

# WORKING DOCUMENT ON

## Possible Ecodesign requirements for refrigerated commercial display cabinets

### EXPLANATORY NOTES

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## 1 Context of the proposal

### 1.1 Grounds for and objectives of the proposal

The Ecodesign Directive 2009/125/EC<sup>1</sup> establishes a framework for setting Ecodesign requirements for energy-related products. It is a key instrument of EU policy for improving the energy efficiency and other aspects of the environmental performance of products in the internal market. The Ecodesign Working Plan for 2009-2011<sup>2</sup> identified "refrigerating and freezing equipment" as one of the ten priority product groups, for which there is currently no EU legislation specifically dealing the energy consumption. DG Energy and DG JRC have explored, within this group, the possibility of setting Ecodesign requirements for the category of commercial refrigeration, *i.e.* refrigerated commercial display cabinets, which includes five product types:

- display cabinets of the supermarket segment
- beverage coolers
- small ice-cream freezers
- soft scoop ice-cream freezers
- refrigerated vending machines.

Following the practice in Ecodesign regulations, the possibility of introducing a labelling system under the Energy Labelling Directive (2010/30/EU) of the European Parliament and of the Council has also been explored. Additional savings are expected from the combined effect of setting minimum energy performance requirements and energy labelling. It is thus proposed to adopt both Ecodesign requirements and energy labelling requirements for the five product categories under commercial refrigeration.

For products belonging to the commercial refrigeration group, the market is today still often driven by purchase price, although an increasing interest is detected in the significant savings that can be obtained by purchasing energy efficient products. A number of factors explain the slow uptake of cost-effective energy-saving technologies, despite the fact that these products are bought by professionals who in general have higher expertise in energy use matters than the average consumer. The most important is that commercial cabinets are devised to display products for sale, and the ability of a given cabinet design to effectively enhance the sale of products is the main factor of purchase. Related to this, one of the most effective means of energy saving is the closing of cabinets by means of (semi-)transparent doors, a design option that is by some retailers believed to have a detrimental impact on the sales of products. Retailers fear that substitution/retrofit to closed, energy saving cabinets under an uneven playing regulatory field in the Union may benefit the sales

<sup>1</sup> OJ L 285, 31.10.2009, p. 10.

<sup>2</sup> COM (2008) 660

of competitors that chose to maintain less efficient open cabinets<sup>3</sup>. Another relevant factor is that the ownership structure of some of the categories such as most beverage coolers, small ice-cream freezers and vending machines is such that the retailer covering the energy running costs of the machines is often not the owner of the device, and therefore is unable to choose energy efficient cabinets (split incentive).

The proposed Regulation aims to help correct some of these market failures.

The general objective of the proposed Regulation is to develop a policy which addresses the market imperfections described above, and which consequently reduces energy consumption, and related CO<sub>2</sub> and pollutant emissions, and promotes energy efficiency hence encouraging innovation and reducing energy dependence. The proposed Regulation will also contribute to the EU objective of saving 20% of the EU's energy consumption by 2020. The specific objectives of this proposal are:

- to facilitate the removal of the poorest performing products from the market, where their life cycle cost disadvantages have proven insufficient to do this.
- to help purchasers to make an informed and rational choice based on performance information, thereby moving the market to adopt improved technology solutions.
- to set incentives for producers to further develop and market energy efficient technology and products.
- to generate cost savings for end-users.

The products covered by the proposed Regulation were analysed in the preparatory study ENER Lot 12 on commercial refrigeration<sup>4</sup> and have been recently updated by the DG JRC. This preparatory study analysed the technical, environmental and economic aspects of the products.

The preparatory study's main outcomes are:

- Commercial refrigeration products are placed in significant quantities on the internal market.
- The main environmental impact in the life cycle of these products is the energy consumption (electricity) in the use phase. This impact is considered significant.
- There is a wide disparity in the environmental impacts of the products currently on the market.
- Cost-effective solutions exist that could lead to significant improvements as regards their environmental performance.

Under Article 15 of Directive 2009/125/EC<sup>5</sup>, these products should therefore be covered by an Ecodesign implementing measure as the criteria<sup>6</sup> listed in Article 15(2) of the Ecodesign Directive are met.

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<sup>3</sup> However, other retailers have already undertaken such retrofitting and report stable sales results, with increase comfort by customers (no cold air currents in corridors) and perception of better conservation of products than in open cabinets.

<sup>4</sup> Preparatory Studies for Eco-design requirements of EuPs (TREN/D1/40-2005/LOT12/S07.56644), Lot 12, Commercial refrigerators and freezers, Final Report, 2007, BIO Intelligence Service

<sup>5</sup> An energy-related product (ErP), or a group of ErPs, shall be covered by Ecodesign implementing measures, or by self-regulation (cf. Criteria in Article 17), if the ErP represents significant sales volumes, while having a

## 1.2 General context

On the basis of data presented in the preparatory study and additional analysis, the annual electricity consumption related to commercial refrigeration was estimated to have been about 85 TWh in the Union in 2013, corresponding to 34 Mt CO<sub>2-eq</sub> emissions. Unless specific measures are taken, annual energy consumption is expected to remain high at about 82 TWh in 2020 and increase to 88 TWh in 2030, corresponding to 31 and 30 Mt CO<sub>2-eq</sub> respectively<sup>7</sup>. The combined effect of this Regulation and of the Commission Delegated Regulation supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling, is expected to result in annual electricity savings of about 18 TWh by 2020 and up to 58 TWh by 2030, if compared to what would happen if no measures were taken. A fifth cabinet category under scope, soft scoop ice-cream cabinets, has at this stage not sufficiently reliable stock and energy use statistics as to be included in the estimations presented above.

The market failures outlined above explain the current persistent sales of low efficiency products. They also fail to provide incentives for manufacturers to place high-efficiency products on the market (regulatory failure), and to guide end-users away from purchase decisions based on purchase costs rather than on the life cycle cost of the product. Cost-effective improvement potentials for the end-user are therefore often not realised.

Refrigerant fluids are addressed under Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases. This Regulation has undergone a review, proposed by the Commission on 7 November 2012<sup>8</sup> and which was subject to a first reading by the Parliament on 12 March 2014<sup>9</sup>. Moreover, the preparatory study has shown that (1) the global warming potential (GWP) impact of direct emissions of refrigerant gases is less than 3% of the total impact, which is dominated by the indirect emissions due to energy consumption in the use phase, and (2) an increasing use of low-GWP refrigerants registered in the last decade in the EU market indicates that the cabinet manufacturers are already undertaking a gradual substitution towards refrigerants with reduced harmful impact on the environment, without the need of additional policy intervention by means of Ecodesign. Following these arguments, no specific requirements on refrigerants are set in the proposed Ecodesign Regulation.

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significant environmental impact and significant improvement potential (Article 15). The structure and content of an Ecodesign implementing measure shall follow the provisions of the Ecodesign Directive (Annex VII). Article 16 provides the legal basis for the Commission to adopt implementing measures on this product category. Consultation of stakeholders is based on the Ecodesign Consultation Forum as foreseen in Article 18 of the Directive (see next section for details). 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 measure by the Commission can take place.

- <sup>6</sup>
- (a) the energy using product shall "represent a significant volume of sales and trade, indicatively more than 200 000 units a year";
  - (b) it shall "have a significant environmental impact within the EU";
  - (c) it shall "present significant potential for improvement in terms of its environmental impact without entailing excessive costs"

<sup>7</sup> The calculations incorporate correction factors for reduction of specific CO<sub>2</sub> emissions per kWh by 2020 and 2030.

<sup>8</sup> COM(2012) 643 final

<sup>9</sup> [http://ec.europa.eu/clima/policies/f-gas/legislation/docs/fluorinated\\_greenhouse\\_gases\\_en.pdf](http://ec.europa.eu/clima/policies/f-gas/legislation/docs/fluorinated_greenhouse_gases_en.pdf)

### 1.3 Market significance

Key figures on sales, stocks, and market shares of the products are shown below based on information in the preparatory study and supplemented/amended by further information from stakeholders.

An estimation of the stock evolution is presented for the years 2004 to 2030 in Figure 1-1, based on the stock model built in connection with the preparatory study. Soft scoop ice-cream cabinets - not shown in Figure 1-1 – had an estimated stock in the EU of about 65 000 units in 2013.

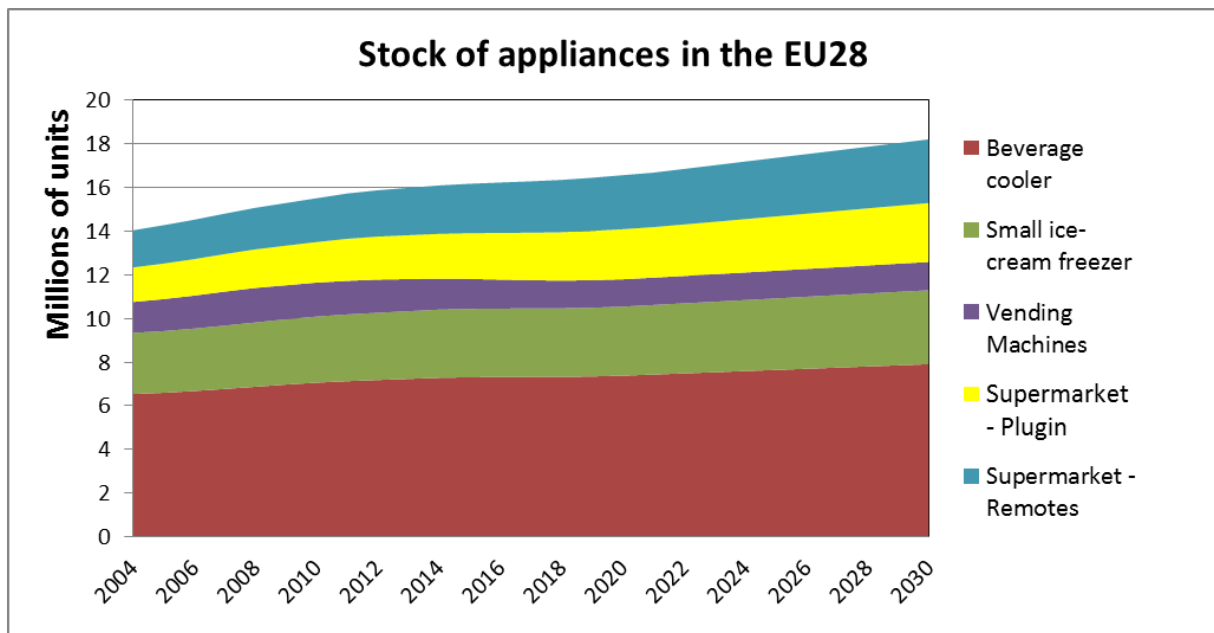


Figure 1-1 Estimation of stock evolution of commercial refrigeration appliances for 2004-2030.

Figure 1-1 and Figure 1-2 illustrate that beverage coolers are the dominant appliance type in the EU, while soft scoop ice-cream freezers are the smallest appliance type. As depicted in Figure 1-1, the shares of stocks have not significantly changed over the recent years, and this trend has been kept for the estimations of 2020 and 2030.

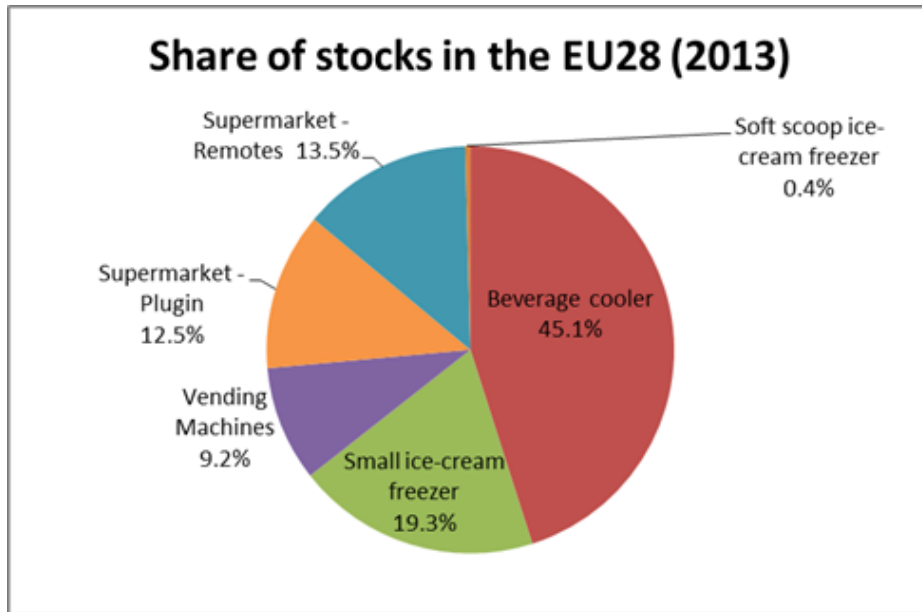


Figure 1-2 Estimated share of stocks in units for the different product types of commercial refrigeration in 2013.

The following commercial refrigeration appliance types have been excluded from the scope of the current draft Regulation:

- Refrigerated retail display cabinets for the sale and display of live foodstuff e.g. fish and shellfish refrigerated aquaria and water tanks, displayed at restaurants and some supermarkets.
- Domestic appliances used for commercial purposes
- Water dispensers
- Ice makers
- Ice-cream makers
- Wine coolers for domestic use
- Wine coolers for commercial use
- Storage for medicines and scientific research
- Ice-cream freezers on vehicles (e.g. motorbikes, vans)
- Vending machines with combined heating and cooling parts, or food preparation
- Minibars for hotels and household use
- Professional service cabinets (dealt with in ENTR Lot 1)
- Walk-in cold rooms

More detailed arguments for the rationale of these exclusions can be found in the preparatory study.

Assumptions regarding the volume of sales and stock of commercial refrigeration products will be re-assessed during the Impact Assessment phase, but is not expected to vary much as most data has been directly provided by industry or industry associations.

## 1.4 Economic significance

Energy costs of commercial refrigeration appliances have been calculated in earlier phases of the study to be around 3-4% of the total sales prices of a refrigerated food or drink item. Thus, a reduction in energy consumption could have a small deflationary effect on the retail price of chilled and frozen products.

The total annual sales in the EU of commercial refrigeration products is about 1.8 million units, amounting to a value of some 3000 million euro, representing on average 20% of the total product costs of these appliances (ca. 10000 million euro annually). The annual running costs of these appliances exclusively for energy (electricity) make up for some 7000 million euro (ca. 70% of the total).

The results of the life-cycle cost calculations over the total product life (purchase, running costs, etc.) indicate differences between appliance groups. For the supermarket segment the cost of the electricity is the largest part (65-80%), while the purchase price is much smaller (10 % for remotes, 30 % for plugins). Vending machines have a different distribution of the life cycle costs, with product price being the most significant expense (over 50 %), and the cost of electricity being more modest (40 %).

## 1.5 Market Structure and sales destination

The scope of commercial refrigeration covers a diverse range of products, each with distinct market characteristics. Typically, commercial refrigeration equipment is distributed by using the manufacturer's own sales staff to sell directly to the end-user, working through regional sales offices or manufacturers' representatives to sell equipment to independent wholesalers (equipment dealers, distributors, agents, brokers, etc.) or by selling to large food and beverage companies who then supply further their appliances to end users.

Supermarket segment cabinets are mostly sold directly to the end users. Most medium and large retailers have technical departments which define, together with procurement departments, the need of provision of cabinets, as well as their technical details. Some retailers would launch open calls for each procurement batch, while others work with closed list or framework contracts with one or more manufacturers. More than 95 % of beverage coolers and small ice cream freezers are sold to the food and beverage industry. For cold vending machines, only 10 % of the products are sold directly to the end-users. Here, vending companies own a stock of machines, which they lease to end users, while ensuring maintenance and product replacement.

The supermarket segment for remote cabinet manufacturing is dominated by 5-7 manufacturers, representing ca. 70 % of the market. The plug-in segment is more fragmented, with over 50 manufacturers in the EU. Commercial refrigeration equipment is produced mainly in Japan, Western Europe and the US, but the markets in these regions are saturated and offer the opportunity for development. However, while intra EU trade is fluent, the EU has currently a relatively small share (<10%) of extra EU exports, as commercial cabinets (contrary to the more homogeneous household refrigeration cabinets) are to a certain extent tailored goods, which are bulky, and of relatively low value in the basic configurations that do not incorporate advanced energy saving designs. The vending machine markets have additional specificities, following the different consumer habits of

the US/EU/Japan. The vending manufacturing market is also fragmented, with some 50 manufacturers in the EU mainly in the UK, Germany, Italy, Netherlands and Spain.

The preparatory studies did not specify the share of SMEs<sup>10</sup> involved in design and manufacturing of these products.

## 1.6 Environmental significance

The preparatory study has shown that for all products within the scope, the energy consumption during use is the most significant environmental parameter, accounting for more than 97% of GWP impacts.

The use phase accounts also for 85 % of the total energy use of the whole life cycle. It is about 6 times higher than the previous stage, the production phase. The distribution phase and the end-of-life phase are negligible in energy terms.

Regarding other impact categories analysed in the preparatory studies, the use phase also accounts for 75 % of water use, 85 % of acidification impacts, 42 % of non-hazardous waste production, 34 % of heavy metals emissions to water, and 12 % of particulate matter (in this case, the major part comes from the distribution phase)

Therefore, the analysis of improvement potentials and Ecodesign requirements deal essentially with technologies that reduce power consumption and improve energy efficiency in the use phase of the cabinets.

Regarding the end-of-life phase, the average product life of most refrigerated display cabinets is estimated to be between 8 and 9 years. Some cabinets are in busy areas or retailers and therefore subject to very intensive use and wear. Most cabinets are not substituted because of malfunction, but because of commercial reasons related to their design (newer designs attract consumers and can increase sales), and image loss for retailers when displaying worn-out cabinets. Little reliable data is available on the end-of-life phase. Often, cabinets can be refurbished/retrofitted and have further lives within the EU (in less design-influenced retailers, or backshops), or in countries close to the EU where the purchase price of the cabinet is essential. Refurbishment, reuse of parts, and modularity are especially developed for vending machines. When finally dismantled, cabinets are normally split into smaller parts, and follow the existing WEEE management routes in each Member State, where the two main concerns are (1) reclaiming of the materials for recycling, especially metals, and (2) the removal of potentially hazardous materials, especially the refrigeration fluid, the foaming agent, and any electronic components.

WEEE compliance has so far been dealt with in Ecodesign regulations by means of a generic information provision request. In this proposed Regulation, a more specific option is laid out (see further below), as an alternative to better address the specific end-of-life impacts of refrigerated commercial display cabinets.

## 1.7 Improvement potential and justification for action at Community level

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<sup>10</sup> SMEs are defined as companies with less than 250 employees . See [http://ec.europa.eu/enterprise/policies/sme/files/sme\\_definition/sme\\_user\\_guide\\_en.pdf](http://ec.europa.eu/enterprise/policies/sme/files/sme_definition/sme_user_guide_en.pdf)



The preparatory study has identified various improvement options that would result in lower overall energy consumption and related emissions at no excessive life cycle costs for the products within scope. Therefore, this working document proposes Ecodesign minimum energy efficiency requirements combined with energy labelling requirements for these products. The proposed Ecodesign and energy labelling requirements presented are based on the strictest scenarios developed in the preparatory study. These scenarios will be re-assessed in the Impact Assessment.

It is important to highlight that since the conception of the Ecodesign regulation for commercial refrigeration in 2004, in particular several measures have been taken up as standard practice by certain manufacturers, and these measures have been maintained despite the delay in the last stages of the preparation of the Regulation. The extent of uptake of such measures has been estimated and built in the scenarios to the extent possible. This is reflected for instance in Figure 1-3 below, which depicts a very moderate and almost stable progress of the overall energy use of commercial cabinets between 2005 and 2030.

A first assessment of the data available for the preparatory study indicates that the implementation of the proposed Regulation would result in the annual energy savings outlined in the Table 1.1 below, and depicted in Figure 1-3. These estimations will be re-assessed in the Impact Assessment phase. Sufficiently reliable data on the improvement potential for soft scoop ice-cream freezers is not available at this stage, but is expected during the Impact Assessment phase. Only minor additional energy savings are expected in total from this cabinet type.

**Table 1.1. Estimated energy savings (TWh/year) per cabinet type in 2020 and 2030 by the proposed regulation**

Commercial refrigeration product type	Estimated energy savings (TWh/year)	
	2020	2030
Supermarket segment display cabinets	12	42
Beverage coolers	4.5	13
Small ice-cream freezers	1	2
Vending machines	0.5	1
Total	18	58

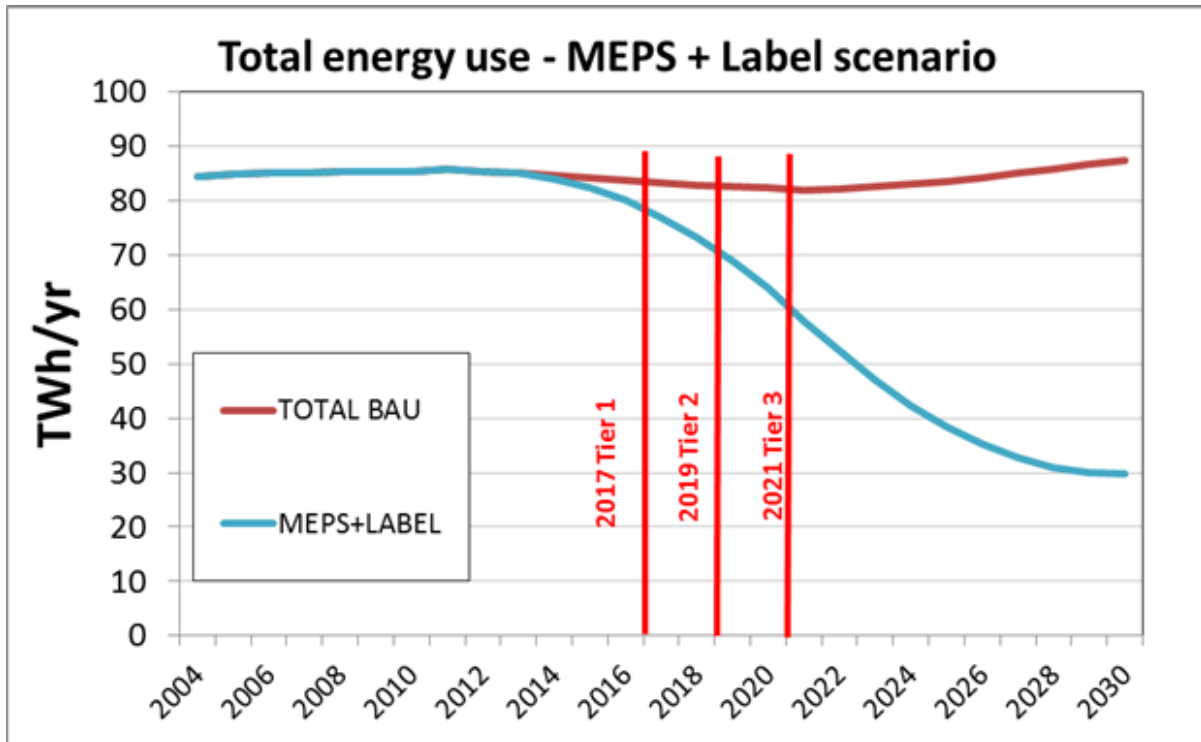


Figure 1-3 . Comparison of the yearly consumption of energy for refrigerated commercial display cabinets for BAU (Business as usual) and MEPS+Label scenarios.

CO<sub>2</sub> emissions would drop by up to 20 Mt CO<sub>2</sub>-eq by 2030 by implementing ecodesign and energy labelling requirements.

The saving potentials outlined above may seem at first sight quite dramatic. However, they are based on the implementation of a very limited number of extremely efficient and affordable energy saving technologies, with payback times frequently under one year. The most remarkable of these are:

- (1) Physical closing of open cabinets by means of (transparent) glass or polymer doors (annual energy savings of 40% on average).
- (2) Installation of electronic energy management devices, which allow reducing energy use (lighting, power of components) in time periods where the cabinet is not used (night time, weekends). These electronic devices are especially useful for temperature control of cabinets containing non-perishable products such as canned and bottled beverages, as these do not require constant low temperatures for food safety reasons. (annual energy savings between 20 and 50%, depending on the application).

The update of the preparatory study undertaken by the JRC confirms that despite the significant reduction in average energy consumption witnessed since 2004 of the best performing cabinets, the purchase culture of many appliances is still based on acquisition price, and not life-cycle costs. The existence of proven, very affordable technology options for energy efficiency is not yet systematically exploited.

From the above it can be concluded that the proposed measures will help to bring down the energy consumption by products in the scope with no excessive life cycle costs. The measures are estimated

to be most demanding for industry in the years between adoption (2017) and the strictest Tier (Tier 2 in 2021), and deliver from that point on the largest savings, until 2027-2028, after which they would level out and cease to be as noticeable to manufacturers.

If fully implemented, the measures would change the landscape of commercial refrigeration substantially, and complete in the EU the important adaptation that many manufacturers, retailers and foodstuff companies have already initiated to redesign and accommodate closed cabinets, hand in hand with end user adaptation. These preliminary estimations undertaken have all been based on data delivered by industry, but they will be complemented and re-assessed with additional cost impact analyses in the Impact Assessment phase.

## 1.8 Existing legislation

No direct regulatory approach to reduce the energy consumption of commercial refrigeration products has been identified in the EU to date. In the preparatory study and earlier Consultation Forum debates, options such as self-regulation based on existing voluntary, sectorial benchmarks – e.g. Eurovent and/or EVA certification and labelling scheme were judged insufficient to achieve the policy objectives set.

Relevant Community legislation in the field of safety, both mechanical and electrical, applies and harmonised standards have been issued for this purpose. Other legislation with relevance for commercial refrigeration products on environmental aspects includes:

- Directive 2012/19/EU<sup>11</sup> of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (recast)
- Directive 2011/65/EU<sup>12</sup> of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS);
- Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases (F-gas Regulation).

The previous WEEE Directive (2006), covered explicitly only some types of commercial appliances, such as vending machines (in category 10 “Automatic dispensers”). After the recent recast of the WEEE Directive (2012/19/EU), the inclusion of all commercial refrigeration appliances is foreseen, with an adaptation time until 15 August of 2018.

The RoHS Directive does not apply explicitly to commercial refrigeration products, but the electronics in commercial refrigeration products are expected to be in compliance with this Directive through the implementation of the Directive in the general product portfolio of suppliers.

Regarding the F-gas Regulation, a review of has been proposed by the Commission on 7 November 2012<sup>13</sup> and has been subject to first reading by the Parliament on 12 March 2014<sup>14</sup>.

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<sup>11</sup> OJ L 197, 24.7.2012, p. 38

<sup>12</sup> OJ L 174, 1.7.2011, p. 88.

<sup>13</sup> COM(2012) 643 final

<sup>14</sup> [http://ec.europa.eu/clima/policies/f-gas/legislation/docs/fluorinated\\_greenhouse\\_gases\\_en.pdf](http://ec.europa.eu/clima/policies/f-gas/legislation/docs/fluorinated_greenhouse_gases_en.pdf)

## 1.9 Proposed measures

Requirements for minimum energy efficiency and energy labelling are proposed for the following categories or segments of equipment:

- Supermarket segment display cabinets
- Beverage coolers
- Small ice-cream freezers
- Soft scoop ice-cream cabinets(\*)
- Refrigerated vending machines

(\*) Sufficiently reliable data of the current performance and improvement potential for soft scoop ice-cream freezers is not available at this stage. If this situation is unchanged throughout the Impact Assessment phase, one option may be to only require at this stage mandatory information requirements, with the prospect of introducing minimum efficiency requirements and labelling at a later stage, see Section 1.12.

The proposed measures do not set requirements on refrigerants, banning, penalising or rewarding the use of certain fluids (e.g. bonus-malus system based on GWP) placed on the market, as this is the prerogative of the F-gas Regulation. It has been observed that substitution of the gases to low GWP agents has already taken place in this sector for over a decade, by a combination of the effect of the F-gas Regulation, technology and market forces, including the better energy efficiency of a large number of low GWP refrigerants compared to fluorinated fluids, image and green policy of food and beverage companies, and taxation policies to F-gases introduced in some Member States.

Regarding end-of-life, this proposed Regulation sets specific requirements on manufacturers, on (1) compulsory hazardous component identification and dismantling instructions, and (2) foaming agent identification and labelling, both devised to help recyclers more effectively comply with the WEEE Directive (2012/19/EU), that will explicitly comprise all refrigeration cabinets from 15 August 2018. This approach is novel, as in other similar Ecodesign proposals only generic information requirements have been prescribed. The proposed specific requirements are meant to better address the specific end-of-life impacts of commercial refrigeration cabinets. A preliminary screening of the potential impact of this information measure has been discussed with stakeholders including manufacturers, obtaining general support, as the measures are perceived as only resulting in marginal costs. This information will be complemented and re-assessed with additional cost impact analyses in the Impact Assessment.

### 1.10 Consistency with other policies and objectives of the Union

The Ecodesign Framework Directive 2009/125/EC is an important instrument for achieving the objective of 20 % energy savings compared with projections for 2020, and its implementation is one of the priorities in the Commission's Communication on Energy 2020 and Energy Efficiency Plan 2011. Furthermore, implementation of the Directive 2009/125/EC will contribute to the EU's target of reducing greenhouse gases by at least 20 % by 2020, or 30 % if there is an international agreement that commits other developed countries to comparable emissions reductions. The proposed Regulation is a concrete contribution to this process and is in line with the Commission Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy.

Promotion of market take-up of efficient professional refrigeration products complies with the Europe 2020 agenda and its 20% energy savings target by the year 2020, as it aims to support more efficient and sustainable use of resources, protect the environment, strengthen EU's leadership in developing new green technologies, improve the business environment and help consumers make more informed choices.

Complementary to this proposal, Member States shall set requirements on air heating and/or cooling systems under the Energy Performance of Buildings Directive 2010/31/EU. Such requirements should complement the specificity of the proposed Regulation with the more general consideration of the building context of the products, and analyse from a system perspective the interaction of heat and chill demands of cabinets with other technical systems in stores and supermarkets such as air conditioning, heating, and other products/areas with high energy throughput (professional refrigeration and heating areas, kitchens).

### **1.11 Limitations of scope due to other Ecodesign studies and measures**

Two other Ecodesign measures are relevant to the proposed Regulation on commercial refrigeration:

- Ecodesign requirements for household refrigerating appliances, Commission Regulation (EC) No 643/2009
- Professional refrigeration (ENTR Lot1), currently in the last steps of the adoption phase.

Household refrigerated cabinets are intended for the storage, but not the sale or display of chilled and/or frozen foodstuff, and are not designed for the use by commercial, institutional or industrial facilities. In addition, household refrigerators are subject to energy labelling following Commission Delegated Regulation (EU) No 1060/2010

Contrary to commercial refrigeration cabinets, professional refrigerated cabinets are intended for the storage, but not the sale and display, of chilled and/or frozen foodstuff. Equipment used in gastronomy and non-household refrigerating equipment for storage purposes without any display or merchandising function are not included in the proposed Regulation, and belong to the scope of the Ecodesign Regulation on professional refrigeration (ENTR Lot 1).

Commercial refrigerators are found in areas where customers have visual contact with the products and normally have access (supermarkets, beverage coolers, commercial ice cream freezers, etc.). Professional refrigeration appliances are found in areas where customers neither have visual contact nor direct access, such as back shops, below or behind counters, or professional kitchens. The devices are intended exclusively for professional use.

### **1.12 Form of implementing measures**

The working document describes implementing measures in the form of:

- Commission Regulation setting minimum Ecodesign requirements.
- a delegated Commission Regulation for energy labelling of the products within scope.

It is proposed to give the implementing measures the form of directly applicable Regulations.

The Ecodesign requirements relate to the minimum energy efficiency of products (MEPS), and provision of supplementary product information, including end-of-life. Under this option, only products that declare information about their energy performance and that perform above a given energy efficiency level could be placed on the market.

The prescription of minimum energy efficiency thresholds is a very common option in Ecodesign regulations, and it would help to tackle the problem by removing the worst performing products from the market. The diffusion of energy savings technologies would be encouraged, while the effect on innovation would be limited, since only the lower end of the market would be affected.

Combined with this, energy labelling is a user friendly way of giving information about the energy performance of the products, which would not only have to be accompanied by information, but also ranked according to their performance. Therefore, users would not have to go through the difficult and time-consuming process of comparing products themselves by collecting the necessary information: the labels convey it immediately. Such a system has already been introduced for many household products, including refrigerators, and some professional products including professional storage cabinets. The effect of this option on the market is quite different from minimum efficiency requirements: minimum requirements would improve the average performance by pushing the worst performing products out of the market, while labels would encourage the improvement of all products, including the already efficient ones, through an increased demand for energy efficiency by better informed buyers.

Combining minimum requirements and labelling for commercial cabinets could achieve the effect of removing the worst products from the market together with the motivating effect of transparency on efficiency information that will drive competition and innovation on energy efficiency issues. The simultaneous introduction of both measures (minimum energy performance standards and labelling) could thus combine the pushing effect of the minimum requirements and the pulling effect of the new labelling energy efficiency scale. This pattern is well known in the practice of many Ecodesign and Energy labelling regulations.

In the proposed regulation, the combined effect of MEPS and labelling has been devised as to provide retailers and manufacturers the greatest possible freedom and responsibility in the practical implementation of the instruments. This is achieved by restricting the number of appliance subcategories, and not subdividing further when it is seen that the cabinets are able to deliver the same refrigeration service, regardless of the design. Within these larger categories, different cabinet designs will obtain different energy class labels. When confronted with the procurement of new cabinets, retailers are thus invited to not only think in terms of looking for the most efficient cabinets with a given design (horizontal, vertical, semi-vertical), but also to look broadly for the designs that overall (and using life cycle cost principles) deliver most efficiently the refrigeration service needed. Manufacturers are likewise invited to think broadly in terms of the designs that are most energy efficient to deliver the refrigeration service, and not only in optimisation of the energy efficiency of known designs.

Regarding soft scoop ice-cream freezers, the option of only requiring mandatory Information requirements is possible, if the situation of limited market and performance data available persists throughout the Impact Assessment phase. Otherwise the likelihood of setting incorrect requirements on the basis of limited data is unacceptably high. The imposition of mandatory

information requirements foreseen imposes a cost on producers while doing little to achieve the objectives of the Ecodesign Directive, but it can be accepted as a preliminary step for further policy measures. Given the technology and market similarities between soft scoop ice-cream cabinets and other serve-over cabinets, it is clear that once data is made available by the mandatory information requirements the same policy options now retained for the rest of cabinets might become viable for soft scoop ice-cream freezers.

## 2 Consultation of interested parties

The earlier preparatory study and Impact Assessment (IA) concluded that commercial refrigeration appliances were eligible for Ecodesign requirements against the criteria of Article 15 sub 1 of the Ecodesign Directive 2009/125/EC. Furthermore, commercial refrigeration appliances were deemed eligible for energy labelling requirements under Directive 2010/30/EU on the indication of labelling and standard product information for the consumption of energy and other sources by energy-related products. Energy labelling would reinforce the impact of an implementing measure under Ecodesign.

Following the preparatory study, the implementing phase was initiated in 2008-2010. Further to Article 18 of the 2009/125/EC Directive, a formal consultation of the stakeholders was carried out through the Ecodesign Consultation Forum on 23 April 2010. A background impact assessment study<sup>15</sup> was carried out from October 2008 to July 2010.

The update of the preparatory work, and the initial formulation of technical options for the implementing measure, has been undertaken by the JRC through an intensive interaction process with stakeholders, by means of a structured Technical Working Group (TWG). In the preparatory study, the methodology followed the provisions of the Ecodesign Directive 2009/125/EC, in particular Article 15 and Annexes I and II. The technical, environmental and economic analysis followed the structure of the 'Methodology Study Ecodesign of Energy-using Products' devised for the Commission's DG Enterprise and Industry and endorsed by stakeholders.

The Technical Working Group on commercial refrigeration is composed of experts from Member States' administrations, industry, NGOs and academia. The experts of the group have voluntarily collaborated through the website of the project<sup>16</sup>, and have contributed with data, information and/or written comments to interim draft versions of the preparatory study, and through participation in expert workshops organised by the JRC-IPTS. The first workshop was held on 23 April 2013 in Seville. The second workshop took place on 10 December 2013 in Brussels. In addition, three questionnaires have been distributed to the TWG especially addressing a general information update and specific data gaps on scope and definition, and energy consumption. Furthermore, stakeholder communication has included numerous bilateral meetings, and site visits to manufacturing, testing and dismantling plants.

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<sup>15</sup> Impact Assessment accompanying the Proposal for a Commission Regulation implementing Directive 2009/125/EC with regard to Ecodesign requirements for ENER Lot 12: Commercial Cold Appliances (ENER/D3/92-2007, Final report, 2010, Wuppertal Institute.

<sup>16</sup> 7. <http://susproc.jrc.ec.europa.eu/comrefrig/index.html>

No potentially serious risks with irreversible consequences were mentioned by any stakeholder, nor were any identified during the preparatory work.

The information presented in the preparatory study, especially the estimations related to analysis of future scenarios, will be complemented and re-assessed with additional cost impact analyses in the Impact Assessment. Several policy options for achieving market transformation will be considered, including the business as usual case, energy labelling, Ecodesign requirements, and mandatory information requirements.

The option of self-regulation based on existing voluntary, sectorial benchmarks – e.g. Eurovent and/or EVA certification and labelling scheme was assessed and rejected, as they were judged insufficient to achieve the policy objectives set. A re-assessment of this option has been undertaken, confirming the judgment already made. Due to the clear conclusions of the policy preparation process on commercial refrigeration between 2004 and 2010, and the mandate given by the legislator to pursue the chosen option of establishing Ecodesign requirements and energy labelling for commercial refrigeration products, the depth of analysis for options other than an implementing legal act is proportionate, and the focus is on the assessment of the proposed implementing regulations.

### **3 Legal elements of the proposal**

#### **3.1 Scope of the proposed Regulation**

The scope of the proposed Ecodesign Regulation covers commercial refrigeration products which have been segmented as follows:

- Supermarket segment display cabinets<sup>17</sup>
  - o Vertical freezers
  - o Horizontal freezers
  - o Vertical refrigerators
  - o Horizontal refrigerators
- Beverage coolers
- Small ice-cream freezers
- Soft scoop ice-cream cabinets
- Refrigerated vending machines

#### **3.2 Phased implementation of ecodesign requirements**

It is proposed that requirements on minimum energy efficiency, information to be provided by manufacturers and energy labelling will enter into force as follows:

The proposed regulation includes three Tiers, and the exclusion of the less efficient products based on their Energy Efficiency Index (EEI), with the following timeplan:

- i) From 1 January 2017: EEI < 150
- ii) From 1 January 2019: EEI < 130

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<sup>17</sup> Subdivided into four subcategories only for the purpose of the calculation of EEI.



iii) From 1 January 2021: EEI < 110

The time plan above is related to the following assumptions, which follow the prescriptions of the MEErP methodology and are based on the experience of past Ecodesign processes:

Scenario	2015/2016	2019 (Tier 2)	2021 (Tier 3)
<b><u>Mandatory MEPS + Label</u></b>	Average 2015 = Class C/D (EEI ≈ 100) No appliances in class A	In between Tier 1 and Tier 3	Average 2021 = Class A. Exclusion of worse classes (e.g. E and/or F and/or G)

NOTES: MEPS: Minimum energy performance standards

In addition to the MEPS, the following time plan relates to the compulsory information requirements and labelling:

1) From 1 January 2017 (Tier 1):

Commercial refrigeration cabinets must comply with the requirements for energy efficiency, and product information provision (including end-of-life) indicated in Article 3 of the proposed Ecodesign Regulation;

Commercial refrigeration cabinets must comply with the requirements for energy labelling indicated in Article 3 of the proposed energy labelling Regulation.

2) From 1 January 2019 (Tier 2):

Commercial refrigeration cabinets must comply with the requirements for energy efficiency, indicated in Article 3 of the proposed Ecodesign Regulation;

3) From 1 January 2021 (Tier 3):

Commercial refrigeration cabinets must comply with the requirements for energy efficiency, indicated in Article 3 of the proposed Ecodesign Regulation;

More specifically on labelling, the following requirements would apply to the different product subtypes:

An energy label scheme for commercial display cabinets is proposed. Each category of refrigerated commercial display cabinet supermarket segment, beverage coolers, vending machines, small ice-cream freezer and soft scoop ice-cream cabinet is labelled following a specific scheme.

The energy classes have been proposed after an analysis of the distribution pattern of energy use of the current cabinet stocks. The available data shows a pattern of normal distribution. Following the prescriptions of MEErP, the average energy consumption values have been set as corresponding to energy class C/D. The current best available appliances are on the boundary of classes B and A. There are no classes better than class A foreseen, such as A+, A++ or A+++.

All energy efficiency classes are defined based on the energy efficiency index (EEI). The following tables include the specific values proposed.

### *Energy efficiency classes for beverage coolers*

**Table 1:** Energy efficiency classes for beverage coolers

<b>Energy efficiency classes for beverage coolers</b>	
<b>Energy efficiency class</b>	<b>EEI</b>
A	$EEI < 30$
B	$30 \leq EEI < 50$
C	$50 \leq EEI < 80$
D	$80 \leq EEI < 110$
E	$110 \leq EEI < 130$
F	$130 \leq EEI < 140$
G	$140 \leq EEI$

### *Energy efficiency classes for small ice-cream freezers*

**Table 2:** Energy efficiency classes for small ice-cream freezers

<b>Energy efficiency classes for small ice-cream freezers</b>	
<b>Energy efficiency class</b>	<b>EEI</b>
A	$EEI < 40$
B	$40 \leq EEI < 70$
C	$70 \leq EEI < 90$
D	$90 \leq EEI < 110$
E	$110 \leq EEI < 130$
F	$130 \leq EEI < 140$
G	$140 \leq EEI$

### *Energy efficiency classes for vending machines*

**Table 3:** Energy efficiency classes of vending machines

<b>Energy efficiency classes for vending machines</b>	
<b>Energy efficiency class</b>	<b>EEI</b>
A	$EEI < 55$
B	$55 \leq EEI < 75$
C	$75 \leq EEI < 95$
D	$95 \leq EEI < 115$
E	$115 \leq EEI < 135$
F	$135 \leq EEI < 145$
G	$145 \leq EEI$

### *Energy efficiency classes for soft scoop ice-cream cabinets*

**Table 4:** Energy efficiency classes for soft scoop ice-cream cabinets

<b>Energy efficiency classes for soft scoop ice-cream cabinets</b>	
<b>Energy efficiency class</b>	<b>EEI</b>
A	$EEI < 40$
B	$40 \leq EEI < 60$
C	$60 \leq EEI < 80$
D	$80 \leq EEI < 100$
E	$100 \leq EEI < 120$
F	$120 \leq EEI < 140$
G	$140 \leq EEI$

## Energy efficiency classes for supermarket segment cabinets

**Table 5:** Energy efficiency classes for supermarket segment cabinets

Energy efficiency classes for supermarket segment	
Energy efficiency class	EEI
A	$EEI < 30$
B	$30 \leq EEI < 50$
C	$50 \leq EEI < 80$
D	$80 \leq EEI < 110$
E	$110 \leq EEI < 120$
F	$120 \leq EEI < 130$
G	$130 \leq EEI$

These requirements aim at realising the potential for reducing the use-phase energy consumption while fulfilling the criteria for Ecodesign implementing measures set out in the Ecodesign Directive. This process will be complemented by the new energy label providing consumers with comparative information on the efficiency of refrigerated commercial display cabinets. This pull strategy will further encourage manufacturers to place more efficient products on the market.

### 3.3 Product information requirements

Product information requirements apply to all products for which specific Ecodesign requirements related to energy efficiency have been set. These requirements can be found in Annex II (2) of the proposed Ecodesign Regulation.

### 3.4 Measurements and calculations

Measurements and calculations of the relevant product parameters should be performed taking into account generally recognised state-of-the-art calculation and measurement methods. In this context, manufacturers shall apply reliable, accurate and reproducible measurement and calculation methods and harmonised standards established in accordance with Article 10 of Directive 2009/125/EC, as soon as they are made available and published for that purpose in the *Official Journal of the European Union*.

Requirements for calculation and measurement methods are specified in Annexes III, and IV of the proposed Ecodesign Regulation.

The testing burden which is entailed by the proposed regulation can be optimally reduced through a scheduled entry into force of requirements and extensive use of agreed calculation methodologies that reduce the number of tests necessary to comply with the regulation.

### **3.5 Benchmarks**

Based on the currently available technologies, benchmarks for high energy efficiency are provided for best performing products and can be found in Annex VI of the proposed ecodesign Regulation.

### **3.6 Date for evaluation and possible revision**

Taking into account the time necessary to collect, analyse and complement the data in order to properly assess technological progress, a review can be presented to the Consultation Forum no later than five years after the proposed regulation comes into force regarding refrigerated commercial display cabinets. The main issue for a possible revision of the proposed Regulation is the appropriateness of setting stricter Ecodesign requirements for refrigerated commercial display cabinets' energy efficiency.

### **3.7 Conformity assessment**

As required in Article 8 of Directive 2009/125/EC, the proposed Regulation specifies the applicable conformity assessment procedures, which should be based on an internal design control or a management system as described in Annexes IV and V of Directive 2009/125/EC. Other conformity assessment procedures of those described in Annex II of Decision 768/2008/EC<sup>18</sup> are considered not duly justified and proportionate to the risk.

For the purposes of conformity assessment, the technical documentation shall contain the product information referred to in Article 4 of the proposed Regulation.

### **3.8 Verification procedure for market surveillance purposes**

When performing the market surveillance checks referred to in Article 3 (2) of Directive 2009/125/EC, the authorities of the Member States shall apply the verification procedure as lays down in Annex V of the proposed ecodesign regulation for the requirements referred to in Article 5 of the said Regulation, as established in its Annex II.

### **3.9 Legal basis**

The proposed Regulation is an implementing measure pursuant to Directive 2009/125/EC, in particular its Article 15(1). The Directive is based on Article 95 of the EU Treaty.

### **3.10 Subsidiarity principle**

The adoption of ecodesign measures for commercial refrigeration products by individual Member States' legislation would lead to obstacles to the free movement of goods within the Union. Such measures must therefore have the same content throughout the Union. In line with the principle of subsidiarity, it is thus appropriate for the measure in question to be adopted at Union level.

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<sup>18</sup> common framework for the marketing of products, OJ L 218, 13.8.2008, p. 82.

### **3.11 Proportionality principle**

In accordance with the principle of proportionality, these measures do not go beyond what is necessary in order to achieve the objective. It offers requirements which act as an incentive for technology leaders to invest in high-efficiency refrigerating technology. It also leads to higher savings than any other conceivable option with minimum administrative costs.

### **3.12 Entry into force**

The Regulation is proposed to enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

The Regulation shall be binding in its entirety and directly applicable in all Member States.

### **3.13 Choice of instruments**

Proposed instruments: Regulation and Commission delegated Regulation.

The proposed form of action is a Commission Regulation implementing Directive 2009/125/EC, because the objectives of the action can be achieved most efficiently by fully harmonised requirements throughout the EU (including the date for entry into force), thus ensuring the free movement of complying commercial refrigeration products. No costs arise for national administrations for transposition into national legislation.

### **3.14 Impact on other EU legislation**

No EU legislation focusing specifically on energy efficiency for commercial refrigeration has been identified.

The measures proposed in this working document will help to harmonise these limit values as this is one of the goals of the Directive 2009/125/EC, Article 1(1).

## **4 Additional information**

### **4.1 Review/revision/sunset clause**

The proposal includes a review clause.

### **4.2 European Economic Area**

The proposed act concerns an EEA matter and should therefore extend to the European Economic Area.