Report

ECODESIGN IMPACT ACCOUNTING

Part 1 – Status Nov. 2013

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Client:

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

Author:

René Kemna (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
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
CHAL	Chiller, Air-cooled, Large
CHAS	Chiller, Air-cooled, Small
CHC	Central heating combi (boiler)
CHeng	Chiller combustion engine driven
CHsorp	Chiller, ab-/adsorption type
CHWL	Chiller, Water-cooled, Large
CHWS	Chiller, Water-cooled, Small
CIRC	Circulator
CM	Coffee maker
CO_2	Carbon Dioxide
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
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
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	**RVU**	Residential VU
LoNA	Low network availability	**SB, sb**	Standby
LS	Light source	**SCOP**	Seasonal coefficient of performance (for space heating of heat pump)
ltr	Liters		
m	million	**SEER**	Seasonal energy efficiency ratio (for space cooling of heat pump)
m €	million euro		
max.	maximum	**SFB**	Solid fuel boilers
MeNA	Medium network availabilty	**SFD**	Single function device
MFD	Multi funtion device	**SHR**	Slow Heat Release (stoves)
mg	milligrammes (0.001 gramme)	**SSTB**	Simple set-up box
min.	minimum	**STB**	Set-up box
MT	Industrial motors	**t**	metric tonne (1000 kg)
Mt	Mega tonnes (10^9 kg)	**TEC**	Typical energy consumption
mtoe	mega tonne oil equivalent	**Th**	Tera (10^{12}) hours
MWh	Megawatt hours (1000 kWh)	**Th on**	Tera hours 'on'
NAS	Network attached storage	**Th sb**	Tera hours 'standby'
NCV	Net calorific value	**Tlm**	Tera lumen
NOx	Nitrogen Oxides (emission)	**Tm³**	Tera cubic metre
NRVU	Non-residential VU	**toe**	Tonne of oil equivalent
PC	Personal computer	**TRAFO**	Distribution transformer
PF	Professional refrigeration products	**TWh**	Terawatt hours=10^{12} Wh = 10^9 kWh
ps	Place setting (dishwasher load unit, consisting of a defined set of different plates, cutlery, etc.)	**TYRE**	Replacement Tyre
R...1	Rate (price per unit) for residential customers	**UV, UVA, UVB, UVC**	Ultraviolet, types A, B, C (radiation)
R…2	Rate (price per unit) for non-residential customers	**VC**	Vacuum cleaner
		VRF	Variable Referigerant Flow (AC)
RAC	Room air conditioner	**VU**	Ventilation unit
rpm	Rounds per minute	**W**	Watt
RR	Rolling resistance	**WH**	Water heater
RRC	Rolling resistance coefficient	**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 kgoe (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 available on 1 November 2013.

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 the accounting represent approximately 36 000 PJ (860 Mtoe) of direct and indirect primary energy consumption. This is 48% 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 7000 PJ (166 mtoe, 1930 TWh) primary energy saving, i.e. a saving of 19% for the average product;
- Of this, 465 TWh is electricity (direct 40 mtoe plus indirect 60 mtoe) and 2770 PJ (66 mtoe) is direct fuel saving;
- 320 Mt CO2 equivalent (7% of 2010 EU-total) less greenhouse gas emissions;
- 336 million m³ drinking water and 0.4 Mt printer paper saving; 214 kt less NOx emissions;
- € 110 bn net saving on consumer expenditure (ca. € 170 bn gross saving, € 60 bn extra acquisition);
- € 54 bn extra revenue for industry, wholesale and retail sector;
- 0.8 million extra direct jobs for industry, wholesale and retail sector.[1]

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.

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

[1] 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.

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.

A first update of the accounting has been foreseen for the end of March 2015 ('Part 2' of the contract), including new products and new figures for products for which measures were not finalized per 1.11.2013. A final update is foreseen for October 2015 ('Part 3').

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. Also not taken into account is an ex post re-evaluation where some specific adopted measures such as the ones on space/water heating and electric motors were subject to 'last-minute' changes before the vote.[2]
- However, for some product groups the accounting has been conservative, e.g. for personal computers and professional refrigeration.[3] Also as regards the effect of labelling of new products (i.e. beyond 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;
- 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 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.

[2] E.g. the exemption for combi-boilers <30 kW instead of <10kW, the limitation of the motor-scope to only single speed AC motors instead of a general scope. This may have cost up to one-third of the projected savings for 2020;

[3] For instance, there is no savings for PCs, because it was not possible to quantify them with the data available. No savings were projected for professional refrigeration, as at the reference date for the projections (1.11.2013) there was no draft Working Document and the information in the preparatory study was insufficient to derive any credible targets

CONTENT

Annexes

MS Excel files:

EIA Masterfile (15 Mb), complete dataset and equations, 1-year time step;

EIA Printerfile (3.4 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. In 2014 the EC will review the EL Directive and may review the ED 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 2014 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 (recently launched) develops and manages a European database on energy efficiency and other relevant environmental aspects of selected product groups made available on the EU market.
- A number of studies are ongoing or will be soon launched reviewing the impact of ecodesign and labelling implementing measures already in place.

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 three impact assessment reports (IARs) of product groups where (updated) projections are available, to be delivered to the EC on:

- 8 months after starting date: Part 1, including tasks 1, 2 and 3;
- 17 months after starting date: Part 2, update task 2;
- 23 months after starting date (1 Sept. 2015): Part 3, 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 1st of Sept. 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.

[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.

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 1 Oct. 2013. The planning below corrects for the three months delay.

Planning milestones:

- Project start: 1 Oct. 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: 1 June 2014 (8 months after starting date);
- Reference date Part 2 for the status of preparatory and impact assessment studies: 1 Nov. 2014.
- Delivery of Part 2: 30 March 2015 (17 months after starting date);
- Reference date Part 3 for the status of preparatory and impact assessment studies: 1 May 2015.
- Delivery of Part 3: 1 Sept. 2015 (23 months after starting date).
- Project end: 1 October 2015 (duration of contract 24 months)

A graphic representation of the timeline is given below.

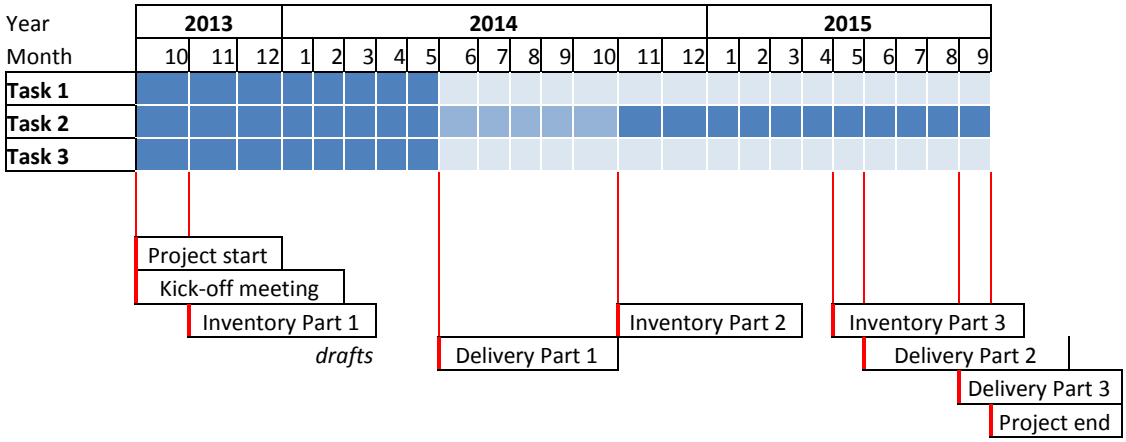

Figure 1. Project timeline

1.5. Activities realised for Part 1

Overall, the activities of the contractor followed the 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 5tht 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 Nov. 2013, 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” (15 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 (3.4 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 preparatory and IA studies. 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 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 catalyst and compass, accelerating the trend towards energy efficient and environmentally friendly products.

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 for the 2030-2050 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.

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, such as the ones on space heating boilers and electric motors, were subject to 'last-minute' changes before the vote.[5] Preparatory and impact assessment studies are primarily an input to decision making; ex post re-evaluation for accounting purposes is not a priority.

[5] E.g. the exemption for combi-boilers <30 kW instead of <10kW, the limitation of the motor-scope to only single speed AC motors instead of a general scope. This may have cost up to one-third of the projected savings for 2020;

On the other hand, for some product groups the accounting has been conservative. This has been the case e.g. for personal computers and professional refrigeration where in November 2013 there wer no indications to differentiate between the BAU and the ECO scenario.[6]

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;
- for space heating and cooling load of buildings, the historical trends are extrapolated with a fixed percentage (minus 1% per year);
- the BAU and the ECO scenario use the same performance/load, only the product's efficiency differs.

[6] For instance, there is no savings for PCs, because it was not possible to quantify them with the data available. No savings were projected for professional refrigeration, as at the reference date for the projections (1.11.2013) there was no draft Working Document and the information in the preparatory study was insufficient to derive any credible targets

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.[7]

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 D). For most energy sources there are two rates, e.g. Rel1 and Rel2 for electricity, whereby the former relates to the residential sector and the latter relates to the non-residential sector. Apart from rates for energy, the sheet also contains rates for water (in €/m³), printer toner & paper, detergents and vacuum cleaner bags. The nominal energy rates are not used in the calculation, but only given as a background information

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

The inflation corrected rates, i.e. whereby all rates are recalculated to fixed € 2010 euros, is given in the RATES sheet (see Annex D). 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[8] 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 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[9]—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.
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.

[8] 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.

[9] Boolean parameter CC in the Excel sheets.

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.[10] 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. [11]

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.[12] 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.

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

[11] 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.

[12] 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%.[13] 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.[14]

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 (yet) give a problem because the available studies for these product groups –where such a credit is currently being discussed—treat the possible credit as an ex-post factor that is clearly separated from the overall calculation.

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 D).

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.

[13] 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).

[14] 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 D.

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 [15]), water consumption (litres per year[16]), 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 D (LOAD sheet),

[15] 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.

[16] 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.

with further explanations of the test and calculation procedures in. The load of the product is expressed by parameters such as:

- kWh per year heating or cooling for a given nominal capacity of the product (in kW),
- the energy equivalent in kWh per year of the annual hot-water volume delivered with a certain temperature according to a declared standardised tapping pattern,
- m^3 of ventilation air per m^2 building surface with a certain effectiveness and heat recovery[17],
- lumens (lm) emitted by light sources,
- dm^2 of viewable surface area of TVs displaying standardized dynamic video content,
- standard test cycles, mimicking typical (standby- and) usage pattern as well as usage intensity,
- m^3 of storage volume at chill (e.g. +5°C) and/or freezing (e.g. -18°C) conditions, for food preservation,
- dust pick-up (dpu in grammes of test dust) on hard floor and/or carpets, for vacuum cleaners,
- kg of laundry washed and dried according to predefined test cycles,
- kWh of mechanical or aero-/ hydrodynamic labour performed by motors, fans, pumps and compressors, etc..

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

Efficiency

The 'efficiency'[18] 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 output/load are both expressed in kWh (heat output). The value then becomes 'dimensionless'

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

[18] Or 'luminous efficacy' for light sources, 'Seasonal Coefficient of Performance' (SCOP) for the heating and 'Seasonal Energy Efficiency Rate' (SEER) for the cooling performance t of heat pumps/air-conditioners, etc.

(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 D, 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 D). 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.

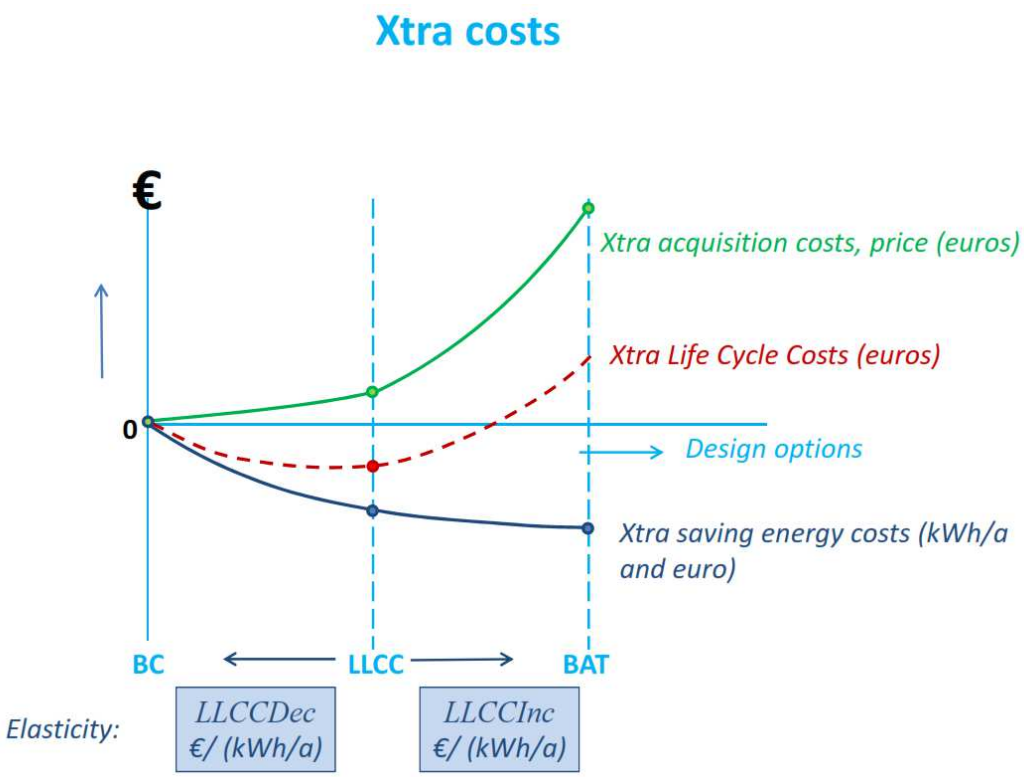

Figure 4. Illustration of anchor points in the calculation of the Least Life Cycle Costs.

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)[19];
- 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%)
- Retail/Installer 'wages', in euro/employee (not actual wages, but total company revenue divided by staff; usually around 0.1 m euro/installer

constants
Manuwages
OEMfactor
ExtraEUfrac
Wholewages
Retailwages

[19] 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.

personnel or 0.06 m euro/retailer personnel ±20%)

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

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

$$EUOEMJobs_0 = EUManuJobs_0 \text{ x } OEMfactor \quad [15]$$

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

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

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 overcomethe 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 studyThe boiler efficiency has actually been changing over the years. At first, there was an increased 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[20]).

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

The price-elasticity of the efficiency improvement (in €/% or €/kWh) for both functions may be different, i.e. it may be more costly to improve heating efficiency than the cooling efficiency. So there

[20] 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 A to C.

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

PRICE_HEAT= PRICE* HEAT_SALES/(COOL_SALES+HEAT_SALES)

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.

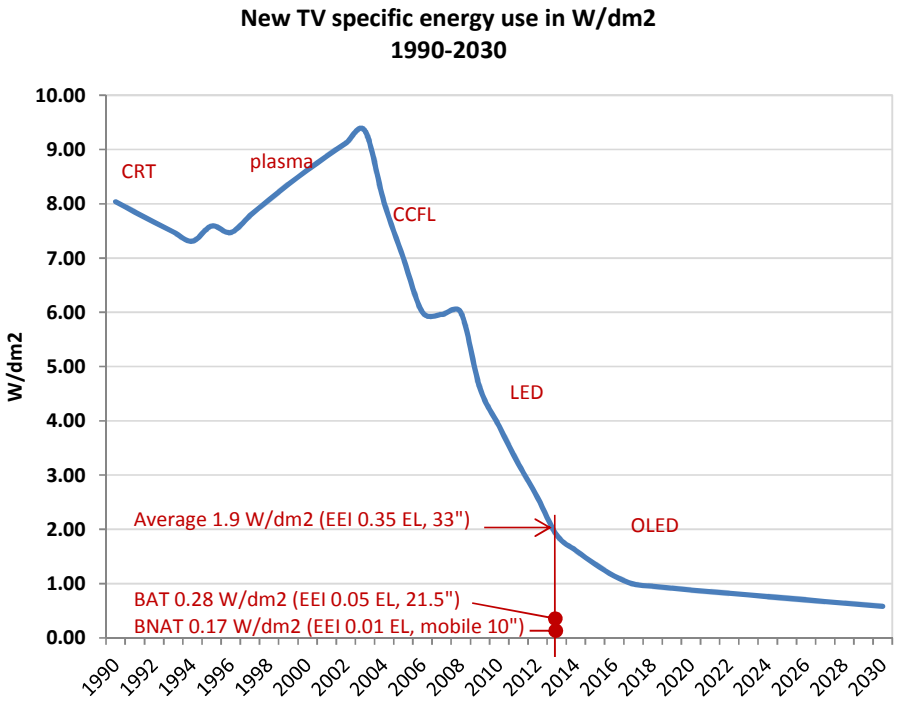

Figure 2. Specific energy use in W/dm^2 of new TVs

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'[22], 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.

[22] 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 dm^2 of viewable area, of around a factor 25.

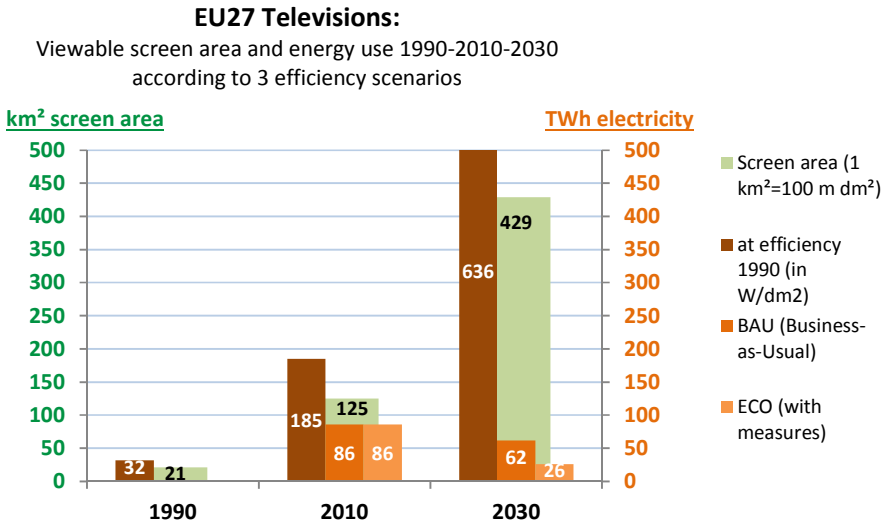

Figure 3. EU-27 television 1990-2030. Evolution of the load as well as the energy consumption according to 'freeze', BAU and ECO scenarios

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 D. 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) The efficiency of electric space heating devices does not take into account the efficiency of power generation and distribution (Ecodesign default 40%), i.e. 1 kWh electricity equals 1 kWh fuel and 1 kWh heat according the Eurostat conventions.

d) 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).

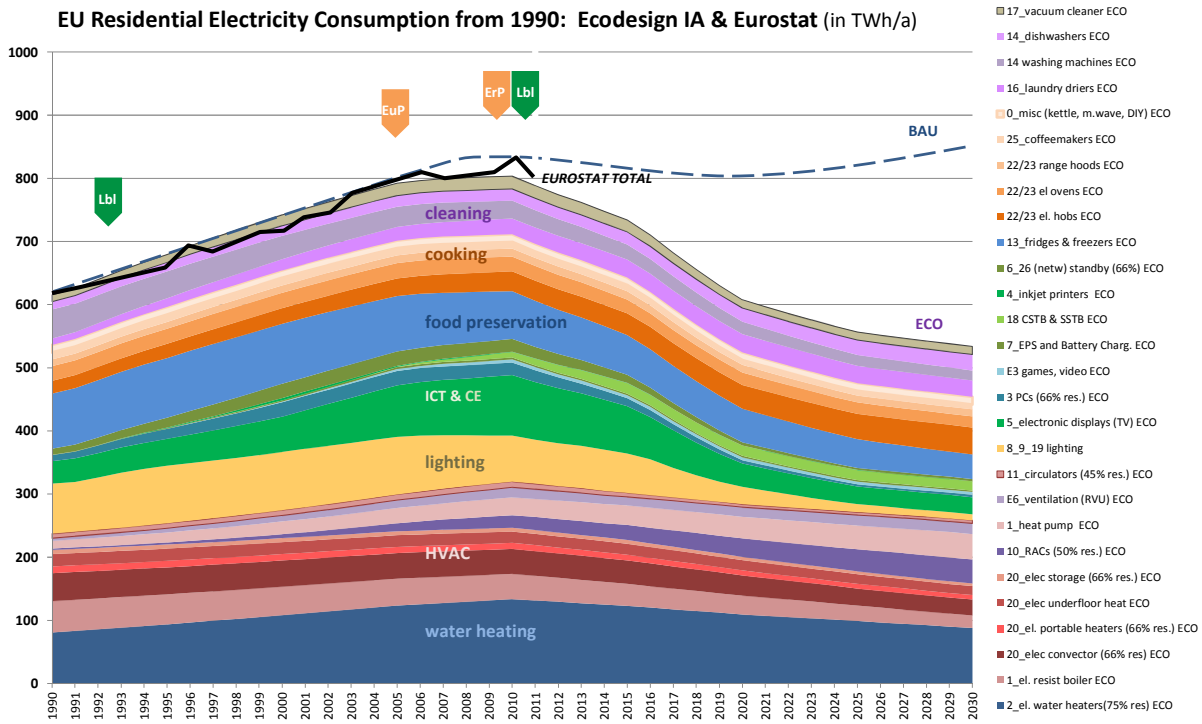

Figure 4. Comparison of interim data from ecodesign impact accounting (coloured graph) versus Eurostat energy balance outcomes (black line), for the EU residential electricity consumption. (VHK, Jan. 2014).

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 1.11.2013

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 November 2013. 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.

These provisional ECO-scenario figures will be corrected or confirmed in Part 2 of this contract (to be published March 2015).

Annex A gives an overview of the various ED, EL, ES and TL measures and their status on the 1st of November 2013. The full references are given in Annex K.

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 B**.

On the 1st of November 2013 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 2006-2013 (7 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 basecases),
- understanding and selective copying data from Excel files to templates,
- updating data where newer data are available (from later Review or IA studies),
- complementing/estimating lacking core data (exception where external sources were consulted),
- correcting calculation errors (contractors not following MEEuP/MEErP),
- updating and harmonising tariffs and price data as much as possible,
- transforming product databases to statistical distribution tables,
- preliminary total calculations to check compatibility with Eurostat conventions

The overview in Annex B shows studies, product groups where data have been used. **Annex C** 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 D**, which summarizes the core calculation in the MS Excel Masterfile, the sheets are organized per parameter.

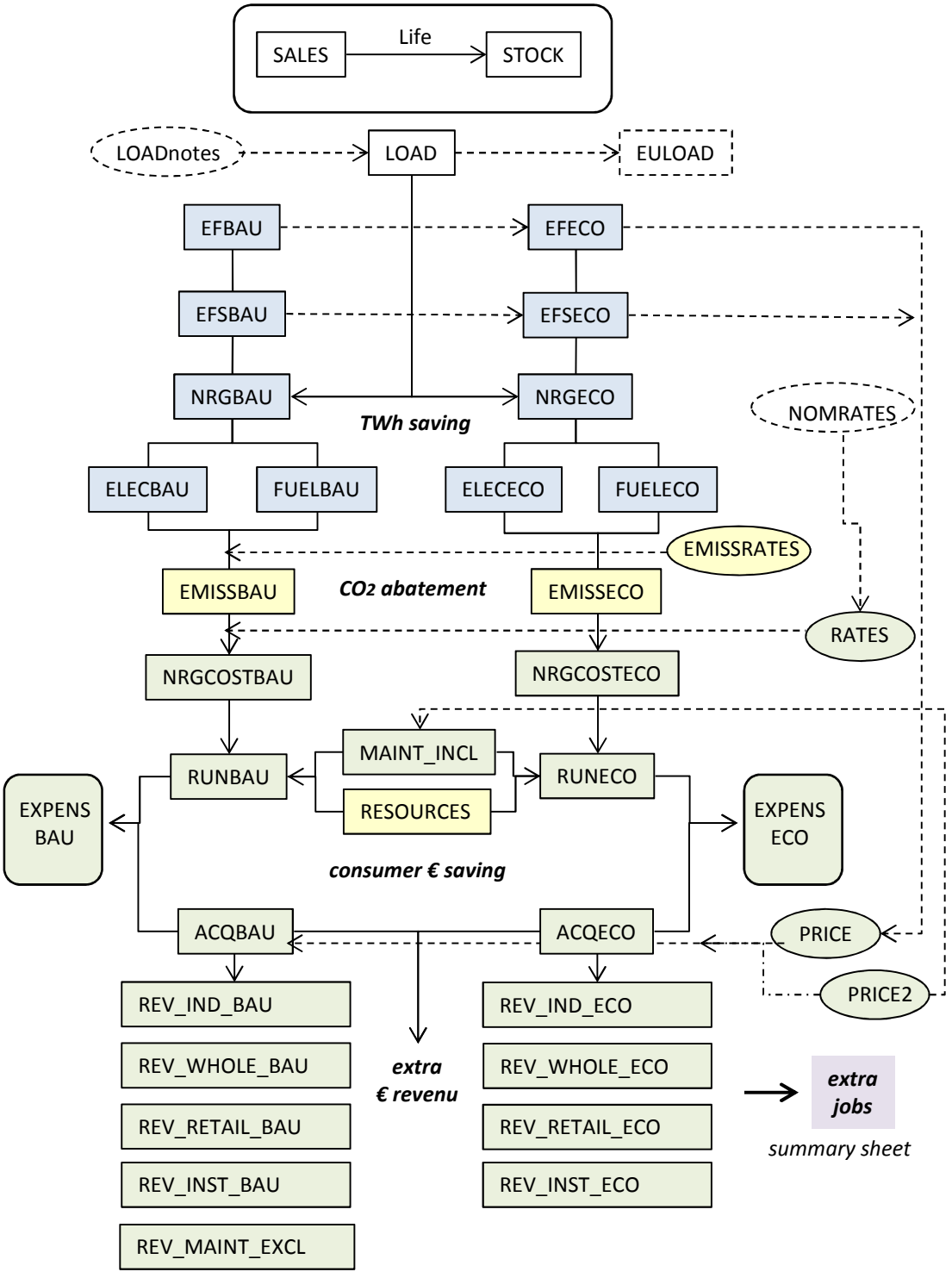

Figure 5. Structure of Annex D (core calculation). generic; energy ; non-energy ; money; jobs

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_BAU** (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 D, but in the summary sheets of Annex G. The inputs however are the revenue calculations in Annex D.

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

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 36 000 PJ (860 mtoe, 10 000 TWh) of direct and indirect primary energy consumption or 48% of total EU-28 gross energy consumption in 2010 (1759 mtoe).

The primary energy savings of these products for the EU-28 in 2020 (ECO versus BAU) amounts to 1932 TWh (6955 PJ, 166 mtoe), of which 213 TWh (767 PJ, 18 mtoe) are achieved in the period 1990-2010[23] and 1719 TWh (6188 PJ, 148 mtoe) in the period 2010-2020.

On average the energy saving is 19% for the products included in the accounting. For the EU as a whole it means an energy saving of 9%.

The primary energy savings are achieved from an electricity saving of 465 TWh electricity (1162 TWh primary energy, including losses of power generation) and 2770 PJ or 769 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 50%, to 11 240 PJ (269 mtoe, 3123 TWh) with an average saving of the included products of 31%. Compared to the EU 2010 total this is a saving of 15%.

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

Figure 6 demonstrates that, without new measures, the savings diminish and even out after 2030. For instance, in 2050 the saving is only 32% for the average included product (16% 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.

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

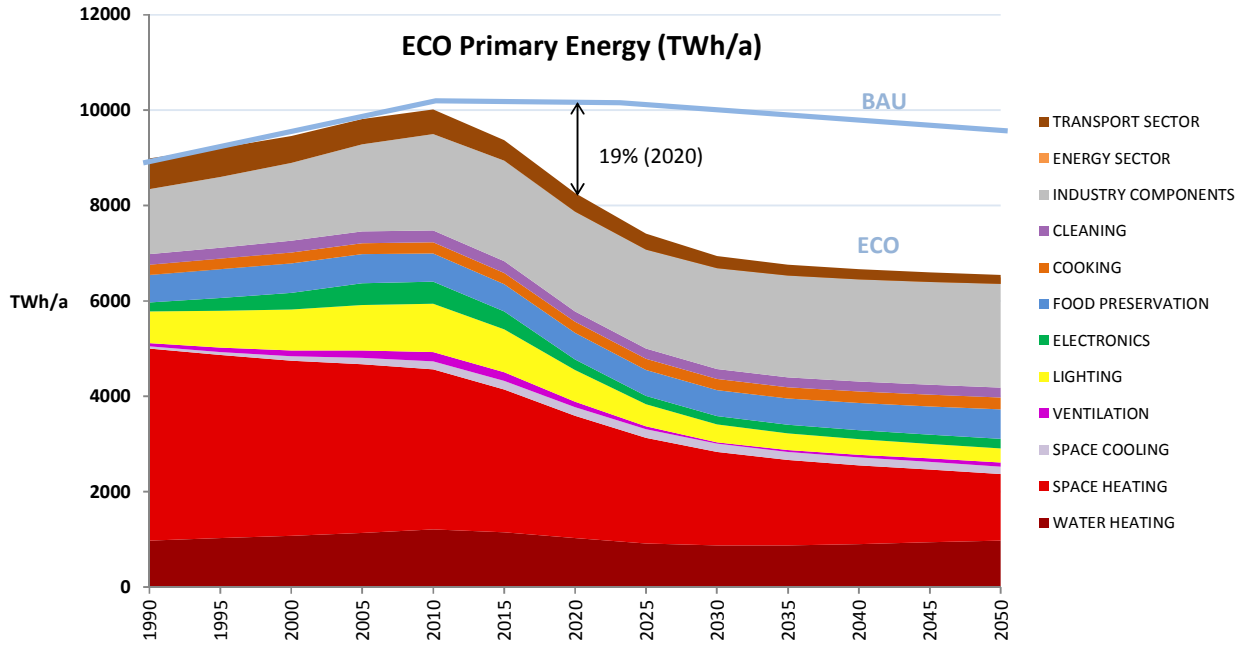

Figure 6. Primary energy consumption of products included in ecodesign impact accounting, status 1 Nov. 2013 (energy sector impact not shown)

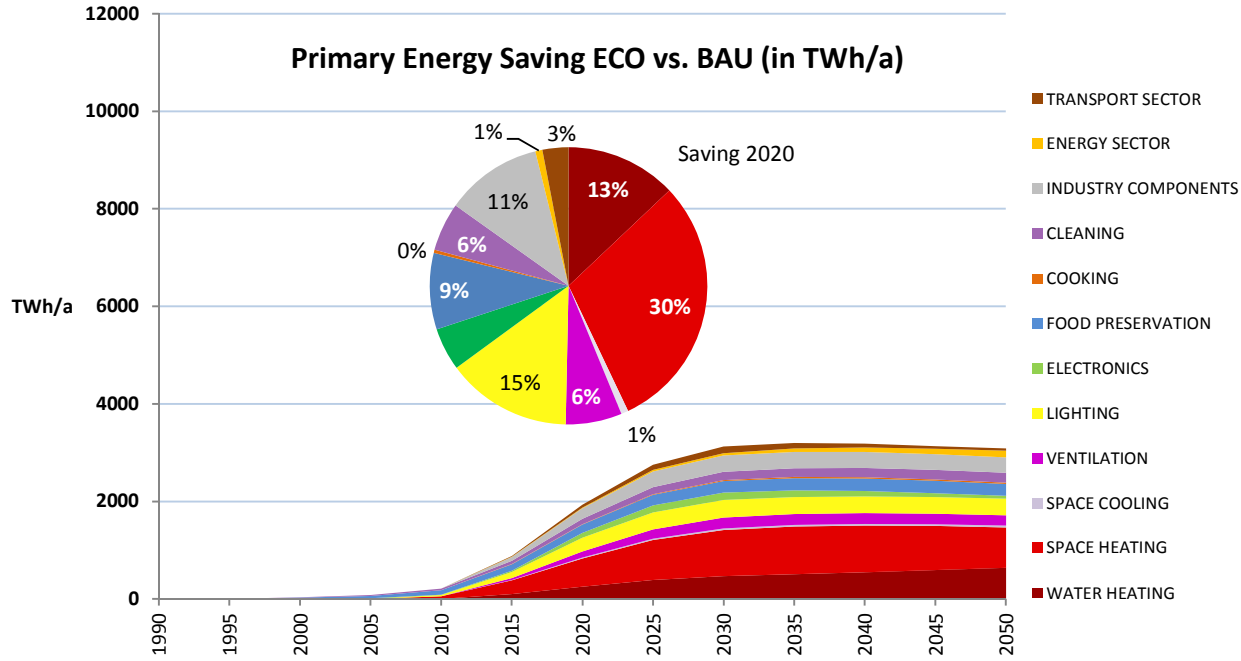

Figure 7. Primary energy saving of ECO versus BAU of products in ecodesign impact accounting, status 1 Nov. 2013

For 2030 these results increase approximately by over 50%. The projections for the period 2030-2050 show that without new measures the pace of improvements slows down and eventually evens out.

3.4.3. Emissions

The greenhouse gas emission reduction, from less fuel-related CO_2 and emissions of refrigerants, amounts to 320 Mt CO_2 equivalent in the EU in 2020 (ECO versus BAU). This is 18% of the included

products and 6.7% of the EU total (4721 Mt CO2[24]). For 2030 a reduction of 496 Mt CO_2 equivalent is expected. This is a 31% 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 305 kt SO_2 equivalent[25] in the EU 2020 (ca. 3% of EU 2010 total NO_x emissions[26]). 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 being discussed, but there is no final decision on the 1st of November and therefore they 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 D, 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[27]).

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 D.

3.4.5. Consumer expenditure

In 2020 approximately € 110 bn will be saved by consumers resulting from Ecodesign and labelling measures. This is the result from a € 170 bn gross saving on running costs (87% energy) and € 60 bn extra acquisition costs for more efficient products. Given BAU-totals in the EU 2020 of € 1383 bn spent on running costs (€ 951 bn) and acquisition costs (€ 432 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[28] 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 November 2013. It should be interpreted with caution, because for some product groups like central space cooling, professional/commercial refrigeration (food preservation) no final decision has been taken and the provisional ECO scenario is chosen very close (or equal) to the BAU scenario.

[24] Source: EEA, GHG Inventory 2012. Total for EU-27 excl. LULUCF.

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

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

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

[28] 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 with space cooling and food refrigeration are expected to increase once the final decision has been taken on 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 (49%). For electronics the acquisition costs are 75% of the total costs and relative 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 D, but otherwise also in all money-related worksheets.

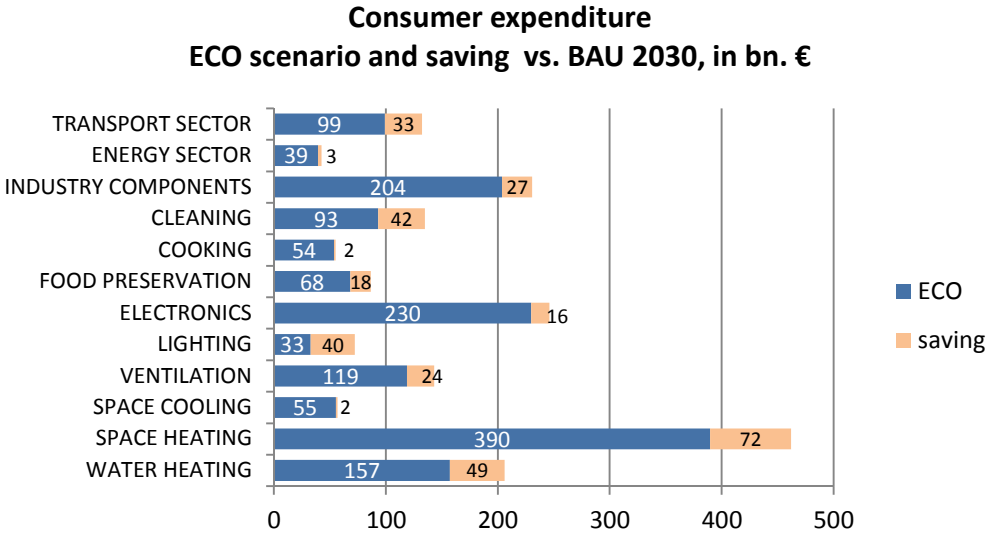

Figure 8. Consumer expenditure EU 2030 on products included in the accounting.

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 € 75 bn compared to a situation without measures. Some 43% will go to industry, 11-12% to wholesale and 45% to retail, subdivided into 13-16% retail and –because there is a large share of installed products-- 30-33% to installers.

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

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 direct jobs due to the measures are calculated. 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.

3.5. Outlook

A first update of the accounting is foreseen for the end of March 2015 ('Part 2' of the contract), including new products and new figures for products for which measures were not finalized per 1.11.2013. A final update is foreseen for October 2015 ('Part 3').

New product groups expected for Part 2, where there should be at least sufficiently robust data for a BAU scenario, include

- Professional laundry appliances (ENER Lot 24)
- Uninterruptable Power Supplies (ENER Lot 27)
- Waste water pumps (ENER Lot 28)
- Large pumps and pool pumps (ENER Lot 29)
- Special motors (ENER Lot 30)
- Industrial Ovens (ENTR Lot 4)
- Machine Tools (ENTR Lot 5)
- Medical Equipment (self-regulation, with enough robust data to be included)

New figures may be needed for products that are included in the current accounting but where the measures were not finalized per 1 November 2013. Relevant product groups include

- Ventilation units (ENTR Lot 6), positive vote December 2013
- Distribution transformers (ENTR Lot 2), positive vote December 2013
- Solid fuel boilers (ENER Lot 15), decision expected before Nov. 2014
- Local heaters (ENER Lot 20), idem
- Air heating and cooling appliances (ENER Lot 21/6), idem
- Electronic Displays (ENER Lot 4 reviewed), idem
- Enterprise servers (ENTR Lot 9), study expected to be concluded by Nov. 2014

Appendices

ANNEX A: Status of measures per 1.11.2013

Ecodesign, Energy Labelling, Energy Star & Voluntary Agreements [status 1.1.2013]

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					WD draft
21 /E6	AHC Air Cooling & Heating (>12 kW)					WD draft
20	LH Local Heaters					WD draft
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					WD app
Lighting						
8 /9 /19	LS Light Sources	CD 98/11		CDR 874/2012		rev.
	Tertiary sector (LFL, HID, ballast)	Dir 2000/55 (ballasts, MEPS)	CR 245/2009, am 347/2010			rev.
	NDLS Non Directional LS		CR 244/2009, am 859/2009			rev.
	DLS Directional LS		CR 1194/2012			rev.
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	Computer servers					prep.
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)
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					WD draft
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/L 298/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			
11	MT Industrial motors (> 1 hp)		CR 640/2009, am 4/2014			
11	WP Water pumps		CR 547/2012			
Energy sector						
E2	TRAFO Utility Transformers					WD app
Transportation sector						
T	TYRE Replacement Tyres			Dir		
Other (see note)						
24	Professional dishwashers					1st draft WD
E0	Medical equipment (VA)					www.cocir.org
E4	Industrial furnaces and ovens					
E5	Machine tools					VA?

ANNEX A: MEASURES

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 an 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 B: Studies per 1.11.2013

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		
21 /E6	AHC Air Cooling & Heating (>12 kW)	Armines, Sept. 2011 (Lot E6, AC); BIOIS, July 2012 (Lot 21)		
20	LH Local Heaters	BIOIS, June 2012		
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)		
Lighting				
8 /9 /19	LS Light Sources			
	Tertiary sector (LFL, HID, ballast)	VITO, Jan-April 2007	SEC(2009)324	COM(2010/C 92/04)
	NDLS Non Directional LS	VITO, Oct. 2009	SEC(2009)327	
	DLS Directional LS	VITO, Oct. 2009	SWD(2012)419	
Electronics				
5	DP electronic DisPlays	Fh IZM, Aug. 2007	SEC(2009)1011	Guide 2009
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	CS Computer servers	BIOIS/Fh IZM, ongoing		
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)
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		
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 (> 1 hp)	ISR, Feb. 2008	SEC(2009)1013	
11	WP Water pumps	AEA, Feb. 2008	SWD(2012)178	
Energy sector				
E2	TRAFO Utility Transformers	VITO/ BIOIS, Jan. 2011		
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		
24	Professional dishwashers	BIOIS/Öko/Ö-Q, May 2011		
	Professional washing machines and driers	BIOIS/Öko, May 2011		
Ongoing studies				
27	Uninterruptable Power Supplies (UPS)	Ricardo-AEA, ongoing		
28	Wastewater Pumps	BIOIS/ Atkins, ongoing		
29	Pool- & acquarium pumps	BIOIS/ Atkins, ongoing		
30	Special motors (not in CR 640/2009)	ISR, ongoing		
31	Compressors	VHK, ongoing		
32	Windows	ift/VHK/VITO, ongoing		
E7	Steam boilers	PwC/Fh ISI/NTUA, ongoing		
E8	Power cables	VITO, ongoing		
JRC	Taps and shower heads	IPTS, ongoing		

ANNEX B: STUDIES

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 C: Product groups and defined base cases per 1.11.2013

Full IA data availability expected under-VHK contract for product 33 groups (nrs. 1-27, 29-30,36-38, 41). On the inventory date (1.11.2013) 52 product groups with in total 286 base cases were defined. The status per 1.11.2013 is given between brackets.

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 (>750 W), Lot 11 (Regulation)

Electric industrial motors

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)

- 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)

- 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 (ongoing, draft IA)

- 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 (ongoing, part IA)

- 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 and AC products, Lot 21 (+ENTR Lot 6 AC + ENTR Lot1 HT Chillers) (draft WD, part IA)

Chillers, Air, Small (CHAS)
Chillers, Air, Large (CHAL)
Chillers, Air, Fossil fuel fired, sorption type (CHAF)
Chillers, Water, Small (CHWS)
Chillers, Water, Large (CHWL)
Chillers, Water, Fossil-fuel fired, engine type (CHWF)
Air Conditioning total (AC_all, aggregate of)
AC rooftop
AC splits
AC VRF (Variable Refrigerant Flow)
Air Conditioning, Fossil-fuel fired, engine type (ACF, type AC/ HP eng)
Air Heaters, Fossil-fuel fired (AHF_all, aggregate of)
AHFS (AHF small)
AHFL (AHF Large) central
AHFL (AHF Large) local (was previously included in local heaters Lot 20)
Air Heaters electric (AH el)
High Temperature process Chillers, Air, Small (HTAS)
High Temperature process Chillers, Air, Large (HTAL)
High Temperature process Chillers, Water, Small (HTWS)
High Temperature process Chillers, Water, Large (HTWL)

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 (prep. study ongoing, data incomplete)

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 ongoing, data incomplete)

Small induction motor - 1 phase IE1 0.12 - 0.75 kW [0.37 kW] (BC1)
Small induction motor - 3 phase IE1 0.12 - 0.75 kW [0.37 kW] (BC2)
Medium induction motor (S) - 3 phase IE3 0.75 - 7.5 kW [1.1 kW] (BC3)
Medium induction motor (M) - 3 phase IE3 7.5 - 75kW [11 kW] (BC4)
Medium induction motor (L) - 3 phase IE3 75 - 375kW [110 kW] (BC5)
Large induction motor - LV IE2 375 - 1,000kW [750 kW] (BC6)
Large induction motor - MV IE2 375 - 1,000kW [750 kW] (BC7)
VSD (Variable Speed Driven) - Very Small 0.12 - 0.75 kW [0.37 kW] (BC8)
VSD - Small 0.75 - 7.5kW [1.1 kW] (BC9)
VSD - Medium 7.5 - 75kW [11 kW] (BC10)
VSD - Large 75 - 375kW [110 kW] (BC11)
VSD - Very Large 375 - 750kW [550 kW] (BC12)
Soft Starter - Small 0.12 - 7.5kW [1.1 kW] (BC13)
Soft Starter - Medium 7.5 - 75kW [11 kW] (BC14)
Soft Starter - Large 75 - 750kW [110 kW] (BC15)

31 CP Compressors, Lot 31 (prep. study ongoing, data incomplete)

Standard air compressor (BC1)
Low pressure compressor (BC2)
Oilfree/ non-lubricated air compressor (BC3)
Turbo (Nitro/ air) compressor (BC4)
Rotary lobe / air compressor (BC5)
Piston compressor (BC6)
turbo (Other gasses) compressor (BC7)
Screw/oil-free compressor (BC8)
Screw/oil-injected compressor (BC9)
Rotary lobe / other gas compressor (BC10)

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)

E0 MED Medical imaging equipment ENTR (Voluntary agreement, IA data incomplete)

MR scanner
CT scanner
X-ray Angio

NO DATA (just or not yet started)

32	**WIN**	**Windows, Lot 32**
33	**SGA**	**Smart grid appliances, Lot 33**
34		void
35	**POW**	**Selected power generation equipment, Lot 35**
36	**INS**	**Thermal insulation, Lot 36**
E7	**BOIL**	**Steam boilers, Lot ENTR 7**
E8	**CABL**	**Power cables in indoor installations, Lot ENTR 8**
E9	**ES**	**Enterprise servers, Lot ENTR 9**
V1	**TAP**	**Water taps and shower heads, Lot ENV 1**
V2	**TOIL**	**Toilets, Lot ENV 2**

ANNEX D: Ecodesign Impact Accounting by Parameter

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ANNEX D: 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 Nov. 2013. 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	CHAS Chillers, Air-cooled, Small	21	88	97	107	118	130	142	154	166	178
21 /E6	CHAL Chillers, Air-cooled, Large	2	6	6	7	7	7	7	8	8	8
21 /E6	CHsorp, Sorption chillers	0	1	1	2	2	3	3	4	5	5
21 /E6	CHWS Chillers, Water-cooled, Small	2	9	10	11	12	13	14	15	16	18
21 /E6	CHWL Chillers, Water-cooled, Large	1	2	3	3	3	3	3	3	3	3
21 /E6	CHeng Chillers, combustion engine driven	0	1	1	1	2	2	3	3	4	4
21 /E6	AC Air Conditioning, all	73	324	385	369	348	348	328	309	289	269
21 /E6	*o/w AC rooftop*	*13*	*31*	*23*	*19*	*16*	*16*	*13*	*9*	*6*	*3*
21 /E6	*o/w AC splits*	*55*	*224*	*255*	*241*	*226*	*226*	*211*	*196*	*181*	*167*
21 /E6	*o/w AC VRF*	*5*	*69*	*107*	*109*	*107*	*107*	*105*	*103*	*101*	*99*
21 /E6	ACF (AC/ HP eng) Fossil fuel fired AC	0	1	1	1	2	2	3	3	4	4
21 /E6	**AHC central Air Cooling**	**99**	**431**	**503**	**500**	**494**	**509**	**504**	**499**	**494**	**489**
21 /E6	AC all, rev	22	224	298	311	311	325	317	309	289	269
21 /E6	*o/w AC rooftop, rev*	*4*	*22*	*18*	*16*	*14*	*15*	*12*	*9*	*6*	*3*
21 /E6	*o/w AC splits, rev*	*17*	*155*	*197*	*203*	*202*	*211*	*204*	*196*	*181*	*167*
21 /E6	*o/w AC VRF, rev*	*2*	*48*	*83*	*92*	*96*	*100*	*101*	*103*	*101*	*99*
21 /E6	ACF (AC/ HP eng), rev	0	0	1	1	2	2	3	3	4	4
21 /E6	AHF Fossil-fuel fired Air Heaters	133	87	82	77	73	69	65	61	57	53
21 /E6	*o/w AHFS (Small)*	*41*	*7*	*5*	*3*	*2*	*2*	*1*	*0*	*0*	*0*
21 /E6	*o/w AHFL central (Large)*	*37*	*30*	*28*	*26*	*24*	*22*	*21*	*19*	*18*	*16*
21 /E6	*o/w AHFL local (Large)*	*55*	*50*	*49*	*48*	*46*	*45*	*44*	*42*	*41*	*39*
21 /E6	AH el, electric resistance Air Heater	3	5	5	5	5	3	0			
21 /E6	**AHC central Air Heating**	**158**	**317**	**385**	**394**	**391**	**399**	**385**	**373**	**350**	**326**
20	LH open fireplace	514	750	775	760	750	750	750	750	750	750
20	LH closed fireplace/inset	315	850	996	1047	1074	1074	1074	1074	1074	1074
20	LH wood stove	340	400	450	487	500	500	500	500	500	500
20	LH coal stove	155	120	110	100	75	50	25	0	-25	-50
20	LH cooker	249	500	648	708	744	744	744	744	744	744
20	LH SHR stove	215	300	366	445	541	550	559	568	577	586
20	LH pellet stove	0	230	300	350	400	400	400	400	400	400
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	415	425	435	445
20	LH flueless fuel heater	249	500	500	450	400	350	300	250	200	150
20	LH elec.portable	5901	7200	7411	7657	8043	8349	8654	8960	9265	9571
20	LH elec.convector	9310	11360	11692	12080	12690	13172	13654	14137	14619	15101
20	LH elec.storage	270	330	340	351	369	383	397	411	425	439
20	LH elec.underfloor	1065	1300	1338	1382	1452	1507	1563	1618	1673	1728
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**	**19009**	**24342**	**25449**	**26360**	**27591**	**28392**	**29193**	**29994**	**30795**	**31596**
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, in million 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, in million 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	**CS Computer Serverss**	**221**	**2500**	**2500**	**2500**	**2500**	**2500**	**2500**	**2500**	**2500**	**2500**
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**
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)	798	2617	3004	3391	3391	3391	3391	3391	3391	3391
11	FAN Axial>300Pa	826	2857	3014	3171	3171	3171	3171	3171	3171	3171
11	FAN Centr.FC	410	1042	1203	1363	1363	1363	1363	1363	1363	1363
11	FAN Centr.BC-free	126	306	348	390	432	440	449	457	465	474
11	FAN Centr.BC	128	341	390	440	490	500	549	599	649	698
11	FAN Cross-flow	118	264	301	337	374	381	418	455	491	528
11	**FAN Industrial Fans >125W**	**2406**	**7427**	**8260**	**9092**	**9220**	**9246**	**9341**	**9435**	**9530**	**9625**
11	**MT Industrial motors > 1 hp**	**6719**	**9899**	**10394**	**10850**	**10850**	**10850**	**10850**	**10850**	**10850**	**10850**
11	**WP Water pumps**	**1227**	**1666**	**1791**	**1926**	**2070**	**2214**	**2359**	**2503**	**2648**	**2792**
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, unless otherwise shown)	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		**8862**	**5265**	**5969**	**6600**	**6920**	**6603**	**6627**	**7169**	**8293**	**9732**
CHAS	**22**	392	1 246	1 589	1 895	2 136	2 346	2 585	2 837	3 097	3 360
CHAL	**22**	40	98	119	134	142	146	150	155	160	165
CHsorp	**20**	0	6	10	17	25	35	46	58	69	81
CHWS	**22**	40	126	160	191	215	235	258	283	308	334
CHWL	**22**	15	38	46	52	55	57	59	61	63	65
CHeng	**15**	0	4	8	12	18	25	32	40	47	54
AC all	**15**	276	3 780	4 608	5 227	5 502	5 451	5 245	5 045	4 747	4 450
o/w AC rooftop	**15**	44	490	470	401	322	273	239	207	159	112
o/w AC splits	**15**	203	2 702	3 198	3 525	3 626	3 554	3 401	3 253	3 031	2 810
o/w AC VRF	**15**	28	587	940	1 301	1 554	1 624	1 605	1 585	1 556	1 527
ACF (AC/ HP eng)	**15**	0	4	8	12	18	25	32	40	47	54
AHC central Air Cooling		**763**	**5 301**	**6 548**	**7 540**	**8 112**	**8 321**	**8 408**	**8 519**	**8 539**	**8 562**
AC all, rev	**15**	76	2 166	3 062	3 889	4 457	4 733	4 797	4 800	4 647	4 429
o/w AHC AC rooftop, rev	**15**	12	275	302	290	257	236	218	196	155	111
o/w AHC AC splits, rev	**15**	56	1 544	2 118	2 615	2 934	3 085	3 110	3 094	2 967	2 797
o/w AHC AC VRF, rev	**15**	7	347	642	983	1 266	1 411	1 469	1 510	1 525	1 521
ACF (AC/ HP eng), rev	**15**	0	3	5	9	15	22	30	38	46	54
AHF all	**16**	2 183	1 543	1 421	1 328	1 247	1 175	1 110	1 047	989	936
o/w AHFS	**15**	718	197	127	89	62	43	28	15	5	-
o/w AHFL central	**17**	633	570	536	501	465	431	400	372	345	320
o/w AHFL local	**15**	832	777	758	739	720	702	682	661	639	617
AH el	**10**	38	85	73	50	50	43	23	5	-	-
AHC central Air Heating (AC rev double)		**2 297**	**3 797**	**4 561**	**5 276**	**5 769**	**5 973**	**5 959**	**5 891**	**5 682**	**5 418**
LH open fireplace	**25**	10 356	15 101	16 447	17 553	18 330	18 790	18 925	18 850	18 770	18 750
LH closed fireplace/inset	**25**	4 639	12 532	15 785	19 078	22 036	24 383	25 877	26 559	26 796	26 850
LH wood stove	**25**	7 715	9 084	9 562	10 182	10 842	11 453	11 985	12 335	12 474	12 500
LH coal stove	**25**	5 265	3 460	3 215	3 005	2 760	2 425	1 990	1 470	875	250
LH cooker	**15**	2 966	5 957	7 250	8 704	10 012	10 788	11 088	11 160	11 160	11 160
LH SHR stove	**25**	4 433	6 188	6 845	7 782	9 066	10 462	11 787	12 911	13 711	14 110
LH pellet stove	**15**	-	1 910	2 960	4 000	4 910	5 550	5 900	6 000	6 000	6 000
LH open fire gas	**20**	985	1 561	1 704	1 860	2 000	2 110	2 180	2 200	2 200	2 200
LH closed fire gas	**20**	6 076	6 897	7 102	7 308	7 513	7 718	7 920	8 120	8 320	8 520
LH flueless fuel heater	**7**	1 577	3 167	3 484	3 350	3 010	2 660	2 310	1 960	1 610	1 260
LH elec.portable	**9**	51 061	62 304	65 013	67 181	69 773	72 840	75 687	78 438	81 188	83 939
LH elec.convector	**9**	80 563	98 302	102 576	105 997	110 087	114 925	119 417	123 757	128 097	132 437
LH elec.storage	**15**	3 788	4 622	4 836	5 029	5 219	5 425	5 648	5 866	6 076	6 286
LH elec.underfloor	**29**	26 978	32 918	34 512	36 060	37 636	39 235	40 812	42 359	43 959	45 617
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		**207 035**	**264 775**	**282 097**	**297 917**	**314 032**	**329 603**	**342 367**	**352 824**	**362 076**	**370 718**
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 (residential & nonR)		**19360**	**43417**	**51583**	**56142**	**60325**	**65605**	**71799**	**78793**	**85828**	**92864**
LFL	**6.87**	1161	1928	2220	2304	2292	2193	2083	1968	1870	1778
CFL	**12.07**	325	3453	4737	4698	4084	3604	3232	2928	2667	2424
Tungsten	**3.76**	297	2034	2484	2639	2189	1612	1188	840	636	575
GLS	**2.22**	3731	2726	2057	1492	917	306	67	5	2	2
HID	**2.50**	40	97	89	86	81	81	81	81	81	81
LED	**23.29**	0	18	208	1274	3707	6261	8204	9711	10884	11754
LS Light Sources, in million units BAU		**5554**	**10255**	**11796**	**12493**	**13270**	**14057**	**14855**	**15533**	**16140**	**16615**
STOCK (000 units, light m units)	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LFL	**6.31**	1161	1930	2159	1911	1300	799	581	412	233	88
CFL	**12.07**	325	3682	4589	3431	1227	352	34	21	21	21

Tungsten	**3.81**	297	2059	2706	991	142	16	16	16	16	16
GLS	**2.22**	3731	1952	129	153	94	86	86	86	86	86
HID	**2.56**	40	98	66	47	27	15	15	15	15	15
LED	**21.35**	0	14	644	5482	10269	12685	13896	14705	15467	16174
GLS stock	**2.22**	0	187	566	47	0	0	0	0	0	0
Tungsten stock	**3.81**	0	90	433	73	0	0	0	0	0	0
LS Light Sources, in million units ECO		**5554**	**10011**	**11292**	**12136**	**13058**	**13954**	**14628**	**15254**	**15838**	**16399**
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		**228000**	**568000**	**604920**	**575460**	**646431**	**696422**	**750031**	**804673**	**859324**	**913974**
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)		**0**	**177700**	**271033**	**218489**	**222795**	**215157**	**227654**	**246370**	**265086**	**283802**
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**	**151008**	**117513**	**85435**	**76389**	**82340**	**81566**	**81566**	**81566**	**81566**
CS Computer Servers	**5**	**841**	**12417**	**12500**	**12500**	**12500**	**12500**	**12500**	**12500**	**12500**	**12500**
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		**29423**	**242735**	**357110**	**483000**	**616000**	**731500**	**766000**	**796000**	**826000**	**856000**
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**	**64063**	**122603**	**136035**	**145132**	**151159**	**159775**	**168375**	**177137.5**	**186100**	**195100**
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)		**29314**	**361900**	**453500**	**539514**	**604500**	**664000**	**723500**	**783000**	**842500**	**902000**
BC Battery Charged devices	**3**	**61429**	**1000000**	**1000000**	**1000000**	**1000000**	**1000000**	**1000000**	**1000000**	**1000000**	**1000000**
RF Household Refrigerators & freezers	**16**	**268000**	**297800**	**303200**	**308000**	**312800**	**317600**	**322400**	**327200**	**332000**	**336800**
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
STOCK (000 units, unless otherwise shown**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**

CM household Coffee Makers		**126 808**	**155 842**	**158 518**	**161 657**	**165 757**	**170 855**	**175 890**	**180 861**	**185 833**	**190 805**
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**	11 974	32 872	38 586	43 076	47 381	50 090	50 865	50 865	50 865	50 865
FAN Axial>300Pa	**15**	12 391	36 488	41 850	44 267	46 151	47 250	47 564	47 564	47 564	47 564
FAN Centr.FC	**15**	6 149	12 943	15 736	17 553	19 001	20 124	20 445	20 445	20 445	20 445
FAN Centr.BC-free	**15**	1 886	3 913	4 651	5 103	5 599	6 114	6 473	6 665	6 803	6 928
FAN Centr.BC	**15**	1 922	4 333	5 200	5 720	6 303	6 909	7 455	8 002	8 687	9 432
FAN Cross-flow	**15**	1 773	3 148	3 627	4 214	4 839	5 286	5 690	6 094	6 600	7 151
FAN Industrial Fans >125W *(excl. box/ roof)*		**36 095**	**93 696**	**109 650**	**119 933**	**129 274**	**135 773**	**138 492**	**139 634**	**140 963**	**142 384**
MT Industrial motors > 1 hp	**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**
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	**4.21**	720	877	892	1 025	1 181	1 212	1 212	1 212	1 212	1 212
TYRE van replacement tyres C2	**3.4**	153	177	181	209	241	245	245	245	245	245
TYRE truck replacement tyres C3	**3.4**	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

Test and calculation methods for solid fuel boilers are only available as a draft because current Commission proposals have not (yet) been approved. In principle they are similar to the ones for the other central heating boilers far as seasonal efficiency is concerned.

The performance in kWh annual heat output is, as is the case for other boilers, a multiplication of operating hours (h) and the rated heat output (P, in kW) as given in the table below.

Furthermore, the model assumes an autonomous annual decrease (HeatDec) of the heating load after the year 2010 and an increase before 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 :
ηs =BLF*(0.85*ηp + 0.15*ηn) - F1 - F2 + F3

		P	h	HeatDec
SFB Wood Manual	kWh heat/a	18	1000	2%
SFB Wood Direct Draft	kWh heat/a	20	1000	2%
SFB Coal	kWh heat/a	25	1000	2%
SFB Pellets	kWh heat/a	25	1000	2%
SFB Wood chips	kWh heat/a	160	1000	2%

Air Heating and Cooling

Test and calculation methods for central air heating and cooling are available only as drafts, because the regulation has not (yet) been approved.

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 thus do not include distribution losses or emitter losses.

[all according to draft communication text on transitional method 2013]

In the model, an aggregate GCV to NCV conversion factor of 1.08 (CHsorp) or 1.09 (AHF) is used between published values in IA study and the model.

		P	h	HeatDec
CHAS	kWh cool/a	44	600	1%
CHAL	kWh cool/a	714	600	1%
CHsorp	kWh cool/a	50	600	1%
CHWS	kWh cool/a	61	600	1%
CHWL	kWh cool/a	894	600	1%
CHeng	kWh cool/a	50	600	1%
AC all	kWh cool/a	28	600	1%
AC rooftop	kWh cool/a	80	600	1%
AC splits	kWh cool/a	14	600	1%
AC VRF	kWh cool/a	50	600	1%
ACF (AC/ HP eng)	kWh cool/a	50	600	1%
		P	h	HeatDec
o/w AHC AC all, rev	kWh heat/a	28	1400	1%
o/w AHC AC rooftop, rev	kWh heat/a	80	1400	1%
o/w AHC AC splits, rev	kWh heat/a	14	1400	1%
o/w AHC AC VRF, rev	kWh heat/a	50	1400	1%
o/w AHC ACF (AC/ HP eng), rev	kWh heat/a	50	1400	1%
AHF all	kWh heat/a	59	1400	1%
AHFS	kWh heat/a	15	1400	1%
AHFL central	kWh heat/a	120	1400	1%
AHFL local	kWh heat/a	28.6	1400	1%
AH el	kWh heat/a	20	1400	1%

LH Local Space Heaters

Test and calculation methods for central air heating and cooling are available only as drafts, because the regulation has not (yet) been approved.

The 'seasonal efficiency' of all local space heaters, except luminous and tube heaters, is based on the thermal efficiency at nominal heat output, established for GCV of the fuel (except for electric heaters of course).

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.

Flueless heaters are also covered by the intended ecodesign regulation, but for information requirements only.

[all according to draft communication text on transitional method 2013]

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

**=Regulation gas and oil local heaters in NCV. Luminous and tube heaters in GCV*

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
o/w RAC reversible (heating demand) — 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

		CTRL	x (motor)	MISC	ηt	heat saved vs.ref, kWh	heat saved, kWh prim/	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
DP Monitor viewable area	dm²
DP TV share of UHD/ 3D (all TV types)	%
DP Monitor share of UHD/ 3D	%
DP TV standby	h sb/d
DP Monitor standby	h sb/d

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.
For monitors, according to Energy Star before July 2013, test luminance is at a fixed 200 cd/m².
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.
Both for TV and monitors an on-mode use of 4h/d is assumed

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 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 TEC

The average power draw of servers depends on the number of CPU-sockets (1, 2 or 4) and the load (between 'active idle' and 100% load). The average load is around 30%. The average number of sockets is not given in the report but e.g. the 2-socket server used around 1400 kWh/a in 2009 (at 160W) and will use 960 kWh/a in 2013 (110W at 8760 h). Power draw for 1-CPU servers is 70W (2009) and 35W (2013). Power draw for 4-CPU servers is 340W (2009) and 280W (2013). Note that the relationship between number of sockets and power is not fully linear (but close).

If the 2-socket server represents the average (around 3/4 of shipments according to Gartner) then the energy demand on the whole product group is in the order of 17.5 TWh in 2009 and 12 TWh in the EU-2013.

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
PC Workstation	TEC	Only regulation of internal power supply efficiency till now. Other aspects to do (provisional estimates VHK used in the model)

Imaging Equipment

EP-Copier mono	TEC	EP (TEC) products are Standard-size copiers, Multifunction Devices (MFDs), and printers that use Electrophotography (EP), Solid Ink (SI), and High Performance Ink Jet (IJ) marking technologies. IJ (OM) products cover the remainder of mainly non high-performance inkjet (IJ) products.
EP-Copier colour	TEC	
EP-printer mono	TEC	
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.(EU27 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
RF Household Refrigerators		
RF Net volume Vnet (CECED 2013)	ltr	from CECED database
RF Estimated equivalent volume Veq	ltr	Veq=∑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
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 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 m³, 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 m³ (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
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 WM Rated capacity ***c*** , in kg WM Real (rated) load, in kg WM Cycles/yr per unit (est.) WM programme time WM SAEc (EEI=100)	°C kg/cycle kg/cycle cyc/a kWh/a	SAEC=47c +51.7 (SAEC= Standard Annual Energy Consumption, calculated from c=capacity, in kg) EEI=AEC/SAEC (EEI=Energy Efficiency Index) AEC=220*[(3E60 + 2E60½ + 2E40½)/7] +Esb AEC is Annual Energy Consumption (measured); Esb is standby energy (small, see regulation) 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.
DW Household Dishwashers		
DW Real average programme temperature, in DW Rated capacity, ps, in place settings DW Real load, in place settings DW Cycles/yr per unit (est.) DW programme time DW SAEc (EEI=100)	°C ps/cycl ps/cycl cyc/a kWh/a	SAEC=7ps+378 (normal size) or 25.2ps+126 (compact) EEI=AEC/SAEC AEC=280 x Ecyc +Esb Esb is standby energy (small, see regulation) 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

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)
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.
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	0.247	2000
FAN Axial>300Pa	kWh flow/ a	0.489	2000
FAN Centr.FC	kWh flow/ a	0.141	3000
FAN Centr.BC-free	kWh flow/ a	2.120	3000
FAN Centr.BC	kWh flow/ a	2.052	3000
FAN Cross-flow	kWh flow/ a	0.031	1865

MT Industrial motors > 1 hp (=750 W), 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):
WP Water pumps (load)	kWh flow/a	
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	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]

0.85 kg/ltr, 36 MJ/litre; 50/50 --> 34.2 MJ/litre (0.817 kgoe/litre, 9.5 kWh/litre)

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	15162	10595	9675	8835	8068	7301	6534	5767	5000	4233
SFB Wood Manual	kWh heat/a	18000	18000	16303	14766	13374	12113	10972	9937	9000	8152
SFB Wood Direct Draft	kWh heat/a	20000	20000	18115	16407	14860	13459	12191	11041	10001	9058
SFB Coal	kWh heat/a	25000	25000	22643	20509	18575	16824	15238	13802	12501	11322
SFB Pellets	kWh heat/a	25000	25000	22643	20509	18575	16824	15238	13802	12501	11322
SFB Wood chips	kWh heat/a	160000	160000	144917	131256	118882	107675	97525	88331	80004	72462
CHAS	kWh cool/a	32213	26400	25119	23900	22740	21636	20554	19472	18391	17309
CHAL	kWh cool/a	522729	428400	407608	387825	369002	351093	333538	315984	298429	280874
CHsorp	kWh cool/a	36606	30000	28544	27159	25840	24586	23357	22128	20898	19669
CHWS	kWh cool/a	44659	36600	34824	33134	31525	29995	28496	26996	25496	23996
CHWL	kWh cool/a	654510	536400	510366	485596	462028	439604	417623	395643	373663	351683
CHeng	kWh cool/a	36606	30000	28544	27159	25840	24586	23357	22128	20898	19669
AC all	kWh cool/a	20499	16800	15985	15209	14471	13768	13080	12392	11703	11015
AC rooftop	kWh cool/a	58569	48000	45670	43454	41345	39338	37371	35404	33437	31471
AC splits	kWh cool/a	10250	8400	7992	7604	7235	6884	6540	6196	5852	5507
AC VRF	kWh cool/a	36606	30000	28544	27159	25840	24586	23357	22128	20898	19669
ACF (AC/ HP eng)	kWh cool/a	36606	30000	28544	27159	25840	24586	23357	22128	20898	19669
o/w AHC AC all, rev	kWh heat/a	47831	39200	37297	35487	33765	32126	30520	28914	27307	25701
o/w AHC AC rooftop, rev	kWh heat/a	136661	112000	106564	101392	96471	91789	87200	82610	78021	73431
o/w AHC AC splits, rev	kWh heat/a	23916	19600	18649	17744	16882	16063	15260	14457	13654	12850
o/w AHC AC VRF, rev	kWh heat/a	85413	70000	66603	63370	60294	57368	54500	51631	48763	45894
o/w AHC ACF (AC/ HP eng), rev	kWh heat/a	85413	70000	66603	63370	60294	57368	54500	51631	48763	45894
AHF all	kWh heat/a	100788	82600	78591	74777	71147	67694	64310	60925	57540	54155
AHFS	kWh heat/a	25624	21000	19981	19011	18088	17210	16350	15489	14629	13768
AHFL central	kWh heat/a	204992	168000	159846	152088	144707	137683	130799	123915	117031	110147
AHFL local	kWh heat/a	48856	40040	38097	36248	34488	32815	31174	29533	27892	26252
AH el	kWh heat/a	34165	28000	26641	25348	24118	22947	21800	20653	19505	18358
LH open fireplace	kWh heat/a	410	336	320	304	289	275	262	248	234	220
LH closed fireplace/inset	kWh heat/a	2597	2128	2025	1926	1833	1744	1657	1570	1482	1395
LH wood stove	kWh heat/a	3290	2696	2565	2441	2322	2209	2099	1989	1878	1768
LH coal stove	kWh heat/a	3290	2696	2565	2441	2322	2209	2099	1989	1878	1768
LH cooker	kWh heat/a	1367	1120	1066	1014	965	918	872	826	780	734
LH SHR stove	kWh heat/a	3290	2696	2565	2441	2322	2209	2099	1989	1878	1768
LH pellet stove	kWh heat/a	3934	3224	3068	2919	2777	2642	2510	2378	2246	2114
LH open fire gas	kWh heat/a	256	210	200	190	181	172	163	155	146	138
LH closed fire gas	kWh heat/a	1379	1130	1075	1023	973	926	880	833	787	741
LH flueless fuel heater	kWh heat/a	92	75	71	68	65	61	58	55	52	49
LH elec.portable	kWh heat/a	395	324	308	293	279	266	252	239	226	212
LH elec.convector	kWh heat/a	1037	850	809	769	732	697	662	627	592	557
LH elec.storage	kWh heat/a	1611	1320	1256	1195	1137	1082	1028	974	920	865
LH elec.underfloor	kWh heat/a	402	330	314	299	284	270	257	243	230	216
LH luminous heaters	kWh heat/a	14886	12200	11608	11045	10508	9998	9499	8999	8499	7999
LH tube heaters	kWh heat/a	22329	18300	17412	16567	15763	14998	14248	13498	12748	11998
								0	0	0	0
RAC (cooling demand), all RAC types <12 kW	kWh cool/a	1086	1133	1152	1172	1183	1207	1228	1249	1270	1291
o/w RAC reversible (heating demand)	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

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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 m³/h											
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 types)	dm²	10.0	28.1	36.8	53.4	62.2	71.7	81	91	101	111
DP Monitor viewable area (avg.)	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
CS Computer Servers	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
	TEC										
PC Tablet/slate		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
	TEC										
EP-Copier colour		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

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
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 m³/h)	h/a	57	33	31	31	28	25	23	20	18	16
VC nondom	h/a	500	500	500	500	500	500	500	500	500	500
FAN Axial<300Pa (all FAN types >125W)	kWh flow/ a	494	494	494	494	494	494	494	494	494	494
FAN Axial>300Pa	kWh flow/ a	979	979	979	979	979	979	979	979	979	979
FAN Centr.FC	kWh flow/ a	423	423	423	423	423	423	423	423	423	423
FAN Centr.BC-free	kWh flow/ a	6360	6360	6360	6360	6360	6360	6360	6360	6360	6360
FAN Centr.BC	kWh flow/ a	6155	6155	6155	6155	6155	6155	6155	6155	6155	6155
FAN Cross-flow	kWh flow/ a	57	57	57	57	57	57	57	57	57	57

LOAD

LOAD	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
MT Industrial motors > 1 hp (=750 W), net load	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
TRAFO Distribution	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Industry oil	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Industry dry	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Power	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO DER oil	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO DER dry	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Small	TEC	1	1	1	1	1	1	1	1	1	1
TYRE											
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 EU27 Total	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Total WH dedicated Water Heater	**TWh heat/a**	**189**	**240**	**255**	**269**	**284**	**299**	**314**	**330**	**347**	**363**
Total CH Central Heating combi, water heat	**TWh heat/a**	**106**	**188**	**207**	**222**	**239**	**258**	**277**	**297**	**317**	**337**
Total CH Central Heating boiler, space heat	**TWh heat/a**	**1049**	**1176**	**1158**	**1133**	**1108**	**1082**	**1050**	**1006**	**942**	**857**
SFB Wood Manual	TWh heat/a	119	53	41	30	19	11	7	5	4	3
SFB Wood Direct Draft	TWh heat/a	1	21	38	51	58	55	53	54	59	65
SFB Coal	TWh heat/a	54	23	15	9	5	2	1	1	1	0
SFB Pellets	TWh heat/a	0	8	14	19	22	23	23	22	22	22
SFB Wood chips	TWh heat/a	0	13	15	16	14	13	14	14	14	14
SFB total net heat demand	**TWh heat/a**	**175**	**117**	**122**	**125**	**119**	**104**	**97**	**95**	**99**	**104**
CHAS	TWh cool/a	13	33	40	45	49	51	53	55	57	58
CHAL	TWh cool/a	21	42	48	52	52	51	50	49	48	46
CHsorp	TWh cool/a	0	0	0	0	1	1	1	1	1	2
CHWS	TWh cool/a	2	5	6	6	7	7	7	8	8	8
CHWL	TWh cool/a	10	20	23	25	25	25	25	24	24	23
CHeng	TWh cool/a	0	0	0	0	0	1	1	1	1	1
AC all	TWh cool/a	6	64	74	80	80	75	69	63	56	49
o/w AC rooftop	TWh cool/a	3	24	21	17	13	11	9	7	5	4
o/w AC splits	TWh cool/a	2	23	26	27	26	24	22	20	18	15
o/w AC VRF	TWh cool/a	1	18	27	35	40	40	37	35	33	30
ACF (AC/ HP eng)	TWh cool/a	0	0	0	0	0	1	1	1	1	1
CH & AC cool total	**TWh cool/a**	**51**	**164**	**192**	**209**	**214**	**211**	**206**	**202**	**195**	**188**
AC all, rev	TWh heat/a	4	85	114	138	151	152	147	139	127	114
o/w AC rooftop, rev	TWh heat/a	2	31	32	29	25	22	19	16	12	8
o/w AC splits, rev	TWh heat/a	1	30	39	46	50	50	47	45	41	36
o/w AC VRF, rev	TWh heat/a	1	24	43	62	76	81	80	78	74	70
ACF (AC/ HP eng), rev	TWh heat/a	0	0	0	1	1	1	2	2	2	2
AHF all	TWh heat/a	189	131	117	105	93	83	74	66	58	51
AHFS	TWh heat/a	18	4	3	2	1	1	0	0	0	0
AHFL central	TWh heat/a	130	96	86	76	67	59	52	46	40	35
AHFL local	TWh heat/a	41	31	29	27	25	23	21	20	18	16
AH el	TWh heat/a	1	2	2	1	1	1	0	0	0	0
AC & AH heat total	**TWh heat/a**	**194**	**219**	**234**	**245**	**246**	**238**	**223**	**207**	**188**	**168**
								0			
LH open fireplace	TWh heat/a	4	5	5	5	5	5	5	5	4	4
LH closed fireplace/inset	TWh heat/a	12	27	32	37	40	43	43	42	40	37
LH wood stove	TWh heat/a	25	24	25	25	25	25	25	25	23	22
LH coal stove	TWh heat/a	17	9	8	7	6	5	4	3	2	0
LH cooker	TWh heat/a	4	7	8	9	10	10	10	9	9	8
LH SHR stove	TWh heat/a	15	17	18	19	21	23	25	26	26	25
LH pellet stove	TWh heat/a	0	6	9	12	14	15	15	14	13	13
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	7	7	7	7	7	7	6
LH flueless fuel heater	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH elec.portable	TWh heat/a	20	20	20	20	19	19	19	19	18	18
LH elec.convector	TWh heat/a	84	84	83	82	81	80	79	78	76	74
LH elec.storage	TWh heat/a	6	6	6	6	6	6	6	6	6	5
LH elec.underfloor	TWh heat/a	11	11	11	11	11	11	10	10	10	10
LH luminous heaters	TWh heat/a	4	4	4	4	4	4	3	3	3	3
LH tube heaters	TWh heat/a	8	8	8	8	8	7	7	6	6	6
LH total		**219**	**236**	**244**	**252**	**258**	**260**	**258**	**252**	**243**	**232**
RAC (cooling demand), <12 kW	**TWh cool/a**	**5**	**56**	**75**	**96**	**123**	**141**	**151**	**157**	**162**	**168**
o/w RAC reversible (heating demand)	**TWh heat/a**	**4**	**59**	**90**	**127**	**163**	**176**	**176**	**171**	**165**	**158**
CIRC Circulator pumps <2.5 kW	**TWh flow/a**	**54**	**23**	**15**	**9**	**5**	**2**	**1**	**1**	**1**	**0**
NRVU total ventilated (17.3 Mm^3/a)	T m^3/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 Mm^3/a)	T m^3/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/Mm^3= GWh/Tm^3)	TWh/a	20	244	312	374	423	459	496	533	570	608
RVU Central Unidir. VU ≤125W/fan (173 m^3/h)	T m^3/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 m^3/h)	T m^3/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 m^3/h per unit)	T m^3/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 m^3/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 m^3/a**	**30**	**103**	**126**	**142**	**155**	**166**	**180**	**195**	**210**	**225**

LOAD EU27 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
	km^2	**21**	**111**	**175**	**255**	**341**	**429**	**531**	**645**	**769**	**904**
DP TV viewable area (avg.of all TV types), sales											
DP Monitor viewable area (avg.of all types), sales	km^2	**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	km^2	**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
CS Computer Servers	m units	0.84	12.42	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
	m units										
PC Desktop		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
RF freezer net volume	M m^3 @ -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 m^3 @ 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 m^3)	M m^3 @ 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 m^3)	M m^3 @ -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 m^3)	M m^3 @ 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 m^3)	M m^3 @ -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 m^3)	M m^3 @ 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 m^3 @ -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 m^3 @ 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, 300	Mt food/a	30	63	73	81	88	97	107	117	126	136
PF Walk in cold rooms FR (V=29.55 m^3, 32% frozen)	M m^3 @ -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 m^3, 68% chilled)	M m^3 @ 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

LOAD EU27 Total	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
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 wate	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**
EU27 no.of households	*m*	*172*	*196*	*200*	*204*	*208*	*210*	*213*	*216*	*218*	*221*
COFFEE per household/ day	*cups/d.household*	*4.43*	*4.76*	*4.75*	*4.76*	*4.79*	*4.87*	*4.96*	*5.03*	*5.11*	*5.18*
EU27 population	*m*	*470*	*500*	*504*	*510*	*517*	*523*	*530*	*536*	*543*	*550*
COFFEE per capita/day, in households	*cups/d.capita*	*1.62*	*1.87*	*1.89*	*1.90*	*1.92*	*1.96*	*1.99*	*2.02*	*2.05*	*2.08*
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 Industrial motors > 1 hp (=750 W), net load	**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**
								0	0	0	0
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 C2	bn km/a		496								
TYRE trucks, distance travelled with replacement tyres C3	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	%	45%	56%	57%	58%	59%	61%	62%	63%	64%	65%
SFB Wood Manual	kWh/a	48%	66%	66%	66%	66%	66%	66%	66%	66%	66%
SFB Wood Direct Draft	kWh/a	70%	88%	88%	88%	88%	88%	88%	88%	88%	88%
SFB Coal	kWh/a	64%	82%	82%	82%	82%	82%	82%	82%	82%	82%
SFB Pellets	kWh/a	70%	88%	88%	88%	88%	88%	88%	88%	88%	88%
SFB Wood chips	kWh/a	70%	88%	88%	88%	88%	88%	88%	88%	88%	88%
CHAS (elec)	SEER	2.69	3.48	3.60	3.94	4.04	4.14	4.25	4.35	4.46	4.58
CHAL (elec)	SEER	2.76	3.58	3.65	4.11	4.21	4.32	4.43	4.54	4.66	4.77
Chsorp (fossil)	SEER	0.65	1.30	1.40	1.54	1.57	1.61	1.65	1.70	1.74	1.78
CHWS	SEER	3.43	4.83	5.00	5.51	5.65	5.79	5.94	6.09	6.24	6.40
CHWL	SEER	4.03	5.51	5.70	6.53	6.70	6.87	7.04	7.22	7.40	7.59
Cheng (fossil)	SEER	0.65	1.30	1.40	1.54	1.57	1.61	1.65	1.70	1.74	1.78
AC all	SEER	2.96	4.03	4.20	4.31	4.41	4.53	4.64	4.76	4.88	5.00
AC rooftop	SEER	2.87	3.88	4.10	4.20	4.31	4.42	4.53	4.64	4.76	4.88
AC splits	SEER	3.11	3.97	4.10	4.20	4.31	4.42	4.53	4.64	4.76	4.88
AC VRF	SEER	2.90	4.20	4.30	4.40	4.51	4.63	4.74	4.86	4.99	5.11
ACF (AC/ HP eng), fossil	SEER	0.65	1.31	1.41	1.55	1.59	1.63	1.67	1.71	1.76	1.80
AC all, rev	SCOP	2.81	3.17	3.32	3.38	3.46	3.55	3.64	3.73	3.83	3.92
o/w AC rooftop, rev	SCOP	2.77	3.18	3.28	3.33	3.41	3.50	3.59	3.68	3.77	3.87
o/w AC splits, rev	SCOP	2.86	3.00	3.28	3.33	3.41	3.50	3.59	3.68	3.77	3.87
o/w AC VRF, rev	SCOP	2.79	3.32	3.37	3.42	3.51	3.60	3.69	3.78	3.88	3.97
ACF (AC/ HP eng), rev , fossil	SCOP	0.65	1.31	1.41	1.55	1.59	1.63	1.67	1.71	1.76	1.80
AHF all (fossil)	SCOP	0.54	0.65	0.67	0.70	0.71	0.73	0.75	0.77	0.79	0.81
AHFS (fossil)	SCOP	0.46	0.58	0.59	0.62	0.63	0.65	0.67	0.68	0.70	0.72
AHFL central (fossil)	SCOP	0.56	0.68	0.69	0.72	0.74	0.75	0.77	0.79	0.81	0.83
AHFL local (fossil)	SCOP	0.55	0.72	0.72	0.73	0.73	0.73	0.74	0.74	0.75	0.75
AH el	SCOP	0.84	0.87	0.87	0.87	0.90	0.92	0.94	0.97	0.99	1.02
LH open fireplace	%	27%	30%	30%	30%	31%	32%	32%	33%	34%	35%
LH closed fireplace/inset	%	62%	69%	70%	70%	72%	74%	75%	77%	79%	81%
LH wood stove	%	62%	69%	70%	70%	72%	74%	75%	77%	79%	81%
LH coal stove	%	62%	69%	70%	70%	72%	74%	75%	77%	79%	81%
LH cooker	%	58%	64%	65%	65%	67%	68%	70%	72%	73%	75%
LH SHR stove	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
LH pellet stove	%	77%	85%	86%	86%	88%	90%	91%	91%	92%	93%
LH open fire gas	%	37%	42%	42%	42%	43%	44%	45%	46%	47%	48%
LH closed fire gas	%	58%	64%	65%	65%	67%	68%	70%	72%	73%	75%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	67%	74%	75%	75%	77%	79%	81%	83%	84%	86%
LH elec.convector	%	67%	74%	75%	75%	77%	79%	81%	83%	84%	86%
LH elec.storage	%	67%	74%	75%	75%	77%	79%	81%	83%	84%	86%
LH elec.underfloor	%	67%	74%	75%	75%	77%	79%	81%	83%	84%	86%
LH luminous heaters	%	72%	81%	88%	98%	98%	98%	98%	98%	98%	98%
LH tube heaters	%	64%	71%	82%	91%	91%	91%	91%	91%	91%	91%
RAC (cooling demand), all RAC types <12 kW	SEER	2.04	3.47	3.83	4.07	4.21	4.25	4.25	4.26	4.26	4.26
o/w RAC reversible (heating demand)	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	7.5	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
CS Computer Servers	kWh/a	5122	1290	840	600	400	400	400	400	400	400
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

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
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
Service cabinets (commercial, non-retail)											
CH (Chiller, Horizontal)											
CV (Chiller Vertical)											
FH (Freezer, Horizontal)											
FV (Freezer, Vertical)											
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
Walk-in Cold Room (retail, industrial)											
CH-Small (<20 m³, 15)											
CH-Medium (20-100 m³, 50)											
CH-Large (100-400 m³, 200)											
FR-Small (<20 m³, 15)											
FR-Medium (20-100 m³, 50)											
FR-Large (100-400 m³, 200)											
PF Walk-In Cold Room (WICR, average)	kWh/a	12587	12587	12587	12587	12587	12587	12587	12587	12587	12587
MT & LT Industrial process chillers											
MT AC											
MT WC											
LT AC											
MT WC											
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

EFFICIENCY SALES BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
FAN Axial>300Pa	%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
FAN Centr.FC	%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
FAN Centr.BC-free	%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
FAN Centr.BC	%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
FAN Cross-flow	%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MT Industrial motors > 1 hp, 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 > 1 hp, extra VSD effect*											
MT Industrial motors > 1 hp (=750 W), net load	kWh output/a	71.9%	79.1%	79.6%	80.1%	80.6%	81.1%	81.6%	82.1%	82.6%	83.1%
WP Water pumps (load)	kWh flow/a	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%
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 in m units											
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	%	45%	63%	86%	99%	112%	118%	124%	131%	137%	144%
SFB Wood Manual	%	48%	66%	79%	87%	89%	89%	89%	89%	89%	89%
SFB Wood Direct Draft	%	70%	88%	89%	91%	93%	93%	93%	93%	93%	93%
SFB Coal	%	64%	82%	84%	91%	93%	93%	93%	93%	93%	93%
SFB Pellets	%	70%	88%	90%	91%	93%	93%	93%	93%	93%	93%
SFB Wood chips	%	70%	88%	90%	91%	93%	93%	93%	93%	93%	93%
CHAS	SEER	2.69	3.48	3.98	4.37	4.59	4.83	5.07	5.33	5.60	5.89
CHAL	SEER	2.76	3.58	4.05	4.62	4.86	5.10	5.36	5.64	5.93	6.23
CHsorp	SEER	0.65	1.30	1.48	1.65	1.73	1.82	1.91	2.01	2.11	2.22
CHWS	SEER	3.43	4.83	5.25	5.66	5.94	6.25	6.57	6.90	7.25	7.62
CHWL	SEER	4.03	5.51	6.10	6.94	7.30	7.67	8.06	8.47	8.90	9.36
CHeng	SEER	0.65	1.31	1.47	1.63	1.71	1.80	1.89	1.99	2.09	2.20
AC all	SEER	2.96	4.03	4.63	4.92	5.17	5.44	5.72	6.01	6.31	6.64
AC rooftop	SEER	2.87	3.88	4.63	4.92	5.17	5.44	5.72	6.01	6.31	6.64
AC splits	SEER	3.11	3.97	4.63	4.92	5.17	5.44	5.72	6.01	6.31	6.64
AC VRF	SEER	2.90	4.20	4.63	4.92	5.17	5.44	5.72	6.01	6.31	6.64
ACF (AC/ HP eng)	SEER	0.71	1.43	1.61	1.78	1.87	1.96	2.06	2.17	2.28	2.39
AC all, rev	SCOP	2.81	3.17	3.68	3.86	4.06	4.26	4.48	4.71	4.95	5.20
o/w AC rooftop, rev	SCOP	2.77	3.18	3.68	3.86	4.06	4.26	4.48	4.71	4.95	5.20
o/w AC splits, rev	SCOP	2.86	3.00	3.68	3.86	4.06	4.26	4.48	4.71	4.95	5.20
o/w AC VRF, rev	SCOP	2.79	3.32	3.68	3.86	4.06	4.26	4.48	4.71	4.95	5.20
ACF (AC/ HP eng), rev , fossil	SCOP	0.65	1.31	1.47	1.62	1.70	1.79	1.88	1.97	2.07	2.18
AHF all	SCOP	0.54	0.65	0.76	0.88	0.89	0.91	0.92	0.94	0.95	0.96
AHFS	SCOP	0.46	0.58	0.73	0.88	0.89	0.91	0.92	0.94	0.95	0.96
AHFL central	SCOP	0.56	0.68	0.77	0.88	0.89	0.91	0.92	0.94	0.95	0.96
AHFL local	SCOP	0.55	0.72	0.82	0.92	0.94	0.95	0.97	0.97	0.97	0.97
AH el	SCOP	0.84	0.87	0.86	0.90	0.94	0.99	1.04	1.09	1.15	1.21
LH open fireplace	%	27%	30%	39%	52%	53%	53%	53%	53%	53%	53%
LH closed fireplace/inset	%	62%	69%	78%	86%	88%	88%	88%	88%	88%	88%
LH wood stove	%	62%	69%	78%	86%	88%	88%	88%	88%	88%	88%
LH coal stove	%	62%	69%	78%	86%	88%	88%	88%	88%	88%	88%
LH cooker	%	58%	64%	72%	84%	86%	86%	86%	86%	86%	86%
LH SHR stove	%	80%	80%	89%	92%	94%	94%	94%	94%	94%	94%
LH pellet stove	%	77%	85%	88%	98%	98%	98%	98%	98%	98%	98%
LH open fire gas	%	37%	42%	48%	53%	54%	54%	54%	54%	54%	54%
LH closed fire gas	%	58%	64%	72%	84%	86%	86%	86%	86%	86%	86%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	67%	74%	82%	88%	89%	89%	89%	89%	89%	89%
LH elec.convector	%	67%	74%	82%	95%	97%	97%	97%	97%	97%	97%
LH elec.storage	%	67%	74%	82%	93%	97%	97%	97%	97%	97%	97%
LH elec.underfloor	%	67%	74%	82%	98%	94%	94%	94%	94%	94%	94%
LH luminous heaters	%	72%	81%	94%	103%	109%	109%	109%	109%	109%	109%
LH tube heaters	%	64%	71%	82%	95%	97%	97%	97%	97%	97%	97%
RAC (cooling demand), all RAC types <12 kW	SEER	2.04	3.47	4.74	5.06	5.26	5.31	5.31	5.31	5.31	5.31
o/w RAC reversible (heating demand)	SCOP	1.98	2.91	3.65	3.86	3.96	3.99	3.99	3.99	3.99	3.99
CIRC Circulator pumps <2.5 kW, net load	%	94%	130%	228%	230%	233%	232%	232%	232%	232%	232%
NRVU avg (stock weighted 2010)	kWh elec/a	8800	8400	7093	6162	5967	5784	5763	5741	5720	5698
NRVU avg (stock weighted 2010)	kWh heat/a	79479	94169	107620	113000	113000	113000	113000	113000	113000	113000
RVU Central Unidir. VU ≤125W/fan (1 fan)	kWh elec/a	454	454	244	244	244	244	244	244	244	244
RVU Central Balanced VU ≤125W/fan (2 fans)	kWh elec/a	501	501	246	246	246	246	246	246	246	246
RVU Local Balanced VU (<125 W, also NR) (2 fans)	kWh elec/a	217	217	134	134	134	134	134	134	134	134
RVU Central Unidir. VU ≤125W/fan (1 fan)	kWh prim/a	951	951	2505	2505	2505	2505	2505	2505	2505	2505
RVU Central Balanced VU ≤125W/fan (2 fans)	kWh prim/a	3863	3863	5188	5188	5188	5188	5188	5188	5188	5188
RVU Local Balanced VU (<125 W, also NR) (2 fans)	kWh prim/a	1706	1706	2507	2507	2507	2507	2507	2507	2507	2507
VU reference: natural ventilation 220 m3/h											
LS Light Sources ECO lumen/Watt											
LFL	lm/W	64	69	75	78	78	79	79	79	80	80
CFL	lm/W	48	51	51	54	54	55	55	55	54	54
Tungsten	lm/W	12	12	12	16	16	15	15	15	15	15
GLS	lm/W	10	10	10	10	10	10	10	10	10	10
HID	lm/W	55	67	73	95	95	92	90	87	85	83
LED	lm/W	25	30	120	200	230	255	280	300	300	300
GLS stock	lm/W	10	10	10	10	0	0	0	0	0	0
Tungsten stock	lm/W	14	14	14	14	0	0	0	0	0	0
DP TV power per screen area (avg.of all types), sales	W/dm^2	8.0	3.9	0.8	0.2	0.2	0.1	0.1	0.1	0.1	0.1
DP Monitor power per screen area (avg), sales	W/dm^2	10.9	3.3	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1
DP TV standard, standby power	W	8.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV LoNA, standby power	W	0.0	2.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP TV Smart, standby power	W	0.0	0.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP Monitor, standby power	W	9.0	4.0	4.0	4.0	4.0	4.0	4	4	4	4
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
CS Computer Servers	kWh/a	5122	1290	840	600	400	400	400	400	400	400

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
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%	36.5%	36.5%	36.5%	36.5%	36.5%	36.5%	36.5%	36.5%
FAN Axial>300Pa	%	37%	37.1%	41.2%	41.2%	41.2%	41.2%	41.2%	41.2%	41.2%	41.2%
FAN Centr.FC	%	32%	32.1%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%
FAN Centr.BC-free	%	56%	56.4%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%	65.1%
FAN Centr.BC	%	54%	53.7%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%
FAN Cross-flow	%	7%	7.3%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%
MT Industrial motors > 1 hp (=750 W), IE3 only		71.9%	80.1%	85.1%	85.6%	86.1%	86.1%	86.1%	86.1%	86.1%	86.1%
MT Industrial motors > 1 hp, extra VSD/IE2 effect		0.0%	0.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
MT Industrial motors > 1 hp (=750 W), VSD+IE3	%	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%

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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.

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	%	41.0%	51%	53%	56%	58%	59%	60%	61%	62%	63%
SFB Wood Manual	kWh/a	35%	61%	64%	66%	66%	66%	66%	66%	66%	66%
SFB Wood Direct Draft	kWh/a	60%	87%	88%	88%	88%	88%	88%	88%	88%	88%
SFB Coal	kWh/a	50%	75%	79%	81%	82%	82%	82%	82%	82%	82%
SFB Pellets	kWh/a		86%	87%	88%	88%	88%	88%	88%	88%	88%
SFB Wood chips	kWh/a		86%	87%	88%	88%	88%	88%	88%	88%	88%
CHAS (elec)	SEER	2.71	3.10	3.26	3.46	3.67	3.86	4.01	4.15	4.25	4.36
CHAL (elec)	SEER	2.76	3.17	3.32	3.53	3.77	3.98	4.16	4.32	4.43	4.54
Chsorp (fossil)	SEER	0.53	1.11	1.24	1.36	1.46	1.53	1.59	1.63	1.67	1.71
CHWS	SEER	3.43	4.11	4.40	4.74	5.09	5.38	5.61	5.80	5.94	6.09
CHWL	SEER	4.03	4.73	5.03	5.43	5.88	6.27	6.59	6.86	7.04	7.21
Cheng (fossil)	SEER	0.53	1.14	1.26	1.40	1.49	1.56	1.60	1.64	1.68	1.73
AC all	SEER	2.96	3.52	3.85	4.10	4.26	4.37	4.48	4.59	4.71	4.82
AC rooftop	SEER	2.87	3.38	3.67	3.93	4.12	4.26	4.36	4.46	4.57	4.68
AC splits	SEER	3.11	3.59	3.83	4.03	4.16	4.26	4.37	4.48	4.59	4.71
AC VRF	SEER	2.90	3.61	4.01	4.24	4.37	4.47	4.58	4.70	4.81	4.94
ACF (AC/ HP eng), fossil	SEER	0.54	1.15	1.28	1.41	1.51	1.57	1.62	1.66	1.70	1.74
AC all, rev	SCOP	2.81	3.04	3.18	3.28	3.36	3.43	3.52	3.60	3.69	3.78
o/w AC rooftop, rev	SCOP	2.78	2.99	3.11	3.21	3.30	3.38	3.46	3.54	3.62	3.71
o/w AC splits, rev	SCOP	2.86	3.05	3.16	3.24	3.32	3.38	3.47	3.55	3.64	3.73
o/w AC VRF, rev	SCOP	2.79	3.09	3.26	3.35	3.41	3.48	3.56	3.65	3.74	3.84
ACF (AC/ HP eng), rev , fossil	SCOP	0.56	1.17	1.29	1.42	1.51	1.58	1.62	1.66	1.70	1.74
AHF all (fossil)	SCOP	0.51	0.62	0.65	0.67	0.70	0.72	0.74	0.76	0.77	0.78
AHFS (fossil)	SCOP	0.43	0.53	0.55	0.58	0.60	0.62	0.64	0.65	0.66	
AHFL central (fossil)	SCOP	0.52	0.63	0.65	0.68	0.70	0.72	0.74	0.76	0.78	0.80
AHFL local (fossil)	SCOP	0.51	0.65	0.69	0.72	0.73	0.73	0.73	0.74	0.74	0.74
AH el	SCOP	0.84	0.87	0.87	0.87	0.88	0.90	0.91	0.93		
LH open fireplace	%	26%	28%	29%	29%	30%	30%	31%	31%	32%	33%
LH closed fireplace/inset	%	60%	66%	68%	69%	70%	71%	72%	73%	75%	76%
LH wood stove	%	60%	65%	67%	68%	69%	71%	72%	73%	75%	76%
LH coal stove	%	59%	65%	67%	68%	69%	70%	71%	72%	72%	67%
LH cooker	%	56%	62%	64%	65%	65%	66%	68%	69%	71%	72%
LH SHR stove	%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
LH pellet stove	%		83%	85%	86%	87%	88%	89%	90%	91%	92%
LH open fire gas	%	36%	40%	41%	41%	42%	43%	43%	44%	45%	46%
LH closed fire gas	%	56%	61%	63%	64%	65%	66%	67%	68%	70%	72%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	65%	73%	74%	75%	76%	77%	79%	81%	83%	85%
LH elec.convector	%	65%	73%	74%	75%	76%	77%	79%	81%	83%	85%
LH elec.storage	%	64%	72%	73%	75%	75%	76%	78%	80%	82%	84%
LH elec.underfloor	%	64%	69%	71%	72%	74%	75%	77%	78%	79%	81%
LH luminous heaters	%	70%	78%	81%	86%	92%	97%	98%	98%	98%	98%
LH tube heaters	%	61%	68%	70%	76%	82%	87%	91%	91%	91%	91%
RAC (cooling demand), all RAC types <12 kW	SEER	2.04	3.04	3.44	3.82	4.05	4.18	4.24	4.25	4.26	4.26
o/w RAC reversible (heating demand)	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	12.6	3.3	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

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
CS Computer Servers	kWh/a	5787	1619	990	684	480	400	400	400	400	400
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	0.29	0.27	0.25	0.24
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

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LD AEc vented el.	kWh elec/a	427	388	418	446	456	456	455	457	460	464
LD AEc condens el.	kWh elec/a	455	415	438	453	453	445	436	428	423	417
LD AEc vented gas	kWh prim/a	387	399	438	465	472	470	469	471	474	478
VC dom	W	1176	1440	1888	1864	2564	2883	3312	3685	4059	4433
VC nondom	W	929	1247	1343	1447	1500	1500	1500	1500	1500	1500
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
FAN Axial>300Pa	%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
FAN Centr.FC	%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
FAN Centr.BC-free	%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
FAN Centr.BC	%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
FAN Cross-flow	%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MT Industrial motors > 1 hp (=750 W), net load	kWh output/a	71.4%	76.5%	78.5%	79.5%	80.0%	80.5%	81.0%	81.5%	82.0%	82.5%
WP Water pumps (load)	kWh flow/a	65.6%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%
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 in m units											
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	%	41%	52%	61%	73%	89%	103%	113%	120%	127%	133%
SFB Wood Manual	%	35%	61%	65%	70%	75%	83%	88%	89%	89%	89%
SFB Wood Direct Draft	%	60%	87%	88%	89%	90%	91%	92%	93%	93%	93%
SFB Coal	%	50%	75%	79%	82%	83%	86%	91%	93%	93%	93%
SFB Pellets	%		86%	88%	89%	90%	91%	92%	93%	93%	93%
SFB Wood chips	%		86%	87%	88%	90%	91%	92%	93%	93%	93%
CHAS (was met CC=40%)	SEER	2.71	3.10	3.30	3.61	3.94	4.27	4.59	4.85	5.09	5.35
CHAL	SEER	2.76	3.17	3.37	3.68	4.05	4.43	4.80	5.10	5.36	5.63
CHsorp	SEER	0.53	1.11	1.25	1.43	1.56	1.67	1.77	1.86	1.95	2.04
CHWS	SEER	3.43	4.11	4.43	4.81	5.22	5.60	5.95	6.27	6.59	6.92
CHWL	SEER	4.03	4.73	5.07	5.58	6.14	6.70	7.22	7.67	8.06	8.47
CHeng	SEER	0.54	1.15	1.29	1.46	1.59	1.70	1.78	1.87	1.96	2.06
AC all	SEER	2.96	3.52	3.92	4.36	4.73	5.07	5.33	5.60	5.88	6.18
o/w AC rooftop	SEER	2.87	3.38	3.72	4.16	4.62	5.05	5.31	5.56	5.83	6.10
o/w AC splits	SEER	3.11	3.59	3.92	4.33	4.71	5.06	5.33	5.59	5.88	6.18
o/w AC VRF	SEER	2.90	3.61	4.08	4.49	4.78	5.07	5.33	5.61	5.89	6.19
ACF (AC/ HP eng)	SEER	0.58	1.25	1.41	1.59	1.73	1.85	1.94	2.04	2.14	2.25
AC all, rev	SCOP	2.81	3.04	3.25	3.51	3.75	3.99	4.18	4.39	4.61	4.84
AC all, rev	SCOP	2.78	2.99	3.15	3.40	3.69	3.98	4.17	4.36	4.57	4.78
o/w AC rooftop, rev	SCOP	2.86	3.05	3.23	3.48	3.74	3.99	4.18	4.39	4.61	4.84
o/w AC splits, rev	SCOP	2.79	3.09	3.33	3.58	3.78	3.99	4.19	4.40	4.62	4.85
o/w AC VRF, rev	SCOP	0.56	1.17	1.30	1.46	1.59	1.69	1.77	1.86	1.95	2.05
ACF (AC/ HP eng), rev , fossil	SCOP	0.51	0.62	0.66	0.73	0.81	0.89	0.92	0.94	0.95	0.95
o/w AHFS	SCOP	0.43	0.53	0.56	0.65	0.75	0.87	0.90	0.91	0.92	
o/w AHFL central	SCOP	0.52	0.63	0.66	0.72	0.79	0.86	0.90	0.91	0.93	0.94
o/w AHFL local	SCOP	0.51	0.65	0.71	0.78	0.86	0.92	0.94	0.96	0.97	0.97
AH el	SCOP	0.84	0.87	0.87	0.87	0.90	0.94	0.98	1.01		
LH open fireplace	%	26%	28%	30%	34%	39%	43%	48%	52%	53%	53%
LH closed fireplace/inset	%	60%	66%	68%	73%	77%	81%	84%	87%	88%	88%
LH wood stove	%	60%	65%	68%	72%	77%	81%	84%	87%	88%	88%
LH coal stove	%	59%	65%	67%	71%	75%	78%	82%	86%	87%	88%
LH cooker	%	56%	62%	65%	71%	78%	83%	86%	86%	86%	86%
LH SHR stove	%	80%	80%	81%	84%	87%	90%	92%	93%	94%	94%
LH pellet stove	%		83%	85%	89%	93%	97%	98%	98%	98%	98%
LH open fire gas	%	36%	40%	41%	45%	48%	51%	54%	54%	54%	54%
LH closed fire gas	%	56%	61%	64%	68%	74%	79%	84%	86%	86%	86%
LH flueless fuel heater	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH elec.portable	%	65%	73%	76%	83%	88%	89%	89%	89%	89%	89%
LH elec.convector	%	65%	73%	76%	85%	95%	97%	97%	97%	97%	97%
LH elec.storage	%	64%	72%	74%	80%	88%	94%	97%	97%	97%	97%
LH elec.underfloor	%	64%	69%	72%	76%	81%	85%	89%	92%	94%	94%
LH luminous heaters	%	70%	78%	81%	89%	99%	107%	109%	109%	109%	109%
LH tube heaters	%	61%	68%	70%	77%	83%	90%	95%	96%	97%	97%
RAC (cooling demand), all RAC types <12 kW	SEER	2.04	3.04	3.71	4.52	5.03	5.22	5.30	5.31	5.31	5.31
o/w RAC reversible (heating demand)	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	4364	4805	5030	5177	5188	5188	5188	5188
RVU Local Balanced, heat saved vs. ref	kWh heat/a	1706	1706	2001	2283	2426	2503	2507	2507	2507	2507
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	3.4	3.2	1.9	1.9	2	2	2	2
DP TV Smart, standby power	W			6.4	3.2	1.9	1.9	2	2	2	2
DP Monitor, standby power	W	9.0	4.0	4.0	4.0	4.0	4.0	4	4	4	4
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

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CS Computer Servers	kWh/a	5787	1619	990	684	480	400	400	400	400	400
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%
	W										
SB Home Gateway, on-mode hours			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
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%	32.2%	34.1%	35.9%	36.5%	36.5%	36.5%	36.5%	36.5%
FAN Axial>300Pa	%	37%	37.1%	38.0%	39.4%	40.7%	41.2%	41.2%	41.2%	41.2%	41.2%
FAN Centr.FC	%	32%	32.1%	33.3%	35.6%	37.6%	38.5%	38.5%	38.5%	38.5%	38.5%
FAN Centr.BC-free	%	56%	56.4%	58.5%	61.5%	64.3%	65.1%	65.1%	65.1%	65.1%	65.1%
FAN Centr.BC	%	54%	53.7%	56.1%	59.3%	62.2%	62.9%	62.9%	62.9%	62.9%	62.9%
FAN Cross-flow	%	7%	7.3%	9.0%	12.6%	15.7%	17.4%	17.4%	17.4%	17.4%	17.4%

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total MT Industrial motors > 1 hp	%	71.4%	76.6%	82.1%	89.6%	95.2%	95.9%	1	96.1%	96.1%	96.1%
Total WP Water Pumps	%	65.6%	66.6%	67.3%	68.2%	68.5%	68.5%	1	68.5%	68.5%	68.5%
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

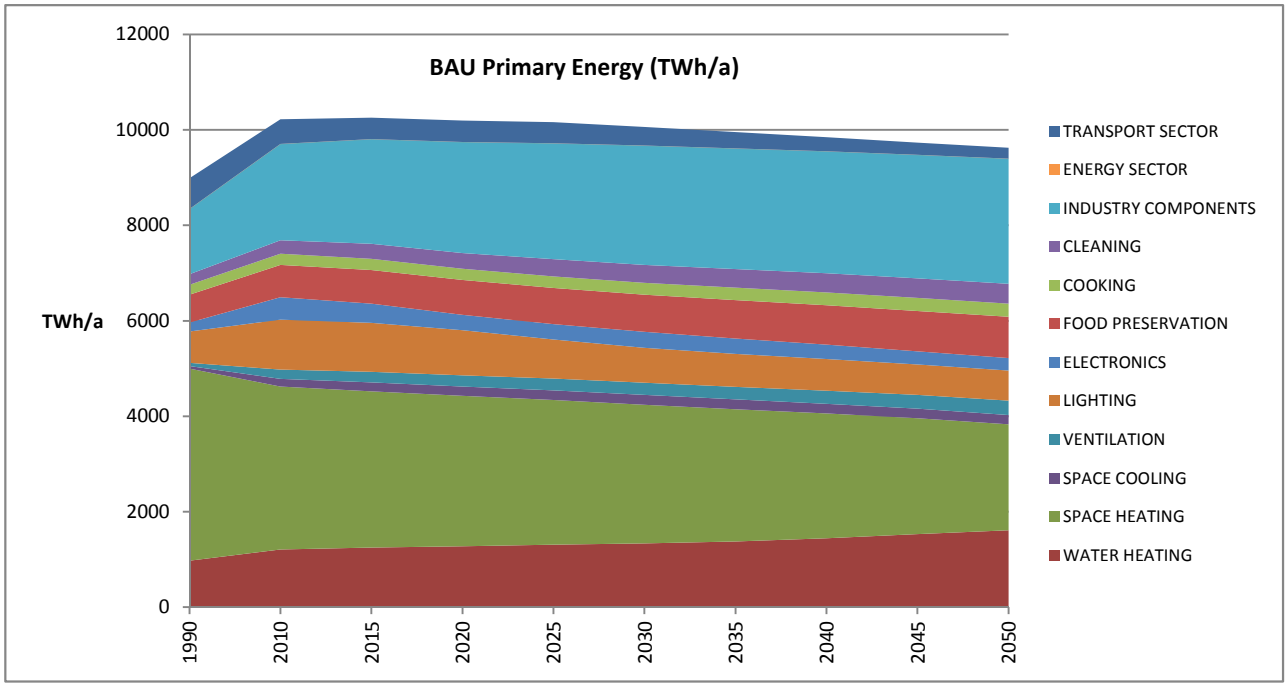
db	BAU Primary Energy (in TWh primary)	unit	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*CCsel,1=40%*	*1*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**TWh/a**	**0**	**718**	**797**	**811**	**821**	**826**	**824**	**833**	**861**	**904**	**947**
	Total CH Central Heating combi, water heat	**TWh/a**	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	*2304*	*1992*	*1854*	*1733*	*1626*	*1543*	*1458*	*1363*	*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	**TWh/a**	0	**2558**	**2307**	**2168**	**2037**	**1926**	**1842**	**1754**	**1651**	**1519**	**1358**
	SFB Wood Manual	TWh/a	0	339	87	63	45	29	17	10	7	6	5
	SFB Wood Direct Draft	TWh/a	0	2	24	43	58	66	62	60	61	67	74
	SFB Coal	TWh/a	0	109	30	20	11	6	2	1	1	1	1
	SFB Pellets	TWh/a	0		10	16	21	25	27	26	25	25	25
	SFB Wood chips	TWh/a	0		15	17	18	16	15	15	16	16	16
	Total Solid Fuel Boiler	**TWh/a**		**451**	**165**	**159**	**154**	**143**	**123**	**112**	**110**	**114**	**120**
	CHAS (was met CC=40%)	TWh/a	1	12	27	31	33	33	33	33	33	33	33
	CHAL	TWh/a	1	19	33	36	37	35	32	30	28	27	25
	CHsorp	TWh/a	0	0.0	0.2	0.2	0.3	0.4	0.6	0.7	0.8	0.9	0.9
	CHWS	TWh/a	1	1	3	3	3	3	3	3	3	3	3
	CHWL	TWh/a	1	6	11	12	12	11	10	9	9	8	8
	CHeng	TWh/a	0	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6
	AC all	TWh/a	1	5	45	48	49	47	43	38	34	29	25
	o/w AC rooftop	TWh/a	1	2	17	15	11	8	6	5	4	3	2
	o/w AC splits	TWh/a	1	2	16	17	17	16	14	13	11	10	8
	o/w AC VRF	TWh/a	1	1	12	17	21	23	22	20	19	17	15
	ACF (AC/ HP eng)	TWh/a	0	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6
	Total AHC Air Heating & Cooling, cooling	**TWh/a**		**43**	**119**	**130**	**134**	**130**	**123**	**116**	**110**	**104**	**98**
	AC all, rev	TWh/a	1	3	70	90	105	112	111	104	96	86	75
	o/w AC rooftop, rev	TWh/a	1	1.5	25.7	25.9	22.9	18.8	16.0	13.7	11.4	8.4	5.5
	o/w AC splits, rev	TWh/a	1	1.2	24.8	31.3	35.8	37.4	36.6	34.2	31.5	27.8	24.1
	o/w AC VRF, rev	TWh/a	1	0.5	19.6	32.8	46.5	55.9	58.2	56.2	53.4	49.7	45.5
	ACF (AC/ HP eng), rev , fossil	TWh/a	0	0.0	0.2	0.3	0.4	0.6	0.8	1.0	1.2	1.3	1.4
	AHF all	TWh/a	0	371	208	178	153	132	115	100	87	76	66
	o/w AHFS	TWh/a	0	43.1	7.9	4.6	2.9	1.9	1.2	0.7	0.3	0.1	0.0
	o/w AHFL central	TWh/a	0	248	153	131	112	96	82	71	61	52	44
	o/w AHFL local	TWh/a	0	80	48	42	37	34	32	29	27	24	22
	AH el	TWh/a	1	3.8	6.9	5.6	3.6	3.4	2.7	1.3	0.3	0.0	0.0
	Total AHC Air Heating & Cooling, heating	**TWh/a**		**378**	**286**	**274**	**262**	**248**	**229**	**207**	**185**	**163**	**142**
										0			
	LH open fireplace	TWh/a	0	17	18	18	18	18	17	16	15	14	13
	LH closed fireplace/inset	TWh/a	0	20	40	47	54	58	60	60	57	53	49
	LH wood stove	TWh/a	0	43	38	37	36	36	36	35	34	31	29
	LH coal stove	TWh/a	0	29	14	12	11	9	8	6	4	2	1
	LH cooker	TWh/a	0	7	11	12	14	15	15	14	13	12	11
	LH SHR stove	TWh/a	0	18	21	22	24	26	29	31	32	32	31
	LH pellet stove	TWh/a	0		7	11	14	16	17	17	16	15	14
	LH open fire gas	TWh/a	0	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	TWh/a	0	15	13	12	12	11	11	10	10	9	9
	LH flueless fuel heater	TWh/a	0	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	TWh/a	1	77	69	67	66	64	63	60	58	55	53
	LH elec.convector	TWh/a	1	320	287	279	272	266	259	250	239	229	218
	LH elec.storage	TWh/a	1	24	21	21	20	20	19	19	18	17	16
	LH elec.underfloor	TWh/a	1	43	39	38	37	36	35	34	33	32	30
	LH luminous heaters	TWh/a	0	6	5	5	5	4	4	3	3	3	3
	LH tube heaters	TWh/a	0	13	12	11	10	9	8	8	7	7	6
	LH total	**TWh/a**		**632**	**597**	**594**	**592**	**590**	**581**	**564**	**540**	**513**	**483**
	RAC (cooling demand), all RAC types <12 kW	TWh/a	1	6	46	54	63	76	85	89	92	95	99
	o/w RAC reversible (heating demand)	TWh/a	1	4	55	77	101	125	132	130	126	122	117
	Total RAC Room Air Conditioner	**TWh/a**		**11**	**101**	**132**	**164**	**201**	**216**	**219**	**218**	**217**	**215**
1	**CIRC Circulator pumps <2.5 kW, net load**	**TWh/a**	1	**40**	**52**	**54**	**55**	**57**	**59**	**60**	**57**	**54**	**51**
	TOTAL SPACE HEATING			**4023**	**3410**	**3272**	**3146**	**3032**	**2908**	**2767**	**2613**	**2431**	**2220**
	TOTAL SPACE COOLING			**49**	**165**	**185**	**197**	**206**	**207**	**205**	**202**	**199**	**196**
	NRVU electricity	TWh/a	1	47	152	172	185	191	194	197	202	208	216
1	NRVU heat (negative=saving vs. natural ventilation)	TWh/a	0	-136	-633	-754	-855	-938	-1004	-1071	-1138	-1207	-1276
	RVU Central Unidir. VU ≤125W/fan (1 fan)	TWh/a	1	19	38	43	42	40	40	42	45	48	51
	RVU Central Balanced VU ≤125W/fan (2 fans)	TWh/a	1	0	3	5	9	14	18	20	22	25	27
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	TWh/a	1	0	0	1	1	2	3	4	5	7	8
1	RVU Central Unidir., heat (negative=saving)	TWh/a	0	-16	-32	-36	-35	-34	-34	-35	-38	-40	-43
1	RVU Central Balanced, heat (negative=saving)	TWh/a	0	-1	-8	-16	-29	-42	-55	-63	-69	-76	-82
1	RVU Local Balanced, heat (negative=saving)	TWh/a	0	0	-1	-2	-4	-7	-10	-14	-17	-21	-24
	Total VU Ventilation Units	**TWh/a**		**-86**	**-481**	**-587**	**-686**	**-773**	**-847**	**-918**	**-987**	**-1056**	**-1124**
	TOTAL VENTILATION (electricity)			**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	TWh/a	1	203	313	343	334	325	311	295	279	265	252
CFL Compact Fluorescent	TWh/a	1	9	67	90	82	56	43	38	34	30	27
Tungsten	TWh/a	1	22	131	138	136	93	66	48	34	26	23
GLS GeneralLighting Service (incandescent)	TWh/a	1	210	153	116	84	52	17	4	0	0	0
HID High Intensity Discharge	TWh/a	1	89	188	170	151	142	142	142	142	142	142
LED Light Emitting Diode	TWh/a	1	0	1	2	13	32	54	68	77	83	87
SP Special Purpose (exempt)	TWh/a	1	*100*	*151*	*132*	*112*	*92*	*76*	*76*	*76*	*76*	*76*
lighting controls & sb	TWh/a	1	*28*	*43*	*37*	*31*	*26*	*21*	*21*	*21*	*21*	*21*
TOTAL LIGHTING	**TWh/a**		**661**	**1047**	**1028**	**943**	**816**	**729**	**692**	**663**	**643**	**628**
DP TV, on mode	TWh/a	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	TWh/a	1	3.0	24.1	21.4	17.3	17.5	16.2	13.0	9.1	4.6	3.0
DP TV , sb mode	TWh/a	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	TWh/a	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	**TWh/a**	1	**81**	**250**	**205**	**156**	**169**	**180**	**173**	**153**	**120**	**112**
SSTB	TWh/a	1	0	8	4	0	0	0	0	0	0	0
CSTB	TWh/a	1	0	17	43	48	49	47	50	54	58	62
Total STB set top boxes (Complex & Simple)	**TWh/a**		**0**	**26**	**46**	**48**	**49**	**47**	**50**	**54**	**58**	**62**
VIDEO players/recorders	TWh/a	1	0	3	1	0	0	0	0	0	0	0
VIDEO projectors	TWh/a	1	0	4	5	4	2	0	0	0	0	0
VIDEO game consoles	TWh/a	1	0	5	6	7	9	11	12	13	14	15
Total VIDEO	**TWh/a**		**0**	**13**	**12**	**11**	**11**	**11**	**12**	**13**	**14**	**15**
Total CS Computer Servers	**TWh/a**	1	**12**	**50**	**31**	**21**	**15**	**13**	**13**	**13**	**13**	**13**
PC Desktop	TWh/a	1	36	54	32	12	7	7	7	7	7	7
PC Notebook	TWh/a	1	0	18	10	3	2	2	2	2	2	2
PC Tablet/slate	TWh/a	1	0	0	4	4	4	4	5	5	5	5
PC Thin client	TWh/a	1	0	1	0	0	0	0	0	0	0	0
PC Workstation	TWh/a	1	0	3	2	1	1	1	1	1	1	1
Total PC, electricity	**TWh/a**		**36**	**76**	**48**	**20**	**13**	**14**	**14**	**14**	**14**	**15**
EP-Copier mono	TWh/a	1	26	3	2	1	1	0	0	0	0	0
EP-Copier colour	TWh/a	1	0	1	2	4	4	5	5	5	6	6
EP-printer mono	TWh/a	1	23	7	5	4	4	3	3	2	2	1
EP-printer colour	TWh/a	1	0	3	5	6	8	9	10	12	13	14
IJ SFD printer	TWh/a	1	3	2	1	1	0	0	0	0	0	0
IJ MFD printer	TWh/a	1	3	3	4	4	5	5	6	6	7	7
Total imaging equipment, electricity	**TWh/a**		**56**	**18**	**19**	**20**	**21**	**23**	**24**	**26**	**27**	**29**
SB Home Gateway, on-mode hours	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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	TWh/a	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)	**TWh/a**		**3**	**25**	**30**	**34**	**35**	**33**	**31**	**27**	**21**	**11**
Total BC Battery Charged devices	**TWh/a**	1	**1**	**11**	**11**	**11**	**11**	**11**	**6**	**6**	**6**	**5**

TOTAL ELECTRONICS			**189**	**470**	**401**	**321**	**323**	**332**	**323**	**305**	**274**	**262**
Total RF household Refrigerators & Freezers	**TWh/a**	1	**343**	**345**	**347**	**346**	**346**	**345**	**345**	**344**	**343**	**342**
CF open vertical chilled multi deck (RCV2)	TWh/a	1	71	95	101	108	114	119	123	126	129	130
CF open horizontal frozen island (RHF4)	TWh/a	1	19	13	14	15	16	16	17	18	18	18
CF Plug in one door beverage cooler	TWh/a	1	36	41	42	42	42	43	42	42	42	41
CF Plug in horizontal ice cream freezer	TWh/a	1	9	11	11	12	12	12	12	12	11	11
CF Spiral vending machine	TWh/a	1	5	8	9	10	12	13	14	15	16	17
Total CF Commercial Refrigeration	**TWh/a**		**141**	**168**	**177**	**187**	**195**	**202**	**208**	**213**	**216**	**217**
PF Service cabinets	TWh/a	1	15	21	22	23	24	25	26	28	29	30
PF Blast cabinets	TWh/a	1	5	11	12	14	15	16	18	20	21	23
PF Walk in cold rooms	TWh/a	1	35	45	47	49	51	54	56	59	61	63
PF MT & LT industrial process chillers	TWh/a	1	41	85	98	111	123	135	149	162	175	188
PF Remote condensing units (double count with Lot 12)												
Total PF Professional Refrigeration	**TWh/a**		**96**	**161**	**179**	**197**	**213**	**231**	**249**	**268**	**286**	**304**
TOTAL FOOD PRESERVATION			**579**	**675**	**703**	**730**	**754**	**779**	**802**	**824**	**844**	**863**

BAU Primary Energy (in TWh prim), c'td		**nrg**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CA El. Hobs	TWh/a	1	50	78	86	94	101	107	113	118	123	128
CA El. Ovens	TWh/a	1	58	58	55	52	51	52	53	53	54	54
CA Gas Hobs	TWh/a	0	35	29	28	27	25	24	23	22	21	19
CA Gas Ovens	TWh/a	0	14	10	9	8	8	7	7	7	6	6
CA Range Hoods	TWh/a	1	25	31	32	34	36	37	39	41	43	45
Total CA Cooking Appliances	**TWh/a**		**183**	**206**	**210**	**215**	**220**	**227**	**235**	**241**	**247**	**253**
CM Dripfilter (glass)	TWh/a	1	16	11	10	8	7	7	7	7	7	7
CM Dripfilter (thermos)	TWh/a	1	1	3	3	3	3	3	3	3	3	3
CM Dripfilter (full automatic)	TWh/a	1	0	1	1	2	2	2	2	2	2	3
CM Pad filter	TWh/a	1	0	1	1	2	2	2	2	2	2	2
CM Hard cap espresso	TWh/a	1	0	0	1	1	1	1	1	1	1	1
CM Semi-auto espresso	TWh/a	1	0	0	0	0	0	0	0	0	0	0
CM Fully-auto espresso	TWh/a	1	0	0	0	0	0	0	0	0	0	0
CM Dripfilter (glass), standby/keep warm	TWh/a	1	11	8	7	6	5	5	5	5	5	5
CM Dripfilter (thermos), standby/keep warm	TWh/a	1	0	0	0	0	0	0	0	0	0	0
CM Dripfilter (full automatic), standby/keep warm	TWh/a	1	0	0	0	0	0	0	0	0	0	0
CM Pad filter, standby/keep warm	TWh/a	1	0	1	2	2	2	2	2	2	2	3
CM Hard cap espresso, standby/keep warm	TWh/a	1	0	0	1	1	1	1	1	1	1	1
CM Semi-auto espresso, standby/keep warm	TWh/a	1	0	0	0	0	0	0	0	0	0	0
CM Fully-auto espresso, standby/keep warm	TWh/a	1	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	**TWh/a**		**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	**TWh/a**	1	**131**	**110**	**106**	**98**	**90**	**84**	**78**	**72**	**66**	**61**
Total DW household Dishwasher	**TWh/a**	1	**31**	**58**	**67**	**76**	**84**	**93**	**100**	**107**	**113**	**118**
	TWh/a											
LD vented el.		1	21	28	29	28	27	26	26	27	27	27
LD condens el.	TWh/a	1	4	35	44	52	58	60	60	59	59	59
LD vented gas	TWh/a	0	0	0	0	0	0	0	0	0	0	0
Total LD household Laundry Drier	**TWh/a**		**25**	**63**	**73**	**81**	**86**	**87**	**87**	**86**	**86**	**86**
VC dom	TWh/a	1	25	42	56	59	85	97	108	117	123	126
VC nondom	TWh/a	1	8	12	13	15	16	17	18	19	20	20
Total VC Vacuum Cleaner	**TWh/a**		**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)	TWh/a	1	48	131	154	172	190	200	203	203	203	203
0.5 FAN Axial>300Pa	TWh/a	1	82	241	276	292	305	312	314	314	314	314
0.5 FAN Centr.FC	TWh/a	1	20	43	52	58	63	66	67	67	67	67
0.5 FAN Centr.BC-free	TWh/a	1	53	110	131	144	158	172	183	188	192	195
0.5 FAN Centr.BC	TWh/a	1	55	124	149	164	181	198	214	229	249	270
0.5 FAN Cross-flow	TWh/a	1	3	6	7	8	9	10	11	12	13	14
Total FAN, industrial (excl. box & roof fans)	**TWh/a**		**131**	**328**	**385**	**419**	**452**	**480**	**496**	**507**	**519**	**532**
0.5 **Total MT Industrial motors > 1 hp**	**TWh/a**	1	**2034**	**2796**	**2981**	**3131**	**3221**	**3247**	**3229**	**3209**	**3190**	**3170**
Total WP Water Pumps	**TWh/a**	1	**219**	**294**	**317**	**341**	**366**	**393**	**420**	**448**	**475**	**503**
TOTAL INDUSTRY COMPONENTS			1367	2020	2192	2325	2429	2496	2531	2559	2589	2620
TRAFO Distribution	TWh/a	1	30	50	56	62	68	75	81	88	94	101
TRAFO Industry oil	TWh/a	1	22	39	43	48	52	56	60	65	69	74
TRAFO Industry dry	TWh/a	1	7	12	14	15	16	18	19	21	22	23
TRAFO Power	TWh/a	1	86	133	148	164	180	196	212	227	244	260
TRAFO DER oil	TWh/a	1		1	2	4	6	10	16	25	35	47
TRAFO DER dry	TWh/a	1		5	9	16	26	43	69	104	147	197
TRAFO Small	TWh/a	1	5	5	5	5	5	5	5	5	5	5
Total TRAFO Utility Transformers	**TWh/a**		**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	TWh/a	298	261	238	243	246	220	190	162	138	128
TYRE van replacement tyres C2	TWh/a	118	99	89	90	90	79	67	56	51	48
TYRE truck replacement tyres C3	TWh/a	225	157	121	112	103	93	84	75	66	58
TYRE Replacement Tyres	**TWh/a**	**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)		**8985**	**10224**	**10251**	**10191**	**10158**	**10061**	**9952**	**9845**	**9731**	**9627**
GENERAL TOTAL (in PJ primary)		32346	36805	36904	36687	36569	36221	35827	35443	35032	34658
GENERAL TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		773	879	881	876	873	865	856	847	837	828
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		4023	3410	3272	3146	3032	2908	2767	2613	2431	2220
SPACE COOLING		49	165	185	197	206	207	205	202	199	196
VENTILATION		67	193	221	238	247	254	263	275	287	302
LIGHTING	TWh/a	661	1047	1028	943	816	729	692	663	643	628
ELECTRONICS		189	470	401	321	323	332	323	305	274	262
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		1367	2020	2192	2325	2429	2496	2531	2559	2589	2620
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		**8985**	**10224**	**10251**	**10191**	**10158**	**10061**	**9952**	**9845**	**9731**	**9627**
TOTAL (in PJ primary)		32346	36805	36904	36687	36569	36221	35827	35443	35032	34658
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		773	879	881	876	873	865	856	847	837	828

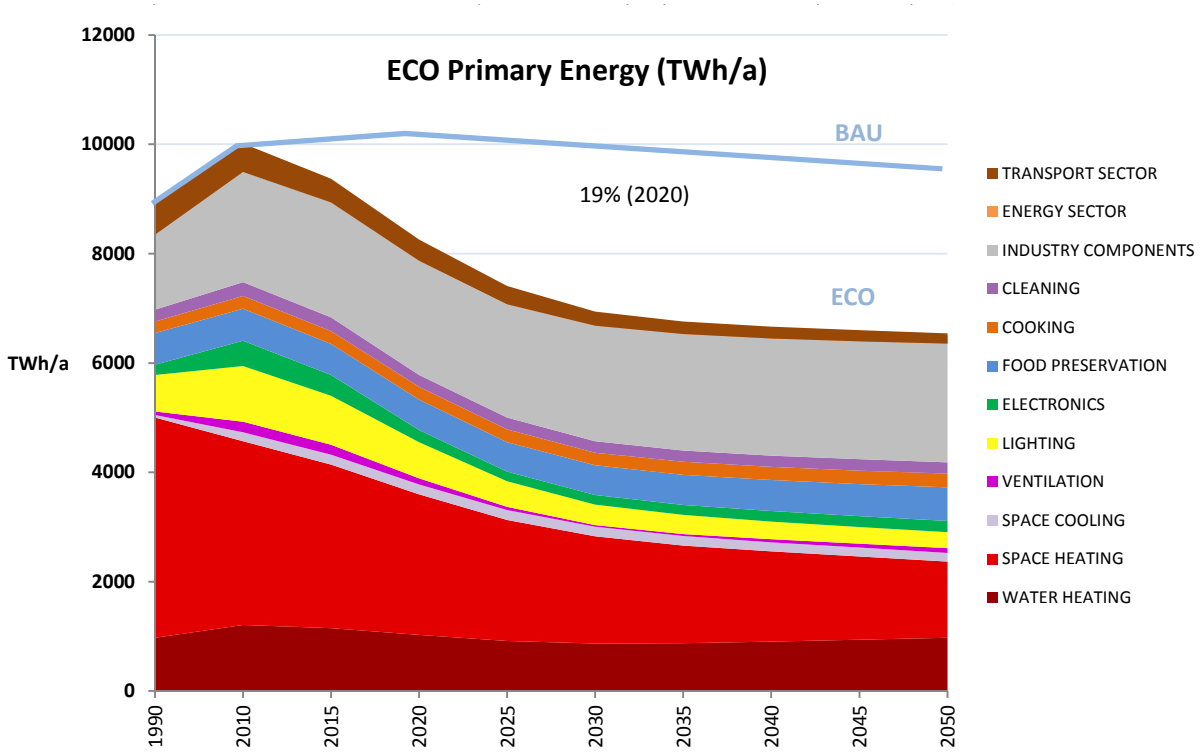


db	ECO Primary Energy (in TWh primary)	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**718**	**797**	**733**	**644**	**565**	**533**	**531**	**549**	**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		*2304*	*1946*	*1605*	*1258*	*969*	*761*	*631*	*527*	*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	**2558**	**2254**	**1908**	**1544**	**1250**	**1053**	**932**	**836**	**743**	**643**
	SFB Wood Manual	0	339	87	62	42	26	14	8	5	4	3
	SFB Wood Direct Draft	0	2	24	43	57	64	60	57	58	64	70
	SFB Coal	0	109	30	20	11	6	2	1	1	1	0
	SFB Pellets	0		10	16	21	25	26	25	24	24	24
	SFB Wood chips	0		15	17	18	16	15	15	15	15	15
	Total Solid Fuel Boiler		**451**	**165**	**158**	**150**	**137**	**116**	**105**	**103**	**107**	**113**
	CHAS (was met CC=40%)	1	12	27	30	31	31	30	29	28	28	27
	CHAL	1	19	33	36	35	32	29	26	24	22	21
	CHsorp	0	0.0	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8
	CHWS	1	1	3	3	3	3	3	3	3	3	3
	CHWL	1	6	11	12	11	10	9	9	8	7	7
	CHeng	0	0.0	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.5
	AC all	1	5	45	47	46	42	37	32	28	24	20
	o/w AC rooftop	1	2	17	14	10	7	5	4	3	2	1
	o/w AC splits	1	2	16	16	15	14	12	10	9	8	6
	o/w AC VRF	1	1	12	16	20	21	20	18	16	14	12
	ACF (AC/ HP eng)	0	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	Total AHC Air Heating & Cooling, cooling		**43**	**119**	**128**	**128**	**120**	**109**	**100**	**93**	**86**	**79**
	AC all, rev	1	3	70	88	98	100	95	88	79	69	59
	o/w AC rooftop, rev	1	2	26	26	22	17	14	11	9	7	4
	o/w AC splits, rev	1	1	25	31	33	33	31	28	25	22	19
	o/w AC VRF, rev	1	1	20	32	44	51	51	48	44	40	36
	ACF (AC/ HP eng), rev , fossil	0	0.0	0.2	0.3	0.4	0.6	0.8	0.9	1.1	1.2	1.2
	AHF all	0	371	208	175	142	115	95	81	71	62	54
	o/w AHFS	0	43	8	5	3	1	1	1	0	0	0
	o/w AHFL central	0	248	153	130	105	85	69	58	50	44	37
	o/w AHFL local	0	80	48	41	34	29	25	23	20	18	17
	AH el	1	3.8	6.9	5.6	3.6	3.4	2.6	1.3	0.3	0.0	0.0
	Total AHC Air Heating & Cooling, heating		**378**	**286**	**269**	**245**	**220**	**194**	**171**	**151**	**132**	**114**
	LH open fireplace	0	17	18	18	16	14	12	10	9	8	8
	LH closed fireplace/inset	0	20	40	47	50	52	53	51	48	45	43
	LH wood stove	0	43	38	36	35	33	31	30	28	27	25
	LH coal stove	0	29	14	12	10	9	7	5	3	2	1
	LH cooker	0	7	11	12	12	12	12	11	11	10	10
	LH SHR stove	0	18	21	22	23	24	26	27	27	27	27
	LH pellet stove	0		7	11	13	15	15	15	14	14	13
	LH open fire gas	0	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	15	13	12	11	10	9	8	8	8	7
	LH flueless fuel heater	0	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	1	77	69	66	59	55	54	53	52	51	50
	LH elec.convector	1	320	287	273	239	212	206	204	200	195	190
	LH elec.storage	1	24	21	20	19	17	16	15	15	14	14
	LH elec.underfloor	1	43	39	38	35	33	31	30	28	27	26
	LH luminous heaters	0	6	5	5	4	4	3	3	3	3	3
	LH tube heaters	0	13	12	11	10	9	8	7	7	6	6
	LH total		**632**	**597**	**584**	**538**	**500**	**484**	**471**	**455**	**439**	**422**
	RAC (cooling demand), all RAC types <12 kW	1	6	46	51	53	61	68	71	74	76	79
	o/w RAC reversible (heating demand)	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		**4023**	**3357**	**2992**	**2566**	**2212**	**1959**	**1789**	**1653**	**1525**	**1392**
	TOTAL SPACE COOLING		**49**	**165**	**179**	**181**	**181**	**177**	**172**	**167**	**162**	**158**
	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	-18	-36	-55	-73	-84	-93	-102	-111
1	RVU Local Balanced, heat (negative=saving)	0	0	-1	-3	-6	-10	-15	-20	-25	-30	-36
	Total VU Ventilation Units		**-86**	**-481**	**-628**	**-812**	**-988**	**-1135**	**-1223**	**-1298**	**-1371**	**-1444**
	TOTAL VENTILATION (electricity + extra heat saving=negative versus BAU)		**67**	**193**	**180**	**112**	**59**	**27**	**38**	**55**	**70**	**87**

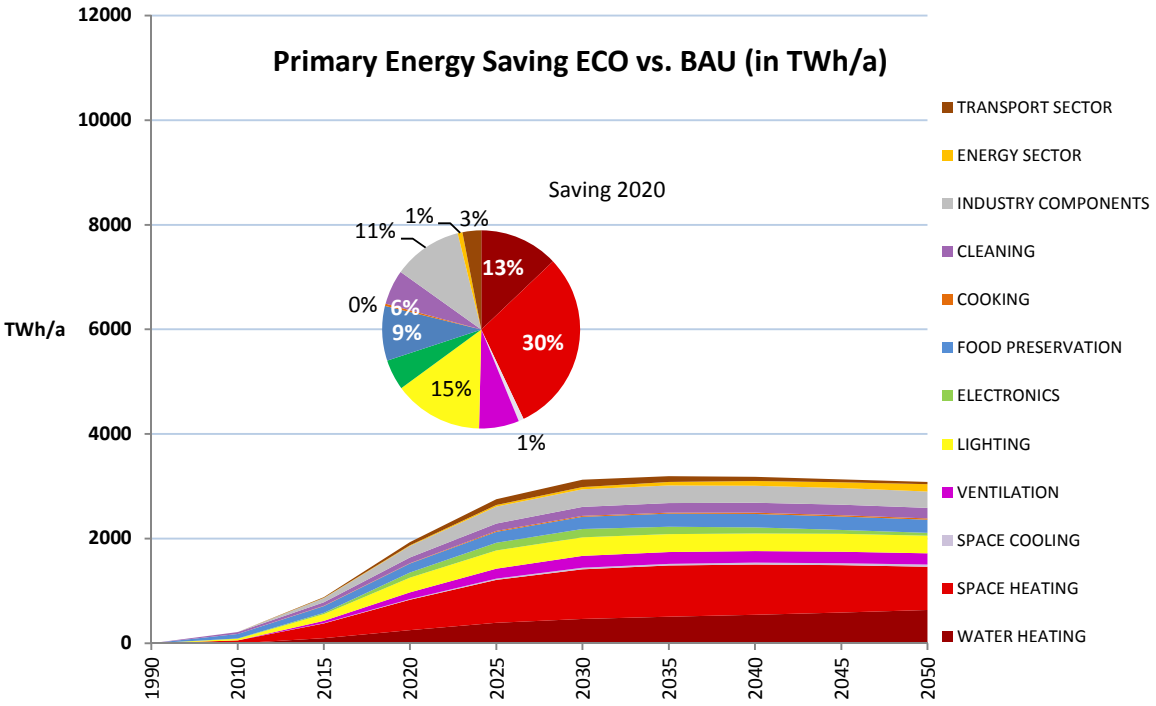
ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources ECO											
LFL Linear Fluorescent	1	203	314	333	274	181	108	75	51	27	10
CFL Compact Fluorescent	1	10	67	79	64	21	5	0	0	0	0
Tungsten	1	23	132	129	56	7	1	1	1	1	1
GLS GeneralLighting Service (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	14.9	24.9	19.2	21.0	22.9	24.8	26.7	28.6
DP Monitor, sb mode	1	0.4	2.5	1.9	1.4	1.4	1.4	1.4	1.4	1.4	1.4
DP Total electronic DisPlays	1	**81**	**256**	**202**	**89**	**52**	**55**	**59**	**68**	**78**	**88**
SSTB	1	0	3	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**
Total CS Computer Servers	1	**12**	**50**	**31**	**21**	**15**	**13**	**13**	**13**	**13**	**13**
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**
TOTAL ELECTRONICS		189	463	377	225	176	176	181	190	200	205
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

	ECO Primary Energy (in TWh primary), c'td		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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	131	148	156	163	169	172	172	172	172
0.5	FAN Axial>300Pa	1	82	241	270	275	278	281	282	282	282	282
0.5	FAN Centr.FC	1	20	43	50	52	53	55	56	56	56	56
0.5	FAN Centr.BC-free	1	53	110	126	132	138	149	158	163	166	169
0.5	FAN Centr.BC	1	55	124	143	149	156	169	182	196	213	231
0.5	FAN Cross-flow	1	3	6	6	5	4	4	5	5	5	6
	Total FAN, industrial (excl. box & roof fans)		**131**	**328**	**371**	**384**	**396**	**414**	**428**	**437**	**447**	**458**
0.5	**Total MT Industrial motors > 1 hp**	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**
	TOTAL INDUSTRY COMPONENTS		**1367**	**2018**	**2110**	**2107**	**2106**	**2159**	**2198**	**2234**	**2271**	**2308**
	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)		**8986**	**10011**	**9371**	**8259**	**7408**	**6938**	**6757**	**6664**	**6597**	**6541**
	GENERAL TOTAL (in PJ primary)		32348	36039	33734	29732	26669	24977	24324	23989	23750	23548
	TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)		773	861	806	710	637	597	581	573	567	562

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	4023	3357	2992	2566	2212	1959	1789	1653	1525	1392
SPACE COOLING	49	165	179	181	181	177	172	167	162	158
VENTILATION	67	193	180	112	59	27	38	55	70	87
LIGHTING	662	1017	900	661	465	373	349	324	302	291
ELECTRONICS	189	463	377	225	176	176	181	190	200	205
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	1367	2018	2110	2107	2106	2159	2198	2234	2271	2308
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	**8986**	**10011**	**9371**	**8259**	**7408**	**6938**	**6757**	**6664**	**6597**	**6541**
TOTAL (in PJ primary)	32348	36039	33734	29732	26669	24977	24324	23989	23750	23548
TOTAL (in mtoe primary=mtoe final + share power generation & distributrion)	773	861	806	710	637	597	581	573	567	562



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	280	580	820	949	978	960	906	828
SPACE COOLING	0	0	6	16	25	30	33	35	37	38
VENTILATION	0	0	41	126	188	227	225	220	217	214
LIGHTING	0	29	128	282	351	356	343	339	341	337
ELECTRONICS	0	6	24	96	147	156	142	114	74	57
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	219	323	337	333	326	319	312
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**	**213**	**880**	**1932**	**2750**	**3123**	**3195**	**3181**	**3134**	**3086**
TOTAL in mtoe final + share power generation & distr.	0	18	76	166	236	269	275	274	269	265
Saving in % versus BAU (from 1990=0)	0.0%	2.1%	8.6%	19.0%	27.1%	31.0%	32.1%	32.3%	32.2%	32.1%
Saving In % versus BAU (from 2010=0)	-2.4%	0.0%	6.5%	16.9%	25.0%	28.9%	30.0%	30.2%	30.0%	29.8%

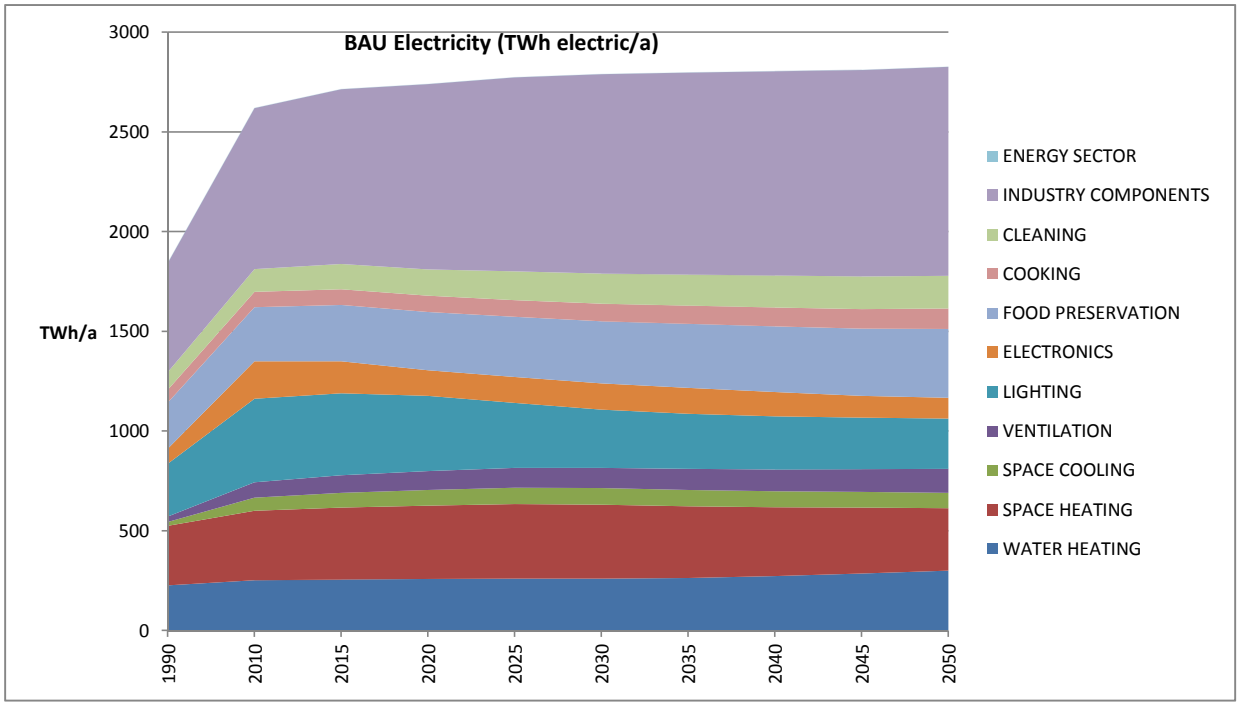


db	BAU Electricity (in TWh elec)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	**78%**	**224**	**249**	**253**	**256**	**258**	**257**	**260**	**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
	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**
	CHAS (was met CC=40%)	1	100%	5	11	12	13	13	13	13	13	13	13
	CHAL	1	100%	8	13	15	15	14	13	12	11	11	10
	CHsorp	0	5%	0	0	0	0	0	0	0	0	0	0
	CHWS	1	100%	1	1	1	1	1	1	1	1	1	1
	CHWL	1	100%	2	4	5	5	4	4	4	4	3	3
	CHeng	0	5%	0	0	0	0	0	0	0	0	0	0
	AC all	1	100%	2	18	19	19	19	17	15	14	12	10
	o/w AC rooftop	1	100%	1	7	6	4	3	3	2	2	1	1
	o/w AC splits	1	100%	1	6	7	7	6	6	5	5	4	3
	o/w AC VRF	1	100%	0	5	7	8	9	9	8	7	7	6
	ACF (AC/ HP eng)	0	5%	0	0	0	0	0	0	0	0	0	0
	Total AHC Air Heating & Cooling, cooling			**17**	**47**	**52**	**53**	**52**	**49**	**46**	**43**	**41**	**38**
	AC all, rev	1	100%	1	28	36	42	45	44	42	39	34	30
	o/w AC rooftop, rev	1	100%	1	10	10	9	8	6	5	5	3	2
	o/w AC splits, rev	1	100%	0	10	13	14	15	15	14	13	11	10
	o/w AC VRF, rev	1	100%	0	8	13	19	22	23	22	21	20	18
	ACF (AC/ HP eng), rev , fossil	0	5%	0	0	0	0	0	0	0	0	0	0
	AHF all	0	5%	7	4	4	3	3	2	2	2	2	1
	o/w AHFS	0	5%	1	0	0	0	0	0	0	0	0	0
	o/w AHFL central	0	5%	5	3	3	2	2	2	1	1	1	1
	o/w AHFL local	0	5%	2	1	1	1	1	1	1	1	0	0
	AH el	1	100%	2	3	2	1	1	1	1	0	0	0
	Total AHC Air Heating & Cooling, heating			**10**	**35**	**42**	**47**	**49**	**48**	**44**	**40**	**36**	**31**
										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
		1											
	LH elec.portable		100%	31	28	27	26	26	25	24	23	22	21
	LH elec.convector	1	100%	128	115	112	109	106	104	100	96	92	87
	LH elec.storage	1	100%	9	9	8	8	8	8	7	7	7	7
	LH elec.underfloor	1	100%	17	16	15	15	14	14	14	13	13	12
	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			**185**	**167**	**162**	**158**	**155**	**150**	**145**	**139**	**133**	**127**
	RAC (cooling demand), all RAC types <12 kW	1	100%	3	18	22	25	30	34	36	37	38	39
	o/w RAC reversible (heating demand)	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			**299**	**350**	**360**	**366**	**373**	**371**	**360**	**345**	**329**	**313**
	TOTAL SPACE COOLING			**20**	**66**	**74**	**78**	**82**	**82**	**81**	**80**	**79**	**78**
	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 Ventilation Units			**27**	**77**	**88**	**95**	**99**	**102**	**105**	**110**	**115**	**121**
	TOTAL VENTILATION (electricity)			**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	10	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**	**100**	**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**
Total CS Computer Servers	1	**5**	**20**	**12**	**9**	**6**	**5**	**5**	**5**	**5**	**5**
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
TOTAL ELECTRONICS		**76**	**188**	**161**	**128**	**129**	**133**	**129**	**122**	**109**	**105**
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**

	BAU Electricity (in TWh elec), c'td	nrg		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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	126	126	126	126
0.5	FAN Centr.FC	1		8	17	21	23	25	27	27	27	27	27
0.5	FAN Centr.BC-free	1		21	44	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 Industrial motors > 1 hp**	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**
	TOTAL INDUSTRY COMPONENTS			**547**	**808**	**877**	**930**	**972**	**998**	**1012**	**1024**	**1036**	**1048**
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			**1843**	**2620**	**2714**	**2740**	**2773**	**2789**	**2798**	**2804**	**2812**	**2827**
	GENERAL TOTAL in mtoe final demand electric			158	225	233	236	238	240	241	241	242	243

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	299	350	360	366	373	371	360	345	329	313
SPACE COOLING	20	66	74	78	82	82	81	80	79	78
VENTILATION	27	77	88	95	99	102	105	110	115	121
LIGHTING	265	419	411	377	326	292	277	265	257	251
ELECTRONICS	76	188	161	128	129	133	129	122	109	105
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	547	808	877	930	972	998	1012	1024	1036	1048
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TOTAL in TWh electric	**1843**	**2620**	**2714**	**2740**	**2773**	**2789**	**2798**	**2804**	**2812**	**2827**
TOTAL in mtoe final (11.63 TWh/mtoe)	158	225	233	236	238	240	241	241	242	243



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**
	CHAS (was met CC=40%)	1	100%	5	11	12	13	12	12	12	11	11	11
	CHAL	1	100%	8	13	14	14	13	12	10	10	9	8
	CHsorp	0	5%	0	0	0	0	0	0	0	0	0	0
	CHWS	1	100%	1	1	1	1	1	1	1	1	1	1
	CHWL	1	100%	2	4	5	5	4	4	3	3	3	3
	CHeng	0	5%	0	0	0	0	0	0	0	0	0	0
	AC all	1	100%	2	18	19	18	17	15	13	11	9	8
	o/w AC rooftop	1	100%	1	7	6	4	3	2	2	1	1	1
	o/w AC splits	1	100%	1	6	7	6	6	5	4	4	3	3
	o/w AC VRF	1	100%	0	5	7	8	8	8	7	6	6	5
	ACF (AC/ HP eng)	0	5%	0	0	0	0	0	0	0	0	0	0
	Total AHC Air Heating & Cooling, cooling			**17**	**47**	**51**	**51**	**48**	**43**	**40**	**37**	**34**	**31**
	AC all, rev	1	100%	1	28	35	39	40	38	35	32	28	24
	o/w AC rooftop, rev	1	100%	1	10	10	9	7	5	5	4	3	2
	o/w AC splits, rev	1	100%	0	10	12	13	13	12	11	10	9	7
	o/w AC VRF, rev	1	100%	0	8	13	17	20	20	19	18	16	14
	ACF (AC/ HP eng), rev , fossil	0	5%	0	0	0	0	0	0	0	0	0	0
	AHF all	0	5%	7	4	4	3	2	2	2	1	1	1
	o/w AHFS	0	5%	1	0	0	0	0	0	0	0	0	0
	o/w AHFL central	0	5%	5	3	3	2	2	1	1	1	1	1
	o/w AHFL local	0	5%	2	1	1	1	1	1	0	0	0	0
	AH el	1	100%	2	3	2	1	1	1	1	0	0	0
	Total AHC Air Heating & Cooling, heating			**10**	**35**	**41**	**44**	**44**	**41**	**37**	**33**	**29**	**25**
										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%	31	28	26	24	22	22	21	21	21	20
	LH elec.convector	1	100%	128	115	109	95	85	83	81	80	78	76
	LH elec.storage	1	100%	9	9	8	7	7	6	6	6	6	6
	LH elec.underfloor	1	100%	17	16	15	14	13	13	12	11	11	10
	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			**185**	**167**	**159**	**141**	**127**	**123**	**121**	**118**	**115**	**112**
	RAC (cooling demand), all RAC types <12 kW	1	100%	3	18	20	21	25	27	29	30	31	32
	o/w RAC reversible (heating demand)	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			**299**	**347**	**350**	**335**	**326**	**326**	**322**	**318**	**312**	**306**
	TOTAL SPACE COOLING			**20**	**66**	**71**	**72**	**72**	**70**	**68**	**66**	**64**	**63**
	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 Ventilation Units			**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	8	9	10	11	11
DP Monitor, sb mode	1	0	1	1	1	1	1	1	1	1	1
DP Total electronic DisPlays	1	**32**	**102**	**81**	**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**
Total CS Computer Servers	1	**5**	**20**	**12**	**9**	**6**	**5**	**5**	**5**	**5**	**5**
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
TOTAL ELECTRONICS		**75**	**185**	**151**	**90**	**71**	**70**	**72**	**76**	**80**	**82**
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**

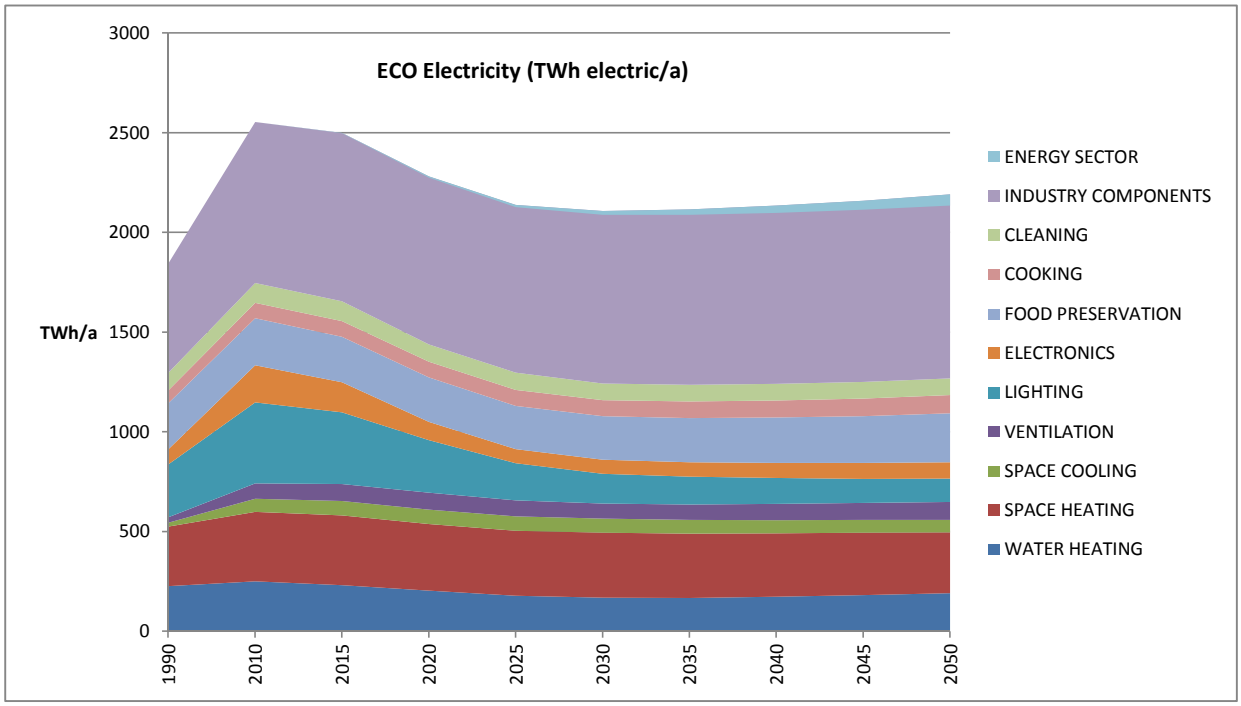
	ECO Electricity (in TWh elec), c'td	nrg		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	1		20	31	34	38	40	43	45	47	49	51
	CA El. Ovens	1		23	23	22	20	19	19	19	19	19	19
	CA Gas Hobs	0	0%	0	0	0	0	0	0	0	0	0	0
	CA Gas Ovens	0	0%	0	0	0	0	0	0	0	0	0	0
	CA Range Hoods	1		10	12	13	13	12	12	11	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	65	68	69	69	69	69
0.5	FAN Axial>300Pa	1		33	96	108	110	111	112	113	113	113	113
0.5	FAN Centr.FC	1		8	17	20	21	21	22	22	22	22	22
0.5	FAN Centr.BC-free	1		21	44	51	53	55	60	63	65	66	68
0.5	FAN Centr.BC	1		22	50	57	59	62	68	73	78	85	92
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**	**154**	**159**	**166**	**171**	**175**	**179**	**183**
0.5	**Total MT Industrial motors > 1 hp**	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**
	TOTAL INDUSTRY COMPONENTS			547	807	844	843	842	864	879	893	908	923
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			**1843**	**2554**	**2498**	**2275**	**2127**	**2088**	**2089**	**2098**	**2114**	**2136**
	GENERAL TOTAL in mtoe final (11.63 TWh/mtoe)			159	220	215	196	183	180	180	180	182	184

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

number) is counted.

included in the diminishing net heat load of buildings (CH boilers, AC, etc.)

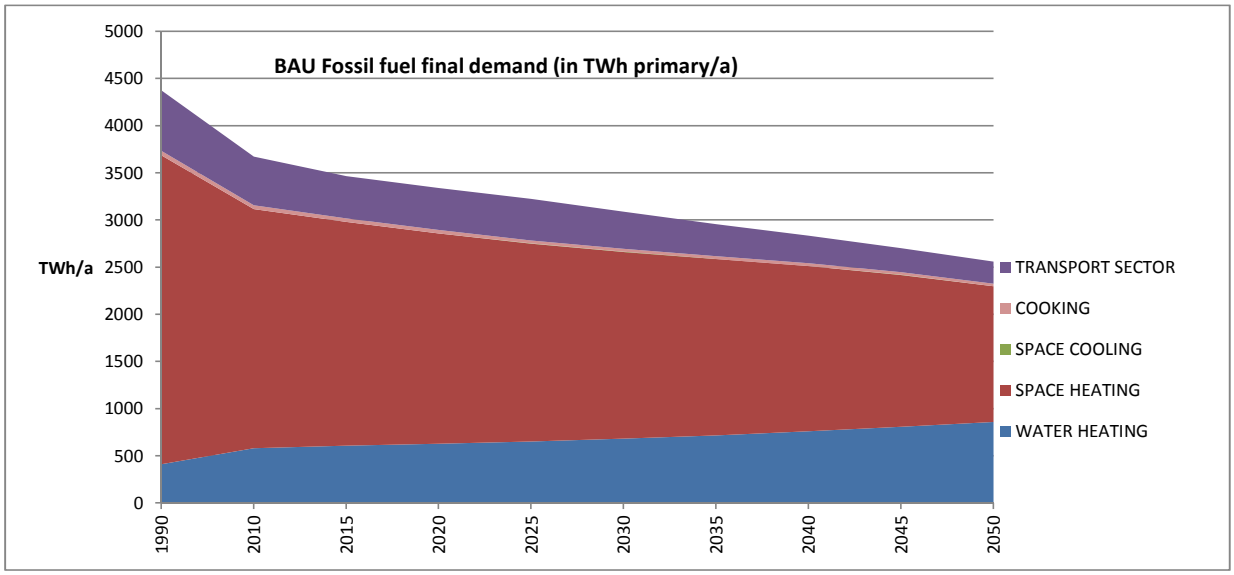
ECO Electricity (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	226	252	232	204	179	169	168	174	183	191
SPACE HEATING	299	347	350	335	326	326	322	318	312	306
SPACE COOLING	20	66	71	72	72	70	68	66	64	63
VENTILATION	27	77	85	84	80	76	78	81	85	90
LIGHTING	265	407	360	264	186	149	140	130	121	116
ELECTRONICS	75	185	151	90	71	70	72	76	80	82
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	547	807	844	843	842	864	879	893	908	923
ENERGY SECTOR	0	0	-2	-6	-12	-19	-27	-36	-46	-55
TOTAL in TWh electric	**1843**	**2554**	**2498**	**2275**	**2127**	**2088**	**2089**	**2098**	**2114**	**2136**



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	10	32	48	45	37	28	17	7
SPACE COOLING	0	0	2	6	10	12	13	14	15	15
VENTILATION	0	0	3	11	19	25	27	28	30	31
LIGHTING	0	12	51	113	140	142	137	135	137	135
ELECTRONICS	0	2	10	38	59	62	57	46	30	23
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	87	129	135	133	130	128	125
ENERGY SECTOR	0	0	2	6	12	19	27	36	46	55
TOTAL in TWh electric	**0**	**66**	**217**	**465**	**646**	**701**	**709**	**706**	**698**	**691**
TOTAL in mtoe final (11.63 TWh/mtoe)	0	6	19	40	56	60	61	61	60	59
TOTAL in mtoe final + share power generation & distr.	0	14	47	100	139	151	152	152	150	149

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		2304	1992	1854	1733	1626	1543	1458	1363	1240	1088
	Total CH Central Heating boiler, space heat	0		**2304**	**1992**	**1854**	**1733**	**1626**	**1543**	**1458**	**1363**	**1240**	**1088**
	SFB Wood Manual	0		339	87	63	45	29	17	10	7	6	5
	SFB Wood Direct Draft	0		2	24	43	58	66	62	60	61	67	74
	SFB Coal	0		109	30	20	11	6	2	1	1	1	1
	SFB Pellets	0		0	10	16	21	25	27	26	25	25	25
	SFB Wood chips	0		0	15	17	18	16	15	15	16	16	16
	Total Solid Fuel Boiler			**451**	**165**	**159**	**154**	**143**	**123**	**112**	**110**	**114**	**120**
	CHsorp	0	5%	0	0	0	0	0	1	1	1	1	1
	CHeng	0	5%	0	0	0	0	0	0	0	1	1	1
	ACF (AC/ HP eng)	0	5%	0	0	0	0	0	0	0	1	1	1
	Total AHC Air Cooling			**0**	**0**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**
	ACF (AC/ HP eng), rev	0	5%	0	0	0	0	1	1	1	1	1	1
	AHF all	0	5%	352	198	169	145	125	109	95	83	72	62
	o/w AHFS	0	5%	41	7	4	3	2	1	1	0	0	0
	o/w AHFL central	0	5%	236	145	125	107	91	78	67	58	49	42
	o/w AHFL local	0	5%	76	45	40	36	33	30	28	25	23	21
	AH el	1	###	0	0	0	0	0	0	0	0	0	0
	Total AHC Air Heating			**352**	**198**	**169**	**145**	**126**	**110**	**96**	**84**	**73**	**64**
										0			
	LH open fireplace	0	0%	17	18	18	18	18	17	16	15	14	13
	LH closed fireplace/inset	0	0%	20	40	47	54	58	60	60	57	53	49
	LH wood stove	0	0%	43	38	37	36	36	36	35	34	31	29
	LH coal stove	0	0%	29	14	12	11	9	8	6	4	2	1
	LH cooker	0	0%	7	11	12	14	15	15	14	13	12	11
	LH SHR stove	0	0%	18	21	22	24	26	29	31	32	32	31
	LH pellet stove	0	0%	0	7	11	14	16	17	17	16	15	14
	LH open fire gas	0	0%	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	0%	15	13	12	12	11	11	10	10	9	9
	LH flueless fuel heater	0	0%	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters	0	0%	6	5	5	5	4	4	3	3	3	3
	LH tube heaters	0	0%	13	12	11	10	9	8	8	7	7	6
	Total LH Local Heaters			**169**	**180**	**189**	**198**	**204**	**205**	**201**	**192**	**180**	**166**
	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			**3276**	**2536**	**2371**	**2230**	**2098**	**1981**	**1868**	**1749**	**1608**	**1438**
	TOTAL SPACE COOLING			**0**	**0**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**
1	NRVU heat (negative=saving vs. natural	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 Ventilation Units			**-153**	**-674**	**-808**	**-924**	**-1021**	**-1102**	**-1182**	**-1262**	**-1343**	**-1426**
	TOTAL VENTILATION (BAU heat saving already included in space heating energy, so			**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 CA Cooking Appliances			**49**	**39**	**37**	**35**	**33**	**31**	**30**	**28**	**27**	**26**
	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			**3736**	**3157**	**3018**	**2895**	**2786**	**2696**	**2617**	**2542**	**2447**	**2325**
	GENERAL TOTAL in mtoe final demand electric			321	271	259	249	240	232	225	219	210	200

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	3276	2536	2371	2230	2098	1981	1868	1749	1608	1438
SPACE COOLING	0	0	1	1	1	1	2	2	2	2
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	**3736**	**3157**	**3018**	**2895**	**2786**	**2696**	**2617**	**2542**	**2447**	**2325**
TOTAL in mtoe final (11.63 TWh/mtoe)	321	271	259	249	240	232	225	219	210	200
Total PJ primary	13449	11364	10864	10422	10028	9705	9423	9151	8810	8372



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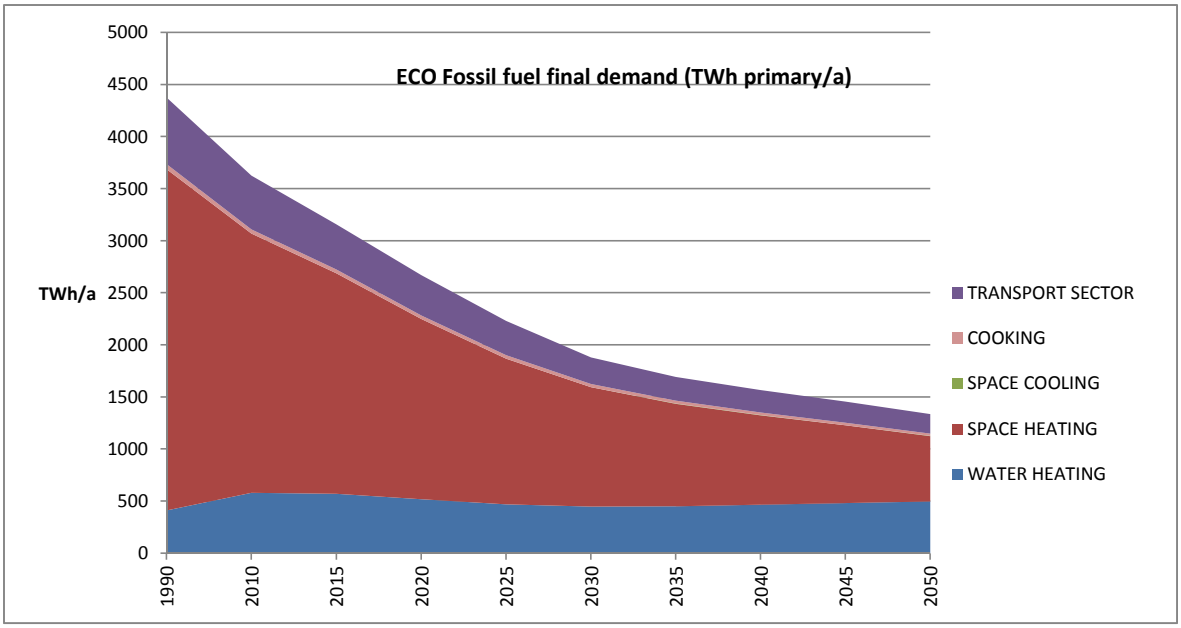
db	ECO Fossil Fuel (in TWh NCV)	nrg	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*		*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	**0**	78%	**158**	**175**	**161**	**142**	**124**	**117**	**117**	**121**	**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		2304	1946	1605	1258	969	761	631	527	428	320
	Total CH Central Heating boiler, space heat	0		**2304**	**1946**	**1605**	**1258**	**969**	**761**	**631**	**527**	**428**	**320**
	SFB Wood Manual	0		339	87	62	42	26	14	8	5	4	3
	SFB Wood Direct Draft	0		2	24	43	57	64	60	57	58	64	70
	SFB Coal	0		109	30	20	11	6	2	1	1	1	0
	SFB Pellets	0		0	10	16	21	25	26	25	24	24	24
	SFB Wood chips	0		0	15	17	18	16	15	15	15	15	15
	Total Solid Fuel Boiler			**451**	**165**	**158**	**150**	**137**	**116**	**105**	**103**	**107**	**113**
	CHsorp	0	5%	0	0	0	0	0	0	1	1	1	1
	CHeng	0	5%	0	0	0	0	0	0	0	0	0	0
	ACF (AC/ HP eng)	0	5%	0	0	0	0	0	0	0	0	0	0
	Total AHC Air Cooling			**0**	**0**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
	ACF (AC/ HP eng), rev	0	5%	0	0	0	0	1	1	1	1	1	1
	AHF all	0	5%	352	198	166	135	109	90	77	68	59	51
	o/w AHFS	0	5%	41	7	4	2	1	1	0	0	0	0
	o/w AHFL central	0	5%	236	145	123	100	81	65	55	48	41	36
	o/w AHFL local	0	5%	76	45	39	32	27	24	21	19	18	16
	AH el	1	100%	0	0	0	0	0	0	0	0	0	0
	Total AHC Air Heating			**352**	**198**	**167**	**135**	**110**	**91**	**78**	**69**	**60**	**53**
										0			
	LH open fireplace	0	0%	17	18	18	16	14	12	10	9	8	8
	LH closed fireplace/inset	0	0%	20	40	47	50	52	53	51	48	45	43
	LH wood stove	0	0%	43	38	36	35	33	31	30	28	27	25
	LH coal stove	0	0%	29	14	12	10	9	7	5	3	2	1
	LH cooker	0	0%	7	11	12	12	12	12	11	11	10	10
	LH SHR stove	0	0%	18	21	22	23	24	26	27	27	27	27
	LH pellet stove	0	0%	0	7	11	13	15	15	15	14	14	13
	LH open fire gas	0	0%	1	1	1	1	1	1	1	1	1	1
	LH closed fire gas	0	0%	15	13	12	11	10	9	8	8	8	7
	LH flueless fuel heater	0	0%	0	0	0	0	0	0	0	0	0	0
	LH luminous heaters	0	0%	6	5	5	4	4	3	3	3	3	3
	LH tube heaters	0	0%	13	12	11	10	9	8	7	7	6	6
	Total LH Local Heaters			**169**	**180**	**187**	**186**	**182**	**177**	**169**	**160**	**151**	**142**
	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			**3276**	**2489**	**2116**	**1729**	**1398**	**1145**	**983**	**859**	**746**	**627**
	TOTAL SPACE COOLING			**0**	**0**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
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	-18	-36	-55	-73	-84	-93	-102	-111
1	RVU Local Balanced, heat (negative=saving)	0	0%	0	-1	-3	-6	-10	-15	-20	-25	-30	-36
	Total VU Ventilation Units			**-153**	**-674**	**-840**	**-1023**	**-1188**	**-1327**	**-1418**	**-1501**	**-1585**	**-1668**
	TOTAL VENTILATION (extra heat saving=negative versus BAU)			**0**	**0**	**-32**	**-99**	**-142**	**-164**	**-157**	**-149**	**-143**	**-137**
	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 CA Cooking Appliances			**49**	**39**	**37**	**34**	**32**	**30**	**28**	**26**	**25**	**24**
	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)			**3736**	**3110**	**2693**	**2184**	**1759**	**1461**	**1308**	**1204**	**1112**	**1013**
	GENERAL TOTAL in mtoe final			321	267	232	188	151	126	112	104	96	87

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	3276	2489	2116	1729	1398	1145	983	859	746	627
SPACE COOLING	0	0	1	1	1	1	1	2	2	2
VENTILATION	0	0	-32	-99	-142	-164	-157	-149	-143	-137
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)	**4377**	**3626**	**3126**	**2570**	**2090**	**1717**	**1535**	**1418**	**1313**	**1201**
TOTAL in mtoe final (11.63 TWh/mtoe)	376	312	269	221	180	148	132	122	113	103



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	255	501	700	836	884	891	862	811
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	32	99	142	164	157	149	143	137
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**	**339**	**769**	**1134**	**1371**	**1422**	**1416**	**1390**	**1358**
TOTAL in mtoe final (11.63 TWh/mtoe)	0	4	29	66	98	118	122	122	119	117
TOTAL in PJ primary	0	169	1221	2770	4084	4936	5121	5097	5003	4889

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	0.022										
GWPpellets	pellets	kg CO_2/kWh	0.040										
GWPcoal	coal	kg CO_2/kWh	0.392										
GWPwoodchip	wood chips	kg CO_2/kWh	0.014										
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	kg CO_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)

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

Vacuum cleaners, Lot 17 (from 1.9.2017)

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

Tyres (Tyre regulation): Rolling Noise requirements

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

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

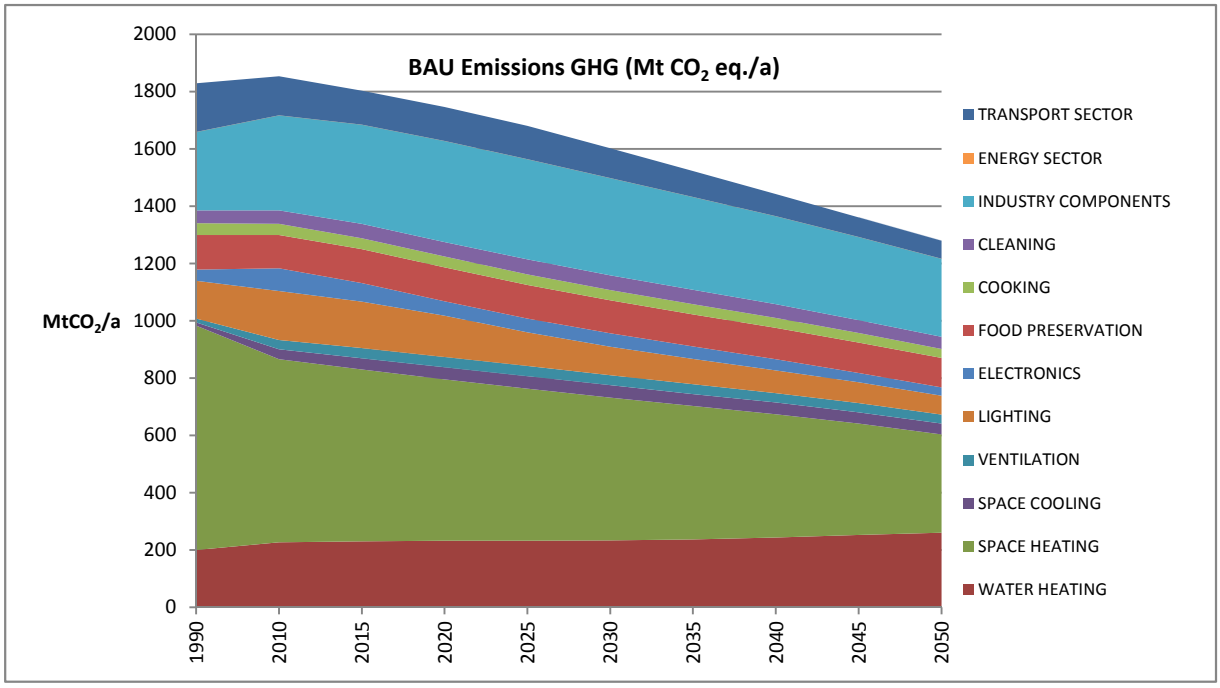
db	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also NO_x emissions at bottom of Table										
	Total WH dedicated Water Heater	**146**	**139**	**138**	**136**	**131**	**126**	**122**	**121**	**121**	**121**
	Total CH Central Heating combi, water heat	**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	**540**	**475**	**443**	**414**	**389**	**368**	**348**	**324**	**295**	**259**
	SFB Wood Manual	7.3	1.9	1.4	1.0	0.6	0.4	0.2	0.1	0.1	0.1
	SFB Wood Direct Draft	0.1	0.5	0.9	1.2	1.4	1.3	1.3	1.3	1.5	1.6
	SFB Coal	42.9	11.8	7.7	4.5	2.3	0.9	0.4	0.3	0.3	0.2
	SFB Pellets	0.0	0.4	0.6	0.8	1.0	1.1	1.0	1.0	1.0	1.0
	SFB Wood chips	0.0	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	Total Solid Fuel Boiler	**50**	**15**	**11**	**8**	**6**	**4**	**3**	**3**	**3**	**3**
	CHAS (was met CC=40%)	3.1	6.9	8.1	8.8	9.1	9.2	9.5	9.8	10.0	10.3
	CHAL	4.0	6.0	6.4	6.3	5.8	5.2	4.7	4.3	3.9	3.6
	CHsorp	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	CHWS	0.3	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	CHWL	1.4	2.1	2.3	2.3	2.1	1.9	1.8	1.7	1.6	1.5
	CHeng	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	AC all	1.2	10.3	11.2	11.7	11.4	10.5	9.4	8.5	7.5	6.6
	o/w AC rooftop	*0.5*	*3.5*	*3.0*	*2.3*	*1.6*	*1.2*	*1.0*	*0.8*	*0.6*	*0.4*
	o/w AC splits	*0.4*	*3.7*	*3.9*	*3.9*	*3.7*	*3.4*	*3.0*	*2.6*	*2.3*	*2.0*
	o/w AC VRF	*0.2*	*3.0*	*4.3*	*5.5*	*6.1*	*5.9*	*5.5*	*5.1*	*4.6*	*4.3*
	ACF (AC/ HP eng)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling	**10**	**26**	**29**	**30**	**29**	**28**	**26**	**25**	**24**	**23**
	AC all, rev	0.7	13.1	16.6	19.2	19.9	19.1	17.5	15.7	13.7	11.8
	o/w AC rooftop, rev	*0.3*	*4.6*	*4.5*	*3.9*	*3.1*	*2.5*	*2.1*	*1.7*	*1.2*	*0.7*
	o/w AC splits, rev	*0.3*	*4.7*	*5.8*	*6.5*	*6.5*	*6.2*	*5.6*	*5.0*	*4.3*	*3.6*
	o/w AC VRF, rev	*0.1*	*3.8*	*6.3*	*8.8*	*10.3*	*10.4*	*9.8*	*9.1*	*8.3*	*7.4*
	ACF (AC/ HP eng), rev , fossil	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
	AHF all	79	44	37	32	28	24	21	18	16	14
	o/w AHFS	*9.1*	*1.7*	*1.0*	*0.6*	*0.4*	*0.2*	*0.1*	*0.1*	*0.0*	*0.0*
	o/w AHFL central	*53*	*32*	*28*	*24*	*20*	*17*	*15*	*13*	*11*	*9*
	o/w AHFL local	*17*	*10*	*9*	*8*	*7*	*7*	*6*	*6*	*5*	*5*
	AH el	0.8	1.1	0.9	0.6	0.5	0.4	0.2	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating	**80**	**58**	**55**	**52**	**48**	**44**	**39**	**34**	**30**	**26**
	LH open fireplace	0.4	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	1.1
	LH wood stove	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6
	LH coal stove	11.4	5.6	4.9	4.2	3.6	3.0	2.3	1.6	0.9	0.3
	LH cooker	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
	LH SHR stove	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7
	LH pellet stove	0.0	0.3	0.4	0.5	0.6	0.7	0.7	0.6	0.6	0.5
	LH open fire gas	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	LH closed fire gas	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3
	LH flueless fuel heater	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	LH elec.portable	15.5	11.4	10.6	10.0	9.3	8.5	7.7	6.9	6.2	5.5
	LH elec.convector	64.0	47.1	44.1	41.3	38.3	35.2	32.0	28.7	25.6	22.6
	LH elec.storage	4.7	3.5	3.3	3.1	2.8	2.6	2.4	2.1	1.9	1.7
	LH elec.underfloor	8.5	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.6	3.2
	LH luminous heaters	1.2	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.6
	LH tube heaters	2.8	2.5	2.4	2.2	2.0	1.8	1.6	1.5	1.4	1.3
	LH total	**111**	**81**	**76**	**72**	**67**	**61**	**56**	**50**	**44**	**39**
	RAC (cooling demand), all RAC types <12 kW	1.4	9.2	10.9	12.4	14.6	15.5	15.6	15.4	15.1	14.7
	o/w RAC reversible (heating demand)	0.9	10.0	13.8	17.8	21.1	21.5	20.4	19.0	17.5	16.1
	Total RAC Room Air Conditioner	**2**	**19**	**25**	**30**	**36**	**37**	**36**	**34**	**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	**782**	**639**	**599**	**563**	**530**	**499**	**466**	**430**	**389**	**343**
	TOTAL SPACE COOLING	**11**	**35**	**40**	**42**	**44**	**43**	**42**	**41**	**39**	**38**
	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
GLS stock										
Tungsten stock										
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	0.6	3.9	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**	**41**	**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**
Total CS Computer Servers	**2**	**8**	**5**	**3**	**2**	**2**	**2**	**2**	**1**	**1**
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**
TOTAL ELECTRONICS	**39**	**78**	**65**	**50**	**48**	**47**	**43**	**38**	**33**	**29**
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	27.2	26.0	24.4	22.8	21.2
0.5	FAN Axial>300Pa	16.4	39.5	43.6	44.4	43.9	42.4	40.2	37.7	35.2	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 Industrial motors > 1 hp**	**407**	**459**	**471**	**476**	**464**	**442**	**413**	**385**	**357**	**330**
	Total WP Water Pumps	**44**	**48**	**50**	**52**	**53**	**53**	**54**	**54**	**53**	**52**
	TOTAL INDUSTRY COMPONENTS	**273**	**331**	**346**	**353**	**350**	**339**	**324**	**307**	**290**	**272**
	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)	**1828**	**1854**	**1803**	**1746**	**1680**	**1602**	**1522**	**1442**	**1360**	**1279**

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	782	639	599	563	530	499	466	430	389	343
SPACE COOLING	11	35	40	42	44	43	42	41	39	38
VENTILATION	13	32	35	36	36	35	34	33	32	31
LIGHTING	132	172	162	143	117	99	89	80	72	65
ELECTRONICS	39	78	65	50	48	47	43	38	33	29
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	273	331	346	353	350	339	324	307	290	272
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	**1828**	**1854**	**1803**	**1746**	**1680**	**1602**	**1522**	**1442**	**1360**	**1279**

Compare: The EU total emissions of greenhouse gases in 2007 amounts to 5054 Mt CC_2 equivalent (CO_2 4187 + CH_4 416 + N_2O 374 + HFCs 63
Source: European Environmental Agency (EEA), Annual European Community greenhouse gas inventory 1990–2007 and inventory report



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	**438**	**379**	**352**	**329**	**309**	**293**	**277**	**259**	**236**	**207**
Total direct NO_x BAU in NO_x	516	489	468	449	433	423	413	404	390	370
Direct NO_x BAU in SO_2 eq.(=1 /0.7 NO_x)	**737**	**698**	**669**	**641**	**619**	**604**	**591**	**577**	**557**	**529**

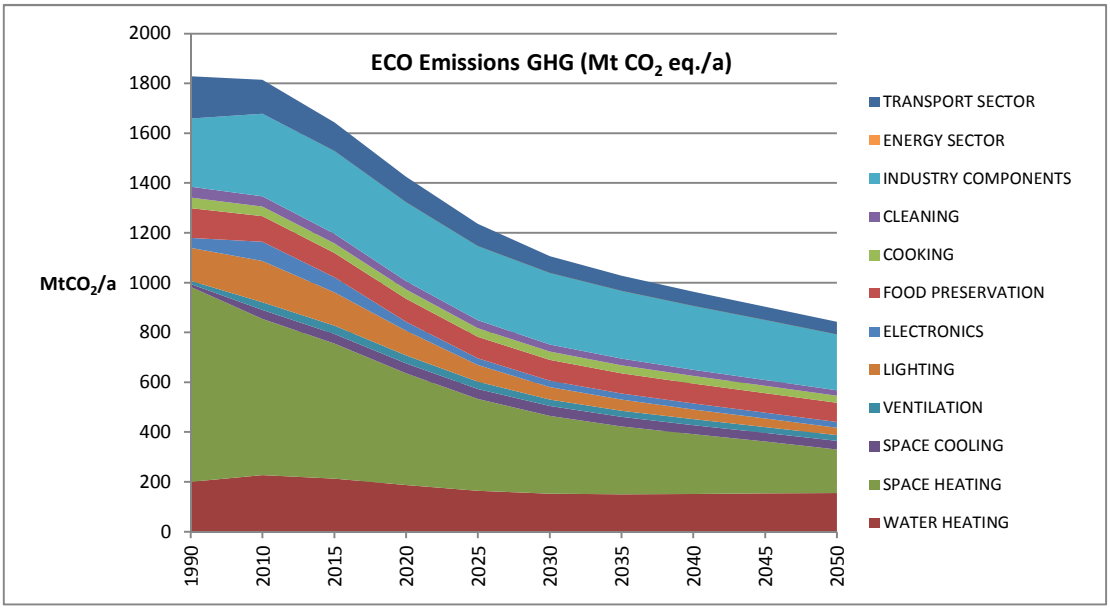
Compare: The EU total emissions of acidifying agents in 2007 is 22 432 kt SC_2 equivalent (NO_x 11 151 + SO_x 7339 + NH_3 3 876). The above is
Source for EU-total: European Environmental Agency (EEA), National emissions reported to the Convention on Long-range Transboundary Air

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	**540**	**464**	**389**	**311**	**246**	**201**	**173**	**149**	**126**	**102**
	SFB Wood Manual	7.3	1.9	1.3	0.9	0.6	0.3	0.2	0.1	0.1	0.1
	SFB Wood Direct Draft	0.1	0.5	0.9	1.2	1.4	1.3	1.2	1.3	1.4	1.5
	SFB Coal	42.9	11.8	7.7	4.5	2.3	0.8	0.4	0.3	0.2	0.2
	SFB Pellets	0.0	0.4	0.6	0.8	1.0	1.0	1.0	0.9	0.9	0.9
	SFB Wood chips	0.0	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	Total Solid Fuel Boiler	**50**	**15**	**11**	**8**	**5**	**4**	**3**	**3**	**3**	**3**
	CHAS (was met CC=40%)	3.1	6.9	8.0	8.6	8.8	8.8	9.0	9.2	9.4	9.6
	CHAL	4.0	6.0	6.3	6.1	5.4	4.7	4.2	3.7	3.4	3.1
	CHsorp	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	CHWS	0.3	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	CHWL	1.4	2.1	2.3	2.2	2.0	1.8	1.7	1.6	1.4	1.4
	CHeng	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	AC all	1.2	10.3	11.1	11.2	10.7	9.7	8.7	7.7	6.8	6.0
	o/w AC rooftop	*0.5*	*3.5*	*2.9*	*2.2*	*1.5*	*1.1*	*0.9*	*0.7*	*0.5*	*0.3*
	o/w AC splits	*0.4*	*3.7*	*3.8*	*3.8*	*3.4*	*3.1*	*2.7*	*2.4*	*2.0*	*1.8*
	o/w AC VRF	*0.2*	*3.0*	*4.3*	*5.3*	*5.8*	*5.6*	*5.1*	*4.7*	*4.3*	*4.0*
	ACF (AC/ HP eng)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling	**10**	**26**	**28**	**29**	**28**	**26**	**24**	**23**	**22**	**21**
	AC all, rev	0.7	13.1	16.3	18.2	18.2	17.0	15.4	13.7	11.8	10.1
	o/w AC rooftop, rev	*0.3*	*4.6*	*4.5*	*3.7*	*2.8*	*2.2*	*1.8*	*1.4*	*1.0*	*0.6*
	o/w AC splits, rev	*0.3*	*4.7*	*5.7*	*6.1*	*5.9*	*5.5*	*4.9*	*4.3*	*3.6*	*3.0*
	o/w AC VRF, rev	*0.1*	*3.8*	*6.2*	*8.4*	*9.5*	*9.4*	*8.7*	*8.0*	*7.2*	*6.4*
	ACF (AC/ HP eng), rev , fossil	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
	AHF all	79	44	37	30	24	20	17	15	13	11
	o/w AHFS	*9.1*	*1.7*	*0.9*	*0.5*	*0.3*	*0.2*	*0.1*	*0.1*	*0.0*	*0.0*
	o/w AHFL central	*53*	*32*	*27*	*22*	*18*	*14*	*12*	*10*	*9*	*8*
	o/w AHFL local	*17*	*10*	*9*	*7*	*6*	*5*	*5*	*4*	*4*	*3*
	AH el	0.8	1.1	0.9	0.6	0.5	0.4	0.2	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating	**80**	**58**	**54**	**49**	**43**	**37**	**33**	**29**	**25**	**22**
	LH open fireplace	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	LH closed fireplace/inset	0.4	0.9	1.0	1.1	1.1	1.1	1.1	1.0	1.0	0.9
	LH wood stove	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5
	LH coal stove	11.4	5.6	4.8	4.1	3.4	2.7	2.0	1.3	0.7	0.2
	LH cooker	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	LH SHR stove	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	LH pellet stove	0.0	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5
	LH open fire gas	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH closed fire gas	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	LH flueless fuel heater	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	LH elec.portable	15.5	11.4	10.4	9.0	8.0	7.4	6.8	6.3	5.7	5.2
	LH elec.convector	64.0	47.1	43.2	36.3	30.6	28.1	26.1	24.0	21.9	19.8
	LH elec.storage	4.7	3.5	3.2	2.8	2.4	2.1	1.9	1.8	1.6	1.5
	LH elec.underfloor	8.5	6.4	6.0	5.4	4.8	4.3	3.8	3.4	3.0	2.7
	LH luminous heaters	1.2	1.1	1.1	0.9	0.8	0.7	0.7	0.6	0.6	0.6
	LH tube heaters	2.8	2.5	2.4	2.2	1.9	1.7	1.5	1.4	1.3	1.3
	LH total	**111**	**81**	**75**	**65**	**56**	**51**	**47**	**43**	**38**	**35**
	RAC (cooling demand), all RAC types <12 kW	1.4	9.2	10.2	10.9	12.4	13.3	13.4	13.2	13.0	12.7
	o/w RAC reversible (heating demand)	0.9	10.0	13.1	15.9	18.4	18.8	17.9	16.7	15.5	14.3
	Total RAC Room Air Conditioner	**2**	**19**	**23**	**27**	**31**	**32**	**31**	**30**	**28**	**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	**782**	**628**	**542**	**448**	**369**	**312**	**273**	**240**	**208**	**175**
	TOTAL SPACE COOLING	**11**	**35**	**39**	**40**	**40**	**39**	**38**	**36**	**35**	**34**
	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	-3.9	-7.6	-11.7	-15.5	-17.8	-19.7	-21.6	-23.5
1	RVU Local Balanced, heat (negative=saving)	0.0	-0.2	-0.5	-1.2	-2.1	-3.2	-4.3	-5.4	-6.5	-7.6
	Total VU Ventilation Units	**-19**	**-112**	**-145**	**-185**	**-224**	**-256**	**-276**	**-294**	**-313**	**-331**
	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
GLS stock										
Tungsten stock										
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	3.8	2.8	2.9	2.9	3.0	3.0	3.0
DP Monitor, sb mode	0.1	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
DP Total electronic DisPlays	**16**	**42**	**32**	**13**	**8**	**8**	**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**
Total CS Computer Servers	**2**	**8**	**5**	**3**	**2**	**2**	**2**	**2**	**1**	**1**
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**
TOTAL ELECTRONICS	**39**	**77**	**61**	**36**	**27**	**25**	**25**	**24**	**24**	**23**
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	23.4	23.7	23.5	23.0	22.0	20.6	19.3	17.9
0.5	FAN Axial>300Pa	16.4	39.5	42.6	41.8	40.0	38.2	36.2	33.9	31.6	29.4
0.5	FAN Centr.FC	4.1	7.0	7.9	7.9	7.7	7.5	7.2	6.7	6.3	5.8
0.5	FAN Centr.BC-free	10.6	18.1	20.0	20.0	19.9	20.3	20.2	19.5	18.6	17.6
0.5	FAN Centr.BC	11.0	20.4	22.5	22.6	22.5	23.0	23.3	23.5	23.8	24.0
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**	**57**	**56**	**55**	**52**	**50**	**48**
0.5	**Total MT Industrial motors > 1 hp**	**407**	**458**	**450**	**423**	**390**	**371**	**349**	**327**	**305**	**283**
	Total WP Water Pumps	**44**	**48**	**49**	**51**	**51**	**52**	**52**	**52**	**52**	**51**
	TOTAL INDUSTRY COMPONENTS	**273**	**331**	**333**	**320**	**303**	**294**	**281**	**268**	**254**	**240**
	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)	**1829**	**1815**	**1644**	**1425**	**1235**	**1107**	**1027**	**964**	**903**	**843**

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	782	628	542	448	369	312	273	240	208	175
SPACE COOLING	11	35	39	40	40	39	38	36	35	34
VENTILATION	13	32	34	32	29	26	25	24	24	23
LIGHTING	132	165	134	100	67	51	45	39	34	30
ELECTRONICS	39	77	61	36	27	25	25	24	24	23
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	273	331	333	320	303	294	281	268	254	240
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	1829	1815	1644	1425	1235	1107	1027	964	903	843



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	58	116	161	187	193	191	182	168
SPACE COOLING	0	0	1	2	4	4	4	4	4	4
VENTILATION	0	0	1	4	7	9	9	9	8	8
LIGHTING	0	7	29	43	51	48	44	41	38	35
ELECTRONICS	0	1	4	15	21	21	18	14	9	6
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	33	47	46	43	39	36	32
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	39	159	320	445	496	495	478	457	436
Saving in % versus BAU (from 1990=0)	0.0%	2.1%	8.8%	18.3%	26.5%	30.9%	32.5%	33.2%	33.6%	34.1%
Saving In % versus BAU (from 2010=0)	-2.1%	0.0%	6.7%	16.1%	24.1%	28.5%	30.0%	30.5%	30.7%	31.1%

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	438	370	288	167	94	57	47	40	32	24
Total direct NO_x ECO	516	480	390	235	139	91	81	75	68	61
Total direct NO_x ECO in SO_2 eq.(=1 /0.7 NO_x)	737	686	557	336	198	130	116	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	111	305	420	474	475	470	459	441

UNIT PRICE ECO (in euro 2010)	unit	BC	BC	mid	mid	BAT	BAT	dec	inc	PriceDec
		€	EF	€	EF	€	EF	€/EF	€/EF	%
		€	%	€	%	€	%	€ct/%	€ct/%	
WH dedicated Water Heater	€	497	31%	885	47%	2197	102%	2381	2381	0.7%
		€	%	€	%	€	%	€ct/%	€ct/%	
CH Central Heating combi, water heat [24 kW]	€	994	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	66%	7806	83%	9318	90%	19832	19817	0.7%
SFB Wood Direct Draft [20 kW]	€	6500	88%	7010	89%	7801	90%	56622	56550	0.8%
SFB Coal [25 kW]	€	5500	82%	5500	85%	5500	87%	0	0	0.7%
SFB Pellets [25 kW]	€	8000	88%	8701	91%	9316	93%	26366	26268	0.8%
SFB Wood chips [160 kW]	€	33500	88%	37911	91%	39083	92%	139583	139583	0.9%
		€	%	€	%	€	%	€ct/%	€ct/%	
CHAS (elec) [44 kW]	€	25068	348%	30804	465%	30804	465%	4924	4924	0.7%
CHAL (elec) [714 kW]	€	68520	358%	79082	484%	102021	549%	8416	35291	0.7%
Chsorp (fossil, efficiency NCV) [50 kW]	€	10515	130%	10793	175%	15061	190%	613	28452	0.7%
CHWS [61 kW]	€	29174	483%	30524	560%	33875	613%	1753	6323	0.8%
CHWL [894 kW]	€	227314	551%	249574	757%	316974	896%	10806	48489	0.9%
Cheng (fossil), NCV [50 kW]	€	10515	131%	10985	147%	14383	190%	2899	7903	0.7%
AC all [28 kW]	€	21438	403%	23378	492%	25830	583%	2175	2701	0.6%
o/w AC rooftop [80 kW]	€	21500	388%	23000	518%	23000	518%	1158	1158	0.6%
o/w AC splits [14 kW]	€	5381	397%	6084	517%	9363	680%	588	2012	0.7%
o/w AC VRF [50 kW]	€	35970	420%	39352	453%	42829	544%	10406	3821	0.6%
ACF (AC/ HP eng), fossil, NCV [50 kW]	€	21438	143%	22429	177%	23982	200%	2880	6751	0.6%
AC all, rev [28 kW]	€	21438	317%	23378	380%	25830	439%	3098	4170	0.6%
o/w AC rooftop, rev [80 kW]	€	21500	318%	23000	395%	23000	395%	1961	1961	0.6%
o/w AC splits, rev [14 kW]	€	5381	300%	6084	394%	9363	505%	752	2954	0.7%
o/w AC VRF, rev [50 kW]	€	35970	332%	39352	357%	42829	411%	13804	6439	0.6%
o/w ACF (AC/ HP eng), rev , fossil [50 kW]	€	21438	131%	22429	136%	23982	150%	19070	11092	0.6%
AHF all (fossil) [59 kW]	€	10243	65%	15040	78%	16774	84%	36793	29399	0.6%
o/w AHFS (fossil) [15 kW]	€	2700	58%	3233	65%	3900	80%	7372	4447	0.6%
o/w AHFL central (fossil) [120 kW]	€	11300	68%	15102	78%	16940	84%	36487	30634	0.6%
o/w AHFL local (fossil) [28.6 kW]	€	5700	74%	8175	78%	9000	84%	57057	13750	0.5%
AH el [20 kW]	€	3500	85%	3600	87%	3900	95%	5000	3750	0.9%
		€	%	€	%	€	%	€ct/%	€ct/%	
LH open fireplace [8 kW]	€	2650	30%	4614	45%	6577	60%	12962	9538	0.7%
LH closed fireplace/inset [8 kW]	€	2717	69%	3182	75%	3648	80%	8695	6455	0.7%
LH wood stove [8 kW]	€	2517	69%	2948	75%	3379	80%	8055	2150	0.8%
LH coal stove [8 kW]	€	1845	69%	2160	75%	2476	80%	5899	4300	0.7%
LH cooker [10 kW]	€	2847	64%	3613	72%	4379	80%	9786	8067	0.8%
LH SHR stove [8 kW]	€	7956	80%	8520	83%	9084	85%	22577	2150	0.4%
LH pellet stove [8 kW]	€	3369	85%	3483	88%	3624	90%	4692	4465	0.9%
LH open fire gas, NCV [4.2 kW]	€	856	42%	943	51%	1030	60%	941	666	0.7%
LH closed fire gas, NCV [4.2 kW]	€	821	64%	891	72%	961	80%	892	620	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	95%	12	30	1.0%
LH elec.convector [1 kW]	€	155	74%	161	87%	167	95%	48	98	0.8%
LH elec.storage [2.75 kW]	€	572	74%	718	87%	864	95%	1133	2436	0.9%
LH elec.underfloor [0.62 kW]	€	381	74%	425	87%	468	95%	338	501	0.6%
LH luminous heaters [20 kW]	€	1293	81%	1750	82%	2208	90%	43843	4411	0.8%
LH tube heaters [30 kW]	€	1284	71%	3054	75%	4824	85%	45507	13807	0.8%
		€	%	€	%	€	%	€ct/%	€ct/%	
RAC cooling [nom. avg. 3.8 kW]	€	1674	301%	1958	474%	2115	531%	164	275	0.5%
o/w RAC rev. Heating	€	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%

UNIT PRICE (in euro 2010)	unit	BC	BC	mid	mid	BAT	BAT	dec	inc	PriceDec
		€	EF	€	EF	€	EF	€/EF	€/EF	%
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								
		€								
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%
CS Computer Servers	€	na								
		€								
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								
		€	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**			**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**			**140**	**140**	**1%**

		€	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%
UNIT PRICE (in euro 2010)	**unit**	**BC**	**BC**	**mid**	**mid**	**BAT**	**BAT**	**dec**	**inc**	**PriceDec**
		€	EF	€	EF	€	EF	€/EF	€/EF	%
		€	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]	€	500	31%	646	35%	793	40%	3204	3204	0.9%
FAN Axial>300Pa [489 W fluid-dyn out]	€	650	37%	715	42%	781	47%	1319	1319	0.9%
FAN Centr.FC [141 W flow out]	€	800	32%	1017	37%	1234	42%	4369	4369	0.9%
FAN Centr.BC-free [2120 W flow out]	€	1540	56%	1875	63%	2209	70%	4915	4915	0.9%
FAN Centr.BC [2052 W flow out]	€	3300	54%	4401	60%	5503	67%	16577	16577	0.9%
FAN Cross-flow [31 W flow out]	€	650	7%	825	9%	1000	10%	12860	12860	0.9%
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 elec in [%]	€	242	79.1%	273	80.1%	769	96.1%	3100	3100	1%
		€	%	€	%	€	%	€ct/%	€ct/%	
WP Water pumps (load) [%]	€	1431	66.50%	1434	68.60%	1477	69.70%	143	3909	0.7%
		€	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 BAU (in euro 2010)	unit	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	4500	4500	4500	4500	4500	4500	4500	4500
SFB Wood Direct Draft [20 kW]	€	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500
SFB Coal [25 kW]	€	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
SFB Pellets [25 kW]	€	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
SFB Wood chips [160 kW]	€	33500	33500	33500	33500	33500	33500	33500	33500	33500	33500
CHAS (elec) [44 kW]	€	25068	25068	25068	25411	25068	25068	25068	25068	25068	25068
CHAL (elec) [714 kW]	€	68520	68520	68520	68520	68520	68520	68520	68520	68520	68520
Chsorp (fossil, efficiency NCV) [50 kW]	€	10515	10515	10515	10515	10515	10515	10515	10515	10515	10515
CHWS [61 kW]	€	29174	29174	29174	29174	29174	29174	29174	29174	29174	29174
CHWL [894 kW]	€	227314	227314	227314	227314	227314	227314	227314	227314	227314	227314
Cheng (fossil), NCV [50 kW]	€	10515	10515	10515	10692	10584	10515	10515	10515	10515	10515
AC all [28 kW]	€	10414	13433	14855	15248	15493	15493	15769	16080	16433	16839
o/w AC rooftop [80 kW]	€	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*
o/w AC splits [14 kW]	€	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*
o/w AC VRF [50 kW]	€	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*
ACF (AC/ HP eng), fossil, NCV [50 kW]	€	21438	21438	21438	21438	21438	21438	21438	21438	21438	21438
AC all, rev [28 kW]	€	10414	13433	14866	15248	15493	15493	15769	16080	16433	16839
o/w AC rooftop, rev [80 kW]	€	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*
o/w AC splits, rev [14 kW]	€	*5381*	*5381*	*5398*	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*	*5381*
o/w AC VRF, rev [50 kW]	€	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*	*35970*
o/w ACF (AC/ HP eng), rev , fossil [50 kW]	€	21438	21438	22289	23050	22739	22436	22139	21849	21566	21438
AHF all (fossil) [59 kW]	€	6355	7403	7522	7711	7778	7826	7907	7934	7893	7842
o/w AHFS (fossil) [15 kW]	€	*2700*	*2700*	*2743*	*2842*	*2870*	*2896*	*2881*	*2865*	*2850*	*2835*
o/w AHFL central (fossil) [120 kW]	€	*11300*	*11300*	*11518*	*12021*	*12241*	*12449*	*12646*	*12771*	*12856*	*12934*
o/w AHFL local (fossil) [28.6 kW]	€	*5700*	*5700*	*5700*	*5700*	*5700*	*5700*	*5700*	*5700*	*5700*	*5700*
AH el [20 kW]	€	3500	3600	3500	3500	3500	3500	3500	3500	3500	3500
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	1951	2277	2188	2102	2019	1939	1863	1790
LH tube heaters [30 kW]	€	1284	1284	3936	4937	4743	4557	4378	4205	4040	3881
RAC cooling [nom. avg. 3.8 kW]	€	1674	1750	1764	1757	1734	1697	1674	1674	1674	1674
o/w RAC rev. Heating	€	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
prices incl VAT											
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)	unit	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
CS Computer Servers	€	na	na	na	na	na	na	na	na	na	na
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
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**
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

UNIT PRICE BAU (in euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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]	€	500	500	500	500	500	500	500	500	500	500
FAN Axial>300Pa [489 W fluid-dyn out]	€	650	650	650	650	650	650	650	650	650	650
FAN Centr.FC [141 W flow out]	€	800	800	800	800	800	800	800	800	800	800
FAN Centr.BC-free [2120 W flow out]	€	1540	1540	1540	1540	1540	1540	1540	1540	1540	1540
FAN Centr.BC [2052 W flow out]	€	3300	3300	3300	3300	3300	3300	3300	3300	3300	3300
FAN Cross-flow [31 W flow out]	€	650	650	650	650	650	650	650	650	650	650
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 elec in [%]	€	242	242	245	247	248	249	249	248	247	246
WP Water pumps (load) [%]	€	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431
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)	unit	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	3881	5620	7398	9056	9579	10098	10616	11131	11646
SFB Wood Manual [18 kW]	€	4500	4500	6799	8082	8131	7866	7609	7360	7120	6887
SFB Wood Direct Draft [20 kW]	€	6500	6500	6664	7541	8181	7874	7578	7293	7019	6755
SFB Coal [25 kW]	€	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
SFB Pellets [25 kW]	€	8000	8000	8088	8134	8266	8000	8000	8000	8000	8000
SFB Wood chips [160 kW]	€	33500	33500	34042	34348	35087	33558	33500	33500	33500	33500
CHAS (elec) [44 kW]	€	25068	25068	26522	27373	27378	27396	27426	27469	27524	27591
CHAL (elec) [714 kW]	€	68520	68520	69884	71850	71576	76574	81494	86342	91120	95833
Chsorp (fossil, efficiency NCV) [50 kW]	€	10515	10515	10515	10515	10515	11038	12844	14615	16353	18059
CHWS [61 kW]	€	29174	29174	29174	29174	29174	29483	29972	30457	30939	31419
CHWL [894 kW]	€	227314	227314	227314	227314	227314	227314	227314	227314	231920	237627
Cheng (fossil), NCV [50 kW]	€	10515	10515	10618	11384	11566	11749	11933	12120	12307	12497
AC all [28 kW]	€	10414	13433	15700	16074	16226	16318	16709	17134	17600	18117
o/w AC rooftop [80 kW]	*€*	*21500*	*21500*	*21729*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*	*21500*
o/w AC splits [14 kW]	*€*	*5381*	*5381*	*5569*	*5542*	*5498*	*5772*	*6043*	*6313*	*6580*	*6845*
o/w AC VRF [50 kW]	*€*	*35970*	*35970*	*38517*	*38410*	*38108*	*37832*	*37581*	*37354*	*37152*	*36974*
ACF (AC/ HP eng), fossil, NCV [50 kW]	€	21438	21438	21438	21438	21438	21438	21438	21438	21438	21438
AC all, rev [28 kW]	€	10414	13433	15872	16229	16609	16822	17343	17906	18517	19189
o/w AC rooftop, rev [80 kW]	€	21500	21500	21833	21553	21500	21500	21500	21500	21500	21500
o/w AC splits, rev [14 kW]	€	5381	5381	5687	5621	5800	6133	6462	6789	7112	7433
o/w AC VRF, rev [50 kW]	€	35970	35970	38833	38753	38720	38710	38723	38758	38815	38893
o/w ACF (AC/ HP eng), rev , fossil [50 kW]	€	21438	21438	22891	23757	23863	23982	24112	24255	24411	24578
AHF all (fossil) [59 kW]	€	6355	7403	10149	11890	11803	11700	11650	11487	11201	10910
o/w AHFS (fossil) [15 kW]	*€*	*2700*	*2700*	*3482*	*4031*	*3976*	*3921*	*3867*	*3813*	*3761*	*3709*
o/w AHFL central (fossil) [120 kW]	*€*	*11300*	*11300*	*14176*	*17066*	*16895*	*16724*	*16551*	*16378*	*16204*	*16030*
o/w AHFL local (fossil) [28.6 kW]	*€*	*5700*	*5700*	*8499*	*9620*	*9548*	*9476*	*9403*	*9228*	*8989*	*8756*
AH el [20 kW]	€	3500	3600	3500	3500	3500	3500	3500	3500	3500	3500
LH open fireplace [8 kW]	€	2650	2650	3717	4921	4834	4660	4492	4330	4174	4024
LH closed fireplace/inset [8 kW]	€	2717	2717	3244	3636	3604	3473	3347	3226	3108	2996
LH wood stove [8 kW]	€	2517	2517	2892	2947	2865	2753	2645	2542	2517	2517
LH coal stove [8 kW]	€	1845	1845	2202	2463	2442	2355	2271	2190	2112	2036
LH cooker [10 kW]	€	2847	2847	3428	4207	4159	3991	3831	3677	3529	3387
LH SHR stove [8 kW]	€	7956	7956	8501	8407	8290	8138	7988	7956	7956	7956
LH pellet stove [8 kW]	€	3369	3369	3369	3628	3496	3369	3369	3369	3369	3369
LH open fire gas, NCV [4.2 kW]	€	856	856	885	892	868	856	856	856	856	856
LH closed fire gas, NCV [4.2 kW]	€	821	821	857	900	878	848	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	156	155	155	155	155	155	155
LH elec.storage [2.75 kW]	€	572	572	632	779	841	806	772	740	709	679
LH elec.underfloor [0.62 kW]	€	381	381	396	449	422	410	398	386	381	381
LH luminous heaters [20 kW]	€	1293	1293	2196	2501	2638	2534	2434	2338	2246	2158
LH tube heaters [30 kW]	€	1284	1284	3936	5358	5380	5169	4966	4771	4583	4403
RAC cooling [nom. avg. 3.8 kW]	€	1674	1750	1908	1946	1946	1911	1863	1817	1771	1727
o/w RAC rev. Heating	€	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
prices incl VAT											
RVU Central Unidir. VU (1 fan)	€	1446	1446	2439	2365	2293	2224	2156	2091	2028	1966
RVU Central Balanced VU (2 fans)	€	4349	4349	6320	6117	5921	5731	5548	5370	5198	5031
RVU Local Balanced VU (2 fans)	€	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218

UNIT PRICE ECO (in euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
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
CS Computer Servers	€	na	na	na	na	na	na	na	na	na	na
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
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**
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)	€	30	30	29	27	26	25	23	22	21	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

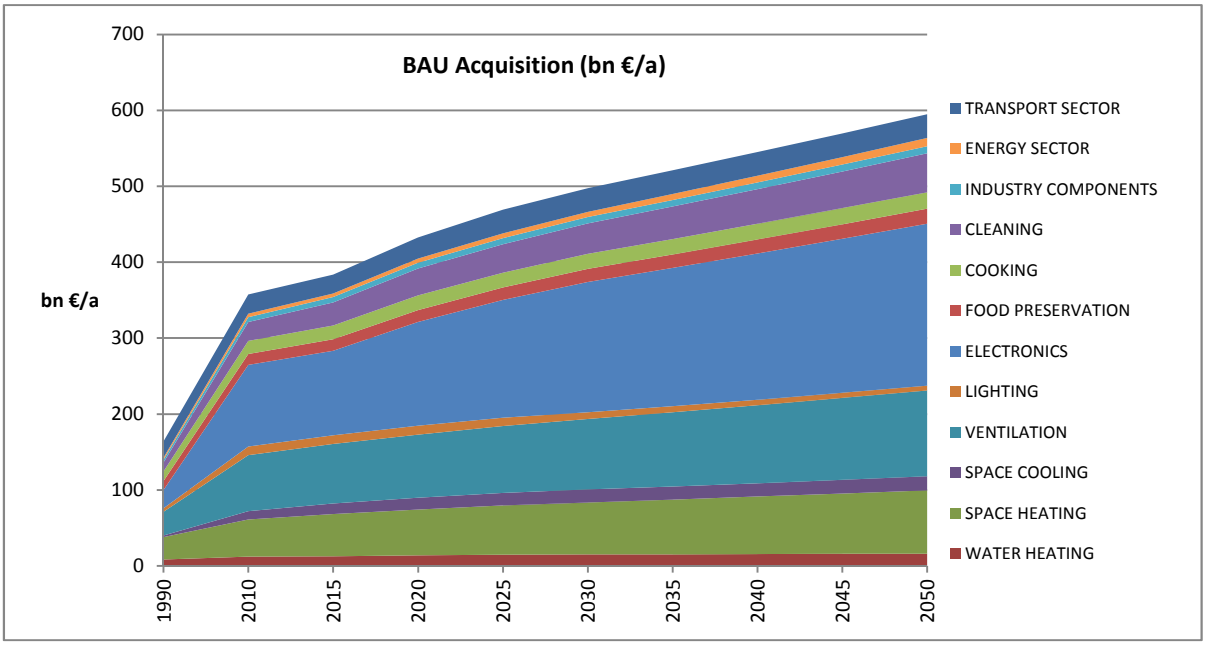
UNIT PRICE ECO (in euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WM Household Washing Machine	€	449	541	559	574	565	537	511	486	463	449
DW Household Dishwasher	€	541	718	719	704	686	667	649	631	614	596
LD Household Laundry Drier vented el.	€	426	400	400	400	400	400	400	400	400	400
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]	€	500	500	651	622	595	569	544	520	500	500
FAN Axial>300Pa [489 W fluid-dyn out]	€	650	650	673	650	650	650	650	650	650	650
FAN Centr.FC [141 W flow out]	€	800	800	1032	984	940	897	856	817	800	800
FAN Centr.BC-free [2120 W flow out]	€	1540	1540	1881	1798	1718	1642	1570	1540	1540	1540
FAN Centr.BC [2052 W flow out]	€	3300	3300	4610	4406	4211	4025	3847	3676	3514	3358
FAN Cross-flow [31 W flow out]	€	650	650	1864	1780	1701	1624	1551	1482	1415	1352
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 elec in [%]	€	242	274	702	682	662	630	599	570	543	516
WP Water pumps (load) [%]	€	1431	1432	1431	1431	1431	1431	1431	1431	1431	1431
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 bn €)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**5**	**6**	**6**	**6**	**7**	**7**	**7**	**7**	**7**	**7**
	Total CH Central Heating combi, water heat	bn €	**4**	**6**	**7**	**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	bn €	**19**	**27**	**29**	**31**	**34**	**37**	**40**	**43**	**46**	**49**
	SFB Wood Manual	bn €	1	1	0	0	0	0	0	0	0	0
	SFB Wood Direct Draft	bn €	0	1	1	1	1	2	2	2	3	4
	SFB Coal	bn €	0	0	0	0	0	0	0	0	0	0
	SFB Pellets	bn €	0	0	1	1	1	1	1	1	1	1
	SFB Wood chips	bn €	0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler		**1**	**3**	**3**	**3**	**2**	**3**	**3**	**4**	**4**	**5**
	CHAS (was met CC=40%)	bn €	1	2	2	3	3	3	4	4	4	4
	CHAL	bn €	0	0	0	0	0	0	0	1	1	1
	CHsorp	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	CHWS	bn €	0	0	0	0	0	0	0	0	0	1
	CHWL	bn €	0	1	1	1	1	1	1	1	1	1
	CHeng	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC all	bn €	0.6	2.6	3.2	3.1	2.8	2.8	2.6	2.5	2.4	2.3
	o/w AC rooftop	*bn €*	*0.2*	*0.4*	*0.3*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*
	o/w AC splits	*bn €*	*0.2*	*0.7*	*0.8*	*0.7*	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*	*0.4*
	o/w AC VRF	*bn €*	*0.1*	*1.5*	*2.2*	*2.1*	*2.0*	*2.0*	*1.9*	*1.9*	*1.8*	*1.8*
	ACF (AC/ HP eng)	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling		**1**	**6**	**7**	**7**	**7**	**8**	**8**	**8**	**8**	**9**
1	AC all, rev	bn €	0.2	1.8	2.5	2.6	2.5	2.6	2.5	2.5	2.4	2.3
1	*o/w AC rooftop, rev*	*bn €*	*0.1*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*
1	*o/w AC splits, rev*	*bn €*	*0.1*	*0.5*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*	*0.4*
1	*o/w AC VRF, rev*	*bn €*	*0.0*	*1.0*	*1.7*	*1.8*	*1.8*	*1.9*	*1.9*	*1.9*	*1.8*	*1.8*
1	ACF (AC/ HP eng), rev	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	AHF all	bn €	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4
	o/w AHFS	*bn €*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	o/w AHFL central	*bn €*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*
	o/w AHFL local	*bn €*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*
	AH el	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating		**1**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
									0			
	LH open fireplace	bn €	1	2	2	2	2	2	2	2	2	2
	LH closed fireplace/inset	bn €	1	2	3	3	3	3	3	3	3	3
	LH wood stove	bn €	1	1	1	1	1	1	1	1	1	1
	LH coal stove	bn €	0	0	0	0	0	0	0	0	0	0
	LH cooker	bn €	1	1	2	2	2	2	2	2	2	2
	LH SHR stove	bn €	2	2	3	4	4	4	4	5	5	5
	LH pellet stove	bn €	0	1	1	1	1	1	1	1	1	1
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.convector	bn €	1	2	2	2	2	2	2	2	2	2
	LH elec.storage	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.underfloor	bn €	0	0	1	1	1	1	1	1	1	1
	LH luminous heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH total	bn €	**8**	**13**	**15**	**17**	**18**	**18**	**18**	**18**	**18**	**18**
	RAC (cooling demand), all RAC types <12 kW	bn €	1	5	7	8	9	9	9	9	10	10
1	o/w RAC reversible (heating demand)	bn €	0	3	6	7	8	8	8	8	9	9
	Total RAC Room Air Conditioner	bn €	**1**	**8**	**13**	**16**	**17**	**18**	**18**	**18**	**18**	**18**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL SPACE HEATING	bn €	**29**	**49**	**56**	**60**	**65**	**69**	**72**	**76**	**80**	**84**
	TOTAL SPACE COOLING	bn €	**2**	**11**	**14**	**16**	**17**	**17**	**17**	**18**	**18**	**18**
	NRVU Ventilation units	bn €	30	69	73	76	81	85	89	93	98	102
	RVU Central Unidir.	bn €	1	3	3	3	3	3	3	3	3	4
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0	1	3	3	4	4	5	5	6	6
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0	0	0	0	1	1	1	1	1	1
	Total VU Ventilation Units		**31**	**74**	**78**	**83**	**88**	**93**	**98**	**103**	**108**	**113**
	TOTAL VENTILATION (electricity)	bn €	**31**	**74**	**78**	**83**	**88**	**93**	**98**	**103**	**108**	**113**

BAU Acquisition (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources											
LFL Linear Fluorescent	bn €	2.3	3.2	2.9	2.9	2.7	2.5	2.3	2.1	1.9	1.7
CFL Compact Fluorescent	bn €	0.3	2.4	2.0	1.7	1.5	1.4	1.2	1.1	1.0	0.9
Tungsten	bn €	0.5	3.6	4.1	4.3	3.2	2.3	1.7	1.2	0.9	0.8
GLS GeneralLighting Service (incandescent)	bn €	1.4	1.0	0.8	0.5	0.3	0.1	0.0	0.0	0.0	0.0
HID High Intensity Discharge	bn €	0.4	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
LED Light Emitting Diode	bn €	0.0	0.3	0.6	1.7	2.3	1.8	2.0	2.1	2.1	2.1
TOTAL LIGHTING (excl. SP & controls)	bn €	**4.9**	**11.5**	**11.3**	**12.0**	**10.9**	**8.9**	**8.1**	**7.3**	**6.7**	**6.5**
DP TV standard	bn €	11.7	26.9	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV LoNA	bn €	0.0	3.7	13.1	16.4	14.3	11.7	8.9	6.1	3.2	0.4
DP TV Smart	bn €	0.0	0.0	7.8	16.4	21.4	27.3	33.5	39.6	45.8	52.0
DP Monitor	bn €	1.7	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Total Electronic Displays	**bn €**	**13.4**	**34.9**	**28.5**	**35.1**	**38.1**	**41.3**	**44.7**	**48.1**	**51.4**	**54.8**
SSTB	bn €	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	bn €	0.0	5.0	6.1	6.6	6.7	6.5	7.1	7.6	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	bn €	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	bn €	0.0	1.7	1.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	bn €	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**
Total CS Computer Servers	bn €	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	bn €	3.3	11.1	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5
PC Notebook	bn €	0.4	25.2	11.6	10.9	10.9	10.9	10.9	10.9	10.9	10.9
PC Tablet/slate	bn €	0.0	1.7	27.0	43.9	56.7	67.5	70.9	74.3	77.6	81.0
PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	bn €	0.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total PC, electricity		**3.9**	**40.4**	**49.3**	**64.7**	**77.5**	**88.3**	**91.7**	**95.1**	**98.5**	**101.8**
EP-Copier mono	bn €	3.5	1.4	0.8	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	bn €	0.0	0.5	2.0	3.1	3.5	3.8	4.1	4.4	4.8	5.1
EP-printer mono	bn €	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
EP-printer colour	bn €	0.0	0.6	1.0	1.3	1.6	1.8	2.0	2.3	2.5	2.8
IJ SFD printer	bn €	0.6	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1
IJ MFD printer	bn €	0.7	2.4	3.3	3.8	4.2	4.6	5.0	5.3	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	bn €	0.0	6.2	7.9	9.7	11.5	13.3	15.1	16.8	18.6	20.4
SB Home NAS	bn €	0.0	0.6	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
SB Home Phones (fixed)	bn €	0.5	2.3	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
SB Office Phones (fixed)	bn €	0.6	1.1	1.2	1.3	1.3	1.4	1.5	1.5	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	bn €	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS		**24**	**107**	**112**	**137**	**155**	**172**	**182**	**192**	**203**	**213**
Total RF household Refrigerators & Freezers	bn €	**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)	bn €	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)	bn €	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	bn €	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	bn €	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
CF Spiral vending machine	bn €	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	bn €	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
PF Blast cabinets	bn €	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	bn €	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	bn €	0.2	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8
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 bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	bn €	2.3	5.2	5.6	6.1	6.4	6.7	7.0	7.2	7.5	7.7
	CA El. Ovens	bn €	5.0	6.0	6.3	6.8	6.6	6.7	6.7	6.8	6.9	7.0
	CA Gas Hobs	bn €	2.7	2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.1	1.0
	CA Gas Ovens	bn €	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
	CA Range Hoods	bn €	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)	bn €	0.36	0.25	0.21	0.18	0.17	0.17	0.17	0.17	0.17	0.17
	COFFEE Dripfilter (thermos)	bn €	0.07	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.18	0.21	0.23	0.26	0.28	0.30	0.33	0.35	0.38
	COFFEE Pad filter	bn €	0.00	0.42	0.46	0.50	0.54	0.58	0.62	0.66	0.70	0.74
	COFFEE Hard cap espresso	bn €	0.05	0.22	0.47	0.71	0.75	0.75	0.75	0.75	0.75	0.75
	COFFEE Semi-auto espresso	bn €	0.06	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04
	COFFEE Fully-auto espresso	bn €	0.34	0.39	0.45	0.51	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	bn €	**4.0**	**6.2**	**6.1**	**6.5**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**
	Total DW household Dishwasher	bn €	**1.7**	**3.8**	**4.4**	**5.0**	**5.6**	**6.2**	**6.8**	**7.4**	**8.0**	**8.6**
	LD vented el.	bn €	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	LD condens el.	bn €	0.5	1.7	2.0	2.3	2.3	2.4	2.4	2.4	2.4	2.4
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**1.3**	**2.6**	**2.8**	**3.0**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**
	VC dom	bn €	3.9	11.6	16.3	19.8	21.9	24.0	26.0	28.1	30.2	32.2
	VC nondom	bn €	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)	bn €	0.4	1.3	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
0.5	FAN Axial>300Pa	bn €	0.5	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
0.5	FAN Centr.FC	bn €	0.3	0.8	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
0.5	FAN Centr.BC-free	bn €	0.2	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	bn €	0.4	1.1	1.3	1.5	1.6	1.6	1.8	2.0	2.1	2.3
0.5	FAN Cross-flow	bn €	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	Total FAN, industrial (excl. box & roof fans)		**1.0**	**2.9**	**3.2**	**3.6**	**3.7**	**3.7**	**3.8**	**3.9**	**4.0**	**4.1**
0.5	**Total MT Industrial motors > 1 hp**	bn €	**1.6**	**2.4**	**2.5**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**
	Total WP Water Pumps	bn €	**1.8**	**2.4**	**2.6**	**2.8**	**3.0**	**3.2**	**3.4**	**3.6**	**3.8**	**4.0**
	TOTAL INDUSTRY COMPONENTS		**3.5**	**6.5**	**7.1**	**7.7**	**8.0**	**8.2**	**8.5**	**8.8**	**9.1**	**9.4**
	TRAFO Distribution	bn €	0.5	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.3
	TRAFO Industry oil	bn €	0.2	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	TRAFO Industry dry	bn €	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	TRAFO Power	bn €	1.9	3.0	3.2	3.5	3.7	4.0	4.3	4.6	4.9	5.2
	TRAFO DER oil	bn €	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	TRAFO DER dry	bn €	0.0	0.1	0.2	0.4	0.6	1.0	1.5	1.9	2.4	2.9
	TRAFO Small	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers		**2.8**	**4.5**	**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	bn €	13	16	16	18	20	20	20	20	20	20
	TYRE van replacement tyres C2	bn €	5	6	6	6	7	7	7	7	7	7
	TYRE truck replacement tyres C3	bn €	4	4	3	4	4	4	4	4	4	4
	TYRE Replacement Tyres	bn €	**21**	**25**	**25**	**28**	**31**	**31**	**31**	**31**	**31**	**31**
	TRANSPORT SECTOR	bn €	**21**	**25**	**25**	**28**	**31**	**31**	**31**	**31**	**31**	**31**
	GENERAL TOTAL (in bn €)		**164**	**357**	**383**	**433**	**469**	**498**	**521**	**545**	**570**	**595**

BAU Acquisition (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	8	12	13	14	15	15	15	15	16	16
SPACE HEATING	bn €	29	49	56	60	65	69	72	76	80	84
SPACE COOLING	bn €	2	11	14	16	17	17	17	18	18	18
VENTILATION	bn €	31	74	78	83	88	93	98	103	108	113
LIGHTING	bn €	5	11	11	12	11	9	8	7	7	6
ELECTRONICS	bn €	24	107	112	137	155	172	182	192	203	213
FOOD PRESERVATION	bn €	12	14	15	16	16	17	18	19	19	20
COOKING	bn €	13	17	18	19	19	20	20	21	21	22
CLEANING	bn €	12	25	30	35	38	40	43	46	48	51
INDUSTRY COMPONENTS	bn €	4	6	7	8	8	8	9	9	9	9
ENERGY SECTOR	bn €	3	5	5	5	6	7	8	9	10	11
TRANSPORT SECTOR	bn €	21	25	25	28	31	31	31	31	31	31
TOTAL in bn €		164	357	383	433	469	498	521	545	570	595

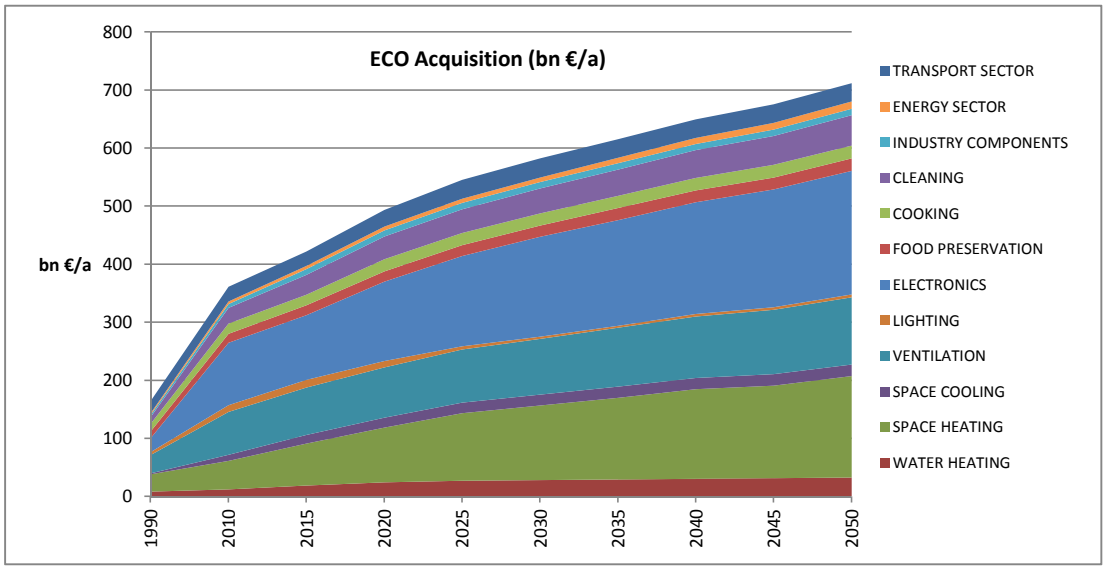


db	ECO Acquisition (in bn €)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	primary energy factor power gen.&distr. CC	*1*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
	Total WH dedicated Water Heater	bn €	**5**	**6**	**10**	**11**	**13**	**12**	**12**	**12**	**12**	**12**
	Total CH Central Heating combi, water heat	bn €	**4**	**6**	**10**	**14**	**15**	**16**	**17**	**18**	**20**	**21**
	TOTAL WATER HEATING		**8**	**12**	**19**	**25**	**27**	**28**	**30**	**31**	**32**	**33**
	Total CH Central Heating boiler, space heat	bn €	**19**	**27**	**42**	**59**	**79**	**91**	**103**	**117**	**131**	**146**
	SFB Wood Manual	bn €	1	1	1	0	0	0	0	0	0	0
	SFB Wood Direct Draft	bn €	0	1	2	2	2	2	2	3	3	4
	SFB Coal	bn €	0	0	0	0	0	0	0	0	0	0
	SFB Pellets	bn €	0	0	1	1	1	1	1	1	1	1
	SFB Wood chips	bn €	0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler		**1**	**3**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**5**
	CHAS (was met CC=40%)	bn €	0.5	2.2	2.6	2.9	3.2	3.6	3.9	4.2	4.6	4.9
	CHAL	bn €	0.1	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8
	CHsorp	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	CHWS	bn €	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6
	CHWL	bn €	0.2	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8
	CHeng	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	AC all	bn €	0.6	2.6	3.4	3.3	3.1	3.0	2.9	2.8	2.7	2.6
	o/w AC rooftop	*bn €*	*0.2*	*0.4*	*0.3*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*
	o/w AC splits	*bn €*	*0.2*	*0.7*	*0.8*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*
	o/w AC VRF	*bn €*	*0.1*	*1.5*	*2.3*	*2.3*	*2.2*	*2.1*	*2.1*	*2.0*	*2.0*	*1.9*
	ACF (AC/ HP eng)	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling		**1**	**6**	**7**	**8**	**8**	**8**	**9**	**9**	**9**	**10**
1	AC all, rev	bn €	0.2	1.8	2.7	2.7	2.7	2.8	2.8	2.8	2.7	2.6
1	*o/w AC rooftop, rev*	*bn €*	*0.1*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*
1	*o/w AC splits, rev*	*bn €*	*0.1*	*0.5*	*0.6*	*0.6*	*0.6*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*
1	*o/w AC VRF, rev*	*bn €*	*0.0*	*1.0*	*1.8*	*1.9*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*1.9*
1	ACF (AC/ HP eng), rev	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	AHF all	bn €	0.8	0.6	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.6
	o/w AHFS	*bn €*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	o/w AHFL central	*bn €*	*0.4*	*0.3*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*
	o/w AHFL local	*bn €*	*0.3*	*0.3*	*0.4*	*0.5*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*
	AH el	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating		**1**	**2**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	**3**
	LH open fireplace	bn €	1	2	3	4	4	3	3	3	3	3
	LH closed fireplace/inset	bn €	1	2	3	4	4	4	4	3	3	3
	LH wood stove	bn €	1	1	1	1	1	1	1	1	1	1
	LH coal stove	bn €	0	0	0	0	0	0	0	0	0	0
	LH cooker	bn €	1	1	2	3	3	3	3	3	3	3
	LH SHR stove	bn €	2	2	3	4	4	4	4	5	5	5
	LH pellet stove	bn €	0	1	1	1	1	1	1	1	1	1
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.convector	bn €	1	2	2	2	2	2	2	2	2	2
	LH elec.storage	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.underfloor	bn €	0	0	1	1	1	1	1	1	1	1
	LH luminous heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH total	bn €	**8**	**13**	**17**	**21**	**22**	**21**	**21**	**21**	**20**	**20**
	RAC (cooling demand), all RAC types <12 kW	bn €	1	5	7	9	10	10	10	10	10	10
1	o/w RAC reversible (heating demand)	bn €	0	3	6	8	9	9	9	9	9	9
	Total RAC Room Air Conditioner	bn €	**1**	**8**	**14**	**18**	**19**	**20**	**20**	**19**	**19**	**19**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	TOTAL SPACE HEATING	bn €	**29**	**49**	**72**	**94**	**116**	**128**	**141**	**154**	**159**	**175**
	TOTAL SPACE COOLING	bn €	**2**	**11**	**15**	**17**	**18**	**19**	**19**	**19**	**20**	**20**
	NRVU Ventilation units	bn €	30	69	73	76	81	85	89	93	98	102
	RVU Central Unidir.	bn €	1	3	5	5	5	5	5	5	6	6
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0	1	4	5	5	6	6	7	7	7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0	0	0	0	1	1	1	1	1	1
	Total VU Ventilation Units		**31**	**74**	**82**	**86**	**91**	**96**	**101**	**106**	**111**	**116**
	TOTAL VENTILATION (electricity)	bn €	**31**	**74**	**82**	**86**	**91**	**96**	**101**	**106**	**111**	**116**

ECO Acquisition (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources											
LFL Linear Fluorescent	bn €	2.3	3.3	2.5	2.1	1.1	0.7	0.5	0.3	0.1	0.0
CFL Compact Fluorescent	bn €	0.3	2.8	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten	bn €	0.5	3.7	4.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0
GLS GeneralLighting Service (incandescent)	bn €	1.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
HID High Intensity Discharge	bn €	0.4	1.1	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2
LED Light Emitting Diode	bn €	0.0	0.2	4.3	7.2	4.4	2.7	2.9	3.6	3.8	4.4
TOTAL LIGHTING (excl. SP & controls)	bn €	**4.9**	**11.7**	**12.8**	**11.3**	**5.9**	**3.6**	**3.7**	**4.1**	**4.2**	**4.7**
DP TV standard	bn €	11.7	26.9	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV LoNA	bn €	0.0	3.7	13.1	16.4	14.3	11.7	8.9	6.1	3.2	0.4
DP TV Smart	bn €	0.0	0.0	7.8	16.4	21.4	27.3	33.5	39.6	45.8	52.0
DP Monitor	bn €	1.7	4.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Total Electronic Displays	**bn €**	**13.4**	**34.9**	**28.5**	**35.1**	**38.1**	**41.3**	**44.7**	**48.1**	**51.4**	**54.8**
SSTB	bn €	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	bn €	0.0	5.0	6.3	6.6	6.7	6.5	7.1	7.6	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	bn €	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	bn €	0.0	1.7	1.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	bn €	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**
Total CS Computer Servers	bn €	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	bn €	3.3	11.1	8.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5
PC Notebook	bn €	0.4	25.2	11.6	10.9	10.9	10.9	10.9	10.9	10.9	10.9
PC Tablet/slate	bn €	0.0	1.7	27.0	43.9	56.7	67.5	70.9	74.3	77.6	81.0
PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	bn €	0.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total PC, electricity		**3.9**	**40.4**	**49.3**	**64.7**	**77.5**	**88.3**	**91.7**	**95.1**	**98.5**	**101.8**
EP-Copier mono	bn €	3.5	1.4	0.8	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	bn €	0.0	0.5	2.0	3.1	3.5	3.8	4.1	4.4	4.8	5.1
EP-printer mono	bn €	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
EP-printer colour	bn €	0.0	0.6	1.0	1.3	1.6	1.8	2.0	2.3	2.5	2.8
IJ SFD printer	bn €	0.6	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1
IJ MFD printer	bn €	0.7	2.4	3.3	3.8	4.2	4.6	5.0	5.3	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	bn €	0.0	6.2	7.9	9.7	11.5	13.3	15.1	16.8	18.6	20.4
SB Home NAS	bn €	0.0	0.6	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8
SB Home Phones (fixed)	bn €	0.5	2.3	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
SB Office Phones (fixed)	bn €	0.6	1.1	1.2	1.3	1.3	1.4	1.5	1.5	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	bn €	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS		**24**	**107**	**112**	**137**	**155**	**172**	**182**	**192**	**203**	**213**
Total RF household Refrigerators & Freezers	bn €	**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)	bn €	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)	bn €	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	bn €	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	bn €	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
CF Spiral vending machine	bn €	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	bn €	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
PF Blast cabinets	bn €	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	bn €	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	bn €	0.2	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8
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 bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	bn €	2.3	5.2	5.6	6.3	6.6	6.9	7.2	7.5	7.7	8.0
	CA El. Ovens	bn €	5.0	6.0	6.4	7.2	6.9	6.7	6.7	6.8	6.9	7.0
	CA Gas Hobs	bn €	2.7	2.2	2.0	1.7	1.6	1.4	1.3	1.2	1.1	1.0
	CA Gas Ovens	bn €	0.7	0.7	0.7	0.9	0.9	0.9	0.8	0.8	0.8	0.7
	CA Range Hoods	bn €	1.2	1.5	1.6	2.0	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)	bn €	0.55	0.38	0.31	0.24	0.22	0.21	0.20	0.19	0.18	0.17
	COFFEE Dripfilter (thermos)	bn €	0.07	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.18	0.21	0.23	0.26	0.28	0.30	0.33	0.35	0.38
	COFFEE Pad filter	bn €	0.00	0.42	0.46	0.50	0.54	0.58	0.62	0.66	0.70	0.74
	COFFEE Hard cap espresso	bn €	0.05	0.22	0.47	0.71	0.75	0.75	0.75	0.75	0.75	0.75
	COFFEE Semi-auto espresso	bn €	0.06	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04
	COFFEE Fully-auto espresso	bn €	0.34	0.39	0.45	0.51	0.58	0.64	0.70	0.76	0.83	0.89
	Total CM household Coffee Makers		**1.1**	**1.8**	**2.1**	**2.4**	**2.5**	**2.6**	**2.7**	**2.9**	**3.0**	**3.1**
	TOTAL COOKING		**13**	**17**	**18**	**21**	**21**	**21**	**21**	**22**	**22**	**22**
	Total WM household Washing Machine	bn €	**4.0**	**7.1**	**7.3**	**8.1**	**7.6**	**7.3**	**6.9**	**6.6**	**6.3**	**6.1**
	Total DW household Dishwasher	bn €	**1.7**	**5.0**	**5.8**	**6.5**	**7.1**	**7.7**	**8.2**	**8.7**	**9.1**	**9.5**
	LD vented el.	bn €	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	LD condens el.	bn €	0.5	1.7	2.2	2.6	2.7	2.6	2.6	2.5	2.4	2.4
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**1.3**	**2.6**	**3.0**	**3.4**	**3.4**	**3.4**	**3.3**	**3.2**	**3.2**	**3.2**
	VC dom	bn €	3.9	11.6	16.8	20.4	21.9	24.0	26.0	28.1	30.2	32.2
	VC nondom	bn €	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)	bn €	0.4	1.3	2.0	2.1	2.0	1.9	1.8	1.8	1.7	1.7
0.5	FAN Axial>300Pa	bn €	0.5	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
0.5	FAN Centr.FC	bn €	0.3	0.8	1.2	1.3	1.3	1.2	1.2	1.1	1.1	1.1
0.5	FAN Centr.BC-free	bn €	0.2	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	bn €	0.4	1.1	1.8	1.9	2.1	2.0	2.1	2.2	2.3	2.3
0.5	FAN Cross-flow	bn €	0.1	0.2	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7
	Total FAN, industrial (excl. box & roof fans)		**1.0**	**2.9**	**4.1**	**4.4**	**4.4**	**4.3**	**4.3**	**4.3**	**4.3**	**4.3**
0.5	**Total MT Industrial motors > 1 hp**	bn €	**1.6**	**2.7**	**7.3**	**7.4**	**7.2**	**6.8**	**6.5**	**6.2**	**5.9**	**5.6**
	Total WP Water Pumps	bn €	**1.8**	**2.4**	**2.6**	**2.8**	**3.0**	**3.2**	**3.4**	**3.6**	**3.8**	**4.0**
	TOTAL INDUSTRY COMPONENTS		**3.5**	**6.6**	**10.3**	**10.8**	**11.0**	**10.9**	**10.9**	**10.9**	**11.0**	**11.1**
	TRAFO Distribution	bn €	0.5	0.7	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	TRAFO Industry oil	bn €	0.2	0.4	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0
	TRAFO Industry dry	bn €	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	TRAFO Power	bn €	1.9	3.0	3.2	3.5	3.7	4.0	4.3	4.6	4.9	5.2
	TRAFO DER oil	bn €	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8
	TRAFO DER dry	bn €	0.0	0.1	0.3	0.5	0.8	1.3	1.9	2.5	3.1	3.7
	TRAFO Small	bn €	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers		**2.8**	**4.5**	**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	bn €	13	16	16	18	21	21	20	20	20	20
	TYRE van replacement tyres C2	bn €	5	6	6	6	7	7	7	7	7	7
	TYRE truck replacement tyres C3	bn €	4	4	4	4	5	5	5	5	4	4
	TYRE Replacement Tyres	bn €	**21**	**25**	**25**	**29**	**33**	**33**	**32**	**32**	**32**	**32**
	TRANSPORT SECTOR	bn €	**21**	**25**	**25**	**29**	**33**	**33**	**32**	**32**	**32**	**32**
	GENERAL TOTAL (in bn €)		**164**	**361**	**422**	**493**	**545**	**583**	**616**	**650**	**676**	**712**

ECO Acquisition (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	8	12	19	25	27	28	30	31	32	33
SPACE HEATING	bn €	29	49	72	94	116	128	141	154	159	175
SPACE COOLING	bn €	2	11	15	17	18	19	19	19	20	20
VENTILATION	bn €	31	74	82	86	91	96	101	106	111	116
LIGHTING	bn €	5	12	13	11	6	4	4	4	4	5
ELECTRONICS	bn €	24	107	112	137	155	172	182	192	203	213
FOOD PRESERVATION	bn €	12	16	17	18	19	19	20	21	21	21
COOKING	bn €	13	17	18	21	21	21	21	22	22	22
CLEANING	bn €	12	27	34	39	41	43	45	48	50	52
INDUSTRY COMPONENTS	bn €	4	7	10	11	11	11	11	11	11	11
ENERGY SECTOR	bn €	3	5	6	6	7	8	9	10	12	13
TRANSPORT SECTOR	bn €	21	25	25	29	33	33	32	32	32	32
TOTAL in bn €		164	361	422	493	545	583	616	650	676	712



Increase acquisition ECO vs. BAU		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	0	0	6	11	13	13	14	15	16	17
SPACE HEATING	bn €	0	0	16	34	51	59	68	78	80	91
SPACE COOLING	bn €	0	0	1	1	2	2	2	2	2	1
VENTILATION	bn €	0	0	4	3	4	4	4	3	3	3
LIGHTING	bn €	0	0	1	-1	-5	-5	-4	-3	-3	-2
ELECTRONICS	bn €	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	bn €	0	1	2	2	2	2	3	2	2	1
COOKING	bn €	0	0	0	1	1	1	1	1	1	1
CLEANING	bn €	0	2	3	4	3	3	2	2	1	1
INDUSTRY COMPONENTS	bn €	0	0	3	3	3	3	2	2	2	2
ENERGY SECTOR	bn €	0	0	1	1	1	1	1	1	2	2
TRANSPORT SECTOR	bn €	0	0	0	1	1	2	1	1	1	0
TOTAL in bn €		0	4	39	61	76	85	95	105	106	117
Increase in % versus BAU (from 1990=0)		0.1%	1.1%	10.1%	14.1%	16.2%	17.1%	18.1%	19.2%	18.6%	19.7%
Increase in % versus BAU (from 2010=0)		-2.3%	0.0%	9.0%	13.2%	15.4%	16.3%	17.4%	18.5%	17.9%	19.1%

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

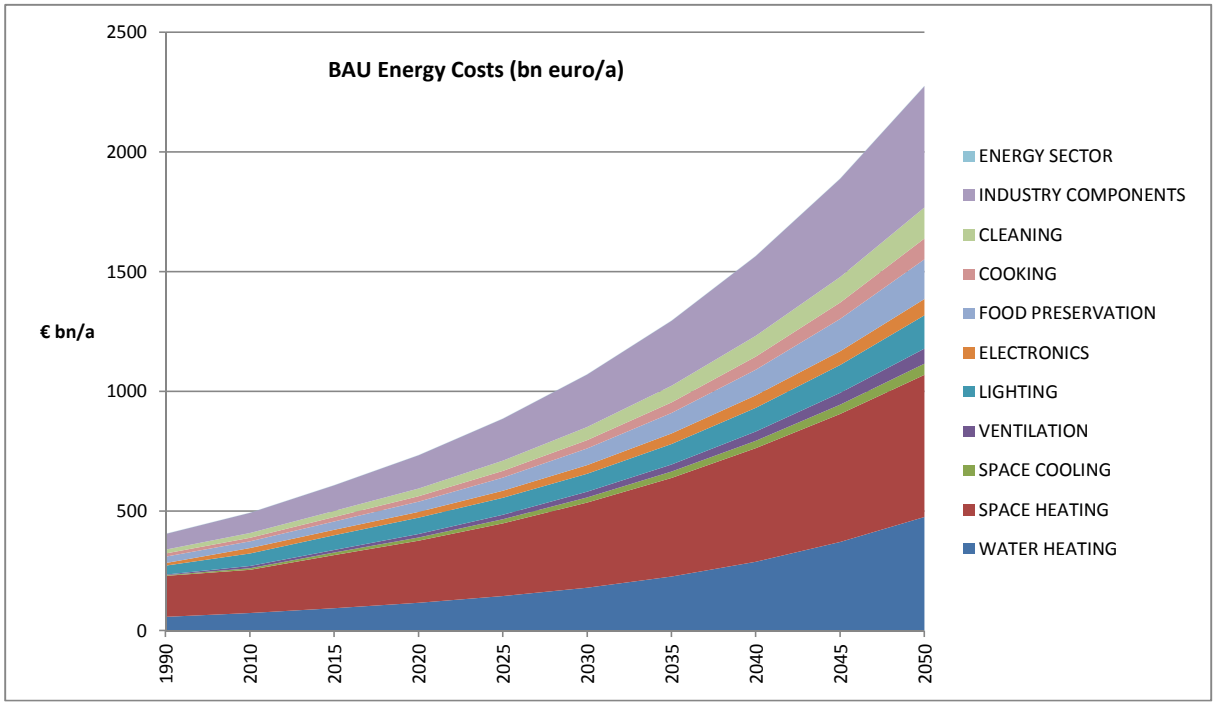
REAL Energy & consumables rates				1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(Rel in €/kwh elec, other energy in €/kwh NCV)													
R=residential (incl. VAT); NR=industry (excl. VAT, tariff Ie)													
REAL rates (in Euro 2010, inflation corrected)			Inc %/a	Real									
Rel1	electricity 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	€/m³	3%	2.13	3.84	4.45	5.16	5.98	6.94	8.04	9.32	10.81	12.53
Rtoner	copier/printer R & NR	€/page	0%	0.0401	0.0401	0.0401	0.0401	0.0401	0.0401	0.0401	0.0401	0.0401	0.0401
Rpaper	copier/printer R& NR	€/page	0%	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Rdishw1	dishwasher det. R	€/cycle	0%	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Rwash1	washing mach. det. R	€/cycle	0%	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Rbags1	vacuum cl. bags R	€/year(57h)	0%	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00

db	BAU Energy costs (in € bn)	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	**115**	**128**	**155**	**177**	**204**	**237**	**275**	**315**	**353**	**383**
	SFB Wood Manual	6.8	2.4	2.5	2.2	1.7	1.2	0.9	0.7	0.7	0.7
	SFB Wood Direct Draft	0.0	0.7	1.7	2.8	3.8	4.4	5.2	6.5	8.6	11.6
	SFB Coal	2.1	0.8	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1
	SFB Pellets	0.0	0.3	0.6	1.0	1.5	1.9	2.3	2.7	3.2	3.9
	SFB Wood chips	0.0	0.3	0.6	0.8	0.8	0.9	1.1	1.4	1.7	2.1
	Total Solid Fuel Boiler	**9**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**14**	**18**
	CHAS (was met CC=40%)	0.6	1.1	1.5	2.0	2.4	2.9	3.5	4.3	5.3	6.4
	CHAL	0.9	1.4	1.8	2.2	2.5	2.8	3.2	3.7	4.3	4.9
	CHsorp	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	CHWS	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.6
	CHWL	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.5
	CHeng	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	AC all	0.2	1.9	2.4	2.9	3.4	3.8	4.1	4.4	4.7	4.9
1	*o/w AC rooftop*	*0.1*	*0.7*	*0.7*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*
1	*o/w AC splits*	*0.1*	*0.7*	*0.8*	*1.0*	*1.1*	*1.3*	*1.4*	*1.5*	*1.5*	*1.6*
1	*o/w AC VRF*	*0.0*	*0.5*	*0.8*	*1.2*	*1.7*	*2.0*	*2.2*	*2.4*	*2.7*	*2.9*
	ACF (AC/ HP eng)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling	**2**	**5**	**6**	**8**	**9**	**11**	**12**	**14**	**16**	**19**
	AC all, rev	0.2	2.9	4.4	6.3	8.1	9.8	11.2	12.6	13.6	14.5
1	*o/w AC rooftop, rev*	*0.1*	*1.1*	*1.3*	*1.4*	*1.4*	*1.4*	*1.5*	*1.5*	*1.3*	*1.1*
1	*o/w AC splits, rev*	*0.1*	*1.0*	*1.5*	*2.1*	*2.7*	*3.2*	*3.7*	*4.1*	*4.4*	*4.7*
1	*o/w AC VRF, rev*	*0.0*	*0.8*	*1.6*	*2.8*	*4.1*	*5.1*	*6.0*	*7.0*	*7.9*	*8.8*
	ACF (AC/ HP eng), rev	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3
	AHF all	10.0	8.3	9.5	9.9	10.4	11.1	11.7	12.4	13.2	13.9
1	*o/w AHFS*	*1.2*	*0.3*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*
1	*o/w AHFL central*	*6.7*	*6.1*	*7.0*	*7.3*	*7.6*	*7.9*	*8.3*	*8.6*	*9.0*	*9.3*
1	*o/w AHFL local*	*2.2*	*1.9*	*2.2*	*2.4*	*2.7*	*3.0*	*3.4*	*3.8*	*4.2*	*4.6*
	AH el	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating	**10**	**11**	**14**	**16**	**19**	**21**	**23**	**25**	**27**	**29**
								0			
	LH open fireplace	0.4	0.5	0.8	1.0	1.2	1.4	1.6	1.7	2.0	2.2
	LH closed fireplace/inset	0.4	1.2	2.1	2.9	3.8	4.8	5.8	6.7	7.6	8.5
	LH wood stove	0.9	1.1	1.6	1.9	2.4	2.8	3.4	3.9	4.5	5.0
	LH coal stove	0.6	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.3	0.1
	LH cooker	0.2	0.3	0.5	0.7	1.0	1.2	1.4	1.6	1.8	2.0
	LH SHR stove	0.4	0.6	1.0	1.3	1.7	2.3	3.0	3.8	4.6	5.4
	LH pellet stove	0.0	0.3	0.6	0.9	1.3	1.7	2.1	2.4	2.7	3.1
	LH open fire gas	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	LH closed fire gas	0.8	0.8	0.9	1.1	1.2	1.5	1.7	2.0	2.3	2.6
	LH flueless fuel heater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.portable	5.5	4.7	5.5	6.5	7.8	9.2	10.8	12.6	14.7	17.0
	LH elec.convector	22.8	19.6	22.8	27.0	32.2	38.2	44.8	52.3	60.7	70.3
	LH elec.storage	1.7	1.4	1.7	2.0	2.4	2.8	3.3	3.9	4.5	5.3
	LH elec.underfloor	3.0	2.7	3.1	3.7	4.4	5.2	6.1	7.2	8.4	9.8
	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	**37**	**34**	**41**	**50**	**60**	**72**	**85**	**99**	**114**	**131**
	RAC (cooling demand), all RAC types <12 kW	0	3	4	5	8	11	14	17	22	27
	o/w RAC reversible (heating demand)	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	**171**	**181**	**222**	**259**	**304**	**356**	**412**	**474**	**536**	**594**
	TOTAL SPACE COOLING	**2**	**8**	**10**	**13**	**17**	**22**	**26**	**32**	**38**	**46**
	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 € bn)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources BAU										
LFL Linear Fluorescent	9.9	13.5	17.4	20.5	24.3	28.3	32.7	37.6	43.5	50.3
CFL Compact Fluorescent	0.6	4.0	6.5	7.2	5.9	5.6	6.0	6.5	7.1	7.7
Tungsten	1.4	7.9	9.9	11.9	9.9	8.5	7.6	6.6	6.0	6.6
GLS GeneralLighting Service (incandescent)	13.5	9.2	8.3	7.3	5.5	2.2	0.6	0.1	0.0	0.0
HID High Intensity Discharge	4.2	7.9	8.3	9.0	10.3	12.5	15.2	18.5	22.5	27.4
LED Light Emitting Diode	0.0	0.0	0.1	1.0	3.1	6.3	9.7	13.5	17.7	22.5
SP Special Purpose (exempt)	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
lighting controls & sb	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
GLS stock	0.0	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	0.0
TOTAL LIGHTING	**37**	**53**	**62**	**68**	**70**	**75**	**86**	**100**	**117**	**140**
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	1.0	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
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	0.0
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**	**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	0.0
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**	**1**	**1**	**1**	**1**	**2**	**2**	**3**	**4**	**5**
Total CS Computer Servers	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
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**	**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	0.0
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	**3**	**1**	**1**	**1**	**2**	**2**	**3**	**4**	**5**	**7**
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
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home Gateway, standby hours										
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
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Home NAS, idle hours										
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**	**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**	**0.7**	**0.8**	**0.9**	**1.0**
TOTAL ELECTRONICS	**10**	**23**	**23**	**24**	**29**	**36**	**44**	**51**	**57**	**67**
Total RF household Refrigerators & Freezers	**16**	**14**	**17**	**21**	**25**	**30**	**37**	**45**	**54**	**66**
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	**28**	**28**	**34**	**43**	**55**	**69**	**86**	**108**	**134**	**167**

	BAU Energy costs (in € bn)	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	5	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 Industrial motors > 1 hp**	**97**	**117**	**146**	**187**	**233**	**286**	**346**	**419**	**507**	**613**
	Total WP Water Pumps	**10**	**12**	**16**	**20**	**27**	**35**	**45**	**58**	**75**	**97**
	TOTAL INDUSTRY COMPONENTS	65	84	107	139	176	220	272	334	411	506
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 € bn	**404**	**492**	**608**	**733**	**887**	**1071**	**1295**	**1566**	**1889**	**2275**

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	171	181	222	259	304	356	412	474	536	594
SPACE COOLING	2	8	10	13	17	22	26	32	38	46
VENTILATION	3	8	11	15	19	24	30	38	49	63
LIGHTING	37	53	62	68	70	75	86	100	117	140
ELECTRONICS	10	23	23	24	29	36	44	51	57	67
FOOD PRESERVATION	28	28	34	43	55	69	86	108	134	167
COOKING	14	15	18	23	28	35	44	56	69	86
CLEANING	16	19	25	32	43	55	69	86	106	130
INDUSTRY COMPONENTS	65	84	107	139	176	220	272	334	411	506
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 € bn	**445**	**546**	**671**	**810**	**980**	**1172**	**1402**	**1677**	**2007**	**2407**



Compare (Eurostat 2011)

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

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

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

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

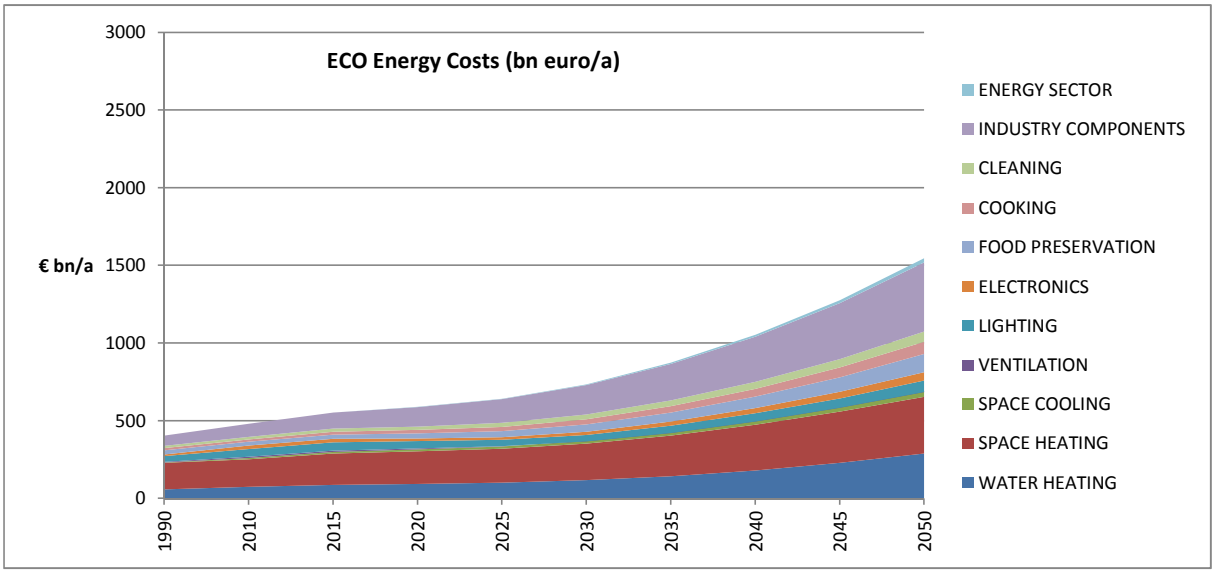
db	ECO Energy costs (in € bn)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	**47**	**51**	**56**	**60**	**64**	**74**	**90**	**113**	**144**	**184**
	Total CH Central Heating combi, water heat	**11**	**23**	**30**	**33**	**37**	**44**	**54**	**67**	**84**	**105**
	TOTAL WATER HEATING	**58**	**73**	**86**	**94**	**102**	**117**	**143**	**180**	**228**	**288**
	Total CH Central Heating boiler, space heat	**115**	**125**	**136**	**134**	**132**	**136**	**146**	**160**	**173**	**182**
	SFB Wood Manual	6.8	2.4	2.5	2.0	1.5	1.0	0.7	0.5	0.5	0.5
	SFB Wood Direct Draft	0.0	0.7	1.7	2.8	3.8	4.3	5.0	6.1	8.2	11.0
	SFB Coal	2.1	0.8	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	SFB Pellets	0.0	0.3	0.6	1.0	1.4	1.8	2.2	2.5	3.0	3.7
	SFB Wood chips	0.0	0.3	0.6	0.7	0.8	0.9	1.1	1.4	1.7	2.0
	Total Solid Fuel Boiler	**9**	**4**	**6**	**7**	**8**	**8**	**9**	**11**	**13**	**17**
	CHAS (was met CC=40%)	0.6	1.1	1.5	1.9	2.2	2.6	3.1	3.7	4.4	5.3
	CHAL	0.9	1.4	1.8	2.1	2.3	2.5	2.8	3.1	3.5	4.0
	CHsorp	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
	CHWS	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6
	CHWL	0.3	0.4	0.6	0.7	0.8	0.8	0.9	1.0	1.2	1.3
	CHeng	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	AC all	0.2	1.9	2.3	2.7	3.1	3.3	3.5	3.6	3.8	3.8
	o/w AC rooftop	*0.1*	*0.7*	*0.7*	*0.6*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.3*
	o/w AC splits	*0.1*	*0.7*	*0.8*	*0.9*	*1.0*	*1.1*	*1.1*	*1.2*	*1.2*	*1.2*
	o/w AC VRF	*0.0*	*0.5*	*0.8*	*1.2*	*1.5*	*1.7*	*1.9*	*2.0*	*2.2*	*2.3*
	ACF (AC/ HP eng)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling	**2**	**5**	**6**	**8**	**9**	**10**	**11**	**12**	**14**	**15**
	AC all, rev	0.2	2.9	4.3	5.9	7.3	8.4	9.4	10.3	10.9	11.4
1	*o/w AC rooftop, rev*	*0.1*	*1.1*	*1.3*	*1.3*	*1.2*	*1.2*	*1.2*	*1.2*	*1.1*	*0.8*
1	*o/w AC splits, rev*	*0.1*	*1.0*	*1.5*	*2.0*	*2.4*	*2.7*	*3.0*	*3.3*	*3.5*	*3.6*
1	*o/w AC VRF, rev*	*0.0*	*0.8*	*1.6*	*2.6*	*3.7*	*4.5*	*5.1*	*5.8*	*6.4*	*6.9*
	ACF (AC/ HP eng), rev	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3
	AHF all	10.0	8.3	9.4	9.2	9.1	9.1	9.5	10.1	10.8	11.4
1	*o/w AHFS*	*1.2*	*0.3*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*
1	*o/w AHFL central*	*6.7*	*6.1*	*6.9*	*6.8*	*6.7*	*6.6*	*6.8*	*7.2*	*7.6*	*7.9*
1	*o/w AHFL local*	*2.2*	*1.9*	*2.2*	*2.2*	*2.3*	*2.4*	*2.6*	*2.9*	*3.2*	*3.5*
	AH el	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating	**10**	**11**	**14**	**15**	**17**	**18**	**19** 0	**21**	**22**	**23**
	LH open fireplace	0.4	0.5	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.3
	LH closed fireplace/inset	0.4	1.2	2.1	2.7	3.4	4.2	4.9	5.6	6.5	7.4
	LH wood stove	0.9	1.1	1.6	1.8	2.1	2.5	2.9	3.3	3.8	4.4
	LH coal stove	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.1
	LH cooker	0.2	0.3	0.5	0.7	0.8	0.9	1.1	1.3	1.4	1.7
	LH SHR stove	0.4	0.6	1.0	1.2	1.6	2.0	2.6	3.2	3.9	4.6
	LH pellet stove	0.0	0.3	0.6	0.9	1.2	1.5	1.9	2.2	2.5	2.9
	LH open fire gas	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	LH closed fire gas	0.8	0.8	0.9	1.0	1.1	1.2	1.4	1.6	1.8	2.2
	LH flueless fuel heater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH elec.portable	5.5	4.7	5.4	5.9	6.7	8.0	9.6	11.5	13.6	16.1
	LH elec.convector	22.8	19.6	22.4	23.8	25.7	30.4	36.5	43.6	51.9	61.4
	LH elec.storage	1.7	1.4	1.7	1.9	2.0	2.3	2.7	3.2	3.8	4.5
	LH elec.underfloor	3.0	2.7	3.1	3.5	4.0	4.6	5.3	6.1	7.1	8.4
	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	**37**	**34**	**41**	**45**	**50**	**59**	**70**	**83**	**98**	**115**
	RAC (cooling demand), all RAC types <12 kW	0	3	4	5	6	9	11	14	18	22
	o/w RAC reversible (heating demand)	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	**171**	**178**	**202**	**209**	**218**	**235**	**262**	**294**	**330**	**365**
	TOTAL SPACE COOLING	**2**	**8**	**10**	**12**	**15**	**18**	**22**	**26**	**31**	**37**
	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	-1	-2	-3	-3	-5	-6
1	RVU Local Balanced, heat (negative=saving)	0	0	0	0	0	0	-1	-1	-2	-2
	Total VU Ventilation Units	**3**	**8**	**9**	**6**	**2**	**-4**	**-6**	**-6**	**-6**	**-6**
	TOTAL VENTILATION (electricity & extra heat saved)	**3**	**8**	**9**	**6**	**2**	**-4**	**-6**	**-6**	**-6**	**-6**

ECO Energy costs (in € bn)	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	2.2	3.0	3.9	5.2	6.8	8.9
DP Monitor, sb mode	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4
DP Total electronic DisPlays	**4**	**11.1**	**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**
Total CS Computer Servers	**1**	**2.1**	**2**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
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**
TOTAL ELECTRONICS	**10**	**22**	**22**	**17**	**17**	**21**	**26**	**34**	**43**	**53**
Total RF household Refrigerators & Freezers	**16**	**11**	**10**	**11**	**11**	**11**	**11**	**11**	**11**	**13**
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	**28**	**25**	**28**	**33**	**39**	**48**	**59**	**74**	**93**	**119**

	ECO Energy costs (in € bn)	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	5	7	9	12	15	18	22	27	33
0.5	FAN Axial>300Pa	4	10	13	16	20	25	30	37	45	55
0.5	FAN Centr.FC	1	2	2	3	4	5	6	7	9	11
0.5	FAN Centr.BC-free	3	5	6	8	10	13	17	21	26	33
0.5	FAN Centr.BC	3	5	7	9	11	15	20	26	34	45
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**	**29**	**37**	**46**	**57**	**71**	**89**
0.5	**Total MT Industrial motors > 1 hp**	**97**	**117**	**140**	**166**	**196**	**240**	**292**	**355**	**432**	**526**
	Total WP Water Pumps	**10**	**12**	**15**	**20**	**26**	**34**	**44**	**57**	**73**	**94**
	TOTAL INDUSTRY COMPONENTS	**65**	**84**	**103**	**125**	**153**	**190**	**236**	**292**	**361**	**446**
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 € bn	**404**	**481**	**552**	**589**	**641**	**734**	**874**	**1054**	**1276**	**1547**

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	171	178	202	209	218	235	262	294	330	365
SPACE COOLING	2	8	10	12	15	18	22	26	31	37
VENTILATION	3	8	9	6	2	-4	-6	-6	-6	-6
LIGHTING	37	51	53	47	40	41	47	54	61	73
ELECTRONICS	10	22	22	17	17	21	26	34	43	53
FOOD PRESERVATION	28	25	28	33	39	48	59	74	93	119
COOKING	14	15	18	22	27	33	41	51	63	78
CLEANING	16	17	20	21	26	30	36	44	54	65
INDUSTRY COMPONENTS	65	84	103	125	153	190	236	292	361	446
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 € bn	**445**	**535**	**614**	**656**	**711**	**800**	**945**	**1135**	**1369**	**1653**

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	20	50	86	120	151	180	206	229
SPACE COOLING	0	0	0	1	2	3	4	6	7	9
VENTILATION	0	0	2	8	17	28	36	45	55	68
LIGHTING	0	2	8	21	30	34	39	46	56	67
ELECTRONICS	0	0	1	6	12	15	17	17	15	14
FOOD PRESERVATION	0	4	6	10	15	21	27	34	41	48
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	23	30	36	43	51	60
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 € bn	**0**	**11**	**58**	**154**	**268**	**372**	**457**	**542**	**639**	**754**
% saving versus BAU (from 1990=0%)	0%	2%	9%	19%	27%	32%	33%	32%	32%	31%
% saving versus BAU (from 2010=0%)	-2.5%	0%	7%	18%	26%	31%	32%	32%	31%	31%



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	MAINTENANCE incl. VAT (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	bn€	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]	bn€	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]	**bn€**	13.7	22.1	23.8	25.5	27.3	29.5	31.9	34.7	37.4	40
	SFB Wood Manual [18 kW]	bn€	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0
	SFB Wood Direct Draft [20 kW]	bn€	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0
	SFB Coal [25 kW]	bn€	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	SFB Pellets [25 kW]	bn€	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0
	SFB Wood chips [160 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total Solid Fuel Boiler	**bn€**	**0.4**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0**
	CHAS (elec) [44 kW]	bn€	0.4	1.2	1.6	1.9	2.1	2.4	2.6	2.8	3.1	3
	CHAL (elec) [714 kW]	bn€	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0
	Chsorp (fossil, efficiency NCV) [50 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	CHWS [61 kW]	bn€	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0
	CHWL [894 kW]	bn€	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0
	Cheng (fossil), NCV [50 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	AC all [28 kW]	bn€	0.1	1.8	2.4	3.0	3.3	3.3	3.2	3.2	3.0	2.9
1	*o/w AC rooftop [80 kW]*	*bn€*	*0.0*	*0.4*	*0.4*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.1*	*0*
1	*o/w AC splits [14 kW]*	*bn€*	*0.0*	*0.6*	*0.7*	*0.8*	*0.8*	*0.8*	*0.7*	*0.7*	*0.7*	*1*
1	*o/w AC VRF [50 kW]*	*bn€*	*0.0*	*0.8*	*1.4*	*1.9*	*2.2*	*2.3*	*2.3*	*2.3*	*2.2*	*2*
	ACF (AC/ HP eng), fossil, NCV [50 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total AHC Air Heating & Cooling, cooling	**bn€**	**0.7**	**3.6**	**4.7**	**5.7**	**6.3**	**6.6**	**6.8**	**7.0**	**7.2**	**7**
1	AC all, rev [28 kW]	bn€	0.0	1.1	1.6	2.2	2.7	2.9	3.0	3.0	3.0	2.9
1	*o/w AC rooftop, rev [80 kW]*	*bn€*	*0.0*	*0.2*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.1*	*0*
1	*o/w AC splits, rev [14 kW]*	*bn€*	*0.0*	*0.3*	*0.5*	*0.6*	*0.6*	*0.7*	*0.7*	*0.7*	*0.6*	*1*
1	*o/w AC VRF, rev [50 kW]*	*bn€*	*0.0*	*0.5*	*0.9*	*1.4*	*1.8*	*2.0*	*2.1*	*2.2*	*2.2*	*2*
1	ACF (AC/ HP eng), rev , fossil [50 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	AHF all (fossil) [59 kW]	bn€	0.9	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4
1	*o/w AHFS (fossil) [15 kW]*	*bn€*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0*
1	*o/w AHFL central (fossil) [120 kW]*	*bn€*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0*
1	*o/w AHFL local (fossil) [28.6 kW]*	*bn€*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0*
	AH el [20 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total AHC Air Heating & Cooling, heating	**bn€**	**0.9**	**0.7**	**0.7**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.4**	**0**
	LH open fireplace [8 kW]	bn€	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0
	LH closed fireplace/inset [8 kW]	bn€	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.5	1
	LH wood stove [8 kW]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
	LH coal stove [8 kW]	bn€	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH cooker [10 kW]	bn€	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.6	1
	LH SHR stove [8 kW]	bn€	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0
	LH pellet stove [8 kW]	bn€	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0
	LH open fire gas, NCV [4.2 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH closed fire gas, NCV [4.2 kW]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
	LH flueless fuel heater, NCV [1.5 kW]	bn€	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0
	LH elec.portable [1 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH elec.convector [1 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH elec.storage [2.75 kW]	bn€	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
	LH elec.underfloor [0.62 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH luminous heaters [20 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH tube heaters [30 kW]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LH total	**bn€**	**1.0**	**1.6**	**1.8**	**2.0**	**2.2**	**2.4**	**2.4**	**2.5**	**2.5**	**2**
	RAC (cooling only & reversibles)	**bn€**	**0.1**	**1.0**	**1.3**	**1.6**	**2.1**	**2.3**	**2.5**	**2.5**	**2.6**	**2.6**
1	o/w RAC rev. Heating	bn€	0.0	0.6	0.9	1.4	1.8	2.1	2.2	2.2	2.3	2.3
1	**CIRC Circulator pumps <2.5 kW**	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	TOTAL SPACE HEATING		**16.0**	**24.6**	**26.5**	**28.4**	**30.4**	**32.7**	**35.2**	**38.0**	**40.8**	**43.6**
	TOTAL SPACE COOLING		**0.8**	**4.6**	**6.0**	**7.3**	**8.4**	**8.9**	**9.2**	**9.5**	**9.7**	**10**
	NRVU avg (sales wt.)	**bn€**	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)	bn€	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0
	RVU Central Balanced VU (2 fans)	bn€	0.0	0.1	0.2	0.4	0.5	0.7	0.8	0.9	0.9	1
	RVU Local Balanced VU (2 fans)	bn€	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0
	TOTAL VENTILATION		**1.0**	**3.1**	**3.7**	**4.3**	**4.7**	**5.1**	**5.5**	**5.9**	**6.2**	**7**
	LS Light Sources in Euro/unit											
	LFL	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	CFL	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Tungsten	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	GLS	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	HID	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LED BAU	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	SP	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	controls	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL LIGHTING	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**

	MAINTENANCE incl. VAT (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	DP TV LoNA	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	DP TV Smart	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	DP Monitor	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	DP Total electronic DisPlays	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	SSTB	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	CSTB	bn€	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	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	VIDEO projectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	VIDEO game consoles	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total VIDEO	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	CS Computer Serverss	bn€	na	na	na	na	na	na	na	na	na	na
	PC Desktop	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	PC Notebook	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	PC Tablet/slate	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	PC Thin client	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	PC Workstation	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total PC, electricity	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	EP-Copier mono	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	EP-Copier colour	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	EP-printer mono	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	EP-printer colour	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	IJ SFD printer	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	IJ MFD printer	bn€	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)	bn€										
	Total imaging equipment, electricity	**bn€**	**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	bn€	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	bn€	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	bn€	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	bn€	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**
	BC_EPS Mobile phones etc.	**bn€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
	TOTAL ELECTRONICS		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	RF Household refrigerator and freezer	**bn€**	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)	bn€	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)	bn€	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	bn€	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	bn€	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
1	CF Spiral vending machine	bn€	0.0	0.1	0.1	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)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	PF Blast cabinet	bn€	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)	bn€	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)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total PF Professional Refrigeration	**bn€**	**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	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COOK El. Ovens, kWh/a	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COOK Gas Hobs, % efficiency NCV	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COOK Gas Ovens, kWh prim, NCV	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COOK Range Hoods, kWh elec	bn€	0.0	0.0	0.0	0.0	0.0	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)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COFFEE Dripfilter (thermos)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COFFEE Dripfilter (full automatic)	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COFFEE Pad filter	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COFFEE Hard cap espresso	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COFFEE Semi-auto espresso	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	COFFEE Fully-auto espresso	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total CM household Coffee Makers	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**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 (m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	DW Household Dishwasher	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	LD Household Laundry Drier vented el.	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LD Household Laundry Drier condens el.	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	LD Household Laundry Drier vented gas	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total LD household Laundry Drier	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	VC dom. Vacuum Cleaner	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	VC nondom Vacuum Cleaner	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Total VC Vacuum Cleaner	**bn€**	**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]	bn€	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	bn€	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0
0.5	FAN Centr.FC [141 W flow out]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
0.5	FAN Centr.BC-free [2120 W flow out]	bn€	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
0.5	FAN Centr.BC [2052 W flow out]	bn€	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0
0.5	FAN Cross-flow [31 W flow out]	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0
	Total FAN, industrial (excl. box & roof fans)	**bn€**	**0.2**	**0.4**	**0.5**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**bn€**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	WP Water pumps (load) [%]	**bn€**	**1.0**	**1.4**	**1.5**	**1.6**	**1.7**	**1.9**	**2.0**	**2.1**	**2.3**	**2**
	TOTAL INDUSTRY COMPONENTS		**1.2**	**1.8**	**2.0**	**2.2**	**2.3**	**2.5**	**2.6**	**2.8**	**2.9**	**3**
	TRAFO Distribution, kWh/a	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Industry oil	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Industry dry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Power	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO DER oil	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO DER dry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TRAFO Small	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL ENERGY SECTOR	bn€	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**
	TYRE in m units											
	TYRE car replacement tyres C1	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TYRE van replacement tyres C2	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TYRE truck replacement tyres C3	bn€	0.0	0.0	0.0	0.0	0.0	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**
	GENERAL TOTAL (in bn euro 2010)		**27**	**44**	**49**	**53**	**57**	**61**	**65**	**69**	**73**	**77**

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	**16.0**	**24.6**	**26.5**	**28.4**	**30.4**	**32.7**	**35.2**	**38.0**	**40.8**	**43.6**
SPACE COOLING	**0.8**	**4.6**	**6.0**	**7.3**	**8.4**	**8.9**	**9.2**	**9.5**	**9.7**	**10.0**
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**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ELECTRONICS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
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	**1.2**	**1.8**	**2.0**	**2.2**	**2.3**	**2.5**	**2.6**	**2.8**	**2.9**	**3.1**
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	**27**	**44**	**49**	**53**	**57**	**61**	**65**	**69**	**73**	**77**

CONSUMABLE RESOURCES incl. VAT (m 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

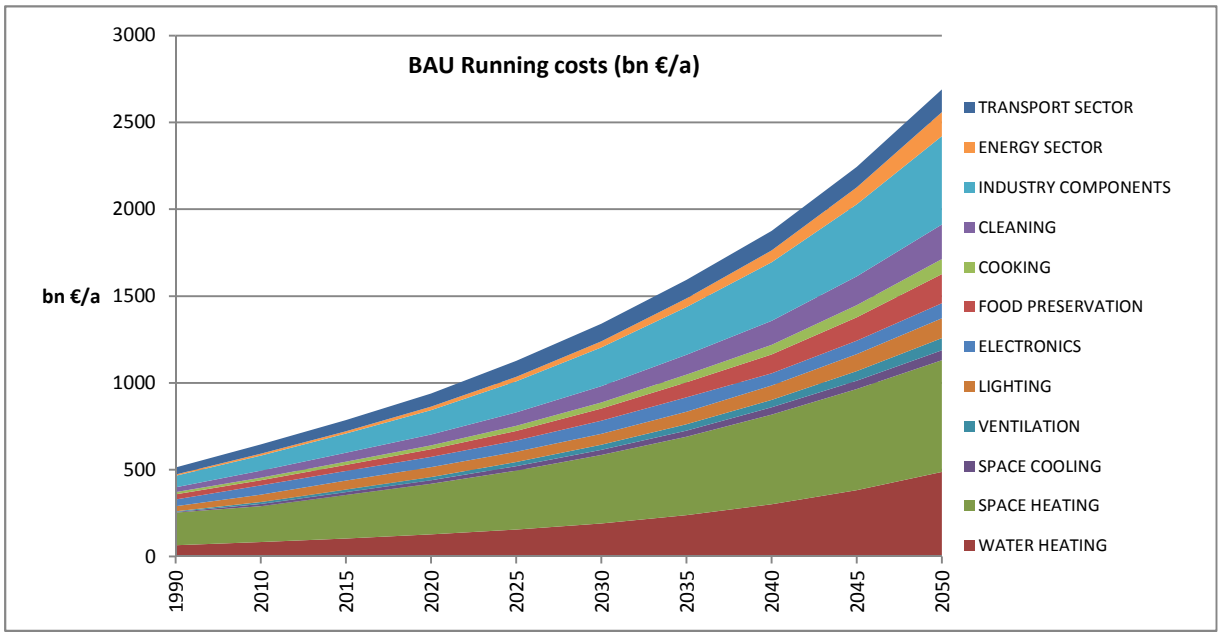
RESOURCES ECO incl. VAT (bn euro 2010)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS	**29**	**31**	**32**	**34**	**35**	**37**	**39**	**40**	**42**	**44**
CLEANING	**12.7**	**16.3**	**16.9**	**17.2**	**18.2**	**19.7**	**21.7**	**24.0**	**26.7**	**29.8**
TOTAL in bn euro 2010	**42**	**47**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

db	BAU Running costs (in bn €)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**53**	**58**	**70**	**84**	**102**	**122**	**148**	**185**	**234**	**296**
	Total CH Central Heating combi, water heat	bn €	**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	bn €	**129**	**150**	**179**	**203**	**231**	**267**	**307**	**350**	**390**	**424**
	SFB Wood Manual	bn €	7	3	3	2	2	1	1	1	1	1
	SFB Wood Direct Draft	bn €	0	1	2	3	4	5	5	7	9	12
	SFB Coal	bn €	2	1	1	1	0	0	0	0	0	0
	SFB Pellets	bn €	0	0	1	1	2	2	2	3	3	4
	SFB Wood chips	bn €	0	0	1	1	1	1	1	1	2	2
	Total Solid Fuel Boiler		**9**	**5**	**6**	**8**	**9**	**9**	**10**	**12**	**15**	**19**
	CHAS (was met CC=40%)	bn €	1	2	3	4	5	5	6	7	8	10
	CHAL	bn €	1	2	2	3	3	3	4	4	5	5
	CHsorp	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	CHWS	bn €	0	0	0	0	0	0	1	1	1	1
	CHWL	bn €	0	1	1	1	1	1	1	1	2	2
	CHeng	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
	AC all	bn €	0.4	3.7	4.8	5.9	6.7	7.1	7.4	7.6	7.7	7.8
1	*o/w AC rooftop*	*bn €*	*0.1*	*1.1*	*1.1*	*1.0*	*0.9*	*0.8*	*0.8*	*0.7*	*0.6*	*0.5*
1	*o/w AC splits*	*bn €*	*0.1*	*1.2*	*1.5*	*1.7*	*1.9*	*2.0*	*2.1*	*2.2*	*2.2*	*2.2*
1	*o/w AC VRF*	*bn €*	*0.1*	*1.4*	*2.2*	*3.1*	*3.9*	*4.3*	*4.5*	*4.7*	*4.9*	*5.1*
	ACF (AC/ HP eng)	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
	Total AHC Air Heating & Cooling, cooling		**3**	**9**	**11**	**14**	**16**	**17**	**19**	**21**	**24**	**26**
1	AC all, rev	bn €	0.2	4.0	6.0	8.5	10.8	12.7	14.1	15.6	16.6	17.4
1	*o/w AC rooftop, rev*	*bn €*	*0.1*	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*1*	*1*
1	*o/w AC splits, rev*	*bn €*	*0.1*	*1*	*2*	*3*	*3*	*4*	*4*	*5*	*5*	*5*
1	*o/w AC VRF, rev*	*bn €*	*0.0*	*1*	*3*	*4*	*6*	*7*	*8*	*9*	*10*	*11*
1	ACF (AC/ HP eng), rev	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3
	AHF all	bn €	10.9	9.0	10.1	10.5	11.0	11.6	12.2	12.9	13.6	14.3
1	*o/w AHFS*	*bn €*	*1.3*	*0.4*	*0.3*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*
1	*o/w AHFL central*	*bn €*	*7.1*	*6.4*	*7.4*	*7.6*	*7.9*	*8.2*	*8.5*	*8.9*	*9.2*	*9.5*
1	*o/w AHFL local*	*bn €*	*2.4*	*2.2*	*2.5*	*2.7*	*3.0*	*3.3*	*3.6*	*4.0*	*4.4*	*4.8*
	AH el	bn €	0.2	0.3	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating		**11**	**13**	**16**	**19**	**22**	**25**	**27**	**29**	**30**	**32**
									0			
	LH open fireplace	bn €	1	1	1	1	1	2	2	2	2	3
	LH closed fireplace/inset	bn €	1	1	2	3	4	5	6	7	8	9
	LH wood stove	bn €	1	1	2	2	3	3	4	4	5	5
	LH coal stove	bn €	1	0	1	1	1	1	1	0	0	0
	LH cooker	bn €	0	1	1	1	2	2	2	2	2	3
	LH SHR stove	bn €	0	1	1	1	2	2	3	4	5	6
	LH pellet stove	bn €	0	0	1	1	1	2	2	3	3	3
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	1	1	1	1	1	2	2	2	2	3
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	6	5	6	7	8	9	11	13	15	17
	LH elec.convector	bn €	23	20	23	27	32	38	45	52	61	70
	LH elec.storage	bn €	2	2	2	2	2	3	3	4	5	5
	LH elec.underfloor	bn €	3	3	3	4	4	5	6	7	8	10
	LH luminous heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH total	bn €	**38**	**35**	**43**	**52**	**62**	**74**	**87**	**101**	**117**	**134**
	RAC (cooling demand), all RAC types <12 kW	bn €	0	4	5	7	10	13	16	20	24	30
	o/w RAC reversible (heating demand)	bn €	0	4	6	10	15	19	22	26	30	35
	Total RAC Room Air Conditioner	bn €	**1**	**8**	**12**	**17**	**25**	**32**	**39**	**46**	**55**	**65**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**2**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**11**
	TOTAL SPACE HEATING	bn €	**187**	**207**	**251**	**291**	**339**	**393**	**453**	**517**	**582**	**643**
	TOTAL SPACE COOLING	bn €	**3**	**12**	**16**	**21**	**26**	**31**	**35**	**41**	**48**	**56**
	NRVU Ventilation units	bn €	3.1	9.1	11.6	14.5	17.6	21.1	25.3	30.8	37.7	46.6
	RVU Central Unidir.	bn €	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)	bn €	0.0	0.3	0.6	1.3	2.2	3.3	4.4	5.8	7.5	9.7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.0	0.1	0.2	0.3	0.6	0.9	1.4	2.0	2.8
	Total VU Ventilation Units		**4**	**11**	**15**	**19**	**23**	**29**	**36**	**44**	**55**	**69**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**4**	**11**	**15**	**19**	**23**	**29**	**36**	**44**	**55**	**69**

BAU Running costs (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources											
LFL Linear Fluorescent	bn €	9.9	13.5	17.4	20.5	24.3	28.3	32.7	37.6	43.5	50.3
CFL Compact Fluorescent	bn €	0.6	4.0	6.5	7.2	5.9	5.6	6.0	6.5	7.1	7.7
Tungsten	bn €	1.4	7.9	9.9	11.9	9.9	8.5	7.6	6.6	6.0	6.6
GLS GeneralLighting Service (incandescent)	bn €	13.5	9.2	8.3	7.3	5.5	2.2	0.6	0.1	0.0	0.0
HID High Intensity Discharge	bn €	4.2	7.9	8.3	9.0	10.3	12.5	15.2	18.5	22.5	27.4
LED Light Emitting Diode	bn €	0.0	0.0	0.1	1.0	3.1	6.3	9.7	13.5	17.7	22.5
SP Special Purpose (exempt)	bn €	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
lighting controls & sb	bn €	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
TOTAL LIGHTING (excl. SP & controls)	bn €	**30**	**43**	**51**	**57**	**59**	**64**	**72**	**83**	**97**	**115**
DP TV, on mode	bn €	3.2	8.9	8.4	6.5	8.4	11.1	13.0	13.6	12.4	14.6
DP Monitor, on mode	bn €	0.1	1.0	1.0	1.0	1.3	1.4	1.4	1.2	0.7	0.6
DP TV , sb mode	bn €	0.6	0.8	1.0	2.7	4.1	5.3	6.8	8.3	9.6	10.5
DP Monitor, sb mode	bn €	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Electronic Displays	**bn €**	**4.1**	**10.8**	**10.4**	**10.3**	**13.8**	**17.9**	**21.1**	**23.0**	**22.7**	**25.7**
SSTB	bn €	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	bn €	0.0	1.1	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	bn €	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	bn €	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	bn €	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**
Total CS Computer Servers	bn €	0.6	2.1	1.5	1.3	1.1	1.1	1.3	1.6	2.0	2.4
PC Desktop	bn €	2.3	3.2	2.2	1.0	0.7	0.9	1.1	1.3	1.6	2.0
PC Notebook	bn €	0.0	1.1	0.7	0.2	0.2	0.2	0.2	0.3	0.4	0.4
PC Tablet/slate	bn €	0.0	0.0	0.3	0.4	0.4	0.6	0.8	1.0	1.3	1.6
PC Thin client	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PC Workstation	bn €	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Total PC, electricity		**2.3**	**4.4**	**3.4**	**1.7**	**1.4**	**1.8**	**2.2**	**2.7**	**3.4**	**4.2**
EP-Copier mono	bn €	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP-Copier colour	bn €	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2
EP-printer mono	bn €	1.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
EP-printer colour	bn €	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.6	2.1	2.8
IJ SFD printer	bn €	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
IJ MFD printer	bn €	0.2	0.2	0.3	0.4	0.6	0.8	1.0	1.3	1.7	2.2
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	bn €	0.0	1.0	1.4	2.0	2.5	3.0	3.5	3.7	3.6	2.6
SB Home NAS	bn €	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.3
SB Home Phones (fixed)	bn €	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
SB Office Phones (fixed)	bn €	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	bn €	0.0	0.5	0.5	0.7	0.8	1.0	0.7	0.8	0.9	1.0
TOTAL ELECTRONICS		**40**	**54**	**57**	**58**	**65**	**74**	**83**	**70**	**78**	**87**
Total RF household Refrigerators & Freezers	bn €	**16.3**	**14.4**	**17.0**	**20.6**	**25.0**	**30.4**	**37.0**	**44.9**	**54.4**	**66.0**
CF open vertical chilled multi deck (RCV2)	bn €	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)	bn €	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	bn €	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	bn €	0.4	0.5	0.6	0.8	0.9	1.1	1.3	1.6	1.9	2.3
CF Spiral vending machine	bn €	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	bn €	0.7	0.9	1.1	1.4	1.8	2.2	2.8	3.6	4.6	5.8
PF Blast cabinets	bn €	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	bn €	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	bn €	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		**28**	**29**	**35**	**44**	**56**	**70**	**87**	**109**	**135**	**168**

	BAU Running costs (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	bn €	3.6	5.3	7.1	9.3	12.2	15.8	20.2	25.8	32.7	41.5
	CA El. Ovens	bn €	3.9	3.7	4.1	4.8	5.6	7.0	8.7	10.7	13.1	16.1
	CA Gas Hobs	bn €	1.7	1.6	1.9	2.2	2.6	3.0	3.5	4.0	4.6	5.3
	CA Gas Ovens	bn €	0.7	0.6	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.8
	CA Range Hoods	bn €	1.7	1.9	2.4	3.1	4.0	5.1	6.5	8.3	10.5	13.4
	Total CA Cooking Appliances		**12**	**13**	**16**	**20**	**25**	**32**	**40**	**50**	**62**	**78**
	COFFEE Dripfilter (glass)	bn €	1.89	1.26	1.34	1.35	1.47	1.78	2.16	2.63	3.20	3.90
	COFFEE Dripfilter (thermos)	bn €	0.06	0.18	0.22	0.27	0.33	0.41	0.51	0.62	0.76	0.94
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.08	0.12	0.16	0.22	0.29	0.38	0.51	0.66	0.86
	COFFEE Pad filter	bn €	0.00	0.18	0.25	0.33	0.43	0.57	0.74	0.96	1.24	1.60
	COFFEE Hard cap espresso	bn €	0.00	0.05	0.10	0.21	0.32	0.39	0.48	0.58	0.70	0.86
	COFFEE Semi-auto espresso	bn €	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	COFFEE Fully-auto espresso	bn €	0.02	0.02	0.03	0.04	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	bn €	**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	*bn €*	*10.0*	*17.6*	*20.5*	*23.1*	*26.2*	*29.8*	*33.6*	*37.9*	*43.1*	*49.1*
	Total DW household Dishwasher	bn €	**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	*bn €*	*1.2*	*3.2*	*4.1*	*5.2*	*6.5*	*8.0*	*9.8*	*12.0*	*14.6*	*17.7*
	LD vented el.	bn €	1.5	1.9	2.4	2.8	3.3	3.9	4.7	5.8	7.2	8.9
	LD condens el.	bn €	0.3	2.4	3.6	5.2	7.1	8.9	10.8	13.0	15.7	18.9
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**1.8**	**4.3**	**6.0**	**8.0**	**10.4**	**12.8**	**15.5**	**18.8**	**22.9**	**27.8**
	VC dom	bn €	1.8	2.9	4.6	5.8	10.2	14.3	19.4	25.5	32.6	40.6
	VC nondom	bn €	0.4	0.5	0.6	0.9	1.2	1.5	1.9	2.5	3.1	3.9
	Total VC Vacuum Cleaner	bn €	**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	bn €	*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)	bn €	2.3	5.7	7.8	10.5	14.0	18.0	22.1	26.9	32.6	39.6
0.5	FAN Axial>300Pa	bn €	4.0	10.4	13.9	17.8	22.4	27.9	34.1	41.4	50.2	61.0
0.5	FAN Centr.FC	bn €	1.0	1.9	2.7	3.6	4.7	6.1	7.4	9.0	10.9	13.2
0.5	FAN Centr.BC-free	bn €	2.6	4.7	6.5	8.7	11.5	15.3	19.7	24.7	30.6	37.9
0.5	FAN Centr.BC	bn €	2.7	5.3	7.5	10.0	13.3	17.7	23.2	30.2	39.8	52.5
0.5	FAN Cross-flow	bn €	0.2	0.3	0.4	0.5	0.7	1.0	1.2	1.6	2.1	2.8
	Total FAN, industrial (excl. box & roof fans)		**6.4**	**14.1**	**19.4**	**25.5**	**33.4**	**42.9**	**53.9**	**66.8**	**83.1**	**103.5**
0.5	**Total MT Industrial motors > 1 hp**	bn €	**96.7**	**116.9**	**146.0**	**186.5**	**233.4**	**286.3**	**346.4**	**418.9**	**506.5**	**612.5**
	Total WP Water Pumps	bn €	**11.5**	**13.7**	**17.0**	**21.9**	**28.3**	**36.5**	**47.1**	**60.6**	**77.7**	**99.5**
	TOTAL INDUSTRY COMPONENTS		66	86	109	141	178	223	274	337	414	509
	TRAFO Distribution	bn €	1.4	2.1	2.7	3.7	4.9	6.6	8.7	11.5	15.0	19.5
	TRAFO Industry oil	bn €	1.1	1.6	2.1	2.9	3.8	5.0	6.5	8.5	11.0	14.3
	TRAFO Industry dry	bn €	0.3	0.5	0.7	0.9	1.2	1.6	2.1	2.7	3.5	4.5
	TRAFO Power	bn €	4.1	5.5	7.3	9.8	13.1	17.3	22.7	29.7	38.7	50.3
	TRAFO DER oil	bn €	0.0	0.0	0.1	0.2	0.4	0.9	1.8	3.2	5.5	9.0
	TRAFO DER dry	bn €	0.0	0.2	0.4	0.9	1.9	3.8	7.4	13.6	23.4	38.0
	TRAFO Small	bn €	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	Total TRAFO Utility Transformers		**7.1**	**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	bn €	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	bn €	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	bn €	11.8	13.9	14.9	16.8	18.8	20.7	22.6	24.5	26.4	28.2
	TYRE Replacement Tyres	bn €	**40.9**	**53.7**	**63.7**	**77.2**	**93.1**	**101.2**	**106.8**	**111.4**	**117.9**	**131.8**
	TRANSPORT SECTOR	bn €	**41**	**54**	**64**	**77**	**93**	**101**	**107**	**111**	**118**	**132**
	GENERAL TOTAL (in bn €)		**513**	**646**	**785**	**940**	**1127**	**1341**	**1593**	**1875**	**2243**	**2690**

BAU Running costs (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	65	83	104	127	156	191	238	300	383	488
SPACE HEATING	bn €	187	207	251	291	339	393	453	517	582	643
SPACE COOLING	bn €	3	12	16	21	26	31	35	41	48	56
VENTILATION	bn €	4	11	15	19	23	29	36	44	55	69
LIGHTING	bn €	30	43	51	57	59	64	72	83	97	115
ELECTRONICS	bn €	40	54	57	58	65	74	83	70	78	87
FOOD PRESERVATION	bn €	28	29	35	44	56	70	87	109	135	168
COOKING	bn €	14	15	18	23	28	35	44	56	69	86
CLEANING	bn €	28	42	52	62	78	95	114	138	166	199
INDUSTRY COMPONENTS	bn €	66	86	109	141	178	223	274	337	414	509
ENERGY SECTOR	bn €	7	10	14	19	26	36	50	70	98	137
TRANSPORT SECTOR	bn €	41	54	64	77	93	101	107	111	118	132
TOTAL in bn €		513	646	785	940	1127	1341	1593	1875	2243	2690

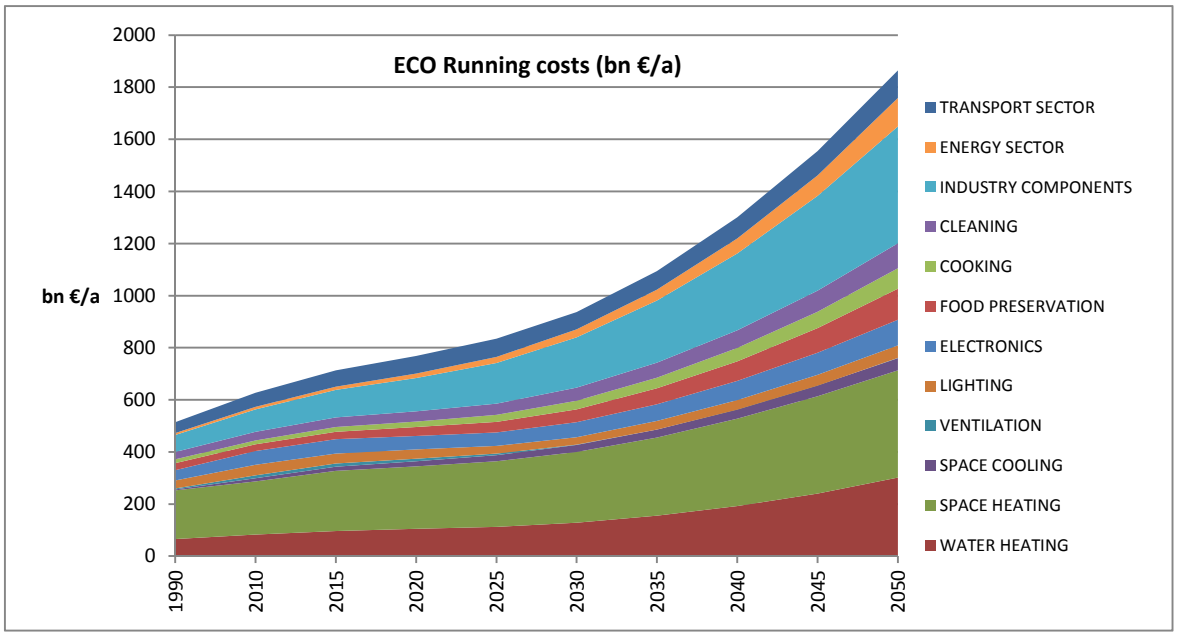


db	ECO Running costs (in bn €)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**53**	**58**	**64**	**68**	**72**	**82**	**97**	**121**	**152**	**192**
	Total CH Central Heating combi, water heat	bn €	**13**	**25**	**33**	**37**	**41**	**47**	**57**	**71**	**88**	**109**
	TOTAL WATER HEATING		**65**	**83**	**96**	**104**	**112**	**129**	**155**	**192**	**240**	**301**
	Total CH Central Heating boiler, space heat	bn €	**129**	**147**	**160**	**160**	**160**	**165**	**178**	**194**	**210**	**222**
	SFB Wood Manual	bn €	7	3	3	2	2	1	1	1	1	1
	SFB Wood Direct Draft	bn €	0	1	2	3	4	4	5	6	8	11
	SFB Coal	bn €	2	1	1	1	0	0	0	0	0	0
	SFB Pellets	bn €	0	0	1	1	1	2	2	3	3	4
	SFB Wood chips	bn €	0	0	1	1	1	1	1	1	2	2
	Total Solid Fuel Boiler		**9**	**5**	**6**	**7**	**8**	**8**	**9**	**11**	**14**	**18**
	CHAS (was met CC=40%)	bn €	1	2	3	4	4	5	6	7	8	9
	CHAL	bn €	1	2	2	2	3	3	3	4	4	4
	CHsorp	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	CHWS	bn €	0	0	0	0	0	0	1	1	1	1
	CHWL	bn €	0	1	1	1	1	1	1	1	1	2
	CHeng	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	AC all	bn €	0.4	3.7	4.8	5.7	6.3	6.6	6.7	6.8	6.8	6.7
1	*o/w AC rooftop*	*bn €*	*0.1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0*	*0*
1	*o/w AC splits*	*bn €*	*0.1*	*1*	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
1	*o/w AC VRF*	*bn €*	*0.1*	*1*	*2*	*3*	*4*	*4*	*4*	*4*	*4*	*5*
	ACF (AC/ HP eng)	bn €	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	Total AHC Air Heating & Cooling, cooling		**3**	**9**	**11**	**13**	**15**	**16**	**18**	**19**	**21**	**23**
	AC all, rev	bn €	0.2	4.0	6.0	8.1	10.0	11.3	12.4	13.3	13.9	14.2
1	*o/w AHC AC rooftop, rev*	*bn €*	*0.1*	*1.3*	*1.5*	*1.5*	*1.4*	*1.4*	*1.4*	*1.4*	*1.2*	*0.9*
1	*o/w AHC AC splits, rev*	*bn €*	*0.1*	*1.4*	*2.0*	*2.5*	*3.0*	*3.4*	*3.7*	*4.0*	*4.1*	*4.2*
1	*o/w AHC AC VRF, rev*	*bn €*	*0.0*	*1.3*	*2.5*	*4.0*	*5.5*	*6.5*	*7.2*	*8.0*	*8.6*	*9.1*
	ACF (AC/ HP eng), rev	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
	AHF all	bn €	10.9	9.0	10.0	9.8	9.7	9.7	10.0	10.6	11.2	11.8
1	*o/w AHFS*	*bn €*	*1.3*	*0.4*	*0.3*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*
1	*o/w AHFL central*	*bn €*	*7.1*	*6.4*	*7.3*	*7.2*	*7.0*	*6.9*	*7.1*	*7.4*	*7.8*	*8.1*
1	*o/w AHFL local*	*bn €*	*2.4*	*2.2*	*2.4*	*2.5*	*2.5*	*2.6*	*2.9*	*3.1*	*3.4*	*3.7*
	AH el	bn €	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating		**11**	**13**	**16**	**18**	**20**	**21**	**23**	**24**	**25**	**26**
									0			
	LH open fireplace	bn €	1	1	1	1	1	1	1	1	1	2
	LH closed fireplace/inset	bn €	1	1	2	3	4	5	5	6	7	8
	LH wood stove	bn €	1	1	2	2	2	3	3	4	4	5
	LH coal stove	bn €	1	0	1	1	1	1	0	0	0	0
	LH cooker	bn €	0	1	1	1	1	2	2	2	2	2
	LH SHR stove	bn €	0	1	1	1	2	2	3	3	4	5
	LH pellet stove	bn €	0	0	1	1	1	2	2	2	3	3
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	1	1	1	1	1	1	2	2	2	2
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	6	5	5	6	7	8	10	11	14	16
	LH elec.convector	bn €	23	20	22	24	26	30	37	44	52	61
	LH elec.storage	bn €	2	2	2	2	2	2	3	3	4	5
	LH elec.underfloor	bn €	3	3	3	4	4	5	5	6	7	8
	LH luminous heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH total	bn €	**38**	**35**	**42**	**47**	**52**	**62**	**73**	**86**	**101**	**118**
	RAC (cooling demand), all RAC types <12 kW	bn €	0	4	5	6	8	11	13	16	20	25
	o/w RAC reversible (heating demand)	bn €	0	3	5	8	11	14	17	20	24	28
	Total RAC Room Air Conditioner	bn €	**1**	**7**	**10**	**14**	**20**	**25**	**31**	**37**	**44**	**52**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**4**	**5**	**5**
	TOTAL SPACE HEATING	bn €	**187**	**203**	**230**	**240**	**251**	**271**	**300**	**335**	**374**	**412**
	TOTAL SPACE COOLING	bn €	**3**	**12**	**16**	**19**	**23**	**27**	**31**	**36**	**41**	**47**
	NRVU Ventilation units	bn €	3.1	9.1	10.3	9.4	7.0	3.8	3.6	5.1	7.5	11.2
	RVU Central Unidir.	bn €	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)	bn €	0.0	0.3	0.4	0.5	0.4	0.2	0.0	-0.1	-0.4	-0.7
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.0	0.1	0.1	0.0	0.0	-0.1	-0.2	-0.4	-0.6
	Total VU Ventilation Units		**4**	**11**	**13**	**11**	**6**	**1**	**0**	**-1**	**0**	**1**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**4**	**11**	**13**	**11**	**6**	**1**	**-0**	**-1**	**-0**	**1**

ECO Running costs (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources											
LFL Linear Fluorescent	bn €	9.9	13.5	16.9	16.9	13.6	9.8	8.3	6.9	4.5	2.0
CFL Compact Fluorescent	bn €	0.6	4.0	5.7	5.6	2.2	0.6	0.1	0.1	0.1	0.1
Tungsten	bn €	1.5	8.0	9.3	4.9	0.7	0.2	0.2	0.2	0.3	0.3
GLS GeneralLighting Service (incandescent)	bn €	13.5	6.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HID High Intensity Discharge	bn €	4.2	7.9	5.9	4.0	2.7	2.0	2.4	3.0	3.7	4.7
LED Light Emitting Diode	bn €	0.0	0.0	0.6	4.3	9.8	16.5	21.9	26.5	32.3	40.9
SP Special Purpose (exempt)	bn €	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
lighting controls & sb	bn €	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
GLS stock	bn €	0.0	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten stock	bn €	0.0	0.0	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL LIGHTING (excl. SP & controls)	bn €	**30**	**40**	**39**	**36**	**29**	**29**	**33**	**37**	**41**	**48**
DP TV, on mode	bn €	3.2	8.9	8.1	3.5	2.2	2.7	3.6	5.2	7.6	10.8
DP Monitor, on mode	bn €	0.1	1.2	1.0	0.2	0.1	0.1	0.2	0.3	0.3	0.5
DP TV , sb mode	bn €	0.6	0.8	1.2	2.4	2.2	3.0	3.9	5.2	6.8	8.9
DP Monitor, sb mode	bn €	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4
Total Electronic Displays	**bn €**	**4.0**	**11.1**	**10.4**	**6.2**	**4.7**	**6.1**	**7.9**			
SSTB	bn €	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	bn €	0.0	1.1	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	bn €	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	bn €	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	bn €	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**
Total CS Computer servers	**bn €**	**0.6**	**2.1**	**1.5**	**1.3**	**1.1**	**1.1**	**1.3**	**1.6**	**2.0**	**2.4**
PC Desktop	bn €	2.3	3.2	2.2	1.0	0.7	0.9	1.1	1.3	1.6	2.0
PC Notebook	bn €	0.0	1.1	0.7	0.2	0.2	0.2	0.2	0.3	0.4	0.4
PC Tablet/slate	bn €	0.0	0.0	0.3	0.4	0.4	0.6	0.8	1.0	1.3	1.6
PC Thin client	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PC Workstation	bn €	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Total PC, electricity		**2.3**	**4.4**	**3.4**	**1.7**	**1.4**	**1.8**	**2.2**	**2.7**	**3.4**	**4.2**
EP-Copier mono	bn €	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP-Copier colour	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4
EP-printer mono	bn €	1.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
EP-printer colour	bn €	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.9
IJ SFD printer	bn €	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IJ MFD printer	bn €	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.6
Total imaging equipment, electricity and	**bn €**	**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:	bn €	*29.4*	*31.0*	*32.4*	*33.9*	*35.2*	*36.9*	*38.6*	*40.3*	*42.3*	*44.3*
SB Home Gateway	bn €	0.0	1.0	1.4	2.0	2.5	3.0	3.5	3.7	3.6	2.6
SB Home NAS	bn €	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.3
SB Home Phones (fixed)	bn €	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
SB Office Phones (fixed)	bn €	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)	**bn €**	**0.2**	**1.4**	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**3**
Total BC Battery Charged devices	bn €	0.0	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.3
TOTAL ELECTRONICS		**40**	**53**	**54**	**51**	**52**	**58**	**65**	**74**	**85**	**98**
Total RF household Refrigerators & Freezers	bn €	**16.3**	**10.8**	**10.5**	**10.6**	**10.9**	**11.3**	**11.3**	**11.2**	**11.4**	**13.0**
CF open vertical chilled multi deck (RCV2)	bn €	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)	bn €	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	bn €	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	bn €	0.4	0.5	0.6	0.7	0.8	1.0	1.3	1.6	2.0	2.5
CF Spiral vending machine	bn €	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	bn €	0.7	0.9	1.1	1.4	1.8	2.2	2.8	3.6	4.6	5.8
PF Blast cabinets	bn €	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	bn €	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	bn €	1.9	3.5	4.8	6.6	8.9	11.9	15.9	21.1	27.8	36.4
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		**28**	**25**	**29**	**34**	**40**	**49**	**60**	**75**	**94**	**120**

	ECO Running costs (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	bn €	3.6	5.3	7.1	9.3	12.2	15.7	20.1	25.6	32.6	41.3
	CA El. Ovens	bn €	3.9	3.7	4.1	4.7	5.4	6.5	7.8	9.6	11.7	14.3
	CA Gas Hobs	bn €	1.7	1.6	1.9	2.2	2.6	2.9	3.4	3.9	4.5	5.1
	CA Gas Ovens	bn €	0.7	0.6	0.6	0.7	0.7	0.8	0.8	1.0	1.1	1.3
	CA Range Hoods	bn €	1.7	1.9	2.4	2.9	3.4	3.9	4.7	5.9	7.5	9.4
	Total CA Cooking Appliances	**bn €**	**12**	**13.1**	**16**	**20**	**24**	**30**	**37**	**46**	**57**	**71**
	COFFEE Dripfilter (glass)	bn €	1.89	1.26	1.28	1.09	1.17	1.42	1.73	2.10	2.55	3.11
	COFFEE Dripfilter (thermos)	bn €	0.06	0.18	0.22	0.27	0.33	0.41	0.51	0.62	0.76	0.94
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.08	0.12	0.16	0.22	0.29	0.38	0.51	0.66	0.86
	COFFEE Pad filter	bn €	0.00	0.18	0.23	0.25	0.32	0.42	0.55	0.71	0.92	1.18
	COFFEE Hard cap espresso	bn €	0.00	0.05	0.09	0.16	0.24	0.29	0.35	0.43	0.52	0.63
	COFFEE Semi-auto espresso	bn €	0.02	0.02	0.03	0.02	0.03	0.03	0.04	0.04	0.04	0.05
	COFFEE Fully-auto espresso	bn €	0.02	0.02	0.03	0.03	0.05	0.06	0.08	0.11	0.15	0.19
	Total CM household Coffee Makers	**bn €**	**2.0**	**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	bn €	**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	*bn €*	*10.0*	*11.9*	*12.0*	*11.7*	*12.1*	*12.8*	*13.9*	*15.2*	*16.8*	*18.7*
	Total DW household Dishwasher	bn €	**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	*bn €*	*1.2*	*2.5*	*2.9*	*3.4*	*4.0*	*4.7*	*5.6*	*6.6*	*7.7*	*9.1*
	LD vented el.	bn €	1.5	1.9	2.3	2.7	3.2	3.7	4.5	5.5	6.8	8.4
	LD condens el.	bn €	0.3	2.4	3.5	4.4	5.2	5.9	6.8	7.9	9.3	10.8
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**1.8**	**4.3**	**5.8**	**7.2**	**8.3**	**9.6**	**11.3**	**13.4**	**16.1**	**19.2**
	VC dom	bn €	1.8	2.9	3.7	2.5	3.7	4.4	5.2	6.0	6.8	7.5
	VC nondom	bn €	0.4	0.5	0.6	0.6	0.7	0.9	1.1	1.4	1.7	2.1
	Total VC Vacuum Cleaner	bn €	**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	bn €	*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)	bn €	2.3	5.7	7.5	9.5	12.1	15.2	18.8	22.8	27.6	33.5
0.5	FAN Axial>300Pa	bn €	4.0	10.4	13.5	16.7	20.5	25.1	30.7	37.2	45.2	55.0
0.5	FAN Centr.FC	bn €	1.0	1.9	2.6	3.3	4.1	5.1	6.2	7.5	9.1	11.1
0.5	FAN Centr.BC-free	bn €	2.6	4.7	6.3	8.0	10.1	13.3	17.1	21.4	26.5	32.8
0.5	FAN Centr.BC	bn €	2.7	5.3	7.2	9.0	11.5	15.1	19.8	25.8	34.0	44.9
0.5	FAN Cross-flow	bn €	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.7	0.9	1.2
	Total FAN, industrial (excl. box & roof fans)		**6.4**	**14.1**	**18.7**	**23.4**	**29.3**	**37.1**	**46.6**	**57.7**	**71.7**	**89.2**
0.5	**Total MT Industrial motors > 1 hp**	bn €	**96.7**	**116.8**	**139.6**	**165.6**	**196.2**	**240.4**	**292.2**	**355.4**	**432.4**	**526.1**
	Total WP Water Pumps	bn €	**11.5**	**13.7**	**16.8**	**21.4**	**27.5**	**35.5**	**45.8**	**58.9**	**75.6**	**96.7**
	TOTAL INDUSTRY COMPONENTS		66	86	105	128	155	193	238	294	364	449
	TRAFO Distribution	bn €	1.4	2.1	2.7	3.4	4.3	5.4	6.8	8.4	10.5	12.9
	TRAFO Industry oil	bn €	1.1	1.6	2.0	2.5	2.9	3.5	4.0	4.9	6.3	8.2
	TRAFO Industry dry	bn €	0.3	0.5	0.6	0.8	1.0	1.3	1.6	2.0	2.5	3.3
	TRAFO Power	bn €	4.1	5.5	7.3	9.8	13.1	17.3	22.7	29.7	38.7	50.3
	TRAFO DER oil	bn €	0.0	0.0	0.1	0.2	0.3	0.6	1.1	1.9	3.3	5.4
	TRAFO DER dry	bn €	0.0	0.2	0.4	0.8	1.5	3.0	5.6	10.3	17.7	28.7
	TRAFO Small	bn €	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	0.9
	Total TRAFO Utility Transformers		**7.1**	**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	bn €	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	bn €	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	bn €	11.8	13.9	14.4	14.7	14.6	13.8	15.2	17.4	19.8	22.6
	TYRE Replacement Tyres	bn €	**40.9**	**53.7**	**61.7**	**67.3**	**70.6**	**66.1**	**71.1**	**81.5**	**93.0**	**105.7**
	TRANSPORT SECTOR	bn €	**41**	**54**	**62**	**67**	**71**	**66**	**71**	**81**	**93**	**106**
	GENERAL TOTAL (in bn €)		**513**	**627**	**713**	**768**	**835**	**937**	**1094**	**1301**	**1555**	**1865**

ECO Running costs (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	65	83	96	104	112	129	155	192	240	301
SPACE HEATING	bn €	187	203	230	240	251	271	300	335	374	412
SPACE COOLING	bn €	3	12	16	19	23	27	31	36	41	47
VENTILATION	bn €	4	11	13	11	6	1	0	-1	0	1
LIGHTING	bn €	30	40	39	36	29	29	33	37	41	48
ELECTRONICS	bn €	40	53	54	51	52	58	65	74	85	98
FOOD PRESERVATION	bn €	28	25	29	34	40	49	60	75	94	120
COOKING	bn €	14	15	18	22	27	33	41	51	63	78
CLEANING	bn €	28	33	37	39	44	50	58	68	81	95
INDUSTRY COMPONENTS	bn €	66	86	105	128	155	193	238	294	364	449
ENERGY SECTOR	bn €	7	10	13	18	24	31	42	58	80	110
TRANSPORT SECTOR	bn €	41	54	62	67	71	66	71	81	93	106
TOTAL in bn €		513	627	713	768	835	937	1094	1301	1555	1865



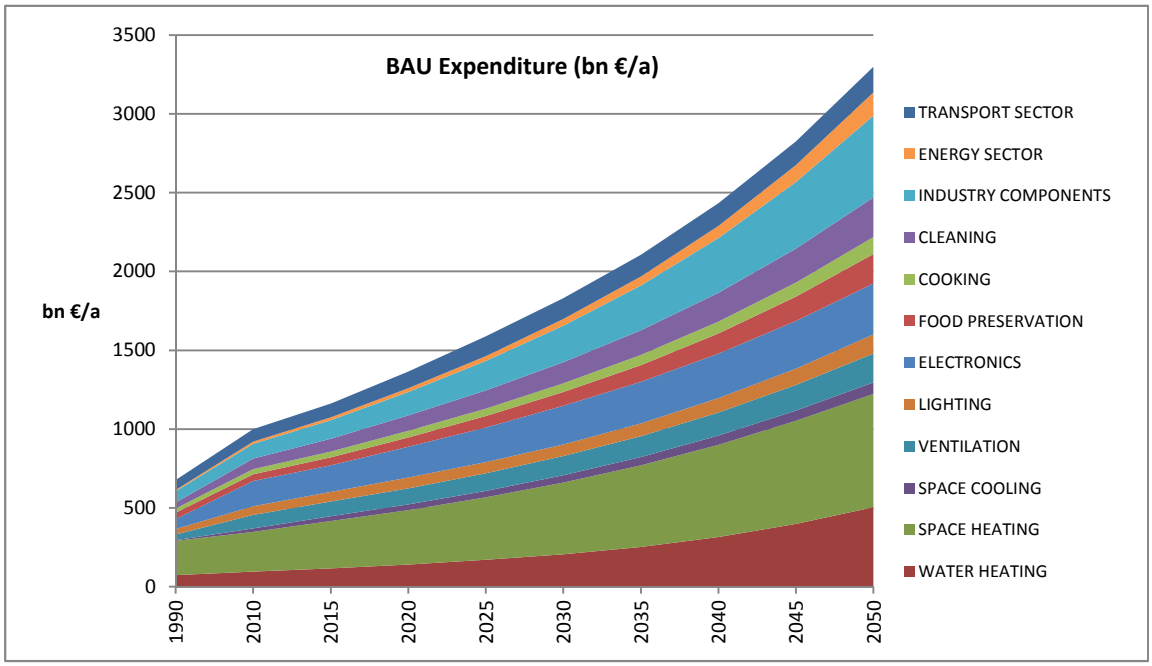
Running costs saving ECO vs. BAU		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	0	0	8	23	43	63	83	108	143	187
SPACE HEATING	bn €	0	4	21	51	88	122	153	182	208	231
SPACE COOLING	bn €	0	0	0	1	2	3	4	6	7	9
VENTILATION	bn €	0	0	2	8	17	28	36	45	55	68
LIGHTING	bn €	0	2	12	21	30	34	39	46	56	67
ELECTRONICS	bn €	0	1	2	7	13	16	18	-4	-7	-10
FOOD PRESERVATION	bn €	0	4	6	10	15	21	27	34	41	48
COOKING	bn €	0	0	0	1	1	3	4	5	6	8
CLEANING	bn €	0	9	15	24	34	45	56	69	85	104
INDUSTRY COMPONENTS	bn €	0	0	4	13	23	30	36	43	51	60
ENERGY SECTOR	bn €	0	0	0	1	2	4	7	12	18	27
TRANSPORT SECTOR	bn €	0	0	2	10	23	35	36	30	25	26
TOTAL in bn €		0	19	73	171	292	404	499	574	689	825
Saving in % versus BAU (from 1990=0)		0.0%	2.9%	9.2%	18.2%	25.9%	30.1%	31.3%	30.6%	30.7%	30.7%
Saving In % versus BAU (from 2010=0)		-2.9%	0.6%	7.3%	16.6%	24.6%	29.0%	30.4%	29.8%	30.0%	30.1%

db	BAU Expenditure (in bn €)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**58**	**64**	**75**	**91**	**109**	**129**	**155**	**192**	**241**	**303**
	Total CH Central Heating combi, water heat	bn €	**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	bn €	**147**	**177**	**208**	**233**	**265**	**304**	**347**	**392**	**436**	**472**
	SFB Wood Manual	bn €	8	3	3	2	2	1	1	1	1	1
	SFB Wood Direct Draft	bn €	0	2	3	4	5	6	7	9	12	15
	SFB Coal	bn €	3	1	1	1	0	0	0	0	0	0
	SFB Pellets	bn €	0	1	1	2	2	3	3	3	4	5
	SFB Wood chips	bn €	0	1	1	1	1	1	1	2	2	3
	Total Solid Fuel Boiler		**11**	**7**	**9**	**10**	**11**	**12**	**13**	**15**	**19**	**24**
	CHAS (was met CC=40%)	bn €	1	5	6	7	7	9	10	11	13	14
	CHAL	bn €	1	2	3	3	3	4	4	5	5	6
	CHsorp	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
	CHWS	bn €	0	0	1	1	1	1	1	1	1	1
	CHWL	bn €	1	1	1	2	2	2	2	2	2	3
	CHeng	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	AC all	bn €	0.9	6.3	8.0	8.9	9.5	9.9	10.0	10.1	10.1	10.1
	o/w AC rooftop	*bn €*	*0.4*	*1.5*	*1.4*	*1.2*	*1.0*	*1.0*	*0.9*	*1*	*1*	*0*
	o/w AC splits	*bn €*	*0.3*	*2.0*	*2.3*	*2.5*	*2.6*	*2.7*	*2.7*	*3*	*3*	*3*
	o/w AC VRF	*bn €*	*0.2*	*2.8*	*4.3*	*5.2*	*5.9*	*6.3*	*6.4*	*7*	*7*	*7*
	ACF (AC/ HP eng)	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3
	Total AHC Air Heating & Cooling, cooling		**4**	**15**	**18**	**21**	**23**	**25**	**27**	**29**	**32**	**35**
	AC all, rev	bn €	0.4	5.8	8.5	11.1	13.3	15.3	16.7	18.1	19.0	19.7
	o/w AC rooftop, rev	*bn €*	*0.1*	*1.6*	*1.8*	*1.8*	*1.7*	*1.8*	*1.8*	*2*	*2*	*1*
	o/w AC splits, rev	*bn €*	*0.1*	*1.9*	*2.6*	*3.3*	*3.9*	*4.5*	*4.9*	*5*	*6*	*6*
	o/w AC VRF, rev	*bn €*	*0.1*	*2.3*	*4.2*	*6.0*	*7.7*	*9.0*	*10.0*	*11*	*12*	*13*
	ACF (AC/ HP eng), rev	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.4
	AHF all	bn €	11.7	9.6	10.8	11.1	11.6	12.1	12.8	13.4	14.1	14.7
	o/w AHFS	*bn €*	*1.4*	*0.4*	*0.3*	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*
	o/w AHFL central	*bn €*	*7.5*	*6.8*	*7.7*	*8.0*	*8.2*	*8.5*	*8.8*	*9.1*	*9.4*	*9.7*
	o/w AHFL local	*bn €*	*2.7*	*2.4*	*2.8*	*3.0*	*3.2*	*3.5*	*3.9*	*4.2*	*4.6*	*5.0*
	AH el	bn €	0.2	0.3	0.3	0.2	0.3	0.3	0.1	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating	bn €	**12**	**16**	**20**	**23**	**25**	**28**	**30**	**32**	**33**	**35**
	LH open fireplace	bn €	2	3	3	3	3	4	4	4	4	4
	LH closed fireplace/inset	bn €	1	4	5	6	7	8	9	10	11	12
	LH wood stove	bn €	2	2	3	3	4	4	5	5	6	6
	LH coal stove	bn €	1	1	1	1	1	1	1	0	0	0
	LH cooker	bn €	1	2	3	3	4	4	4	4	5	5
	LH SHR stove	bn €	2	3	4	5	6	7	8	8	9	10
	LH pellet stove	bn €	0	1	2	2	3	3	4	4	4	5
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	1	1	1	2	2	2	2	2	3	3
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	6	5	6	7	8	9	11	13	15	17
	LH elec.convector	bn €	24	21	25	29	34	40	47	54	63	73
	LH elec.storage	bn €	2	2	2	2	3	3	4	4	5	6
	LH elec.underfloor	bn €	3	3	4	4	5	6	7	8	9	10
	LH luminous heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH total	bn €	**46**	**49**	**58**	**68**	**80**	**92**	**105**	**119**	**135**	**152**
	RAC (cooling demand), all RAC types <12 kW	bn €	1	8	12	16	19	22	26	29	34	40
	o/w RAC reversible (heating demand)	bn €	0	4	6	10	15	19	22	26	30	35
	Total RAC Room Air Conditioner	bn €	**1**	**12**	**18**	**26**	**34**	**41**	**48**	**55**	**64**	**75**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**13**
	TOTAL SPACE HEATING	bn €	**217**	**252**	**301**	**344**	**396**	**454**	**517**	**585**	**653**	**718**
	TOTAL SPACE COOLING	bn €	**5**	**23**	**30**	**36**	**42**	**47**	**53**	**59**	**66**	**75**
	NRVU Ventilation units	bn €	32.7	78.4	84.1	91.0	98.3	106.0	114.5	124.1	135.3	148.5
	RVU Central Unidir.	bn €	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)	bn €	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)	bn €	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)	bn €	**35**	**85**	**93**	**102**	**111**	**122**	**133**	**147**	**163**	**182**

BAU Expenditure (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources											
LFL Linear Fluorescent	bn €	12.1	16.8	20.3	23.4	27.0	30.8	35.0	39.7	45.4	52.0
CFL Compact Fluorescent	bn €	0.9	6.4	8.5	8.9	7.5	7.0	7.2	7.6	8.1	8.6
Tungsten	bn €	1.9	11.5	14.0	16.2	13.1	10.9	9.3	7.8	6.9	7.5
GLS GeneralLighting Service (incandescent)	bn €	14.9	10.2	9.1	7.9	5.8	2.3	0.6	0.1	0.0	0.0
HID High Intensity Discharge	bn €	4.7	8.9	9.3	9.9	11.1	13.3	16.1	19.3	23.3	28.2
LED Light Emitting Diode	bn €	0.0	0.3	0.8	2.7	5.4	8.1	11.7	15.6	19.7	24.6
TOTAL LIGHTING (excl. SP & controls)	bn €	**34**	**54**	**62**	**69**	**70**	**72**	**80**	**90**	**104**	**121**
DP TV	bn €	15.6	40.3	35.4	42.0	48.2	55.4	62.1	67.5	71.0	77.5
DP Monitor	bn €	1.9	5.4	3.5	3.4	3.7	3.8	3.8	3.6	3.1	3.0
Total Electronic Displays	**bn €**	**17.5**	**45.6**	**38.9**	**45.4**	**51.9**	**59.2**	**65.8**	**71.1**	**74.2**	**80.5**
SSTB	bn €	0.0	1.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	bn €	0.0	6.1	9.5	11.1	12.4	13.2	15.7	19.0	23.0	28.1
Total STB set top boxes (Complex & Simple)		**0.0**	**8.0**	**10.0**	**11.1**	**12.4**	**13.2**	**15.7**	**19.0**	**23.0**	**28.1**
VIDEO players/recorders	bn €	0.0	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	bn €	0.0	1.9	1.8	1.3	0.6	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	bn €	0.0	6.8	4.8	5.1	5.9	6.5	7.0	7.7	8.6	9.7
Total VIDEO		**0.0**	**9.7**	**6.9**	**6.4**	**6.6**	**6.5**	**7.0**	**7.7**	**8.6**	**9.7**
Total CS Computer Servers	bn €	0.6	2.1	1.5	1.3	1.1	1.1	1.3	1.6	2.0	2.4
PC Desktop	bn €	5.6	14.2	10.5	8.5	8.2	8.4	8.6	8.8	9.1	9.5
PC Notebook	bn €	0.4	26.3	12.2	11.1	11.0	11.0	11.1	11.1	11.2	11.3
PC Tablet/slate	bn €	0.0	1.7	27.3	44.3	57.1	68.1	71.7	75.3	78.9	82.6
PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	bn €	0.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1
Total PC, electricity		**6.2**	**44.9**	**52.7**	**66.4**	**78.9**	**90.1**	**93.9**	**97.8**	**101.9**	**106.0**
EP-Copier mono	bn €	4.7	1.5	0.9	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	bn €	0.0	0.5	2.2	3.3	3.8	4.2	4.7	5.2	5.7	6.3
EP-printer mono	bn €	2.0	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.5
EP-printer colour	bn €	0.0	0.8	1.2	1.7	2.1	2.6	3.2	3.9	4.7	5.6
IJ SFD printer	bn €	0.8	1.1	0.8	0.5	0.4	0.4	0.3	0.2	0.2	0.1
IJ MFD printer	bn €	1.0	2.6	3.6	4.3	4.8	5.3	6.0	6.7	7.4	8.3
Total imaging equipment, electricity and		**38.0**	**38.8**	**42.7**	**45.8**	**48.4**	**51.4**	**54.6**	**58.0**	**62.0**	**66.4**
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	bn €	0.0	7.1	9.3	11.7	14.0	16.3	18.5	20.5	22.2	23.0
SB Home NAS	bn €	0.0	0.6	1.1	1.6	2.0	2.5	3.0	3.4	3.8	4.1
SB Home Phones (fixed)	bn €	0.5	2.5	3.0	3.2	3.2	3.3	3.3	3.2	3.2	3.1
SB Office Phones (fixed)	bn €	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)		**1.2**	**11**	**15**	**18**	**21**	**24**	**26**	**29**	**31**	**32**
Total BC Battery Charged devices	bn €	0.0	0.5	0.5	0.7	0.8	1.0	0.7	0.8	0.9	1.0
TOTAL ELECTRONICS		**63**	**161**	**168**	**195**	**221**	**246**	**266**	**283**	**301**	**323**
Total RF household Refrigerators & Freezers	bn €	**23.7**	**22.5**	**25.1**	**28.9**	**33.5**	**39.0**	**45.7**	**53.7**	**63.4**	**75.0**
CF open vertical chilled multi deck (RCV2)	bn €	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)	bn €	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	bn €	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	bn €	0.6	0.8	0.9	1.1	1.3	1.5	1.7	2.0	2.3	2.7
CF Spiral vending machine	bn €	0.5	0.9	1.1	1.5	1.8	2.3	2.8	3.4	4.1	5.0
Total CF Commercial Refrigeration		**8.6**	**9.9**	**11.9**	**14.7**	**18.0**	**22.1**	**27.0**	**32.7**	**39.6**	**47.6**
PF Service cabinets	bn €	1.1	1.3	1.6	1.9	2.3	2.8	3.4	4.2	5.2	6.4
PF Blast cabinets	bn €	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	bn €	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	bn €	2.2	4.0	5.3	7.1	9.5	12.6	16.6	21.9	28.6	37.2
Total PF Professional Refrigeration		**7.4**	**10.8**	**13.1**	**16.3**	**20.4**	**25.6**	**32.3**	**40.8**	**51.6**	**65.3**
TOTAL FOOD PRESERVATION		**40**	**43**	**50**	**60**	**72**	**87**	**105**	**127**	**155**	**188**

	BAU Expenditure (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	bn €	5.9	10.5	12.7	15.4	18.6	22.5	27.2	33.0	40.2	49.2
	CA El. Ovens	bn €	8.9	9.6	10.4	11.6	12.3	13.7	15.5	17.5	20.0	23.1
	CA Gas Hobs	bn €	4.4	3.8	3.9	4.0	4.2	4.5	4.8	5.2	5.7	6.3
	CA Gas Ovens	bn €	1.4	1.3	1.3	1.4	1.5	1.6	1.7	1.9	2.1	2.3
	CA Range Hoods	bn €	2.9	3.4	4.0	4.7	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)	bn €	2.25	1.51	1.56	1.53	1.64	1.95	2.34	2.81	3.38	4.07
	COFFEE Dripfilter (thermos)	bn €	0.13	0.29	0.33	0.38	0.45	0.53	0.63	0.74	0.88	1.06
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.27	0.32	0.39	0.47	0.57	0.69	0.83	1.02	1.24
	COFFEE Pad filter	bn €	0.00	0.61	0.71	0.83	0.98	1.15	1.36	1.62	1.94	2.34
	COFFEE Hard cap espresso	bn €	0.06	0.27	0.57	0.93	1.06	1.14	1.22	1.32	1.45	1.60
	COFFEE Semi-auto espresso	bn €	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10
	COFFEE Fully-auto espresso	bn €	0.36	0.41	0.48	0.56	0.64	0.72	0.81	0.91	1.02	1.15
	Total CM household Coffee Makers		**2.9**	**3.4**	**4.1**	**4.7**	**5.3**	**6.2**	**7.1**	**8.3**	**9.8**	**11.6**
	TOTAL COOKING		**26**	**32**	**36**	**42**	**48**	**55**	**65**	**76**	**90**	**108**
	Total WM household Washing Machine	bn €	**23.4**	**31.3**	**35.3**	**39.4**	**43.2**	**48.3**	**53.6**	**59.6**	**66.8**	**74.9**
	including detergent and water costs	*bn €*	*10.0*	*17.6*	*20.5*	*23.1*	*26.2*	*29.8*	*33.6*	*37.9*	*43.1*	*49.1*
	Total DW household Dishwasher	bn €	**5.2**	**10.9**	**13.9**	**17.7**	**22.3**	**27.8**	**34.6**	**42.7**	**52.6**	**64.6**
	including detergent and water costs	*bn €*	*1.2*	*3.2*	*4.1*	*5.2*	*6.5*	*8.0*	*9.8*	*12.0*	*14.6*	*17.7*
	LD vented el.	bn €	2.3	2.7	3.1	3.5	4.0	4.6	5.5	6.6	7.9	9.6
	LD condens el.	bn €	0.7	4.1	5.6	7.5	9.4	11.3	13.1	15.4	18.1	21.3
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**3.1**	**6.9**	**8.8**	**11.0**	**13.4**	**15.9**	**18.6**	**21.9**	**26.0**	**30.9**
	VC dom	bn €	5.7	14.5	20.9	25.7	32.2	38.2	45.4	53.6	62.8	72.8
	VC nondom	bn €	1.1	1.3	1.5	1.7	2.1	2.4	2.9	3.5	4.2	5.1
	Total VC Vacuum Cleaner	bn €	**8.3**	**17.6**	**24.3**	**29.5**	**36.4**	**42.9**	**50.5**	**59.3**	**69.1**	**79.9**
	including costs of bags & filters	bn €	*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)	bn €	2.7	7.0	9.3	12.2	15.7	19.7	23.8	28.6	34.3	41.3
0.5	FAN Axial>300Pa	bn €	4.5	12.2	15.8	19.8	24.5	29.9	36.1	43.4	52.3	63.1
0.5	FAN Centr.FC	bn €	1.4	2.7	3.7	4.7	5.8	7.1	8.5	10.1	12.0	14.3
0.5	FAN Centr.BC-free	bn €	2.8	5.2	7.0	9.3	12.2	16.0	20.4	25.4	31.3	38.6
0.5	FAN Centr.BC	bn €	3.1	6.5	8.8	11.4	14.9	19.3	25.0	32.2	42.0	54.8
0.5	FAN Cross-flow	bn €	0.3	0.5	0.6	0.7	1.0	1.2	1.5	1.9	2.4	3.1
	Total FAN, industrial (excl. box & roof fans)		**7.4**	**17.0**	**22.6**	**29.1**	**37.1**	**46.6**	**57.7**	**70.8**	**87.2**	**107.6**
0.5	**Total MT Industrial motors > 1 hp**	bn €	**98.3**	**119.3**	**148.5**	**189.2**	**236.1**	**289.0**	**349.1**	**421.6**	**509.2**	**615.2**
	Total WP Water Pumps	bn €	**13.2**	**16.1**	**19.6**	**24.7**	**31.2**	**39.7**	**50.5**	**64.2**	**81.5**	**103.5**
	TOTAL INDUSTRY COMPONENTS		**70**	**93**	**116**	**148**	**186**	**231**	**283**	**346**	**423**	**519**
	TRAFO Distribution	bn €	1.9	2.8	3.5	4.5	5.9	7.6	9.8	12.6	16.1	20.7
	TRAFO Industry oil	bn €	1.3	2.0	2.5	3.3	4.3	5.5	7.0	9.1	11.7	15.0
	TRAFO Industry dry	bn €	0.5	0.7	0.9	1.1	1.4	1.8	2.3	3.0	3.8	4.8
	TRAFO Power	bn €	6.0	8.6	10.5	13.3	16.8	21.3	27.0	34.3	43.6	55.5
	TRAFO DER oil	bn €	0.0	0.1	0.1	0.3	0.5	1.1	2.0	3.5	5.9	9.5
	TRAFO DER dry	bn €	0.0	0.3	0.7	1.3	2.5	4.8	8.9	15.5	25.8	40.9
	TRAFO Small	bn €	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0
	Total TRAFO Utility Transformers		**9.9**	**14.7**	**18.5**	**24.1**	**31.8**	**42.5**	**57.6**	**78.6**	**107.7**	**147.3**
	TOTAL ENERGY SECTOR		**10**	**15**	**19**	**24**	**32**	**42**	**58**	**79**	**108**	**147**
	TYRE car replacement tyres C1	bn €	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	bn €	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	bn €	15.9	18.0	18.3	20.3	22.4	24.3	26.2	28.2	30.0	31.8
	TYRE Replacement Tyres	bn €	**62.3**	**79.0**	**88.2**	**105.2**	**124.3**	**132.4**	**138.0**	**142.6**	**149.1**	**163.0**
	TRANSPORT SECTOR	bn €	**62**	**79**	**88**	**105**	**124**	**132**	**138**	**143**	**149**	**163**
	GENERAL TOTAL (in bn €)		**677**	**1000**	**1163**	**1365**	**1588**	**1830**	**2106**	**2432**	**2825**	**3298**

BAU Expenditure (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	74	95	117	141	171	206	253	316	399	504
SPACE HEATING	bn €	217	252	301	344	396	454	517	585	653	718
SPACE COOLING	bn €	5	23	30	36	42	47	53	59	66	75
VENTILATION	bn €	35	85	93	102	111	122	133	147	163	182
LIGHTING	bn €	34	54	62	69	70	72	80	90	104	121
ELECTRONICS	bn €	63	161	168	195	221	246	266	283	301	323
FOOD PRESERVATION	bn €	40	43	50	60	72	87	105	127	155	188
COOKING	bn €	26	32	36	42	48	55	65	76	90	108
CLEANING	bn €	40	67	82	98	115	135	157	184	214	250
INDUSTRY COMPONENTS	bn €	70	93	116	148	186	231	283	346	423	519
ENERGY SECTOR	bn €	10	15	19	24	32	42	58	79	108	147
TRANSPORT SECTOR	bn €	62	79	88	105	124	132	138	143	149	163
TOTAL in bn €		677	1000	1163	1365	1588	1830	2106	2432	2825	3298

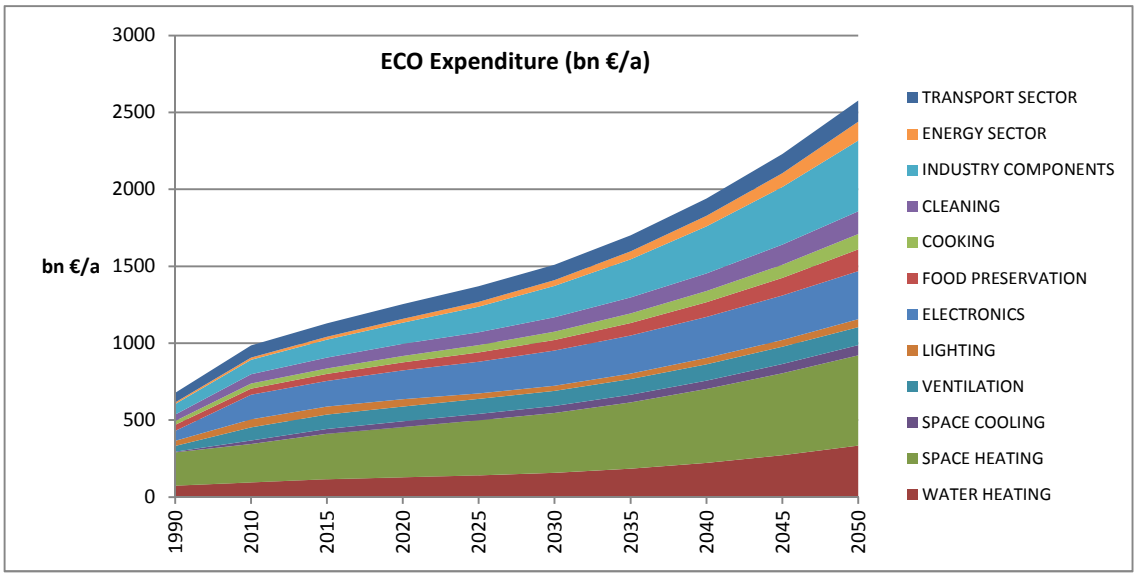


db	ECO Expenditure (in bn €)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total WH dedicated Water Heater	bn €	**58**	**64**	**73**	**79**	**84**	**94**	**110**	**133**	**164**	**204**
	Total CH Central Heating combi, water heat	bn €	**16**	**32**	**42**	**50**	**55**	**63**	**75**	**90**	**108**	**130**
	TOTAL WATER HEATING		**74**	**95**	**116**	**129**	**140**	**157**	**184**	**222**	**272**	**334**
	Total CH Central Heating boiler, space heat	bn €	**147**	**174**	**202**	**218**	**238**	**256**	**282**	**311**	**342**	**369**
	SFB Wood Manual	bn €	8	3	3	3	2	1	1	1	1	1
	SFB Wood Direct Draft	bn €	0	2	3	5	6	6	7	9	12	15
	SFB Coal	bn €	3	1	1	1	0	0	0	0	0	0
	SFB Pellets	bn €	0	1	1	2	2	3	3	3	4	5
	SFB Wood chips	bn €	0	1	1	1	1	1	1	2	2	2
	Total Solid Fuel Boiler		**11**	**7**	**9**	**10**	**11**	**11**	**13**	**15**	**18**	**23**
	CHAS (was met CC=40%)	bn €	1	5	6	7	8	9	10	11	12	14
	CHAL	bn €	1	2	3	3	3	3	4	4	5	5
	CHsorp	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
	CHWS	bn €	0	0	1	1	1	1	1	1	1	1
	CHWL	bn €	1	1	1	1	2	2	2	2	2	2
	CHeng	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	AC all	bn €	0.9	6.3	8.2	8.9	9.4	9.6	9.6	9.6	9.5	9.3
	o/w AC rooftop	*bn €*	*0.4*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0*
	o/w AC splits	*bn €*	*0.3*	*2*	*2*	*2*	*2*	*3*	*3*	*3*	*2*	*2*
	o/w AC VRF	*bn €*	*0.2*	*3*	*4*	*5*	*6*	*6*	*6*	*6*	*6*	*6*
	ACF (AC/ HP eng)	bn €	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	Total AHC Air Heating & Cooling, cooling		**4**	**15**	**18**	**21**	**23**	**24**	**26**	**28**	**30**	**32**
	AC all, rev	bn €	0.4	5.8	8.6	10.8	12.7	14.1	15.2	16.1	16.6	16.8
	o/w AC rooftop, rev	*bn €*	*0.1*	*1.6*	*1.7*	*1.7*	*1.6*	*1.6*	*1.5*	*1.5*	*1.3*	*1.0*
	o/w AC splits, rev	*bn €*	*0.1*	*1.9*	*2.6*	*3.2*	*3.6*	*4.1*	*4.4*	*4.7*	*4.8*	*4.8*
	o/w AC VRF, rev	*bn €*	*0.1*	*2.3*	*4.3*	*5.9*	*7.4*	*8.5*	*9.2*	*10.0*	*10.5*	*11.1*
	ACF (AC/ HP eng), rev	bn €	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
	AHF all	bn €	11.7	9.6	10.8	10.8	10.5	10.5	10.8	11.3	11.9	12.4
	o/w AHFS	*bn €*	*1.4*	*0.4*	*0.3*	*0.2*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*
	o/w AHFL central	*bn €*	*7.5*	*6.8*	*7.7*	*7.6*	*7.4*	*7.3*	*7.4*	*7.8*	*8.1*	*8.4*
	o/w AHFL local	*bn €*	*2.7*	*2.4*	*2.9*	*2.9*	*3.0*	*3.1*	*3.3*	*3.5*	*3.8*	*4.1*
	AH el	bn €	0.2	0.3	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0
	Total AHC Air Heating & Cooling, heating		**12**	**16**	**20**	**22**	**24**	**25**	**26**	**28**	**29**	**30**
	LH open fireplace	bn €	2	3	4	5	5	5	5	5	5	5
	LH closed fireplace/inset	bn €	1	4	6	7	8	8	9	10	10	11
	LH wood stove	bn €	2	2	3	3	4	4	4	5	5	6
	LH coal stove	bn €	1	1	1	1	1	1	1	0	0	0
	LH cooker	bn €	1	2	3	4	4	5	5	5	5	5
	LH SHR stove	bn €	2	3	4	5	6	7	7	8	9	9
	LH pellet stove	bn €	0	1	2	2	3	3	3	4	4	4
	LH open fire gas	bn €	0	0	0	0	0	0	0	0	0	0
	LH closed fire gas	bn €	1	1	1	1	2	2	2	2	2	3
	LH flueless fuel heater	bn €	0	0	0	0	0	0	0	0	0	0
	LH elec.portable	bn €	6	5	6	6	7	8	10	12	14	16
	LH elec.convector	bn €	24	21	24	26	28	32	39	46	54	64
	LH elec.storage	bn €	2	2	2	2	2	3	3	4	4	5
	LH elec.underfloor	bn €	3	3	4	4	5	5	6	7	8	9
	LH luminous heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH tube heaters	bn €	0	0	0	0	0	0	0	0	0	0
	LH total	bn €	**46**	**49**	**60**	**68**	**74**	**83**	**94**	**106**	**121**	**138**
	RAC (cooling demand), all RAC types <12 kW	bn €	1	8	12	16	19	21	24	27	30	35
	o/w RAC reversible (heating demand)	bn €	0	3	5	8	11	14	17	20	24	28
	Total RAC Room Air Conditioner	bn €	**1**	**12**	**17**	**23**	**30**	**36**	**41**	**47**	**54**	**62**
1	**CIRC Circulator pumps <2.5 kW, net load**	bn €	**3**	**4**	**4**	**4**	**5**	**5**	**5**	**6**	**6**	**7**
	TOTAL SPACE HEATING	bn €	**217**	**249**	**296**	**326**	**358**	**390**	**431**	**480**	**533**	**587**
	TOTAL SPACE COOLING	bn €	**5**	**23**	**31**	**36**	**42**	**46**	**50**	**55**	**60**	**67**
	NRVU Ventilation units	bn €	32.7	78.4	83.1	85.9	87.7	88.7	92.8	98.5	105.1	113.0
	RVU Central Unidir.	bn €	2.6	5.3	6.8	5.3	3.8	2.0	1.2	0.1	-1.4	-3.4
	RVU Central Balanced VU ≤125W/fan (2 fans)	bn €	0.2	1.4	4.4	5.5	5.8	6.0	6.2	6.4	6.5	6.4
	RVU Local Balanced VU (<125 W, also NR) (2 fans)	bn €	0.0	0.1	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7
	Total VU Ventilation Units		**35**	**85**	**95**	**97**	**98**	**97**	**101**	**106**	**111**	**117**
	TOTAL VENTILATION (electr. & maint. only)	bn €	**35**	**85**	**95**	**97**	**98**	**97**	**101**	**106**	**111**	**117**

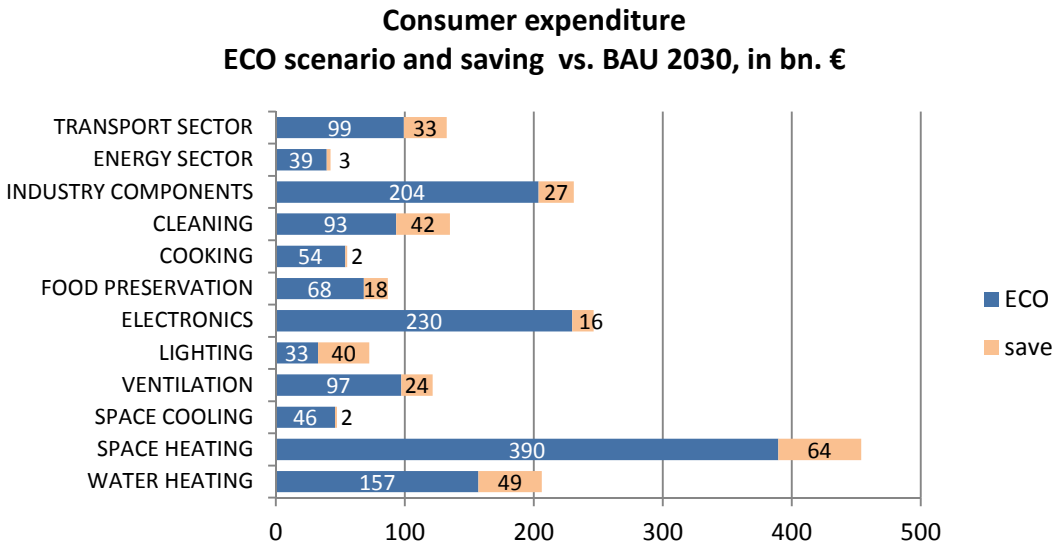
ECO Expenditure (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS Light Sources											
LFL Linear Fluorescent	bn €	12.1	16.8	19.3	19.0	14.7	10.6	8.9	7.2	4.6	2.0
CFL Compact Fluorescent	bn €	0.9	6.9	6.8	6.1	2.2	0.6	0.1	0.1	0.1	0.1
Tungsten	bn €	2.0	11.7	13.5	5.9	0.8	0.2	0.2	0.2	0.3	0.4
GLS GeneralLighting Service (incandescent)	bn €	14.9	7.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
HID High Intensity Discharge	bn €	4.7	9.0	6.6	4.4	3.0	2.1	2.5	3.1	3.9	4.9
LED Light Emitting Diode	bn €	0.0	0.3	4.9	11.5	14.2	19.2	24.8	30.1	36.1	45.3
SP Special Purpose (exempt)	bn €	5.9	8.3	8.6	8.9	8.9	8.9	10.9	13.2	16.1	19.5
lighting controls & sb	bn €	1.7	2.3	2.4	2.5	2.5	2.5	3.0	3.7	4.5	5.5
GLS stock	bn €	0.0	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten stock	bn €	0.0	0.0	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL LIGHTING (excl. SP & controls)	bn €	**35**	**52**	**52**	**47**	**35**	**33**	**37**	**41**	**45**	**53**
DP TV	bn €	15.6	40.3	35.4	38.6	40.1	44.7	49.8	56.1	63.4	72.1
DP Monitor	bn €	1.9	5.6	3.5	2.8	2.6	2.7	2.8	2.9	3.1	3.3
Total Electronic Displays	**bn €**	**17.4**	**45.9**	**38.9**	**41.3**	**42.8**	**47.4**	**52.6**	**59.0**	**66.5**	**75.4**
SSTB	bn €	0.0	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	bn €	0.0	6.1	9.2	10.1	11.0	11.6	13.7	16.3	19.6	23.6
Total STB set top boxes (Complex & Simple)		**0.0**	**7.8**	**9.8**	**10.1**	**11.0**	**11.6**	**13.7**	**16.3**	**19.6**	**23.6**
VIDEO players/recorders	bn €	0.0	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIDEO projectors	bn €	0.0	1.9	1.8	1.3	0.6	0.0	0.0	0.0	0.0	0.0
VIDEO game consoles	bn €	0.0	6.8	4.8	5.1	5.9	6.5	7.0	7.7	8.6	9.7
Total VIDEO		**0.0**	**9.7**	**6.9**	**6.4**	**6.6**	**6.5**	**7.0**	**7.7**	**8.6**	**9.7**
Total CS Computer Servers	bn €	0.6	2.1	1.5	1.3	1.1	1.1	1.3	1.6	2.0	2.4
PC Desktop	bn €	5.6	14.2	10.5	8.5	8.2	8.4	8.6	8.8	9.1	9.5
PC Notebook	bn €	0.4	26.3	12.2	11.1	11.0	11.0	11.1	11.1	11.2	11.3
PC Tablet/slate	bn €	0.0	1.7	27.3	44.3	57.1	68.1	71.7	75.3	78.9	82.6
PC Thin client	bn €	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PC Workstation	bn €	0.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1
Total PC, electricity		**6.2**	**44.9**	**52.7**	**66.4**	**78.9**	**90.1**	**93.9**	**97.8**	**101.9**	**106.0**
EP-Copier mono	bn €	4.7	1.5	0.9	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EP-Copier colour	bn €	0.0	0.5	2.1	3.1	3.6	3.9	4.3	4.7	5.0	5.4
EP-printer mono	bn €	2.0	0.9	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3
EP-printer colour	bn €	0.0	0.8	1.0	1.4	1.7	2.1	2.4	2.8	3.2	3.7
IJ SFD printer	bn €	0.8	1.0	0.7	0.5	0.4	0.3	0.3	0.2	0.1	0.1
IJ MFD printer	bn €	1.0	2.5	3.4	3.9	4.3	4.8	5.2	5.7	6.1	6.6
Total imaging equipment, electricity and		**38.0**	**38.3**	**41.3**	**43.9**	**46.1**	**48.7**	**51.3**	**54.1**	**57.2**	**60.4**
this total includes following toner and paper costs:		*89.9*	*171.4*	*188.0*	*199.7*	*208.0*	*219.8*	*231.7*	*243.7*	*256.1*	*268.5*
SB Home Gateway	bn €	0.0	7.1	9.3	11.7	14.0	16.3	18.5	20.5	22.2	23.0
SB Home NAS	bn €	0.0	0.6	1.1	1.5	2.0	2.5	3.0	3.4	3.8	4.1
SB Home Phones (fixed)	bn €	0.5	2.5	3.0	3.2	3.2	3.3	3.3	3.2	3.2	3.1
SB Office Phones (fixed)	bn €	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)		**1.2**	**11**	**15**	**18**	**21**	**24**	**26**	**29**	**31**	**32**
Total BC Battery Charged devices	bn €	0.0	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.3
TOTAL ELECTRONICS		**63**	**161**	**166**	**188**	**208**	**230**	**247**	**266**	**288**	**311**
Total RF household Refrigerators & Freezers	bn €	**23.7**	**20.1**	**20.6**	**21.1**	**21.7**	**22.2**	**22.6**	**22.1**	**22.0**	**23.2**
CF open vertical chilled multi deck (RCV2)	bn €	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)	bn €	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	bn €	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	bn €	0.6	0.8	0.9	1.1	1.2	1.4	1.6	2.0	2.4	3.0
CF Spiral vending machine	bn €	0.5	0.9	1.1	1.4	1.8	2.2	2.7	3.4	4.3	5.4
Total CF Commercial Refrigeration		**8.6**	**9.9**	**11.9**	**14.4**	**16.9**	**20.5**	**25.9**	**32.9**	**41.7**	**52.9**
PF Service cabinets	bn €	1.1	1.3	1.6	1.9	2.3	2.8	3.4	4.2	5.2	6.4
PF Blast cabinets	bn €	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	bn €	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	bn €	2.2	4.0	5.3	7.1	9.5	12.6	16.6	21.9	28.6	37.2
Total PF Professional Refrigeration		**7.4**	**10.8**	**13.1**	**16.3**	**20.4**	**25.6**	**32.3**	**40.8**	**51.6**	**65.3**
TOTAL FOOD PRESERVATION		**40**	**41**	**46**	**52**	**59**	**68**	**81**	**96**	**115**	**141**

	ECO Expenditure (in bn €), c'td	nrg	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA El. Hobs	bn €	5.9	10.5	12.7	15.6	18.8	22.7	27.4	33.1	40.3	49.2
	CA El. Ovens	bn €	8.9	9.6	10.5	11.8	12.3	13.1	14.6	16.4	18.6	21.3
	CA Gas Hobs	bn €	4.4	3.8	3.9	3.9	4.1	4.3	4.6	5.1	5.6	6.2
	CA Gas Ovens	bn €	1.4	1.3	1.4	1.6	1.6	1.6	1.7	1.8	1.9	2.0
	CA Range Hoods	bn €	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)	bn €	2.43	1.64	1.59	1.33	1.40	1.63	1.93	2.29	2.74	3.28
	COFFEE Dripfilter (thermos)	bn €	0.13	0.29	0.33	0.38	0.45	0.53	0.63	0.74	0.88	1.06
	COFFEE Dripfilter (full automatic)	bn €	0.00	0.27	0.32	0.39	0.47	0.57	0.69	0.83	1.02	1.24
	COFFEE Pad filter	bn €	0.00	0.61	0.70	0.75	0.86	1.00	1.17	1.37	1.62	1.92
	COFFEE Hard cap espresso	bn €	0.06	0.27	0.57	0.87	0.98	1.03	1.10	1.17	1.27	1.38
	COFFEE Semi-auto espresso	bn €	0.08	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	COFFEE Fully-auto espresso	bn €	0.36	0.41	0.48	0.55	0.62	0.70	0.78	0.87	0.97	1.08
	Total CM household Coffee Makers		**3.1**	**3.6**	**4.1**	**4.4**	**4.9**	**5.6**	**6.4**	**7.4**	**8.6**	**10.0**
	TOTAL COOKING		**27**	**32**	**37**	**42**	**48**	**54**	**62**	**72**	**85**	**101**
	Total WM household Washing Machine	bn €	**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	*bn €*	*10.0*	*17.6*	*20.5*	*23.1*	*26.2*	*29.8*	*33.6*	*37.9*	*43.1*	*49.1*
	Total DW household Dishwasher	bn €	**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	*bn €*	*1.2*	*3.2*	*4.1*	*5.2*	*6.5*	*8.0*	*9.8*	*12.0*	*14.6*	*17.7*
	LD vented el.	bn €	2.3	2.7	3.1	3.4	3.9	4.4	5.2	6.2	7.5	9.1
	LD condens el.	bn €	0.7	4.1	5.7	7.1	7.9	8.5	9.3	10.4	11.7	13.2
	LD vented gas	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Drier		**3.1**	**6.9**	**8.8**	**10.5**	**11.7**	**13.0**	**14.6**	**16.7**	**19.2**	**22.4**
	VC dom	bn €	5.7	14.5	20.5	22.9	25.6	28.4	31.2	34.1	36.9	39.7
	VC nondom	bn €	1.1	1.3	1.4	1.5	1.6	1.8	2.1	2.4	2.7	3.2
	Total VC Vacuum Cleaner	bn €	**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	bn €	*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)	bn €	2.7	7.0	9.4	11.6	14.1	17.2	20.6	24.5	29.3	35.2
0.5	FAN Axial>300Pa	bn €	4.5	12.2	15.6	18.8	22.5	27.2	32.7	39.3	47.3	57.0
0.5	FAN Centr.FC	bn €	1.4	2.7	3.8	4.6	5.3	6.3	7.4	8.7	10.2	12.2
0.5	FAN Centr.BC-free	bn €	2.8	5.2	6.9	8.7	10.9	14.0	17.8	22.1	27.2	33.6
0.5	FAN Centr.BC	bn €	3.1	6.5	9.0	11.0	13.6	17.1	21.9	28.0	36.3	47.2
0.5	FAN Cross-flow	bn €	0.3	0.5	0.9	0.9	1.0	1.0	1.2	1.4	1.6	1.9
	Total FAN, industrial (excl. box & roof fans)		**7.4**	**17.0**	**22.8**	**27.8**	**33.7**	**41.4**	**50.8**	**62.0**	**76.0**	**93.6**
0.5	**Total MT Industrial motors > 1 hp**	bn €	**98.3**	**119.5**	**146.9**	**173.0**	**203.4**	**247.2**	**298.7**	**361.6**	**438.3**	**531.7**
	Total WP Water Pumps	bn €	**13.2**	**16.1**	**19.4**	**24.2**	**30.5**	**38.7**	**49.2**	**62.5**	**79.4**	**100.7**
	TOTAL INDUSTRY COMPONENTS		**70**	**93**	**116**	**138**	**166**	**204**	**249**	**305**	**375**	**460**
	TRAFO Distribution	bn €	1.9	2.8	3.6	4.4	5.4	6.6	8.1	9.8	11.9	14.5
	TRAFO Industry oil	bn €	1.3	2.0	2.7	3.2	3.7	4.3	4.9	5.8	7.3	9.3
	TRAFO Industry dry	bn €	0.5	0.7	0.9	1.1	1.3	1.6	2.0	2.4	2.9	3.7
	TRAFO Power	bn €	6.0	8.6	10.5	13.3	16.8	21.3	27.0	34.3	43.6	55.5
	TRAFO DER oil	bn €	0.0	0.1	0.2	0.3	0.5	0.8	1.5	2.5	4.0	6.2
	TRAFO DER dry	bn €	0.0	0.3	0.7	1.3	2.3	4.2	7.5	12.8	20.8	32.4
	TRAFO Small	bn €	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0
	Total TRAFO Utility Transformers		**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	bn €	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	bn €	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	bn €	15.9	18.0	18.1	18.9	19.2	18.8	19.9	21.9	24.2	26.7
	TYRE Replacement Tyres	bn €	**62.3**	**79.0**	**86.4**	**95.9**	**103.1**	**99.2**	**103.4**	**113.5**	**124.9**	**137.4**
	TRANSPORT SECTOR	bn €	**62**	**79**	**86**	**96**	**103**	**99**	**103**	**114**	**125**	**137**
	GENERAL TOTAL (in bn €)		**677**	**985**	**1128**	**1253**	**1371**	**1510**	**1701**	**1941**	**2231**	**2577**

ECO Expenditure (summary table)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	74	95	116	129	140	157	184	222	272	334
SPACE HEATING	bn €	217	249	296	326	358	390	431	480	533	587
SPACE COOLING	bn €	5	23	31	36	42	46	50	55	60	67
VENTILATION	bn €	35	85	95	97	98	97	101	106	111	117
LIGHTING	bn €	35	52	52	47	35	33	37	41	45	53
ELECTRONICS	bn €	63	161	166	188	208	230	247	266	288	311
FOOD PRESERVATION	bn €	40	41	46	52	59	68	81	96	115	141
COOKING	bn €	27	32	37	42	48	54	62	72	85	101
CLEANING	bn €	40	60	71	78	85	93	104	116	130	147
INDUSTRY COMPONENTS	bn €	70	93	116	138	166	204	249	305	375	460
ENERGY SECTOR	bn €	10	15	19	24	30	39	51	68	91	122
TRANSPORT SECTOR	bn €	62	79	86	96	103	99	103	114	125	137
TOTAL in bn €		677	985	1128	1253	1371	1510	1701	1941	2231	2577



Expenditure saving ECO vs. BAU		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	bn €	0	0	1	12	31	49	68	93	127	170
SPACE HEATING	bn €	0	4	5	18	38	64	85	104	120	132
SPACE COOLING	bn €	0	0	-1	0	1	2	3	4	6	8
VENTILATION	bn €	0	0	-2	5	13	24	32	41	52	65
LIGHTING	bn €	0	2	10	22	35	40	43	49	58	68
ELECTRONICS	bn €	0	1	2	7	13	16	18	16	13	12
FOOD PRESERVATION	bn €	0	2	5	8	13	18	24	31	39	47
COOKING	bn €	0	0	0	-1	0	2	3	4	6	7
CLEANING	bn €	0	7	12	20	30	42	54	68	84	103
INDUSTRY COMPONENTS	bn €	0	0	1	10	20	27	33	40	49	59
ENERGY SECTOR	bn €	0	0	0	0	1	3	6	10	16	25
TRANSPORT SECTOR	bn €	0	0	2	9	21	33	35	29	24	26
TOTAL in bn €		0	15	35	111	217	320	405	491	594	721
Saving in % versus BAU (from 1990=0)		0.0%	1.5%	3.0%	8.2%	13.7%	17.5%	19.2%	20.2%	21.0%	21.9%
Saving In % versus BAU (from 2010=0)		-2.2%	0.0%	1.7%	7.1%	12.7%	16.7%	18.5%	19.6%	20.5%	21.4%



2030

	ECO	save
WATER HEATING	157	49
SPACE HEATING	390	64
SPACE COOLING	46	2
VENTILATION	97	24
LIGHTING	33	40
ELECTRONICS	230	16
FOOD PRESERVATION	68	18
COOKING	54	2
CLEANING	93	42
INDUSTRY COMPONENTS	204	27
ENERGY SECTOR	39	3
TRANSPORT SECTOR	99	33

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	0.14	0.16	0.55
SFB Wood Direct Draft [20 kW]	0.77		0.23		48	90%	18%	0.15	0.14	0.16	0.55
SFB Coal [25 kW]	0.73		0.27		43	90%	18%	0.15	0.14	0.16	0.55
SFB Pellets [25 kW]	0.75		0.25		43	70%	14%	0.12	0.15	0.16	0.57
SFB Wood chips [160 kW]	0.90		0.10		55	0%	0%	0.00	0.10	0.10	0.80
	unit	kit	install	cooler	maint/a						
CHAS (elec) [44 kW]	0.60	0.14	0.27		1003	0%	0%	0.00	0.10	0.10	0.80
CHAL (elec) [714 kW]	0.60	0.14	0.27		2741	0%	0%	0.00	0.10	0.10	0.80
Chsorp (fossil, efficiency NCV) [50 kW]	0.60	0.14	0.27		421	0%	0%	0.00	0.10	0.10	0.80
CHWS [61 kW]	0.43	0.10	0.19	0.28	841	0%	0%	0.00	0.10	0.10	0.80
CHWL [894 kW]	0.28	0.06	0.13	0.53	4319	0%	0%	0.00	0.10	0.10	0.80
Cheng (fossil), NCV [50 kW]	0.60	0.14	0.27		421	0%	0%	0.00	0.10	0.10	0.80
AC all [28 kW]	0.56	0.02	0.42		858	0%	0%	0.00	0.10	0.10	0.80
o/w AC rooftop [80 kW]	*0.56*	*0.02*	*0.42*		*860*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
o/w AC splits [14 kW]	*0.66*	*0.04*	*0.30*		*215*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
o/w AC VRF [50 kW]	*0.54*	*0.09*	*0.38*		*1439*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
ACF (AC/ HP eng), fossil, NCV [50 kW]	0.54	0.09	0.38		858	0%	0%	0.00	0.10	0.10	0.80
AC all, rev [28 kW]	0.56	0.02	0.42		858	0%	0%	0.00	0.10	0.10	0.80
o/w AC rooftop, rev [80 kW]	*0.56*	*0.02*	*0.42*		*860*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
o/w AC splits, rev [14 kW]	*0.66*	*0.04*	*0.30*		*215*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
o/w AC VRF, rev [50 kW]	*0.54*	*0.09*	*0.38*		*1439*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
ACF (AC/ HP eng), rev , fossil [50 kW]	0.54	0.09	0.38		858	0%	0%	0.00	0.10	0.10	0.80
AHF all (fossil) [59 kW]	0.60	0.00	0.40		431	0%	0%	0.00	0.10	0.10	0.80
o/w AHFS (fossil) [15 kW]	*0.56*	*0.00*	*0.44*		*250*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
o/w AHFL central (fossil) [120 kW]	*0.65*	*0.00*	*0.35*		*675*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
o/w AHFL local (fossil) [28.6 kW]	*0.53*	*0.00*	*0.47*		*338*	*0%*	*0%*	*0.00*	*0.10*	*0.10*	*0.80*
AH el [20 kW]	0.86	0.00	0.14		140	0%	0%	0.00	0.10	0.10	0.80
	unit	excl. kit	install	excl. store	maint/a						
LH open fireplace [8 kW]	0.74		0.26		16.7	100%	20%	0.17	0.17	0.16	0.50
LH closed fireplace/inset [8 kW]	0.74		0.26		18.7	100%	20%	0.17	0.17	0.16	0.50
LH wood stove [8 kW]	0.80		0.20		16.1	100%	20%	0.17	0.17	0.16	0.50
LH coal stove [8 kW]	0.73		0.27		16.1	100%	20%	0.17	0.17	0.16	0.50
LH cooker [10 kW]	0.82		0.18		56.8	100%	20%	0.17	0.17	0.16	0.50
LH SHR stove [8 kW]	0.37		0.63		15.2	100%	20%	0.17	0.17	0.16	0.50
LH pellet stove [8 kW]	0.85		0.15		33.0	100%	20%	0.17	0.17	0.16	0.50
LH open fire gas, NCV [4.2 kW]	0.71		0.29		21.5	100%	20%	0.17	0.17	0.16	0.50
LH closed fire gas, NCV [4.2 kW]	0.70		0.30		21.5	100%	20%	0.17	0.17	0.16	0.50
LH flueless fuel heater, NCV [1.5 kW]	1.00		0.00		15.0	100%	20%	0.17	0.17	0.16	0.50
LH elec.portable [1 kW]	1.00		0.00		0.0	100%	20%	0.17	0.17	0.16	0.50
LH elec.convector [1 kW]	0.81		0.19		0.0	100%	20%	0.17	0.17	0.16	0.50
LH elec.storage [2.75 kW]	0.86		0.14		15.0	100%	20%	0.17	0.17	0.16	0.50
LH elec.underfloor [0.62 kW]	0.59		0.41		0.0	100%	20%	0.17	0.17	0.16	0.50
LH luminous heaters [20 kW]	0.81		0.19		101.3	0%	0%	0.00	0.10	0.10	0.80
LH tube heaters [30 kW]	0.81		0.19		76.0	0%	0%	0.00	0.10	0.10	0.80
	unit		install+kit		maint €/a						
RAC cooling [nom. avg. 3.8 kW]	0.51		0.49		20	66%	13%	0.12	0.15	0.16	0.57
o/w RAC rev. Heating	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						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 price by party			
	split up (price=100%)				€/a	resident.	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
CS Computer Servers	1					0%	0%	0.00	0.10	0.25	0.65
PC Desktop	1					66%	13%	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										
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**		**223.0187**	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
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

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	resident.	tariff	VAT	retail	whole	industry
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		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 elec in [%]	1		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
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

	REVENU INDUSTRY BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1778	2163	2138	2301	2551	2574	2540	2506	2471	2436
	CH Central Heating combi, water heat [24 kW]	m€	1310	2282	2464	2741	2823	2896	2987	3147	3306	3465
	TOTAL WATER HEATING	**m€**	**3088**	**4445**	**4602**	**5042**	**5374**	**5470**	**5527**	**5652**	**5776**	**5900**
	CH Central Heating boiler, space heat [24 kW]	**m€**	6836	9947	10633	11319	12428	13537	14645	15754	16863	17972
	SFB Wood Manual [18 kW]	m€	369	223	144	81	46	42	38	34	31	28
	SFB Wood Direct Draft [20 kW]	m€	14	608	619	631	561	683	831	1011	1230	1496
	SFB Coal [25 kW]	m€	138	61	8	7	6	5	5	4	4	4
	SFB Pellets [25 kW]	m€	0	156	241	241	241	266	294	325	359	396
	SFB Wood chips [160 kW]	m€	0	120	120	144	168	185	205	226	250	276
	Total Solid Fuel Boiler	**m€**	**521**	**1167**	**1131**	**1105**	**1023**	**1182**	**1372**	**1600**	**1873**	**2199**
	CHAS (elec) [44 kW]	m€	308	1288	1418	1586	1731	1906	2081	2256	2431	2606
	CHAL (elec) [714 kW]	m€	76	250	258	266	275	283	292	301	310	319
	Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	4	7	10	14	17	21	24	28	32
	CHWS [61 kW]	m€	40	166	183	201	222	244	266	288	310	332
	CHWL [894 kW]	m€	115	383	397	411	426	441	456	471	486	501
	Cheng (fossil), NCV [50 kW]	m€	0	4	6	9	12	15	17	20	23	26
	AC all [28 kW]	m€	386	2219	2917	2873	2753	2753	2643	2532	2422	2312
1	o/w AC rooftop [80 kW]	m€	125	310	233	189	156	156	124	93	61	30
1	o/w AC splits [14 kW]	m€	165	674	766	726	679	679	635	590	546	502
1	o/w AC VRF [50 kW]	m€	96	1236	1918	1958	1918	1918	1884	1849	1815	1780
	ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	6	10	15	20	25	30	36	41	46
	Total AHC Air Heating & Cooling, cooling	**m€**	**926**	**4321**	**5195**	**5372**	**5452**	**5685**	**5807**	**5929**	**6051**	**6173**
1	AC all, rev [28 kW]	m€	119	1535	2258	2417	2462	2569	2555	2532	2422	2312
1	o/w AC rooftop, rev [80 kW]	m€	39	214	180	159	139	145	120	93	61	30
1	o/w AC splits, rev [14 kW]	m€	51	466	594	610	607	634	614	590	546	502
1	o/w AC VRF, rev [50 kW]	m€	30	854	1483	1648	1716	1790	1821	1849	1815	1780
1	ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	4	8	13	19	25	30	36	41	46
	AHF all (fossil) [59 kW]	m€	398	305	290	280	267	254	242	229	216	203
1	o/w AHFS (fossil) [15 kW]	m€	49	8	6	4	3	2	1	0	0	0
1	o/w AHFL central (fossil) [120 kW]	m€	218	177	167	162	153	144	137	128	119	110
1	o/w AHFL local (fossil) [28.6 kW]	m€	132	120	117	114	111	108	104	101	97	94
	AH el [20 kW]	m€	7	12	12	12	12	6	0	0	0	0
	Total AHC Air Heating & Cooling, heating	**m€**	**405**	**318**	**302**	**292**	**279**	**260**	**242**	**229**	**216**	**203**
	LH open fireplace [8 kW]	m€	505	736	761	746	736	736	736	736	736	736
	LH closed fireplace/inset [8 kW]	m€	319	863	1011	1063	1091	1091	1091	1091	1091	1091
	LH wood stove [8 kW]	m€	345	406	457	494	508	508	508	508	508	508
	LH coal stove [8 kW]	m€	105	81	74	68	51	34	17	0	-17	-34
	LH cooker [10 kW]	m€	294	591	766	837	879	879	879	879	879	879
	LH SHR stove [8 kW]	m€	320	446	544	662	805	818	832	845	858	872
	LH pellet stove [8 kW]	m€	0	332	433	505	578	578	578	578	578	578
	LH open fire gas, NCV [4.2 kW]	m€	19	27	31	34	34	34	34	34	34	34
	LH closed fire gas, NCV [4.2 kW]	m€	93	105	108	111	114	116	119	122	125	128
	LH flueless fuel heater, NCV [1.5 kW]	m€	34	68	68	62	55	48	41	34	27	21
	LH elec.portable [1 kW]	m€	80	98	100	104	109	113	117	121	126	130
	LH elec.convector [1 kW]	m€	586	714	735	760	798	828	859	889	919	950
	LH elec.storage [2.75 kW]	m€	67	82	84	87	91	95	98	102	105	109
	LH elec.underfloor [0.62 kW]	m€	121	148	152	158	165	172	178	184	191	197
	LH luminous heaters [20 kW]	m€	16	20	30	35	34	33	31	30	29	28
	LH tube heaters [30 kW]	m€	16	20	61	76	73	70	68	65	62	60
	LH total	**m€**	**2921**	**4738**	**5417**	**5801**	**6120**	**6152**	**6185**	**6218**	**6251**	**6284**
	RAC (cooling only & reversibles)	**m€**	**192**	**2390**	**3699**	**4635**	**5050**	**5102**	**5120**	**5208**	**5295**	**5383**
1	o/w RAC rev. Heating	m€	54	1775	3265	4108	4484	4535	4540	4622	4703	4785
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**868**	**1280**	**1356**	**1439**	**1522**	**1506**	**1422**	**1339**	**1256**	**1173**
	TOTAL SPACE HEATING	**m€**	**10683**	**16169**	**17483**	**18516**	**19849**	**21130**	**22444**	**23801**	**25202**	**26658**
	TOTAL SPACE COOLING	**m€**	**1118**	**6711**	**8895**	**10006**	**10502**	**10787**	**10927**	**11137**	**11346**	**11556**
	NRVU avg (sales wt.)	**m€**	10082	23588	24674	26013	27451	28889	30327	31765	33202	34640
	RVU Central Unidir. VU (1 fan)	m€	466	1044	898	819	859	896	948	1011	1073	1136
	RVU Central Balanced VU (2 fans)	m€	52	366	890	1143	1284	1425	1567	1708	1850	1991
	RVU Local Balanced VU (2 fans)	m€	4	48	105	170	239	308	377	446	514	583
	TOTAL VENTILATION (electricity)	**m€**	**10604**	**25045**	**26567**	**28144**	**29833**	**31518**	**33219**	**34929**	**36640**	**38351**
	LS Light Sources in Euro/unit											
	LFL	m€	1780	2566	2277	2295	2130	1964	1799	1642	1510	1377
	CFL	m€	101	935	806	677	607	538	477	437	397	357
	Tungsten	m€	198	1412	1615	1696	1289	926	673	470	357	334
	GLS	m€	570	393	301	215	127	34	9	0	0	0
	HID	m€	341	851	753	727	692	692	692	692	692	692
	LED BAU	m€	0	120	276	716	985	759	856	893	881	917
	TOTAL LIGHTING	**m€**	**2990**	**6276**	**6029**	**6325**	**5829**	**4914**	**4507**	**4135**	**3837**	**3679**

REVENU INDUSTRY BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	4650	10703	2078	0	0	0	0	0	0	0
DP TV LoNA	m€	0	1459	5194	6502	5676	4645	3525	2405	1285	166
DP TV Smart	m€	0	0	3116	6502	8514	10838	13297	15756	18215	20674
DP Monitor	m€	676	1689	946	946	946	946	946	946	946	946
DP Total electronic DisPlays	**m€**	**5326**	**13851**	**11334**	**13951**	**15136**	**16429**	**17768**	**19107**	**20446**	**21785**
SSTB	m€	0	725	164	0	0	0	0	0	0	0
CSTB	m€	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	m€	0	363	99	0	0	0	0	0	0	0
VIDEO projectors	m€	9	980	910	618	267	0	0	0	0	0
VIDEO game consoles	m€	0	2513	1693	1733	1925	1925	1925	1925	1925	1925
Total VIDEO	**m€**	**9**	**3856**	**2703**	**2350**	**2192**	**1925**	**1925**	**1925**	**1925**	**1925**
CS Computer Servers	m€	na	na	na	na	na	na	na	na	na	na
PC Desktop	m€	1338	4460	3328	3025	3025	3025	3025	3025	3025	3025
PC Notebook	m€	141	10165	4659	4377	4377	4377	4377	4377	4377	4377
PC Tablet/slate	m€	0	679	10731	17438	22536	26828	28170	29511	30853	32194
PC Thin client	m€	22	264	264	264	264	264	264	264	264	264
PC Workstation	m€	110	1101	1101	1101	1101	1101	1101	1101	1101	1101
Total PC, electricity	**m€**	**1611**	**16669**	**20083**	**26205**	**31303**	**35595**	**36937**	**38278**	**39620**	**40961**
EP-Copier mono	m€	2454	985	590	249	184	118	53	0	0	0
EP-Copier colour	m€	0	329	1433	2149	2450	2669	2888	3106	3325	3544
EP-printer mono	m€	442	419	367	299	257	228	197	166	135	103
EP-printer colour	m€	0	446	662	892	1070	1242	1415	1587	1760	1932
IJ SFD printer	m€	245	389	271	192	141	121	96	71	45	20
IJ MFD printer	m€	301	974	1336	1543	1694	1845	1997	2148	2299	2450
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**3442**	**3543**	**4660**	**5324**	**5795**	**6224**	**6644**	**7078**	**7564**	**8050**
SB Home Gateway, on-mode power	m€	0	2973	3834	4694	5554	6415	7275	8135	8996	9856
SB Home NAS, on-mode power	m€	0	299	512	725	939	1152	1365	1579	1792	2005
SB Home Phones (fixed), on-mode power	m€	186	923	1107	1181	1181	1181	1181	1181	1181	1181
SB Office Phones (fixed), on-mode power	m€	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.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS	**m€**	**10866**	**46127**	**48336**	**58665**	**66411**	**73176**	**77694**	**82224**	**86808**	**91391**
RF Household refrigerator and freezer	**m€**	**2972**	**3243**	**3294**	**3345**	**3396**	**3447**	**3498**	**3549**	**3600**	**3651**
1 CF open vertical chilled multi deck (RCV2)	m€	247	392	438	486	534	583	631	680	728	776
1 CF open horizontal frozen island (RHF4)	m€	63	59	66	74	81	89	96	104	111	119
1 CF Plug in one door beverage cooler	m€	355	492	517	546	575	604	633	662	691	720
1 CF Plug in horizontal ice cream freezer	m€	133	203	214	226	238	250	262	274	286	298
1 CF Spiral vending machine	m€	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)	m€	249	323	336	348	365	381	398	415	432	448
PF Blast cabinet	m€	403	787	879	948	1055	1161	1268	1374	1481	1587
PF Walk-In Cold Room (WICR, avg)	m€	1150	1404	1473	1553	1620	1688	1755	1822	1889	1956
PF MT & LT industrial chillers (avg)	m€	174	333	349	365	404	442	480	518	556	594
Total PF Professional Refrigeration	**m€**	**1976**	**2846**	**3037**	**3215**	**3443**	**3672**	**3900**	**4129**	**4357**	**4585**
TOTAL FOOD PRESERVATION	**m€**	**5940**	**7597**	**8001**	**8419**	**8887**	**9355**	**9823**	**10291**	**10760**	**11228**
COOK El. Hobs, Wh/ltr	m€	928	2110	2262	2442	2576	2697	2811	2918	3019	3112
COOK El. Ovens, kWh/a	m€	2170	2579	2719	2951	2854	2875	2911	2948	2985	3022
COOK Gas Hobs, % efficiency NCV	m€	1163	958	864	777	700	631	567	508	473	445
COOK Gas Ovens, kWh prim, NCV	m€	296	302	287	280	271	263	255	247	239	231
COOK Range Hoods, kWh elec	m€	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)	m€	147	102	87	72	70	70	70	70	70	70
COFFEE Dripfilter (thermos)	m€	28	44	45	46	47	47	48	48	48	49
COFFEE Dripfilter (full automatic)	m€	0	74	84	93	103	113	123	132	142	152
COFFEE Pad filter	m€	0	171	187	203	219	235	251	267	283	299
COFFEE Hard cap espresso	m€	21	90	191	287	301	301	301	301	301	301
COFFEE Semi-auto espresso	m€	24	27	26	24	22	21	19	18	16	14
COFFEE Fully-auto espresso	m€	137	157	182	207	233	258	283	308	333	359
Total CM household Coffee Makers	**m€**	**357**	**665**	**802**	**933**	**994**	**1044**	**1094**	**1143**	**1193**	**1243**
TOTAL COOKING	**m€**	**5441**	**7258**	**7611**	**8093**	**8143**	**8296**	**8462**	**8627**	**8809**	**8992**

REVENU INDUSTRY BAU (in m euro 2010)		unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WM Household Washing Machine		**m€**	**1628**	**2503**	**2461**	**2606**	**2445**	**2445**	**2445**	**2445**	**2445**	**2445**
DW Household Dishwasher		**m€**	**698**	**1528**	**1771**	**2015**	**2259**	**2502**	**2746**	**2989**	**3233**	**3476**
LD Household Laundry Drier vented el.		m€	331	335	316	281	287	289	291	293	294	296
LD Household Laundry Drier condens el.		m€	188	703	822	923	942	950	955	960	966	971
LD Household Laundry Drier vented gas		m€	3	6	7	8	8	8	9	9	9	9
Total LD household Laundry Drier		**m€**	**522**	**1044**	**1145**	**1213**	**1237**	**1248**	**1255**	**1262**	**1269**	**1276**
		m€										
VC dom. Vacuum Cleaner			1584	4690	6578	8003	8836	9669	10502	11335	12168	13001
VC nondom Vacuum Cleaner		m€	485	500	526	552	581	609	637	665	693	722
Total VC Vacuum Cleaner		**m€**	**2070**	**5190**	**7104**	**8556**	**9417**	**10278**	**11139**	**12000**	**12862**	**13723**
TOTAL CLEANING		**m€**	**4918**	**10265**	**12481**	**14389**	**15358**	**16473**	**17585**	**18696**	**19808**	**20920**
0.5	FAN Axial<300Pa [247 W flow out]	m€	241	789	906	1022	1022	1022	1022	1022	1022	1022
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	332	1149	1212	1275	1275	1275	1275	1275	1275	1275
0.5	FAN Centr.FC [141 W flow out]	m€	206	524	604	685	685	685	685	685	685	685
0.5	FAN Centr.BC-free [2120 W flow out]	m€	118	287	327	366	405	413	421	429	436	444
0.5	FAN Centr.BC [2052 W flow out]	m€	258	685	785	885	984	1004	1104	1204	1304	1404
0.5	FAN Cross-flow [31 W flow out]	m€	48	106	121	136	150	153	168	183	198	212
	Total FAN, industrial (excl. box & roof fans)	**m€**	**601**	**1770**	**1977**	**2184**	**2261**	**2276**	**2337**	**2399**	**2460**	**2521**
0.5	MT motor industry only	m€	1089	1605	1703	1794	1804	1808	1809	1804	1796	1785
0.5	MT extra revenu drive industry (ref=0)	m€	0	0	0	0	0	0	0	0	0	0
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**1089**	**1605**	**1703**	**1794**	**1804**	**1808**	**1809**	**1804**	**1796**	**1785**
WP Water pumps (load) [%]		**m€**	**806**	**1095**	**1177**	**1266**	**1361**	**1456**	**1550**	**1645**	**1740**	**1835**
TOTAL INDUSTRY COMPONENTS			1952	3668	4006	4346	4523	4636	4792	4946	5098	5249
TRAFO Distribution, kWh/a		m€	374	588	632	678	728	782	838	893	948	1004
TRAFO Industry oil		m€	195	314	337	362	389	418	447	477	506	536
TRAFO Industry dry		m€	92	148	158	170	182	195	208	222	235	249
TRAFO Power		m€	1502	2409	2590	2785	2995	3220	3452	3684	3916	4148
TRAFO DER oil		m€	0	17	28	47	77	127	188	248	309	370
TRAFO DER dry		m€	0	106	175	288	476	785	1160	1535	1910	2284
TRAFO Small		m€	42	42	42	42	42	42	42	42	42	42
TOTAL ENERGY SECTOR		**m€**	**2205**	**3623**	**3962**	**4372**	**4889**	**5570**	**6335**	**7101**	**7867**	**8633**
TYRE in m units												
TYRE car replacement tyres C1		m€	5833	7191	7138	8275	9332	9332	9332	9332	9332	9332
TYRE van replacement tyres C2		m€	2719	3352	3327	3857	4350	4350	4350	4350	4350	4350
TYRE truck replacement tyres C3		m€	2497	2455	2077	2120	2174	2188	2195	2197	2193	2184
TRANSPORT SECTOR		**m€**	**11049**	**12998**	**12542**	**14253**	**15856**	**15870**	**15878**	**15879**	**15875**	**15867**
GENERAL TOTAL (in m euro 2010)			**70853**	**150182**	**160514**	**180570**	**195454**	**207195**	**217192**	**227419**	**237827**	**248422**
GENERAL TOTAL (in bn euro 2010)			71	150	161	181	195	207	217	227	238	248

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	10.7	16.2	17.5	18.5	19.8	21.1	22.4	23.8	25.2	26.7
SPACE COOLING	1.1	6.7	8.9	10.0	10.5	10.8	10.9	11.1	11.3	11.6
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	10.9	46.1	48.3	58.7	66.4	73.2	77.7	82.2	86.8	91.4
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	2.0	3.7	4.0	4.3	4.5	4.6	4.8	4.9	5.1	5.2
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	**71**	**150**	**161**	**181**	**195**	**207**	**217**	**227**	**238**	**248**

	REVENU INDUSTRY ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1778	2163	3471	3994	4595	4537	4477	4417	4356	4294
	CH Central Heating combi, water heat [24 kW]	m€	1310	2282	3494	4967	5414	5862	6310	6756	7198	7637
	TOTAL WATER HEATING	**m€**	**3088**	**4445**	**6964**	**8961**	**10009**	**10399**	**10787**	**11172**	**11554**	**11930**
	CH Central Heating boiler, space heat [24 kW]	**m€**	6836	9947	15399	21577	29002	33410	38108	43095	48369	53931
	SFB Wood Manual [18 kW]	m€	369	223	217	146	84	73	64	56	49	43
	SFB Wood Direct Draft [20 kW]	m€	14	608	634	732	706	827	968	1134	1328	1555
	SFB Coal [25 kW]	m€	138	61	8	7	6	5	5	4	4	4
	SFB Pellets [25 kW]	m€	0	156	244	245	249	266	294	325	359	396
	SFB Wood chips [160 kW]	m€	0	120	122	148	176	186	205	226	250	276
		m€										
	Total Solid Fuel Boiler		**521**	**1167**	**1225**	**1278**	**1221**	**1358**	**1536**	**1745**	**1989**	**2272**
	CHAS (elec) [44 kW]	m€	308	1288	1500	1709	1891	2083	2277	2473	2670	2869
	CHAL (elec) [714 kW]	m€	76	250	263	279	287	317	348	379	412	446
	Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	4	7	10	14	18	26	34	44	54
	CHWS [61 kW]	m€	40	166	183	201	222	247	273	301	328	357
	CHWL [894 kW]	m€	115	383	397	411	426	441	456	471	496	524
	Cheng (fossil), NCV [50 kW]	m€	0	4	6	9	13	16	20	24	27	31
	AC all [28 kW]	m€	386	2219	3082	3028	2882	2902	2805	2706	2603	2498
1	o/w AC rooftop [80 kW]	m€	125	310	236	189	156	156	124	93	61	30
1	o/w AC splits [14 kW]	m€	165	674	793	747	694	728	713	693	668	638
1	o/w AC VRF [50 kW]	m€	96	1236	2054	2091	2032	2018	1968	1920	1874	1830
	ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	6	10	15	20	25	30	36	41	46
	Total AHC Air Heating & Cooling, cooling	**m€**	**926**	**4321**	**5448**	**5662**	**5754**	**6049**	**6235**	**6422**	**6621**	**6824**
1	AC all, rev [28 kW]	m€	119	1535	2411	2572	2640	2794	2818	2830	2741	2648
1	o/w AC rooftop, rev [80 kW]	m€	39	214	183	159	139	145	120	93	61	30
1	o/w AC splits, rev [14 kW]	m€	51	466	626	638	654	722	737	745	722	693
1	o/w AC VRF, rev [50 kW]	m€	30	854	1601	1775	1847	1926	1961	1993	1958	1925
1	ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	4	8	14	20	26	33	40	46	52
	AHF all (fossil) [59 kW]	m€	398	305	388	428	402	376	352	327	303	280
1	o/w AHFS (fossil) [15 kW]	m€	49	8	8	6	4	3	1	0	0	0
1	o/w AHFL central (fossil) [120 kW]	m€	218	177	206	229	211	194	179	164	150	136
1	o/w AHFL local (fossil) [28.6 kW]	m€	132	120	175	192	186	179	172	163	153	144
	AH el [20 kW]	m€	7	12	12	12	12	6	0	0	0	0
	Total AHC Air Heating & Cooling, heating	**m€**	**405**	**318**	**400**	**440**	**414**	**382**	**352**	**327**	**303**	**280**
	LH open fireplace [8 kW]	m€	505	736	1067	1385	1343	1294	1248	1203	1160	1118
	LH closed fireplace/inset [8 kW]	m€	319	863	1207	1423	1446	1394	1343	1295	1248	1202
	LH wood stove [8 kW]	m€	345	406	525	579	578	555	534	513	508	508
	LH coal stove [8 kW]	m€	105	81	89	90	67	43	21	0	-19	-37
	LH cooker [10 kW]	m€	294	591	922	1236	1284	1232	1183	1135	1089	1046
	LH SHR stove [8 kW]	m€	320	446	582	700	839	837	835	845	858	872
	LH pellet stove [8 kW]	m€	0	332	433	544	599	578	578	578	578	578
	LH open fire gas, NCV [4.2 kW]	m€	19	27	32	35	34	34	34	34	34	34
	LH closed fire gas, NCV [4.2 kW]	m€	93	105	112	121	121	120	119	122	125	128
	LH flueless fuel heater, NCV [1.5 kW]	m€	34	68	68	62	55	48	41	34	27	21
	LH elec.portable [1 kW]	m€	80	98	100	104	109	113	117	121	126	130
	LH elec.convector [1 kW]	m€	586	714	735	764	798	828	859	889	919	950
	LH elec.storage [2.75 kW]	m€	67	82	93	118	134	133	133	132	130	129
	LH elec.underfloor [0.62 kW]	m€	121	148	158	186	183	184	186	187	191	197
	LH luminous heaters [20 kW]	m€	16	20	34	39	41	39	38	36	35	33
	LH tube heaters [30 kW]	m€	16	20	61	83	83	80	77	74	71	68
	LH total	**m€**	**2921**	**4738**	**6219**	**7468**	**7715**	**7514**	**7343**	**7196**	**7078**	**6974**
	RAC (cooling only & reversibles)	**m€**	**192**	**2390**	**4002**	**5133**	**5666**	**5746**	**5699**	**5651**	**5602**	**5552**
1	o/w RAC rev. Heating	m€	54	1775	3524	4544	5007	5084	5047	5009	4969	4929
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**868**	**1384**	**1766**	**1792**	**1813**	**1704**	**1532**	**1372**	**1256**	**1173**
	TOTAL SPACE HEATING	**m€**	**10683**	**16169**	**23243**	**30763**	**38351**	**42664**	**47340**	**52363**	**57739**	**63457**
	TOTAL SPACE COOLING	**m€**	**1118**	**6711**	**9450**	**10795**	**11421**	**11795**	**11934**	**12074**	**12223**	**12377**
	NRVU avg (sales wt.)	**m€**	10082	23588	24763	26013	27451	28889	30327	31765	33202	34640
	RVU Central Unidir. VU (1 fan)	m€	466	1044	1562	1424	1494	1559	1618	1673	1722	1767
	RVU Central Balanced VU (2 fans)	m€	52	366	1316	1635	1779	1911	2033	2146	2249	2343
	RVU Local Balanced VU (2 fans)	m€	4	48	105	170	239	308	377	446	514	583
	TOTAL VENTILATION (electricity)	**m€**	**10604**	**25045**	**27746**	**29242**	**30963**	**32667**	**34355**	**36029**	**37688**	**39334**
	LS Light Sources in Euro/unit											
	LFL	m€	1780	2582	1945	1673	885	587	423	258	93	28
	CFL	m€	101	1125	455	203	5	4	4	4	4	4
	Tungsten	m€	198	1468	1668	383	25	9	9	9	9	9
	GLS	m€	570	235	13	23	14	13	13	13	13	13
	HID	m€	341	863	514	331	186	124	124	124	124	124
	LED ECO	m€	0	101	1828	3075	1881	1142	1233	1518	1626	1882
	TOTAL LIGHTING	**m€**	**2990**	**6374**	**6424**	**5687**	**2994**	**1879**	**1806**	**1926**	**1869**	**2060**

REVENU INDUSTRY ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	4650	10703	2078	0	0	0	0	0	0	0
DP TV LoNA	m€	0	1459	5194	6502	5676	4645	3525	2405	1285	166
DP TV Smart	m€	0	0	3116	6502	8514	10838	13297	15756	18215	20674
DP Monitor	m€	676	1689	946	946	946	946	946	946	946	946
DP Total electronic DisPlays	**m€**	**5326**	**13851**	**11334**	**13951**	**15136**	**16429**	**17768**	**19107**	**20446**	**21785**
SSTB	m€	0	725	164	0	0	0	0	0	0	0
CSTB	m€	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	m€	0	363	99	0	0	0	0	0	0	0
VIDEO projectors	m€	9	980	910	618	267	0	0	0	0	0
VIDEO game consoles	m€	0	2513	1693	1733	1925	1925	1925	1925	1925	1925
Total VIDEO	**m€**	**9**	**3856**	**2703**	**2350**	**2192**	**1925**	**1925**	**1925**	**1925**	**1925**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	1338	4460	3328	3025	3025	3025	3025	3025	3025	3025
PC Notebook	m€	141	10165	4659	4377	4377	4377	4377	4377	4377	4377
PC Tablet/slate	m€	0	679	10731	17438	22536	26828	28170	29511	30853	32194
PC Thin client	m€	22	264	264	264	264	264	264	264	264	264
PC Workstation	m€	110	1101	1101	1101	1101	1101	1101	1101	1101	1101
Total PC, electricity	**m€**	**1611**	**16669**	**20083**	**26205**	**31303**	**35595**	**36937**	**38278**	**39620**	**40961**
EP-Copier mono	m€	2454	985	590	249	184	118	53	0	0	0
EP-Copier colour	m€	0	329	1433	2149	2450	2669	2888	3106	3325	3544
EP-printer mono	m€	442	419	367	299	257	228	197	166	135	103
EP-printer colour	m€	0	446	662	892	1070	1242	1415	1587	1760	1932
IJ SFD printer	m€	245	389	271	192	141	121	96	71	45	20
IJ MFD printer	m€	301	974	1336	1543	1694	1845	1997	2148	2299	2450
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**3442**	**3543**	**4660**	**5324**	**5795**	**6224**	**6644**	**7078**	**7564**	**8050**
SB Home Gateway, on-mode power	m€	0	2973	3834	4694	5554	6415	7275	8135	8996	9856
SB Home NAS, on-mode power	m€	0	299	512	725	939	1152	1365	1579	1792	2005
SB Home Phones (fixed), on-mode power	m€	186	923	1107	1181	1181	1181	1181	1181	1181	1181
SB Office Phones (fixed), on-mode power	m€	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.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS	**m€**	**10866**	**46127**	**48434**	**58665**	**66411**	**73176**	**77694**	**82224**	**86808**	**91391**
RF Household refrigerator and freezer	**m€**	**2972**	**3752**	**4082**	**4236**	**4329**	**4373**	**4575**	**4416**	**4262**	**4113**
1 CF open vertical chilled multi deck (RCV2)	m€	247	392	438	486	534	583	631	680	728	776
1 CF open horizontal frozen island (RHF4)	m€	63	59	66	74	81	89	96	104	111	119
1 CF Plug in one door beverage cooler	m€	355	492	517	546	575	604	633	662	691	720
1 CF Plug in horizontal ice cream freezer	m€	133	203	214	226	238	250	262	274	286	298
1 CF Spiral vending machine	m€	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)	m€	249	323	336	348	365	381	398	415	432	448
PF Blast cabinet	m€	403	787	879	948	1055	1161	1268	1374	1481	1587
PF Walk-In Cold Room (WICR, avg)	m€	1150	1404	1473	1553	1620	1688	1755	1822	1889	1956
PF MT & LT industrial chillers (avg)	m€	174	333	349	365	404	442	480	518	556	594
Total PF Professional Refrigeration	**m€**	**1976**	**2846**	**3037**	**3215**	**3443**	**3672**	**3900**	**4129**	**4357**	**4585**
TOTAL FOOD PRESERVATION	**m€**	**5940**	**8105**	**8788**	**9310**	**9820**	**10281**	**10900**	**11159**	**11422**	**11690**
COOK El. Hobs, Wh/ltr	m€	928	2110	2262	2544	2678	2800	2914	3021	3121	3214
COOK El. Ovens, kWh/a	m€	2170	2579	2756	3101	2995	2892	2911	2948	2985	3022
COOK Gas Hobs, % efficiency NCV	m€	1163	958	864	743	670	603	542	501	473	445
COOK Gas Ovens, kWh prim, NCV	m€	296	302	305	386	372	357	344	330	317	304
COOK Range Hoods, kWh elec	m€	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)	m€	220	153	124	98	90	86	82	78	74	70
COFFEE Dripfilter (thermos)	m€	28	44	45	46	47	47	48	48	48	49
COFFEE Dripfilter (full automatic)	m€	0	74	84	93	103	113	123	132	142	152
COFFEE Pad filter	m€	0	171	187	203	219	235	251	267	283	299
COFFEE Hard cap espresso	m€	21	90	191	287	301	301	301	301	301	301
COFFEE Semi-auto espresso	m€	24	27	26	24	22	21	19	18	16	14
COFFEE Fully-auto espresso	m€	137	157	182	207	233	258	283	308	333	359
Total CM household Coffee Makers	**m€**	**431**	**716**	**839**	**959**	**1014**	**1060**	**1106**	**1151**	**1197**	**1243**
TOTAL COOKING	**m€**	**5515**	**7310**	**7702**	**8618**	**8760**	**8753**	**8863**	**9002**	**9145**	**9281**

	REVENU INDUSTRY ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**m€**	**1628**	**2858**	**2952**	**3258**	**3078**	**2929**	**2787**	**2651**	**2523**	**2445**
	DW Household Dishwasher	**m€**	**698**	**2028**	**2353**	**2621**	**2862**	**3087**	**3296**	**3489**	**3668**	**3832**
	LD Household Laundry Drier vented el.	m€	331	335	316	281	287	289	291	293	294	296
	LD Household Laundry Drier condens el.	m€	188	703	893	1063	1081	1061	1032	1004	977	971
	LD Household Laundry Drier vented gas	m€	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**522**	**1044**	**1216**	**1353**	**1376**	**1359**	**1332**	**1305**	**1280**	**1276**
	VC dom. Vacuum Cleaner	m€	1584	4690	6785	8230	8836	9669	10502	11335	12168	13001
	VC nondom Vacuum Cleaner	m€	485	500	538	568	581	609	637	665	693	722
	Total VC Vacuum Cleaner	**m€**	**2070**	**5190**	**7323**	**8798**	**9417**	**10278**	**11139**	**12000**	**12862**	**13723**
	TOTAL CLEANING	**m€**	**4918**	**11119**	**13844**	**16030**	**16733**	**17652**	**18553**	**19446**	**20332**	**21276**
0.5	FAN Axial<300Pa [247 W flow out]	m€	241	789	1179	1272	1217	1163	1112	1064	1022	1022
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	332	1149	1254	1275	1275	1275	1275	1275	1275	1275
0.5	FAN Centr.FC [141 W flow out]	m€	206	524	779	843	804	768	733	699	685	685
0.5	FAN Centr.BC-free [2120 W flow out]	m€	118	287	399	427	452	440	429	429	436	444
0.5	FAN Centr.BC [2052 W flow out]	m€	258	685	1096	1181	1256	1225	1287	1341	1388	1428
0.5	FAN Cross-flow [31 W flow out]	m€	48	106	347	371	393	383	401	417	430	441
	Total FAN, industrial (excl. box & roof fans)	**m€**	**601**	**1770**	**2527**	**2685**	**2699**	**2627**	**2618**	**2612**	**2618**	**2648**
0.5	MT motor industry only	m€	1089	1814	2834	2916	2872	2732	2600	2474	2354	2239
0.5	MT extra revenu drive industry	m€	0	0	1284	1275	1214	1155	1099	1045	995	946
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**1089**	**1814**	**4118**	**4192**	**4085**	**3887**	**3698**	**3519**	**3348**	**3186**
	WP Water pumps (load) [%]	**m€**	**806**	**1096**	**1177**	**1266**	**1361**	**1456**	**1550**	**1645**	**1740**	**1835**
	TOTAL INDUSTRY COMPONENTS		1952	3773	5763	6046	6102	6026	6018	6017	6033	6076
	TRAFO Distribution, kWh/a	m€	374	588	780	838	900	966	1035	1103	1172	1240
	TRAFO Industry oil	m€	195	314	516	554	595	639	684	729	775	820
	TRAFO Industry dry	m€	92	148	214	229	246	263	282	300	318	336
	TRAFO Power	m€	1502	2409	2590	2785	2995	3220	3452	3684	3916	4148
	TRAFO DER oil	m€	0	17	47	78	129	214	315	417	519	621
	TRAFO DER dry	m€	0	106	229	378	623	1029	1520	2011	2502	2993
	TRAFO Small	m€	42	42	42	42	42	42	42	42	42	42
	TOTAL ENERGY SECTOR	**m€**	**2205**	**3623**	**4418**	**4904**	**5530**	**6374**	**7330**	**8287**	**9244**	**10200**
	TYRE in m units											
	TYRE car replacement tyres C1	m€	5833	7191	7138	8283	9486	9595	9332	9332	9332	9332
	TYRE van replacement tyres C2	m€	2719	3352	3327	3857	4350	4350	4350	4350	4350	4350
	TYRE truck replacement tyres C3	m€	2497	2455	2214	2521	2803	3017	2871	2731	2599	2473
	TRANSPORT SECTOR	**m€**	**11049**	**12998**	**12680**	**14661**	**16639**	**16962**	**16553**	**16414**	**16281**	**16155**
	GENERAL TOTAL (in m euro 2010)		**70927**	**151799**	**175456**	**203681**	**223733**	**238627**	**252133**	**266113**	**280337**	**295227**
	GENERAL TOTAL (in bn euro 2010)		71	152	175	204	224	239	252	266	280	295

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	10.7	16.2	23.2	30.8	38.4	42.7	47.3	52.4	57.7	63.5
SPACE COOLING	1.1	6.7	9.4	10.8	11.4	11.8	11.9	12.1	12.2	12.4
VENTILATION	10.6	25.0	27.7	29.2	31.0	32.7	34.4	36.0	37.7	39.3
LIGHTING	3.0	6.4	6.4	5.7	3.0	1.9	1.8	1.9	1.9	2.1
ELECTRONICS	10.9	46.1	48.4	58.7	66.4	73.2	77.7	82.2	86.8	91.4
FOOD PRESERVATION	5.9	8.1	8.8	9.3	9.8	10.3	10.9	11.2	11.4	11.7
COOKING	5.5	7.3	7.7	8.6	8.8	8.8	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	2.0	3.8	5.8	6.0	6.1	6.0	6.0	6.0	6.0	6.1
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	**71**	**152**	**175**	**204**	**224**	**239**	**252**	**266**	**280**	**295**

	REVENU RETAIL BAU (in m euro 2010)	unit	1990	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	455	547	588	652	658	650	641	632	623
	CH Central Heating combi, water heat [24 kW]	m€	346	652	725	746	766	790	832	874	916
	TOTAL WATER HEATING	**m€**	**801**	**1198**	**1313**	**1399**	**1424**	**1440**	**1473**	**1506**	**1539**
	CH Central Heating boiler, space heat [24 kW]	**m€**	1808	2812	2993	3287	3580	3873	4166	4460	4753
	SFB Wood Manual [18 kW]	m€	94	37	21	12	11	10	9	8	7
	SFB Wood Direct Draft [20 kW]	m€	4	158	161	144	175	212	258	314	383
	SFB Coal [25 kW]	m€	35	2	2	2	1	1	1	1	1
	SFB Pellets [25 kW]	m€	0	64	64	64	70	78	86	95	105
	SFB Wood chips [160 kW]	m€	0	15	18	21	23	26	28	31	34
	Total Solid Fuel Boiler	**m€**	**133**	**276**	**266**	**242**	**280**	**327**	**382**	**449**	**530**
	CHAS (elec) [44 kW]	m€	39	177	198	216	238	260	282	304	326
	CHAL (elec) [714 kW]	m€	10	32	33	34	35	37	38	39	40
	Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	1	1	2	2	3	3	4	4
	CHWS [61 kW]	m€	5	23	25	28	31	33	36	39	41
	CHWL [894 kW]	m€	14	50	51	53	55	57	59	61	63
	Cheng (fossil), NCV [50 kW]	m€	0	1	1	1	2	2	3	3	3
	AC all [28 kW]	m€	48	365	359	344	344	330	317	303	289
1	o/w AC rooftop [80 kW]	m€	16	29	24	19	19	16	12	8	4
1	o/w AC splits [14 kW]	m€	21	96	91	85	85	79	74	68	63
1	o/w AC VRF [50 kW]	m€	12	240	245	240	240	235	231	227	223
	ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	1	2	3	3	4	4	5	6
	Total AHC Air Heating & Cooling, cooling	**m€**	**116**	**649**	**671**	**682**	**711**	**726**	**741**	**756**	**772**
1	AC all, rev [28 kW]	m€	15	282	302	308	321	319	317	303	289
1	o/w AC rooftop, rev [80 kW]	m€	5	23	20	17	18	15	12	8	4
1	o/w AC splits, rev [14 kW]	m€	6	74	76	76	79	77	74	68	63
1	o/w AC VRF, rev [50 kW]	m€	4	185	206	214	224	228	231	227	223
1	ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	1	2	2	3	4	5	5	6
	AHF all (fossil) [59 kW]	m€	50	36	35	33	32	30	29	27	25
1	o/w AHFS (fossil) [15 kW]	m€	6	1	1	0	0	0	0	0	0
1	o/w AHFL central (fossil) [120 kW]	m€	27	21	20	19	18	17	16	15	14
1	o/w AHFL local (fossil) [28.6 kW]	m€	16	15	14	14	13	13	13	12	12
	AH el [20 kW]	m€	1	1	1	1	1	0	0	0	0
	Total AHC Air Heating & Cooling, heating	**m€**	**51**	**38**	**36**	**35**	**33**	**30**	**29**	**27**	**25**
	LH open fireplace [8 kW]	m€	170	257	252	249	249	249	249	249	249
	LH closed fireplace/inset [8 kW]	m€	108	342	359	368	368	368	368	368	368
	LH wood stove [8 kW]	m€	117	154	167	171	171	171	171	171	171
	LH coal stove [8 kW]	m€	35	25	23	17	11	6	0	-6	-11
	LH cooker [10 kW]	m€	99	259	283	297	297	297	297	297	297
	LH SHR stove [8 kW]	m€	108	184	224	272	276	281	285	290	294
	LH pellet stove [8 kW]	m€	0	146	171	195	195	195	195	195	195
	LH open fire gas, NCV [4.2 kW]	m€	7	10	11	11	11	11	11	11	11
	LH closed fire gas, NCV [4.2 kW]	m€	31	36	37	38	39	40	41	42	43
	LH flueless fuel heater, NCV [1.5 kW]	m€	12	23	21	18	16	14	12	9	7
	LH elec.portable [1 kW]	m€	27	34	35	37	38	40	41	42	44
	LH elec.convector [1 kW]	m€	198	248	257	270	280	290	300	311	321
	LH elec.storage [2.75 kW]	m€	23	28	29	31	32	33	34	36	37
	LH elec.underfloor [0.62 kW]	m€	41	51	53	56	58	60	62	64	67
	LH luminous heaters [20 kW]	m€	2	4	4	4	4	4	4	4	3
	LH tube heaters [30 kW]	m€	2	8	10	9	9	8	8	8	8
	LH total	**m€**	**980**	**1810**	**1935**	**2044**	**2056**	**2068**	**2080**	**2092**	**2104**
	RAC (cooling only & reversibles)	**m€**	**50**	**968**	**1212**	**1321**	**1335**	**1339**	**1362**	**1385**	**1408**
1	o/w RAC rev. Heating	m€	14	854	1075	1173	1186	1188	1209	1230	1252
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**69**	**108**	**115**	**122**	**120**	**114**	**107**	**100**	**94**
	TOTAL SPACE HEATING	**m€**	**2971**	**4936**	**5231**	**5607**	**5949**	**6298**	**6657**	**7028**	**7412**
	TOTAL SPACE COOLING	**m€**	**166**	**1617**	**1884**	**2003**	**2045**	**2065**	**2103**	**2142**	**2180**
	NRVU avg (sales wt.)	**m€**	1260	3084	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	m€	157	303	277	290	303	320	341	362	384
	RVU Central Balanced VU (2 fans)	m€	18	301	386	434	481	529	577	625	672
	RVU Local Balanced VU (2 fans)	m€	1	35	57	81	104	127	151	174	197
	TOTAL VENTILATION (electricity)	**m€**	**1436**	**3724**	**3972**	**4236**	**4499**	**4768**	**5039**	**5311**	**5583**
	LS Light Sources in Euro/unit										
	LFL	m€	225	288	290	270	249	228	208	191	174
	CFL	m€	109	872	732	657	582	516	473	430	387
	Tungsten	m€	215	1749	1836	1395	1003	729	509	386	362
	GLS	m€	617	326	233	138	37	10	0	0	0
	HID	m€	43	94	91	87	87	87	87	87	87
	LED BAU	m€	0	277	718	987	761	858	895	883	919
	TOTAL LIGHTING	**m€**	**1208**	**3606**	**3900**	**3533**	**2718**	**2427**	**2172**	**1977**	**1929**

	REVENU RETAIL BAU (in m euro 2010)	unit	1990	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV standard	m€	4680	2091	0	0	0	0	0	0	0
	DP TV LoNA	m€	0	5227	6544	5712	4675	3548	2421	1294	167
	DP TV Smart	m€	0	3136	6544	8568	10908	13382	15857	18332	20806
	DP Monitor	m€	680	952	952	952	952	952	952	952	952
	DP Total electronic DisPlays	**m€**	**5360**	**11406**	**14040**	**15233**	**16535**	**17882**	**19230**	**20577**	**21925**
	SSTB	m€	0	15	0	0	0	0	0	0	0
	CSTB	m€	0	306	329	333	325	353	381	409	437
	Total STB set top boxes (Complex & Simple)		**0**	**321**	**329**	**333**	**325**	**353**	**381**	**409**	**437**
	VIDEO players/recorders	m€	0	100	0	0	0	0	0	0	0
	VIDEO projectors	m€	2	157	106	46	0	0	0	0	0
	VIDEO game consoles	m€	0	1679	1718	1909	1909	1909	1909	1909	1909
	Total VIDEO	**m€**	**2**	**1936**	**1824**	**1955**	**1909**	**1909**	**1909**	**1909**	**1909**
	CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
	PC Desktop	m€	1426	3548	3225	3225	3225	3225	3225	3225	3225
	PC Notebook	m€	151	4967	4666	4666	4666	4666	4666	4666	4666
	PC Tablet/slate	m€	0	10800	17550	22680	27000	28350	29700	31050	32400
	PC Thin client	m€	8	96	96	96	96	96	96	96	96
	PC Workstation	m€	40	400	400	400	400	400	400	400	400
	Total PC, electricity	**m€**	**1625**	**19810**	**25937**	**31067**	**35387**	**36737**	**38087**	**39437**	**40787**
	EP-Copier mono	m€	701	169	71	53	34	15	0	0	0
	EP-Copier colour	m€	0	410	614	700	763	825	888	950	1013
	EP-printer mono	m€	141	117	96	82	73	63	53	43	33
	EP-printer colour	m€	0	192	258	310	360	410	460	510	560
	IJ SFD printer	m€	243	269	190	140	120	95	70	45	20
	IJ MFD printer	m€	298	1325	1530	1680	1830	1980	2130	2280	2430
	paper (2.5 euro/kg paper (6.25 euro/pack)	m€									
	Total imaging equipment, electricity	**m€**	**1384**	**2481**	**2760**	**2965**	**3179**	**3388**	**3601**	**3828**	**4056**
	SB Home Gateway, on-mode power	m€	0	793	971	1149	1327	1505	1683	1861	2039
	SB Home NAS, on-mode power	m€	0	48	68	88	108	128	148	168	188
	SB Home Phones (fixed), on-mode power	m€	184	1098	1171	1171	1171	1171	1171	1171	1171
	SB Office Phones (fixed), on-mode power	m€	175	356	377	399	420	441	463	484	506
	Total SB (networked) StandBy (rest)		**359**	**2295**	**2588**	**2807**	**3027**	**3246**	**3465**	**3685**	**3904**
	BC_EPS Mobile phones etc.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
	TOTAL ELECTRONICS	**m€**	**8729**	**38249**	**47477**	**54359**	**60360**	**63514**	**66672**	**69844**	**73017**
	RF Household refrigerator and freezer	**m€**	**2947**	**3267**	**3317**	**3368**	**3419**	**3469**	**3520**	**3570**	**3621**
1	CF open vertical chilled multi deck (RCV2)	m€	35	63	69	76	83	90	97	104	111
1	CF open horizontal frozen island (RHF4)	m€	9	9	11	12	13	14	15	16	17
1	CF Plug in one door beverage cooler	m€	51	74	78	82	86	90	95	99	103
1	CF Plug in horizontal ice cream freezer	m€	19	31	32	34	36	37	39	41	43
1	CF Spiral vending machine	m€	28	62	75	88	102	115	128	141	154
1	**CF average**		**142**	**238**	**265**	**292**	**319**	**346**	**373**	**400**	**427**
	PF service cabinet (average)	m€	36	48	50	52	54	57	59	62	64
	PF Blast cabinet	m€	58	126	135	151	166	181	196	212	227
	PF Walk-In Cold Room (WICR, avg)	m€	164	210	222	231	241	251	260	270	279
	PF MT & LT industrial chillers (avg)	m€	25	50	52	58	63	69	74	79	85
	Total PF Professional Refrigeration	**m€**	**282**	**434**	**459**	**492**	**525**	**557**	**590**	**622**	**655**
	TOTAL FOOD PRESERVATION	**m€**	**3371**	**3939**	**4042**	**4152**	**4263**	**4373**	**4483**	**4593**	**4703**
	COOK El. Hobs, Wh/ltr	m€	920	2244	2422	2554	2674	2788	2894	2994	3086
	COOK El. Ovens, kWh/a	m€	2009	2517	2732	2642	2662	2695	2729	2763	2798
	COOK Gas Hobs, % efficiency NCV	m€	1076	799	719	648	584	525	471	438	412
	COOK Gas Ovens, kWh prim, NCV	m€	283	275	268	260	252	244	237	229	221
	COOK Range Hoods, kWh elec	m€	488	627	659	692	728	763	798	834	869
	Total CA Cooking Appliances		**4777**	**6462**	**6799**	**6797**	**6900**	**7015**	**7129**	**7258**	**7387**
	COFFEE Dripfilter (glass)	m€	146	86	71	69	69	69	69	69	69
	COFFEE Dripfilter (thermos)	m€	28	45	45	46	47	47	48	48	48
	COFFEE Dripfilter (full automatic)	m€	0	83	93	102	112	122	131	141	151
	COFFEE Pad filter	m€	0	185	201	217	233	249	265	281	296
	COFFEE Hard cap espresso	m€	21	190	285	298	298	298	298	298	298
	COFFEE Semi-auto espresso	m€	24	25	24	22	21	19	17	16	14
	COFFEE Fully-auto espresso	m€	136	181	206	231	256	281	306	331	356
	Total CM household Coffee Makers	**m€**	**354**	**795**	**925**	**986**	**1035**	**1085**	**1134**	**1183**	**1232**
	TOTAL COOKING	**m€**	**5132**	**7257**	**7724**	**7782**	**7935**	**8100**	**8263**	**8441**	**8619**

	REVENU RETAIL BAU (in m euro 2010)	unit	1990	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**m€**	**1615**	**2441**	**2584**	**2425**	**2425**	**2425**	**2425**	**2425**	**2425**
	DW Household Dishwasher	**m€**	**692**	**1756**	**1998**	**2240**	**2481**	**2723**	**2964**	**3206**	**3448**
	LD Household Laundry Drier vented el.	m€	329	313	279	285	287	289	290	292	293
	LD Household Laundry Drier condens el.	m€	186	815	915	934	942	947	952	958	963
	LD Household Laundry Drier vented gas	m€	3	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**518**	**1136**	**1202**	**1227**	**1237**	**1244**	**1251**	**1258**	**1265**
	VC dom. Vacuum Cleaner	m€	1571	6524	7937	8763	9589	10415	11241	12068	12894
	VC nondom Vacuum Cleaner	m€	112	121	127	134	141	147	154	160	167
	Total VC Vacuum Cleaner	**m€**	**1683**	**6645**	**8065**	**8897**	**9730**	**10562**	**11395**	**12228**	**13060**
	TOTAL CLEANING	**m€**	**4508**	**11978**	**13849**	**14789**	**15874**	**16955**	**18036**	**19117**	**20198**
0.5	FAN Axial<300Pa [247 W flow out]	m€	36	135	153	153	153	153	153	153	153
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	50	181	190	190	190	190	190	190	190
0.5	FAN Centr.FC [141 W flow out]	m€	31	90	102	102	102	102	102	102	102
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	49	55	60	62	63	64	65	66
0.5	FAN Centr.BC [2052 W flow out]	m€	38	117	132	147	150	165	180	195	210
0.5	FAN Cross-flow [31 W flow out]	m€	7	18	20	22	23	25	27	29	32
	Total FAN, industrial (excl. box & roof fans)	**m€**	**90**	**295**	**326**	**337**	**340**	**349**	**358**	**367**	**376**
1	MT motor only		163	254	268	269	270	270	269	268	266
1	MT extra drive sales revenu		0	0	0	0	0	0	0	0	0
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**163**	**254**	**268**	**269**	**270**	**270**	**269**	**268**	**266**
	WP Water pumps (load) [%]	**m€**	**120**	**176**	**189**	**203**	**217**	**231**	**246**	**260**	**274**
	TOTAL INDUSTRY COMPONENTS		291	598	649	675	692	715	738	761	783
	TRAFO Distribution, kWh/a	m€	47	79	85	91	98	105	112	119	125
	TRAFO Industry oil	m€	24	42	45	49	52	56	60	63	67
	TRAFO Industry dry	m€	12	20	21	23	24	26	28	29	31
	TRAFO Power	m€	188	324	348	374	403	432	461	490	519
	TRAFO DER oil	m€	0	4	6	10	16	23	31	39	46
	TRAFO DER dry	m€	0	22	36	59	98	145	192	239	286
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**276**	**495**	**547**	**611**	**696**	**792**	**888**	**983**	**1079**
	TYRE in m units										
	TYRE car replacement tyres C1	m€	2536	3104	3598	4058	4058	4058	4058	4058	4058
	TYRE van replacement tyres C2	m€	906	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	m€	832	692	707	725	729	732	732	731	728
	TRANSPORT SECTOR	m€	4275	4905	5590	6232	6237	6239	6240	6239	6236
	GENERAL TOTAL (in m euro 2010)		**33164**	**82503**	**96178**	**105378**	**112692**	**117685**	**122763**	**127941**	**133278**
	GENERAL TOTAL (in bn euro 2010)		33	83	96	105	113	118	123	128	133

SUMMARY BAU

retail revenue (bn euro 2010)	1990	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.8	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.5
SPACE HEATING	3.0	4.9	5.2	5.6	5.9	6.3	6.7	7.0	7.4
SPACE COOLING	0.2	1.6	1.9	2.0	2.0	2.1	2.1	2.1	2.2
VENTILATION	1.4	3.7	4.0	4.2	4.5	4.8	5.0	5.3	5.6
LIGHTING	1.2	3.6	3.9	3.5	2.7	2.4	2.2	2.0	1.9
ELECTRONICS	8.7	38.2	47.5	54.4	60.4	63.5	66.7	69.8	73.0
FOOD PRESERVATION	3.4	3.9	4.0	4.2	4.3	4.4	4.5	4.6	4.7
COOKING	5.1	7.3	7.7	7.8	7.9	8.1	8.3	8.4	8.6
CLEANING	4.5	12.0	13.8	14.8	15.9	17.0	18.0	19.1	20.2
INDUSTRY COMPONENTS	0.3	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8
ENERGY SECTOR	0.3	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1
TRANSPORT SECTOR	4.3	4.9	5.6	6.2	6.2	6.2	6.2	6.2	6.2
TOTAL in bn euro 2010	**33**	**83**	**96**	**105**	**113**	**118**	**123**	**128**	**133**

	REVENU RETAIL ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	455	553	888	1021	1175	1160	1145	1130	1114	1098
	CH Central Heating combi, water heat [24 kW]	m€	346	604	924	1314	1432	1550	1669	1787	1904	2020
	TOTAL WATER HEATING	m€	801	1157	1812	2335	2607	2710	2814	2916	3018	3118
	CH Central Heating boiler, space heat [24 kW]	**m€**	1808	2631	4072	5706	7670	8836	10078	11397	12792	14263
	SFB Wood Manual [18 kW]	m€	94	57	55	37	21	19	16	14	13	11
	SFB Wood Direct Draft [20 kW]	m€	4	155	162	187	181	211	248	290	340	398
	SFB Coal [25 kW]	m€	35	15	2	2	2	1	1	1	1	1
	SFB Pellets [25 kW]	m€	0	41	65	65	66	70	78	86	95	105
	SFB Wood chips [160 kW]	m€	0	15	15	18	22	23	26	28	31	34
	Total Solid Fuel Boiler	**m€**	**133**	**284**	**299**	**310**	**291**	**325**	**369**	**420**	**479**	**549**
	CHAS (elec) [44 kW]	m€	39	161	188	214	236	260	285	309	334	359
	CHAL (elec) [714 kW]	m€	10	31	33	35	36	40	43	47	52	56
	Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	1	1	1	2	2	3	4	5	7
	CHWS [61 kW]	m€	5	21	23	25	28	31	34	38	41	45
	CHWL [894 kW]	m€	14	48	50	51	53	55	57	59	62	65
	Cheng (fossil), NCV [50 kW]	m€	0	0	1	1	2	2	2	3	3	4
	AC all [28 kW]	m€	48	277	385	378	360	363	351	338	325	312
1	o/w AC rooftop [80 kW]	m€	16	39	29	24	19	19	16	12	8	4
1	o/w AC splits [14 kW]	m€	21	84	99	93	87	91	89	87	83	80
1	o/w AC VRF [50 kW]	m€	12	154	257	261	254	252	246	240	234	229
	ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	1	1	2	3	3	4	4	5	6
	Total AHC Air Heating & Cooling, cooling	**m€**	**116**	**540**	**681**	**708**	**719**	**756**	**779**	**803**	**828**	**853**
1	AC all, rev [28 kW]	m€	15	192	301	322	330	349	352	354	343	331
1	o/w AC rooftop, rev [80 kW]	m€	5	27	23	20	17	18	15	12	8	4
1	o/w AC splits, rev [14 kW]	m€	6	58	78	80	82	90	92	93	90	87
1	o/w AC VRF, rev [50 kW]	m€	4	107	200	222	231	241	245	249	245	241
1	ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	1	1	2	2	3	4	5	6	7
	AHF all (fossil) [59 kW]	m€	50	38	48	53	50	47	44	41	38	35
1	o/w AHFS (fossil) [15 kW]	m€	6	1	1	1	1	0	0	0	0	0
1	o/w AHFL central (fossil) [120 kW]	m€	27	22	26	29	26	24	22	21	19	17
1	o/w AHFL local (fossil) [28.6 kW]	m€	16	15	22	24	23	22	22	20	19	18
	AH el [20 kW]	m€	1	2	1	1	1	1	0	0	0	0
	Total AHC Air Heating & Cooling, heating	**m€**	**51**	**40**	**50**	**55**	**52**	**48**	**44**	**41**	**38**	**35**
	LH open fireplace [8 kW]	m€	170	249	360	468	454	437	421	406	392	378
	LH closed fireplace/inset [8 kW]	m€	108	292	408	480	489	471	454	437	421	406
	LH wood stove [8 kW]	m€	117	137	177	196	195	188	180	173	171	171
	LH coal stove [8 kW]	m€	35	27	30	31	23	15	7	0	-7	-13
	LH cooker [10 kW]	m€	99	200	311	417	434	416	399	383	368	353
	LH SHR stove [8 kW]	m€	108	151	196	236	283	283	282	285	290	294
	LH pellet stove [8 kW]	m€	0	112	146	184	202	195	195	195	195	195
	LH open fire gas, NCV [4.2 kW]	m€	7	9	11	12	11	11	11	11	11	11
	LH closed fire gas, NCV [4.2 kW]	m€	31	35	38	41	41	41	40	41	42	43
	LH flueless fuel heater, NCV [1.5 kW]	m€	12	23	23	21	18	16	14	12	9	7
	LH elec.portable [1 kW]	m€	27	33	34	35	37	38	40	41	42	44
	LH elec.convector [1 kW]	m€	198	241	248	258	270	280	290	300	311	321
	LH elec.storage [2.75 kW]	m€	23	28	31	40	45	45	45	44	44	44
	LH elec.underfloor [0.62 kW]	m€	41	50	53	63	62	62	63	63	64	67
	LH luminous heaters [20 kW]	m€	2	3	4	5	5	5	5	5	4	4
	LH tube heaters [30 kW]	m€	2	2	8	10	10	10	10	9	9	9
	LH total	**m€**	**980**	**1592**	**2080**	**2496**	**2579**	**2512**	**2456**	**2407**	**2368**	**2334**
	RAC (cooling only & reversibles)	**m€**	**50**	**625**	**1047**	**1343**	**1482**	**1503**	**1491**	**1478**	**1466**	**1453**
1	o/w RAC rev. Heating	m€	14	464	922	1189	1310	1330	1320	1310	1300	1289
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**69**	**110**	**141**	**143**	**145**	**136**	**122**	**110**	**100**	**94**
	TOTAL SPACE HEATING	m€	2971	4546	6502	8567	10592	11721	12947	14264	15677	17180
	TOTAL SPACE COOLING	m€	166	1165	1728	2051	2202	2259	2270	2281	2293	2306
	NRVU avg (sales wt.)	**m€**	1260	2948	3095	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	m€	157	353	528	481	505	526	547	565	582	597
	RVU Central Balanced VU (2 fans)	m€	18	124	445	552	601	645	687	725	760	791
	RVU Local Balanced VU (2 fans)	m€	1	16	35	57	81	104	127	151	174	197
	TOTAL VENTILATION (electricity)	m€	1436	3441	4103	4342	4617	4887	5151	5411	5665	5915
	LS Light Sources in Euro/unit											
	LFL	m€	225	327	246	212	112	74	54	33	12	4
	CFL	m€	109	1218	493	220	5	4	4	4	4	4
	Tungsten	m€	215	1589	1806	414	27	10	10	10	10	10
	GLS	m€	617	255	14	25	15	14	14	14	14	14
	HID	m€	43	108	64	41	23	16	16	16	16	16
	LED ECO	m€	0	107	1932	3248	1987	1207	1302	1604	1718	1988
	TOTAL LIGHTING	m€	1208	3604	4555	4160	2169	1325	1400	1681	1773	2036

REVENU RETAIL ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	4680	10771	2091	0	0	0	0	0	0	0
DP TV LoNA	m€	0	1469	5227	6544	5712	4675	3548	2421	1294	167
DP TV Smart	m€	0	0	3136	6544	8568	10908	13382	15857	18332	20806
DP Monitor	m€	680	1700	952	952	952	952	952	952	952	952
DP Total electronic DisPlays	**m€**	**5360**	**13940**	**11406**	**14040**	**15233**	**16535**	**17882**	**19230**	**20577**	**21925**
SSTB	m€	0	66	15	0	0	0	0	0	0	0
CSTB	m€	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	m€	0	365	100	0	0	0	0	0	0	0
VIDEO projectors	m€	2	169	157	106	46	0	0	0	0	0
VIDEO game consoles	m€	0	2492	1679	1718	1909	1909	1909	1909	1909	1909
Total VIDEO	**m€**	**2**	**3026**	**1936**	**1824**	**1955**	**1909**	**1909**	**1909**	**1909**	**1909**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	1426	4754	3548	3225	3225	3225	3225	3225	3225	3225
PC Notebook	m€	151	10836	4967	4666	4666	4666	4666	4666	4666	4666
PC Tablet/slate	m€	0	683	10800	17550	22680	27000	28350	29700	31050	32400
PC Thin client	m€	8	96	96	96	96	96	96	96	96	96
PC Workstation	m€	40	400	400	400	400	400	400	400	400	400
Total PC, electricity	**m€**	**1625**	**16769**	**19810**	**25937**	**31067**	**35387**	**36737**	**38087**	**39437**	**40787**
EP-Copier mono	m€	701	281	169	71	53	34	15	0	0	0
EP-Copier colour	m€	0	94	410	614	700	763	825	888	950	1013
EP-printer mono	m€	141	134	117	96	82	73	63	53	43	33
EP-printer colour	m€	0	129	192	258	310	360	410	460	510	560
IJ SFD printer	m€	243	386	269	190	140	120	95	70	45	20
IJ MFD printer	m€	298	966	1325	1530	1680	1830	1980	2130	2280	2430
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**1384**	**1991**	**2481**	**2760**	**2965**	**3179**	**3388**	**3601**	**3828**	**4056**
SB Home Gateway, on-mode power	m€	0	615	793	971	1149	1327	1505	1683	1861	2039
SB Home NAS, on-mode power	m€	0	28	48	68	88	108	128	148	168	188
SB Home Phones (fixed), on-mode power	m€	184	915	1098	1171	1171	1171	1171	1171	1171	1171
SB Office Phones (fixed), on-mode power	m€	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.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS	**m€**	**8729**	**37934**	**38258**	**47477**	**54359**	**60360**	**63514**	**66672**	**69844**	**73017**
RF Household refrigerator and freezer	**m€**	**2947**	**3721**	**4048**	**4201**	**4293**	**4337**	**4537**	**4380**	**4227**	**4079**
1 CF open vertical chilled multi deck (RCV2)	m€	35	56	63	69	76	83	90	97	104	111
1 CF open horizontal frozen island (RHF4)	m€	9	8	9	11	12	13	14	15	16	17
1 CF Plug in one door beverage cooler	m€	51	70	74	78	82	86	90	95	99	103
1 CF Plug in horizontal ice cream freezer	m€	19	29	31	32	34	36	37	39	41	43
1 CF Spiral vending machine	m€	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)	m€	36	46	48	50	52	54	57	59	62	64
PF Blast cabinet	m€	58	112	126	135	151	166	181	196	212	227
PF Walk-In Cold Room (WICR, avg)	m€	164	201	210	222	231	241	251	260	270	279
PF MT & LT industrial chillers (avg)	m€	25	48	50	52	58	63	69	74	79	85
Total PF Professional Refrigeration	**m€**	**282**	**407**	**434**	**459**	**492**	**525**	**557**	**590**	**622**	**655**
TOTAL FOOD PRESERVATION	**m€**	**3371**	**4343**	**4720**	**4926**	**5078**	**5181**	**5441**	**5343**	**5250**	**5161**
COOK El. Hobs, Wh/ltr	m€	920	2093	2244	2523	2656	2777	2890	2996	3095	3187
COOK El. Ovens, kWh/a	m€	2009	2388	2551	2871	2772	2678	2695	2729	2763	2798
COOK Gas Hobs, % efficiency NCV	m€	1076	887	799	688	620	559	502	464	438	412
COOK Gas Ovens, kWh prim, NCV	m€	283	289	292	370	356	342	329	316	304	292
COOK Range Hoods, kWh elec	m€	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)	m€	219	152	123	97	89	85	81	77	73	70
COFFEE Dripfilter (thermos)	m€	28	44	45	45	46	47	47	48	48	48
COFFEE Dripfilter (full automatic)	m€	0	73	83	93	102	112	122	131	141	151
COFFEE Pad filter	m€	0	170	185	201	217	233	249	265	281	296
COFFEE Hard cap espresso	m€	21	89	190	285	298	298	298	298	298	298
COFFEE Semi-auto espresso	m€	24	27	25	24	22	21	19	17	16	14
COFFEE Fully-auto espresso	m€	136	156	181	206	231	256	281	306	331	356
Total CM household Coffee Makers	**m€**	**427**	**710**	**832**	**951**	**1006**	**1051**	**1096**	**1142**	**1187**	**1233**
TOTAL COOKING	**m€**	**5204**	**6963**	**7345**	**8222**	**8365**	**8369**	**8481**	**8620**	**8762**	**8896**

	REVENU RETAIL ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**m€**	**1615**	**2834**	**2928**	**3231**	**3053**	**2904**	**2763**	**2629**	**2502**	**2425**
	DW Household Dishwasher	**m€**	**692**	**2011**	**2333**	**2600**	**2838**	**3061**	**3268**	**3460**	**3638**	**3801**
	LD Household Laundry Drier vented el.	m€	329	332	313	279	285	287	289	290	292	293
	LD Household Laundry Drier condens el.	m€	186	697	886	1055	1072	1052	1024	996	968	963
	LD Household Laundry Drier vented gas	m€	3	6	7	8	8	8	9	9	9	9
	Total LD household Laundry Drier	**m€**	**518**	**1035**	**1206**	**1342**	**1365**	**1347**	**1321**	**1295**	**1269**	**1265**
	VC dom. Vacuum Cleaner	m€	1571	4651	6729	8162	8763	9589	10415	11241	12068	12894
	VC nondom Vacuum Cleaner	m€	112	115	124	131	134	141	147	154	160	167
	Total VC Vacuum Cleaner	**m€**	**1683**	**4767**	**6853**	**8293**	**8897**	**9730**	**10562**	**11395**	**12228**	**13060**
	TOTAL CLEANING	**m€**	**4508**	**10647**	**13320**	**15465**	**16153**	**17043**	**17915**	**18779**	**19636**	**20551**
0.5	FAN Axial<300Pa [247 W flow out]	m€	36	118	176	190	182	174	166	159	153	153
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	50	171	187	190	190	190	190	190	190	190
0.5	FAN Centr.FC [141 W flow out]	m€	31	78	116	126	120	115	109	104	102	102
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	43	60	64	67	66	64	64	65	66
0.5	FAN Centr.BC [2052 W flow out]	m€	38	102	164	176	187	183	192	200	207	213
0.5	FAN Cross-flow [31 W flow out]	m€	7	16	52	55	59	57	60	62	64	66
	Total FAN, industrial (excl. box & roof fans)	**m€**	**90**	**264**	**377**	**401**	**403**	**392**	**391**	**390**	**391**	**395**
0.5	MT motor only		163	271	423	435	429	408	388	369	351	334
0.5	MT extra drive sales revenu		0	0	192	190	181	172	164	156	148	141
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**163**	**271**	**615**	**626**	**610**	**580**	**552**	**525**	**500**	**475**
	WP Water pumps (load) [%]	**m€**	**120**	**164**	**176**	**189**	**203**	**217**	**231**	**246**	**260**	**274**
	TOTAL INDUSTRY COMPONENTS		291	563	860	902	911	899	898	898	900	907
	TRAFO Distribution, kWh/a	m€	47	74	98	105	112	121	129	138	146	155
	TRAFO Industry oil	m€	24	39	64	69	74	80	86	91	97	102
	TRAFO Industry dry	m€	12	18	27	29	31	33	35	37	40	42
	TRAFO Power	m€	188	301	324	348	374	403	432	461	490	519
	TRAFO DER oil	m€	0	2	6	10	16	27	39	52	65	78
	TRAFO DER dry	m€	0	13	29	47	78	129	190	251	313	374
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**276**	**453**	**552**	**613**	**691**	**797**	**916**	**1036**	**1155**	**1275**
	TYRE in m units											
	TYRE car replacement tyres C1	m€	2536	3127	3104	3601	4124	4172	4058	4058	4058	4058
	TYRE van replacement tyres C2	m€	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	m€	832	818	738	840	934	1006	957	910	866	824
	TRANSPORT SECTOR	**m€**	**4275**	**5062**	**4951**	**5727**	**6509**	**6627**	**6464**	**6418**	**6374**	**6332**
	GENERAL TOTAL (in m euro 2010)		**33237**	**79877**	**88706**	**104788**	**114253**	**122179**	**128211**	**134318**	**140347**	**146692**
	GENERAL TOTAL (in bn euro 2010)		33	80	89	105	114	122	128	134	140	147

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	**3.0**	**4.5**	**6.5**	**8.6**	**10.6**	**11.7**	**12.9**	**14.3**	**15.7**	**17.2**
SPACE COOLING	**0.2**	**1.2**	**1.7**	**2.1**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**
VENTILATION	**1.4**	**3.4**	**4.1**	**4.3**	**4.6**	**4.9**	**5.2**	**5.4**	**5.7**	**5.9**
LIGHTING	**1.2**	**3.6**	**4.6**	**4.2**	**2.2**	**1.3**	**1.4**	**1.7**	**1.8**	**2.0**
ELECTRONICS	**8.7**	**37.9**	**38.3**	**47.5**	**54.4**	**60.4**	**63.5**	**66.7**	**69.8**	**73.0**
FOOD PRESERVATION	**3.4**	**4.3**	**4.7**	**4.9**	**5.1**	**5.2**	**5.4**	**5.3**	**5.2**	**5.2**
COOKING	**5.2**	**7.0**	**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**	**80**	**89**	**105**	**114**	**122**	**128**	**134**	**140**	**147**

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	-	-	**1.6**	**3.3**	**5.0**	**5.8**	**6.6**	**7.6**	**8.6**	**9.8**
SPACE COOLING	-	-	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**
VENTILATION	-	-	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**
LIGHTING	-	**0.1**	**0.9**	**0.3** -	**1.4** -	**1.4** -	**1.0** -	**0.5** -	**0.2**	**0.1**
ELECTRONICS	-	-	**0.0**	-	-	-	-	-	-	-
FOOD PRESERVATION	-	**0.5**	**0.8**	**0.9**	**0.9**	**0.9**	**1.1**	**0.9**	**0.7**	**0.5**
COOKING	**0.1**	**0.1**	**0.1**	**0.5**	**0.6**	**0.4**	**0.4**	**0.4**	**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**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**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	**0.1**	**1.5**	**6.2**	**8.6**	**8.9**	**9.5**	**10.5**	**11.6**	**12.4**	**13.4**

REVENU WHOLESALE BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WH dedicated Water Heater	m€	520	632	625	672	746	752	742	732	722	712
CH Central Heating combi, water heat [24 kW]	m€	369	644	695	773	796	817	843	888	932	977
TOTAL WATER HEATING	**m€**	**889**	**1276**	**1320**	**1446**	**1542**	**1569**	**1585**	**1620**	**1655**	**1689**
CH Central Heating boiler, space heat [24 kW]	**m€**	1928	2806	2999	3193	3506	3819	4131	4444	4757	5070
SFB Wood Manual [18 kW]	m€	108	65	42	24	14	12	11	10	9	8
SFB Wood Direct Draft [20 kW]	m€	4	178	181	184	164	200	243	295	359	437
SFB Coal [25 kW]	m€	40	18	2	2	2	2	1	1	1	1
SFB Pellets [25 kW]	m€	0	44	68	68	68	75	83	92	101	112
SFB Wood chips [160 kW]	m€	0	15	15	18	21	23	26	28	31	34
Total Solid Fuel Boiler	**m€**	**152**	**319**	**308**	**296**	**268**	**312**	**364**	**426**	**502**	**593**
CHAS (elec) [44 kW]	m€	39	161	177	198	216	238	260	282	304	326
CHAL (elec) [714 kW]	m€	10	31	32	33	34	35	37	38	39	40
Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	1	1	1	2	2	3	3	4	4
CHWS [61 kW]	m€	5	21	23	25	28	31	33	36	39	41
CHWL [894 kW]	m€	14	48	50	51	53	55	57	59	61	63
Cheng (fossil), NCV [50 kW]	m€	0	0	1	1	1	2	2	3	3	3
AC all [28 kW]	m€	48	277	365	359	344	344	330	317	303	289
1 o/w AC rooftop [80 kW]	m€	16	39	29	24	19	19	16	12	8	4
1 o/w AC splits [14 kW]	m€	21	84	96	91	85	85	79	74	68	63
1 o/w AC VRF [50 kW]	m€	12	154	240	245	240	240	235	231	227	223
ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	1	1	2	3	3	4	4	5	6
Total AHC Air Heating & Cooling, cooling	**m€**	**116**	**540**	**649**	**671**	**682**	**711**	**726**	**741**	**756**	**772**
1 AC all, rev [28 kW]	m€	15	192	282	302	308	321	319	317	303	289
1 o/w AC rooftop, rev [80 kW]	m€	5	27	23	20	17	18	15	12	8	4
1 o/w AC splits, rev [14 kW]	m€	6	58	74	76	76	79	77	74	68	63
1 o/w AC VRF, rev [50 kW]	m€	4	107	185	206	214	224	228	231	227	223
1 ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	1	1	2	2	3	4	5	5	6
AHF all (fossil) [59 kW]	m€	50	38	36	35	33	32	30	29	27	25
1 o/w AHFS (fossil) [15 kW]	m€	6	1	1	1	0	0	0	0	0	0
1 o/w AHFL central (fossil) [120 kW]	m€	27	22	21	20	19	18	17	16	15	14
1 o/w AHFL local (fossil) [28.6 kW]	m€	16	15	15	14	14	13	13	13	12	12
AH el [20 kW]	m€	1	2	1	1	1	1	0	0	0	0
Total AHC Air Heating & Cooling, heating	**m€**	**51**	**40**	**38**	**36**	**35**	**33**	**30**	**29**	**27**	**25**
LH open fireplace [8 kW]	m€	160	234	242	237	234	234	234	234	234	234
LH closed fireplace/inset [8 kW]	m€	102	274	321	338	347	347	347	347	347	347
LH wood stove [8 kW]	m€	110	129	145	157	161	161	161	161	161	161
LH coal stove [8 kW]	m€	33	26	24	22	16	11	5	0	-5	-11
LH cooker [10 kW]	m€	93	188	243	266	279	279	279	279	279	279
LH SHR stove [8 kW]	m€	102	142	173	210	256	260	264	269	273	277
LH pellet stove [8 kW]	m€	0	106	138	161	184	184	184	184	184	184
LH open fire gas, NCV [4.2 kW]	m€	6	9	10	11	11	11	11	11	11	11
LH closed fire gas, NCV [4.2 kW]	m€	30	33	34	35	36	37	38	39	40	41
LH flueless fuel heater, NCV [1.5 kW]	m€	11	22	22	20	17	15	13	11	9	7
LH elec.portable [1 kW]	m€	25	31	32	33	35	36	37	39	40	41
LH elec.convector [1 kW]	m€	186	227	234	242	254	263	273	283	292	302
LH elec.storage [2.75 kW]	m€	21	26	27	28	29	30	31	32	33	35
LH elec.underfloor [0.62 kW]	m€	39	47	48	50	53	55	57	59	61	63
LH luminous heaters [20 kW]	m€	2	3	4	4	4	4	4	4	4	3
LH tube heaters [30 kW]	m€	2	2	8	10	9	9	8	8	8	8
LH total	**m€**	**922**	**1498**	**1704**	**1822**	**1925**	**1936**	**1947**	**1958**	**1969**	**1981**
RAC (cooling only & reversibles)	**m€**	**53**	**667**	**1032**	**1293**	**1409**	**1424**	**1429**	**1453**	**1478**	**1502**
1 o/w RAC rev. Heating	m€	15	495	911	1146	1251	1266	1267	1290	1312	1335
1 **CIRC Circulator pumps <2.5 kW**	**m€**	**173**	**255**	**271**	**287**	**304**	**301**	**284**	**267**	**251**	**234**
TOTAL SPACE HEATING	**m€**	**3054**	**4663**	**5050**	**5348**	**5734**	**6098**	**6472**	**6857**	**7255**	**7668**
TOTAL SPACE COOLING	**m€**	**169**	**1207**	**1682**	**1965**	**2091**	**2134**	**2155**	**2194**	**2234**	**2274**
NRVU avg (sales wt.)	**m€**	1260	2948	3084	3252	3431	3611	3791	3971	4150	4330
RVU Central Unidir. VU (1 fan)	m€	148	332	285	260	273	285	301	321	341	361
RVU Central Balanced VU (2 fans)	m€	17	116	283	363	408	453	498	543	588	633
RVU Local Balanced VU (2 fans)	m€	1	15	33	54	76	98	120	142	164	185
TOTAL VENTILATION (electricity)	**m€**	**1426**	**3412**	**3686**	**3929**	**4189**	**4447**	**4710**	**4977**	**5243**	**5509**
LS Light Sources in Euro/unit											
LFL	m€	225	325	288	290	270	249	228	208	191	174
CFL	m€	13	118	101	85	76	68	60	55	50	45
Tungsten	m€	25	178	203	213	162	117	85	59	45	42
GLS	m€	72	49	38	27	16	4	1	0	0	0
HID	m€	43	106	94	91	87	87	87	87	87	87
LED BAU	m€	0	14	32	83	115	88	100	104	103	107
TOTAL LIGHTING	**m€**	**377**	**790**	**757**	**790**	**725**	**612**	**560**	**513**	**475**	**455**

REVENU WHOLESALE BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	585	1346	261	0	0	0	0	0	0	0
DP TV LoNA	m€	0	184	653	818	714	584	443	303	162	21
DP TV Smart	m€	0	0	392	818	1071	1363	1673	1982	2291	2601
DP Monitor	m€	85	213	119	119	119	119	119	119	119	119
DP Total electronic DisPlays	**m€**	**670**	**1743**	**1426**	**1755**	**1904**	**2067**	**2235**	**2404**	**2572**	**2741**
SSTB	m€	0	331	75	0	0	0	0	0	0	0
CSTB	m€	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	m€	0	46	13	0	0	0	0	0	0	0
VIDEO projectors	m€	5	506	470	319	138	0	0	0	0	0
VIDEO game consoles	m€	0	319	215	220	245	245	245	245	245	245
Total VIDEO	**m€**	**5**	**872**	**698**	**539**	**383**	**245**	**245**	**245**	**245**	**245**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	166	553	413	375	375	375	375	375	375	375
PC Notebook	m€	18	1260	578	543	543	543	543	543	543	543
PC Tablet/slate	m€	0	85	1350	2194	2835	3375	3544	3713	3881	4050
PC Thin client	m€	10	120	120	120	120	120	120	120	120	120
PC Workstation	m€	46	460	460	460	460	460	460	460	460	460
Total PC, electricity	**m€**	**239**	**2478**	**2920**	**3691**	**4333**	**4873**	**5041**	**5210**	**5379**	**5548**
EP-Copier mono	m€	351	141	84	36	26	17	8	0	0	0
EP-Copier colour	m€	0	47	205	307	350	381	413	444	475	506
EP-printer mono	m€	71	67	59	48	41	37	31	26	21	16
EP-printer colour	m€	0	65	96	129	155	180	205	230	255	280
IJ SFD printer	m€	18	29	20	14	11	9	7	5	3	2
IJ MFD printer	m€	22	72	99	115	126	137	149	160	171	182
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**462**	**421**	**563**	**649**	**709**	**761**	**812**	**865**	**926**	**987**
SB Home Gateway, on-mode power	m€	0	1538	1983	2428	2873	3318	3763	4208	4653	5098
SB Home NAS, on-mode power	m€	0	140	240	340	440	540	640	740	840	940
SB Home Phones (fixed), on-mode power	m€	14	69	82	88	88	88	88	88	88	88
SB Office Phones (fixed), on-mode power	m€	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.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS	**m€**	**1506**	**9061**	**9752**	**11388**	**12660**	**13794**	**14882**	**15972**	**17069**	**18167**
RF Household refrigerator and freezer	**m€**	**221**	**241**	**245**	**249**	**253**	**256**	**260**	**264**	**268**	**272**
1 CF open vertical chilled multi deck (RCV2)	m€	70	112	125	139	153	166	180	194	208	222
1 CF open horizontal frozen island (RHF4)	m€	18	17	19	21	23	25	27	30	32	34
1 CF Plug in one door beverage cooler	m€	102	141	148	156	164	173	181	189	198	206
1 CF Plug in horizontal ice cream freezer	m€	38	58	61	64	68	71	75	78	82	85
1 CF Spiral vending machine	m€	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)	m€	71	92	96	99	104	109	114	119	123	128
PF Blast cabinet	m€	115	225	251	271	301	332	362	393	423	453
PF Walk-In Cold Room (WICR, avg)	m€	329	401	421	444	463	482	501	521	540	559
PF MT & LT industrial chillers (avg)	m€	50	95	100	104	115	126	137	148	159	170
Total PF Professional Refrigeration	**m€**	**565**	**813**	**868**	**919**	**984**	**1049**	**1114**	**1180**	**1245**	**1310**
TOTAL FOOD PRESERVATION	**m€**	**1069**	**1485**	**1590**	**1698**	**1821**	**1944**	**2067**	**2190**	**2313**	**2436**
COOK El. Hobs, Wh/ltr	m€	69	157	168	182	192	201	209	217	225	231
COOK El. Ovens, kWh/a	m€	151	179	189	205	198	200	202	205	207	210
COOK Gas Hobs, % efficiency NCV	m€	81	67	60	54	49	44	39	35	33	31
COOK Gas Ovens, kWh prim, NCV	m€	21	22	21	20	19	19	18	18	17	17
COOK Range Hoods, kWh elec	m€	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)	m€	11	8	6	5	5	5	5	5	5	5
COFFEE Dripfilter (thermos)	m€	2	3	3	3	3	4	4	4	4	4
COFFEE Dripfilter (full automatic)	m€	0	5	6	7	8	8	9	10	11	11
COFFEE Pad filter	m€	0	13	14	15	16	17	19	20	21	22
COFFEE Hard cap espresso	m€	2	7	14	21	22	22	22	22	22	22
COFFEE Semi-auto espresso	m€	2	2	2	2	2	2	1	1	1	1
COFFEE Fully-auto espresso	m€	10	12	14	15	17	19	21	23	25	27
Total CM household Coffee Makers	**m€**	**27**	**49**	**60**	**69**	**74**	**78**	**81**	**85**	**89**	**92**
TOTAL COOKING	**m€**	**385**	**518**	**544**	**579**	**584**	**595**	**607**	**620**	**633**	**646**

	REVENU WHOLESALE BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**m€**	**121**	**186**	**183**	**194**	**182**	**182**	**182**	**182**	**182**	**182**
	DW Household Dishwasher	**m€**	**52**	**114**	**132**	**150**	**168**	**186**	**204**	**222**	**240**	**259**
	LD Household Laundry Drier vented el.	m€	25	25	24	21	21	22	22	22	22	22
	LD Household Laundry Drier condens el.	m€	14	52	61	69	70	71	71	71	72	72
	LD Household Laundry Drier vented gas	m€	0	0	1	1	1	1	1	1	1	1
	Total LD household Laundry Drier	**m€**	**39**	**78**	**85**	**90**	**92**	**93**	**93**	**94**	**94**	**95**
	VC dom. Vacuum Cleaner	m€	118	349	489	595	657	719	781	843	905	967
	VC nondom Vacuum Cleaner	m€	149	154	162	170	179	187	196	205	213	222
	Total VC Vacuum Cleaner	**m€**	**267**	**503**	**651**	**765**	**836**	**907**	**977**	**1048**	**1118**	**1189**
	TOTAL CLEANING	**m€**	**479**	**880**	**1051**	**1199**	**1278**	**1367**	**1457**	**1546**	**1635**	**1724**
	FAN Axial<300Pa [247 W flow out]	m€	83	271	311	351	351	351	351	351	351	351
	FAN Axial>300Pa [489 W fluid-dyn out]	m€	114	394	416	438	438	438	438	438	438	438
0.5	FAN Centr.FC [141 W flow out]	m€	71	180	207	235	235	235	235	235	235	235
0.5	FAN Centr.BC-free [2120 W flow out]	m€	40	99	112	126	139	142	144	147	150	152
0.5	FAN Centr.BC [2052 W flow out]	m€	88	235	269	304	338	345	379	413	448	482
0.5	FAN Cross-flow [31 W flow out]	m€	16	36	41	47	52	53	58	63	68	73
	Total FAN, industrial (excl. box & roof fans)	**m€**	**305**	**940**	**1042**	**1144**	**1170**	**1176**	**1197**	**1218**	**1239**	**1260**
0.5	MT motor only	m€	374	551	585	616	619	621	621	619	617	613
0.5	MT extra drive sales revenu	m€	0	0	0	0	0	0	0	0	0	0
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**374**	**551**	**585**	**616**	**619**	**621**	**621**	**619**	**617**	**613**
	WP Water pumps (load) [%]	**m€**	**277**	**376**	**404**	**434**	**467**	**500**	**532**	**565**	**597**	**630**
	TOTAL INDUSTRY COMPONENTS		768	1592	1739	1886	1947	1986	2039	2092	2144	2196
	TRAFO Distribution, kWh/a	m€	47	74	79	85	91	98	105	112	119	125
	TRAFO Industry oil	m€	24	39	42	45	49	52	56	60	63	67
	TRAFO Industry dry	m€	12	18	20	21	23	24	26	28	29	31
	TRAFO Power	m€	188	301	324	348	374	403	432	461	490	519
	TRAFO DER oil	m€	0	2	4	6	10	16	23	31	39	46
	TRAFO DER dry	m€	0	13	22	36	59	98	145	192	239	286
	TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**m€**	**276**	**453**	**495**	**547**	**611**	**696**	**792**	**888**	**983**	**1079**
	TYRE in m units											
	TYRE car replacement tyres C1	m€	2536	3127	3104	3598	4058	4058	4058	4058	4058	4058
	TYRE van replacement tyres C2	m€	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
	TYRE truck replacement tyres C3	m€	832	818	692	707	725	729	732	732	731	728
	TRANSPORT SECTOR	**m€**	**4275**	**5062**	**4905**	**5590**	**6232**	**6237**	**6239**	**6240**	**6239**	**6236**
	GENERAL TOTAL (in m euro 2010)		**14673**	**30399**	**32571**	**36366**	**39413**	**41481**	**43566**	**45708**	**47879**	**50080**
	GENERAL TOTAL (in bn euro 2010)		15	30	33	36	39	41	44	46	48	50

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	**3.1**	**4.7**	**5.0**	**5.3**	**5.7**	**6.1**	**6.5**	**6.9**	**7.3**	**7.7**
SPACE COOLING	**0.2**	**1.2**	**1.7**	**2.0**	**2.1**	**2.1**	**2.2**	**2.2**	**2.2**	**2.3**
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	**1.5**	**9.1**	**9.8**	**11.4**	**12.7**	**13.8**	**14.9**	**16.0**	**17.1**	**18.2**
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	**0.8**	**1.6**	**1.7**	**1.9**	**1.9**	**2.0**	**2.0**	**2.1**	**2.1**	**2.2**
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	**15**	**30**	**33**	**36**	**39**	**41**	**44**	**46**	**48**	**50**

	REVENU WHOLESALE ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	520	632	1014	1167	1343	1326	1309	1291	1273	1255
	CH Central Heating combi, water heat [24 kW]	m€	369	644	985	1401	1527	1654	1780	1906	2031	2154
	TOTAL WATER HEATING	m€	889	1276	2000	2568	2870	2980	3088	3197	3304	3409
	CH Central Heating boiler, space heat [24 kW]	**m€**	1928	2806	4344	6087	8181	9425	10750	12157	13644	15213
	SFB Wood Manual [18 kW]	m€	108	65	63	43	24	21	19	16	14	13
	SFB Wood Direct Draft [20 kW]	m€	4	178	185	214	206	242	283	331	388	454
	SFB Coal [25 kW]	m€	40	18	2	2	2	2	1	1	1	1
	SFB Pellets [25 kW]	m€	0	44	69	69	70	75	83	92	101	112
	SFB Wood chips [160 kW]	m€	0	15	15	18	22	23	26	28	31	34
	Total Solid Fuel Boiler	**m€**	**152**	**319**	**335**	**346**	**325**	**363**	**412**	**469**	**536**	**614**
	CHAS (elec) [44 kW]	m€	39	161	188	214	236	260	285	309	334	359
	CHAL (elec) [714 kW]	m€	10	31	33	35	36	40	43	47	52	56
	Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	1	1	1	2	2	3	4	5	7
	CHWS [61 kW]	m€	5	21	23	25	28	31	34	38	41	45
	CHWL [894 kW]	m€	14	48	50	51	53	55	57	59	62	65
	Cheng (fossil), NCV [50 kW]	m€	0	0	1	1	2	2	2	3	3	4
	AC all [28 kW]	m€	48	277	385	378	360	363	351	338	325	312
1	o/w AC rooftop [80 kW]	m€	16	39	29	24	19	19	16	12	8	4
1	o/w AC splits [14 kW]	m€	21	84	99	93	87	91	89	87	83	80
1	o/w AC VRF [50 kW]	m€	12	154	257	261	254	252	246	240	234	229
	ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	1	1	2	3	3	4	4	5	6
	Total AHC Air Heating & Cooling, cooling	**m€**	**116**	**540**	**681**	**708**	**719**	**756**	**779**	**803**	**828**	**853**
1	AC all, rev [28 kW]	m€	15	192	301	322	330	349	352	354	343	331
1	o/w AC rooftop, rev [80 kW]	m€	5	27	23	20	17	18	15	12	8	4
1	o/w AC splits, rev [14 kW]	m€	6	58	78	80	82	90	92	93	90	87
1	o/w AC VRF, rev [50 kW]	m€	4	107	200	222	231	241	245	249	245	241
1	ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	1	1	2	2	3	4	5	6	7
	AHF all (fossil) [59 kW]	m€	50	38	48	53	50	47	44	41	38	35
1	o/w AHFS (fossil) [15 kW]	m€	6	1	1	1	1	0	0	0	0	0
1	o/w AHFL central (fossil) [120 kW]	m€	27	22	26	29	26	24	22	21	19	17
1	o/w AHFL local (fossil) [28.6 kW]	m€	16	15	22	24	23	22	22	20	19	18
	AH el [20 kW]	m€	1	2	1	1	1	1	0	0	0	0
	Total AHC Air Heating & Cooling, heating	**m€**	**51**	**40**	**50**	**55**	**52**	**48**	**44**	**41**	**38**	**35**
	LH open fireplace [8 kW]	m€	160	234	339	440	427	411	397	382	369	355
	LH closed fireplace/inset [8 kW]	m€	102	274	384	452	460	443	427	412	397	382
	LH wood stove [8 kW]	m€	110	129	167	184	184	176	170	163	161	161
	LH coal stove [8 kW]	m€	33	26	28	29	21	14	7	0	-6	-12
	LH cooker [10 kW]	m€	93	188	293	393	408	392	376	361	346	332
	LH SHR stove [8 kW]	m€	102	142	185	222	267	266	265	269	273	277
	LH pellet stove [8 kW]	m€	0	106	138	173	191	184	184	184	184	184
	LH open fire gas, NCV [4.2 kW]	m€	6	9	10	11	11	11	11	11	11	11
	LH closed fire gas, NCV [4.2 kW]	m€	30	33	36	39	39	38	38	39	40	41
	LH flueless fuel heater, NCV [1.5 kW]	m€	11	22	22	20	17	15	13	11	9	7
	LH elec.portable [1 kW]	m€	25	31	32	33	35	36	37	39	40	41
	LH elec.convector [1 kW]	m€	186	227	234	243	254	263	273	283	292	302
	LH elec.storage [2.75 kW]	m€	21	26	30	38	43	42	42	42	41	41
	LH elec.underfloor [0.62 kW]	m€	39	47	50	59	58	59	59	59	61	63
	LH luminous heaters [20 kW]	m€	2	3	4	5	5	5	5	5	4	4
	LH tube heaters [30 kW]	m€	2	2	8	10	10	10	10	9	9	9
	LH total	**m€**	**922**	**1498**	**1959**	**2351**	**2428**	**2366**	**2312**	**2266**	**2230**	**2197**
	RAC (cooling only & reversibles)	**m€**	**53**	**667**	**1117**	**1432**	**1581**	**1603**	**1590**	**1577**	**1563**	**1549**
1	o/w RAC rev. Heating	m€	15	495	983	1268	1397	1419	1408	1398	1387	1375
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**173**	**276**	**353**	**358**	**362**	**340**	**306**	**274**	**251**	**234**
	TOTAL SPACE HEATING	m€	3054	4663	6688	8838	10986	12201	13518	14933	16448	18060
	TOTAL SPACE COOLING	m€	169	1207	1798	2140	2300	2359	2370	2380	2391	2402
	NRVU avg (sales wt.)	**m€**	1260	2948	3095	3252	3431	3611	3791	3971	4150	4330
	RVU Central Unidir. VU (1 fan)	m€	148	332	497	453	475	496	514	532	547	562
	RVU Central Balanced VU (2 fans)	m€	17	116	418	520	565	608	646	682	715	745
	RVU Local Balanced VU (2 fans)	m€	1	15	33	54	76	98	120	142	164	185
	TOTAL VENTILATION (electricity)	m€	1426	3412	4044	4278	4548	4812	5071	5326	5576	5822
	LS Light Sources in Euro/unit											
	LFL	m€	225	327	246	212	112	74	54	33	12	4
	CFL	m€	13	142	57	26	1	1	1	1	1	1
	Tungsten	m€	25	185	210	48	3	1	1	1	1	1
	GLS	m€	72	30	2	3	2	2	2	2	2	2
	HID	m€	43	108	64	41	23	16	16	16	16	16
	LED ECO	m€	0	12	215	361	221	134	145	178	191	221
	TOTAL LIGHTING	m€	377	803	794	691	361	227	217	230	221	243

REVENU WHOLESALE ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	585	1346	261	0	0	0	0	0	0	0
DP TV LoNA	m€	0	184	653	818	714	584	443	303	162	21
DP TV Smart	m€	0	0	392	818	1071	1363	1673	1982	2291	2601
DP Monitor	m€	85	213	119	119	119	119	119	119	119	119
DP Total electronic DisPlays	**m€**	**670**	**1743**	**1426**	**1755**	**1904**	**2067**	**2235**	**2404**	**2572**	**2741**
SSTB	m€	0	331	75	0	0	0	0	0	0	0
CSTB	m€	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	m€	0	46	13	0	0	0	0	0	0	0
VIDEO projectors	m€	5	506	470	319	138	0	0	0	0	0
VIDEO game consoles	m€	0	319	215	220	245	245	245	245	245	245
Total VIDEO	**m€**	**5**	**872**	**698**	**539**	**383**	**245**	**245**	**245**	**245**	**245**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	166	553	413	375	375	375	375	375	375	375
PC Notebook	m€	18	1260	578	543	543	543	543	543	543	543
PC Tablet/slate	m€	0	85	1350	2194	2835	3375	3544	3713	3881	4050
PC Thin client	m€	10	120	120	120	120	120	120	120	120	120
PC Workstation	m€	46	460	460	460	460	460	460	460	460	460
Total PC, electricity	**m€**	**239**	**2478**	**2920**	**3691**	**4333**	**4873**	**5041**	**5210**	**5379**	**5548**
EP-Copier mono	m€	351	141	84	36	26	17	8	0	0	0
EP-Copier colour	m€	0	47	205	307	350	381	413	444	475	506
EP-printer mono	m€	71	67	59	48	41	37	31	26	21	16
EP-printer colour	m€	0	65	96	129	155	180	205	230	255	280
IJ SFD printer	m€	18	29	20	14	11	9	7	5	3	2
IJ MFD printer	m€	22	72	99	115	126	137	149	160	171	182
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**462**	**421**	**563**	**649**	**709**	**761**	**812**	**865**	**926**	**987**
SB Home Gateway, on-mode power	m€	0	1538	1983	2428	2873	3318	3763	4208	4653	5098
SB Home NAS, on-mode power	m€	0	140	240	340	440	540	640	740	840	940
SB Home Phones (fixed), on-mode power	m€	14	69	82	88	88	88	88	88	88	88
SB Office Phones (fixed), on-mode power	m€	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.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS	**m€**	**1506**	**9061**	**9797**	**11388**	**12660**	**13794**	**14882**	**15972**	**17069**	**18167**
RF Household refrigerator and freezer	**m€**	**221**	**279**	**304**	**315**	**322**	**325**	**340**	**328**	**317**	**306**
1 CF open vertical chilled multi deck (RCV2)	m€	70	112	125	139	153	166	180	194	208	222
1 CF open horizontal frozen island (RHF4)	m€	18	17	19	21	23	25	27	30	32	34
1 CF Plug in one door beverage cooler	m€	102	141	148	156	164	173	181	189	198	206
1 CF Plug in horizontal ice cream freezer	m€	38	58	61	64	68	71	75	78	82	85
1 CF Spiral vending machine	m€	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)	m€	71	92	96	99	104	109	114	119	123	128
PF Blast cabinet	m€	115	225	251	271	301	332	362	393	423	453
PF Walk-In Cold Room (WICR, avg)	m€	329	401	421	444	463	482	501	521	540	559
PF MT & LT industrial chillers (avg)	m€	50	95	100	104	115	126	137	148	159	170
Total PF Professional Refrigeration	**m€**	**565**	**813**		**919**	**984**	**1049**	**1114**	**1180**	**1245**	**1310**
TOTAL FOOD PRESERVATION	**m€**	**1069**	**1523**	**1648**	**1765**	**1891**	**2013**	**2147**	**2255**	**2363**	**2471**
COOK El. Hobs, Wh/ltr	m€	69	157	168	189	199	208	217	225	232	239
COOK El. Ovens, kWh/a	m€	151	179	191	215	208	201	202	205	207	210
COOK Gas Hobs, % efficiency NCV	m€	81	67	60	52	47	42	38	35	33	31
COOK Gas Ovens, kWh prim, NCV	m€	21	22	22	28	27	26	25	24	23	22
COOK Range Hoods, kWh elec	m€	37	45	47	61	72	72	73	73	73	73
Total CA Cooking Appliances		**358**	**469**	**488**	**545**	**552**	**549**	**554**	**561**	**568**	**575**
COFFEE Dripfilter (glass)	m€	16	11	9	7	7	6	6	6	5	5
COFFEE Dripfilter (thermos)	m€	2	3	3	3	3	4	4	4	4	4
COFFEE Dripfilter (full automatic)	m€	0	5	6	7	8	8	9	10	11	11
COFFEE Pad filter	m€	0	13	14	15	16	17	19	20	21	22
COFFEE Hard cap espresso	m€	2	7	14	21	22	22	22	22	22	22
COFFEE Semi-auto espresso	m€	2	2	2	2	2	2	1	1	1	1
COFFEE Fully-auto espresso	m€	10	12	14	15	17	19	21	23	25	27
Total CM household Coffee Makers	**m€**	**32**	**53**	**62**	**71**	**75**	**79**	**82**	**86**	**89**	**92**
TOTAL COOKING	**m€**	**390**	**522**	**551**	**617**	**627**	**628**	**636**	**646**	**657**	**667**

REVENU WHOLESALE ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WM Household Washing Machine	**m€**	**121**	**213**	**220**	**242**	**229**	**218**	**207**	**197**	**188**	**182**
DW Household Dishwasher	**m€**	**52**	**151**	**175**	**195**	**213**	**230**	**245**	**260**	**273**	**285**
LD Household Laundry Drier vented el.	m€	25	25	24	21	21	22	22	22	22	22
LD Household Laundry Drier condens el.	m€	14	52	66	79	80	79	77	75	73	72
LD Household Laundry Drier vented gas	m€	0	0	1	1	1	1	1	1	1	1
Total LD household Laundry Drier	**m€**	**39**	**78**	**90**	**101**	**102**	**101**	**99**	**97**	**95**	**95**
VC dom. Vacuum Cleaner	m€	118	349	505	612	657	719	781	843	905	967
VC nondom Vacuum Cleaner	m€	149	154	166	175	179	187	196	205	213	222
Total VC Vacuum Cleaner	**m€**	**267**	**503**	**670**	**787**	**836**	**907**	**977**	**1048**	**1118**	**1189**
TOTAL CLEANING	**m€**	**479**	**944**	**1155**	**1325**	**1380**	**1455**	**1529**	**1602**	**1674**	**1751**
0.5 FAN Axial<300Pa [247 W flow out]	m€	83	271	405	437	418	399	382	365	351	351
0.5 FAN Axial>300Pa [489 W fluid-dyn out]	m€	114	394	431	438	438	438	438	438	438	438
0.5 FAN Centr.FC [141 W flow out]	m€	71	180	267	289	276	264	252	240	235	235
0.5 FAN Centr.BC-free [2120 W flow out]	m€	40	99	137	147	155	151	147	147	150	152
0.5 FAN Centr.BC [2052 W flow out]	m€	88	235	376	405	431	420	442	460	477	490
0.5 FAN Cross-flow [31 W flow out]	m€	16	36	119	127	135	131	138	143	148	152
Total FAN, industrial (excl. box & roof fans)	**m€**	**206**	**608**	**867**	**922**	**926**	**902**	**899**	**897**	**899**	**909**
0.5 MT motor only	m€	374	623	973	1001	986	938	892	849	808	769
0.5 MT extra drive sales revenu	m€	0	0	441	438	417	396	377	359	341	325
0.5 MT Industrial motors, avg. 3 kW elec in [%]	**m€**	**374**	**623**	**1414**	**1439**	**1402**	**1334**	**1270**	**1208**	**1149**	**1094**
WP Water pumps (load) [%]	**m€**	**277**	**376**	**404**	**434**	**467**	**500**	**532**	**565**	**597**	**630**
TOTAL INDUSTRY COMPONENTS		670	1295	1978	2076	2095	2069	2066	2066	2071	2086
TRAFO Distribution, kWh/a	m€	47	74	98	105	112	121	129	138	146	155
TRAFO Industry oil	m€	24	39	64	69	74	80	86	91	97	102
TRAFO Industry dry	m€	12	18	27	29	31	33	35	37	40	42
TRAFO Power	m€	188	301	324	348	374	403	432	461	490	519
TRAFO DER oil	m€	0	2	6	10	16	27	39	52	65	78
TRAFO DER dry	m€	0	13	29	47	78	129	190	251	313	374
TRAFO Small	m€	5	5	5	5	5	5	5	5	5	5
TOTAL ENERGY SECTOR	**m€**	**276**	**453**	**552**	**613**	**691**	**797**	**916**	**1036**	**1155**	**1275**
TYRE in m units											
TYRE car replacement tyres C1	m€	2536	3127	3104	3601	4124	4172	4058	4058	4058	4058
TYRE van replacement tyres C2	m€	906	1117	1109	1286	1450	1450	1450	1450	1450	1450
TYRE truck replacement tyres C3	m€	832	818	738	840	934	1006	957	910	866	824
TRANSPORT SECTOR	**m€**	**4275**	**5062**	**4951**	**5727**	**6509**	**6627**	**6464**	**6418**	**6374**	**6332**
GENERAL TOTAL (in m euro 2010)		**14581**	**30220**	**35956**	**42026**	**46919**	**49962**	**52905**	**56059**	**59303**	**62685**
GENERAL TOTAL (in bn euro 2010)		15	30	36	42	47	50	53	56	59	63

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	3.1	4.7	6.7	8.8	11.0	12.2	13.5	14.9	16.4	18.1
SPACE COOLING	0.2	1.2	1.8	2.1	2.3	2.4	2.4	2.4	2.4	2.4
VENTILATION	1.4	3.4	4.0	4.3	4.5	4.8	5.1	5.3	5.6	5.8
LIGHTING	0.4	0.8	0.8	0.7	0.4	0.2	0.2	0.2	0.2	0.2
ELECTRONICS	1.5	9.1	9.8	11.4	12.7	13.8	14.9	16.0	17.1	18.2
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	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
CLEANING	0.5	0.9	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.8
INDUSTRY COMPONENTS	0.7	1.3	2.0	2.1	2.1	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	**15**	**30**	**36**	**42**	**47**	**50**	**53**	**56**	**59**	**63**

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	-	-	1.6	3.5	5.3	6.1	7.0	8.1	9.2	10.4
SPACE COOLING	-	-	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1
VENTILATION	-	-	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3
LIGHTING	-	0.0	0.0	- 0.1	- 0.4	- 0.4	- 0.3	- 0.3	- 0.3	- 0.2
ELECTRONICS	-	-	0.0	-	-	-	-	-	-	-
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	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	- 0.1	- 0.3	0.2	0.2	0.1	0.1	0.0	- 0.0	- 0.1	- 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	**-0.1**	**-0.2**	**3.4**	**5.7**	**7.5**	**8.5**	**9.3**	**10.4**	**11.4**	**12.6**

INSTALL excl. VAT BAU (in m euro 2010)		unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	m€	1376	1674	1655	1781	1975	1992	1966	1939	1912	1885
	CH Central Heating combi, water heat [24 kW]	m€	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]	**m€**	5693	8283	8855	9426	10349	11273	12196	13119	14043	14966
	SFB Wood Manual [18 kW]	m€	286	172	111	63	36	32	29	26	24	22
	SFB Wood Direct Draft [20 kW]	m€	6	282	287	293	261	317	386	469	571	695
	SFB Coal [25 kW]	m€	80	35	4	4	3	3	3	3	2	2
	SFB Pellets [25 kW]	m€	0	80	124	124	124	137	152	167	185	204
	SFB Wood chips [160 kW]	m€	0	18	18	21	25	27	30	33	36	40
	Total Solid Fuel Boiler	**m€**	**372**	**587**	**545**	**505**	**449**	**517**	**599**	**699**	**818**	**963**
	CHAS (elec) [44 kW]	m€	142	592	652	730	796	877	957	1038	1118	1199
	CHAL (elec) [714 kW]	m€	35	115	119	122	126	130	134	138	143	147
	Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	2	3	5	6	8	10	11	13	14
	CHWS [61 kW]	m€	12	50	55	61	67	73	80	87	93	100
	CHWL [894 kW]	m€	21	70	73	75	78	81	83	86	89	92
	Cheng (fossil), NCV [50 kW]	m€	0	2	3	4	5	7	8	9	11	12
	AC all [28 kW]	m€	275	1577	2071	2039	1953	1953	1874	1796	1717	1638
1	o/w AC rooftop [80 kW]	m€	114	284	214	173	143	143	114	85	56	27
1	o/w AC splits [14 kW]	m€	89	363	412	391	365	365	342	318	294	270
1	o/w AC VRF [50 kW]	m€	72	931	1445	1475	1445	1445	1419	1393	1367	1341
	ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	5	8	11	15	19	23	27	31	34
	Total AHC Air Heating & Cooling, cooling	**m€**	**486**	**2413**	**2983**	**3047**	**3047**	**3148**	**3170**	**3192**	**3214**	**3236**
1	AC all, rev [28 kW]	m€	85	1091	1602	1715	1747	1823	1812	1796	1717	1638
1	o/w AC rooftop, rev [80 kW]	m€	35	196	165	146	128	133	110	85	56	27
1	o/w AC splits, rev [14 kW]	m€	27	251	320	329	327	341	330	318	294	270
1	o/w AC VRF, rev [50 kW]	m€	22	644	1117	1241	1292	1348	1372	1393	1367	1341
1	ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	3	6	10	14	19	23	27	31	34
	AHF all (fossil) [59 kW]	m€	347	265	252	243	233	222	212	201	191	180
1	o/w AHFS (fossil) [15 kW]	m€	49	8	6	4	3	2	1	0	0	0
1	o/w AHFL central (fossil) [120 kW]	m€	149	121	115	111	105	99	94	88	81	75
1	o/w AHFL local (fossil) [28.6 kW]	m€	149	135	132	128	125	122	118	113	109	105
	AH el [20 kW]	m€	1	3	3	3	3	1	0	0	0	0
	Total AHC Air Heating & Cooling, heating	**m€**	**348**	**267**	**255**	**246**	**236**	**224**	**212**	**201**	**191**	**180**
	LH open fireplace [8 kW]	m€	300	438	452	443	438	438	438	438	438	438
	LH closed fireplace/inset [8 kW]	m€	184	496	581	611	627	627	627	627	627	627
	LH wood stove [8 kW]	m€	142	167	188	203	208	208	208	208	208	208
	LH coal stove [8 kW]	m€	65	50	46	42	31	21	10	0	-10	-21
	LH cooker [10 kW]	m€	104	208	270	295	310	310	310	310	310	310
	LH SHR stove [8 kW]	m€	895	1250	1525	1854	2254	2292	2329	2367	2404	2442
	LH pellet stove [8 kW]	m€	0	96	125	146	167	167	167	167	167	167
	LH open fire gas, NCV [4.2 kW]	m€	13	19	21	23	23	23	23	23	23	23
	LH closed fire gas, NCV [4.2 kW]	m€	67	76	78	80	82	84	86	89	91	93
	LH flueless fuel heater, NCV [1.5 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.portable [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
	LH elec.convector [1 kW]	m€	233	284	292	302	317	329	341	353	365	378
	LH elec.storage [2.75 kW]	m€	18	22	23	23	25	26	26	27	28	29
	LH elec.underfloor [0.62 kW]	m€	138	168	173	179	188	195	202	209	216	223
	LH luminous heaters [20 kW]	m€	5	6	9	11	10	10	9	9	9	8
	LH tube heaters [30 kW]	m€	5	6	18	23	22	21	20	20	19	18
	LH total	**m€**	**2168**	**3285**	**3801**	**4234**	**4701**	**4749**	**4797**	**4846**	**4894**	**4942**
	RAC (cooling only & reversibles)	**m€**	**285**	**3556**	**5505**	**6897**	**7514**	**7592**	**7619**	**7749**	**7880**	**8010**
1	o/w RAC rev. Heating	m€	80	2641	4858	6112	6672	6749	6756	6877	6998	7120
1	**CIRC Circulator pumps <2.5 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING		**8581**	**12423**	**13455**	**14411**	**15735**	**16763**	**17805**	**18865**	**19946**	**21051**
	TOTAL SPACE COOLING		**771**	**5970**	**8487**	**9944**	**10561**	**10740**	**10789**	**10942**	**11094**	**11246**
	NRVU avg (sales wt.)	**m€**	17034	39853	41688	43950	46379	48809	51238	53668	56097	58526
	RVU Central Unidir. VU (1 fan)	m€	478	1073	923	841	883	921	975	1039	1103	1167
	RVU Central Balanced VU (2 fans)	m€	46	321	780	1002	1126	1250	1374	1498	1622	1746
	RVU Local Balanced VU (2 fans)	m€	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	m€	0	0	0	0	0	0	0	0	0	0
	CFL	m€	0	0	0	0	0	0	0	0	0	0
	Tungsten	m€	0	0	0	0	0	0	0	0	0	0
	GLS	m€	0	0	0	0	0	0	0	0	0	0
	HID	m€	0	0	0	0	0	0	0	0	0	0
	LED BAU	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL LIGHTING	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

INSTALL excl. VAT BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	0	0	0	0	0	0	0	0	0	0
DP TV LoNA	m€	0	0	0	0	0	0	0	0	0	0
DP TV Smart	m€	0	0	0	0	0	0	0	0	0	0
DP Monitor	m€	0	0	0	0	0	0	0	0	0	0
DP Total electronic DisPlays	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SSTB	m€	0	0	0	0	0	0	0	0	0	0
CSTB	m€	0	0	0	0	0	0	0	0	0	0
Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
VIDEO players/recorders	m€	0	0	0	0	0	0	0	0	0	0
VIDEO projectors	m€	0	0	0	0	0	0	0	0	0	0
VIDEO game consoles	m€	0	0	0	0	0	0	0	0	0	0
Total VIDEO	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	0	0	0	0	0	0	0	0	0	0
PC Notebook	m€	0	0	0	0	0	0	0	0	0	0
PC Tablet/slate	m€	0	0	0	0	0	0	0	0	0	0
PC Thin client	m€	0	0	0	0	0	0	0	0	0	0
PC Workstation	m€	0	0	0	0	0	0	0	0	0	0
Total PC, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
EP-Copier mono	m€	0	0	0	0	0	0	0	0	0	0
EP-Copier colour	m€	0	0	0	0	0	0	0	0	0	0
EP-printer mono	m€	0	0	0	0	0	0	0	0	0	0
EP-printer colour	m€	0	0	0	0	0	0	0	0	0	0
IJ SFD printer	m€	0	0	0	0	0	0	0	0	0	0
IJ MFD printer	m€	0	0	0	0	0	0	0	0	0	0
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SB Home Gateway, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Home NAS, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Home Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Office Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BC_EPS Mobile phones etc.	m€	na	na	na	na	na	na	na	na	na	na
TOTAL ELECTRONICS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RF Household refrigerator and freezer	**m€**	0	0	0	0	0	0	0	0	0	0
1 CF open vertical chilled multi deck (RCV2)	m€	35	56	63	69	76	83	90	97	104	111
1 CF open horizontal frozen island (RHF4)	m€	9	8	9	11	12	13	14	15	16	17
1 CF Plug in one door beverage cooler	m€	0	0	0	0	0	0	0	0	0	0
1 CF Plug in horizontal ice cream freezer	m€	0	0	0	0	0	0	0	0	0	0
1 CF Spiral vending machine	m€	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)	m€	0	0	0	0	0	0	0	0	0	0
PF Blast cabinet	m€	0	0	0	0	0	0	0	0	0	0
PF Walk-In Cold Room (WICR, avg)	m€	0	0	0	0	0	0	0	0	0	0
PF MT & LT industrial chillers (avg)	m€	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration	**m€**	**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	m€	0	0	0	0	0	0	0	0	0	0
COOK El. Ovens, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
COOK Gas Hobs, % efficiency NCV	m€	0	0	0	0	0	0	0	0	0	0
COOK Gas Ovens, kWh prim, NCV	m€	0	0	0	0	0	0	0	0	0	0
COOK Range Hoods, kWh elec	m€	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
COFFEE Dripfilter (glass)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (thermos)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Pad filter	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Hard cap espresso	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Semi-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Fully-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL COOKING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	INSTALL excl. VAT BAU (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD Household Laundry Drier vented el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	m€	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.5	FAN Axial<300Pa [247 W flow out]	m€	40	131	150	170	170	170	170	170	170	170
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	41	143	151	159	159	159	159	159	159	159
0.5	FAN Centr.FC [141 W flow out]	m€	20	52	60	68	68	68	68	68	68	68
0.5	FAN Centr.BC-free [2120 W flow out]	m€	18	43	49	55	60	62	63	64	65	66
0.5	FAN Centr.BC [2052 W flow out]	m€	38	102	117	132	147	150	165	180	195	210
0.5	FAN Cross-flow [31 W flow out]	m€	6	13	15	17	19	19	21	23	25	26
	Total FAN, industrial (excl. box & roof fans)	**m€**	**82**	**242**	**271**	**300**	**311**	**313**	**322**	**331**	**340**	**349**
0.5	MT motor only		0	0	0	0	0	0	0	0	0	0
0.5	MT extra drive installation revenu		0	0	0	0	0	0	0	0	0	0
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**m€**	**552**	**750**	**806**	**866**	**931**	**996**	**1061**	**1126**	**1191**	**1256**
	TOTAL INDUSTRY COMPONENTS		634	992	1077	1166	1243	1310	1384	1458	1532	1606
	TRAFO Distribution, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE in m units											
	TYRE car replacement tyres C1	m€	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	m€	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	m€	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euro 2010)		**30083**	**64322**	**70254**	**75537**	**80430**	**84393**	**88234**	**92265**	**96316**	**100391**
	GENERAL TOTAL (in bn euro 2010)		30	64	70	76	80	84	88	92	96	100

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	**8.6**	**12.4**	**13.5**	**14.4**	**15.7**	**16.8**	**17.8**	**18.9**	**19.9**	**21.1**
SPACE COOLING	**0.8**	**6.0**	**8.5**	**9.9**	**10.6**	**10.7**	**10.8**	**10.9**	**11.1**	**11.2**
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	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
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	**0.6**	**1.0**	**1.1**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**	**1.5**	**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**	**64**	**70**	**76**	**80**	**84**	**88**	**92**	**96**	**100**

INSTALL excl. VAT ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WH dedicated Water Heater	m€	1376	1674	2686	3091	3557	3512	3465	3419	3371	3323
CH Central Heating combi, water heat [24 kW]	m€	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]	**m€**	5693	8283	12824	17968	24151	27823	31735	35887	40279	44911
SFB Wood Manual [18 kW]	m€	286	172	168	113	65	57	50	43	38	33
SFB Wood Direct Draft [20 kW]	m€	6	282	295	340	328	384	450	527	617	722
SFB Coal [25 kW]	m€	80	35	4	4	3	3	3	3	2	2
SFB Pellets [25 kW]	m€	0	80	126	126	129	137	152	167	185	204
SFB Wood chips [160 kW]	m€	0	18	18	22	26	27	30	33	36	40
Total Solid Fuel Boiler	**m€**	**372**	**587**	**610**	**605**	**550**	**608**	**684**	**773**	**878**	**1001**
CHAS (elec) [44 kW]	m€	142	592	690	786	870	958	1048	1137	1228	1320
CHAL (elec) [714 kW]	m€	35	115	121	128	132	146	160	174	190	205
Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	2	3	5	6	8	12	16	20	25
CHWS [61 kW]	m€	12	50	55	61	67	74	82	90	99	107
CHWL [894 kW]	m€	21	70	73	75	78	81	83	86	91	96
Cheng (fossil), NCV [50 kW]	m€	0	2	3	4	6	7	9	11	13	14
AC all [28 kW]	m€	275	1577	2190	2151	2047	2054	1980	1904	1827	1749
1 o/w AC rooftop [80 kW]	m€	114	284	216	173	143	143	114	85	56	27
1 o/w AC splits [14 kW]	m€	89	363	427	402	373	392	384	373	359	344
1 o/w AC VRF [50 kW]	m€	72	931	1547	1575	1531	1520	1482	1446	1412	1378
ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	5	8	11	15	19	23	27	31	34
Total AHC Air Heating & Cooling, cooling	**m€**	**486**	**2413**	**3142**	**3221**	**3221**	**3348**	**3397**	**3446**	**3498**	**3551**
1 AC all, rev [28 kW]	m€	85	1091	1711	1827	1871	1973	1983	1987	1920	1850
1 o/w AC rooftop, rev [80 kW]	m€	35	196	168	146	128	133	110	85	56	27
1 o/w AC splits, rev [14 kW]	m€	27	251	337	343	352	389	397	401	389	373
1 o/w AC VRF, rev [50 kW]	m€	22	644	1206	1337	1391	1451	1477	1501	1475	1450
1 ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	3	6	10	15	20	25	30	35	39
AHF all (fossil) [59 kW]	m€	347	265	345	380	359	338	317	296	275	255
1 o/w AHFS (fossil) [15 kW]	m€	49	8	8	6	4	3	1	0	0	0
1 o/w AHFL central (fossil) [120 kW]	m€	149	121	141	157	145	133	122	112	103	93
1 o/w AHFL local (fossil) [28.6 kW]	m€	149	135	197	217	210	202	194	184	173	162
AH el [20 kW]	m€	1	3	3	3	3	1	0	0	0	0
Total AHC Air Heating & Cooling, heating	**m€**	**348**	**267**	**348**	**382**	**361**	**339**	**317**	**296**	**275**	**255**
LH open fireplace [8 kW]	m€	300	438	634	823	798	769	742	715	689	664
LH closed fireplace/inset [8 kW]	m€	184	496	694	817	831	801	772	744	717	691
LH wood stove [8 kW]	m€	142	167	215	238	237	228	219	210	208	208
LH coal stove [8 kW]	m€	65	50	55	56	41	27	13	0	-12	-23
LH cooker [10 kW]	m€	104	208	325	436	453	435	417	400	384	369
LH SHR stove [8 kW]	m€	895	1250	1629	1959	2349	2344	2339	2367	2404	2442
LH pellet stove [8 kW]	m€	0	96	125	157	173	167	167	167	167	167
LH open fire gas, NCV [4.2 kW]	m€	13	19	22	24	23	23	23	23	23	23
LH closed fire gas, NCV [4.2 kW]	m€	67	76	82	88	88	87	86	89	91	93
LH flueless fuel heater, NCV [1.5 kW]	m€	0	0	0	0	0	0	0	0	0	0
LH elec.portable [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
LH elec.convector [1 kW]	m€	233	284	292	304	317	329	341	353	365	378
LH elec.storage [2.75 kW]	m€	18	22	25	32	36	36	36	35	35	35
LH elec.underfloor [0.62 kW]	m€	138	168	179	210	208	209	210	212	216	223
LH luminous heaters [20 kW]	m€	5	6	10	12	12	12	11	11	10	10
LH tube heaters [30 kW]	m€	5	6	18	25	25	24	23	22	21	21
LH total	**m€**	**2168**	**3285**	**4306**	**5180**	**5592**	**5490**	**5399**	**5348**	**5319**	**5299**
RAC (cooling only & reversibles)	**m€**	**285**	**3556**	**5955**	**7638**	**8432**	**8550**	**8481**	**8410**	**8337**	**8262**
1 o/w RAC rev. Heating	m€	80	2641	5244	6762	7451	7565	7511	7454	7395	7334
1 **CIRC Circulator pumps <2.5 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL SPACE HEATING		8581	12423	18087	24136	30654	34260	38135	42304	46752	51467
TOTAL SPACE COOLING		771	5970	9097	10859	11653	11898	11877	11855	11834	11813
NRVU avg (sales wt.)	**m€**	17034	39853	41838	43950	46379	48809	51238	53668	56097	58526
RVU Central Unidir. VU (1 fan)	m€	478	1073	1605	1463	1536	1602	1663	1719	1770	1816
RVU Central Balanced VU (2 fans)	m€	46	321	1154	1434	1559	1676	1783	1881	1972	2054
RVU Local Balanced VU (2 fans)	m€	1	6	14	23	32	42	51	60	70	79
TOTAL VENTILATION (electricity)		17559	41252	44612	46870	49507	52128	54735	57328	59908	62476
LS Light Sources in Euro/unit											
LFL	m€	0	0	0	0	0	0	0	0	0	0
CFL	m€	0	0	0	0	0	0	0	0	0	0
Tungsten	m€	0	0	0	0	0	0	0	0	0	0
GLS	m€	0	0	0	0	0	0	0	0	0	0
HID	m€	0	0	0	0	0	0	0	0	0	0
LED ECO	m€	0	0	0	0	0	0	0	0	0	0
TOTAL LIGHTING	m€	0	0	0	0	0	0	0	0	0	0

INSTALL excl. VAT ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	0	0	0	0	0	0	0	0	0	0
DP TV LoNA	m€	0	0	0	0	0	0	0	0	0	0
DP TV Smart	m€	0	0	0	0	0	0	0	0	0	0
DP Monitor	m€	0	0	0	0	0	0	0	0	0	0
DP Total electronic DisPlays	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SSTB	m€	0	0	0	0	0	0	0	0	0	0
CSTB	m€	0	0	0	0	0	0	0	0	0	0
Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
VIDEO players/recorders	m€	0	0	0	0	0	0	0	0	0	0
VIDEO projectors	m€	0	0	0	0	0	0	0	0	0	0
VIDEO game consoles	m€	0	0	0	0	0	0	0	0	0	0
Total VIDEO	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	0	0	0	0	0	0	0	0	0	0
PC Notebook	m€	0	0	0	0	0	0	0	0	0	0
PC Tablet/slate	m€	0	0	0	0	0	0	0	0	0	0
PC Thin client	m€	0	0	0	0	0	0	0	0	0	0
PC Workstation	m€	0	0	0	0	0	0	0	0	0	0
Total PC, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
EP-Copier mono	m€	0	0	0	0	0	0	0	0	0	0
EP-Copier colour	m€	0	0	0	0	0	0	0	0	0	0
EP-printer mono	m€	0	0	0	0	0	0	0	0	0	0
EP-printer colour	m€	0	0	0	0	0	0	0	0	0	0
IJ SFD printer	m€	0	0	0	0	0	0	0	0	0	0
IJ MFD printer	m€	0	0	0	0	0	0	0	0	0	0
paper (2.5 euro/kg paper (6.25 euro/pack)	m€										
Total imaging equipment, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SB Home Gateway, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Home NAS, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Home Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Office Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BC_EPS Mobile phones etc.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RF Household refrigerator and freezer	**m€**	0	0	0	0	0	0	0	0	0	0
1 CF open vertical chilled multi deck (RCV2)	m€	35	56	63	69	76	83	90	97	104	111
1 CF open horizontal frozen island (RHF4)	m€	9	8	9	11	12	13	14	15	16	17
1 CF Plug in one door beverage cooler	m€	0	0	0	0	0	0	0	0	0	0
1 CF Plug in horizontal ice cream freezer	m€	0	0	0	0	0	0	0	0	0	0
1 CF Spiral vending machine	m€	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)	m€	0	0	0	0	0	0	0	0	0	0
PF Blast cabinet	m€	0	0	0	0	0	0	0	0	0	0
PF Walk-In Cold Room (WICR, avg)	m€	0	0	0	0	0	0	0	0	0	0
PF MT & LT industrial chillers (avg)	m€	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration	**m€**	**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	m€	0	0	0	0	0	0	0	0	0	0
COOK El. Ovens, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
COOK Gas Hobs, % efficiency NCV	m€	0	0	0	0	0	0	0	0	0	0
COOK Gas Ovens, kWh prim, NCV	m€	0	0	0	0	0	0	0	0	0	0
COOK Range Hoods, kWh elec	m€	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
COFFEE Dripfilter (glass)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (thermos)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Pad filter	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Hard cap espresso	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Semi-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Fully-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL COOKING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

INSTALL excl. VAT ECO (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WM Household Washing Machine	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
DW Household Dishwasher	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
LD Household Laundry Drier vented el.	m€	0	0	0	0	0	0	0	0	0	0
LD Household Laundry Drier condens el.	m€	0	0	0	0	0	0	0	0	0	0
LD Household Laundry Drier vented gas	m€	0	0	0	0	0	0	0	0	0	0
Total LD household Laundry Drier	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	m€										
VC dom. Vacuum Cleaner		0	0	0	0	0	0	0	0	0	0
VC nondom Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
Total VC Vacuum Cleaner	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.5 FAN Axial<300Pa [247 W flow out]	m€	40	131	195	211	202	193	184	176	170	170
0.5 FAN Axial>300Pa [489 W fluid-dyn out]	m€	41	143	156	159	159	159	159	159	159	159
0.5 FAN Centr.FC [141 W flow out]	m€	20	52	78	84	80	76	73	70	68	68
0.5 FAN Centr.BC-free [2120 W flow out]	m€	18	43	60	64	67	66	64	64	65	66
0.5 FAN Centr.BC [2052 W flow out]	m€	38	102	164	176	187	183	192	200	207	213
0.5 FAN Cross-flow [31 W flow out]	m€	6	13	43	46	49	48	50	52	53	55
Total FAN, industrial (excl. box & roof fans)	**m€**	**82**	**242**	**348**	**370**	**372**	**362**	**361**	**360**	**361**	**365**
0.5 MT motor only	m€	0	0	0	0	0	0	0	0	0	0
0.5 MT extra drive installation revenu	m€	0	0	1150	1142	1087	1034	984	936	891	847
0.5 MT Industrial motors, avg. 3 kW elec in [%]	**m€**	**0**	**0**	**1150**	**1142**	**1087**	**1034**	**984**	**936**	**891**	**847**
WP Water pumps (load) [%]	**m€**	**552**	**750**	**806**	**866**	**931**	**996**	**1061**	**1126**	**1191**	**1256**
TOTAL INDUSTRY COMPONENTS		634	992	1729	1807	1847	1875	1914	1955	1998	2045
TRAFO Distribution, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
TRAFO Industry oil	m€	0	0	0	0	0	0	0	0	0	0
TRAFO Industry dry	m€	0	0	0	0	0	0	0	0	0	0
TRAFO Power	m€	0	0	0	0	0	0	0	0	0	0
TRAFO DER oil	m€	0	0	0	0	0	0	0	0	0	0
TRAFO DER dry	m€	0	0	0	0	0	0	0	0	0	0
TRAFO Small	m€	0	0	0	0	0	0	0	0	0	0
TOTAL ENERGY SECTOR	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TYRE in m units											
TYRE car replacement tyres C1	m€	0	0	0	0	0	0	0	0	0	0
TYRE van replacement tyres C2	m€	0	0	0	0	0	0	0	0	0	0
TYRE truck replacement tyres C3	m€	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
GENERAL TOTAL (in m euro 2010)		**30083**	**64323**	**79264**	**91082**	**101925**	**108771**	**115614**	**122737**	**130126**	**137768**
GENERAL TOTAL (in bn euro 2010)		30	64	79	91	102	109	116	123	130	138

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	**8.6**	**12.4**	**18.1**	**24.1**	**30.7**	**34.3**	**38.1**	**42.3**	**46.8**	**51.5**
SPACE COOLING	**0.8**	**6.0**	**9.1**	**10.9**	**11.7**	**11.9**	**11.9**	**11.9**	**11.8**	**11.8**
VENTILATION	**17.6**	**41.3**	**44.6**	**46.9**	**49.5**	**52.1**	**54.7**	**57.3**	**59.9**	**62.5**
LIGHTING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ELECTRONICS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
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	**0.6**	**1.0**	**1.7**	**1.8**	**1.8**	**1.9**	**1.9**	**2.0**	**2.0**	**2.0**
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**	**64**	**79**	**91**	**102**	**109**	**116**	**123**	**130**	**138**

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	-	-	**4.6**	**9.7**	**14.9**	**17.5**	**20.3**	**23.4**	**26.8**	**30.4**
SPACE COOLING	-	-	**0.6**	**0.9**	**1.1**	**1.2**	**1.1**	**0.9**	**0.7**	**0.6**
VENTILATION	-	-	**1.2**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.0**	**1.0**
LIGHTING	-	-	-	-	-	-	-	-	-	-
ELECTRONICS	-	-	-	-	-	-	-	-	-	-
FOOD PRESERVATION	-	-	-	-	-	-	-	-	-	-
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	-	-	-	-	-	-	-	-	-	-
INDUSTRY COMPONENTS	-	0.0	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euro 2010	**0**	**0**	**9**	**16**	**21**	**24**	**27**	**30**	**34**	**37**

MAINTENANCE excl. VAT (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WH dedicated Water Heater	m€	5073	5887	6053	6183	6313	6447	6581	6716	6850	6984
CH Central Heating combi, water heat [24 kW]	m€	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]	**m€**	12059	19346	20874	22364	23939	25842	28016	30417	32849	35281
SFB Wood Manual [18 kW]	m€	270	119	102	82	59	38	25	19	16	15
SFB Wood Direct Draft [20 kW]	m€	3	42	85	126	159	165	176	200	241	293
SFB Coal [25 kW]	m€	78	33	25	16	9	4	2	2	2	1
SFB Pellets [25 kW]	m€	0	12	23	34	44	52	56	60	66	72
SFB Wood chips [160 kW]	m€	0	4	6	7	7	7	8	9	9	10
Total Solid Fuel Boiler	**m€**	**351**	**210**	**239**	**265**	**278**	**266**	**267**	**289**	**334**	**393**
CHAS (elec) [44 kW]	m€	393	1249	1594	1901	2142	2353	2592	2845	3106	3369
CHAL (elec) [714 kW]	m€	109	268	325	367	389	399	412	425	438	452
Chsorp (fossil, efficiency NCV) [50 kW]	m€	0	2	4	7	11	15	19	24	29	34
CHWS [61 kW]	m€	33	106	135	161	181	198	217	238	259	281
CHWL [894 kW]	m€	65	162	198	224	238	246	254	263	272	281
Cheng (fossil), NCV [50 kW]	m€	0	2	3	5	8	11	14	17	20	23
AC all [28 kW]	m€	122	1848	2445	2976	3294	3336	3247	3159	3029	2899
1 o/w AC rooftop [80 kW]	m€	38	422	404	345	277	235	205	178	137	96
1 o/w AC splits [14 kW]	m€	44	582	688	759	780	765	732	700	652	605
1 o/w AC VRF [50 kW]	m€	40	845	1353	1872	2236	2337	2309	2281	2239	2198
ACF (AC/ HP eng), fossil, NCV [50 kW]	m€	0	4	7	11	16	22	28	34	40	46
Total AHC Air Heating & Cooling, cooling	**m€**	**723**	**3641**	**4710**	**5651**	**6277**	**6579**	**6783**	**7005**	**7194**	**7385**
1 AC all, rev [28 kW]	m€	33	1067	1639	2227	2674	2898	2970	3007	2966	2885
1 o/w AC rooftop, rev [80 kW]	m€	11	236	260	250	221	203	187	169	133	95
1 o/w AC splits, rev [14 kW]	m€	12	332	456	563	632	664	669	666	639	602
1 o/w AC VRF, rev [50 kW]	m€	10	499	923	1414	1821	2031	2113	2173	2194	2188
1 ACF (AC/ HP eng), rev , fossil [50 kW]	m€	0	2	5	8	13	19	26	33	40	46
AHF all (fossil) [59 kW]	m€	888	696	650	610	572	538	507	478	450	424
1 o/w AHFS (fossil) [15 kW]	m€	180	49	32	22	15	11	7	4	1	0
1 o/w AHFL central (fossil) [120 kW]	m€	427	384	362	338	314	291	270	251	233	216
1 o/w AHFL local (fossil) [28.6 kW]	m€	281	262	256	249	243	237	230	223	216	208
AH el [20 kW]	m€	5	12	10	7	7	6	3	1	0	0
Total AHC Air Heating & Cooling, heating	**m€**	**893**	**708**	**660**	**617**	**579**	**544**	**510**	**478**	**450**	**424**
LH open fireplace [8 kW]	m€	145	211	230	245	256	262	264	263	262	262
LH closed fireplace/inset [8 kW]	m€	72	195	246	297	343	380	403	414	418	418
LH wood stove [8 kW]	m€	103	122	128	136	145	153	161	165	167	167
LH coal stove [8 kW]	m€	71	46	43	40	37	32	27	20	12	3
LH cooker [10 kW]	m€	140	282	343	412	474	510	525	528	528	528
LH SHR stove [8 kW]	m€	56	78	87	99	115	133	150	164	174	179
LH pellet stove [8 kW]	m€	0	53	81	110	135	153	162	165	165	165
LH open fire gas, NCV [4.2 kW]	m€	18	28	31	33	36	38	39	39	39	39
LH closed fire gas, NCV [4.2 kW]	m€	109	124	127	131	135	138	142	145	149	153
LH flueless fuel heater, NCV [1.5 kW]	m€	20	40	44	42	38	33	29	25	20	16
LH elec.portable [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
LH elec.convector [1 kW]	m€	0	0	0	0	0	0	0	0	0	0
LH elec.storage [2.75 kW]	m€	47	58	60	63	65	68	71	73	76	79
LH elec.underfloor [0.62 kW]	m€	0	0	0	0	0	0	0	0	0	0
LH luminous heaters [20 kW]	m€	28	34	35	36	36	36	36	36	36	36
LH tube heaters [30 kW]	m€	27	33	35	36	36	36	36	36	36	36
LH total	**m€**	**836**	**1303**	**1490**	**1680**	**1851**	**1974**	**2044**	**2074**	**2083**	**2082**
RAC (cooling only & reversibles)	**m€**	**83**	**870**	**1150**	**1451**	**1840**	**2071**	**2172**	**2219**	**2258**	**2296**
1 o/w RAC rev. Heating	m€	23	503	817	1206	1614	1833	1925	1968	2003	2039
1 **CIRC Circulator pumps <2.5 kW**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL SPACE HEATING		14139	21568	23263	24927	26648	28626	30838	33259	35716	38180
TOTAL SPACE COOLING		807	4511	5861	7101	8117	8650	8956	9225	9451	9680
NRVU avg (sales wt.)	m€	820	2711	3151	3515	3796	4005	4218	4434	4650	4867
RVU Central Unidir. VU (1 fan)	m€	128	253	285	279	267	264	276	296	316	337
RVU Central Balanced VU (2 fans)	m€	6	85	169	298	439	565	647	716	785	853
RVU Local Balanced VU (2 fans)	m€	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	m€	0	0	0	0	0	0	0	0	0	0
CFL	m€	0	0	0	0	0	0	0	0	0	0
Tungsten	m€	0	0	0	0	0	0	0	0	0	0
GLS	m€	0	0	0	0	0	0	0	0	0	0
HID	m€	0	0	0	0	0	0	0	0	0	0
LED	m€	0	0	0	0	0	0	0	0	0	0
TOTAL LIGHTING	m€	0	0	0	0	0	0	0	0	0	0

MAINTENANCE excl. VAT (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV standard	m€	0	0	0	0	0	0	0	0	0	0
DP TV LoNA	m€	0	0	0	0	0	0	0	0	0	0
DP TV Smart	m€	0	0	0	0	0	0	0	0	0	0
DP Monitor	m€	0	0	0	0	0	0	0	0	0	0
DP Total electronic DisPlays	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SSTB	m€	0	0	0	0	0	0	0	0	0	0
CSTB	m€	0	0	0	0	0	0	0	0	0	0
Total STB set top boxes (Complex & Simple)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
VIDEO players/recorders	m€	0	0	0	0	0	0	0	0	0	0
VIDEO projectors	m€	0	0	0	0	0	0	0	0	0	0
VIDEO game consoles	m€	0	0	0	0	0	0	0	0	0	0
Total VIDEO	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CS Computer Servers	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
PC Desktop	m€	0	0	0	0	0	0	0	0	0	0
PC Notebook	m€	0	0	0	0	0	0	0	0	0	0
PC Tablet/slate	m€	0	0	0	0	0	0	0	0	0	0
PC Thin client	m€	0	0	0	0	0	0	0	0	0	0
PC Workstation	m€	0	0	0	0	0	0	0	0	0	0
Total PC, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
EP-Copier mono	m€	0	0	0	0	0	0	0	0	0	0
EP-Copier colour	m€	0	0	0	0	0	0	0	0	0	0
EP-printer mono	m€	0	0	0	0	0	0	0	0	0	0
EP-printer colour	m€	0	0	0	0	0	0	0	0	0	0
IJ SFD printer	m€	0	0	0	0	0	0	0	0	0	0
IJ MFD printer	m€	0	0	0	0	0	0	0	0	0	0
paper (2.5 euro/kg paper (6.25 euro/500pack)	m€										
Total imaging equipment, electricity	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SB Home Gateway, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Home NAS, on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Home Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
SB Office Phones (fixed), on-mode power	m€	0	0	0	0	0	0	0	0	0	0
Total SB (networked) StandBy (rest)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BC_EPS Mobile phones etc.	**m€**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
TOTAL ELECTRONICS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RF Household refrigerator and freezer	**m€**	0	0	0	0	0	0	0	0	0	0
1 CF open vertical chilled multi deck (RCV2)	m€	196	316	355	398	441	484	527	570	613	656
1 CF open horizontal frozen island (RHF4)	m€	54	46	49	55	62	68	74	80	86	92
1 CF Plug in one door beverage cooler	m€	128	179	191	203	214	225	236	248	259	270
1 CF Plug in horizontal ice cream freezer	m€	36	57	61	65	69	72	76	80	83	87
1 CF Spiral vending machine	m€	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)	m€	0	0	0	0	0	0	0	0	0	0
PF Blast cabinet	m€	0	0	0	0	0	0	0	0	0	0
PF Walk-In Cold Room (WICR, avg)	m€	0	0	0	0	0	0	0	0	0	0
PF MT & LT industrial chillers (avg)	m€	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration	**m€**	**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	m€	0	0	0	0	0	0	0	0	0	0
COOK El. Ovens, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
COOK Gas Hobs, % efficiency NCV	m€	0	0	0	0	0	0	0	0	0	0
COOK Gas Ovens, kWh prim, NCV	m€	0	0	0	0	0	0	0	0	0	0
COOK Range Hoods, kWh elec	m€	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
COFFEE Dripfilter (glass)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (thermos)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Dripfilter (full automatic)	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Pad filter	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Hard cap espresso	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Semi-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
COFFEE Fully-auto espresso	m€	0	0	0	0	0	0	0	0	0	0
Total CM household Coffee Makers	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL COOKING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	MAINTENANCE excl. VAT (in m euro 2010)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WM Household Washing Machine	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD Household Laundry Drier vented el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier condens el.	m€	0	0	0	0	0	0	0	0	0	0
	LD Household Laundry Drier vented gas	m€	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Drier	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	VC dom. Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	m€	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.5	FAN Axial<300Pa [247 W flow out]	m€	72	197	232	258	284	301	305	305	305	305
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	m€	99	292	335	354	369	378	381	381	381	381
0.5	FAN Centr.FC [141 W flow out]	m€	61	129	157	176	190	201	204	204	204	204
0.5	FAN Centr.BC-free [2120 W flow out]	m€	35	73	87	95	105	114	121	124	127	129
0.5	FAN Centr.BC [2052 W flow out]	m€	64	144	173	191	210	230	249	267	290	314
0.5	FAN Cross-flow [31 W flow out]	m€	14	25	29	34	39	42	46	49	53	57
	Total FAN, industrial (excl. box & roof fans)	**m€**	**173**	**431**	**506**	**554**	**598**	**633**	**653**	**665**	**680**	**696**
0.5	**MT Industrial motors, avg. 3 kW elec in [%]**	**m€**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WP Water pumps (load) [%]	**m€**	**1027**	**1398**	**1505**	**1618**	**1739**	**1867**	**1997**	**2128**	**2258**	**2388**
	TOTAL INDUSTRY COMPONENTS		1200	1829	2012	2172	2338	2500	2650	2793	2938	3084
	TRAFO Distribution, kWh/a	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Industry dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Power	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER oil	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO DER dry	m€	0	0	0	0	0	0	0	0	0	0
	TRAFO Small	m€	0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR	m€	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TYRE in m units											
	TYRE car replacement tyres C1	m€	0	0	0	0	0	0	0	0	0	0
	TYRE van replacement tyres C2	m€	0	0	0	0	0	0	0	0	0	0
	TYRE truck replacement tyres C3	m€	0	0	0	0	0	0	0	0	0	0
	TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euro 2010)		**23853**	**39883**	**44131**	**48076**	**51799**	**55243**	**58656**	**62233**	**65806**	**69389**
	GENERAL TOTAL (in bn euro 2010)		24	40	44	48	52	55	59	62	66	69

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	**14.1**	**21.6**	**23.3**	**24.9**	**26.6**	**28.6**	**30.8**	**33.3**	**35.7**	**38.2**
SPACE COOLING	**0.8**	**4.5**	**5.9**	**7.1**	**8.1**	**8.6**	**9.0**	**9.2**	**9.5**	**9.7**
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	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
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	**1.2**	**1.8**	**2.0**	**2.2**	**2.3**	**2.5**	**2.6**	**2.8**	**2.9**	**3.1**
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	**24**	**40**	**44**	**48**	**52**	**55**	**59**	**62**	**66**	**69**

ANNEX E: Ecodesign Impacts Accounting by Product Group (Key Facts)

Summary of Key Facts, quantitative data derived from impacts per parameter (Annex E) 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 central heating boilers, electric resistance boilers, heat pump boilers (electric and gas-fired) and micro-cogeneration boilers smaller than 50 kW all intended for space heating ('solo') or space- and water heating ('combi').
For seasonal efficiency and NO_x emission limits there is a category below 70 kW (with an unconditional exemption for solo-boilers to 10 kW and combi-boilers to 30 kW) and above 70 kW.
Excluded are boilers for gaseous or liquid biomass, solid fuel boilers, certain replacement heat generators or their housing, micro-cogeneration boilers with a maximum electrical capacity of 50 kW or above, dedicated water heaters, air or steam heaters as well as heaters covered by the Industrial Emissions Directive 2010/75/EU.
The scope of Energy Label regulation covers the same scope as the Ecodesign regulation but is limited to a rated heat output smaller than 70 kW.

Design options for more efficient space heating with central heating boilers include condensing technology (secondary heat exchanger to extract extra heat from flue gases), pre-mix or otherwise fan-assisted burners, improved combustion control (e.g. O_2 sensors), lower radiation losses of the housing, improved efficiency and control of the integrated circulation pump, lower auxiliary electricity for the gas valves, CPU and a possible combustion fan, weather dependent boiler temperature control, temperature control with local emitters sensors/actuators ('smart home' systems), solar assistance, hybrid solutions with traditional boilers and electric heat pumps, full electric air/water/ground source heat pumps, gas-fired (ab)sorption heat pumps, fuel cells, efficient micro-cogeneration.
Design options for water heating with combi boilers are similar to those for dedicated water heaters but also include passive flue heat recovery devices (PFHRD), where the cold sanitary water temperature (colder than returning central heating water) allows to extract (and store) more heat from flue gases both during water- and space heating.

CHC Central Heating combi, water heating	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	3 606	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	15 162	10 595			8 835			7 301		
EU effective heat output	TWh heat/a	1 049	1 176			1 133			1 082		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	2558	2307	2254	-53	2037	1544	-493	1842	1053	-789
o/w electricity	TWh elec/a	102	126	123	-3	121	115	-7	120	117	-3
o/w fuel	TWh fuel/a	2304	1992	1946	-47	1733	1258	-475	1543	761	-782
GWP emissions	$MtCO_2$/a	540	475	464	-11	414	311	-104	368	201	-167
Acquisition costs (incl. install)	bn €	19	27	27	0	31	59	28	37	91	54
Energy costs	bn €	115	128	125	-3	177	134	-43	237	136	-102
Maintenance costs (incl. VAT)	bn €	14	22	22	0	25	25	0	29	29	0
Total running costs	bn €	129	150	147	-3	203	160	-43	267	165	-102
Total expenditure	bn €	147	177	174	-3	233	218	-15	304	256	-48
Revenu Industry	m €	6836	9947	9947	0	11319	21577	10258	13537	33410	19874
Revenu Wholesale	m €	1928	2806	2806	0	3193	6087	2894	3819	9425	5606
Revenu Retail	m €	1808	2631	2631	0	2993	5706	2713	3580	8836	5256
Revenu Installation	m €	5693	8283	8283	0	9426	17968	8542	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	199	0	226	432	205	271	668	397
Jobs Wholesale	'000 jobs	8	11	11	0	13	24	12	15	38	22
Jobs Retail/ installation/ maintenance	'000 jobs	208	320	320	0	368	498	131	431	684	253
Jobs Total	'000 jobs	352	530	530	0	607	954	347	717	1390	673

Solid Fuel Boilers

Working documents are not finalized. The (draft) product scope includes domestic local space heaters with a nominal heat output of 50 kW or less and commercial local space heaters with a nominal heat output of the product or of a single segment of 120 kW or less.
Excluded are products using a electric or fuel-driven vapour compression cycle or sorption cycle for the generation of heat, products specified for non-woody biomass only, products specified specified for purposes other than indoor space heating to achieve a certain thermal comfort of human beings, products for outdoor use only, 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'), solid fuel local space heaters that are not factory assembled, or are not provided as prefabricated components or parts by a single manufacturer which are to be assembled on site.

Ecodesign requirements for energy efficiency and for emissions of particulate matter (PM), organic gaseous compounds (OGC), carbon monoxide (CO) and nitrogen oxides (NOX) are being discussed (status Nov. 2013). The (draft) product scope for Energy labelling is restricted to local space heaters with a nominal heat output of 50 kW or less, whereby --apart from the exemptions as mentioned for Ecodesign measures-- also 'electric local space heaters', luminous and tube local space heaters are excluded. The energy label (draft) design shows energy efficiency class (A-G), direct and indirect heat output (both in kW) as product-specific parameters.

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)

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	19 726	22 189			18 887			15 791		
EU effective heat output	TWh heat/a	175	117			125			104		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	451	165	165	0	154	150	-4	123	116	-7
o/w electricity	TWh elec/a	0	0	0	0	0	0	0	0	0	0
o/w fuel	TWh fuel/a	451	165	165	0	154	150	-4	123	116	-7
GWP emissions	$MtCO_2/a$	50	15	15	0	8	8	0	4	4	0
Acquisition costs (incl. install)	bn €	1	3	3	0	3	3	0	3	3	0
Energy costs	bn €	9	4	4	0	7	7	0	9	8	0
Maintenance costs (incl. VAT)	bn €	0	0	0	0	0	0	0	0	0	0
Total running costs	bn €	9	5	5	0	8	7	0	9	8	0
Total expenditure	bn €	11	7	7	0	10	10	0	12	11	0
Revenu Industry	m €	521	1167	1167	0	1105	1278	174	1182	1358	176
Revenu Wholesale	m €	152	319	319	0	296	346	50	312	363	51
Revenu Retail	m €	133	284	284	0	266	310	44	280	325	45
Revenu Installation	m €	372	587	587	0	505	605	100	517	608	91
Revenu Maintenance (excl. VAT)	m €	351	210	210	0	265	265	0	266	266	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	10	23	23	0	22	26	3	24	27	4
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	9	13	13	0	12	14	2	12	14	2
Jobs Total	'000 jobs	20	37	37	0	35	41	5	37	43	5

Air Heating & Cooling

Working documents not finalized

AHC central Air Cooling	unit	1990	2010			2020			2030		
Sales comfort chillers & AC	'000	99	431			500			509		
o/w AC	'000	73	325			371			351		
Stock comfort chillers & reversibles	'000	763	5 301			7 540			8 321		
o/w AC	'000	276	3 784			5 239			5 477		
Effective cooling output per unit	kWh cooling/a	184 248	43 281			39 969			38 565		
EU effective cooling output	TWh cooling/a	51	164			209			211		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	43	119	119	0	134	128	-6	123	109	-13
o/w electricity	TWh elec/a	17	47	47	0	53	51	-2	49	43	-5
o/w fuel	TWh fuel/a	0	0	0	0	1	1	0	1	1	0
GWP emissions from energy & refrig. loss	$MtCO_2/a$	10	26	26	0	30	29	-1	28	26	-2
o/w GWP emissions from energy	$MtCO_2/a$	8	17	17	0	16	15	-1	12	10	-2
o/w GWP emissions refrigerant loss	$MtCO_2/a$	2	9	9	0	14	14	0	16	16	0
Acquisition costs (incl. install)	bn €	1	6	6	0	7	8	0	8	8	1
Energy costs	bn €	2	5	5	0	8	8	0	11	10	-1
Maintenance costs (incl. VAT)	bn €	1	4	4	0	6	6	0	7	7	0
Total running costs	bn €	3	9	9	0	14	13	0	17	16	-1
Total expenditure	bn €	4	15	15	0	21	21	0	25	24	-1
Revenu Industry	m €	926	4321	4321	0	5372	5662	291	5685	6049	364
Revenu Wholesale	m €	116	540	540	0	671	708	36	711	756	46
Revenu Retail	m €	116	540	540	0	671	708	36	711	756	46
Revenu Installation	m €	486	2413	2413	0	3047	3221	174	3148	3348	200
Revenu Maintenance (excl. VAT)	m €	723	3641	3641	0	5651	5651	0	6579	6579	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	19	86	86	0	107	113	6	114	121	7
Jobs Wholesale	'000 jobs	0	2	2	0	3	3	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	14	70	70	0	98	101	2	109	112	3
Jobs Total	'000 jobs	33	158	158	0	208	217	8	226	236	10

AHC central Air Heating	unit	1990	2010			2020			2030		
Sales air heaters & reversibles	'000	158	317			394			399		
o/w reversible AC	'000	22	224			312			327		
Stock	'000	2 297	3 797			5 276			5 973		
o/w reversible AC	'000	774	1 741			2 704			3 128		
Effective heat output per unit	kWh heat/a	250 241	125 662			90 461			75 937		
EU effective heat output	TWh heat/a	194	219			245			238		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	378	286	286	0	262	245	-17	229	194	-36
o/w electricity	TWh elec/a	10	35	35	0	47	44	-3	48	41	-7
o/w fuel	TWh fuel/a	352	198	198	0	145	135	-10	110	91	-19
GWP emissions from energy	$MtCO_2/a$	80	58	58	0	52	49	-3	44	37	-6
Acquisition costs (incl. install, excl. rev.AC)	bn €	1	2	2	0	3	4	0	3	4	0
Energy costs	bn €	10	11	11	0	16	15	-1	21	18	-3
Maintenance costs (incl. VAT, excl. rev.AC)	bn €	1	1	1	0	1	1	0	1	1	0
Total running costs	bn €	11	13	13	0	19	18	-1	25	21	-3
Total expenditure	bn €	12	16	16	0	23	22	-1	28	25	-3
Revenu Industry (excl. rev. AC)	m €	405	318	318	0	292	440	148	260	382	122
Revenu Wholesale (")	m €	51	40	40	0	36	55	18	33	48	15
Revenu Retail (")	m €	51	40	40	0	36	55	18	33	48	15
Revenu Installation (")	m €	348	267	267	0	246	382	136	224	339	115
Revenu Maintenance (", excl. VAT)	m €	893	708	708	0	617	617	0	544	544	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	8	6	6	0	6	9	3	5	8	2
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	13	10	10	0	9	11	2	8	10	1
Jobs Total	'000 jobs	22	17	17	0	15	20	5	14	17	4

Local Space Heaters

Working documents are not finalized. The (draft) product scope includes domestic local space heaters with a nominal heat output of 50 kW or less and commercial local space heaters with a nominal heat output of the product or of a single segment of 120 kW or less.
Excluded are products using a electric or fuel-driven vapour compression cycle or sorption cycle for the generation of heat, products specified for non-woody biomass only, products specified specified for purposes other than indoor space heating to achieve a certain thermal comfort of human beings, products for outdoor use only, 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'), solid fuel local space heaters that are not factory assembled, or are not provided as prefabricated components or parts by a single manufacturer which are to be assembled on site.

Ecodesign requirements for energy efficiency and for emissions of particulate matter (PM), organic gaseous compounds (OGC), carbon monoxide (CO) and nitrogen oxides (NOX) are being discussed (status Nov. 2013). The (draft) product scope for Energy labelling is restricted to local space heaters with a nominal heat output of 50 kW or less, whereby --apart from the exemptions as mentioned for Ecodesign measures-- also 'electric local space heaters', luminous and tube local space heaters are excluded. The energy label (draft) design shows energy efficiency class (A-G), direct and indirect heat output (both in kW) as product-specific parameters.

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)

The figures for the ECO scenario in the table below are placeholder values from first studies. They will be updated and extended (for emissions) at a later stage.

LH Local Heaters	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	19 009	24 342			26 360			28 392		
Stock	'000	207 035	264 775			297 917			329 603		
Effective heat output per unit	kWh/a	1 059	892			845			790		
EU effective heat output	TWh heat/a	219	236			252			260		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	632	597	597	0	592	538	-54	581	484	-97
o/w electricity	TWh elec/a	185	167	167	0	158	141	-17	150	123	-27
o/w fuel	TWh fuel/a	169	180	180	0	198	186	-12	205	177	-28
GWP emissions from energy	$MtCO_2/a$	111	81	81	0	72	65	-7	61	51	-10
Acquisition costs (incl. install)	bn €	8	13	13	0	17	21	4	18	21	4
Energy costs	bn €	37	34	34	0	50	45	-5	72	59	-12
Maintenance costs (incl. VAT)	bn €	1	2	2	0	2	2	0	2	2	0
Total running costs	bn €	38	35	35	0	52	47	-5	74	62	-12
Total expenditure	bn €	46	49	49	0	68	68	0	92	83	-9
Revenu Industry	m €	2921	4738	4738	0	5801	7468	1668	6152	7514	1362
Revenu Wholesale	m €	922	1498	1498	0	1822	2351	528	1936	2366	430
Revenu Retail	m €	980	1592	1592	0	1935	2496	561	2056	2512	457
Revenu Installation	m €	2168	3285	3285	0	4234	5180	946	4749	5490	741
Revenu Maintenance (excl. VAT)	m €	836	1303	1303	0	1680	1680	0	1974	1974	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	58	95	95	0	116	149	33	123	150	27
Jobs Wholesale	'000 jobs	4	6	6	0	7	9	2	8	9	2
Jobs Retail/ installation/ maintenance	'000 jobs	46	72	72	0	91	110	19	101	117	15
Jobs Total	'000 jobs	108	173	173	0	215	269	54	232	276	44

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	$MtCO_2/a$	2.4	19.3	19.3	0.0	30.2	26.8	-3.4	37.0	32.1	-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	$MtCO_2/a$	0.2	2.7	2.7	0.0	5.2	5.2	0.0	7.6	7.6	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	0	0	0	0	0	0	0	0	0
Total running costs	bn €	1	8	7	-1	17	14	-3	32	25	-7
Total expenditure	bn €	1	12	12	-1	26	23	-2	41	36	-6
Revenu Industry	m €	192	2390	2390	0	4635	5133	498	5102	5746	644
Revenu Wholesale	m €	53	667	667	0	1293	1432	139	1424	1603	180
Revenu Retail	m €	50	625	625	0	1212	1343	130	1335	1503	168
Revenu Installation	m €	285	3556	3556	0	6897	7638	741	7592	8550	958
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	10	119	131	12
Jobs Total	'000 jobs	9	105	105	0	202	222	20	227	253	26

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 ·m^3/s; kWh=10^3·W·h)	kWh flow/a	300	277			266			261		
EU load (1 TWh=10^{12}·W·h)	TWh flow/a	54	23			9			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

Not finalized

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	TWh prim/a	-86	-481	-481	0	-686	-911	-225	-847	-1072	-225
o/w electricity	TWh elec/a	27	77	77	0	95	84	-11	102	76	-25
o/w fuel (negative= saving vs. natural vent.)	TWh fuel/a	-153	-674	-674	0	-924	-1023	-99	-1102	-1327	-225
GWP emissions	$MtCO_2/a$	13	32	32	0	36	32	-4	35	26	-9
Acquisition costs (incl. install)	bn €	31	74	74	0	83	86	3	93	96	4
Electricity costs	bn €	3	8	8	0	15	6	-8	24	-4	-28
Heating costs for vent.& infiltr. losses+	bn €	-7	-37	-37	0	-80	-89	-9	-142	-171	-29
Maintenance costs (incl. VAT)	bn €	1	3	3	0	4	4	0	5	5	0
Total running costs	bn €	-2	-26	-26	0	-61	-78	-17	-113	-170	-57
Total expenditure	bn €	29	48	48	0	22	8	-13	-20	-73	-53
Revenu Industry	m €	10604	25045	25045	0	28144	29242	1098	31518	32667	1148
Revenu Wholesale	m €	1426	3412	3412	0	3929	4278	349	4447	4812	365
Revenu Retail	m €	1436	3441	3441	0	3972	4342	371	4499	4887	388
Revenu Installation	m €	17559	41252	41252	0	45816	46870	1054	51021	52128	1107
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	585	22	630	653	23
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	582	17	635	652	18
Jobs Total	'000 jobs	427	1015	1015	0	1144	1184	40	1283	1325	42

Light Sources

LS Light Sources, in million 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	dm²	10	28			53			72		
Viewable area per monitor	dm²	5	11			16			20		
EU electronic displays viewable area	km²	22	131			270			449		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	81	250	256	5	156	89	-67	180	55	-125
o/w electricity	TWh elec/a	32	100	102	2	62	35	-27	72	22	-50
GWP emissions	$MtCO_2$/a	16	41	42	1	24	13	-10	24	8	-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

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

Computer Servers

CS Computer Serverss	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	221	2 500			2 500			2 500		
Stock	'000	841	12 417			12 500			12 500		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	12	50	50	0	21	21	0	13	13	0
o/w electricity	TWh elec/a	5	20	20	0	9	9	0	5	5	0
GWP emissions	$MtCO_2/a$	2	8	8	0	3	3	0	2	2	0
Energy costs	bn €	1	2	2	0	1	1	0	1	1	0

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 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

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
Design options for imaging equipment include standard duplexing and N-print ability (paper saving), more efficient drying technology (EP), improved ink/ toner (lower

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
Design options to reduce standby energy use include (improved) power management of the various standby states, reduction of standby through reduction of sensing

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,
Design options for battery chargers include microprocessor controlled ('smart') charging. For external power supplies design options include the use of primary

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	

Household Refrigerators & Freezers

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 €	16	14	11	-4	21	11	-10	30	11	-19
Total expenditure	bn €	24	22	20	-2	29	21	-8	39	22	-17
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

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 current draft working document proposes also to include 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 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

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)	Mm³/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	4	0	5	4	0	6	6	-1
Revenu Industry	m €	357	665	716	51	933	959	26	1044	1060	16
Revenu Wholesale	m €	27	49	53	4	69	71	2	78	79	1
Revenu Retail	m €	354	660	710	51	925	951	25	1035	1051	16
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	7	13	14	1	19	19	1	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	12	1	15	16	0	17	18	0
Jobs Total	'000 jobs	13	24	26	2	34	35	1	38	39	1

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.

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).

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

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	2 406	7 427			9 092			9 246		
Stock	'000	36 095	93 696			119 933			135 773		
Load per unit	unit	1 235	1 165			1 167			1 187		
EU load (W=Pa * m^3/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	384	-35	480	414	-66
o/w electricity	TWh elec/a	52	131	131	0	168	154	-14	192	166	-26
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	-5	65	56	-9
Acquisition costs (incl. install)	bn €	1	3	3	0	4	4	1	4	4	1
Energy costs	bn €	6	14	14	0	25	23	-2	42	37	-6
Total expenditure	bn €	7	17	17	0	29	28	-1	47	41	-5
Revenu Industry	m €	601	1770	1770	0	2184	2685	501	2276	2627	351
Revenu Wholesale	m €	305	940	608	-333	1144	922	-222	1176	902	-274
Revenu Retail	m €	90	264	264	0	326	401	75	340	392	52
Revenu Installation	m €	82	242	242	0	300	370	70	313	362	49
Revenu Maintenance (excl. VAT)	m €	173	431	431	0	554	554	0	633	633	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	12	35	35	0	44	54	10	46	53	7
Jobs Wholesale	'000 jobs	1	4	2	-1	5	4	-1	5	4	-1
Jobs Retail/ installation/ maintenance	'000 jobs	4	11	11	0	14	16	2	15	16	1
Jobs Total	'000 jobs	17	50	49	-1	62	73	11	65	73	7

Industrial Motors

The ED measure relates to 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 of 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).

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 Industrial motors > 1 hp	**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 * m^3/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

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 E)

REVENU

Revenu Industry (in m €)

	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	9947	0	11319	21577	10258	13537	33410	19874
SFB Solid Fuel Boilers	521	1167	1167	0	1105	1278	174	1182	1358	176
AHC central Air Cooling	926	4321	4321	0	5372	5662	291	5685	6049	364
AHC central Air Heating	405	318	318	0	292	440	148	260	382	122
LH Local Heaters	2921	4738	4738	0	5801	7468	1668	6152	7514	1362
RAC Room Air Conditioner	192	2390	2390	0	4635	5133	498	5102	5746	644
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	29242	1098	31518	32667	1148
LS Light Sources, in million 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
CS Computer Serverss	na	na	na	na	na	na	na	na	na	na
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
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	716	51	933	959	26	1044	1060	16
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	2685	501	2276	2627	351
MT Industrial motors > 1 hp	0	0	0	0	0	1275	1275	0	1155	1155
WP Water pumps	806	1095	1096	1	1266	1266	0	1456	1456	0
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	**71**	**151**	**152**	**2**	**181**	**205**	**24**	**208**	**240**	**32**

Revenu Wholesale (in m €)

	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	2806	0	3193	6087	2894	3819	9425	5606
SFB Solid Fuel Boilers	152	319	319	0	296	346	50	312	363	51
AHC central Air Cooling	116	540	540	0	671	708	36	711	756	46
AHC central Air Heating (incl. AC rev)	51	40	40	0	36	55	18	33	48	15
LH Local Heaters	922	1498	1498	0	1822	2351	528	1936	2366	430
RAC Room Air Conditioner	53	667	667	0	1293	1432	139	1424	1603	180
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	4278	349	4447	4812	365
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	53	4	69	71	2	78	79	1
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)	305	940	608	-333	1144	922	-222	1176	902	-274
MT Industrial motors > 1 hp	374	551	623	72	616	1439	823	621	1334	714
WP Water pumps	277	376	376	0	434	434	0	500	500	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	**15**	**31**	**31**	**0**	**37**	**43**	**6**	**42**	**51**	**9**

Revenu Retail (in m €)

	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	2631	0	2993	5706	2713	3580	8836	5256
SFB Solid Fuel Boilers	133	284	284	0	266	310	44	280	325	45
AHC central Air Cooling	116	540	540	0	671	708	36	711	756	46
AHC central Air Heating (incl. AC rev)	51	40	40	0	36	55	18	33	48	15
LH Local Heaters	980	1592	1592	0	1935	2496	561	2056	2512	457
RAC Room Air Conditioner	50	625	625	0	1212	1343	130	1335	1503	168
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	4342	371	4499	4887	388
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	710	51	925	951	25	1035	1051	16
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	401	75	340	392	52
MT Industrial motors > 1 hp	163	240	271	31	268	626	358	270	580	310
WP Water pumps	120	163	164	0	189	189	0	217	217	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**	**79**	**80**	**2**	**96**	**105**	**9**	**113**	**123**	**10**

Revenu Installation (in m €)

	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	8283	0	9426	17968	8542	11273	27823	16550
SFB Solid Fuel Boilers	372	587	587	0	505	605	100	517	608	91
AHC central Air Cooling	486	2413	2413	0	3047	3221	174	3148	3348	200
AHC central Air Heating (incl. AC rev)	348	267	267	0	246	382	136	224	339	115
LH Local Heaters	2168	3285	3285	0	4234	5180	946	4749	5490	741
RAC Room Air Conditioner	285	3556	3556	0	6897	7638	741	7592	8550	958
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	46870	1054	51021	52128	1107
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	370	70	313	362	49
MT Industrial motors > 1 hp	0	0	0	0	0	1142	1142	0	1034	1034
WP Water pumps	552	750	750	0	866	866	0	996	996	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	**30**	**64**	**64**	**0**	**76**	**92**	**16**	**84**	**109**	**25**

Revenu Maintenance (excl. VAT, in m€)

	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	723	3641	3641	0	5651	5651	0	6579	6579	0
AHC central Air Heating (incl. AC rev)	893	708	708	0	617	617	0	544	544	0
LH Local Heaters	836	1303	1303	0	1680	1680	0	1974	1974	0
RAC Room Air Conditioner	83	870	870	0	1451	1451	0	2071	2071	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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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)	173	431	431	0	554	554	0	633	633	0
MT Industrial motors > 1 hp	0	0	0	0	0	0	0	0	0	0
WP Water pumps	1027	1398	1398	0	1618	1618	0	1867	1867	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**	**40**	**40**	**0**	**48**	**48**	**0**	**55**	**55**	**0**

Total revenu by product group (in m€)

	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	43013	0	49295	73702	24407	58050	105336	47286
SFB Solid Fuel Boilers	1531	2568	2568	0	2437	2805	367	2556	2920	363
AHC central Air Cooling	2368	11456	11456	0	15412	15949	538	16833	17489	655
AHC central Air Heating (incl. AC rev)	1747	1372	1372	0	1227	1548	321	1093	1360	267
LH Local Heaters	7826	12416	12416	0	15473	19176	3703	16867	19856	2989
RAC Room Air Conditioner	663	8108	8108	0	15488	16998	1509	17522	19472	1950
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	88866	2871	96420	99427	3008
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	1480	106	1927	1980	53	2157	2190	33
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)	1250	3647	3314	-333	4508	4931	423	4738	4916	178
MT Industrial motors > 1 hp	537	791	894	103	883	4482	3599	891	4103	3212
WP Water pumps	2783	3783	3784	1	4373	4373	0	5036	5036	0
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	**173**	**364**	**367**	**3**	**438**	**493**	**55**	**502**	**578**	**75**

Total revenu by functional group (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	14	19	19	0	21	30	9	23	34	12
SPACE HEATING	41	65	65	0	78	108	30	89	141	52
SPACE COOLING	3	16	16	0	23	24	1	26	27	2
VENTILATION	32	76	76	0	86	89	3	96	99	3
LIGHTING	5	11	11	0	11	11	0	8	3	-5
ELECTRONICS	21	93	93	0	118	118	0	147	147	0
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	5	8	8	0	10	14	4	11	14	3
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	**173**	**364**	**367**	**3**	**438**	**493**	**55**	**502**	**578**	**75**

Total revenu by sector (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	71	151	152	2	181	205	24	208	240	32
Wholesale	15	31	31	0	37	43	6	42	51	9
Retail	33	79	80	2	96	105	9	113	123	10
Installation	30	64	64	0	76	92	16	84	109	25
Maintenance	24	40	40	0	48	48	0	55	55	0
TOTAL in bn euros	**173**	**364**	**367**	**3**	**438**	**493**	**55**	**502**	**578**	**75**

ANNEX G: Direct Employment Impacts (summary tables)

Quantitative data are summarised from impacts per parameter (Annex E). 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	199	0	226	432	205	271	668	397
SFB Solid Fuel Boilers	10	23	23	0	22	26	3	24	27	4
AHC central Air Cooling	19	86	86	0	107	113	6	114	121	7
AHC central Air Heating (incl. AC rev)	8	6	6	0	6	9	3	5	8	2
LH Local Heaters	58	95	95	0	116	149	33	123	150	27
RAC Room Air Conditioner	4	48	48	0	93	103	10	102	115	13
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	585	22	630	653	23
LS Light Sources, in million units BAU	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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	14	1	19	19	1	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	54	10	46	53	7
MT Industrial motors > 1 hp	0	0	0	0	0	26	26	0	23	23
WP Water pumps	16	22	22	0	25	25	0	29	29	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	**1424**	**3013**	**3046**	**32**	**3622**	**4093**	**471**	**4156**	**4791**	**635**

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	11	0	13	24	12	15	38	22
SFB Solid Fuel Boilers	1	1	1	0	1	1	0	1	1	0
AHC central Air Cooling	0	2	2	0	3	3	0	3	3	0
AHC central Air Heating (incl. AC rev)	0	0	0	0	0	0	0	0	0	0
LH Local Heaters	4	6	6	0	7	9	2	8	9	2
RAC Room Air Conditioner	0	3	3	0	5	6	1	6	6	1
CIRC Circulator pumps <2.5 kW	1	1	1	0	1	1	0	1	1	0
VU Ventilation Units (res & nonres)	6	14	14	0	16	17	1	18	19	1
LS Light Sources, in million units BAU	2	3	3	0	3	3	0	2	1	-2
DP electronic DisPlays	3	7	7	0	7	7	0	8	8	0
STB set top boxes (Complex & Simple)	0	6	6	0	7	7	0	6	6	0
VIDEO	0	3	3	0	2	2	0	1	1	0
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	4	2	-1	5	4	-1	5	4	-1
MT Industrial motors > 1 hp	1	2	2	0	2	6	3	2	5	3
WP Water pumps	1	2	2	0	2	2	0	2	2	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	**60**	**124**	**123**	**0**	**148**	**172**	**25**	**168**	**204**	**36**

Jobs Retail (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	8	9	9	0	10	17	7	11	19	8
CHC Central Heating combi, water heat	6	10	10	0	12	22	10	13	26	13
CH Central Heating boiler, space heat	30	44	44	0	50	95	45	60	147	88
SFB Solid Fuel Boilers	2	5	5	0	4	5	1	5	5	1
AHC central Air Cooling	2	9	9	0	11	12	1	12	13	1
AHC central Air Heating (incl. AC rev)	1	1	1	0	1	1	0	1	1	0
LH Local Heaters	16	27	27	0	32	42	9	34	42	8
RAC Room Air Conditioner	1	10	10	0	20	22	2	22	25	3
CIRC Circulator pumps <2.5 kW	1	2	2	0	2	2	0	2	2	0
VU Ventilation Units (res & nonres)	24	57	57	0	66	72	6	75	81	6
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	12	1	15	16	0	17	18	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	1	6	7	1
MT Industrial motors > 1 hp	3	4	5	1	4	10	6	4	10	5
WP Water pumps	2	3	3	0	3	3	0	4	4	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	**555**	**1310**	**1335**	**25**	**1607**	**1754**	**147**	**1882**	**2043**	**161**

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	83	0	94	180	85	113	278	166
SFB Solid Fuel Boilers	4	6	6	0	5	6	1	5	6	1
AHC central Air Cooling	5	24	24	0	30	32	2	31	33	2
AHC central Air Heating (incl. AC rev)	3	3	3	0	2	4	1	2	3	1
LH Local Heaters	22	33	33	0	42	52	9	47	55	7
RAC Room Air Conditioner	3	36	36	0	69	76	7	76	85	10
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	469	11	510	521	11
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	0
MT Industrial motors > 1 hp	0	0	0	0	0	11	11	0	10	10
WP Water pumps	6	7	8	0	9	9	0	10	10	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in 1000 jobs	**301**	**643**	**643**	**0**	**755**	**917**	**161**	**844**	**1093**	**249**

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	7	36	36	0	57	57	0	66	66	0
AHC central Air Heating (incl. AC rev)	9	7	7	0	6	6	0	5	5	0
LH Local Heaters	8	13	13	0	17	17	0	20	20	0
RAC Room Air Conditioner	1	9	9	0	15	15	0	21	21	0
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	10	31	31	0	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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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)	2	4	4	0	6	6	0	6	6	0
MT Industrial motors > 1 hp	0	0	0	0	0	0	0	0	0	0
WP Water pumps	10	14	14	0	16	16	0	19	19	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**	**399**	**399**	**0**	**481**	**481**	**0**	**552**	**552**	**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	530	0	607	954	347	717	1390	673
SFB Solid Fuel Boilers	20	37	37	0	35	41	5	37	43	5
AHC central Air Cooling	33	158	158	0	208	217	8	226	236	10
AHC central Air Heating (incl. AC rev)	22	17	17	0	15	20	5	14	17	4
LH Local Heaters	108	173	173	0	215	269	54	232	276	44
RAC Room Air Conditioner	9	105	105	0	202	222	20	227	253	26
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	1184	40	1283	1325	42
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
CS Computer Servers	na	na	na	na	na	na	na	na	na	na
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
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	26	2	34	35	1	38	39	1
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)	17	50	49	-1	62	73	11	65	73	7
MT Industrial motors > 1 hp	4	6	7	1	7	53	46	7	48	41
WP Water pumps	35	48	48	0	55	55	0	63	63	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	**2578**	**5489**	**5546**	**57**	**6613**	**7417**	**803**	**7603**	**8683**	**1080**

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	526	839	841	2	1005	1435	430	1147	1890	744
SPACE COOLING	37	211	211	0	309	327	18	339	362	23
VENTILATION	427	1015	1015	0	1144	1184	40	1283	1325	42
LIGHTING	81	187	191	3	195	186	-9	146	61	-85
ELECTRONICS	369	1591	1591	0	2010	2010	0	2525	2525	0
FOOD PRESERVATION	184	229	248	19	251	284	33	276	311	34
COOKING	196	262	264	2	293	312	19	301	317	17
CLEANING	175	372	404	31	523	584	60	599	643	43
INDUSTRY COMPONENTS	57	104	104	-1	124	181	57	136	184	49
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	**2578**	**5489**	**5546**	**57**	**6613**	**7417**	**803**	**7603**	**8683**	**1080**

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)	1424	3013	3046	32	3622	4093	471	4156	4791	635
Wholesale	60	124	123	0	148	172	25	168	204	36
Retail	555	1310	1335	25	1607	1754	147	1882	2043	161
Installation	301	643	643	0	755	917	161	844	1093	249
Maintenance	239	399	399	0	481	481	0	552	552	0
TOTAL in 1000 jobs	**2578**	**5489**	**5546**	**57**	**6613**	**7417**	**803**	**7603**	**8683**	**1080**

ANNEX H: References

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