. Reporting

The reporting for Part 1 is in line with the requirements (par. 1.3). The accounting method (Task 1) is reported in the underlying report, Chapter 2. The application of the accounting method, i.e. the inventory of impacts per 1 May 2015, is introduced in Chapter 3, but is mostly performed in the MS Excel files. The print-out of those files, for 5 year intervals only, are contained in the Appendices A to G of this report. Annex H is a reference list.

There are 2 Excel files as separate deliverables:

- A "Masterfile" (16 Mb) that contains the full calculation formulas and data employed in the accounting with a time-step of 1 year, up to the year 2050 and –depending on the life of the products still installed—sometimes going back to 1960.

- A "Printfile" (1.8 Mb) that only contains the straight data (no equations) for 5-year intervals over the period 1990-2050; the printfile also contains other table formats that are used in this report (acronyms, references)

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[6]. 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 studies, the measures in the ECO scenario work as a

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

catalyst and compass, accelerating the trend towards energy efficient and environmentally friendly products [7].

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 product 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

The following 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, 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.

[7] 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.

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.[8]

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 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;

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

– 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.[9]

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

[9] The calculation is first done for full years (rounded down) and then for the remaining fractional (oldest) year. This may introduce a small r. 0 (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.

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, is 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[10] 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, calorific value of fuels

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[11]—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 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 of the viewpoint of the one who is making the calculation.

[10] 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.

[11] Boolean parameter CC in the Excel sheets.

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.[12] 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. [13]

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+F)**	**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.[14] On the other hand, and largely compensating for 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.

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

[13] 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.

[14] 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%).

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%.[15] 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.[16]

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.

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.

Note that the EMISSRATES sheet also contains emission rates for NOx and Noise, but these are product-specific and not generic parameters.

[15] 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).

[16] 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)

Direct fuel-related CO emissions were addressed in studies on central heating boilers, water heaters, and solid fuel small combustion installations. 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. For non-domestic refrigeration and large air conditioners Ecodesign preparatory work is underway that address the issue of GWP of refrigerants in Ecodesign measures and/or labelling.

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

var
S_t
L or L_t
E_t
P_t
I_t
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 of 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. 2.2.2 on time index t). Finally, there are two product groups - 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 (see also par. 2.4 on Stock). 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 [17]), water consumption (litres per year[18]), 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 CO2 emissions. The CO2-emissions from refrigerants are also addressed in the relevant products covered by Ecodesign (e.g. air conditioners and, possibly, commercial cooling appliances). NOx emission limits are covered by the regulations on central heating boilers and water heaters; these emissions may be included in future regulations, such as the pending regulation on solid fuel boilers (SFB), on certain local heaters (LH) and other fossil-fuel fired space cooling and –heating products (AHC). For solid fuel combustion appliances in particular, limits on other emissions - such as CO (carbon monoxide), PM (particulate matter) or OCG (organic gaseous compounds)- could also be envisaged. 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 (primary energy total), ELECBAU/ELECECO (electricity), FUELBAU/FUELECO (fossil fuels), EMISSBAU/EMISSECO (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

[17] 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.

[18] 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.

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,
- m³ of ventilation air per m² building surface with a certain effectiveness and heat recovery[19],
- lumens (lm) emitted by light sources,
- dm² 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,
- m³ 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 LOADnotes sheet (Annex A) a brief introduction to the relevant test- and calculation procedures can be found. Also in Annex A, in the EULOAD sheet, the aggregated EU levels are provided as background information.

Efficiency

The 'efficiency'[20] 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 EFBAU/EFECO 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

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

[20] 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.

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.

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 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.

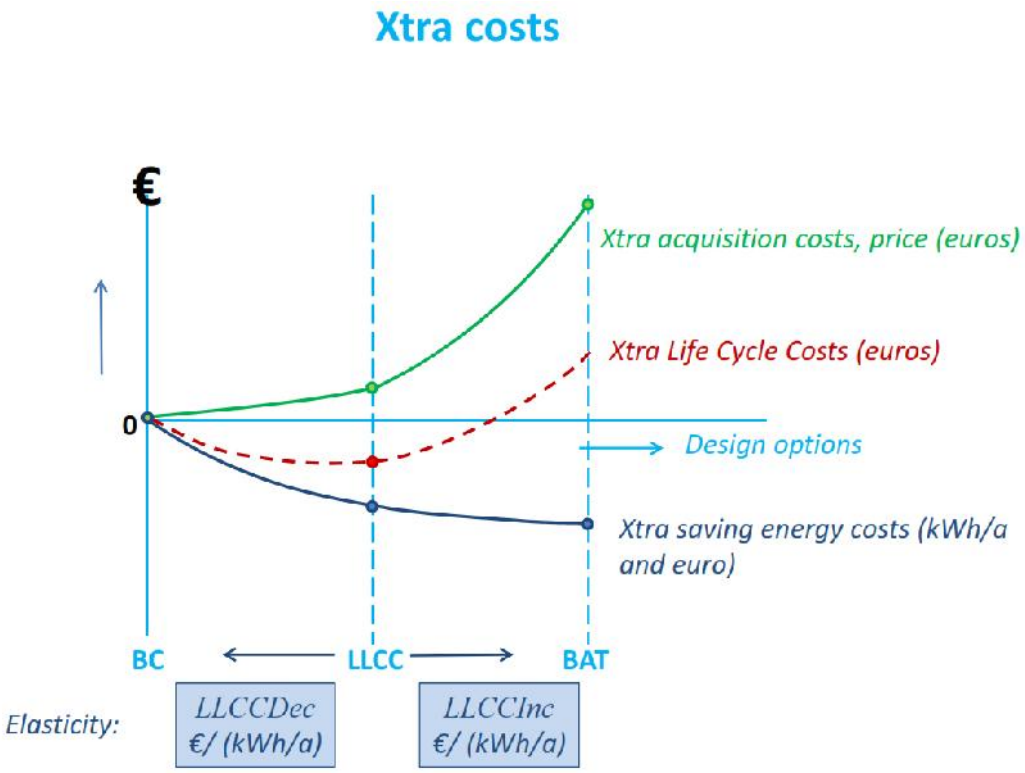

Figure 4. Illustration of anchor points in the calculation of the Least Life Cycle Costs.

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 sale-weighted Eco-impact per unit installed *[sheet EFSBAU and EFSECO for energy, sheet EMISSRATES for refrigerants, 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];*
- The energy costs, which can be determined by multiplying the energy consumption (data from ELECBAU/ELECECO/FUELBAU/FUELECO) by the appropriate energy rates (see par. 2.2). *[sheets NRGCOSTBAU and ERGCOSTECO]*;
- Maintenance costs (EUMaint), 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:

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

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

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

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

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

$$EUExpense€_0 = EUA_0 + EUR€_0 \quad [9]$$

2.5.3. Monetary business impacts/revenues

For the estimate of the business revenue for the various stakeholders, a number of constants need to be assessed. These are given in the PRICE2 sheet:

Economic constants

- Installation costs (*Rinstall*), in euro, possibly part of consumer end-price;
- End-of-Life costs (*Reol*), in euro (if applicable and info available ('recupel'), part of consumer end-price;
- Maintenance and repair costs (*Rmaint*), in euro/a (if applicable)[21];
- Manufacturer fraction of Price (*Manufrac*), reported in % (-);
- Wholesale fraction of manufacturer selling price (*Wholefrac*), reported in % (-);
- Retailer fraction of wholesale price(*Retailfrac*), reported in % (-)
- Value Added Tax (*VAT*), also including possible other levies, reported in %.

constants
Rinstall
Reol
Rmaint
Manufrac
Wholefrac
Retailfrac
VAT

For the assessment of the business revenues, the following equations apply. For retail revenues, there are two (equivalent) options:

$$EUManu€_0 = (EUA_0 - S_0 \times Rinstall) \times Manufrac \quad [10]$$

$$EUWhole€_0 = EUManu€_0 \times Wholefrac \quad [11]$$

$$EUVAT€_0 = EUA_0 \times VAT/(1-VAT) \quad [12]$$

$$EURetail€_0 = EUA_0 - EUManu€_0 - EUWhole€_0 - EUVAT€_0 \quad [13a]$$

$$EURetail€_0 = EUA_0 \times Manufrac \times (1 + Wholefrac) \times Retailfrac + .. \quad [13b]$$
$$.. + EUM€_0 + S_0 \times Rinstall$$

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:

- Manufacturer's 'wages', in euro/employee (not actual wages, but total company revenue divided by staff; usually around 0.15 m euro/employee ±10%)
- OEM factor, multiplier of OEM jobs versus manufacturer's jobs (usually around 1)
- Extra-EU fraction, estimated ratio of extra-EU industrial OEM jobs versus all OEM jobs
- Wholesale 'wages', in euro/employee (not actual wages, but total company revenue divided by staff; usually around 0.3 m euro/employee ±20%)

constants
Manuwages
OEMfactor
ExtraEUfrac
Wholewages
Retailwages

[21] 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.

- Retail/Installer 'wages', in euro/employee (not actual wages, but total company revenue divided by staff; usually around 0.1 m euro/installer personnel or 0.06 m euro/retailer personnel ±20%)

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

$$EUManuJobs_0 = EUManu€_0/ManuWages \quad [14]$$

$$EUOEMJobs_0 = EUManuJobs_0 \times OEMfactor \quad [15]$$

$$EUW\ oleJobs_0 = EUW\ ole€_0/W\ oleWages \quad [16]$$

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

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) and circulators (*db*=1, auxiliary energy of boilers). It is listed in the first column of the relevant spreadsheets/tables. The value of 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[22]).

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, to zero (0) and only looks at the marginal improvements (the savings), expressed as negative numbers, in the ECO scenario.

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 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[23]. This split is done in the ACQBAU and ACQECO sheets.

[22] 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.

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

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.

2.6.5. Subdivided base cases

For two product groups, i.e., the base case is subdivided by type in the underlying preparatory and impact assessment studies. This occurs with fossil fuel fired air heaters (AHF) and central air conditioners (AC) that are both part of Lot 6/21.
In the aggregation this is dealt with by using the sales-weighted average of the subtypes for the base case and the acquisition costs. For the running costs and energy, the base case value is the sum of the subtypes.

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 2). 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.

PRICE_HEAT= PRICE* HEAT_SALES/(COOL_SALES+HEAT_SALES)

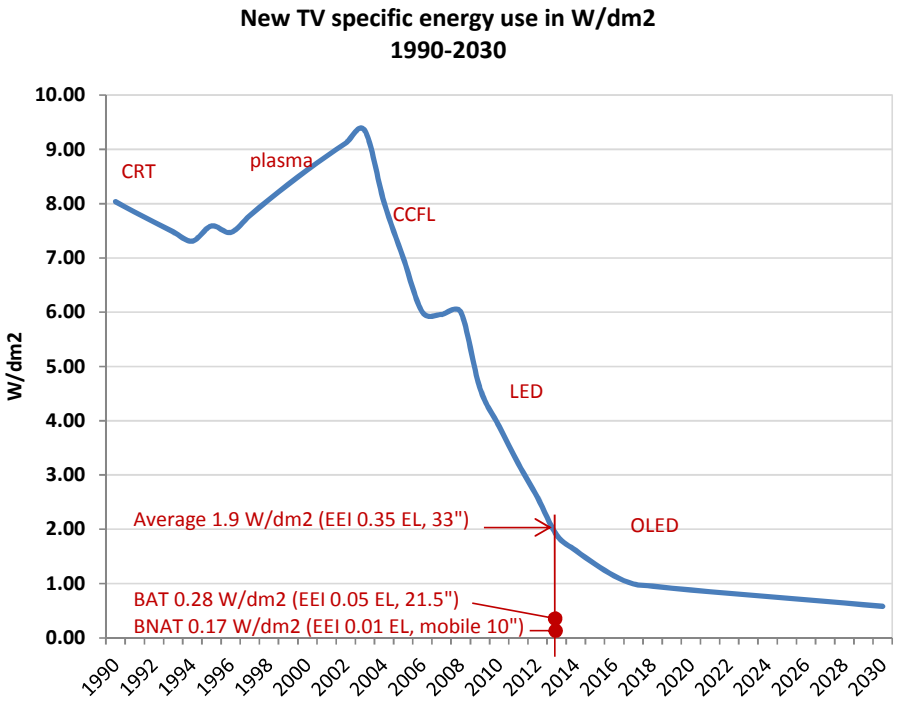

Figure 2. Specific energy use in W/dm² of new TVs

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'[24], 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 below gives the numbers at EU level, i.e. also taking into account population growth.

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

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.

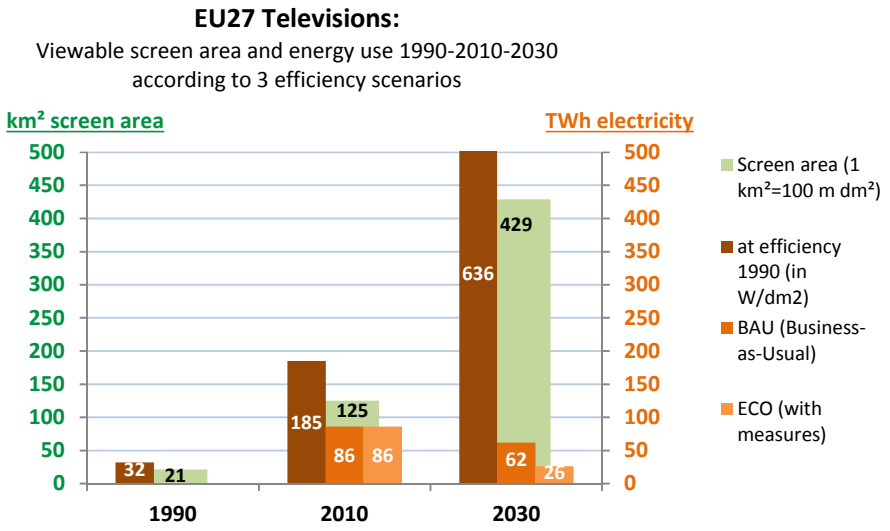

Figure 3. EU-28 television 1990-2030. Evolution of the load as well as the energy consumption according to 'freeze', BAU and ECO scenarios

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.

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.

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 an analysis, based on interim (not finalised) data from the impact accounting, to verify whether there could be a match also in the results. This was done for the sector with the most complete coverage, i.e. the residential electricity consumption (see figure 4).

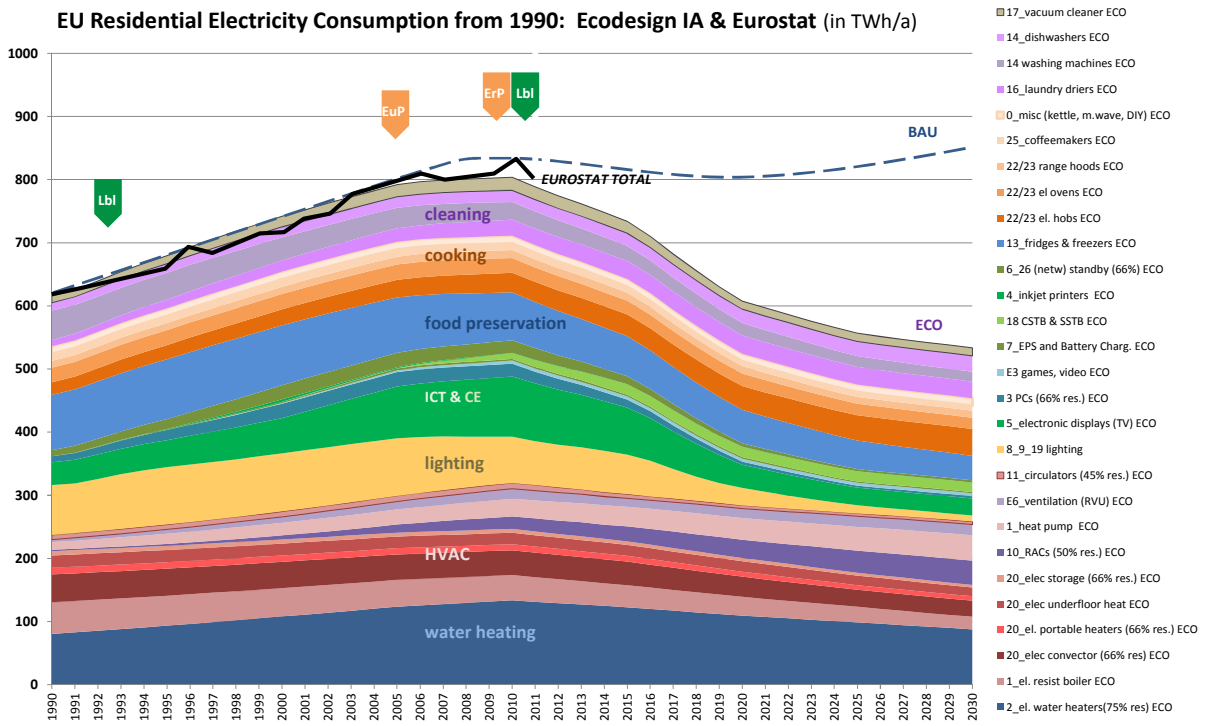

Figure 4. Comparison of interim data from ecodesign impact accounting (coloured graph) versus Eurostat energy balance outcomes (black line), for the EU residential electricity consumption. (VHK, Jan. 2014).

The figure shows a surprising good match, probably with an accuracy of ±10%. This is surprising because the ecodesign impact accounting was always performed, over the 2006-2013 period, at individual product level, without any attempt to match the outcome with the aggregate Eurostat energy balance 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 1.5.2015

3.1. Product groups

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 May 2015. 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 1 below gives an overview of the main changes implemented in the accounting in the Annexes.

Table 2 List of main changes in the update (EIA2) with respect to the original issue (EIA1)

Product Group added or updated in EIA Part 2	Change in BAU Primary Energy Consumption in TWh/a in year 2010	Change in Primary Energy Savings in TWh/a in **year**	Change in Primary Energy Savings in TWh/a in **year 2030**	Main reason for change in savings
Lot 1, CH Central Heating Boiler, space heating	EIA1: 2307 EIA2: 2307 Variation: 0	EIA1 savings: 493 EIA2 savings: 465 **Variation: - 27**	EIA1 savings: 789 EIA2 savings: 763 **Variation: - 26**	Smaller scope in final CR; new load and efficiency data from building heat demand study
Lot 5, DP Electronic Displays	EIA1: 250 EIA2: 254 Variation: + 4	EIA1 savings: 67 EIA2 savings: 68 **Variation: + 1**	EIA1 savings: 125 EIA2 savings: 125 **Variation: 0**	Corrections in Excel formulas
Lot 10 / ENTR 6, VU, Ventilation Units	EIA1: -481 EIA2: -481 Variation: 0	EIA1 savings: 126 EIA2 savings: 115 **Variation: - 11**	EIA1 savings: 227 EIA2 savings: 212 **Variation: - 15**	Indirect effect due to link with space heating efficiencies
Lot 11, FAN Industrial Fans	EIA1: 328 EIA2: 328 Variation: 0	EIA1 savings: 35 EIA2 savings: 38 **Variation: + 3**	EIA1 savings: 66 EIA2 savings: 85 **Variation: + 19**	Updated sales and load data following revision study
Lot 15, SFB, Solid Fuel Boilers	EIA1: 165 EIA2: 167 Variation: + 2	EIA1 savings: 4 EIA2 savings: 3 **Variation: - 1**	EIA1 savings: 7 EIA2 savings: 6 **Variation: - 1**	Final CR less ambitious than assumed in EIA1; new IA data available.
Lot 20, LSH, Local Space Heaters	EIA1: 597 EIA2: 600 Variation: + 3	EIA1 savings: 54 EIA2 savings: 31 **Variation: - 23**	EIA1 savings: 97 EIA2 savings: 54 **Variation: - 43**	Final CR less ambitious than assumed in EIA1; new IA data available.
Lot 21/ENTR 1&6, AHC, Air Heaters and Coolers (Cooling part)	EIA1: 119 EIA2: 378 Variation: + 259	EIA1 savings: 6 EIA2 savings: 9 **Variation: + 3**	EIA1 savings: 13 EIA2 savings: 34 **Variation: + 21**	Addition of high temperature process chillers in CR
Lot 21/ENTR 1&6, AHC, Air Heaters and Coolers (Heating part)	EIA1: 286 EIA2: 289 Variation: + 3	EIA1 savings: 17 EIA2 savings: 7 **Variation: - 10**	EIA1 savings: 36 EIA2 savings: 22 **Variation: - 14**	Draft proposal less ambitious than assumed in EIA1; new IA data available.
Lot 27, UPS, Uninterruptable Power Supplies	EIA1: 0 EIA2: 31 Variation: + 31	EIA1 savings: 0 EIA2 savings: 11 **Variation: + 11**	EIA1 savings: 0 EIA2 savings: 33 **Variation: + 33**	New addition, based on final prep. study (ECO option 2)
Lot 31, CP Standard Air Compressors	EIA1: 0 EIA2: 147 Variation: + 147	EIA1 savings: 0 EIA2 savings: 2 **Variation: + 2**	EIA1 savings: 0 EIA2 savings: 4 **Variation: + 4**	New addition based on draft regulation proposal and draft IA
ENTR Lot 9, ES, Enterprise Servers (a.k.a Computer Servers)	EIA1: 50 EIA2: 62 Variation: + 12	EIA1 savings: 0 EIA2 savings: 10 **Variation: + 10**	EIA1 savings: 0 EIA2 savings: 33 **Variation: + 33**	ECO diversified from BAU using LLCC 2015 scenario from final prep. study and draft IA
Sum of the above	EIA1: 3622 EIA2: 4082	EIA1 savings: 802 EIA2 savings: 760	EIA1 savings: 1360 EIA2 savings: 1371	All the above
Sum all products	EIA1: 10224 EIA2: 10684	EIA1 savings: 1932 EIA2 savings: 1890	EIA1 savings: 3123 EIA2 savings: 3134	All the above
	Variation: + 460	**Variation: - 42**	**Variation: + 11**	

Several of these provisional ECO-scenario figures from the first issue of this report have been corrected or confirmed in the current update of this contract. Data for Uninterruptable Power Supplies (UPS, Lot 27), Standard Air Compressors (CP, Lot 31) and High Temperature Process Chillers (part of AHC, Lot 21/ ENTR Lots 1&6) were newly added in the update (Table 2).

Annex B gives an overview of the various ED, EL, ES and TL measures and their status on the 1st of November 2015. The full references are given in **Annex H**.

For a number of products no saving scenarios were implemented in EIA1[25], because there were no proposals available at the time. In the meanwhile, proposals or measures and estimated saving potentials have become available for these products, but their implementation in accounting requires additional research that is outside the budgetary and time constraints of the study. This implementation will be subject to follow-up activities. The table gives the savings that are indicated in the source material.

Table 3 List of indicative changes with respect to EIA1&2 to be implemented in follow-up

Product Group to be updated in follow-up study	Primary Energy Consumption in TWh/a in **year 2010**	Primary Energy Savings in TWh/a in **year 2020**	Primary Energy Savings in TWh/a in **year 2030**	Source
Lot E1, PF Professional Refrigeration	EIA1 & 2: 161 IA/CR: 291 Variation: + 130	EIA1 & 2: 0 IA/CR: 16 **Variation: + 16**	EIA1 & 2: 0 IA/CR: 39 **Variation: + 39**	IA study of the new regulation
Lot 12, CF Commercial Refrigeration	EIA1 & 2: 168 IA: 103 / 163 Variation: - 65 /- 5	EIA1 & 2: 5 IA: 10 /15 **Variation: + 5 / + 10**	EIA1 & 2: 18 IA: 30 /48 **Variation: + 12 /+ 30**	IA study of the Working Document (currently in cc.)
Lot E3, VIDEO (part) Game consoles	EIA1 & 2: 5 IA: 5 Variation: 0	EIA1 & 2: 0 IA: 1 **Variation: + 1**	EIA1 & 2: 0 IA: 1 **Variation: + 1**	IA study for the Voluntary Agreement [26]

Furthermore, for Lot 6/26, SB (networked) standby, a correction is needed for the savings from the measure for Home Gateways, Home NAS and Home and Office phones. Estimated extra saving following the correction is 1.1 TWh/yr in 2020 and 0.4 TWh/yr in 2030.

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 May 2015 useable data were available for approximately 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 (9 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 selective copying data from Excel files to templates,

[25] Meaning that the BAU scenario equals the ECO scenario.

[26] Values reported in Impact Assessment have been interpreted as primary energy (to be confirmed in follow-up)

- 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.

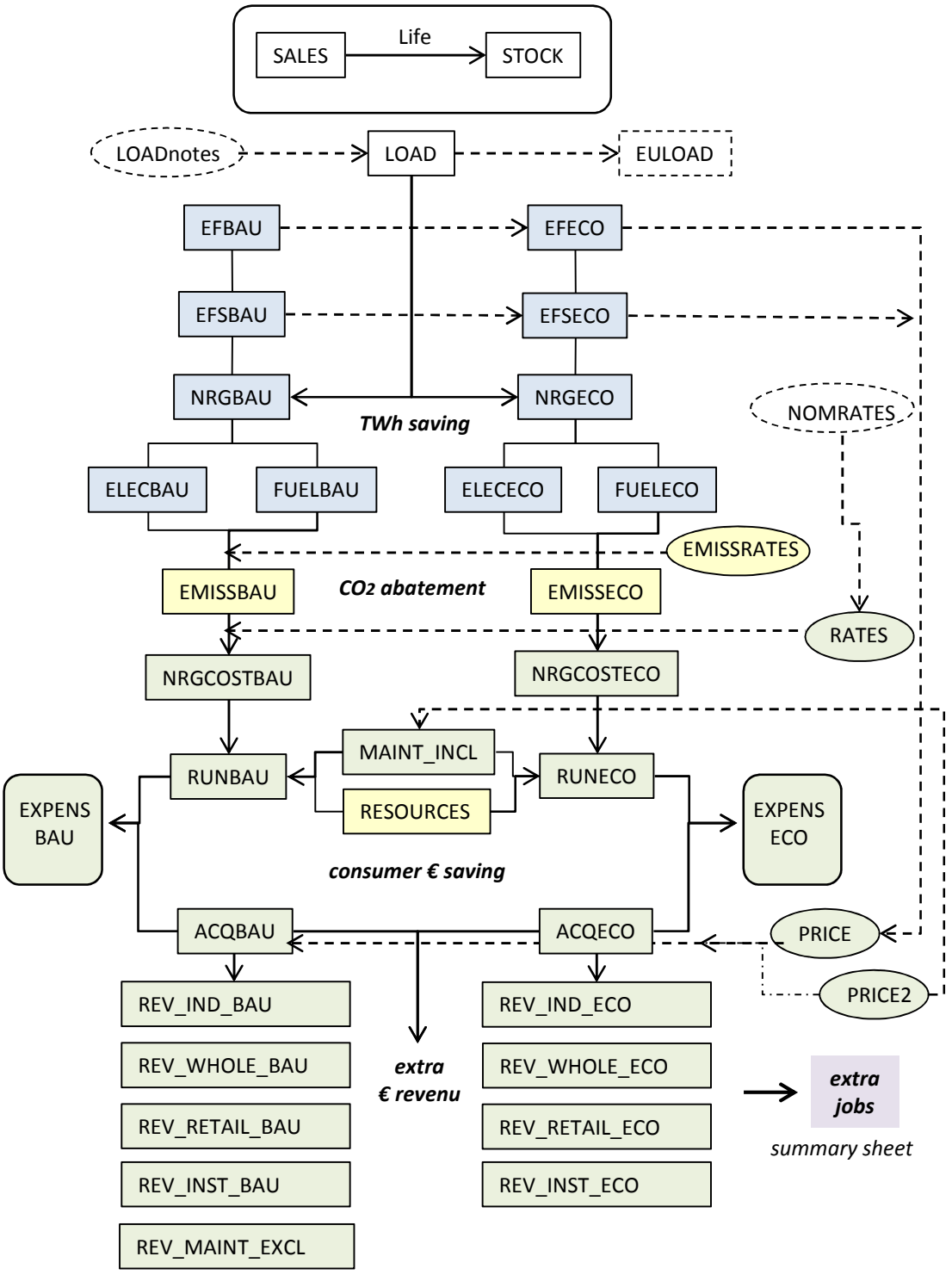

Figure 5. Structure of Annex A (core calculation). = generic; = energy ; = non-energy ; = money; = jobs

The figure above gives the structure with the sheet-names.

A short description of the items in Fig. 5 is given below:

- The SALES and STOCK (incl. Life) sheets are essential to most calculations and expressed in **1000 units per year.**

- LOAD, EFBAU, EFECO, EFSBAU and EFSECO sheets give the product performance, the respective efficiencies of new products (EF…) 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 (**EF…** 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.

- 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). It also gives data on the noise regulations in the relevant products.

- 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). 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 at the end of the EXPENSECO 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.

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. 2.6, 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 38 000 PJ (910 mtoe, 10 500 TWh) of direct and indirect primary energy consumption or 51% 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 1890 TWh (6800 PJ, 162 mtoe), of which 218 TWh (785 PJ, 19 mtoe) are achieved in the period 1990-2010[27] and 1672 TWh (6019 PJ, 143 mtoe) in the period 2010-2020.

On average the primary energy saving in 2020 is 18% for the products included in the accounting [28]. Compared to the EU as a whole in 2010 it means an energy saving of 9% [29].

The 2020 primary energy savings are achieved from an electricity saving of 469 TWh electricity (1173 TWh primary energy, including losses of power generation) and 2579 PJ or 717 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 11 282 PJ (269 mtoe, 3134 TWh) with an average saving of the included products of 29%. Compared to the EU 2010 total this is a saving of 15%.

In 2020, the new primary energy savings in this update (versus BAU) are slightly smaller than in the original Part 1 issue of May 2014 (1932-1890= 42 TWh or 2% less, see main changes in Table 2), notwithstanding the addition of new product groups (UPS, Compressors, High Temperature Process Chillers). This is mainly due to updates for space heating (and related effects on ventilation units), where the final introduced regulations e.g. for local space heaters are less ambitious than was assumed in Part 1, based on the available data in November 2013. The lower overall primary savings are entirely due to lower savings on fuel; savings on electricity increased by 4 TWh (469 vs 465 TWh) in this update.

In 2030 the primary energy savings in this update (versus BAU) are 11 TWh higher than in the first issue (3134 vs 3123 TWh). Electricity savings are 28 TWh higher than calculated in November 2013, due to the addition of new product groups. (729 vs 701 TWh electric).

The figures above are for the products currently accounted in EIA. Including the available indications for the products to be updated or corrected in the follow-up study (Table 3):

- The total 2010 primary energy covered would increase from 10 500 to 10 600 TWh (9 mtoe extra);
- The 2020 primary energy savings would increase from 1890 to 1913 - 1918 TWh (~2-2.4 mtoe extra);
- The 2030 primary energy savings would increase from 3134 to 3186 - 3204 TWh (~4.5-5 mtoe extra).

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

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

[28] 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%).

[29] Eurostat energy balance, gross inland consumption: 1760 mtoe in 2010 (162 mtoe=9.2%).

Figure 6 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 (15% of the EU 2010 total).

Figure 7 emphasizes that, not unexpectedly, the space- and water heating products as well as the light sources are the main contributors to the savings.

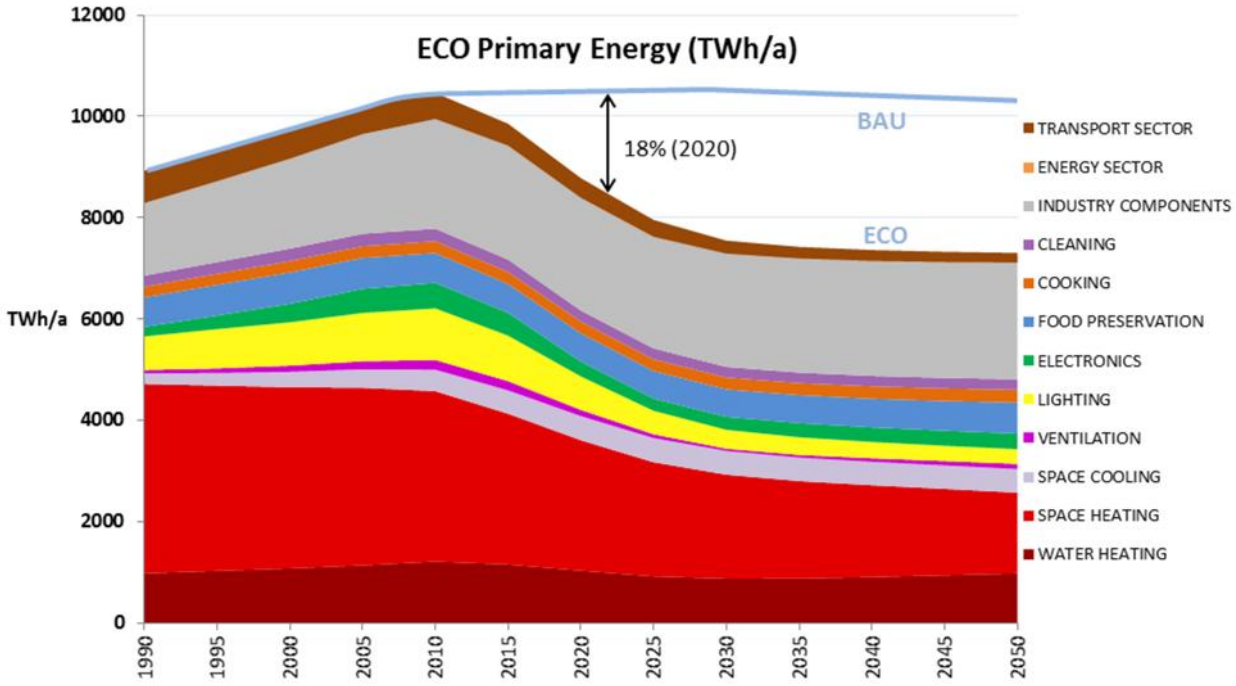

Figure 6. Primary energy consumption of products included in ecodesign impact accounting, status 1 May 2015 (energy sector impact not shown)

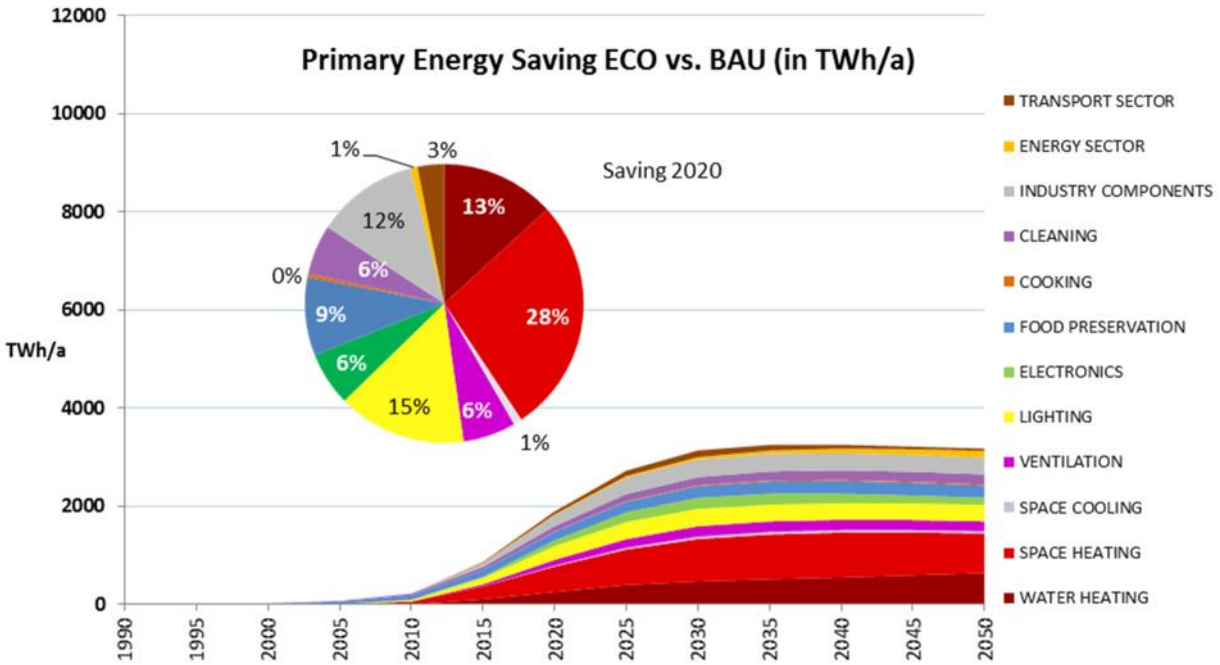

Figure 7. Primary energy saving of ECO versus BAU of products in ecodesign impact accounting, status 1 May 2015

3.4.3. Emissions

The greenhouse gas emission reduction, from less fuel-related CO_2 and emissions of refrigerants, amounts to 314 Mt CO_2 equivalent in the EU in 2020 (ECO versus BAU). This is 17% of the included products and 6.7% of the EU total (4721 Mt CO2[30]). For 2030 a reduction of 498 Mt CO_2 equivalent is expected. This is a 30% reduction for the average included product and 10.5% of the EU 2010 total.

The reduction of nitrogen-oxides NO_x emission, acidifying agent and ozone precursor (smog), is 293 kt SO_2 equivalent[31] in the EU 2020 (ca. 3% of EU 2010 total NO_x emissions[32]). This is a result from the Ecodesign emission limits set for heating boilers and water heaters. Other emission-limits for e.g. solid fuel combustion appliances are not (yet) included in the accounting at this stage.

The trend line for greenhouse gas emissions is similar to that of energy (see summary at the end of EMISSECO sheet in Annex A, also for NO_x results).

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[33]).

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. Consumer expenditure

In 2020 approximately € 111 bn will be saved by consumers resulting from Ecodesign and labelling measures. This is the result from a € 173 bn gross saving on running costs (91% energy) and € 62 bn extra acquisition costs for more efficient products. Given BAU-totals in the EU 2020 of € 1442 bn spent on running costs (€ 984 bn) and acquisition costs (€ 457 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[34] will rise by almost 14% for these products.

In 2030 the net saving (ECO versus BAU) will have grown to over € 300 bn, saving the EU consumers almost 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 May 2015. 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.

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

[31] Equals 213 kt NOx. (factor 0.7)

[32] Ca. 10 000 kt SO2 equivalent in 2010 (source: EEA, emission inventory report 1990-2010 on LRTAP.

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

[34] Prices include installation 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).

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). The saving for food refrigeration are expected to increase once the final data can be inserted for certain product groups.

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 75% 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 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, ACQECO and RUNECO in Annex A, but otherwise also in all money-related worksheets.

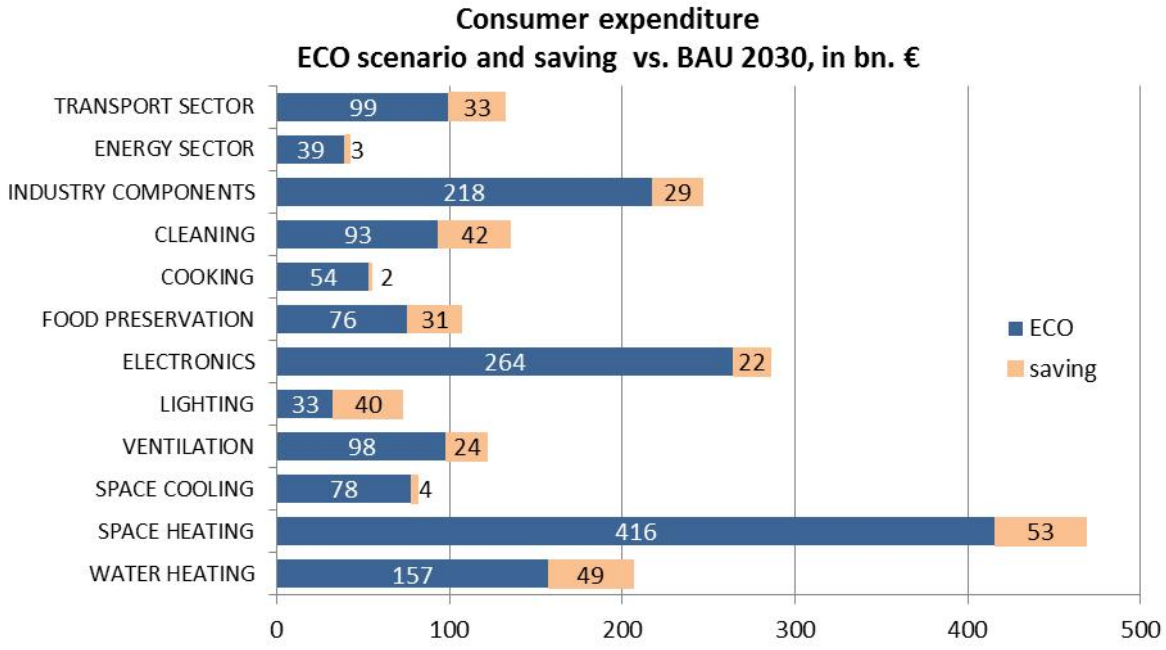


Figure 8. Consumer expenditure EU 2030 on products included in the accounting.

3.4.6. Business revenue

The increase in acquisition costs for the consumers translates into higher business revenue for market actors (plus taxes). It is calculated that for 2020 the extra revenue will be € 55 bn and for 2030 it will grow to € 73 bn compared to a situation without measures. Some 43% will go to industry, 12-13% to wholesale and 45% to retail, subdivided into 12-16% retail and –because there is a large share of installed products-- 29-33% to installers.

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. 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 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.

Appendices

ANNEX A: Ecodesign Impact Accounting by Parameter

CONTENTS

ANNEX A: Ecodesign Impacts by Parameter

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 May 2015. 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.

SALES

Lot	SALES, in 000 units (Light in m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
2	**WH dedicated Water Heater**	**9806**	**10864**	**11103**	**11341**	**11580**	**11819**	**12058**	**12297**	**12536**	**12775**
1	**CHC Central Heating combi, water heating**	**3606**	**6035**	**6473**	**6911**	**7349**	**7787**	**8225**	**8663**	**9101**	**9539**
1	**CH Central Heating boiler, space heating**	**4778**	**6952**	**7432**	**7911**	**8686**	**9461**	**10236**	**11011**	**11786**	**12561**
15	SFB Wood Manual	225	136	87	50	28	25	23	21	19	17
15	SFB Wood Direct Draft	5	222	226	231	205	249	303	369	449	546
15	SFB Coal	63	28	4	3	3	2	2	2	2	2
15	SFB Pellets	0	46	71	71	71	78	86	95	105	116
15	SFB Wood chips	0	5	5	6	7	8	9	9	10	11
15	**SFB Solid Fuel Boilers**	**293**	**436**	**393**	**360**	**314**	**363**	**424**	**497**	**586**	**693**
21 /E6	CHAE-S ≤400 kW	21	88	97	107	118	129	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	35	36	27	16	4	4	4	4	4
21 /E6	AC splits	92	333	348	336	324	312	300	288	276	265
21 /E6	AC VRF	0	90	118	172	217	262	305	344	377	401
21 /E6	ACF	0	0	1	1	1	1	1	1	1	1
21 /E6	**AHC central Air Cooling**	**145**	**592**	**647**	**694**	**730**	**765**	**778**	**756**	**741**	**743**
21 /E6	AC rooftop (rev)	7	22	21	17	9	2	0	0	0	0
21 /E6	AC splits (rev)	66	230	240	232	224	216	208	199	191	183
21 /E6	AC VRF (rev)	0	79	99	151	184	211	233	251	262	265
21 /E6	ACF (rev)	0	1	1	1	1	2	2	2	2	3
21 /E6	AHF	133	87	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)	**209**	**424**	**448**	**484**	**497**	**504**	**513**	**518**	**517**	**508**
21 /E6	**AHC total Heating & Cooling**	**281**	**684**	**734**	**776**	**808**	**839**	**847**	**821**	**803**	**800**
20	LH open fireplace	514	750	755	760	755	750	749	749	749	749
20	LH closed fireplace/inset	314	850	949	1047	1061	1074	1077	1077	1077	1077
20	LH wood stove	340	400	444	487	494	500	501	501	501	501
20	LH coal stove	155	120	110	100	75	50	45	45	45	45
20	LH cooker	249	500	604	708	726	744	748	748	748	748
20	LH SHR stove	215	300	373	445	498	550	561	561	561	561
20	LH pellet stove	0	230	290	350	375	400	405	405	405	405
20	LH open fire gas	63	90	100	110	110	110	110	110	110	110
20	LH closed fire gas	323	364	375	385	395	405	407	407	407	407
20	LH flueless fuel heater	249	500	475	450	400	350	340	340	340	340
20	LH elec.portable	5901	7200	7428	7657	8003	8349	8418	8418	8418	8418
20	LH elec.convector	9310	11360	11720	12080	12626	13172	13282	13282	13282	13282
20	LH elec.storage	270	330	340	351	367	383	386	386	386	386
20	LH elec.underfloor	1065	1300	1341	1382	1445	1507	1520	1520	1520	1520
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**	**19008**	**24342**	**25351**	**26360**	**27376**	**28392**	**28598**	**28598**	**28598**	**28598**
10	RAC cooling, all RAC types <12 kW	392	4682	7190	9044	9982	10307	10487	10666	10845	11025
10	o/w RAC reversible (also heating)	110	3474	6338	7996	8836	9132	9299	9466	9632	9799
10	**RAC Room Air Conditioner**	**392**	**4682**	**7190**	**9044**	**9982**	**10307**	**10487**	**10666**	**10845**	**11025**
11	**CIRC Circulator pumps <2.5 kW**	**5475**	**8025**	**8550**	**9075**	**9600**	**9495**	**8970**	**8445**	**7920**	**7395**
E6 /10	NRVU Central Unidir. >125W/fan CEXH	168	276	282	290	297	304	312	319	326	333
E6 /10	NRVU Central Balanced >125W/fan	60	256	277	301	326	351	377	402	427	452
E6 /10	RVU Central Unidir. ≤125W/fan	1037	2324	2062	1939	2098	2257	2416	2576	2735	2894
E6 /10	RVU Central Balanced ≤125W/fan	36	256	633	812	913	1013	1114	1214	1315	1415
E6 /10	RVU Local Balanced	7	84	185	300	422	543	665	786	908	1029
E6 /10	**VU Ventilation Units** (res & nonres)	**1309**	**3196**	**3440**	**3642**	**4055**	**4469**	**4883**	**5297**	**5711**	**6125**
8 /9 /19	LFL	269	388	344	347	322	297	272	248	228	208
8 /9 /19	CFL	51	471	406	341	306	271	240	220	200	180
8 /9 /19	Tungsten	88	625	715	750	570	410	298	208	158	148
8 /9 /19	GLS	1688	1164	893	638	377	102	27	1	1	1
8 /9 /19	HID	17	41	36	35	33	33	33	33	33	33
8 /9 /19	LED	0	10	67	341	547	505	449	445	419	386
8 /9 /19	**LS Light Sources, mln units BAU**	**2112**	**2698**	**2461**	**2452**	**2156**	**1618**	**1320**	**1156**	**1039**	**957**

SALES

Lot	SALES, in 000 units (Light in m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
8 /9 /19	LFL	269	390	294	253	134	89	64	39	14	4
8 /9 /19	CFL	51	567	229	102	2	2	2	2	2	2
8 /9 /19	Tungsten	88	650	738	169	11	4	4	4	4	4
8 /9 /19	GLS	1688	697	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	8	312	1153	782	527	496	541	520	546
8 /9 /19	GLS stock		112	223	10						
8 /9 /19	Tungsten stock		90	130	10						
8 /9 /19	**LS Light Sources, mln units ECO**	**2112**	**2354**	**1637**	**1761**	**978**	**666**	**610**	**631**	**585**	**601**
5	DP TV standard	26000	59840	11616	0	0	0	0	0	0	0
5	DP TV LoNA	0	8160	29040	36355	31735	25971	19710	13448	7187	926
5	DP TV Smart	0	0	17424	36355	47603	60599	74347	88094	101842	115590
5	DP Monitor PC	10000	25000	14000	14000	14000	14000	14000	14000	14000	14000
5	**DP electronic DisPlays**	**36000**	**93000**	**72080**	**86710**	**93338**	**100570**	**108056**	**115543**	**123029**	**130515**
18	SSTB Simple STB		26500	6000	0	0	0	0	0	0	0
18	CSTB Complex STB		33250	40740	43897	44404	43285	47028	50771	54514	58258
18	**STB Set Top Boxes**	**0**	**59750**	**46740**	**43897**	**44404**	**43285**	**47028**	**50771**	**54514**	**58258**
E3	VIDEO DVD players/recorders		9133	2500	0	0	0	0	0	0	0
E3	VIDEO projectors	20	2110	1960	1330	575	0	0	0	0	0
E3	VIDEO game consoles		17748	11958	12237	13594	13594	13594	13594	13594	13594
E3	**VIDEO**	**20**	**28990**	**16418**	**13567**	**14169**	**13594**	**13594**	**13594**	**13594**	**13594**
E9	ES Rack servers	90	2370	2650	3075	3700	4700	5100	5000	5000	5000
E9	ES Blade servers	6	67	68	75	89	109	118	114	114	114
E9	ES Storage	11	140	160	176	195	210	220	213	213	213
E9	**ES Enterprise Servers**	**107**	**2577**	**2878**	**3326**	**3984**	**5019**	**5438**	**5327**	**5327**	**5327**
3	PC Desktop	6633	22110	16500	15000	15000	15000	15000	15000	15000	15000
3	PC Notebook	500	36000	16500	15500	15500	15500	15500	15500	15500	15500
3	PC Tablet/slate	0	3795	60000	97500	126000	150000	157500	165000	172500	180000
3	PC Thin client	100	1200	1200	1200	1200	1200	1200	1200	1200	1200
3	PC Workstation	80	800	800	800	800	800	800	800	800	800
3	**PC Personal Computers**	**7313**	**63905**	**95000**	**130000**	**158500**	**182500**	**190000**	**197500**	**205000**	**212500**
4	EP-Copier mono	2337	938	562	238	175	113	50	0	0	0
4	EP-Copier colour	0	188	819	1228	1400	1525	1650	1775	1900	2025
4	EP-printer mono	3534	3347	2931	2392	2050	1825	1575	1325	1075	825
4	EP-printer colour	0	1294	1920	2585	3100	3600	4100	4600	5100	5600
4	IJ SFD printer	6069	9655	6725	4750	3500	3000	2375	1750	1125	500
4	IJ MFD printer	4975	16094	22080	25500	28000	30500	33000	35500	38000	40500
4	**EP & IJ imaging equipment**	**16915**	**31516**	**35037**	**36693**	**38225**	**40563**	**42750**	**44950**	**47200**	**49450**
6 /26	SB Home Gateway		30760	39660	48560	57460	66360	75260	84160	93060	101960
6 /26	SB Home NAS		2800	4800	6800	8800	10800	12800	14800	16800	18800
6 /26	SB Home Phones (fixed)	4600	22886	27457	29286	29286	29286	29286	29286	29286	29286
6 /26	SB Office Phones (fixed)	5829	11143	11857	12571	13286	14000	14714	15429	16143	16857
6 /26	**SB (networked) Stand-By** (rest)	**10429**	**67589**	**83774**	**97217**	**108831**	**120446**	**132060**	**143674**	**155289**	**166903**
7	**BC Battery Charged devices**	**24762**	**333333**	**333333**	**333333**	**333333**	**333333**	**333333**	**333333**	**333333**	**333333**
27	UPS below 1.5 kVA	502	995	1036	1259	1481	1701	1906	2084	2223	2313
27	UPS 1.5 to 5 kVA	202	400	416	506	596	684	766	838	894	930
27	UPS 5 to 10 kVA	13	26	27	32	38	44	49	53	57	59
27	UPS 10 to 200 kVA	7	13	14	17	20	23	25	28	29	31
27	**UPS Total**	**724**	**1434**	**1493**	**1814**	**2135**	**2451**	**2746**	**3003**	**3203**	**3334**
13	**RF Household Refrigeration**	**17500**	**19100**	**19400**	**19700**	**20000**	**20300**	**20600**	**20900**	**21200**	**21500**
12	CF open vertical chilled multi deck (RCV2)	102	162	182	202	222	242	262	282	302	322
12	CF open horizontal frozen island (RHF4)	23	21	24	27	29	32	35	37	40	43
12	CF Plug in one door beverage cooler	612	840	890	940	990	1040	1090	1140	1190	1240
12	CF Plug in horizontal ice cream freezer	238	360	381	403	424	446	467	489	510	532
12	CF Spiral vending machine	79	147	178	215	253	290	328	365	403	440
	CF Commercial Refrigeration	**1054**	**1530**	**1655**	**1786**	**1918**	**2050**	**2182**	**2314**	**2445**	**2577**
E1	PF Service cabinets	296	384	401	416	436	456	476	496	516	536
E1	PF Blast cabinets	90	176	196	212	235	259	283	307	330	354
E1	PF Walk in cold rooms	73	90	94	99	104	108	112	116	121	125
E1	PF CH MT & LT industrial chillers (avg)	3	7	7	8	9	10	11	11	12	13
E1	**PF Professional Refrigeration**	**463**	**656**	**699**	**735**	**784**	**833**	**881**	**930**	**979**	**1028**
22 /23	CA El. Hobs	6543	10349	11250	12169	12891	13582	14272	14963	15654	16345
22 /23	CA El. Ovens	9612	10467	10931	12419	12575	12733	12892	13054	13218	13384
22 /23	CA Gas Hobs	7366	6189	5892	5597	5328	5073	4817	4561	4305	4050
22 /23	CA Gas Ovens	2674	2106	1982	1973	1948	1924	1900	1876	1853	1830
22 /23	CA Range Hoods	5752	7032	7392	7769	8166	8582	8999	9415	9832	10249
22 /23	**CA Cooking Appliances**	**31947**	**36143**	**37448**	**39927**	**40907**	**41893**	**42880**	**43870**	**44863**	**45857**
25	CM Dripfilter (glasss)	18208	12670	10738	8901	8650	8650	8650	8650	8650	8650
25	CM Dripfilter (thermos)	2341	3664	3727	3790	3853	3910	3942	3973	4005	4036
25	CM Dripfilter (full automatic)		1832	2073	2315	2556	2798	3039	3280	3522	3763
25	CM Pad filter		5235	5724	6214	6703	7192	7682	8171	8661	9150
25	CM Hard cap espresso	334	1423	3042	4568	4776	4776	4776	4776	4776	4776
25	CM Semi-auto espresso	572	654	616	577	538	499	461	422	383	345
25	CM Fully-auto espresso	572	654	759	864	969	1074	1179	1284	1389	1494
25	**CM household Coffee Makers**	**22028**	**26132**	**26680**	**27229**	**28047**	**28901**	**29729**	**30558**	**31386**	**32215**

SALES

Lot	**SALES, in 000 units** (Light in m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
14	**WM household Washing Machine**	**9000**	**13099**	**13099**	**14081**	**13518**	**13518**	**13518**	**13518**	**13518**	**13518**
14	**DW Household Dishwashers**	**3200**	**6999**	**8116**	**9233**	**10351**	**11467**	**12583**	**13699**	**14815**	**15931**
16	LD el.vented	1929	2077	1959	1744	1779	1794	1804	1813	1823	1833
16	LD el.condensor	831	3145	3680	4132	4215	4251	4275	4298	4322	4346
16	LD gas.dryer	10	19	23	27	27	28	28	29	29	30
16	**LD household Laundry Drier**	**2769**	**5241**	**5661**	**5902**	**6022**	**6073**	**6107**	**6141**	**6174**	**6208**
17	VC household	16662	52856	74133	90194	99582	108969	118357	127744	137131	146519
17	VC professional	1105	1282	1348	1417	1489	1561	1633	1706	1778	1850
17	**VC Vacuum Cleaners**	**17767**	**54138**	**75481**	**91611**	**101070**	**110530**	**119990**	**129450**	**138909**	**148369**
11	FAN Axial<300Pa (all FAN types >125W)	1597	5234	6008	6782	6782	6782	6782	6782	6782	6782
11	FAN Axial>300Pa	1652	5714	6028	6342	6342	6342	6342	6342	6342	6342
11	FAN Centr.FC	820	2084	2405	2726	2726	2726	2726	2726	2726	2726
11	FAN Centr.BC-free	251	613	696	780	864	880	897	914	930	947
11	FAN Centr.BC	256	681	781	880	979	999	1099	1198	1297	1397
11	FAN Cross-flow	236	528	601	675	748	763	836	909	983	1056
11	**FAN Industrial Fans >125W**	**4813**	**14854**	**16519**	**18184**	**18441**	**18492**	**18681**	**18871**	**19060**	**19250**
11	**MT Motors 0.75-375 kW**	**6719**	**9899**	**10394**	**10850**	**10850**	**10850**	**10850**	**10850**	**10850**	**10850**
11	**WP Water pumps**	**1227**	**1666**	**1791**	**1926**	**2070**	**2214**	**2359**	**2503**	**2648**	**2792**
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	49	52	53	55	57	59	61	63	65	67
31	**CP Standard Air Compressors**	**101**	**106**	**108**	**112**	**117**	**121**	**124**	**128**	**132**	**136**
E2	TRAFO Distribution	60	95	102	110	118	127	135	144	153	162
E2	TRAFO Industry oil	18	29	32	34	36	39	42	45	47	50
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	10	17	29	42	56	69	83
E2	TRAFO Small	38	38	38	38	38	38	38	38	38	38
E2	**TRAFO Utility Transformers**	**122**	**176**	**189**	**204**	**224**	**251**	**280**	**310**	**339**	**369**
	TYRE replacement tyres **in m units**										
T	TYRE car replacement tyres C1	180	222	220	255	288	288	288	288	288	288
T	TYRE van replacement tyres C2	45	55	55	64	72	72	72	72	72	72
T	TYRE truck replacement tyres C3	8.85	8.7	7	7	8	8	8	8	8	8
T	**TYRE Replacement Tyres**	**234**	**286**	**283**	**327**	**368**	**368**	**368**	**368**	**368**	**368**

STOCK (000 units, Lights in m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WH dedicated Water Heater	**15**	**135,540**	**157,293**	**161,740**	**165,192**	**168,688**	**172,268**	**175,851**	**179,436**	**183,021**	**186,606**
CHC Central Heating combi, water heat	**15**	**42,540**	**81,828**	**89,283**	**95,022**	**101,038**	**107,607**	**114,177**	**120,747**	**127,317**	**133,887**
CH Central Heating boiler, space heat	**18**	**69,174**	**110,976**	**119,737**	**128,288**	**137,321**	**148,239**	**160,710**	**174,483**	**188,433**	**202,383**
SFB Wood Manual	**18**	6,625	2,918	2,490	2,003	1,454	931	608	459	405	366
SFB Wood Direct Draft	**18**	71	1,035	2,082	3,101	3,895	4,050	4,325	4,899	5,914	7,195
SFB Coal	**20**	2,165	905	682	455	259	109	55	49	44	40
SFB Pellets	**20**	-	327	613	920	1,190	1,389	1,501	1,605	1,757	1,940
SFB Wood chips	**20**	-	80	102	122	121	123	139	156	173	192
SFB Solid Fuel Boilers		**8,862**	**5,265**	**5,969**	**6,600**	**6,920**	**6,603**	**6,627**	**7,169**	**8,293**	**9,732**
CHAE-S ≤400 kW	**20**	287	1,204	1,519	1,781	1,974	2,170	2,307	2,177	1,759	1,169
CHAE-L > 400 kW	**25**	29	103	126	145	159	165	170	176	183	190
CHWE-S ≤400 kW	**20**	29	122	153	179	198	218	239	261	283	305
CHWE-M >400 kW; ≤1500 kW	**25**	8	29	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**	107	190	214	235	251	264	275	286	297	308
HT PCH-AE-L	**15**	34	60	68	74	79	83	87	91	94	98
HT PCH-WE-S	**15**	28	49	55	61	65	68	71	74	77	80
HT PCH-WE-M	**15**	21	37	42	46	49	52	54	56	59	61
HT PCH-WE-L	**20**	2	4	4	5	5	5	6	6	6	6
AC rooftop	**15**	125	499	548	535	452	305	167	86	63	63
AC splits	**15**	1,054	4,484	4,908	5,062	5,072	4,935	4,745	4,568	4,391	4,215
AC VRF	**15**	0	704	1,136	1,716	2,270	2,973	3,673	4,309	4,909	5,432
ACF	**15**	0	2	5	7	8	10	12	14	16	17
AHC central Air Cooling		**1,727**	**7,500**	**8,830**	**9,908**	**10,653**	**11,323**	**11,884**	**12,187**	**12,224**	**12,035**
AC rooftop (rev)	**15**	78	310	336	322	270	180	90	28	2	0
AC splits (rev)	**15**	764	3,094	3,386	3,494	3,504	3,413	3,284	3,162	3,039	2,918
AC VRF (rev)	**15**	0	619	986	1,459	1,929	2,489	2,998	3,350	3,635	3,831
ACF (rev)	**15**	0	5	9	13	17	20	24	28	31	34
AHF	**16**	1,582	1,565	1,434	1,338	1,255	1,183	1,117	1,052	988	925
AHE	**10**	24	85	73	50	50	50	50	50	50	50
AHC central Air Heating (rev double)		**2,447**	**5,678**	**6,224**	**6,677**	**7,025**	**7,336**	**7,562**	**7,669**	**7,746**	**7,758**
AHC total Heating & Cooling		**3,332**	**9,150**	**10,337**	**11,296**	**11,958**	**12,556**	**13,051**	**13,290**	**13,262**	**13,009**
LH open fireplace	**25**	10,356	15,129	16,415	17,473	18,260	18,721	18,845	18,825	18,780	18,740
LH closed fireplace/inset	**25**	4,638	12,693	15,805	18,968	21,861	24,119	25,586	26,424	26,769	26,877
LH wood stove	**25**	7,715	9,087	9,546	10,152	10,792	11,389	11,927	12,303	12,461	12,513
LH coal stove	**25**	5,265	3,473	3,228	3,010	2,760	2,425	2,042	1,700	1,407	1,209
LH cooker	**15**	2,966	5,998	7,150	8,497	9,738	10,610	11,016	11,160	11,214	11,214
LH SHR stove	**25**	4,433	6,197	6,874	7,821	8,973	10,279	11,629	12,715	13,438	13,859
LH pellet stove	**15**	-	1,945	2,955	3,960	4,785	5,405	5,800	6,001	6,076	6,076
LH open fire gas	**20**	985	1,555	1,698	1,854	1,998	2,110	2,180	2,200	2,200	2,200
LH closed fire gas	**20**	6,076	6,896	7,100	7,305	7,510	7,716	7,899	8,030	8,110	8,140
LH flueless fuel heater	**7**	1,577	3,191	3,410	3,255	3,005	2,660	2,411	2,382	2,382	2,382
LH elec.portable	**9**	51,061	62,345	65,076	67,266	69,673	72,646	75,071	75,765	75,765	75,765
LH elec.convector	**9**	80,563	98,367	102,675	106,130	109,929	114,619	118,445	119,540	119,540	119,540
LH elec.storage	**15**	3,788	4,625	4,841	5,034	5,217	5,417	5,613	5,740	5,788	5,788
LH elec.underfloor	**30**	27,776	33,907	35,560	37,166	38,772	40,411	41,942	43,165	44,141	44,911
LH luminous heaters	**15**	275	336	350	358	360	360	360	360	360	360
LH tube heaters	**20**	359	438	456	470	478	480	480	480	480	480
LH Local Heaters		**207,833**	**266,180**	**283,138**	**298,719**	**314,111**	**329,366**	**341,245**	**346,788**	**348,911**	**350,054**
RAC cooling, all RAC types <12 kW	**12**	4,707	49,224	65,115	82,113	104,151	117,199	122,959	125,623	127,775	129,928
o/w RAC reversible (also heating)	**12**	1,320	28,491	46,222	68,277	91,358	103,727	108,931	111,386	113,387	115,388
RAC Room Air Conditioner		**4,707**	**49,224**	**65,115**	**82,113**	**104,151**	**117,199**	**122,959**	**125,623**	**127,775**	**129,928**
CIRC Circulator pumps <2.5 kW	**10**	**49,800**	**75,225**	**80,775**	**86,025**	**91,275**	**94,635**	**93,585**	**89,175**	**83,925**	**78,675**
NRVU Central Unidir. >125W/fan CEXH (1 fan)	**17**	1,870	4,136	4,479	4,702	4,850	4,974	5,097	5,221	5,346	5,470
NRVU Central Balanced >125W/fan	**17**	232	2,812	3,596	4,307	4,878	5,291	5,713	6,143	6,573	7,004
RVU Central Unidir. ≤125W/fan	**17**	17,063	33,709	37,996	37,252	35,611	35,259	36,807	39,456	42,162	44,868
RVU Central Balanced ≤125W/fan	**17**	162	2,129	4,223	7,454	10,964	14,121	16,184	17,909	19,618	21,327
RVU Local Balanced	**17**	33	630	1,289	2,426	4,022	5,961	7,998	10,063	12,129	14,195
VU Ventilation Units (resident. & nonRes)		**19,360**	**43,417**	**51,583**	**56,142**	**60,325**	**65,605**	**71,799**	**78,793**	**85,828**	**92,864**
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		215000	374912	331064	49976	0	0	0	0	0	0
DP TV LoNA		0	21088	108322	239388	253227	216468	172792	127100	81392	35684
DP TV Smart		0	0	35534	188096	295203	381954	479238	579574	679932	780290
DP Monitor PC	**7**	13000	172000	130000	98000	98000	98000	98000	98000	98000	98000
DP electronic DisPlays		**228,000**	**568,000**	**604,920**	**575,460**	**646,431**	**696,422**	**750,031**	**804,673**	**859,324**	**913,974**
SSTB	**5**	0	98200	77460	2000	0	0	0	0	0	0
CSTB	**5**	0	79500	193573	216489	222795	215157	227654	246370	265086	283802
STB set top boxes (Complex & Simple)		**-**	**177,700**	**271,033**	**218,489**	**222,795**	**215,157**	**227,654**	**246,370**	**265,086**	**283,802**
VIDEO DVD players/recorders	**5**	0	70615	25294	2000	0	0	0	0	0	0
VIDEO projectors	**5**	30	8550	10100	8390	4190	774	0	0	0	0
VIDEO game consoles	**6**	0	71844	82119	75045	72199	81566	81566	81566	81566	81566
VIDEO		**30**	**151,008**	**117,513**	**85,435**	**76,389**	**82,340**	**81,566**	**81,566**	**81,566**	**81,566**
ES Rack servers	**5**	350	11136	12909	14325	17200	21300	25600	25000	25000	25000
ES Blade servers	**5**	20	333	355	358	414	499	598	570	570	570
ES Storage	**4**	41	548	637	683	755	823	910	852	852	852
ES Enterprise Servers		**411**	**12,017**	**13,901**	**15,366**	**18,369**	**22,622**	**27,108**	**26,422**	**26,422**	**26,422**
PC Desktop	**5**	28743	110940	97110	75500	75000	75000	75000	75000	75000	75000
PC Notebook	**4**	500	120000	94500	62000	62000	62000	62000	62000	62000	62000
PC Tablet/slate	**4**	0	3795	157500	337500	471000	586500	621000	651000	681000	711000
PC Thin client	**4**	100	4800	4800	4800	4800	4800	4800	4800	4800	4800
PC Workstation	**4**	80	3200	3200	3200	3200	3200	3200	3200	3200	3200
PC Personal Computers		**29,423**	**242,735**	**357,110**	**483,000**	**616,000**	**731,500**	**766,000**	**796,000**	**826,000**	**856,000**
EP-Copier mono	**4**	9754	4282	2731	1222	775	525	275	38	0	0
EP-Copier colour	**4**	0	673	2584	4590	5446	5950	6450	6950	7450	7950
EP-printer mono	**4**	14078	13790	12328	10215	8683	7625	6600	5600	4600	3600
EP-printer colour	**4**	0	4529	6840	9650	11755	13800	15800	17800	19800	21800
IJ SFD printer	**4**	22108	42138	30415	20566	15500	12875	10250	7750	5250	2750
IJ MFD printer	**4**	18122	57191	81137	98889	109000	119000	129000	139000	149000	159000
EP & IJ imaging equipment	**4**	**64,063**	**122,603**	**136,035**	**145,132**	**151,159**	**159,775**	**168,375**	**177,138**	**186,100**	**195,100**
SB Home Gateway	**5**	-	135,900	180,500	225,000	269,500	314,000	358,500	403,000	447,500	492,000
SB Home NAS	**5**	-	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
SB Home Phones (fixed)	**7**	13,886	141,000	173,000	199,514	205,000	205,000	205,000	205,000	205,000	205,000
SB Office Phones (fixed)	**7**	15,429	75,000	80,000	85,000	90,000	95,000	100,000	105,000	110,000	115,000
SB (networked) Stand-By (rest)		**29,314**	**361,900**	**453,500**	**539,514**	**604,500**	**664,000**	**723,500**	**783,000**	**842,500**	**902,000**
BC Battery Charged devices	**3**	**6.14E+04**	**1.00E+06**	**1.00E+06**	**1.00E+06**	**1.00E+06**	**1.00E+06**	**1.00E+06**	**1.00E+06**	**1.00E+06**	**1.00E+06**
UPS below 1.5 kVA	**4**	1,871	4,007	4,045	4,767	5,658	6,543	7,384	8,132	8,739	9,162
UPS 1.5 to 5 kVA	**8**	1,371	2,980	3,226	3,581	4,263	4,977	5,669	6,302	6,837	7,238
UPS 5 to 10 kVA	**10**	105	229	256	279	329	386	441	493	537	572
UPS 10 to 200 kVA	**12**	62	139	155	169	197	232	267	299	328	350
UPS Total		**3,408**	**7,355**	**7,682**	**8,796**	**10,447**	**12,138**	**13,761**	**15,227**	**16,441**	**17,322**
RF Household Refrig. & freezers	**16**	**268,000**	**297,800**	**303,200**	**308,000**	**312,800**	**317,600**	**322,400**	**327,200**	**332,000**	**336,800**
CF open vertical chilled multi deck (RCV2)	**9**	823	1,328	1,492	1,672	1,852	2,033	2,214	2,395	2,576	2,757
CF open horizontal frozen island (RHF4)	**9**	213	180	196	219	243	268	292	316	341	365
CF Plug in one door beverage cooler	**8**	4,580	6,378	6,833	7,240	7,640	8,040	8,440	8,840	9,240	9,640
CF Plug in horizontal ice cream freezer	**8**	1,727	2,725	2,928	3,103	3,275	3,447	3,619	3,791	3,963	4,135
CF Spiral vending machine	**9**	608	1,157	1,382	1,674	2,003	2,341	2,678	3,016	3,353	3,691
CF Commercial Refrigeration		**7,951**	**11,768**	**12,831**	**13,907**	**15,014**	**16,129**	**17,243**	**18,358**	**19,473**	**20,587**
PF Service cabinets	**9**	2,406	3,309	3,485	3,635	3,784	3,958	4,138	4,318	4,498	4,677
PF Blast cabinets	**9**	664	1,410	1,618	1,794	1,958	2,162	2,376	2,590	2,803	3,017
PF Walk in cold rooms	**17**	1,113	1,428	1,494	1,563	1,634	1,713	1,789	1,862	1,935	2,008
PF CH MT & LT industrial chillers (avg)	**15**	39	81	93	106	117	129	142	154	167	180
PF Remote condensing units (double count)	***8***	*6,199*	*4,976*	*4,598*	*4,267*	*3,915*	*3,563*	*3,211*	*2,859*	*2,507*	*2,155*
PF Professional Refrigeration		**4,222**	**6,228**	**6,690**	**7,098**	**7,494**	**7,962**	**8,444**	**8,924**	**9,403**	**9,882**
CA El. Hobs	**15**	83,689	133,781	149,114	163,566	176,468	188,544	199,516	209,940	220,302	230,665
CA El. Ovens	**19**	174,643	191,823	199,332	209,502	220,505	232,059	239,092	242,545	245,592	248,678
CA Gas Hobs	**15**	116,538	97,479	93,516	89,725	85,806	81,628	77,650	73,787	69,951	66,114
CA Gas Ovens	**19**	56,691	44,735	42,390	40,275	38,748	37,653	36,918	36,463	36,010	35,562
CA Range Hoods	**14**	74,990	92,371	97,111	102,060	107,267	112,741	118,428	124,235	130,067	135,898
CA Cooking Appliances		**506,551**	**560,188**	**581,463**	**605,128**	**628,793**	**652,625**	**671,603**	**686,971**	**701,922**	**716,917**
CM Dripfilter (glass)	**6**	113,689	79,307	70,533	58,499	52,237	51,903	51,903	51,903	51,903	51,903
CM Dripfilter (thermos)	**6**	7,256	21,778	22,174	22,553	22,932	23,304	23,556	23,745	23,934	24,124
CM Dripfilter (full automatic)	**6**	-	10,134	11,717	13,165	14,613	16,061	17,509	18,957	20,405	21,854
CM Pad filter	**6**	-	28,953	32,876	35,813	38,750	41,686	44,623	47,560	50,496	53,433
CM Hard cap espresso	**6**	585	7,892	13,167	23,178	28,380	28,657	28,657	28,657	28,657	28,657
CM Semi-auto espresso	**6**	2,639	3,889	3,810	3,578	3,345	3,113	2,881	2,648	2,416	2,184
CM Fully-auto espresso	**6**	2,639	3,889	4,241	4,871	5,501	6,131	6,761	7,391	8,021	8,651
CM household Coffee Makers		**126,808**	**155,842**	**158,518**	**161,657**	**165,757**	**170,855**	**175,890**	**180,861**	**185,833**	**190,805**

STOCK (000 units, Lights in m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WM household Washing Machine	**15**	**121,000**	**185,828**	**196,821**	**200,805**	**202,648**	**204,744**	**203,893**	**202,766**	**202,766**	**202,766**
DW Household Dishwashers	**15**	**36,633**	**82,799**	**98,345**	**115,036**	**131,797**	**148,553**	**165,303**	**182,047**	**198,790**	**215,532**
LD el.vented	**13**	19,827	28,620	27,532	25,417	23,986	23,156	23,265	23,421	23,547	23,672
LD el.condensor	**13**	3,474	33,892	40,241	46,098	51,455	54,269	55,130	55,508	55,818	56,126
LD gas.dryer	**13**	87	211	245	287	327	353	362	368	375	382
LD household Laundry Drier		**23,388**	**62,723**	**68,018**	**71,801**	**75,767**	**77,778**	**78,757**	**79,297**	**79,739**	**80,180**
VC household		150189	356718	380966	411114	479133	536028	573008	619945	666882	713820
VC professional	**6**	6,545	7,508	7,891	8,293	8,716	9,150	9,583	10,017	10,451	10,884
VC Vacuum Cleaners		**156,734**	**364,226**	**388,857**	**419,407**	**487,849**	**545,178**	**582,591**	**629,962**	**677,333**	**724,704**
FAN Axial<300Pa (all FAN types >125W)	**15**	23,948	65,745	77,172	86,152	94,761	100,181	101,729	101,729	101,729	101,729
FAN Axial>300Pa	**15**	24,781	72,975	83,700	88,535	92,302	94,500	95,128	95,128	95,128	95,128
FAN Centr.FC	**15**	12,298	25,886	31,472	35,105	38,002	40,248	40,890	40,890	40,890	40,890
FAN Centr.BC-free	**15**	3,771	7,826	9,302	10,206	11,199	12,227	12,946	13,331	13,605	13,856
FAN Centr.BC	**15**	3,844	8,666	10,400	11,439	12,606	13,818	14,910	16,003	17,374	18,864
FAN Cross-flow	**15**	3,547	6,295	7,254	8,427	9,677	10,573	11,380	12,188	13,201	14,302
FAN Industrial Fans >125W *(excl. box/ roof)*		**72,190**	**187,392**	**219,299**	**239,865**	**258,547**	**271,546**	**276,983**	**279,268**	**281,927**	**284,769**
MT Motors 0.75-375 kW	**12**	**72,282**	**106,468**	**116,446**	**123,933**	**128,273**	**130,104**	**130,196**	**130,196**	**130,196**	**130,196**
WP Water pumps	**11**	**12,526**	**17,050**	**18,355**	**19,732**	**21,211**	**22,770**	**24,358**	**25,947**	**27,536**	**29,124**
CP Fixed Speed 5-1280 l/s	12	284	613	552	499	500	517	534	551	568	585
CP Variable speed 5-1280 l/s	12	-	45	98	144	170	178	185	190	196	202
CP Pistons 2-64 l/s	9	398	502	490	492	510	528	546	563	580	597
CP Standard Air Compressors		**681**	**1,161**	**1,139**	**1,136**	**1,180**	**1,223**	**1,265**	**1,304**	**1,344**	**1,385**
TRAFO Distribution	**40**	1,523	2,540	2,841	3,151	3,471	3,798	4,131	4,465	4,793	5,125
TRAFO Industry oil	**25**	329	572	639	705	769	829	890	955	1,021	1,090
TRAFO Industry dry	**30**	71	122	137	151	165	180	193	207	221	236
TRAFO Power	**30**	47	73	82	91	100	108	117	125	134	144
TRAFO DER oil	**25**	-	8	15	25	42	69	111	167	236	315
TRAFO DER dry	**25**	-	32	58	100	166	275	443	668	945	1,261
TRAFO Small	**20**	750	750	750	750	750	750	750	750	750	750
TRAFO Utility Transformers		**2,720**	**4,097**	**4,521**	**4,973**	**5,462**	**6,009**	**6,635**	**7,337**	**8,100**	**8,920**
TYRE in m units											
TYRE car replacement tyres C1	**4**	720	877	892	1,025	1,181	1,212	1,212	1,212	1,212	1,212
TYRE van replacement tyres C2	**3**	153	177	181	209	241	245	245	245	245	245
TYRE truck replacement tyres C3	**3**	30	29	25	25	25	26	26	26	26	26
TYRE Replacement Tyres		**903**	**1,083**	**1,097**	**1,260**	**1,447**	**1,483**	**1,483**	**1,483**	**1,483**	**1,483**

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 kW; ≤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 <12kV 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)* kWh prim/a	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	0.3	454	454	-7
RVU Central Balanced VU ≤125W/fan (2 fans)	TEC	1	50	143	0.4	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	24h duty cycle: 0.25h/d record, 0.75h/d play, 2h live-pause (with also HDD), 4h on-idle, 17h sb or off
VIDEO projectors	TEC	24h duty cycle: 2.1 on, 8.5 sb, 13.5h off
VIDEO game consoles	TEC	24h duty cycle: 0.5h on, rest sb

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 EP-Copier colour EP-printer mono	TEC TEC 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.
EP-printer colour	TEC	Voluntary Agreement (www.eurovaprint.eu) currently says that on 1.1.2012 90% of models will comply with Energy Star v.1.1.
IJ SFD printer	OM	
IJ MFD printer	OM	
Duplexing		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%). 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 — average from CECED database

RF Estimated equivalent volume Veq ltr — Veq=SUM [Vc x (25-Tc)/20 x FFc] x CC x BI ≈ (Freeze_net*2.15+Vfridge_net) x 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

CF open vertical chilled multi deck (RCV2) TEC — TEC=E24h x 365 (test standard to do). Uses remote condensing unit. Total Display Area (TDA) is 7 m^2, temperature class M2 (-1 to +7 °C), test ambient 25 °C, correction Real vs. Test=0.77

CF open horizontal frozen island (RHF4) TEC — TEC=E24h x 365 (test standard to do). Uses remote condensing unit. Total Display Area (TDA) is 7 m^2, temperature class L2 (-12 to -18 °C), test ambient 25 °C, correction Real vs. Test=0.88.

CF Plug in one door beverage cooler TEC — TEC=E24h x 365 (test standard to do). Net volume 0.5 m^3, temperature class H1 (+1 to +10 °C), test ambient 30 °C, correction Real vs. Test=0.80.

CF Plug in horizontal ice cream freezer TEC — TEC=E24h x 365 (test standard to do). Net volume 0.291 m^3, temperature class L1 (-15 to -18 °C), test ambient 25 °C, correction Real vs. Test=0.89.

CF Spiral vending machine TEC — TEC=E24h x 365 (test standard to do). Net volume 0.75 m^3 (288 cans), temperature class M2 (-1 to +7 °C), test ambient 25 °C, correction Real vs. Test=1.00.

PF Professional Refrigeraton

PF Service cabinets TEC — Test standard to be developed with ECFEM. Average size in dbase 437 ltr.: CH-Hor 589 ltr (40%), CH-Vert 285 ltr(35%), FR-Hor 539 ltr (20%), FR-Vert 204 ltr (5%) .

PF Blast cabinets TEC — TEC based on 5h/d usage. Average 3030 kWh/a (BAU, according to IA report). 15% (capacity >70 kg up to 300 kg) have remote condensing unit (85% are integral cabinets, usually<60 kg cap.). Mandate for new EN standard is considered on the basis of French standard NF AC D40-003. Metric kWh/kg foodstuff. The model assumes 30 kg foodstuff x 5/d=150 kg/d, 300 d)

PF Walk in cold rooms TEC — Average WICR is 29.55 m^3 (20.1 chilled + 9.45 frozen): 67% small (15, <20), 31% medium (50, 20-100), 2% large (200, 100-400 m^3)

PF MT & LT industrial process chillers	TEC	Average 418 MWh/a: MT-AC (air cooled) 312, MT-WC (water cooled) 391, LT-AC 643, LT-WC 627
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	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).
VC non-dom	h/a	

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
FAN Cross-flow	kWh flow/ a	0.015	1865

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)	kWh elec/a	1	1	1	1	1	1	1	1	1	1
NRVU avg (stock weighted 2010)	kWh prim/a	1	1	1	1	1	1	1	1	1	1
RVU Central Unidir. VU ≤125W/fan (1 fan)	TEC	1	1	1	1	1	1	1	1	1	1
RVU Central Balanced VU ≤125W/fan (2 fans)	TEC	1	1	1	1	1	1	1	1	1	1
RVU Local Balanced VU (≤125 W, also NR) (2 fans)	TEC	1	1	1	1	1	1	1	1	1	1
RVU Central Unidir. VU ≤125W/fan (1 fan)	TEC	1	1	1	1	1	1	1	1	1	1
RVU Central Balanced VU ≤125W/fan (2 fans)	TEC	1	1	1	1	1	1	1	1	1	1
RVU Local Balanced VU (≤125 W, also NR) (2 fans)	TEC	1	1	1	1	1	1	1	1	1	1

VU reference: natural ventilation 220 m^3/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	2277	2238	2278	2261	2237	2168	2086	2005	1924	1842
CFL	lm	590	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	12044	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
								0			
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 (RCV2)	TEC	1	1	1	1	1	1	1	1	1	1
CF open horizontal frozen island (RHF4)	TEC	1	1	1	1	1	1	1	1	1	1
CF Plug in one door beverage cooler	TEC	1	1	1	1	1	1	1	1	1	1
CF Plug in horizontal ice cream freezer	TEC	1	1	1	1	1	1	1	1	1	1
CF Spiral vending machine	TEC	1	1	1	1	1	1	1	1	1	1
PF Service cabinets	TEC	1	1	1	1	1	1	1	1	1	1
PF Blast cabinets	TEC	1	1	1	1	1	1	1	1	1	1
PF Walk in cold rooms	TEC	1	1	1	1	1	1	1	1	1	1
PF MT & LT industrial process chillers	TEC	1	1	1	1	1	1	1	1	1	1
PF Remote condensing units (double count)	TEC	1	1	1	1	1	1	1	1	1	1
								0			
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	1	1	1
								0			
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	689	689	689
								0	0	0	0
VC dom (87 m²/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
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	4,593	4,593	4,593	4,593	4,593	4,593	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
								0	0	0	0
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

LOAD

TYRE											
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**	**189**	**240**	**255**	**269**	**284**	**299**	**314**	**330**	**347**	**363**
Total CH Central Heating combi, water heat	**TWh prim heat/a**	**106**	**188**	**207**	**222**	**239**	**258**	**277**	**297**	**317**	**337**
Total CH Central Heating boiler, space heat	**TWh prim heat/a**	**1164**	**1305**	**1245**	**1179**	**1113**	**1082**	**1050**	**1006**	**942**	**857**
SFB Wood Manual	TWh heat/a	97	43	35	26	18	11	7	5	4	4
SFB Wood Direct Draft	TWh heat/a	1	17	32	45	54	54	55	59	68	78
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	26
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**	**104**	**111**	**111**	**103**	**100**	**104**	**113**	**125**
CHAE-S ≤400 kW	TWh cool/a	9	32	38	43	45	47	47	43	33	21
CHAE-L > 400 kW	TWh cool/a	15	44	51	56	59	58	57	56	55	55
CHWE-S ≤400 kW	TWh cool/a	1	4	5	6	6	7	7	7	7	7
CHWE-M >400 kW; ≤1500 kW	TWh cool/a	5	15	17	19	20	20	19	19	19	19
CHWE-L > 1500 kW	TWh cool/a	3	9	11	12	13	13	12	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	164	185	203	217	228	238	248	257	267
HT PCH-AE-L	TWh cool/a	96	170	191	210	224	236	246	256	266	276
HT PCH-WE-S	TWh cool/a	31	54	61	67	72	75	78	82	85	88
HT PCH-WE-M	TWh cool/a	69	123	138	152	162	171	178	185	192	199
HT PCH-WE-L	TWh cool/a	13	24	27	30	33	35	37	38	40	41
AC rooftop	TWh cool/a	6	21	22	20	16	10	5	3	2	2
AC splits	TWh cool/a	13	45	47	46	44	41	37	34	31	28
AC VRF	TWh cool/a	0	12	18	26	33	41	48	54	58	61
ACF	TWh cool/a	0	0	0	0	0	0	0	0	0	0
AHC central Air Cooling	**TWh cool/a**	**355**	**718**	**812**	**891**	**944**	**981**	**1011**	**1037**	**1058**	**1076**
AC rooftop (rev)	TWh heat/a	9	30	31	29	23	14	7	2	0	0
AC splits (rev)	TWh heat/a	22	72	75	74	71	65	60	55	50	46
AC VRF (rev)	TWh heat/a	0	24	37	52	65	80	92	97	101	101
ACF (rev)	TWh heat/a	0	0	0	1	1	1	1	1	1	1
AHF	TWh heat/a	137	111	97	86	77	69	62	55	50	44
AHE	TWh heat/a	1	2	2	1	1	1	1	1	1	1
AHC central Air Heating	**TWh heat/a**	**169**	**241**	**243**	**242**	**237**	**231**	**222**	**212**	**203**	**193**
AHC total Heating & Cooling	**TWh heat/a**	**524**	**958**	**1055**	**1133**	**1181**	**1211**	**1234**	**1248**	**1261**	**1269**
								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	38	43	46	48	48	48	47
LH wood stove	TWh heat/a	23	24	25	26	27	28	28	29	28	28
LH coal stove	TWh heat/a	16	9	8	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	22	25	28	30	30	31
LH pellet stove	TWh heat/a	0	6	9	12	14	16	17	17	16	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	21	21	21	20
LH elec.convector	TWh heat/a	76	84	85	86	87	88	89	87	85	83
LH elec.storage	TWh heat/a	6	6	6	6	6	6	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		**198**	**237**	**251**	**265**	**277**	**287**	**292**	**291**	**287**	**281**
RAC (cooling demand), <12 kW	**TWh cool/a**	**5**	**56**	**75**	**96**	**123**	**141**	**151**	**157**	**162**	**168**
RAC (heating demand), reversible <12kW	**TWh heat/a**	**4**	**59**	**90**	**127**	**163**	**176**	**176**	**171**	**165**	**158**
CIRC Circulator pumps <2.5 kW	**TWh flow/a**	**44**	**18**	**13**	**8**	**5**	**2**	**1**	**1**	**1**	**1**
NRVU total ventilated (17.3 Mm³/a)	T m³/a	4.02	48.64	62.21	74.51	84.39	91.54	98.84	106.27	113.72	121.16
NRVU ventilated during heating season (10.08 Mm³/a)	T m³/a	2.34	28.34	36.25	43.41	49.17	53.34	57.59	61.92	66.26	70.60
NRVU total heat saved (8606 kWh/Mm³= GWh/Tm³)	TWh/a	20	244	312	374	423	459	496	533	570	608
RVU Central Unidir. VU ≤125W/fan (173 m³/h)	T m³/a	25.86	51.09	57.58	56.45	53.97	53.43	55.78	59.80	63.90	68.00
RVU Central Balanced VU≤125W/fan (143 m³/h)	T m³/a	0.20	2.67	5.29	9.34	13.73	17.69	20.27	22.43	24.57	26.72
RVU Local Balanced VU (≤125 W, also NR) (70 m³/h per unit)	T m³/a	0.020	0.386	0.790	1.488	2.466	3.655	4.904	6.171	7.438	8.704
RVU total ventilated	T m³/a	26.1	54.1	63.7	67.3	70.2	74.8	81.0	88.4	95.9	103.4
RVU Central Unidir. , heat saved (951 kWh/a)	TWh/a	16.23	32.06	36.13	35.43	33.87	33.53	35.00	37.52	40.10	42.67
RVU Central Balanced VU ≤125W/fan (3863 kWh/a)≤	TWh/a	0.63	8.23	16.32	28.80	42.35	54.55	62.52	69.18	75.78	82.39
RVU Local Balanced VU (1706 kWh/a)	TWh/a	0.06	1.07	2.20	4.14	6.86	10.17	13.64	17.17	20.69	24.22
VU Ventilation Units, total ventilated	**T m³/a**	**30**	**103**	**126**	**142**	**155**	**166**	**180**	**195**	**210**	**225**

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	2.64	4.32	4.92	4.32	2.91	1.73	1.21	0.83	0.45	0.16
CFL	Tlm	0.19	1.98	2.45	1.84	0.66	0.19	0.02	0.01	0.01	0.01
Tungsten	Tlm	0.25	1.46	1.41	0.74	0.10	0.02	0.02	0.02	0.02	0.02
GLS	Tlm	1.91	1.00	0.07	0.08	0.05	0.04	0.04	0.04	0.04	0.04
HID	Tlm	0.49	1.26	0.87	0.62	0.36	0.20	0.20	0.20	0.20	0.20
LED	Tlm	0.00	0.01	0.55	4.95	9.68	13.01	14.67	15.96	17.25	18.53
GLS stock	Tlm	0.00	0.10	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tungsten stock	Tlm	0.00	0.00	0.22	0.04	0.00	0.00	0.00	0.00	0.00	0.00
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**	**21**	**111**	**175**	**255**	**341**	**429**	**531**	**645**	**769**	**904**
DP Monitor viewable area (avg.of all types), sales	**km²**	**1**	**20**	**18**	**16**	**18**	**20**	**22**	**24**	**26**	**28**
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	330	396	398	457	499	543	589	634	680
DP Monitor standby	Th sb/a	2	29	22	16	16	16	16	16	16	16
DP electronic DisPlays	**km²**	**22**	**131**	**192**	**270**	**359**	**449**	**553**	**669**	**795**	**933**
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	0.35	0.37	0.40	0.44	0.47
VIDEO players/recorders (1 h/d play or record)	Th on/a	0.000	0.026	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000
VIDEO projectors (2.1 h/d on)	Th on/a	0.000	0.007	0.008	0.006	0.003	0.001	0.000	0.000	0.000	0.000
VIDEO game consoles (0.5 h/d active play)	Th on/a	0.000	0.013	0.015	0.014	0.013	0.015	0.015	0.015	0.015	0.015
ES Rack servers	m units	0.4	11.1	12.9	14.3	17.2	21.3	25.6	25.0	25.0	25.0
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	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9
PC Desktop	m units	29	111	97	76	75	75	75	75	75	75
PC Notebook	m units	1	120	95	62	62	62	62	62	62	62
PC Tablet/slate	m units	0	4	158	338	471	587	621	651	681	711
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	667	557	514	460	433	422	411	400	396	392
EP-Colour images per yr (28k ipy/unit, col.=35% BW)	bn ipy	0	95	172	259	313	359	405	450	496	541
IJ-BW images (1k ipy/unit, colour=35% BW)	bn ipy	28	62	59	55	54	55	55	56	57	58
IJ-Colour images (1k ipy/unit, colour=35% BW)	bn ipy	12	37	53	64	71	77	84	90	97	103
Total images per year	bn ipy	708	751	797	838	871	913	955	998	1046	1096
Total sheets per year at 65% duplex, 15% N print	bn A4-sheets	442	469	498	523	544	570	596	623	653	684
EP&IJ Paper for sheets (200 sheets/ kg)	Mt/a	2.2	2.3	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	0.57	0.69	0.80	0.92	1.03	1.14	1.26
SB Home NAS, on-mode hours	Th on/a	0.00	0.01	0.02	0.03	0.04	0.05	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	2.9
UPS 1.5 to 5 kVA	GW output	2.6	5.8	6.2	6.9	8.2	9.6	11.0	12.2	13.2	14.0
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	7.4	8.6	10.2	11.7	13.1	14.4	15.3
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°	11.9	17.0	18.6	20.1	21.8	23.5	25.4	27.3	29.3	31.3
RF refrigerator net volume	M m³ @ 5C°	42.3	60.2	65.8	71.3	77.1	83.5	90.1	96.9	103.8	110.9
CF open vertical chilled multi deck (RCV2) (3.5 m³)	M m³ @ 5C°	2.88	4.65	5.22	5.85	6.48	7.12	7.75	8.38	9.02	9.65
CF open horizontal frozen island (RHF4) (3.5 m³)	M m³ @ -18C°	0.75	0.63	0.68	0.77	0.85	0.94	1.02	1.11	1.19	1.28
CF Plug in one door beverage cooler (0.5 m³)	M m³ @ 5C°	2.29	3.19	3.42	3.62	3.82	4.02	4.22	4.42	4.62	4.82
CF Plug in horizontal ice cream freezer (0.291 m³)	M m³ @ -18C°	0.50	0.79	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20
CF Spiral vending machine (0.75 m³)	M m³ @ 5C°	0.46	0.87	1.04	1.26	1.50	1.76	2.01	2.26	2.52	2.77
PF Service cabinets (27% freeze of 437.5 ltr=118 ltr)	M m³ @ -18C°	0.284	0.391	0.411	0.429	0.447	0.467	0.488	0.509	0.531	0.552
PF Service cabinets (73% fridge of 437.5 ltr=319.5)	M m³ @ 5C°	0.769	1.057	1.113	1.161	1.209	1.265	1.322	1.379	1.437	1.494
PF Blast cabinets (est. 30 kg foodstuff x 5/d=150 kg/d, 3	Mt food/a	30	63	73	81	88	97	107	117	126	136
PF Walk in cold rooms FR (V=29.55 m³, 32% frozen)	M m³ @ -18C°	10.5	13.5	14.1	14.8	15.5	16.2	16.9	17.6	18.3	19.0
PF Walk in cold rooms CH (V=29.55 m³, 68% chilled)	M m³ @ 5C°	22.4	28.7	30.0	31.4	32.8	34.4	35.9	37.4	38.9	40.3
PF MT & LT industrial process chillers	m units/a	0.04	0.08	0.09	0.11	0.12	0.13	0.14	0.15	0.17	0.18
Total freezer volume (excl. process chillers)	M m³ @ -18C°	**24**	**32**	**35**	**37**	**39**	**42**	**45**	**48**	**50**	**53**
Total refrigerator volume (excl. process chillers)	M m³ @ 5C°	**71**	**99**	**107**	**115**	**123**	**132**	**141**	**151**	**160**	**170**
COOK El. Hobs (heating + keep 20 min. warm 1229 ltr w	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	143	120	115	110	105	100	95	91	86	81
COOK Gas Ovens (110 cycles/a)	bn cyc/a	6.2	4.9	4.7	4.4	4.3	4.1	4.1	4.0	4.0	3.9
COOK Range Hoods (365 h/a extraction)	Th/a	27.4	33.7	35.4	37.3	39.2	41.2	43.2	45.3	47.5	49.6
								0			
COFFEE Dripfilter (glass), 3 cups (135 g), 2 times/d	bn filter cups/a	249	174	154	128	114	114	114	114	114	114
COFFEE Dripfilter (thermos)	bn filter cups/a	16	48	49	49	50	51	52	52	52	53
COFFEE Dripfilter (full automatic)	bn filter cups/a	0	22	26	29	32	35	38	42	45	48
COFFEE Pad filter	bn filter cups/a	0	63	72	78	85	91	98	104	111	117
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**	**278**	**341**	**347**	**354**	**363**	**374**	**385**	**396**	**407**	**418**
EU-28 no.of households	*m*	*172*	*211*	*218*	*223*	*224*	*225*	*227*	*228*	*228*	*228*
COFFEE per household/ day	*cups/d.household*	*4.43*	*4.44*	*4.36*	*4.35*	*4.44*	*4.55*	*4.66*	*4.77*	*4.89*	*5.01*
EU-28 population	*m*	*475*	*503*	*508*	*512*	*515*	*518*	*521*	*524*	*525*	*526*
COFFEE per capita/day, in households	*cups/d.capita*	*1.60*	*1.86*	*1.87*	*1.89*	*1.93*	*1.98*	*2.03*	*2.07*	*2.13*	*2.18*
WM laundry washed	**Mt laundry/a**	**83**	**131**	**138**	**140**	**141**	**142**	**142**	**141**	**141**	**141**
DW place settings washed	**bn ps/a**	**52**	**154**	**188**	**224**	**257**	**290**	**322**	**355**	**388**	**420**
LD vented el.	Mt laundry/a	10.8	21.4	22.1	21.0	19.9	19.3	19.4	19.5	19.6	19.7
LD condens el.	Mt laundry/a	1.9	25.3	32.4	38.0	42.8	45.2	45.9	46.2	46.5	46.8
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**	**59**	**63**	**65**	**66**	**66**	**66**	**67**
VC dom (87m² x 50 times/a=4350 m²-->/57h=76.3m³/h	1000 km²/a	659	889	907	959	1007	1025	995	968	924	864
VC nondom (76.3 m²/h)	1000 km²/a	250	286.42	301	316	333	349	366	382	399	415
VC Vacuum Cleaners	**1000 km²/a**	**908**	**1,176**	**1,208**	**1,275**	**1,339**	**1,374**	**1,361**	**1,350**	**1,323**	**1,280**
FAN Axial<300Pa (all FAN types >125W)	TWh flow/ a	6	16	19	21	23	25	25	25	25	25
FAN Axial>300Pa	TWh flow/ a	12	36	41	43	45	46	47	47	47	47
FAN Centr.FC	TWh flow/ a	3	5	7	7	8	9	9	9	9	9
FAN Centr.BC-free	TWh flow/ a	12	25	30	32	36	39	41	42	43	44
FAN Centr.BC	TWh flow/ a	12	27	32	35	39	43	46	49	53	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**	**109**	**128**	**140**	**151**	**161**	**168**	**172**	**177**	**183**
MT Motors 0.75-375 kW	**TWh output/a**	**581**	**856**	**936**	**996**	**1031**	**1046**	**1047**	**1047**	**1047**	**1047**
WP Water pumps (load)	**TWh flow/a**	**58**	**78**	**84**	**91**	**97**	**105**	**112**	**119**	**126**	**134**
CP Fixed Speed 5-1280 l/s	TWh flow/a	13.6	30.3	25.7	22.5	22.2	22.9	23.6	24.4	25.1	25.8
CP Variable speed 5-1280 l/s	TWh flow/a	0.0	5.9	10.2	13.0	14.3	14.9	15.3	15.7	16.1	16.5
CP Pistons 2-64 l/s	TWh flow/a	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
CP Standard Air Compressors	**TWh flow/a**	**14.1**	**36.9**	**36.6**	**36.2**	**37.2**	**38.5**	**39.7**	**40.9**	**42.0**	**43.1**
TRAFO Distribution	m units/a	1.52	2.54	2.84	3.15	3.47	3.80	4.13	4.46	4.79	5.12
TRAFO Industry oil	m units/a	0.33	0.57	0.64	0.70	0.77	0.83	0.89	0.95	1.02	1.09
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	0.13	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	0.27	0.44	0.67	0.94	1.26
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**	**2.72**	**4.10**	**4.52**	**4.97**	**5.46**	**6.01**	**6.63**	**7.34**	**8.10**	**8.92**
TYRE cars, distance travelled with replacement tyres C1	bn km/a		2182								
TYRE vans, distance travelled with replacement tyres C1	bn km/a		496								
TYRE trucks, distance travelled with replacement tyres	bn km/a		127								
Tyres	**bn km/a**		**2805**								

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	17	17	17	17	17	17	17	17	17	17
VIDEO projectors	kWh/a	200	200	200	200	200	200	200	200	200	200
VIDEO game consoles	kWh/a	0	30	30	44	51	56	61	66	71	76
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	16	11	10	9	8	6	5	4	3	2
SB Home NAS, on-mode power	W	26	19	17	15	13	11	9	7	5	3
SB Home Phones (fixed), on-mode power	W	6	4	4	3	3	2	2	1	1	1
SB Office Phones (fixed), on-mode power	W	8	6	5	4	4	3	3	2	1	1
SB Home Gateway, standby power	W	16	4	1	0	0	0	0	0	0	0
SB Home NAS, standby power	W	7	5	4	4	3	3	2	2	1	1
SB Home Phones (fixed), standby power	W	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
SB Home Gateway, idle power	W	13	9	8	7	6	5	4	3	2	1
SB Home NAS, idle power	W	20	14	13	11	10	8	7	5	4	2
SB Home Phones (fixed), idle power	W	5	3	3	3	2	2	1	1	1	0
SB Office Phones (fixed), idle power	W	7	5	4	4	3	3	2	2	1	1
BC_EPS Mobile phones etc.	W	0.50	0.50	0.50	0.50	0.50	0.50	0.28	0.27	0.25	0.23
UPS below 1.5 kVA	%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
UPS 1.5 to 5 kVA	%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
UPS 5 to 10 kVA	%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
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 (RCV2)	MWh/a	33.4	27.4	26.1	24.8	23.6	22.4	21.3	20.2	19.1	18.0
CF open horizontal frozen island (RHF4)	MWh/a	35.2	28.8	27.4	26.1	24.8	23.6	22.4	21.3	20.1	18.9
CF Plug in one door beverage cooler	MWh/a	3.0	2.5	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.6
CF Plug in horizontal ice cream freezer	MWh/a	1.9	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.0
CF Spiral vending machine	MWh/a	3.2	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.8	1.7
PF service cabinet (average)	kWh/a	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555
PF Blast cabinet (commercial, non-retail)	kWh/a	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030
PF Walk-In Cold Room (WICR, average)	kWh/a	12587	12587	12587	12587	12587	12587	12587	12587	12587	12587
PF MT & LT industrial chillers (average)	MWh/a	419	419	419	419	419	419	419	419	419	419
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 EEI	kWh/a	310	269	262	254	247	239	232	225	217	210
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%

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	13.38	11.34	10.57	9.83	9.08	8.33	7.58	6.83	6.38	6.38
TYRE van replacement tyres C2	kg/t	12.92	10.95	10.05	9.25	8.45	7.65	6.85	6.05	6.05	6.05
TYRE truck replacement tyres C3	kg/t	11.22	9.51	9.08	8.68	8.27	7.87	7.47	7.06	6.66	6.26

*= 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. electricity	kWh elec/a	8800	8400	7093	6162	5967	5784	5763	5741	5720	5698
NRVU avg. heat saved vs. ref	kWh heat/a	79479	94169	107620	113000	113000	113000	113000	113000	113000	113000
RVU Central Unidirectional, electricity	kWh elec/a	454	454	244	244	244	244	244	244	244	244
RVU Central Balanced, electricity	kWh elec/a	501	501	246	246	246	246	246	246	246	246
RVU Local Balanced, electricity	kWh elec/a	217	217	134	134	134	134	134	134	134	134
RVU Central Unidirect., heat saved vs. ref	kWh prim/a	951	951	2505	2505	2505	2505	2505	2505	2505	2505
RVU Central Balanced, heat saved vs. ref	kWh prim/a	3863	3863	4218	4218	4218	4218	4218	4218	4218	4218
RVU Local Balanced, heat saved vs. ref	kWh prim/a	1706	1706	2109	2109	2109	2109	2109	2109	2109	2109
ref: natural ventilation											
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	TEC	17	17	17	17	17	17	17	17	17	17
VIDEO projectors (schools, offices)	TEC	200	200	200	200	200	200	200	200	200	200
VIDEO game consoles	TEC	0	30	30	44	51	56	61	66	71	76
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	16	11	10	9	8	6	5	4	3	2
SB Home NAS, on-mode power	W	26	19	17	15	13	11	9	7	5	3
SB Home Phones (fixed), on-mode power	W	6	4	4	3	3	2	2	1	1	1
SB Office Phones (fixed), on-mode power	W	8	6	5	4	4	3	3	2	1	1
SB Home Gateway, standby power	W	16	4	1	0	0	0	0	0	0	0
SB Home NAS, standby power	W	7	5	4	4	3	3	2	2	1	1
SB Home Phones (fixed), standby power	W	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
SB Home Gateway, idle power	W	13	9	8	7	6	5	4	3	2	1
SB Home NAS, idle power	W	20	14	6	2	2	2	2	2	2	2
SB Home Phones (fixed), idle power	W	5	3	3	3	2	2	1	1	1	0
SB Office Phones (fixed), idle power	W	7	5	4	4	3	3	2	2	1	1
BC_EPS Mobile phones etc.	W	0.43	0.37	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
UPS below 1.5 kVA	%	88%	88%	88%	99%	99%	99%	99%	99%	99%	99%
UPS 1.5 to 5 kVA	%	90%	90%	90%	99%	99%	99%	99%	99%	99%	99%
UPS 5 to 10 kVA	%	92%	92%	92%	95%	95%	95%	95%	95%	95%	95%
UPS 10 to 200 kVA	%	93%	93%	94%	96%	96%	96%	96%	96%	96%	96%
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 (RCV2)	MWh/a	33.4	27.4	26.1	23.0	21.2	21.2	21.2	21.2	21.2	21.2
CF open horizontal frozen island (RHF4)	MWh/a	35.2	28.8	27.4	24.2	22.3	22.3	22.3	22.3	22.3	22.3
CF Plug in one door beverage cooler	MWh/a	3.0	2.5	2.4	2.1	1.9	1.9	1.9	1.9	1.9	1.9
CF Plug in horizontal ice cream freezer	MWh/a	1.9	1.6	1.5	1.3	1.2	1.2	1.2	1.2	1.2	1.2
CF Spiral vending machine	MWh/a	3.2	2.6	2.5	2.2	2.0	2.0	2.0	2.0	2.0	2.0
PF service cabinet (average)	kWh/a	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555
PF Blast cabinet (commercial, non-retail)	kWh/a	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030
PF Walk-In Cold Room (WICR, average)	kWh/a	12587	12587	12587	12587	12587	12587	12587	12587	12587	12587
PF CH MT & LT industrial chillers (average)	MWh/a	419	419	419	419	419	419	419	419	419	419
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	0	0	0
WM energy/a	kWh/a	350	130	108	85	75	75	75	75	75	75
DW AEC	kWh/a	1.48	0.94	0.87	0.83	0.79	0.76	0.72	0.69	0.65	0.62
DW EEI	EEI	310	198	183	174	167	159	152	145	137	130
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%	30.9%	35.6%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
FAN Axial>300Pa	%	37%	37.1%	39.2%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
FAN Centr.FC	%	32%	32.1%	38.5%	45.4%	45.4%	45.4%	45.4%	45.4%	45.4%	45.4%
FAN Centr.BC-free	%	56%	56.4%	65.1%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%
FAN Centr.BC	%	54%	53.7%	62.9%	64.8%	64.8%	64.8%	64.8%	64.8%	64.8%	64.8%
FAN Cross-flow	%	7%	7.3%	17.4%	21.0%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	13.38	11.34	10.03	8.38	6.72	5.06	5.06	5.06	5.06	5.06
TYRE van replacement tyres C2	kg/t	12.92	10.95	9.35	7.39	5.42	5.03	5.03	5.03	5.03	5.03
TYRE truck replacement tyres C3	kg/t	11.22	9.51	8.61	7.43	6.25	5.07	5.07	5.07	5.07	5.07

*=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	1.1	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		17	17	17						
VIDEO projectors	kWh/a	200	200	200	200	200	200				
VIDEO game consoles	kWh/a		30	28	37	47	54	59	64	69	74
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		12	11	9	8	7	6	5	3	2
SB Home NAS, on-mode power	W		19	18	16	14	12	10	8	6	4
SB Home Phones (fixed), on-mode power	W	6	4	4	4	3	3	2	2	1	1
SB Office Phones (fixed), on-mode power	W	8	6	5	5	4	3	3	2	2	1
SB Home Gateway, standby power	W		2	0	0	0	0	0	0	0	0
SB Home NAS, standby power	W		3	2	2	1	1	1	1	0	0
SB Home Phones (fixed), standby power	W	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
SB Home Gateway, idle power	W		4	4	3	3	2	2	1	1	0
SB Home NAS, idle power	W		8	6	5	4	3	3	2	1	0
SB Home Phones (fixed), idle power	W	3	1	1	1	1	1	0	0	0	0
SB Office Phones (fixed), idle power	W	6	1	1	1	1	1	1	0	0	0
BC_EPS Mobile phones etc.	W	0.50	0.50	0.50	0.50	0.50	0.50	0.33	0.27	0.25	0.24
UPS below 1.5 kVA	%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
UPS 1.5 to 5 kVA	%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
UPS 5 to 10 kVA	%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
UPS 10 to 200 kVA	%	93%	93%	93%	93%	94%	94%	94%	94%	94%	94%
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 (RCV2)	MWh/a	34.7	28.5	27.1	25.8	24.5	23.3	22.2	21.1	20.0	18.8
CF open horizontal frozen island (RHF4)	MWh/a	36.6	30.0	28.5	27.1	25.8	24.6	23.4	22.2	21.0	19.8
CF Plug in one door beverage cooler	MWh/a	3.1	2.6	2.5	2.3	2.2	2.1	2.0	1.9	1.8	1.7
CF Plug in horizontal ice cream freezer	MWh/a	2.0	1.6	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.1
CF Spiral vending machine	MWh/a	3.4	2.7	2.6	2.5	2.4	2.3	2.1	2.0	1.9	1.8
PF service cabinet (average)	kWh/a	2555	2555	2555	2555	2555	2555	2555	2555	2555	2555
PF Blast cabinet (commercial, non-retail)	kWh/a	3030	3030	3030	3030	3030	3030	3030	3030	3030	3030
PF Walk-In Cold Room (WICR, average)	kWh/a	12587	12587	12587	12587	12587	12587	12587	12587	12587	12587
PF MT & LT industrial chillers (average)	MWh/a	419	419	419	419	419	419	419	419	419	419
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 energy/a	kWh/a	343	278	271	264	256	249	242	234	227	220
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%

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	11.3	9.6	9.2	8.8	8.4	7.9	7.5	7.1	6.7	6.3

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	3.9	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		17	17	17						
VIDEO projectors	kWh/a	200	200	200	200	200	200				
VIDEO game consoles	kWh/a		30	28	37	47	54	59	64	69	74
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		12	11	9	8	7	6	5	3	2
SB Home NAS, on-mode hours	W		19	18	16	14	12	10	8	6	4
SB Home Phones (fixed), on-mode hours	W	6	4	4	4	3	3	2	2	1	1
SB Office Phones (fixed), on-mode hours	W	8	6	5	5	4	3	3	2	2	1
SB Home Gateway, standby hours	W		2	0	0	0	0	0	0	0	0
SB Home NAS, standby hours	W		3	2	2	1	1	1	1	0	0
SB Home Phones (fixed), standby hours	W	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
SB Home Gateway, idle hours	W		4	4	3	3	2	2	1	1	0
SB Home NAS, idle hours	W		8	3	1	1	1	1	1	1	0
SB Home Phones (fixed), idle hours	W	3	1	1	1	1	1	0	0	0	0
SB Office Phones (fixed), idle hours	W	6	1	1	1	1	1	1	0	0	0
Total BC Battery Charged devices	W	0.44	0.37	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
UPS below 1.5 kVA	%	88%	88%	88%	96%	99%	99%	99%	99%	99%	99%
UPS 1.5 to 5 kVA	%	90%	90%	90%	93%	98%	99%	99%	99%	99%	99%
UPS 5 to 10 kVA	%	92%	92%	92%	93%	94%	95%	95%	95%	95%	95%
UPS 10 to 200 kVA	%	93%	93%	93%	94%	95%	96%	96%	96%	96%	96%
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 (RCV2)	MWh/a	34.7	28.5	27.1	25.1	22.5	21.2	21	21.2	21.2	21.2
CF open horizontal frozen island (RHF4)	MWh/a	36.6	30.0	28.5	26.4	23.7	22.3	22	22.3	22.3	22.3
CF Plug in one door beverage cooler	MWh/a	3.1	2.6	2.5	2.3	2.0	1.9	2	1.9	1.9	1.9
CF Plug in horizontal ice cream freezer	MWh/a	2.0	1.6	1.6	1.5	1.3	1.2	1	1.2	1.2	1.2
CF Spiral vending machine	MWh/a	3.4	2.7	2.6	2.4	2.2	2.1	2	2.0	2.0	2.0
PF Service cabinets	kWh/a	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555	2,555
PF Blast cabinets	kWh/a	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030
PF Walk in cold rooms	kWh/a	12587	12587	12587	12587	12587	12587	12587	12587	12587	12587
PF MT & LT industrial process chillers	MWh/a	419	419	419	419	419	419	419	419	419	419
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 household DishWasher	kWh/cyc	1.63	1.06	0.96	0.90	0.85	0.81	1	0.74	0.70	0.67
DW household DishWasher	EEI	343	223	202	189	178	169	162	154	147	140
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%	30.9%	32.1%	34.4%	37.0%	38.4%	39.0%	39.0%	39.0%	39.0%
FAN Axial>300Pa	%	37%	37.1%	37.8%	39.5%	41.8%	43.4%	44.0%	44.0%	44.0%	44.0%
FAN Centr.FC	%	32%	32.1%	33.3%	37.1%	41.5%	44.5%	45.4%	45.4%	45.4%	45.4%
FAN Centr.BC-free	%	56%	56.4%	58.5%	62.0%	65.4%	66.8%	67.0%	67.0%	67.0%	67.0%
FAN Centr.BC	%	54%	53.7%	56.1%	59.7%	63.3%	64.6%	64.8%	64.8%	64.8%	64.8%
FAN Cross-flow	%	7%	7.3%	9.0%	13.5%	16.4%	18.1%	17.4%	17.4%	17.4%	17.4%

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	11.3	9.6	8.8	7.7	6.5	5.3	5.1	5.1	5.1	5.1

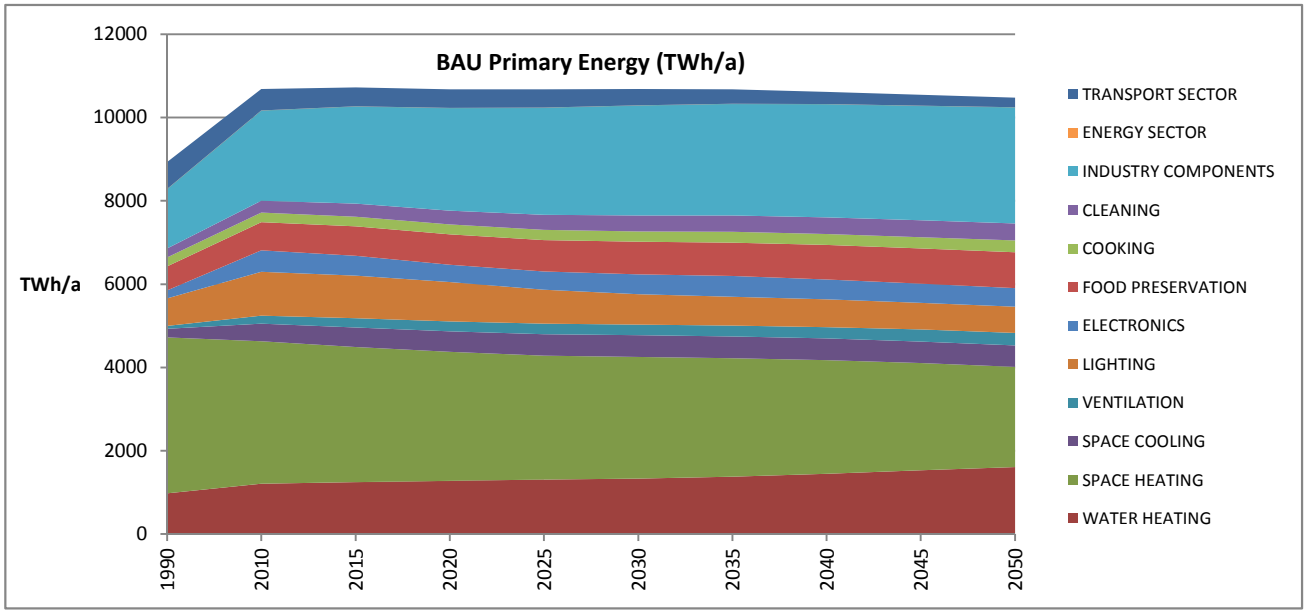
db	BAU Primary Energy (in TWh primary)	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**718**	**797**	**811**	**821**	**826**	**824**	**833**	**861**	**904**	**947**
	Total CH Central Heating combi, water heat	0	**258**	**414**	**440**	**458**	**481**	**511**	**546**	**585**	**624**	**664**
	TOTAL WATER HEATING		**976**	**1210**	**1250**	**1278**	**1307**	**1335**	**1379**	**1446**	**1528**	**1611**
	CH non-electric	0	*2200*	*1992*	*1799*	*1646*	*1526*	*1488*	*1438*	*1360*	*1240*	*1088*
	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*	*76*	*78*	*75*	*71*	*67*
	Total CH Central Heating boiler, space heat	0	**2454**	**2307**	**2113**	**1950**	**1826**	**1787**	**1734**	**1648**	**1519**	**1358**
	SFB Wood Manual	0	343	90	70	52	35	21	13	9	7	6
	SFB Wood Direct Draft	0	2	24	44	62	73	72	72	77	88	102
	SFB Coal	0	106	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		9	16	23	28	31	31	31	33	34
	SFB Wood chips	0		15	18	20	18	18	19	20	21	22
	Total Solid Fuel Boiler		**452**	**167**	**168**	**169**	**161**	**143**	**136**	**138**	**150**	**165**
	CHAE-S ≤400 kW	1	10	26	30	31	31	31	30	26	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	99	106	110	112	113	115	116	117
	HT PCH-AE-L	1	55	86	94	100	104	105	106	107	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	45	46	47	48	48	49
	HT PCH-WE-L	1	4	8	8	9	9	10	10	10	10	10
	AC rooftop	1	8	19	19	16	12	8	4	2	1	1
	AC splits	1	11	32	31	29	27	24	22	19	17	15
	AC VRF	1	0	8	11	16	19	23	27	29	31	32
	ACF	0	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**203**	**378**	**412**	**433**	**439**	**436**	**433**	**428**	**422**	**415**
	AC rooftop (rev)	1	11	33	33	29	22	14	7	2	0	0
	AC splits (rev)	1	20	61	63	61	57	52	46	41	37	33
	AC VRF (rev)	1	0	20	29	40	49	60	68	71	71	70
	ACF (rev)	0	0	0	0	1	1	1	1	1	1	1
	AHF	0	225	168	143	124	108	95	84	75	66	58
	AHE	1	3	7	6	4	3	3	3	3	3	2
	SubTotal AHC central Air Heating		**258**	**289**	**273**	**257**	**241**	**225**	**208**	**192**	**177**	**164**
	Total AHC central Air Heating & Cooling		**461**	**668**	**685**	**690**	**680**	**661**	**641**	**619**	**599**	**578**
									0			
	LH open fireplace	0	14	18	19	20	21	21	21	21	21	20
	LH closed fireplace/inset	0	18	41	49	56	61	65	66	66	65	63
	LH wood stove	0	39	38	37	38	38	39	39	39	38	37
	LH coal stove	0	26	14	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	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	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	69	69	68	67	67	67	66	64	63
	LH elec.convector	1	290	287	285	282	279	279	278	273	266	259
	LH elec.storage	1	21	21	21	21	21	21	21	20	20	20
	LH elec.underfloor	1	40	40	40	40	40	40	39	39	39	38
	LH luminous heaters	0	5	5	5	5	5	5	4	4	4	4
	LH tube heaters	0	12	12	12	12	11	11	10	10	10	9
	LH total		**572**	**600**	**610**	**619**	**626**	**632**	**632**	**624**	**611**	**597**
	RAC (cooling demand), all types <12 kW	1	6	46	54	63	76	85	89	92	95	99
	RAC (heating demand), reversible <12kW	1	4	55	77	101	125	132	130	126	122	117
	Total RAC Room Air Conditioner		**11**	**101**	**132**	**164**	**201**	**216**	**219**	**218**	**217**	**215**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**40**	**52**	**54**	**55**	**57**	**59**	**60**	**57**	**54**	**51**
	TOTAL SPACE HEATING		**3741**	**3418**	**3242**	**3096**	**2980**	**2919**	**2840**	**2728**	**2579**	**2401**
	TOTAL SPACE COOLING		**209**	**424**	**466**	**496**	**515**	**521**	**521**	**520**	**517**	**513**
	NRVU electricity	1	47	152	172	185	191	194	197	202	208	216
1	NRVU heat (negative=saving vs. natural ventilation)	0	-136	-633	-754	-855	-938	-1004	-1071	-1138	-1207	-1276
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	19	38	43	42	40	40	42	45	48	51
	RVU Central Balanced VU ≤125W/fan (2 fans)	1	0	3	5	9	14	18	20	22	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	-35	-34	-34	-35	-38	-40	-43
1	RVU Central Balanced, heat (negative=saving)	0	-1	-8	-16	-29	-42	-55	-63	-69	-76	-82
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**	**-481**	**-587**	**-686**	**-773**	**-847**	**-918**	**-987**	**-1056**	**-1124**
	TOTAL VENTILATION (electricity only)		**67**	**193**	**221**	**238**	**247**	**254**	**263**	**275**	**287**	**302**

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		**661**	**1047**	**1028**	**943**	**816**	**729**	**692**	**663**	**643**	**628**
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	9.4	12.5	12.2	28.3	35.1	37.7	39.4	39.4	37.6	33.9
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**	**254**	**205**	**156**	**169**	**180**	**173**	**153**	**120**	**112**
SSTB	1	0	8	4	0	0	0	0	0	0	0
CSTB	1	0	17	43	48	49	47	50	54	58	62
Total STB set top boxes (Complex & Simple)		**0**	**26**	**46**	**48**	**49**	**47**	**50**	**54**	**58**	**62**
VIDEO players/recorders	1	0	3	1	0	0	0	0	0	0	0
VIDEO projectors	1	0	4	5	4	2	0	0	0	0	0
VIDEO game consoles	1	0	5	6	7	9	11	12	13	14	15
Total VIDEO		**0**	**13**	**12**	**11**	**11**	**11**	**12**	**13**	**14**	**15**
ES Rack servers	1	1	46	54	59	71	88	106	104	104	104
ES Blade servers	1	1	11	12	12	14	17	20	19	19	19
ES Storage	1	0	4	5	6	6	7	7	7	7	7
Total ES Enterprise Servers		**2**	**62**	**71**	**77**	**91**	**112**	**134**	**130**	**130**	**130**
PC Desktop	1	36	54	32	12	7	7	7	7	7	7
PC Notebook	1	0	18	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**	**14**	**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	5	6	6
EP-printer mono	1	23	7	5	4	4	3	3	2	2	1
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**	**18**	**19**	**20**	**21**	**23**	**24**	**26**	**27**	**29**
SB Home Gateway, on-mode hours	1	0.0	10.2	12.1	13.4	14.0	13.9	13.2	11.7	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	1.2	1.3	1.1	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	1.0	0.9	0.7	0.5
SB Home Gateway, standby hours	1	0.0	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby hours	1	0.0	0.5	0.7	0.9	1.0	1.0	1.0	0.9	0.7	0.2
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	4.6	7.8	11.2	11.4	11.1	10.2	8.7	6.7	2.2
SB Home NAS, idle hours	1	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1
SB Home Phones (fixed), idle hours	1	0.9	3.0	3.2	2.9	2.5	2.1	1.7	1.3	0.9	0.2
SB Office Phones (fixed), idle hours	1	1.6	1.9	1.8	1.6	1.5	1.3	1.1	0.9	0.6	0.2
Total SB (networked) StandBy (rest)		**3**	**25**	**30**	**34**	**35**	**33**	**31**	**27**	**21**	**11**
Total BC Battery Charged devices	1	**1**	**11**	**11**	**11**	**11**	**11**	**7**	**6**	**6**	**5**
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	6.6	14.4	15.6	17.3	20.6	24.0	27.4	30.4	33.0	34.9
UPS 5 to 10 kVA	1	0.8	1.8	2.0	2.2	2.6	3.1	3.5	3.9	4.2	4.5
UPS 10 to 200 kVA	1	4.7	10.5	11.3	11.4	12.3	14.5	16.7	18.7	20.5	21.9
Total UPS - Uninterrupted Power Supplies	**1**	**14**	**31**	**33**	**35**	**41**	**48**	**55**	**61**	**66**	**70**
TOTAL ELECTRONICS		**193**	**516**	**474**	**412**	**441**	**479**	**500**	**483**	**457**	**450**

	BAU Primary Energy (in TWh prim), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**343**	**345**	**347**	**346**	**346**	**345**	**345**	**344**	**343**	**342**
	CF open vertical chilled multi deck (RCV2)	1	71	95	101	108	114	119	123	126	129	130
	CF open horizontal frozen island (RHF4)	1	19	13	14	15	16	16	17	18	18	18
	CF Plug in one door beverage cooler	1	36	41	42	42	42	43	42	42	42	41
	CF Plug in horizontal ice cream freezer	1	9	11	11	12	12	12	12	12	11	11
	CF Spiral vending machine	1	5	8	9	10	12	13	14	15	16	17
	Total CF Commercial Refrigeration		**141**	**168**	**177**	**187**	**195**	**202**	**208**	**213**	**216**	**217**
	PF Service cabinets	1	15	21	22	23	24	25	26	28	29	30
	PF Blast cabinets	1	5	11	12	14	15	16	18	20	21	23
	PF Walk in cold rooms	1	35	45	47	49	51	54	56	59	61	63
	PF MT & LT industrial process chillers	1	41	85	98	111	123	135	149	162	175	188
	Total PF Professional Refrigeration		**96**	**161**	**179**	**197**	**213**	**231**	**249**	**268**	**286**	**304**
	TOTAL FOOD PRESERVATION		**579**	**675**	**703**	**730**	**754**	**779**	**802**	**824**	**844**	**863**
	CA El. Hobs	1	50	78	86	94	101	107	113	118	123	128
	CA El. Ovens	1	58	58	55	52	51	52	53	53	54	54
	CA Gas Hobs	0	35	29	28	27	25	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	37	39	41	43	45
	Total CA Cooking Appliances		**183**	**206**	**210**	**215**	**220**	**227**	**235**	**241**	**247**	**253**
	CM Dripfilter (glass)	1	16	11	10	8	7	7	7	7	7	7
	CM Dripfilter (thermos)	1	1	3	3	3	3	3	3	3	3	3
	CM Dripfilter (full automatic)	1	0	1	1	2	2	2	2	2	2	3
	CM Pad filter	1	0	1	1	2	2	2	2	2	2	2
	CM Hard cap espresso	1	0	0	1	1	1	1	1	1	1	1
	CM Semi-auto espresso	1	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
	CM Dripfilter (glass), standby/keep warm	1	11	8	7	6	5	5	5	5	5	5
	CM Dripfilter (thermos), standby/keep warm	1	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
	CM Pad filter, standby/keep warm	1	0	1	2	2	2	2	2	2	2	3
	CM Hard cap espresso, standby/keep warm	1	0	0	1	1	1	1	1	1	1	1
	CM Semi-auto espresso, standby/keep warm	1	0	0	0	0	0	0	0	0	0	0
	CM Fully-auto espresso, standby/keep warm	1	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers		**28**	**26**	**25**	**24**	**24**	**24**	**25**	**25**	**26**	**26**
	TOTAL COOKING		**211**	**233**	**236**	**239**	**244**	**252**	**259**	**266**	**273**	**279**
	Total WM household Washing Machine	1	**131**	**110**	**106**	**98**	**90**	**84**	**78**	**72**	**66**	**61**
	Total DW household Dishwasher	1	**31**	**58**	**67**	**76**	**84**	**93**	**100**	**107**	**113**	**118**
	LD vented el.	1	21	28	29	28	27	26	26	27	27	27
	LD condens el.	1	4	35	44	52	58	60	60	59	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**	**86**	**86**	**86**
	VC dom	1	25	42	56	59	85	97	108	117	123	126
	VC nondom	1	8	12	13	15	16	17	18	19	20	20
	Total VC Vacuum Cleaner		**33**	**54**	**69**	**74**	**101**	**114**	**126**	**136**	**143**	**146**
	TOTAL CLEANING		**221**	**284**	**315**	**328**	**362**	**377**	**390**	**401**	**408**	**412**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	48	132	154	172	190	200	204	204	204	204
0.5	FAN Axial>300Pa	1	82	241	276	292	304	312	314	314	314	314
0.5	FAN Centr.FC	1	20	43	52	58	63	66	67	67	67	67
0.5	FAN Centr.BC-free	1	53	110	131	144	158	172	183	188	192	195
0.5	FAN Centr.BC	1	55	124	149	164	181	198	214	229	249	270
0.5	FAN Cross-flow	1	3	6	7	8	9	10	11	12	13	14
	Total FAN, industrial (excl. box & roof fans)		**131**	**328**	**385**	**419**	**452**	**480**	**496**	**507**	**519**	**532**
0.5	**Total MT Motors 0.75-375 kW**	1	**2034**	**2796**	**2981**	**3131**	**3221**	**3247**	**3229**	**3209**	**3190**	**3170**
	Total WP Water Pumps	1	**219**	**294**	**317**	**341**	**366**	**393**	**420**	**448**	**475**	**503**
	CP Fixed Speed 5-1280 l/s	1	59	121	102	89	87	89	91	94	96	98
	CP Variable speed 5-1280 l/s	1	0	22	39	50	55	57	58	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		**62**	**147**	**145**	**142**	**145**	**150**	**154**	**157**	**161**	**164**
	TOTAL INDUSTRY COMPONENTS		1429	2167	2337	2468	2574	2646	2684	2716	2750	2784

BAU Primary Energy (in TWh prim), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution	1	30	50	56	62	68	75	81	88	94	101
TRAFO Industry oil	1	22	39	43	48	52	56	60	65	69	74
TRAFO Industry dry	1	7	12	14	15	16	18	19	21	22	23
TRAFO Power	1	86	133	148	164	180	196	212	227	244	260
TRAFO DER oil	1		1	2	4	6	10	16	25	35	47
TRAFO DER dry	1		5	9	16	26	43	69	104	147	197
TRAFO Small	1	5	5	5	5	5	5	5	5	5	5
Total TRAFO Utility Transformers		**150**	**244**	**277**	**313**	**354**	**403**	**463**	**534**	**616**	**707**
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		298	261	238	243	246	220	190	162	138	128
TYRE van replacement tyres C2		118	99	89	90	90	79	67	56	51	48
TYRE truck replacement tyres C3		225	157	121	112	103	93	84	75	66	58
TYRE Replacement Tyres		**641**	**516**	**447**	**445**	**439**	**392**	**340**	**292**	**255**	**234**
TRANSPORT SECTOR		**641**	**516**	**447**	**445**	**439**	**392**	**340**	**292**	**255**	**234**
GENERAL TOTAL (in TWh primary)		**8929**	**10684**	**10719**	**10673**	**10677**	**10683**	**10672**	**10614**	**10541**	**10476**
GENERAL TOTAL (in PJ primary)		32146	38461	38588	38424	38438	38458	38419	38210	37948	37715
GENERAL TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		768	919	922	918	918	919	918	913	906	901

BAU Primary energy (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**976**	**1210**	**1250**	**1278**	**1307**	**1335**	**1379**	**1446**	**1528**	**1611**
SPACE HEATING	**3741**	**3418**	**3242**	**3096**	**2980**	**2919**	**2840**	**2728**	**2579**	**2401**
SPACE COOLING	**209**	**424**	**466**	**496**	**515**	**521**	**521**	**520**	**517**	**513**
VENTILATION	**67**	**193**	**221**	**238**	**247**	**254**	**263**	**275**	**287**	**302**
LIGHTING	**661**	**1047**	**1028**	**943**	**816**	**729**	**692**	**663**	**643**	**628**
ELECTRONICS	**193**	**516**	**474**	**412**	**441**	**479**	**500**	**483**	**457**	**450**
FOOD PRESERVATION	**579**	**675**	**703**	**730**	**754**	**779**	**802**	**824**	**844**	**863**
COOKING	**211**	**233**	**236**	**239**	**244**	**252**	**259**	**266**	**273**	**279**
CLEANING	**221**	**284**	**315**	**328**	**362**	**377**	**390**	**401**	**408**	**412**
INDUSTRY COMPONENTS	**1429**	**2167**	**2337**	**2468**	**2574**	**2646**	**2684**	**2716**	**2750**	**2784**
ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TRANSPORT SECTOR	**641**	**516**	**447**	**445**	**439**	**392**	**340**	**292**	**255**	**234**
TOTAL in TWh primary	**8929**	**10684**	**10719**	**10673**	**10677**	**10683**	**10672**	**10614**	**10541**	**10476**
TOTAL (in PJ primary)	32146	38461	38588	38424	38438	38458	38419	38210	37948	37715
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	768	919	922	918	918	919	918	913	906	901



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**	**718**	**797**	**733**	**644**	**565**	**533**	**531**	**549**	**576**	**604**
	Total CH Central Heating combi, water heat	0	**258**	**414**	**418**	**385**	**352**	**339**	**343**	**353**	**362**	**372**
	TOTAL WATER HEATING		**976**	**1210**	**1151**	**1029**	**917**	**871**	**873**	**902**	**938**	**976**
	CH non-electric		*2200*	*1946*	*1559*	*1198*	*911*	*733*	*621*	*526*	*428*	*320*
	CH electric resistance boiler, 1st estimate		*125*	*100*	*87*	*74*	*62*	*50*	*38*	*25*	*13*	*0*
	CH heat pump, 1st estimate		*60*	*140*	*156*	*165*	*186*	*207*	*228*	*250*	*271*	*292*
	CH auxiliary electricity (incl. circulator), 1st estimate		*69*	*68*	*59*	*47*	*33*	*35*	*35*	*34*	*33*	*31*
	Total CH Central Heating boiler, space heat	0	**2454**	**2254**	**1862**	**1485**	**1191**	**1025**	**922**	**834**	**743**	**643**
	SFB Wood Manual	0	343	90	69	49	31	17	9	6	5	5
	SFB Wood Direct Draft	0	2	24	44	62	73	71	71	76	87	100
	SFB Coal	0	106	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		9	16	23	28	30	31	31	32	34
	SFB Wood chips	0		15	17	20	18	17	18	20	21	22
	Total Solid Fuel Boiler		**452**	**167**	**167**	**166**	**156**	**138**	**130**	**133**	**146**	**161**
	CHAE-S ≤400 kW	1	10	26	30	31	30	29	28	24	18	11
	CHAE-L > 400 kW	1	15	36	39	40	38	35	32	30	28	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	6	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	103	103	102	103	105	108	110
	HT PCH-AE-L	1	55	86	94	97	96	93	91	92	94	97
	HT PCH-WE-S	1	12	19	21	22	22	23	23	23	24	24
	HT PCH-WE-M	1	23	37	41	43	44	45	46	47	48	49
	HT PCH-WE-L	1	4	8	8	9	9	9	9	9	9	10
	AC rooftop	1	8	19	19	16	12	7	4	2	1	1
	AC splits	1	11	32	31	28	25	22	19	17	16	14
	AC VRF	1	0	8	11	15	18	21	24	26	28	29
	ACF	0	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**203**	**378**	**411**	**424**	**416**	**402**	**394**	**391**	**389**	**387**
	AC rooftop (rev)	1	11	33	33	28	20	12	5	2	0	0
	AC splits (rev)	1	20	61	63	59	54	48	43	38	35	31
	AC VRF (rev)	1	0	20	29	40	48	58	64	67	68	68
	ACF (rev)	0	0	0	0	0	1	1	1	1	1	1
	AHF	0	225	168	143	120	99	82	70	62	55	49
	AHE	1	3	7	6	4	3	3	3	3	3	2
	SubTotal AHC central Air Heating		**258**	**289**	**273**	**250**	**226**	**203**	**186**	**173**	**162**	**151**
	Total AHC central Air Heating & Cooling		**461**	**668**	**684**	**674**	**641**	**605**	**580** U	**564**	**550**	**538**
	LH open fireplace	0	14	18	19	19	18	17	15	14	13	13
	LH closed fireplace/inset	0	18	41	49	55	58	60	59	58	56	54
	LH wood stove	0	39	38	37	37	36	36	35	34	33	32
	LH coal stove	0	26	14	13	11	10	8	6	5	4	3
	LH cooker	0	7	11	12	14	14	15	15	14	14	14
	LH SHR stove	0	17	21	23	25	27	30	33	35	35	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	69	68	62	58	59	60	59	57	56
	LH elec.convector	1	290	287	282	264	256	259	261	257	251	245
	LH elec.storage	1	21	21	21	19	18	17	17	17	17	16
	LH elec.underfloor	1	40	40	40	38	37	35	34	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		**572**	**600**	**604**	**587**	**575**	**578**	**577**	**566**	**552**	**540**
	RAC (cooling demand), all types <12 kW	1	6	46	51	53	61	68	71	74	76	79
	RAC (heating demand), reversible <12kW	1	4	55	73	89	106	112	111	107	103	99
	Total RAC Room Air Conditioner		**11**	**101**	**123**	**142**	**167**	**180**	**182**	**181**	**180**	**178**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**40**	**50**	**36**	**27**	**26**	**27**	**27**	**26**	**25**	**24**
	TOTAL SPACE HEATING		**3741**	**3365**	**2979**	**2577**	**2254**	**2055**	**1926**	**1814**	**1706**	**1595**
	TOTAL SPACE COOLING		**209**	**424**	**462**	**477**	**477**	**470**	**465**	**465**	**465**	**466**
	NRVU electricity	1	47	152	168	170	165	159	160	165	171	179
1	NRVU heat (negative=saving vs. natural ventilation)	0	-136	-633	-773	-921	-1049	-1151	-1222	-1284	-1347	-1410
	RVU Central Unidir. VU ≤125W/fan (1 fan)	1	19	38	40	34	27	22	22	24	26	27
	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	-92	-99	-106	-112
1	RVU Central Balanced, heat (negative=saving)	0	-1	-8	-17	-31	-46	-60	-68	-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**	**-481**	**-627**	**-806**	**-977**	**-1120**	**-1204**	**-1276**	**-1347**	**-1418**
	TOTAL VENTILATION (electricity +(negative) extra heat savings versus BAU)		**67**	**193**	**182**	**122**	**75**	**43**	**52**	**68**	**85**	**102**

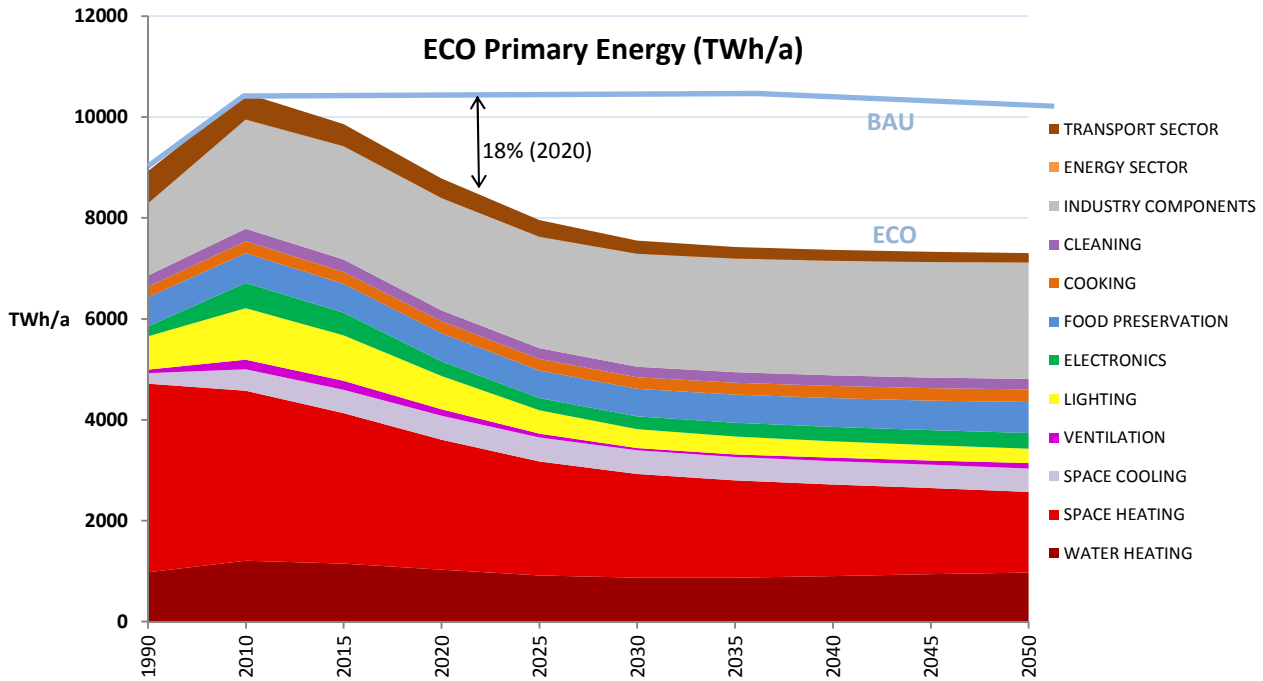
ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources ECO											
LFL Linear Fluorescent	1	203	314	333	274	181	108	75	51	27	10
CFL Compact Fluorescent	1	10	67	79	64	21	5	0	0	0	0
Tungsten	1	23	132	129	56	7	1	1	1	1	1
GLS GeneralLighting Service (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		662	1017	900	661	465	373	349	324	302	291
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	9.4	12.5	15.1	25.4	20.0	21.8	23.8	25.8	27.8	29.8
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	17	37	37	38	36	38	42	45	48
Total STB set top boxes (Complex & Simple)		**0**	**22**	**41**	**37**	**38**	**36**	**38**	**42**	**45**	**48**
VIDEO players/recorders	1	0	3	1	0	0	0	0	0	0	0
VIDEO projectors	1	0	4	5	4	2	0	0	0	0	0
VIDEO game consoles	1	0	5	6	7	9	11	12	13	14	15
Total VIDEO		**0**	**13**	**12**	**11**	**11**	**11**	**12**	**13**	**14**	**15**
ES Rack servers	1	1	46	54	53	52	63	76	74	74	74
ES Blade servers	1	1	11	12	10	10	12	14	13	13	13
ES Storage	1	0	4	5	4	4	4	4	4	4	4
Total ES Enterprise Servers		**2**	**62**	**71**	**67**	**66**	**79**	**94**	**91**	**91**	**91**
PC Desktop	1	36	54	32	12	7	7	7	7	7	7
PC Notebook	1	0	18	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**	**14**	**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	23	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	12.1	13.4	14.0	13.9	13.2	11.7	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	1.2	1.3	1.1	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	1.0	0.9	0.7	0.5
SB Home Gateway, standby hours	1	0.0	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby hours	1	0.0	0.5	0.7	0.9	1.0	1.0	1.0	0.9	0.7	0.2
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	4.6	7.7	11.2	11.4	11.1	10.2	8.7	6.7	2.2
SB Home NAS, idle hours	1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
SB Home Phones (fixed), idle hours	1	0.9	3.0	3.2	2.9	2.5	2.1	1.7	1.3	0.9	0.2
SB Office Phones (fixed), idle hours	1	1.6	1.9	1.8	1.6	1.5	1.3	1.1	0.9	0.6	0.2
Total SB (networked) StandBy (rest)		**3**	**25**	**30**	**34**	**34**	**33**	**31**	**26**	**21**	**11**
Total BC Battery Charged devices	1	**1**	**8**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**
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	6.6	14.4	15.6	10.7	3.3	2.8	3.2	3.6	3.9	4.1
UPS 5 to 10 kVA	1	0.8	1.8	2.0	1.9	1.8	2.0	2.3	2.5	2.7	2.9
UPS 10 to 200 kVA	1	4.7	10.5	11.3	10.5	9.2	9.1	10.5	11.8	12.9	13.8
Total UPS - Uninterrupted Power Supplies	**1**	**14**	**31**	**33**	**24**	**15**	**14**	**17**	**19**	**20**	**22**
TOTAL ELECTRONICS		193	505	448	295	242	256	279	287	298	305

	ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**343**	**259**	**214**	**179**	**151**	**128**	**105**	**86**	**72**	**67**
	CF open vertical chilled multi deck (RCV2)	1	71	95	101	105	104	108	117	127	136	146
	CF open horizontal frozen island (RHF4)	1	19	13	14	14	14	15	16	18	19	20
	CF Plug in one door beverage cooler	1	36	41	42	41	39	39	41	43	45	46
	CF Plug in horizontal ice cream freezer	1	9	11	11	11	11	11	11	12	12	13
	CF Spiral vending machine	1	5	8	9	10	11	12	14	15	17	19
	Total CF Commercial Refrigeration		**141**	**168**	**177**	**182**	**179**	**184**	**199**	**214**	**229**	**244**
	PF Service cabinets	1	15	21	22	23	24	25	26	28	29	30
	PF Blast cabinets	1	5	11	12	14	15	16	18	20	21	23
	PF Walk in cold rooms	1	35	45	47	49	51	54	56	59	61	63
	PF MT & LT industrial process chillers	1	41	85	98	111	123	135	149	162	175	188
	Total PF Professional Refrigeration		**96**	**161**	**179**	**197**	**213**	**231**	**249**	**268**	**286**	**304**
	TOTAL FOOD PRESERVATION		**579**	**588**	**571**	**558**	**543**	**544**	**553**	**567**	**587**	**615**
	CA El. Hobs	1	50	78	86	94	100	107	112	117	123	128
	CA El. Ovens	1	58	58	55	51	48	48	48	48	48	48
	CA Gas Hobs	0	35	29	28	27	25	24	22	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	29	31	32
	Total CA Cooking Appliances		**183**	**206**	**210**	**211**	**211**	**213**	**216**	**221**	**226**	**231**
	CM Dripfilter (glass)	1	16	11	10	8	7	7	7	7	7	7
	CM Dripfilter (thermos)	1	1	3	3	3	3	3	3	3	3	3
	CM Dripfilter (full automatic)	1	0	1	1	2	2	2	2	2	2	3
	CM Pad filter	1	0	1	1	2	2	2	2	2	2	2
	CM Hard cap espresso	1	0	0	1	1	1	1	1	1	1	1
	CM Semi-auto espresso	1	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
	CM Dripfilter (glass), standby/keep warm	1	11	8	6	3	2	2	2	2	2	2
	CM Dripfilter (thermos), standby/keep warm	1	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
	CM Pad filter, standby/keep warm	1	0	1	1	1	1	1	1	1	1	1
	CM Hard cap espresso, standby/keep warm	1	0	0	1	1	1	1	1	1	1	1
	CM Semi-auto espresso, standby/keep warm	1	0	0	0	0	0	0	0	0	0	0
	CM Fully-auto espresso, standby/keep warm	1	0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	1	**28**	**26**	**24**	**20**	**19**	**20**	**20**	**21**	**21**	**22**
	TOTAL COOKING		**211**	**233**	**234**	**231**	**231**	**233**	**236**	**242**	**247**	**253**
	Total WM household Washing Machine	1	**131**	**86**	**71**	**59**	**48**	**42**	**38**	**38**	**38**	**38**
	Total DW household Dishwasher	1	**31**	**46**	**50**	**54**	**59**	**63**	**67**	**70**	**73**	**75**
	LD vented el.	1	21	28	28	28	26	25	25	25	26	26
	LD condens el.	1	4	35	42	44	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	25	42	45	25	31	30	29	27	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		**221**	**249**	**248**	**219**	**216**	**210**	**207**	**208**	**208**	**207**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	48	132	148	155	158	161	161	161	161	161
0.5	FAN Axial>300Pa	1	82	241	271	274	270	266	264	264	264	264
0.5	FAN Centr.FC	1	20	43	50	50	48	48	48	48	48	48
0.5	FAN Centr.BC-free	1	53	110	126	131	136	146	154	158	161	164
0.5	FAN Centr.BC	1	55	124	143	147	153	165	177	190	206	224
0.5	FAN Cross-flow	1	3	6	6	4	4	4	5	5	5	6
	Total FAN, industrial (excl. box & roof fans)		**131**	**328**	**372**	**381**	**385**	**395**	**404**	**413**	**423**	**434**
0.5	**Total MT Motors 0.75-375 kW**	1	**2034**	**2793**	**2851**	**2780**	**2707**	**2726**	**2723**	**2723**	**2723**	**2723**
	Total WP Water Pumps	1	**219**	**294**	**313**	**332**	**356**	**382**	**408**	**435**	**462**	**488**
	CP Fixed Speed 5-1280 l/s	1	59	121	102	87	84	86	89	91	94	97
	CP Variable speed 5-1280 l/s	1	0	22	39	50	54	56	57	59	60	61
	CP Pistons 2-64 l/s	1	3	4	4	3	4	4	4	4	4	4
	Total CP Standard Air Compressors		**62**	**147**	**144**	**140**	**142**	**145**	**150**	**154**	**158**	**162**
	TOTAL INDUSTRY COMPONENTS		1429	2165	2255	2243	2236	2285	2324	2364	2404	2446

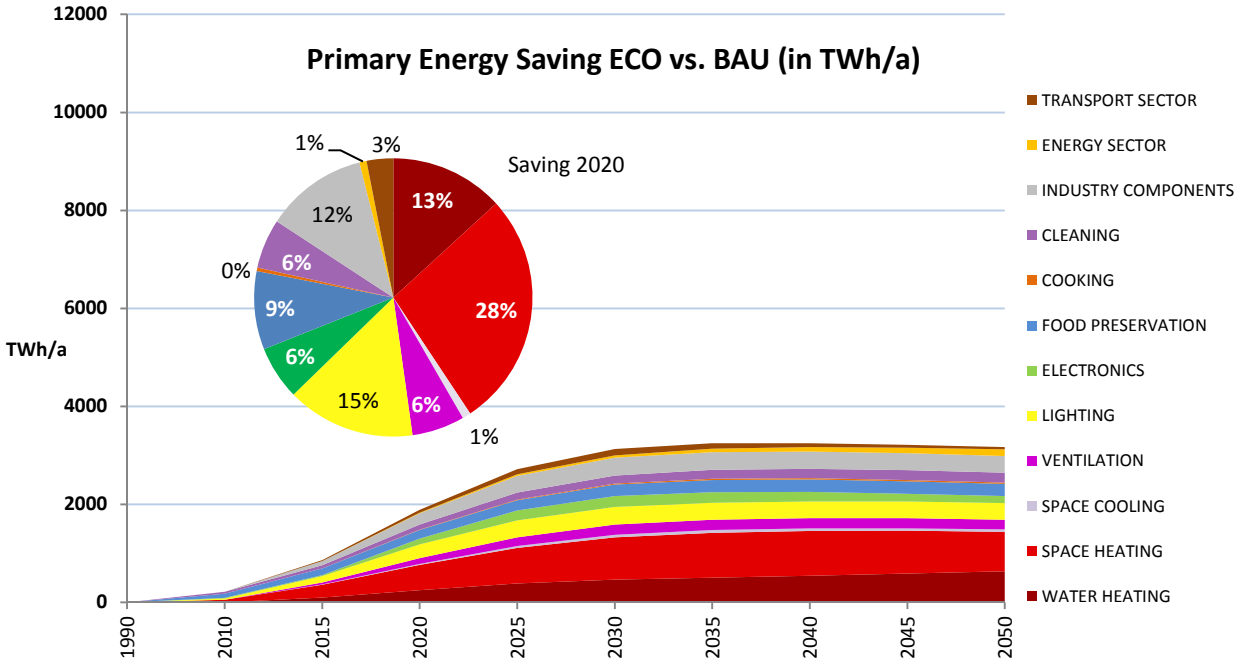
ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution	1	30	50	54	57	59	61	63	65	66	67
TRAFO Industry oil	1	22	39	42	41	41	39	37	37	40	43
TRAFO Industry dry	1	7	12	13	14	14	15	15	15	16	17
TRAFO Power	1	86	133	148	164	180	196	212	227	244	260
TRAFO DER oil	1		1	2	3	4	7	10	15	21	28
TRAFO DER dry	1		5	9	14	21	34	53	79	111	149
TRAFO Small	1	5	5	5	5	5	5	5	5	5	5
Total TRAFO Utility Transformers		**150**	**244**	**273**	**298**	**324**	**356**	**395**	**443**	**502**	**568**
TOTAL ENERGY SECTOR		**0**	**0**	**-4**	**-16**	**-30**	**-47**	**-68**	**-91**	**-114**	**-139**
TYRE car replacement tyres C1		298	261	232	214	191	143	123	116	109	102
TYRE van replacement tyres C2		118	99	85	75	61	51	48	45	42	40
TYRE truck replacement tyres C3		225	157	117	98	80	62	56	53	50	46
TYRE Replacement Tyres		**641**	**516**	**433**	**386**	**331**	**256**	**227**	**214**	**201**	**188**
TOTAL TRANSPORT SECTOR		**641**	**516**	**433**	**386**	**331**	**256**	**227**	**214**	**201**	**188**
GENERAL TOTAL (in TWh primary)		**8930**	**10466**	**9858**	**8784**	**7957**	**7549**	**7425**	**7364**	**7328**	**7305**
GENERAL TOTAL (in PJ primary)		32149	37678	35490	31621	28646	27176	26730	26510	26382	26299
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		768	900	848	755	684	649	638	633	630	628

ECO Primary energy (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	976	1210	1151	1029	917	871	873	902	938	976
SPACE HEATING	3741	3365	2979	2577	2254	2055	1926	1814	1706	1595
SPACE COOLING	209	424	462	477	477	470	465	465	465	466
VENTILATION	67	193	182	122	75	43	52	68	85	102
LIGHTING	662	1017	900	661	465	373	349	324	302	291
ELECTRONICS	193	505	448	295	242	256	279	287	298	305
FOOD PRESERVATION	579	588	571	558	543	544	553	567	587	615
COOKING	211	233	234	231	231	233	236	242	247	253
CLEANING	221	249	248	219	216	210	207	208	208	207
INDUSTRY COMPONENTS	1429	2165	2255	2243	2236	2285	2324	2364	2404	2446
ENERGY SECTOR	0	0	-4	-16	-30	-47	-68	-91	-114	-139
TRANSPORT SECTOR	641	516	433	386	331	256	227	214	201	188
TOTAL in TWh primary	**8930**	**10466**	**9858**	**8784**	**7957**	**7549**	**7425**	**7364**	**7328**	**7305**
TOTAL (in PJ primary)	32149	37678	35490	31621	28646	27176	26730	26510	26382	26299
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	768	900	848	755	684	649	638	633	630	628

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



SAVINGS ECO VS. BAU Primary energy (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	99	250	390	464	506	544	589	636
SPACE HEATING	0	53	262	519	725	864	914	914	873	805
SPACE COOLING	0	0	4	19	38	51	56	55	52	47
VENTILATION	0	0	39	115	173	212	211	206	203	199
LIGHTING	0	29	128	282	351	356	343	339	341	337
ELECTRONICS	0	11	26	118	199	223	221	195	158	144
FOOD PRESERVATION	0	87	133	172	211	235	249	257	257	247
COOKING	0	0	1	8	13	19	23	25	26	27
CLEANING	0	35	66	109	145	168	183	193	200	205
INDUSTRY COMPONENTS	0	2	82	224	338	361	360	353	346	339
ENERGY SECTOR	0	0	4	16	30	47	68	91	114	139
TRANSPORT SECTOR	0	0	14	58	108	136	113	78	54	46
TOTAL in TWh primary energy	**0**	**218**	**861**	**1890**	**2720**	**3134**	**3247**	**3250**	**3213**	**3171**
TOTAL in mtoe final + share power generation & distr.	0	19	74	162	234	269	279	279	276	273
Saving in % versus BAU (from 1990=0)	0.0%	2.0%	8.0%	17.7%	25.5%	29.3%	30.4%	30.6%	30.5%	30.3%
Saving In % versus BAU (from 2010=0)	-2.4%	0.0%	6.0%	15.7%	23.4%	27.3%	28.4%	28.6%	28.4%	28.2%



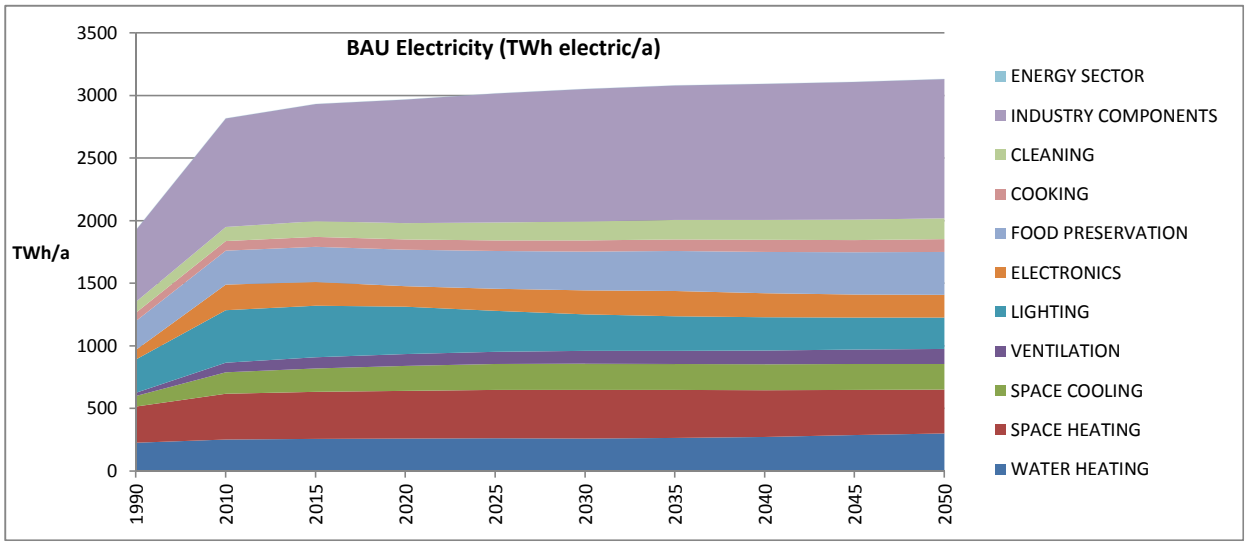
db	BAU Electricity (in TWh elec)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**224**	**249**	**253**	**256**	**258**	**257**	**260**	**269**	**282**	**296**
	Total CH Central Heating combi, water heat	0	**2%**	**2**	**3**	**4**	**4**	**4**	**4**	**4**	**5**	**5**	**5**
	TOTAL WATER HEATING			**226**	**252**	**256**	**260**	**261**	**261**	**264**	**273**	**287**	**301**
	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	30	31	30	28	27
	Total CH Central Heating boiler, space heat	0		**102**	**126**	**126**	**121**	**120**	**120**	**118**	**115**	**111**	**108**
	SFB Wood Manual	0		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	0
	SFB Coal	0		0.0	0	0	0	0	0	0	0	0	0
	SFB Pellets	0		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	0
	Total Solid Fuel Boiler			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CHAE-S ≤400 kW	1	100%	4	10	12	13	12	12	12	11	8	5
	CHAE-L > 400 kW	1	100%	6	14	16	16	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	3	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	42	44	45	45	46	46	47
	HT PCH-AE-L	1	100%	22	35	38	40	41	42	42	43	43	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	17	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	7	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			**81**	**151**	**165**	**173**	**175**	**174**	**173**	**171**	**168**	**166**
	AC rooftop (rev)	1	100%	4	13	13	12	9	6	3	1	0	0
	AC splits (rev)	1	100%	8	24	25	24	23	21	18	16	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%	4	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**	**53**	**51**	**48**	**46**	**43**
	Total AHC central Air Heating & Cooling			**99**	**203**	**219**	**229**	**231**	**228**	**224**	**219**	**214**	**209**
										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	114	113	112	112	111	109	106	104
	LH elec.storage	1	100%	9	9	8	8	8	8	8	8	8	8
	LH elec.underfloor	1	100%	16	16	16	16	16	16	16	16	15	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			**168**	**167**	**166**	**164**	**163**	**163**	**162**	**159**	**155**	**152**
	RAC (cooling demand), all types <12 kW	1	100%	3	18	22	25	30	34	36	37	38	39
	RAC (heating demand), reversible <12kW	1	100%	2	22	31	41	50	53	52	50	49	47
	Total RAC Room Air Conditioner			**4**	**40**	**53**	**66**	**80**	**87**	**88**	**87**	**87**	**86**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	**100%**	16	21	21	22	23	24	24	23	22	20
	TOTAL SPACE HEATING			**290**	**367**	**378**	**382**	**388**	**389**	**383**	**373**	**361**	**349**
	TOTAL SPACE COOLING			**84**	**170**	**186**	**198**	**206**	**208**	**208**	**208**	**207**	**205**
	NRVU electricity	1	100%	19	61	69	74	76	77	79	81	83	86
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	5	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**	**77**	**88**	**95**	**99**	**102**	**105**	**110**	**115**	**121**
	TOTAL VENTILATION (electricity only)			**27**	**77**	**88**	**95**	**99**	**102**	**105**	**110**	**115**	**121**

BAU Electricity (in TWh elec), c'td	nrg	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
GLS stock		0	0	0	0	0	0	0	0	0	0
Tungsten stock		0	0	0	0	0	0	0	0	0	0
TOTAL LIGHTING		**265**	**419**	**411**	**377**	**326**	**292**	**277**	**265**	**257**	**251**
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	1	0	0	0	0	0	0	0	0
VIDEO projectors	1	0	2	2	2	1	0	0	0	0	0
VIDEO game consoles	1	0	2	2	3	3	4	5	5	6	6
Total VIDEO		**0**	**5**	**5**	**5**	**4**	**5**	**5**	**5**	**6**	**6**
ES Rack servers	1	1	18	21	24	29	35	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**	**53**	**52**	**52**	**52**
PC Desktop	1	14	21	13	5	3	3	3	3	3	3
PC Notebook	1	0	7	4	1	1	1	1	1	1	1
PC Tablet/slate	1	0	0	2	2	1	2	2	2	2	2
PC Thin client	1	0	0	0	0	0	0	0	0	0	0
PC Workstation	1	0	1	1	0	0	0	0	0	0	0
Total PC, electricity		**14**	**30**	**19**	**8**	**5**	**5**	**6**	**6**	**6**	**6**
EP-Copier mono	1	10	1	1	0	0	0	0	0	0	0
EP-Copier colour	1	0	0	1	1	2	2	2	2	2	3
EP-printer mono	1	9	3	2	2	1	1	1	1	1	1
EP-printer colour	1	0	1	2	3	3	4	4	5	5	6
IJ SFD printer	1	1	1	0	0	0	0	0	0	0	0
IJ MFD printer	1	1	1	2	2	2	2	2	2	3	3
Total imaging equipment, electricity		**22**	**7**	**8**	**8**	**9**	**9**	**10**	**10**	**11**	**12**
SB Home Gateway, on-mode hours	1	0	4	5	5	6	6	5	5	4	3
SB Home NAS, on-mode hours	1	0	0	0	1	1	1	1	1	0	0
SB Home Phones (fixed), on-mode hours	1	0	0	0	1	0	0	0	0	0	0
SB Office Phones (fixed), on-mode hours	1	0	1	1	1	1	0	0	0	0	0
SB Home Gateway, standby hours	1	0	1	0	0	0	0	0	0	0	0
SB Home NAS, standby hours	1	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
SB Office Phones (fixed), standby hours	1	0	0	0	0	0	0	0	0	0	0
SB Home Gateway, idle hours	1	0	2	3	4	5	4	4	3	3	1
SB Home NAS, idle hours	1	0	0	0	0	0	0	0	0	0	0
SB Home Phones (fixed), idle hours	1	0	1	1	1	1	1	1	1	0	0
SB Office Phones (fixed), idle hours	1	1	1	1	1	1	1	0	0	0	0
Total SB (networked) StandBy (rest)		**1**	**10**	**12**	**14**	**14**	**13**	**12**	**11**	**8**	**5**
Total BC Battery Charged devices	**1**	**0**	**4**	**4**	**4**	**4**	**4**	**3**	**2**	**2**	**2**
UPS below 1.5 kVA	1	0.7	1.5	1.5	1.8	2.1	2.5	2.8	3.1	3.3	3.5
UPS 1.5 to 5 kVA	1	2.6	5.8	6.2	6.9	8.2	9.6	10.9	12.2	13.2	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	4.5	4.6	4.9	5.8	6.7	7.5	8.2	8.8
Total UPS - Uninterrupted Power Supplies	**1**	**6**	**12**	**13**	**14**	**16**	**19**	**22**	**24**	**26**	**28**
TOTAL ELECTRONICS		**77**	**206**	**190**	**165**	**176**	**192**	**200**	**193**	**183**	**180**

	BAU Electricity (in TWh elec), c'td	nrg		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1		**137**	**138**	**139**	**138**	**138**	**138**	**138**	**138**	**137**	**137**
	CF open vertical chilled multi deck (RCV2)	1		29	38	40	43	45	47	49	50	51	52
	CF open horizontal frozen island (RHF4)	1		8	5	6	6	6	7	7	7	7	7
	CF Plug in one door beverage cooler	1		14	16	17	17	17	17	17	17	17	16
	CF Plug in horizontal ice cream freezer	1		3	4	5	5	5	5	5	5	5	5
	CF Spiral vending machine	1		2	3	4	4	5	5	6	6	6	7
	Total CF Commercial Refrigeration			**56**	**67**	**71**	**75**	**78**	**81**	**83**	**85**	**86**	**87**
	PF Service cabinets	1		6	8	9	9	10	10	11	11	11	12
	PF Blast cabinets	1		2	4	5	5	6	7	7	8	8	9
	PF Walk in cold rooms	1		14	18	19	20	21	22	23	23	24	25
	PF MT & LT industrial process chillers	1		16	34	39	44	49	54	59	65	70	75
	Total PF Professional Refrigeration			**38**	**65**	**72**	**79**	**85**	**92**	**100**	**107**	**114**	**122**
	TOTAL FOOD PRESERVATION			**232**	**270**	**281**	**292**	**302**	**311**	**321**	**330**	**338**	**345**
	CA El. Hobs	1		20	31	34	38	40	43	45	47	49	51
	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	16	17	18
	Total CA Cooking Appliances			**54**	**67**	**69**	**72**	**75**	**78**	**82**	**85**	**88**	**91**
	CM Dripfilter (glass)	1		6	4	4	3	3	3	3	3	3	3
	CM Dripfilter (thermos)	1		0	1	1	1	1	1	1	1	1	1
	CM Dripfilter (full automatic)	1		0	0	1	1	1	1	1	1	1	1
	CM Pad filter	1		0	1	1	1	1	1	1	1	1	1
	CM Hard cap espresso	1		0	0	0	0	1	1	1	1	1	1
	CM Semi-auto espresso	1		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
	CM Dripfilter (glass), standby/keep warm	1		4	3	3	2	2	2	2	2	2	2
	CM Dripfilter (thermos), standby/keep warm	1		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
	CM Pad filter, standby/keep warm	1		0	1	1	1	1	1	1	1	1	1
	CM Hard cap espresso, standby/keep warm	1		0	0	0	0	1	1	1	1	1	1
	CM Semi-auto espresso, standby/keep warm	1		0	0	0	0	0	0	0	0	0	0
	CM Fully-auto espresso, standby/keep warm	1		0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	1		**11**	**11**	**10**	**10**	**9**	**10**	**10**	**10**	**10**	**10**
	TOTAL COOKING			**65**	**77**	**80**	**82**	**84**	**88**	**92**	**95**	**98**	**102**
	Total WM household Washing Machine	1		**52**	**44**	**42**	**39**	**36**	**34**	**31**	**29**	**27**	**24**
	Total DW household Dishwasher	1		**13**	**23**	**27**	**30**	**34**	**37**	**40**	**43**	**45**	**47**
	LD vented el.	1		8	11	12	11	11	11	11	11	11	11
	LD condens el.	1		2	14	18	21	23	24	24	24	24	23
	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**	**34**	**34**	**34**
	VC dom	1		10	17	22	23	34	39	43	47	49	50
	VC nondom	1		3	5	5	6	7	7	7	8	8	8
	Total VC Vacuum Cleaner			**13**	**21**	**28**	**29**	**40**	**46**	**50**	**54**	**57**	**58**
	TOTAL CLEANING			**88**	**114**	**126**	**131**	**145**	**151**	**156**	**160**	**163**	**165**
0.5	FAN Axial<300Pa (all FAN types >125W)	1		19	53	62	69	76	80	81	81	81	81
0.5	FAN Axial>300Pa	1		33	96	110	117	122	125	125	125	125	125
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	52	58	63	69	73	75	77	78
0.5	FAN Centr.BC	1		22	50	60	66	72	79	85	92	100	108
0.5	FAN Cross-flow	1		1	2	3	3	4	4	4	5	5	6
	Total FAN, industrial (excl. box & roof fans)			**52**	**131**	**154**	**168**	**181**	**192**	**198**	**203**	**208**	**213**
0.5	**Total MT Motors 0.75-375 kW**	**1**		**814**	**1119**	**1192**	**1252**	**1288**	**1299**	**1292**	**1284**	**1276**	**1268**
	Total WP Water Pumps	1		**88**	**118**	**127**	**136**	**146**	**157**	**168**	**179**	**190**	**201**
	CP Fixed Speed 5-1280 l/s	1		24	48	41	35	35	36	36	37	38	39
	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**	**61**	**63**	**64**	**66**
	TOTAL INDUSTRY COMPONENTS			572	867	935	987	1030	1058	1074	1087	1100	1114

	BAU Electricity (in TWh elec), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
1	TRAFO Distribution	1	12	20	22	25	27	30	32	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	59	66	72	79	85	91	97	104
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**	**125**	**142**	**161**	**185**	**214**	**246**	**283**
	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		**1924**	**2818**	**2931**	**2969**	**3017**	**3052**	**3081**	**3094**	**3109**	**3132**
	GENERAL TOTAL in mtoe final demand electric		165	242	252	255	259	262	265	266	267	269

BAU Electricity (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	226	252	256	260	261	261	264	273	287	301
SPACE HEATING	290	367	378	382	388	389	383	373	361	349
SPACE COOLING	84	170	186	198	206	208	208	208	207	205
VENTILATION	27	77	88	95	99	102	105	110	115	121
LIGHTING	265	419	411	377	326	292	277	265	257	251
ELECTRONICS	77	206	190	165	176	192	200	193	183	180
FOOD PRESERVATION	232	270	281	292	302	311	321	330	338	345
COOKING	65	77	80	82	84	88	92	95	98	102
CLEANING	88	114	126	131	145	151	156	160	163	165
INDUSTRY COMPONENTS	572	867	935	987	1030	1058	1074	1087	1100	1114
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TOTAL in TWh electric	**1924**	**2818**	**2931**	**2969**	**3017**	**3052**	**3081**	**3094**	**3109**	**3132**
TOTAL in mtoe final (11.63 TWh/mtoe)	165	242	252	255	259	262	265	266	267	269



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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%**	**224**	**249**	**229**	**201**	**176**	**166**	**166**	**171**	**180**	**188**
	Total CH Central Heating combi, water heat	0	**2%**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	TOTAL WATER HEATING			**226**	**252**	**232**	**204**	**179**	**169**	**168**	**174**	**183**	**191**
	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	10	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	3	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	38	37	36	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	7	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	8	10	10	11	12
	ACF	0	5%	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling			**81**	**151**	**164**	**169**	**166**	**161**	**158**	**156**	**155**	**155**
	AC rooftop (rev)	1	100%	4	13	13	11	8	5	2	1	0	0
	AC splits (rev)	1	100%	8	24	25	24	22	19	17	15	14	12
	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%	4	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**	**47**	**45**	**43**	**42**
	Total AHC central Air Heating & Cooling			**99**	**203**	**219**	**224**	**219**	**211**	**205**	**201**	**199**	**196**
										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	27	25	23	24	24	23	23	22
	LH elec.convector	1	100%	116	115	113	106	102	104	105	103	100	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			**168**	**167**	**164**	**153**	**147**	**148**	**149**	**146**	**143**	**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	42	45	44	43	41	40
	Total RAC Room Air Conditioner			**4**	**40**	**49**	**57**	**67**	**72**	**73**	**72**	**72**	**71**
1	**CIRC Circulator pumps <2.5 kW, net load**	1	100%	16	20	14	11	10	11	11	10	10	10
	TOTAL SPACE HEATING			**290**	**364**	**369**	**358**	**355**	**360**	**361**	**358**	**354**	**350**
	TOTAL SPACE COOLING			**84**	**170**	**185**	**191**	**191**	**188**	**186**	**186**	**186**	**186**
	NRVU electricity	1	100%	19	61	67	68	66	63	64	66	69	71
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	13	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**	**77**	**85**	**84**	**80**	**76**	**78**	**81**	**85**	**90**
	TOTAL VENTILATION (electricity)			**27**	**77**	**85**	**84**	**80**	**76**	**78**	**81**	**85**	**90**

ECO Electricity (in TWh elec), c'td	nrg	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		**265**	**407**	**360**	**264**	**186**	**149**	**140**	**130**	**121**	**116**
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	1	0	0	0	0	0	0	0	0
VIDEO projectors	1	0	2	2	2	1	0	0	0	0	0
VIDEO game consoles	1	0	2	2	3	3	4	5	5	6	6
Total VIDEO		**0**	**5**	**5**	**5**	**4**	**5**	**5**	**5**	**6**	**6**
ES Rack servers	1	1	18	21	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**	**31**	**38**	**37**	**37**	**37**
PC Desktop	1	14	21	13	5	3	3	3	3	3	3
PC Notebook	1	0	7	4	1	1	1	1	1	1	1
PC Tablet/slate	1	0	0	2	2	1	2	2	2	2	2
PC Thin client	1	0	0	0	0	0	0	0	0	0	0
PC Workstation	1	0	1	1	0	0	0	0	0	0	0
Total PC, electricity		**14**	**30**	**19**	**8**	**5**	**5**	**6**	**6**	**6**	**6**
EP-Copier mono	1	10	1	0	0	0	0	0	0	0	0
EP-Copier colour	1	0	0	0	0	1	1	1	1	1	1
EP-printer mono	1	9	2	1	1	1	1	1	0	0	0
EP-printer colour	1	0	1	1	1	1	1	1	1	2	2
IJ SFD printer	1	1	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	4	5	5	6	6	5	5	4	3
SB Home NAS, on-mode hours	1	0	0	0	1	1	1	1	1	0	0
SB Home Phones (fixed), on-mode hours	1	0	0	0	1	0	0	0	0	0	0
SB Office Phones (fixed), on-mode hours	1	0	1	1	1	1	0	0	0	0	0
SB Home Gateway, standby hours	1	0	1	0	0	0	0	0	0	0	0
SB Home NAS, standby hours	1	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
SB Office Phones (fixed), standby hours	1	0	0	0	0	0	0	0	0	0	0
SB Home Gateway, idle hours	1	0	2	3	4	5	4	4	3	3	1
SB Home NAS, idle hours	1	0	0	0	0	0	0	0	0	0	0
SB Home Phones (fixed), idle hours	1	0	1	1	1	1	1	1	1	0	0
SB Office Phones (fixed), idle hours	1	1	1	1	1	1	1	0	0	0	0
Total SB (networked) StandBy (rest)		**1**	**10**	**12**	**14**	**14**	**13**	**12**	**11**	**8**	**5**
Total BC Battery Charged devices	**1**	**0**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
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	2.6	5.8	6.2	4.3	1.3	1.1	1.3	1.4	1.5	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	4.5	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		**77**	**202**	**179**	**118**	**97**	**102**	**111**	**115**	**119**	**122**

	ECO Electricity (in TWh elec), c'td	nrg		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1		**137**	**103**	**86**	**71**	**60**	**51**	**42**	**34**	**29**	**27**
	CF open vertical chilled multi deck (RCV2)	1		29	38	40	42	42	43	47	51	55	58
	CF open horizontal frozen island (RHF4)	1		8	5	6	6	6	6	7	7	8	8
	CF Plug in one door beverage cooler	1		14	16	17	16	15	15	16	17	18	19
	CF Plug in horizontal ice cream freezer	1		3	4	5	5	4	4	4	5	5	5
	CF Spiral vending machine	1		2	3	4	4	4	5	5	6	7	8
	Total CF Commercial Refrigeration			**56**	**67**	**71**	**73**	**72**	**74**	**80**	**86**	**92**	**98**
	PF Service cabinets	1		6	8	9	9	10	10	11	11	11	12
	PF Blast cabinets	1		2	4	5	5	6	7	7	8	8	9
	PF Walk in cold rooms	1		14	18	19	20	21	22	23	23	24	25
	PF MT & LT industrial process chillers	1		16	34	39	44	49	54	59	65	70	75
	Total PF Professional Refrigeration			**38**	**65**	**72**	**79**	**85**	**92**	**100**	**107**	**114**	**122**
	TOTAL FOOD PRESERVATION			**232**	**235**	**228**	**223**	**217**	**217**	**221**	**227**	**235**	**246**
	CA El. Hobs	1		20	31	34	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	11	12	12	13
	Total CA Cooking Appliances			**54**	**67**	**69**	**71**	**72**	**73**	**75**	**78**	**80**	**83**
	CM Dripfilter (glass)	1		6	4	4	3	3	3	3	3	3	3
	CM Dripfilter (thermos)	1		0	1	1	1	1	1	1	1	1	1
	CM Dripfilter (full automatic)	1		0	0	1	1	1	1	1	1	1	1
	CM Pad filter	1		0	1	1	1	1	1	1	1	1	1
	CM Hard cap espresso	1		0	0	0	0	1	1	1	1	1	1
	CM Semi-auto espresso	1		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
	CM Dripfilter (glass), standby/keep warm	1		4	3	2	1	1	1	1	1	1	1
	CM Dripfilter (thermos), standby/keep warm	1		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
	CM Pad filter, standby/keep warm	1		0	1	1	0	0	0	0	0	0	1
	CM Hard cap espresso, standby/keep warm	1		0	0	0	0	0	0	0	0	0	0
	CM Semi-auto espresso, standby/keep warm	1		0	0	0	0	0	0	0	0	0	0
	CM Fully-auto espresso, standby/keep warm	1		0	0	0	0	0	0	0	0	0	0
	Total CM household Coffee Makers	1		**11**	**11**	**10**	**8**	**8**	**8**	**8**	**8**	**8**	**9**
	TOTAL COOKING			**65**	**77**	**79**	**79**	**80**	**81**	**83**	**86**	**89**	**92**
	Total WM household Washing Machine	1		**52**	**35**	**28**	**23**	**19**	**17**	**15**	**15**	**15**	**15**
	Total DW household Dishwasher	1		**13**	**18**	**20**	**22**	**23**	**25**	**27**	**28**	**29**	**30**
	LD vented el.	1		8	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**	**21**	**23**	**14**	**16**	**16**	**16**	**15**	**14**	**14**
	TOTAL CLEANING			**88**	**100**	**99**	**88**	**86**	**84**	**83**	**83**	**83**	**83**
0.5	FAN Axial<300Pa (all FAN types >125W)	1		19	53	59	62	63	64	65	65	65	65
0.5	FAN Axial>300Pa	1		33	96	108	109	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	52	54	58	61	63	65	66
0.5	FAN Centr.BC	1		22	50	57	59	61	66	71	76	83	90
0.5	FAN Cross-flow	1		1	2	2	2	2	2	2	2	2	2
	Total FAN, industrial (excl. box & roof fans)			**52**	**131**	**149**	**152**	**154**	**158**	**162**	**165**	**169**	**174**
0.5	**Total MT Motors 0.75-375 kW**	**1**		**814**	**1117**	**1140**	**1112**	**1083**	**1090**	**1089**	**1089**	**1089**	**1089**
	Total WP Water Pumps	1		**88**	**118**	**125**	**133**	**142**	**153**	**163**	**174**	**185**	**195**
	CP Fixed Speed 5-1280 l/s	1		24	48	41	35	34	34	35	37	38	39
	CP Variable speed 5-1280 l/s	1		0	9	16	20	22	22	23	23	24	25
	CP Pistons 2-64 l/s	1		1	2	1	1	1	1	1	2	2	2
	Total CP Standard Air Compressors			**25**	**59**	**58**	**56**	**57**	**58**	**60**	**62**	**63**	**65**
	TOTAL INDUSTRY COMPONENTS			572	866	902	897	894	914	930	945	962	978

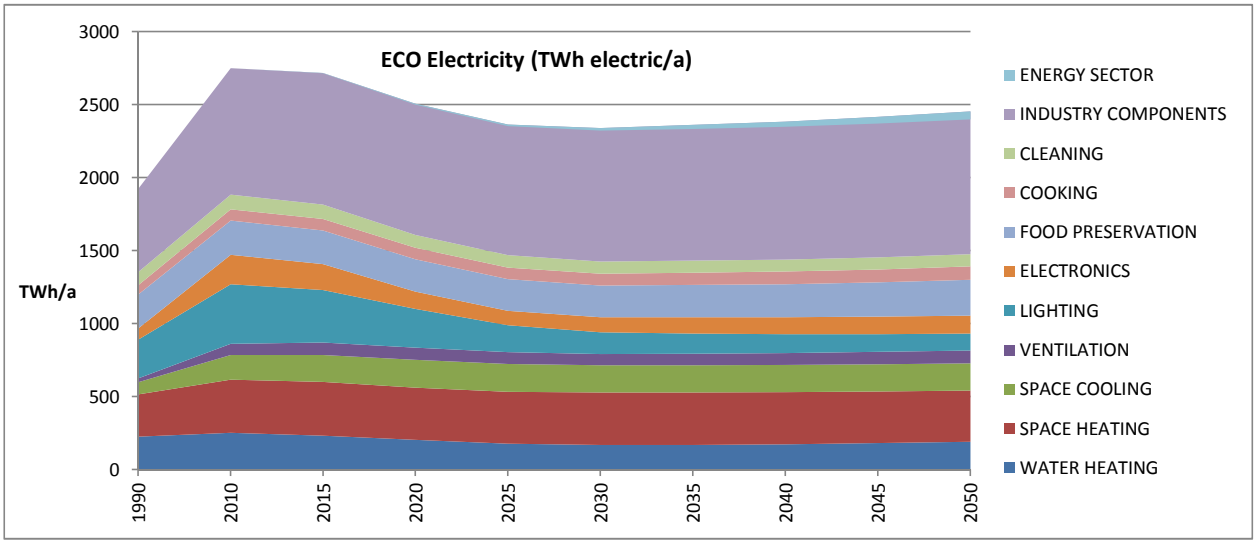
	ECO Electricity (in TWh elec), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
1	TRAFO Distribution	1	12	20	22	23	24	24	25	26	26	27
1	TRAFO Industry oil	1	9	16	17	17	16	16	15	15	16	17
1	TRAFO Industry dry	1	3	5	5	6	6	6	6	6	6	7
1	TRAFO Power	1	34	53	59	66	72	79	85	91	97	104
1	TRAFO DER oil	1	0	0	1	1	2	3	4	6	8	11
1	TRAFO DER dry	1	0	2	3	5	8	13	21	31	44	59
1	TRAFO Small	1	2	2	2	2	2	2	2	2	2	2
	Total TRAFO Utility Transformers**		**60**	**98**	**109**	**119**	**130**	**142**	**158**	**177**	**201**	**227**
	TOTAL ENERGY SECTOR (only improvement over BAU)		**0**	**0**	**-2**	**-6**	**-12**	**-19**	**-27**	**-36**	**-46**	**-55**
	TOTAL TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL in TWh electric		**1925**	**2750**	**2716**	**2500**	**2353**	**2322**	**2335**	**2349**	**2371**	**2399**
	GENERAL TOTAL in mtoe final (11.63 TWh/mtoe)		166	236	234	215	202	200	201	202	204	206

*=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.)

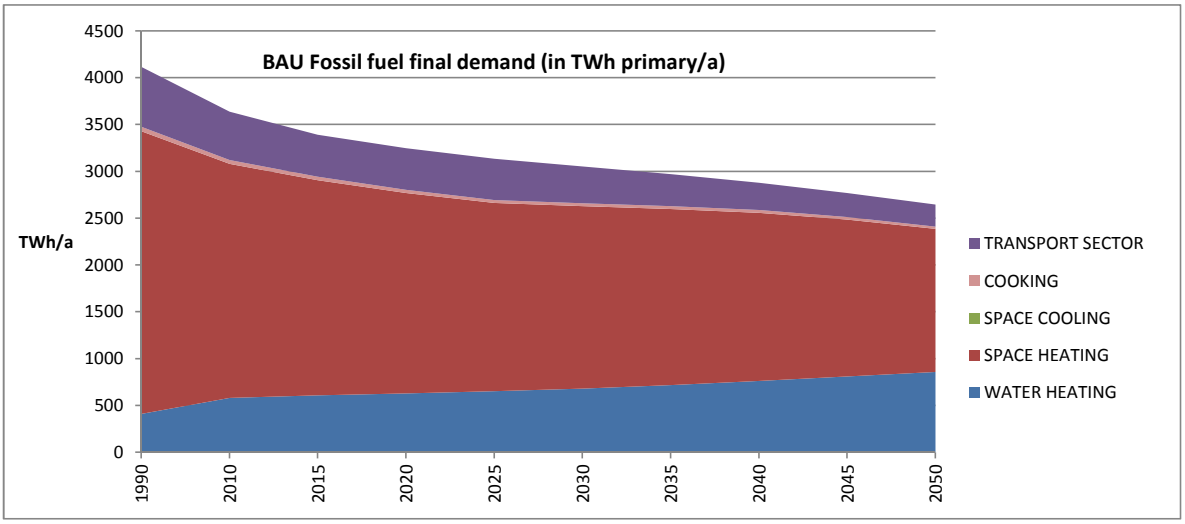
ECO Electricity (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	226	252	232	204	179	169	168	174	183	191
SPACE HEATING	290	364	369	358	355	360	361	358	354	350
SPACE COOLING	84	170	185	191	191	188	186	186	186	186
VENTILATION	27	77	85	84	80	76	78	81	85	90
LIGHTING	265	407	360	264	186	149	140	130	121	116
ELECTRONICS	77	202	179	118	97	102	111	115	119	122
FOOD PRESERVATION	232	235	228	223	217	217	221	227	235	246
COOKING	65	77	79	79	80	81	83	86	89	92
CLEANING	88	100	99	88	86	84	83	83	83	83
INDUSTRY COMPONENTS	572	866	902	897	894	914	930	945	962	978
ENERGY SECTOR	0	0	-2	-6	-12	-19	-27	-36	-46	-55
TOTAL in TWh electric	**1925**	**2750**	**2716**	**2500**	**2353**	**2322**	**2335**	**2349**	**2371**	**2399**



SAVINGS ECO VS. BAU Electricity (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	25	56	82	92	96	99	104	110
SPACE HEATING	0	3	9	24	34	29	22	15	7	-1
SPACE COOLING	0	0	2	8	15	20	22	22	21	19
VENTILATION	0	0	3	11	19	25	27	28	30	31
LIGHTING	0	12	51	113	140	142	137	135	137	135
ELECTRONICS	0	4	10	47	80	89	88	78	63	58
FOOD PRESERVATION	0	35	53	69	84	94	100	103	103	99
COOKING	0	0	1	3	5	7	8	9	9	10
CLEANING	0	14	27	44	58	67	73	77	80	82
INDUSTRY COMPONENTS	0	1	33	90	135	144	144	141	138	135
ENERGY SECTOR	0	0	2	6	12	19	27	36	46	55
TOTAL in TWh electric	**0**	**68**	**215**	**469**	**664**	**729**	**746**	**745**	**738**	**733**
TOTAL in mtoe final (11.63 TWh/mtoe)	0	6	18	40	57	63	64	64	63	63
TOTAL in mtoe final + share power generation & distr.	0	15	46	101	143	157	160	160	159	158

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%**	**158**	**175**	**178**	**181**	**182**	**181**	**183**	**189**	**199**	**208**
	Total CH Central Heating combi, water heat	0	**2%**	**253**	**406**	**431**	**449**	**471**	**501**	**535**	**573**	**611**	**651**
	TOTAL WATER HEATING			**411**	**581**	**609**	**629**	**653**	**682**	**718**	**762**	**810**	**859**
	CH non-electric	0		2200	1992	1799	1646	1526	1488	1438	1360	1240	1088
	Total CH Central Heating boiler, space heat	0		**2200**	**1992**	**1799**	**1646**	**1526**	**1488**	**1438**	**1360**	**1240**	**1088**
	SFB Wood Manual	0		343	90	70	52	35	21	13	9	7	6
	SFB Wood Direct Draft	0		2	24	44	62	73	72	72	77	88	102
	SFB Coal	0		106	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		0	9	16	23	28	31	31	31	33	34
	SFB Wood chips	0		0	15	18	20	18	18	19	20	21	22
	Total Solid Fuel Boiler			**452**	**167**	**168**	**169**	**161**	**143**	**136**	**138**	**150**	**165**
	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%	213	160	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			**213**	**160**	**136**	**118**	**103**	**91**	**81**	**71**	**63**	**56**
	Total AHC central Air Heating & Cooling			**213**	**160**	**136**	**118**	**104**	**91**	**81**	**72**	**64**	**56**
										0			
	LH open fireplace	0	0%	14	18	19	20	21	21	21	21	21	20
	LH closed fireplace/inset	0	0%	18	41	49	56	61	65	66	66	65	63
	LH wood stove	0	0%	39	38	37	38	38	39	39	39	38	37
	LH coal stove	0	0%	26	14	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	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	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	4	4	4	4
	LH tube heaters	0	0%	12	12	12	12	11	11	10	10	10	9
	Total LH Local Heaters			**151**	**181**	**194**	**208**	**219**	**225**	**227**	**226**	**222**	**218**
	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			**3017**	**2501**	**2297**	**2141**	**2009**	**1947**	**1882**	**1796**	**1676**	**1527**
	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	-633	-754	-855	-938	-1004	-1071	-1138	-1207	-1276
1	RVU Central Unidir., heat (negative=saving)	0	0%	-16	-32	-36	-35	-34	-34	-35	-38	-40	-43
1	RVU Central Balanced, heat (negative=saving)	0	0%	-1	-8	-16	-29	-42	-55	-63	-69	-76	-82
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**	**-674**	**-808**	**-924**	**-1021**	**-1102**	**-1182**	**-1262**	**-1343**	**-1426**
	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**
	CA Gas Hobs	0	0%	35	29	28	27	25	24	23	22	21	19
	CA Gas Ovens	0	0%	14	10	9	8	8	7	7	7	6	6
	TOTAL COOKING			**49**	**39**	**37**	**35**	**33**	**31**	**30**	**28**	**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			298	261	238	243	246	220	190	162	138	128
	TYRE van replacement tyres C2			118	99	89	90	90	79	67	56	51	48
	TYRE truck replacement tyres C3			225	157	121	112	103	93	84	75	66	58
	TYRE Replacement Tyres			641	516	447	445	439	392	340	292	255	234
	TOTAL TRANSPORT SECTOR			**641**	**516**	**447**	**445**	**439**	**392**	**340**	**292**	**255**	**234**
	GENERAL TOTAL in TWh electric			**3477**	**3121**	**2943**	**2805**	**2696**	**2661**	**2630**	**2587**	**2514**	**2412**
	GENERAL TOTAL in mtoe final demand electric			299	268	253	241	232	229	226	222	216	207

BAU fossil fuel (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	411	581	609	629	653	682	718	762	810	859
SPACE HEATING	3017	2501	2297	2141	2009	1947	1882	1796	1676	1527
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	28	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	641	516	447	445	439	392	340	292	255	234
TOTAL in TWh primary	**3477**	**3121**	**2943**	**2805**	**2696**	**2661**	**2630**	**2587**	**2514**	**2412**
TOTAL in mtoe final (11.63 TWh/mtoe)	299	268	253	241	232	229	226	222	216	207
Total PJ primary	12517	11235	10596	10099	9704	9580	9469	9315	9050	8685



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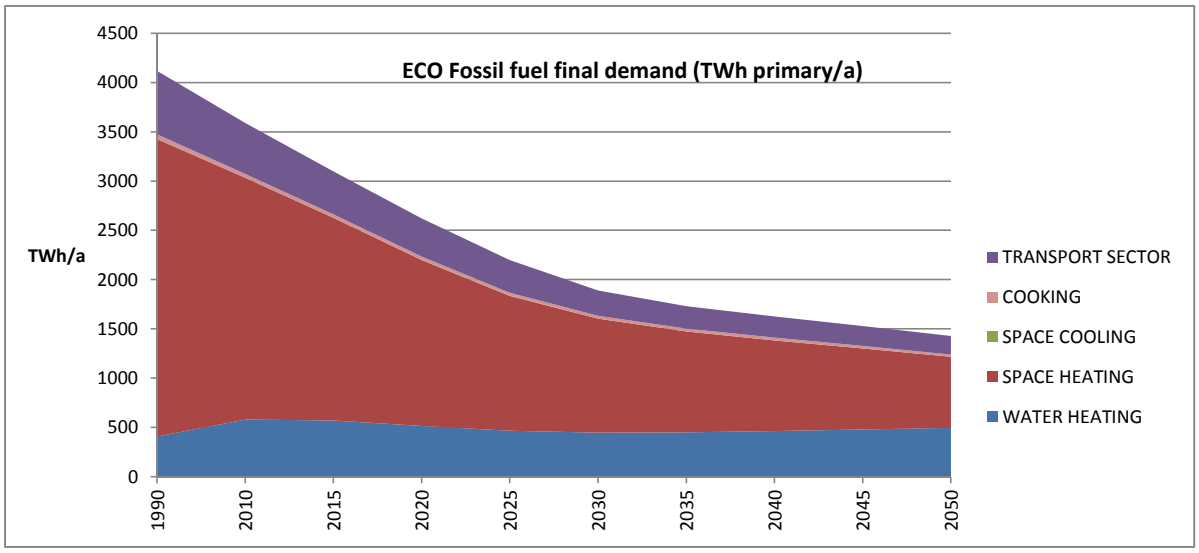
db	ECO Fossil Fuel (in TWh NCV)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**158**	**175**	**161**	**142**	**124**	**117**	**117**	**121**	**127**	**133**
	Total CH Central Heating combi, water heat	0	**2%**	**253**	**406**	**410**	**377**	**345**	**332**	**336**	**346**	**355**	**365**
	TOTAL WATER HEATING			**411**	**581**	**571**	**519**	**469**	**449**	**452**	**466**	**482**	**497**
	CH non-electric	0		2200	1946	1559	1198	911	733	621	526	428	320
	Total CH Central Heating boiler, space heat	0		**2200**	**1946**	**1559**	**1198**	**911**	**733**	**621**	**526**	**428**	**320**
	SFB Wood Manual	0		343	90	69	49	31	17	9	6	5	5
	SFB Wood Direct Draft	0		2	24	44	62	73	71	71	76	87	100
	SFB Coal	0		106	30	20	13	7	3	1	1	1	1
	SFB Pellets	0		0	9	16	23	28	30	31	31	32	34
	SFB Wood chips	0		0	15	17	20	18	17	18	20	21	22
	Total Solid Fuel Boiler			**452**	**167**	**167**	**166**	**156**	**138**	**130**	**133**	**146**	**161**
	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%	213	160	136	114	94	78	67	59	52	46
	AHE	1	100%	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Heating			**213**	**160**	**136**	**114**	**94**	**78**	**68**	**60**	**53**	**47**
	Total AHC central Air Heating & Cooling			**213**	**160**	**136**	**114**	**94**	**79**	**68**	**60**	**53**	**47**
										0			
	LH open fireplace	0	0%	14	18	19	19	18	17	15	14	13	13
	LH closed fireplace/inset	0	0%	18	41	49	55	58	60	59	58	56	54
	LH wood stove	0	0%	39	38	37	37	36	36	35	34	33	32
	LH coal stove	0	0%	26	14	13	11	10	8	6	5	4	3
	LH cooker	0	0%	7	11	12	14	14	15	15	14	14	14
	LH SHR stove	0	0%	17	21	23	25	27	30	33	35	35	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	0	0	0	0	0	0	0	0	0
	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			**151**	**181**	**194**	**204**	**207**	**207**	**205**	**200**	**195**	**192**
	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			**3017**	**2454**	**2057**	**1682**	**1368**	**1156**	**1024**	**919**	**822**	**720**
	TOTAL SPACE COOLING			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	NRVU heat (negative=saving vs. natural ventilation)	0	0%	-136	-633	-773	-921	-1049	-1151	-1222	-1284	-1347	-1410
1	RVU Central Unidir., heat (negative=saving)	0	0%	-16	-32	-46	-61	-75	-88	-92	-99	-106	-112
1	RVU Central Balanced, heat (negative=saving)	0	0%	-1	-8	-17	-31	-46	-60	-68	-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**	**-674**	**-839**	**-1017**	**-1178**	**-1311**	**-1399**	**-1480**	**-1561**	**-1642**
	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**	**-126**	**-148**	**-143**	**-135**	**-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**
	CA Gas Hobs	0	0%	35	29	28	27	25	24	22	21	20	19
	CA Gas Ovens	0	0%	14	10	9	8	7	6	5	5	5	5
	TOTAL COOKING			**49**	**39**	**37**	**34**	**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			298	261	232	214	191	143	123	116	109	102
	TYRE van replacement tyres C2			118	99	85	75	61	51	48	45	42	40
	TYRE truck replacement tyres C3			225	157	117	98	80	62	56	53	50	46
	TYRE Replacement Tyres			641	516	433	386	331	256	227	214	201	188
	TOTAL TRANSPORT SECTOR			**641**	**516**	**433**	**386**	**331**	**256**	**227**	**214**	**201**	**188**
	GENERAL TOTAL in TWh fossil fuel (=primary)			**3477**	**3074**	**2634**	**2147**	**1743**	**1486**	**1361**	**1277**	**1200**	**1120**
	GENERAL TOTAL in mtoe final			299	264	227	185	150	128	117	110	103	96

ECO fossil fuel (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	411	581	571	519	469	449	452	466	482	497
SPACE HEATING	3017	2454	2057	1682	1368	1156	1024	919	822	720
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	-31	-89	-126	-148	-143	-135	-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	34	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	641	516	433	386	331	256	227	214	201	188
TOTAL in TWh fossil fuel (=primary)	**4118**	**3591**	**3068**	**2534**	**2075**	**1743**	**1589**	**1491**	**1401**	**1308**
TOTAL in mtoe final (11.63 TWh/mtoe)	354	309	264	218	178	150	137	128	120	112



SAVINGS ECO VS. BAU fossil fuel (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	38	111	184	233	266	296	328	362
SPACE HEATING	0	47	240	459	641	792	858	877	854	807
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	31	89	126	148	143	135	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	0	0	0	0	1	2	2	2	2	2
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	0	0	14	58	108	136	113	78	54	46
TOTAL in TWh fossil fuel (=primary)	**0**	**47**	**323**	**716**	**1060**	**1311**	**1382**	**1388**	**1368**	**1339**
TOTAL in mtoe final (11.63 TWh/mtoe)	0	4	28	62	91	113	119	119	118	115
TOTAL in PJ primary	0	168	1163	2579	3815	4719	4976	4997	4924	4819

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)		GWP kg CO_2 /kg	charge in kg	loss in %/a	kgCO_2/ a
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
GWPCF1	CF vertical chilled (Lot 12)	kgCO_2/a	2280	20	8.5%	3876
GWPCF2	CF horizontal frozen (Lot 12)	kgCO_2/a	2280	20	8.5%	3876
GWPCF3	CF beverage cooler (Lot 12)	kgCO_2/a	1300	0.318	4.5%	19
GWPCF4	CF ice cream freezer (lot 12)	kgCO_2/a	2550	0.22	4.5%	25
GWPCF5	CF vending machine (Lot 12)	kgCO_2/a	1300	0.546	4.0%	28

*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, negigble loss). For professional refrigeration no data are available in the prep. study.

NO_x

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.
It is uncertain whether NO_x or other emissions from combustion (OGC, CO, PM) will be included in possible regulations for solid fuel boilers (Lot 15), non-electric local heaters (Lot 20) or fossil-fuel fired air heaters (Lot 21_6). Therefore they are not reported for the moment.

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)

≤ 12 kW rated capacity	indoors	60
	outdoors	65
> 12 kW ≤ 45 kW rated capacity	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 NO_x emissions at bottom of Table										
	Total WH dedicated Water Heater	**146**	**139**	**138**	**136**	**131**	**126**	**122**	**121**	**121**	**121**
	Total CH Central Heating combi, water heat	**55**	**88**	**93**	**97**	**102**	**108**	**115**	**123**	**131**	**140**
	TOTAL WATER HEATING	**200**	**227**	**231**	**232**	**233**	**234**	**237**	**244**	**252**	**261**
	Total CH Central Heating boiler, space heat	**518**	**475**	**432**	**396**	**367**	**357**	**343**	**323**	**295**	**259**
	SFB Wood Manual	7.4	1.9	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	1.5	1.6	1.7	1.9	2.2
	SFB Coal	41.8	11.6	8.0	5.0	2.6	1.0	0.5	0.4	0.3	0.3
	SFB Pellets	0.0	0.4	0.6	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**	**4**	**4**	**4**	**4**	**4**
	CHAE-S ≤400 kW	2.5	6.7	7.8	8.4	8.5	8.6	8.6	7.6	5.8	3.7
	CHAE-L > 400 kW	3.2	6.5	6.9	7.1	6.7	6.0	5.4	4.9	4.5	4.1
	CHWE-S ≤400 kW	0.2	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	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	0.6	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	11.5	14.9	15.6	16.1	15.8	15.2	14.5	13.7	13.0	12.2
	HT PCH-AE-L	11.1	14.2	14.9	15.2	14.9	14.3	13.6	12.9	12.2	11.4
	HT PCH-WE-S	2.3	3.1	3.3	3.4	3.3	3.2	3.0	2.9	2.7	2.6
	HT PCH-WE-M	4.7	6.1	6.5	6.6	6.5	6.3	6.0	5.7	5.4	5.1
	HT PCH-WE-L	0.9	1.2	1.3	1.3	1.3	1.3	1.2	1.2	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	2.6	7.0	6.9	6.4	5.9	5.3	4.7	4.1	3.7	3.3
	AC VRF	0.0	2.6	3.8	5.4	6.8	8.4	9.9	11.1	12.2	12.9
	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**	**69**	**74**	**77**	**75**	**73**	**70**	**67**	**63**	**59**
	AC rooftop (rev)	2.3	5.8	5.6	4.8	3.6	2.2	1.0	0.3	0.0	0.0
	AC splits (rev)	4.3	11.2	11.3	10.7	9.7	8.4	7.2	6.2	5.3	4.6
	AC VRF (rev)	0.0	4.4	6.3	8.6	10.5	12.5	14.0	14.4	14.4	14.0
	ACF (rev)	0	0	0	0	0	0	0	0	0	0
	AHF	48	35	30	26	23	20	18	15	14	12
	AHE	0.5	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**	**127**	**128**	**127**	**122**	**117**	**111**	**104**	**97**	**90**
	LH open fireplace	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
	LH closed fireplace/inset	0.4	0.9	1.0	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	4.4	3.9	3.3	2.6	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	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
	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	14.0	11.4	10.9	10.3	9.7	9.2	8.6	7.9	7.2	6.5
	LH elec.convector	58.0	47.1	45.1	42.8	40.2	37.9	35.5	32.7	29.8	27.0
	LH elec.storage	4.3	3.5	3.3	3.2	3.0	2.8	2.6	2.4	2.2	2.0
	LH elec.underfloor	7.9	6.6	6.4	6.1	5.7	5.4	5.0	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	**101**	**82**	**78**	**75**	**71**	**67**	**63**	**58**	**53**	**49**
	RAC (cooling demand), all types <12 kW	1.4	9.2	10.9	12.4	14.6	15.5	15.6	15.4	15.1	14.7
	RAC (heating demand), reversible <12kW	1.1	10.7	14.5	18.3	21.5	22.0	20.9	19.5	18.0	16.6
	Total RAC Room Air Conditioner	**2**	**20**	**25**	**31**	**36**	**38**	**37**	**35**	**33**	**31**
1	**CIRC Circulator pumps <2.5 kW, net load**	**8.0**	**8.5**	**8.5**	**8.3**	**8.1**	**8.0**	**7.6**	**6.8**	**6.0**	**5.3**
	TOTAL SPACE HEATING	**724**	**640**	**590**	**548**	**513**	**494**	**471**	**442**	**404**	**360**
	TOTAL SPACE COOLING	**43**	**78**	**85**	**89**	**90**	**89**	**86**	**82**	**78**	**74**
	NRVU electricity	9.4	24.9	27.2	28.1	27.5	26.3	25.2	24.2	23.3	22.5
1	NRVU heat (negative=saving vs. natural ventilation)	-28.8	-134.4	-160.1	-181.6	-199.2	-213.2	-227.4	-241.7	-256.3	-271.1
	RVU Central Unidir. VU ≤125W/fan (1 fan)	3.9	6.3	6.8	6.4	5.8	5.4	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)	-3.4	-6.8	-7.7	-7.5	-7.2	-7.1	-7.4	-8.0	-8.5	-9.1
1	RVU Central Balanced, heat (negative=saving)	-0.1	-1.7	-3.5	-6.1	-9.0	-11.6	-13.3	-14.7	-16.1	-17.5
1	RVU Local Balanced, heat (negative=saving)	0.0	-0.2	-0.5	-0.9	-1.5	-2.2	-2.9	-3.6	-4.4	-5.1
	Total VU Ventilation Units	**-19**	**-112**	**-137**	**-160**	**-181**	**-199**	**-217**	**-235**	**-253**	**-271**
	TOTAL VENTILATION (electricity)	**13**	**32**	**35**	**36**	**36**	**35**	**34**	**33**	**32**	**31**

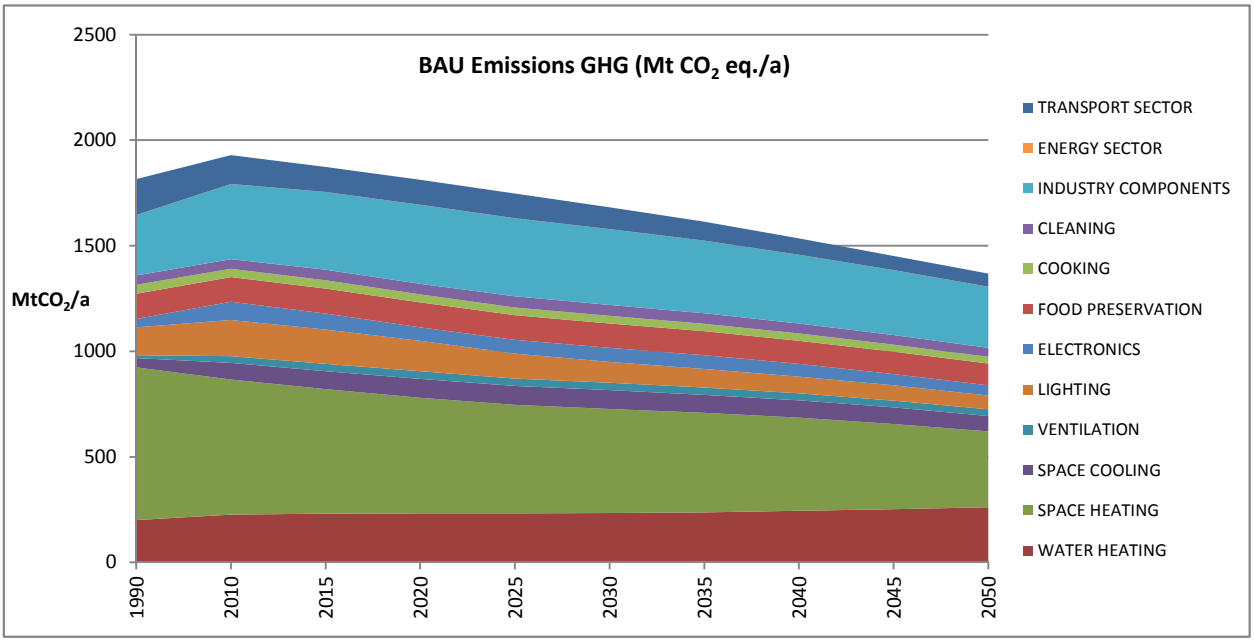
BAU Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources										
LFL Linear Fluorescent	40.5	51.4	54.3	50.7	46.7	42.2	37.8	33.4	29.7	26.2
CFL Compact Fluorescent	1.9	11.0	14.2	12.5	8.0	5.9	4.9	4.1	3.4	2.8
Tungsten	4.5	21.5	21.8	20.7	13.3	9.0	6.2	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	**132**	**172**	**162**	**143**	**117**	**99**	**89**	**80**	**72**	**65**
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	5.1	5.0	4.7	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**	**13**	**12**
SSTB	0.0	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	2.9	6.7	7.2	7.1	6.4	6.4	6.5	6.5	6.5
Total STB set top boxes (Complex & Simple)	**0**	**4**	**7**	**7**	**7**	**6**	**6**	**7**	**7**	**6**
VIDEO players/recorders	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	0.7	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	0.9	0.9	1.1	1.2	1.5	1.5	1.6	1.6	1.6
Total VIDEO	**0**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
ES Rack servers	0.3	7.6	8.5	9.0	10.3	12.0	13.6	12.5	11.6	10.8
ES Blade servers	0.1	1.8	1.9	1.8	2.0	2.3	2.5	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**	**13**
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**	**12**	**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	0.8	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	**12**	**4**	**4**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
incl. paper	*1*	*1*	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
SB Home Gateway, on-mode hours	0.0	1.7	1.9	2.0	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby hours	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	0.7	1.2	1.7	1.6	1.5	1.3	1.0	0.8	0.2
SB Home NAS, idle 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), idle hours	0.2	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.0
SB Office Phones (fixed), idle hours	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0
Total SB (networked) StandBy (rest)	**1**	**4**	**5**	**5**	**5**	**5**	**4**	**3**	**2**	**1**
Total BC Battery Charged devices	**0**	**2**	**2**	**2**	**2**	**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	3.6
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	2.2	2.3	2.3
Total UPS - Uninterrupted Power Supplies	**3**	**5**	**5**	**5**	**6**	**7**	**7**	**7**	**7**	**7**
TOTAL ELECTRONICS	**40**	**86**	**76**	**64**	**65**	**67**	**66**	**60**	**53**	**49**
Total RF household Refrigerators & Freezers	**69**	**57**	**55**	**53**	**50**	**47**	**44**	**41**	**38**	**36**
CF open vertical chilled multi deck (RCV2)	17.5	20.7	21.7	22.9	23.5	24.0	24.3	24.4	24.4	24.2
CF open horizontal frozen island (RHF4)	4.7	2.9	3.0	3.1	3.2	3.3	3.3	3.3	3.3	3.3
CF Plug in one door beverage cooler	7.3	6.9	6.8	6.6	6.3	5.9	5.6	5.2	4.8	4.5
CF Plug in horizontal ice cream freezer	1.8	1.9	1.9	1.8	1.8	1.7	1.6	1.5	1.4	1.3
CF Spiral vending machine	1.0	1.3	1.5	1.6	1.8	1.9	1.9	1.9	1.9	1.9
Total CF Commercial Refrigeration	**32**	**34**	**35**	**36**	**37**	**37**	**37**	**36**	**36**	**35**
PF Service cabinets	3	3	4	4	3	3	3	3	3	3
PF Blast cabinets	1	2	2	2	2	2	2	2	2	2
PF Walk in cold rooms	7	7	7	7	7	7	7	7	7	7
PF MT & LT industrial process chillers	8	14	15	17	18	18	19	19	20	20
Total PF Professional Refrigeration	**19**	**26**	**28**	**30**	**31**	**31**	**32**	**32**	**32**	**32**
TOTAL FOOD PRESERVATION	**120**	**117**	**118**	**119**	**117**	**115**	**113**	**110**	**106**	**102**

	BAU Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	10.1	12.8	13.6	14.3	14.5	14.6	14.4	14.2	13.8	13.3
	CA El. Ovens	11.7	9.6	8.7	7.9	7.3	7.0	6.8	6.4	6.0	5.6
	CA Gas Hobs	7.0	5.8	5.5	5.3	5.0	4.8	4.5	4.3	4.1	3.8
	CA Gas Ovens	2.7	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	5.1	5.1	5.1	5.0	4.9	4.8	4.7
	Total CA Cooking Appliances	**36**	**35**	**35**	**34**	**33**	**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**	**39**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**31**
	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	13.8	14.0	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**	**51**	**50**	**48**	**46**	**43**
0.5	FAN Axial<300Pa (all FAN types >125W)	9.6	21.6	24.4	26.2	27.3	27.3	26.1	24.4	22.8	21.2
0.5	FAN Axial>300Pa	16.3	39.5	43.6	44.4	43.8	42.4	40.2	37.6	35.1	32.6
0.5	FAN Centr.FC	4.1	7.0	8.2	8.8	9.0	9.0	8.6	8.1	7.6	7.0
0.5	FAN Centr.BC-free	10.6	18.1	20.7	21.9	22.7	23.4	23.4	22.6	21.5	20.3
0.5	FAN Centr.BC	11.0	20.4	23.5	24.9	26.0	26.9	27.3	27.5	27.9	28.1
0.5	FAN Cross-flow	0.7	1.0	1.1	1.3	1.4	1.4	1.4	1.4	1.4	1.5
	Total FAN, industrial (excl. box & roof fans)	**26**	**54**	**61**	**64**	**65**	**65**	**63**	**61**	**58**	**55**
0.5	**Total MT Motors 0.75-375 kW**	**407**	**459**	**471**	**476**	**464**	**442**	**413**	**385**	**357**	**330**
	Total WP Water Pumps	**44**	**48**	**50**	**52**	**53**	**53**	**54**	**54**	**53**	**52**
	CP Fixed Speed 5-1280 l/s	11.8	19.8	16.1	13.5	12.5	12.1	11.7	11.2	10.8	10.2
	CP Variable speed 5-1280 l/s	0.0	3.6	6.2	7.6	7.9	7.8	7.5	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	0.5	0.4
	Total CP Standard Air Compressors	**12**	**24**	**23**	**22**	**21**	**20**	**20**	**19**	**18**	**17**
	TOTAL INDUSTRY COMPONENTS	**286**	**355**	**369**	**375**	**371**	**360**	**344**	**326**	**308**	**290**
	TRAFO Distribution	6.0	8.2	8.8	9.4	9.8	10.1	10.4	10.5	10.5	10.5
	TRAFO Industry oil	4.5	6.4	6.9	7.3	7.5	7.7	7.7	7.8	7.8	7.7
	TRAFO Industry dry	1.4	2.0	2.1	2.3	2.4	2.4	2.5	2.5	2.5	2.4
	TRAFO Power	17.1	21.8	23.5	25.0	26.0	26.7	27.1	27.3	27.3	27.1
	TRAFO DER oil	0.0	0.2	0.3	0.6	0.9	1.4	2.1	3.0	3.9	4.8
	TRAFO DER dry	0.0	0.8	1.4	2.4	3.7	5.8	8.8	12.5	16.5	20.5
	TRAFO Small	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5
	Total TRAFO Utility Transformers	**30**	**40**	**44**	**48**	**51**	**55**	**59**	**64**	**69**	**73**
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	79	69	63	64	65	58	50	43	37	34
	TYRE van replacement tyres C2	31	26	23	24	24	21	18	15	13	13
	TYRE truck replacement tyres C3	59	41	32	30	27	25	22	20	17	15
	TYRE Replacement Tyres	**170**	**137**	**118**	**118**	**116**	**104**	**90**	**77**	**68**	**62**
	TRANSPORT SECTOR	**170**	**137**	**118**	**118**	**116**	**104**	**90**	**77**	**68**	**62**
	GENERAL TOTAL (in Mt CO_2)	**1815**	**1929**	**1874**	**1813**	**1747**	**1683**	**1614**	**1536**	**1452**	**1368**

BAU Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	200	227	231	232	233	234	237	244	252	261
SPACE HEATING	724	640	590	548	513	494	471	442	404	360
SPACE COOLING	43	78	85	89	90	89	86	82	78	74
VENTILATION	13	32	35	36	36	35	34	33	32	31
LIGHTING	132	172	162	143	117	99	89	80	72	65
ELECTRONICS	40	86	76	64	65	67	66	60	53	49
FOOD PRESERVATION	120	117	118	119	117	115	113	110	106	102
COOKING	42	39	39	38	37	36	35	34	33	31
CLEANING	44	47	50	50	52	51	50	48	46	43
INDUSTRY COMPONENTS	286	355	369	375	371	360	344	326	308	290
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	170	137	118	118	116	104	90	77	68	62
TOTAL in Mt CO_2	1815	1929	1874	1813	1747	1683	1614	1536	1452	1368

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	34	35	36	38	40
Total CH Central Heating combi, water heat	48	77	82	85	90	95	102	109	116	124
Total CH Central Heating boiler, space heat	418	379	342	313	290	283	273	258	236	207
Total direct NO_x BAU in NO_x	496	489	457	432	414	412	410	403	390	370
Direct NO_x BAU in SO_2 eq.(=1 /0.7 NO_x)	**709**	**698**	**654**	**618**	**591**	**589**	**585**	**576**	**557**	**529**

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 3.1% 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).

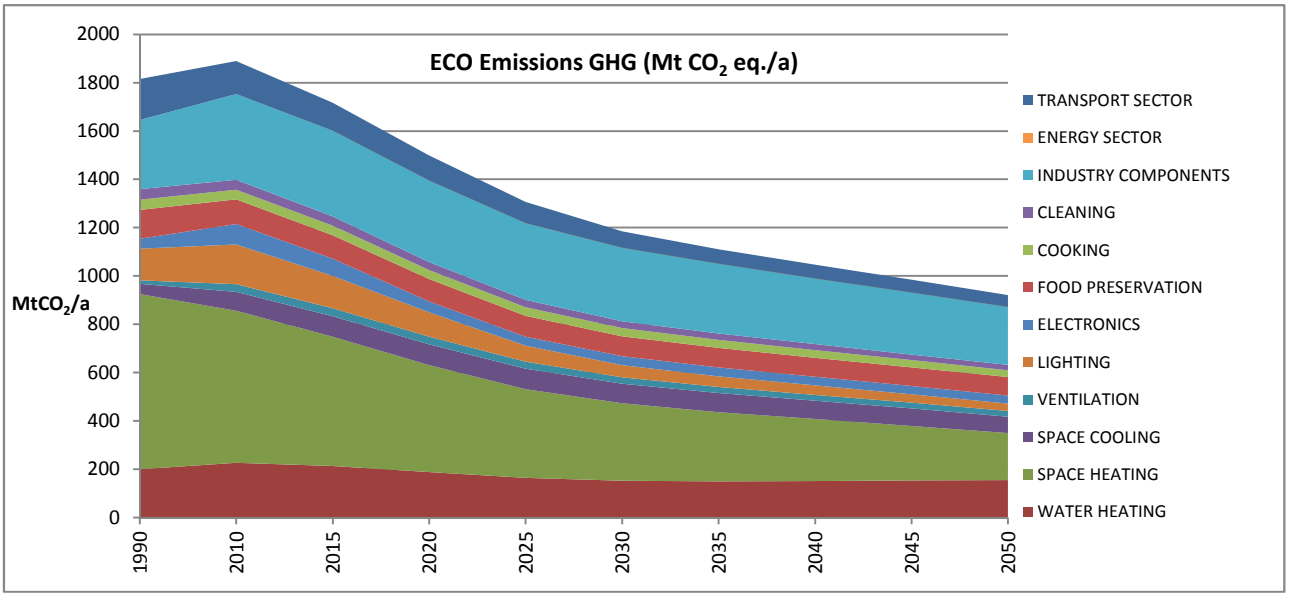
Source for EU-total: European Environmental Agency (EEA), National emissions reported to the Convention on Long-range Transboundary Air Pollution (LRTAP Convention), EU-27 (national territory), 2007.

db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also NO_x emissions at bottom of Table										
	Total WH dedicated Water Heater	**146**	**139**	**125**	**106**	**90**	**81**	**78**	**77**	**77**	**77**
	Total CH Central Heating combi, water heat	**55**	**88**	**88**	**81**	**74**	**71**	**72**	**74**	**76**	**78**
	TOTAL WATER HEATING	**200**	**227**	**213**	**188**	**164**	**153**	**150**	**151**	**153**	**155**
	Total CH Central Heating boiler, space heat	**518**	**464**	**379**	**298**	**234**	**195**	**170**	**149**	**126**	**102**
	SFB Wood Manual	7.4	1.9	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	41.8	11.6	8.0	4.9	2.6	1.0	0.4	0.4	0.3	0.3
	SFB Pellets	0.0	0.4	0.6	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	6.7	7.8	8.3	8.4	8.4	8.3	7.3	5.6	3.6
	CHAE-L > 400 kW	3.2	6.5	6.9	7.0	6.4	5.7	5.0	4.6	4.2	3.9
	CHWE-S ≤400 kW	0.2	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	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	11.5	14.9	15.6	15.7	14.8	13.9	13.1	12.6	12.1	11.5
	HT PCH-AE-L	11.1	14.2	14.9	14.8	13.8	12.6	11.7	11.0	10.5	10.0
	HT PCH-WE-S	2.3	3.1	3.3	3.4	3.2	3.1	2.9	2.8	2.7	2.5
	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	1.4	0.7	0.3	0.2	0.2
	AC splits	2.6	7.0	6.9	6.3	5.6	4.9	4.3	3.9	3.5	3.1
	AC VRF	0.0	2.6	3.8	5.4	6.6	8.2	9.6	10.8	11.8	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**	**69**	**74**	**75**	**72**	**68**	**65**	**63**	**59**	**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	11.2	11.3	10.4	9.2	7.9	6.7	5.9	5.1	4.4
	AC VRF (rev)	0.0	4.4	6.3	8.6	10.4	12.2	13.5	14.0	14.1	13.8
	ACF (rev)	0	0	0	0	0	0	0	0	0	0
	AHF	48	35	30	25	21	17	15	13	11	10
	AHE	0.5	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**	**49**	**44**	**40**	**36**	**33**	**31**	**29**
	Total AHC central Air Heating & Cooling	**97**	**127**	**128**	**125**	**116**	**108**	**102**	**96**	**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	1.0	1.2	1.3	1.3	1.3	1.2	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	3.7	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	0.6	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	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3
	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	14.0	11.4	10.7	9.4	8.4	8.0	7.6	7.0	6.4	5.8
	LH elec.convector	58.0	47.1	44.5	40.2	36.8	35.3	33.5	30.9	28.1	25.5
	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	7.9	6.6	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	1.0	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	**101**	**82**	**78**	**71**	**65**	**61**	**58**	**53**	**49**	**45**
	RAC (cooling demand), all types <12 kW	1.4	9.2	10.2	10.9	12.4	13.3	13.4	13.2	13.0	12.7
	RAC (heating demand), reversible <12kW	1.1	10.7	13.7	16.4	18.9	19.3	18.4	17.2	16.0	14.8
	Total RAC Room Air Conditioner	**2**	**20**	**24**	**27**	**31**	**33**	**32**	**30**	**29**	**27**
1	**CIRC Circulator pumps <2.5 kW, net load**	8.0	8.3	5.6	4.1	3.7	3.6	3.4	3.1	2.8	2.5
	TOTAL SPACE HEATING	**724**	**629**	**536**	**443**	**368**	**320**	**286**	**256**	**226**	**194**
	TOTAL SPACE COOLING	**43**	**78**	**84**	**86**	**85**	**82**	**79**	**76**	**72**	**69**
	NRVU electricity	9.4	24.9	26.5	25.9	23.8	21.6	20.5	19.8	19.2	18.6
1	NRVU heat (negative=saving vs. natural ventilation)	-28.8	-134.4	-164.3	-195.5	-222.7	-244.5	-259.5	-272.8	-286.1	-299.4
	RVU Central Unidir. VU ≤125W/fan (1 fan)	3.9	6.3	6.3	5.1	3.8	3.0	2.9	2.9	2.9	2.8
	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)	-3.4	-6.8	-9.8	-12.9	-15.9	-18.6	-19.6	-21.0	-22.4	-23.9
1	RVU Central Balanced, heat (negative=saving)	-0.1	-1.7	-3.6	-6.6	-9.8	-12.7	-14.5	-16.0	-17.6	-19.1
1	RVU Local Balanced, heat (negative=saving)	0.0	-0.2	-0.5	-1.0	-1.8	-2.7	-3.6	-4.5	-5.4	-6.4
	Total VU Ventilation Units	**-19**	**-112**	**-145**	**-184**	**-221**	**-252**	**-272**	**-290**	**-308**	**-325**
	TOTAL VENTILATION (electricity)	**13**	**32**	**34**	**32**	**29**	**26**	**25**	**24**	**24**	**23**

ECO Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources										
LFL Linear Fluorescent	40.6	51.4	52.7	41.6	26.1	14.7	9.6	6.1	3.1	1.0
CFL Compact Fluorescent	2.0	11.0	12.5	9.7	3.0	0.7	0.1	0.0	0.0	0.0
Tungsten	4.6	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	**132**	**165**	**134**	**100**	**67**	**51**	**45**	**39**	**34**	**30**
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	3.0	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	4.9	4.9	5.0	5.0	5.0
Total STB set top boxes (Complex & Simple)	**0**	**4**	**6**	**6**	**5**	**5**	**5**	**5**	**5**	**5**
VIDEO players/recorders	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	0.7	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	0.9	0.9	1.1	1.2	1.5	1.5	1.6	1.6	1.6
Total VIDEO	**0**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
ES Rack servers	0.3	7.6	8.5	8.0	7.5	8.5	9.7	8.9	8.3	7.7
ES Blade servers	0.1	1.8	1.9	1.6	1.4	1.6	1.8	1.6	1.5	1.4
ES Storage	0.1	0.7	0.8	0.6	0.5	0.5	0.6	0.5	0.5	0.4
Total ES Enterprise Servers	**0**	**10**	**11**	**10**	**9**	**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**	**12**	**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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total imaging equipment, electricity	**12**	**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	2.0	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, standby hours	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	0.7	1.2	1.7	1.6	1.5	1.3	1.0	0.8	0.2
SB Home NAS, idle 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), idle hours	0.2	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.0
SB Office Phones (fixed), idle hours	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0
Total SB (networked) StandBy (rest)	**1**	**4**	**5**	**5**	**5**	**5**	**4**	**3**	**2**	**1**
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	1.4	1.4
Total UPS - Uninterrupted Power Supplies	**3**	**5**	**5**	**4**	**2**	**2**	**2**	**2**	**2**	**2**
TOTAL ELECTRONICS	**40**	**84**	**72**	**46**	**36**	**36**	**37**	**36**	**35**	**33**
Total RF household Refrigerators & Freezers	**69**	**42**	**34**	**27**	**22**	**17**	**13**	**10**	**8**	**7**
CF open vertical chilled multi deck (RCV2)	17.5	20.7	21.7	22.4	22.2	22.6	23.6	24.5	25.2	25.9
CF open horizontal frozen island (RHF4)	4.7	2.9	3.0	3.1	3.0	3.1	3.2	3.3	3.4	3.5
CF Plug in one door beverage cooler	7.3	6.9	6.8	6.4	5.7	5.4	5.4	5.3	5.2	5.0
CF Plug in horizontal ice cream freezer	1.8	1.9	1.9	1.8	1.6	1.5	1.5	1.5	1.5	1.4
CF Spiral vending machine	1.0	1.3	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.1
Total CF Commercial Refrigeration	**32**	**34**	**35**	**35**	**34**	**34**	**35**	**37**	**37**	**38**
PF Service cabinets	3	3	4	4	3	3	3	3	3	3
PF Blast cabinets	1	2	2	2	2	2	2	2	2	2
PF Walk in cold rooms	7	7	7	7	7	7	7	7	7	7
PF MT & LT industrial process chillers	8	14	15	17	18	18	19	19	20	20
Total PF Professional Refrigeration	**19**	**26**	**28**	**30**	**31**	**31**	**32**	**32**	**32**	**32**
TOTAL FOOD PRESERVATION	**120**	**103**	**97**	**92**	**87**	**83**	**81**	**79**	**77**	**76**

	ECO Emissions GHG (in $MtCO_2$ eq./a), c'td	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	10.1	12.8	13.6	14.3	14.5	14.5	14.4	14.1	13.7	13.3
	CA El. Ovens	11.7	9.6	8.7	7.7	6.9	6.5	6.1	5.7	5.4	5.0
	CA Gas Hobs	7.0	5.8	5.5	5.3	5.0	4.7	4.4	4.2	4.0	3.8
	CA Gas Ovens	2.7	2.0	1.8	1.6	1.3	1.2	1.1	1.0	1.0	0.9
	CA Range Hoods	5.0	5.0	5.1	4.9	4.4	4.0	3.7	3.5	3.4	3.3
	Total CA Cooking Appliances	**36**	**35**	**35**	**34**	**32**	**31**	**30**	**29**	**27**	**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**	**39**	**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	4	4	4	3	3	3	3	3
	LD condens el.	1	6	7	7	6	5	5	4	4	3
	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	4.4	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	1.2	1.2	1.1
	Total VC Vacuum Cleaner	**7**	**9**	**9**	**5**	**6**	**5**	**5**	**5**	**4**	**4**
	TOTAL CLEANING	**44**	**41**	**39**	**33**	**31**	**29**	**27**	**25**	**23**	**22**
0.5	FAN Axial<300Pa (all FAN types >125W)	9.6	21.6	23.5	23.5	22.8	21.9	20.6	19.4	18.1	16.8
0.5	FAN Axial>300Pa	16.3	39.5	42.7	41.6	38.8	36.2	33.8	31.7	29.6	27.5
0.5	FAN Centr.FC	4.1	7.0	7.9	7.6	7.0	6.5	6.1	5.7	5.3	5.0
0.5	FAN Centr.BC-free	10.6	18.1	20.0	19.9	19.6	19.8	19.7	19.0	18.1	17.1
0.5	FAN Centr.BC	11.0	20.4	22.5	22.4	22.1	22.4	22.7	22.8	23.1	23.3
0.5	FAN Cross-flow	0.7	1.0	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.6
	Total FAN, industrial	**26**	**54**	**59**	**58**	**55**	**54**	**52**	**50**	**47**	**45**
0.5	**Total MT Motors 0.75-375 kW**	**407**	**458**	**450**	**423**	**390**	**371**	**349**	**327**	**305**	**283**
	Total WP Water Pumps	**44**	**48**	**49**	**51**	**51**	**52**	**52**	**52**	**52**	**51**
	CP Fixed Speed 5-1280 l/s	11.8	19.8	16.1	13.2	12.1	11.7	11.4	11.0	10.5	10.0
	CP Variable speed 5-1280 l/s	0.0	3.6	6.2	7.6	7.8	7.6	7.3	7.0	6.7	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	**12**	**24**	**23**	**21**	**20**	**20**	**19**	**18**	**18**	**17**
	TOTAL INDUSTRY COMPONENTS	**286**	**355**	**356**	**341**	**322**	**311**	**297**	**284**	**269**	**254**
	TRAFO Distribution	6.0	8.2	8.6	8.6	8.5	8.3	8.1	7.8	7.4	7.0
	TRAFO Industry oil	4.5	6.4	6.6	6.3	5.8	5.3	4.8	4.5	4.5	4.4
	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	17.1	21.8	23.5	25.0	26.0	26.7	27.1	27.3	27.3	27.1
	TRAFO DER oil	0.0	0.2	0.3	0.4	0.6	0.9	1.3	1.8	2.3	2.9
	TRAFO DER dry	0.0	0.8	1.4	2.1	3.0	4.6	6.7	9.4	12.5	15.4
	TRAFO Small	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5
	Total TRAFO Utility Transformers	**30**	**40**	**43**	**45**	**47**	**48**	**51**	**53**	**56**	**59**
	TOTAL ENERGY SECTOR	**0**	**0**	**-1**	**-2**	**-4**	**-6**	**-9**	**-11**	**-13**	**-14**
	TYRE car replacement tyres C1	79	69	62	57	51	38	33	31	29	27
	TYRE van replacement tyres C2	31	26	22	20	16	13	13	12	11	10
	TYRE truck replacement tyres C3	59	41	31	26	21	16	15	14	13	12
	TYRE Replacement Tyres	**170**	**137**	**115**	**102**	**88**	**68**	**60**	**57**	**53**	**50**
	TRANSPORT SECTOR	**170**	**137**	**115**	**102**	**88**	**68**	**60**	**57**	**53**	**50**
	GENERAL TOTAL (in Mt CO_2)	**1815**	**1889**	**1717**	**1498**	**1307**	**1185**	**1111**	**1047**	**985**	**921**

ECO Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	200	227	213	188	164	153	150	151	153	155
SPACE HEATING	724	629	536	443	368	320	286	256	226	194
SPACE COOLING	43	78	84	86	85	82	79	76	72	69
VENTILATION	13	32	34	32	29	26	25	24	24	23
LIGHTING	132	165	134	100	67	51	45	39	34	30
ELECTRONICS	40	84	72	46	36	36	37	36	35	33
FOOD PRESERVATION	120	103	97	92	87	83	81	79	77	76
COOKING	42	39	39	37	35	34	32	31	30	29
CLEANING	44	41	39	33	31	29	27	25	23	22
INDUSTRY COMPONENTS	286	355	356	341	322	311	297	284	269	254
ENERGY SECTOR	0	0	-1	-2	-4	-6	-9	-11	-13	-14
TRANSPORT SECTOR	170	137	115	102	88	68	60	57	53	50
TOTAL in Mt CO_2	1815	1889	1717	1498	1307	1185	1111	1047	985	921



Emissions GHG Savings ECO vs. BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	18	45	69	81	87	93	99	105
SPACE HEATING	0	11	54	105	145	174	185	185	178	166
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	18	15
FOOD PRESERVATION	0	14	21	26	30	32	32	31	29	26
COOKING	0	0	0	1	2	3	3	3	3	3
CLEANING	0	6	10	17	21	23	23	23	22	21
INDUSTRY COMPONENTS	0	0	13	34	49	49	46	42	39	35
ENERGY SECTOR	0	0	1	2	4	6	9	11	13	14
TRANSPORT SECTOR	0	0	4	15	28	36	30	21	14	12
TOTAL in Mt CO_2	0	40	156	314	440	498	503	489	467	446
Saving in % versus BAU (from 1990=0)	0.0%	2.1%	8.3%	17.3%	25.2%	29.6%	31.2%	31.8%	32.2%	32.6%
Saving In % versus BAU (from 2010=0)	-2.2%	0.0%	6.2%	15.1%	22.9%	27.2%	28.7%	29.2%	29.4%	29.7%

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	73	50	33	25	25	26	27	27
Total CH Central Heating boiler, space heat	418	370	279	159	88	55	47	39	32	24
Total direct NO_x ECO	496	480	382	227	133	89	81	74	68	61
Total direct NO_x ECO in SO_2 eq.(=1 /0.7 NO_x)	709	686	545	325	190	127	115	106	97	88

NO_x savings ECO vs. BAU (in kt NO_x/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Savings in SO_2 eq.(=1 /0.7 NO_x)	0	13	108	293	401	462	470	470	459	441

UNIT PRICE ECO (in euro 2010)	BC	BC	mid	mid	BAT	BAT	dec	inc	PriceDec
	€	EF	€	EF	€	EF	€ct/EF	€ct/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	0.46483	2750	93%	4343	135%	3779	3779	0.6%
	€	%	€	%	€	%	€ct/%	€ct/%	
CH Central Heating boiler, space heat [24 kW]	3881	68.1%	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. ctr	211	100%	281	215%	291	232%	61	61	1.0%
		kWh prim		kWh prim		kWh prim	€/kWh	€/kWh	
NRVU avg (sales wt.)	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)	1264	4980	1696	4139	2,128	3299	0.51	0.51	0.6%
RVU Central Balanced VU (2 fans)	4275	1897	4802	1422	5,330	947	1.11	1.11	0.7%
RVU Local Balanced VU (2 fans)	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)	BC €	BC EF	mid €	mid EF	BAT €	BAT EF	dec €ct/EF	inc €ct/EF	PriceDec %
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	50	19	52	17	59	4	0.6	0.6	1%
CSTB	150	88	184	31	192	18	0.6	0.6	1%
	€								
VIDEO players/recorders	100								1.0%
VIDEO projectors	800								1.0%
VIDEO game consoles	360								1.0%
	€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
ES Rack servers	2500	1661	2500	1347	2554	1180	0.00	0.32	0%
ES Blade servers	65000	13286	65000	10779	65280	9443	0.00	0.21	0%
ES Storage	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	421	430	487	242	706	76	0.35	1.32	1%
	€	MWh/a	€	MWh/a			€/MWh/a	€/MWh/a	
CF open vertical chilled multi deck (RCV2)	3784	28.22	4039	21.16			36	36	0.9%
CF open horizontal frozen island (RHF4)	4367	29.69	4684	22.27			43	43	0.9%
CF Plug in one door beverage cooler	830	2.57	894	1.93			100	100	1.0%
CF Plug in horizontal ice cream freezer	800	1.64	841	1.23			100	100	1.0%
CF Spiral vending machine	3500	2.73	3568	2.04			100	100	1.0%
CF average	**3846**	**26**	**4147**	**19.6**			**46**	**46**	**0.9%**
Service cabinets (commercial, non-retail)	€	kWh/a	€	kWh/a			€/kWh/a	€/kWh/a	
CH (Chiller, Horizontal)	1460	1,389	2200	475			0.81	0.81	1%
CV (Chiller Vertical)	700	2,714	1010	548			0.14	0.14	1%
FH (Freezer, Horizontal)	1724	4,018	2421	1825			0.32	0.32	1%
FV (Freezer, Vertical)	1200	3,927	1780	1460			0.24	0.24	1%
PF service cabinet (average)	**1196**	**2572**	**1922**	**823**			**0.42**	**0.42**	**1%**
PF Blast cabinet	**6400**	**3030**	**6850**	**1970**			**0.42**	**0.42**	**1%**
Walk-in Cold Room (retail, industrial)	€	kWh/a	€	kWh/a			€/kWh/a	€/kWh/a	
CH-Small (<20 m³, 15)	13250	6665	13250	6665			1.99	1.99	1%
CH-Medium (20-100 m³, 50)	30000	16357	30000	16357			1.83	1.83	1%
CH-Large (100-400 m³, 200)	80000	59278	80000	59278			1.35	1.35	1%
FR-Small (<20 m³, 15)	18000	8627	18000	8627			2.09	2.09	1%
FR-Medium (20-100 m³, 50)	44500	27293	44500	27293			1.63	1.63	1%
FR-Large (100-400 m³, 200)	113000	113224	113000	113224			1.00	1.00	1%
PF Walk-In Cold Room (WICR, avg)	**22360**	**12587**	**22360**	**12587**	**0**	**0**	**1.78**	**1.78**	**1%**
MT & LT Industrial process chillers	€	MWh/a	€	MWh/a			€/MWh/a	€/MWh/a	
MT AC	43500	312	43500	312			139	139	1%
MT WC	62500	391	62500	391			160	160	1%
LT AC	79200	643	79200	643			123	123	1%
MT WC	100365	627	100365	627			160	160	1%
PF MT & LT industrial chillers (avg)	**64416**	**467**	**64416**	**467**	**0**	**0**	**140**	**140**	**1%**

UNIT PRICE (in euro 2010)	BC €	BC EF	mid €	mid EF	BAT €	BAT EF	dec €ct/EF	inc €ct/EF	PriceDec %
	€	eff	€	eff	€	eff	€/eff	€/eff	
COOK El. Hobs, Wh/ltr	145	205	428	190	859	174	18.9	26.9	1%
COOK El. Ovens, kWh/a	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	265	231	376	190	525	145	2.73	3.29	1%
COOK Range Hoods, kWh elec	212	130	259	120	293	110	4.66	3.39	1%
	€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
COFFEE Dripfilter (glass)	20	93	25	74	30	55	0.26	0.26	1%
COFFEE Dripfilter (thermos)	30	48	30	48	30	48	0	0	1%
COFFEE Dripfilter (full automatic)	100	49	100	49	100	49	0	0	1%
COFFEE Pad filter	81	37	81	30	81	27	0	0	1%
COFFEE Hard cap espresso	156	37	156	30	156	27	0	0	1%
COFFEE Semi-auto espresso	103	37	103	30	103	27	0	0	1%
COFFEE Fully-auto espresso	595	37	595	30	595	27	0	0	1%
	€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
WM Household Washing Machine	449	207	541	130	630	87	0.87	2.07	1%
	€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
DW Household Dishwasher	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.	400	432	425	403	450	374	0.87	0.87	1%
LD Household Laundry Drier condens el.	554	447	677	339	800	231	1.14	1.14	1%
LD Household Laundry Drier vented gas	750	452	750	452	750	452	0.00	0.00	1%
	€	W	€	W	€	W	€/W	€/W	
VC dom. Vacuum Cleaner	220	1739	245	1000	278	650	0.034	0.094	1%
VC nondom Vacuum Cleaner	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	66.50%	1434	68.60%	1477	69.70%	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	7727	7859	8636	6457	9545	5056	0.65	0.65	
TRAFO Industry oil	13330	27168	16862	21400	20395	15631	0.61	0.61	
TRAFO Industry dry	33401	39727	39278	34178	45155	28629	1.06	1.06	
TRAFO Power	907541	724886	907541	724886	907541	724886	0.00	0.00	
TRAFO DER oil	22263	59094	29832	47304	37402	35515	0.64	0.64	
TRAFO DER dry	34393	62415	39724	54762	45055	47109	0.70	0.70	
TRAFO Small	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	70.44	11.34	73.29	9.83	77.88	8.38	1.88	3.17	1%
TYRE van replacement tyres C2	100.69	10.95	103.68	9.25	108.33	7.39	1.75	2.50	1%
TYRE truck replacement tyres C3	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		17	100%	20%	0.17	0.11	0.09	0.63
LH closed fireplace/inset [8 kW]	0.74		0.26		19	100%	20%	0.17	0.11	0.09	0.63
LH wood stove [8 kW]	0.80		0.20		16	100%	20%	0.17	0.11	0.09	0.63
LH coal stove [8 kW]	0.73		0.27		16	100%	20%	0.17	0.11	0.09	0.63
LH cooker [10 kW]	0.82		0.18		57	100%	20%	0.17	0.11	0.09	0.63
LH SHR stove [8 kW]	0.37		0.63		15	100%	20%	0.17	0.11	0.09	0.63
LH pellet stove [8 kW]	0.85		0.15		33	100%	20%	0.17	0.11	0.09	0.63
LH open fire gas, NCV [4.2 kW]	0.71		0.29		22	100%	20%	0.17	0.11	0.09	0.63
LH closed fire gas, NCV [4.2 kW]	0.70		0.30		22	100%	20%	0.17	0.11	0.09	0.63
LH flueless fuel heater, NCV [1.5 kW]	1.00		0.00		0	100%	20%	0.17	0.11	0.09	0.63
LH elec.portable [1 kW]	1.00		0.00		0	100%	20%	0.17	0.11	0.09	0.63
LH elec.convector [1 kW]	0.81		0.19		0	100%	20%	0.17	0.11	0.09	0.63
LH elec.storage [2.75 kW]	0.86		0.14		0	100%	20%	0.17	0.11	0.09	0.63
LH elec.underfloor [0.62 kW]	0.59		0.41		0	100%	20%	0.17	0.11	0.09	0.63
LH luminous heaters [20 kW]	0.81		0.19		101	0%	0%	0.00	0.10	0.10	0.80
LH tube heaters [30 kW]	0.81		0.19		76	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 (RCV2)	0.91		0.09		238	0%	0%	0.00	0.10	0.20	0.70
CF open horizontal frozen island (RHF4)	0.91		0.09		253	0%	0%	0.00	0.10	0.20	0.70
CF Plug in one door beverage cooler	1.00		0.00		28	0%	0%	0.00	0.10	0.20	0.70
CF Plug in horizontal ice cream freezer	1.00		0.00		21	0%	0%	0.00	0.10	0.20	0.70
CF Spiral vending machine	1.00		0.00		47	0%	0%	0.00	0.10	0.20	0.70
CF average	**0.92**		**0.08**		**223.02**	0%	0%	0.00	0.10	0.20	0.70
Service cabinets (commercial, non-retail)											
CH (Chiller, Horizontal)	1					0%	0%	0.00	0.10	0.20	0.70
CV (Chiller Vertical)	1					0%	0%	0.00	0.10	0.20	0.70
FH (Freezer, Horizontal)	1					0%	0%	0.00	0.10	0.20	0.70
FV (Freezer, Vertical)	1					0%	0%	0.00	0.10	0.20	0.70
PF service cabinet (average)	**1**					0%	0%	0.00	0.10	0.20	0.70
PF Blast cabinet						0%	0%	0.00	0.10	0.20	0.70
Walk-in Cold Room (retail, industrial)											
CH-Small (<20 m³, 15)	1					0%	0%	0.00	0.10	0.20	0.70
CH-Medium (20-100 m³, 50)	1					0%	0%	0.00	0.10	0.20	0.70
CH-Large (100-400 m³, 200)	1					0%	0%	0.00	0.10	0.20	0.70
FR-Small (<20 m³, 15)	1					0%	0%	0.00	0.10	0.20	0.70
FR-Medium (20-100 m³, 50)	1					0%	0%	0.00	0.10	0.20	0.70
FR-Large (100-400 m³, 200)	1					0%	0%	0.00	0.10	0.20	0.70
PF Walk-In Cold Room (WICR, avg)	**1**					0%	0%	0.00	0.10	0.20	0.70
MT & LT Industrial process chillers											
MT AC	1					0%	0%	0.00	0.10	0.20	0.70
MT WC	1					0%	0%	0.00	0.10	0.20	0.70
LT AC	1					0%	0%	0.00	0.10	0.20	0.70
MT WC	1					0%	0%	0.00	0.10	0.20	0.70
PF MT & LT industrial chillers (avg)	**1**					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 in m units											
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	800	800	800	800	800	800	800	800	800	800
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)	3784	3814	3784	3784	3784	3784	3784	3784	3784	3784
CF open horizontal frozen island (RHF4)	4367	4404	4367	4367	4367	4367	4367	4367	4367	4367
CF Plug in one door beverage cooler	830	838	830	830	830	830	830	830	830	830
CF Plug in horizontal ice cream freezer	800	805	800	800	800	800	800	800	800	800
CF Spiral vending machine	3500	3508	3500	3500	3500	3500	3500	3500	3500	3500
CF average	**5048**	**5048**	**4822**	**4607**	**4401**	**4204**	**4016**	**3846**	**3846**	**3846**
Service cabinets (commercial, non-retail)										
CH (Chiller, Horizontal)	2583	2583	2458	2338	2225	2117	2014	1916	1823	1735
CV (Chiller Vertical)	1089	1089	1036	986	938	892	849	808	769	731
FH (Freezer, Horizontal)	3001	3001	2855	2717	2585	2459	2340	2227	2118	2016
FV (Freezer, Vertical)	2123	2123	2020	1922	1829	1740	1656	1575	1499	1426
PF service cabinet (average)	**1203**	**1203**	**1196**	**1196**	**1196**	**1196**	**1196**	**1196**	**1196**	**1196**
PF Blast cabinet	**6405**	**6405**	**6400**	**6400**	**6400**	**6400**	**6400**	**6400**	**6400**	**6400**
Walk-in Cold Room (retail, industrial)										
CH-Small (<20 m³, 15)	26500	26500	25214	23990	22826	21718	20664	19661	18707	17799
CH-Medium (20-100 m³, 50)	60000	60000	57088	54317	51681	49173	46786	44515	42355	40299
CH-Large (100-400 m³, 200)	160000	160000	152235	144846	137816	131127	124763	118708	112946	107465
FR-Small (<20 m³, 15)	36000	36000	34253	32590	31009	29504	28072	26709	25413	24180
FR-Medium (20-100 m³, 50)	89000	89000	84680	80571	76660	72939	69399	66031	62826	59777
FR-Large (100-400 m³, 200)	226000	226000	215031	204595	194665	185217	176228	167675	159537	151794
PF Walk-In Cold Room (WICR, avg)	**22361**	**22361**	**22360**	**22360**	**22360**	**22360**	**22360**	**22360**	**22360**	**22360**
MT & LT Industrial process chillers										
MT AC	87000	87000	82778	78760	74937	71300	67840	64547	61415	58434
MT WC	125000	125000	118933	113161	107669	102443	97471	92740	88239	83957
LT AC	158400	158400	150712	143397	136438	129816	123515	117521	111817	106390
MT WC	200730	200730	190988	181718	172899	164507	156523	148926	141698	134821
PF MT & LT industrial chillers (avg)	**71137**	**71137**	**67684**	**64416**	**64416**	**64416**	**64416**	**64416**	**64416**	**64416**

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 in m units										
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	8000	8000	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	800	800	800	800	800	800	800	800	800	800
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)	3784	3814	3784	3784	3784	3784	3784	3784	3784	3784
CF open horizontal frozen island (RHF4)	4367	4404	4367	4367	4367	4367	4367	4367	4367	4367
CF Plug in one door beverage cooler	830	838	830	830	830	830	830	830	830	830
CF Plug in horizontal ice cream freezer	800	805	800	800	800	800	800	800	800	800
CF Spiral vending machine	3500	3508	3500	3500	3500	3500	3500	3500	3500	3500
CF average	**5048**	**5048**	**4822**	**4607**	**4401**	**4204**	**4016**	**3846**	**3846**	**3846**
Service cabinets (commercial, non-retail)										
CH (Chiller, Horizontal)	2583	2583	2458	2338	2225	2117	2014	1916	1823	1735
CV (Chiller Vertical)	1089	1089	1036	986	938	892	849	808	769	731
FH (Freezer, Horizontal)	3001	3001	2855	2717	2585	2459	2340	2227	2118	2016
FV (Freezer, Vertical)	2123	2123	2020	1922	1829	1740	1656	1575	1499	1426
PF service cabinet (average)	**1203**	**1203**	**1196**	**1196**	**1196**	**1196**	**1196**	**1196**	**1196**	**1196**
PF Blast cabinet	**6405**	**6405**	**6400**	**6400**	**6400**	**6400**	**6400**	**6400**	**6400**	**6400**
Walk-in Cold Room (retail, industrial)										
CH-Small (<20 m³, 15)	26500	26500	25214	23990	22826	21718	20664	19661	18707	17799
CH-Medium (20-100 m³, 50)	60000	60000	57088	54317	51681	49173	46786	44515	42355	40299
CH-Large (100-400 m³, 200)	160000	160000	152235	144846	137816	131127	124763	118708	112946	107465
FR-Small (<20 m³, 15)	36000	36000	34253	32590	31009	29504	28072	26709	25413	24180
FR-Medium (20-100 m³, 50)	89000	89000	84680	80571	76660	72939	69399	66031	62826	59777
FR-Large (100-400 m³, 200)	226000	226000	215031	204595	194665	185217	176228	167675	159537	151794
PF Walk-In Cold Room (WICR, avg)	**22361**	**22361**	**22360**	**22360**	**22360**	**22360**	**22360**	**22360**	**22360**	**22360**
MT & LT Industrial process chillers										
MT AC	87000	87000	82778	78760	74937	71300	67840	64547	61415	58434
MT WC	125000	125000	118933	113161	107669	102443	97471	92740	88239	83957
LT AC	158400	158400	150712	143397	136438	129816	123515	117521	111817	106390
MT WC	200730	200730	190988	181718	172899	164507	156523	148926	141698	134821
PF MT & LT industrial chillers (avg)	**71137**	**71137**	**67684**	**64416**	**64416**	**64416**	**64416**	**64416**	**64416**	**64416**

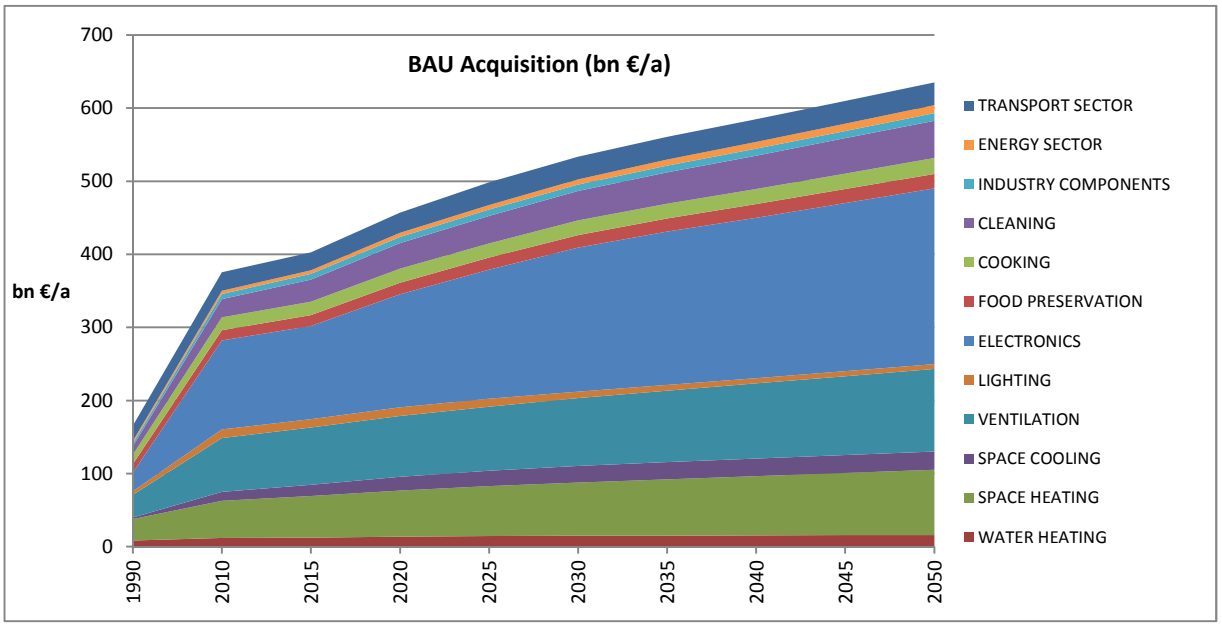
UNIT PRICE ECO (in euro 2010, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
COOK El. Hobs, Wh/ltr	352	506	499	518	515	511	506	501	494	488
COOK El. Ovens, kWh/a	523	570	583	578	551	526	523	523	523	523
COOK Gas Hobs, % efficiency NCV	365	358	339	307	291	275	261	254	254	254
COOK 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	850	812	776	741	708	676
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 in m units										
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 billion euro 2010, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**5**	**6**	**6**	**6**	**7**	**7**	**7**	**7**	**7**	**7**
	Total CH Central Heating combi, water heat	**4**	**6**	**7**	**7**	**8**	**8**	**8**	**9**	**9**	**9**
	TOTAL WATER HEATING	**8**	**12**	**13**	**14**	**15**	**15**	**15**	**15**	**16**	**16**
	Total CH Central Heating boiler, space heat	**19**	**27**	**29**	**31**	**34**	**37**	**40**	**43**	**46**	**49**
	SFB Wood Manual	1.0	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	SFB Wood Direct Draft	0.0	1.4	1.5	1.6	1.5	1.9	2.2	2.5	3.0	3.6
	SFB Coal	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SFB Pellets	0.0	0.4	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.9
	SFB Wood chips	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4
	Total Solid Fuel Boiler	**1**	**3**	**3**	**3**	**2**	**3**	**3**	**4**	**4**	**5**
	CHAE-S ≤400 kW	0.4	1.5	1.7	1.8	2.0	2.2	1.9	1.0	0.3	0.0
	CHAE-L > 400 kW	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CHWE-S ≤400 kW	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M >400 kW; ≤1500 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CHWE-L > 1500 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	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	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	HT PCH-AE-L	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	AC rooftop	0.2	0.7	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	AC splits	0.3	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9
	AC VRF	0.0	2.8	3.6	5.3	6.7	8.1	9.4	10.6	11.6	12.3
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**2**	**7**	**9**	**10**	**12**	**13**	**14**	**14**	**15**	**15**
	AC rooftop (rev)	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	AC VRF (rev)	0.0	2.4	2.9	4.5	5.5	6.3	7.0	7.5	7.8	7.9
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	AHE	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**	**14**	**15**	**15**	**16**
	LH open fireplace	1.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	LH closed fireplace/inset	0.9	2.3	2.6	2.8	2.9	2.9	2.9	2.9	2.9	2.9
	LH wood stove	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3
	LH coal stove	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH cooker	0.7	1.4	1.7	2.0	2.1	2.1	2.1	2.1	2.1	2.1
	LH SHR stove	1.7	2.4	3.0	3.5	4.0	4.4	4.5	4.5	4.5	4.5
	LH pellet stove	0.0	0.8	1.0	1.2	1.3	1.3	1.4	1.4	1.4	1.4
	LH open fire gas	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH closed fire gas	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH flueless fuel heater	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH elec.portable	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.convector	1.4	1.8	1.8	1.9	2.0	2.0	2.1	2.1	2.1	2.1
	LH elec.storage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.underfloor	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	LH luminous heaters	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0
	LH total	**8.4**	**13.3**	**14.9**	**16.4**	**17.1**	**17.7**	**17.9**	**17.9**	**17.9**	**17.9**
	RAC (cooling demand), all types <12 kW	1	5	7	8	9	9	9	9	10	10
	RAC (heating demand), reversible <12kW	0	3	6	7	8	8	8	8	9	9
	Total RAC Room Air Conditioner	**1**	**8**	**13**	**16**	**17**	**18**	**18**	**18**	**18**	**18**
	CIRC Circulator pumps <2.5 kW, net load	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL SPACE HEATING (incl. rev AC)	**29**	**50**	**57**	**63**	**68**	**73**	**77**	**81**	**85**	**89**
	TOTAL SPACE COOLING	**2**	**12**	**15**	**19**	**21**	**22**	**23**	**24**	**24**	**25**
	NRVU Ventilation units	30	69	73	76	81	85	89	93	98	102
	RVU Central Unidir.	1	3	3	3	3	3	3	3	3	4
	RVU Central Balanced VU ≤125W/fan (2 fans)	0	1	3	3	4	4	5	5	6	6
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0	0	0	0	1	1	1	1	1	1
	Total VU Ventilation Units	**31**	**74**	**78**	**83**	**88**	**93**	**98**	**103**	**108**	**113**
	TOTAL VENTILATION (electricity)	**31**	**74**	**78**	**83**	**88**	**93**	**98**	**103**	**108**	**113**
	LS Light Sources										
	LFL Linear Fluorescent	2.3	3.2	2.9	2.9	2.7	2.5	2.3	2.1	1.9	1.7
	CFL Compact Fluorescent	0.3	2.4	2.0	1.7	1.5	1.4	1.2	1.1	1.0	0.9
	Tungsten	0.5	3.6	4.1	4.3	3.2	2.3	1.7	1.2	0.9	0.8
	GLS GeneralLighting Service (incandescent)	1.4	1.0	0.8	0.5	0.3	0.1	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	0.4	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	LED Light Emitting Diode	0.0	0.3	0.6	1.7	2.3	1.8	2.0	2.1	2.1	2.1
	TOTAL LIGHTING (excl. SP & controls)	**4.9**	**11.5**	**11.3**	**12.0**	**10.9**	**8.9**	**8.1**	**7.3**	**6.7**	**6.5**

BAU Acquisition (in billion euro 2010, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	11.7	26.9	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV LoNA	0.0	3.7	13.1	16.4	14.3	11.7	8.9	6.1	3.2	0.4
DP TV Smart	0.0	0.0	7.8	16.4	21.4	27.3	33.5	39.6	45.8	52.0
DP Monitor	1.7	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Total Electronic Displays	**13.4**	**34.9**	**28.5**	**35.1**	**38.1**	**41.3**	**44.7**	**48.1**	**51.4**	**54.8**
SSTB	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	5.0	6.1	6.6	6.7	6.5	7.1	7.6	8.2	8.7
Total STB set top boxes (Complex & Simple)	**0.0**	**6.3**	**6.4**	**6.6**	**6.7**	**6.5**	**7.1**	**7.6**	**8.2**	**8.7**
VIDEO players/recorders	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	1.7	1.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	6.4	4.3	4.4	4.9	4.9	4.9	4.9	4.9	4.9
Total VIDEO	**0.0**	**9.0**	**6.1**	**5.5**	**5.4**	**4.9**	**4.9**	**4.9**	**4.9**	**4.9**
ES Rack servers	0.2	5.9	6.6	7.7	9.3	11.8	12.8	12.5	12.5	12.5
ES Blade servers	0.4	4.4	4.4	4.9	5.8	7.1	7.7	7.4	7.4	7.4
ES Storage	0.3	3.2	3.7	4.1	4.5	4.8	5.1	4.9	4.9	4.9
Total ES Enterprise Servers	**0.9**	**13.5**	**14.7**	**16.6**	**19.5**	**23.7**	**25.5**	**24.8**	**24.8**	**24.8**
PC Desktop	3.3	11.1	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5
PC Notebook	0.4	25.2	11.6	10.9	10.9	10.9	10.9	10.9	10.9	10.9
PC Tablet/slate	0.0	1.7	27.0	43.9	56.7	67.5	70.9	74.3	77.6	81.0
PC Thin client	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	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**	**40.4**	**49.3**	**64.7**	**77.5**	**88.3**	**91.7**	**95.1**	**98.5**	**101.8**
EP-Copier mono	3.5	1.4	0.8	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	0.0	0.5	2.0	3.1	3.5	3.8	4.1	4.4	4.8	5.1
EP-printer mono	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
EP-printer colour	0.0	0.6	1.0	1.3	1.6	1.8	2.0	2.3	2.5	2.8
IJ SFD printer	0.6	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1
IJ MFD printer	0.7	2.4	3.3	3.8	4.2	4.6	5.0	5.3	5.7	6.1
Total imaging equipment, electricity	**5.6**	**6.6**	**8.4**	**9.5**	**10.3**	**11.0**	**11.8**	**12.5**	**13.3**	**14.2**
SB Home Gateway	0.0	6.2	7.9	9.7	11.5	13.3	15.1	16.8	18.6	20.4
SB Home NAS	0.0	0.6	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
SB Home Phones (fixed)	0.5	2.3	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
SB Office Phones (fixed)	0.6	1.1	1.2	1.3	1.3	1.4	1.5	1.5	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	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
UPS below 1.5 kVA	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	0.2	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9
UPS 5 to 10 kVA	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	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	**0.5**	**1.1**	**1.1**	**1.3**	**1.6**	**1.8**	**2.0**	**2.2**	**2.4**	**2.5**
TOTAL ELECTRONICS	**25**	**122**	**127**	**155**	**177**	**197**	**210**	**219**	**230**	**240**
Total RF household Refrigerators & Freezers	**7.4**	**8.0**	**8.2**	**8.3**	**8.4**	**8.5**	**8.7**	**8.8**	**8.9**	**9.1**
CF open vertical chilled multi deck (RCV2)	0.4	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.1	1.2
CF open horizontal frozen island (RHF4)	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
CF Plug in one door beverage cooler	0.5	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0
CF Plug in horizontal ice cream freezer	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
CF Spiral vending machine	0.3	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5
Total CF Commercial Refrigeration	**1.5**	**2.2**	**2.5**	**2.7**	**3.0**	**3.3**	**3.6**	**3.8**	**4.1**	**4.4**
PF Service cabinets	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
PF Blast cabinets	0.6	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.3
PF Walk in cold rooms	1.6	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
PF MT & LT industrial process chillers	0.2	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8
PF Remote condensing units (double count with Lot 12)										
Total PF Professional Refrigeration	**2.8**	**4.1**	**4.3**	**4.6**	**4.9**	**5.2**	**5.6**	**5.9**	**6.2**	**6.6**
TOTAL FOOD PRESERVATION	**12**	**14**	**15**	**16**	**16**	**17**	**18**	**19**	**19**	**20**

	BAU Acquisition (in billion euro 2010, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	2.3	5.2	5.6	6.1	6.4	6.7	7.0	7.2	7.5	7.7
	CA El. Ovens	5.0	6.0	6.3	6.8	6.6	6.7	6.7	6.8	6.9	7.0
	CA Gas Hobs	2.7	2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.1	1.0
	CA Gas Ovens	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
	CA Range Hoods	1.2	1.5	1.6	1.6	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**	**18**
	COFFEE Dripfilter (glass)	0.36	0.25	0.21	0.18	0.17	0.17	0.17	0.17	0.17	0.17
	COFFEE Dripfilter (thermos)	0.07	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
	COFFEE Dripfilter (full automatic)	0.00	0.18	0.21	0.23	0.26	0.28	0.30	0.33	0.35	0.38
	COFFEE Pad filter	0.00	0.42	0.46	0.50	0.54	0.58	0.62	0.66	0.70	0.74
	COFFEE Hard cap espresso	0.05	0.22	0.47	0.71	0.75	0.75	0.75	0.75	0.75	0.75
	COFFEE Semi-auto espresso	0.06	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04
	COFFEE Fully-auto espresso	0.34	0.39	0.45	0.51	0.58	0.64	0.70	0.76	0.83	0.89
	Total CM household Coffee Makers	**0.9**	**1.6**	**2.0**	**2.3**	**2.5**	**2.6**	**2.7**	**2.8**	**3.0**	**3.1**
	TOTAL COOKING	**13**	**17**	**18**	**19**	**19**	**20**	**20**	**21**	**21**	**22**
	Total WM household Washing Machine	**4.0**	**6.2**	**6.1**	**6.5**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**
	Total DW household Dishwasher	**1.7**	**3.8**	**4.4**	**5.0**	**5.6**	**6.2**	**6.8**	**7.4**	**8.0**	**8.6**
	LD vented el.	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	LD condens el.	0.5	1.7	2.0	2.3	2.3	2.4	2.4	2.4	2.4	2.4
	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	**1.3**	**2.6**	**2.8**	**3.0**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**
	VC dom	3.9	11.6	16.3	19.8	21.9	24.0	26.0	28.1	30.2	32.2
	VC nondom	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1
	Total VC Vacuum Cleaner	**4.7**	**12.4**	**17.1**	**20.7**	**22.8**	**24.9**	**27.0**	**29.1**	**31.2**	**33.3**
	TOTAL CLEANING	**12**	**25**	**30**	**35**	**38**	**40**	**43**	**46**	**48**	**51**
0.5	FAN Axial<300Pa (all FAN types >125W)	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	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	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	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	0.4	1.1	1.3	1.5	1.6	1.6	1.8	2.0	2.1	2.3
0.5	FAN Cross-flow	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**	**1.6**	**2.4**	**2.5**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**
	Total WP Water Pumps	**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	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	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	CP Pistons 2-64 l/s	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	**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**	**8.7**	**9.0**	**9.3**	**9.7**	**10.0**	**10.4**
	TRAFO Distribution	0.5	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.3
	TRAFO Industry oil	0.2	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	TRAFO Industry dry	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	TRAFO Power	1.9	3.0	3.2	3.5	3.7	4.0	4.3	4.6	4.9	5.2
	TRAFO DER oil	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	TRAFO DER dry	0.0	0.1	0.2	0.4	0.6	1.0	1.5	1.9	2.4	2.9
	TRAFO Small	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**	**4.5**	**5.0**	**5.5**	**6.1**	**7.0**	**7.9**	**8.9**	**9.8**	**10.8**
	TOTAL ENERGY SECTOR	**3**	**5**	**5**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
	TYRE car replacement tyres C1	13	16	16	18	20	20	20	20	20	20
	TYRE van replacement tyres C2	5	6	6	6	7	7	7	7	7	7
	TYRE truck replacement tyres C3	4	4	3	4	4	4	4	4	4	4
	TYRE Replacement Tyres	**21**	**25**	**25**	**28**	**31**	**31**	**31**	**31**	**31**	**31**
	TRANSPORT SECTOR	**21**	**25**	**25**	**28**	**31**	**31**	**31**	**31**	**31**	**31**
	GENERAL TOTAL (in billion euro 2010)	**166**	**376**	**403**	**457**	**498**	**534**	**561**	**585**	**610**	**635**

BAU Acquisition (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	8	12	13	14	15	15	15	15	16	16
SPACE HEATING	29	50	57	63	68	73	77	81	85	89
SPACE COOLING	2	12	15	19	21	22	23	24	24	25
VENTILATION	31	74	78	83	88	93	98	103	108	113
LIGHTING	5	11	11	12	11	9	8	7	7	6
ELECTRONICS	25	122	127	155	177	197	210	219	230	240
FOOD PRESERVATION	12	14	15	16	16	17	18	19	19	20
COOKING	13	17	18	19	19	20	20	21	21	22
CLEANING	12	25	30	35	38	40	43	46	48	51
INDUSTRY COMPONENTS	4	7	8	8	9	9	9	10	10	10
ENERGY SECTOR	3	5	5	5	6	7	8	9	10	11
TRANSPORT SECTOR	21	25	25	28	31	31	31	31	31	31
TOTAL in billion euro 2010 incl VAT & install	166	376	403	457	498	534	561	585	610	635

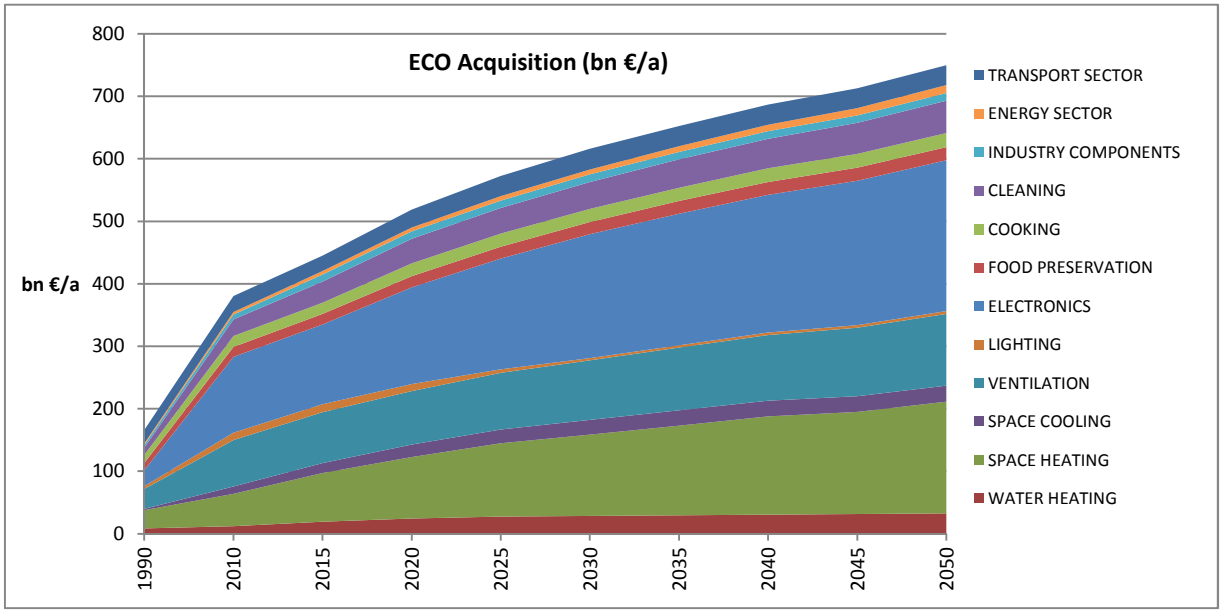


db	ECO Acquisition (in billion euro 2010, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**5**	**6**	**10**	**11**	**13**	**12**	**12**	**12**	**12**	**12**
	Total CH Central Heating combi, water heat	**4**	**6**	**10**	**14**	**15**	**16**	**17**	**18**	**20**	**21**
	TOTAL WATER HEATING	**8**	**12**	**19**	**25**	**27**	**28**	**30**	**31**	**32**	**33**
	Total CH Central Heating boiler, space heat	**19**	**28**	**49**	**63**	**79**	**91**	**103**	**117**	**131**	**146**
	SFB Wood Manual	1	1	1	0	0	0	0	0	0	0
	SFB Wood Direct Draft	0	1	2	2	2	2	2	3	3	4
	SFB Coal	0	0	0	0	0	0	0	0	0	0
	SFB Pellets	0	0	1	1	1	1	1	1	1	1
	SFB Wood chips	0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler	**1**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**5**	**5**
	CHAE-S ≤400 kW	0.4	1.5	1.7	1.8	2.0	2.2	1.9	1.0	0.3	0.0
	CHAE-L > 400 kW	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CHWE-S ≤400 kW	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M >400 kW; ≤1500 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CHWE-L > 1500 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	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	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	HT PCH-AE-L	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	AC rooftop	0.2	0.7	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	AC splits	0.3	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9
	AC VRF	0.0	2.8	3.6	5.3	6.7	8.1	9.4	10.6	11.6	12.3
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**2**	**7**	**9**	**10**	**12**	**13**	**14**	**14**	**15**	**15**
	AC rooftop (rev)	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	AC VRF (rev)	0.0	2.4	2.9	4.5	5.5	6.3	7.0	7.5	7.8	7.9
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	AHE	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**	**14**	**15**	**15**	**16**
	LH open fireplace	1.4	2.0	2.0	2.5	2.7	2.6	2.5	2.4	2.3	2.2
	LH closed fireplace/inset	0.9	2.3	2.6	3.4	3.6	3.5	3.4	3.3	3.2	3.1
	LH wood stove	0.9	1.0	1.1	1.5	1.6	1.5	1.5	1.4	1.4	1.3
	LH coal stove	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH cooker	0.7	1.4	1.7	2.2	2.4	2.3	2.2	2.1	2.1	2.1
	LH SHR stove	1.7	2.4	3.0	3.6	4.0	4.4	4.5	4.5	4.5	4.5
	LH pellet stove	0.0	0.8	1.0	1.2	1.3	1.3	1.4	1.4	1.4	1.4
	LH open fire gas	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH closed fire gas	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH flueless fuel heater	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH elec.portable	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH elec.convector	1.4	1.8	1.8	1.9	2.0	2.0	2.1	2.1	2.1	2.1
	LH elec.storage	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	LH elec.underfloor	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	LH luminous heaters	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0
	LH total	**8.4**	**13.3**	**14.9**	**18.0**	**19.3**	**19.5**	**19.3**	**18.9**	**18.6**	**18.3**
	RAC (cooling demand), all types <12 kW	1	5	7	9	10	10	10	10	10	10
	RAC (heating demand), reversible <12kW	0	3	6	8	9	9	9	9	9	9
	Total RAC Room Air Conditioner	**1**	**8**	**14**	**18**	**19**	**20**	**20**	**19**	**19**	**19**
	CIRC Circulator pumps <2.5 kW, net load	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL SPACE HEATING (incl. rev AC)	**29**	**52**	**78**	**98**	**117**	**130**	**143**	**157**	**163**	**179**
	TOTAL SPACE COOLING	**2**	**12**	**16**	**20**	**22**	**24**	**25**	**25**	**25**	**25**
	NRVU Ventilation units	30	69	73	76	81	85	89	93	98	102
	RVU Central Unidir.	1	3	5	5	5	5	5	5	6	6
	RVU Central Balanced VU ≤125W/fan (2 fans)	0	1	3	4	5	5	5	5	6	6
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0	0	0	0	1	1	1	1	1	1
	Total VU Ventilation Units	**31**	**74**	**81**	**86**	**91**	**95**	**100**	**105**	**110**	**115**
	TOTAL VENTILATION (electricity)	**31**	**74**	**81**	**86**	**91**	**95**	**100**	**105**	**110**	**115**
	LS Light Sources										
	LFL Linear Fluorescent	2.3	3.3	2.5	2.1	1.1	0.7	0.5	0.3	0.1	0.0
	CFL Compact Fluorescent	0.3	2.8	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	Tungsten	0.5	3.7	4.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0
	GLS GeneralLighting Service (incandescent)	1.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	HID High Intensity Discharge	0.4	1.1	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2
	LED Light Emitting Diode	0.0	0.2	4.3	7.2	4.4	2.7	2.9	3.6	3.8	4.4
	TOTAL LIGHTING (excl. SP & controls)	**4.9**	**11.7**	**12.8**	**11.3**	**5.9**	**3.6**	**3.7**	**4.1**	**4.2**	**4.7**

ECO Acquisition (in billion euro 2010, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	11.7	26.9	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV LoNA	0.0	3.7	13.1	16.4	14.3	11.7	8.9	6.1	3.2	0.4
DP TV Smart	0.0	0.0	7.8	16.4	21.4	27.3	33.5	39.6	45.8	52.0
DP Monitor	1.7	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Total Electronic Displays	**13.4**	**34.9**	**28.5**	**35.1**	**38.1**	**41.3**	**44.7**	**48.1**	**51.4**	**54.8**
SSTB	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	5.0	6.3	6.6	6.7	6.5	7.1	7.6	8.2	8.7
Total STB set top boxes (Complex & Simple)	**0.0**	**6.3**	**6.6**	**6.6**	**6.7**	**6.5**	**7.1**	**7.6**	**8.2**	**8.7**
VIDEO players/recorders	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	1.7	1.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	6.4	4.3	4.4	4.9	4.9	4.9	4.9	4.9	4.9
Total VIDEO	**0.0**	**9.0**	**6.1**	**5.5**	**5.4**	**4.9**	**4.9**	**4.9**	**4.9**	**4.9**
ES Rack servers	0.2	5.9	6.6	7.7	9.4	12.0	13.0	12.8	12.8	12.8
ES Blade servers	0.4	4.4	4.4	4.9	5.8	7.1	7.7	7.4	7.4	7.4
ES Storage	0.3	3.2	3.7	4.5	5.0	5.4	5.6	5.5	5.5	5.5
Total ES Enterprise Servers	**0.9**	**13.5**	**14.7**	**17.0**	**20.3**	**24.5**	**26.4**	**25.7**	**25.7**	**25.7**
PC Desktop	3.3	11.1	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5
PC Notebook	0.4	25.2	11.6	10.9	10.9	10.9	10.9	10.9	10.9	10.9
PC Tablet/slate	0.0	1.7	27.0	43.9	56.7	67.5	70.9	74.3	77.6	81.0
PC Thin client	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	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**	**40.4**	**49.3**	**64.7**	**77.5**	**88.3**	**91.7**	**95.1**	**98.5**	**101.8**
EP-Copier mono	3.5	1.4	0.8	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	0.0	0.5	2.0	3.1	3.5	3.8	4.1	4.4	4.8	5.1
EP-printer mono	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
EP-printer colour	0.0	0.6	1.0	1.3	1.6	1.8	2.0	2.3	2.5	2.8
IJ SFD printer	0.6	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1
IJ MFD printer	0.7	2.4	3.3	3.8	4.2	4.6	5.0	5.3	5.7	6.1
Total imaging equipment, electricity	**5.6**	**6.6**	**8.4**	**9.5**	**10.3**	**11.0**	**11.8**	**12.5**	**13.3**	**14.2**
SB Home Gateway	0.0	6.2	7.9	9.7	11.5	13.3	15.1	16.8	18.6	20.4
SB Home NAS	0.0	0.6	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
SB Home Phones (fixed)	0.5	2.3	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
SB Office Phones (fixed)	0.6	1.1	1.2	1.3	1.3	1.4	1.5	1.5	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	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
UPS below 1.5 kVA	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	0.2	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9
UPS 5 to 10 kVA	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	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	**0.5**	**1.1**	**1.1**	**1.3**	**1.6**	**1.8**	**2.0**	**2.2**	**2.4**	**2.5**
TOTAL ELECTRONICS	**25**	**122**	**128**	**155**	**177**	**198**	**211**	**220**	**231**	**241**
Total RF household Refrigerators & Freezers	**7.4**	**9.3**	**10.1**	**10.5**	**10.7**	**10.8**	**11.3**	**10.9**	**10.6**	**10.2**
CF open vertical chilled multi deck (RCV2)	0.4	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.1	1.2
CF open horizontal frozen island (RHF4)	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
CF Plug in one door beverage cooler	0.5	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0
CF Plug in horizontal ice cream freezer	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
CF Spiral vending machine	0.3	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5
Total CF Commercial Refrigeration	**1.5**	**2.2**	**2.5**	**2.7**	**3.0**	**3.3**	**3.6**	**3.8**	**4.1**	**4.4**
PF Service cabinets	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
PF Blast cabinets	0.6	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.3
PF Walk in cold rooms	1.6	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
PF MT & LT industrial process chillers	0.2	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8
PF Remote condensing units (double count with Lot 12)										
Total PF Professional Refrigeration	**2.8**	**4.1**	**4.3**	**4.6**	**4.9**	**5.2**	**5.6**	**5.9**	**6.2**	**6.6**
TOTAL FOOD PRESERVATION	**12**	**16**	**17**	**18**	**19**	**19**	**20**	**21**	**21**	**21**

	ECO Acquisition (in billion euro 2010, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	2.3	5.2	5.6	6.3	6.6	6.9	7.2	7.5	7.7	8.0
	CA El. Ovens	5.0	6.0	6.4	7.2	6.9	6.7	6.7	6.8	6.9	7.0
	CA Gas Hobs	2.7	2.2	2.0	1.7	1.6	1.4	1.3	1.2	1.1	1.0
	CA Gas Ovens	0.7	0.7	0.7	0.9	0.9	0.9	0.8	0.8	0.8	0.7
	CA Range Hoods	1.2	1.5	1.6	2.0	2.4	2.4	2.4	2.4	2.4	2.4
	Total CA Cooking Appliances	**12**	**16**	**16**	**18**	**18**	**18**	**18**	**19**	**19**	**19**
	COFFEE Dripfilter (glass)	0.36	0.25	0.24	0.20	0.19	0.18	0.17	0.17	0.17	0.17
	COFFEE Dripfilter (thermos)	0.07	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
	COFFEE Dripfilter (full automatic)	0.00	0.18	0.21	0.23	0.26	0.28	0.30	0.33	0.35	0.38
	COFFEE Pad filter	0.00	0.42	0.46	0.50	0.54	0.58	0.62	0.66	0.70	0.74
	COFFEE Hard cap espresso	0.05	0.22	0.47	0.71	0.75	0.75	0.75	0.75	0.75	0.75
	COFFEE Semi-auto espresso	0.06	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04
	COFFEE Fully-auto espresso	0.34	0.39	0.45	0.51	0.58	0.64	0.70	0.76	0.83	0.89
	Total CM household Coffee Makers	**0.9**	**1.6**	**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	**4.0**	**7.1**	**7.3**	**8.1**	**7.6**	**7.3**	**6.9**	**6.6**	**6.3**	**6.1**
	Total DW household Dishwasher	**1.7**	**5.0**	**5.8**	**6.5**	**7.1**	**7.7**	**8.2**	**8.7**	**9.1**	**9.5**
	LD vented el.	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	LD condens el.	0.5	1.7	2.2	2.6	2.7	2.6	2.6	2.5	2.4	2.4
	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	**1.3**	**2.6**	**3.0**	**3.4**	**3.4**	**3.4**	**3.3**	**3.2**	**3.2**	**3.2**
	VC dom	3.9	11.6	16.8	20.4	21.9	24.0	26.0	28.1	30.2	32.2
	VC nondom	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1
	Total VC Vacuum Cleaner	**4.7**	**12.4**	**17.7**	**21.3**	**22.8**	**24.9**	**27.0**	**29.1**	**31.2**	**33.3**
	TOTAL CLEANING	**12**	**27**	**34**	**39**	**41**	**43**	**45**	**48**	**50**	**52**
0.5	FAN Axial<300Pa (all FAN types >125W)	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	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	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	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	0.4	1.1	1.8	2.1	2.2	2.1	2.3	2.3	2.4	2.5
0.5	FAN Cross-flow	0.1	0.2	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.7
	Total FAN, industrial (excl. box & roof fans)	**1.0**	**2.9**	**4.0**	**4.9**	**4.8**	**4.6**	**4.6**	**4.6**	**4.6**	**4.5**
0.5	**Total MT Motors 0.75-375 kW**	**1.6**	**2.7**	**7.3**	**7.4**	**7.2**	**6.8**	**6.5**	**6.2**	**5.9**	**5.6**
	Total WP Water Pumps	**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	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
	CP Variable speed 5-1280 l/s	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CP Pistons 2-64 l/s	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	**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**	**10.9**	**12.1**	**12.1**	**12.1**	**12.1**	**12.2**	**12.2**	**12.3**
	TRAFO Distribution	0.5	0.7	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	TRAFO Industry oil	0.2	0.4	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0
	TRAFO Industry dry	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	TRAFO Power	1.9	3.0	3.2	3.5	3.7	4.0	4.3	4.6	4.9	5.2
	TRAFO DER oil	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8
	TRAFO DER dry	0.0	0.1	0.3	0.5	0.8	1.3	1.9	2.5	3.1	3.7
	TRAFO Small	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**	**4.5**	**5.5**	**6.1**	**6.9**	**8.0**	**9.2**	**10.4**	**11.6**	**12.8**
	TOTAL ENERGY SECTOR	**3**	**5**	**6**	**6**	**7**	**8**	**9**	**10**	**12**	**13**
	TYRE car replacement tyres C1	13	16	16	18	21	21	20	20	20	20
	TYRE van replacement tyres C2	5	6	6	6	7	7	7	7	7	7
	TYRE truck replacement tyres C3	4	4	4	4	5	5	5	5	4	4
	TYRE Replacement Tyres	**21**	**25**	**25**	**29**	**33**	**33**	**32**	**32**	**32**	**32**
	TRANSPORT SECTOR	**21**	**25**	**25**	**29**	**33**	**33**	**32**	**32**	**32**	**32**
	GENERAL TOTAL (in billion euro 2010)	**166**	**380**	**445**	**519**	**573**	**616**	**653**	**687**	**713**	**750**

ECO Acquisition (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	8	12	19	25	27	28	30	31	32	33
SPACE HEATING	29	52	78	98	117	130	143	157	163	179
SPACE COOLING	2	12	16	20	22	24	25	25	25	25
VENTILATION	31	74	81	86	91	95	100	105	110	115
LIGHTING	5	12	13	11	6	4	4	4	4	5
ELECTRONICS	25	122	128	155	177	198	211	220	231	241
FOOD PRESERVATION	12	16	17	18	19	19	20	21	21	21
COOKING	13	17	18	21	21	21	21	22	22	22
CLEANING	12	27	34	39	41	43	45	48	50	52
INDUSTRY COMPONENTS	4	7	11	12	12	12	12	12	12	12
ENERGY SECTOR	3	5	6	6	7	8	9	10	12	13
TRANSPORT SECTOR	21	25	25	29	33	33	32	32	32	32
TOTAL in billion euro 2010 incl VAT & Install	166	380	445	519	573	616	653	687	713	750



Increase acquisition ECO vs. BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	6	11	13	13	14	15	16	17
SPACE HEATING	0	1	21	35	49	57	66	76	78	90
SPACE COOLING	0	0	1	1	1	1	1	1	1	0
VENTILATION	0	0	3	3	3	3	3	2	2	2
LIGHTING	0	0	1	-1	-5	-5	-4	-3	-3	-2
ELECTRONICS	0	0	0	0	1	1	1	1	1	1
FOOD PRESERVATION	0	1	2	2	2	2	3	2	2	1
COOKING	0	0	0	1	1	1	1	1	1	1
CLEANING	0	2	3	4	3	3	2	2	1	1
INDUSTRY COMPONENTS	0	0	3	4	3	3	3	2	2	2
ENERGY SECTOR	0	0	1	1	1	1	1	1	2	2
TRANSPORT SECTOR	0	0	0	1	1	2	1	1	1	0
TOTAL in billion euro 2010	0	5	42	62	74	82	92	102	103	115
Increase in % versus BAU (from 1990=0)	0.0%	1.3%	10.5%	13.5%	14.9%	15.4%	16.4%	17.4%	16.9%	18.1%
Increase in % versus BAU (from 2010=0)	-2.9%	0.0%	9.3%	12.5%	13.9%	14.5%	15.5%	16.6%	16.1%	17.3%

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 (traditiona 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.

NOMINAL Energy & consumables rates			1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
(Rel in euro/kwh elec, other energy in euro/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	€/m^3	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 €/m^3	drinking water €/m^3	total €/m^3	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 euro 3.84/m^3. 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 (euro 75.5/a) and water costs (euro 35.5/a) calculated at 80 m^3/a

[2]=fixed costs euro 310 for sewage calculated at 105 m^3 /a, drinking water tariff net of taxes

[3]=fixed sewage costs 65.6 calculated at 80 m^3/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)

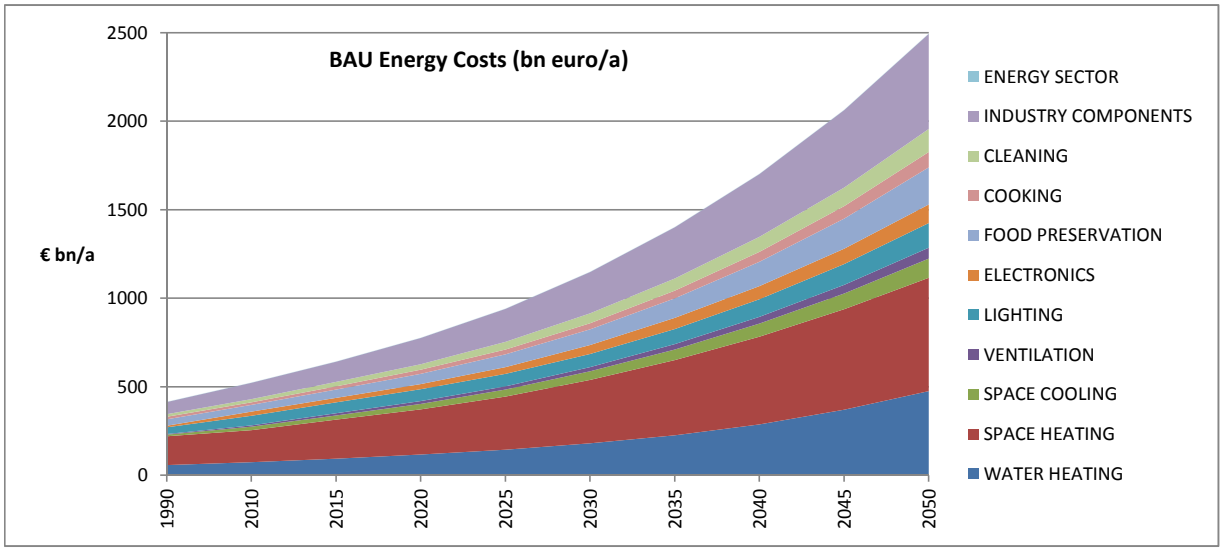
REAL Energy & consumables rates				1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(Rel in euros/kwh elec, other energy in euros/kwh NCV)													
R=residential (incl. VAT); NR=industry (excl. VAT, tariff Ie)													
REAL rates (in Euro 2010, inflation corrected)			Inc %/a	Real									
Rel1	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	€/m^3	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 billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**47**	**51**	**62**	**77**	**94**	**114**	**141**	**177**	**226**	**288**
	Total CH Central Heating combi, water heat	**11**	**23**	**31**	**40**	**51**	**66**	**86**	**111**	**145**	**187**
	TOTAL WATER HEATING	**58**	**73**	**94**	**117**	**145**	**180**	**226**	**288**	**370**	**475**
	Total CH Central Heating boiler, space heat	**110**	**128**	**151**	**170**	**193**	**230**	**272**	**314**	**353**	**383**
	SFB Wood Manual	7.6	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	6.9	9.0	12.6	17.7
	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	4.7	6.0	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**	**11**	**12**	**14**	**17**	**22**	**29**
	CHAE-S ≤400 kW	0.5	1.1	1.5	1.9	2.3	2.7	3.2	3.4	3.2	2.4
	CHAE-L > 400 kW	0.7	1.5	1.9	2.4	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	2.7	3.8	4.8	6.3	7.9	9.8	12.1	14.9	18.4	22.7
	HT PCH-AE-L	2.6	3.6	4.6	6.0	7.5	9.3	11.4	14.0	17.2	21.2
	HT PCH-WE-S	0.6	0.8	1.0	1.3	1.7	2.1	2.6	3.1	3.9	4.8
	HT PCH-WE-M	1.1	1.6	2.0	2.6	3.3	4.1	5.1	6.2	7.7	9.4
	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	2.1	2.3	2.5	2.7	3.0
	AC VRF	0.0	0.3	0.6	0.9	1.4	2.0	2.9	3.8	4.9	6.1
	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**	**38**	**46**	**56**	**67**	**80**
	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)	0.9	2.6	3.1	3.6	4.2	4.6	4.9	5.4	5.8	6.3
	AC VRF (rev)	0.0	0.8	1.4	2.4	3.6	5.3	7.3	9.2	11.3	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	7.6	8.0	8.6	9.2	9.9	10.6	11.4	12.2
	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**	**18**	**21**	**23**	**26**	**29**	**33**
	Total AHC Heating & Cooling	**17**	**28**	**34**	**42**	**50**	**59**	**70**	**82**	**96**	**113**
								0			
	LH open fireplace	0.3	0.5	0.8	1.1	1.3	1.6	2.0	2.4	2.9	3.5
	LH closed fireplace/inset	0.4	1.2	2.1	3.0	4.0	5.1	6.4	7.7	9.2	10.9
	LH wood stove	0.9	1.1	1.6	2.0	2.5	3.1	3.8	4.6	5.4	6.4
	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	0.7	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	4.7	5.6	6.8	8.2	9.9	12.0	14.4	17.1	20.2
	LH elec.convector	20.7	19.6	23.4	28.1	33.9	41.1	49.8	59.5	70.6	83.8
	LH elec.storage	1.5	1.5	1.7	2.1	2.5	3.1	3.7	4.4	5.3	6.3
	LH elec.underfloor	2.8	2.8	3.3	4.0	4.8	5.9	7.1	8.5	10.2	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	0.5	0.7	0.8	0.9	1.1	1.2	1.5	1.7
	LH total	**34**	**35**	**43**	**53**	**65**	**79**	**96**	**115**	**137**	**163**
	RAC (cooling demand), all types <12 kW	0	3	4	5	8	11	14	17	22	27
	RAC (heating demand), reversible <12kW	0	3	5	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	**162**	**182**	**221**	**256**	**300**	**358**	**425**	**496**	**569**	**641**
	TOTAL SPACE COOLING	**10**	**19**	**24**	**31**	**40**	**49**	**60**	**73**	**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	4	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	2
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**

BAU Energy costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources BAU										
LFL Linear Fluorescent	9.9	13.5	17.4	21	24.3	28.3	32.7	37.6	43.5	50.3
CFL Compact Fluorescent	0.6	4.0	6.5	7	5.9	5.6	6.0	6.5	7.1	7.7
Tungsten	1.4	7.9	9.9	12	9.9	8.5	7.6	6.6	6.0	6.6
GLS GeneralLighting Service (incandescent)	13.5	9.2	8.3	7	5.5	2.2	0.6	0.1	0.0	0.0
HID High Intensity Discharge	4.2	7.9	8.3	9	10.3	12.5	15.2	18.5	22.5	27.4
LED Light Emitting Diode	0.0	0.0	0.1	1	3.1	6.3	9.7	13.5	17.7	22.5
SP Special Purpose (exempt)	5.9	8.3	8.6	9	8.9	8.9	10.9	13.2	16.1	19.5
lighting controls & sb	1.7	2.3	2.4	2	2.5	2.5	3.0	3.7	4.5	5.5
GLS stock	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten stock	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL LIGHTING	**37**	**53**	**62**	**68**	**70**	**75**	**86**	**100**	**117**	**140**
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	0.6	0.8	1.0	3	4.1	5.3	6.8	8.3	9.6	10.5
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	1.1	3.3	5	5.7	6.7	8.6	11.4	14.9	19.4
Total STB set top boxes (Complex & Simple)	**0**	**2**	**4**	**5**	**6**	**7**	**9**	**11**	**15**	**19**
VIDEO players/recorders	0.0	0.2	0.1	0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	0.2	0.3	0	0.2	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	0.4	0.5	1	1.0	1.6	2.1	2.8	3.7	4.8
Total VIDEO	**0**	**1**	**1**	**1**	**1**	**2**	**2**	**3**	**4**	**5**
ES Rack servers	0.1	1.9	2.6	3.5	5.2	7.8	11.4	13.6	16.5	20.1
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	0.4	0.6	0.8	0.9	1.1	1.3
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	0.3	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	2.2
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	2.5	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	0.1	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	0.1	0.1	0.1	0.1	0.1	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
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	0.2	0.4	1	0.8	1.0	1.1	1.1	1.1	0.4
SB Home NAS, idle hours	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home Phones (fixed), idle hours	0.0	0.1	0.2	0	0.2	0.2	0.2	0.2	0.1	0.0
SB Office Phones (fixed), idle hours	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.0
Total SB (networked) StandBy (rest)	**0**	**1**	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**3**
Total BC Battery Charged devices	**0.0**	**0.5**	**0.5**	**1**	**0.8**	**1.0**	**0.8**	**0.8**	**0.9**	**1.0**
UPS below 1.5 kVA	0.1	0.2	0.2	0	0.4	0.5	0.7	1.0	1.3	1.7
UPS 1.5 to 5 kVA	0.3	0.6	0.8	1	1.5	2.1	2.9	4.0	5.2	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	2.4	3.3	4.2
Total UPS - Uninterrupted Power Supplies	**0.7**	**1.3**	**1.6**	**2**	**3.0**	**4.2**	**5.9**	**7.9**	**10.5**	**13.5**
TOTAL ELECTRONICS	**10**	**24**	**27**	**29**	**38**	**49**	**63**	**74**	**86**	**104**
Total RF household Refrigerators & Freezers	**24**	**24**	**28**	**34**	**42**	**51**	**62**	**75**	**91**	**110**
CF open vertical chilled multi deck (RCV2)	3	4	5	6	8	10	13	16	20	25
CF open horizontal frozen island (RHF4)	1	1	1	1	1	1	2	2	3	3
CF Plug in one door beverage cooler	2	2	2	3	3	4	5	6	7	8
CF Plug in horizontal ice cream freezer	0	0	1	1	1	1	1	2	2	2
CF Spiral vending machine	0	0	0	1	1	1	2	2	3	3
Total CF Commercial Refrigeration	**7**	**7**	**9**	**11**	**14**	**18**	**22**	**28**	**34**	**42**
PF Service cabinets	1	1	1	1	2	2	3	4	5	6
PF Blast cabinets	0	0	1	1	1	1	2	3	3	4
PF Walk in cold rooms	2	2	2	3	4	5	6	8	10	12
PF MT & LT industrial process chillers	2	4	5	7	9	12	16	21	28	36
Total PF Professional Refrigeration	**5**	**7**	**9**	**12**	**15**	**20**	**27**	**35**	**45**	**59**
TOTAL FOOD PRESERVATION	**36**	**37**	**46**	**57**	**71**	**89**	**111**	**138**	**171**	**211**

	BAU Energy costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	4	5	7	9	12	16	20	26	33	41
	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	6	8	11	13
	Total CA Cooking Appliances	**12**	**13**	**16**	**20**	**25**	**32**	**40**	**50**	**62**	**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**	**8**
	TOTAL COOKING	**14**	**15**	**18**	**23**	**28**	**35**	**44**	**56**	**69**	**86**
	Total WM household Washing Machine	**9**	**7**	**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**	**106**	**130**
0.5	FAN Axial<300Pa (all FAN types >125W)	2	6	8	10	14	18	22	27	32	39
0.5	FAN Axial>300Pa	4	10	14	17	22	27	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	11	15	20	25	30	38
0.5	FAN Centr.BC	3	5	7	10	13	17	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**	**42**	**53**	**66**	**82**	**103**
0.5	**Total MT Motors 0.75-375 kW**	**97**	**117**	**146**	**187**	**233**	**286**	**346**	**419**	**507**	**613**
	Total WP Water Pumps	**10**	**12**	**16**	**20**	**27**	**35**	**45**	**58**	**75**	**97**
	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**	**11**	**13**	**16**	**21**	**26**	**32**
	TOTAL INDUSTRY COMPONENTS	68	91	114	147	187	233	288	355	437	538
1	TRAFO Distribution	1	2	3	4	5	7	9	11	15	19
1	TRAFO Industry oil	1	2	2	3	4	5	6	8	11	14
1	TRAFO Industry dry	0	1	1	1	1	2	2	3	3	5
1	TRAFO Power	4	6	7	10	13	17	23	30	39	50
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	23	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE car replacement tyres C1	23	31	38	47	58	63	66	69	71	80
	TYRE van replacement tyres C2	6	9	11	14	16	18	18	18	20	23
	TYRE truck replacement tyres C3	12	14	15	17	19	21	23	24	26	28
	TYRE Replacement Tyres	**41**	**54**	**64**	**77**	**93**	**101**	**107**	**111**	**118**	**132**
	TOTAL TRANSPORT SECTOR	**41**	**54**	**64**	**77**	**93**	**101**	**107**	**111**	**118**	**132**
	GENERAL TOTAL in billion euros	**414**	**522**	**642**	**775**	**941**	**1148**	**1401**	**1703**	**2063**	**2495**

BAU Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	58	73	94	117	145	180	226	288	370	475
SPACE HEATING	162	182	221	256	300	358	425	496	569	641
SPACE COOLING	10	19	24	31	40	49	60	73	89	108
VENTILATION	3	8	11	15	19	24	30	38	49	63
LIGHTING	37	53	62	68	70	75	86	100	117	140
ELECTRONICS	10	24	27	29	38	49	63	74	86	104
FOOD PRESERVATION	36	37	46	57	71	89	111	138	171	211
COOKING	14	15	18	23	28	35	44	56	69	86
CLEANING	16	19	25	32	43	55	69	86	106	130
INDUSTRY COMPONENTS	68	91	114	147	187	233	288	355	437	538
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	41	54	64	77	93	101	107	111	118	132
TOTAL in billion euros	**455**	**576**	**706**	**853**	**1034**	**1249**	**1508**	**1814**	**2181**	**2627**



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).

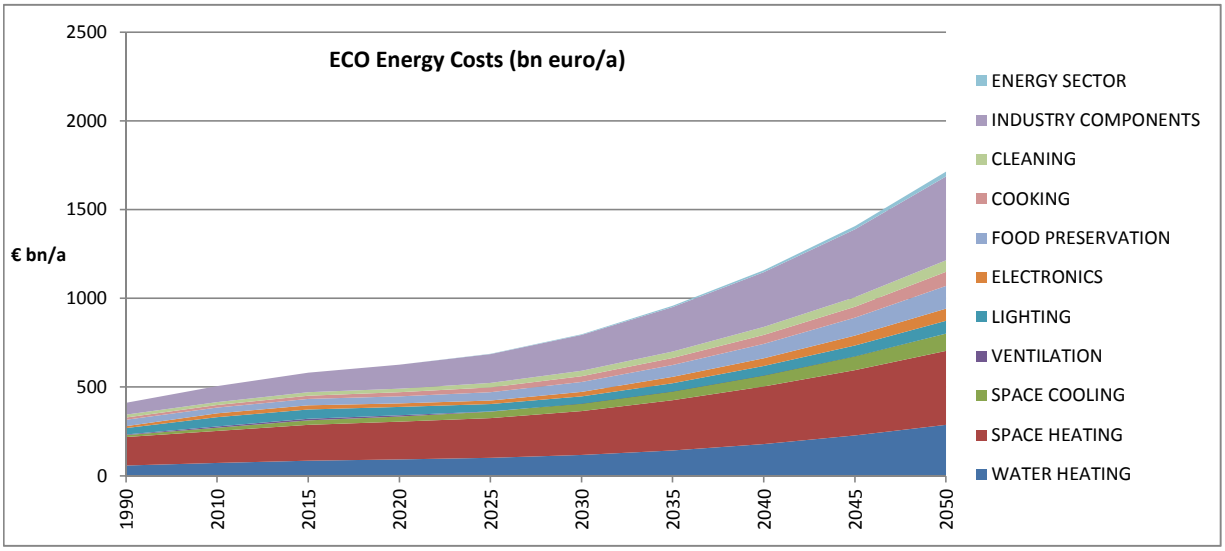
db	ECO Energy costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**47**	**51**	**56**	**60**	**64**	**74**	**90**	**113**	**144**	**184**
	Total CH Central Heating combi, water heat	**11**	**23**	**30**	**33**	**37**	**44**	**54**	**67**	**84**	**105**
	TOTAL WATER HEATING	**58**	**73**	**86**	**94**	**102**	**117**	**143**	**180**	**228**	**288**
	Total CH Central Heating boiler, space heat	**110**	**125**	**133**	**129**	**126**	**132**	**145**	**159**	**173**	**182**
	SFB Wood Manual	7.6	2.7	3.0	2.6	2.0	1.3	0.9	0.7	0.8	0.8
	SFB Wood Direct Draft	0.1	0.7	1.9	3.3	4.7	5.6	6.8	8.9	12.4	17.4
	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**	**21**	**29**
	CHAE-S ≤400 kW	0.5	1.1	1.5	1.8	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	3.4	3.9	4.5	5.3
	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	2.7	3.8	4.8	6.1	7.5	9.0	11.0	13.7	17.1	21.3
	HT PCH-AE-L	2.6	3.6	4.6	5.8	6.9	8.2	9.8	12.0	14.9	18.6
	HT PCH-WE-S	0.6	0.8	1.0	1.3	1.6	2.0	2.5	3.1	3.8	4.7
	HT PCH-WE-M	1.1	1.6	2.0	2.6	3.2	4.0	4.9	6.2	7.6	9.4
	HT PCH-WE-L	0.2	0.3	0.4	0.5	0.6	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	4.4	5.6
	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**	**35**	**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)	0.9	2.6	3.1	3.5	3.9	4.2	4.6	5.0	5.5	6.0
	AC VRF (rev)	0.0	0.8	1.4	2.4	3.5	5.1	6.9	8.8	10.9	13.1
	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	7.6	7.8	7.8	7.9	8.2	8.9	9.6	10.3
	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**	**26**	**30**
	Total AHC Heating & Cooling	**17**	**28**	**34**	**41**	**47**	**54**	**63**	**74**	**88**	**105**
								0			
	LH open fireplace	0.3	0.5	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	6.7	7.9	9.4
	LH wood stove	0.9	1.1	1.6	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	3.1	4.0	5.0	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	0.7	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	4.7	5.5	6.1	7.1	8.7	10.7	12.8	15.2	18.0
	LH elec.convector	20.7	19.6	23.1	26.3	31.0	38.2	46.9	56.2	66.6	79.1
	LH elec.storage	1.5	1.5	1.7	1.9	2.1	2.5	3.0	3.7	4.4	5.3
	LH elec.underfloor	2.8	2.8	3.3	3.8	4.4	5.2	6.2	7.3	8.6	10.3
	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	0.5	0.6	0.7	0.9	1.0	1.2	1.4	1.6
	LH total	**34**	**35**	**43**	**50**	**59**	**72**	**88**	**105**	**124**	**148**
	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	**162**	**179**	**202**	**211**	**224**	**248**	**283**	**324**	**369**	**417**
	TOTAL SPACE COOLING	**10**	**19**	**24**	**30**	**37**	**44**	**53**	**65**	**79**	**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	-24	-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**

ECO Energy costs (in billion 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	4.0	5.7	5.6	2.2	0.6	0.1	0.1	0.1	0.1
Tungsten	1.5	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	**37**	**51**	**53**	**47**	**40**	**41**	**47**	**54**	**61**	**73**
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	0.6	0.8	1.2	2.4	2.3	3.1	4.1	5.4	7.1	9.2
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	1.1	2.9	3.5	4.4	5.1	6.6	8.7	11.4	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	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	0.4	0.5	0.7	1.0	1.6	2.1	2.8	3.7	4.8
Total VIDEO	**0**	**0.8**	**1**	**1**	**1**	**2**	**2**	**3**	**4**	**5**
ES Rack servers	0.1	1.9	2.6	3.1	3.8	5.5	8.1	9.6	11.7	14.2
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	0.3	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**	**4.4**	**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	2.5	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	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	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	0.2	0.4	0.7	0.8	1.0	1.1	1.1	1.1	0.4
SB Home NAS, idle 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), idle hours	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0
SB Office Phones (fixed), idle hours	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Total SB (networked) StandBy (rest)	**0**	**1.4**	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**3**
Total BC Battery Charged devices	**0.0**	**0.3**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.9**	**1.0**	**1.3**
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	2.0	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**	**23**	**24**	**20**	**21**	**27**	**35**	**44**	**55**	**69**
Total RF household Refrigerators & Freezers	**24**	**18**	**18**	**18**	**18**	**19**	**19**	**19**	**19**	**22**
CF open vertical chilled multi deck (RCV2)	3	4	5	6	8	10	13	17	22	28
CF open horizontal frozen island (RHF4)	1	1	1	1	1	1	2	2	3	4
CF Plug in one door beverage cooler	2	2	2	2	3	3	4	6	7	9
CF Plug in horizontal ice cream freezer	0	0	1	1	1	1	1	2	2	2
CF Spiral vending machine	0	0	0	1	1	1	1	2	3	4
Total CF Commercial Refrigeration	**7**	**7**	**9**	**11**	**13**	**16**	**21**	**28**	**36**	**47**
PF Service cabinets	1	1	1	1	2	2	3	4	5	6
PF Blast cabinets	0	0	1	1	1	1	2	3	3	4
PF Walk in cold rooms	2	2	2	3	4	5	6	8	10	12
PF MT & LT industrial process chillers	2	4	5	7	9	12	16	21	28	36
Total PF Professional Refrigeration	**5**	**7**	**9**	**12**	**15**	**20**	**27**	**35**	**45**	**59**
TOTAL FOOD PRESERVATION	**36**	**31**	**35**	**40**	**47**	**56**	**67**	**82**	**101**	**128**

	ECO Energy costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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	4	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**	**13.1**	**16**	**20**	**24**	**30**	**37**	**46**	**57**	**71**
	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	0	0	0	0	0	1	1	1
	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	0	0
	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**	**1.8**	**2**	**2**	**2**	**3**	**4**	**5**	**6**	**7**
	TOTAL COOKING	**14**	**15**	**18**	**22**	**27**	**33**	**41**	**51**	**63**	**78**
	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**	**19**	**24**
	LD vented el.	2	2	2	3	3	4	4	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**	**13**	**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**	**21**	**26**	**30**	**36**	**44**	**54**	**65**
0.5	FAN Axial<300Pa (all FAN types >125W)	2	6	7	9	11	14	17	21	26	31
0.5	FAN Axial>300Pa	4	10	13	16	20	23	28	34	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	16	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**	**43**	**54**	**67**	**84**
0.5	**Total MT Motors 0.75-375 kW**	**97**	**117**	**140**	**166**	**196**	**240**	**292**	**355**	**432**	**526**
	Total WP Water Pumps	**10**	**12**	**15**	**20**	**26**	**34**	**44**	**57**	**73**	**94**
	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**	**110**	**134**	**162**	**201**	**249**	**309**	**382**	**473**
1	TRAFO Distribution	1	2	3	3	4	5	7	8	10	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	50
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**	**31**	**42**	**58**	**80**	**110**
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**1**	**2**	**4**	**7**	**12**	**18**	**27**
	TYRE car replacement tyres C1	23	31	37	41	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	12	14	14	15	15	14	15	17	20	23
	TYRE Replacement Tyres	**41**	**54**	**62**	**67**	**71**	**66**	**71**	**81**	**93**	**106**
	TOTAL TRANSPORT SECTOR	**41**	**54**	**62**	**67**	**71**	**66**	**71**	**81**	**93**	**106**
	GENERAL TOTAL in billion euros	**413**	**507**	**582**	**627**	**689**	**799**	**958**	**1160**	**1408**	**1714**

ECO Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	58	73	86	94	102	117	143	180	228	288
SPACE HEATING	162	179	202	211	224	248	283	324	369	417
SPACE COOLING	10	19	24	30	37	44	53	65	79	97
VENTILATION	3	8	9	7	3	-3	-4	-3	-2	0
LIGHTING	37	51	53	47	40	41	47	54	61	73
ELECTRONICS	10	23	24	20	21	27	35	44	55	69
FOOD PRESERVATION	36	31	35	40	47	56	67	82	101	128
COOKING	14	15	18	22	27	33	41	51	63	78
CLEANING	16	17	20	21	26	30	36	44	54	65
INDUSTRY COMPONENTS	68	91	110	134	162	201	249	309	382	473
ENERGY SECTOR	0	0	0	1	2	4	7	12	18	27
TRANSPORT SECTOR	41	54	62	67	71	66	71	81	93	106
TOTAL in billion euros	**454**	**561**	**644**	**694**	**759**	**865**	**1030**	**1241**	**1501**	**1820**

ECO savings vs. BAU (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	8	23	43	63	83	108	143	187
SPACE HEATING	0	3	19	45	76	110	141	172	200	224
SPACE COOLING	0	0	0	1	3	5	7	8	10	11
VENTILATION	0	0	2	8	16	26	34	42	51	63
LIGHTING	0	2	8	21	30	34	39	46	56	67
ELECTRONICS	1	2	3	9	17	23	28	30	31	35
FOOD PRESERVATION	0	6	11	17	25	34	44	56	70	83
COOKING	0	0	0	1	1	3	4	5	6	8
CLEANING	0	2	5	11	17	24	32	41	52	65
INDUSTRY COMPONENTS	0	0	4	13	25	32	39	46	55	65
ENERGY SECTOR	0	0	0	-1	-2	-4	-7	-12	-18	-27
TRANSPORT SECTOR	0	0	2	10	23	35	36	30	25	26
TOTAL in billion euros	**1**	**15**	**62**	**158**	**274**	**384**	**479**	**573**	**680**	**807**
% saving versus BAU (from 1990=0%)	0%	3%	9%	19%	27%	31%	32%	32%	31%	31%
% saving versus BAU (from 2010=0%)	-3.2%	0%	7%	17%	25%	30%	31%	31%	30%	30%



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	MAINTENANCE incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	6.0	6.9	7.1	7.3	7.4	7.6	7.8	7.9	8.1	8
	CH Central Heating combi, water heat [24 kW]	1.4	2.7	3.0	3.1	3.3	3.6	3.8	4.0	4.2	4
	TOTAL WATER HEATING	**7.4**	**9.7**	**10.1**	**10.4**	**10.8**	**11.2**	**11.5**	**11.9**	**12.3**	**13**
	CH Central Heating boiler, space heat [24 kW]	13.7	22.1	23.8	25.5	27.3	29.5	31.9	34.7	37.4	40
	SFB Wood Manual [18 kW]	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]	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	SFB Coal [25 kW]	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SFB Pellets [25 kW]	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]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Solid Fuel Boiler	**0.4**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.5**
	CHAE-S ≤400 kW	0.2	0.9	1.1	1.3	1.5	1.6	1.7	1.6	1.3	0.9
	CHAE-L > 400 kW	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CHWE-S ≤400 kW	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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	CHWE-L > 1500 kW	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	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	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-AE-L	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC rooftop	0.1	0.4	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.1
	AC splits	0.2	1.0	1.0	1.1	1.1	1.1	1.0	1.0	0.9	0.9
	AC VRF	0.0	1.0	1.6	2.5	3.3	4.3	5.3	6.2	7.1	7.8
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**11**	**12**
	AC rooftop (rev)	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6
	AC VRF (rev)	0.0	0.9	1.4	2.1	2.8	3.6	4.3	4.8	5.2	5.5
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	AHE	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)	**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]	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]	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]	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]	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker [10 kW]	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]	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]	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]	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]	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]	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]	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]	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]	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]	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]	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]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH total	**0.9**	**1.4**	**1.6**	**1.9**	**2.1**	**2.2**	**2.3**	**2.4**	**2.4**	**2.4**
	RAC (cooling demand), all types <12 kW	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	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	**0.1**	**1.0**	**1.3**	**1.6**	**2.1**	**2.3**	**2.5**	**2.5**	**2.6**	**2.6**
1	**CIRC Circulator pumps <2.5 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	TOTAL SPACE HEATING	**15.4**	**26.0**	**28.8**	**31.6**	**34.5**	**37.6**	**40.9**	**44.2**	**47.4**	**50.5**
	TOTAL SPACE COOLING	**1.1**	**5.0**	**6.3**	**7.6**	**8.8**	**10.0**	**11.1**	**11.9**	**12.5**	**13**
	NRVU avg (sales wt.)	0.8	2.7	3.2	3.5	3.8	4.0	4.2	4.4	4.7	5
	RVU Central Unidir. VU (1 fan)	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)	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)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0
	TOTAL VENTILATION	**1.0**	**3.1**	**3.7**	**4.3**	**4.7**	**5.1**	**5.5**	**5.9**	**6.2**	**7**
	LS Light Sources										
	LFL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	CFL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Tungsten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	GLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	HID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LED BAU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	SP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	controls	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**

MAINTENANCE incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
DP TV LoNA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
DP TV Smart	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
DP Monitor	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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
SSTB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
CSTB	0.0	0.0	0.0	0.0	0.0	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**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
VIDEO players/recorders	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
VIDEO game consoles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total VIDEO	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
ES Rack servers	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3
ES Blade servers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ES Enterprise Servers	**0.0**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**
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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
EP-Copier mono	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP-printer mono	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP-printer colour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IJ SFD printer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IJ MFD printer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
paper (2.5 euro/kg paper (6.25 euro/500pack)										
Total imaging equipment, electricity	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
SB Home Gateway, on-mode power	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 power	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 power	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 power	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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
BC_EPS Mobile phones etc.	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
UPS below 1.5 kVA	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	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	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	0.24	0.53	0.59	0.65	0.76	0.89	1.02	1.15	1.25	1.34
Total UPS - Uninterrupted Power Supplies	**0.3**	**0.6**	**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	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
1 CF open vertical chilled multi deck (RCV2)	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	1
1 CF open horizontal frozen island (RHF4)	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0
1 CF Plug in one door beverage cooler	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0
1 CF Plug in horizontal ice cream freezer	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
1 CF Spiral vending machine	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0
1 CF average	**0.4**	**0.7**	**0.7**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1**
PF service cabinet (average)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
PF Blast cabinet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
PF Walk-In Cold Room (WICR, avg)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
PF MT & LT industrial chillers (avg)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total PF Professional Refrigeration	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
TOTAL FOOD PRESERVATION	**0.4**	**0.7**	**0.7**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1**
COOK El. Hobs, Wh/ltr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COOK El. Ovens, kWh/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COOK Gas Hobs, % efficiency NCV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COOK Gas Ovens, kWh prim, NCV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COOK Range Hoods, kWh elec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total CA Cooking Appliances	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
COFFEE Dripfilter (glass)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COFFEE Dripfilter (thermos)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COFFEE Dripfilter (full automatic)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COFFEE Pad filter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COFFEE Hard cap espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COFFEE Semi-auto espresso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
COFFEE Fully-auto espresso	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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
TOTAL COOKING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**

	MAINTENANCE incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	DW Household Dishwasher	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.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LD Household Laundry Drier condens el.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LD Household Laundry Drier vented gas	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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	VC dom. Vacuum Cleaner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	VC nondom Vacuum Cleaner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total VC Vacuum Cleaner	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	TOTAL CLEANING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
0.5	FAN Axial<300Pa [247 W flow out]	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]	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]	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]	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0
0.5	FAN Centr.BC [2052 W flow out]	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]	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)	**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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	WP Water pumps (load) [%]	**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	0.3	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7
	CP Variable speed 5-1280 l/s	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	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	**0.4**	**0.9**	**0.9**	**0.9**	**1.0**	**1.0**	**1.1**	**1.1**	**1.1**	**1.2**
	TOTAL INDUSTRY COMPONENTS	1.8	3.2	3.4	3.7	3.9	4.2	4.4	4.6	4.8	4.9
	TRAFO Distribution, kWh/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Industry oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Industry dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Power	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	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO DER dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
	TYRE in m units										
	TYRE car replacement tyres C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TYRE van replacement tyres C2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TYRE truck replacement tyres C3	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
	GENERAL TOTAL (in bn euro 2010)	**27**	**48**	**54**	**59**	**65**	**70**	**76**	**81**	**86**	**91**

SUMMARY

MAINTENANCE incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	7.4	9.7	10.1	10.4	10.8	11.2	11.5	11.9	12.3	12.7
SPACE HEATING	15.4	26.0	28.8	31.6	34.5	37.6	40.9	44.2	47.4	50.5
SPACE COOLING	1.1	5.0	6.3	7.6	8.8	10.0	11.1	11.9	12.5	12.9
VENTILATION	1.0	3.1	3.7	4.3	4.7	5.1	5.5	5.9	6.2	6.6
LIGHTING	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	0.4	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	1.8	3.2	3.4	3.7	3.9	4.2	4.4	4.6	4.8	4.9
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	**27**	**48**	**54**	**59**	**65**	**70**	**76**	**81**	**86**	**91**

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	708	751	797	838	871	913	955	998	1046	1096
toner costs (€0.04 per image, at 15% N-print)	bn€	24	26	27	29	30	31	33	34	36	37
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	2.3	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€	5.30	5.63	5.97	6.28	6.53	6.84	7.15	7.47	7.84	8.21
ECO paper costs (200 pages/kg; 1 kg=€2.5)	bn€	5.30	5.44	5.26	5.32	5.52	5.79	6.05	6.32	6.63	6.95
BAU paper indirect energy (40 MJ=11.1 kWh/kg)	TWh	24.5	26.0	27.6	29.1	30.2	31.6	33.1	34.6	36.2	38.0
ECO paper indirect energy (40 MJ=11.1 kWh/kg)	TWh	24.5	25.2	24.3	24.6	25.5	26.8	28.0	29.3	30.7	32.1
BAU paper CO_2 (1 kg= 0.6 kg CO_2 eq.)	$MtCO_2$	1	1	1	2	2	2	2	2	2	2
ECO paper CO_2 (1 kg= 0.6 kg CO_2 eq.)	$MtCO_2$	1	1	1	1	1	1	2	2	2	2
BAU total toner and paper costs	**bn€**	**29.42**	**31.22**	**33.14**	**34.86**	**36.21**	**37.96**	**39.70**	**41.48**	**43.49**	**45.55**
ECO total toner and paper costs	**bn€**	**29.42**	**31.04**	**32.43**	**33.89**	**35.21**	**36.91**	**38.60**	**40.33**	**42.29**	**44.29**
TOTAL ELECTRONICS (BAU)		**29**	**31**	**33**	**35**	**36**	**38**	**40**	**41**	**43**	**46**
TOTAL ELECTRONICS (ECO)		**29**	**31.0**	**32**	**34**	**35**	**37**	**39**	**40**	**42**	**44**
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	5.2	5.3	5.3	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	3532	3517	3498	3498	3498
Water costs	bn€	5.7	12.3	15.1	17.9	20.9	24.5	28.3	32.6	37.8	43.8
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	1078	1074	1068	1068	1068
Water costs	bn€	5.7	6.6	6.6	6.5	6.8	7.5	8.6	10.0	11.5	13.4
WM detergent & water costs BAU	**bn€**	**10.0**	**17.6**	**20.5**	**23.1**	**26.2**	**29.8**	**33.6**	**37.9**	**43.1**	**49.1**
WM detergent & water costs ECO	**bn€**	**10.0**	**11.9**	**12.0**	**11.7**	**12.1**	**12.8**	**13.9**	**15.2**	**16.8**	**18.7**
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	3.4	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	234	417	496	580	664	749	833	918	1002	1086
Water costs	bn€	0.5	1.6	2.2	3.0	4.0	5.2	6.7	8.6	10.8	13.6
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	234	253	242	244	253	275	306	337	368	399
Water costs	bn€	0.5	1.0	1.1	1.3	1.5	1.9	2.5	3.1	4.0	5.0
DW detergent & water costs BAU	**bn€**	**1.2**	**3.2**	**4.1**	**5.2**	**6.5**	**8.0**	**9.8**	**12.0**	**14.6**	**17.7**
DW detergent & water costs ECO	**bn€**	**1.2**	**2.5**	**2.9**	**3.4**	**4.0**	**4.7**	**5.6**	**6.6**	**7.7**	**9.1**
VC dom. Vacuum Cleaner	bn€	1.1	1.4	1.5	1.5	1.6	1.6	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**	**1.9**	**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**	**85**	**94**	**103**	**114**
TOTAL ECO (in bn euro 2010)		**42**	**47**	**49**	**51**	**53**	**57**	**60**	**64**	**69**	**74**

SUMMARY

RESOURCES BAU incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS	**29**	**31**	**33**	**35**	**36**	**38**	**40**	**41**	**43**	**46**
CLEANING	**13**	**23**	**27**	**30**	**35**	**40**	**46**	**52**	**60**	**69**
TOTAL in bn euro 2010	**42**	**54**	**60**	**65**	**71**	**78**	**85**	**94**	**103**	**114**

SUMMARY

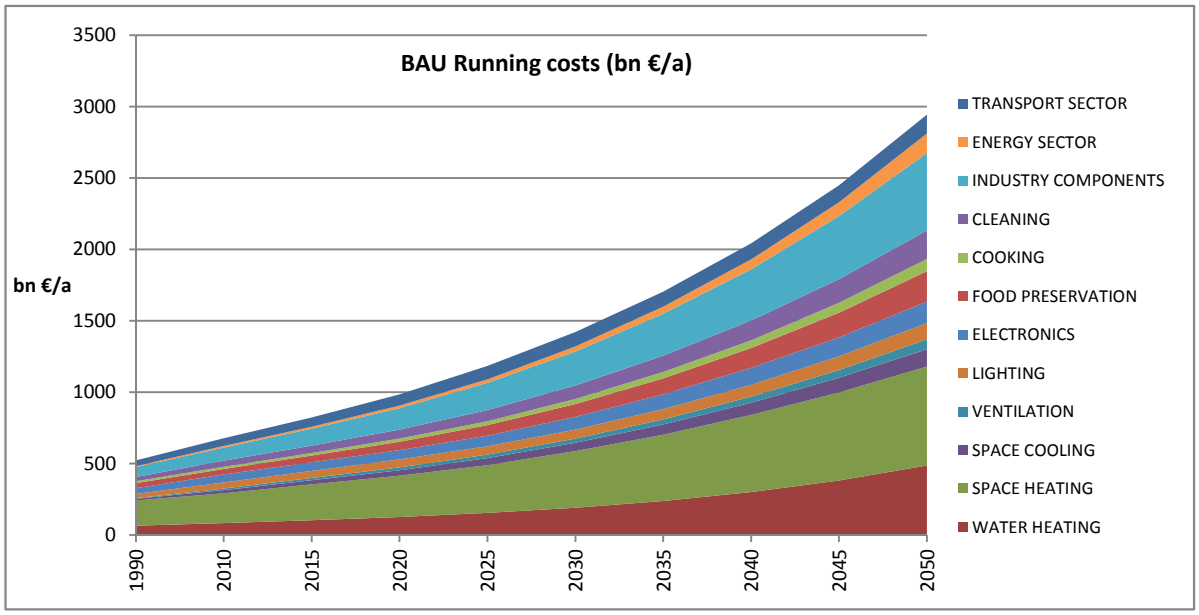
RESOURCES ECO incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS	**29**	**31**	**32**	**34**	**35**	**37**	**39**	**40**	**42**	**44**
CLEANING	**12.7**	**16.3**	**16.9**	**17.2**	**18.2**	**19.7**	**21.7**	**24.0**	**26.7**	**29.8**
TOTAL in bn euro 2010	**42**	**47**	**49**	**51**	**53**	**57**	**60**	**64**	**69**	**74**

db	BAU Running costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**53**	**58**	**70**	**84**	**102**	**122**	**148**	**185**	**234**	**296**
	Total CH Central Heating combi, water heat	**13**	**25**	**34**	**43**	**54**	**69**	**89**	**115**	**149**	**192**
	TOTAL WATER HEATING	**65**	**83**	**104**	**127**	**156**	**191**	**238**	**300**	**383**	**488**
	Total CH Central Heating boiler, space heat	**124**	**150**	**175**	**195**	**221**	**260**	**304**	**349**	**390**	**424**
	SFB Wood Manual	8	3	3	3	2	2	1	1	1	1
	SFB Wood Direct Draft	0	1	2	3	5	6	7	9	13	18
	SFB Coal	2	1	1	1	0	0	0	0	0	0
	SFB Pellets	0	0	1	2	2	3	4	5	6	8
	SFB Wood chips	0	0	1	1	1	1	1	2	2	3
	Total Solid Fuel Boiler	**10**	**5**	**8**	**9**	**11**	**12**	**14**	**17**	**22**	**30**
	CHAE-S ≤400 kW	0.7	2.0	2.6	3.2	3.7	4.4	5.0	5.1	4.5	3.3
	CHAE-L > 400 kW	0.8	1.7	2.2	2.7	3.2	3.6	4.0	4.6	5.3	6.1
	CHWE-S ≤400 kW	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	0.2	0.4	0.5	0.7	0.8	0.8	0.9	1.1	1.2	1.4
	CHWE-L > 1500 kW	0.1	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.9
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	HT PCH-AE-S	2.8	4.0	5.1	6.5	8.2	10.1	12.4	15.2	18.7	23.0
	HT PCH-AE-L	2.7	3.8	4.8	6.2	7.8	9.5	11.7	14.3	17.5	21.5
	HT PCH-WE-S	0.6	0.8	1.1	1.4	1.7	2.1	2.6	3.2	3.9	4.8
	HT PCH-WE-M	1.2	1.7	2.2	2.8	3.5	4.3	5.3	6.5	8.0	9.7
	HT PCH-WE-L	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	2.0
	AC rooftop	0.5	1.2	1.4	1.4	1.3	0.9	0.5	0.3	0.2	0.3
	AC splits	0.8	2.3	2.6	2.8	3.0	3.2	3.3	3.5	3.7	3.9
	AC VRF	0.0	1.4	2.2	3.4	4.7	6.3	8.2	10.0	12.0	13.9
	ACF	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**	**47**	**56**	**66**	**78**	**92**
	AC rooftop (rev)	0.6	1.6	1.9	2.0	1.9	1.4	0.8	0.3	0.0	0.0
	AC splits (rev)	1.1	3.2	3.8	4.4	4.9	5.3	5.6	6.0	6.5	6.9
	AC VRF (rev)	0.0	1.7	2.8	4.5	6.3	8.9	11.6	14.0	16.6	19.0
	ACF (rev)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	AHF	6.2	6.8	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 Air Heating	**8**	**14**	**17**	**19**	**22**	**25**	**28**	**32**	**35**	**39**
	Total AHC Air Heating & Cooling	**18**	**32**	**40**	**49**	**58**	**68**	**79**	**92**	**107**	**124**
								0			
	LH open fireplace	0	1	1	1	2	2	2	3	3	4
	LH closed fireplace/inset	0	1	2	3	4	6	7	8	10	11
	LH wood stove	1	1	2	2	3	3	4	5	6	7
	LH coal stove	1	0	1	1	1	1	1	1	1	1
	LH cooker	0	1	1	1	2	2	2	2	3	3
	LH SHR stove	0	1	1	1	2	3	3	4	5	6
	LH pellet stove	0	0	1	1	2	2	2	3	3	4
	LH open fire gas	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	1	1	1	1	1	2	2	2	3	3
	LH flueless fuel heater	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	5	5	6	7	8	10	12	14	17	20
	LH elec.convector	21	20	23	28	34	41	50	59	71	84
	LH elec.storage	2	1	2	2	3	3	4	4	5	6
	LH elec.underfloor	3	3	3	4	5	6	7	9	10	12
	LH luminous heaters	0	0	0	0	0	0	0	1	1	1
	LH tube heaters	0	0	1	1	1	1	1	1	2	2
	LH total	**35**	**36**	**45**	**55**	**67**	**81**	**98**	**117**	**139**	**165**
	RAC (cooling demand), all types <12 kW	0	3	5	6	9	12	15	19	23	29
	RAC (heating demand), reversible <12kW	0	4	6	9	14	18	21	25	29	34
	Total RAC Room Air Conditioner	**1**	**7**	**11**	**16**	**23**	**30**	**36**	**44**	**52**	**63**
1	**CIRC Circulator pumps <2.5 kW, net load**	**2**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**
	TOTAL SPACE HEATING	**178**	**208**	**250**	**288**	**334**	**396**	**465**	**540**	**616**	**691**
	TOTAL SPACE COOLING	**11**	**23**	**30**	**39**	**49**	**59**	**71**	**85**	**101**	**120**
	NRVU Ventilation units	3.1	9.1	11.6	14.5	17.6	21.1	25.3	30.8	37.7	46.6
	RVU Central Unidir.	1.1	1.9	2.5	2.9	3.3	3.8	4.8	6.2	8.0	10.3
	RVU Central Balanced VU ≤125W/fan (2 fans)	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)	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**	**23**	**29**	**36**	**44**	**55**	**69**
	TOTAL VENTILATION (electr. & maint. only)	**4**	**11**	**15**	**19**	**23**	**29**	**36**	**44**	**55**	**69**

BAU Running costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources										
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 (excl. SP & controls)	**30**	**43**	**51**	**57**	**59**	**64**	**72**	**83**	**97**	**115**
DP TV, on mode	3.2	8.9	8.4	6.5	8.4	11.1	13.0	13.6	12.4	14.6
DP Monitor, on mode	0.1	1.2	1.0	1.0	1.3	1.4	1.4	1.2	0.7	0.6
DP TV , sb mode	0.6	0.8	1.0	2.7	4.1	5.3	6.8	8.3	9.6	10.5
DP Monitor, sb mode	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Electronic Displays	**4.0**	**11.0**	**10.4**	**10.3**	**13.8**	**17.9**	**21.1**	**23.0**	**22.7**	**25.7**
SSTB	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	1.1	3.3	4.6	5.7	6.7	8.6	11.4	14.9	19.4
Total STB set top boxes (Complex & Simple)	**0.0**	**1.7**	**3.6**	**4.6**	**5.7**	**6.7**	**8.6**	**11.4**	**14.9**	**19.4**
VIDEO players/recorders	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	0.4	0.5	0.7	1.0	1.6	2.1	2.8	3.7	4.8
Total VIDEO	**0.0**	**0.8**	**0.8**	**1.0**	**1.2**	**1.6**	**2.1**	**2.8**	**3.7**	**4.8**
ES Rack servers	0.1	2.0	2.8	3.7	5.3	8.0	11.7	13.8	16.7	20.3
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	**0.1**	**2.7**	**3.6**	**4.7**	**6.8**	**10.1**	**14.6**	**17.2**	**20.9**	**25.3**
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	0.3	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	**2.3**	**4.4**	**3.4**	**1.7**	**1.4**	**1.8**	**2.2**	**2.7**	**3.4**	**4.2**
EP-Copier mono	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP-Copier colour	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2
EP-printer mono	1.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
EP-printer colour	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.6	2.1	2.8
IJ SFD printer	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
IJ MFD printer	0.2	0.2	0.3	0.4	0.6	0.8	1.0	1.3	1.7	2.2
Total imaging equipment, electricity and	**32.4**	**32.2**	**34.3**	**36.3**	**38.1**	**40.4**	**42.8**	**45.5**	**48.7**	**52.2**
this total includes following toner and paper costs:	*29.4*	*31.2*	*33.1*	*34.9*	*36.2*	*38.0*	*39.7*	*41.5*	*43.5*	*45.6*
SB Home Gateway	0.0	1.0	1.4	2.0	2.5	3.0	3.5	3.7	3.6	2.6
SB Home NAS	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.3
SB Home Phones (fixed)	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
SB Office Phones (fixed)	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Total SB (networked) StandBy (rest)	**0.2**	**1**	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**3**
Total BC Battery Charged devices	**0.0**	**0.5**	**0.5**	**0.7**	**0.8**	**1.0**	**0.8**	**0.8**	**0.9**	**1.0**
UPS below 1.5 kVA	0.1	0.2	0.2	0.3	0.4	0.5	0.7	1.0	1.3	1.7
UPS 1.5 to 5 kVA	0.4	0.7	0.9	1.1	1.6	2.3	3.1	4.2	5.4	7.0
UPS 5 to 10 kVA	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	0.5	1.0	1.1	1.3	1.6	2.2	2.8	3.6	4.5	5.6
Total UPS - Uninterrupted Power Supplies	**1**	**2**	**2**	**3**	**4**	**5**	**7**	**9**	**12**	**15**
TOTAL ELECTRONICS	**40**	**56**	**61**	**65**	**75**	**89**	**104**	**117**	**132**	**151**
Total RF household Refrigerators & Freezers	**24**	**24**	**28**	**34**	**42**	**51**	**62**	**75**	**91**	**110**
CF open vertical chilled multi deck (RCV2)	3.6	4.3	5.3	6.8	8.7	10.9	13.7	17.0	21.0	25.7
CF open horizontal frozen island (RHF4)	1.0	0.6	0.7	0.9	1.2	1.5	1.9	2.4	2.9	3.6
CF Plug in one door beverage cooler	1.8	1.9	2.2	2.7	3.3	4.0	4.8	5.8	6.9	8.2
CF Plug in horizontal ice cream freezer	0.4	0.5	0.6	0.8	0.9	1.1	1.3	1.6	1.9	2.3
CF Spiral vending machine	0.3	0.4	0.5	0.7	1.0	1.3	1.7	2.1	2.7	3.4
Total CF Commercial Refrigeration	**7.1**	**7.7**	**9.4**	**11.9**	**15.0**	**18.8**	**23.4**	**28.9**	**35.5**	**43.2**
PF Service cabinets	0.7	0.9	1.1	1.4	1.8	2.2	2.8	3.6	4.6	5.8
PF Blast cabinets	0.2	0.4	0.6	0.8	1.1	1.4	1.9	2.6	3.4	4.4
PF Walk in cold rooms	1.7	1.9	2.3	2.9	3.7	4.8	6.0	7.6	9.7	12.2
PF MT & LT industrial process chillers	1.9	3.5	4.8	6.6	8.9	11.9	15.9	21.1	27.8	36.4
PF Remote condensing units (double count with Lot 12)										
Total PF Professional Refrigeration	**4.6**	**6.7**	**8.8**	**11.7**	**15.5**	**20.4**	**26.7**	**34.9**	**45.4**	**58.8**
TOTAL FOOD PRESERVATION	**36**	**38**	**47**	**58**	**72**	**90**	**112**	**139**	**172**	**212**

	BAU Running costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	3.6	5.3	7.1	9.3	12.2	15.8	20.2	25.8	32.7	41.5
	CA El. Ovens	3.9	3.7	4.1	4.8	5.6	7.0	8.7	10.7	13.1	16.1
	CA Gas Hobs	1.7	1.6	1.9	2.2	2.6	3.0	3.5	4.0	4.6	5.3
	CA Gas Ovens	0.7	0.6	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.8
	CA Range Hoods	1.7	1.9	2.4	3.1	4.0	5.1	6.5	8.3	10.5	13.4
	Total CA Cooking Appliances	**12**	**13**	**16**	**20**	**25**	**32**	**40**	**50**	**62**	**78**
	COFFEE Dripfilter (glass)	1.89	1.26	1.34	1.35	1.47	1.78	2.16	2.63	3.20	3.90
	COFFEE Dripfilter (thermos)	0.06	0.18	0.22	0.27	0.33	0.41	0.51	0.62	0.76	0.94
	COFFEE Dripfilter (full automatic)	0.00	0.08	0.12	0.16	0.22	0.29	0.38	0.51	0.66	0.86
	COFFEE Pad filter	0.00	0.18	0.25	0.33	0.43	0.57	0.74	0.96	1.24	1.60
	COFFEE Hard cap espresso	0.00	0.05	0.10	0.21	0.32	0.39	0.48	0.58	0.70	0.86
	COFFEE Semi-auto espresso	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	COFFEE Fully-auto espresso	0.02	0.02	0.03	0.04	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**	**4.4**	**5.5**	**6.8**	**8.5**
	TOTAL COOKING	**14**	**15**	**18**	**23**	**28**	**35**	**44**	**56**	**69**	**86**
	Total WM household Washing Machine	**19.4**	**25.1**	**29.2**	**32.9**	**37.2**	**42.2**	**47.5**	**53.6**	**60.7**	**68.8**
	including detergent and water costs	*10.0*	*17.6*	*20.5*	*23.1*	*26.2*	*29.8*	*33.6*	*37.9*	*43.1*	*49.1*
	Total DW household Dishwasher	**3.4**	**7.1**	**9.5**	**12.7**	**16.7**	**21.6**	**27.7**	**35.3**	**44.6**	**55.9**
	including detergent and water costs	*1.2*	*3.2*	*4.1*	*5.2*	*6.5*	*8.0*	*9.8*	*12.0*	*14.6*	*17.7*
	LD vented el.	1.5	1.9	2.4	2.8	3.3	3.9	4.7	5.8	7.2	8.9
	LD condens el.	0.3	2.4	3.6	5.2	7.1	8.9	10.8	13.0	15.7	18.9
	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	**1.8**	**4.3**	**6.0**	**8.0**	**10.4**	**12.8**	**15.5**	**18.8**	**22.9**	**27.8**
	VC dom	1.8	2.9	4.6	5.8	10.2	14.3	19.4	25.5	32.6	40.6
	VC nondom	0.4	0.5	0.6	0.9	1.2	1.5	1.9	2.5	3.1	3.9
	Total VC Vacuum Cleaner	**3.6**	**5.2**	**7.2**	**8.8**	**13.6**	**18.0**	**23.5**	**30.1**	**37.9**	**46.6**
	including costs of bags & filters	*1.5*	*1.9*	*1.9*	*2.1*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.1*
	TOTAL CLEANING	**28**	**42**	**52**	**62**	**78**	**95**	**114**	**138**	**166**	**199**
0.5	FAN Axial<300Pa (all FAN types >125W)	2.4	5.9	8.0	10.8	14.3	18.3	22.4	27.2	32.9	39.9
0.5	FAN Axial>300Pa	4.1	10.6	14.2	18.1	22.8	28.2	34.4	41.7	50.6	61.4
0.5	FAN Centr.FC	1.1	2.0	2.9	3.8	4.9	6.3	7.6	9.2	11.1	13.4
0.5	FAN Centr.BC-free	2.6	4.8	6.6	8.8	11.7	15.4	19.8	24.8	30.7	38.0
0.5	FAN Centr.BC	2.7	5.5	7.6	10.1	13.5	17.9	23.4	30.5	40.1	52.8
0.5	FAN Cross-flow	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)	**6.6**	**14.6**	**19.9**	**26.1**	**34.0**	**43.6**	**54.5**	**67.5**	**83.8**	**104.2**
0.5	**Total MT Motors 0.75-375 kW**	**97**	**117**	**146**	**187**	**233**	**286**	**346**	**419**	**507**	**613**
	Total WP Water Pumps	**11.5**	**13.7**	**17.0**	**21.9**	**28.3**	**36.5**	**47.1**	**60.6**	**77.7**	**99.5**
	CP Fixed Speed 5-1280 l/s	3.1	5.8	5.6	5.9	6.9	8.4	10.4	12.9	15.9	19.7
	CP Variable speed 5-1280 l/s	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	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	**3.4**	**7.0**	**8.0**	**9.4**	**11.5**	**14.2**	**17.5**	**21.6**	**26.7**	**32.9**
	TOTAL INDUSTRY COMPONENTS	**70**	**94**	**118**	**151**	**190**	**237**	**292**	**359**	**441**	**543**
	TRAFO Distribution	1.4	2.1	2.7	3.7	4.9	6.6	8.7	11.5	15.0	19.5
	TRAFO Industry oil	1.1	1.6	2.1	2.9	3.8	5.0	6.5	8.5	11.0	14.3
	TRAFO Industry dry	0.3	0.5	0.7	0.9	1.2	1.6	2.1	2.7	3.5	4.5
	TRAFO Power	4.1	5.5	7.3	9.8	13.1	17.3	22.7	29.7	38.7	50.3
	TRAFO DER oil	0.0	0.0	0.1	0.2	0.4	0.9	1.8	3.2	5.5	9.0
	TRAFO DER dry	0.0	0.2	0.4	0.9	1.9	3.8	7.4	13.6	23.4	38.0
	TRAFO Small	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	Total TRAFO Utility Transformers	**7.1**	**10.2**	**13.6**	**18.7**	**25.7**	**35.5**	**49.6**	**69.7**	**97.8**	**136.5**
	TOTAL ENERGY SECTOR	**7**	**10**	**14**	**19**	**26**	**36**	**50**	**70**	**98**	**137**
	TYRE car replacement tyres C1	23.0	31.1	37.9	47.0	57.9	63.1	66.1	68.5	71.2	80.4
	TYRE van replacement tyres C2	6.2	8.7	10.9	13.5	16.5	17.5	18.1	18.3	20.4	23.2
	TYRE truck replacement tyres C3	11.8	13.9	14.9	16.8	18.8	20.7	22.6	24.5	26.4	28.2
	TYRE Replacement Tyres	**40.9**	**53.7**	**63.7**	**77.2**	**93.1**	**101.2**	**106.8**	**111.4**	**117.9**	**131.8**
	TRANSPORT SECTOR	**41**	**54**	**64**	**77**	**93**	**101**	**107**	**111**	**118**	**132**
	GENERAL TOTAL (in billion euros)	**524**	**678**	**822**	**984**	**1184**	**1422**	**1705**	**2042**	**2448**	**2944**

BAU Running costs (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	65	83	104	127	156	191	238	300	383	488
SPACE HEATING	178	208	250	288	334	396	465	540	616	691
SPACE COOLING	11	23	30	39	49	59	71	85	101	120
VENTILATION	4	11	15	19	23	29	36	44	55	69
LIGHTING	30	43	51	57	59	64	72	83	97	115
ELECTRONICS	40	56	61	65	75	89	104	117	132	151
FOOD PRESERVATION	36	38	47	58	72	90	112	139	172	212
COOKING	14	15	18	23	28	35	44	56	69	86
CLEANING	28	42	52	62	78	95	114	138	166	199
INDUSTRY COMPONENTS	70	94	118	151	190	237	292	359	441	543
ENERGY SECTOR	7	10	14	19	26	36	50	70	98	137
TRANSPORT SECTOR	41	54	64	77	93	101	107	111	118	132
TOTAL in billion euros	524	678	822	984	1184	1422	1705	2042	2448	2944

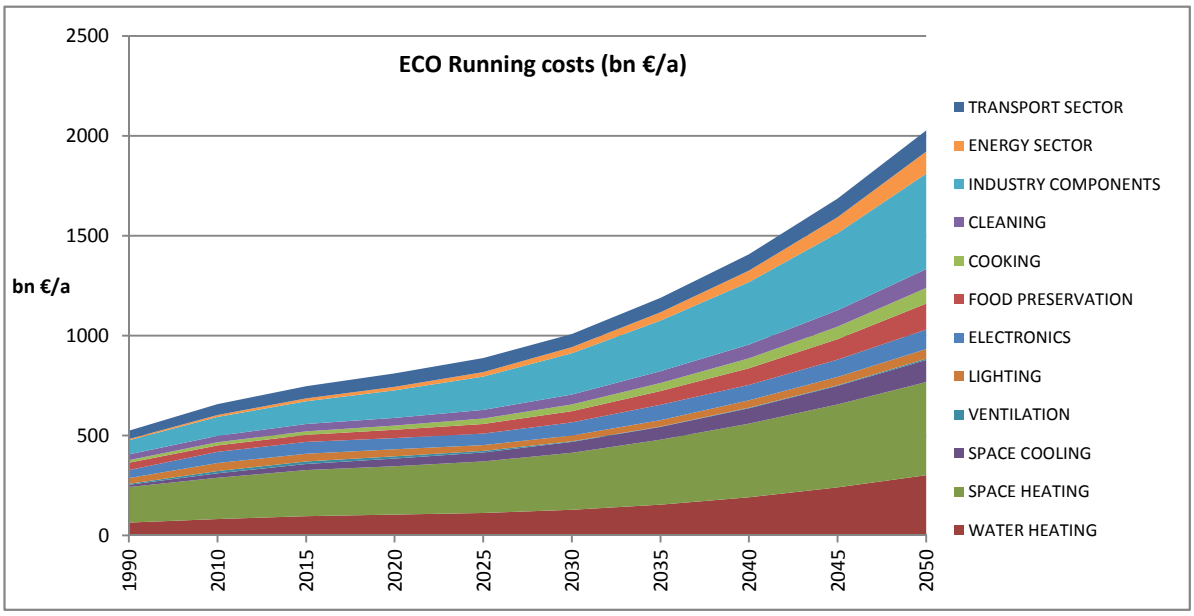


db	ECO Running costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**53**	**58**	**64**	**68**	**72**	**82**	**97**	**121**	**152**	**192**
	Total CH Central Heating combi, water heat	**13**	**25**	**33**	**37**	**41**	**47**	**57**	**71**	**88**	**109**
	TOTAL WATER HEATING	**65**	**83**	**96**	**104**	**112**	**129**	**155**	**192**	**240**	**301**
	Total CH Central Heating boiler, space heat	**124**	**147**	**157**	**155**	**154**	**162**	**177**	**194**	**210**	**222**
	SFB Wood Manual	8	3	3	3	2	1	1	1	1	1
	SFB Wood Direct Draft	0	1	2	3	5	6	7	9	13	18
	SFB Coal	2	1	1	1	0	0	0	0	0	0
	SFB Pellets	0	0	1	2	2	3	4	5	6	8
	SFB Wood chips	0	0	1	1	1	1	1	2	2	3
	Total Solid Fuel Boiler	**10**	**5**	**8**	**9**	**11**	**12**	**13**	**16**	**22**	**29**
	CHAE-S ≤400 kW	0.7	2.0	2.6	3.2	3.7	4.2	4.8	4.8	4.2	3.1
	CHAE-L > 400 kW	0.8	1.7	2.2	2.7	3.1	3.4	3.8	4.2	4.9	5.7
	CHWE-S ≤400 kW	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	0.2	0.4	0.5	0.7	0.8	0.8	0.9	1.0	1.2	1.4
	CHWE-L > 1500 kW	0.1	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.8
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	HT PCH-AE-S	2.8	4.0	5.1	6.4	7.7	9.3	11.3	14.0	17.4	21.6
	HT PCH-AE-L	2.7	3.8	4.8	6.0	7.2	8.4	10.1	12.3	15.2	19.0
	HT PCH-WE-S	0.6	0.8	1.1	1.4	1.7	2.0	2.5	3.1	3.9	4.8
	HT PCH-WE-M	1.2	1.7	2.2	2.8	3.5	4.2	5.2	6.4	7.9	9.7
	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	0.5	1.2	1.4	1.4	1.3	0.9	0.5	0.3	0.2	0.3
	AC splits	0.8	2.3	2.6	2.8	2.9	3.0	3.1	3.2	3.4	3.6
	AC VRF	0.0	1.4	2.2	3.4	4.6	6.2	7.9	9.6	11.5	13.5
	ACF	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**	**86**
	AC rooftop (rev)	0.6	1.6	1.9	1.9	1.7	1.2	0.7	0.2	0.0	0.0
	AC splits (rev)	1.1	3.2	3.8	4.3	4.7	4.9	5.3	5.7	6.1	6.7
	AC VRF (rev)	0.0	1.7	2.8	4.5	6.3	8.7	11.2	13.6	16.1	18.6
	ACF (rev)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	AHF	6.2	6.8	7.7	7.9	7.9	8.0	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 Air Heating	**8**	**14**	**17**	**19**	**21**	**23**	**26**	**29**	**32**	**36**
	Total AHC Air Heating & Cooling	**18**	**32**	**40**	**48**	**55**	**63**	**73**	**85**	**99**	**116**
								0			
	LH open fireplace	0.5	1	1	1	1	2	2	2	2	3
	LH closed fireplace/inset	0.5	1	2	3	4	5	6	7	8	10
	LH wood stove	1.0	1	2	2	3	3	4	4	5	6
	LH coal stove	0.6	0	1	1	1	1	1	1	1	1
	LH cooker	0.3	1	1	1	1	2	2	2	3	3
	LH SHR stove	0.4	1	1	1	2	3	3	4	5	6
	LH pellet stove	0.0	0	1	1	1	2	2	3	3	4
	LH open fire gas	0.1	0	0	0	0	0	0	0	0	0
	LH closed fire gas	0.9	1	1	1	1	2	2	2	2	3
	LH flueless fuel heater	0.0	0	0	0	0	0	0	0	0	0
	LH elec.portable	5.0	5	6	6	7	9	11	13	15	18
	LH elec.convector	20.7	20	23	26	31	38	47	56	67	79
	LH elec.storage	1.5	1	2	2	2	2	3	4	4	5
	LH elec.underfloor	2.8	3	3	4	4	5	6	7	9	10
	LH luminous heaters	0.2	0	0	0	0	0	0	1	1	1
	LH tube heaters	0.3	0	1	1	1	1	1	1	1	2
	LH total	**34.8**	**36**	**44**	**52**	**61**	**74**	**90**	**107**	**127**	**150**
	RAC (cooling demand), all types <12 kW	0	3	4	5	8	10	12	15	19	23
	RAC (heating demand), reversible <12kW	0	4	6	8	12	15	18	21	25	29
	Total RAC Room Air Conditioner	**1**	**7**	**10**	**14**	**20**	**25**	**31**	**37**	**44**	**52**
1	**CIRC Circulator pumps <2.5 kW, net load**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**4**	**5**	**5**
	TOTAL SPACE HEATING	**178**	**205**	**231**	**243**	**258**	**286**	**324**	**368**	**416**	**467**
	TOTAL SPACE COOLING	**11**	**23**	**30**	**37**	**45**	**54**	**64**	**77**	**92**	**110**
	NRVU Ventilation units	3.1	9.1	10.3	9.4	7.0	3.8	3.6	5.1	7.5	11.2
	RVU Central Unidir.	1.1	1.9	1.8	0.7	-1.0	-3.0	-4.0	-5.3	-6.9	-9.1
	RVU Central Balanced VU ≤125W/fan (2 fans)	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)	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)	**4**	**11**	**13**	**11**	**7**	**2**	**2**	**3**	**4**	**6**

ECO Running costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources										
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	4.0	5.7	5.6	2.2	0.6	0.1	0.1	0.1	0.1
Tungsten	1.5	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 (excl. SP & controls)	**30**	**40**	**39**	**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	0.6	0.8	1.2	2.4	2.3	3.1	4.1	5.4	7.1	9.2
DP Monitor, sb mode	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Electronic Displays	**4.0**	**11.0**	**10.3**	**6.2**	**4.6**	**6.0**	**7.9**			
SSTB	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	1.1	2.9	3.5	4.4	5.1	6.6	8.7	11.4	14.9
Total STB set top boxes (Complex & Simple)	**0.0**	**1.5**	**3.2**	**3.5**	**4.4**	**5.1**	**6.6**	**8.7**	**11.4**	**14.9**
VIDEO players/recorders	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	0.4	0.5	0.7	1.0	1.6	2.1	2.8	3.7	4.8
Total VIDEO	**0.0**	**0.8**	**0.8**	**1.0**	**1.2**	**1.6**	**2.1**	**2.8**	**3.7**	**4.8**
ES Rack servers	0.1	2.0	2.8	3.3	3.9	5.8	8.4	9.9	12.0	14.5
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	0.6	0.7	0.8
Total ES Enterprise Servers	**0.1**	**2.7**	**3.6**	**4.2**	**5.0**	**7.2**	**10.4**	**12.2**	**14.8**	**17.9**
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	0.3	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	**2.3**	**4.4**	**3.4**	**1.7**	**1.4**	**1.8**	**2.2**	**2.7**	**3.4**	**4.2**
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 and	**32.4**	**31.7**	**32.8**	**34.4**	**35.8**	**37.7**	**39.6**	**41.6**	**43.9**	**46.3**
including the following toner and paper costs:	*29.4*	*31.0*	*32.4*	*33.9*	*35.2*	*36.9*	*38.6*	*40.3*	*42.3*	*44.3*
SB Home Gateway	0.0	1.0	1.4	2.0	2.5	3.0	3.5	3.7	3.6	2.6
SB Home NAS	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.3
SB Home Phones (fixed)	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
SB Office Phones (fixed)	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Total SB (networked) StandBy (rest)	**0.2**	**1.4**	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**3**
Total BC Battery Charged devices	**0.0**	**0.3**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.9**	**1.0**	**1.3**
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	0.4	0.7	0.9	0.7	0.4	0.4	0.5	0.7	0.8	1.0
UPS 5 to 10 kVA	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	0.5	1.0	1.1	1.3	1.4	1.7	2.1	2.7	3.3	4.0
Total UPS - Uninterrupted Power Supplies	**1.0**	**1.9**	**2.3**	**2.2**	**2.0**	**2.4**	**3.0**	**3.8**	**4.7**	**5.8**
TOTAL ELECTRONICS	**40**	**56**	**59**	**56**	**58**	**66**	**77**	**77**	**87**	**98**
Total RF household Refrigerators & Freezers	**24**	**18**	**18**	**18**	**18**	**19**	**19**	**19**	**19**	**22**
CF open vertical chilled multi deck (RCV2)	3.6	4.3	5.3	6.7	8.0	10.0	13.1	17.1	22.3	28.8
CF open horizontal frozen island (RHF4)	1.0	0.6	0.7	0.9	1.1	1.4	1.8	2.4	3.1	4.0
CF Plug in one door beverage cooler	1.8	1.9	2.2	2.7	3.0	3.6	4.6	5.8	7.3	9.2
CF Plug in horizontal ice cream freezer	0.4	0.5	0.6	0.7	0.8	1.0	1.3	1.6	2.0	2.5
CF Spiral vending machine	0.3	0.4	0.5	0.7	0.9	1.2	1.6	2.2	2.9	3.8
Total CF Commercial Refrigeration	**7.1**	**7.7**	**9.4**	**11.6**	**13.8**	**17.2**	**22.4**	**29.1**	**37.6**	**48.5**
PF Service cabinets	0.7	0.9	1.1	1.4	1.8	2.2	2.8	3.6	4.6	5.8
PF Blast cabinets	0.2	0.4	0.6	0.8	1.1	1.4	1.9	2.6	3.4	4.4
PF Walk in cold rooms	1.7	1.9	2.3	2.9	3.7	4.8	6.0	7.6	9.7	12.2
PF MT & LT industrial process chillers	1.9	3.5	4.8	6.6	8.9	11.9	15.9	21.1	27.8	36.4
PF Remote condensing units (double count with Lot 12)										
Total PF Professional Refrigeration	**4.6**	**6.7**	**8.8**	**11.7**	**15.5**	**20.4**	**26.7**	**34.9**	**45.4**	**58.8**
TOTAL FOOD PRESERVATION	**36**	**32**	**36**	**41**	**48**	**56**	**68**	**83**	**102**	**129**

	ECO Running costs (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	3.6	5.3	7.1	9.3	12.2	15.7	20.1	25.6	32.6	41.3
	CA El. Ovens	3.9	3.7	4.1	4.7	5.4	6.5	7.8	9.6	11.7	14.3
	CA Gas Hobs	1.7	1.6	1.9	2.2	2.6	2.9	3.4	3.9	4.5	5.1
	CA Gas Ovens	0.7	0.6	0.6	0.7	0.7	0.8	0.8	1.0	1.1	1.3
	CA Range Hoods	1.7	1.9	2.4	2.9	3.4	3.9	4.7	5.9	7.5	9.4
	Total CA Cooking Appliances	**12**	**13.1**	**16**	**20**	**24**	**30**	**37**	**46**	**57**	**71**
	COFFEE Dripfilter (glass)	1.89	1.26	1.28	1.09	1.17	1.42	1.73	2.10	2.55	3.11
	COFFEE Dripfilter (thermos)	0.06	0.18	0.22	0.27	0.33	0.41	0.51	0.62	0.76	0.94
	COFFEE Dripfilter (full automatic)	0.00	0.08	0.12	0.16	0.22	0.29	0.38	0.51	0.66	0.86
	COFFEE Pad filter	0.00	0.18	0.23	0.25	0.32	0.42	0.55	0.71	0.92	1.18
	COFFEE Hard cap espresso	0.00	0.05	0.09	0.16	0.24	0.29	0.35	0.43	0.52	0.63
	COFFEE Semi-auto espresso	0.02	0.02	0.03	0.02	0.03	0.03	0.04	0.04	0.04	0.05
	COFFEE Fully-auto espresso	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	**2.0**	**1.8**	**2.0**	**2.0**	**2.4**	**2.9**	**3.6**	**4.5**	**5.6**	**7.0**
	TOTAL COOKING	**14**	**15**	**18**	**22**	**27**	**33**	**41**	**51**	**63**	**78**
	Total WM household Washing Machine	**19.4**	**17.8**	**17.8**	**17.5**	**17.9**	**19.0**	**20.8**	**23.5**	**26.9**	**30.9**
	including detergent and water costs	*10.0*	*11.9*	*12.0*	*11.7*	*12.1*	*12.8*	*13.9*	*15.2*	*16.8*	*18.7*
	Total DW household Dishwasher	**3.4**	**5.7**	**7.0**	**8.8**	**11.1**	**14.0**	**17.6**	**21.9**	**27.1**	**33.4**
	including detergent and water costs	*1.2*	*2.5*	*2.9*	*3.4*	*4.0*	*4.7*	*5.6*	*6.6*	*7.7*	*9.1*
	LD vented el.	1.5	1.9	2.3	2.7	3.2	3.7	4.5	5.5	6.8	8.4
	LD condens el.	0.3	2.4	3.5	4.4	5.2	5.9	6.8	7.9	9.3	10.8
	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	**1.8**	**4.3**	**5.8**	**7.2**	**8.3**	**9.6**	**11.3**	**13.4**	**16.1**	**19.2**
	VC dom	1.8	2.9	3.7	2.5	3.7	4.4	5.2	6.0	6.8	7.5
	VC nondom	0.4	0.5	0.6	0.6	0.7	0.9	1.1	1.4	1.7	2.1
	Total VC Vacuum Cleaner	**3.6**	**5.2**	**6.2**	**5.1**	**6.6**	**7.5**	**8.5**	**9.5**	**10.6**	**11.6**
	including costs of bags & filters	*1.5*	*1.9*	*1.9*	*2.1*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.1*
	TOTAL CLEANING	**28**	**33**	**37**	**39**	**44**	**50**	**58**	**68**	**81**	**95**
0.5	FAN Axial<300Pa (all FAN types >125W)	2.4	5.9	7.7	9.7	12.0	14.8	17.9	21.7	26.2	31.8
0.5	FAN Axial>300Pa	4.1	10.6	13.9	17.0	20.3	24.2	29.1	35.3	42.7	51.8
0.5	FAN Centr.FC	1.1	2.0	2.8	3.3	3.9	4.6	5.5	6.6	8.0	9.6
0.5	FAN Centr.BC-free	2.6	4.8	6.4	8.0	10.1	13.1	16.7	20.9	25.9	32.0
0.5	FAN Centr.BC	2.7	5.5	7.3	9.2	11.5	15.0	19.5	25.3	33.3	43.9
0.5	FAN Cross-flow	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.7	1.0	1.2
	Total FAN, industrial (excl. box & roof fans)	**6.6**	**14.6**	**19.2**	**23.8**	**29.1**	**36.1**	**44.7**	**55.3**	**68.6**	**85.2**
0.5	**Total MT Motors 0.75-375 kW**	**97**	**117**	**140**	**166**	**196**	**240**	**292**	**355**	**432**	**526**
	Total WP Water Pumps	**11.5**	**13.7**	**16.8**	**21.4**	**27.5**	**35.5**	**45.8**	**58.9**	**75.6**	**96.7**
	CP Fixed Speed 5-1280 l/s	3.1	5.8	5.6	5.8	6.7	8.2	10.1	12.6	15.6	19.4
	CP Variable speed 5-1280 l/s	0.0	1.0	2.1	3.2	4.2	5.2	6.5	8.0	9.9	12.2
	CP Pistons 2-64 l/s	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	**3.4**	**7.0**	**8.0**	**9.3**	**11.3**	**13.9**	**17.1**	**21.2**	**26.2**	**32.5**
	TOTAL INDUSTRY COMPONENTS	**70**	**94**	**114**	**137**	**166**	**206**	**254**	**313**	**387**	**477**
	TRAFO Distribution	1.4	2.1	2.7	3.4	4.3	5.4	6.8	8.4	10.5	12.9
	TRAFO Industry oil	1.1	1.6	2.0	2.5	2.9	3.5	4.0	4.9	6.3	8.2
	TRAFO Industry dry	0.3	0.5	0.6	0.8	1.0	1.3	1.6	2.0	2.5	3.3
	TRAFO Power	4.1	5.5	7.3	9.8	13.1	17.3	22.7	29.7	38.7	50.3
	TRAFO DER oil	0.0	0.0	0.1	0.2	0.3	0.6	1.1	1.9	3.3	5.4
	TRAFO DER dry	0.0	0.2	0.4	0.8	1.5	3.0	5.6	10.3	17.7	28.7
	TRAFO Small	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	Total TRAFO Utility Transformers	**7.1**	**10.2**	**13.4**	**17.7**	**23.5**	**31.4**	**42.3**	**57.8**	**79.7**	**109.7**
	TOTAL ENERGY SECTOR	**7**	**10**	**13**	**18**	**24**	**31**	**42**	**58**	**80**	**110**
	TYRE car replacement tyres C1	23.0	31.1	36.9	41.4	44.9	41.0	42.9	49.2	56.2	63.8
	TYRE van replacement tyres C2	6.2	8.7	10.4	11.2	11.1	11.3	13.0	14.9	17.0	19.3
	TYRE truck replacement tyres C3	11.8	13.9	14.4	14.7	14.6	13.8	15.2	17.4	19.8	22.6
	TYRE Replacement Tyres	**40.9**	**53.7**	**61.7**	**67.3**	**70.6**	**66.1**	**71.1**	**81.5**	**93.0**	**105.7**
	TRANSPORT SECTOR	**41**	**54**	**62**	**67**	**71**	**66**	**71**	**81**	**93**	**106**
	GENERAL TOTAL (in billion euros)	**524**	**657**	**747**	**811**	**889**	**1009**	**1189**	**1407**	**1686**	**2026**

ECO Running costs (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	65	83	96	104	112	129	155	192	240	301
SPACE HEATING	178	205	231	243	258	286	324	368	416	467
SPACE COOLING	11	23	30	37	45	54	64	77	92	110
VENTILATION	4	11	13	11	7	2	2	3	4	6
LIGHTING	30	40	39	36	29	29	33	37	41	48
ELECTRONICS	40	56	59	56	58	66	77	77	87	98
FOOD PRESERVATION	36	32	36	41	48	56	68	83	102	129
COOKING	14	15	18	22	27	33	41	51	63	78
CLEANING	28	33	37	39	44	50	58	68	81	95
INDUSTRY COMPONENTS	70	94	114	137	166	206	254	313	387	477
ENERGY SECTOR	7	10	13	18	24	31	42	58	80	110
TRANSPORT SECTOR	41	54	62	67	71	66	71	81	93	106
TOTAL in billion euros	524	657	747	811	889	1009	1189	1407	1686	2026



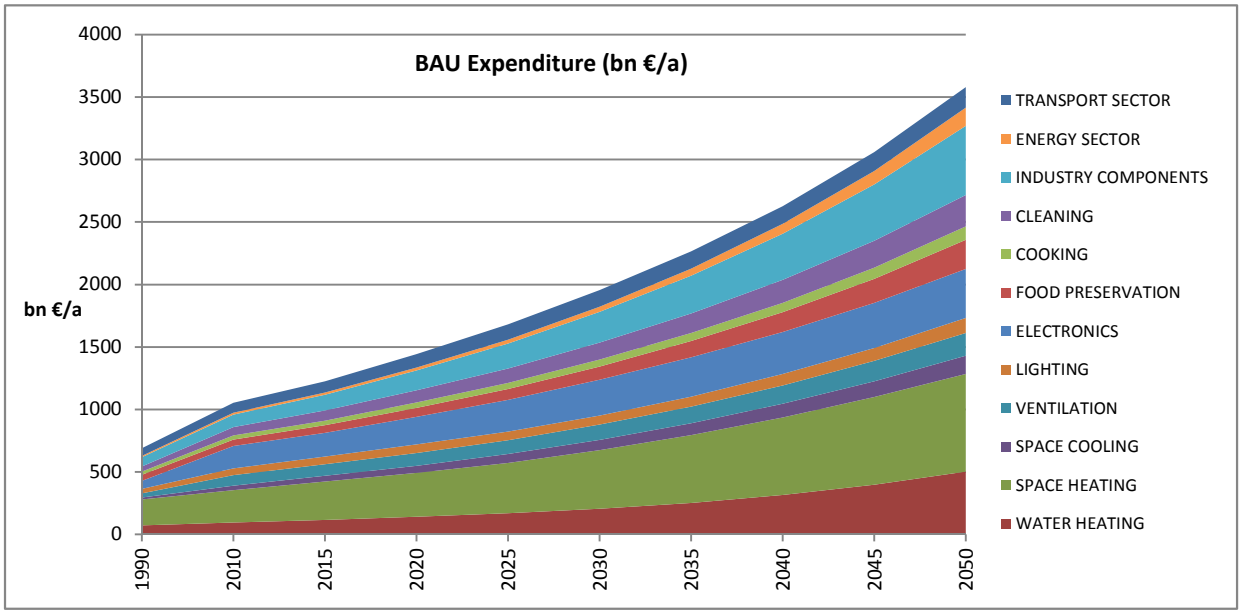
Running costs saving ECO vs. BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	8	23	43	63	83	108	143	187
SPACE HEATING	0	3	19	45	76	110	141	172	200	224
SPACE COOLING	0	0	0	1	3	5	7	8	10	11
VENTILATION	0	0	2	8	16	26	34	42	51	63
LIGHTING	0	2	12	21	30	34	39	46	56	67
ELECTRONICS	0	1	2	9	17	22	27	40	44	53
FOOD PRESERVATION	0	6	11	17	25	34	44	56	70	83
COOKING	0	0	0	1	1	3	4	5	6	8
CLEANING	0	9	15	24	34	45	56	69	85	104
INDUSTRY COMPONENTS	0	0	4	13	25	32	39	46	55	65
ENERGY SECTOR	0	0	0	1	2	4	7	12	18	27
TRANSPORT SECTOR	0	0	2	10	23	35	36	30	25	26
TOTAL in billion euros	0	21	75	173	295	413	516	635	762	918
Saving in % versus BAU (from 1990=0)	0.0%	3.1%	9.1%	17.6%	24.9%	29.0%	30.3%	31.1%	31.1%	31.2%
Saving In % versus BAU (from 2010=0)	-2.9%	0.9%	7.3%	16.1%	23.7%	28.0%	29.4%	30.3%	30.5%	30.7%

db	BAU Expenditure (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**58**	**64**	**75**	**91**	**109**	**129**	**155**	**192**	**241**	**303**
	Total CH Central Heating combi, water heat	**16**	**32**	**41**	**50**	**62**	**77**	**97**	**124**	**158**	**201**
	TOTAL WATER HEATING	**74**	**95**	**117**	**141**	**171**	**206**	**253**	**316**	**399**	**504**
	Total CH Central Heating boiler, space heat	**143**	**177**	**204**	**226**	**254**	**296**	**343**	**392**	**436**	**472**
	SFB Wood Manual	9	3	4	3	2	2	1	1	1	1
	SFB Wood Direct Draft	0	2	4	5	6	8	9	12	16	22
	SFB Coal	3	1	1	1	0	0	0	0	0	0
	SFB Pellets	0	1	2	2	3	4	5	6	7	9
	SFB Wood chips	0	1	1	1	1	1	2	2	3	3
	Total Solid Fuel Boiler	**12**	**8**	**10**	**12**	**13**	**15**	**17**	**21**	**27**	**35**
	CHAE-S ≤400 kW	1.0	3.5	4.3	5.1	5.8	6.6	6.9	6.0	4.8	3.3
	CHAE-L > 400 kW	0.9	2.0	2.4	3.0	3.5	3.9	4.3	4.9	5.6	6.4
	CHWE-S ≤400 kW	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	0.2	0.5	0.6	0.8	0.9	1.0	1.1	1.2	1.3	1.5
	CHWE-L > 1500 kW	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9
	CHF	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	HT PCH-AE-S	3.0	4.3	5.4	6.9	8.5	10.5	12.8	15.6	19.1	23.4
	HT PCH-AE-L	2.9	4.0	5.1	6.5	8.0	9.8	11.9	14.6	17.8	21.8
	HT PCH-WE-S	0.6	0.9	1.1	1.5	1.8	2.2	2.7	3.3	4.0	4.9
	HT PCH-WE-M	1.3	2.0	2.4	3.1	3.8	4.6	5.6	6.8	8.3	10.1
	HT PCH-WE-L	0.2	0.4	0.5	0.6	0.7	0.9	1.1	1.4	1.7	2.0
	AC rooftop	0.7	1.9	2.1	2.0	1.6	1.0	0.6	0.4	0.3	0.3
	AC splits	1.1	3.4	3.7	3.9	4.1	4.2	4.3	4.4	4.6	4.7
	AC VRF	0.0	4.1	5.8	8.7	11.3	14.4	17.5	20.6	23.6	26.3
	ACF	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**	**51**	**60**	**70**	**81**	**93**	**107**
	AC rooftop (rev)	0.7	2.1	2.3	2.3	2.0	1.4	0.8	0.3	0.0	0.0
	AC splits (rev)	1.3	3.9	4.5	5.1	5.6	5.9	6.3	6.6	7.0	7.5
	AC VRF (rev)	0.0	4.1	5.8	9.0	11.8	15.2	18.5	21.5	24.4	26.9
	ACF (rev)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	AHF	6.8	7.2	8.1	8.5	9.0	9.6	10.3	11.0	11.8	12.6
	AHE	0.1	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5
	SubTotal AHC Air Heating	**9**	**18**	**21**	**25**	**29**	**33**	**36**	**40**	**44**	**48**
	Total AHC Air Heating & Cooling	**21**	**40**	**49**	**59**	**70**	**81**	**94**	**107**	**123**	**140**
	LH open fireplace	2	3	3	3	4	4	4	5	5	6
	LH closed fireplace/inset	1	4	5	6	7	9	10	11	13	14
	LH wood stove	2	2	3	3	4	5	5	6	7	8
	LH coal stove	1	1	1	1	1	1	1	1	1	1
	LH cooker	1	2	3	3	4	4	4	5	5	5
	LH SHR stove	2	3	4	5	6	7	8	9	10	11
	LH pellet stove	0	1	2	2	3	3	4	4	5	5
	LH open fire gas	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	1	1	1	2	2	2	2	3	3	4
	LH flueless fuel heater	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	5	5	6	7	8	10	12	15	17	20
	LH elec.convector	22	21	25	30	36	43	52	62	73	86
	LH elec.storage	2	2	2	2	3	3	4	5	6	7
	LH elec.underfloor	3	3	4	5	5	6	8	9	11	13
	LH luminous heaters	0	0	0	0	0	0	1	1	1	1
	LH tube heaters	0	0	1	1	1	1	1	1	2	2
	LH total	**43**	**49**	**60**	**71**	**84**	**99**	**116**	**135**	**157**	**183**
	RAC (cooling demand), all types <12 kW	1	8	11	15	18	21	24	28	33	39
	RAC (heating demand), reversible <12kW	0	7	12	17	22	26	30	33	38	42
	Total RAC Room Air Conditioner	**1**	**15**	**23**	**32**	**40**	**47**	**54**	**62**	**70**	**81**
	CIRC Circulator pumps <2.5 kW, net load	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**13**
	TOTAL SPACE HEATING	**207**	**259**	**307**	**351**	**403**	**469**	**543**	**621**	**701**	**780**
	TOTAL SPACE COOLING	**13**	**36**	**46**	**58**	**70**	**82**	**95**	**109**	**126**	**146**
	NRVU Ventilation units	32.7	78.4	84.1	91.0	98.3	106.0	114.5	124.1	135.3	148.5
	RVU Central Unidir.	2.6	5.3	5.3	5.5	6.0	6.7	7.9	9.5	11.4	13.9
	RVU Central Balanced VU ≤125W/fan (2 fans)	0.2	1.4	3.3	4.8	6.1	7.6	9.2	10.9	13.1	15.7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0.0	0.1	0.3	0.5	0.9	1.3	1.7	2.4	3.1	4.0
	Total VU Ventilation Units	**35**	**85**	**93**	**102**	**111**	**122**	**133**	**147**	**163**	**182**
	TOTAL VENTILATION (electr. & maint. only)	**35**	**85**	**93**	**102**	**111**	**122**	**133**	**147**	**163**	**182**

BAU Expenditure (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources										
LFL Linear Fluorescent	12.1	16.8	20.3	23.4	27.0	30.8	35.0	39.7	45.4	52.0
CFL Compact Fluorescent	0.9	6.4	8.5	8.9	7.5	7.0	7.2	7.6	8.1	8.6
Tungsten	1.9	11.5	14.0	16.2	13.1	10.9	9.3	7.8	6.9	7.5
GLS GeneralLighting Service (incandescent)	14.9	10.2	9.1	7.9	5.8	2.3	0.6	0.1	0.0	0.0
HID High Intensity Discharge	4.7	8.9	9.3	9.9	11.1	13.3	16.1	19.3	23.3	28.2
LED Light Emitting Diode	0.0	0.3	0.8	2.7	5.4	8.1	11.7	15.6	19.7	24.6
TOTAL LIGHTING (excl. SP & controls)	**34**	**54**	**62**	**69**	**70**	**72**	**80**	**90**	**104**	**121**
DP TV	15.6	40.3	35.4	42.0	48.2	55.4	62.1	67.5	71.0	77.5
DP Monitor	1.9	5.5	3.5	3.4	3.7	3.8	3.8	3.6	3.1	3.0
Total Electronic Displays	**17**	**46**	**39**	**45**	**52**	**59**	**66**	**71**	**74**	**80**
SSTB	0.0	1.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	6.1	9.5	11.1	12.4	13.2	15.7	19.0	23.0	28.1
Total STB set top boxes (Complex & Simple)	**0**	**8**	**10**	**11**	**12**	**13**	**16**	**19**	**23**	**28**
VIDEO players/recorders	0.0	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	1.9	1.8	1.3	0.6	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	6.8	4.8	5.1	5.9	6.5	7.0	7.7	8.6	9.7
Total VIDEO	**0**	**10**	**7**	**6**	**7**	**7**	**7**	**8**	**9**	**10**
ES Rack servers	0.3	8.0	9.4	11.4	14.6	19.8	24.4	26.3	29.2	32.8
ES Blade servers	0.4	4.8	5.0	5.6	6.8	8.6	9.8	9.9	10.4	11.1
ES Storage	0.3	3.4	3.9	4.4	4.9	5.4	5.9	5.8	6.0	6.3
Total ES Enterprise Servers	**1**	**16**	**18**	**21**	**26**	**34**	**40**	**42**	**46**	**50**
PC Desktop	5.6	14.2	10.5	8.5	8.2	8.4	8.6	8.8	9.1	9.5
PC Notebook	0.4	26.3	12.2	11.1	11.0	11.0	11.1	11.1	11.2	11.3
PC Tablet/slate	0.0	1.7	27.3	44.3	57.1	68.1	71.7	75.3	78.9	82.6
PC Thin client	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	0.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1
Total PC, electricity	**6**	**45**	**53**	**66**	**79**	**90**	**94**	**98**	**102**	**106**
EP-Copier mono	4.7	1.5	0.9	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	0.0	0.5	2.2	3.3	3.8	4.2	4.7	5.2	5.7	6.3
EP-printer mono	2.0	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.5
EP-printer colour	0.0	0.8	1.2	1.7	2.1	2.6	3.2	3.9	4.7	5.6
IJ SFD printer	0.8	1.1	0.8	0.5	0.4	0.4	0.3	0.2	0.2	0.1
IJ MFD printer	1.0	2.6	3.6	4.3	4.8	5.3	6.0	6.7	7.4	8.3
Total imaging equipment, electricity and	**38**	**39**	**43**	**46**	**48**	**51**	**55**	**58**	**62**	**66**
this total includes following toner and paper costs:	*29*	*31*	*33*	*35*	*36*	*38*	*40*	*41*	*43*	*46*
SB Home Gateway	0.0	7.1	9.3	11.7	14.0	16.3	18.5	20.5	22.2	23.0
SB Home NAS	0.0	0.6	1.1	1.6	2.0	2.5	3.0	3.4	3.8	4.1
SB Home Phones (fixed)	0.5	2.5	3.0	3.2	3.2	3.3	3.3	3.2	3.2	3.1
SB Office Phones (fixed)	0.7	1.3	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.8
Total SB (networked) StandBy (rest)	**1**	**11**	**15**	**18**	**21**	**24**	**26**	**29**	**31**	**32**
Total BC Battery Charged devices	**0.0**	**0.5**	**0.5**	**0.7**	**0.8**	**1.0**	**0.8**	**0.8**	**0.9**	**1.0**
UPS below 1.5 kVA	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	0.5	1.1	1.3	1.6	2.2	2.9	3.8	5.0	6.3	7.9
UPS 5 to 10 kVA	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	0.7	1.4	1.6	1.8	2.2	2.8	3.6	4.4	5.4	6.5
Total UPS - Uninterrupted Power Supplies	**1**	**3**	**3**	**4**	**5**	**7**	**9**	**12**	**14**	**18**
TOTAL ELECTRONICS	**65**	**178**	**188**	**219**	**251**	**286**	**313**	**337**	**362**	**391**
Total RF household Refrigerators & Freezers	**32**	**32**	**37**	**43**	**50**	**59**	**71**	**84**	**100**	**119**
CF open vertical chilled multi deck (RCV2)	4.0	4.9	6.0	7.6	9.5	11.9	14.7	18.1	22.2	27.0
CF open horizontal frozen island (RHF4)	1.1	0.7	0.8	1.1	1.3	1.7	2.1	2.5	3.1	3.8
CF Plug in one door beverage cooler	2.4	2.6	3.0	3.5	4.1	4.8	5.7	6.7	7.9	9.2
CF Plug in horizontal ice cream freezer	0.6	0.8	0.9	1.1	1.3	1.5	1.7	2.0	2.3	2.7
CF Spiral vending machine	0.5	0.9	1.1	1.5	1.8	2.3	2.8	3.4	4.1	5.0
Total CF Commercial Refrigeration	**9**	**10**	**12**	**15**	**18**	**22**	**27**	**33**	**40**	**48**
PF Service cabinets	1.1	1.3	1.6	1.9	2.3	2.8	3.4	4.2	5.2	6.4
PF Blast cabinets	0.8	1.6	1.9	2.2	2.6	3.1	3.7	4.5	5.5	6.7
PF Walk in cold rooms	3.3	3.9	4.4	5.1	6.0	7.2	8.5	10.3	12.4	15.0
PF MT & LT industrial process chillers	2.2	4.0	5.3	7.1	9.5	12.6	16.6	21.9	28.6	37.2
Total PF Professional Refrigeration	**7**	**11**	**13**	**16**	**20**	**26**	**32**	**41**	**52**	**65**
TOTAL FOOD PRESERVATION	**48**	**52**	**62**	**74**	**89**	**107**	**130**	**157**	**191**	**232**

	BAU Expenditure (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	5.9	10.5	12.7	15.4	18.6	22.5	27.2	33.0	40.2	49.2
	CA El. Ovens	8.9	9.6	10.4	11.6	12.3	13.7	15.5	17.5	20.0	23.1
	CA Gas Hobs	4.4	3.8	3.9	4.0	4.2	4.5	4.8	5.2	5.7	6.3
	CA Gas Ovens	1.4	1.3	1.3	1.4	1.5	1.6	1.7	1.9	2.1	2.3
	CA Range Hoods	2.9	3.4	4.0	4.7	5.7	6.9	8.4	10.3	12.6	15.6
	Total CA Cooking Appliances	**24**	**29**	**32**	**37**	**42**	**49**	**58**	**68**	**81**	**96**
	COFFEE Dripfilter (glass)	2.25	1.51	1.56	1.53	1.64	1.95	2.34	2.81	3.38	4.07
	COFFEE Dripfilter (thermos)	0.13	0.29	0.33	0.38	0.45	0.53	0.63	0.74	0.88	1.06
	COFFEE Dripfilter (full automatic)	0.00	0.27	0.32	0.39	0.47	0.57	0.69	0.83	1.02	1.24
	COFFEE Pad filter	0.00	0.61	0.71	0.83	0.98	1.15	1.36	1.62	1.94	2.34
	COFFEE Hard cap espresso	0.06	0.27	0.57	0.93	1.06	1.14	1.22	1.32	1.45	1.60
	COFFEE Semi-auto espresso	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10
	COFFEE Fully-auto espresso	0.36	0.41	0.48	0.56	0.64	0.72	0.81	0.91	1.02	1.15
	Total CM household Coffee Makers	**3**	**3**	**4**	**5**	**5**	**6**	**7**	**8**	**10**	**12**
	TOTAL COOKING	**26**	**32**	**36**	**42**	**48**	**55**	**65**	**76**	**90**	**108**
	Total WM household Washing Machine	**23**	**31**	**35**	**39**	**43**	**48**	**54**	**60**	**67**	**75**
	including detergent and water costs	*10*	*18*	*21*	*23*	*26*	*30*	*34*	*38*	*43*	*49*
	Total DW household Dishwasher	**5**	**11**	**14**	**18**	**22**	**28**	**35**	**43**	**53**	**65**
	including detergent and water costs	*1*	*3*	*4*	*5*	*6*	*8*	*10*	*12*	*15*	*18*
	LD vented el.	2.3	2.7	3.1	3.5	4.0	4.6	5.5	6.6	7.9	9.6
	LD condens el.	0.7	4.1	5.6	7.5	9.4	11.3	13.1	15.4	18.1	21.3
	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	**3**	**7**	**9**	**11**	**13**	**16**	**19**	**22**	**26**	**31**
	VC dom	5.7	14.5	20.9	25.7	32.2	38.2	45.4	53.6	62.8	72.8
	VC nondom	1.1	1.3	1.5	1.7	2.1	2.4	2.9	3.5	4.2	5.1
	Total VC Vacuum Cleaner	**8**	**18**	**24**	**29**	**36**	**43**	**51**	**59**	**69**	**80**
	including costs of bags & filters	*1.5*	*1.9*	*1.9*	*2.1*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.1*
	TOTAL CLEANING	**40**	**67**	**82**	**98**	**115**	**135**	**157**	**184**	**214**	**250**
0.5	FAN Axial<300Pa (all FAN types >125W)	2.8	7.2	9.5	12.5	16.0	20.0	24.1	28.9	34.6	41.6
0.5	FAN Axial>300Pa	4.6	12.5	16.1	20.2	24.9	30.3	36.5	43.8	52.6	63.4
0.5	FAN Centr.FC	1.4	2.9	3.8	4.9	6.0	7.3	8.7	10.3	12.2	14.5
0.5	FAN Centr.BC-free	2.8	5.2	7.1	9.4	12.3	16.1	20.5	25.5	31.4	38.7
0.5	FAN Centr.BC	3.2	6.6	8.9	11.6	15.1	19.6	25.2	32.4	42.2	55.1
0.5	FAN Cross-flow	0.3	0.5	0.6	0.8	1.0	1.2	1.6	2.0	2.5	3.2
	Total FAN, industrial (excl. box & roof fans)	**8**	**17**	**23**	**30**	**38**	**47**	**58**	**71**	**88**	**108**
0.5	**Total MT Motors 0.75-375 kW**	**98**	**119**	**149**	**189**	**236**	**289**	**349**	**422**	**509**	**615**
	Total WP Water Pumps	**13**	**16**	**20**	**25**	**31**	**40**	**50**	**64**	**82**	**104**
	CP Fixed Speed 5-1280 l/s	3.5	6.1	6.0	6.2	7.2	8.8	10.8	13.3	16.3	20.1
	CP Variable speed 5-1280 l/s	0.0	1.2	2.3	3.5	4.6	5.6	6.9	8.4	10.3	12.6
	CP Pistons 2-64 l/s	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	**4**	**8**	**9**	**10**	**12**	**15**	**18**	**22**	**28**	**34**
	TOTAL INDUSTRY COMPONENTS	**74**	**101**	**126**	**159**	**199**	**246**	**302**	**369**	**451**	**553**
	TRAFO Distribution	1.9	2.8	3.5	4.5	5.9	7.6	9.8	12.6	16.1	20.7
	TRAFO Industry oil	1.3	2.0	2.5	3.3	4.3	5.5	7.0	9.1	11.7	15.0
	TRAFO Industry dry	0.5	0.7	0.9	1.1	1.4	1.8	2.3	3.0	3.8	4.8
	TRAFO Power	6.0	8.6	10.5	13.3	16.8	21.3	27.0	34.3	43.6	55.5
	TRAFO DER oil	0.0	0.1	0.1	0.3	0.5	1.1	2.0	3.5	5.9	9.5
	TRAFO DER dry	0.0	0.3	0.7	1.3	2.5	4.8	8.9	15.5	25.8	40.9
	TRAFO Small	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**	**42**	**58**	**79**	**108**	**147**
	TOTAL ENERGY SECTOR	**10**	**15**	**19**	**24**	**32**	**42**	**58**	**79**	**108**	**147**
	TYRE car replacement tyres C1	35.6	46.7	53.4	64.9	78.2	83.3	86.4	88.8	91.4	100.7
	TYRE van replacement tyres C2	10.7	14.3	16.5	20.0	23.7	24.8	25.3	25.6	27.7	30.4
	TYRE truck replacement tyres C3	15.9	18.0	18.3	20.3	22.4	24.3	26.2	28.2	30.0	31.8
	TYRE Replacement Tyres	**62**	**79**	**88**	**105**	**124**	**132**	**138**	**143**	**149**	**163**
	TRANSPORT SECTOR	**62**	**79**	**88**	**105**	**124**	**132**	**138**	**143**	**149**	**163**
	GENERAL TOTAL (in billion euros)	**690**	**1053**	**1225**	**1442**	**1682**	**1955**	**2266**	**2627**	**3058**	**3579**

BAU Expenditure (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	74	95	117	141	171	206	253	316	399	504
SPACE HEATING	207	259	307	351	403	469	543	621	701	780
SPACE COOLING	13	36	46	58	70	82	95	109	126	146
VENTILATION	35	85	93	102	111	122	133	147	163	182
LIGHTING	34	54	62	69	70	72	80	90	104	121
ELECTRONICS	65	178	188	219	251	286	313	337	362	391
FOOD PRESERVATION	48	52	62	74	89	107	130	157	191	232
COOKING	26	32	36	42	48	55	65	76	90	108
CLEANING	40	67	82	98	115	135	157	184	214	250
INDUSTRY COMPONENTS	74	101	126	159	199	246	302	369	451	553
ENERGY SECTOR	10	15	19	24	32	42	58	79	108	147
TRANSPORT SECTOR	62	79	88	105	124	132	138	143	149	163
TOTAL in billion euros	690	1053	1225	1442	1682	1955	2266	2627	3058	3579

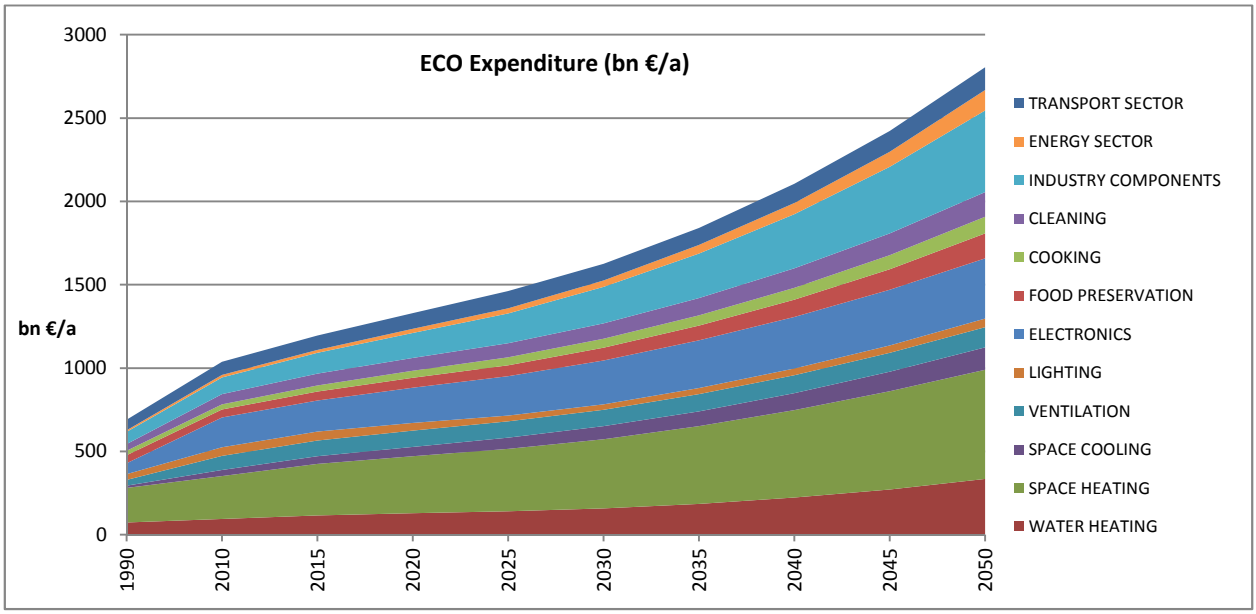


db	ECO Expenditure (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**58**	**64**	**73**	**79**	**84**	**94**	**110**	**133**	**164**	**204**
	Total CH Central Heating combi, water heat	**16**	**32**	**42**	**50**	**55**	**63**	**75**	**90**	**108**	**130**
	TOTAL WATER HEATING	**74**	**95**	**116**	**129**	**140**	**157**	**184**	**222**	**272**	**334**
	Total CH Central Heating boiler, space heat	**143**	**175**	**206**	**218**	**233**	**252**	**280**	**311**	**342**	**369**
	SFB Wood Manual	9	3	4	3	2	2	1	1	1	1
	SFB Wood Direct Draft	0	2	4	5	7	8	9	12	16	22
	SFB Coal	3	1	1	1	0	0	0	0	0	0
	SFB Pellets	0	1	2	2	3	4	5	6	7	9
	SFB Wood chips	0	1	1	1	1	1	2	2	3	3
	Total Solid Fuel Boiler	**12**	**8**	**10**	**12**	**14**	**15**	**17**	**21**	**26**	**35**
	CHAE-S ≤400 kW	1.0	3.5	4.3	5.0	5.7	6.5	6.6	5.8	4.5	3.1
	CHAE-L > 400 kW	0.9	2.0	2.4	3.0	3.4	3.7	4.1	4.6	5.2	6.0
	CHWE-S ≤400 kW	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	0.2	0.5	0.6	0.8	0.9	1.0	1.1	1.2	1.3	1.5
	CHWE-L > 1500 kW	0.1	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.9
	CHF	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	HT PCH-AE-S	3.0	4.3	5.4	6.7	8.1	9.6	11.7	14.4	17.8	22.0
	HT PCH-AE-L	2.9	4.0	5.1	6.3	7.5	8.7	10.4	12.6	15.6	19.3
	HT PCH-WE-S	0.6	0.9	1.1	1.4	1.8	2.1	2.6	3.2	4.0	4.9
	HT PCH-WE-M	1.3	2.0	2.4	3.1	3.7	4.5	5.5	6.7	8.2	10.1
	HT PCH-WE-L	0.2	0.4	0.5	0.6	0.7	0.9	1.1	1.3	1.6	2.0
	AC rooftop	0.7	1.9	2.1	2.0	1.6	1.0	0.6	0.4	0.3	0.3
	AC splits	1.1	3.4	3.7	3.9	3.9	4.0	4.1	4.2	4.3	4.5
	AC VRF	0.0	4.1	5.8	8.7	11.3	14.2	17.3	20.2	23.1	25.8
	ACF	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**	**42**	**50**	**57**	**66**	**76**	**88**	**102**
	AC rooftop (rev)	0.7	2.1	2.3	2.3	1.9	1.3	0.7	0.2	0.0	0.0
	AC splits (rev)	1.3	3.9	4.5	5.0	5.4	5.6	5.9	6.3	6.7	7.2
	AC VRF (rev)	0.0	4.1	5.8	9.0	11.8	15.0	18.2	21.1	23.9	26.5
	ACF (rev)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	AHF	6.8	7.2	8.1	8.3	8.3	8.3	8.7	9.2	9.9	10.6
	AHE	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**	**37**	**41**	**45**
	Total AHC Air Heating & Cooling	**21**	**40**	**49**	**58**	**67**	**76**	**87**	**100**	**115**	**132**
	LH open fireplace	1.8	2.8	3.1	3.8	4.2	4.2	4.3	4.4	4.6	4.9
	LH closed fireplace/inset	1.3	3.8	5.0	6.7	7.8	8.7	9.6	10.5	11.6	13.0
	LH wood stove	1.8	2.3	2.9	3.6	4.1	4.5	5.0	5.6	6.3	7.1
	LH coal stove	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6
	LH cooker	1.0	2.1	2.7	3.4	3.8	4.1	4.3	4.5	4.8	5.1
	LH SHR stove	2.1	3.1	4.1	5.0	5.9	6.9	7.8	8.7	9.7	10.8
	LH pellet stove	0.0	1.2	1.7	2.3	2.7	3.3	3.7	4.2	4.8	5.4
	LH open fire gas	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
	LH closed fire gas	1.1	1.2	1.4	1.6	1.7	1.9	2.0	2.3	2.6	3.0
	LH flueless fuel heater	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
	LH elec.portable	5.2	4.9	5.7	6.3	7.3	8.9	10.9	13.0	15.4	18.3
	LH elec.convector	22.1	21.3	24.9	28.2	32.9	40.3	48.9	58.2	68.7	81.1
	LH elec.storage	1.7	1.6	1.9	2.2	2.4	2.7	3.3	3.9	4.6	5.5
	LH elec.underfloor	3.2	3.3	3.8	4.4	5.0	5.8	6.7	7.8	9.2	10.9
	LH luminous heaters	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8
	LH tube heaters	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.7
	LH total	**43**	**49**	**59**	**70**	**80**	**94**	**109**	**126**	**145**	**169**
	RAC (cooling demand), all types <12 kW	1.0	8.0	11.6	14.8	17.8	20.3	22.7	25.5	29.0	33.5
	RAC (heating demand), reversible <12kW	0.4	7.1	12.1	16.7	21.2	24.6	27.5	30.5	33.9	37.8
	Total RAC Room Air Conditioner	**1**	**15**	**24**	**31**	**39**	**45**	**50**	**56**	**63**	**71**
1	**CIRC Circulator pumps <2.5 kW, net load**	**3**	**4**	**4**	**4**	**5**	**5**	**5**	**6**	**6**	**7**
	TOTAL SPACE HEATING	**207**	**257**	**309**	**341**	**376**	**416**	**468**	**525**	**588**	**655**
	TOTAL SPACE COOLING	**13**	**36**	**46**	**57**	**67**	**78**	**89**	**102**	**117**	**135**
	NRVU Ventilation units	32.7	78.4	83.1	85.9	87.7	88.7	92.8	98.5	105.1	113.0
	RVU Central Unidir.	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)	0.2	1.4	3.8	5.0	5.7	6.3	7.0	7.8	8.6	9.7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	0.0	0.1	0.3	0.5	0.6	0.8	1.1	1.3	1.6	1.9
	Total VU Ventilation Units	**35**	**85**	**94**	**97**	**98**	**98**	**102**	**108**	**114**	**121**
	TOTAL VENTILATION (electr. & maint. only)	**35**	**85**	**94**	**97**	**98**	**98**	**102**	**108**	**114**	**121**

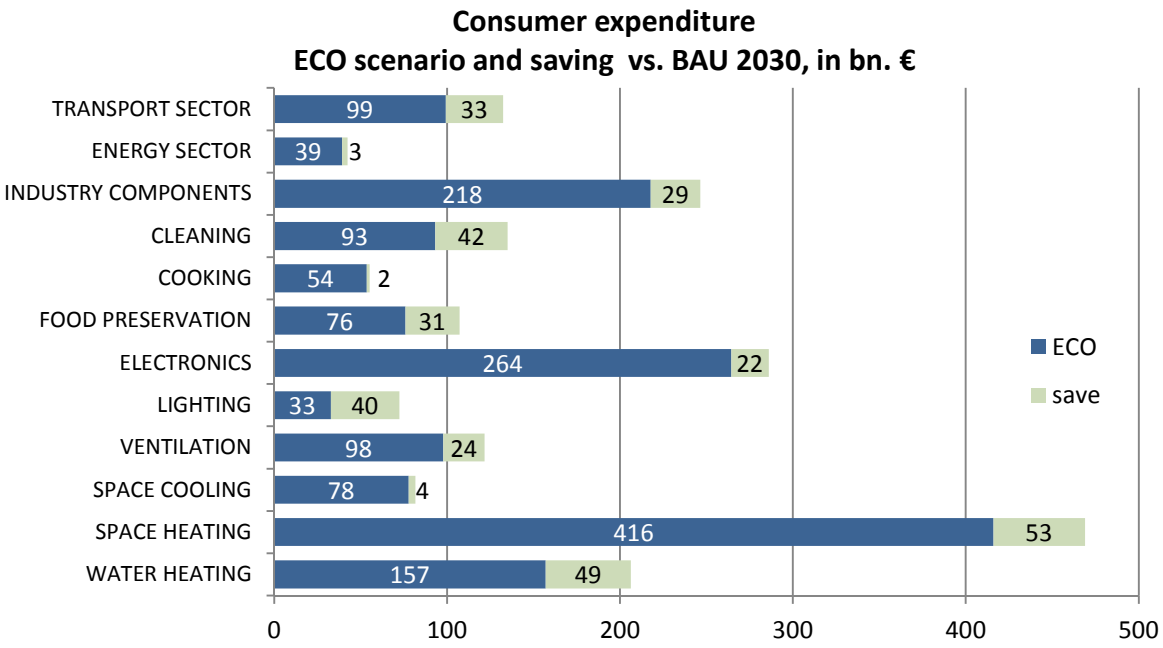
ECO Expenditure (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources										
LFL Linear Fluorescent	12.1	16.8	19.3	19.0	14.7	10.6	8.9	7.2	4.6	2.0
CFL Compact Fluorescent	0.9	6.9	6.8	6.1	2.2	0.6	0.1	0.1	0.1	0.1
Tungsten	2.0	11.7	13.5	5.9	0.8	0.2	0.2	0.2	0.3	0.4
GLS GeneralLighting Service (incandescent)	14.9	7.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
HID High Intensity Discharge	4.7	9.0	6.6	4.4	3.0	2.1	2.5	3.1	3.9	4.9
LED Light Emitting Diode	0.0	0.3	4.9	11.5	14.2	19.2	24.8	30.1	36.1	45.3
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 (excl. SP & controls)	**35**	**52**	**55**	**47**	**35**	**33**	**37**	**41**	**45**	**53**
DP TV	15.6	40.3	35.4	38.6	40.2	44.8	50.0	56.3	63.7	72.5
DP Monitor	1.9	5.5	3.4	2.6	2.5	2.5	2.6	2.6	2.7	2.8
Total Electronic Displays	**17**	**46**	**39**	**41**	**43**	**47**	**53**	**59**	**66**	**75**
SSTB	0.0	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	6.1	9.2	10.1	11.0	11.6	13.7	16.3	19.6	23.6
Total STB set top boxes (Complex & Simple)	**0**	**8**	**10**	**10**	**11**	**12**	**14**	**16**	**20**	**24**
VIDEO players/recorders	0.0	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	0.0	1.9	1.8	1.3	0.6	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	0.0	6.8	4.8	5.1	5.9	6.5	7.0	7.7	8.6	9.7
Total VIDEO	**0**	**10**	**7**	**6**	**7**	**7**	**7**	**8**	**9**	**10**
ES Rack servers	0.3	8.0	9.4	11.0	13.4	17.8	21.4	22.6	24.7	27.3
ES Blade servers	0.4	4.8	5.0	5.5	6.5	8.2	9.2	9.2	9.6	10.0
ES Storage	0.3	3.4	3.9	4.7	5.3	5.8	6.1	6.0	6.1	6.3
Total ES Enterprise Servers	**1**	**16**	**18**	**21**	**25**	**32**	**37**	**38**	**40**	**44**
PC Desktop	5.6	14.2	10.5	8.5	8.2	8.4	8.6	8.8	9.1	9.5
PC Notebook	0.4	26.3	12.2	11.1	11.0	11.0	11.1	11.1	11.2	11.3
PC Tablet/slate	0.0	1.7	27.3	44.3	57.1	68.1	71.7	75.3	78.9	82.6
PC Thin client	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	0.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1
Total PC, electricity	**6**	**45**	**53**	**66**	**79**	**90**	**94**	**98**	**102**	**106**
EP-Copier mono	4.7	1.5	0.9	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	0.0	0.5	2.1	3.1	3.6	3.9	4.3	4.7	5.0	5.4
EP-printer mono	2.0	0.9	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3
EP-printer colour	0.0	0.8	1.0	1.4	1.7	2.1	2.4	2.8	3.2	3.7
IJ SFD printer	0.8	1.0	0.7	0.5	0.4	0.3	0.3	0.2	0.1	0.1
IJ MFD printer	1.0	2.5	3.4	3.9	4.3	4.8	5.2	5.7	6.1	6.6
Total imaging equipment, electricity and	**38**	**38**	**41**	**44**	**46**	**49**	**51**	**54**	**57**	**60**
this total includes following toner and paper costs:	*29*	*31*	*32*	*34*	*35*	*37*	*39*	*40*	*42*	*44*
SB Home Gateway	0.0	7.1	9.3	11.7	14.0	16.3	18.5	20.5	22.2	23.0
SB Home NAS	0.0	0.6	1.1	1.5	2.0	2.5	3.0	3.4	3.8	4.1
SB Home Phones (fixed)	0.5	2.5	3.0	3.2	3.2	3.3	3.3	3.2	3.2	3.1
SB Office Phones (fixed)	0.7	1.3	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.8
Total SB (networked) StandBy (rest)	**1**	**11**	**15**	**18**	**21**	**24**	**26**	**29**	**31**	**32**
Total BC Battery Charged devices	0.0	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.3
UPS below 1.5 kVA	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	0.5	1.1	1.3	1.2	0.9	1.0	1.2	1.5	1.7	1.9
UPS 5 to 10 kVA	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	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	**1**	**3**	**3**	**4**	**4**	**4**	**5**	**6**	**7**	**8**
TOTAL ELECTRONICS	**65**	**178**	**186**	**211**	**235**	**264**	**287**	**309**	**333**	**360**
Total RF household Refrigerators & Freezers	**32**	**27**	**28**	**28**	**29**	**30**	**30**	**30**	**30**	**32**
CF open vertical chilled multi deck (RCV2)	4.0	4.9	6.0	7.4	8.8	10.9	14.1	18.2	23.4	30.1
CF open horizontal frozen island (RHF4)	1.1	0.7	0.8	1.0	1.2	1.5	2.0	2.5	3.3	4.2
CF Plug in one door beverage cooler	2.4	2.6	3.0	3.4	3.8	4.5	5.5	6.8	8.3	10.3
CF Plug in horizontal ice cream freezer	0.6	0.8	0.9	1.1	1.2	1.4	1.6	2.0	2.4	3.0
CF Spiral vending machine	0.5	0.9	1.1	1.4	1.8	2.2	2.7	3.4	4.3	5.4
Total CF Commercial Refrigeration	**9**	**10**	**12**	**14**	**17**	**20**	**26**	**33**	**42**	**53**
PF Service cabinets	1.1	1.3	1.6	1.9	2.3	2.8	3.4	4.2	5.2	6.4
PF Blast cabinets	0.8	1.6	1.9	2.2	2.6	3.1	3.7	4.5	5.5	6.7
PF Walk in cold rooms	3.3	3.9	4.4	5.1	6.0	7.2	8.5	10.3	12.4	15.0
PF MT & LT industrial process chillers	2.2	4.0	5.3	7.1	9.5	12.6	16.6	21.9	28.6	37.2
Total PF Professional Refrigeration	**7**	**11**	**13**	**16**	**20**	**26**	**32**	**41**	**52**	**65**
TOTAL FOOD PRESERVATION	**48**	**48**	**53**	**59**	**66**	**76**	**88**	**103**	**123**	**150**

	ECO Expenditure (in billion euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	5.9	10.5	12.7	15.6	18.8	22.7	27.4	33.1	40.3	49.2
	CA El. Ovens	8.9	9.6	10.5	11.8	12.3	13.1	14.6	16.4	18.6	21.3
	CA Gas Hobs	4.4	3.8	3.9	3.9	4.1	4.3	4.6	5.1	5.6	6.2
	CA Gas Ovens	1.4	1.3	1.4	1.6	1.6	1.6	1.7	1.8	1.9	2.0
	CA Range Hoods	2.9	3.4	4.0	5.0	5.8	6.4	7.1	8.3	9.9	11.8
	Total CA Cooking Appliances	**24**	**29**	**32**	**38**	**43**	**48**	**55**	**65**	**76**	**91**
	COFFEE Dripfilter (glass)	2.25	1.51	1.52	1.29	1.36	1.60	1.90	2.27	2.73	3.28
	COFFEE Dripfilter (thermos)	0.13	0.29	0.33	0.38	0.45	0.53	0.63	0.74	0.88	1.06
	COFFEE Dripfilter (full automatic)	0.00	0.27	0.32	0.39	0.47	0.57	0.69	0.83	1.02	1.24
	COFFEE Pad filter	0.00	0.61	0.70	0.75	0.86	1.00	1.17	1.37	1.62	1.92
	COFFEE Hard cap espresso	0.06	0.27	0.57	0.87	0.98	1.03	1.10	1.17	1.27	1.38
	COFFEE Semi-auto espresso	0.08	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	COFFEE Fully-auto espresso	0.36	0.41	0.48	0.55	0.62	0.70	0.78	0.87	0.97	1.08
	Total CM household Coffee Makers	**2.9**	**3.4**	**4.0**	**4.3**	**4.8**	**5.5**	**6.3**	**7.4**	**8.6**	**10.0**
	TOTAL COOKING	**26**	**32**	**36**	**42**	**47**	**54**	**62**	**72**	**85**	**101**
	Total WM household Washing Machine	**23.4**	**24.8**	**25.1**	**25.6**	**25.6**	**26.3**	**27.8**	**30.1**	**33.1**	**37.0**
	including detergent and water costs	*10.0*	*17.6*	*20.5*	*23.1*	*26.2*	*29.8*	*33.6*	*37.9*	*43.1*	*49.1*
	Total DW household Dishwasher	**5.2**	**10.7**	**12.8**	**15.3**	**18.2**	**21.6**	**25.7**	**30.6**	**36.2**	**42.9**
	including detergent and water costs	*1.2*	*3.2*	*4.1*	*5.2*	*6.5*	*8.0*	*9.8*	*12.0*	*14.6*	*17.7*
	LD vented el.	2.3	2.7	3.1	3.4	3.9	4.4	5.2	6.2	7.5	9.1
	LD condens el.	0.7	4.1	5.7	7.1	7.9	8.5	9.3	10.4	11.7	13.2
	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	**3.1**	**6.9**	**8.8**	**10.5**	**11.7**	**13.0**	**14.6**	**16.7**	**19.2**	**22.4**
	VC dom	5.7	14.5	20.5	22.9	25.6	28.4	31.2	34.1	36.9	39.7
	VC nondom	1.1	1.3	1.4	1.5	1.6	1.8	2.1	2.4	2.7	3.2
	Total VC Vacuum Cleaner	**8.3**	**17.6**	**23.9**	**26.4**	**29.4**	**32.4**	**35.5**	**38.6**	**41.8**	**45.0**
	including costs of bags & filters	*1.5*	*1.9*	*1.9*	*2.1*	*2.2*	*2.2*	*2.2*	*2.2*	*2.1*	*2.1*
	TOTAL CLEANING	**40**	**60**	**71**	**78**	**85**	**93**	**104**	**116**	**130**	**147**
0.5	FAN Axial<300Pa (all FAN types >125W)	2.8	7.2	9.6	12.1	14.3	16.9	20.0	23.6	28.1	33.6
0.5	FAN Axial>300Pa	4.6	12.5	15.9	19.2	22.4	26.3	31.2	37.3	44.8	53.9
0.5	FAN Centr.FC	1.4	2.9	4.0	5.0	5.5	6.2	7.0	8.1	9.3	10.9
0.5	FAN Centr.BC-free	2.8	5.2	7.0	8.7	10.9	13.8	17.5	21.6	26.6	32.8
0.5	FAN Centr.BC	3.2	6.6	9.1	11.2	13.7	17.1	21.7	27.7	35.8	46.4
0.5	FAN Cross-flow	0.3	0.5	0.9	1.1	1.0	1.1	1.2	1.4	1.7	2.0
	Total FAN, industrial (excl. box & roof fans)	**7.5**	**17.5**	**23.3**	**28.7**	**33.9**	**40.7**	**49.3**	**59.9**	**73.1**	**89.7**
0.5	**Total MT Motors 0.75-375 kW**	**98**	**120**	**147**	**173**	**203**	**247**	**299**	**362**	**438**	**532**
	Total WP Water Pumps	**13.2**	**16.1**	**19.4**	**24.2**	**30.5**	**38.7**	**49.2**	**62.5**	**79.4**	**100.7**
	CP Fixed Speed 5-1280 l/s	3.5	6.1	6.0	6.1	7.1	8.6	10.6	13.0	16.0	19.8
	CP Variable speed 5-1280 l/s	0.0	1.2	2.3	3.5	4.5	5.5	6.8	8.3	10.2	12.5
	CP Pistons 2-64 l/s	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	**3.9**	**7.6**	**8.7**	**10.1**	**12.1**	**14.7**	**18.0**	**22.1**	**27.1**	**33.4**
	TOTAL INDUSTRY COMPONENTS	**74**	**101**	**125**	**149**	**178**	**218**	**266**	**325**	**399**	**490**
	TRAFO Distribution	1.9	2.8	3.6	4.4	5.4	6.6	8.1	9.8	11.9	14.5
	TRAFO Industry oil	1.3	2.0	2.7	3.2	3.7	4.3	4.9	5.8	7.3	9.3
	TRAFO Industry dry	0.5	0.7	0.9	1.1	1.3	1.6	2.0	2.4	2.9	3.7
	TRAFO Power	6.0	8.6	10.5	13.3	16.8	21.3	27.0	34.3	43.6	55.5
	TRAFO DER oil	0.0	0.1	0.2	0.3	0.5	0.8	1.5	2.5	4.0	6.2
	TRAFO DER dry	0.0	0.3	0.7	1.3	2.3	4.2	7.5	12.8	20.8	32.4
	TRAFO Small	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0
	Total TRAFO Utility Transformers	**9.9**	**14.7**	**18.9**	**23.9**	**30.4**	**39.4**	**51.5**	**68.2**	**91.3**	**122.5**
	TOTAL ENERGY SECTOR	**10**	**15**	**19**	**24**	**30**	**39**	**51**	**68**	**91**	**122**
	TYRE car replacement tyres C1	35.6	46.7	52.4	59.4	65.5	61.9	63.2	69.5	76.5	84.1
	TYRE van replacement tyres C2	10.7	14.3	16.0	17.6	18.4	18.5	20.2	22.1	24.2	26.5
	TYRE truck replacement tyres C3	15.9	18.0	18.1	18.9	19.2	18.8	19.9	21.9	24.2	26.7
	TYRE Replacement Tyres	**62.3**	**79.0**	**86.4**	**95.9**	**103.1**	**99.2**	**103.4**	**113.5**	**124.9**	**137.4**
	TRANSPORT SECTOR	**62**	**79**	**86**	**96**	**103**	**99**	**103**	**114**	**125**	**137**
	GENERAL TOTAL (in billion euros)	**690**	**1038**	**1196**	**1331**	**1461**	**1625**	**1841**	**2105**	**2423**	**2805**

ECO Expenditure (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	74	95	116	129	140	157	184	222	272	334
SPACE HEATING	207	257	309	341	376	416	468	525	588	655
SPACE COOLING	13	36	46	57	67	78	89	102	117	135
VENTILATION	35	85	94	97	98	98	102	108	114	121
LIGHTING	35	52	55	47	35	33	37	41	45	53
ELECTRONICS	65	178	186	211	235	264	287	309	333	360
FOOD PRESERVATION	48	48	53	59	66	76	88	103	123	150
COOKING	26	32	36	42	47	54	62	72	85	101
CLEANING	40	60	71	78	85	93	104	116	130	147
INDUSTRY COMPONENTS	74	101	125	149	178	218	266	325	399	490
ENERGY SECTOR	10	15	19	24	30	39	51	68	91	122
TRANSPORT SECTOR	62	79	86	96	103	99	103	114	125	137
TOTAL in billion euros	690	1038	1196	1331	1461	1625	1841	2105	2423	2805



Expenditure saving ECO vs. BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	12	31	49	68	93	127	170
SPACE HEATING	0	2	-2	10	27	53	75	96	113	126
SPACE COOLING	0	0	0	0	2	4	6	7	9	10
VENTILATION	0	0	-1	5	14	24	31	39	49	61
LIGHTING	0	2	7	22	35	40	43	49	58	68
ELECTRONICS	0	1	2	8	16	22	26	28	28	31
FOOD PRESERVATION	0	5	9	15	22	31	41	54	68	82
COOKING	0	0	0	0	0	2	3	4	6	7
CLEANING	0	7	12	20	30	42	54	68	84	103
INDUSTRY COMPONENTS	0	0	1	10	21	29	36	44	53	64
ENERGY SECTOR	0	0	0	0	1	3	6	10	16	25
TRANSPORT SECTOR	0	0	2	9	21	33	35	29	24	26
TOTAL inbillion euros	0	16	29	111	221	331	424	522	635	774
Saving in % versus BAU (from 1990=0)	0.0%	1.5%	2.4%	7.7%	13.1%	16.9%	18.7%	19.9%	20.8%	21.6%
Saving In % versus BAU (from 2010=0)	-2.2%	0.1%	1.2%	6.7%	12.2%	16.1%	18.1%	19.3%	20.3%	21.2%



	2030	
	ECO	save
WATER HEATING	157	49
SPACE HEATING	416	53
SPACE COOLING	78	4
VENTILATION	98	24
LIGHTING	33	40
ELECTRONICS	264	22
FOOD PRESERVATION	76	31
COOKING	54	2
CLEANING	93	42
INDUSTRY COMPONENTS	218	29
ENERGY SECTOR	39	3
TRANSPORT SECTOR	99	33

	REVENUE INDUSTRY BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	1778	2163	2138	2301	2551	2574	2540	2506	2471	2436
	CH Central Heating combi, water heat [24 kW]	1310	2282	2464	2741	2823	2896	2987	3147	3306	3465
	TOTAL WATER HEATING	**3088**	**4445**	**4602**	**5042**	**5374**	**5470**	**5527**	**5652**	**5776**	**5900**
	CH Central Heating boiler, space heat [24 kW]	6836	9947	10633	11319	12428	13537	14645	15754	16863	17972
	SFB Wood Manual [18 kW]	530	320	215	127	75	70	65	60	56	52
	SFB Wood Direct Draft [20 kW]	20	873	909	967	900	1121	1313	1537	1800	2149
	SFB Coal [25 kW]	199	87	11	10	8	8	7	6	6	5
	SFB Pellets [25 kW]	0	223	347	346	346	382	422	466	515	568
	SFB Wood chips [160 kW]	0	139	140	168	195	215	238	262	290	320
	Total Solid Fuel Boiler	**749**	**1643**	**1621**	**1618**	**1524**	**1796**	**2044**	**2332**	**2666**	**3094**
	CHAE-S ≤400 kW	212	890	978	1081	1195	1308	1089	559	167	27
	CHAE-L > 400 kW	47	153	158	163	170	176	183	190	196	203
	CHWE-S ≤400 kW	19	79	87	96	106	117	127	137	146	155
	CHWE-M >400 kW; ≤1500 kW	21	72	75	77	80	84	87	90	94	97
	CHWE-L > 1500 kW	13	46	48	50	52	54	56	58	61	63
	CHF	0	3	4	5	6	8	9	10	11	11
	HT PCH-AE-S	103	168	180	190	198	206	214	223	231	239
	HT PCH-AE-L	83	134	144	152	158	165	172	178	185	191
	HT PCH-WE-S	23	37	39	41	43	45	47	49	50	52
	HT PCH-WE-M	89	145	155	164	171	178	185	192	199	206
	HT PCH-WE-L	17	27	29	31	32	33	35	36	37	39
	AC rooftop	96	314	317	243	141	37	37	37	37	37
	AC splits	168	612	639	617	596	572	551	529	507	486
	AC VRF	1	1387	1811	2638	3337	4027	4685	5290	5797	6163
	ACF	0	3	4	5	6	8	9	10	11	11
	SubTotal AHC Air Cooling	**893**	**4071**	**4670**	**5554**	**6292**	**7019**	**7485**	**7587**	**7729**	**7981**
	AC rooftop (rev)	59	193	185	149	83	21	0	0	0	0
	AC splits (rev)	113	392	410	396	383	368	354	340	326	312
	AC VRF (rev)	0	1184	1471	2252	2737	3143	3479	3737	3896	3942
	ACF (rev)	0	7	10	12	14	17	19	21	23	25
	AHF	330	217	203	191	181	171	161	151	141	131
	AHE	1	2	2	2	2	2	2	2	2	2
	SubTotal AHC Air Heating (rev double)	**504**	**1995**	**2281**	**3002**	**3400**	**3721**	**4014**	**4251**	**4388**	**4412**
	Total AHC Air Heating & Cooling	**1224**	**4290**	**4876**	**5748**	**6476**	**7193**	**7649**	**7741**	**7873**	**8116**
	LH open fireplace [8 kW]	635	926	932	939	932	926	925	925	925	925
	LH closed fireplace/inset [8 kW]	401	1086	1212	1338	1355	1372	1376	1376	1376	1376
	LH wood stove [8 kW]	434	511	567	622	631	639	640	640	640	640
	LH coal stove [8 kW]	132	102	94	85	64	43	39	39	39	39
	LH cooker [10 kW]	370	743	898	1053	1079	1106	1112	1112	1112	1112
	LH SHR stove [8 kW]	402	562	697	833	931	1030	1050	1050	1050	1050
	LH pellet stove [8 kW]	0	418	527	636	681	727	736	736	736	736
	LH open fire gas, NCV [4.2 kW]	24	35	38	42	42	42	42	42	42	42
	LH closed fire gas, NCV [4.2 kW]	117	132	135	139	143	146	147	147	147	147
	LH flueless fuel heater, NCV [1.5 kW]	43	86	82	77	69	60	59	59	59	59
	LH elec.portable [1 kW]	101	123	127	131	136	142	144	144	144	144
	LH elec.convector [1 kW]	737	899	927	956	999	1042	1051	1051	1051	1051
	LH elec.storage [2.75 kW]	84	103	106	109	114	119	120	120	120	120
	LH elec.underfloor [0.62 kW]	153	186	192	198	207	216	218	218	218	218
	LH luminous heaters [20 kW]	16	20	20	20	20	20	20	20	20	20
	LH tube heaters [30 kW]	16	20	20	20	20	20	20	20	20	20
	LH total	**3666**	**5951**	**6575**	**7198**	**7425**	**7651**	**7698**	**7698**	**7698**	**7698**
	RAC (cooling demand), all types <12 kW	150	1373	1968	2466	2687	2714	2714	2759	2804	2850
	RAC (heating demand), reversible <12kW	42	1019	1735	2180	2379	2405	2406	2449	2491	2533
	Total Room Air Conditioner	**192**	**2392**	**3704**	**4646**	**5066**	**5119**	**5120**	**5208**	**5295**	**5383**
1	**CIRC Circulator pumps <2.5 kW**	**868**	**1280**	**1356**	**1439**	**1522**	**1506**	**1422**	**1339**	**1256**	**1173**
	TOTAL SPACE HEATING (incl. rev.AC)	**11797**	**20555**	**22845**	**25317**	**27155**	**29109**	**30808**	**32483**	**34106**	**35709**
	TOTAL SPACE COOLING	**1042**	**5444**	**6638**	**8020**	**8979**	**9733**	**10199**	**10346**	**10533**	**10831**
	NRVU avg (sales wt.)	10082	23588	24674	26013	27451	28889	30327	31765	33202	34640
	RVU Central Unidir. VU (1 fan)	466	1044	898	819	859	896	948	1011	1073	1136
	RVU Central Balanced VU (2 fans)	52	366	890	1143	1284	1425	1567	1708	1850	1991
	RVU Local Balanced VU (2 fans)	4	48	105	170	239	308	377	446	514	583
	TOTAL VENTILATION (electricity)	**10604**	**25045**	**26567**	**28144**	**29833**	**31518**	**33219**	**34929**	**36640**	**38351**
	LS Light Sources										
	LFL	1780	2566	2277	2295	2130	1964	1799	1642	1510	1377
	CFL	101	935	806	677	607	538	477	437	397	357
	Tungsten	198	1412	1615	1696	1289	926	673	470	357	334
	GLS	570	393	301	215	127	34	9	0	0	0
	HID	341	851	753	727	692	692	692	692	692	692
	LED BAU	0	120	276	716	985	759	856	893	881	917
	TOTAL LIGHTING	**2990**	**6276**	**6029**	**6325**	**5829**	**4914**	**4507**	**4135**	**3837**	**3679**

REVENU INDUSTRY BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	4650	10703	2078	0	0	0	0	0	0	0
DP TV LoNA	0	1459	5194	6502	5676	4645	3525	2405	1285	166
DP TV Smart	0	0	3116	6502	8514	10838	13297	15756	18215	20674
DP Monitor	676	1689	946	946	946	946	946	946	946	946
DP Total electronic DisPlays	**5326**	**13851**	**11334**	**13951**	**15136**	**16429**	**17768**	**19107**	**20446**	**21785**
SSTB	0	725	164	0	0	0	0	0	0	0
CSTB	0	2730	3346	3605	3646	3554	3862	4169	4477	4784
Total STB set top boxes (Complex & Simple)	**0**	**3456**	**3510**	**3605**	**3646**	**3554**	**3862**	**4169**	**4477**	**4784**
VIDEO players/recorders	0	363	99	0	0	0	0	0	0	0
VIDEO projectors	9	980	910	618	267	0	0	0	0	0
VIDEO game consoles	0	2513	1693	1733	1925	1925	1925	1925	1925	1925
Total VIDEO	**9**	**3856**	**2703**	**2350**	**2192**	**1925**	**1925**	**1925**	**1925**	**1925**
ES Rack servers	142	3733	4174	4843	5828	7403	8033	7875	7875	7875
ES Blade servers	252	2814	2864	3150	3738	4578	4956	4788	4788	4788
ES Storage	166	2113	2415	2658	2943	3170	3321	3215	3215	3215
Total ES Enterprise Servers	**560**	**8660**	**9452**	**10652**	**12509**	**15150**	**16309**	**15878**	**15878**	**15878**
PC Desktop	1338	4460	3328	3025	3025	3025	3025	3025	3025	3025
PC Notebook	141	10165	4659	4377	4377	4377	4377	4377	4377	4377
PC Tablet/slate	0	679	10731	17438	22536	26828	28170	29511	30853	32194
PC Thin client	22	264	264	264	264	264	264	264	264	264
PC Workstation	110	1101	1101	1101	1101	1101	1101	1101	1101	1101
Total PC, electricity	**1611**	**16669**	**20083**	**26205**	**31303**	**35595**	**36937**	**38278**	**39620**	**40961**
EP-Copier mono	2454	985	590	249	184	118	53	0	0	0
EP-Copier colour	0	329	1433	2149	2450	2669	2888	3106	3325	3544
EP-printer mono	442	419	367	299	257	228	197	166	135	103
EP-printer colour	0	446	662	892	1070	1242	1415	1587	1760	1932
IJ SFD printer	245	389	271	192	141	121	96	71	45	20
IJ MFD printer	301	974	1336	1543	1694	1845	1997	2148	2299	2450
Total imaging equipment, electricity	**3442**	**3543**	**4660**	**5324**	**5795**	**6224**	**6644**	**7078**	**7564**	**8050**
SB Home Gateway, on-mode power	0	2973	3834	4694	5554	6415	7275	8135	8996	9856
SB Home NAS, on-mode power	0	299	512	725	939	1152	1365	1579	1792	2005
SB Home Phones (fixed), on-mode power	186	923	1107	1181	1181	1181	1181	1181	1181	1181
SB Office Phones (fixed), on-mode power	291	557	593	629	664	700	736	771	807	843
Total SB (networked) StandBy (rest)	**477**	**4752**	**6046**	**7229**	**8339**	**9448**	**10557**	**11667**	**12776**	**13886**
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	45	90	93	113	133	153	172	188	200	208
UPS 1.5 to 5 kVA	84	167	174	211	249	286	320	350	374	389
UPS 5 to 10 kVA	29	58	61	74	87	99	111	122	130	135
UPS 10 to 200 kVA	125	247	257	313	368	422	473	518	552	575
Total UPS - Uninterrupted Power Supplies	**284**	**562**	**585**	**711**	**837**	**961**	**1077**	**1177**	**1256**	**1307**
TOTAL ELECTRONICS	**11709**	**55349**	**58373**	**70027**	**79757**	**89287**	**95079**	**99279**	**103941**	**108575**
RF Household refrigerator and freezer	**2972**	**3243**	**3294**	**3345**	**3396**	**3447**	**3498**	**3549**	**3600**	**3651**
1 CF open vertical chilled multi deck (RCV2)	247	392	438	486	534	583	631	680	728	776
1 CF open horizontal frozen island (RHF4)	63	59	66	74	81	89	96	104	111	119
1 CF Plug in one door beverage cooler	355	492	517	546	575	604	633	662	691	720
1 CF Plug in horizontal ice cream freezer	133	203	214	226	238	250	262	274	286	298
1 CF Spiral vending machine	194	360	435	527	619	711	803	894	986	1078
1 CF average	**993**	**1507**	**1669**	**1858**	**2047**	**2236**	**2425**	**2614**	**2803**	**2992**
PF service cabinet (average)	249	323	336	348	365	381	398	415	432	448
PF Blast cabinet	403	787	879	948	1055	1161	1268	1374	1481	1587
PF Walk-In Cold Room (WICR, avg)	1150	1404	1473	1553	1620	1688	1755	1822	1889	1956
PF MT & LT industrial chillers (avg)	174	333	349	365	404	442	480	518	556	594
Total PF Professional Refrigeration	**1976**	**2846**	**3037**	**3215**	**3443**	**3672**	**3900**	**4129**	**4357**	**4585**
TOTAL FOOD PRESERVATION	**5940**	**7597**	**8001**	**8419**	**8887**	**9355**	**9823**	**10291**	**10760**	**11228**
COOK El. Hobs, Wh/ltr	928	2110	2262	2442	2576	2697	2811	2918	3019	3112
COOK El. Ovens, kWh/a	2170	2579	2719	2951	2854	2875	2911	2948	2985	3022
COOK Gas Hobs, % efficiency NCV	1163	958	864	777	700	631	567	508	473	445
COOK Gas Ovens, kWh prim, NCV	296	302	287	280	271	263	255	247	239	231
COOK Range Hoods, kWh elec	527	644	677	712	748	786	824	862	901	939
Total CA Cooking Appliances	**5084**	**6593**	**6809**	**7160**	**7149**	**7252**	**7368**	**7484**	**7616**	**7749**
COFFEE Dripfilter (glass)	147	102	87	72	70	70	70	70	70	70
COFFEE Dripfilter (thermos)	28	44	45	46	47	47	48	48	48	49
COFFEE Dripfilter (full automatic)	0	74	84	93	103	113	123	132	142	152
COFFEE Pad filter	0	171	187	203	219	235	251	267	283	299
COFFEE Hard cap espresso	21	90	191	287	301	301	301	301	301	301
COFFEE Semi-auto espresso	24	27	26	24	22	21	19	18	16	14
COFFEE Fully-auto espresso	137	157	182	207	233	258	283	308	333	359
Total CM household Coffee Makers	**357**	**665**	**802**	**933**	**994**	**1044**	**1094**	**1143**	**1193**	**1243**
TOTAL COOKING	**5441**	**7258**	**7611**	**8093**	**8143**	**8296**	**8462**	**8627**	**8809**	**8992**

	REVENU INDUSTRY BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	1628	2503	2461	2606	2445	2445	2445	2445	2445	2445
	DW Household Dishwasher	698	1528	1771	2015	2259	2502	2746	2989	3233	3476
	LD Household Laundry Drier vented el.	331	335	316	281	287	289	291	293	294	296
	LD Household Laundry Drier condens el.	188	703	822	923	942	950	955	960	966	971
	LD Household Laundry Drier vented gas	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**522**	**1044**	**1145**	**1213**	**1237**	**1248**	**1255**	**1262**	**1269**	**1276**
	VC dom. Vacuum Cleaner	1584	4690	6578	8003	8836	9669	10502	11335	12168	13001
	VC nondom Vacuum Cleaner	485	500	526	552	581	609	637	665	693	722
	Total VC Vacuum Cleaner	**2070**	**5190**	**7104**	**8556**	**9417**	**10278**	**11139**	**12000**	**12862**	**13723**
	TOTAL CLEANING	4918	10265	12481	14389	15358	16473	17585	18696	19808	20920
0.5	FAN Axial<300Pa [247 W flow out]	241	789	906	1022	1022	1022	1022	1022	1022	1022
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	332	1149	1212	1275	1275	1275	1275	1275	1275	1275
0.5	FAN Centr.FC [141 W flow out]	206	524	604	685	685	685	685	685	685	685
0.5	FAN Centr.BC-free [2120 W flow out]	118	287	327	366	405	413	421	429	436	444
0.5	FAN Centr.BC [2052 W flow out]	258	685	785	885	984	1004	1104	1204	1304	1404
0.5	FAN Cross-flow [31 W flow out]	48	106	121	136	150	153	168	183	198	212
	Total FAN, industrial (excl. box & roof fans)	**601**	**1770**	**1977**	**2184**	**2261**	**2276**	**2337**	**2399**	**2460**	**2521**
	MT motor industry only	1089	1605	1703	1794	1804	1808	1809	1804	1796	1785
	MT extra revenu drive industry (ref=0)	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**1089**	**1605**	**1703**	**1794**	**1804**	**1808**	**1809**	**1804**	**1796**	**1785**
	WP Water pumps	**806**	**1095**	**1177**	**1266**	**1361**	**1456**	**1550**	**1645**	**1740**	**1835**
	CP Fixed Speed 5-1280 l/s	381	336	317	331	348	365	380	395	412	429
	CP Variable speed 5-1280 l/s	0	143	216	235	247	258	268	278	289	300
	CP Pistons 2-64 l/s	77	84	92	101	108	115	122	130	137	145
	Total CP Standard Air Compressors	**458**	**564**	**626**	**667**	**704**	**738**	**770**	**803**	**838**	**874**
	TOTAL INDUSTRY COMPONENTS	2410	4231	4631	5014	5227	5374	5562	5749	5936	6123
	TRAFO Distribution, kWh/a	374	588	632	678	728	782	838	893	948	1004
	TRAFO Industry oil	195	314	337	362	389	418	447	477	506	536
	TRAFO Industry dry	92	148	158	170	182	195	208	222	235	249
	TRAFO Power	1502	2409	2590	2785	2995	3220	3452	3684	3916	4148
	TRAFO DER oil	0	17	28	47	77	127	188	248	309	370
	TRAFO DER dry	0	106	175	288	476	785	1160	1535	1910	2284
	TRAFO Small	42	42	42	42	42	42	42	42	42	42
	TOTAL ENERGY SECTOR	2205	3623	3962	4372	4889	5570	6335	7101	7867	8633
	TYRE in m units										
	TYRE car replacement tyres C1	5833	7191	7138	8275	9332	9332	9332	9332	9332	9332
	TYRE van replacement tyres C2	2719	3352	3327	3857	4350	4350	4350	4350	4350	4350
	TYRE truck replacement tyres C3	2497	2455	2077	2120	2174	2188	2195	2197	2193	2184
	TRANSPORT SECTOR	11049	12998	12542	14253	15856	15870	15878	15879	15875	15867
	GENERAL TOTAL (in m euro 2010)	**73193**	**163087**	**174282**	**197414**	**215286**	**230969**	**242984**	**253169**	**263889**	**274807**
	GENERAL TOTAL (in bn euro 2010)	73	163	174	197	215	231	243	253	264	275

SUMMARY BAU

Industry revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3.1	4.4	4.6	5.0	5.4	5.5	5.5	5.7	5.8	5.9
SPACE HEATING	11.8	20.6	22.8	25.3	27.2	29.1	30.8	32.5	34.1	35.7
SPACE COOLING	1.0	5.4	6.6	8.0	9.0	9.7	10.2	10.3	10.5	10.8
VENTILATION	10.6	25.0	26.6	28.1	29.8	31.5	33.2	34.9	36.6	38.4
LIGHTING	3.0	6.3	6.0	6.3	5.8	4.9	4.5	4.1	3.8	3.7
ELECTRONICS	11.7	55.3	58.4	70.0	79.8	89.3	95.1	99.3	103.9	108.6
FOOD PRESERVATION	5.9	7.6	8.0	8.4	8.9	9.4	9.8	10.3	10.8	11.2
COOKING	5.4	7.3	7.6	8.1	8.1	8.3	8.5	8.6	8.8	9.0
CLEANING	4.9	10.3	12.5	14.4	15.4	16.5	17.6	18.7	19.8	20.9
INDUSTRY COMPONENTS	2.4	4.2	4.6	5.0	5.2	5.4	5.6	5.7	5.9	6.1
ENERGY SECTOR	2.2	3.6	4.0	4.4	4.9	5.6	6.3	7.1	7.9	8.6
TRANSPORT SECTOR	11.0	13.0	12.5	14.3	15.9	15.9	15.9	15.9	15.9	15.9
TOTAL in bn euro 2010	**73**	**163**	**174**	**197**	**215**	**231**	**243**	**253**	**264**	**275**

	REVENU INDUSTRY ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	1778	2163	3471	3994	4595	4537	4477	4417	4356	4294
	CH Central Heating combi, water heat [24 kW]	1310	2282	3494	4967	5414	5862	6310	6756	7198	7637
	TOTAL WATER HEATING	**3088**	**4445**	**6964**	**8961**	**10009**	**10399**	**10787**	**11172**	**11554**	**11930**
	CH Central Heating boiler, space heat [24 kW]	6836	10318	18168	23327	29265	33410	38108	43095	48369	53931
	SFB Wood Manual [18 kW]	530	320	289	226	129	113	99	86	76	66
	SFB Wood Direct Draft [20 kW]	20	873	912	981	1068	1251	1464	1715	2008	2351
	SFB Coal [25 kW]	199	87	11	10	8	8	7	6	6	5
	SFB Pellets [25 kW]	0	223	346	346	361	384	422	466	515	568
	SFB Wood chips [160 kW]	0	139	146	178	199	215	238	262	290	320
	Total Solid Fuel Boiler	**749**	**1643**	**1704**	**1741**	**1765**	**1970**	**2230**	**2536**	**2893**	**3310**
	CHAE-S ≤400 kW	212	890	978	1081	1195	1308	1089	559	167	27
	CHAE-L > 400 kW	47	153	158	163	170	176	183	190	196	203
	CHWE-S ≤400 kW	19	79	87	96	106	117	127	137	146	155
	CHWE-M >400 kW; ≤1500 kW	21	72	75	77	80	84	87	90	94	97
	CHWE-L > 1500 kW	13	46	48	50	52	54	56	58	61	63
	CHF	0	3	4	6	7	8	9	10	11	11
	HT PCH-AE-S	103	168	180	190	198	206	214	223	231	239
	HT PCH-AE-L	83	134	144	152	158	165	172	178	185	191
	HT PCH-WE-S	23	37	39	41	43	45	47	49	50	52
	HT PCH-WE-M	89	145	155	164	171	178	185	192	199	206
	HT PCH-WE-L	17	27	29	31	32	33	35	36	37	39
	AC rooftop	96	314	317	243	141	37	37	37	37	37
	AC splits	168	612	639	617	596	572	551	529	507	486
	AC VRF	1	1387	1811	2638	3337	4027	4685	5290	5797	6163
	ACF	0	3	4	6	7	8	9	10	11	11
	SubTotal AHC Air Cooling	**893**	**4071**	**4670**	**5555**	**6294**	**7020**	**7486**	**7587**	**7729**	**7981**
	AC rooftop (rev)	59	193	185	149	83	21	0	0	0	0
	AC splits (rev)	113	392	410	396	383	368	354	340	326	312
	AC VRF (rev)	0	1184	1471	2252	2737	3143	3479	3737	3896	3942
	ACF (rev)	0	7	10	12	14	17	19	21	23	25
	AHF	330	217	203	209	200	185	167	151	141	131
	AHE	1	2	2	2	2	2	2	2	2	2
	SubTotal AHC Air Heating (rev double)	**504**	**1995**	**2281**	**3020**	**3419**	**3735**	**4020**	**4251**	**4388**	**4412**
	Total AHC Air Heating & Cooling	**1224**	**4290**	**4876**	**5767**	**6496**	**7208**	**7655**	**7741**	**7873**	**8116**
	LH open fireplace [8 kW]	635	926	932	1157	1268	1214	1169	1127	1086	1047
	LH closed fireplace/inset [8 kW]	401	1086	1212	1589	1706	1665	1609	1550	1494	1440
	LH wood stove [8 kW]	434	511	567	748	805	784	755	725	697	670
	LH coal stove [8 kW]	132	102	94	101	80	52	45	44	42	41
	LH cooker [10 kW]	370	743	898	1156	1228	1208	1165	1118	1112	1112
	LH SHR stove [8 kW]	402	562	697	838	933	1030	1050	1050	1050	1050
	LH pellet stove [8 kW]	0	418	527	636	681	727	736	736	736	736
	LH open fire gas, NCV [4.2 kW]	24	35	38	44	45	44	42	42	42	42
	LH closed fire gas, NCV [4.2 kW]	117	132	135	146	152	150	147	147	147	147
	LH flueless fuel heater, NCV [1.5 kW]	43	86	82	77	69	60	59	59	59	59
	LH elec.portable [1 kW]	101	123	127	131	136	142	144	144	144	144
	LH elec.convector [1 kW]	737	899	927	956	999	1042	1051	1051	1051	1051
	LH elec.storage [2.75 kW]	84	103	119	137	138	137	133	127	122	120
	LH elec.underfloor [0.62 kW]	153	186	197	207	210	216	218	218	218	218
	LH luminous heaters [20 kW]	16	20	21	25	24	23	22	21	20	20
	LH tube heaters [30 kW]	16	20	20	23	22	21	20	20	20	20
	LH total	**3666**	**5951**	**6593**	**7972**	**8497**	**8516**	**8364**	**8179**	**8039**	**7915**
	RAC (cooling demand), all types <12 kW	**150**	**1373**	**2127**	**2728**	**3006**	**3046**	**3021**	**2994**	**2967**	**2940**
	RAC (heating demand), reversible <12kW	42	1019	1875	2412	2661	2699	2679	2657	2635	2613
	Total Room Air Conditioner	**192**	**2392**	**4002**	**5139**	**5666**	**5746**	**5699**	**5651**	**5602**	**5552**
1	**CIRC Circulator pumps <2.5 kW**	**868**	**1384**	**1766**	**1792**	**1813**	**1704**	**1532**	**1372**	**1256**	**1173**
	TOTAL SPACE HEATING (incl. rev.AC)	**11797**	**20927**	**30621**	**38472**	**45606**	**50331**	**55401**	**60717**	**66325**	**72181**
	TOTAL SPACE COOLING	**1042**	**5444**	**6797**	**8283**	**9300**	**10067**	**10507**	**10581**	**10696**	**10921**
	NRVU avg (sales wt.)	10082	23588	24763	26013	27451	28889	30327	31765	33202	34640
	RVU Central Unidir. VU (1 fan)	466	1044	1562	1424	1494	1559	1618	1673	1722	1767
	RVU Central Balanced VU (2 fans)	52	366	1099	1365	1485	1596	1698	1792	1878	1991
	RVU Local Balanced VU (2 fans)	4	48	105	170	239	308	377	446	514	583
	TOTAL VENTILATION (electricity)	**10604**	**25045**	**27529**	**28972**	**30669**	**32351**	**34020**	**35675**	**37317**	**38982**
	LS Light Sources										
	LFL	1780	2582	1945	1673	885	587	423	258	93	28
	CFL	101	1125	455	203	5	4	4	4	4	4
	Tungsten	198	1468	1668	383	25	9	9	9	9	9
	GLS	570	235	13	23	14	13	13	13	13	13
	HID	341	863	514	331	186	124	124	124	124	124
	LED ECO	0	101	1828	3075	1881	1142	1233	1518	1626	1882
	TOTAL LIGHTING	**2990**	**6374**	**6424**	**5687**	**2994**	**1879**	**1806**	**1926**	**1869**	**2060**

REVENU INDUSTRY ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	4650	10703	2078	0	0	0	0	0	0	0
DP TV LoNA	0	1459	5194	6502	5676	4645	3525	2405	1285	166
DP TV Smart	0	0	3116	6502	8514	10838	13297	15756	18215	20674
DP Monitor	676	1689	946	946	946	946	946	946	946	946
DP Total electronic DisPlays	**5326**	**13851**	**11334**	**13951**	**15136**	**16429**	**17768**	**19107**	**20446**	**21785**
SSTB	0	725	164	0	0	0	0	0	0	0
CSTB	0	2730	3444	3605	3646	3554	3862	4169	4477	4784
Total STB set top boxes (Complex & Simple)	**0**	**3456**	**3608**	**3605**	**3646**	**3554**	**3862**	**4169**	**4477**	**4784**
VIDEO players/recorders	0	363	99	0	0	0	0	0	0	0
VIDEO projectors	9	980	910	618	267	0	0	0	0	0
VIDEO game consoles	0	2513	1693	1733	1925	1925	1925	1925	1925	1925
Total VIDEO	**9**	**3856**	**2703**	**2350**	**2192**	**1925**	**1925**	**1925**	**1925**	**1925**
ES Rack servers	142	3733	4174	4843	5953	7562	8206	8045	8045	8045
ES Blade servers	252	2814	2864	3150	3754	4598	4977	4809	4809	4809
ES Storage	166	2113	2415	2924	3284	3536	3705	3587	3587	3587
Total ES Enterprise Servers	**560**	**8660**	**9452**	**10917**	**12991**	**15696**	**16888**	**16441**	**16441**	**16441**
PC Desktop	1338	4460	3328	3025	3025	3025	3025	3025	3025	3025
PC Notebook	141	10165	4659	4377	4377	4377	4377	4377	4377	4377
PC Tablet/slate	0	679	10731	17438	22536	26828	28170	29511	30853	32194
PC Thin client	22	264	264	264	264	264	264	264	264	264
PC Workstation	110	1101	1101	1101	1101	1101	1101	1101	1101	1101
Total PC, electricity	**1611**	**16669**	**20083**	**26205**	**31303**	**35595**	**36937**	**38278**	**39620**	**40961**
EP-Copier mono	2454	985	590	249	184	118	53	0	0	0
EP-Copier colour	0	329	1433	2149	2450	2669	2888	3106	3325	3544
EP-printer mono	442	419	367	299	257	228	197	166	135	103
EP-printer colour	0	446	662	892	1070	1242	1415	1587	1760	1932
IJ SFD printer	245	389	271	192	141	121	96	71	45	20
IJ MFD printer	301	974	1336	1543	1694	1845	1997	2148	2299	2450
Total imaging equipment, electricity	**3442**	**3543**	**4660**	**5324**	**5795**	**6224**	**6644**	**7078**	**7564**	**8050**
SB Home Gateway, on-mode power	0	2973	3834	4694	5554	6415	7275	8135	8996	9856
SB Home NAS, on-mode power	0	299	512	725	939	1152	1365	1579	1792	2005
SB Home Phones (fixed), on-mode power	186	923	1107	1181	1181	1181	1181	1181	1181	1181
SB Office Phones (fixed), on-mode power	291	557	593	629	664	700	736	771	807	843
Total SB (networked) StandBy (rest)	**477**	**4752**	**6046**	**7229**	**8339**	**9448**	**10557**	**11667**	**12776**	**13886**
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	45	90	93	113	133	153	172	188	200	208
UPS 1.5 to 5 kVA	84	167	174	211	249	286	320	350	374	389
UPS 5 to 10 kVA	29	58	61	74	87	99	111	122	130	135
UPS 10 to 200 kVA	125	247	257	313	368	422	473	518	552	575
Total UPS - Uninterrupted Power Supplies	**284**	**562**	**585**	**711**	**837**	**961**	**1077**	**1177**	**1256**	**1307**
TOTAL ELECTRONICS	**11709**	**55349**	**58471**	**70293**	**80239**	**89833**	**95658**	**99842**	**104504**	**109138**
RF Household refrigerator and freezer	**2972**	**3752**	**4082**	**4236**	**4329**	**4373**	**4575**	**4416**	**4262**	**4113**
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PF Blast cabinet	403	787	879	948	1055	1161	1268	1374	1481	1587
PF Walk-In Cold Room (WICR, avg)	1150	1404	1473	1553	1620	1688	1755	1822	1889	1956
PF MT & LT industrial chillers (avg)	174	333	349	365	404	442	480	518	556	594
Total PF Professional Refrigeration	**1976**	**2846**	**3037**	**3215**	**3443**	**3672**	**3900**	**4129**	**4357**	**4585**
TOTAL FOOD PRESERVATION	**5940**	**8105**	**8788**	**9310**	**9820**	**10281**	**10900**	**11159**	**11422**	**11690**
COOK El. Hobs, Wh/ltr	928	2110	2262	2544	2678	2800	2914	3021	3121	3214
COOK El. Ovens, kWh/a	2170	2579	2756	3101	2995	2892	2911	2948	2985	3022
COOK Gas Hobs, % efficiency NCV	1163	958	864	743	670	603	542	501	473	445
COOK Gas Ovens, kWh prim, NCV	296	302	305	386	372	357	344	330	317	304
COOK Range Hoods, kWh elec	527	644	677	885	1031	1040	1046	1050	1052	1052
Total CA Cooking Appliances	**5084**	**6593**	**6863**	**7659**	**7746**	**7693**	**7757**	**7851**	**7948**	**8037**
COFFEE Dripfilter (glass)	147	102	98	81	75	71	70	70	70	70
COFFEE Dripfilter (thermos)	28	44	45	46	47	47	48	48	48	49
COFFEE Dripfilter (full automatic)	0	74	84	93	103	113	123	132	142	152
COFFEE Pad filter	0	171	187	203	219	235	251	267	283	299
COFFEE Hard cap espresso	21	90	191	287	301	301	301	301	301	301
COFFEE Semi-auto espresso	24	27	26	24	22	21	19	18	16	14
COFFEE Fully-auto espresso	137	157	182	207	233	258	283	308	333	359
Total CM household Coffee Makers	**357**	**665**	**813**	**942**	**999**	**1046**	**1094**	**1143**	**1193**	**1243**
TOTAL COOKING	**5441**	**7258**	**7676**	**8601**	**8745**	**8738**	**8851**	**8994**	**9141**	**9280**

	REVENU INDUSTRY ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	1628	2858	2952	3258	3078	2929	2787	2651	2523	2445
	DW Household Dishwasher	698	2028	2353	2621	2862	3087	3296	3489	3668	3832
	LD Household Laundry Drier vented el.	331	335	316	281	287	289	291	293	294	296
	LD Household Laundry Drier condens el.	188	703	893	1063	1081	1061	1032	1004	977	971
	LD Household Laundry Drier vented gas	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**522**	**1044**	**1216**	**1353**	**1376**	**1359**	**1332**	**1305**	**1280**	**1276**
	VC dom. Vacuum Cleaner	1584	4690	6785	8230	8836	9669	10502	11335	12168	13001
	VC nondom Vacuum Cleaner	485	500	538	568	581	609	637	665	693	722
	Total VC Vacuum Cleaner	**2070**	**5190**	**7323**	**8798**	**9417**	**10278**	**11139**	**12000**	**12862**	**13723**
	TOTAL CLEANING	**4918**	**11119**	**13844**	**16030**	**16733**	**17652**	**18553**	**19446**	**20332**	**21276**
0.5	FAN Axial<300Pa [247 W flow out]	241	789	1129	1419	1357	1298	1241	1186	1134	1085
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	332	1149	1212	1326	1275	1275	1275	1275	1275	1275
0.5	FAN Centr.FC [141 W flow out]	206	524	779	1078	1029	982	937	894	854	815
0.5	FAN Centr.BC-free [2120 W flow out]	118	287	399	447	473	461	449	437	436	444
0.5	FAN Centr.BC [2052 W flow out]	258	685	1096	1258	1338	1305	1371	1429	1479	1522
0.5	FAN Cross-flow [31 W flow out]	48	106	347	459	393	383	401	417	430	441
	Total FAN, industrial (excl. box & roof fans)	**601**	**1770**	**2481**	**2994**	**2933**	**2852**	**2837**	**2819**	**2804**	**2791**
	MT motor industry only	1089	1814	2834	2916	2872	2732	2600	2474	2354	2239
	MT extra revenu drive industry (ref=0)	0	0	1284	1275	1214	1155	1099	1045	995	946
0.5	**Total MT Motors 0.75-375 kW**	**1089**	**1814**	**4118**	**4192**	**4085**	**3887**	**3698**	**3519**	**3348**	**3186**
	WP Water pumps	**806**	**1096**	**1177**	**1266**	**1361**	**1456**	**1550**	**1645**	**1740**	**1835**
	CP Fixed Speed 5-1280 l/s	381	336	332	359	376	390	403	416	430	443
	CP Variable speed 5-1280 l/s	0	143	218	247	258	267	275	284	292	301
	CP Pistons 2-64 l/s	77	84	105	128	135	140	144	148	153	157
	Total CP Standard Air Compressors	**458**	**564**	**655**	**733**	**769**	**797**	**822**	**848**	**875**	**901**
	TOTAL INDUSTRY COMPONENTS	**2410**	**4337**	**6372**	**7089**	**7105**	**7048**	**7059**	**7072**	**7093**	**7120**
	TRAFO Distribution, kWh/a	374	588	780	838	900	966	1035	1103	1172	1240
	TRAFO Industry oil	195	314	516	554	595	639	684	729	775	820
	TRAFO Industry dry	92	148	214	229	246	263	282	300	318	336
	TRAFO Power	1502	2409	2590	2785	2995	3220	3452	3684	3916	4148
	TRAFO DER oil	0	17	47	78	129	214	315	417	519	621
	TRAFO DER dry	0	106	229	378	623	1029	1520	2011	2502	2993
	TRAFO Small	42	42	42	42	42	42	42	42	42	42
	TOTAL ENERGY SECTOR	**2205**	**3623**	**4418**	**4904**	**5530**	**6374**	**7330**	**8287**	**9244**	**10200**
	TYRE in m units										
	TYRE car replacement tyres C1	5833	7191	7138	8283	9486	9595	9332	9332	9332	9332
	TYRE van replacement tyres C2	2719	3352	3327	3857	4350	4350	4350	4350	4350	4350
	TYRE truck replacement tyres C3	2497	2455	2214	2521	2803	3017	2871	2731	2599	2473
	TRANSPORT SECTOR	**11049**	**12998**	**12680**	**14661**	**16639**	**16962**	**16553**	**16414**	**16281**	**16155**
	GENERAL TOTAL (in m euro 2010)	**73193**	**165025**	**190585**	**221263**	**243390**	**261915**	**277424**	**291285**	**305777**	**320933**
	GENERAL TOTAL (in bn euro 2010)	73	165	191	221	243	262	277	291	306	321

SUMMARY ECO

Industry revenue (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**3.1**	**4.4**	**7.0**	**9.0**	**10.0**	**10.4**	**10.8**	**11.2**	**11.6**	**11.9**
SPACE HEATING	**11.8**	**20.9**	**30.6**	**38.5**	**45.6**	**50.3**	**55.4**	**60.7**	**66.3**	**72.2**
SPACE COOLING	**1.0**	**5.4**	**6.8**	**8.3**	**9.3**	**10.1**	**10.5**	**10.6**	**10.7**	**10.9**
VENTILATION	**10.6**	**25.0**	**27.5**	**29.0**	**30.7**	**32.4**	**34.0**	**35.7**	**37.3**	**39.0**
LIGHTING	**3.0**	**6.4**	**6.4**	**5.7**	**3.0**	**1.9**	**1.8**	**1.9**	**1.9**	**2.1**
ELECTRONICS	**11.7**	**55.3**	**58.5**	**70.3**	**80.2**	**89.8**	**95.7**	**99.8**	**104.5**	**109.1**
FOOD PRESERVATION	**5.9**	**8.1**	**8.8**	**9.3**	**9.8**	**10.3**	**10.9**	**11.2**	**11.4**	**11.7**
COOKING	**5.4**	**7.3**	**7.7**	**8.6**	**8.7**	**8.7**	**8.9**	**9.0**	**9.1**	**9.3**
CLEANING	**4.9**	**11.1**	**13.8**	**16.0**	**16.7**	**17.7**	**18.6**	**19.4**	**20.3**	**21.3**
INDUSTRY COMPONENTS	**2.4**	**4.3**	**6.4**	**7.1**	**7.1**	**7.0**	**7.1**	**7.1**	**7.1**	**7.1**
ENERGY SECTOR	**2.2**	**3.6**	**4.4**	**4.9**	**5.5**	**6.4**	**7.3**	**8.3**	**9.2**	**10.2**
TRANSPORT SECTOR	**11.0**	**13.0**	**12.7**	**14.7**	**16.6**	**17.0**	**16.6**	**16.4**	**16.3**	**16.2**
TOTAL in bn euro 2010	**73**	**165**	**191**	**221**	**243**	**262**	**277**	**291**	**306**	**321**

	REVENU RETAIL BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	455	553	547	588	652	658	650	641	632	623
	CH Central Heating combi, water heat [24 kW]	346	604	652	725	746	766	790	832	874	916
	TOTAL WATER HEATING	**801**	**1157**	**1198**	**1313**	**1399**	**1424**	**1440**	**1473**	**1506**	**1539**
	CH Central Heating boiler, space heat [24 kW]	1808	2631	2812	2993	3287	3580	3873	4166	4460	4753
	SFB Wood Manual [18 kW]	21	12	8	5	3	3	3	2	2	2
	SFB Wood Direct Draft [20 kW]	1	34	35	37	35	43	51	59	70	83
	SFB Coal [25 kW]	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	0	9	13	13	13	15	16	18	20	22
	SFB Wood chips [160 kW]	0	5	5	6	8	8	9	10	11	12
	Total Solid Fuel Boiler	**29**	**64**	**63**	**63**	**59**	**69**	**79**	**90**	**103**	**120**
	CHAE-S ≤400 kW	27	111	122	135	149	164	136	70	21	3
	CHAE-L > 400 kW	6	19	20	20	21	22	23	24	25	25
	CHWE-S ≤400 kW	2	10	11	12	13	15	16	17	18	19
	CHWE-M >400 kW; ≤1500 kW	3	9	9	10	10	10	11	11	12	12
	CHWE-L > 1500 kW	2	6	6	6	6	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	22	24	25	26	27	28	29	30
	HT PCH-AE-L	10	17	18	19	20	21	21	22	23	24
	HT PCH-WE-S	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	11	18	19	21	21	22	23	24	25	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
	AC rooftop	12	39	40	30	18	5	5	5	5	5
	AC splits	21	76	80	77	74	72	69	66	63	61
	AC VRF	0	173	226	330	417	503	586	661	725	770
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**112**	**509**	**584**	**694**	**787**	**877**	**936**	**948**	**966**	**998**
	AC rooftop (rev)	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	14	49	51	50	48	46	44	43	41	39
	AC VRF (rev)	0	148	184	281	342	393	435	467	487	493
	ACF (rev)	0	1	1	1	2	2	2	3	3	3
	AHF	41	27	25	24	23	21	20	19	18	16
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**63**	**249**	**285**	**375**	**425**	**465**	**502**	**531**	**549**	**551**
	Total AHC Air Heating & Cooling	**153**	**536**	**609**	**718**	**810**	**899**	**956**	**968**	**984**	**1015**
	LH open fireplace [8 kW]	109	158	159	161	159	158	158	158	158	158
	LH closed fireplace/inset [8 kW]	69	186	207	229	232	235	235	235	235	235
	LH wood stove [8 kW]	74	87	97	106	108	109	110	110	110	110
	LH coal stove [8 kW]	23	17	16	15	11	7	7	7	7	7
	LH cooker [10 kW]	63	127	154	180	185	189	190	190	190	190
	LH SHR stove [8 kW]	69	96	119	142	159	176	180	180	180	180
	LH pellet stove [8 kW]	0	71	90	109	117	124	126	126	126	126
	LH open fire gas, NCV [4.2 kW]	4	6	7	7	7	7	7	7	7	7
	LH closed fire gas, NCV [4.2 kW]	20	23	23	24	24	25	25	25	25	25
	LH flueless fuel heater, NCV [1.5 kW]	7	15	14	13	12	10	10	10	10	10
	LH elec.portable [1 kW]	17	21	22	22	23	24	25	25	25	25
	LH elec.convector [1 kW]	126	154	159	164	171	178	180	180	180	180
	LH elec.storage [2.75 kW]	14	18	18	19	20	20	21	21	21	21
	LH elec.underfloor [0.62 kW]	26	32	33	34	35	37	37	37	37	37
	LH luminous heaters [20 kW]	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	2	2	2	2	2	2	2	2	2	2
	LH total	**626**	**1016**	**1123**	**1229**	**1268**	**1307**	**1315**	**1315**	**1315**	**1315**
	RAC (cooling demand), all types <12 kW	39	359	515	645	703	710	710	722	734	746
	RAC (heating demand), reversible <12kW	11	267	454	570	622	629	630	641	652	663
	Total Room Air Conditioner	**50**	**626**	**969**	**1215**	**1325**	**1339**	**1339**	**1362**	**1385**	**1408**
1	**CIRC Circulator pumps <2.5 kW**	**69**	**102**	**108**	**115**	**122**	**120**	**114**	**107**	**100**	**94**
	TOTAL SPACE HEATING (incl. rev.AC)	**2536**	**4226**	**4737**	**5231**	**5661**	**6050**	**6398**	**6743**	**7078**	**7402**
	TOTAL SPACE COOLING	**151**	**868**	**1099**	**1339**	**1489**	**1587**	**1646**	**1670**	**1700**	**1743**
	NRVU avg (sales wt.)	1260	2948	3084	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	157	353	303	277	290	303	320	341	362	384
	RVU Central Balanced VU (2 fans)	18	124	301	386	434	481	529	577	625	672
	RVU Local Balanced VU (2 fans)	1	16	35	57	81	104	127	151	174	197
	TOTAL VENTILATION (electricity)	**1436**	**3441**	**3724**	**3972**	**4236**	**4499**	**4768**	**5039**	**5311**	**5583**
	LS Light Sources										
	LFL	225	325	288	290	270	249	228	208	191	174
	CFL	109	1012	872	732	657	582	516	473	430	387
	Tungsten	215	1529	1749	1836	1395	1003	729	509	386	362
	GLS	617	425	326	233	138	37	10	0	0	0
	HID	43	106	94	91	87	87	87	87	87	87
	LED BAU	0	120	277	718	987	761	858	895	883	919
	TOTAL LIGHTING	**1208**	**3517**	**3606**	**3900**	**3533**	**2718**	**2427**	**2172**	**1977**	**1929**

REVENU RETAIL BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	4680	10771	2091	0	0	0	0	0	0	0
DP TV LoNA	0	1469	5227	6544	5712	4675	3548	2421	1294	167
DP TV Smart	0	0	3136	6544	8568	10908	13382	15857	18332	20806
DP Monitor	680	1700	952	952	952	952	952	952	952	952
DP Total electronic DisPlays	**5360**	**13940**	**11406**	**14040**	**15233**	**16535**	**17882**	**19230**	**20577**	**21925**
SSTB	0	66	15	0	0	0	0	0	0	0
CSTB	0	249	306	329	333	325	353	381	409	437
Total STB set top boxes (Complex & Simple)	**0**	**316**	**321**	**329**	**333**	**325**	**353**	**381**	**409**	**437**
VIDEO players/recorders	0	365	100	0	0	0	0	0	0	0
VIDEO projectors	2	169	157	106	46	0	0	0	0	0
VIDEO game consoles	0	2492	1679	1718	1909	1909	1909	1909	1909	1909
Total VIDEO	**2**	**3026**	**1936**	**1824**	**1955**	**1909**	**1909**	**1909**	**1909**	**1909**
ES Rack servers	41	1067	1193	1384	1665	2115	2295	2250	2250	2250
ES Blade servers	72	804	818	900	1068	1308	1416	1368	1368	1368
ES Storage	47	604	690	760	841	906	949	919	919	919
Total ES Enterprise Servers	**160**	**2474**	**2701**	**3043**	**3574**	**4329**	**4660**	**4537**	**4537**	**4537**
PC Desktop	1426	4754	3548	3225	3225	3225	3225	3225	3225	3225
PC Notebook	151	10836	4967	4666	4666	4666	4666	4666	4666	4666
PC Tablet/slate	0	683	10800	17550	22680	27000	28350	29700	31050	32400
PC Thin client	8	96	96	96	96	96	96	96	96	96
PC Workstation	40	400	400	400	400	400	400	400	400	400
Total PC, electricity	**1625**	**16769**	**19810**	**25937**	**31067**	**35387**	**36737**	**38087**	**39437**	**40787**
EP-Copier mono	701	281	169	71	53	34	15	0	0	0
EP-Copier colour	0	94	410	614	700	763	825	888	950	1013
EP-printer mono	141	134	117	96	82	73	63	53	43	33
EP-printer colour	0	129	192	258	310	360	410	460	510	560
IJ SFD printer	243	386	269	190	140	120	95	70	45	20
IJ MFD printer	298	966	1325	1530	1680	1830	1980	2130	2280	2430
Total imaging equipment, electricity	**1384**	**1991**	**2481**	**2760**	**2965**	**3179**	**3388**	**3601**	**3828**	**4056**
SB Home Gateway, on-mode power	0	615	793	971	1149	1327	1505	1683	1861	2039
SB Home NAS, on-mode power	0	28	48	68	88	108	128	148	168	188
SB Home Phones (fixed), on-mode power	184	915	1098	1171	1171	1171	1171	1171	1171	1171
SB Office Phones (fixed), on-mode power	175	334	356	377	399	420	441	463	484	506
Total SB (networked) StandBy (rest)	**359**	**1893**	**2295**	**2588**	**2807**	**3027**	**3246**	**3465**	**3685**	**3904**
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	36	72	75	91	107	122	137	150	160	167
UPS 1.5 to 5 kVA	45	90	94	114	134	154	172	189	201	209
UPS 5 to 10 kVA	16	31	33	40	47	54	60	66	70	73
UPS 10 to 200 kVA	67	133	139	168	198	227	255	279	297	309
Total UPS - Uninterrupted Power Supplies	**165**	**326**	**339**	**412**	**485**	**557**	**625**	**683**	**728**	**758**
TOTAL ELECTRONICS	**9053**	**40734**	**41289**	**50933**	**58418**	**65246**	**68798**	**71891**	**75109**	**78311**
RF Household refrigerator and freezer	**2947**	**3216**	**3267**	**3317**	**3368**	**3419**	**3469**	**3520**	**3570**	**3621**
1 CF open vertical chilled multi deck (RCV2)	35	56	63	69	76	83	90	97	104	111
1 CF open horizontal frozen island (RHF4)	9	8	9	11	12	13	14	15	16	17
1 CF Plug in one door beverage cooler	51	70	74	78	82	86	90	95	99	103
1 CF Plug in horizontal ice cream freezer	19	29	31	32	34	36	37	39	41	43
1 CF Spiral vending machine	28	51	62	75	88	102	115	128	141	154
1 CF average	**142**	**215**	**238**	**265**	**292**	**319**	**346**	**373**	**400**	**427**
PF service cabinet (average)	36	46	48	50	52	54	57	59	62	64
PF Blast cabinet	58	112	126	135	151	166	181	196	212	227
PF Walk-In Cold Room (WICR, avg)	164	201	210	222	231	241	251	260	270	279
PF MT & LT industrial chillers (avg)	25	48	50	52	58	63	69	74	79	85
Total PF Professional Refrigeration	**282**	**407**	**434**	**459**	**492**	**525**	**557**	**590**	**622**	**655**
TOTAL FOOD PRESERVATION	**3371**	**3838**	**3939**	**4042**	**4152**	**4263**	**4373**	**4483**	**4593**	**4703**
COOK El. Hobs, Wh/ltr	920	2093	2244	2422	2554	2674	2788	2894	2994	3086
COOK El. Ovens, kWh/a	2009	2388	2517	2732	2642	2662	2695	2729	2763	2798
COOK Gas Hobs, % efficiency NCV	1076	887	799	719	648	584	525	471	438	412
COOK Gas Ovens, kWh prim, NCV	283	289	275	268	260	252	244	237	229	221
COOK Range Hoods, kWh elec	488	596	627	659	692	728	763	798	834	869
Total CA Cooking Appliances	**4777**	**6253**	**6462**	**6799**	**6797**	**6900**	**7015**	**7129**	**7258**	**7387**
COFFEE Dripfilter (glass)	146	101	86	71	69	69	69	69	69	69
COFFEE Dripfilter (thermos)	28	44	45	45	46	47	47	48	48	48
COFFEE Dripfilter (full automatic)	0	73	83	93	102	112	122	131	141	151
COFFEE Pad filter	0	170	185	201	217	233	249	265	281	296
COFFEE Hard cap espresso	21	89	190	285	298	298	298	298	298	298
COFFEE Semi-auto espresso	24	27	25	24	22	21	19	17	16	14
COFFEE Fully-auto espresso	136	156	181	206	231	256	281	306	331	356
Total CM household Coffee Makers	**354**	**660**	**795**	**925**	**986**	**1035**	**1085**	**1134**	**1183**	**1232**
TOTAL COOKING	**5132**	**6913**	**7257**	**7724**	**7782**	**7935**	**8100**	**8263**	**8441**	**8619**

	REVENU RETAIL BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	1615	2483	2441	2584	2425	2425	2425	2425	2425	2425
	DW Household Dishwasher	692	1515	1756	1998	2240	2481	2723	2964	3206	3448
	LD Household Laundry Drier vented el.	329	332	313	279	285	287	289	290	292	293
	LD Household Laundry Drier condens el.	186	697	815	915	934	942	947	952	958	963
	LD Household Laundry Drier vented gas	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**518**	**1035**	**1136**	**1202**	**1227**	**1237**	**1244**	**1251**	**1258**	**1265**
	VC dom. Vacuum Cleaner	1571	4651	6524	7937	8763	9589	10415	11241	12068	12894
	VC nondom Vacuum Cleaner	112	115	121	127	134	141	147	154	160	167
	Total VC Vacuum Cleaner	**1683**	**4767**	**6645**	**8065**	**8897**	**9730**	**10562**	**11395**	**12228**	**13060**
	TOTAL CLEANING	**4508**	**9800**	**11978**	**13849**	**14789**	**15874**	**16955**	**18036**	**19117**	**20198**
0.5	FAN Axial<300Pa [247 W flow out]	36	118	135	153	153	153	153	153	153	153
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	50	171	181	190	190	190	190	190	190	190
0.5	FAN Centr.FC [141 W flow out]	31	78	90	102	102	102	102	102	102	102
0.5	FAN Centr.BC-free [2120 W flow out]	18	43	49	55	60	62	63	64	65	66
0.5	FAN Centr.BC [2052 W flow out]	38	102	117	132	147	150	165	180	195	210
0.5	FAN Cross-flow [31 W flow out]	7	16	18	20	22	23	25	27	29	32
	Total FAN, industrial (excl. box & roof fans)	**90**	**264**	**295**	**326**	**337**	**340**	**349**	**358**	**367**	**376**
	MT motor industry only	163	240	254	268	269	270	270	269	268	266
	MT extra drive sales revenu	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**163**	**240**	**254**	**268**	**269**	**270**	**270**	**269**	**268**	**266**
	WP Water pumps	**120**	**163**	**176**	**189**	**203**	**217**	**231**	**246**	**260**	**274**
	CP Fixed Speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS	291	547	598	649	675	692	715	738	761	783
	TRAFO Distribution, kWh/a	47	74	79	85	91	98	105	112	119	125
	TRAFO Industry oil	24	39	42	45	49	52	56	60	63	67
	TRAFO Industry dry	12	18	20	21	23	24	26	28	29	31
	TRAFO Power	188	301	324	348	374	403	432	461	490	519
	TRAFO DER oil	0	2	4	6	10	16	23	31	39	46
	TRAFO DER dry	0	13	22	36	59	98	145	192	239	286
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**276**	**453**	**495**	**547**	**611**	**696**	**792**	**888**	**983**	**1079**
	TYRE in m units										
	TYRE car replacement tyres C1	2536	3127	3104	3598	4058	4058	4058	4058	4058	4058
	TYRE van replacement tyres C2	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	832	818	692	707	725	729	732	732	731	728
	TRANSPORT SECTOR	**4275**	**5062**	**4905**	**5590**	**6232**	**6237**	**6239**	**6240**	**6239**	**6236**
	GENERAL TOTAL (in m euro 2010)	**33039**	**80555**	**84825**	**99089**	**108978**	**117222**	**122650**	**127635**	**132814**	**138126**
	GENERAL TOTAL (in bn euro 2010)	33	81	85	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	4.7	5.2	5.7	6.1	6.4	6.7	7.1	7.4
SPACE COOLING	0.2	0.9	1.1	1.3	1.5	1.6	1.6	1.7	1.7	1.7
VENTILATION	1.4	3.4	3.7	4.0	4.2	4.5	4.8	5.0	5.3	5.6
LIGHTING	1.2	3.5	3.6	3.9	3.5	2.7	2.4	2.2	2.0	1.9
ELECTRONICS	9.1	40.7	41.3	50.9	58.4	65.2	68.8	71.9	75.1	78.3
FOOD PRESERVATION	3.4	3.8	3.9	4.0	4.2	4.3	4.4	4.5	4.6	4.7
COOKING	5.1	6.9	7.3	7.7	7.8	7.9	8.1	8.3	8.4	8.6
CLEANING	4.5	9.8	12.0	13.8	14.8	15.9	17.0	18.0	19.1	20.2
INDUSTRY COMPONENTS	0.3	0.5	0.6	0.6	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	4.3	5.1	4.9	5.6	6.2	6.2	6.2	6.2	6.2	6.2
TOTAL in bn euro 2010	**33**	**81**	**85**	**99**	**109**	**117**	**123**	**128**	**133**	**138**

	REVENU RETAIL ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	455	553	888	1021	1175	1160	1145	1130	1114	1098
	CH Central Heating combi, water heat [24 kW]	346	604	924	1314	1432	1550	1669	1787	1904	2020
	TOTAL WATER HEATING	**801**	**1157**	**1812**	**2335**	**2607**	**2710**	**2814**	**2916**	**3018**	**3118**
	CH Central Heating boiler, space heat [24 kW]	1808	2729	4805	6169	7739	8836	10078	11397	12792	14263
	SFB Wood Manual [18 kW]	21	12	11	9	5	4	4	3	3	3
	SFB Wood Direct Draft [20 kW]	1	34	35	38	41	48	57	66	78	91
	SFB Coal [25 kW]	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	0	9	13	13	14	15	16	18	20	22
	SFB Wood chips [160 kW]	0	5	6	7	8	8	9	10	11	12
	Total Solid Fuel Boiler	**29**	**64**	**66**	**67**	**68**	**76**	**86**	**98**	**112**	**128**
	CHAE-S ≤400 kW	27	111	122	135	149	164	136	70	21	3
	CHAE-L > 400 kW	6	19	20	20	21	22	23	24	25	25
	CHWE-S ≤400 kW	2	10	11	12	13	15	16	17	18	19
	CHWE-M >400 kW; ≤1500 kW	3	9	9	10	10	10	11	11	12	12
	CHWE-L > 1500 kW	2	6	6	6	6	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	22	24	25	26	27	28	29	30
	HT PCH-AE-L	10	17	18	19	20	21	21	22	23	24
	HT PCH-WE-S	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	11	18	19	21	21	22	23	24	25	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
	AC rooftop	12	39	40	30	18	5	5	5	5	5
	AC splits	21	76	80	77	74	72	69	66	63	61
	AC VRF	0	173	226	330	417	503	586	661	725	770
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**112**	**509**	**584**	**694**	**787**	**878**	**936**	**948**	**966**	**998**
	AC rooftop (rev)	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	14	49	51	50	48	46	44	43	41	39
	AC VRF (rev)	0	148	184	281	342	393	435	467	487	493
	ACF (rev)	0	1	1	1	2	2	2	3	3	3
	AHF	41	27	25	26	25	23	21	19	18	16
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**63**	**249**	**285**	**377**	**427**	**467**	**503**	**531**	**549**	**551**
	Total AHC Air Heating & Cooling	**153**	**536**	**609**	**721**	**812**	**901**	**957**	**968**	**984**	**1015**
	LH open fireplace [8 kW]	109	158	159	198	217	208	200	193	186	179
	LH closed fireplace/inset [8 kW]	69	186	207	272	292	285	275	265	256	246
	LH wood stove [8 kW]	74	87	97	128	138	134	129	124	119	115
	LH coal stove [8 kW]	23	17	16	17	14	9	8	7	7	7
	LH cooker [10 kW]	63	127	154	198	210	207	199	191	190	190
	LH SHR stove [8 kW]	69	96	119	143	160	176	180	180	180	180
	LH pellet stove [8 kW]	0	71	90	109	117	124	126	126	126	126
	LH open fire gas, NCV [4.2 kW]	4	6	7	8	8	7	7	7	7	7
	LH closed fire gas, NCV [4.2 kW]	20	23	23	25	26	26	25	25	25	25
	LH flueless fuel heater, NCV [1.5 kW]	7	15	14	13	12	10	10	10	10	10
	LH elec.portable [1 kW]	17	21	22	22	23	24	25	25	25	25
	LH elec.convector [1 kW]	126	154	159	164	171	178	180	180	180	180
	LH elec.storage [2.75 kW]	14	18	20	23	24	24	23	22	21	21
	LH elec.underfloor [0.62 kW]	26	32	34	35	36	37	37	37	37	37
	LH luminous heaters [20 kW]	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	2	2	3	3	3	3	3	2	2	2
	LH total	**626**	**1016**	**1126**	**1361**	**1451**	**1455**	**1429**	**1397**	**1373**	**1352**
	RAC (cooling demand), all types <12 kW	39	359	556	714	786	797	790	783	776	769
	RAC (heating demand), reversible <12kW	11	267	490	631	696	706	701	695	689	684
	Total Room Air Conditioner	**50**	**626**	**1047**	**1344**	**1482**	**1503**	**1491**	**1478**	**1466**	**1453**
1	**CIRC Circulator pumps <2.5 kW**	**69**	**110**	**141**	**143**	**145**	**136**	**122**	**110**	**100**	**94**
	TOTAL SPACE HEATING (incl. rev.AC)	**2536**	**4324**	**6772**	**8606**	**10382**	**11540**	**12796**	**14118**	**15515**	**16978**
	TOTAL SPACE COOLING	**151**	**868**	**1140**	**1408**	**1573**	**1674**	**1726**	**1732**	**1742**	**1767**
	NRVU avg (sales wt.)	1260	2948	3095	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	157	353	528	481	505	526	547	565	582	597
	RVU Central Balanced VU (2 fans)	18	124	371	461	502	539	573	605	634	672
	RVU Local Balanced VU (2 fans)	1	16	35	57	81	104	127	151	174	197
	TOTAL VENTILATION (electricity)	**1436**	**3441**	**4030**	**4251**	**4518**	**4781**	**5038**	**5291**	**5540**	**5796**
	LS Light Sources										
	LFL	225	327	246	212	112	74	54	33	12	4
	CFL	109	1218	493	220	5	4	4	4	4	4
	Tungsten	215	1589	1806	414	27	10	10	10	10	10
	GLS	617	255	14	25	15	14	14	14	14	14
	HID	43	108	64	41	23	16	16	16	16	16
	LED ECO	0	107	1932	3248	1987	1207	1302	1604	1718	1988
	TOTAL LIGHTING	**1208**	**3604**	**4555**	**4160**	**2169**	**1325**	**1400**	**1681**	**1773**	**2036**

REVENU RETAIL ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	4680	10771	2091	0	0	0	0	0	0	0
DP TV LoNA	0	1469	5227	6544	5712	4675	3548	2421	1294	167
DP TV Smart	0	0	3136	6544	8568	10908	13382	15857	18332	20806
DP Monitor	680	1700	952	952	952	952	952	952	952	952
DP Total electronic DisPlays	**5360**	**13940**	**11406**	**14040**	**15233**	**16535**	**17882**	**19230**	**20577**	**21925**
SSTB	0	66	15	0	0	0	0	0	0	0
CSTB	0	249	315	329	333	325	353	381	409	437
Total STB set top boxes	**0**	**316**	**330**	**329**	**333**	**325**	**353**	**381**	**409**	**437**
VIDEO players/recorders	0	365	100	0	0	0	0	0	0	0
VIDEO projectors	2	169	157	106	46	0	0	0	0	0
VIDEO game consoles	0	2492	1679	1718	1909	1909	1909	1909	1909	1909
Total VIDEO	**2**	**3026**	**1936**	**1824**	**1955**	**1909**	**1909**	**1909**	**1909**	**1909**
ES Rack servers	41	1067	1193	1384	1701	2161	2345	2299	2299	2299
ES Blade servers	72	804	818	900	1073	1314	1422	1374	1374	1374
ES Storage	47	604	690	836	938	1010	1058	1025	1025	1025
Total ES Enterprise Servers	**160**	**2474**	**2701**	**3119**	**3712**	**4485**	**4825**	**4697**	**4697**	**4697**
PC Desktop	1426	4754	3548	3225	3225	3225	3225	3225	3225	3225
PC Notebook	151	10836	4967	4666	4666	4666	4666	4666	4666	4666
PC Tablet/slate	0	683	10800	17550	22680	27000	28350	29700	31050	32400
PC Thin client	8	96	96	96	96	96	96	96	96	96
PC Workstation	40	400	400	400	400	400	400	400	400	400
Total PC, electricity	**1625**	**16769**	**19810**	**25937**	**31067**	**35387**	**36737**	**38087**	**39437**	**40787**
EP-Copier mono	701	281	169	71	53	34	15	0	0	0
EP-Copier colour	0	94	410	614	700	763	825	888	950	1013
EP-printer mono	141	134	117	96	82	73	63	53	43	33
EP-printer colour	0	129	192	258	310	360	410	460	510	560
IJ SFD printer	243	386	269	190	140	120	95	70	45	20
IJ MFD printer	298	966	1325	1530	1680	1830	1980	2130	2280	2430
Total imaging equipment, electricity	**1384**	**1991**	**2481**	**2760**	**2965**	**3179**	**3388**	**3601**	**3828**	**4056**
SB Home Gateway, on-mode power	0	615	793	971	1149	1327	1505	1683	1861	2039
SB Home NAS, on-mode power	0	28	48	68	88	108	128	148	168	188
SB Home Phones (fixed), on-mode power	184	915	1098	1171	1171	1171	1171	1171	1171	1171
SB Office Phones (fixed), on-mode power	175	334	356	377	399	420	441	463	484	506
Total SB (networked) StandBy (rest)	**359**	**1893**	**2295**	**2588**	**2807**	**3027**	**3246**	**3465**	**3685**	**3904**
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	36	72	75	91	107	122	137	150	160	167
UPS 1.5 to 5 kVA	45	90	94	114	134	154	172	189	201	209
UPS 5 to 10 kVA	16	31	33	40	47	54	60	66	70	73
UPS 10 to 200 kVA	67	133	139	168	198	227	255	279	297	309
Total UPS - Uninterrupted Power Supplies	**165**	**326**	**339**	**412**	**485**	**557**	**625**	**683**	**728**	**758**
TOTAL ELECTRONICS	**9053**	**40734**	**41298**	**51009**	**58556**	**65402**	**68964**	**72052**	**75270**	**78472**
RF Household refrigerator and freezer	**2947**	**3721**	**4048**	**4201**	**4293**	**4337**	**4537**	**4380**	**4227**	**4079**
1 CF open vertical chilled multi deck (RCV2)	35	56	63	69	76	83	90	97	104	111
1 CF open horizontal frozen island (RHF4)	9	8	9	11	12	13	14	15	16	17
1 CF Plug in one door beverage cooler	51	70	74	78	82	86	90	95	99	103
1 CF Plug in horizontal ice cream freezer	19	29	31	32	34	36	37	39	41	43
1 CF Spiral vending machine	28	51	62	75	88	102	115	128	141	154
1 CF average	**142**	**215**	**238**	**265**	**292**	**319**	**346**	**373**	**400**	**427**
PF service cabinet (average)	36	46	48	50	52	54	57	59	62	64
PF Blast cabinet	58	112	126	135	151	166	181	196	212	227
PF Walk-In Cold Room (WICR, avg)	164	201	210	222	231	241	251	260	270	279
PF MT & LT industrial chillers (avg)	25	48	50	52	58	63	69	74	79	85
Total PF Professional Refrigeration	**282**	**407**	**434**	**459**	**492**	**525**	**557**	**590**	**622**	**655**
TOTAL FOOD PRESERVATION	**3371**	**4343**	**4720**	**4926**	**5078**	**5181**	**5441**	**5343**	**5250**	**5161**
COOK El. Hobs, Wh/ltr	920	2093	2244	2523	2656	2777	2890	2996	3095	3187
COOK El. Ovens, kWh/a	2009	2388	2551	2871	2772	2678	2695	2729	2763	2798
COOK Gas Hobs, % efficiency NCV	1076	887	799	688	620	559	502	464	438	412
COOK Gas Ovens, kWh prim, NCV	283	289	292	370	356	342	329	316	304	292
COOK Range Hoods, kWh elec	488	596	627	819	955	963	969	972	974	974
Total CA Cooking Appliances	**4777**	**6253**	**6513**	**7271**	**7359**	**7318**	**7385**	**7478**	**7574**	**7663**
COFFEE Dripfilter (glass)	146	101	97	80	74	71	69	69	69	69
COFFEE Dripfilter (thermos)	28	44	45	45	46	47	47	48	48	48
COFFEE Dripfilter (full automatic)	0	73	83	93	102	112	122	131	141	151
COFFEE Pad filter	0	170	185	201	217	233	249	265	281	296
COFFEE Hard cap espresso	21	89	190	285	298	298	298	298	298	298
COFFEE Semi-auto espresso	24	27	25	24	22	21	19	17	16	14
COFFEE Fully-auto espresso	136	156	181	206	231	256	281	306	331	356
Total CM household Coffee Makers	**354**	**660**	**806**	**934**	**991**	**1037**	**1085**	**1134**	**1183**	**1232**
TOTAL COOKING	**5132**	**6913**	**7319**	**8205**	**8350**	**8355**	**8469**	**8612**	**8758**	**8895**

	REVENU RETAIL ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	1615	2834	2928	3231	3053	2904	2763	2629	2502	2425
	DW Household Dishwasher	692	2011	2333	2600	2838	3061	3268	3460	3638	3801
	LD Household Laundry Drier vented el.	329	332	313	279	285	287	289	290	292	293
	LD Household Laundry Drier condens el.	186	697	886	1055	1072	1052	1024	996	968	963
	LD Household Laundry Drier vented gas	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**518**	**1035**	**1206**	**1342**	**1365**	**1347**	**1321**	**1295**	**1269**	**1265**
	VC dom. Vacuum Cleaner	1571	4651	6729	8162	8763	9589	10415	11241	12068	12894
	VC nondom Vacuum Cleaner	112	115	124	131	134	141	147	154	160	167
	Total VC Vacuum Cleaner	**1683**	**4767**	**6853**	**8293**	**8897**	**9730**	**10562**	**11395**	**12228**	**13060**
	TOTAL CLEANING	4508	10647	13320	15465	16153	17043	17915	18779	19636	20551
0.5	FAN Axial<300Pa [247 W flow out]	36	118	168	212	203	194	185	177	169	162
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	50	171	181	198	190	190	190	190	190	190
0.5	FAN Centr.FC [141 W flow out]	31	78	116	161	154	147	140	133	127	122
0.5	FAN Centr.BC-free [2120 W flow out]	18	43	60	67	71	69	67	65	65	66
0.5	FAN Centr.BC [2052 W flow out]	38	102	164	188	200	195	205	213	221	227
0.5	FAN Cross-flow [31 W flow out]	7	16	52	69	59	57	60	62	64	66
	Total FAN, industrial (excl. box & roof fans)	**90**	**264**	**370**	**447**	**438**	**426**	**423**	**421**	**419**	**417**
	MT motor industry only	163	271	423	435	429	408	388	369	351	334
	MT extra drive sales revenu	0	0	192	190	181	172	164	156	148	141
0.5	**Total MT Motors 0.75-375 kW**	**163**	**271**	**615**	**626**	**610**	**580**	**552**	**525**	**500**	**475**
	WP Water pumps	**120**	**164**	**176**	**189**	**203**	**217**	**231**	**246**	**260**	**274**
	CP Fixed Speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS	291	563	853	949	946	933	931	929	928	928
	TRAFO Distribution, kWh/a	47	74	98	105	112	121	129	138	146	155
	TRAFO Industry oil	24	39	64	69	74	80	86	91	97	102
	TRAFO Industry dry	12	18	27	29	31	33	35	37	40	42
	TRAFO Power	188	301	324	348	374	403	432	461	490	519
	TRAFO DER oil	0	2	6	10	16	27	39	52	65	78
	TRAFO DER dry	0	13	29	47	78	129	190	251	313	374
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	276	453	552	613	691	797	916	1036	1155	1275
	TYRE in m units										
	TYRE car replacement tyres C1	2536	3127	3104	3601	4124	4172	4058	4058	4058	4058
	TYRE van replacement tyres C2	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	832	818	738	840	934	1006	957	910	866	824
	TRANSPORT SECTOR	4275	5062	4951	5727	6509	6627	6464	6418	6374	6332
	GENERAL TOTAL (in m euro 2010)	**33039**	**82108**	**91322**	**107655**	**117532**	**126368**	**132874**	**138907**	**144958**	**151308**
	GENERAL TOTAL (in bn euro 2010)	33	82	91	108	118	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	11.5	12.8	14.1	15.5	17.0
SPACE COOLING	0.2	0.9	1.1	1.4	1.6	1.7	1.7	1.7	1.7	1.8
VENTILATION	1.4	3.4	4.0	4.3	4.5	4.8	5.0	5.3	5.5	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	40.7	41.3	51.0	58.6	65.4	69.0	72.1	75.3	78.5
FOOD PRESERVATION	3.4	4.3	4.7	4.9	5.1	5.2	5.4	5.3	5.2	5.2
COOKING	5.1	6.9	7.3	8.2	8.4	8.4	8.5	8.6	8.8	8.9
CLEANING	4.5	10.6	13.3	15.5	16.2	17.0	17.9	18.8	19.6	20.6
INDUSTRY COMPONENTS	0.3	0.6	0.9	0.9	0.9	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	4.3	5.1	5.0	5.7	6.5	6.6	6.5	6.4	6.4	6.3
TOTAL in bn euro 2010	**33**	**82**	**91**	**108**	**118**	**126**	**133**	**139**	**145**	**151**

Retail revenu 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	1.4	1.5	1.6
SPACE HEATING	-	0.1	2.0	3.4	4.7	5.5	6.4	7.4	8.4	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	0.9	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	0.3	0.3	0.3
CLEANING	-	0.8	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	0.1
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**	**9.1**	**10.2**	**11.3**	**12.1**	**13.2**

	REVENU WHOLESALE BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	520	632	625	672	746	752	742	732	722	712
	CH Central Heating combi, water heat [24 kW]	369	644	695	773	796	817	843	888	932	977
	TOTAL WATER HEATING	**889**	**1276**	**1320**	**1446**	**1542**	**1569**	**1585**	**1620**	**1655**	**1689**
	CH Central Heating boiler, space heat [24 kW]	1928	2806	2999	3193	3506	3819	4131	4444	4757	5070
	SFB Wood Manual [18 kW]	21	12	8	5	3	3	3	2	2	2
	SFB Wood Direct Draft [20 kW]	1	34	35	37	35	43	51	59	70	83
	SFB Coal [25 kW]	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	0	9	13	13	13	15	16	18	20	22
	SFB Wood chips [160 kW]	0	5	5	6	8	8	9	10	11	12
	Total Solid Fuel Boiler	**29**	**64**	**63**	**63**	**59**	**69**	**79**	**90**	**103**	**120**
	CHAE-S ≤400 kW	27	111	122	135	149	164	136	70	21	3
	CHAE-L > 400 kW	6	19	20	20	21	22	23	24	25	25
	CHWE-S ≤400 kW	2	10	11	12	13	15	16	17	18	19
	CHWE-M >400 kW; ≤1500 kW	3	9	9	10	10	10	11	11	12	12
	CHWE-L > 1500 kW	2	6	6	6	6	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	22	24	25	26	27	28	29	30
	HT PCH-AE-L	10	17	18	19	20	21	21	22	23	24
	HT PCH-WE-S	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	11	18	19	21	21	22	23	24	25	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
	AC rooftop	12	39	40	30	18	5	5	5	5	5
	AC splits	21	76	80	77	74	72	69	66	63	61
	AC VRF	0	173	226	330	417	503	586	661	725	770
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**112**	**509**	**584**	**694**	**787**	**877**	**936**	**948**	**966**	**998**
	AC rooftop (rev)	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	14	49	51	50	48	46	44	43	41	39
	AC VRF (rev)	0	148	184	281	342	393	435	467	487	493
	ACF (rev)	0	1	1	1	2	2	2	3	3	3
	AHF	41	27	25	24	23	21	20	19	18	16
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**63**	**249**	**285**	**375**	**425**	**465**	**502**	**531**	**549**	**551**
	Total AHC Air Heating & Cooling	**153**	**536**	**609**	**718**	**810**	**899**	**956**	**968**	**984**	**1015**
	LH open fireplace [8 kW]	92	134	135	136	135	134	134	134	134	134
	LH closed fireplace/inset [8 kW]	58	157	175	194	196	199	199	199	199	199
	LH wood stove [8 kW]	63	74	82	90	91	92	93	93	93	93
	LH coal stove [8 kW]	19	15	14	12	9	6	6	6	6	6
	LH cooker [10 kW]	54	108	130	152	156	160	161	161	161	161
	LH SHR stove [8 kW]	58	81	101	121	135	149	152	152	152	152
	LH pellet stove [8 kW]	0	60	76	92	99	105	107	107	107	107
	LH open fire gas, NCV [4.2 kW]	4	5	6	6	6	6	6	6	6	6
	LH closed fire gas, NCV [4.2 kW]	17	19	20	20	21	21	21	21	21	21
	LH flueless fuel heater, NCV [1.5 kW]	6	12	12	11	10	9	8	8	8	8
	LH elec.portable [1 kW]	15	18	18	19	20	21	21	21	21	21
	LH elec.convector [1 kW]	107	130	134	138	145	151	152	152	152	152
	LH elec.storage [2.75 kW]	12	15	15	16	17	17	17	17	17	17
	LH elec.underfloor [0.62 kW]	22	27	28	29	30	31	32	32	32	32
	LH luminous heaters [20 kW]	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	2	2	2	2	2	2	2	2	2	2
	LH total	**530**	**861**	**951**	**1041**	**1074**	**1107**	**1113**	**1113**	**1113**	**1113**
	RAC (cooling demand), all types <12 kW	42	383	549	688	750	757	757	770	783	795
	RAC (heating demand), reversible <12kW	12	284	484	608	664	671	671	683	695	707
	Total Room Air Conditioner	**53**	**668**	**1033**	**1296**	**1413**	**1428**	**1429**	**1453**	**1478**	**1502**
1	**CIRC Circulator pumps <2.5 kW**	**173**	**255**	**271**	**287**	**304**	**301**	**284**	**267**	**251**	**234**
	TOTAL SPACE HEATING (incl. rev.AC)	**2562**	**4264**	**4782**	**5280**	**5727**	**6131**	**6497**	**6862**	**7217**	**7561**
	TOTAL SPACE COOLING	**153**	**892**	**1133**	**1382**	**1536**	**1635**	**1693**	**1718**	**1749**	**1793**
	NRVU avg (sales wt.)	1260	2948	3084	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	148	332	285	260	273	285	301	321	341	361
	RVU Central Balanced VU (2 fans)	17	116	283	363	408	453	498	543	588	633
	RVU Local Balanced VU (2 fans)	1	15	33	54	76	98	120	142	164	185
	TOTAL VENTILATION (electricity)	**1426**	**3412**	**3686**	**3929**	**4189**	**4447**	**4710**	**4977**	**5243**	**5509**
	LS Light Sources										
	LFL	225	325	288	290	270	249	228	208	191	174
	CFL	13	118	101	85	76	68	60	55	50	45
	Tungsten	25	178	203	213	162	117	85	59	45	42
	GLS	72	49	38	27	16	4	1	0	0	0
	HID	43	106	94	91	87	87	87	87	87	87
	LED BAU	0	14	32	83	115	88	100	104	103	107
	TOTAL LIGHTING	**377**	**790**	**757**	**790**	**725**	**612**	**560**	**513**	**475**	**455**

REVENU WHOLESALE BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	585	1346	261	0	0	0	0	0	0	0
DP TV LoNA	0	184	653	818	714	584	443	303	162	21
DP TV Smart	0	0	392	818	1071	1363	1673	1982	2291	2601
DP Monitor	85	213	119	119	119	119	119	119	119	119
DP Total electronic DisPlays	**670**	**1743**	**1426**	**1755**	**1904**	**2067**	**2235**	**2404**	**2572**	**2741**
SSTB	0	331	75	0	0	0	0	0	0	0
CSTB	0	1247	1528	1646	1665	1623	1764	1904	2044	2185
Total STB set top boxes (Complex & Simple)	**0**	**1578**	**1603**	**1646**	**1665**	**1623**	**1764**	**1904**	**2044**	**2185**
VIDEO players/recorders	0	46	13	0	0	0	0	0	0	0
VIDEO projectors	5	506	470	319	138	0	0	0	0	0
VIDEO game consoles	0	319	215	220	245	245	245	245	245	245
Total VIDEO	**5**	**872**	**698**	**539**	**383**	**245**	**245**	**245**	**245**	**245**
ES Rack servers	20	533	596	692	833	1058	1148	1125	1125	1125
ES Blade servers	36	402	409	450	534	654	708	684	684	684
ES Storage	24	302	345	380	420	453	474	459	459	459
Total ES Enterprise Servers	**80**	**1237**	**1350**	**1522**	**1787**	**2164**	**2330**	**2268**	**2268**	**2268**
PC Desktop	166	553	413	375	375	375	375	375	375	375
PC Notebook	18	1260	578	543	543	543	543	543	543	543
PC Tablet/slate	0	85	1350	2194	2835	3375	3544	3713	3881	4050
PC Thin client	10	120	120	120	120	120	120	120	120	120
PC Workstation	46	460	460	460	460	460	460	460	460	460
Total PC, electricity	**239**	**2478**	**2920**	**3691**	**4333**	**4873**	**5041**	**5210**	**5379**	**5548**
EP-Copier mono	351	141	84	36	26	17	8	0	0	0
EP-Copier colour	0	47	205	307	350	381	413	444	475	506
EP-printer mono	71	67	59	48	41	37	31	26	21	16
EP-printer colour	0	65	96	129	155	180	205	230	255	280
IJ SFD printer	18	29	20	14	11	9	7	5	3	2
IJ MFD printer	22	72	99	115	126	137	149	160	171	182
Total imaging equipment, electricity	**462**	**421**	**563**	**649**	**709**	**761**	**812**	**865**	**926**	**987**
SB Home Gateway, on-mode power	0	1538	1983	2428	2873	3318	3763	4208	4653	5098
SB Home NAS, on-mode power	0	140	240	340	440	540	640	740	840	940
SB Home Phones (fixed), on-mode power	14	69	82	88	88	88	88	88	88	88
SB Office Phones (fixed), on-mode power	117	223	237	251	266	280	294	309	323	337
Total SB (networked) StandBy (rest)	**130**	**1970**	**2543**	**3107**	**3667**	**4226**	**4785**	**5344**	**5904**	**6463**
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	9	18	19	23	27	31	34	38	40	42
UPS 1.5 to 5 kVA	0	0	0	0	0	0	0	0	0	0
UPS 5 to 10 kVA	0	0	0	0	0	0	0	0	0	0
UPS 10 to 200 kVA	0	0	0	0	0	0	0	0	0	0
Total UPS - Uninterrupted Power Supplies	**9**	**18**	**19**	**23**	**27**	**31**	**34**	**38**	**40**	**42**
TOTAL ELECTRONICS	**1595**	**10316**	**11121**	**12932**	**14473**	**15989**	**17246**	**18278**	**19378**	**20477**
RF Household refrigerator and freezer	**221**	**241**	**245**	**249**	**253**	**256**	**260**	**264**	**268**	**272**
1 CF open vertical chilled multi deck (RCV2)	70	112	125	139	153	166	180	194	208	222
1 CF open horizontal frozen island (RHF4)	18	17	19	21	23	25	27	30	32	34
1 CF Plug in one door beverage cooler	102	141	148	156	164	173	181	189	198	206
1 CF Plug in horizontal ice cream freezer	38	58	61	64	68	71	75	78	82	85
1 CF Spiral vending machine	55	103	124	151	177	203	229	256	282	308
1 CF average	**284**	**431**	**477**	**531**	**585**	**639**	**693**	**747**	**801**	**855**
PF service cabinet (average)	71	92	96	99	104	109	114	119	123	128
PF Blast cabinet	115	225	251	271	301	332	362	393	423	453
PF Walk-In Cold Room (WICR, avg)	329	401	421	444	463	482	501	521	540	559
PF MT & LT industrial chillers (avg)	50	95	100	104	115	126	137	148	159	170
Total PF Professional Refrigeration	**565**	**813**	**868**	**919**	**984**	**1049**	**1114**	**1180**	**1245**	**1310**
TOTAL FOOD PRESERVATION	**1069**	**1485**	**1590**	**1698**	**1821**	**1944**	**2067**	**2190**	**2313**	**2436**
COOK El. Hobs, Wh/ltr	69	157	168	182	192	201	209	217	225	231
COOK El. Ovens, kWh/a	151	179	189	205	198	200	202	205	207	210
COOK Gas Hobs, % efficiency NCV	81	67	60	54	49	44	39	35	33	31
COOK Gas Ovens, kWh prim, NCV	21	22	21	20	19	19	18	18	17	17
COOK Range Hoods, kWh elec	37	45	47	49	52	55	57	60	63	65
Total CA Cooking Appliances	**358**	**469**	**485**	**510**	**510**	**517**	**526**	**535**	**544**	**554**
COFFEE Dripfilter (glass)	11	8	6	5	5	5	5	5	5	5
COFFEE Dripfilter (thermos)	2	3	3	3	3	4	4	4	4	4
COFFEE Dripfilter (full automatic)	0	5	6	7	8	8	9	10	11	11
COFFEE Pad filter	0	13	14	15	16	17	19	20	21	22
COFFEE Hard cap espresso	2	7	14	21	22	22	22	22	22	22
COFFEE Semi-auto espresso	2	2	2	2	2	2	1	1	1	1
COFFEE Fully-auto espresso	10	12	14	15	17	19	21	23	25	27
Total CM household Coffee Makers	**27**	**49**	**60**	**69**	**74**	**78**	**81**	**85**	**89**	**92**
TOTAL COOKING	**385**	**518**	**544**	**579**	**584**	**595**	**607**	**620**	**633**	**646**

	REVENU WHOLESALE BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	121	186	183	194	182	182	182	182	182	182
	DW Household Dishwasher	52	114	132	150	168	186	204	222	240	259
	LD Household Laundry Drier vented el.	25	25	24	21	21	22	22	22	22	22
	LD Household Laundry Drier condens el.	14	52	61	69	70	71	71	71	72	72
	LD Household Laundry Drier vented gas	0	0	1	1	1	1	1	1	1	1
	Total LD household Laundry Drier	**39**	**78**	**85**	**90**	**92**	**93**	**93**	**94**	**94**	**95**
	VC dom. Vacuum Cleaner	118	349	489	595	657	719	781	843	905	967
	VC nondom Vacuum Cleaner	149	154	162	170	179	187	196	205	213	222
	Total VC Vacuum Cleaner	**267**	**503**	**651**	**765**	**836**	**907**	**977**	**1048**	**1118**	**1189**
	TOTAL CLEANING	479	880	1051	1199	1278	1367	1457	1546	1635	1724
0.5	FAN Axial<300Pa [247 W flow out]	83	271	311	351	351	351	351	351	351	351
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	114	394	416	438	438	438	438	438	438	438
0.5	FAN Centr.FC [141 W flow out]	71	180	207	235	235	235	235	235	235	235
0.5	FAN Centr.BC-free [2120 W flow out]	40	99	112	126	139	142	144	147	150	152
0.5	FAN Centr.BC [2052 W flow out]	88	235	269	304	338	345	379	413	448	482
0.5	FAN Cross-flow [31 W flow out]	16	36	41	47	52	53	58	63	68	73
	Total FAN, industrial (excl. box & roof fans)	**206**	**608**	**679**	**750**	**776**	**781**	**802**	**823**	**844**	**865**
	MT motor industry only	374	551	585	616	619	621	621	619	617	613
	MT extra drive sales revenu	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**374**	**551**	**585**	**616**	**619**	**621**	**621**	**619**	**617**	**613**
	WP Water pumps	**277**	**376**	**404**	**434**	**467**	**500**	**532**	**565**	**597**	**630**
	CP Fixed Speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS	670	1259	1375	1492	1553	1591	1645	1698	1750	1802
	TRAFO Distribution, kWh/a	47	74	79	85	91	98	105	112	119	125
	TRAFO Industry oil	24	39	42	45	49	52	56	60	63	67
	TRAFO Industry dry	12	18	20	21	23	24	26	28	29	31
	TRAFO Power	188	301	324	348	374	403	432	461	490	519
	TRAFO DER oil	0	2	4	6	10	16	23	31	39	46
	TRAFO DER dry	0	13	22	36	59	98	145	192	239	286
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	276	453	495	547	611	696	792	888	983	1079
	TYRE in m units										
	TYRE car replacement tyres C1	2536	3127	3104	3598	4058	4058	4058	4058	4058	4058
	TYRE van replacement tyres C2	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	832	818	692	707	725	729	732	732	731	728
	TRANSPORT SECTOR	4275	5062	4905	5590	6232	6237	6239	6240	6239	6236
	GENERAL TOTAL (in m euro 2010)	**14157**	**30607**	**32760**	**36866**	**40272**	**42814**	**45099**	**47149**	**49270**	**51408**
	GENERAL TOTAL (in bn euro 2010)	14	31	33	37	40	43	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	1.4	1.5	1.6	1.6	1.6	1.7	1.7
SPACE HEATING	2.6	4.3	4.8	5.3	5.7	6.1	6.5	6.9	7.2	7.6
SPACE COOLING	0.2	0.9	1.1	1.4	1.5	1.6	1.7	1.7	1.7	1.8
VENTILATION	1.4	3.4	3.7	3.9	4.2	4.4	4.7	5.0	5.2	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	10.3	11.1	12.9	14.5	16.0	17.2	18.3	19.4	20.5
FOOD PRESERVATION	1.1	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4
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	1.5	1.6	1.7
INDUSTRY COMPONENTS	0.7	1.3	1.4	1.5	1.6	1.6	1.6	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	4.3	5.1	4.9	5.6	6.2	6.2	6.2	6.2	6.2	6.2
TOTAL in bn euro 2010	**14**	**31**	**33**	**37**	**40**	**43**	**45**	**47**	**49**	**51**

	REVENU WHOLESALE ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	520	632	1014	1167	1343	1326	1309	1291	1273	1255
	CH Central Heating combi, water heat [24 kW]	369	644	985	1401	1527	1654	1780	1906	2031	2154
	TOTAL WATER HEATING	**889**	**1276**	**2000**	**2568**	**2870**	**2980**	**3088**	**3197**	**3304**	**3409**
	CH Central Heating boiler, space heat [24 kW]	1928	2911	5125	6580	8255	9425	10750	12157	13644	15213
	SFB Wood Manual [18 kW]	21	12	11	9	5	4	4	3	3	3
	SFB Wood Direct Draft [20 kW]	1	34	35	38	41	48	57	66	78	91
	SFB Coal [25 kW]	8	3	0	0	0	0	0	0	0	0
	SFB Pellets [25 kW]	0	9	13	13	14	15	16	18	20	22
	SFB Wood chips [160 kW]	0	5	6	7	8	8	9	10	11	12
	Total Solid Fuel Boiler	**29**	**64**	**66**	**67**	**68**	**76**	**86**	**98**	**112**	**128**
	CHAE-S ≤400 kW	27	111	122	135	149	164	136	70	21	3
	CHAE-L > 400 kW	6	19	20	20	21	22	23	24	25	25
	CHWE-S ≤400 kW	2	10	11	12	13	15	16	17	18	19
	CHWE-M >400 kW; ≤1500 kW	3	9	9	10	10	10	11	11	12	12
	CHWE-L > 1500 kW	2	6	6	6	6	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	22	24	25	26	27	28	29	30
	HT PCH-AE-L	10	17	18	19	20	21	21	22	23	24
	HT PCH-WE-S	3	5	5	5	5	6	6	6	6	7
	HT PCH-WE-M	11	18	19	21	21	22	23	24	25	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
1	AC rooftop	12	39	40	30	18	5	5	5	5	5
1	AC splits	21	76	80	77	74	72	69	66	63	61
1	AC VRF	0	173	226	330	417	503	586	661	725	770
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**112**	**509**	**584**	**694**	**787**	**878**	**936**	**948**	**966**	**998**
1	AC rooftop (rev)	7	24	23	19	10	3	0	0	0	0
	AC splits (rev)	14	49	51	50	48	46	44	43	41	39
1	AC VRF (rev)	0	148	184	281	342	393	435	467	487	493
1	ACF (rev)	0	1	1	1	2	2	2	3	3	3
1	AHF	41	27	25	26	25	23	21	19	18	16
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**63**	**249**	**285**	**377**	**427**	**467**	**503**	**531**	**549**	**551**
	Total AHC Air Heating & Cooling	**153**	**536**	**609**	**721**	**812**	**901**	**957**	**968**	**984**	**1015**
	LH open fireplace [8 kW]	92	134	135	168	184	176	169	163	157	152
	LH closed fireplace/inset [8 kW]	58	157	175	230	247	241	233	224	216	208
	LH wood stove [8 kW]	63	74	82	108	117	113	109	105	101	97
	LH coal stove [8 kW]	19	15	14	15	12	7	7	6	6	6
	LH cooker [10 kW]	54	108	130	167	178	175	169	162	161	161
	LH SHR stove [8 kW]	58	81	101	121	135	149	152	152	152	152
	LH pellet stove [8 kW]	0	60	76	92	99	105	107	107	107	107
	LH open fire gas, NCV [4.2 kW]	4	5	6	6	7	6	6	6	6	6
	LH closed fire gas, NCV [4.2 kW]	17	19	20	21	22	22	21	21	21	21
	LH flueless fuel heater, NCV [1.5 kW]	6	12	12	11	10	9	8	8	8	8
	LH elec.portable [1 kW]	15	18	18	19	20	21	21	21	21	21
	LH elec.convector [1 kW]	107	130	134	138	145	151	152	152	152	152
	LH elec.storage [2.75 kW]	12	15	17	20	20	20	19	18	18	17
	LH elec.underfloor [0.62 kW]	22	27	28	30	30	31	32	32	32	32
	LH luminous heaters [20 kW]	2	3	3	3	3	3	3	3	3	3
	LH tube heaters [30 kW]	2	2	3	3	3	3	3	2	2	2
	LH total	**530**	**861**	**953**	**1153**	**1229**	**1232**	**1210**	**1183**	**1163**	**1145**
	RAC (cooling demand), all types <12 kW	42	383	593	761	839	850	843	835	828	820
	RAC (heating demand), reversible <12kW	12	284	523	673	742	753	747	741	735	729
	Total Room Air Conditioner	**53**	**668**	**1117**	**1434**	**1581**	**1603**	**1590**	**1577**	**1563**	**1549**
1	**CIRC Circulator pumps <2.5 kW**	**173**	**276**	**353**	**358**	**362**	**340**	**306**	**274**	**251**	**234**
	TOTAL SPACE HEATING (incl. rev.AC)	**2562**	**4369**	**6953**	**8851**	**10722**	**11953**	**13296**	**14710**	**16203**	**17767**
	TOTAL SPACE COOLING	**153**	**892**	**1177**	**1456**	**1625**	**1728**	**1779**	**1784**	**1794**	**1818**
	NRVU avg (sales wt.)	1260	2948	3095	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	148	332	497	453	475	496	514	532	547	562
	RVU Central Balanced VU (2 fans)	17	116	349	434	472	507	540	570	597	633
	RVU Local Balanced VU (2 fans)	1	15	33	54	76	98	120	142	164	185
	TOTAL VENTILATION (electricity)	**1426**	**3412**	**3975**	**4192**	**4454**	**4712**	**4965**	**5214**	**5458**	**5710**
	LS Light Sources										
	LFL	225	327	246	212	112	74	54	33	12	4
	CFL	13	142	57	26	1	1	1	1	1	1
	Tungsten	25	185	210	48	3	1	1	1	1	1
	GLS	72	30	2	3	2	2	2	2	2	2
	HID	43	108	64	41	23	16	16	16	16	16
	LED ECO	0	12	215	361	221	134	145	178	191	221
	TOTAL LIGHTING	**377**	**803**	**794**	**691**	**361**	**227**	**217**	**230**	**221**	**243**

REVENU WHOLESALE ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	585	1346	261	0	0	0	0	0	0	0
DP TV LoNA	0	184	653	818	714	584	443	303	162	21
DP TV Smart	0	0	392	818	1071	1363	1673	1982	2291	2601
DP Monitor	85	213	119	119	119	119	119	119	119	119
DP Total electronic DisPlays	**670**	**1743**	**1426**	**1755**	**1904**	**2067**	**2235**	**2404**	**2572**	**2741**
SSTB	0	331	75	0	0	0	0	0	0	0
CSTB	0	1247	1573	1646	1665	1623	1764	1904	2044	2185
Total STB set top boxes (Complex & Simple)	**0**	**1578**	**1648**	**1646**	**1665**	**1623**	**1764**	**1904**	**2044**	**2185**
VIDEO players/recorders	0	46	13	0	0	0	0	0	0	0
VIDEO projectors	5	506	470	319	138	0	0	0	0	0
VIDEO game consoles	0	319	215	220	245	245	245	245	245	245
Total VIDEO	**5**	**872**	**698**	**539**	**383**	**245**	**245**	**245**	**245**	**245**
ES Rack servers	20	533	596	692	850	1080	1172	1149	1149	1149
ES Blade servers	36	402	409	450	536	657	711	687	687	687
ES Storage	24	302	345	418	469	505	529	512	512	512
Total ES Enterprise Servers	**80**	**1237**	**1350**	**1560**	**1856**	**2242**	**2413**	**2349**	**2349**	**2349**
PC Desktop	166	553	413	375	375	375	375	375	375	375
PC Notebook	18	1260	578	543	543	543	543	543	543	543
PC Tablet/slate	0	85	1350	2194	2835	3375	3544	3713	3881	4050
PC Thin client	10	120	120	120	120	120	120	120	120	120
PC Workstation	46	460	460	460	460	460	460	460	460	460
Total PC, electricity	**239**	**2478**	**2920**	**3691**	**4333**	**4873**	**5041**	**5210**	**5379**	**5548**
EP-Copier mono	351	141	84	36	26	17	8	0	0	0
EP-Copier colour	0	47	205	307	350	381	413	444	475	506
EP-printer mono	71	67	59	48	41	37	31	26	21	16
EP-printer colour	0	65	96	129	155	180	205	230	255	280
IJ SFD printer	18	29	20	14	11	9	7	5	3	2
IJ MFD printer	22	72	99	115	126	137	149	160	171	182
Total imaging equipment, electricity	**462**	**421**	**563**	**649**	**709**	**761**	**812**	**865**	**926**	**987**
SB Home Gateway, on-mode power	0	1538	1983	2428	2873	3318	3763	4208	4653	5098
SB Home NAS, on-mode power	0	140	240	340	440	540	640	740	840	940
SB Home Phones (fixed), on-mode power	14	69	82	88	88	88	88	88	88	88
SB Office Phones (fixed), on-mode power	117	223	237	251	266	280	294	309	323	337
Total SB (networked) StandBy (rest)	**130**	**1970**	**2543**	**3107**	**3667**	**4226**	**4785**	**5344**	**5904**	**6463**
BC_EPS Mobile phones etc.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	9	18	19	23	27	31	34	38	40	42
UPS 1.5 to 5 kVA	0	0	0	0	0	0	0	0	0	0
UPS 5 to 10 kVA	0	0	0	0	0	0	0	0	0	0
UPS 10 to 200 kVA	0	0	0	0	0	0	0	0	0	0
Total UPS - Uninterrupted Power Supplies	**9**	**18**	**19**	**23**	**27**	**31**	**34**	**38**	**40**	**42**
TOTAL ELECTRONICS	**1595**	**10316**	**11166**	**12970**	**14542**	**16067**	**17329**	**18358**	**19458**	**20557**
RF Household refrigerator and freezer	**221**	**279**	**304**	**315**	**322**	**325**	**340**	**328**	**317**	**306**
1 CF open vertical chilled multi deck (RCV2)	70	112	125	139	153	166	180	194	208	222
1 CF open horizontal frozen island (RHF4)	18	17	19	21	23	25	27	30	32	34
1 CF Plug in one door beverage cooler	102	141	148	156	164	173	181	189	198	206
1 CF Plug in horizontal ice cream freezer	38	58	61	64	68	71	75	78	82	85
1 CF Spiral vending machine	55	103	124	151	177	203	229	256	282	308
1 CF average	**284**	**431**	**477**	**531**	**585**	**639**	**693**	**747**	**801**	**855**
PF service cabinet (average)	71	92	96	99	104	109	114	119	123	128
PF Blast cabinet	115	225	251	271	301	332	362	393	423	453
PF Walk-In Cold Room (WICR, avg)	329	401	421	444	463	482	501	521	540	559
PF MT & LT industrial chillers (avg)	50	95	100	104	115	126	137	148	159	170
Total PF Professional Refrigeration	**565**	**813**	**868**	**919**	**984**	**1049**	**1114**	**1180**	**1245**	**1310**
TOTAL FOOD PRESERVATION	**1069**	**1523**	**1648**	**1765**	**1891**	**2013**	**2147**	**2255**	**2363**	**2471**
COOK El. Hobs, Wh/ltr	69	157	168	189	199	208	217	225	232	239
COOK El. Ovens, kWh/a	151	179	191	215	208	201	202	205	207	210
COOK Gas Hobs, % efficiency NCV	81	67	60	52	47	42	38	35	33	31
COOK Gas Ovens, kWh prim, NCV	21	22	22	28	27	26	25	24	23	22
COOK Range Hoods, kWh elec	37	45	47	61	72	72	73	73	73	73
Total CA Cooking Appliances	**358**	**469**	**488**	**545**	**552**	**549**	**554**	**561**	**568**	**575**
COFFEE Dripfilter (glass)	11	8	7	6	6	5	5	5	5	5
COFFEE Dripfilter (thermos)	2	3	3	3	3	4	4	4	4	4
COFFEE Dripfilter (full automatic)	0	5	6	7	8	8	9	10	11	11
COFFEE Pad filter	0	13	14	15	16	17	19	20	21	22
COFFEE Hard cap espresso	2	7	14	21	22	22	22	22	22	22
COFFEE Semi-auto espresso	2	2	2	2	2	2	1	1	1	1
COFFEE Fully-auto espresso	10	12	14	15	17	19	21	23	25	27
Total CM household Coffee Makers	**27**	**49**	**60**	**70**	**74**	**78**	**81**	**85**	**89**	**92**
TOTAL COOKING	**385**	**518**	**549**	**615**	**626**	**627**	**635**	**646**	**657**	**667**

	REVENU WHOLESALE ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	121	213	220	242	229	218	207	197	188	182
	DW Household Dishwasher	52	151	175	195	213	230	245	260	273	285
	LD Household Laundry Drier vented el.	25	25	24	21	21	22	22	22	22	22
	LD Household Laundry Drier condens el.	14	52	66	79	80	79	77	75	73	72
	LD Household Laundry Drier vented gas	0	0	1	1	1	1	1	1	1	1
	Total LD household Laundry Drier	**39**	**78**	**90**	**101**	**102**	**101**	**99**	**97**	**95**	**95**
	VC dom. Vacuum Cleaner	118	349	505	612	657	719	781	843	905	967
	VC nondom Vacuum Cleaner	149	154	166	175	179	187	196	205	213	222
	Total VC Vacuum Cleaner	**267**	**503**	**670**	**787**	**836**	**907**	**977**	**1048**	**1118**	**1189**
	TOTAL CLEANING	**479**	**944**	**1155**	**1325**	**1380**	**1455**	**1529**	**1602**	**1674**	**1751**
0.5	FAN Axial<300Pa [247 W flow out]	83	271	387	487	466	445	426	407	389	372
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	114	394	416	455	438	438	438	438	438	438
0.5	FAN Centr.FC [141 W flow out]	71	180	267	370	353	337	322	307	293	280
0.5	FAN Centr.BC-free [2120 W flow out]	40	99	137	154	163	158	154	150	150	152
0.5	FAN Centr.BC [2052 W flow out]	88	235	376	432	459	448	471	491	508	522
0.5	FAN Cross-flow [31 W flow out]	16	36	119	158	135	131	138	143	148	152
	Total FAN, industrial (excl. box & roof fans)	**206**	**608**	**852**	**1028**	**1007**	**979**	**974**	**968**	**963**	**958**
	MT motor industry only	374	623	973	1001	986	938	892	849	808	769
	MT extra drive sales revenu	0	0	441	438	417	396	377	359	341	325
0.5	**Total MT Motors 0.75-375 kW**	**374**	**623**	**1414**	**1439**	**1402**	**1334**	**1270**	**1208**	**1149**	**1094**
	WP Water pumps	**277**	**376**	**404**	**434**	**467**	**500**	**532**	**565**	**597**	**630**
	CP Fixed Speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Variable speed 5-1280 l/s	0	0	0	0	0	0	0	0	0	0
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS	670	1295	1962	2182	2175	2146	2141	2137	2135	2135
	TRAFO Distribution, kWh/a	47	74	98	105	112	121	129	138	146	155
	TRAFO Industry oil	24	39	64	69	74	80	86	91	97	102
	TRAFO Industry dry	12	18	27	29	31	33	35	37	40	42
	TRAFO Power	188	301	324	348	374	403	432	461	490	519
	TRAFO DER oil	0	2	6	10	16	27	39	52	65	78
	TRAFO DER dry	0	13	29	47	78	129	190	251	313	374
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**276**	**453**	**552**	**613**	**691**	**797**	**916**	**1036**	**1155**	**1275**
	TYRE in m units										
	TYRE car replacement tyres C1	2536	3127	3104	3601	4124	4172	4058	4058	4058	4058
	TYRE van replacement tyres C2	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	832	818	738	840	934	1006	957	910	866	824
	TRANSPORT SECTOR	**4275**	**5062**	**4951**	**5727**	**6509**	**6627**	**6464**	**6418**	**6374**	**6332**
	GENERAL TOTAL (in m euro 2010)	**14157**	**30862**	**36883**	**42955**	**47848**	**51331**	**54507**	**57585**	**60796**	**64135**
	GENERAL TOTAL (in bn euro 2010)	14	31	37	43	48	51	55	58	61	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	10.7	12.0	13.3	14.7	16.2	17.8
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	10.3	11.2	13.0	14.5	16.1	17.3	18.4	19.5	20.6
FOOD PRESERVATION	1.1	1.5	1.6	1.8	1.9	2.0	2.1	2.3	2.4	2.5
COOKING	0.4	0.5	0.5	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	2.1	2.1	2.1	2.1	2.1
ENERGY SECTOR	0.3	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.2	1.3
TRANSPORT SECTOR	4.3	5.1	5.0	5.7	6.5	6.6	6.5	6.4	6.4	6.3
TOTAL in bn euro 2010	**14**	**31**	**37**	**43**	**48**	**51**	**55**	**58**	**61**	**64**

Wholesale revenu ECO-BAU (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	-	-	0.7	1.1	1.3	1.4	1.5	1.6	1.6	1.7
SPACE HEATING	-	0.1	2.2	3.6	5.0	5.8	6.8	7.8	9.0	10.2
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	0.2	0.2	0.2
LIGHTING	-	0.0	0.0	- 0.1	- 0.4	- 0.4	- 0.3	- 0.3	- 0.3	- 0.2
ELECTRONICS	-	-	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
FOOD PRESERVATION	-	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
COOKING	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CLEANING	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
INDUSTRY COMPONENTS	-	0.0	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.3
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**	**0.3**	**4.1**	**6.1**	**7.6**	**8.5**	**9.4**	**10.4**	**11.5**	**12.7**

	INSTALL excl. VAT BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	1376	1674	1655	1781	1975	1992	1966	1939	1912	1885
	CH Central Heating combi, water heat [24 kW]	1118	1947	2102	2339	2408	2471	2549	2685	2821	2956
	TOTAL WATER HEATING	**2494**	**3621**	**3757**	**4120**	**4383**	**4463**	**4515**	**4624**	**4733**	**4841**
	CH Central Heating boiler, space heat [24 kW]	5693	8283	8855	9426	10349	11273	12196	13119	14043	14966
	SFB Wood Manual [18 kW]	286	172	116	68	40	38	35	32	30	28
	SFB Wood Direct Draft [20 kW]	6	282	294	313	291	362	424	497	582	695
	SFB Coal [25 kW]	80	35	4	4	3	3	3	3	2	2
	SFB Pellets [25 kW]	0	80	124	124	124	137	152	167	185	204
	SFB Wood chips [160 kW]	0	18	18	21	25	27	30	33	36	40
	Total Solid Fuel Boiler	**372**	**587**	**556**	**530**	**483**	**567**	**644**	**732**	**835**	**969**
	CHAE-S ≤400 kW	98	409	450	497	550	602	501	257	77	13
	CHAE-L > 400 kW	22	70	72	75	78	81	84	87	90	93
	CHWE-S ≤400 kW	6	24	26	29	32	35	38	41	44	47
	CHWE-M >400 kW; ≤1500 kW	6	22	22	23	24	25	26	27	28	29
	CHWE-L > 1500 kW	2	8	9	9	10	10	10	11	11	11
	CHF	0	2	2	2	3	3	4	4	5	5
	HT PCH-AE-S	48	77	83	87	91	95	99	102	106	110
	HT PCH-AE-L	38	62	66	70	73	76	79	82	85	88
	HT PCH-WE-S	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-M	27	44	47	49	51	54	56	58	60	62
	HT PCH-WE-L	3	5	5	6	6	6	6	7	7	7
	AC rooftop	88	288	291	222	129	34	34	34	34	34
	AC splits	91	329	344	332	321	308	296	285	273	262
	AC VRF	0	1045	1364	1987	2513	3033	3529	3984	4366	4642
	ACF	0	2	2	2	3	3	4	4	5	5
	SubTotal AHC Air Cooling	**439**	**2403**	**2802**	**3411**	**3903**	**4387**	**4788**	**5006**	**5214**	**5432**
	AC rooftop (rev)	54	177	170	137	76	19	0	0	0	0
	AC splits (rev)	61	211	221	213	206	198	191	183	176	168
	AC VRF (rev)	0	892	1108	1696	2061	2367	2620	2815	2935	2969
	ACF (rev)	0	3	5	5	7	8	9	10	11	12
	AHF	275	181	169	159	151	142	134	125	117	109
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**391**	**1464**	**1673**	**2211**	**2501**	**2735**	**2954**	**3134**	**3239**	**3258**
	Total AHC Air Heating & Cooling	**714**	**2584**	**2972**	**3571**	**4055**	**4530**	**4923**	**5133**	**5333**	**5543**
	LH open fireplace [8 kW]	300	438	440	443	440	438	437	437	437	437
	LH closed fireplace/inset [8 kW]	183	496	553	611	619	627	628	628	628	628
	LH wood stove [8 kW]	142	167	185	203	206	208	209	209	209	209
	LH coal stove [8 kW]	65	50	46	42	31	21	19	19	19	19
	LH cooker [10 kW]	104	208	252	295	303	310	312	312	312	312
	LH SHR stove [8 kW]	895	1250	1552	1854	2073	2292	2336	2336	2336	2336
	LH pellet stove [8 kW]	0	96	121	146	156	167	169	169	169	169
	LH open fire gas, NCV [4.2 kW]	13	19	21	23	23	23	23	23	23	23
	LH closed fire gas, NCV [4.2 kW]	67	76	78	80	82	84	85	85	85	85
	LH flueless fuel heater, NCV [1.5 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	233	284	293	302	316	329	332	332	332	332
	LH elec.storage [2.75 kW]	18	22	23	23	24	26	26	26	26	26
	LH elec.underfloor [0.62 kW]	138	168	173	179	187	195	196	196	196	196
	LH luminous heaters [20 kW]	5	6	6	6	6	6	6	6	6	6
	LH tube heaters [30 kW]	5	6	6	6	6	6	6	6	6	6
	LH total	**2167**	**3285**	**3749**	**4213**	**4472**	**4730**	**4783**	**4783**	**4783**	**4783**
	RAC (cooling demand), all types <12 kW	223	2044	2929	3669	3998	4039	4038	4106	4173	4241
	RAC (heating demand), reversible <12kW	62	1516	2582	3244	3539	3578	3581	3644	3706	3769
	Total Room Air Conditioner	**285**	**3560**	**5511**	**6914**	**7538**	**7617**	**7619**	**7749**	**7880**	**8010**
1	**CIRC Circulator pumps <2.5 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING (incl. rev.AC)	**8686**	**15136**	**17414**	**19624**	**21345**	**22883**	**24157**	**25412**	**26607**	**27746**
	TOTAL SPACE COOLING	**662**	**4447**	**5731**	**7080**	**7902**	**8425**	**8826**	**9112**	**9388**	**9673**
	NRVU avg (sales wt.)	17034	39853	41688	43950	46379	48809	51238	53668	56097	58526
	RVU Central Unidir. VU (1 fan)	478	1073	923	841	883	921	975	1039	1103	1167
	RVU Central Balanced VU (2 fans)	46	321	780	1002	1126	1250	1374	1498	1622	1746
	RVU Local Balanced VU (2 fans)	1	6	14	23	32	42	51	60	70	79
	TOTAL VENTILATION (electricity)	**17559**	**41252**	**43405**	**45816**	**48420**	**51021**	**53638**	**56264**	**58891**	**61518**
	LS Light Sources in Euro/unit										
	LFL	0	0	0	0	0	0	0	0	0	0
	CFL	0	0	0	0	0	0	0	0	0	0
	Tungsten	0	0	0	0	0	0	0	0	0	0
	GLS	0	0	0	0	0	0	0	0	0	0
	HID	0	0	0	0	0	0	0	0	0	0
	LED BAU	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	INSTALL excl. VAT BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	0	0	0	0	0	0	0	0	0	0
	DP TV LoNA	0	0	0	0	0	0	0	0	0	0
	DP TV Smart	0	0	0	0	0	0	0	0	0	0
	DP Monitor	0	0	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SSTB	0	0	0	0	0	0	0	0	0	0
	CSTB	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	0	0	0	0	0	0	0	0	0	0
	VIDEO projectors	0	0	0	0	0	0	0	0	0	0
	VIDEO game consoles	0	0	0	0	0	0	0	0	0	0
	Total VIDEO	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	23	593	663	769	925	1175	1275	1250	1250	1250
	ES Blade servers	30	335	341	375	445	545	590	570	570	570
	ES Storage	16	201	230	253	280	302	316	306	306	306
	Total ES Enterprise Servers	**68**	**1129**	**1233**	**1397**	**1650**	**2022**	**2181**	**2126**	**2126**	**2126**
	PC Desktop	0	0	0	0	0	0	0	0	0	0
	PC Notebook	0	0	0	0	0	0	0	0	0	0
	PC Tablet/slate	0	0	0	0	0	0	0	0	0	0
	PC Thin client	0	0	0	0	0	0	0	0	0	0
	PC Workstation	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	0	0	0	0	0	0	0
	EP-Copier colour	0	0	0	0	0	0	0	0	0	0
	EP-printer mono	0	0	0	0	0	0	0	0	0	0
	EP-printer colour	0	0	0	0	0	0	0	0	0	0
	IJ SFD printer	0	0	0	0	0	0	0	0	0	0
	IJ MFD printer	0	0	0	0	0	0	0	0	0	0
	Total imaging equipment, electricity	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SB Home Gateway, on-mode power	0	0	0	0	0	0	0	0	0	0
	SB Home NAS, on-mode power	0	0	0	0	0	0	0	0	0	0
	SB Home Phones (fixed), on-mode power	0	0	0	0	0	0	0	0	0	0
	SB Office Phones (fixed), on-mode power	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.	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	0	0	0	0	0	0	0	0	0	0
	UPS 1.5 to 5 kVA	62	123	128	156	183	211	236	258	275	286
	UPS 5 to 10 kVA	6	13	13	16	19	22	25	27	29	30
	UPS 10 to 200 kVA	8	16	17	20	24	28	31	34	36	37
	Total UPS - Uninterrupted Power Supplies	**77**	**152**	**158**	**192**	**227**	**260**	**291**	**319**	**340**	**354**
	TOTAL ELECTRONICS	**145**	**1281**	**1392**	**1589**	**1877**	**2282**	**2473**	**2445**	**2466**	**2480**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	CF open vertical chilled multi deck (RCV2)	35	56	63	69	76	83	90	97	104	111
1	CF open horizontal frozen island (RHF4)	9	8	9	11	12	13	14	15	16	17
1	CF Plug in one door beverage cooler	0	0	0	0	0	0	0	0	0	0
1	CF Plug in horizontal ice cream freezer	0	0	0	0	0	0	0	0	0	0
1	CF Spiral vending machine	0	0	0	0	0	0	0	0	0	0
1	**CF average**	**44**	**65**	**72**	**80**	**88**	**96**	**104**	**112**	**120**	**128**
	PF service cabinet (average)	0	0	0	0	0	0	0	0	0	0
	PF Blast cabinet	0	0	0	0	0	0	0	0	0	0
	PF Walk-In Cold Room (WICR, avg)	0	0	0	0	0	0	0	0	0	0
	PF MT & LT industrial chillers (avg)	0	0	0	0	0	0	0	0	0	0
	Total PF Professional Refrigeration	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**44**	**65**	**72**	**80**	**88**	**96**	**104**	**112**	**120**	**128**
	COOK El. Hobs, Wh/ltr	0	0	0	0	0	0	0	0	0	0
	COOK El. Ovens, kWh/a	0	0	0	0	0	0	0	0	0	0
	COOK Gas Hobs, % efficiency NCV	0	0	0	0	0	0	0	0	0	0
	COOK Gas Ovens, kWh prim, NCV	0	0	0	0	0	0	0	0	0	0
	COOK Range Hoods, kWh elec	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)	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (thermos)	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (full automatic)	0	0	0	0	0	0	0	0	0	0
	COFFEE Pad filter	0	0	0	0	0	0	0	0	0	0
	COFFEE Hard cap espresso	0	0	0	0	0	0	0	0	0	0
	COFFEE Semi-auto espresso	0	0	0	0	0	0	0	0	0	0
	COFFEE Fully-auto espresso	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**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	INSTALL excl. VAT BAU (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	0	0	0	0	0	0	0	0	0	0
	DW Household Dishwasher	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented el.	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**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]	40	131	150	170	170	170	170	170	170	170
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	41	143	151	159	159	159	159	159	159	159
0.5	FAN Centr.FC [141 W flow out]	20	52	60	68	68	68	68	68	68	68
0.5	FAN Centr.BC-free [2120 W flow out]	18	43	49	55	60	62	63	64	65	66
0.5	FAN Centr.BC [2052 W flow out]	38	102	117	132	147	150	165	180	195	210
0.5	FAN Cross-flow [31 W flow out]	6	13	15	17	19	19	21	23	25	26
	Total FAN, industrial (excl. box & roof fans)	**82**	**242**	**271**	**300**	**311**	**313**	**322**	**331**	**340**	**349**
	MT motor industry only	0	0	0	0	0	0	0	0	0	0
	MT extra drive installation revenu	0	0	0	0	0	0	0	0	0	0
0.5	**Total MT Motors 0.75-375 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**552**	**750**	**806**	**866**	**931**	**996**	**1061**	**1126**	**1191**	**1256**
	CP Fixed Speed 5-1280 l/s	16	14	13	14	15	15	16	16	17	18
	CP Variable speed 5-1280 l/s	0	6	9	10	10	11	11	12	12	13
	CP Pistons 2-64 l/s	5	5	6	6	7	7	8	8	9	9
	Total CP Standard Air Compressors	**21**	**25**	**28**	**30**	**32**	**33**	**35**	**36**	**38**	**40**
	TOTAL INDUSTRY COMPONENTS	655	1017	1105	1196	1274	1343	1419	1494	1570	1645
	TRAFO Distribution, kWh/a	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
	TYRE in m units										
	TYRE car replacement tyres C1	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	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)	**30244**	**66818**	**72877**	**79506**	**85289**	**90515**	**95131**	**99463**	**103774**	**108032**
	GENERAL TOTAL (in bn euro 2010)	30	67	73	80	85	91	95	99	104	108

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	4.7	4.8
SPACE HEATING	8.7	15.1	17.4	19.6	21.3	22.9	24.2	25.4	26.6	27.7
SPACE COOLING	0.7	4.4	5.7	7.1	7.9	8.4	8.8	9.1	9.4	9.7
VENTILATION	17.6	41.3	43.4	45.8	48.4	51.0	53.6	56.3	58.9	61.5
LIGHTING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRONICS	0.1	1.3	1.4	1.6	1.9	2.3	2.5	2.4	2.5	2.5
FOOD PRESERVATION	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.7	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6
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	**30**	**67**	**73**	**80**	**85**	**91**	**95**	**99**	**104**	**108**

	INSTALL excl. VAT ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	1376	1674	2686	3091	3557	3512	3465	3419	3371	3323
	CH Central Heating combi, water heat [24 kW]	1118	1947	2981	4238	4619	5002	5384	5764	6142	6516
	TOTAL WATER HEATING	**2494**	**3621**	**5667**	**7329**	**8176**	**8513**	**8849**	**9183**	**9513**	**9840**
	CH Central Heating boiler, space heat [24 kW]	5693	8593	15130	19426	24370	27823	31735	35887	40279	44911
	SFB Wood Manual [18 kW]	286	172	156	122	70	61	53	47	41	36
	SFB Wood Direct Draft [20 kW]	6	282	295	317	345	404	473	554	649	760
	SFB Coal [25 kW]	80	35	4	4	3	3	3	3	2	2
	SFB Pellets [25 kW]	0	80	124	124	129	138	152	167	185	204
	SFB Wood chips [160 kW]	0	18	18	22	25	27	30	33	36	40
	Total Solid Fuel Boiler	**372**	**587**	**597**	**590**	**573**	**633**	**711**	**804**	**913**	**1042**
	CHAE-S ≤400 kW	98	409	450	497	550	602	501	257	77	13
	CHAE-L > 400 kW	22	70	72	75	78	81	84	87	90	93
	CHWE-S ≤400 kW	6	24	26	29	32	35	38	41	44	47
	CHWE-M >400 kW; ≤1500 kW	6	22	22	23	24	25	26	27	28	29
	CHWE-L > 1500 kW	2	8	9	9	10	10	10	11	11	11
	CHF	0	2	2	3	3	4	4	4	5	5
	HT PCH-AE-S	48	77	83	87	91	95	99	102	106	110
	HT PCH-AE-L	38	62	66	70	73	76	79	82	85	88
	HT PCH-WE-S	10	17	18	19	20	21	22	22	23	24
	HT PCH-WE-M	27	44	47	49	51	54	56	58	60	62
	HT PCH-WE-L	3	5	5	6	6	6	6	7	7	7
	AC rooftop	88	288	291	222	129	34	34	34	34	34
	AC splits	91	329	344	332	321	308	296	285	273	262
	AC VRF	0	1045	1364	1987	2513	3033	3529	3984	4366	4642
	ACF	0	2	2	3	3	4	4	4	5	5
	SubTotal AHC Air Cooling	**439**	**2403**	**2802**	**3412**	**3904**	**4387**	**4788**	**5006**	**5214**	**5432**
	AC rooftop (rev)	54	177	170	137	76	19	0	0	0	0
	AC splits (rev)	61	211	221	213	206	198	191	183	176	168
	AC VRF (rev)	0	892	1108	1696	2061	2367	2620	2815	2935	2969
	ACF (rev)	0	3	5	5	7	8	9	10	11	12
	AHF	275	181	169	175	167	154	139	125	117	109
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**391**	**1464**	**1673**	**2226**	**2517**	**2747**	**2959**	**3134**	**3239**	**3258**
	Total AHC Air Heating & Cooling	**714**	**2584**	**2972**	**3587**	**4071**	**4542**	**4928**	**5133**	**5333**	**5543**
	LH open fireplace [8 kW]	300	438	440	547	599	574	552	532	513	495
	LH closed fireplace/inset [8 kW]	183	496	553	726	779	760	734	708	682	657
	LH wood stove [8 kW]	142	167	185	244	263	256	246	237	227	218
	LH coal stove [8 kW]	65	50	46	49	39	25	22	21	21	20
	LH cooker [10 kW]	104	208	252	324	344	338	326	313	312	312
	LH SHR stove [8 kW]	895	1250	1552	1865	2078	2292	2336	2336	2336	2336
	LH pellet stove [8 kW]	0	96	121	146	156	167	169	169	169	169
	LH open fire gas, NCV [4.2 kW]	13	19	21	24	25	24	23	23	23	23
	LH closed fire gas, NCV [4.2 kW]	67	76	78	84	88	87	85	85	85	85
	LH flueless fuel heater, NCV [1.5 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	233	284	293	302	316	329	332	332	332	332
	LH elec.storage [2.75 kW]	18	22	26	29	29	29	28	27	26	26
	LH elec.underfloor [0.62 kW]	138	168	177	186	189	195	196	196	196	196
	LH luminous heaters [20 kW]	5	6	6	7	7	7	7	6	6	6
	LH tube heaters [30 kW]	5	6	6	7	7	6	6	6	6	6
	LH total	**2167**	**3285**	**3756**	**4540**	**4918**	**5088**	**5064**	**4992**	**4934**	**4881**
	RAC (cooling demand), all types <12 kW	223	2044	3165	4059	4473	4533	4495	4455	4415	4374
	RAC (heating demand), reversible <12kW	62	1516	2790	3589	3959	4016	3986	3954	3921	3888
	Total Room Air Conditioner	**285**	**3560**	**5955**	**7648**	**8432**	**8550**	**8481**	**8410**	**8337**	**8262**
1	**CIRC Circulator pumps <2.5 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING (incl. rev.AC)	**8686**	**15445**	**23945**	**30371**	**36337**	**40308**	**44454**	**48771**	**53287**	**57980**
	TOTAL SPACE COOLING	**662**	**4447**	**5967**	**7471**	**8377**	**8921**	**9283**	**9462**	**9630**	**9807**
	NRVU avg (sales wt.)	17034	39853	41838	43950	46379	48809	51238	53668	56097	58526
	RVU Central Unidir. VU (1 fan)	478	1073	1605	1463	1536	1602	1663	1719	1770	1816
	RVU Central Balanced VU (2 fans)	46	321	964	1197	1302	1399	1489	1571	1646	1746
	RVU Local Balanced VU (2 fans)	1	6	14	23	32	42	51	60	70	79
	TOTAL VENTILATION (electricity)	**17559**	**41252**	**44421**	**46634**	**49249**	**51852**	**54441**	**57018**	**59583**	**62167**
	LS Light Sources in Euro/unit										
	LFL	0	0	0	0	0	0	0	0	0	0
	CFL	0	0	0	0	0	0	0	0	0	0
	Tungsten	0	0	0	0	0	0	0	0	0	0
	GLS	0	0	0	0	0	0	0	0	0	0
	HID	0	0	0	0	0	0	0	0	0	0
	LED ECO	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	INSTALL excl. VAT ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	0	0	0	0	0	0	0	0	0	0
	DP TV LoNA	0	0	0	0	0	0	0	0	0	0
	DP TV Smart	0	0	0	0	0	0	0	0	0	0
	DP Monitor	0	0	0	0	0	0	0	0	0	0
	DP Total electronic DisPlays	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SSTB	0	0	0	0	0	0	0	0	0	0
	CSTB	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	0	0	0	0	0	0	0	0	0	0
	VIDEO projectors	0	0	0	0	0	0	0	0	0	0
	VIDEO game consoles	0	0	0	0	0	0	0	0	0	0
	Total VIDEO	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	ES Rack servers	23	593	663	769	945	1200	1303	1277	1277	1277
	ES Blade servers	30	335	341	375	447	547	593	572	572	572
	ES Storage	16	201	230	279	313	337	353	342	342	342
	Total ES Enterprise Servers	**68**	**1129**	**1233**	**1422**	**1705**	**2085**	**2248**	**2191**	**2191**	**2191**
	PC Desktop	0	0	0	0	0	0	0	0	0	0
	PC Notebook	0	0	0	0	0	0	0	0	0	0
	PC Tablet/slate	0	0	0	0	0	0	0	0	0	0
	PC Thin client	0	0	0	0	0	0	0	0	0	0
	PC Workstation	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	0	0	0	0	0	0	0
	EP-Copier colour	0	0	0	0	0	0	0	0	0	0
	EP-printer mono	0	0	0	0	0	0	0	0	0	0
	EP-printer colour	0	0	0	0	0	0	0	0	0	0
	IJ SFD printer	0	0	0	0	0	0	0	0	0	0
	IJ MFD printer	0	0	0	0	0	0	0	0	0	0
	Total imaging equipment, electricity	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SB Home Gateway, on-mode power	0	0	0	0	0	0	0	0	0	0
	SB Home NAS, on-mode power	0	0	0	0	0	0	0	0	0	0
	SB Home Phones (fixed), on-mode power	0	0	0	0	0	0	0	0	0	0
	SB Office Phones (fixed), on-mode power	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.	na	na	na	na	na	na	na	na	na	na
	UPS below 1.5 kVA	0	0	0	0	0	0	0	0	0	0
	UPS 1.5 to 5 kVA	62	123	128	156	183	211	236	258	275	286
	UPS 5 to 10 kVA	6	13	13	16	19	22	25	27	29	30
	UPS 10 to 200 kVA	8	16	17	20	24	28	31	34	36	37
	Total UPS - Uninterrupted Power Supplies	**77**	**152**	**158**	**192**	**227**	**260**	**291**	**319**	**340**	**354**
	TOTAL ELECTRONICS	**145**	**1281**	**1392**	**1615**	**1931**	**2345**	**2539**	**2510**	**2531**	**2545**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	CF open vertical chilled multi deck (RCV2)	35	56	63	69	76	83	90	97	104	111
1	CF open horizontal frozen island (RHF4)	9	8	9	11	12	13	14	15	16	17
1	CF Plug in one door beverage cooler	0	0	0	0	0	0	0	0	0	0
1	CF Plug in horizontal ice cream freezer	0	0	0	0	0	0	0	0	0	0
1	CF Spiral vending machine	0	0	0	0	0	0	0	0	0	0
1	**CF average**	**44**	**65**	**72**	**80**	**88**	**96**	**104**	**112**	**120**	**128**
	PF service cabinet (average)	0	0	0	0	0	0	0	0	0	0
	PF Blast cabinet	0	0	0	0	0	0	0	0	0	0
	PF Walk-In Cold Room (WICR, avg)	0	0	0	0	0	0	0	0	0	0
	PF MT & LT industrial chillers (avg)	0	0	0	0	0	0	0	0	0	0
	Total PF Professional Refrigeration	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**44**	**65**	**72**	**80**	**88**	**96**	**104**	**112**	**120**	**128**
	COOK El. Hobs, Wh/ltr	0	0	0	0	0	0	0	0	0	0
	COOK El. Ovens, kWh/a	0	0	0	0	0	0	0	0	0	0
	COOK Gas Hobs, % efficiency NCV	0	0	0	0	0	0	0	0	0	0
	COOK Gas Ovens, kWh prim, NCV	0	0	0	0	0	0	0	0	0	0
	COOK Range Hoods, kWh elec	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)	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (thermos)	0	0	0	0	0	0	0	0	0	0
	COFFEE Dripfilter (full automatic)	0	0	0	0	0	0	0	0	0	0
	COFFEE Pad filter	0	0	0	0	0	0	0	0	0	0
	COFFEE Hard cap espresso	0	0	0	0	0	0	0	0	0	0
	COFFEE Semi-auto espresso	0	0	0	0	0	0	0	0	0	0
	COFFEE Fully-auto espresso	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**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	INSTALL excl. VAT ECO (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	0	0	0	0	0	0	0	0	0	0
	DW Household Dishwasher	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented el.	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**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]	40	131	187	235	225	215	206	197	188	180
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	41	143	151	165	159	159	159	159	159	159
0.5	FAN Centr.FC [141 W flow out]	20	52	78	107	102	98	93	89	85	81
0.5	FAN Centr.BC-free [2120 W flow out]	18	43	60	67	71	69	67	65	65	66
0.5	FAN Centr.BC [2052 W flow out]	38	102	164	188	200	195	205	213	221	227
0.5	FAN Cross-flow [31 W flow out]	6	13	43	57	49	48	50	52	53	55
	Total FAN, industrial (excl. box & roof fans)	**82**	**242**	**341**	**410**	**403**	**391**	**390**	**387**	**385**	**384**
	MT motor industry only	0	0	0	0	0	0	0	0	0	0
	MT extra drive installation revenu	0	0	1150	1142	1087	1034	984	936	891	847
0.5	**Total MT Motors 0.75-375 kW**	**0**	**0**	**1150**	**1142**	**1087**	**1034**	**984**	**936**	**891**	**847**
	WP Water pumps (load) [%]	**552**	**750**	**806**	**866**	**931**	**996**	**1061**	**1126**	**1191**	**1256**
	CP Fixed Speed 5-1280 l/s	16	14	14	15	16	16	17	17	18	18
	CP Variable speed 5-1280 l/s	0	6	9	10	11	11	11	12	12	13
	CP Pistons 2-64 l/s	5	5	7	8	9	9	9	9	10	10
	Total CP Standard Air Compressors	**21**	**25**	**30**	**33**	**35**	**36**	**37**	**39**	**40**	**41**
	TOTAL INDUSTRY COMPONENTS	655	1018	1751	1881	1912	1941	1980	2020	2062	2105
	TRAFO Distribution, kWh/a	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
	TYRE in m units										
	TYRE car replacement tyres C1	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	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)	**30244**	**67128**	**83216**	**95380**	**106071**	**113975**	**121651**	**129075**	**136726**	**144571**
	GENERAL TOTAL (in bn euro 2010)	30	67	83	95	106	114	122	129	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	7.3	8.2	8.5	8.8	9.2	9.5	9.8
SPACE HEATING	8.7	15.4	23.9	30.4	36.3	40.3	44.5	48.8	53.3	58.0
SPACE COOLING	0.7	4.4	6.0	7.5	8.4	8.9	9.3	9.5	9.6	9.8
VENTILATION	17.6	41.3	44.4	46.6	49.2	51.9	54.4	57.0	59.6	62.2
LIGHTING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRONICS	0.1	1.3	1.4	1.6	1.9	2.3	2.5	2.5	2.5	2.5
FOOD PRESERVATION	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.7	1.0	1.8	1.9	1.9	1.9	2.0	2.0	2.1	2.1
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	**30**	**67**	**83**	**95**	**106**	**114**	**122**	**129**	**137**	**145**

INSTALL excl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	-	-	1.9	3.2	3.8	4.0	4.3	4.6	4.8	5.0
SPACE HEATING	-	0.3	6.5	10.7	15.0	17.4	20.3	23.4	26.7	30.2
SPACE COOLING	-	-	0.2	0.4	0.5	0.5	0.5	0.3	0.2	0.1
VENTILATION	-	-	1.0	0.8	0.8	0.8	0.8	0.8	0.7	0.6
LIGHTING	-	-	-	-	-	-	-	-	-	-
ELECTRONICS	-	-	-	0.0	0.1	0.1	0.1	0.1	0.1	0.1
FOOD PRESERVATION	-	-	-	-	-	-	-	-	-	-
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**	**23**	**27**	**30**	**33**	**37**

	MAINTENANCE excl. VAT (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	5073	5887	6053	6183	6313	6447	6581	6716	6850	6984
	CH Central Heating combi, water heat [24 kW]	1236	2377	2594	2761	2936	3126	3317	3508	3699	3890
	TOTAL WATER HEATING	**6309**	**8264**	**8647**	**8943**	**9249**	**9574**	**9899**	**10224**	**10549**	**10874**
	CH Central Heating boiler, space heat [24 kW]	12059	19346	20874	22364	23939	25842	28016	30417	32849	35281
	SFB Wood Manual [18 kW]	270	119	102	82	59	38	25	19	16	15
	SFB Wood Direct Draft [20 kW]	3	42	85	126	159	165	176	200	241	293
	SFB Coal [25 kW]	78	33	25	16	9	4	2	2	2	1
	SFB Pellets [25 kW]	0	12	23	34	44	52	56	60	66	72
	SFB Wood chips [160 kW]	0	4	6	7	7	7	8	9	9	10
	Total Solid Fuel Boiler	**351**	**210**	**239**	**265**	**278**	**266**	**267**	**289**	**334**	**393**
	CHAE-S ≤400 kW	217	909	1147	1345	1490	1638	1742	1643	1328	882
	CHAE-L > 400 kW	53	192	234	271	296	307	318	329	341	354
	CHWE-S ≤400 kW	18	77	96	113	125	137	150	164	178	192
	CHWE-M >400 kW; ≤1500 kW	23	86	106	124	135	141	146	152	158	164
	CHWE-L > 1500 kW	12	43	53	62	68	71	73	76	79	82
	CHF	0	7	13	19	24	29	35	40	45	49
	HT PCH-AE-S	108	191	215	237	253	266	277	288	299	311
	HT PCH-AE-L	106	187	210	231	247	259	270	281	292	303
	HT PCH-WE-S	23	41	46	51	54	57	60	62	64	67
	HT PCH-WE-M	104	183	206	227	242	254	265	276	287	297
	HT PCH-WE-L	11	21	24	26	28	30	32	33	34	36
	AC rooftop	108	429	471	460	388	262	143	74	54	54
	AC splits	225	957	1047	1080	1082	1053	1012	975	937	899
	AC VRF	1	1013	1636	2470	3269	4282	5289	6205	7069	7821
	ACF	0	2	5	7	8	10	12	14	16	17
	SubTotal AHC Air Cooling	**1007**	**4340**	**5511**	**6721**	**7710**	**8797**	**9825**	**10613**	**11182**	**11529**
	AC rooftop (rev)	67	266	289	277	232	155	77	24	2	0
	AC splits (rev)	163	660	722	745	748	728	701	675	648	622
	AC VRF (rev)	1	892	1420	2101	2778	3584	4317	4824	5235	5517
	ACF (rev)	0	5	9	13	17	20	24	28	31	35
	AHF	100	99	91	85	79	75	71	67	63	59
	AHE	0	2	1	1	1	1	1	1	1	1
	SubTotal AHC Air Heating (rev double)	**331**	**1924**	**2533**	**3223**	**3855**	**4564**	**5191**	**5618**	**5980**	**6233**
	Total AHC Air Heating & Cooling	**1108**	**4440**	**5603**	**6806**	**7791**	**8873**	**9897**	**10681**	**11246**	**11589**
	LH open fireplace [8 kW]	145	211	229	244	255	261	263	263	262	262
	LH closed fireplace/inset [8 kW]	72	198	246	296	341	376	399	412	417	419
	LH wood stove [8 kW]	103	122	128	136	145	153	160	165	167	168
	LH coal stove [8 kW]	71	47	43	40	37	32	27	23	19	16
	LH cooker [10 kW]	140	284	338	402	461	502	521	528	531	531
	LH SHR stove [8 kW]	56	79	87	99	114	130	148	161	170	176
	LH pellet stove [8 kW]	0	53	81	109	132	149	159	165	167	167
	LH open fire gas, NCV [4.2 kW]	18	28	30	33	36	38	39	39	39	39
	LH closed fire gas, NCV [4.2 kW]	109	124	127	131	135	138	142	144	145	146
	LH flueless fuel heater, NCV [1.5 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.storage [2.75 kW]	0	0	0	0	0	0	0	0	0	0
	LH elec.underfloor [0.62 kW]	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters [20 kW]	28	34	35	36	36	36	36	36	36	36
	LH tube heaters [30 kW]	27	33	35	36	36	36	36	36	36	36
	LH total	**769**	**1212**	**1381**	**1562**	**1726**	**1852**	**1931**	**1973**	**1991**	**1996**
	RAC (cooling demand), all types <12 kW	65	551	673	792	980	1098	1152	1176	1196	1216
	RAC (heating demand), reversible <12kW	18	319	478	659	860	972	1021	1043	1061	1080
	Total Room Air Conditioner	**83**	**870**	**1150**	**1451**	**1840**	**2071**	**2172**	**2219**	**2258**	**2296**
1	**CIRC Circulator pumps <2.5 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING (incl. rev.AC)	**13528**	**23011**	**25504**	**28073**	**30659**	**33496**	**36425**	**39339**	**42216**	**44983**
	TOTAL SPACE COOLING	**1072**	**4890**	**6183**	**7513**	**8691**	**9895**	**10977**	**11789**	**12378**	**12745**
	NRVU avg (sales wt.)	820	2711	3151	3515	3796	4005	4218	4434	4650	4867
	RVU Central Unidir. VU (1 fan)	128	253	285	279	267	264	276	296	316	337
	RVU Central Balanced VU (2 fans)	6	85	169	298	439	565	647	716	785	853
	RVU Local Balanced VU (2 fans)	1	10	21	40	67	99	133	168	202	237
	TOTAL VENTILATION (electricity)	**955**	**3059**	**3626**	**4133**	**4568**	**4934**	**5275**	**5614**	**5953**	**6293**
	LS Light Sources in Euro/unit										
	LFL	0	0	0	0	0	0	0	0	0	0
	CFL	0	0	0	0	0	0	0	0	0	0
	Tungsten	0	0	0	0	0	0	0	0	0	0
	GLS	0	0	0	0	0	0	0	0	0	0
	HID	0	0	0	0	0	0	0	0	0	0
	LED	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

MAINTENANCE excl. VAT (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	0	0	0	0	0	0	0	0	0	0
DP TV LoNA	0	0	0	0	0	0	0	0	0	0
DP TV Smart	0	0	0	0	0	0	0	0	0	0
DP Monitor	0	0	0	0	0	0	0	0	0	0
DP Total electronic DisPlays	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SSTB	0	0	0	0	0	0	0	0	0	0
CSTB	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	0	0	0	0	0	0	0	0	0	0
VIDEO projectors	0	0	0	0	0	0	0	0	0	0
VIDEO game consoles	0	0	0	0	0	0	0	0	0	0
Total VIDEO	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
ES Rack servers	4	111	129	143	172	213	256	250	250	250
ES Blade servers	0	3	4	4	4	5	6	6	6	6
ES Storage	0	5	6	7	8	8	9	9	9	9
Total ES Enterprise Servers	**4**	**120**	**139**	**154**	**184**	**226**	**271**	**264**	**264**	**264**
PC Desktop	0	0	0	0	0	0	0	0	0	0
PC Notebook	0	0	0	0	0	0	0	0	0	0
PC Tablet/slate	0	0	0	0	0	0	0	0	0	0
PC Thin client	0	0	0	0	0	0	0	0	0	0
PC Workstation	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	0	0	0	0	0	0	0
EP-Copier colour	0	0	0	0	0	0	0	0	0	0
EP-printer mono	0	0	0	0	0	0	0	0	0	0
EP-printer colour	0	0	0	0	0	0	0	0	0	0
IJ SFD printer	0	0	0	0	0	0	0	0	0	0
IJ MFD printer	0	0	0	0	0	0	0	0	0	0
Total imaging equipment, electricity	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SB Home Gateway, on-mode power	0	0	0	0	0	0	0	0	0	0
SB Home NAS, on-mode power	0	0	0	0	0	0	0	0	0	0
SB Home Phones (fixed), on-mode power	0	0	0	0	0	0	0	0	0	0
SB Office Phones (fixed), on-mode power	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.	na	na	na	na	na	na	na	na	na	na
UPS below 1.5 kVA	0	0	0	0	0	0	0	0	0	0
UPS 1.5 to 5 kVA	41	90	97	108	128	150	171	190	206	218
UPS 5 to 10 kVA	12	26	29	32	37	44	50	56	61	65
UPS 10 to 200 kVA	237	533	592	648	755	889	1022	1146	1255	1341
Total UPS - Uninterrupted Power Supplies	**291**	**649**	**718**	**788**	**921**	**1083**	**1243**	**1392**	**1522**	**1624**
TOTAL ELECTRONICS	**295**	**769**	**857**	**942**	**1105**	**1309**	**1514**	**1656**	**1786**	**1888**
RF Household refrigerator and freezer	0	0	0	0	0	0	0	0	0	0
1 CF open vertical chilled multi deck (RCV2)	196	316	355	398	441	484	527	570	613	656
1 CF open horizontal frozen island (RHF4)	54	46	49	55	62	68	74	80	86	92
1 CF Plug in one door beverage cooler	128	179	191	203	214	225	236	248	259	270
1 CF Plug in horizontal ice cream freezer	36	57	61	65	69	72	76	80	83	87
1 CF Spiral vending machine	29	54	65	79	94	110	126	142	158	173
1 CF average	**443**	**652**	**722**	**800**	**879**	**959**	**1039**	**1119**	**1199**	**1279**
PF service cabinet (average)	0	0	0	0	0	0	0	0	0	0
PF Blast cabinet	0	0	0	0	0	0	0	0	0	0
PF Walk-In Cold Room (WICR, avg)	0	0	0	0	0	0	0	0	0	0
PF MT & LT industrial chillers (avg)	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL FOOD PRESERVATION	**443**	**652**	**722**	**800**	**879**	**959**	**1039**	**1119**	**1199**	**1279**
COOK El. Hobs, Wh/ltr	0	0	0	0	0	0	0	0	0	0
COOK El. Ovens, kWh/a	0	0	0	0	0	0	0	0	0	0
COOK Gas Hobs, % efficiency NCV	0	0	0	0	0	0	0	0	0	0
COOK Gas Ovens, kWh prim, NCV	0	0	0	0	0	0	0	0	0	0
COOK Range Hoods, kWh elec	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)	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (thermos)	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic)	0	0	0	0	0	0	0	0	0	0
COFFEE Pad filter	0	0	0	0	0	0	0	0	0	0
COFFEE Hard cap espresso	0	0	0	0	0	0	0	0	0	0
COFFEE Semi-auto espresso	0	0	0	0	0	0	0	0	0	0
COFFEE Fully-auto espresso	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**
TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	MAINTENANCE excl. VAT (in m euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	0	0	0	0	0	0	0	0	0	0
	DW Household Dishwasher	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented el.	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**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]	144	394	463	517	569	601	610	610	610	610
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	198	584	670	708	738	756	761	761	761	761
0.5	FAN Centr.FC [141 W flow out]	123	259	315	351	380	402	409	409	409	409
0.5	FAN Centr.BC-free [2120 W flow out]	70	146	174	191	209	228	242	249	254	259
0.5	FAN Centr.BC [2052 W flow out]	128	289	347	381	420	461	497	533	579	629
0.5	FAN Cross-flow [31 W flow out]	28	50	58	67	77	85	91	98	106	114
	Total FAN, industrial (excl. box & roof fans)	**346**	**861**	**1013**	**1108**	**1197**	**1266**	**1305**	**1330**	**1360**	**1391**
0.5	**Total MT Motors 0.75-375 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**1027**	**1398**	**1505**	**1618**	**1739**	**1867**	**1997**	**2128**	**2258**	**2388**
	CP Fixed Speed 5-1280 l/s	334	723	650	589	590	609	630	650	669	690
	CP Variable speed 5-1280 l/s	0	80	171	253	297	313	323	334	344	354
	CP Pistons 2-64 l/s	84	106	104	104	108	112	116	119	123	127
	Total CP Standard Air Compressors	**419**	**909**	**925**	**946**	**995**	**1034**	**1069**	**1103**	**1136**	**1171**
	TOTAL INDUSTRY COMPONENTS	1373	2259	2518	2726	2936	3134	3302	3458	3617	3779
	TRAFO Distribution, kWh/a	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE in m units										
	TYRE car replacement tyres C1	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	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)	**23975**	**42906**	**48059**	**53130**	**58087**	**63301**	**68430**	**73200**	**77699**	**81841**
	GENERAL TOTAL (in bn euro 2010)	24	43	48	53	58	63	68	73	78	82

SUMMARY

MAINTENANCE excl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**6.3**	**8.3**	**8.6**	**8.9**	**9.2**	**9.6**	**9.9**	**10.2**	**10.5**	**10.9**
SPACE HEATING	**13.5**	**23.0**	**25.5**	**28.1**	**30.7**	**33.5**	**36.4**	**39.3**	**42.2**	**45.0**
SPACE COOLING	**1.1**	**4.9**	**6.2**	**7.5**	**8.7**	**9.9**	**11.0**	**11.8**	**12.4**	**12.7**
VENTILATION	**1.0**	**3.1**	**3.6**	**4.1**	**4.6**	**4.9**	**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	**0.4**	**0.7**	**0.7**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1.3**
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**	**2.9**	**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	**24**	**43**	**48**	**53**	**58**	**63**	**68**	**73**	**78**	**82**

ANNEX B: Status of measures per 1.5.2015

Ecodesign, Energy Labelling, Energy Star & Voluntary Agreements [status 1.5.2015]

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 2006/1005	
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			
E6 /10	VU Ventilation Units		CR 1253/2014			
Lighting						
8 /9 /19	LS Light Sources	CD 98/11		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					study ongoing
Electronics						
5	DP electronic DisPlays		CR 642/2009, am 801/2013	CDR 1062/2010	Cd 2009/789*	rev.
18	STB set top boxes (Complex & Simple)		CR 107/2009 (SSTB)		VA (CSTB)	rev. [SSTB] VA: http://cstb.eu
E3	VIDEO recorders, players, games					VA?
E9	Enterprise servers					IA ongoing
3	PC Personal Computers		CR 617/2013		Cd 2009/489*	
4	EP & IJ imaging equipment				Cd 2009/347* VA	www. eurovaprint.eu
6 /26	SB (networked) Stand-By		CR 1275/2008, am 801/2013			
7	BC Battery Charged devices & Ext.Power		CR 278/2009			rev. (WD)
27	UPS Uninterruptable Power Supplies					prep. study completed 6/2014
Food preservation						
13	RF Household Refrigerators & freezers	CD 2003/66 (label) Dir 96/57 (MEPS)		CDR 1060/2010		rev.
12	CF Commercial Refrigeration					post IA
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			
Cleaning						
14	WM household Washing Machine	CD 95/12 (WM) CD 96/60 (W-drier)	CR 1015/2010 cor(2010/L298/p.87)	CDR 1061/2010		rev.
14	DW Household Dishwashers	CD 97/17	CR 1016/2010	CDR 1059/2013		rev.
16	LD household Laundry Drier	CD 95/13	CR 932/2012	CDR 392/2012		rev.
17	VC Vacuum Cleaners		CR 666/2013	CDR 665/2013		
Industrial components						
11	FAN Industrial Fans (>125W)		CR 327/2011			review study completed 3/2015
11	MT Industrial motors (0.75-375 kW)		CR 640/2009, amendment 4/2014			
30	MT Industrial & Special motors (0.12-1000 kW)					WD draft 9/2014; IA draft 8/2015
11	WP Water pumps		CR 547/2012			review, incl. also Lot 28 & 29
28	Wastewater Pumps					prep. study completed 2/2014

29	Pool- & acquarium pumps					prep. study completed 2/2014
31	CP Standard Air Compressors					WD draft 10/2014; IA draft 9/2015
Energy sector						
E2	TRAFO Utility Transformers		CR 548/2014			
E8	Power cables					prep. study completed 2015
Transportation sector						
T	TYRE Replacement Tyres			Dir		
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? www.cocir.org
E4	Industrial furnaces and ovens					WD May 2014
E5	Machine tools					WD May 2014, VA?
E7	Steam boilers					prep. study completed 10/2014
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; Cdec=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 and thus this product group will probably be included in the next update of the Ecodesign Impact report.

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 1.5.2015

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	
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			
	Tertiary sector (LFL, HID, ballast)	VITO, Jan-April 2007, rev. VHK 2015	SEC(2009)324	COM(2010/C 92/04)
	NDLS Non Directional LS	VITO, Oct. 2009, rev. VHK 2015	SEC(2009)327	
	DLS Directional LS	VITO, Oct. 2009, rev. VHK 2015	SWD(2012)419	
Electronics				
5	DP electronic DisPlays	Fh IZM, Aug. 2007	SEC(2009)1011	Guide 2009
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		
E9	ES Enterprise servers	BIOIS/Fh IZM, June 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)
7	BC Battery Charged devices & Ext.Power	BIOIS/Fh IZM, Jan. 2007	SEC(2009)434	COM(2013/C 130/05)
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)
12	CF Commercial Refrigeration	BIOIS, Dec. 2007		
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	
14	DW Household Dishwashers	ENEA/UniBonn, March 2010	SEC(2010)1356	
16	LD household Laundry Drier	PWC, March 2008	SWD(2012)289	
17	VC Vacuum Cleaners	AEA, Feb. 2009	SWD(2013)240	
Industrial components				
11	FAN Industrial Fans (>125W)	Fh ISI, Feb. 2008	SEC(2011)384	
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		
31	CP Standard Air Compressors	VHK, apr. 2014	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	

Other

E	Medical equipment			
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		
37	Lighting Systems	VITO et al, ongoing		
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 1.5.2015

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)

- Remote open vertical chilled multi deck (RCV2)
- Remote open horizontal frozen island (RHF4)
- 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, omnibus review 2013)

- 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)

- 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, others ongoing)

Service cabinets
Blast cabinets
Walk in cold rooms
Process chillers (HT chillers moved to Lot 21)
Remote condensing units

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) players (VP)
Video (DVD) recorders (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, IA data incomplete)

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 (just or not yet started)

33 SGA Smart grid appliances, Lot 33 (ongoing, Task 1 draft available)
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	9,806	10,864			11,341			11,819		
Stock of units in use	'000	135,540	157,293			165,192			172,268		
Effective heat output per unit	kWh/a	1,392	1,524			1,629			1,735		
EU effective heat output	TWh heat/a	189	240			269			299		
EU hot water (60 °C) use	M m^3/a	3,235	4,110			4,613			5,124		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	718	797	797	0	821	644	-176	824	533	-291
o/w electricity	TWh elec/a	224	249	249	0	256	201	-55	257	166	-91
o/w fuel	TWh fuel/a	158	175	175	0	181	142	-39	181	117	-64
GWP emissions	$MtCO_2$/a	146	139	139	0	136	106	-29	126	81	-44
Acquisition costs (incl. install)	bn €	5	6	6	0	6	11	5	7	12	5
Energy costs	bn €	47	51	51	0	77	60	-17	114	74	-40
Maintenance costs	bn €	6	7	7	0	7	7	0	8	8	0
Total running costs	bn €	53	58	58	0	84	68	-17	122	82	-40
Total expenditure	bn €	58	64	64	0	91	79	-12	129	94	-35
Revenu Industry	m €	1778	2163	2163	0	2301	3994	1693	2574	4537	1963
Revenu Wholesale	m €	520	632	632	0	672	1167	495	752	1326	574
Revenu Retail	m €	455	553	553	0	588	1021	433	658	1160	502
Revenu Installation	m €	1376	1674	1674	0	1781	3091	1311	1992	3512	1520
Revenu Maintenance (excl. VAT)	m €	5073	5887	5887	0	6183	6183	0	6447	6447	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	36	43	43	0	46	80	34	51	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	89	110	20	95	119	24
Jobs Total	'000 jobs	110	131	131	0	138	194	56	150	215	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 centra 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	3,606	6,035			6,911			7,787		
Stock	'000	42,540	81,828			95,022			107,607		
Effective heat output per unit	kWh/a	2,492	2,293			2,340			2,400		
EU effective heat output	TWh heat/a	106	188			222			258		
EU hot water (60 °C) use	M m^3/a	1,817	3,217			3,812			4,428		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	258	414	414	0	458	385	-73	511	339	-172
o/w electricity	TWh elec/a	2	3	3	0	4	3	-1	4	3	-1
o/w fuel	TWh fuel/a	253	406	406	0	449	377	-72	501	332	-169
GWP emissions	$MtCO_2$/a	55	88	88	0	97	81	-15	108	71	-36
Acquisition costs (incl. install)	bn €	4	6	6	0	7	14	6	8	16	8
Energy costs	bn €	11	23	23	0	40	33	-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	69	47	-22
Total expenditure	bn €	16	32	32	0	50	50	0	77	63	-14
Revenu Industry	m €	1310	2282	2282	0	2741	4967	2226	2896	5862	2965
Revenu Wholesale	m €	369	644	644	0	773	1401	628	817	1654	837
Revenu Retail	m €	346	604	604	0	725	1314	589	766	1550	784
Revenu Installation	m €	1118	1947	1947	0	2339	4238	1899	2471	5002	2530
Revenu Maintenance (excl. VAT)	m €	1236	2377	2377	0	2761	2761	0	3126	3126	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	26	46	46	0	55	99	45	58	117	59
Jobs Wholesale	'000 jobs	1	3	3	0	3	6	3	3	7	3
Jobs Retail/ installation/ maintenance	'000 jobs	29	53	53	0	63	92	29	69	107	38
Jobs Total	'000 jobs	57	102	102	0	121	197	76	130	231	101

CH Central Heating boiler, space heating	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	4,778	6,952			7,911			9,461		
Stock	'000	69,174	110,976			128,288			148,239		
Effective heat output per unit	kWh/a	16,830	11,760			9,188			7,301		
EU effective heat output	TWh heat/a	1,164	1,305			1,179			1,082		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2454	2307	2254	-53	1950	1485	-465	1787	1025	-763
o/w electricity	TWh elec/a	102	126	123	-3	121	115	-7	120	117	-3
o/w fuel	TWh fuel/a	2200	1992	1946	-47	1646	1198	-448	1488	733	-755
GWP emissions	$MtCO_2$/a	518	475	464	-11	396	298	-98	357	195	-161
Acquisition costs (incl. install)	bn €	19	27	28	1	31	63	33	37	91	54
Energy costs	bn €	110	128	125	-3	170	129	-40	230	132	-98
Maintenance costs (incl. VAT)	bn €	14	22	22	0	25	25	0	29	29	0
Total running costs	bn €	124	150	147	-3	195	155	-40	260	162	-98
Total expenditure	bn €	143	177	175	-2	226	218	-8	296	252	-44
Revenu Industry	m €	6836	9947	10318	372	11319	23327	12008	13537	33410	19874
Revenu Wholesale	m €	1928	2806	2911	105	3193	6580	3387	3819	9425	5606
Revenu Retail	m €	1808	2631	2729	98	2993	6169	3176	3580	8836	5256
Revenu Installation	m €	5693	8283	8593	310	9426	19426	10000	11273	27823	16550
Revenu Maintenance (excl. VAT)	m €	12059	19346	19346	0	22364	22364	0	25842	25842	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	137	199	206	7	226	467	240	271	668	397
Jobs Wholesale	'000 jobs	8	11	12	0	13	26	14	15	38	22
Jobs Retail/ installation/ maintenance	'000 jobs	208	320	325	5	368	521	153	431	684	253
Jobs Total	'000 jobs	352	530	543	13	607	1014	407	717	1390	673

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	293	436			360			363		
Stock	'000	8,862	5,265			6,600			6,603		
Effective heat output per unit	kWh/a	15,978	17,973			16,882			15,576		
EU effective heat output	TWh heat/a	142	95			111			103		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	452	167	167	0	169	166	-3	143	138	-6
o/w electricity	TWh elec/a	0	0	0	0	0	0	0	0	0	0
o/w fuel	TWh fuel/a	452	167	167	0	169	166	-3	143	138	-6
GWP emissions	$MtCO_2/a$	49	15	15	0	9	9	0	4	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
Revenu Industry	m €	749	1643	1643	0	1618	1741	123	1796	1970	174
Revenu Wholesale	m €	29	64	64	0	63	67	5	69	76	7
Revenu Retail	m €	29	64	64	0	63	67	5	69	76	7
Revenu Installation	m €	372	587	587	0	530	590	59	567	633	66
Revenu Maintenance (excl. VAT)	m €	351	210	210	0	265	265	0	266	266	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	15	33	33	0	32	35	2	36	39	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	9	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	145	592			694			765		
o/w CH, comfort chillers	*'000*	*26*	*106*			*127*			*153*		
o/w AC, air conditioners	*'000*	*103*	*459*			*536*			*579*		
o/w HT PCH, high temp. process chillers	*'000*	*17*	*27*			*31*			*33*		
Stock comfort chillers & reversibles	'000	1,727	7,500			9,908			11,323		
o/w CH, comfort chillers	*'000*	*355*	*1,471*			*2,168*			*2,627*		
o/w AC, air conditioners	*'000*	*1,180*	*5,689*			*7,319*			*8,224*		
o/w HT PCH, high temp. process chillers	*'000*	*192*	*340*			*421*			*473*		
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	182			229			236		
EU effective cooling output, HT PCH	TWh cooling/a	302	535			662			745		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	203	378	378	0	433	424	-9	436	402	-34
o/w electricity	*TWh elec/a*	*81*	*151*	*151*	*0*	*173*	*169*	*-4*	*174*	*161*	*-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	69	69	0	77	75	-1	73	68	-5
o/w GWP emissions from energy	*$MtCO_2$/a*	*40*	*58*	*58*	*0*	*60*	*59*	*-1*	*52*	*47*	*-5*
o/w GWP emissions refrigerant loss	*$MtCO_2$/a*	*2*	*11*	*11*	*0*	*16*	*16*	*0*	*21*	*21*	*0*
Acquisition costs (incl. install)	bn €	2	7	7	0	10	10	0	13	13	0
Energy costs	bn €	10	16	16	0	26	25	-1	38	35	-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	47	44	-3
Total expenditure	bn €	12	28	28	0	43	42	-1	60	57	-3
Revenu Industry	m €	893	4071	4071	0	5554	5555	2	7019	7020	1
Revenu Wholesale	m €	112	509	509	0	694	694	0	877	878	0
Revenu Retail	m €	112	509	509	0	694	694	0	877	878	0
Revenu Installation	m €	439	2403	2403	0	3411	3412	1	4387	4387	1
Revenu Maintenance (excl. VAT)	m €	1007	4340	4340	0	6721	6721	0	8797	8797	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	18	81	81	0	111	111	0	140	140	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	146	146	0
Jobs Total	'000 jobs	35	159	159	0	227	227	0	290	290	0

AHC central Air Heating	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales air heaters & reversible AC's	'000	209	424			484			504		
o/w reversible AC (double with cooling)	*'000*	*73*			*332*			*402*			*431*
Stock	'000	2,447	5,678			6,677			7,336		
o/w reversible AC (double with cooling)	*'000*	*841*			*4,028*			*5,289*			*6,103*
Effective heat output per unit	kWh heat/a	69,049	42,356			36,271			31,446		
EU effective heat output	TWh heat/a	169	241			242			231		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	258	289	289	0	257	250	-7	225	203	-22
o/w electricity	TWh elec/a	18	52	52	0	56	55	-1	53	50	-4
o/w fuel	TWh fuel/a	213	160	160	0	118	114	-4	91	78	-13
GWP emissions from energy	$MtCO_2/a$	55	58	58	0	51	49	-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	16	16	0	21	19	-2
Revenu Industry (excl. rev. AC)	m €	331	219	219	0	193	211	18	172	187	15
Revenu Wholesale (")	m €	41	27	27	0	24	26	2	22	23	2
Revenu Retail (")	m €	41	27	27	0	24	26	2	22	23	2
Revenu Installation (")	m €	275	181	181	0	160	175	15	143	155	12
Revenu 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	19,008	24,342			26,360			28,392		
Stock	'000	207,833	266,180			298,719			329,366		
Effective heat output per unit	kWh/a	955	891			886			870		
EU effective heat output	TWh heat/a	198	237			265			287		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	572	600	600	0	619	587	-31	632	578	-54
o/w electricity	TWh elec/a	168	167	167	0	164	153	-11	163	148	-14
o/w fuel	TWh fuel/a	151	181	181	0	208	204	-4	225	207	-18
GWP emissions from energy	$MtCO_2/a$	101	82	82	0	75	71	-4	67	61	-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	81	74	-7
Total expenditure	bn €	43	49	49	0	71	70	-1	99	94	-5
Revenu Industry	m €	3666	5951	5951	0	7198	7972	774	7651	8516	864
Revenu Wholesale	m €	530	861	861	0	1041	1153	112	1107	1232	125
Revenu Retail	m €	626	1016	1016	0	1229	1361	132	1307	1455	148
Revenu Installation	m €	2167	3285	3285	0	4213	4540	328	4730	5088	358
Revenu Maintenance (excl. VAT)	m €	769	1212	1212	0	1562	1562	0	1852	1852	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	73	119	119	0	144	159	15	153	170	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	78	84	5	88	94	6
Jobs Total	'000 jobs	115	184	184	0	226	248	21	245	269	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	392	4,682			9,044			10,307		
o/w reversible (also heat)	'000	110	3,474			7,996			9,132		
Stock	'000	4,707	49,224			82,113			117,199		
o/w reversible	'000	1,320	28,491			68,277			103,727		
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			96			141		
EU effective heat output	TWh heat/a	4	59			127			176		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy total (100% electric)	TWh prim/a	10.7	101	101	0	164	142	-22	216	180	-37
Electricity total	TWh elec/a	4.3	40	40	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	20.0	20.0	0.0	30.7	27.3	-3.4	37.5	32.5	-5.0
o/w GWP emissions electricity cooling	$MtCO_2/a$	1.3	7.5	7.5	0.0	9.6	8.1	-1.5	11.5	9.2	-2.3
o/w GWP emissions electricity heating	$MtCO_2/a$	0.9	9.0	9.0	0.0	15.4	13.5	-1.9	17.9	15.2	-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	31	0	47	45	-3
Revenu Industry	m €	192	2392	2392	0	4646	5139	493	5119	5746	627
Revenu Wholesale	m €	53	668	668	0	1296	1434	138	1428	1603	175
Revenu Retail	m €	50	626	626	0	1215	1344	129	1339	1503	164
Revenu Installation	m €	285	3560	3560	0	6914	7648	734	7617	8550	933
Revenu Maintenance (excl. VAT)	m €	83	870	870	0	1451	1451	0	2071	2071	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	4	48	48	0	93	103	10	102	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	113	9	119	131	12
Jobs Total	'000 jobs	9	105	105	0	202	222	20	227	253	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	5,475	8,025			9,075			9,495		
Stock	'000	49,800	75,225			86,025			94,635		
Load per unit (W=Pa·m³/s; kWh=10³	kWh flow/a	300	277			266			261		
EU load (1 TWh=10¹²·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	50	-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
Revenu Industry	m €	868	1280	1384	104	1439	1792	353	1506	1704	199
Revenu Wholesale	m €	173	255	276	21	287	358	71	301	340	40
Revenu Retail	m €	69	102	110	8	115	143	28	120	136	16
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	1,309	3,196			3,642			4,469		
Stock	'000	19,360	43,417			56,142			65,605		
EU total mechanical ventilation	T m³/a	30	103			142			166		
o/w non-residential	T m³/a	4	49			75			92		
o/w residential	T m³/a	26	54			67			75		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (incl. saving vs. natural vent)	TWh prim/a (1)	-86	-481	-481		-686	-806		-847	-1120	
(incl. corrected saving vs. BAU)	TWh prim/a (2)	67	193	193	0	238	122	-115	254	43	-212
o/w electricity	TWh elec/a (3)	27	77	77	0	95	84	-11	102	76	-25
o/w fuel (negative= saving vs. natural vent.)	TWh fuel/a (4)	-153	-674	-674		-924	-1017		-1102	-1311	
(negative= corrected saving vs. BAU)	TWh fuel/a (5)	0	0	0	0	0	-89	-89	0	-148	-148
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	95	3
Electricity costs	bn €	3	8	8	0	15	7	-8	24	-3	-26
Heating costs for vent.& infiltr. losses+	bn €	-7	-37	-37	0	-80	-88	-8	-142	-169	-27
Maintenance costs (incl. VAT)	bn €	1	3	3	0	4	4	0	5	5	0
Total running costs	bn €	-2	-26	-26	0	-61	-77	-16	-113	-166	-53
Total expenditure	bn €	29	48	48	0	22	8	-13	-20	-71	-51
Revenu Industry	m €	10604	25045	25045	0	28144	28972	828	31518	32351	833
Revenu Wholesale	m €	1426	3412	3412	0	3929	4192	263	4447	4712	265
Revenu Retail	m €	1436	3441	3441	0	3972	4251	280	4499	4781	281
Revenu Installation	m €	17559	41252	41252	0	45816	46634	817	51021	51852	830
Revenu Maintenance (excl. VAT)	m €	955	3059	3059	0	4133	4133	0	4934	4934	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	212	501	501	0	563	579	17	630	647	17
Jobs Wholesale	'000 jobs	6	14	14	0	16	17	1	18	19	1
Jobs Retail/ installation/ maintenance	'000 jobs	209	500	500	0	566	579	13	635	648	13
Jobs Total	'000 jobs	427	1015	1015	0	1144	1175	30	1283	1313	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	2,112	2,698	2,354	-345	2,452	1,761	-691	1,618	666	-951
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	TWh prim/a	661	1047	1017	-29	943	661	-282	729	373	-356
o/w electricity	TWh elec/a	265	419	407	-12	377	264	-113	292	149	-142
GWP emissions	$MtCO_2/a$	132	172	165	-7	143	100	-43	99	51	-48
Acquisition costs (incl. install)	bn €	5	11	12	0	12	11	-1	9	4	-5
Energy costs	bn €	37	53	51	-2	68	47	-21	75	41	-34
Total running costs	bn €	30	43	40	-2	57	36	-21	64	29	-34
Total expenditure	bn €	34	54	52	-2	69	47	-22	72	33	-40
Revenu Industry	m €	2990	6276	6374	98	6325	5687	-638	4914	1879	-3035
Revenu Wholesale	m €	377	790	803	13	790	691	-100	612	227	-385
Revenu Retail	m €	1208	3517	3604	87	3900	4160	260	2718	1325	-1394
Revenu Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenu 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	127	2	127	114	-13	98	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	69	4	45	22	-23
Jobs Total	'000 jobs	81	187	191	3	195	186	-9	146	61	-85

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	36,000	93,000			86,710			100,570		
Stock	'000	228,000	568,000			575,460			696,422		
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			270			449		
	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	41	41	0
Energy costs	bn €	4	11	11	0	10	6	-4	18	6	-12
Total expenditure	bn €	17	46	46	0	45	41	-4	59	47	-12
Revenu Industry	m €	5326	13851	13851	0	13951	13951	0	16429	16429	0
Revenu Wholesale	m €	670	1743	1743	0	1755	1755	0	2067	2067	0
Revenu Retail	m €	5360	13940	13940	0	14040	14040	0	16535	16535	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	107	277	277	0	279	279	0	329	329	0
Jobs Wholesale	'000 jobs	3	7	7	0	7	7	0	8	8	0
Jobs Retail/ installation/ maintenance	'000 jobs	89	232	232	0	234	234	0	276	276	0
Jobs Total	'000 jobs	199	516	516	0	520	520	0	612	612	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	59,750			43,897			43,285		
Stock	'000	0	177,700			218,489			215,157		
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	292			359			353		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	0	26	22	-4	48	37	-11	47	36	-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	-1
Acquisition costs (incl. install)	bn €	0	6	6	0	7	7	0	6	6	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
Revenu Industry	m €	0	3456	3456	0	3605	3605	0	3554	3554	0
Revenu Wholesale	m €	0	1578	1578	0	1646	1646	0	1623	1623	0
Revenu Retail	m €	0	316	316	0	329	329	0	325	325	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	6	6	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	5	5	0	5	5	0	5	5	0
Jobs Total	'000 jobs	0	81	81	0	84	84	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.

VIDEO	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	20	28,990			13,567			13,594		
Stock	'000	30	151,008			85,435			82,340		
Unit average hours in 'on' mode per day	h/d	2.1	0.8			0.7			0.5		
EU billion hours in 'on'-mode per year	bn h 'on'/a	0.0	45			21			15		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	0	13	13	0	11	11	0	11	11	0
o/w electricity	TWh elec/a	0	5	5	0	5	5	0	5	5	0
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	0	2	2	0	2	2	0	2	2	0
Acquisition costs (incl. install)	bn €	0	9	9	0	5	5	0	5	5	0
Energy costs	bn €	0	1	1	0	1	1	0	2	2	0
Total expenditure	bn €	0	10	10	0	6	6	0	7	7	0
Revenu Industry	m €	9	3856	3856	0	2350	2350	0	1925	1925	0
Revenu Wholesale	m €	5	872	872	0	539	539	0	245	245	0
Revenu Retail	m €	2	3026	3026	0	1824	1824	0	1909	1909	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	0	77	77	0	47	47	0	38	38	0
Jobs Wholesale	'000 jobs	0	3	3	0	2	2	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	50	50	0	30	30	0	32	32	0
Jobs Total	'000 jobs	0	131	131	0	80	80	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	107	2,577			3,326			5,019		
Stock	'000	411	12,017			15,366			22,622		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2	62	62	0	77	67	-10	112	79	-33
o/w electricity	TWh elec/a	1	25	25	0	31	27	-4	45	31	-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
Revenu Industry	m €	560	8660	8660	0	10652	10917	266	15150	15696	546
Revenu Wholesale	m €	80	1237	1237	0	1522	1560	38	2164	2242	78
Revenu Retail	m €	160	2474	2474	0	3043	3119	76	4329	4485	156
Revenu Installation	m €	68	1129	1129	0	1397	1422	25	2022	2085	63
Revenu Maintenance (excl. VAT)	m €	4	120	120	0	154	154	0	226	226	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	11	173	173	0	213	218	5	303	314	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	66	68	2	95	98	3
Jobs Total	'000 jobs	15	232	232	0	285	292	7	406	421	14

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	7,313	63,905			130,000			182,500		
Stock	'000	29,423	242,735			483,000			731,500		
	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	14	30	30	0	8	8	0	5	5	0
GWP emissions	$MtCO_2/a$	7	12	12	0	3	3	0	2	2	0
Acquisition costs (incl. install)	bn €	4	40	40	0	65	65	0	88	88	0
Energy costs	bn €	2	4	4	0	2	2	0	2	2	0
Total expenditure	bn €	6	45	45	0	66	66	0	90	90	0
Revenu Industry	m €	1611	16669	16669	0	26205	26205	0	35595	35595	0
Revenu Wholesale	m €	239	2478	2478	0	3691	3691	0	4873	4873	0
Revenu Retail	m €	1625	16769	16769	0	25937	25937	0	35387	35387	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	32	333	333	0	524	524	0	712	712	0
Jobs Wholesale	'000 jobs	1	10	10	0	15	15	0	19	19	0
Jobs Retail/ installation/ maintenance	'000 jobs	27	279	279	0	432	432	0	590	590	0
Jobs Total	'000 jobs	60	623	623	0	971	971	0	1321	1321	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	16,915	31,516			36,693			40,563		
Stock	'000	64,063	122,603			145,132			159,775		
Unit output, images per year (ipy)	ipy	11,217	6,221			5,867			5,804		
EU output, images per year (ipy)	bn ipy	719	763			852			927		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy for electricity	TWh prim/a	56	18	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	$MtCO_2/a$	12	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	2.3	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	9	9	0	11	11	0
Energy costs	bn €	3	1	1	0	1	0	-1	2	1	-2
Consumable resources	bn €	29	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 €	32	32	32	0	36	34	-2	40	38	-3
Total expenditure	bn €	38	39	38	0	46	44	-2	51	49	-3
Revenu Industry	m €	3442	3543	3543	0	5324	5324	0	6224	6224	0
Revenu Wholesale	m €	462	421	421	0	649	649	0	761	761	0
Revenu Retail	m €	1384	1991	1991	0	2760	2760	0	3179	3179	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	69	71	71	0	106	106	0	124	124	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	155	155	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	10,429	67,589			97,217			120,446		
Stock	'000	29,314	361,900			539,514			664,000		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	3	25	25	0	34	34	0	33	33	0
o/w electricity	TWh elec/a	1	10	10	0	14	14	0	13	13	0
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	1	4	4	0	5	5	0	5	5	0
Acquisition costs (incl. install)	bn €	1	10	10	0	15	15	0	20	20	0
Energy costs	bn €	0	1	1	0	3	3	0	4	4	0
Total running costs	bn €	0	1	1	0	3	3	0	4	4	0
Total expenditure	bn €	1	11	11	0	18	18	0	24	24	0
Revenu Industry	m €	477	4752	4752	0	7229	7229	0	9448	9448	0
Revenu Wholesale	m €	130	1970	1970	0	3107	3107	0	4226	4226	0
Revenu Retail	m €	359	1893	1893	0	2588	2588	0	3027	3027	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	10	95	95	0	145	145	0	189	189	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	50	50	0
Jobs Total	'000 jobs	16	134	134	0	200	200	0	256	256	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	24,762	333,333			333,333			333,333		
Stock	'000	61,429	1,000,000			1,000,000			1,000,000		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	1	11	8		11	7		11	7	
o/w electricity	TWh elec/a	0	4	3		4	3		4	3	
o/w fuel	TWh fuel/a	0	0	0		0	0		0	0	
GWP emissions	$MtCO_2/a$	0	2	1		2	1		1	1	
Energy costs	bn €	0	0	0		1	0		1	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	724	1,434			1,814			2,451		
Stock	'000	3,408	7,355			8,796			12,138		
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	35	24	-11	48	14	-33
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	-4.5
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	-2.9
Maintenance costs (incl. VAT)	bn €	0.3	0.6	0.6	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	2.2	-0.7	5.3	2.4	-2.9
Total expenditure	bn €	1.5	3.0	3.0	0.0	4.2	3.6	-0.7	7.1	4.2	-2.9
Revenu Industry	m €	284	562	562	0	711	711	0	961	961	0
Revenu Wholesale	m €	9	18	18	0	23	23	0	31	31	0
Revenu Retail	m €	165	326	326	0	412	412	0	557	557	0
Revenu Installation	m €	77	152	152	0	192	192	0	260	260	0
Revenu Maintenance (excl. VAT)	m €	291	649	649	0	788	788	0	1083	1083	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	13	13	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	17,500	19,100			19,700			20,300		
Stock	'000	268,000	297,800			308,000			317,600		
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°	42	60			71			83		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	343	345	259	-87	346	179	-167	345	128	-217
o/w electricity	TWh elec/a	137	138	103	-35	138	71	-67	138	51	-87
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	69	57	42	-14	53	27	-25	47	17	-29
Acquisition costs (incl. install)	bn €	7	8	9	1	8	11	2	9	11	2
Energy costs	bn €	24	24	18	-6	34	18	-17	51	19	-32
Total expenditure	bn €	32	32	27	-5	43	28	-14	59	30	-30
Revenu Industry	m €	2972	3243	3752	508	3345	4236	891	3447	4373	926
Revenu Wholesale	m €	221	241	279	38	249	315	66	256	325	69
Revenu Retail	m €	2947	3216	3721	504	3317	4201	884	3419	4337	919
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	59	65	75	10	67	85	18	69	87	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	55	70	15	57	72	15
Jobs Total	'000 jobs	109	119	138	19	123	156	33	127	161	34

Commercial Refrigeration

There is no approved definition of commercial refrigeration, but the preparatory study proposes that they are non-household refrigeration appliances that combine the functionality of both refrigerated (incl. frozen) storage and display of the refrigerated products for commercial purposes. The base cases in the preparatory study are horizontal chilled and vertical frozen display cabinets, ice cream freezers, chilled drinks dispensers and chilled vending machines.

CF Commercial Refrigeration	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	1,054	1,530			1,786			2,050		
Stock	'000	7,951	11,768			13,907			16,129		
EU freezer net volume CF	M m³ @ -18C°	1.2	1.4			1.7			1.9		
EU refrigerator net volume CF	M m³ @ 5C°	5.6	8.7			10.7			12.9		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	141	168	168	0	187	182	-5	202	184	-18
o/w electricity	TWh elec/a	56	67	67	0	75	73	-2	81	74	-7
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	32	34	34	0	36	35	-1	37	34	-2
Acquisition costs (incl. install)	bn €	1	2	2	0	3	3	0	3	3	0
Energy costs	bn €	7	7	7	0	11	11	0	18	16	-2
Maintenance costs (incl. VAT)	bn €	0	1	1	0	1	1	0	1	1	0
Total running costs	bn €	7	8	8	0	12	12	0	19	17	-2
Total expenditure	bn €	9	10	10	0	15	14	0	22	20	-2
Revenu Industry	m €	993	1507	1507	0	1858	1858	0	2236	2236	0
Revenu Wholesale	m €	284	431	431	0	531	531	0	639	639	0
Revenu Retail	m €	142	215	215	0	265	265	0	319	319	0
Revenu Installation	m €	44	65	65	0	80	80	0	96	96	0
Revenu Maintenance (excl. VAT)	m €	443	652	652	0	800	800	0	959	959	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	20	30	30	0	37	37	0	45	45	0
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	7	11	11	0	13	13	0	16	16	0
Jobs Total	'000 jobs	28	43	43	0	53	53	0	63	63	0

Professional Refrigeration

Professional refrigeration covers selected non-household refrigeration (chilling/freezing) products that do not also have a commercial display function. This includes refrigeration cabinets and blast cabinets in restaurants, canteens and other catering applications as well as walk-in cold rooms (WICR) for non-household storage and even medium-temperature (MT) and low-temperature (LT) process chillers as used e.g. in the food industry. The new regulation also applies to a component, i.e. the remote condensing unit. The latter is not incorporated in the modelling, because it would cause double-counting with all the other professional and commercial refrigeration products.

PF Professional Refrigeration	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	463	656			735			833		
Stock	'000	4,222	6,228			7,098			7,962		
EU freezer net volume PF	M m³ @ -18C°	24	32			37			42		
EU refrigerator net volume PF	M m³ @ 5C°	71	99			115			132		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	96	161	161	0	197	197	0	231	231	0
o/w electricity	TWh elec/a	38	65	65	0	79	79	0	92	92	0
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	19	26	26	0	30	30	0	31	31	0
Acquisition costs (incl. install)	bn €	3	4	4	0	5	5	0	5	5	0
Energy costs	bn €	5	7	7	0	12	12	0	20	20	0
Total expenditure	bn €	7	11	11	0	16	16	0	26	26	0
Revenu Industry	m €	1976	2846	2846	0	3215	3215	0	3672	3672	0
Revenu Wholesale	m €	565	813	813	0	919	919	0	1049	1049	0
Revenu Retail	m €	282	407	407	0	459	459	0	525	525	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	40	57	57	0	64	64	0	73	73	0
Jobs Wholesale	'000 jobs	2	3	3	0	4	4	0	4	4	0
Jobs Retail/ installation/ maintenance	'000 jobs	5	7	7	0	8	8	0	9	9	0
Jobs Total	'000 jobs	46	67	67	0	76	76	0	86	86	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	31,947	36,143			39,927			41,893		
Stock	'000	506,551	560,188			605,128			652,625		
EU load hobs, volume boiled water (food)	Mm^3/a	0.25	0.28			0.31			0.33		
EU load ovens, no. of cycles (=ovendishes)	bn cyc/a	25	26			27			30		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	183	206	206	0	215	211	-3	227	213	-14
o/w electricity	TWh elec/a	54	67	67	0	72	71	-1	78	73	-5
o/w fuel	TWh fuel/a	49	39	39	0	35	34	0	31	30	-2
GWP emissions	$MtCO_2/a$	36	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
Revenu Industry	m €	5084	6593	6593	0	7160	7659	499	7252	7693	441
Revenu Wholesale	m €	358	469	469	0	510	545	35	517	549	31
Revenu Retail	m €	4777	6253	6253	0	6799	7271	472	6900	7318	418
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	102	132	132	0	143	153	10	145	154	9
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	80	104	104	0	113	121	8	115	122	7
Jobs Total	'000 jobs	183	238	238	0	259	277	18	262	278	16

Coffee Makers

CM household Coffee Makers	unit	1990	2010			2020			2030		
Sales	'000	22,028	26,132			27,229			28,901		
Stock	'000	126,808	155,842			161,657			170,855		
EU cups of coffee drunk in households	bn cups/a	278	341			354			374		
EU volume of coffee drunk in households	Mm^3/a	0.036	0.043			0.042			0.043		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	28	26	26	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
Revenu Industry	m €	357	665	665	0	933	942	9	1044	1046	2
Revenu Wholesale	m €	27	49	49	0	69	70	1	78	78	0
Revenu Retail	m €	354	660	660	0	925	934	9	1035	1037	2
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	24	24	0	34	35	0	38	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	9,000	13,099			14,081			13,518		
Stock	'000	121,000	185,828			200,805			204,744		
EU weight of laundry washed	Mt laundry/a	83	131			140			142		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	131	110	86	-24	98	59	-40	84	42	-42
o/w electricity	TWh elec/a	52	44	35	-9	39	23	-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	7	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 €	23	31	25	-6	39	26	-14	48	26	-22
Revenu Industry	m €	1628	2503	2858	354	2606	3258	652	2445	2929	483
Revenu Wholesale	m €	121	186	213	26	194	242	48	182	218	36
Revenu Retail	m €	1615	2483	2834	351	2584	3231	647	2425	2904	479
Revenu Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenu 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	41	47	6	43	54	11	40	48	8
Jobs Total	'000 jobs	60	92	105	13	96	120	24	90	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	3,200	6,999			9,233			11,467		
Stock	'000	36,633	82,799			115,036			148,553		
EU place settings (ps) washed	bn ps/a	52	154			224			290		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	31	58	46	-11	76	54	-22	93	63	-30
o/w electricity	TWh elec/a	13	23	18	-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	6	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
Revenu Industry	m €	698	1528	2028	500	2015	2621	607	2502	3087	585
Revenu Wholesale	m €	52	114	151	37	150	195	45	186	230	43
Revenu Retail	m €	692	1515	2011	496	1998	2600	602	2481	3061	580
Revenu Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenu 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	52	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	43	10	41	51	10
Jobs Total	'000 jobs	26	56	75	18	74	97	22	92	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	2,769	5,241			5,902			6,073		
Stock	'000	23,388	62,723			71,801			77,778		
EU laundry dried	Mt laundry/a	13	47			59			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	-3	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
Revenu Industry	m €	522	1044	1044	0	1213	1353	140	1248	1359	111
Revenu Wholesale	m €	39	78	78	0	90	101	10	93	101	8
Revenu Retail	m €	518	1035	1035	0	1202	1342	139	1237	1347	110
Revenu Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenu 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	22	2
Jobs Total	'000 jobs	19	38	38	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	17,767	54,138			91,611			110,530		
Stock	'000	156,734	364,226			419,407			545,178		
EU surface vacumed	1000 km²/a	908	1,176			1,275			1,374		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	33	54	54	0	74	35	-39	114	40	-74
o/w electricity	TWh elec/a	13	21	21	0	29	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	12.4	12.4	0	20.7	21.3	0.6	24.9	24.9	0.0
Energy costs	bn €	2.2	3.3	3.3	0	6.7	3.1	-3.7	15.8	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 €	3.6	5.2	5.2	0	8.8	5.1	-3.7	18.0	7.5	-10.5
Total expenditure	bn €	8.3	17.6	17.6	0.0	29.5	26.4	-3.1	42.9	32.4	-10.5
Revenu Industry	m €	2070	5190	5190	0	8556	8798	242	10278	10278	0
Revenu Wholesale	m €	267	503	503	0	765	787	22	907	907	0
Revenu Retail	m €	1683	4767	4767	0	8065	8293	228	9730	9730	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	41	104	104	0	171	176	5	206	206	0
Jobs Wholesale	'000 jobs	1	2	2	0	3	3	0	4	4	0
Jobs Retail/ installation/ maintenance	'000 jobs	28	79	79	0	134	138	4	162	162	0
Jobs Total	'000 jobs	71	185	185	0	309	317	9	371	371	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	4,813	14,854			18,184			18,492		
Stock	'000	72,190	187,392			239,865			271,546		
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	109			140			161		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	131	328	328	0	419	381	-38	480	395	-85
o/w electricity	TWh elec/a	52	131	131	0	168	152	-15	192	158	-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	65	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	42	35	-7
Total expenditure	bn €	8	17	17	0	30	29	-1	47	41	-7
Revenu Industry	m €	601	1770	1770	0	2184	2994	810	2276	2852	575
Revenu Wholesale	m €	206	608	608	0	750	1028	278	781	979	198
Revenu Retail	m €	90	264	264	0	326	447	121	340	426	86
Revenu Installation	m €	82	242	242	0	300	410	110	313	391	78
Revenu Maintenance (excl. VAT)	m €	346	861	861	0	1108	1108	0	1266	1266	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	12	35	35	0	44	60	16	46	57	12
Jobs Wholesale	'000 jobs	1	2	2	0	3	4	1	3	4	1
Jobs Retail/ installation/ maintenance	'000 jobs	6	15	15	0	20	23	3	21	24	2
Jobs Total	'000 jobs	19	53	53	0	66	87	20	70	85	15

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	6,719	9,899			10,850			10,850		
Stock	'000	72,282	106,468			123,933			130,104		
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	581	856			996			1,046		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2034	2796	2793	-3	3131	2780	-351	3247	2726	-521
o/w electricity	TWh elec/a	814	1119	1117	-1	1252	1112	-140	1299	1090	-208
GWP emissions	$MtCO_2$/a	407	459	458	-1	476	423	-53	442	371	-71
Acquisition costs (incl. install)	bn €	2	2	3	0	3	7	5	3	7	4
Energy costs	bn €	97	117	117	0	187	166	-21	286	240	-46
Maintenance costs (incl. VAT)	bn €	0	0	0	0	0	0	0	0	0	0
Total running costs	bn €	97	117	117	0	187	166	-21	286	240	-46
Total expenditure	bn €	98	119	120	0	189	173	-16	289	247	-42
Revenu Industry	m €	1089	1605	1814	209	1794	4192	2398	1808	3887	2079
o/w Revenu Motor Industry	m €	1089	1605	1814	209	1794	2916	1123	1808	2732	924
o/w Extra Revenu VSD-drive Industry	m €	0	0	0	0	0	1275	1275	0	1155	1155
Revenu Wholesale	m €	374	551	623	72	616	1439	823	621	1334	714
Revenu Retail	m €	163	240	271	31	268	626	358	270	580	310
Revenu Installation (of extra VSD only)	m €	0	0	0	0	0	1142	1142	0	1034	1034
Revenu 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	1	2	2	0	2	6	3	2	5	3
Jobs Retail/ installation/ maintenance	'000 jobs	3	4	5	1	4	22	17	4	20	16
Jobs Total	'000 jobs	4	6	7	1	7	53	46	7	48	41

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	1,227	1,666			1,926			2,214		
Stock	'000	12,526	17,050			19,732			22,770		
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	78			91			105		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (for 100% electricity)	TWh prim/a	219	294	294	0	341	332	-8	393	382	-11
o/w electricity	TWh elec/a	88	118	118	0	136	133	-3	157	153	-5
GWP emissions	$MtCO_2$/a	44	48	48	0	52	51	-1	53	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 €	11	14	14	0	22	21	0	37	36	-1
Total expenditure	bn €	13	16	16	0	25	24	0	40	39	-1
Revenu Industry	m €	806	1095	1096	1	1266	1266	0	1456	1456	0
Revenu Wholesale	m €	277	376	376	0	434	434	0	500	500	0
Revenu Retail	m €	120	163	164	0	189	189	0	217	217	0
Revenu Installation	m €	552	750	750	0	866	866	0	996	996	0
Revenu Maintenance (excl. VAT)	m €	1027	1398	1398	0	1618	1618	0	1867	1867	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	63	63	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			112			121		
Stock	'000	681	1,161			1,136			1,223		
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	62	147	147	0	142	140	-2	150	145	-4
o/w electricity	TWh elec/a	25	59	59	0	57	56	-1	60	58	-2
GWP emissions	$MtCO_2$/a	12	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	8	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
Revenu Industry	m €	458	564	564	0	667	733	66	738	797	59
Revenu Wholesale	m €	0	0	0	0	0	0	0	0	0	0
Revenu Retail	m €	0	0	0	0	0	0	0	0	0	0
Revenu Installation	m €	21	25	25	0	30	33	3	33	36	3
Revenu Maintenance (excl. VAT)	m €	419	909	909	0	946	946	0	1034	1034	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	24	0	25	27	0

Utility transformers

TRAFO Utility Transformers	unit	1990	2010			2020			2030		
Sales	'000	122	176			204			251		
Stock	'000	2,720	4,097			4,973			6,009		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy	TWh prim/a	150	244	244	0	313	298	-16	403	356	-47
o/w electricity	TWh elec/a	60	98	98	0	125	119	-6	161	142	-19
GWP emissions	$MtCO_2/a$	30	40	40	0	48	45	-2	55	48	-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	31	-4
Total expenditure	bn €	10	15	15	0	24	24	0	42	39	-3
Revenu Industry	m €	2205	3623	3623	0	4372	4904	532	5570	6374	804
Revenu Wholesale	m €	276	453	453	0	547	613	67	696	797	100
Revenu Retail	m €	276	453	453	0	547	613	67	696	797	100
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	44	72	72	0	87	98	11	111	127	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	144	18

Replacement tyres

TYRE Replacement Tyres	unit	1990	2010			2020			2030		
Sales	'000	234	286			327			368		
Stock	'000	903	1,083			1,260			1,483		
EU distance travelled with repl. tyres	bn km/a	na	2,805			na			na		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy (due to replacement tyres)	TWh prim/a	641	516	516	0	445	386	-58	392	256	-136
o/w fuel	TWh fuel/a	641	516	516	0	445	386	-58	392	256	-136
GWP emissions	$MtCO_2/a$	170	137	137	0	118	102	-15	104	68	-36
Acquisition costs (incl. install)	bn €	21	25	25	0	28	29	1	31	33	2
Energy costs	bn €	41	54	54	0	77	67	-10	101	66	-35
Total expenditure	bn €	62	79	79	0	105	96	-9	132	99	-33
Revenu Industry	m €	11049	12998	12998	0	14253	14661	408	15870	16962	1092
Revenu Wholesale	m €	4275	5062	5062	0	5590	5727	137	6237	6627	391
Revenu Retail	m €	4275	5062	5062	0	5590	5727	137	6237	6627	391
Revenu Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenu Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	221	260	260	0	285	293	8	317	339	22
Jobs Wholesale	'000 jobs	17	20	20	0	22	23	1	25	27	2
Jobs Retail/ installation/ maintenance	'000 jobs	71	84	84	0	93	95	2	104	110	7
Jobs Total	'000 jobs	309	365	365	0	401	412	11	446	476	30

ANNEX F: Business Revenues (summary tables)

Quantitative data summarised from impacts per parameter (Annex A)

REVENU

Revenu Industry (in million euros)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1778	2163	2163	0	2301	3994	1693	2574	4537	1963
CHC Central Heating combi, water heating	1310	2282	2282	0	2741	4967	2226	2896	5862	2965
CH Central Heating boiler, space heating	6836	9947	10318	372	11319	23327	12008	13537	33410	19874
SFB Solid Fuel Boilers	749	1643	1643	0	1618	1741	123	1796	1970	174
AHC central Air Cooling	893	4071	4071	0	5554	5555	2	7019	7020	1
AHC central Air Heating (excl. reversible AC)	331	219	219	0	193	211	18	172	187	15
LH Local Heaters	3666	5951	5951	0	7198	7972	774	7651	8516	864
RAC Room Air Conditioner	150	1373	1373	0	2466	2728	262	2714	3046	332
CIRC Circulator pumps <2.5 kW	868	1280	1384	104	1439	1792	353	1506	1704	199
VU Ventilation Units (res & nonres)	10604	25045	25045	0	28144	28972	828	31518	32351	833
LS Light Sources, mln units BAU	2990	6276	6374	98	6325	5687	-638	4914	1879	-3035
DP electronic DisPlays	5326	13851	13851	0	13951	13951	0	16429	16429	0
STB Set Top Boxes	0	3456	3456	0	3605	3605	0	3554	3554	0
VIDEO	9	3856	3856	0	2350	2350	0	1925	1925	0
ES Enterprise Servers	560	8660	8660	0	10652	10917	266	15150	15696	546
PC Personal Computers	1611	16669	16669	0	26205	26205	0	35595	35595	0
EP & IJ imaging equipment	3442	3543	3543	0	5324	5324	0	6224	6224	0
SB (networked) Stand-By (rest)	477	4752	4752	0	7229	7229	0	9448	9448	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	284	562	562	0	711	711	0	961	961	0
RF Household Refrigeration	2972	3243	3752	508	3345	4236	891	3447	4373	926
CF Commercial Refrigeration	993	1507	1507	0	1858	1858	0	2236	2236	0
PF Professional Refrigeration	1976	2846	2846	0	3215	3215	0	3672	3672	0
CA Cooking Appliances	5084	6593	6593	0	7160	7659	499	7252	7693	441
CM household Coffee Makers	357	665	665	0	933	942	9	1044	1046	2
WM household Washing Machine	1628	2503	2858	354	2606	3258	652	2445	2929	483
DW Household Dishwashers	698	1528	2028	500	2015	2621	607	2502	3087	585
LD household Laundry Drier	522	1044	1044	0	1213	1353	140	1248	1359	111
VC Vacuum Cleaners	2070	5190	5190	0	8556	8798	242	10278	10278	0
FAN Industrial Fans >125W	601	1770	1770	0	2184	2994	810	2276	2852	575
MT Motors 0.75-375 kW	0	0	0	0	0	1275	1275	0	1155	1155
WP Water pumps	806	1095	1096	1	1266	1266	0	1456	1456	0
CP Standard air compressors	458	564	564	0	667	733	66	738	797	59
TRAFO Utility Transformers	2205	3623	3623	0	4372	4904	532	5570	6374	804
TYRE Replacement Tyres	11049	12998	12998	0	14253	14661	408	15870	16962	1092
TOTAL in bn euros	**73**	**161**	**163**	**2**	**193**	**217**	**24**	**226**	**257**	**31**

Revenu Wholesale (in million euros)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	520	632	632	0	672	1167	495	752	1326	574
CHC Central Heating combi, water heat	369	644	644	0	773	1401	628	817	1654	837
CH Central Heating boiler, space heat	1928	2806	2911	105	3193	6580	3387	3819	9425	5606
SFB Solid Fuel Boilers	29	64	64	0	63	67	5	69	76	7
AHC central Air Cooling	112	509	509	0	694	694	0	877	878	0
AHC central Air Heating (excl. reversible AC)	41	27	27	0	24	26	2	22	23	2
LH Local Heaters	530	861	861	0	1041	1153	112	1107	1232	125
RAC Room Air Conditioner	42	383	383	0	688	761	73	757	850	93
CIRC Circulator pumps <2.5 kW	173	255	276	21	287	358	71	301	340	40
VU Ventilation Units (res & nonres)	1426	3412	3412	0	3929	4192	263	4447	4712	265
LS Light Sources, in million units BAU	377	790	803	13	790	691	-100	612	227	-385
DP electronic DisPlays	670	1743	1743	0	1755	1755	0	2067	2067	0
STB set top boxes (Complex & Simple)	0	1578	1578	0	1646	1646	0	1623	1623	0
VIDEO	5	872	872	0	539	539	0	245	245	0
ES Enterprise Servers	80	1237	1237	0	1522	1560	38	2164	2242	78
PC Personal Computers	239	2478	2478	0	3691	3691	0	4873	4873	0
EP & IJ imaging equipment	462	421	421	0	649	649	0	761	761	0
SB (networked) Stand-By (rest)	130	1970	1970	0	3107	3107	0	4226	4226	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	221	241	279	38	249	315	66	256	325	69
Total CF Commercial Refrigeration	284	431	431	0	531	531	0	639	639	0
Total PF Professional Refrigeration (excl.)	565	813	813	0	919	919	0	1049	1049	0
Total CA Cooking Appliances	358	469	469	0	510	545	35	517	549	31
Total CM household Coffee Makers	27	49	49	0	69	70	1	78	78	0
WM household Washing Machine	121	186	213	26	194	242	48	182	218	36
DW Household Dishwashers	52	114	151	37	150	195	45	186	230	43
LD household Laundry Drier	39	78	78	0	90	101	10	93	101	8
VC Vacuum Cleaners	267	503	503	0	765	787	22	907	907	0
FAN Industrial Fans >125W (excl. box/ roof)	206	608	608	0	750	1028	278	781	979	198
MT Motors 0.75-375 kW	374	551	623	72	616	1439	823	621	1334	714
WP Water pumps	277	376	376	0	434	434	0	500	500	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	276	453	453	0	547	613	67	696	797	100
TYRE Replacement Tyres	4275	5062	5062	0	5590	5727	137	6237	6627	391
TOTAL in bn euros	**14**	**31**	**31**	**0**	**37**	**43**	**7**	**42**	**51**	**9**

Revenu Retail (in million euros)

	1990	2010			2020			2030		
product groups	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	455	553	553	0	588	1021	433	658	1160	502
CHC Central Heating combi, water heat	346	604	604	0	725	1314	589	766	1550	784
CH Central Heating boiler, space heat	1808	2631	2729	98	2993	6169	3176	3580	8836	5256
SFB Solid Fuel Boilers	29	64	64	0	63	67	5	69	76	7
AHC central Air Cooling	112	509	509	0	694	694	0	877	878	0
AHC central Air Heating (excl. reversible AC)	41	27	27	0	24	26	2	22	23	2
LH Local Heaters	626	1016	1016	0	1229	1361	132	1307	1455	148
RAC Room Air Conditioner	39	359	359	0	645	714	69	710	797	87
CIRC Circulator pumps <2.5 kW	69	102	110	8	115	143	28	120	136	16
VU Ventilation Units (res & nonres)	1436	3441	3441	0	3972	4251	280	4499	4781	281
LS Light Sources, in million units BAU	1208	3517	3604	87	3900	4160	260	2718	1325	-1394
DP electronic DisPlays	5360	13940	13940	0	14040	14040	0	16535	16535	0
STB set top boxes (Complex & Simple)	0	316	316	0	329	329	0	325	325	0
VIDEO	2	3026	3026	0	1824	1824	0	1909	1909	0
ES Enterprise Servers	160	2474	2474	0	3043	3119	76	4329	4485	156
PC Personal Computers	1625	16769	16769	0	25937	25937	0	35387	35387	0
EP & IJ imaging equipment	1384	1991	1991	0	2760	2760	0	3179	3179	0
SB (networked) Stand-By (rest)	359	1893	1893	0	2588	2588	0	3027	3027	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	165	326	326	0	412	412	0	557	557	0
RF Household Refrigerators & freezers	2947	3216	3721	504	3317	4201	884	3419	4337	919
Total CF Commercial Refrigeration	142	215	215	0	265	265	0	319	319	0
Total PF Professional Refrigeration (excl.)	282	407	407	0	459	459	0	525	525	0
Total CA Cooking Appliances	4777	6253	6253	0	6799	7271	472	6900	7318	418
Total CM household Coffee Makers	354	660	660	0	925	934	9	1035	1037	2
WM household Washing Machine	1615	2483	2834	351	2584	3231	647	2425	2904	479
DW Household Dishwashers	692	1515	2011	496	1998	2600	602	2481	3061	580
LD household Laundry Drier	518	1035	1035	0	1202	1342	139	1237	1347	110
VC Vacuum Cleaners	1683	4767	4767	0	8065	8293	228	9730	9730	0
FAN Industrial Fans >125W (excl. box/ roof)	90	264	264	0	326	447	121	340	426	86
MT Motors 0.75-375 kW	163	240	271	31	268	626	358	270	580	310
WP Water pumps	120	163	164	0	189	189	0	217	217	0
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	276	453	453	0	547	613	67	696	797	100
TYRE Replacement Tyres	4275	5062	5062	0	5590	5727	137	6237	6627	391
TOTAL in bn euros	**33**	**80**	**82**	**2**	**98**	**107**	**9**	**116**	**126**	**9**

Revenu Installation (in million euros)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1376	1674	1674	0	1781	3091	1311	1992	3512	1520
CHC Central Heating combi, water heat	1118	1947	1947	0	2339	4238	1899	2471	5002	2530
CH Central Heating boiler, space heat	5693	8283	8593	310	9426	19426	10000	11273	27823	16550
SFB Solid Fuel Boilers	372	587	587	0	530	590	59	567	633	66
AHC central Air Cooling	439	2403	2403	0	3411	3412	1	4387	4387	1
AHC central Air Heating (excl. reversible AC)	275	181	181	0	160	175	15	143	155	12
LH Local Heaters	2167	3285	3285	0	4213	4540	328	4730	5088	358
RAC Room Air Conditioner	223	2044	2044	0	3669	4059	390	4039	4533	495
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	17559	41252	41252	0	45816	46634	817	51021	51852	830
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	68	1129	1129	0	1397	1422	25	2022	2085	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	152	152	0	192	192	0	260	260	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	44	65	65	0	80	80	0	96	96	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)	82	242	242	0	300	410	110	313	391	78
MT Motors 0.75-375 kW	0	0	0	0	0	1142	1142	0	1034	1034
WP Water pumps	552	750	750	0	866	866	0	996	996	0
CP Standard air compressors	21	25	25	0	30	33	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**	**64**	**64**	**0**	**74**	**90**	**16**	**84**	**108**	**24**

Revenu Maintenance (excl. VAT, in million euros)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	5073	5887	5887	0	6183	6183	0	6447	6447	0
CHC Central Heating combi, water heat	1236	2377	2377	0	2761	2761	0	3126	3126	0
CH Central Heating boiler, space heat	12059	19346	19346	0	22364	22364	0	25842	25842	0
SFB Solid Fuel Boilers	351	210	210	0	265	265	0	266	266	0
AHC central Air Cooling	1007	4340	4340	0	6721	6721	0	8797	8797	0
AHC central Air Heating (excl. reversible AC)	101	101	101	0	86	86	0	76	76	0
LH Local Heaters	769	1212	1212	0	1562	1562	0	1852	1852	0
RAC Room Air Conditioner	65	551	551	0	792	792	0	1098	1098	0
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	955	3059	3059	0	4133	4133	0	4934	4934	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	120	120	0	154	154	0	226	226	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	291	649	649	0	788	788	0	1083	1083	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	443	652	652	0	800	800	0	959	959	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)	346	861	861	0	1108	1108	0	1266	1266	0
MT Motors 0.75-375 kW	0	0	0	0	0	0	0	0	0	0
WP Water pumps	1027	1398	1398	0	1618	1618	0	1867	1867	0
CP Standard air compressors	419	909	909	0	946	946	0	1034	1034	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	**24**	**42**	**42**	**0**	**50**	**50**	**0**	**59**	**59**	**0**

Total revenu by product group (in million euros)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	9202	10908	10908	0	11524	15456	3932	12423	16982	4559
CHC Central Heating combi, water heat	4379	7854	7854	0	9339	14680	5342	10077	17194	7117
CH Central Heating boiler, space heat	28325	43013	43897	885	49295	77866	28571	58050	105336	47286
SFB Solid Fuel Boilers	1531	2568	2568	0	2539	2731	192	2768	3021	253
AHC central Air Cooling	2562	11831	11831	0	17074	17077	3	21957	21960	2
AHC central Air Heating (excl. reversible AC)	790	555	555	0	486	524	38	434	464	30
LH Local Heaters	7758	12325	12325	0	15243	16588	1345	16647	18142	1495
RAC Room Air Conditioner	518	4710	4710	0	8261	9054	793	9319	10325	1007
CIRC Circulator pumps <2.5 kW	1111	1638	1770	133	1841	2293	452	1926	2181	254
VU Ventilation Units (res & nonres)	31980	76209	76209	0	85994	88183	2188	96420	98629	2210
LS Light Sources, in million units BAU	4576	10583	10781	198	11016	10538	-478	8245	3431	-4814
DP electronic DisPlays	11356	29534	29534	0	29745	29745	0	35031	35031	0
STB set top boxes (Complex & Simple)	0	5350	5350	0	5580	5580	0	5502	5502	0
VIDEO	16	7753	7753	0	4714	4714	0	4078	4078	0
ES Enterprise Servers	872	13620	13620	0	16767	17172	405	23891	24734	843
PC Personal Computers	3475	35915	35915	0	55833	55833	0	75854	75854	0
EP & IJ imaging equipment	5288	5954	5954	0	8733	8733	0	10164	10164	0
SB (networked) Stand-By (rest)	966	8615	8615	0	12924	12924	0	16700	16700	0
BC Battery Charged devices	na	na	na	na	na	na	na	na	na	na
UPS Uninterruptable Power Supplies	825	1708	1708	0	2127	2127	0	2892	2892	0
RF Household Refrigerators & freezers	6140	6701	7751	1050	6911	8752	1841	7122	9036	1914
Total CF Commercial Refrigeration	1905	2870	2870	0	3535	3535	0	4249	4249	0
Total PF Professional Refrigeration (excl.)	2823	4066	4066	0	4593	4593	0	5246	5246	0
Total CA Cooking Appliances	10219	13315	13315	0	14469	15475	1006	14669	15560	891
Total CM household Coffee Makers	738	1374	1374	0	1927	1947	19	2157	2160	3
WM household Washing Machine	3364	5172	5904	732	5384	6731	1347	5052	6051	999
DW Household Dishwashers	1443	3157	4189	1033	4163	5416	1253	5170	6377	1208
LD household Laundry Drier	1079	2156	2156	0	2505	2795	290	2578	2807	229
VC Vacuum Cleaners	4020	10460	10460	0	17386	17878	493	20914	20914	0
FAN Industrial Fans >125W (excl. box/ roof)	1325	3745	3745	0	4667	5986	1319	4977	5914	937
MT Motors 0.75-375 kW	537	791	894	103	883	4482	3599	891	4103	3212
WP Water pumps	2783	3783	3784	1	4373	4373	0	5036	5036	0
CP Standard air compressors	897	1498	1498	0	1643	1712	69	1805	1867	62
TRAFO Utility Transformers	2756	4529	4529	0	5465	6130	665	6962	7967	1005
TYRE Replacement Tyres	19598	23122	23122	0	25433	26115	682	28344	30217	1873
TOTAL in bn euros	**175**	**377**	**382**	**4**	**452**	**508**	**55**	**528**	**600**	**73**

Total revenu by functional group (in billion euros)

	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	62	63	1	74	105	31	84	134	50
SPACE COOLING	3	14	14	0	21	22	0	27	27	1
VENTILATION	32	76	76	0	86	88	2	96	99	2
LIGHTING	5	11	11	0	11	11	0	8	3	-5
ELECTRONICS	23	108	108	0	136	137	0	174	175	1
FOOD PRESERVATION	11	14	15	1	15	17	2	17	19	2
COOKING	11	15	15	0	16	17	1	17	18	1
CLEANING	10	21	23	2	29	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	20	23	23	0	25	26	1	28	30	2
TOTAL in bn euros	**175**	**377**	**382**	**4**	**452**	**508**	**55**	**528**	**600**	**73**

Total revenu by sector (in billion euros)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	73	161	163	2	193	217	24	226	257	31
Wholesale	14	31	31	0	37	43	7	42	51	9
Retail	33	80	82	2	98	107	9	116	126	9
Installation	30	64	64	0	74	90	16	84	108	24
Maintenance	24	42	42	0	50	50	0	59	59	0
TOTAL in bn euros	**175**	**377**	**382**	**4**	**452**	**508**	**55**	**528**	**600**	**73**

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%) and the effort.

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	51	91	39
CHC Central Heating combi, water heat	26	46	46	0	55	99	45	58	117	59
CH Central Heating boiler, space heat	137	199	206	7	226	467	240	271	668	397
SFB Solid Fuel Boilers	15	33	33	0	32	35	2	36	39	3
AHC central Air Cooling	18	81	81	0	111	111	0	140	140	0
AHC central Air Heating (excl. AC rev)	7	4	4	0	4	4	0	3	4	0
LH Local Heaters	73	119	119	0	144	159	15	153	170	17
RAC Room Air Conditioner	3	27	27	0	49	55	5	54	61	7
CIRC Circulator pumps <2.5 kW	17	26	28	2	29	36	7	30	34	4
VU Ventilation Units (res & nonres)	212	501	501	0	563	579	17	630	647	17
LS Light Sources	60	126	127	2	127	114	-13	98	38	-61
DP electronic DisPlays	107	277	277	0	279	279	0	329	329	0
STB set top boxes (Complex & Simple)	0	69	69	0	72	72	0	71	71	0
VIDEO	0	77	77	0	47	47	0	38	38	0
ES Enterprise Servers	11	173	173	0	213	218	5	303	314	11
PC Personal Computers	32	333	333	0	524	524	0	712	712	0
EP & IJ imaging equipment	69	71	71	0	106	106	0	124	124	0
SB (networked) Stand-By (rest)	10	95	95	0	145	145	0	189	189	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	59	65	75	10	67	85	18	69	87	19
Total CF Commercial Refrigeration	20	30	30	0	37	37	0	45	45	0
Total PF Professional Refrigeration (excl.)	40	57	57	0	64	64	0	73	73	0
Total CA Cooking Appliances	102	132	132	0	143	153	10	145	154	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	52	12	50	62	12
LD household Laundry Drier	10	21	21	0	24	27	3	25	27	2
VC Vacuum Cleaners	41	104	104	0	171	176	5	206	206	0
FAN Industrial Fans >125W (excl. box/ roof)	12	35	35	0	44	60	16	46	57	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	0	15	16	0
TRAFO Utility Transformers	44	72	72	0	87	98	11	111	127	16
TYRE Replacement Tyres	221	260	260	0	285	293	8	317	339	22
TOTAL in 1000 jobs	**1466**	**3215**	**3254**	**39**	**3859**	**4340**	**480**	**4512**	**5132**	**618**

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	22
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	2	2	0	3	3	0	3	3	0
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	6	6	0
VIDEO	0	3	3	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	19	19	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	1	2	2	0	2	2	0	3	3	0
Total PF Professional Refrigeration (excl.)	2	3	3	0	4	4	0	4	4	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	1	2	2	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	17	20	20	0	22	23	1	25	27	2
TOTAL in 1000 jobs	**58**	**123**	**124**	**1**	**146**	**172**	**26**	**169**	**205**	**35**

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	45	2	50	103	53	60	147	88
SFB Solid Fuel Boilers	0	1	1	0	1	1	0	1	1	0
AHC central Air Cooling	2	8	8	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	20	23	2	22	24	2
RAC Room Air Conditioner	1	6	6	0	11	12	1	12	13	1
CIRC Circulator pumps <2.5 kW	1	2	2	0	2	2	0	2	2	0
VU Ventilation Units (res & nonres)	24	57	57	0	66	71	5	75	80	5
LS Light Sources, in million units BAU	20	59	60	1	65	69	4	45	22	-23
DP electronic DisPlays	89	232	232	0	234	234	0	276	276	0
STB set top boxes (Complex & Simple)	0	5	5	0	5	5	0	5	5	0
VIDEO	0	50	50	0	30	30	0	32	32	0
ES Enterprise Servers	3	41	41	0	51	52	1	72	75	3
PC Personal Computers	27	279	279	0	432	432	0	590	590	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	50	50	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	55	70	15	57	72	15
Total CF Commercial Refrigeration	2	4	4	0	4	4	0	5	5	0
Total PF Professional Refrigeration (excl.)	5	7	7	0	8	8	0	9	9	0
Total CA Cooking Appliances	80	104	104	0	113	121	8	115	122	7
Total CM household Coffee Makers	6	11	11	0	15	16	0	17	17	0
WM household Washing Machine	27	41	47	6	43	54	11	40	48	8
DW Household Dishwashers	12	25	34	8	33	43	10	41	51	10
LD household Laundry Drier	9	17	17	0	20	22	2	21	22	2
VC Vacuum Cleaners	28	79	79	0	134	138	4	162	162	0
FAN Industrial Fans >125W (excl. box/ roof)	1	4	4	0	5	7	2	6	7	1
MT Motors 0.75-375 kW	3	4	5	1	4	10	6	4	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	71	84	84	0	93	95	2	104	110	7
TOTAL in 1000 jobs	**553**	**1338**	**1364**	**26**	**1640**	**1785**	**145**	**1940**	**2094**	**154**

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	19	19	0	23	42	19	25	50	25
CH Central Heating boiler, space heat	57	83	86	3	94	194	100	113	278	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	45	3	47	51	4
RAC Room Air Conditioner	2	20	20	0	37	41	4	40	45	5
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	176	413	413	0	458	466	8	510	519	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	0	0	0	0	0	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	0	1	1	0	1	1	0	1	1	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	7	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	**301**	**640**	**643**	**3**	**742**	**903**	**161**	**843**	**1079**	**235**

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	64	64	0
CHC Central Heating combi, water heat	12	24	24	0	28	28	0	31	31	0
CH Central Heating boiler, space heat	121	193	193	0	224	224	0	258	258	0
SFB Solid Fuel Boilers	4	2	2	0	3	3	0	3	3	0
AHC central Air Cooling	10	43	43	0	67	67	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	6	6	0	8	8	0	11	11	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	41	41	0	49	49	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	6	6	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	4	7	7	0	8	8	0	10	10	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	1	3	3	0	3	3	0	3	3	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	**239**	**411**	**411**	**0**	**496**	**496**	**0**	**582**	**582**	**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	138	194	56	150	215	65
CHC Central Heating combi, water heat	57	102	102	0	121	197	76	130	231	101
CH Central Heating boiler, space heat	352	530	543	13	607	1014	407	717	1390	673
SFB Solid Fuel Boilers	23	42	42	0	42	45	3	46	50	4
AHC central Air Cooling	35	159	159	0	227	227	0	290	290	0
AHC central Air Heating (excl. AC rev)	11	8	8	0	7	7	1	6	7	0
LH Local Heaters	115	184	184	0	226	248	21	245	269	24
RAC Room Air Conditioner	7	61	61	0	107	118	11	121	134	13
CIRC Circulator pumps <2.5 kW	19	28	31	2	32	40	8	33	38	4
VU Ventilation Units (res & nonres)	427	1015	1015	0	1144	1175	30	1283	1313	31
LS Light Sources, in million units BAU	81	187	191	3	195	186	-9	146	61	-85
DP electronic DisPlays	199	516	516	0	520	520	0	612	612	0
STB set top boxes (Complex & Simple)	0	81	81	0	84	84	0	83	83	0
VIDEO	0	131	131	0	80	80	0	71	71	0
ES Enterprise Servers	15	232	232	0	285	292	7	406	421	14
PC Personal Computers	60	623	623	0	971	971	0	1321	1321	0
EP & IJ imaging equipment	94	106	106	0	155	155	0	181	181	0
SB (networked) Stand-By (rest)	16	134	134	0	200	200	0	256	256	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	109	119	138	19	123	156	33	127	161	34
Total CF Commercial Refrigeration	28	43	43	0	53	53	0	63	63	0
Total PF Professional Refrigeration (excl.)	46	67	67	0	76	76	0	86	86	0
Total CA Cooking Appliances	183	238	238	0	259	277	18	262	278	16
Total CM household Coffee Makers	13	24	24	0	34	35	0	38	39	0
WM household Washing Machine	60	92	105	13	96	120	24	90	108	18
DW Household Dishwashers	26	56	75	18	74	97	22	92	114	22
LD household Laundry Drier	19	38	38	0	45	50	5	46	50	4
VC Vacuum Cleaners	71	185	185	0	309	317	9	371	371	0
FAN Industrial Fans >125W (excl. box/ roof)	19	53	53	0	66	87	20	70	85	15
MT Motors 0.75-375 kW	4	6	7	1	7	53	46	7	48	41
WP Water pumps	35	48	48	0	55	55	0	63	63	0
CP Standard air compressors	11	15	15	0	17	18	0	19	20	0
TRAFO Utility Transformers	50	82	82	0	99	111	12	126	144	18
TYRE Replacement Tyres	309	365	365	0	401	412	11	446	476	30
TOTAL in 1000 jobs	**2616**	**5727**	**5796**	**69**	**6884**	**7697**	**812**	**8047**	**9091**	**1043**

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	167	232	232	0	259	391	132	280	446	166
SPACE HEATING (excl. reversible AC)	524	823	838	15	967	1412	445	1107	1820	713
SPACE COOLING	38	190	190	0	280	286	5	351	357	7
VENTILATION	427	1015	1015	0	1144	1175	30	1283	1313	31
LIGHTING	81	187	191	3	195	186	-9	146	61	-85
ELECTRONICS	396	1848	1848	0	2326	2333	7	2973	2988	14
FOOD PRESERVATION	184	229	248	19	251	284	33	276	311	34
COOKING	196	262	262	0	293	311	18	301	317	16
CLEANING	175	372	404	31	523	584	60	599	643	43
INDUSTRY COMPONENTS	69	122	122	1	145	213	67	159	216	56
ENERGY SECTOR	50	82	82	0	99	111	12	126	144	18
TRANSPORT SECTOR	309	365	365	0	401	412	11	446	476	30
TOTAL in 1000 jobs	**2616**	**5727**	**5796**	**69**	**6884**	**7697**	**812**	**8047**	**9091**	**1043**

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)	1466	3215	3254	39	3859	4340	480	4512	5132	618
Wholesale	58	123	124	1	146	172	26	169	205	35
Retail	553	1338	1364	26	1640	1785	145	1940	2094	154
Installation	301	640	643	3	742	903	161	843	1079	235
Maintenance	239	411	411	0	496	496	0	582	582	0
TOTAL in 1000 jobs	**2616**	**5727**	**5796**	**69**	**6884**	**7697**	**812**	**8047**	**9091**	**1043**

ANNEX H: References

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