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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Commission Regulation implementing Directive 2009/125/EC of the European Parliament and of the Council

with regard to Ecodesign requirements for domestic cooking appliances (hobs, ovens and range hoods)

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Lead DG: DG ENER

Associated DG: DG ENTR

Other involved services: SG, LS, DG ENV, DG CLIMA, DG COMP, DG ECFIN, DG CNECT, DG MARKT, DG EMPL, DG SANCO, DG TRADE, DG RTD, JRC.

1. Procedural Issues and Consultation

1.1 Organisation and Timing

These implementing measures on domestic cooking appliances (hereafter 'DCAs'), i.e. ovens, hobs and range hoods, are priorities of the *Action Plan for Energy Efficiency*[1] and the *Energy Efficiency Plan 2011* [2].

The legal basis for these implementing measures is Article 114 TFEU[3] (internal market) for ecodesign requirements and Article 194 TFEU (energy policy) for Labelling measures.

Ecodesign and energy labelling requirements for products constitute an important instrument for meeting the policy objectives under the '*Resource-efficient Europe - Flagship Initiative*'[4], the '*Energy 2020*'[5] strategy paper and the Commission's *Energy Efficiency Plan 2011*.

At an operational level, the *'20-20-20'* target is relevant, which aims amongst others at a 20% reduction of energy consumption and carbon emissions in 2020 with respect of the reference year 1990 [6].

These measures on domestic cooking appliances are part of the holistic energy accounting in the Energy Efficiency Directive[7] (EED), in the Energy Performance of Building Directive[8] (EPBD) and in the EU Emission Trading Scheme Directive[9] (ETS).

The implementing measures are based on the Directive 2009/125/EC[10] of the European Parliament and of the Council establishing a framework for the Commission, assisted by a

[1] COM(2006)545 final. *Action Plan for Energy Efficiency: Realising the Potential*, Brussels, 19.10.2006.
[2] COM(2011)109 final. *Energy Efficiency Plan 2011,* Brussels, 8.3.2011.
[3] Treaty on the European Communities (TEC) was replaced by the Treaty on the functioning of the European Union (TFEU) which entered into force on 1st December 2009 (content of Article 95 TEC was moved to Article 114 TFEU).
[4] COM (2011)21 final. *A resource-efficient Europe – Flagship initiative under the Europe 2020 strategy*, Brussels, 26.1.2011.
[5] COM(2010)639 final. *Energy 2020 – A strategy for competitive, sustainable and secure energy*, Brussels, 10.11.2010.
[6] European Council, Presidency Conclusions, March 2007.
[7] OJ L 315, 14.11.2012, p. 1-56.
[8] OJ L 153, 18.6.2010, p. 13-35.
[9] OJ L 275, 25.10.2003, p. 32-46.

regulatory committee to set ecodesign requirements for energy-related products, in combination with energy labelling under Directive 2010/30/EU[11]. The Ecodesign Directive 2009/125/EC references the objectives of the *EAP6*[12] and *ECCP*[13].

Article 16 of the Ecodesign Directive provides the legal basis for the Commission to adopt implementing measures on this product category.

According to the Ecodesign Directive, an energy-related product or a group of energy-related products shall be covered by ecodesign implementing measures, or by self-regulation (cf. criteria in Article 17), if the products represent significant sales volumes, while having a significant environmental impact and significant improvement potential (Article 15). The structure and content of an ecodesign implementing measure shall follow the provisions of Annex VII of the Directive.

Consultation of stakeholders is based on the Ecodesign Consultation Forum as foreseen in Article 18 of the Ecodesign Directive (see next chapter for details), including the consultation of stakeholders during the preparation of preparatory technical studies from 2006 to 2011 in order to assist the Commission in analysing the likely impacts of the planned measures.

Article 19 of the Directive 2009/125/EC foresees a regulatory procedure with scrutiny for the adoption of implementing measures. Subject to qualified majority support in the regulatory committee and after scrutiny of the European Parliament, the adoption of the measures by the Commission is planned by the end of 2013.

For labelling measures, the consultation of stakeholders and the adoption procedure are carried out in a delegated act procedure according to Articles 10 to 13 of the Labelling Directive 2010/30/EU, to the extent possible in parallel and linked to the ecodesign implementing measures. The preparation of labelling measures are based on the consultation of experts and are followed by a proposal for Delegated Regulation to be adopted by the Commission before going for approval by the Council and the EP

From the product groups under consideration in this impact assessment, only electric ovens have been subject to mandatory energy labelling, introduced under the previous Energy Labelling Directive 92/785/EC.

1.2 Impact Assessment Board

The Commission's Impact Assessment Board (IAB) issued an opinion on the draft Impact Assessment (IA) in its meeting of 18.12.2012 indicating that certain parts of the report were to be extended and clarified.[14]

Following the IAB instructions, the main text of the underlying final IA report has been extended and made more understandable on the points indicated by the IAB. The scope of the measures has been described more extensively and it was explained why certain appliances were excluded. The market structure and industrial players have been described in a

[10] Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (recast), OJ L 285, 31.10.2009.

[11] Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products (recast), OJ L 153, 18.6.2010.

[12] Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July laying down the Sixth Community Environment Action Programme OJ L 242, 10.9.2002, p. 1.

[13] European Climate Change Programme. http://ec.europa.eu/clima/policies/eccp/index_en.htm

[14] European Impact Assessment Board, Opinion regarding the draft version (21.11.2012) of DG ENER – Impact Assessment on a proposal for a Commission Regulation implementing Directive 2009/125/EC of the European Parliament and the Council with regard to Ecodesign requirements for domestic cooking appliances (hobs, ovens and range hoods).

comprehensive new Annex E, which includes –as much as is possible within the limited data availability—a more detailed estimate of industrial employment and the role of SMEs. A summary of that annex is included in the main body text. Graphs have been added showing the breakdown of energy performance per device class. Designs of energy labels illustrate a now more detailed and clear discussion of the content of the options. The calculation methods underlying the options have been described fully, showing that they are coherent with what has been done in similar ecodesign and energy labelling measures. The impact assessment has been improved on the points mentioned by the IAB and the summary section of the IA report was revised. A full reference list and list of abbreviations has been included in Annexes F and G. The executive summary has been adapted as requested by the IAB.

Before the IAB meeting, the draft IA report was subject to the consultation of the Ecodesign Inter-Service Impact Assessment Group in November 2012. The draft IA report was amended according to the comments received from the SG.

1.3 Transparency of the consultation process

This Impact Assessment is supported by preparatory studies for eco-design requirements (hereafter called 'preparatory studies') carried out by external consultants on behalf of the Commission's Directorate General for Energy (DG ENER) as follows:

- 'Preparatory Study for Eco-design Requirements of EuPs, ENER Lot 22, Domestic and commercial ovens (electric, gas, microwave), including when incorporated in cookers'[15];
- 'Preparatory Study for Ecodesign-requirements of EuPs, ENER Lot 23, Domestic and commercial hobs and grills, included when incorporated in cookers'[16];
- 'Preparatory Study for Ecodesign-requirements of EuPs, ENER Lot 10, Room air conditioners, domestic ventilation including range hoods'[17].

The preparatory studies followed the structure of the 'Methodology for the Ecodesign of Energy Using Products (MEEuP)'[18] developed for the Commission's Directorate General for Enterprise and Industry (DG ENTR). MEEuP has been endorsed by stakeholders and is used by all ecodesign preparatory studies.

The purpose of the preparatory studies was to perform a technical, environmental and economic analysis for cooking appliances in order to improve their environmental performance, within the framework of the Ecodesign Directive.

The preparatory studies were developed in an open process, taking into account input from relevant stakeholders including manufacturers and their associations, environmental NGOs, consumer organisations, and EU Member State experts. The final stakeholder meeting on the studies of ovens and hobs & grills took place on 24 March 2011 in Brussels to discuss and

[15] BIO Intelligence Service, in association with ERA technology, *Preparatory Study for Ecodesign Requirements of EuPs, Lot 22: Domestic and commercial ovens*, Final version August 2011.[Contract No TREN/D3/91-2007-Lot 22-SI2.521661], available at project website www.ecocooking.org

[16] BIO Intelligence Service, in co-operation with ERA technology, *Preparatory Study for Ecodesign Requirements of EuPs, Lot 23: Domestic and commercial hobs and grills, included when incorporated in cookers*, Final version August 2011.[Contract No TREN/D3/91-2007-Lot 23-SI2.521679], from project website www.ecocooking.org

[17] ARMINES et al., *Preparatory study on the environmental performance of residential room conditioning appliances (airco and ventilation), Study on residential ventilation*, Final report, February 2009. [Contract TREN/D1/40-2005/LOT10/S07.56606]. Available at http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/airco-vent/files/residential_ventilation_en.pdf

[18] VHK, *Methodology for the Ecodesign of Energy-using Products (MEEuP)*, Final Report 28 Nov. 2005 for EC DG ENTR, available at http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/methodology/index_en.htm

validate the preliminary results of the studies. Minutes of the final stakeholder meetings are attached in **Annex C**.

Further to Article 18 of the 2009/125/EC Directive, formal consultation of stakeholders was carried out through the Ecodesign Consultation Forum consisting of a 'balanced participation of Member States' representatives and all interested parties concerned with the product group in question'.

The meetings of the Ecodesign Consultation Forum took place on 18 April 2012 and on 11 July 2012. Building on the results of the preparatory studies, the Commission services presented a Working Document suggesting ecodesign requirements based on scenarios developed under the preparatory studies. The working documents were circulated duly before the meetings to the members of the Ecodesign Consultation Forum and to the secretariats of the ENVI (Environment, Public Health and Food Safety) and ITRE (Industry, Research and Energy) Committees of the European Parliament for information. The working documents were published on DG ENER's ecodesign website, and they were included in the Commission's CIRCA system alongside the stakeholder comments received in writing before and after the Consultation Forum meeting. Minutes of the Consultation Forum meetings can be found in **Annexes A & B.**

1.4 Results of stakeholder consultation

The **Member States** support in general the revision of the energy label for domestic ovens. They also support in general the setting up of ecodesign minimum requirements measures and labelling in a single package on domestic and commercial cooking appliances to reduce energy consumption. However, various Member States indicated their preference to split the measures between domestic and commercial appliances. The correction factor for domestic gas ovens, introduced to take the energy consumption for heating due to extra required ventilation compared with electric heated ovens, was questioned. Most of the Member States could support a combined labelling measure for electric and gas ovens.

Environmental NGO's and consumer associations indicated that requirements may be more ambitious. The compensation factor for ventilation for using gas ovens was not accepted. Consumer associations indicated that the compensation factor makes the information on the label less clear to consumers. NGO's support a joint label for gas and electric ovens which allows for direct comparison between the energy consumption of both types of ovens. For reasons of clarity to the consumers an energy labelling scheme with steps from A to G is preferred over a scheme from A^{+++} to D.

Industry[19] associations largely supported the approach to set mandatory minimum requirements for domestic appliances in the framework of ecodesign and energy labelling for ovens and range hoods. However, grills and microwave ovens should be excluded from the scope, since energy savings are hardly possible. Industry emphasized that the new standard for measuring hobs should be used. The lack of data on some products groups (i.e. commercial appliances) should not delay measures for the other. The opinions about the use of a correction factor for ventilation for gas ovens were split. However, electric ovens with an A-label in the current system should not be downgraded as far as possible. A part of the ventilation industry suggested setting ambitious minimum requirements on energy performance of range hoods, in line with energy performance of the fans.

[19] See e.g. position papers of CECED (European Committee of Domestic Appliance Manufacturers), available on their website.

2. POLICY CONTEXT, PROBLEM DEFINITION, AND SUBSIDIARITY

2.1 Policy context

Article 15(2) of the Ecodesign Directive formulates the main criteria that makes a product group eligible for ecodesign measures, i.e. *significant sales volume*, a *significant environmental impact* and a *significant improvement potential without excessive costs*. The latter is to take into account the absence of other relevant Community legislation or *failure of market forces* to address the issue properly and a *wide disparity* of environmental performance for functionally comparable products.

The following chapters will subsequently address the three main eligibility criteria and supply the baseline ('BAU', 'Business-as-Usual') data in the process. Note that, while the preparatory study signals poor data availability there has been a considerable effort by the DCA industry, represented by manufacturer's association CECED, to supply appropriate data bases.

2.1.1 Product scope

The scope of the product categories addressed by the future implementing measures is in line with the scope of the preparatory studies and the result of the stakeholder consultations, i.e. domestic cooking appliances (ovens, hobs and range hoods). A more detailed overview of the product scope is given table 1.

Table 1. Products in scope

Products within scope	**Proposed definition**
Domestic appliance	Appliances for household use.
Electric and gas oven	Appliance or part of an appliance which incorporates one or more cavities using gas and/or electricity to operate, including ovens when incorporated in cookers.
Electric hob	Appliance or part of an appliance which incorporates one or more cooking zones and/or cooking areas including a control unit and heated by electricity.
Gas hob	Appliance or part of an appliance which incorporates one or more cooking zones, heated by gas burners, which have a nominal power of 1,16 kW or higher and maximum 4,2 kW.
Mixed hob	Appliance or part of an appliance which incorporates one or more electric cooking zones or areas and one or more cooking zones, heated by gas burners which have a nominal power of 1,16 kW or higher and maximum of 4,2 kW.
Range hood	A motor operated appliance intended to collect contaminated air from above a hob or includes a downdraft system intended for installation adjacent to domestic cooking ranges, hobs and similar cooking appliances, that draws vapour down into an internal exhaust duct. The blower of the domestic range hood may be internal or external, provided that is controlled by the domestic range hood and has an electric power below 280W. The air may be ducted away or discharged back into the room after filtration.
Fully automatic range hood	A domestic range hood in which the air flow and/or other functions are automatically controlled through sensor(s) during the 24h hours including the cooking period with an electric power below 280W.
Products excluded from scope	**Proposed definition**
Appliances that use energy sources other than electricity or gas	Self-explanatory. This excludes appliances using liquid or solid fuels as well as appliances directly using heat from renewable sources.
Commercial cooking appliances	Appliances not for household use
Microwave ovens	Appliances which offer the function 'microwave heating' for heating of food.
Small cavity ovens	Electric or gas ovens with a cavity with a width and depth smaller than 250

	mm or height smaller than 120 mm.
Portable ovens	Appliances other than fixed appliances, with a product mass lower than 18 kilograms, provided they are not designed for built-in installations.
Small burners of gas hobs	Gas burners of hobs which have a power lower than 1.16 kW.
Large burners of gas hobs	Gas burners of hobs which have a power higher than 4.2 kW.
Gas hobs with covered burners	Appliance or part of an appliance which incorporates one or more flat cooking zones, heated from the back side by gas burners.
Range hoods without motor	Appliance intended to collect contaminated air from above a hob connected to a ventilation appliance not controlled by the range hood.

The exclusions mark the boundaries of the scope of the measures discussed in the underlying IA report. They do not preclude that the 'products excluded from the scope' may be included in separate future measures under the Ecodesign Directive 2009/125/EC and/or the Energy Labelling directive 2010/30/EU or that they will be included in the future scope of the measures at the review. For instance, commercial cooking appliances are not included in the scope, because remedying the deficiencies in test standards and market data required to design effective and responsible measures would probably take several years. After consultation of stakeholders at the Ecodesign Consultation Forum held on 18th April 2012 (see **Annex A**), it was decided that inclusion of commercial cooking appliances at this stage would unduly delay the introduction of measures for domestic cooking appliances. Grills are excluded since this category consists of a wide variety of different appliances with different purposes and there is no consistent data available currently. Appliances that use energy sources other than electricity or gas, appliances which offer the function 'microwave heating', small ovens, portable ovens, range hoods without motor and gas hobs with covered burners are excluded, because either these appliances hardly occur anymore on the market or their environmental impact is relatively small compared to the impact of the ovens, hobs and range hoods under scope. [20]

2.1.2 Sales volume and market structure

Sales DCAs

The preparatory studies reports EU unit sales of over 10 million domestic electric hobs, 6 million domestic gas hobs, 10 million domestic electric ovens, 2 million domestic gas ovens and 7 million domestic range hoods per year in 2010, which results in an annual total sales of about 36 million appliances, far above of the minimum sales criterion of Article 15 of the Ecodesign Directive[21].

As with most domestic appliances, the sales of cooking appliances show a moderate growth trend up to the crisis in 2008-2009. Sales growth may pick up its old pace in the New Member States, but industry does not expect a short-term recovery of Western European sales. In 2020 the market is expected to be around 39-40 million units, i.e. similar to the growth in the number of EU27 households over the 2010-2020 period (projected to be less than 1% per year, see Annex D). Figures 1 and 2 show actual sales and stock 1990-2010 and 'business-as-Usual' projections for the period 2010-2030

Figure 1. Sales of domestic cooking appliances in the EU (Business as Usual).

[20] See Explanatory Notes in the draft Commission Working Document on DCAs, June 2012.

[21] Art. 15 of the Ecodesign Directive: minimum sales of over 200.000 pieces/a.

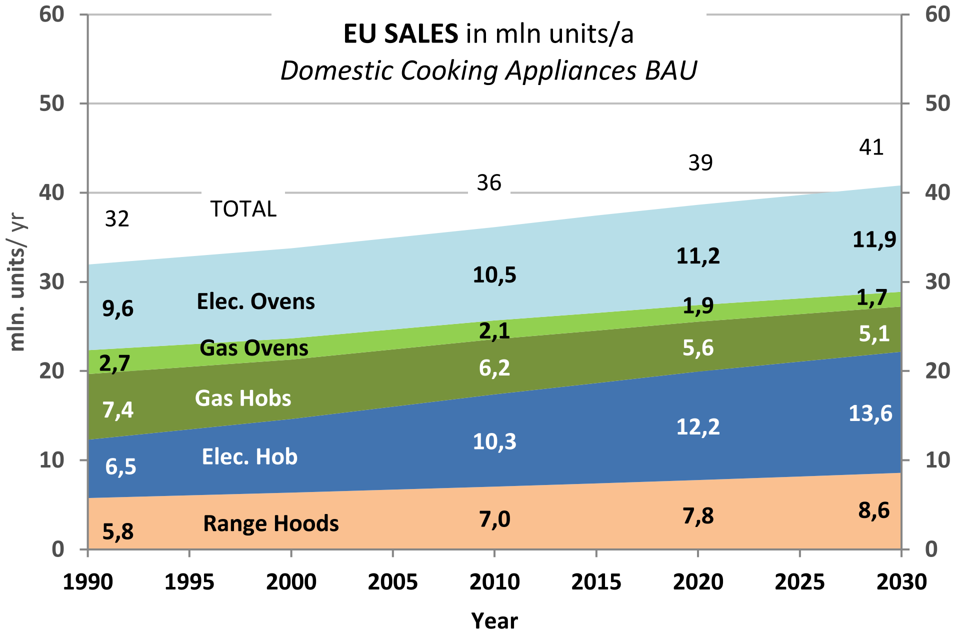
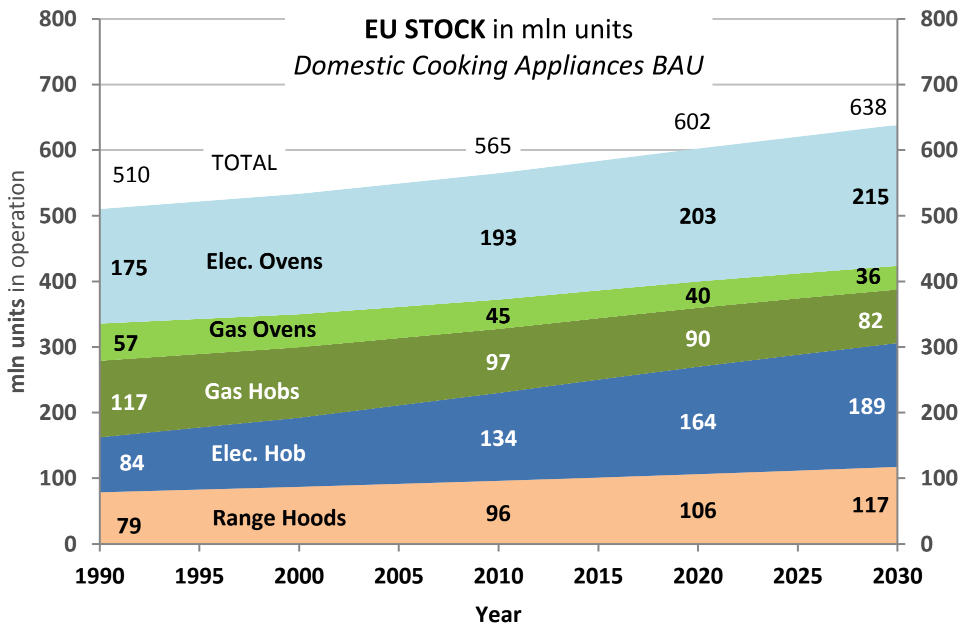


Figure 2. Stock of domestic cooking appliances in the EU (Business as Usual).



The analysis of the EU sales and stocks for DCAs shows that the market for domestic ovens and hobs is saturated, with market penetration[22] over 100%, while range hoods are installed in 44% of the households in the EU. See Figures 1 and 2.

Production and trade of DCAs

[22] Market penetration is the ratio of appliances in use and number of households. At a market penetration of more than 100% means that a fraction of households has more than one appliance per device class.

The preparatory studies show that most DCAs on the EU-market were produced in the EU-27 in 2008. The apparent consumption of cooking appliances is 80% of EU-production in the EU, i.e. 20% is filled in by a negative extra-EU trade balance mainly with Turkey and South-Korea.

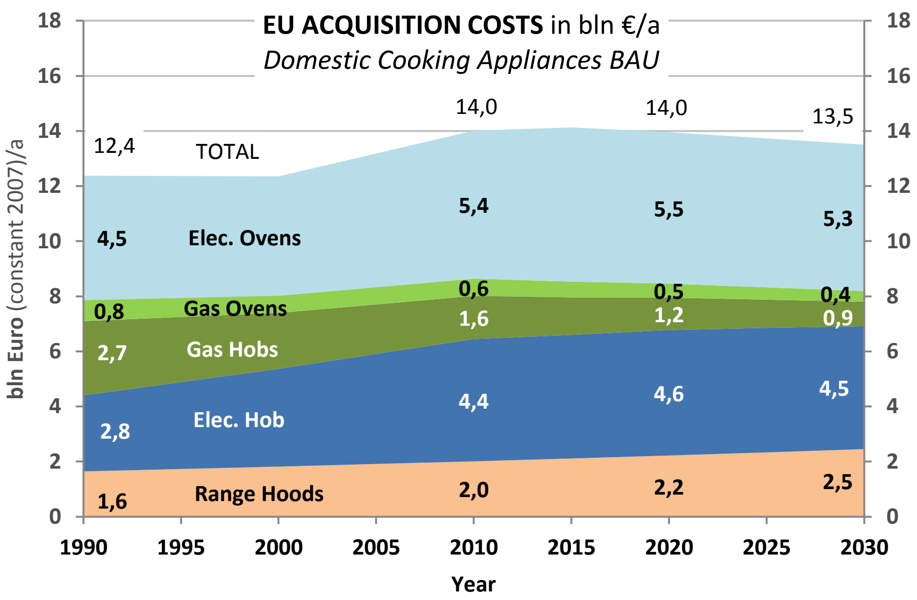
The preparatory studies on ovens and hobs report that major EU producers of domestic cooking appliances are Poland, Italy, Germany, the UK and France. Nearly 50% of the production inside the EU of domestic gas cooking appliances was in 2008 represented by the UK and Italy. The main players in production of domestic electric cookers were Poland, Germany, Italy, the UK and France, who accounted for 80% of the unit sales. Main producers of range hoods are Italy and Germany (see also section on employment).

Business revenue

Sales revenue for market actors can be derived from the total acquisition costs as shown in the graph below. In 2010 the total EU purchase costs of DCAs amounted to 14 billion euros. This is revenue for the utilities. Of this, one-third, around 4.7 billion euros is industry revenue. Wholesale fraction is estimated at 20-30% of the manufacturing selling price, i.e. 1.4 billion euros (10% of the total purchase costs), retailers take about 5.6 billion euros (40% of the total purchase costs) and the remainder of 2.3 billion euros goes to VAT (15-20% of consumer price). At sales of 36 million units this comes down to an average DCA-price of 390 euros per unit. See also section on consumer expenditure hereafter.

Figure 3 shows actual acquisition costs 1990-2010 and 'Business-as-Usual' projections 2010-2030.

Figure 3. Acquisition costs of domestic cooking appliances in the EU (Business as Usual).



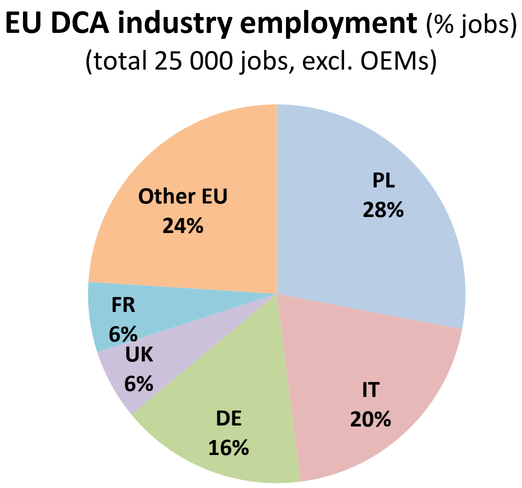
Employment

Employment can be estimated 'top-down' from the average revenue per employee. For the final manufacturers, this is estimated at 188000 euros annual revenue per employee. At an overall revenue of 4.7 billion euros for appliances manufacturing, this results in approximately 25000 jobs. The average revenue figure also contains, at a much lower rate, the costs and thus jobs of Original Equipment Manufacturers (OEMs). Based on anecdotal data, it is estimated that the OEM-fraction is around 50%, i.e. for every two employees in the final manufacturing there is one employee in the OEM-industry supplying materials and components. Total industry employment thus amounts to around 38000 jobs.

The industry employment can also be estimated 'bottom-up', i.e. from estimated employment at the various production sites of the manufacturers. This is elaborated in Annex E and confirms the size of 25000 jobs (of which one-third in range hoods and two-thirds in ovens and hobs) at DCA manufacturers and 10-15000 DCA-related jobs at component suppliers (OEMs). Poland is believed to host the largest EU-27 production of DCAs, followed by Italy, Germany, UK & Ireland, France and the rest of the EU-27.

Industry employment data in Figure 4 are rough estimates and exclude OEM shares (see also section on industrial market actors). This figure is a 2012 snapshot; there is a trend for most EU-based manufacturers to move Western European production to low-labour cost countries (Poland, Turkey and for smaller ovens Asia). Outside the EU-27, Turkey is an important supplier to the EU market, both through Turkish subsidiaries of EU companies (Bosch, Candy) and independent Turkish brands (Arçelik, Vestel). The role of Asian imports, from subsidiaries of EU-companies and South-Korean brands like Samsung and LG, is relatively strongest in smaller-size ovens.

Figure 4. Employment in the EU DCA-industry (excl. OEM)



In the wholesale sectors, average revenue/employee is typically in the range of 300000 euros per employee and thus employment in wholesale is estimated at around 4000 jobs.

In the DCA retail sector a ratio of 100000 euros revenue per employee is assumed to be typical. A considerable fraction of the DCAs is sold as built-ins through kitchen retailers and furniture companies (e.g. IKEA) or as freestanding appliances through specialist appliance shops (e.g. Metro, Media Market, BBC etc.), DIY chains (e.g. low-cost range hoods and hobs), department stores and the non-food section of large supermarkets (e.g. Carrefour). In total there are about 300000 DCA outlets in the EU[23]. Thus around 50-60000 jobs in retailing

[23] Estimate by the technical consultant VHK, based on a proprietary analysis of national and EU NACE statistics.

can be partitioned to selling DCAs, representing 0.2% of the total employment in the EU trade sector.[24]

In total, the number of EU jobs depending on producing, distributing and selling DCAs is estimated at around 100000.

Industrial market actors and stakeholder associations

All large domestic appliance manufacturers market a line of cooking appliances: Electrolux, Whirlpool, BSH, Indesit Company, Candy, Fagor (Fagorbrandt and FagorMastercook), Miele, Gorenje, Teka, SMEG, Franke and Turkish manufacturers with no EU-based manufacturing like Arçelik, Vestel. Manufacturers more specialized in ovens, cookers and hobs are AGA Rangemaster and Amica. Tabletop ovens are a specialty of De Longhi, SEB, LG and Samsung. For range hoods, market leaders are BSH, Faber (Franke Group), Elica, Tecnowind. DCA component suppliers include E.G.O. (amongst others electric and gas heating elements), EBM Papst (fans for ovens and hoods), SABAF (gas burners), Schott (glass cooktops).

Independent SME-employers, i.e. companies with less than 250 employees, are rare in the DCA industry. Medium-large enterprises, i.e. with 250 to 500 employees, are e.g. the Italian Bertazzoni-La Germania company, Nardi, Glem Gas and Fratelli Onofri – Terim. SME enterprises with less than 250 employees are e.g. Jose Das Neves Queirós (PT), Trepol (DK, 50 jobs) and Bertel (DE, 60 jobs). Industrial micro-enterprises could not be identified.

It is estimated that industrial SMEs, including OEM-suppliers, represent no more than 10-15% of employment in EU manufacturing of DCAs (some 5000 jobs), i.e. significantly lower than the EU-average. Over the past decades many SMEs have been taken over, merged and/or abandoned production activities and moved their focus to marketing, logistics and R&D.

In the distributive trade, the share of SMEs is believed to be closer to the EU average, i.e. around 70%.[25]

Annex E presents an indicative list of industrial companies with production facilities in the EU and gives an estimate of their DCA-related employment.

The industry association for manufacturers of DCAs is CECED. The DCA trade sector is represented at EU level by Eurocommerce and, for on-line sellers, by EMOTA. Consumer associations are represented at EU level by ANEC/ BEUC. Green NGOs collaborate in the consultation process e.g. through ECOS. Eurelectric and Marcogaz represent EU electric and gas utilities respectively. AEGPL represents the LPG suppliers.

Consumer expenditure

Consumer expenditure consists of acquisition costs and running costs (energy, filters for hoods, repairs, etc.). Within the latter, the graph below only takes into account the main component, i.e. energy costs which currently amount to over 14 billion euros for the DCAs installed in the EU 2010.

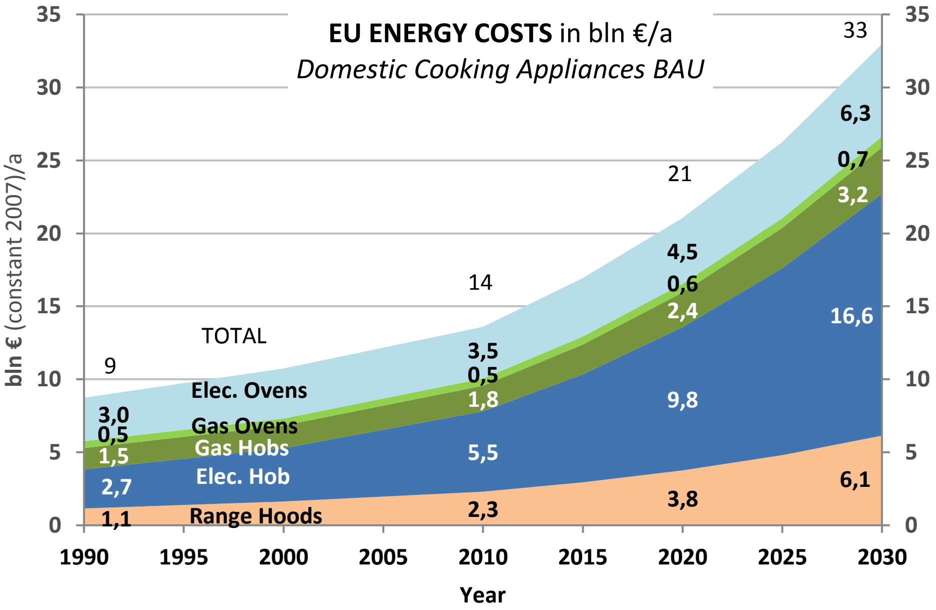
Figure 5 shows actual energy cost 1990-2010 and 2010-2030 ‘Business-as-Usual’ projections of the expected energy costs for consumers. The graph is based on real constant 2007 prices, i.e. inflation corrected. Until about 2007, the average EU electricity rate increase in the EU hardly rose above inflation, but on average over the past 5 years the real (inflation-corrected) electricity rate rose with 4% per year. Gas prices, following oil prices, have been rising at a real (inflation-corrected) rate of 2-3% over the whole period, but also there the real growth

[24] Total employment in the retail sector, according to Eurocommerce, is around 31 million jobs. The total added value of the trade sector in the EU-27 is 11% of EU GDP, i.e. around 1300 billion € (source: www.eurocommerce.org)

[25] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Structural_business_statistics_overview

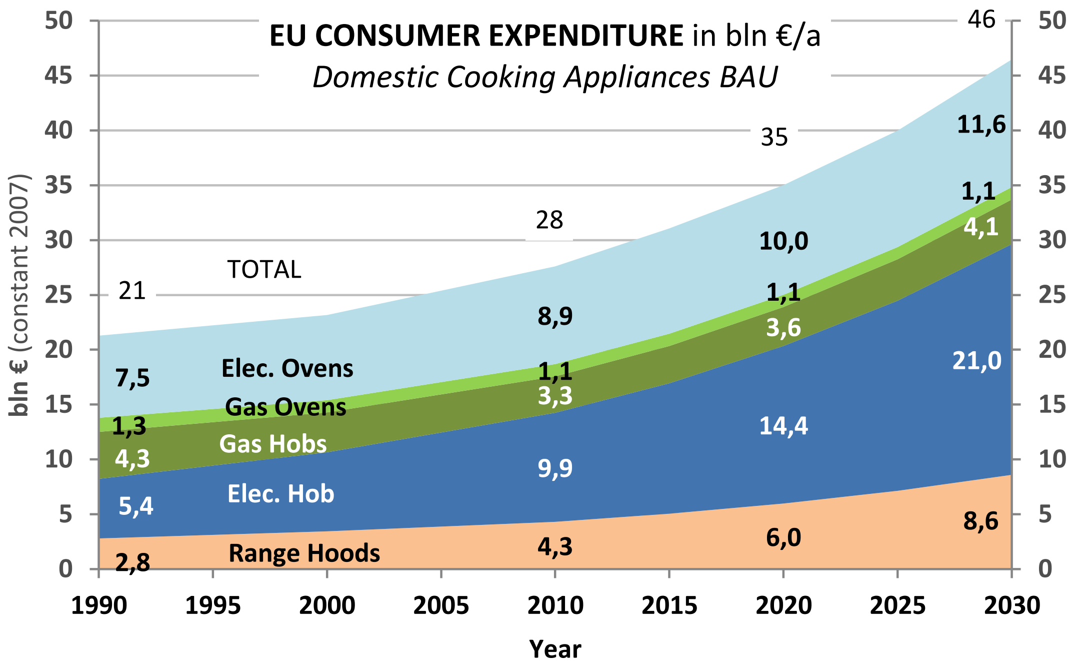
rate has increased. From 2007 onwards, the energy escalation rate of 4% has been used. For the period 2007-2020 this means an increase of 50% of the energy costs related to DCAs. In 2030, the energy bill will have doubled for DCAs with respect of today.

Figure 5. Energy costs of domestic cooking appliances in the EU (Business as Usual).



The total consumer expenditure, the sum of acquisition and running costs, amounted to 28 billion euros in 2010 (see Figure 6). Per household this represents 140 euros/a.

Figure 6. Consumer expenditure on domestic cooking appliances in the EU (Business as Usual).



Currently, expenditure is split half-and-half between acquisition costs and energy running costs. In 2030, in a 'business-as-usual' scenario, the energy costs will make up 70% of the total. Neither 'statistical time series on DCA product service life', nor 'projections of DCA market penetration' are available.

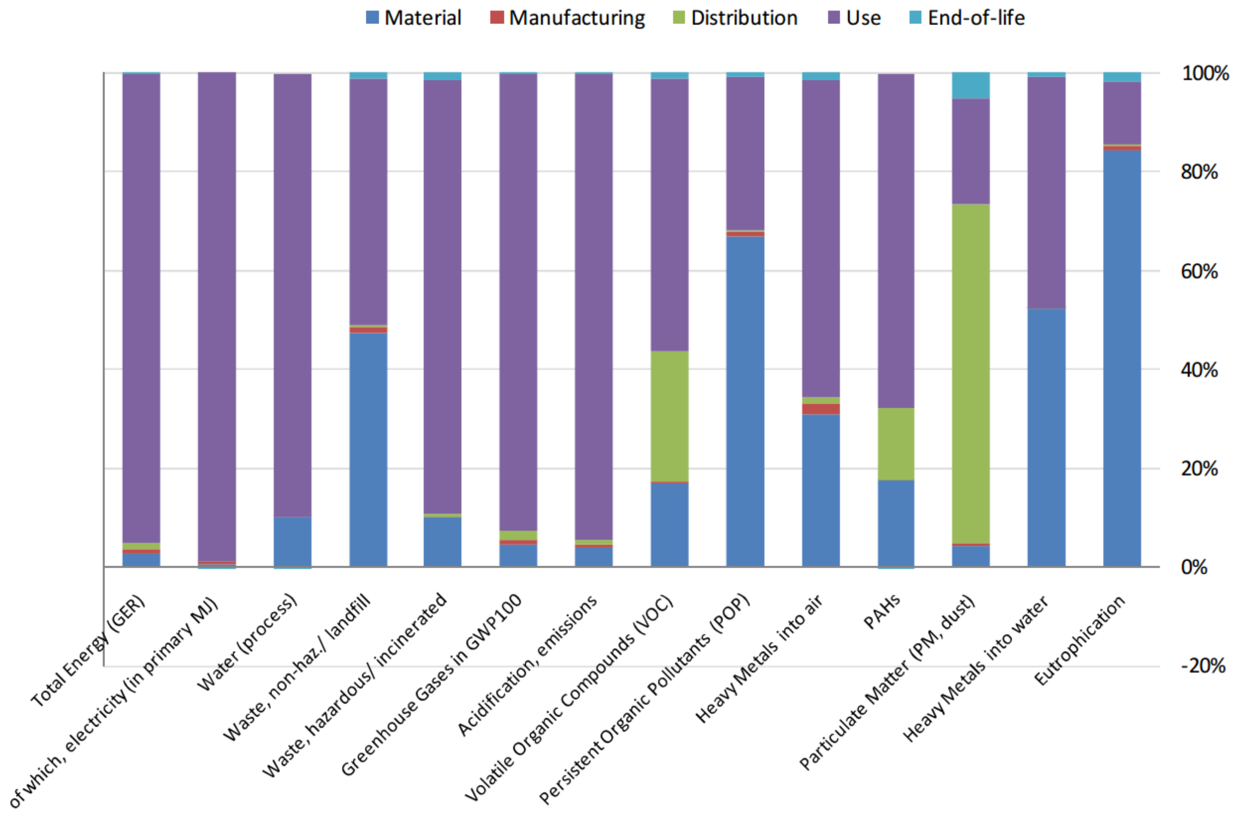
2.1.3 Environmental impact

The environmental impact[26] included in the preparatory studies shows that for DCAs the use phase is by far the most impacting stage of the life cycle of the life cycle in terms of energy consumption and greenhouse gases emissions. The production phase has a significant impact on some aspects as generation of non-hazardous waste, heavy metals emissions and eutrophication.

See Figure 7 below.

[26] Calculated with EcoReport version 5, Eco-design of energy-using products, VHK for European Commission, Nov 2005

Figure 7. Distribution of environmental impacts of domestic electric ovens.



Energy in the use phase (energy and related carbon emissions)

The figures below show the historical data 1990-2010 and the 2010-2030 ‘Business-as-Usual’ of primary energy consumption and Green House Gases (GHG) emissions.

The total primary energy consumption in 2010 is around 755 PJ (18 Mtoe) and the related final energy consumption is around 109 TWh[27]. The GHG emissions of DCAs amount to 35.4 Mt CO_2 equivalent in 2010.

The total primary energy consumption of around 755 PJ is roughly comparable to the current primary energy consumption of Ireland.

The greenhouse gas emissions of 35.4 Mt CO_2 eq. is e.g. half of the current greenhouse gas emissions of Finland. Based on this environmental aspect alone, the environmental impact is significant enough to be elected for policy measures.

Both the total energy consumption and the carbon emissions are relatively stable over the 1990-2030 period.

[27] Final energy consumption by appliances as follows: hobs (58%), ovens (30%) and range hoods (12%).

Figure 8. Primary energy consumption by domestic cooking appliances in the EU (BaU).

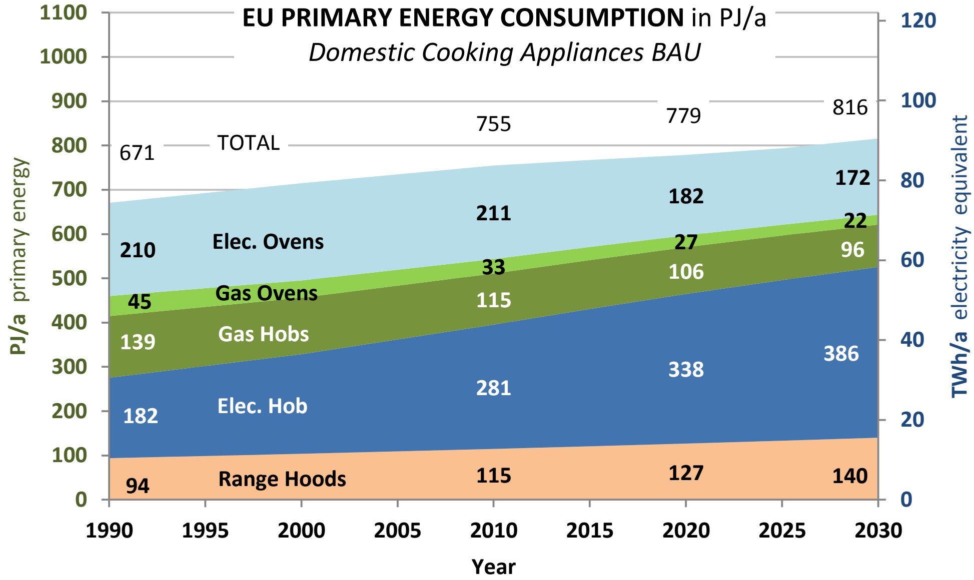
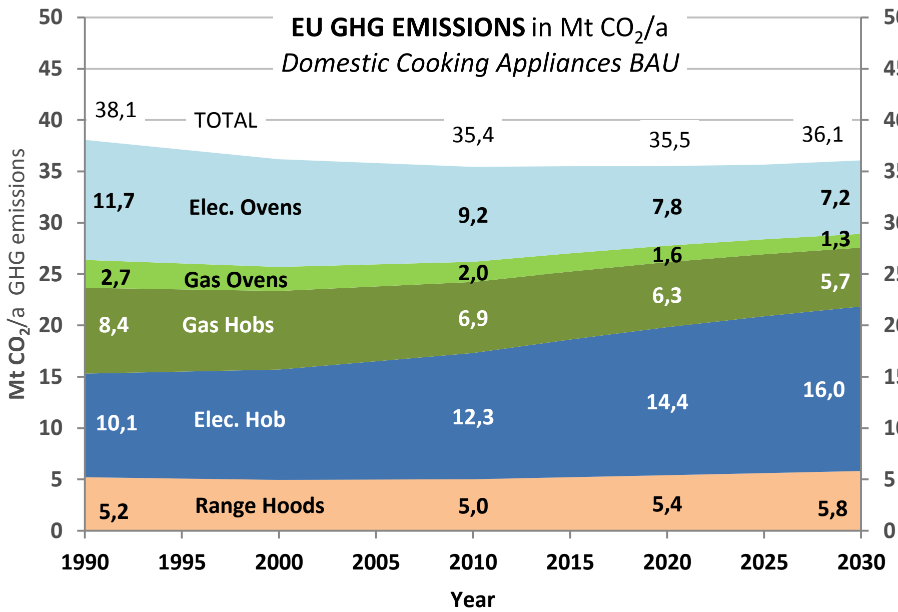


Figure 9. Greenhouse gas emissions due to domestic cooking appliances in the EU (BaU).



Production energy

The average weight of the base-case electric and gas hobs described in the preparatory study is 9.7 kg and 7.8 kg. The weight of the average electric oven is 30.9 kg and of an average gas oven 50.1 kg. With the sales of 29 million units of ovens and hobs, there is a net materials consumption of 578000 tonnes per year. Given the energy requirement between 472 MJ (gas hobs) and 2354 MJ (gas ovens) per product, the total energy required in the EU-27 for production, distribution and end-of-life of cooking appliances amounts to around 39 PJ per year. This amount of energy is not significant compared with the energy consumption in the use phase (<6% of energy in use phase).

Waste

The waste output from discarded cooking appliances lags some 15 to 19 years (product life+ time 'on stock' in the house) behind the developments in sales. Since the stock of gas ovens and hobs is decreasing and of electric ovens and hobs is growing, it relates to a larger stock for gas appliances and a smaller stock for electric appliances. The preparatory study estimates that of collected discarded cooking appliances, 67% of the material of electric hobs, 96% of the material of electric ovens and 98% of the material of the gas ovens and hobs is being recycled, which means that 83 000 tonnes of materials of discarded hobs and ovens is disposed. An estimate of the amount discarded 'illegally', through the normal garbage or dumped, was not given. Other waste in the distribution and use phase is negligible.[28]

Noise

Noise is identified as an environmental impact of range hoods, influencing the user satisfaction (and indirectly health) and is therefore taken into account as a relevant product characteristic.

2.1.4 Saving potential

Given the total absolute energy impact of this product group, the preparatory studies (see section 1.3) concluded that the saving potential is significant enough to be eligible for measures.

The technical design options that would bring about these saving were identified in the preparatory studies as follows:

- *For hobs*

  Optimized burner and pan support design (gas hobs); 2. Switch to more efficient heating technology (electric from solid plate to radiant to induction); 3. Reduction of mass (solid plate); 4. Optimization of electronic controls (gas, radiant and induction); 5. Use of pot sensors (automatic switch off when no pot present) (all types); 6. Automatic cooking (all types).

- *For ovens*
  Improvement of thermal insulation; 2. Reduction of thermal mass; 3. Optimized door design.

- *For range hoods*
  Change of AC motor to EC[29] motor; 2. Improvement of fan design; 3. Improvement of interior air flow design; 4. Improvement of motor and fan control.

The preparatory studies stated that the technical design options did not impose the use of proprietary technology.

The saving potential is linked to the disparity in energy efficiency of the domestic cooking appliances.

The breakdown of energy efficiency of 2012 models is given in Figures 10 (hobs) and 11 (ovens). This breakdown is based on the CECED database of models by EU manufacturers, which is used and accepted as a basis for decision making by all stakeholders including

[28] The preparatory study mentions kilometres for maintenance and repair for hobs and ovens, estimated to 15 kilometre per appliance over the life time

[29] Electronically Commutating

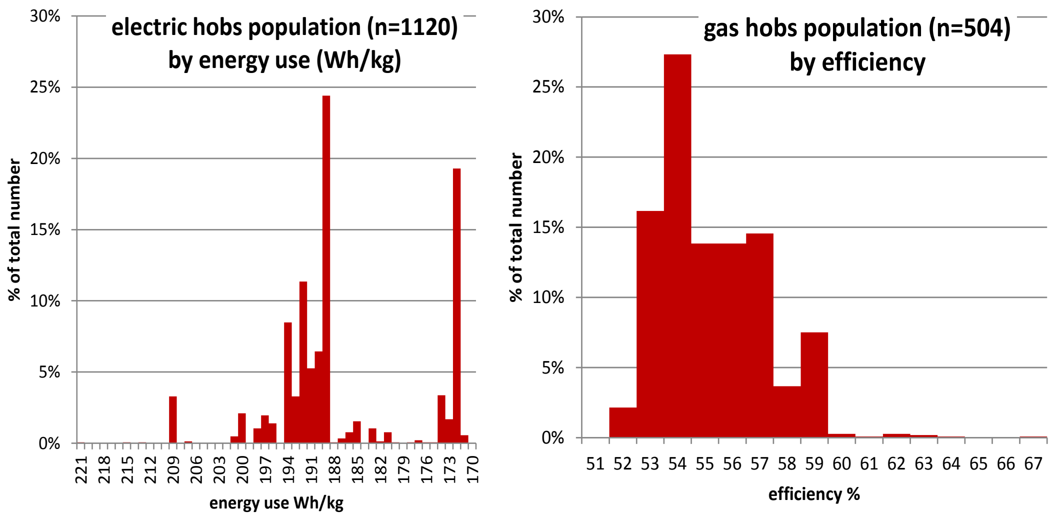
Member States and NGOs. The CECED database does not capture 10-15% of the models, predominantly in the low-cost and low-efficiency segment, imported e.g. from Asia. Thus especially when assessing the elimination of 2012 models in section 4 (Options 4 and 5), the actual savings may be higher than suggested by the elimination levels.

- *Hobs*

  The disparity in energy efficiency of hobs depends on the energy source, gas and electricity. Within both groups, electric and gas, there are considerable differences in efficiencies due to heating techniques and design differences. For electric hobs three different heating technologies are used with different performance characteristics (induction hobs, radiant hobs and solid plates). See Figure 10.

  Note that, with or without ecodesign or labelling measures, the offer of hobs in manufacturers catalogues changes over time for commercial reasons. At an estimated design cycle of 8 years, (almost) all available models currently on the market will be replaced by new versions by 2020.

Figure 10. Spread in efficiency performance[30] of electric hobs and gas hobs (CECED 2012).



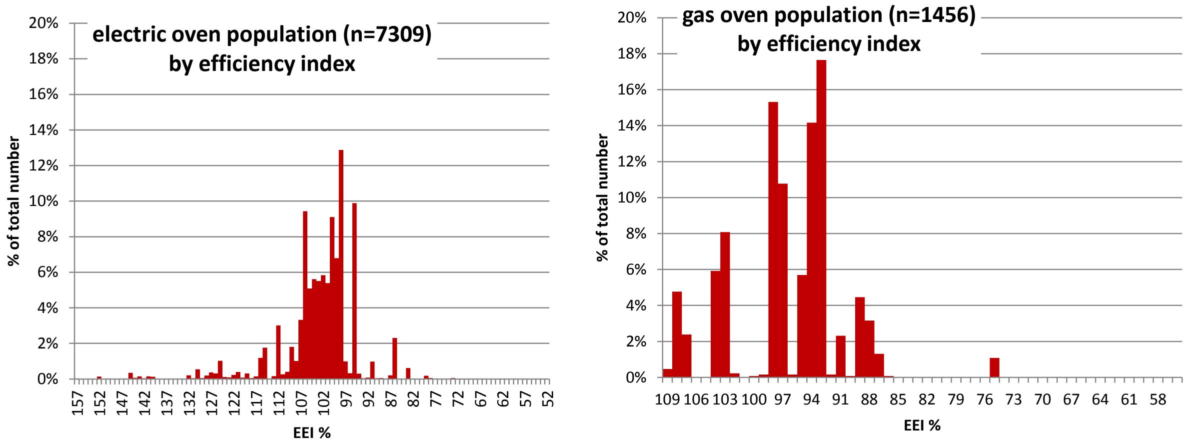
- *Ovens*

  The disparity in energy efficiency of ovens is at first depending of the energy source (gas and electric). Due to the influence of the ‘size dependent’ mandatory energy label, introduced in 2002 by Commission Directive 2002/40/EC[31] on energy labelling for electric ovens, the energy performance of electric ovens has a peak around EEI[32] = 100%, but the performances differ from an EEI over 200% to an EEI just over 70% for the best performing appliances. For gas ovens, the spread between the best and worst performing appliances is smaller. See Figure 11.

  As with hobs, at an assumed design cycle of 8 years, (almost) all models will be replaced by 2020, with or without ecodesign or labelling measures.

[30] Databases with performance data of electric and gas hobs available in the EU market in 2012. Communication CECED (industry association) to the Commission services, d.d. October 2nd 2012.
[31] OJ L 128, 15.5.2002, p45
[32] calculated as indicated in chapter 4

Figure 11. Spread in efficiency performance[33] of electric and gas ovens (CECED 2012)

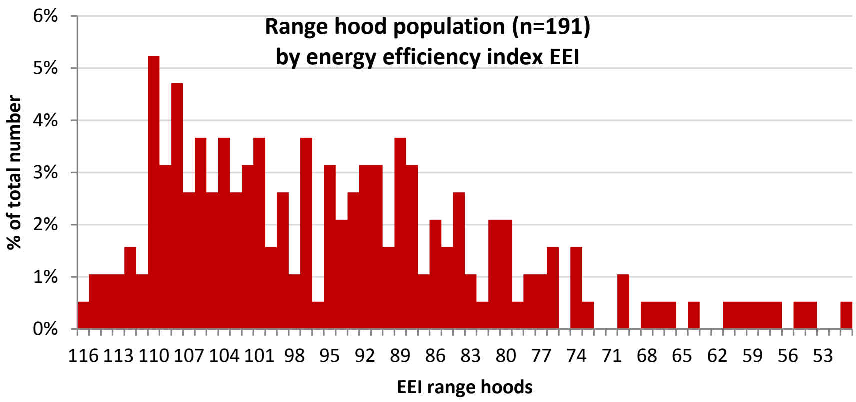


➢ *Range hoods*

The industry data[34] shows that there are considerable differences in energy performance at equal functionality for range hoods, i.e. taking into account electricity use for fans and lamps. The policy discussion focussed rather on what type of functionality should be considered, rather than doubting that there is a significant saving potential. Most stakeholders agree with a measure including energy consumption against power for the air flow and for lighting. Some stakeholders proposed to include measures against over-ventilation standby and low-mode power use.

The energy efficiency of range hoods shows a fairly equal distribution of the number of models over an EEI range from 51 to 116. This indicates a wide disparity and the distribution, without the peaks of ovens and hobs, makes setting of targets much less critical than with hobs and ovens. Note that the database for range hoods is relatively small, with only 191 models.

Figure 12. Spread in efficiency performance of range hoods (CECED 2012)



[33] According to database with performance data of electric and gas ovens available in the EU in 2012 communicated by CECED (industry association) to the Commission services in October 2012.

[34] Communication CECED (industry association) to the Commission services, September 2012.

2.1.5 Legal basis

The Ecodesign Directive and, more specifically, its Article 16 provides the legal basis for the adoption of implementing measures. The Ecodesign Directive uses 'CE marking' of products brought on the market by manufacturers as the legal tool. Subsidiarity in this context is not applicable, because the problem is trans-national and actions by Member States alone would restrict free circulation of goods. Furthermore at the scale of Community level any action would be far more effective than at Member State level.

2.2 Problem definition

The main market and regulatory barriers hampering a larger market penetration of energy efficient cooking appliances were identified in the preparatory studies as follows

2.2.1 Market failures

Lack of consumer information

For most DCAs, consumers are not provided with information that would guide them towards purchasing energy efficient appliances. Only electric ovens are provided with information about energy efficiency due to the energy label introduced in 2002, but harmonised information about gas ovens is missing in the market.

For hobs, several governmental agencies and organisations provide information on smart use of hobs or providing information on the benefit of gas or electric ovens. But neither for gas, nor for electric hobs, relevant energy efficiency information is available at the point of sales that would guide consumers on differences in performance and energy consumption.

The preparatory study on ventilation, including range hoods, indicates that information on air flow rate, filters and acoustic performance must be provided, but that such information on packaging or in instruction does not help end users to make their choice.

Externalities

As with other consumer goods, it is clear that even with accurate environmental information available, a significant portion of purchasers will either not understand the long term implications, or will not care because they are not the ones paying the energy running costs (e.g. in rental situations). One of the justifications for ecodesign requirements is the reduction of the environmental impact of the cooking appliances whenever people buy for themselves or for others. Some of the impacts will be on the end-users (energy cost, indoor air quality); other impacts will be external (impact related to the energy production) with no direct economic consequence for the consumer.

Culture and habits

Cooking appliances are at the heart of the kitchen and many consumers tend to be very attached to certain features or certain real or preconceived notions about these appliances. Some consumers would not want to miss out on the heat-up speed of gas, whereas others are very attached to the safe and easy-to-clean electric cooking appliances.

Induction hobs often outperform the usability, safety and energy efficiency of radiant hobs, since induction hobs do not need time to heat up and react faster on switching off, since they store less heat. However, many people prefer radiant hobs, not only because of the lower purchase price but also the suitability of the radiant hobs for all sorts of pots and pans.

Electric ovens usually have a more even heating distribution and are perceived to be safer than gas ovens. Gas ovens usually heat up quicker and help consumers to avoid the peak electricity tariffs, which utilities in some Member States apply.

Range hoods are not only functional products with specific features regarding grease filtering and lighting, but also an important part of the aesthetics of the kitchen environment. Furthermore, personal preferences as regards the hood's lighting arrangements, the intensity of grease filtering and odour reduction may play a more important role than energy efficiency considerations, especially when information on the latter is lacking.

2.2.2 Regulatory failures

Lack of specific policy measures

The Ecodesign preparatory studies made clear that there has been very little policy action either in the EU or in third countries to reduce the energy consumption of cooking appliances.

Apart from the mandatory energy label on domestic electric ovens, introduced in 2002[35], other cooking appliances have so far escaped the attention of policy makers. Mandatory measures and financial incentives have also never been introduced, neither inside nor outside the EU.

At a component level, the existing Ecodesign regulations on fans and motors will have no effect on range hoods. The Ecodesign Commission Regulation 327/2011 on Fans >125 W will have no impact on range hoods energy efficiency, because fans for range hoods with a total maximum electrical input power up to 280 W are excluded from this regulation.

So far there has been no significant action by Member States to distort the internal market, but in the absence of EU action, the problems described may lead Member States to act on their own (as already has happened in the case of other products, such as circulators recently, or electric ovens in the 1980s. In both cases national action was taken by Denmark).

General legislation applicable to (certain types of) cooking appliances not addressing the currently dominant environmental impact

At a more general level, the possible use of brominated or chlorinated flame-retardants is tackled in the RoHS Directive (2011/65/EU recast), but from literature it is clear that these are not a 'hot' environmental issue.

The WEEE Directive (2012/19/EU recast) was set up to handle recovery/recycling of electronic and electrical waste, amongst which cooking appliances. At present, this seems fairly successful. No particular design measures were found, apart from the usual[36], which would be particularly helpful in recovering and recycling of cooking appliances.

The packaging of cooking appliances has long been regulated through the Packaging directive (94/62/EC and amendments[37]) and after the switch to simple mono-material solutions (cardboard/paper inside and outside) it can actually no longer be considered a priority environmental issue.

The Low Voltage Directive LVD (2006/95/EC) regulates electrical safety of domestic cooking appliances, but in terms of environmentally related issues the most relevant are references to harmonised standards on emissions of toxic materials under fault (on fire) conditions.

Other applicable legislation with little bearing on the environmental impact of cooking appliances is the directive on Electromagnetic Compatibility EMC (2004/108/EC).

[35] Commission Directive 2002/40/EC on energy labelling of household electric ovens, OJ L 128, 15.5.2002, p 45.

[36] E.g. design for disassembly, easy recovery of metals parts, avoid using a mix of plastics that would make the product more difficult to handle in shredder-based recycling, etc.

[37] Amendments to Directive 94/62/EC by Directives 2004/12/EC, 2005/20/EC and Regulation (EC) 219/2009.

Lack of appropriate measurement standards

The applicable standard for measuring the energy efficiency of gas hobs describes a test for energy efficiency performance of heating a load. However, the CEN technical committee 49, working group 2 on energy consumption of domestic gas cooking appliances is discussing a revision of this standard. Although the valid standard describes a relevant method for measuring the energy efficiency of gas hobs, a new standard should be more in line with the average behaviour of consumers during cooking.

For measuring the energy consumption of domestic electric hobs the Cenelec working group on surface cooking appliances of the technical committee 59 (TC 59X/WG 10) is performing a similar revision as is underway for gas hobs. This new pre-standard is in the stage of voting and will be valid in the beginning of 2013. The method describes the measurement of the energy consumption of heating of a load – a pan with water – and subsequently a period of simmering at a steady temperature. The new method is closer to average daily use and shall therefore be the basis for a transitional method.

Suitable test and calculation methods have only recently become available and the lack of these standards has, thus far, been a barrier to providing adequate energy efficiency information and adequate policy measures.

2.2.3 Discrepancy between fundamental EU goals and the existing situation

As mentioned in sections 1 and 3, the EU pursues policy goals in terms of energy efficiency and carbon emission reduction as well as a single internal market. The existing situation with cooking appliances where the potential in contributing to these goals is not explored poses a discrepancy. Furthermore, the legal tools to change this situation exist (Ecodesign, energy labelling) and the boundary conditions set by the legislator for using these tools are fulfilled, as explained in the underlying report.

2.3 Sensitivity analysis of baseline

The actual energy consumption depends to a large extent on cooking behaviour, which can be widely different e.g. between EU Member States, as was shown in the 1997 SAVE study on electric ovens. Statistical data availability on this subject is poor. Time studies suggest that per household around 1 h/day is spent on ‘cooking’ as activity and it is plausible that the lighting in hoods may be used for 2 h/day, but the accuracy of this assumption is probably not higher than ±30%. Furthermore, the analysis is based on cooking cycles which are linked to the test standards and then tuned to what was found to be average EU energy consumption in anecdotal studies. In reality, the way that people use DCAs varies widely depending on the region (e.g. potato versus pasta culture), family size and income (e.g. frequency of eating out). The previously mentioned SAVE study found that the British (cake) and the Fins (bread) are intensive oven-users, whereas in Italy consumers hardly use ovens.

As regards the assessment of statistical market data on energy, it must be taken into account that thus far only for electric ovens there has been an energy label that would allow a third-party (non-industry) assessment of the energy efficiency of the products on sale. For all other appliances, only the non-sales-weighted CECED database is available for analysis.

For the future projections of DCA energy use, the accuracy will certainly not be higher

Economic Crisis

In several consumer product sectors the 2008-2009 crisis has led to drops in sales up to 20 or 25% (air-conditioners, boilers, etc.), after a considerable growth in the 2006-2007 period. The overall effect that is assumed, in line with scenarios given by EC DG ECFIN, is that the 2010 sales equal those of 2005. This scenario has been compared with other standard crisis scenarios proposed by the Commission and appears fairly robust (deviations <10%).

Energy prices

As regards the influence of the electricity rates, the scenarios have been adapted to the latest findings in the MEErP study[38], which signals that the electricity rates (previously in line with inflation) were subject to an escalation rate (real growth, i.e. above inflation) of 3-4%. At the time of previous Impact Assessment (IA) studies of other domestic appliances (refrigerators, washing machines, etc.), it was still believed that the sharp rise in domestic energy rates was a temporary phenomenon and thus electricity rates would return to their usual pace of being slightly higher than inflation. Now, after five years, it can be assumed that the 3-4% real price increase of energy rates is a structural phenomenon. Therefore the energy escalation rate is assumed to be 4% from 2007 on. The result is that the real running costs of DCAs over the 2010-2030 period will more than double. The question is, although it is generally acceptable to extrapolate longer term historic trends to the future, if this is really going to happen. A second question for the DCAs is: if DCA running costs are going to double over the next 20 years, will it change the consumers purchase behaviour (e.g. with energy efficiency becoming more important and thus an autonomous shift in products being offered) and their cooking behaviour?

Functionality

The development of the cooking appliances in the scope has been evolutionary rather than revolutionary. Under the influence of energy cost increases this may change, but also the new technologies (not in the scope) like micro-waves and steam-ovens might have an influence on the appliances in the scope. Cooking behaviour and innovation in 'food design' is more volatile, subject to consumer considerations of health, fashion and environmental impact (e.g. less red meat).

Rebound effect

The 'rebound effect' is a phenomenon whereby the increased popularity of an energy-saving technology has not only triggered replacement of inefficient products, but –presumably because consumers no longer felt 'guilty'—also created completely new applications in places where no energy was consumed before.

With cooking appliances the chances of these rebound effects are very slim, simply because so far the energy use of DCAs was not considered problematic. In the future, with larger awareness of energy costs and environmental impact this may change.

Conclusion

It is believed that the underlying IA represents the currently best possible assessment of energy use related to DCAs, but as a result of the factors above and limited data availability in general, the accuracy of the current energy consumption is limited, as it is the case with most products that have not been subject to measures previously.

2.4 Risk Management

For a sector like cooking appliances there are no issues that meet the conditions for a risk assessment as a part of the impact analysis as addressed in the EU IA Guidelines [39].

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[38] Methodology for the Ecodesign of Energy-related Products (MEErP), VHK for European Commission, 2011.(see www.meerp.eu)

[39] European Commission, Impact Assessment Guidelines, SEC(2009)92

3. OBJECTIVES

As laid out in Chapter 2, the preparatory study has confirmed that a large cost-effective potential for reducing electricity consumption of cooking appliances exists. This potential is not captured, as outlined above. The general objective is to develop a policy which corrects the market failures, and which:

I) Promotes energy efficiency and contributes to security of supply in the framework of the EU objective of saving 20% of energy consumption by 2020.

II) Reduces energy consumption and related CO_2 and pollutant emissions due to cooking appliances following EU environmental priorities, such as those set out in the Sixth Community Environment Action Programme (EAP6) or in the Commissions European Climate Change Programme (ECCP);

The Ecodesign Directive, Article 15, requires that ecodesign implementing measures meet all the following criteria:

a) there shall be no significant negative impacts on the functionality of the product, from the perspective of the user;

b) health, safety and the environment shall not be adversely affected;

c) there shall be no significant negative impact on consumers in particular as regards affordability and life cycle cost of the product;

d) there shall be no significant negative impacts on industry's competitiveness;

e) in principle, the setting of an ecodesign requirement shall not have the consequence of imposing proprietary technology on manufacturers;

f) no excessive administrative burden shall be imposed on manufacturers.

As regards the operational objectives, the 2020 time horizon, in which the overall EU-goal is to reach a 20% energy and carbon saving with respect of 1990 (see Chapter 1), is very important. However, the expected contribution from DCA-related measures is restricted, for the following reasons:

- DCAs, with the exception of electric ovens, have not been subject to energy efficiency measures before. Thus, as shown in Figure 8, their primary energy consumption between 1990 (671 PJ) and 2010 (755 PJ) has grown by 12.5 %. In a business-as-usual scenario, it is expected to be 16 % higher in 2020 with respect of 1990. This means that in order to reach a 20% saving in 2020 with respect of 1990, not only 20% will have to be saved but also the extra 16% energy consumption of the 1990-2020 period will have to be abated.
- The entry into force of new ecodesign and/or labelling measures for DCAs will realistically not take place before the year 2014. Given the average product life of DCAs of at least 15 years, this means that (also taking into account growth of the number of households) in 2020 only one-third of the currently installed DCAs will have been replaced by more efficient models. The full saving of the measures starting in 2014 will only be realized by 2030.
- As mentioned in Chapter 2, DCAs (in particular ovens and hobs) are more than simple technical devices, very much enshrined in the cultural heritage of most Europeans. In that sense, the restriction mentioned above that 'there shall be no significant negative impact on functionality' should not be taken lightly and interpreted in far more than just a technical process. In other words, measures that would ban or seriously restrict current

cooking technologies, even if technically superior alternatives were available, are simply not possible. This is a serious, but unavoidable restriction on the saving potential.

What is possible, however, is to implement design measures, as mentioned in the preparatory studies (see section 2.1.4) that are largely 'invisible' to lay consumers (better insulation, improved controls, etc.) or that would cautiously speed up already on-going processes, such as the replacement of legacy solid plate electric hobs by ceramic plate hobs. Given the fact that DCAs represent a significant source of energy consumption and carbon emissions, these measures can be worthwhile and appropriate within the scope of ecodesign and labelling measures, which will be investigated hereafter.

4. POLICY OPTIONS

4.1 Option 1: No EU action

This option would have the following implications:

– The market failures would persist, and only very slowly the consumers would become aware of the advantages and disadvantages of the different types of appliances.

– It is to be expected that Member States may want to take individual non-harmonised action on cooking appliance efficiency. This would hamper the functioning of the internal market and lead to high administrative burdens and costs for manufacturers, in contradiction to the goals of the Ecodesign Directive.

– The specific mandate of the Legislator would not be respected.

Therefore this option is discarded from further analysis.

4.2 Option 2: Self-regulation

The option of self-regulation was explored, with the following outcome:

– No initiative for self-regulation on cooking appliances was brought forward by any industrial sector during consultation.

– Industry has called for a clear legal framework ('level playing field') ensuring fair competition, while voluntary agreements could lead to competitive advantages for free-riders and/or non-participants to the 'self-commitment'.

The relevant industry association (CECED [40]) made a number of 'voluntary agreements' in the 1990s in respect of some white goods (washing machines, dishwashers and refrigerators and freezers). However in the mid-2000s they decided they would prefer statutory limits as this gave a level playing field, and so ruled out agreeing to self-regulation. This remains their position. Moreover, as explained in par. 2.1.1, the market structure (low concentration and low market power) would probably rule out an effective self-regulation meeting the conditions in the Ecodesign Directive 2009/125/EC.

Therefore this option is discarded from further analysis.

4.3 Option 3: Energy labelling targeting cooking appliances

This option would include the labelling of cooking appliance efficiency in seven efficiency classes as under the Energy Labelling Directive.

This option would imply the following issues:

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[40] European Committee of Domestic Appliance Manufacturers.

– In general, the two main objectives of labelling schemes are to increase the market penetration of energy efficient products by providing incentives for innovation and technology development, and to help consumers to make cost effective purchasing decision by addressing running costs.

– Furthermore, the energy label would be an ideal vehicle to inform the consumers on the performance characteristics of the new(er) technologies.

For ovens and range hoods, option 3 would result in savings. However, it would miss out on the substantial initial reduction in energy consumption from minimum requirements which will eliminate a significant proportion of current models from the market (though design changes will be relatively small). Based on the experience from white goods energy labelling[41], it seems likely that a 'labelling only' policy would allow substantial sales of existing low efficiency models and the EU could miss out on around one-third of the identified technically-economical saving potential for ovens and range hoods. The European Commission is planning an evaluation of the energy labelling directive 2010/30/EC, which might supply more accurate information, but at the moment this is the best available quantitative estimate. A quantitative scenario can thus be simply derived from the calculation of the scenario for Option 5 (combination of labelling and ecodesign requirements), taking 33% of all outcomes.

Especially where cooking appliances are purchased by buyers that are not the users of the equipment or the ones paying the energy bill (e.g. in rental situations, social housing, student flats, etc.), 'labelling only' is not effective and is thus discarded as an option for ovens and range hoods.

For hobs, on top of the reason mentioned above for ovens and range hoods, the option of energy labelling is not possible for practical reasons. The disparity in energy efficiency of hobs is limited and makes it technically/legally almost impossible to implement Energy Labelling measures with seven energy efficiency classes as intended under the 2010/30/EU Directive. More specifically, the spread between the worst and best hob is only ± 10-12% around a median value (see figures in chapter 2). Thus, if the measurement tolerances are also in the same order of magnitude (perhaps at best ± 7%) it is highly problematic to implement and exercise effective market surveillance for a labelling scheme with seven distinct classes.

Hence, also for hobs energy labelling as an option is discarded.

4.4 Option 4: Ecodesign implementing regulation on cooking appliances

This option aims at improving the environmental impact of cooking appliances by setting Minimum Energy Performance Standards (MEPS) for their power consumption. Details of the rationale for the elements of the corresponding regulation, as listed in Annex VII of the ecodesign framework directive, would apply.

In itself this is an effective measure, because it is largely independent on consumer and market behaviour and would take the worst performing products from the market. But if there is a possibility of stimulating also the best performing products through energy labelling, the 'MEPS only' option is less effective than the combination of MEPS and energy labelling (see Option 5).

[41] In the 1990s, the labelling measures for household refrigeration appliances in Commission Directive 94/2/EC, under the 92/75/EC framework directive, were accompanied by Directive 96/57/EC of the European Parliament and the Council with minimum energy efficiency requirements to address the low-efficiency models. Evaluation by manufacturers showed that for refrigerators/freezers, roughly two thirds of the savings were a consequence of energy labelling and rebate/promotion measures by Member States and one third was due to the minimum energy efficiency requirements (CECED, prof. Stamminger, 2001, cited in European Commission, Second ECCP Report, 2003)

This is the case notably for electric/gas ovens and range hoods. The 'MEPS only' option would not address the considerable saving potential from newer technologies as it would not provide the necessary guidance and 'market pull' towards these new technologies. In analogy with the considerations in the previous section, it is plausible that with a 'MEPS only' option the EU would miss out on two-thirds of the identified technical-economical saving potential for ovens and range hoods. A quantitative scenario can be simply derived from the calculation of the scenario for Option 5 (combination of labelling and ecodesign requirements), taking 66% of all outcomes.

For electric/gas ovens and range hoods this option is discarded, i.e. the MEPS are to be complemented by mandatory Energy Label measures (Option 5).

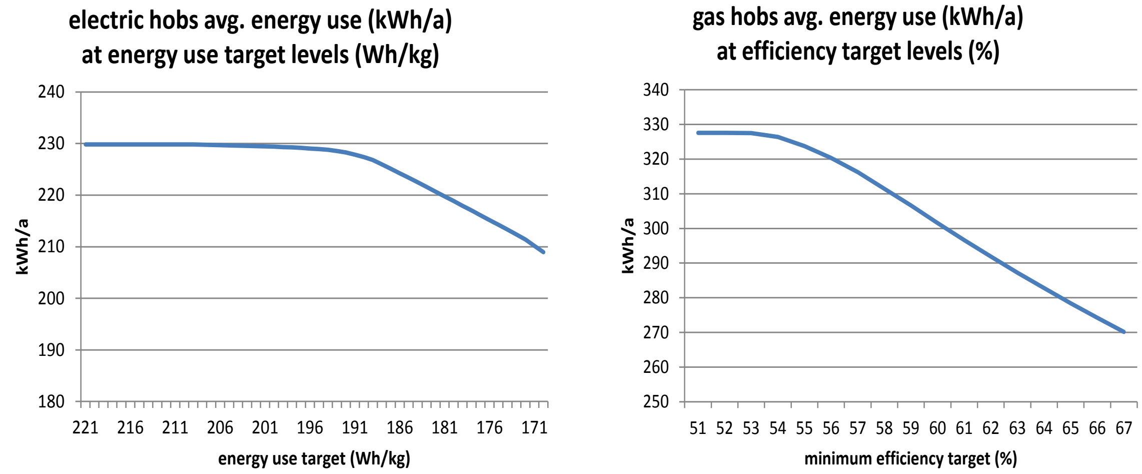
For electric and gas hobs, energy labelling is not possible, as explained in section 4.3 (option 3), and thus the 'MEPS only' is the best remaining option after having discarded options 1 to 3. Option 4 is included in the further analysis of electric and gas hobs.

Within that Option there are still several Sub-options related to especially the target levels, which will be elaborated in Chapter 5.

The graphs in Figure 13 show that setting minimum requirements for hobs requires considerable fine-tuning of target levels and timing between the tiers. The graphs show the effect of energy use targets (in Wh/kg) for hobs in terms of annual energy consumption, in kWh/a, based on the current CECED data base of hobs on offer on the market.

For electric hobs, the graph shows that up to a target efficiency level of around 195 Wh/kg there is hardly any effect on the average annual energy consumption of the models on offer. In other words, this will eliminate very few (less than 10%) of current models on offer according to the CECED database, mostly solid-plate electrical resistance hobs and a few low-efficiency ceramic hobs.

Figure 13. Energy use of hobs at target levels of minimum requirements.



Going beyond this mark of 195 Wh/kg would bring extra energy saving in terms of the CECED database, but beyond around 185 Wh/kg there is a risk that almost all ceramic plate hobs would be eliminated and only induction hobs survive. Apart from the fact that this may be sensitive, i.e. banning a currently popular technology, it would also be costly. The current mix of solid-plate hobs (137 euros/unit), ceramic hobs (400 euros /unit) and induction hobs

(880 euros/unit) results in an average electric hob price to the consumer of close to 500 euros. But if induction hobs become the only option, a 70% price increase may have a serious negative impact on affordability, especially because induction cooking requires special (expensive) cooking gear. The reward in terms of energy saving would be modest: going from 195 Wh/kg to a benchmark ('BAT[42]') level of 170 Wh/kg brings barely 12% energy saving and (although with higher energy prices in 2030 this may be different) would not be the most economical in terms of Least Life Cycle Costs (LLCC).

With gas hobs, the situation is less critical and energy saving potential is higher. There is a relatively linear decrease of annual energy consumption (in kWh/a primary energy) from target level 54% to the benchmark ('BAT') level of 67%. Also the correlation between energy efficiency and price is much less pronounced; prices of typical gas hobs vary between 268 and 390 euros. Also the price is much more influenced by other product features such as aesthetics than the quality of e.g. the burner assembly. On the long run, respecting an industry design cycle of 8 years, it could be feasible to achieve target levels of 60% or more.

4.4.1 Test and calculation methods domestic hobs

For gas hobs, the energy efficiency (EE) of the burner (in %) is calculated by dividing the theoretical energy needed for heating a pot with an amount of water by the measured energy consumption on the gas burner for heating the same pot with the same amount of water. Each gas burner of a gas hob or combination hob shall comply with a set minimum efficiency.

For the test, water is heated by 75 degrees in a standardised environment and with standard pots, see Table 4.

Table 4. Pot sizes and water amount for measuring efficiency of domestic gas burners

Minimum and maximum power of the gas burner (kW)	Internal diameter pot (mm)	Quantity of water (kg)
≥1.16 AND ≤ 1.64	220	3.7
≥1.65 AND ≤ 1.98	240	4.8
≥1.99 AND ≤ 2.36	260	6.1
> 2.37 AND ≤ 4.20	260	6.1
> 4.20	300	9.4

For electric hobs, a new test standard has been issued recently[43], which also measures the energy required to keep the heated water at the final temperature for 20 minutes after heating up. The size and amount of water is dependent of the size of the cooking zone or area in a similar way as with the size of gas hobs. The measurement shall be done for all cooking zones and cooking areas of a hob. For each pot in a cooking area, the energy consumption is calculated in Wh electricity consumption per kg water. The average energy consumption of the hob (in Wh/kg) is the straight average of the energy consumption of all pots/cooking areas.

A gas hob standard that is equivalent to the new test standard for electric hobs is under development, but will be lagging behind by some years. For the time being, the current gas hob standard can be used[44].

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[42] Best Available Technology.

[43] prEN 60350-2:2012. Household electric cooking appliances – Part 2: Hobs – Methods for measuring performance, developed by CENELEC/TC59X/WG.

[44] EN 30-2-1:1998 Domestic cooking appliances burning gas - Part 2-1: Rational use of energy – General. With amendments A1:2003 and A2:2005. Standards for gas hobs are being developed by CEN/TC49/WG2 (gas hobs).

The outcomes of the gas and electric hob standards are incomparable because of the differences in load, but because the requirements do not include any comparative alignment this does not pose any problems.

Lateral measures

As mentioned, hobs are not suitable for mandatory energy labelling under Directive 2010/30/EU but the fact that a mandatory test standard is introduced under Ecodesign Directive does enable the introduction of voluntary endorsement (yes/no) labelling such as the EU Ecolabel or any of the other ecolabels (Blue Angel, Nordic Swan, etc.). It cannot be predicted that these voluntary label schemes will take off or be successful, that is why they are not taken into account in the scenarios in chapter 5, but it should be mentioned that the Ecodesign measure enables such lateral measures to take off.

Timing of 3-tier approach

The table below gives the three scenarios of Sub-options, in increasing level of ambition, for the electric and gas hobs. In each scenario a 3-tier approach, whereby typically the 1st tier is mainly intended to make market actors and surveillance authorities familiar with the nature of the measure and gives time to the industry (with low efficiency appliances) to invest and adapt. The 2nd tier sets high requirements to boost savings. The 3rd tier will establish the conditions for stabilised high energy efficiency standards over time.

The mechanics of the tiered implementation follows the principles on which wide consensus has been reached with stakeholders, including Member States and environmental NGOs, in the Ecodesign Consultation Forum and Regulatory Committee.

The scenarios are all based on the tiers being introduced in 2014, 2016 and 2018.

Table 5. Sub-options ecodesign measures for hobs

	ELECTRIC HOBS	***tier 1***	***tier 2***	***tier 3***
Sub-option	***Target year***	**2014**	**2016**	**2018**
A	*Max. energy, in Wh/kg*	210.0	200.0	195.0
B	*Max. energy, in Wh/kg*	210.0	200.0	190.0
C	*Max. energy, in Wh/kg*	205.0	195.0	175.0

	GAS HOBS	***tier 1***	***tier 2***	***tier 3***
Sub-option	***Target year***	**2014**	**2016**	**2018**
A	*Min. Efficiency, in %*	52.0	53.0	54.0
B	*Min. Efficiency, in %*	53.0	54.0	55.0
C	*Min. Efficiency, in %*	53.0	54.5	56.0

Elimination of 2012-models

The breakdown of energy efficiency of 2012 hob models is given in Figure 10 and can also be derived from Figure 13.

For electric hobs, the fraction of 2012-models that will be eliminated from the 2014 EU manufacturer catalogues is in the order of 4% in 2014 and 6-11% in 2016. Only in 2018, the three Sub-options show more marked differences: With Sub-option A 11%, with Sub-option B 46% and with Sub-option C 73% of the 2012-models would no longer be allowed in 2018.

For gas hobs, the fraction of 2012-models that would be eliminated from the catalogue is in the order of 2-18% in 2014 and 18-53% in 2016. In 2018, the three Sub-options show the following results: With Sub-option A 46%, with Sub-option B 59% and with Sub-option C 73% of the 2012-models would no longer be allowed in 2018.

As mentioned before, the elimination of 2012 over time is not in itself a cause for concern for any of the stakeholders. With or without Ecodesign or labelling measures, the offer of hobs in manufacturer catalogues changes over time for commercial reasons. It is the pace of the elimination that matters. At an estimated design cycle of 8 years, in 2018 the manufacturers will normally have replaced some 75% of the 2012-models. This exceeds the elimination share of even the most stringent Sub-option C and thus none of the measures would disrupt the normal pace of product replacement. Sub-option C would, however, have a negative impact on functionality, as it would for electric hobs allow only inductive cooking. This will be discussed later on, following the impact analysis.

Monitoring and market surveillance

As is the practice with other Ecodesign measures for large domestic appliances (refrigerators, washing machines, dishwashers, laundry driers), the responsibility for market surveillance lies with the Member States and their surveillance authorities.

As regards the monitoring of progress, this is an issue that the Commission, in consultation with the Member States, have tackled through external consultants, which usually employ several sources for monitoring progress, for instance:

- Reports from surveillance authorities on compliance rates found from their investigations;
- Industry databases that are updated continuously or ad-hoc. They are usually not sales-weighted, but progress is measured from the number of models in each energy class in the database;
- Commercial market research institutes such as GfK that could monitor unit sales at points of sale. Data from commercial market research institutes are sales-weighted and provide a more accurate picture, but are available only at a very substantial cost (depending if the latest figures are required or less recent figures from one or two years).

4.5 Option 5: Labelling and Ecodesign combined

As mentioned in the previous section, the most adequate solution for electric and gas ovens as well as range hoods is a combination of options 3 and 4, i.e. labelling and ecodesign requirements. It combines the advantages of the two options, i.e. the ‘market pull’ of labelling and the ‘market push’ of ecodesign requirements (MEPS) as discussed earlier.

The labelling of ovens raised however some questions during stakeholder consultations regarding the following issues:

- The possibility to develop combined label or separate labels for gas and electric ovens. In a combined label for gas and electricity ovens, the label classes should be equivalent for both types of appliances in terms of their primary energy impact. This scheme could be challenging for electric ovens as their primary energy efficiency depends considerably on the energy mix in general and the local electricity production process in particular, which are not under the control of the ovens manufacturers/suppliers.

Additionally, in most countries the building regulations and standards require gas ovens to have an extra permanent ventilation provision (e.g. a hole), which indirectly could cost space heating/cooling energy to heat/cool the incoming air also when the oven is not operating. Adding this extra energy-related effect of the gas oven in the labelling metric would help to even the score between gas and electric ovens for a single labelling scheme. However, the effect of these measures can vary considerably with seasons and depends very much on geographical locations and climatic areas. And there is no tangible method[45] to determine this impact on the overall energy efficiency of gas ovens.

This combined labelling scheme for electric and gas ovens appeared to be challenging for the industry and for some Member States. In this context, the majority of stakeholders did not accept to consider this proposal and thus this option was discarded. Instead, using separate labels for electric and gas ovens, each with their own metrics, was the preferred option.

- Inclusion in the measure of standby- and off-mode electricity consumption or not. Standby and off mode losses form a significant part of the annual energy consumption of domestic electric ovens. However, ovens are addressed in the commission regulation 1275/2008 on standby and off mode power consumption[46], which will limit the standby and off mode power to maximum 1 W from January 2012 onwards. The energy consumption during the cool down phase is likely to be very similar across different ovens. The energy use of cleaning features of ovens is strongly dependent on user behaviour. Therefore the preparatory study proposes to base measures on the energy consumption per cycle, excluding standby- and off-mode use, since it would result in the same ranking as with the inclusion of those items.
- Categorisation for different cavity volumes of ovens or not. The electric oven, the only one for which currently energy label exists under the Energy Labelling Directive 92/75/EC, distinguishes three discrete categories of oven cavity volume ranges. This has proven to be less effective and create some concentration of models just beyond category limits. It was thus decided to eliminate this type of categorisation and to redesign this metric basing the energy classes on a linear relation between volume and energy efficiency of the oven cavity.
- The previous issue raised the question of downgrading of the energy classification for existing models of electric ovens. While in general there was understanding that in general downgrading of existing models (e.g. from ‘A’ to ‘B’) should be avoided as much as possible, it was agreed that downgrading of some models was unavoidable in the design of an effective electric oven label, also compensated by upgrading of other models.
- As regards the general ambition level of labelling requirements, a consensus was reached that all ovens could reach a level that is comparable to the current ‘A’ level for electric ovens and leave the ‘A^{+}’, ‘A^{++}’ and ‘A^{+++}’ levels for the most efficient appliances as foreseen in the Labelling Directive.

[45] Note that the estimated around 25% energy addition resulting from this effect is not universal, i.e. the effect is only significant for those gas appliances that consume little gas annually (like gas ovens, only about 30-35 m^3 gas/a) but still require permanent 24/7 ventilation provisions. For all other gas appliances such as water heaters and boilers this ventilation effect of the room where the appliance is mounted is negligible.

[46] Commission Regulation (EC) No 1275/2008 of 17 December 2008 on ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment, OJ L 339, 18.12.2008, p. 45-52.

The labelling of range hoods raised similar question but also the necessity of the high air flow capacity of the latest domestic range hood models (up to 1000 m3/h in extreme cases) was put into question. Specifically the following issues were raised:

- Standby and off-mode use of not fully automatic range hoods was not taken into account for the same reasons as for electric ovens.
- However, the energy use of the lighting incorporated in range hoods would be part of the integrated energy consumption calculation, set at 2h/day for 365 days.

4.5.1 Test and calculation methods ovens

The basis for energy labelling and ecodesign measures of ovens is the Energy Efficiency Index EEI_{oven}.

The EEI compares the energy consumption of an oven *EC* (for electric and gas oven) with the Standard Energy Consumption *SEC* of an average 2012 oven with the same cavity volume, expressing the former as a percentage of the latter.

The basic formula is *EEI= EC/SEC*. For easier understandable representation on the label, without decimals or '%', the outcome is multiplied by a factor 100.

For instance, an EEI of 50 means that the oven consumes 50% of the average 2012 oven with the same cavity volume.

This approach is coherent with the calculation methods used for other large domestic appliances for which ecodesign and labelling measures were introduced.

The measurement of the electricity consumption for each cavity volume *V* (in litres) of an electric oven shall be based on standardised method[47]. The measurements for gas ovens shall be done with a similar method[48].

The specific energy consumption (SEC) for electric and for gas ovens are derived from a recent market appliances database[49] through a regression analysis.

The SEC for electric ovens is given by $SEC_{electric}$ (in kWh/cycle) = $0.0042*V + 0.525$

The SEC for gas is given by SEC_{gas} (in MJ/cycle) = $0.044*V + 3.53$

For the assessment of the labelling class, the best performing cavity shall meet the minimum level for the EEI as given in table 6. The best of forced air convection or conventional mode may be used for the assessment of the EEI.

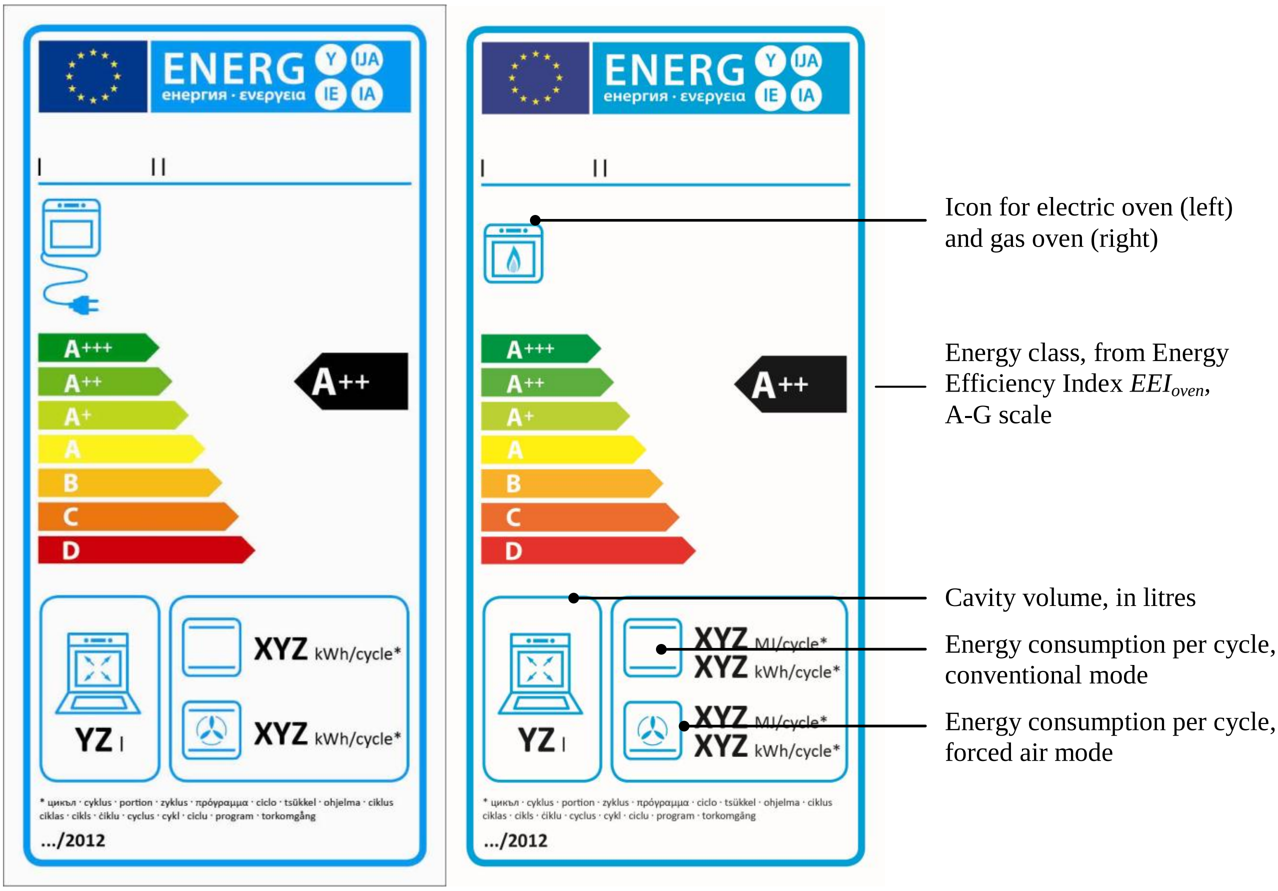
Table 6. Class limits EEI for labelling of ovens

Energy label	Requirements for the EEI
A^{+++} (most efficient)	EEI < 62
A^{++}	$62 \leq$ EEI < 75
A^{+}	$75 \leq$ EEI < 91
A	$91 \leq$ EEI < 109
B	$109 \leq$ EEI < 132
C	$132 \leq$ EEI < 159
D (least efficient)	≥ 159

[47] EN-IEC 60350:2009/A11:2010. Electric cooking ranges, hobs, ovens and grills for household use - Methods for measuring performance.
[48] EN 15181:2008. Measuring method of the energy consumption of gas fired ovens.
[49] representative data of appliances sold in the market in 2012.

The figure below gives the draft of Energy Labels for electric oven and gas ovens

Figure 14. Draft designs of Energy Labels for ovens



The implementation of the energy label will be mandatory in 2014, but may be implemented sooner on a voluntary basis. Table 7 gives the three scenarios of Sub-options at increasing levels of ambition, for the additional minimum requirements for electric and gas ovens. In each scenario a 3-tier approach is chosen in line with the latest regulatory practice. The scenarios are all based on the tiers being introduced in 2014, 2016 and 2018.

Table 7. Sub-options ecodesign measures for ovens

	Electric and gas ovens	***tier 1***	***tier 2***	***tier 3***
Sub-option	***Target year***	**2014**	**2016**	**2018**
A	*Max. EEI*	155	132	109
B	*Max. EEI*	151	125	99
C	*Max. EEI*	144	118	92

Elimination of 2012-models

The breakdown of energy efficiency of 2012 oven models is given in Figure 11.

For electric ovens, the fraction of 2012-models that will be eliminated from the 2014 EU manufacturer catalogues is in the order of 1% in 2014 and 1-5% in 2016. Only in 2018, the three Sub-options show more marked differences: With Sub-option A 14%, with Sub-option B 71% and with Sub-option C 95% of the 2012-models would no longer be allowed in 2018.

For gas ovens, the first two tiers and also the third tier of Sub-option A would hardly result in the elimination of 2012-models of EU manufacturers (although import models may be affected). But tier 3 of Sub-option B would eliminate 22% of the 2012-models in 2018 and tier 3 of Sub-option C would eliminate as much as 88% of the 2012-models.

As mentioned in the previous section (option 4), the elimination of 2012-models over time is not in itself a cause for concern for any of the stakeholders, because in 2018 some 75% of models would be replaced for commercial reasons anyway. It is the pace of the elimination from ecodesign measures that matters. Both for electric and gas ovens, the replacement rate provoked by Sub-options A and B is well within the normal pace of an 8 year full catalogue change. Only Sub-option C is beyond that.

4.5.2 Test and calculation methods range hoods

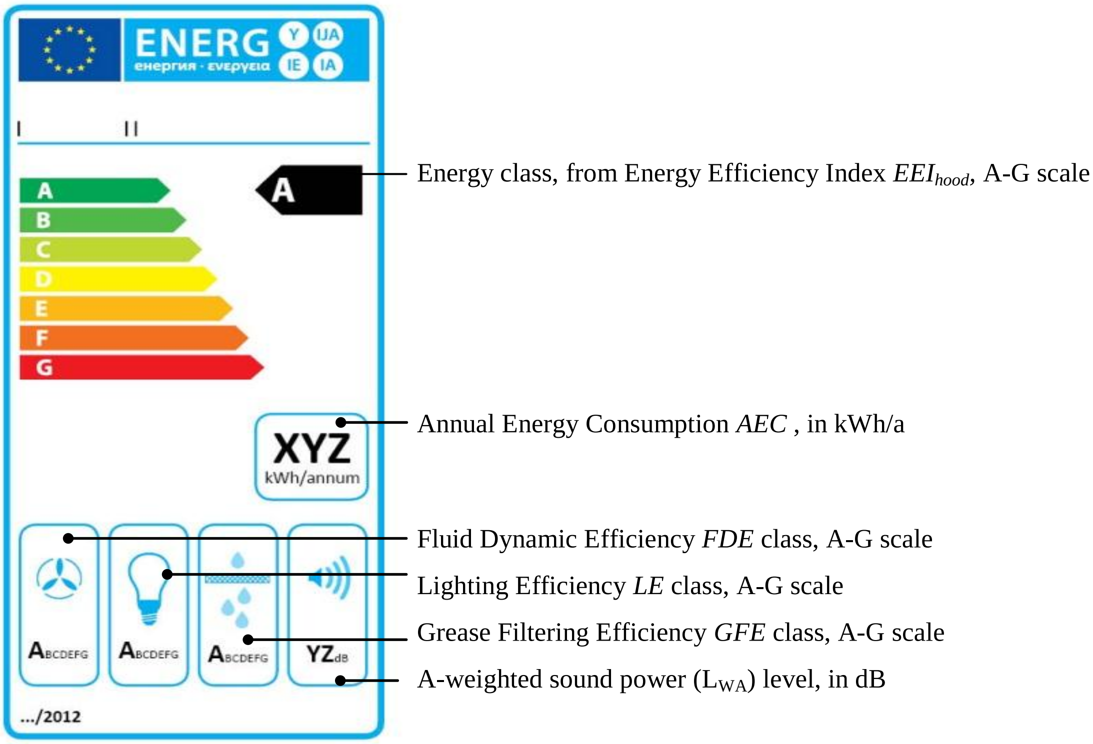
As with ovens, Energy Efficiency Index EEI_{hood} determines the energy class of the range hood and is the basis for Ecodesign measures for the range hood.

The EEI of range hoods compares the annual energy consumption of the labelled model with the annual energy consumption of a comparable standard ('average 2011') reference model, expressing the former as a percentage of the latter.

For instance, an EEI of 50 means that the labelled model consumes 50% of the energy of the comparable standard model.

The annual energy consumption *AEC* (in kWh) is calculated on the basis of 1 h extraction operation daily at best efficiency point *BEP*[50], and 2 h lighting operation daily, during 365 days per year. The electric power consumption (in W) of the extraction fan P_{bep} and the lighting system P_L are measured according to test standard[51].

Figure 15. Draft design of Energy Label for domestic range hoods



[50] BEP is the hood operating point with maximum fluid dynamic efficiency FDE. See also footnote 45

[51] EN 61591:1997. Household range hoods – methods for measuring performance. Including the latest amendments

The power consumption of the extraction fan is corrected with a so-called 'time increase factor' f, which relates to the fluid dynamic efficiency of the fan[52]. Where appropriate, i.e. in the case of a fully automatic hood, the power consumption in off-mode P_o and standby mode P_s is taken into account[53].

The standard energy annual energy consumption *SAEC* (in kWh) is derived from the average of the 2011 database through a regression analysis[54]. The numerical formula for EEI thus becomes $EEI = AEC / SAEC$.

The Fluid Dynamic Efficiency *FDE* is the ratio between on one hand the aerodynamic power output and the electric power input at the best efficiency point of the range hood[55].

The Lighting Efficiency *LE* is the ratio between the average illumination level (lux) and the nominal electric power consumption of the range hood's lighting system (W).

The Grease Filtering Efficiency *GFE* is determined by calculating the ratio between the weight of grease captured in the grease filter(s) and the weight of grease in the rest of the appliance. The grease filtering test involves heating a pan with oil on a reference hob and the range hood for half an hour under standardized circumstances. The range hood is working at maximum setting.

For representation on the energy label, in order to avoid decimals smaller than 1 or percentage points that might confuse laymen, the outcomes of *EEI*, *FDE*, *LE* and *GFE* are multiplied with a factor 100 and should be given with 1 decimal precision.

The noise value of a range hood (in dB) is measured as the airborne acoustical A-weighted sound power emissions (weighted average value - L_{WA}) at the highest setting for normal use, intensive or boost excluded.

Implementation of the energy label is mandatory in 2014, but may be implemented sooner on a voluntary basis. Extra labelling classes are to be introduced (and lowest labelling classes eliminated) in 2015 (add 'A^{+}'), in 2017 (add A^{++}') and in 2019 (add 'A^{+++}').

This is illustrated in Table 8, which gives the available energy classes and their upper class limits in EEI.

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52 For a non-automatic hood, incorporating the constants (e.g. hours per year, conversion W to kW) as numbers, the formula can be summarized as
$AEC_{non\text{-}auto} = 0.365h \cdot (f \cdot P_{BEP} + 2P_L)$, with
$f = 2 - 3.6 \cdot FDE$, where if FDE>55.5% then FDE=55.5% (to avoid negative outcomes).
Example: At *FDE* of the hood of 27.8%, f=1.

53 For fully automatic hoods, the formula is summarised as $AEC_{auto} = 0.365h \cdot \{ f \cdot P_{BEP} + 2P_L + (12-0.5f) \cdot P_o + (12-0.5f) \cdot P_s \}$ with the same boundary conditions and incorporation of constants as with non-automatic hoods.

54 $SAEC = 0.55 \cdot (P_{BEP} + P_L) + 15.3$.

55 $FDE = \Delta p \cdot q / P$, where Δp is the static pressure difference (in Pa), q is flow rate (in m^3/s) and P is the electric power input (in W) at BEP.

Table 8. Energy efficiency classes for labelling of range hoods

Table 2: Energy efficiency classes of range hoods	
Energy Efficiency Class	***Energy Efficiency Index (EEI_{hood})***
A+++ (most efficient)	$EEI_{hood} < 39$
A++	$39 \leq EEI_{hood} < 46$
A+	$46 \leq EEI_{hood} < 54$
A	$54 \leq EEI_{hood} < 64$
B	$64 \leq EEI_{hood} < 76$
C	$76 \leq EEI_{hood} < 90$
D	$90 \leq EEI_{hood} < 100$
E	$100 \leq EEI_{hood} < 110$
F	$110 \leq EEI_{hood} < 120$
G (least efficient)	$EEI_{hood} \geq 120$

The fluid dynamic efficiency class (FDE class), lighting efficiency class (LE class), grease filtering efficiency class (GFE class) are stated on the energy label. The efficiency classes for these performance parameters and their lower class limits are given in table 9.

Table 9. Lower class limits for FDE, LE and GFE classes of range hoods

FDE class	FDE Lower class limits	LE Lower class limits	GFE Lower class limits
A (most efficient)	>28	>28	>95
B	>23	>24	>85
C	>18	>20	>75
D	>13	>16	>65
E	>8	>12	>55
F	>4	>8	>45
G (least efficient)	FDE $\leq$ 4	LE $\leq$ 8	GFE $\leq$ 45

Table 10 gives the scenarios for the Ecodesign requirements for the Energy Efficiency Index *EEI* and Fluid Dynamic Efficiency *FDE* of the range hoods as applied in the three Sub-options. Similar to the electric and gas ovens, in each scenario a 3-tier approach is chosen in line with the latest regulatory practice.

Table 10. Sub-Options ecodesign measures for range hoods

	EEI Range hoods	***tier 1***	***tier 2***	***tier 3***
Sub-option	***Target year***	**2014**	**2016**	**2018**
A	*Max.* EEI_{hood}	125	115	105
B	*Max.* EEI_{hood}	120	110	100
C	*Max.* EEI_{hood}	120	110	100

	FDE Range hoods	*tier 1*	*tier 2*	*tier 3*
Sub-option	***Target year***	**2014**	**2016**	**2018**
A	*Min. FDE*	2	4	6
B	*Min. FDE*	3	5	8
C	*Min. FDE*	3	5	8

Monitoring and market surveillance

Monitoring and surveillance mechanisms are as for ovens. See section on ovens.

Elimination of 2012-models

The breakdown of energy efficiency of 2012 range hood models is given in Figure 12. Sub-option A will ultimately eliminate 28% of 2012 models in 2018 (2% in 2016). Sub-option B and C will eliminate 43% of 2012-models in 2018 (12% in 2016).

4.5.3 Date for evaluation and possible revision

The main issues for a possible revision of the Regulation are

– appropriateness of the product scope;

– appropriateness of the levels for the ecodesign requirements

The third stage of the ecodesign requirements becomes effective in 2018. With a view to the level of requirements proposed and the still immature market for new technologies, a review can be presented to the Consultation Forum in 2019. For this revision, it is important that the necessary measurement standards are fully developed and tested

4.5.4 Interrelation with other ecodesign implementing measures - implications on scope

As mentioned in Chapter 2, there is currently only EU Energy Label legislation under Directive 92/75/EC for electric ovens, which will be repealed when the new Label measures enter into force. Clear agreements with the industry on the treatment transition method (e.g. regarding models on stock) will have to be made, but this is not a new territory for either industry association CECED or the Commission. For the other four appliances (gas ovens, gas hobs, electric hobs and range hoods), there is no energy efficiency related legislation.

At a component level, the existing Ecodesign regulations on fans and motors will have no effect on range hoods. The Ecodesign Commission Regulation 327/2011 on Fans >125 W will have no impact on range hoods energy efficiency, because fans for range hoods with a total maximum electrical input power up to 280 W are excluded from this regulation.

The requirements for the range hoods can interface with the directional and non-directional light source measures under the Ecodesign Directive, but the component-specific measures are consistent with the mentioned measures here and only help the range hood industry to reach its targets, there is no consequence of this interface.

5. IMPACT ANALYSIS

5.1 Introduction

Given that Options 1 to 3 have been discarded in Chapter 4, this Chapter looks into the impacts of Option 4, for hobs, and Option 5 for ovens and range hoods. To this end an assessment of possible Sub-options as regards the ‘intensity’ of the measure, the combination of the levels of requirements for the levels pursuant to Article 15(4f) of the Ecodesign Directive, is carried out, in terms of economic, environmental and social impacts. The savings calculated in this chapter relate to measures for cooking appliances as discussed in chapter 4.

The assessment is done with a view to the criteria set out in Article 15(5) of the Ecodesign Directive, and the impacts on manufacturers including SMEs. The aim is to find a balance between quick realisation for achieving the appropriate level of ambition and the associated benefits for the environment and the user (due to reduction of life-cycle costs, i.e. Least Life Cycle Costs) on the one hand, and potential burdens related e.g. to un-planned re-design of equipment for achieving compliance with ecodesign requirements on the other hand, while avoiding negative impacts for the user, in particular as related to affordability and functionality. The methodology of the analysis is explained in **Annex D**.

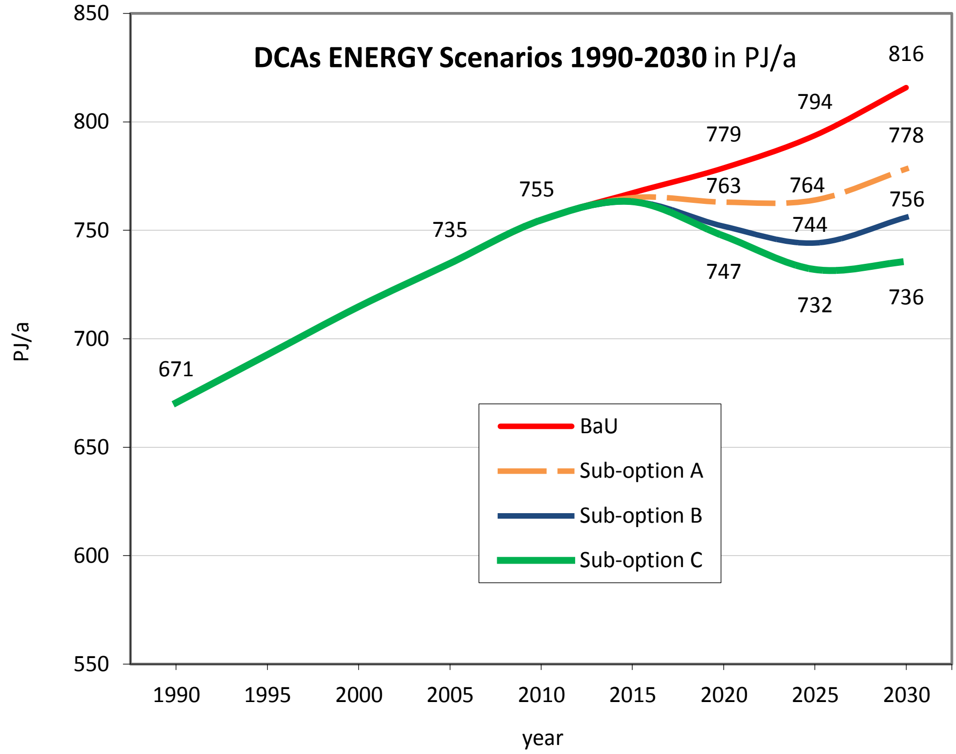
The Sub-options A, B and C consist of ecodesign implementing regulations on electric and gas hobs (Option 4) and a combination of ecodesign implementing regulations and energy labelling on range hoods and electric and gas ovens (Option 5), which are explained in paragraph 4.

5.2 Impacts

5.2.1 Energy

The graph below gives the results for the baseline and the three Sub-option scenarios for the ovens, hobs and range hoods together.

Figure 16. Primary energy consumption scenarios 1990 - 2030

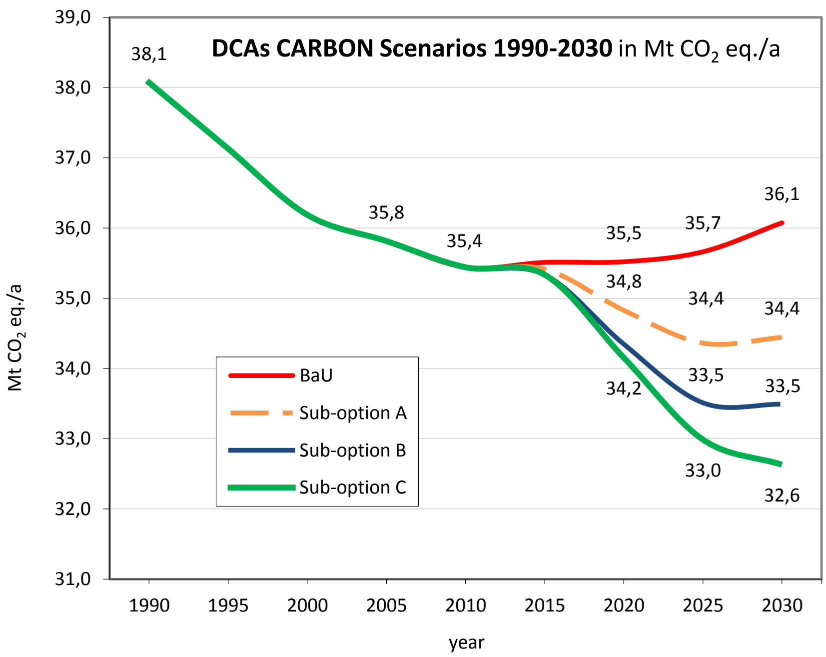


The graph shows that in the next decade the primary energy use of DCAs is expected to grow by over 3%, from 755 PJ/a in 2010 to 779 PJ/a in 2020. Sub-Option A, which measures aim at the ‘low hanging fruit’, is the least ambitious of the three Sub-options and can slow down this growth. With Sub-option B, close to the least lifecycle costs (LLCC), annual savings can reach 27 PJ/a[56] in 2020; the trend can be reversed and the total energy use could maintain the 2020 level in 2030 through a saving of 60 PJ/a[57]. With Sub-Option C, aiming at the level of the best available technology (BAT), an extra 20 PJ/a saving could be achieved in 2030. Clear differences in savings show up only after several years. Even with the most ambitious scenario, the energy savings are relatively modest in 2020 and for all options more than twice as big in 2030. This is also explained by the large stock and the long life time of the products[58].

5.2.2. *Emissions: Carbon*

The situation for greenhouse gas emissions is similar to that of the electricity consumption, which is the main contributor to the carbon emissions with cooking appliances. In 2020 the measures save up to 1.3 Mt CO_2 equivalent. In 2025 this number grows to 1.3-2.7 Mt CO_2 equivalent and in 2030 up to 3.5 Mt CO_2 equivalent could be saved.

Figure 17. Greenhouse gas emissions scenarios 1990 – 2030



5.2.3 *Consumer impact*

The graph below shows the total annual consumer expenditure on domestic cooking appliances (purchase/acquisition and energy running costs).

The level of the acquisition costs[59] per unit DCA will slightly decrease between 2010 (390 euros per unit) and 2030 (330 to 390 euros per unit), though the annual energy running costs

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[56] i.e. 0.6 Mtoe/a (primary energy consumption), equivalent to a reduction of 3.2 TWh of final energy consumption by appliances as follows: range hoods (80%), ovens (18%) and hobs (2%).

[57] i.e. 1.4 Mtoe/a (primary energy consumption), equivalent to a reduction of 7.6 TWh of final energy consumption by appliances as follows: range hoods (66%), ovens (30%) and hobs (4%).

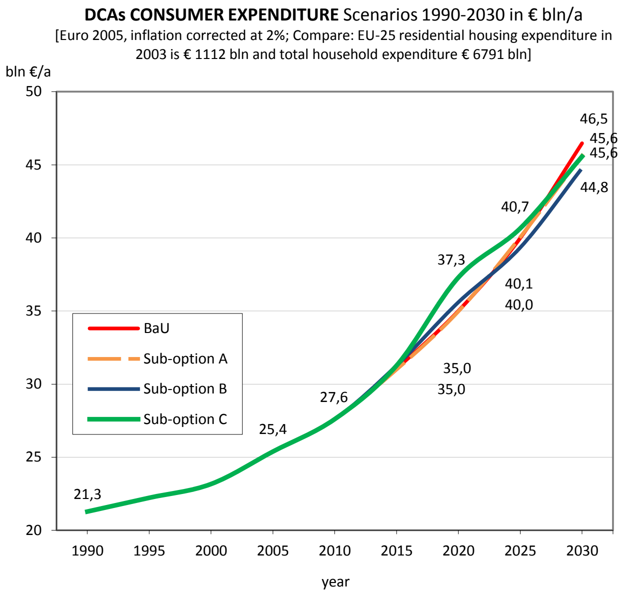
[58] For ovens: 19 years; for hobs: 15 years; for range hoods: 10 years.

[59] See figures in Annex D

of DCAs will more than double (from 24 euros up to 52 euros). This might have an impact on the cooking behaviour of consumers and on their purchase behaviour towards more energy efficient appliances.

The graph shows that scenarios for DCAs consumer expenditure are relatively close together. Sub-option A shows a slight advantage to BaU on consumer expenditure by 2030. Sub-option C causes a rise peak of consumer expenditure in 2020 due to the stock built-up with more expensive top energy efficient appliances, but this is compensated by the lower running costs of these appliances in such a way that in 2030 the total consumer expenditure are lower than those for BaU. Sub-option B does not show significant disadvantage in 2020 compared to BaU and provides the highest advantage for consumers by 2030.

Figure 18. Consumer expenditure scenarios 1990 - 2030



The following table provides some data[60] concerning the average DCA purchase prices and the related energy running costs per appliance, at the base case, Sub-option A (improved technology), Sub-option B (LLCC - Least Life Cycle Cost) and Sub-option C (BAT - Best Available Technology) level of energy efficiency. It shows that Sub-option B offers the highest return on investment for consumers. The additional 20 euros per DCA unit compared to BaU are largely off-set by the lower energy running costs of more energy efficient appliances of Sub-option B, and results in cost savings for consumer at the level of 39 euros over the appliance lifetime (15 years), much higher than Sub-options A and C.

Table 11. DCAs purchase prices and related energy running costs

Euros	BaU 2030	Sub-option A	Sub-option B	Sub-option C
DCAs unit price	330	347	350	389
Annual energy running costs	52	49	48	46
Price difference compared to BaU		17	20	59
Annual energy running costs difference compared to BaU		-2,3	-3,9	-5,3
Annual energy running costs difference over lifetime (15 years) compared to BaU		-35	-59	-80

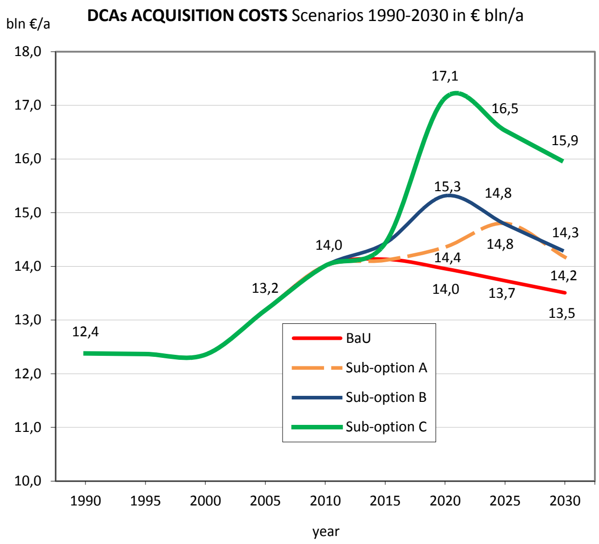
[60] Calculated from figures in Annex D

Costs difference over lifetime (15 years) compared to BaU		-18	-39	-21

5.2.4 Business economics

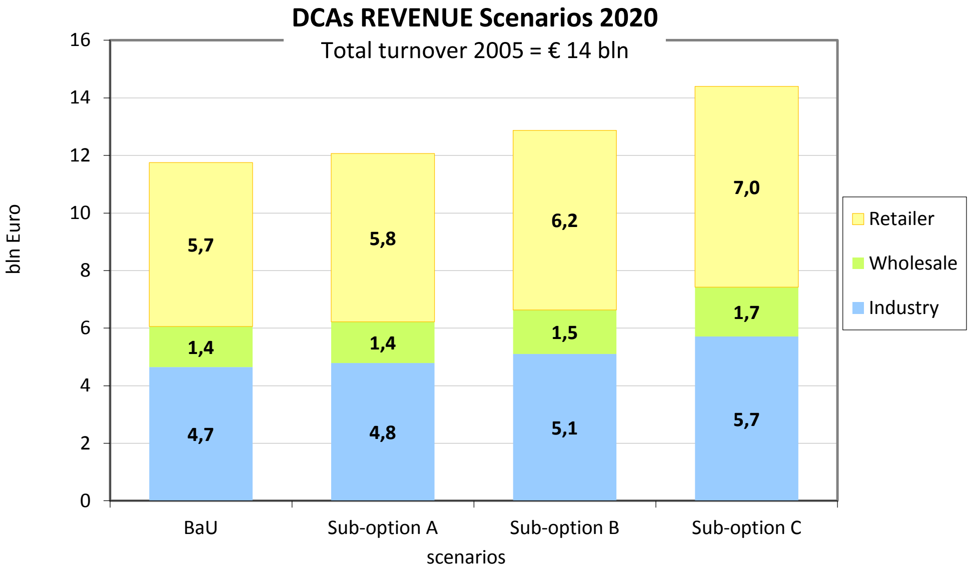
The graph below gives the projected sales value in billion euros per year of the baseline and three Sub-options. It is estimated that Sub-option C, aiming at the best available technology, causes the highest production costs and thus the highest sales value at equal unit sales. At ultimately a price level of around 390 euros per DCA in 2030 (sales 41 million units, see Annex D), the sales value is almost 20% higher than at the baseline (330 euros per baseline unit). Sub-option A requires considerable fewer investments in new components and the sales value is estimated to be initially lower than Sub-option B, which aims at the least lifecycle costs. In 2030 a unit price of around 350 euros per DCA is foreseen for Sub-options A and B.

Figure 19. Acquisition costs scenarios 1990 - 2030



An estimate on how the revenues from the sales are divided over EU-trade and industry is given in Figure 20.

Figure 20. Revenues scenarios 2020



5.2.5 Impacts on competitiveness

Competitiveness Proofing is described in Commission Staff Working document SEC (2012) 0091[61] as a complementary instrument to reinforce the overall assessment of economic impacts of a new proposal with a better account of impacts on enterprise competitiveness at sector and aggregate level by identifying, and – where proportionate – by quantifying the likely impacts of the new proposal in three dimensions of enterprise competitiveness, i.e. costs, capacity to innovate and international competitiveness [of the European industries]. Unfortunately for the DCA sector not enough data are available for quantification and thus the following describes the three dimensions only qualitatively.

The mentioned measures will remove a significant percentage of 2012-models from the market in 2018 (see section 4), but the pace of removal/replacement by more efficient is not faster than that of the normal replacement of models in a manufacturer's catalogue for strictly commercial reasons. Hence, also given the fact that meeting the target levels does not require exotic or highly advanced technology, the ***costs*** of R&D and tooling are not expected to rise above the normal level. The same goes for testing costs, which (as with other large domestic appliances) will constitute less than 0.1% of the product price. The exception to the above may be Sub-option C for ovens, where the pace of required product replacement is slightly higher than the design cycle.

EU-industry is firmly convinced that strong measures both on the energy and the performance side will have a positive impact on their ***competitiveness and their innovation capacity***. It will ban inefficient low-cost imports which have negative impact on profitability. Manufacturers have indicated that they will gladly carry the (modest) costs of printing costs and handling, because in fact the label and the proposed minimum requirements are seen as having a positive impact on competitiveness. The price of labelling, at a costs of less than €0.10 per label and thus 4 million euros for the sector, is a price the industry finds acceptable.

[61] Commission Staff Working Document SEC(2012)91 final, *Operational Guidance for Assessing Impacts on Sectoral Competitiveness within the Commission Impact Assessment System, A "Competitiveness Proofing" Toolkit for use in Impact Assessments*, Brussels, 27.1.2012. Available at: http://ec.europa.eu/governance/impact/key_docs/docs/sec_2012_0091_en.pdf

5.2.6 Impacts on SMEs (manufacturing and distribution)

Not as much as with smaller domestic appliances (vacuum cleaners, small kitchen appliances), but also with DCAs there is a threat of low-cost imports of components and whole products to EU manufacturing and EU industry jobs especially with small and medium-sized companies (SMEs). Given the quality-levels and energy efficiency of these products, e.g. solid plate hobs, also the advantages of these low-cost appliances for consumers, if any, are at best limited.

If the measures reverse the decline in EU manufacturing of cooking appliances, this will no doubt also help (SME) producers of components, with no negative impact on consumers as regards the total Life Cycle monetary costs .

Micro-enterprises could not be identified.

In the distributive trade, the share of SMEs is believed to be closer to the EU average, i.e. around 70%. They did not express antagonistic views during the stakeholders consultations. In general, they do not feel significantly affected by the measures. On the contrary, they will benefit from stronger demand for new technologies and higher turnover, and with no extra costs on them as manufacturers will provide the labels. Additionally no increased installation costs are expected (installation cost does not depend on the efficiency of the product).

5.2.7 Impacts on distribution channels

Between 1990 and 2010 the total consumer expenditure for DCAs, both acquisition and running costs, has raised with more than 20% from 21.6 to 27.7 billion euros.

It is expected that this trend will continue up to 2030. It is not expected that this trend will cease (with or without measures). The figure shows total consumer expenditure to be more or less equal for the baseline and all policy scenarios.

The measures should ensure that the consumers will spend less money on energy, but instead use some of the savings on buying long-lasting high quality appliances. It is possible that the higher acquisition costs will also halt the growth of the penetration rate but because this is by no means proven, a continuation of the trend is projected to continue. Taken together, these factors will probably mean that the measures will increase the value of sales, so benefiting distribution channels. As there is a relatively large proportion of SMEs in these channels it should also benefit them.

5.2.8 Impacts in third countries

The process for establishing ecodesign requirements has been fully transparent, and after endorsement of the regulation by the Regulatory Committee a notification under WTO-TBT will be issued.

There are very few regulations on cooking appliances in third countries. No competitive disadvantages for EU manufacturers exporting affected products to third countries are expected.

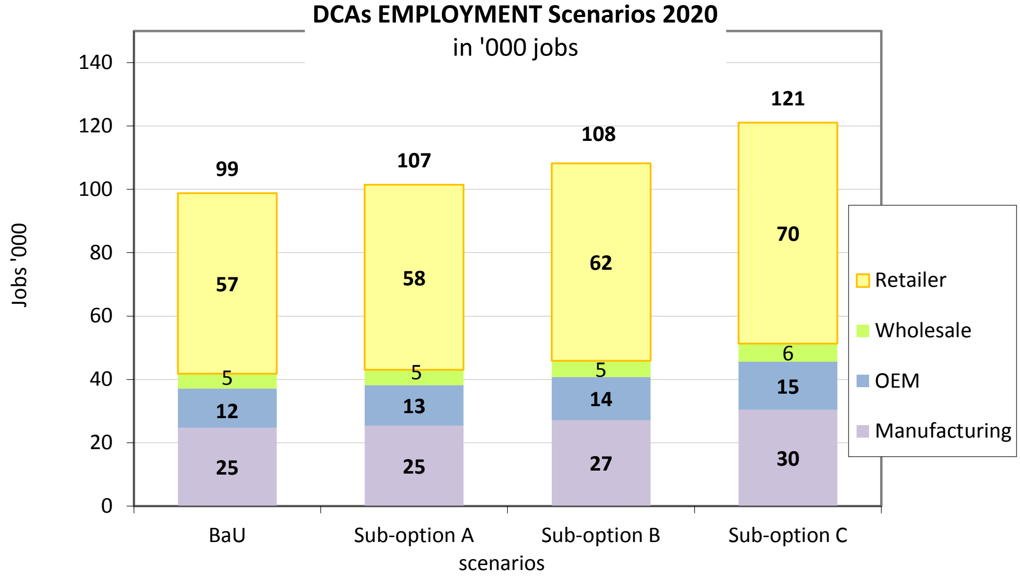
The EU has often been leading in standardisation and energy labelling and it is thus likely that many countries like China would follow the EU example. This will strengthen the global effort of fighting low-efficiency appliances. In the short term this will constitute a negative impact for manufacturers of these low-efficiency appliances around the globe. On the long run, the production of high-quality appliances, once they have made the transition, will also allow them to be more profitable.

5.2.9 Social impacts: Employment

The analysis shows positive employment impacts for the considered Sub-options. See Fig. 21.

For more impact on the structure of current DCA-related employment see Annex E.

Figure 21. Employment scenarios 2020



5.2.10 Territorial impact

Territorial impact assessment (TIA) is one of the possible elements of the impact assessments. As stated in a recent presentation of the Commission services[62], TIA is only required when the policy explicitly targets a (type) of a region and/or the policy targets some regions or areas more than others. In the case of the ecodesign policy for DCAs, these conditions do not apply and thus the TIA is not required.

5.2.11 Administrative burden

The form of the legislation is a regulation which is directly applicable in all Member States. This ensures no costs for national administrations for transposition of the implementing legislation into national legislation.

The Impact Assessment on the recast of the Energy Labelling Directive SEC(2008) 2862 calculates the administrative burden of introducing a new implementing Directive, similar to the proposed to the ecodesign implementing measure, in accordance with the EU Standard Cost Model.

It estimates the administrative cost of implementing measures in the form of a Directive at 4.7 million euros of which 720 000 euros for administrative work on the amendment/development of the new Directive and 4 million euros for transposition by Member States. It follows that the administrative cost of an implementing Regulation, as currently mentioned, would save 4 million euros in avoiding the transposition cost.

Administrative costs of enforcing the ecodesign and labelling Regulations are difficult to estimate. Enforcement could involve random spot-checks by the authorities, but from experience with other regulations of this type most spot testing checks are not random but follow indications of competitors or third parties (e.g. industry or consumer associations). In those cases, the probability of not only recuperating testing costs and legal costs, but also of

[62] European Commission, Impact Assessment Guidelines, SEC(2009)92, Brussels, 15.1.2009

collecting fines is high. Therefore, no extra enforcement costs for Member States are anticipated from the measures, including the introduction of labelling.

For business, extra administrative costs, if any, will be modest. For electric ovens, there are no extra costs with respect to the current situation, where market surveillance has already to be performed to check compliance with the Commission Directive 2002/40/EC. And for the other DCAs, the energy efficiency will be tested according to existing standard, based on current practice of a system of self-declaration in combination with spot-checks by the authorities. In current practice, they are already subject to efficacy and performance tests for a number of reasons (CE-marking, client specification, etc.). The proposed Regulations, including labelling, will not change this situation and no significant extra costs are expected. There is no difference in this respect between various Sub-options.

5.3 Summary economic, social and environmental impacts

The impact analysis was performed for three sets of Sub-options in terms of ambition level, pertaining to two sets of policy options, i.e. setting only Ecodesign minimum requirements (Option 4, for electric and gas hobs) and setting Ecodesign minimum requirements in combination with energy labelling (Option 5, for electric and gas ovens as well as range hoods).

The below table summarises the effectiveness, efficiency and coherence of the Sub-options in relation to their impact on economics, social situation, environment and industry. The table assesses the various scenarios on a relative scale[63]: -, 0, +, ++, +++. '0' means BAU level or no change against its level.

Table 12. Evaluation of policy options

	Base line BaU	**Sub-option A**	**Sub-option B**	**Sub-option C**
Effectiveness of the option	**0**	**0/+**	+/++	++/+++
Promote energy efficiency hence contribute to security of supply	0	0	+	++
Reduce energy consumption and related CO_2 and pollutant emissions	0	+	++	+++
Efficiency of the option	**0**	**+**	**+**	**0/+**
Impact on industry's competitiveness	0	+	+	-
Setting of an ecodesign requirement shall not have the consequence of imposing proprietary technology on manufacturers	0	+	+	+
Impose no excessive administrative burden on manufacturers	0	+	+	+
Impacts on the availability and functionality of the product, from the perspective of the user	0	+	+	-
Impact on consumers in particular as regards affordability and life-cycle costs	0	+	++	+
Coherence of the option	**0**	**0/+**	**+**	**0**
Economics, social situation and environment shall not be adversely affected	0	0	+	-

[63] Based on Article 15 of 2009/125/EC, there should be no 'negative' impacts.

Health, safety and the environment shall not be adversely affected	0	+	+	+

The three Sub-options differ in the energy saving potential and greenhouse gas emissions. Since the increase of energy efficiency of Sub-option A is relatively low, it is assumed to promote energy efficiency less than Sub-options B and C. Sub-option C gives the higher energy savings and carbon abatement but has a negative impact on consumers in terms of significantly higher acquisition costs, negative impact on functionality (e.g. only electric inductive cooking) and a possible negative impact on industry competitiveness through a faster-than-normal pace of product replacement.

The low ambition value of Sub-option A and the negative impacts of Sub-option C, result in the **choice for Sub-option B.**

Sub-option B will eventually restrict the placing on the market of some electric solid plate hobs in favour of alternatives like a ceramic plate, which are functionally superior in the sense of shorter heat-up/cool-down time and feature a better safety (less risks of burns). As regards the other technical improvements, the changes for other products will not be immediately apparent to the consumer, but better insulation (also less risk of burns), more efficient burners (and probably also more advanced in safety), more efficient (lower power, more safety) fans, filters, internal aerodynamics and lighting as well as more effective control technology (more safety and comfort) are not issues with negative impacts on functionality, health, safety and environment. If anything, they will have a positive impact on these points. The design options do not impose the use of proprietary technology.

Sub-option B leads to an increase of business revenues and employment, also for SMEs, and for consumers the extra purchase costs will be compensated by the lower running costs. No negative impacts on industry competitiveness, affordability and life cycle costs for consumers could be identified.

The total administrative burden for all operators amounts to 4 million euros (< 0.1% of annual revenue), which is not excessive in view of the savings achieved.

The territorial impacts are not applicable as the measures are product-oriented and do not differentiate, nor in content nor in effect, between regions.

The tables below give an overview of the most important impacts for the three Sub-options versus the baseline.

The Sub-options A, B, C relate to the Option 4 (minimum ecodesign requirements only, for hobs) and Option 5 (combination of ecodesign requirements and energy labelling, for ovens and range hoods).

To calculate the results when using Option 3, energy labelling only, for ovens and range hoods instead of Option 5, subtract 15% of the outcomes (33% of 45%[64]) for all three Sub-options in Tables 13 and 14.

To calculate the results when using Option 4, minimum Ecodesign requirements only, for ovens and range hoods instead of Option 5, subtract 30% of the outcomes (66% of 45%) for all three Sub-options in Tables 13 and 14.

[64] Ovens and range hoods represent around 45% of the total energy and economic impacts of ovens, hobs and range hoods. Not using the minimum ecodesign requirements for ovens and range hoods means a one-third reduction in savings (see chapter 4, Option 4). Not using energy labelling means a two-third reduction in savings (see chapter 4, Option 5).

The consumer expenditure in 2030, i.e. after complete stock change, roughly represents the monetary lifecycle costs.

Table 13. Annual impacts Sub-options versus BaU (2020 and 2030)

ANNUAL IMPACTS 2020 vs BaU 2020

	BaU absolute	Sub-opt A impact	Sub-opt B impact	Sub-opt C impact
Energy primary PJ/a	778.9	-15.8	-26.9	-31.4
GWP $MtCO_2$/a	35.5	-0.7	-1.2	-1.4
Acquisition € bn/a	13.9	0.4	1.4	3.2
Revenue industry € bn/a	4.6	0.1	0.5	1.1
Revenue trade € bn/a	7.1	0.2	0.7	1.6
Employment industry '000 jobs	37.1	1.1	3.6	8.5
Employment trade '000 jobs	61.4	1.8	6.0	14.0
Energy costs € bn/a	21.1	-0.4	-0.8	-0.9
Consumer expenditure € bn/a	35.0	0.0	0.6	2.3

ANNUAL IMPACTS 2030 vs BaU 2030

	BaU absolute	Sub-opt A impact	Sub-opt B impact	Sub-opt C impact
Energy primary PJ/a	816.0	-37.7	-60.0	-80.3
GWP $MtCO_2$/a	36.1	-1.6	-2.6	-3.5
Acquisition € bn/a	13.5	0.7	0.8	2.4
Revenue industry € bn/a	4.5	0.2	0.3	0.8
Revenues trade € bn/a	6.8	0.3	0.4	1.2
Employment industry '000 jobs	35.9	1.8	2.1	6.5
Employment trade '000 jobs	59.5	2.9	3.4	10.7
Energy costs € bn/a	33.0	-1.5	-2.5	-3.3
Consumer expenditure[65] € bn/a	46.5	-0.8	-1.7	-0.9

[65] Note that the consumer expenditure in 2030, i.e. after complete stock change, roughly represents the monetary lifecycle costs.

Table 14. Accumulative savings Sub-options versus BaU (2020 and 2030)

ACCUMULATIVE SAVINGS 2020 vs BaU 2020

	BaU absolute	**Sub-opt A** saving	**Sub-opt B** saving	**Sub-opt C** saving
Energy primary PJ	8541	91	95	117
of which electric TWh	780.1	9.8	9.9	12.3
GWP $MtCO_2$	384.8	4.0	4.2	5.1
Acquisition € bn	164.1	-1.9	-2.6	-11.5
Energy costs € bn	199.0	2.2	2.3	3.0
Expenditure € bn	329.4	0.2	-0.5	-9.2

ACCUMULATIVE SAVINGS 2030 vs BaU 2030

	BaU absolute	**Sub-opt A** saving	**Sub-opt B** saving	**Sub-opt C** saving
Energy primary PJ	15611	558	579	719
of which electric TWh	1450.6	58.6	59.8	74.6
GWP $MtCO_2$	701.9	24.5	25.6	31.6
Acquisition € bn	280.1	-6.6	-9.0	-31.8
Energy costs € bn	440.8	16.7	17.3	22.5
Expenditure € bn	674.0	9.9	7.9	-9.9

5.4 Sensitivity analysis Sub-options

At the electricity prices used in the scenarios, the extra total expenditure of measures results in no extra costs for Sub-option A and extra costs of 0.6 (Sub-option B) and 2.3 billion euros (Sub-option C) in 2020.

In the model the annual price increases of gas and electricity are set on 4%, since the price increase of energy is higher than the inflation rate. Halving the price increase at 2%, would decrease the energy costs of Sub-options A and B with 3.3 billion euros and of Sub-option C with 3.2 billion euros. Setting the price increase to 6% would increase the energy costs with 4 billion euros, but the changes in price increase would not change the priorities.

On the long term (2030), halving the price increase of energy would lead to an energy price decrease of 28%; doubling the price increase to 6% would lead to a price increase of 42%, but again the order would not change.

The introduction of EU energy labelling is supported by all EU stakeholders: industry, consumer associations and Member States. Prescriptions for internet publication are not new but merely a requirement in line with what is customary in mandatory energy labelling. Member States have not indicated their desire to introduce their own stringent requirements for cooking appliances.

As regards the external societal costs, they are mostly linked to electricity consumption. They would add in the order of magnitude of 10% of electricity costs, but would hardly differentiate between the scenarios.

There is not enough information to assess whether the proposed ecodesign and labelling measures pose a significant threat to the flexibility of Member States in meeting the goals of the national energy efficiency plans, nor whether there will be any detectable interaction between the measures and the functioning of the emissions trading scheme, but both seem unlikely. All in all, it is considered that the scenarios are robust.

6. CONCLUSIONS

Ovens, hobs and range hoods are eligible for measures under the Ecodesign 2009/125/EC and possibly the energy labelling directive 2010/30/EC, representing significant sales, a significant environmental impact and saving potential, not already being addressed by existing EU policy measures.

The most important environmental impacts are energy consumption and carbon emissions during the use phase and it is in those areas that DCA-related measures can make its largest contributions to energy policy objectives on energy efficiency, energy security of supply and abatement of greenhouse gas emissions.

In operational terms this means that the DCA-measures contribute to achieving 20% energy saving and greenhouse gas emission reduction in 2020 with respect of 1990. However, respecting the fact that cooking is not only a technical but also a cultural process, the ambition level will be restricted.

With respect of the alternative policy options, the following conclusions were reached:

- <u>Option 1</u>: No action. As DCAs were found eligible for measures, this would not respect the mandate of the legislator.
- <u>Option 2</u>: Self-regulation. As the DCA-industry explicitly rules out this option and demands mandatory measures this option was discarded.
- <u>Option 3</u>: Energy labelling only. For ovens and range hoods this option misses out on roughly one-third of the saving and abatement potential with respect of Option 5, because an important market segment –e.g. where the buyer is not the user—would not be reached. For hobs this Option is not possible for technical reasons: the energy efficiency of hobs varies over a very restricted range and, also given measurement tolerances, does not allow a subdivision in seven distinct energy classes.
- <u>Option 4</u>: Minimum ecodesign requirements only. **For hobs**, where energy labelling is not possible as mentioned under Option 3, **this is the best possible option**. For ovens and range hoods this Option misses out on around two-thirds of the saving and abatement potential in Option 5, which is the estimated effect of energy labelling in the large domestic appliance market.
- <u>Option 5</u>: Combination of Energy labelling and minimum ecodesign requirements. **For ovens and range hoods this constitutes in all likelihood the best option**.

Option 4 for hobs and Option 5 for ovens and range hoods were selected for further quantitative impact assessment. Within those Options, three sets of possible Sub-options (A, B and C) with different ambition levels were formulated and elaborated in this IA report.

The impact assessment showed that Sub-option A had resulted in the lowest energy saving and abatement of greenhouse gas emissions, and Sub-option C in the highest. However, Sub-option C has inadmissible negative impacts in terms of affordability, functionality and possibly industry competitiveness. Thus Sub-option B was selected, showing no negative impacts on the issues mentioned in Directive 2009/125/EC and reaching a sufficient ambition level in energy saving and greenhouse gas emission abatement.

Furthermore, the impact assessment showed that the option would enhance industry competitiveness and employment. It would have a very small impact on administrative burden for legislators and industry. The measures do not have any specific territorial impact and have the full support of all stakeholders.

Industrial SMEs represent only a small portion (around 10-15%) of industry, as the market is dominated by large multinationals. SMEs represent around 70% of employment in the wholesale and retail sector. The policy options will have no negative impact on them and they are more likely to benefit from a stronger demand for new technologies and a higher turnover.

Subsidiarity in this context is not applicable, because the problem is trans-national and actions by Member States alone, apart from being less effective than actions at EU-scale, would restrict free circulation of goods. The appropriate policy option for realizing the improvement potential of cooking appliances is a Commission Regulation setting ecodesign requirements for all products in question, combined with an Energy Labelling delegated Regulation on range hoods and ovens, to guide customers towards the most efficient appliances. The ecodesign requirements would be set in three tiers with entry into force in 2014, 2016 and 2018. The labelling requirements on ovens and range hoods would be set in 2014. New label classes would be introduced for range hoods in 2015, 2017 and 2019.

This choice ensures that:

- The least energy efficient cooking appliances will be removed from the market, increasing competition on energy efficiency instead of price and additional features;
- on-going energy improvements are fostered by setting a transparent legislative framework that will provide the industry with the long-term security needed to invest in innovative technology;
- information on product differentiation provides consumers with an effective and reliable tool to compare energy consumption of products in an economic setting demand for energy efficient appliances;
- cost-effective potentials to reduce the electricity consumption of cooking appliances are quickly realized leading to significant increase in average efficiency;
- by 2020 the annual energy consumption of cooking appliances will be reduced by 27 PJ in 2020 (60 PJ in 2030) and CO_2 emissions will be reduced by 2.6 Mt in 2030;
- the accumulative energy and CO_2 savings amount to 579 PJ and 26 Mt CO_2 equivalent respectively over the 2010-2030 period;
- this can be achieved at no extra consumer expense over product life and also no negative impact on other aspects (health, safety, competitiveness, etc.) is anticipated;
- there is a clear legal framework for product design which leaves flexibility for manufacturers to achieve the efficiency levels; and gives them a level playing field, ensuring fair competition and free circulation of products;
- requirements for cooking appliances are harmonized in the Community leading to a minimization of administrative burdens and costs for the economic operators;
- market failures are correct and the internal market is functioning properly;
- the specific mandate of the Legislator is respected;
- costs for re-design and re-assessment upon introduction of the regulation, which are limited in absolute terms. and not significant in relative terms (per product); disproportionate burdens for manufacturers are avoided due to transitional periods which duly take into account redesign cycles;

- there are no significant impacts on the competitiveness of industry, and in particular SMEs;
- there is a positive impact on employment, in particular for SMEs.

7. MONITORING AND EVALUATION

The appropriateness of scope, definitions and limits will be reviewed after maximum 7 years from the adoption of the measure (as required by Annex VII.9 of the Ecodesign Directive and laid down in the implementing measure). Account will be taken also of the speed of technological development and the input from stakeholders and Member States. Compliance with the legal provisions will follow the usual process of 'New Approach' regulations as expressed by the CE marking.

Compliance checks are mainly done by market surveillance carried out by Member State authorities ensuring that the requirements are met, whereas the appropriateness of scope, definitions and concepts will be monitored by the on-going dialogue with stakeholders and Member States. Further information from the field as e.g. complaints by consumer organisation or competitors could alert on possible deviations from the provisions and/or of the need to take action.

ANNEX A

MINUTES OF CONSULTATION FORUM MEETING 2012

Meeting of the Consultation Forum under Article 18 of Directive 2009/125/EC on energy-related products

Domestic and commercial kitchen appliances and online labelling

Brussels, 18 April 2012 (09.00 - 17.30)

Participants: See "Attendance List" in Annex

EC Participants: Paul HODSON (Chairman), John DOYLE (INFSO), Ismo GRÖNROOS-SAIKKALA (ENER/C3), Villö LELKES (ENER/C3), Juan MORENO ACEDO (ENER/C3)

1. Welcome and adoption of the agenda

The **Chair** welcomed the participants and recalled that the purpose of this meeting was to consult stakeholders, including Member States, on the various implementing measures to address domestic and commercial kitchen appliances and on the development of online labelling.

The **UK** noted that the documents had been sent out too late to be able to study them properly. According to the Rules of Procedure of this Forum, these papers should have been sent one month before the meeting. Due to the need for documents to undergo the internal democratic process in the UK, it is not acceptable for them to be received late. The **UK** pointed out that this issue had already been raised at previous meetings. The UK contribution would therefore be confined to general policy and highly technical issues.

DE and **IT** supported the position of UK, and added that all of the current proposals are different from the suggestions in the Preparatory Study. They asked the Commission to provide further explanations.

CECED acknowledged the timing problem, but made a case for not postponing the necessary measures. Industry wanted to take advantage of the investments that had already been made in energy efficient appliances, which should be rewarded.

Commission services explained that the meeting date had been maintained in order to avoid losing time in the overall process. Delegates would have an opportunity to give their initial opinion during the meeting, and extra time would be allowed for written comments after this meeting.

The agenda was adopted without amendment.

2. Standby Guidelines on coffee machines

The standby guidelines were presented, including information on **coffee machines**. The Commission services referred to the discussion concerning coffee machines during the Ecodesign Consultation Forum meeting on 16 December 2011, in which it had been agreed that clarification would be provided on the application of the standby regulation to coffee machines (expected annual savings: 2 TWh). The Commission services pointed out that the other two options (suggested at that meeting) had not been not well received in general by the

Forum. This was either because only marginal energy savings (almost 0 TWh annual savings) could be expected for quite a significant effort, or because numerous methodological, legal and practical objections would be raised against the option (despite potential annual savings of 9.5 TWh). Therefore, the measure proposed for coffee machines consists of guidelines on how the standby regulation should apply to this product group.

ANEC/BEUC opposed the preparation of guidelines, since – unlike legislation – they are not binding. Additionally, the suggested guidelines do not address the labelling issue; they mentioned the existence of a scheme for labelling coffee machines in Switzerland for information.

The **Commission** services replied that the existing case law of the European Court of Justice makes it possible to use guidelines. Guidelines are helpful for the national market surveillance authorities (ADCO).

NL, supported by UK, had an issue of principle with the concept of guidelines used as a form of regulation. This may create a precedent and is a way of avoiding the 'normal' legal procedure in order to adopt mandatory legislation, such as the stand-by regulation. Furthermore, the guidelines are indicative and cannot impose specific provisions for placing coffee machines on the market, such as the application of a "power management requirement" after 40 minutes of the completion of the brewing cycle as suggested in the draft guidelines. They queried the technical basis for imposing this time period of 40 minutes. This provision is unclear and needs further explanation.

ECOS had deep concerns about the suggested option on guidelines. This will create a precedent for not taking regulatory action. It will involve the risk of being unable to make energy and cost savings because the rules are not legally binding and, consequently, are not followed. ECOS called for legally binding measures.

DE preferred a mandatory regulation instead of using guidelines: either specifications in an amended standby regulation or a new regulation for coffee machines.

BE was in favour of developing guidelines for coffee machines. It would provide a useful interpretative tool for market surveillance authorities (ADCO) and also provide information to manufacturers. The document could be uploaded on the Commission website for market surveillance purposes.

CECED, like **ECOS,** preferred regulation. Guidelines may be used incorrectly by manufacturers, and it is difficult for market surveillance to interpret them. Regulation is clearer for everyone.

IT, FR and **SE** had not had enough time to study the documents, and therefore did not have any specific comments at that stage. FR suggested that further explanations should be provided. On the issue of **coffee machines**, FR would prefer mandatory regulation. SE preferred a single regulation on **coffee machines,** or at least that **coffee machines** should be incorporated in the standby regulation.

The following possible alternatives were discussed as ways of tackling this specific product group: (1) a single regulation for **coffee machines**, (2) integration in an amended standby regulation and (3) guidelines. Option (1) is not in line with the results of the Consultation Forum of 16 December 2011. Option (2) does not seem to be a realistic option, due to the specific definition of the stand-by mode of **coffee machines** and the extra work, bureaucracy and costs required to develop this option. Furthermore, it does not seem to be the purpose of a horizontal regulation to deal with this specific issue. Option (3) may seem more realistic. It could enable adequate support to the industry and to the national market surveillance authorities within a short time

NL, supported by BE, suggested letting the national market surveillance authorities (ADCO) discuss this issue and give their opinion on usability, instead of discussing details at the meeting.

UK took the view instead that this issue went beyond ADCO's mandate.

ANEC/BEUC, supported by CECED, asked that the legal opinion of the Commission concerning the exclusion of **coffee machines** from the stand-by regulation be circulated.

The **Commission** services pointed out the "one month" deadline for written comments ended on 18 May. The Commission services summarised the main message of the discussion session on **coffee machines**: a) not to re-open the debate held on this matter in December 2011 and b) to discuss the "guidelines" issue with national market surveillance authorities.

3. Working documents on the possibility of introducing Ecodesign requirements and labelling requirements for domestic and commercial kitchen appliances – general content

The **Commission** services, together with technical expert VHK, presented the proposals for kitchen appliances:

- For **ovens**: revised labelling for domestic ovens and ecodesign measures for domestic and commercial ovens (expected annual savings by 2030: 13.3 TWh)
- For **hobs**: ecodesign measures
- For **hoods**: labelling for domestic range hoods

It is suggested that these appliances should be covered by one or more regulations in order to speed up the adoption process.

By 2030, the overall expected annual savings for these appliances are 13.3 TWh (42% for hoods, 29% for domestic ovens, 17% for domestic hobs, 12% for commercial ovens and hobs).

CECED commented that **microwave ovens** and **ovens** with an extra microwave function should be excluded from the scope of the new regulations.

DE felt that the regulations should be split into domestic products and commercial products. As far as the inclusion of commercial **ovens** is concerned, more time is required in order to obtain full information about these appliances. This runs the risk of delaying the process for domestic **ovens**. DE felt that the testing method for commercial appliances was not clear enough. It would be good to have a regulation now, in order to have better data in the next 8 years. One problem might be that new standards, with different methods, will be developed in the meantime. DE pointed out that the working documents show a potential reclassification of the current labels for domestic **ovens**. DE also added that the suggested ecodesign requirements for **ovens** are too modest.

BE preferred separate labels for domestic gas and electric **ovens**. Electric **ovens** should be downgraded in order to provide consumers with a good overview. Concerning range **hoods**, BE pointed out that the method of judging the "grease filtering efficiency" and the "fluid dynamics efficiency" was not clear. BE also suggested that the working documents should address motorless appliances and the recirculation mode. BE felt that comparable information should be available on smells, air flow and filtering efficiency.

IT would not give a positive vote on the proposal for combined regulation for all products. The *compensation factor* for gas **ovens** (to take into account the need for extra ventilation of exhaust gases and moisture) is unclear. It appears to be a political construct rather than a technically based result. IT felt that it was preferable to have separate labels for gas and electric **ovens**. The ecodesign regulation should be completed for all product groups, including grills.

NL was in favour of the combination label for gas and electric **ovens**. For commercial appliances, it would be useful to include combined energy labels for gas and electricity, since this would make the differences clearer for buyers (specifically in relation to Green Public Procurement issues) and would favour the design of minimum requirements. NL supported the position of DE to split the measures for commercial and domestic appliances, but to apply the same methodology for both types of appliances. There is no need to improve the methods of measurement for commercial **ovens,** since the suggested EEI index is now related to the EEI index for domestic **ovens**. The proposals for commercial appliances have not been developed to the same extent as those for domestic appliances.

ANEC/BEUC mentioned that the *compensation factor* seems to have been introduced mainly to penalise gas **ovens,** without any technical justification. This is unnecessary and actually makes the information for consumers less understandable. Instead of applying a *compensation factor* for gas ovens, they suggested providing warning information in the booklets supplied with the appliances to indicate how to cook more efficiently. For **hoods**, more attention should be paid to the overall use of ventilation, the smells emitted by electric ovens and the recirculation function of certain appliances.

DK indicated that they were not in favour of putting products using different energy sources on same scale or ecodesign requirements and referred to space heaters and water heaters where the discussion still is on-going. DK is against "same scales" because they find that the energy labelling should give consumers information about the consumption of energy(and thereby the expenses). That is one of the reasons to be against the complex compensation factors for gas ovens in the draft working proposal.

AEGPL took the view that it is unacceptable to penalise more energy efficient gas **ovens** with a *compensation factor* of 25% as suggested by CECED. This had not been discussed previously. The basis for this factor is extra ventilation, but general building ventilation will be operating in any case. Building ventilation is already mandatory in several Member States.

ECOS did not accept the *compensation factor* for gas **ovens.** These appliances have been efficient and should not be penalised. For consumers it is important to recognise the grading of the label in perspective with the best appliances. Industry should not have too much influence on the number of rescaled **ovens**.

UK stated that the *compensation factor* is based not on a technical principle, but on a solution to a political problem. The UK's view is that ventilation does not need to be taken into account.

SE had not had enough time to conduct an in-depth analysis of **ovens**. SE supported the single label for gas and electric **ovens** with the same function. However, SE stressed that consumers should be provided with clear information about energy consumption, which is one of the main purposes of the labelling scheme. The steps between the higher label ranges are smaller and seem to make it easier to reach the higher classes. The calculation appears to provide an incentive to use appliances with a bigger cavity size. The fact that label categories are unevenly divided does not help. The conversion factor of 2.5 is accepted, but needs to be looked at further, and revised if appropriate. SE indicated that ventilation is not higher for gas appliances than for other appliances. Range **hoods** are very important for Nordic countries. SE suggested that CENELEC should be given a mandate to upgrade the current standard. SE suggested setting in train a revision of the ecodesign regulation after 5 years instead of 7 years.

ORGALIME pointed out that there is an overlap in the definitions of the various **ovens** (commercial bakery ovens, commercial combi-steamer ovens and commercial multi-deck ovens). For instance, some **ovens** can use steam for better baking results, but the requirements should probably be different. It would have been better to focus on the main purpose of the oven when choosing the method of measuring performance.

INFORSE was in favour of a joint label for **ovens** to give consumers a choice between gas and electric appliances. The labelling of commercial **ovens** would help purchasers and planners when it came to choosing a more energy friendly product. INFORSE suggested introducing labelling for domestic and commercial **hobs**, as that would increase the energy saving.

CECED stated that they do not want to penalise gas ovens, since the members of CECED produce both gas and electric ovens. The *compensation factor* is used in order to provide an improved incentive for both gas and electric ovens. Consumers will choose either a gas or an electric oven in any event. Downscaling of labels should be avoided. There is no realistic possibility that electric ovens will be improved to A++ or A+++ label. The steps between the label classes should not be smaller than the tolerances. Including a value for yearly consumption on the label is not necessary. CECED accepted both a single or separate labels for electric/gas **ovens**. CECED did not see the need for a regulation on **microwave ovens**.

CECED referred to the work of CENELEC on new EN standards for **hobs,** with a new approach to better represent the cooking process.

CECED indicated that **grills** are a niche market. They are widespread, but produced in many different varieties and not widely used. It suggested no ecodesign minimum requirements and no labelling scheme for **grills**.

CECED indicated that, for range **hoods**, there is a great deal of scope for improving energy consumption. CECED supported the proposal for the labelling of **hoods** and agreed to take the least efficient models off the market. CECED noted that the standard for range **hoods** (EN 61591) takes into account the ease of accessibility to parts of the **hoods** in order to evaluate the grease filtering efficiency. **Hoods** with electronic controls for regulating the capacity of the air extraction fall within the scope of the standard. They should also be within the scope of the regulation. **Hoods** without a motor or controls for motor power do not fall within the scope of the standards, as it is impossible to measure the requisite values. The standards do not take account of the extraction of heated air, since the inside and outside temperatures are different everywhere and would result in unrealistic comparisons. These **hoods** which have neither a motor nor controls for motor power should be excluded from the scope of the Regulation.

The **Commission** services pointed out that it is not necessary to develop technology dependent labels for appliances with the same function, such as gas and electric **ovens**. The *compensation factor* for gas **ovens** is a technical issue. Gas appliances are the only household appliances that are allowed with open gas burners, which reduce air quality by using oxygen and venting exhaust gases and moisture. In a closed central heating boiler, the built-in ventilation system also makes for greater efficiency. Ventilation should therefore also be taken into account for open systems. The currently proposed *compensation factor* is an estimate which can be the subject of further discussion and fine-tuning, without forgetting that ventilation has to be provided either through a window or by electro-mechanical means. The proposed energy label is the result of a complex set of issues. The purpose of the label is to inform consumers, on the one hand, and to give manufacturers an incentive to improve their appliances, on the other. The oven label is independent of the energy source and size so as to prevent an incentive to build bigger ovens to reach the next size threshold. In fact, it is a new energy label for all ovens, which does away with the need for the reclassification of ovens. Around 50% of ovens will be in the same label class in this proposal as they are now. Although the steps between two thresholds become smaller in the higher labels, it is not easy to achieve the label classes A++ and A+++, since many of the possible improvements to electric ovens have already been made thanks to the labelling scheme. Nevertheless, there is still scope for these appliances to be further improved. In the case of gas ovens, there is still considerable potential for improvement, since this product group has not previously been regulated. In the next 10 years, gas ovens are also likely to see similar improvements to those made for electric ovens. The method of testing for commercial ovens is based on the German DIN standards. It may be that some definitions have been omitted, which might be the reason for an overlap in the product definitions in the proposal; this has to be looked at carefully. Consideration could be given to suggestions to include the main function of commercial **ovens** in the product fiche and to use the appropriate test method. For commercial **ovens**, the energy consumption would be high enough to apply labelling provisions, although the number of sold appliances is relatively very small.

The **Commission** services indicated that, in the case of domestic and commercial electric **hobs**, the level of energy consumption would show only the differences between the three existing technologies: solid plates, radiant and induction. Within each type of technology, the energy performances are quite close. The Commission services pointed out that, if domestic and commercial appliances are split, it will be necessary to provide further justification for the setting up of requirements in return for only small potential savings in the case of commercial appliances.

3.1 Working documents on the possibility of introducing Ecodesign requirements for domestic and commercial kitchen appliances – textual

The **Commission** services presented the details of the text of the proposal.

CECED presented the following main points on domestic appliances:

- on **ovens**: downscaling should be avoided; the best appliances should be given the possibility to populate new classes; “differentiating labels for electricity and gas **ovens**” is a good option, but the energy consumption of the **oven** should be calculated on the better of the two functions, namely hot air or conventional heating; to agree on the proposal as soon as possible; not to waste time;
- on **hobs**: the measurement method of **hobs** should be described in greater detail.

NL wondered about the opinion on the present industry of commercial **ovens** and agreed with the industry not to regulate **grills**. NL inserted some comments into the text:

- The definition of the word ‘appliance’ is missing.
- For hobs, the definition of the Energy Efficiency Index is used, but according to the calculation formula it is a performance indicator, not an index.
- Some of the information requested is not suited for the purpose and should not be in the requirements. The energy efficiency indices should be part of the required information for all regulated appliances.

UK stated that it would send written comments within one month. They asked why small **ovens** below 18 kg are excluded from the proposal.

The **Commission** services replied that, in the existing EN standards, freestanding **ovens** below 18 kg are defined as portable **ovens,** and therefore excluded from the current standard EN 60350 (Electric cooking ranges, **hobs**, **ovens** and grills for household use). In any event, safety regulations on surface temperatures will make it mandatory to improve **ovens** with insulation.

CECED confirmed that small ovens are covered by standard EN 61817 (Household portable appliances for cooking, grilling and similar use) and excluded from the standard EN 60350, as the smallest **ovens** do not comply with the wet brick test.

IT asked whether it is possible to mention the units nearby the formula. The calculation formula for ECB on page 21 of the working document in question is unclear.

The **Commission** pointed out that the formula should be as follows: $ECb = \frac{ECt}{(1.5\, x\, n)}$ ECB = ECt/(1.5xn)

ECOS was disappointed in general by the low ambition level of the Commission's draft proposals. ECOS took the view that **microwave ovens** should not be excluded from the proposal. They also pointed out that the annual energy consumption for **hobs** should be included in the ecodesign requirements. The performance of domestic **hobs** could give enough space for the setting of a labelling scheme on these products. The off-mode and stand-by energy consumption requirements of range **hoods** in the proposal under discussion are not in line with those of the standby regulation.

SE pointed out that the description of the method of measurement for **hobs** in the working document is not complete. For these appliances, SE indicated its preference for using "energy consumption per year" in the calculation formula instead of "energy consumption per cycle".

NL would be in favour of the wording "energy consumption per cycle".

ORGALIME mentioned that the requirements for conventional **ovens** and multiple deck **ovens** are fairly similar, and that there was a considerable risk of overlapping.

NL suggested that the definitions should be clarified and simplified.

The **Commission** services gave an assurance that that the definitions would be thoroughly scrutinised.

DE suggested that the measurement of energy consumption of **ovens** could be based on the average between conventional heating and fan forced heating. DE indicated their preference for the wording "energy consumption per year" to appear on the label, instead of "energy consumption per cycle".

Commission: The wording "energy consumption per cycle" is preferable to "personal energy consumption" as an indication of average annual consumption, given that the methods of using ovens/hobs vary considerably in the EU.

3.2 Working documents on the possibility of introducing labelling requirements for domestic ovens and range hoods – textual

The **Commission** services presented the details of the proposal.

ECOS suggested that commercial hobs should also be included in the labelling scheme.

DK pointed out that re-labelling and the introduction of new requirements will create a serious practical problem, involving the parallel existence of several labels at the same time.

The same appliance would be have to comply with different existing labelling schemes. This is impractical and unclear for consumers.

UK mentioned that the symbol currently proposed for 'electric **oven**' is not suitable, as it resembles a high voltage warning sign. It should be similar to the pictogram used for domestic appliances such as tumble driers.

ANEC/BEUC expressed their general position on re-labelling: they do not like the new labelling indications A+, A++ and A+++, as this makes the labelling unclear for consumers.

DE mentioned that the description of the information required in Annexes IV and V of the draft proposal is unclear. It refers to "all operation modes". In this wording, grilling – for example - would be mandatory, whereas only conventional and fan-forced modes are meant.

IT expressed its opinion that a new meeting should be held to consult on this subject.

NL suggested splitting domestic and commercial appliances in order to take account of delay caused by the lack of information on commercial appliances.

The **Commission** services will consider the option of covering domestic and commercial appliances separately, by acknowledging the impacts on expected savings and the related burden of work.

4. Working document on the possibility of introducing horizontal requirements for online labelling

The **Commission** services presented the proposal for a horizontal measure regulating the online publishing of energy labels. The presentation of the main parts of the working document was well received. The innovation of inviting participants to log onto a demonstration site and explore the proposal in a real online environment was considered stimulating.

UK had no objections to the proposal, but preferred guidance to regulation. The UK is concerned that implementation would be taken away from Member States. They were given assurances that monitoring and compliance of online implementation would remain in the hands of the Member States.

DE supported ADCO guidance and asked whether a horizontal delegated act is legally possible.

Commission services: Articles 7 and 10 (4)(e) clearly state that a horizontal delegated act on this issue is possible. Provision has been made for implementing various aspects of the Labelling Directive (online included).

IT was the only country that expressed reservations about the idea. IT found it premature and not possible under the current Directive, and preferred to discuss it during the review of Directive 2010/30/EU. The Commission pointed out that the intervention was in fact late, as the original Directive required implementation online (Article 4(d) of the Directive 2010/30/EU) – which had been very largely lacking.

NL supported the proposal for legislation, as guidance is not the same as enforceable legislation, and it stressed the importance of consistent online labelling across the EU as a way to facilitate cross border eCommerce.

SE supported the proposal and wondered whether it is applicable to online advertising; it also enquired whether the possibility of using auction sites had been thoroughly examined as a likely sales channel for new appliances to be included in the draft delegated act. (i.e. a legal analysis has to be conducted).

Commission services: the advertising requirements of Directive 2010/30/EU cover online advertisement and promotional material, as the word 'any' is used in the text (Art 4 (c)-(d)). However, in this case it is only the energy efficiency class that has to be shown.

SE accepted the Commission's explanation that auction sites should be excluded for the time being.

CECED supported the proposal for a delegated act, and stated that manufacturers should be able to provide the label and the fiche electronically. However, it should be ensured that there is a single fiche and a single label, and that the issue of the transition period from the old label to the new label when an old piece of legislation is revised should be properly addressed.

INFORSE believes that this is a good initiative. The best web shops already have the information, but too many of them do not. Some countries and NGOs have sites which compare the energy efficiency of products, and this should be taken into consideration going forward. In particular, INFORSE would like to mention that a number of NGOs have organised "top-ten" websites, where the best products are listed. Links to such sites could be considered.

EMOTA (eCommerce association) saw no technical difficulties in the proposal, but asked that there should be a transition period for its implementation.

ANEC/BEUC strongly supported the proposal and looked forward to the approach being applied more widely.

The **Commission** services indicated that, in general, the Forum took a positive view of the proposal to draft a Delegated Act for implementing the online provisions of the EUP labelling directive. The Commission distributed a sheet of FAQ´s to the participants and invited them to submit their questions and send further comments on the working document to the Commission within one month.

5. Next steps

The **Commission** services outlined the following next steps:

- written comments from participants should be sent by 18 May;
- a new meeting of the Forum on this subject could be held before the summer break;
- inter-service consultation of Commission DGs could take place in the autumn;
- WTO-TBT notification could be tackled before the end of the year.

ANNEX B

MINUTES OF CONSULTATION FORUM MEETING 2012

DRAFT MINUTES

Meeting of the Consultation Forum under Article 18 of Directive 2009/125/EC on energy-related products

Domestic kitchen appliances

Brussels, 11 July 2012

Participants: See "Attendance List" in Annex

EC Participants: Ismo GRÖNROOS-SAIKKALA (Chairman), Juan MORENO ACEDO (ENER/C3)

1. Welcome and adoption of the agenda

The **Chair** welcomed the participants. The minutes of the previous meeting on kitchen appliances on 18 April 2012 were adopted with a comment from DK. The agenda was adopted with the inclusion of a discussion point on coffee machines as suggested by CECED**.**

The **Commission** services introduced the current state of play concerning the possible measures on ecodesign and labelling for the kitchen appliances (range hoods, hobs, ovens and coffee machines).

DE suggested to adopt ecodesign measures first and to introduce labelling in a second stage. DE welcomed the split of domestic and commercial appliances. DE suggested also to split the regulation for the various product groups *i.e.* three single regulation for range hoods, for domestic hobs and for domestic ovens, but with one single Impact Assessment for all three regulations to save resources.

IT supported the separate legal measures and was fine with the combination in one Impact Assessment. Italy indicated they will not accept the adoption of the labelling measures before the ecodesign measures.

Inforse expressed their concern on the non-coverage of commercial appliances by regulation despite their high impact (e.g. combi-steamers). Information requirements should be required as a first step for commercial appliances.

NL supported the position of IT and DE concerning the adoption of ecodesign measures first and later on labelling measures. NL suggested going for separate legal measures for range hoods.

Orgalime noticed that the commercial appliances are excluded for the time being and asked the Commission for the planning for that product group.

The **Chair** indicated that splitting the current product groups to measures with insignificant savings would take too much resources and too much time in relation to the savings potential of the individual product groups. The commercial ovens are taken out of the proposals due to the lack of data and available standards and measuring methods.

2. Domestic ovens

The **Commission** services made a technical presentation on ovens. Around 2/3 of the domestic ovens have an A-label. The share of electric ovens is increasing while the share of gas ovens decreasing. The compensation factor for gas ovens is taken out and downgrading of current models is minimised. The new formula to calculate the Standard Energy Consumption (SEC) is based on the combination of data from some 2300 different models of gas and electric ovens, representative of the current market situation. The estimated cost-efficient annual final energy savings are between 0.7 – 0.9 TWh by 2030.

DE welcomed the principles of the approach: the linear scale and the inclusion of both gas and electric appliances. DE expressed criticism on the slope of the regression line: big (more energy consuming ovens) would get a benefit and small ovens would be penalized by the draft proposal.

CY supported DE's point of view on the penalisation of small ovens and asked how consumers could understand downgrading of ovens which were earlier in the highest level.

IT did not like the conversion factor of 2.5 to tackle primary energy from electricity use. IT agreed to take out the compensation factor of 1.25 for gas ovens. IT did not support the downgrading of too many electric ovens.

NL asked if also non-linear regression lines have been examined, since this linear line favours the big ovens. A less steep slope would help. NL also indicated that these product groups and the discussion emphasize the need to have actual data as basis. NL asked the Commission to hurry with an execution plan to generate market data. For NL the up- or downgrading of existing ovens is not the main issue with this draft proposal. The Impact Assessment can be prepared for a combination of appliance groups, but legislation should be separate for legal clarity.

ANEC/BEUC was in favour of the single label, since it gives the opportunity to be used for choosing between gas and electric ovens. The slope of the regression line in the proposal is not fine, due to the penalization of small ovens (more energy friendly). Just as in other cases, ANEC/BEUC is in favour of the redistribution of the A-G labelling scheme, since this is better understandable for consumers.

BE indicated that the proposal is not ambitious enough. BE did not agree with the slope of the regression line, since it penalizes small ovens.

The **Chair** indicated that the data would be complemented in the Impact Assessment. The Chair invited stakeholders to provide newer data. The effect of the steep slope should not phase out small ovens. The design of the new label must facilitate the product group not yet labelled and those having already a label (electric ovens).

The **Commission** services gave further explanation on the regression function, of which the starting point was to have a linear function. The Commission will investigate possibilities to use a non-linear formula or modify the slope of the formula to avoid penalisation of specific groups of appliances. Updated data for 2012 would be welcomed. The Commission services further explained that it is impossible not having downgrading at all, and indicated that "downgrading or upgrading" is not the only right way to look at the energy label, since it is a different label with new calculation formulae combining gas and electric ovens.

SE welcomed the measures, but was afraid of penalisation of small ovens. For SE, it is not acceptable to leave out the compensation factor for gas ovens, since it is important to take into account the required extra ventilation for gas ovens.

FR was fine with the combination of gas and electric ovens and is not afraid of relabeling of electric ovens. FR supported the view that "penalizing small ovens should be avoided".

ECOS supported the combination of gas and electric ovens, since consumers can compare appliances with different energy sources. ECOS also welcomed the third tier, which sets high goals and shows the direction to improvement. For consumer understanding, ECOS was strongly in favour of using the A-G scale instead of the A+++ scale and suggested to indicate the annual energy saving on the label as well.

CECED indicated that they can accept the compensation factor for gas ovens. But the proposal was not supported for the following reasons: 42% of the existing A-label ovens would be downgraded, 86% of all gas ovens would get an A or A+ label directly, electric ovens will never reach the A++ label, small ovens would be penalized, gas & electric ovens would not be equally distributed over the label categories and much improvement potential would be left unused for gas ovens. Moreover, almost all double cavity ovens would phase out. Therefore CECED proposed a separate energy label for a better comparison of electric and gas ovens on a relative equal scale and without penalisation of small ovens. CECED will provide updated data on ovens.

DK indicated that a linear slope is fine, but the impact on small ovens should be improved. DK did not expect problems with rescaling the labels, but was in favour of an A-G scale instead of the proposed. A+++ to D scale. DK indicated that split labels for gas and for electric appliances would be better. For electric ovens both hot-air and conventional heating should be part of the assessment.

The **UK** welcomed that the compensation factor for gas appliances is taken out. The slope of the regression function must be reviewed to reduce the impact on small ovens. The UK supported the introduction of a third tier for ecodesign requirements to get wider view on the future.

ANEC/BEUC indicated that some downscaling to B or C should not be a problem.

ECOS mentioned that relabeling is not a big issue. The problem is that the label scheme will not work anymore when class A is the minimum class.

DE would accept a compensation factor for gas appliances as a compromise.

IT indicated the current draft working proposals would induce a major relabeling and a massive phasing out with the 3th tier. IT mentioned that the use of a 3th tier in the ecodesign proposals should be the exception.

Technical expert VHK indicated in relation to the compensation factor for gas appliances that safety and building requirements could be a legal base for taking measures and that required ventilation needs to be taken into account e.g. for open combustion flueless heaters.

AT referred to the relabeling and indicated that the consumers in general would accept downgrading of appliances.

The **Chair** recalled the need to keep one single frame for the gas and electric ovens with a specific differentiated pictogram for gas and electricity but with the same scale. This scale could be derived from two different regression functions without penalisation of small ovens.

3. Domestic hobs

The **Commission** services presented the draft working proposals on domestic electric and gas hobs. The estimated annual final energy savings by 2030 are between 1.4 and 2.2 TWh.

NL asked for detailed specific data on the performance of these appliances.

DE mentioned that the current working draft proposal is not acceptable: all ceramic hobs would be banned in the 3^{th} tier as well as all current gas hobs.

CENELEC (TC59) explained that a new standard on electric hobs is being developed, which takes into account heating and simmering phase of a cooking appliance. This standard is in the voting phase and the prognosis is that it will be valid by the end of the year.

CECED added that the new draft standard is much more useful for ecodesign and that the old one should no longer be used.

Technical expert VHK indicated that the new draft standard gives a better different relation between the types of hobs (solid and ceramic compared with induction), since the stored heat in the hob is better applied.

ECOS was in favour of using the new standard.

CEN TC49 added that the gas hobs will have a similar standard for gas appliances.

SE supported the use of the new standard including the simmering phase. SE also asked for an energy label scheme for hobs, since the outcomes of the new standard show much more differentiation on energy performance between the different appliances than with the existing standard.

The **Commission** services indicated that the objective was not to phase out all ceramic hobs and current gas hobs but to foster the development of more energy efficient appliances. The Commission services asked for the drafts of the new standards on electric and gas hobs.

CECED will provide data about energy consumption of hobs according to the new standard within two months.

The **Chair** concluded that the results of this discussion, the updated data provided by participants and written comments of participants after this meeting will be taken into account.

4. Domestic range hoods

The **Commission** services presented the draft working proposal and explained the changed formula, which is based on the regression line of the available data received from CECED. Other data about energy efficiency and other proposals are welcome. The annual final energy savings by 2030 are estimated on 4.0 TWh

CECED indicated that they preferred the previous working proposal for the labelling of range hoods, since it allowed more differentiation between appliances. The third tier would phase out all built-in & built-under hoods, which represent 50% of the market. CECED will provide the newest data to the Commission.

DK appreciated the A-G scale, but a more ambitious label would be better as incentive to improve for manufacturers. In the labelling scheme, the capture of odour should get more attention, since that is the most important function.

ECOS also welcomed the proposal especially the tiers of the regulation. The label classes should be wider, e.g. by filling the G-label.

IT Asked to go back to the April proposal and not to phase out all built-in and –under appliances in the last tier.

DE indicated that in their opinion three steps of measures are fine, but they do not understand why the equation has been changed since the April draft working proposal. DE also indicated that lamps could be an issue, if insufficient lighting is provided to minimise the overall electricity consumption and to reach upper classes.

SE supported the April proposal, but the odour removal should be the base of efficiency requirements.

BE supported in general the basic principles of this proposal.

The **Commission** services indicated that the current scheme was based on the available data. The Commission services will consider the new CECED data.

5. Coffee machines

The **Commission** services presented a proposal which had been prepared by CECED. It consists of requirements for power management for three different types of coffee machines: filter machines with insulated jug, filter coffee machines with non-insulated jug and other coffee machines. These requirements can be hosted in the ecodesign regulation on domestic kitchen appliances or in the Networked Standby regulation.

NL suggested including the coffee machines into the standby and off mode regulation. The proposal states two years, although some coffee machines are already covered by the standby regulation which requires one year. This needs to be made consistent.

DE supported the proposal, but would like that the manual change of switch off time is limited. The term 'default setting' implies possibility for change.

ECOS welcomed the proposal. The work on the preparatory studies etc. is well used. ECOS proposes to set 'maximum' instead of default, to make a manual setting possible, but without extending time. ECOS also proposed a revision after 3 or 5 years.

NL opposed the maximum time, since for no other product maximum time settings are defined. NL is in favour of leaving the definition as it is and leave some space to consumers, of which hardly any would change the setting.

BE supported the proposal, but is in favour of including it in the stand-by regulation.

The **Commission** services indicated that the timing will be made consistent with the standby and off mode regulation. In general the text seems mature.

6. Conclusions

The **Chair** concluded that proposals on the domestic kitchen appliances will be prepared based on updated data, on the results of the discussions in April meeting and in this meeting and on the written comments of the participants to be sent within two months after the meeting.

7. Next steps

- written comments from participants should be sent by 11 September;
- inter-service consultation of Commission DGs could take place during the first quarter 2013;
- WTO-TBT notification should be launched during the first quarter of 2013.

ANNEX C

MINUTES FINAL STAKEHOLDER MEETING PREPARATORY STUDIES DOMESTIC APPLIANCES

March 24th 2011

DG ENER Lot 23: Domestic and Commercial hobs and grills

Welcome to new attendees

E. Hoa (BIO): **Tasks 1 to 3 : Main findings on domestic hobs and grills**
No comments from stakeholders on Task1 and Task 2

C. Robertson (ERA) points out an inconsistency in the price for hot plates. The average price is lower than the minimum price presented.
E. Hoa (BIO) explains that this is due to an update of the average prices after buying data to GfK Retail & Technology. This will be corrected.
B. Tinetti (BIO) specifies that EcoReport does not model any increase in the energy costs that may not be representative of the reality. Results related to life cycle cost should be considered with caution.

E. Gasc (BEUC) suggests to list in the Task 3 report the elements that influence energy efficiency from a user behaviour perspective. such as placing the pot in the middle of the cooking zone or using of a lid (only 50% of German consumers use a lid).

C. Egenter (EGO) comments that the lifetime for induction hobs should be reduced to 10-15 years instead of 19 years. Spare parts are not easily available for induction hobs: replacement is often preferred to repair.

A. Smrke (MSX) challenges the energy efficiency of induction hobs. Results are different when taking in consideration an actual cooking cycle and not only heating water. Induction is more efficient than solid plates for heating water. but not for cooking. Conclusion that induction is more efficient is not supported by enough evidence. Complementary documents will be sent to support this position.

E. Gasc (BEUC): What is the source of the barriers to ecodesign described in the Task 3 report? Common sense or studies? Fear from electromagnetic field should be presented as one factor explaining the reluctance to use microwave ovens.
E. Hoa (BIO) answers that this section is based on an Australian study. as well as common sense and stakeholder's feedback. Issues related to electromagnetic field will be mentioned.

P. Goodman (ERA): **Main findings of Task 4.**
E. Gasc (BEUC) explains that simmering must be taken into account after heating up. Induction is the most efficient technology for heating up. but is less efficient for simmering during 20 minutes. All technologies have a similar efficiency for longer simmering time. Documents will be sent to support this.
A. Smrke (MSX) explains that technology to simmer on gas does exist. He underlines that the standard should measure the energy consumption for real simmering. above 90°C. Data was sent to consultants in November 2010 and is not mentioned in the Task 4 report.

C. Egenter (EGO) asks if the study highlighted difference in cooking food with different technologies. Standards are different for gas and electricity. but is there a difference in actual cooking?

A. Smrke (MSX) states that he proposed a measurement method modelling a cooking process. which was rejected by CENELEC. quoting the Lot 23 study.

N. Bekkus (NHO): As witnessed by for instance the ecodesign process on boilers. several Member States insist on having different energy labelling for different energy sources. Norway’s concern is shared by other EU countries.

***E. Hoa (BIO):* Main findings on Task 5**
B. Tinetti (BIO) underlines that the absence of Base-case for domestic grills does not imply that there will be no policy recommendation. There could be some generic requirements.

C. Egenter (EGO) suggests that Base-case 1 (“Domestic electric hob”) should be renamed “Domestic radiant hob”. 70% of the BOM is different between induction and radiant. Only glass and touch controls are similar. It should be clearer in the report.

M. Rambaldi (CECED) asks for the value of the factor used in Task 5 to convert final electric energy into primary energy and suggest to specify it in the report.
E. Hoa (BIO): The database in the EcoReport tool use a conversion factor of 2.91 (1 kWh of electricity is equal to 10.5 MJ of primary energy).
N. Bekkus (NHO) points out that the impossibility of direct comparison between appliances using different energy sources is underlined several times in the report. but figures are nevertheless presented in the same tables. Also. if the intention is not to compare different energy sources. then what is the purpose of the conversion factor?
S. Mudgal (BIO): Data are presented in tables to highlight the order of magnitude of impacts. The process is not about favouring different energy sources but improving products in the same category.
E. Toulouse (ECOS): The objective of the Ecodesign Directive is not to improve all appliances separately. Example with light bulbs. which banned incandescent bulbs.

S. Mudgal (BIO): The Ecodesign implementing measures should not favour any technology. For light bulbs. performance levels have been set. which in practice ban most incandescent bulbs. However. if incandescent light bulbs are efficient enough. they can be sold.

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V. Lelkes (EC): This is a matter for decisions on policy options post this study

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M. Bulgheroni (Electrolux): Multi-ring burners are common in the rest of the EU.even if not in UK. Confirmation by C. Egenter (EGO).

A. Roux (Fagor – CECED): A metal reflector below the heating element cannot be used in heaters of radiant hobs owing to electrical insulation problems.*C. Egenter (EGO) agrees with the two comm*ents above. Additionally. he thinks that there is no significant difference between electromechanical and touch control.
***E. Hoa (BIO):* main finding of Task 7**
A. Smrke (MSX) asks for precision about cooking sensors.

A. Roux (CECED) answers that it is an infrared sensor.

A. Smrke (MSX) observes that pot sensors work only with a certain type of pots.

C. Zimmerman (CECED) explains it is not true anymore.
S. Edwards (ECOS) asks for clarification of the new CECED figures in slide 86.
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E. Johnson (Atlantic consulting) points out that Task 7 is only about hobs and suggests adding some information about grills.
E. Hoa (BIO) reminds that Task 7 is about assessing the improvement potential for the Base-cases defined in Task 5. As there is no Base-case for grills. their improvement potential is not assessed in details in this Task. However. some information is presented in Task 6. A reminder mentioning why grills are not analyzed in Task 7 will be included.
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M. Bulgheroni (Electrolux) suggests that a 4th option - Zone flexibility – should be added to the domestic radiant Base-case.
Precision after the meeting: After discussion with A. Roux (Fagor/CECED). the majority of radiant hobs already include some zone flexibility. Therefore the Base-case is already taking into account that option.
S. Edwards (ECOS) underlines that inputs for improvement options have a significant impact on Task 7 conclusions
E. Hoa (BIO) agrees and explains that a sensitivity analysis will be conducted in Task 8. Stakeholders are asked to provide comments on this data.

No comments from stakeholders.

B. Tinetti (BIO) explains that the LLCC product is usually suggested as the target for minimum performance. but this is not mandatory.

***E. Hoa (BIO)*: Next steps**
Stakeholders ask for Task 8 publication date.
B. Tinetti (BIO) points out that Task 8 being based on the previous tasks. its publication date highly depends on their finalization. and therefore on the time stakeholders will take to comment. Stakeholders would be given at least one week to comment.

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ANNEX D

STOCK MODEL METHODOLOGY & DETAILED RESULTS

The impact analysis uses the variable **inputs** as defined in the following paragraphs and used in Chapter 5.

The **calculation method** for the analysis is a so-called **Stock Model,** which means that it is derived from accumulated annual sales of DCAs over the period 1990-2020 (with a start-up period 1986-1990).

The stock-model sets the pace for the Sub-options. The direction is determined by trends in dwelling size, number of households and characteristics (operating hours. W). From these stock data the fitting sales data were calculated

Outputs for each Sub-option are:

- Electricity consumption in TWh/a;
- Primary energy consumption in PJ/a (conversion 1 TWh electric = 2.5 *3.6 PJ primary);
- Carbon emission in Mt CO_2 equivalent/a. using a multiplier based on electricity and gas shares (see below) and the values from the EcoReport in the preparatory study;
- Customer-related economical parameters: purchase price, energy expenditure, repair cost and total expenditure in billion euros per year (2005 Euro, inflation-corrected at 2%/a);
- Business-related economical parameters: turnover per sector (industry, trade, etc.);
- Employment: calculating job creation/loss using the sector-specific turnover per employee and trade margins.

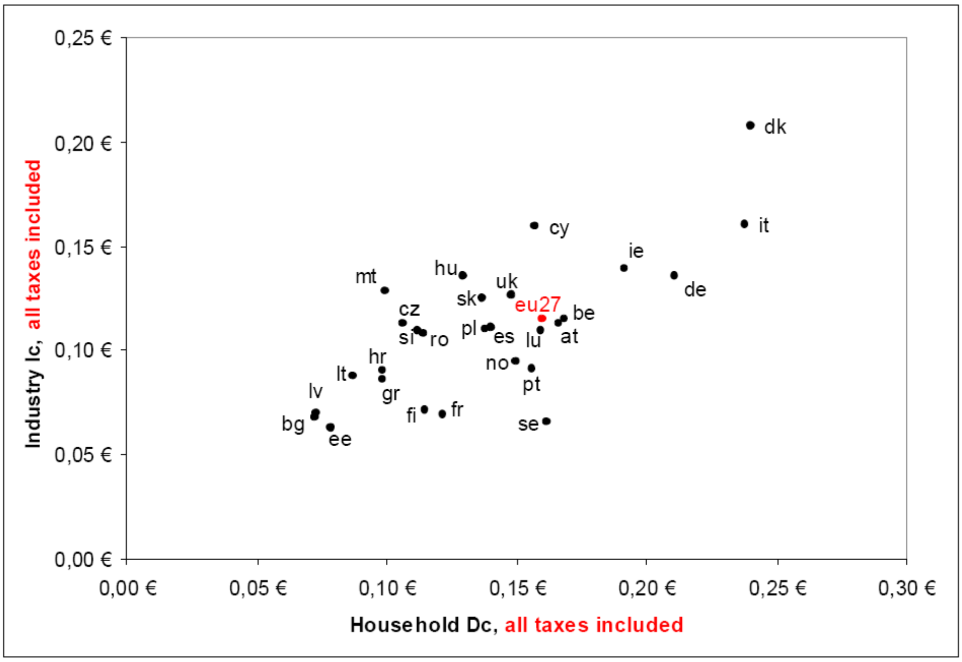
Final outcomes are presented at a high aggregation level (totals), but in the intermediate stages a distinction is made by the typology and by size.

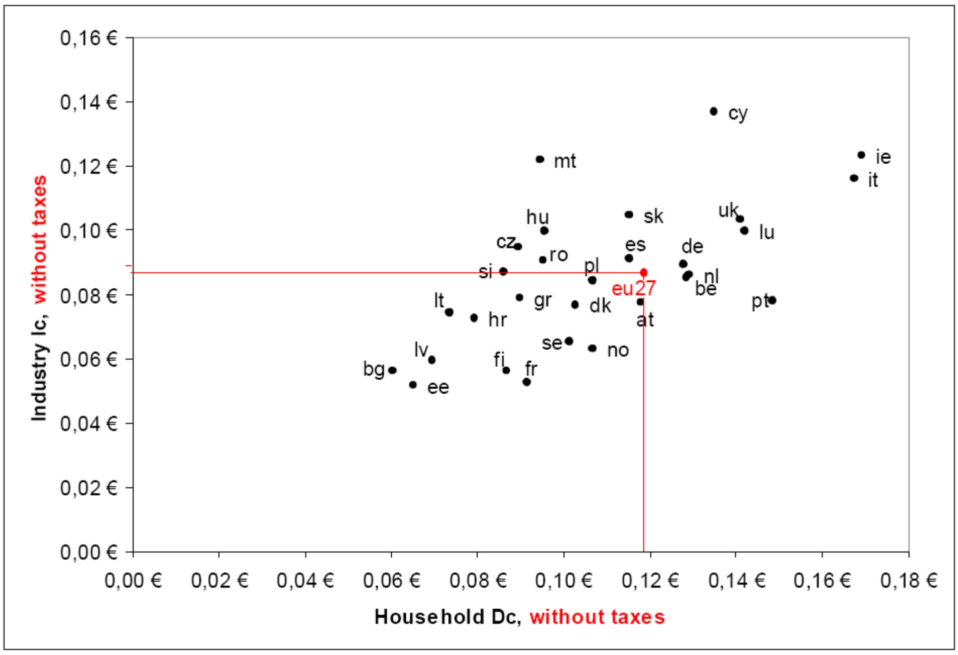
For the economic calculations, an average energy price in €/ kWh primary energy is built from:

- Electricity rates per kWh primary energy at domestic rates, at 3500 kWh electricity /a total energy bill.
- Differentiated energy price rate increases before and after 2007.

Data from Chapter 2 and 5 are used for the definition of the base case and calculated on the basis of the relative market shares of the categories considered. The table below gives the characteristics of the base-case cooking appliances and their substitutes.

The Figure below shows EU27 Electricity rates 2007 with and without taxes.





The following tables are in addition to the baseline data from Table 16 and give the detailed results from chapter 5 for the Sub-options in tabular format:

BaU (Business as Usual)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Sales	Range Hoods	5.8	6.1	6.4	6.7	7.0	7.4	7.8	8.2	8.6
million units	Elec. Hobs	6.5	7.4	8.3	9.3	10.3	11.3	12.2	12.9	13.6
	Gas Hobs	7.4	7.0	6.7	6.4	6.2	5.9	5.6	5.3	5.1
	Gas Ovens	2.7	2.5	2.4	2.2	2.1	2.0	1.9	1.8	1.7
	Elec. Ovens	9.6	9.9	10.1	10.3	10.5	10.9	11.2	11.6	11.9
	Total	**32**	**33**	**34**	**35**	**36**	**37**	**39**	**40**	**41**
Stock	Range Hoods	79	83	87	91	96	101	106	112	117
million units	Elec. Hobs	84	94	105	119	134	149	164	176	189
	Gas Hobs	117	112	107	102	97	94	90	86	82
	Gas Ovens	57	54	50	48	45	42	40	38	36
	Elec. Ovens	175	179	184	188	193	197	203	208	215
	Total	**510**	**522**	**533**	**549**	**565**	**583**	**602**	**620**	**638**
Energy	Range Hoods	94	99	104	109	115	121	127	133	140
PJ/a	Elec. Hobs	182	203	225	253	281	310	338	363	386
	Gas Hobs	139	133	128	121	115	110	106	101	96
	Gas Ovens	45	42	39	36	33	30	27	24	22
	Elec. Ovens	210	215	220	215	211	196	182	173	172
	Total	**671**	**693**	**715**	**735**	**755**	**767**	**779**	**794**	**816**
GWP	Range Hoods	5.2	5.1	5.0	5.0	5.0	5.2	5.4	5.6	5.8
MT CO_2/a	Elec. Hobs	10.1	10.4	10.7	11.5	12.3	13.4	14.4	15.3	16.0
	Gas Hobs	8.4	8.0	7.7	7.3	6.9	6.6	6.3	6.0	5.7
	Gas Ovens	2.7	2.5	2.3	2.2	2.0	1.8	1.6	1.5	1.3
	Elec. Ovens	11.7	11.1	10.5	9.9	9.2	8.5	7.8	7.3	7.2
	Total	**38**	**37**	**36**	**36**	**35**	**36**	**36**	**36**	**36**
Acquisition	Range Hoods	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.5
€ bn/a	Elec. Hobs	2.8	3.2	3.5	4.0	4.4	4.5	4.6	4.5	4.5
	Gas Hobs	2.7	2.4	2.0	1.8	1.6	1.4	1.2	1.0	0.9
	Gas Ovens	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.4
	Elec. Ovens	4.5	4.4	4.3	4.9	5.4	5.6	5.5	5.4	5.3
	Total	**12.4**	**12.4**	**12.4**	**13.2**	**14.0**	**14.1**	**14.0**	**13.7**	**13.5**
Energy cost	Range Hoods	1.1	1.4	1.6	2.0	2.3	2.9	3.8	4.8	6.1
€ bn/a	Elec. Hobs	2.7	3.2	3.7	4.6	5.5	7.4	9.8	12.8	16.6
	Gas Hobs	1.6	1.6	1.6	1.7	1.8	2.0	2.4	2.8	3.2
	Gas Ovens	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7
	Elec. Ovens	3.0	3.2	3.4	3.5	3.5	4.0	4.5	5.2	6.3
	Total	**9**	**10**	**11**	**12**	**14**	**17**	**21**	**26**	**33**
Expenditure	Range Hoods	2.8	3.1	3.4	3.9	4.3	5.0	6.0	7.1	8.6
€ bn/a	Elec. Hobs	5.4	6.3	7.2	8.6	9.9	11.9	14.4	17.3	21.0
	Gas Hobs	4.3	4.0	3.6	3.5	3.3	3.4	3.6	3.8	4.1
	Gas Ovens	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Elec. Ovens	7.5	7.6	7.8	8.3	8.9	9.6	10.0	10.6	11.6
	Total	**21**	**22**	**23**	**25**	**28**	**31**	**35**	**40**	**46**

SCENARIOS TOTAL

Energy		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
PJ/a	BaU	670.5	692.6	714.8	734.7	754.7	767.4	778.9	794.0	816.0
	Sub-option A	670.5	692.6	714.8	734.7	754.7	765.1	763.1	764.1	778.4
	Sub-option B	670.5	692.6	714.8	734.7	754.7	763.3	752.0	744.3	756.1
	Sub-option C	670.5	692.6	714.8	734.7	754.7	763.3	747.6	732.1	735.7
GWP		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
$MtCO_2$	BaU	38.1	37.1	36.2	35.8	35.4	35.5	35.5	35.7	36.1
	Sub-option A	38.1	37.1	36.2	35.8	35.4	35.4	34.8	34.4	34.4
	Sub-option B	38.1	37.1	36.2	35.8	35.4	35.3	34.4	33.5	33.5
	Sub-option C	38.1	37.1	36.2	35.8	35.4	35.3	34.2	33.0	32.6
Acquisition		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	12.4	12.4	12.4	13.2	14.0	14.1	14.0	13.7	13.5
	Sub-option A	12.4	12.4	12.4	13.2	14.0	14.1	14.4	14.8	14.2
	Sub-option B	12.4	12.4	12.4	13.2	14.0	14.4	15.3	14.8	14.3
	Sub-option C	12.4	12.4	12.4	13.2	14.0	14.4	17.1	16.5	15.9
Energy costs		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	8.7	9.7	10.7	12.2	13.6	16.9	21.1	26.3	33.0
	Sub-option A	8.7	9.7	10.7	12.2	13.6	16.9	20.6	25.3	31.5
	Sub-option B	8.7	9.7	10.7	12.2	13.6	16.8	20.3	24.6	30.5
	Sub-option C	8.7	9.7	10.7	12.2	13.6	16.8	20.2	24.1	29.6
Expenditure		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	21.1	22.1	23.1	25.3	27.6	31.1	35.0	40.0	46.5
	Sub-option A	21.1	22.1	23.1	25.3	27.6	31.0	35.0	40.1	45.6
	Sub-option B	21.1	22.1	23.1	25.3	27.6	31.3	35.6	39.3	44.8
	Sub-option C	21.1	22.1	23.1	25.3	27.6	31.3	37.3	40.7	45.6

Electric ovens

Energy		1990	2000	2010	2015	2020	2025	2030
TWh/a	BaU	23.4	24.4	23.5	21.8	20.2	19.2	19.2
	Sub-option A	23.4	24.4	23.5	21.8	19.8	18.3	17.6
	Sub-option B	23.4	24.4	23.5	21.8	19.8	18.3	17.6
	Sub-option C	23.4	24.4	23.5	21.8	19.8	18.3	17.6
GWP		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
$MtCO_2/a$	BaU	11.7	10.5	9.2	8.5	7.8	7.3	7.2
	Sub-option A	11.7	10.5	9.2	8.5	7.6	6.9	6.6
	Sub-option B	11.7	10.5	9.2	8.5	7.6	6.9	6.6
	Sub-option C	11.7	10.5	9.2	8.5	7.6	6.9	6.6
Acquisition		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	4.5	4.3	5.4	5.6	5.5	5.4	5.3
	Sub-option A	4.5	4.3	5.4	5.7	5.8	5.7	5.6
	Sub-option B	4.5	4.3	5.4	5.7	5.8	5.7	5.6
	Sub-option C	4.5	4.3	5.4	5.7	5.8	5.7	5.6
Energy costs		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	3.0	3.4	3.5	4.0	4.5	5.2	6.3
	Sub-option A	3.0	3.4	3.5	4.0	4.4	5.0	5.8
	Sub-option B	3.0	3.4	3.5	4.0	4.4	5.0	5.8
	Sub-option C	3.0	3.4	3.5	4.0	4.4	5.0	5.8
Expenditure		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	7.5	7.8	8.9	9.6	10.0	10.6	11.6
	Sub-option A	7.5	7.8	8.9	9.7	10.2	10.7	11.5
	Sub-option B	7.5	7.8	8.9	9.7	10.2	10.7	11.5
	Sub-option C	7.5	7.8	8.9	9.7	10.2	10.7	11.5

Gas Ovens

Energy		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
PJ/a	BaU	45.3	39.0	32.8	29.7	26.8	24.4	22.4
	Sub-option A	45.3	39.0	32.8	29.6	25.7	22.0	18.8
	Sub-option B	45.3	39.0	32.8	29.6	25.7	22.0	18.8
	Sub-option C	45.3	39.0	32.8	29.6	25.7	22.0	18.8
GWP		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
$MtCO_2/a$	BaU	2.7	2.3	2.0	1.8	1.6	1.5	1.3
	Sub-option A	2.7	2.3	2.0	1.8	1.5	1.3	1.1
	Sub-option B	2.7	2.3	2.0	1.8	1.5	1.3	1.1
	Sub-option C	2.7	2.3	2.0	1.8	1.5	1.3	1.1
Acquisition		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	0.8	0.6	0.6	0.6	0.5	0.4	0.4
	Sub-option A	0.8	0.6	0.6	0.6	0.7	0.6	0.5
	Sub-option B	0.8	0.6	0.6	0.6	0.7	0.6	0.5
	Sub-option C	0.8	0.6	0.6	0.6	0.7	0.6	0.5
Energy costs		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	0.5	0.5	0.5	0.5	0.6	0.7	0.7
	Sub-option A	0.5	0.5	0.5	0.5	0.6	0.6	0.6
	Sub-option B	0.5	0.5	0.5	0.5	0.6	0.6	0.6
	Sub-option C	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Expenditure		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	1.2	1.1	1.1	1.1	1.1	1.1	1.1
	Sub-option A	1.2	1.1	1.1	1.2	1.2	1.2	1.1
	Sub-option B	1.2	1.1	1.1	1.2	1.2	1.2	1.1
	Sub-option C	1.2	1.1	1.1	1.2	1.2	1.2	1.1

Electric hobs

Energy		1990	2000	2010	2015	2020	2025	2030
TWh/a	BaU	20.2	25.0	31.2	34.5	37.5	40.3	42.8
	Sub-option A	20.2	25.0	31.2	34.5	37.5	40.3	42.8
	Sub-option B	20.2	25.0	31.2	34.5	37.5	40.2	42.7
	Sub-option C	20.2	25.0	31.2	34.5	37.0	38.9	40.5
GWP		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
MtCO2/a	BaU	10.1	10.7	12.3	13.4	14.4	15.3	16.0
	Sub-option A	10.1	10.7	12.3	13.4	14.4	15.3	16.0
	Sub-option B	10.1	10.7	12.3	13.4	14.4	15.2	16.0
	Sub-option C	10.1	10.7	12.3	13.4	14.2	14.7	15.1
Acquisition		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	2.8	3.5	4.4	4.5	4.6	4.5	4.5
	Sub-option A	2.8	3.5	4.4	4.5	4.6	4.5	4.5
	Sub-option B	2.8	3.5	4.4	4.5	4.7	4.7	4.6
	Sub-option C	2.8	3.5	4.4	4.5	6.5	6.4	6.2
Energy costs		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	2.7	3.7	5.5	7.4	9.8	12.8	16.6
	Sub-option A	2.7	3.7	5.5	7.4	9.8	12.8	16.6
	Sub-option B	2.7	3.7	5.5	7.4	9.8	12.8	16.5
	Sub-option C	2.7	3.7	5.5	7.4	9.7	12.4	15.7
Expenditure		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	5.4	7.2	9.9	11.9	14.4	17.3	21.0
	Sub-option A	5.4	7.2	9.9	11.9	14.4	17.3	21.0
	Sub-option B	5.4	7.2	9.9	11.9	14.5	17.4	21.1
	Sub-option C	5.4	7.2	9.9	11.9	16.2	18.7	21.9

Gas hobs

Energy		1990	2000	2010	2015	2020	2025	2030
PJ/a	BaU	139.3	127.6	115.3	110.4	105.6	100.8	95.6
	Sub-option A	139.3	127.6	115.3	110.4	105.5	100.5	95.2
	Sub-option B	139.3	127.6	115.3	110.4	105.1	99.6	93.8
	Sub-option C	139.3	127.6	115.3	110.4	104.9	99.1	93.0
GWP		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
$MtCO_2/a$	BaU	8.4	7.7	6.9	6.6	6.3	6.0	5.7
	Sub-option A	8.4	7.7	6.9	6.6	6.3	6.0	5.7
	Sub-option B	8.4	7.7	6.9	6.6	6.3	6.0	5.6
	Sub-option C	8.4	7.7	6.9	6.6	6.3	5.9	5.6
Acquisition		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	2.7	2.0	1.6	1.4	1.2	1.0	0.9
	Sub-option A	2.7	2.0	1.6	1.4	1.2	1.0	0.9
	Sub-option B	2.7	2.0	1.6	1.4	1.2	1.1	0.9
	Sub-option C	2.7	2.0	1.6	1.4	1.3	1.1	1.0
Energy costs		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	1.5	1.6	1.8	2.0	2.4	2.8	3.2
	Sub-option A	1.5	1.6	1.8	2.0	2.4	2.7	3.2
	Sub-option B	1.5	1.6	1.8	2.0	2.4	2.7	3.1
	Sub-option C	1.5	1.6	1.8	2.0	2.4	2.7	3.1
Expenditure		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	4.2	3.6	3.3	3.4	3.6	3.8	4.1
	Sub-option A	4.2	3.6	3.3	3.4	3.6	3.8	4.1
	Sub-option B	4.2	3.6	3.3	3.4	3.6	3.8	4.1
	Sub-option C	4.2	3.6	3.3	3.4	3.6	3.8	4.1

Range hoods

Energy		1990	2000	2010	2015	2020	2025	2030
TWh/a	BaU	10.4	11.5	12.7	13.4	14.1	14.8	15.6
	Sub-option A	10.4	11.5	12.7	13.2	12.9	12.7	13.3
	Sub-option B	10.4	11.5	12.7	13.0	11.7	10.7	11.2
	Sub-option C	10.4	11.5	12.7	13.0	11.7	10.7	11.2
GWP		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
$MtCO_2/a$	BaU	5.2	5.0	5.0	5.2	5.4	5.6	5.8
	Sub-option A	5.2	5.0	5.0	5.1	4.9	4.8	5.0
	Sub-option B	5.2	5.0	5.0	5.0	4.5	4.1	4.2
	Sub-option C	5.2	5.0	5.0	5.0	4.5	4.1	4.2
Acquisition		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	1.6	1.8	2.0	2.1	2.2	2.3	2.5
	Sub-option A	1.6	1.8	2.0	2.0	2.1	2.9	2.7
	Sub-option B	1.6	1.8	2.0	2.3	2.9	2.7	2.6
	Sub-option C	1.6	1.8	2.0	2.3	2.9	2.7	2.6
Energy costs		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	1.1	1.6	2.3	2.9	3.8	4.8	6.1
	Sub-option A	1.1	1.6	2.3	2.9	3.4	4.1	5.3
	Sub-option B	1.1	1.6	2.3	2.8	3.1	3.5	4.4
	Sub-option C	1.1	1.6	2.3	2.8	3.1	3.5	4.4
Expenditure		**1990**	**2000**	**2010**	**2015**	**2020**	**2025**	**2030**
€ billion	BaU	2.8	3.4	4.3	5.0	6.0	7.1	8.6
	Sub-option A	2.8	3.4	4.3	4.9	5.5	7.1	7.9
	Sub-option B	2.8	3.4	4.3	5.2	6.0	6.2	7.0
	Sub-option C	2.8	3.4	4.3	5.2	6.0	6.2	7.0

ANNEX E
EU DOMESTIC COOKING APPLIANCES INDUSTRY

DCA Manufacturers with EU-manufacturing, general characteristics (global, all products)[66]

Company (global figures)	**HQ**	**Turnover** million €	**Jobs** nr.
AGA Rangemaster	UK	340	2532
Amica	PL	350	2088
Berbel	DE	13	58
Bertazzoni	IT	50	250
Bosch Siemens (BSH)	DE	9650	44820
Candy	IT	937	6300
De Longhi	IT	1780	7368
E.G.O.	DE	532	5832
Electrolux	SE	11200	57860
Elica	IT	378	2966
Fagor	ES	1396	8260
Franke	CH	2100	10000
Fratelli Onofri - Terim	IT	100	375
Gorenje	SL	1422	10930
Indesit Company	IT	2825	16112
Jose Das Neves Queirós	PT	na	70
Miele	DE	2830	16600
Nardi	IT	75	300
Nortec (subs. Best, IT)	US	1650	9500
GlemGas	IT	100	350
Groupe SEB	FR	3963	23988
SMEG	IT	425	1800
SABAF	IT	149	714
Tecnowind	IT	84	500
Teka	EU	1400	6000
Trepol Norden	DK	10	42
Whirlpool	US	18700	68230
V-Zug	CH	400	1290
Turkey (candidate country, no sites in current EU-27)			
Arçelik	TR	3630	19100
Vestel	TR	955	4860
Silverline	TR	51	587

[66] Turnover and jobs according to most recent figures found; could range from 2009 to 2011 as source year.

DCA industrial employment in the EU, by company

Electrolux produces cookers in 2 EU sites, i.e. in Rothenburg (DE, 1000 jobs) and Świdnica (PL, 700 jobs). Also there is a small site in Schwanden (CH, 150 jobs)). Over the past 6 years, Electrolux closed cooker production in Spennymoor (UK), Fredericia (DK) and Motola (SV).

Whirlpool's EU cooker manufacturing is concentrated in Cassinetta (IT, 1000-1500 jobs).

Bosch Siemens Hausgeräte (BSH) produces ovens, hobs and hoods in Bretten (DE, 1000 jobs, including *NEFF* brand) as well as Gaggenau (DE, 550 jobs, *Gaggenau* brand) and procures large part of its cooking equipment from its Turkish subsidiary.

The Candy Group (*Rosieres, Süsler* brands) produces cooking appliances in France (300 jobs) and Turkey (650 jobs).

Indesit Company (previously Merloni Elettrodomestici, IT) has moved most of its cooker production to Lodz, Poland where it employs around 3000 people in the production of cold and wet appliances, as well as brown goods (ovens, hobs). Employment in Indesit Company oven and hob production is not published but –given usual partitioning in industry between the three large product groups—can be estimated in the range of 600-900 employees.

AGA Rangemaster Plc has EU-based production in the UK, Ireland, France (e.g. 'La Cornue' in Paris, 60 jobs) and Italy. An estimated 50% of AGA workforce, i.e. 1500 jobs (1000 production & 500 other), is attributed to EU oven and cooker production.

FagorBrandt (previously Groupe Brandt) is producing ovens, stoves and hobs in Saint-Jean-de-la-Ruelle, Orléans (F, 650 jobs), ceramic hobs and steam ovens in Vendôme (F, 350), cookers in Aizenay (F, 120 jobs) as well as hoods in Mondragon, Garagaza (ES) and Wroclaw (PL).

Around half of the workforce at FagorMastercook (formerly Wrozamet S.A.) in Wroclaw (PL), i.e. around 800 jobs, is estimated to depend on cooker production. Both FagorBrandt and FagorMastercook are subsidiaries of Spanish appliance producer Fagor, which in turn is part of Mondragon (MCC).

Around 60% of Polish manufacturer Amica SA in Wronki and Poznan is believed to depend on cooker production, i.e. around 1200 jobs.

It is not clear if and where the Swiss Franke Artemis Group ('Franke' brand, Franke Kitchen Systems ca. 7000 jobs) is producing ovens and hobs in the EU. Franke's Italian subsidiary Faber SpA (1350 jobs, including *Roblin*, F) is a major EU producer of range hoods. Likewise for the Teka group, Gorenje and SMEG no data are available to allow an estimate of jobs in DCA-production.

Elica SpA (1500 jobs, mainly in IT) is, besides BSH and Faber, one of the leaders in the range hoods market. Other hoods producers, besides the ones mentioned above, are Italian firms Tecnowind, (mainly Fabriano, IT, 500 jobs) and Best (subsidiary of US firm Nortec), also located in Italy.

Manufacturers of smaller (tabletop) ovens are De Longhi (IT) and SEB (FR), with probably large part of their production coming from Asia.

Independent SME-employers in DCA production are few. In ovens and hobs production, the Italian Bertazzoni-La Germania company employs around 250 people in Guastalla, Italy and Nardi, also mainly in Italy, employs an internal workforce of 300. Glem Gas, producing amongst others ovens in Italy, employs 350 people in total (share of ovens not known but believed to be significant). Others SMEs are Fratelli Onofri – Terim (IT) and Jose Das Neves

Queirós (PT). Small companies producing hoods are e.g. Trepol (DK, 50 jobs) and Bertel (DE, 60 jobs).

Larger OEM-suppliers are e.g. E.G.O (DE, e.g. el. heating elements) and SABAF (IT, gas burners & oven hinges), but also in the production of large generic suppliers such as Schott (ceramic plates, glass for oven doors) and EBM-Papst (fans for hoods and ovens) the DCA-share is not insignificant The DCA share of employment with EU component-suppliers, including large companies, specialist SMEs and SME-jobbers[67], is estimated at around 10 000 – 15 000 jobs. More exact figures could not be retrieved, because DCA activities are usually combined with non-DCA activities and the DCA-share is not published.

DCA industrial employment in the EU, by country

Including sales, logistics and administrative personnel, the EU-27 manufacturers of DCAs are estimated to supply jobs to around 25 000 people, of which one-third in hoods and two-thirds in ovens and hobs. As mentioned, component suppliers add an extra 10 000 to 15 000 jobs. Poland is believed to host the largest EU-27 production of DCAs (7000 jobs), followed by Italy (5000), Germany (4000), UK & Ireland (1500), France (1500 jobs) and the rest of the EU-27 (6000 in total). Job figures are rough estimates and exclude OEM shares. This a 2012 snapshot; there is a trend for most EU-based manufacturers to move Western European production to low-labour cost countries (Poland, Turkey and for smaller ovens Asia).

Outside the EU-27, Turkey is an important supplier to the EU market, both through Turkish subsidiaries of EU companies (Bosch, Candy) and independent Turkish brands (Arçelik, Vestel). It is believed that there is still some production of ovens and hobs in Switzerland. The role of Asian imports, from subsidiaries of EU-companies and South-Korean brands like Samsung and LG, is relatively strongest in smaller-size ovens.

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The information on DCA-specific employment is based on manufacturer's websites, annual reports and other public information gathered by VHK in the context of technical assistance contract to the Commission services. In many cases the information was incomplete and had to be supplemented by VHK-estimates that were done to the best of VHK-abilities, but VHK nor the Commission services assume no liability for damages, material or immaterial, that may arise from the use of the information mentioned in this Annex.

[67] Companies with generic metalworking or plastic production facilities that manufacture parts for all types of products (not only DCAs).

ANNEX F
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ANNEX G
ACRONYMS & ABBREVIATIONS

General abbreviations and acronyms

AEGPL	Association of European LPG suppliers
ANEC/BEUC	European Consumer Association
BAT	Best Available Technology
BaU	Business-as-Usual (baseline scenario)
BIO	BIO Intelligence Services, contractor preparatory studies on hobs and ovens
BNAT	Best Not yet Available Technology (e.g. at prototype/lab stage)
BSH	Bosch-Siemens Hausgeräte GmbH
CECED	European Committee of Domestic Appliance Manufacturers (manufacturer's association)
CE-marking	Compliance mark (safety, Ecodesign, etc.) for placing products on the EU-market
CEN	European Committee for Standardisation
CENELEC	European Committee for Electro-technical Standardisation
CF	(Ecodesign) Consultation Forum
CIRCA	Communication and Information Resource Centre Administrator (website of the European Commission distributing relevant documents to/from stakeholders, amongst others on ecodesign)
COM	Prefix of a Commission Communication
Commission	European Commission
Council	European Council
CP	Competitiveness Proofing
DCA	Domestic Cooking Appliance
degree	degree Kelvin K (for temperature differences) or Celsius, °C (absolute temperature) unless specified differently
DG	Directorate General
DIY	Do-It-Yourself (store)
EAP6	6tht Environmental Sction Plan
EC	European Communities, European Commission, electronically commutating (of motors)
ECCP	European Climate Change Programme
Ecodesign	Relates to policy measures in the context of the directive on Ecodesign of Energy-related products 2009/125/EC
Eco-labelling	Relates to (voluntary) Community eco-labelling measures in the context of Regulation (EC) No 66/2010
Ecoreport	MEEuP spreadsheet tool providing environmental profile of a product over its life cycle (production, distribution, use, disposal/recycling), in terms of resources (materials, energy, water, waste) and emission-categories currently addressed in EU-policy measures. Weighting of environmental impacts is in accordance with emission limit values and conversion factors in EU-legislation.
EED	Energy Efficiency Directive, Directive 2012/27/EU
EMC	Electromagnetic Compatibility (Directive 2004/108/EEC)
EMOTA	European Multi-channel and Online Trade Association
EN	European Standard, followed by number and possibly year of publication
ENER	European Commission, Directorate-General Energy (a.k.a. 'DG ENER')
ENTR	European Commission, Directorate-General Enterprise (a.k.a. 'DG ENTR')
ENVI	Envrionment, Public Health and Food Safety Committee of the EP
EP	European Parliament
EPBD	Energy Performance of Buildings Directive, Directive 2010/31/EU (recast)
ERA	ERA Technology Ltd, associated contractor preparatory studies on hobs and ovens
ESOs	European Standardisation Organisations (CEN, Cenelec, ETSI)
ETS	Emission Trading Scheme

EU	European Union
EU-27	European Union of 27 Member States (relates to statistics after 2007)
EuP	Energy-using Product
Eurelectric	Association of European electric utilities
Fan Regulation	Commission Regulation no. 327/2011 on the Ecodesign of industrial fans (>125 W)
FAQ	Frequently Asked Question
GDP	Gross Domestic Product
GHG	GreenHouse Gas
GWP	Global Warming Potential. When not specified GWP100, i.e. time horizon 100 years (emission in kg CO2 eq.)
IA	Impact Assessment
IAB	Impact Assessment Board
IAG	Impact Assessment Guidelines
IEC	International Electrotechnical Commission
ISC	Inter Service Consultation
ISO	International Standards Organisation
ITRE	Industry, Research and Energy Committee of the EP
Labelling	Relates to policy measures within the context of Energy Labelling directive 2010/30/EU or its predecessor 92/75/EC
LCA	Life Cycle Analysis
LCC	Life Cycle Costs (monetary)
LCIA	Life Cycle Impact Assessment
LPG	Liquefied Petroleum Gas (propane, butane or mix of both)
LVD	Low Voltage Directive 2006/95/EC
Marcogas	Association of European gas utilities
MEErP	Methodology for Ecodesign of Energy-related Products (VHK 2011 for DG ENTR), methodology used in Ecodesign preparatory studies (replaces MEEuP for studies started after 2011)
MEEuP	Methodology for Ecodesign of Energy-using Products (VHK 2005 for DG ENTR), methodology used in Ecodesign preparatory studies
MEPS	Minimum Energy Performance Standards
NACE	Eurostat classification of Economic Activities
NGO	Non-Governmental Organisation
NHO	Confederation of Norwegian Enterprises
OEM	Original Equipment Manufacturer (component supplier)
Orgalime	European Engineering Industries Association
prEN	draft EN standard, 'pre-standard' (not officially approved by ESO)
preparatory study	Ecodesign preparatory study. Specifically in this report: Studies by BIO IS and ARMINES
PRODCOM	PROduction COMmunautaire, product category denomination in the official CE (Eurostat) publication of EU production and trade data (a.k.a. 'Europroms')
R&D	Research and Development
RoHS	Restriction of the use of certain Hazardous Substances in electrical and electronic equipment, Directive 2011/65/EU (recast of 2002/95/EC)
SEC	Prefix of a Commission Staff Document
SG	Steering Group (Ecodesign Inter-Service Impact Assessment Group), also (but not in this report) Secretary General
SME	Small- and/or Medium sized Enterprise(s)
TC	Technical Committee (of an ESO)
TEC	Treaty on the European Communities (since Dec. 2009 replaced by TFEU)
TFEU	Treaty on the Functioning of the European Union
TIA	Territorial Impact Assessment
VAT	Value Added Taks
VHK	Van Holsteijn en Kemna BV, technical assistant to the Commission Services (framework contract IA)

WEEE	Waste of Electrical and Electronic Equipment directive 2012/19/EU (recast of 2002/96/EC)
WG	Working Group (of an ESO)
WTO-TBT	World Trade Organisation-Technical Barriers on Trade agreement

Numerical parameters and units

a	annum (year)
AEC	Annual Energy Consumption (of range hoods, in kWh/a)
A-G	scale for energy labelling (also sometimes used for labelling other performance parameters on the energy label); the scale may be extended upwards with A+, A++ and A+++ classes
BEP	Best Efficiency Point (a.k.a. 'bep'). Operating point (of range hood) with highest FDE
bn	billion (10^9)
'carbon'	or 'carbon emissions'; expression to indicate GreenHouse Gas emissions
CO_2	Carbon dioxide (main GHG, the equivalent is used as accounting unit for GWP)
EC	Energy Consumption (of ovens, per cycle, in MJ or kWh)
EE	Energy Efficiency (of gas hobs)
EEI	Energy Efficiency Index (of ovens and of hoods)
f	Time imcrease factor
FDE	Fluid Dynamic Efficiency (of range hoods)
GFE	Grease Filtering Efficiency (of range hoods)
h	hour
J	Joule, energy unit, with derived kJ (kiloJoules=10^3 J), MJ (megaJoules=10^6 J), GJ (gigaJoules= 10^9 J), TJ (teraJoules= 10^{12} J), PJ (petaJoules= 10^{15} J)
kWh	kilo Watt hour (10^3 Wh)
LCC	Life Cycle Costs (in €, sum of monetary acquisition and discounted running costs over product life for the consumer In this study LCC includes taxes (VAT, leges), because it relates to consumer products
LE	Lighting Efficiency (of range hoods)
litre	1 dm^3
LLCC	Least Life Cycle Cost point, i.e. the (set of) design option(s) for a product or product group with the lowest LCC as compared to alternative design options. In Ecodesign, unless boundary conditions dictate otherwise, the technical characteristics of the LLCC is to be used as a target value for measures.
max.	maximum
min.	minimum
m	million (10^6)
Mt	mega-tonne (10^6 metric tonne, 10^9 kg)
NCV	Net Calorific Value of a fossil energy source (a.k.a. 'lower heating value', 'lower combustion value', symbol H_i). Compare: Gross Calorific Value GCV ('upper heating value', symbol H_s), which takes into account also the latent heat of possible water vapour generated by the combustion process.
P	power (in W), used in this report for electric power intake
PJ	Peta Joule (10^{15} Joule, energy unit)
q or q_v	air flow (in m^3/s, sometimes expressed in m^3/h), used in this report for air flow of range hoods
SAEC	Standard Annual Energy Consumption (of range hoods, in kWh/a)
SEC	Standard Energy Consumption (of ovens, in MJ/cycle for gas, kWh/cycle for electric)
t	metric tonne (1000 kg), derived Mt (Mega-tonne= 10^6 tonne)
TWh	Tera Watt hour (10^{12} Wh)
Wh	Watt hour, energy unit (3600 J), derived units are kWh (kilo-Watt-hour, 10^3 Wh), MWh (Mega-Watt-hour, 10^6 Wh), GWh (Giga-Watt-hour, 10^9 Wh), TWh (Tera-Watt-hour, 10^{12} Wh)
Δp	pressure difference (in Pa), used in this report for external static pressure difference measured with range hoods

Country abbreviations

EU-27

BE	Belgium	FR	France	AT	Austria
BG	Bulgaria	IT	Italy	PL	Poland
CZ	Czech Republic	CY	Cyprus	PT	Portugal
DK	Denmark	LV	Latvia	RO	Romania
DE	Germany	LT	Lithuania	SI	Slovenia
EE	Estonia	LU	Luxembourg	SK	Slovakia
IE	Ireland	HU	Hungary	FI	Finland
EL	Greece	MT	Malta	SE	Sweden
ES	Spain	NL	Netherlands	UK	United Kingdom

EFTA		**EU-candidates**		**Others**	
(IS)	Iceland	HR	Croatia	JP	Japan
(NO)	Norway	MK	The former Yugoslav Republic of Macedonia	US	United States of America
(LI)	Liechtenstein	TR	Turkey	CN	China
(CH)	Switzerland	ME	Montenegro	RU	Russia
		RS	Serbia	KR	Korea, Republic (South-Korea)