Impact assessment study on a possible extension, tightening or simplification of the framework directive 92/75 EEC on energy labelling of household appliances

Appendix 1
Literature review carried out by Europe Economics

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1 LITERATURE REVIEW

1.1 This section is intended to review previous studies on the impact that the policy framework on energy labelling had on promoting energy efficiency in the past 25 years.

1.2 The first part of the section is focused on analysing the general legal framework for energy efficiencies policies, definitions and level of transposition among MS of efficiency standards measures, and the expected scenario of energy efficiencies policy options as programmed by the EU Action Plan on Energy Efficiency 2007-13. The second part (previous studies) reviews the most relevant and recent studies at European and specific countries level.

Regulatory background

Introduction

1.3 In order to support better integration of energy efficiency measures into national legislation the European Commission has proposed several directives which have been adopted and are now in force. These concern broad areas where there is significant potential for energy savings. Amongst others we will discuss:

(a) Eco-design of Energy-Using Products.

(b) Energy Labelling of Domestic Appliances.

1.4 A number of voluntary instruments were also adopted to foster better cooperation with industry. The Commission has also started several initiatives that aim at promoting energy efficiency and serve as a forum for exchange of ideas of various stakeholders.

Eco-design framework directive 2005/32 EC

1.5 The so-called Eco-design Directive introduces specific environmental requirements for Energy Using Products (EuPs) to improve environmental performance of the products from the earliest stages of design. The Directive was created for a few main reasons; first, the existence of coherent EU-wide trading rules prevents disparate national policies from undermining harmonisation of intra-EU trade, for example, by creating barriers to entry or other distortions to competition. Second, in the context of the European Climate Change Program, energy efficiency is one of the paths enabling the EU to continue to cut greenhouse gas emissions and meet its set targets. Third, the Directive is seen by the Commission as one element of the more comprehensive EU Integrated Product Policy

(IPP), which aims to improve environmental performance of products on an EU-wide level.[1]

1.6 The Directive itself does not apply to all EuPs, but rather to specific cases where market forces fail to make progress in the absence of a local requirement. This may include products that have important environmental impacts or volume of trade in the internal market, and "clear potential for improvement".[2] While the requirements introduced are not directly binding for specific products, the legislation defines conditions and criteria for setting requirements regarding environmentally relevant aspects of production such as energy or water consumption, waste generation, and extension of lifetime. However, once the requirements have been in place for long enough to witness changes in technological innovation, with the aid of impact assessments and stakeholder consultations, the Commission would be able to enact implementing measures on specific products and environmental aspects.

1.7 The Directive framework allows requirements to be improved quickly and efficiently. Ideally, the Directive should increase the effectiveness and synergies of other EU legislative acts and initiatives related to environmental aspects of production, one of which is the Energy Labelling Directive 92/75/EEC. Other environmentally-relevant Directives with which the Eco-design Directive may create synergies include **Directives regulating the management of waste from electrical and electronic equipment** and the **Eco-management and Audit Scheme (EMAS)**.

1.8 Eco-design Directive affects manufacturers and its key elements include:

(a) **Marking and declaration of conformity.** Before an EuP is marketed or put into service, a CE conformity marking must be fixed to it and a declaration of conformity issued, which states that it complies with all relevant implementing measures. The manufacturer or their authorised representative must make sure that an assessment of the EuP's conformity with all relevant requirements is carried out.

(b) **Free movement.** Member States must not prohibit, restrict or impede the marketing and /or putting into service, on grounds relating to ecodesign requirements, of an EuP which complies with all relevant implementing measurers and bears the CE conformity marking.

(c) **Consumer information.** Manufacturers must make sure that consumers of EuP are provided with information on the sustainable use of the product, the ecological profile of the product and the benefits of ecodesign.

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1 Directive 2005/32/EC of the European Parliament and of the Council 2005, Section 1(3).

2 European Commission (2005) "Environmentally-friendly design of energy-using products: framework Directive for setting eco-design requirements for energy-using products (EUP)" http://ec.europa.eu/enterprise/eco_design/index_en.htm

(d) **Implementing measurers.** There are not obligations for all EuP, but only for those meeting certain criteria such as significant environmental impact and volume of trade in the internal market and those that have a clear potential for improvement in terms of environmental impact. Although the directive does not introduce directly binding requirements for specific products, it does define conditions and criteria for setting, through subsequent implementing measures, requirements regarding environmentally relevant product characteristics.

(e) **Small and medium-sized enterprises (SMEs).** By strengthening support networks and structures member states will encourage SMEs and very small firms to adopt an environmentally sound approach as early as the product design stage and to adapt to future European Legislation.

1.9 Currently under the Ecodesign Framework Directive there are **14 ongoing studies** on different product groups with more planned. These studies may provide the analysis needed to develop labelling for these products.

1.10 The Ecodesign Directive foresees an introduction of specific requirements including minimum energy efficiency requirements for Energy Using Products (EuPs). This raises the question whether any product information requirements for such products can best be achieved through an extension of Directive 92/75 EEC to non household energy using products.

Energy labelling of household appliances

1.11 To harmonise national measures relating to the publication of information on the consumption of energy and of other essential resources by household appliances, thereby allowing consumers to choose appliances on the basis of their energy efficiency.

1.12 **Council Directive 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances [Official Journal L 297 of 13.10.1992].**

1.13 The Framework Directive 92/75/EEC on Energy Labelling of Household Appliances has been in place for 14 years. The main purpose of the Directive is to enable the harmonisation of national measures on the publication, particularly by labelling and the provision of product information, of information on the consumption of energy and other essential resources, allowing consumers to choose the most energy-efficient appliances.

1.14 Under the Directive information is to be brought to consumers' attention by means of a fiche and a clearly displayed label. Suppliers are also required to establish technical documentation which would allow the assessment of the accuracy of the information contained in the label and the fiche.

1.15 The Directive applies to the following types of household appliances, even where these are sold for non-household uses:

(a) refrigerators, freezers and their combinations;

(b) washing machines, dryers and their combinations;

(c) dishwashers;

(d) ovens;

(e) water heaters and hot-water storage appliances;

(f) lighting sources;

(g) air-conditioning appliances.

1.16 Household appliances offered for sale, hire or hire-purchase must be accompanied by a fiche and a label providing information relating to their consumption of energy (electrical or other) or of other essential resources.

1.17 The supplier must establish technical documentation sufficient to enable the accuracy of the information contained in the label and the fiche to be assessed. This documentation must include:

(a) a general description of the product;

(b) the results of design calculations, where necessary;

(c) test reports;

(d) where values are derived from those obtained for similar models, the same information for these models.

1.18 The supplier shall make this documentation available for inspection purposes for a period ending five years after the last product has been manufactured.

1.19 Suppliers must provide:

(a) a free label, to be attached to the appliance by the dealer in the appropriate position and in the appropriate language version;

(b) a product fiche, contained in all the brochures relating to the product or, where these are not provided, in all other literature provided with the appliance.

1.20 Suppliers are responsible for the accuracy of the information contained in the labels and fiches that they supply and are deemed to have given their consent to the publication of the information.

1.21 Where appliances are offered for sale, hire or hire-purchase by catalogue or by other means whereby the potential customer is unable to see the appliance displayed, the

essential information contained in the label or fiche must be provided to the potential customer before purchase.

1.22 Information on airborne noise provided pursuant to Directive 86/594/EEC, and other public information relating to the appliance in question and provided pursuant to other Community legislation, must be included on the label or fiche.

1.23 Member States must take the necessary measures to:

(a) ensure that all suppliers and dealers established in their territory fulfil their obligations under this Directive;

(b) prohibit the display of labels, marks, symbols or inscriptions relating to energy consumption which do not comply with the requirements of this Directive and which are likely to cause confusion, with the exception of Community or national environmental labels;

(c) launch educational and promotional information campaigns aimed at encouraging more responsible use of energy by private consumers.

1.24 Where Member States have grounds for suspecting that the information contained in labels or fiches is incorrect, they may require suppliers to provide evidence.

1.25 The Commission is assisted by an advisory committee.

1.26 The Directives adopted in implementation of the present Directive must specify:

(a) the exact definition of the type of appliances to be included;

(b) the measurement standards and methods to be used in obtaining the information relating to energy consumption;

(c) details of the technical documentation required;

(d) the design and content of the label;

(e) the location where the label shall be fixed to the appliance;

(f) the content and where appropriate the format of the fiche, on which must be included the information appearing on the label;

(g) the information details to be provided in the case of mail-order offers for sale.

1.27 Implementing measures:

(a) **Household electric refrigerators, freezers and their combination** Commission Directive 2003/66/EC of 3 July 2003 amending Directive 94/2/EC implementing Council Directive 92/75/EEC with regard to energy labelling of

household electric refrigerators, freezers and their combinations (Text with EEA relevance) - *Official Journal L 170, 09/07/2003, p. 10-13*

(b) **Electric ovens** Commission Directive 2002/40/EC of 8 May 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric ovens (Text with EEA relevance) - *Official Journal L 128, 15/05/2002, p. 45-56*

(c) **Air-conditioners** Commission Directive 2002/31/EC of 22 March 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household air-conditioner (Text with EEA relevance) - *Official Journal L 86, 03/04/2002, p. 26-31*

(d) **Lamps** Commission Directive 98/11/EC of 27 January 1998 implementing Council Directive 92/75/EEC with regard to energy labelling of household lamps (Text with EEA relevance) - *Official Journal L 71, 10/03/1998, p. 1-8*

(e) **Dishwashers** Commission Directive 97/17/EC of 16 April 1997 implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers (Text with EEA relevance) - *Official Journal L 118, 07/05/1997, p. 1-25*

(f) **Combined washers-driers** Commission Directive 96/60/EC of 19 September 1996 implementing Council Directive 92/75/EEC with regard to energy labelling of household combined washer-driers - *Official Journal L 266, 18/10/1996, p. 1-27*

(g) **Electric tumble driers** Commission Directive 95/13/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric tumble driers - *Official Journal L 136, 21/06/1995, p. 28-51*

(h) **Washing machines** Commission Directive 95/12/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household washing machines - *Official Journal L 136, 21/06/1995, p. 1-27*

(i) **Electric refrigerators, freezers and their combination** Commission Directive 94/2/EC of 21 January 1994 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric refrigerators, freezers and their combinations *Official Journal L 45, 17/02/1994, p. 1-22* Commission Directive 2003/66/EC of 3 July 2003 amending Directive 94/2/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household electric refrigerators, freezers and their combinations - *Official Journal L 170, 09/07/2003, p. 10-14*

(j) **Household Appliances** Council Directive 92/75/EEC of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances - *Official Journal L 297, 13/10/1992, p. 16-19*

Others relevant measures for electrical equipment

Minimum efficiency requirements

1.28 Implementing measures:

(a) **Fluorescent lighting** Directive 2000/55/EC of the European Parliament and of the Council of 18 September 2000 on energy efficiency requirements for ballasts for fluorescent lighting -*Official Journal L 279, 01/11/2000, p. 33-38*

(b) **Household electric refrigerators, freezers and combinations** Directive 96/57/EC of the European Parliament and of the Council of 3 September 1996 on energy efficiency requirements for household electric refrigerators, freezers and combinations thereof -*Official Journal L 236, 18/09/1996, p. 36-43*

(c) **Hot-water boilers** Council Directive 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels - *Official Journal L 167, 22/06/1992, p. 17-28*

Office Equipment - Energy Star Programme

1.29 Implementing measures:

(a) Council Decision 2001/469/EC of 14 May 2001 concerning the conclusion on behalf of the European Community of the Agreement between the Government of the United States of America and the European Community on the co-ordination of energy-efficient labelling programmes for office equipment *Official Journal L 172, 26/06/2001, p. 1-30*

(b) Regulation (EC) No 2422/2001 of the European Parliament and of the Council of 6 November 2001 on a Community energy efficiency labelling programme for office equipment *Official Journal L 332, 15/12/2001, p. 1-6*

(c) Commission Decision 2003/168/EC of 11 March 2003 establishing the European Community Energy Star Board*Official Journal L 67, 12/03/2003, p. 22*

The EU Energy Action Plan

1.30 The EU Action Plan on Energy Efficiency 2007-13 is a framework of policies and measures proposing priority actions in order to provide EU citizens with the globally most energy-efficient infrastructure, buildings, appliances, processes, transport means and energy systems.

1.31 According to this Action Plan the largest cost-effective savings potential lies in the residential (households) and commercial buildings sector (tertiary sector), where the full potential is now estimated to be around 27% and 30% of energy use respectively, as the Table 1 overleaf below indicates.

Table 1: Estimates for full energy saving potential in end-use sectors

Sector	Energy Consumption (Mto) 2005	Energy Consumption (Mto) 2020 (Business as usual)	Energy savings potential 2020 (Mto)	Full energy savings potential 2020 (%)
Household (residential)	280	338	91	27%
Commercial building (Tertiary)	157	211	63	30%
Transport	332	405	105	26%
Manufacturing Industry	297	382	95	25%

Source: Communication form the Commission, Action Plan for Energy Efficiency: Realising the Potential COM(2006)545 final.

1.32 The action plan proposes 10 priority actions covering all energy sectors to be initiated immediately or as soon as possible. Among these, priority Action 1 requires "**Appliance and equipment labelling and minimum energy performance standards**".

> "Updated and dynamic labelling and minimum energy performance standards for appliances and other energy-using equipment will be developed as from 2007 on the basis of the Labelling and the Eco-design Directives. Special attention will be devoted to standby loss reduction. The Commission will start adopting such requirements for 14 priority product groups with a view to having all of them approved by the end of 2008. The Commission will revise the Framework Directive 92/75/EC on labelling to reinforce its effectiveness. The existing labelling classifications will be upgraded." [3]

Labelling

1.33 Energy efficiency standards are procedures and regulations that prescribe the energy performance of manufacturing products, sometimes prohibiting the sale of products that are less efficient than a minimum level.[4]

1.34 There are three types of energy-efficiency standards:

(a) Prescriptive standards: which require a particular feature to be installed in the product;

(b) Minimum energy performance standards (MEPS): which must be achieved by the manufacturers in all products; and

[3] Communication from the Commission, Action Plan for Energy Efficiency: Realising the Potential COM(2006)545 final.
[4] See Energy-Efficiency Labels and Standards Guidelines, CLASP 2005.

(c) Class-average standards: this specifies the *average efficiency* of a manufactured product, allowing each manufacturer to select the level of efficiency for each model so that the overall efficiency is achieved.

1.35 Appliance labels and voluntary efficiency targets were used for the first time in the 1970s and 1980s in two individual European Union (EU) Member States, France and West Germany. France developed a mandatory energy labelling scheme with energy consumption information on each of the energy consuming apparatus for the first time in 1974; followed by more specific compulsory labelling of energy consumption for all heating, boilers, refrigerators, washing machines, televisions, ranges and ventilation in 1976. The first discussions held in West Germany on a system able to inform consumers on energy efficiency were in 1970s and in 1980, manufacturers agreed to an informal voluntary agreement to label refrigerators, dishwashers, and electric and gas ovens (Wilson, 1989). Labelling schemes were also supported by testing.

1.36 In 1990s unilateral labels and standards program were proposed, but never implemented, in Denmark and the Netherlands. These proposals prompted the European Commission to intervene and by 2000 labels were required for seven products (refrigerators, freezers tumble dryers, washers, washer-dryers, dishwashers, lamps, ovens), standards on two (hot water boilers and refrigerators) and negotiated agreements on three products (TV, VHS, and audio equipment).

1.37 Directive 92/75/EEC is the framework directive providing the legal basis for energy labelling schemes of household appliances. The labelling specifications are spelled out in individual implementing directives for each product type.

1.38 In recent years other European Countries, as Czech Republic, Hungary, and Poland have adopted appliance efficiency policies as part of the process of acceding to the Union (AE 1999). Norway has implemented labelling programmes following the European Union Directives on clothes dryers, washing machines, dishwashers, lamps and refrigerators (EEU 1999).

1.39 The Directive applies to the following types of household appliances, even where these are sold for non-household uses:

(a) refrigerators, freezers and their combinations;

(b) washing machines, dryers and their combinations;

(c) dishwashers;

(d) ovens;

(e) water heaters and hot-water storage appliances;

(f) lighting sources;

(g) air-conditioning appliances.

1.40 Household appliances offered for sale, hire or hire-purchase must be accompanied by a fiche and a label providing information relating to their consumption of energy (electrical or other) or of other essential resources.

Table 2: Implementing Directives and transposition deadline

Labelling Directives	**Publication date**	**Transposition deadline**
Directive 2003/66/EC of 3 July 2003 amending Directive 94/2/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household electric refrigerators, freezers and their combinations	09/07/2003	30/06/2004
Directive 2002/40/EC of 8 May 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric ovens	15/05/2002	31/12/2002
Directive 2002/31/EC of 22 March 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household air-conditioners	03/04/2002	31/12/2002
Directive 1999/9/EC of 26 February 1999 amending Directive 97/17/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers	04/03/1999	07/03/1999
Directive 98/11/EC of 27 January 1998 implementing Council Directive 92/75/EEC with regard to energy labelling of household lamps	10/03/1998	14/06/1999
Directive 97/17/EC of 16 April 1997 implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwasher	07/05/1997	31/12/1998
Directive 96/89/EC of 17 December 1996 amending Directive 95/12/EC implementing Council Directive 92/75/EEC with regard to energy labelling of household washing machines	28/12/1996	15/04/1997
Directive 96/60/EC of 19 September 1996 implementing Council Directive 92/75/EEC with regard to energy labelling of household combined washer-driers	18/10/1996	01/08/1997
Directive 96/57/EC of the European Parliament and of the Council of 3 September 1996 on energy efficiency requirements for household electric refrigerators, freezers and combinations thereof	18/09/1997	03/09/1997
Directive 95/13/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric tumble driers	21/06/1995	01/03/1996
Directive 95/12/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household washing machines	21/06/1995	01/03/1996

Source: EC DG Energy

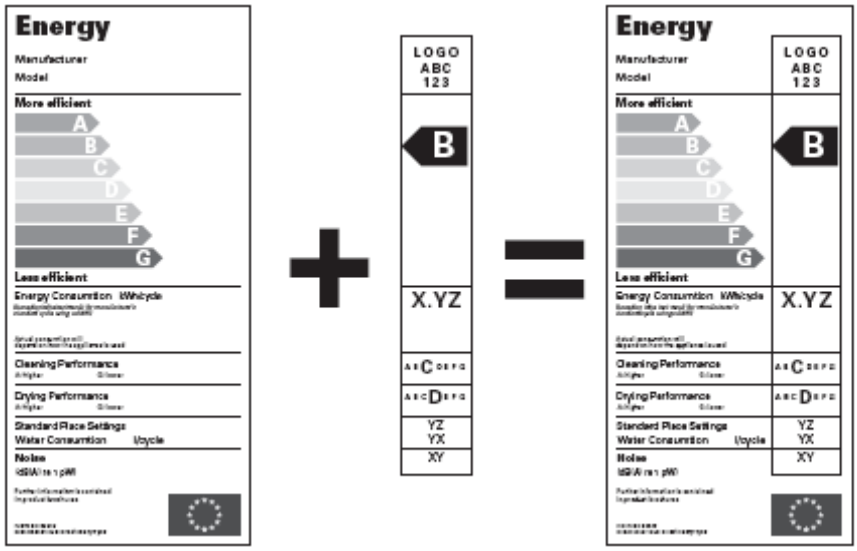
1.41 The energy labelling schemes are based on an *energy efficiency index* generated by comparing the appliance with the average European model when the bands were set at the end of 1993, using values that vary according to the category of appliance. This average is constant and was set as the ratio between classes D and E to allow for efficiency improvements over time.

1.42 The Energy Label identifies the relative energy efficiency of models through colours, arrows and alphabet. The A-G scale ranks appliances from the best (A) to the worst (G);

green denotes more efficient and red less efficient; the arrows show relative efficiency for a given level of service.

1.43 There are two parts to the Energy Label: a colour background and a data strip, which may come separately or combined and stuck on the machines.[5] Additionally there is the possibility for manufacturers to integrate the Eco-label into the appliance energy label; the eco-label aims to promote products with a reduced environmental impact compared with other products in the same product group. It is a voluntary scheme and manufacturers can choose whether or not to apply for the Eco-label. However, not many manufacturers consider the Eco-label as a competitive advantage and it is very rarely included in the information provided with the appliances.

Figure 1: The Energy Label and its Components



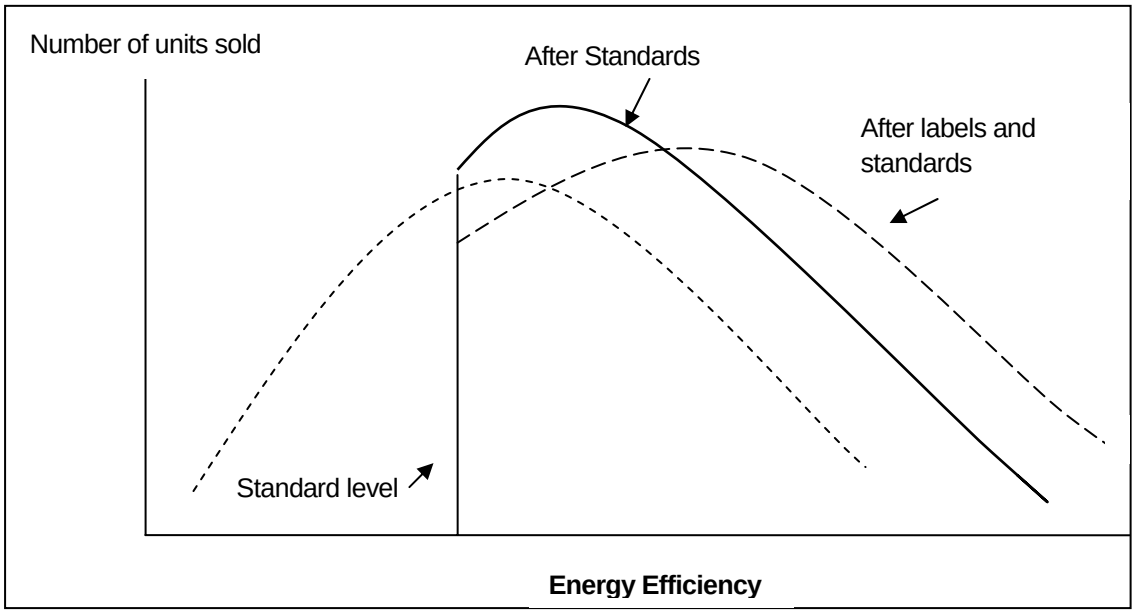
1.44 According to the main literature, labels, standards and targets play different roles in encouraging development, marketing and purchase of energy efficient products. It is in fact necessary to implement a package of multiple policy instruments to deliver cost effective energy efficient policies.

1.45 Standards shift the distribution of energy efficient models of products sold in the market upward by eliminating inefficient models and establishing a baseline for programs that provide incentives for "beating the standard." Labels shift the distribution of energy-

[5] According to a study conducted in Germany (DENA, 2005) the division of the label into data strip and basic label is economically advantageous and also makes the "linguistic" implementation of energy labelling easier for the

efficient models upward by providing information that allows consumers to make rational decisions and by stimulating manufacturers to design products that achieve higher ratings than the minimum standard (see figure below). [6]

Figure 2: The impact of energy efficiency labels and standards on distribution of products in the marketplace



Source: CLASP 2005, Energy-Efficiency Labels and Standards Guidebook.

Previous studies

1.46 The most relevant measure of good appliance efficiency policy is its effectiveness in saving energy, reducing cost or environmental impacts as well as meeting technologies and market needs.

1.47 There is plenty of Impact Assessment Analysis on energy labelling policies generally available; the ones that we include in our analysis are listed in the table overleaf below and further described in the following paragraphs.

manufacturer of appliances destined for sale in several countries, as the data-strip contains no information requiring translation.

[6] See CLASP 2005, Energy-Efficiency Labels and Standards Guidebook.

Table 3: Main Impact Assessment Analysis and studies in EU

Author	Year	Title
Winward, J.	1998	Cool labels. Energy and Environment Program
Waide, P.	2001	Monitoring of energy efficiency trends for refrigerators, freezers, washing machines, wash-dryers and household sold in EU
Bertoldi, P.	2001	Effective policies and measures in energy efficiency in end-use equipment and industrial process
International Energy Agency (IEA)	2000	Energy Labels & Standards
International Energy Agency (IEA)	2003	Cool Appliances. Policy strategies for energy efficient homes.
GfK	2005	Overview of sales and trends for main appliances
European Consumer voice in standardization (ANEC)	2007	Significant shortcoming in the implementation of EU Energy Label Scheme
Atkins, Ecorys	2006	Impact Assessment Analysis of the future Action Plan on Energy Efficiency 2007-13

1.48 In 1998, the European Commission commissioned a study to the **Environmental Change Unit, University of Oxford** on the first three years of the Community's energy labelling scheme, as it applies to cold appliances. This study had a greater focus on the level of formal compliance with the labelling directives and the impact the scheme had on different actors, including consumers.

1.49 The most interesting findings are those related to:

(a) The timing of formal legal implementation. All MS, except Germany and Italy, had implemented Directive 94/2/EC by 1997. Only four countries – Austria, Denmark, Greece and UK – had implemented the directive as required by the 1st January 1995 and there were substantial differences of timing among the other 10 countries (see figure below).

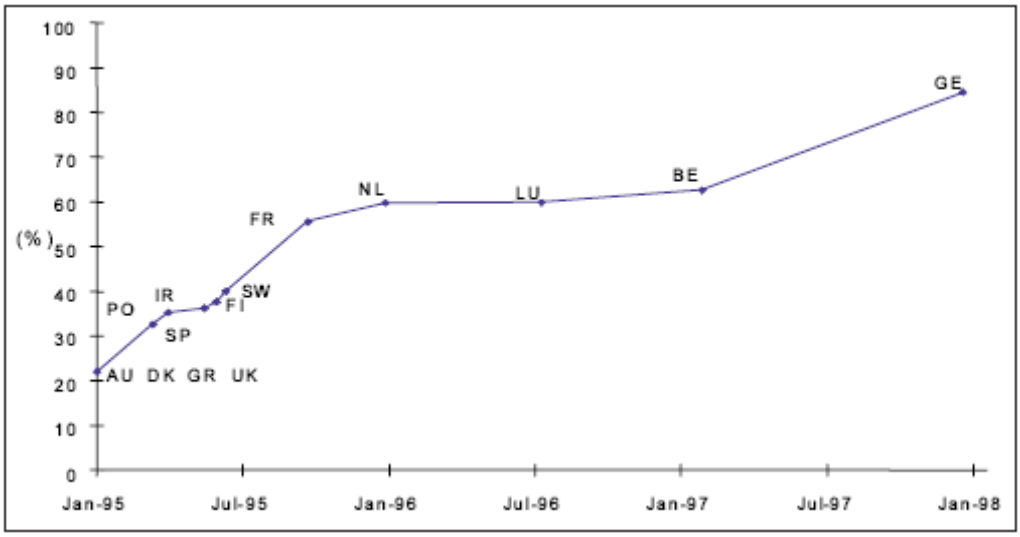
(b) Monitoring and enforcement action. Governments did not seem to have a sufficient role in supporting Energy Labelling (e.g no MS was reported to have taken formal legal action for non-compliance with cold appliance labelling);

(c) Information campaigns. These were found to be quite developed among MS but could not be assessed in terms of their capability to be successful;

(d) Dealer and supplier compliance. The surveys indicated that the general level of dealer compliance was quite low (i.e. 56% of the machines were labelled by June 1997 with

differences though among MS; the Italian consumer was the less likely to found the Energy label) as well as for the suppliers (only few MS had started to have accuracy test, others were outsourced to independent consumer organizations).

Figure 3: The cumulative proportion of EU population covered by Directive 94/2/EC by the end of 1998



Source: Environmental Change Unit, University of Oxford, 1998

1.50 Responses from consumers underlined the fact that the keys to improving the effectiveness of energy labelling were both increasing the proportion of labelled appliances in the shop and persuading individual consumers that energy is an important criterion in buying appliances, as the table overleaf below further explain. Not all countries were successful in both.

Table 4: Overall effectiveness of labelling

	Compliance	Importance of energy efficiency	Influence of label on purchase
Denmark	***	***	56
Netherlands	***	***	45
Austria	**	***	39
Sweden	**	***	39
Finland	**	**	41
Portugal	*	**	35
UK	***	*	24
France	**	*	32
Ireland	**	*	15
Spain	*	*	19
Greece	*	*	4

*Note: ***>70%; **50-70%; *<50%*

Source: Shiellerup, Winward, Boardman, Cool Labels 1998

1.51 Manufacturers interviewed considered Energy Label as a positive policy tool and a source of information for consumers. However, they also believed that labels had no overall effects on the market shares of different manufacturers' appliances but there was a shift of components manufacturers towards the most efficient components. Manufacturers also believed that retailers should be fined for failing to fully label the appliances. Rebates and benefits scheme were well supported by manufacturers.

1.52 Retailers strongly emphasised cultural differences among countries in the way energy efficiency is perceived as a factor for sales and the relative impact of energy labelling on the market.

1.53 A second EU evaluation, in 2001, examined the **energy efficiency trends for refrigerators, freezers, washing machines, wash-dryers and household sold in EU.** This study was based on a database containing relevant market data listing annual sales and price by model and technical data on each cold appliance for sale in the eleven of the most populous EU countries: Austria, Belgium, France, Great Britain, Germany, Italy, the Netherlands, Portugal, Spain and Sweden.

1.54 The report includes detail on energy efficiency and energy consumption in the following markets:

(a) the EU refrigerator market following the introduction of energy labelling in 1995 up to 1999;

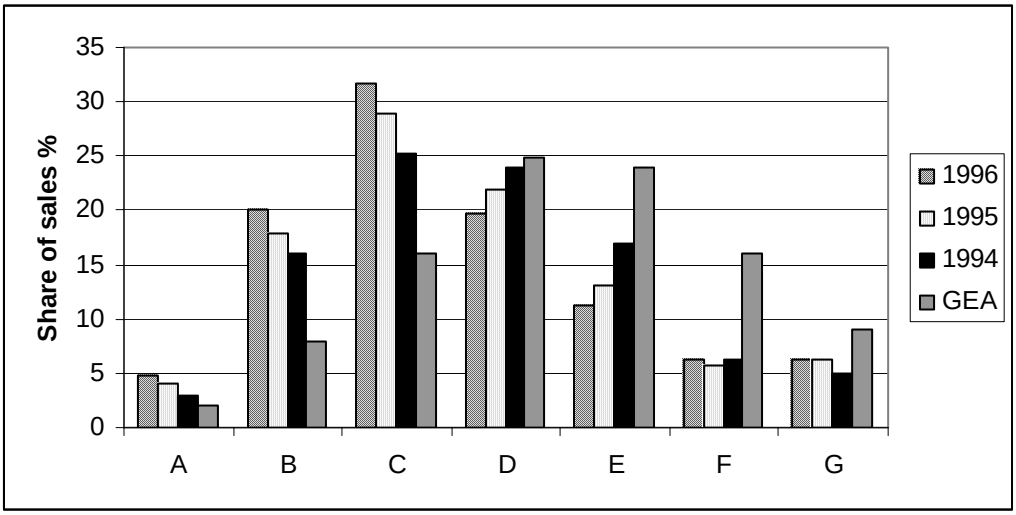
(b) the EU clothes washers and washer-dryer markets following the implementation of the relative directive in 1996 (and voluntary agreements between the Commission and CECED) up to 1999;

(c) Household lamps in the major EU countries.

1.55 Following some of the most relevant results.

1.56 The table below shows the steady improvement in the efficiency of cold appliance sold in EU between 1994 and 1998 (i.e. the overall share of class A, B and C increased from 43% to 73%).

Figure 4: EU cold appliance sales share by energy label class for 1994 to 1996 (with GEA models by label class)



Source: Waide, Market analysis and effect of EU labelling and standards: the example of cold-appliances

1.57 Differences among MS are showed in the table overleaf below.

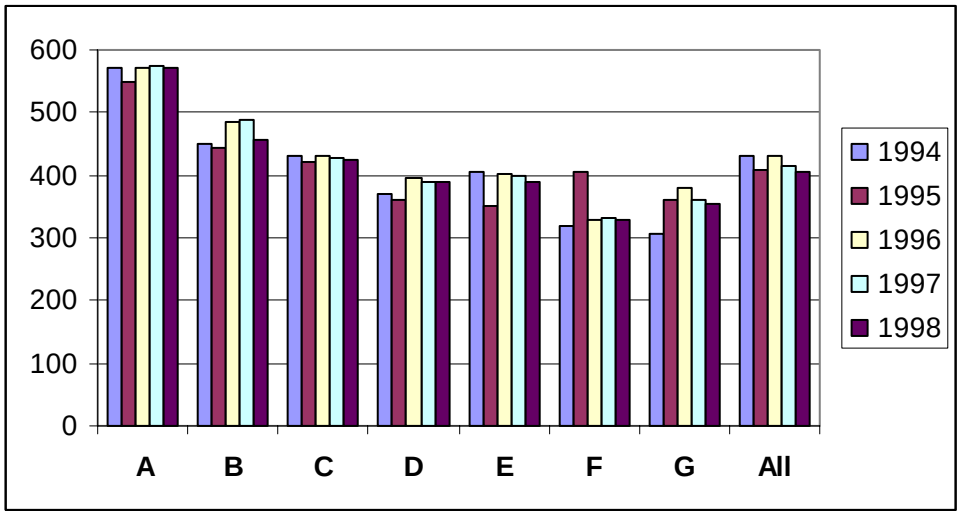
Figure 5: Cold appliances sales-weighted annual average efficiency by MS (%)

	EU	AU	Bel	Den	Fra	GB	Ger	Ita	Nl	Por	Spa	Swe
1998	85.5	77.3	84.1	87.3	89.7	96.8	71.7	90.8	77.9	92.8	95.5	85.1
1997	90.0	82.6	88.8	88.8	95.0	100.5	77.9	95.2	81.4	102.0	94.6	89.8
1996	91.8	85.5	95.6	91.3	98.1	101.8	78.3	97.0	84.3	104.0	98.2	92.2
1995	93.9	87.9	97.0	93.1	101.6	103.4	80.6	99.3	88.2	106.3	100.5	95.0
1994	96.1	89.4	99.4	95.3	104.7	103.3	84.7	101.7	92.3	108.8	99.6	97.2
GEA	102.2	95.1	105.7	92.8	103.9	108.9	96.6	105.1	99.0	121.4	101.0	97.4

Source: Energy efficiency trends for refrigerators, freezers, washing machines, wash-dryers and household sold in EU, 2001

1.58 In this study it is also showed a positive **correlation between average price and average efficiency** (i.e. average A class appliance was 32% more expensive then the all average appliance sold in the EU).

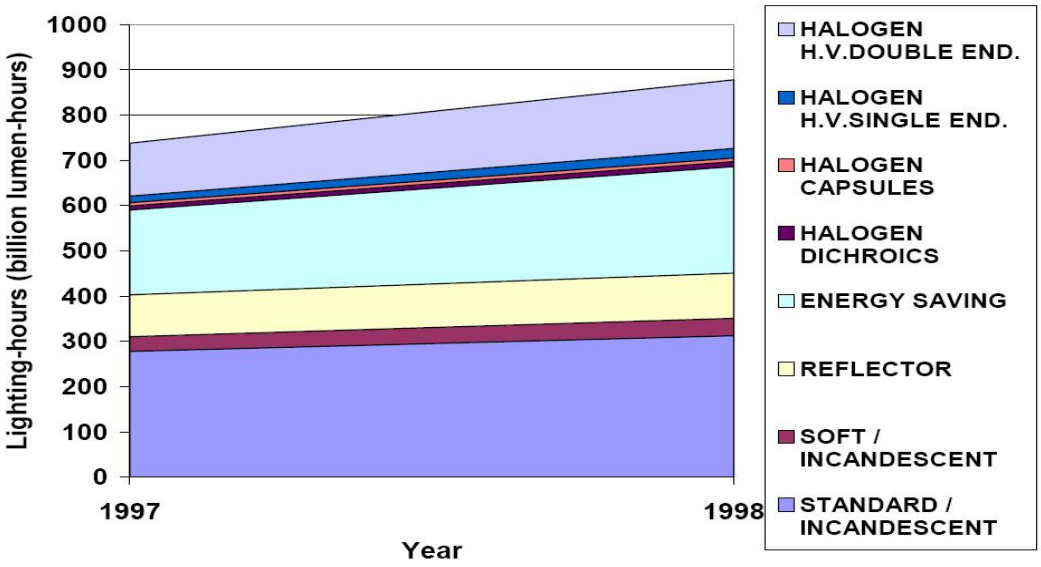
Figure 6: Sales- weighted annual average cold appliance price by energy label class for the EU (ECU/unit) 1994-98



1.59 Clothes washer and washer dryer's energy efficiency improved even if with some differences across countries.

1.60 Data on household lamps show the overall lighting hour attributable to the lamps sales in 1997 and 1998.

Figure 7: Overall lamp output over the operating lifetime of the lamps sold in the EU in 1997 and 1998



1.61 The evaluation of the market outcomes of the E.U labelling programme by IEA in 2000 found that the **sales-weighted annual average energy efficiency of refrigerators** and **freezers** improved 6.0% from 1990/92 to 1994, and an additional 4.5% from 1994 to 1996. The analysis also indicated that the efficiency profiles of national markets vary considerably, such that the 1996 sales weighted energy-efficiency index for Germany was 77.8, but for the United Kingdom was 101.7.[7]

1.62 **Effective policies and measures in energy efficiency in end-use equipment and industrial process, (2001)** analyses the market transformation resulting from the implementation of EU policies such labelling and mandatory and voluntary standards. According to this study the full effects on end user equipment will be felt only when the equipment stock will be completely replaced by more efficient equipment, meeting the targets of the policy actions.

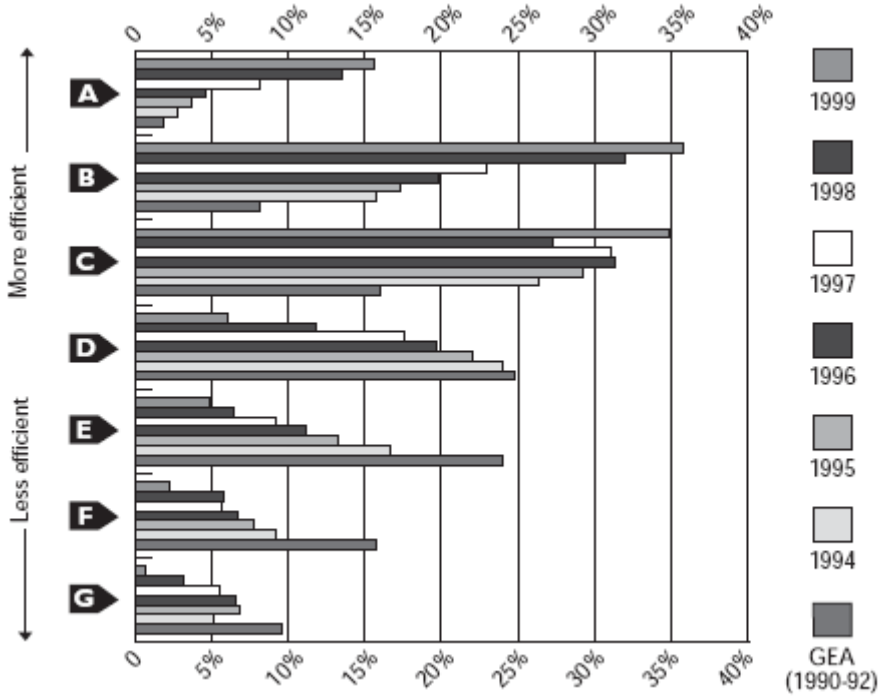
1.63 **The International Energy Agency produced in 2003 a study on the policy strategies for energy efficient homes**. According to this study, the design of the label was proved to be effective in communicating the relative energy performance of different appliances to consumers, retailers and manufacturers. Moreover, the presence of non-energy performance information allowed for a clear visibility of any energy consumption reduction.

[7] IEA – Energy labels and standards, 2000

1.64 Labels have also well been supported by information campaigns, advertising, training for retailers and rebates.

1.65 As emphasised in the IEA report the EU comparison of labelling programme have shown a marked progression towards the more efficient categories (A appliances). See figure below.

Figure 8: Share of EU cold appliance market by labelling class from 1990-92 to 1999

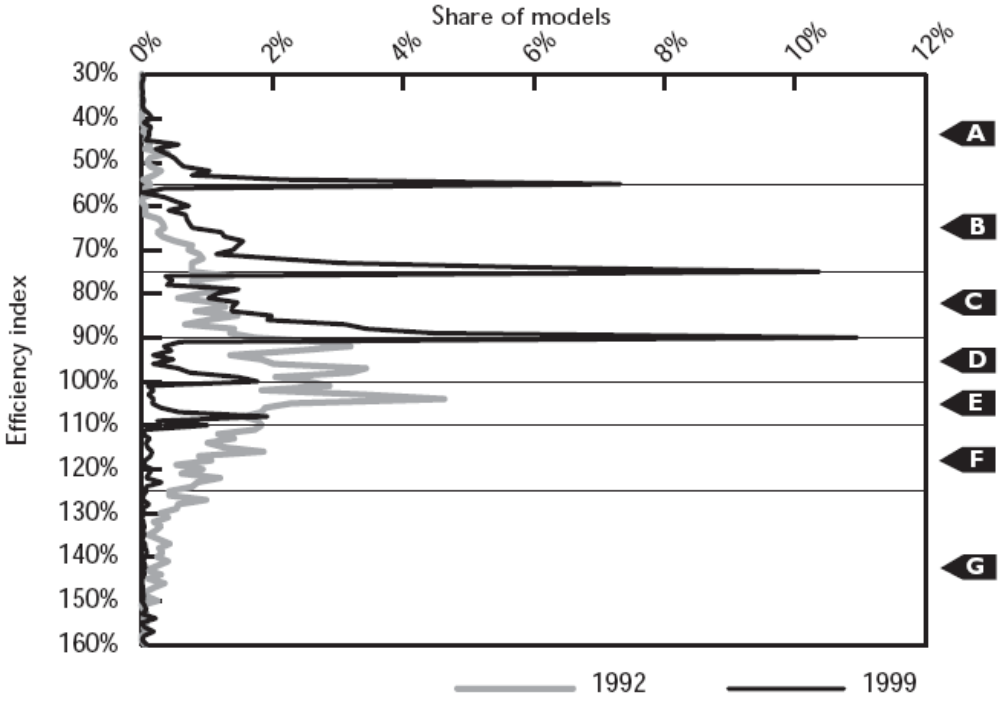


Source: Waide 2001

1.66 MEPS covered instead only three products classes (hot water boilers, refrigerators and freezers) were less developed mainly for two reasons: a) there was no framework regulation for MEPS and each additional appliance required a new legislation; and b) there were no authoritative programmes schedules, timelines, targets, clear procedures.

1.67 The **distribution of refrigerators** before and after labelling is showed in the figure below.

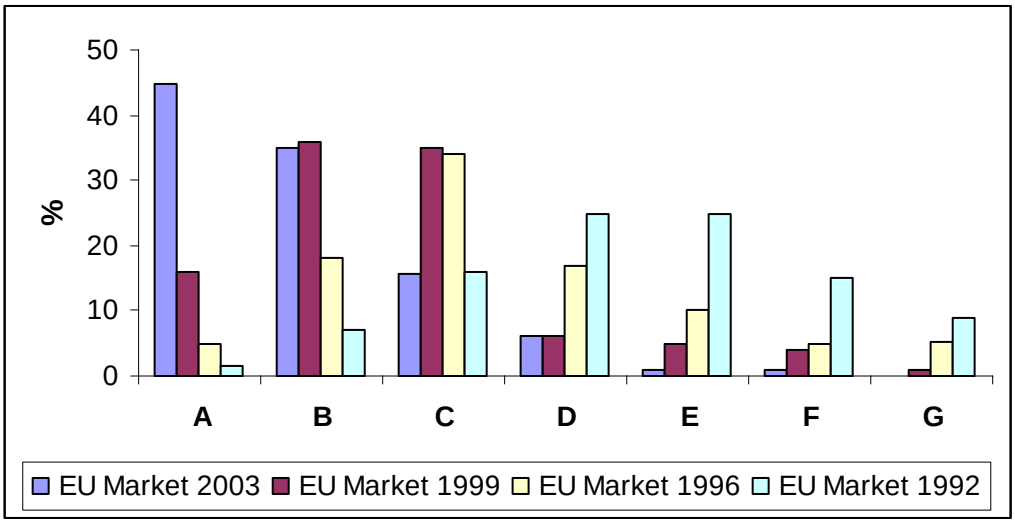
Figure 9: The distribution of refrigerators before and after energy labelling



Source: Waide, 2002

1.68 Most recently, market data on the share of energy efficient appliances also suggest that the EU market for refrigerators is moving towards a higher share of most efficient classes of appliances (i.e. the impact of labels on refrigerators seems to have been quite important).

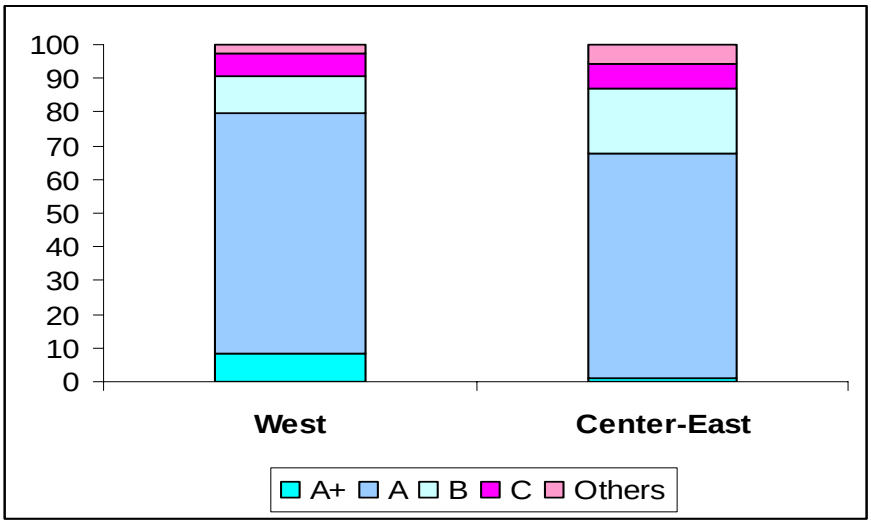
Table 5: Labels impact on EU refrigerators market



Source: Waide 2004

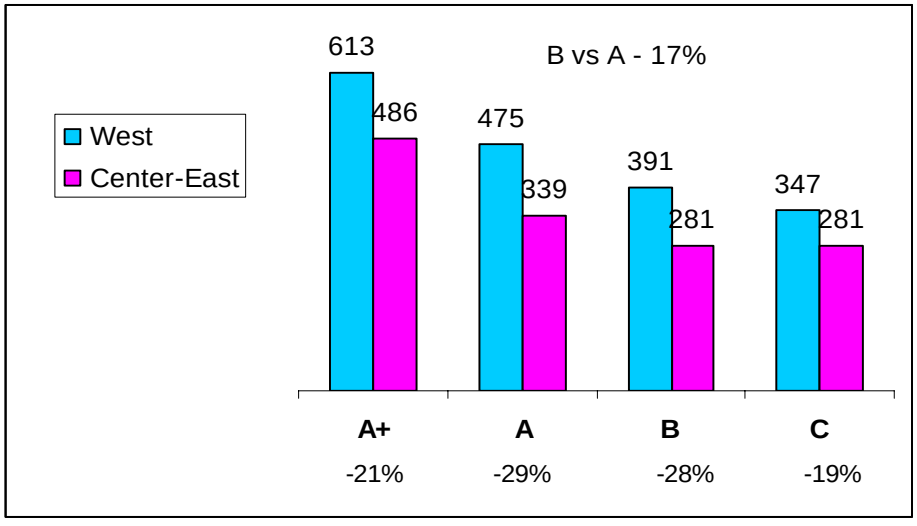
1.69 Differences across western European and Centre-East countries of cold appliances (washing machines, dishwashers, refrigerators and freezers) sales units percentages per classes and prices are analysed in the Gfk analysis (**overview of sales and trends for main appliances in year 2004**). The case of washing machines is showed in the figures below.

Figure 10: Sales unit's % per washing machines classes in EU, 2004



Note: 8 Countries East: PL, CZ, SK, BG, SI, RO, HU, and HR;
10 Country West: AT, BE, DE, ES, FR, GB, IT, NL, PT, SE
Source: Overview of sales and trends for main appliances, GfK 2004

Figure 11: Washing machine price per unit in Euro, 2004



Source: Overview of sales and trends for main appliances, GfK 2004

1.70 In 2007, the European Consumer voice in standardization has revealed that there are significant shortcomings in implementation of the EU Energy Label Scheme. On the basis of interviews and available literature ANEC has estimated that 20-30% of the appliance found in the shops were unlabelled, and in some countries the percentage of is even higher (40%). Moreover, the use of A+ and A++ were confirmed to be confusing for consumers by this study.

1.71 The **Impact Assessment Analysis of the future Action Plan on Energy Efficiency 2007-13** analyses the impact of potential policy options assessed according to five different categories: awareness, transformation, transport, financing mechanisms and full potential of existing legislation. Using multi-criteria analysis method 54 policy options across the policy options have been assessed. Some findings in terms of the current status of the level of awareness and legislation are relevant to our purposes. These are the following:

(a) Information on appliances running costs (awareness). There is an insufficient awareness of concentrated operational costs for consumer decisions although the wealth of information available on the web provided by energy suppliers, local authorities, environmental agencies etc. Mostly this focuses on the % split of use by type of appliance, or guidance on how to calculate the running costs of different appliances your self. Many manufacturers publish running and standby power consumption in Watts in technical spec sheets, but this varies by manufacturer and product type. The Australian Energy Label sets a precedent for including both a star rating and annual consumption data. Overall lack of easily available consumer information on other aspects of appliance operation.

(b) Eco-design, Labelling, Vehicles (awareness). Multiple sites are available for consumers to research energy efficiency product information prior to purchase, but consumers may have to identify and visit several sites to find information required. Single List divided by product type would provide authoritative listing for underpinning other measures (e.g. taxation initiatives). Also clear for product suppliers to how to/why apply for listing on a voluntary basis.

(c) Regular revision and extension of the label system (legislation). Due to the directive on labelling of appliances A- to G-labels have been defined for different appliances. However, new appliances are often more efficient than A-label appliances but this cannot be made clear to customers. Thus there is less incentive for manufacturers to further improve appliances. New devices, such as flat screens and mobile air cooling units, penetrate in the market without a timely labelling of more efficient versions.

Other studies: the industry's view

1.72 According to CECED there is a general willingness on the part of the appliance industry, given the high level of investments undertaken to improve environmental performance of the products, to revise current labels to allow better market differentiation and the promotion of more efficient appliances. [8]

1.73 The most relevant remarks can be summarised in the following points:

- **Existing unilateral commitments will not be updated** (this has been formally announced).[9] CECED emphasises the necessity of mandatory legislation (applicable and enforceable on all market players) in order to achieve any further improvement in the area of energy consumption.

- **Better penetration of highly efficient appliances:** there is a need for governments to push for the early replacement of inefficient appliances and educate consumers to buy only most efficient as well as establishing common measurement testing and procedures for assessing appliance performance.

- **Revision of the energy label framework directive.** CECED welcome an enlargement of the scope to other products and sectors. In general the revision of the label must be in tune with the investments cycles; Any modification of the current label process need to be taken with great care, i.e. avoiding simple rescale of the current A to G scale.

- **Variations** in the measurement standards are inherent given that energy consumption assessment is a statistical process.

- **New standards & revision of the testing methods:** measurement standards must be repeatable and reproducible, up to date, reliable and harmonised. Preferably existing standards may avoid delays of implementation.

- **Enforcement:** there is a need of high degree of compliance that CECED believes should be guaranteed by allocating appropriate resources to competent authorities in MS in order to achieve a higher level of enforcement.

- **The standby issue.** CECED supports the efforts of the EU to minimise power drawn on electricity network while products are not in use by introducing mandatory requirements on off-mode through: a) horizontal legislative measures and b) including in the label efficiency index.

[8] See CECED Vision on Energy Efficiency, Brussels July 2007.

[9] There are different reasons: a) the level of competition is increased over rent year; b) the products offered by the CECED unilateral commitments are quite efficient and very close to the Least Life Cost Point; c) trading companies will become more prominent market players; and d) legally binding efficiency limits should coupled and supported by effective monitoring and enforcement.

1.74 Moreover, CECED supports the efforts of the EU to minimise power drawn on electricity network while products are not in use by introducing mandatory requirements on off-mode through:

(a) horizontal legislative measures; and

(b) including in the label efficiency index.

1.75 The Synovate research Interview to includes a total of 4 focus groups with consumers: those who have purchased a relevant domestic appliance in the last year (2 groups per market); and those considering buying a relevant domestic appliance in the next 6 months (2 groups per market). Over 10 in-depth interviews with retailers per market: sales people and those involved in making stock purchasing decisions for their store; all to have been in current role more than 3 years and from major stores e.g. Tesco, Carrefour, MediaMarkt and Expert. The main results are the following:

- Energy efficiency awareness: there are some country differences: in Germany, energy is a top priority but more from a cost saving perspective than for environmental reasons; in France there is a moderate level of awareness of energy scale, strongly linked to saving money as opposed to saving the environment: in UK there is some knowledge of energy rating scale. Some make the link to environmental benefits; however cost saving is most important. Other factors often take precedence over energy rating. In Italy the rating scale is perceived to be linked to quality - design and aesthetics play a greater role than elsewhere. High energy rating synonymous with owning 'the best' appliance

- Classes: General perceptions of scale are similar to traffic lights or school grading system, whereby anything below a C is unacceptable. This is supported by the fact A/B/C rated are all coloured green (i.e. positive). Consumers find it even harder to differentiate between these lower ratings (i.e. D, to G) and tend to group them together.

- Retailers' reaction to rescaling: most recognise it will make their job harder; however many recognise it is a necessary change and will adapt to it alongside the consumer.

- New scale, reasons for change, date of change and EU endorsements should all be included in any communication. There is a sense that a new scale needs to be different from the old scale in order to differentiate it and ease the transition to a new scale

- Stock retail: In general the majority of appliances stocked are A and B rated across all markets – the ratio of A:B rated appliances can vary according to store location and client.

A review of the range of activity throughout Member States related to compliance with the EU Energy Label regulations in those countries[10]

1.76 This report was prepared by ANEC and DEFRA. The review was based on interviews with 11 governmental bodies in nine Member States and with six consumer bodies in six Member States.

Consumer organisations

1.77 The consumer organisations interviewed stated that the energy labelling scheme was becoming increasingly important to consumers. Increasing energy prices and the focus on climate change issues had made consumers interested in lowering energy costs and energy usage in general.

1.78 It was argued that particularly in those countries with many regulatory activities to secure compliance with the labelling directive (the Netherlands and Denmark), the current test standards and enforcement procedures make it difficult to defend consumer rights for the following reasons:

(a) Test standards are too expensive to follow.

(b) Some test standards do not represent correct consumer usage of the products, particularly washing machines.

(c) The 15 per cent tolerance means that consumers cannot be sure a product belongs to the claimed energy class.

(d) Having a test followed by three retests can lead to a long procedure.

(e) A+ and A++ labels are confusing.

1.79 It was stated that international co-operation through ICRT (International Consumer Research & Testing Ltd) on sharing test information was important and might be a way to reduce test costs and share information in the future.

Key barriers to successful implementation of the energy labelling scheme and options for reducing the barriers

1.80 Key barriers to successful implementation were identified as:

(a) Low overall priority by governments and energy authorities. This included insufficient budgets for testing, and lack of enforcement.

(b) Low or no coordination and information sharing between and within Member States.

[10] ANEC-R&T-2006-ENV-008 (final) January 2007.

(c) Lack of clear, consistent and correct energy class labelling. The 15 per cent tolerance was said to result in a lot of products being categorised in a higher class than their actual performance. Another issue was the lack of updating of the classes, which meant that now apart from a few product groups most appliances were classed as A. There were also variances in test standards.

Options for reducing the barriers

1.81 Various options were suggested for reducing the barriers to successful implementation. These included:

(a) Increasing obligations of Member States. These could include a specified number of inspections to be carried out, and testing quotas.

(b) Increased co-operation and information sharing between and within Member States.

(c) Updating the Directives and technical standards.

(d) Requiring manufacturers to take more obligations. These include: labelling the appliances; and third party testing.

(e) Increasing campaigns and information activities. Including more exchange of information between Member States, and allocating funds for campaigns and information activities.