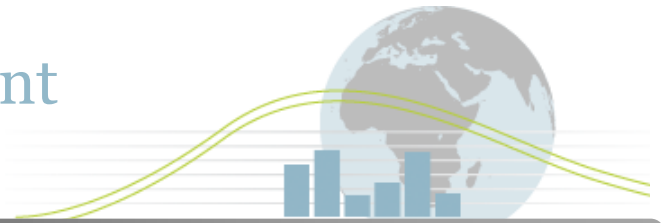


4E

Mapping Document



| | |
|---------------|---|
| Country: | European Union |
| Technology: | Domestic Cold Appliances |
| Sub Category: | Freezers and Refrigerator/ Freezers Combinations |

Introduction

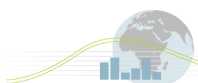
The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent set of products.

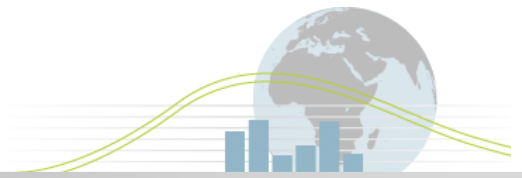
The summary definition for this product is:

| | | | |
|--|--|---|--|
| Under Counter/ upright Refrigerators (Single Grouping – collect data only) | Refrigerator with freezer (ice) compartment (Single grouping – collect data only) | Side-by-Side and Freezer top/ Refrigerator bottom and Refrigerator top/ Freezer bottom (Collect data on proportion of each type of unit in the market) | Chest/Under Counter/Upright Freezer (Collect data on proportion of each type of unit in the market) |
| Where units are: | | | |
| <ul style="list-style-type: none"> From all climate classes (but collect data on specific climate class that may be useful for later analysis) Have freezer compartments with rated temperatures between -12 to \geq-15C (all temperature ratings to refrigerator with freezer (ice) compartment) Differentiated (if possible) between units with peripheral water coolers and ice makers | | | |
| Do not differentiate between | | | |
| <ul style="list-style-type: none"> Defrost Cycles including Manual/Cyclical/Automatic (although collect data in case normalisation is required) Controls mechanisms including manual, automatic and cyclical Built in and stand-alone units (but where differentiated in market, collect data to enable normalisation) Volume (but collect data on gross volumes as base metric) Climate class (but collect data on climate class in case future analysis required, plus data on related local test conditions for climate classes) | | | |

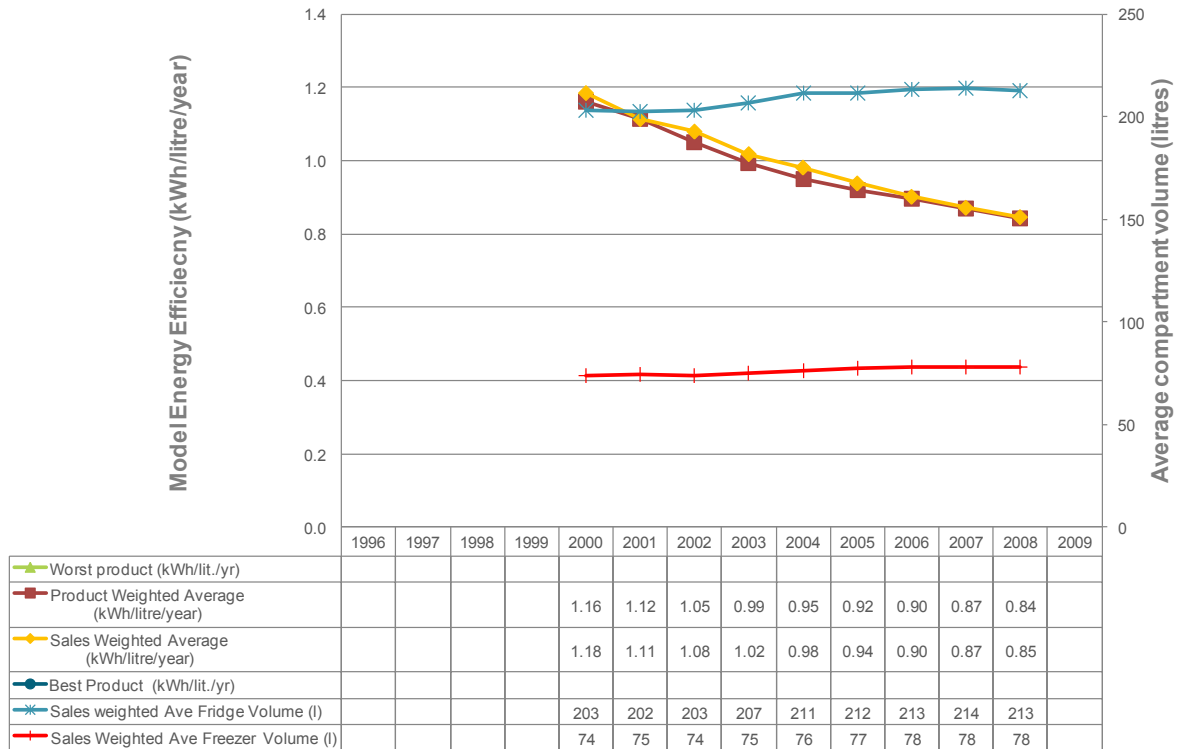
The detailed product definitions can be found at the Annex website:

<http://mappingandbenchmarking.iea-4e.org/>



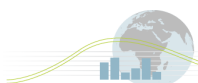


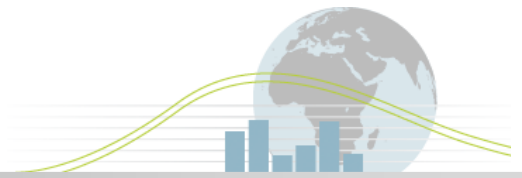
Energy Efficiency of New Fridge Freezers European Union



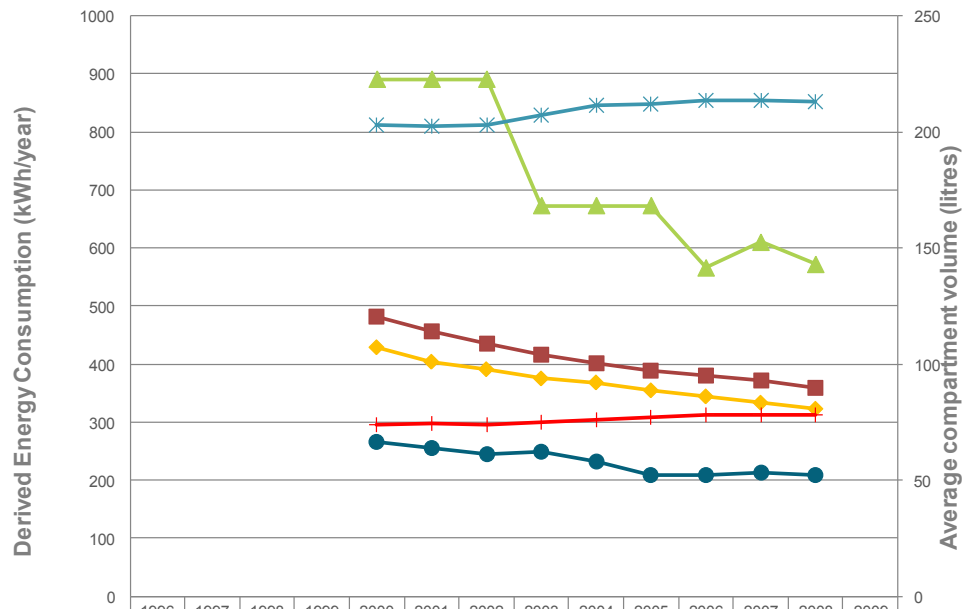
Key notes on Graph (See notes section 1)

- Aggregated data table supplied by GfK based on:
 - Information covering Austria, Belgium, Germany, Spain, France, UK, Italy, Netherlands, Portugal, Sweden, Czech republic, Hungary, Poland, Slovakia
 - Data covers the years 2000-2008, but becomes more reliable over time. Data is reported to cover 57% of total sales in specified countries in 2000, but by 2008 coverage is reported to be over 90% of specified market.
 - The best and worst product having a minimum 0.1% market share on model basis, ie there could be some models with marginal sales, but with some better or worse consumption values.
- Note that there is a slight tendency (undefined but thought to be marginal) for under estimating consumption/over estimating efficiency as not all models in the market report consumption, and it is believed these are typically the less well performing units.





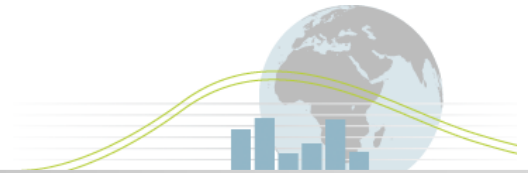
Energy Consumption of New Fridge Freezers European Union



| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Worst Product (kWh/yr) | | | | | 890 | 890 | 890 | 673 | 673 | 673 | 566 | 610 | 572 | |
| Product Weighted Average (kWh/yr) | | | | | 481 | 456 | 435 | 416 | 401 | 389 | 380 | 371 | 360 | |
| Sales Weighted Average (kWh/yr) | | | | | 429 | 404 | 391 | 375 | 368 | 354 | 344 | 333 | 323 | |
| Best Product (kWh/yr) | | | | | 266 | 256 | 245 | 248 | 231 | 208 | 208 | 212 | 208 | |
| Sales weighted Ave Fridge Volume (l) | | | | | 203 | 202 | 203 | 207 | 211 | 212 | 213 | 214 | 213 | |
| Sales Weighted Ave Freezer Volume (l) | | | | | 74 | 75 | 74 | 75 | 76 | 77 | 78 | 78 | 78 | |

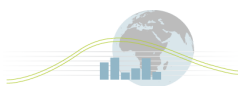
Key notes on Graph (See notes section 2)

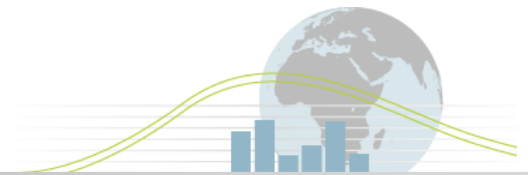
- Aggregated data table supplied by GfK based on:
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Energy Efficiency in the Installed Fridge Freezer Stock European Union

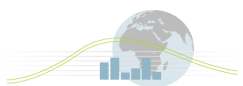
Insufficient data available for analysis.



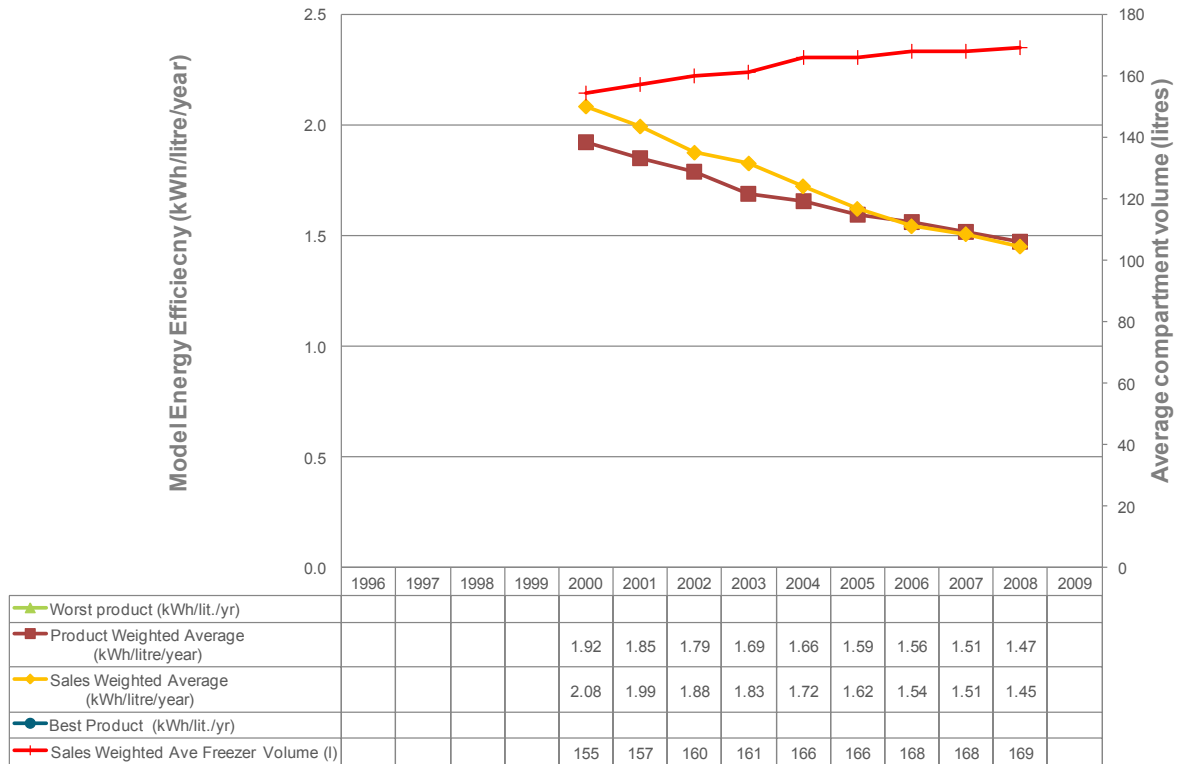


Energy Consumption in the Installed Fridge Freezer Stock European Union

Insufficient data available for analysis.



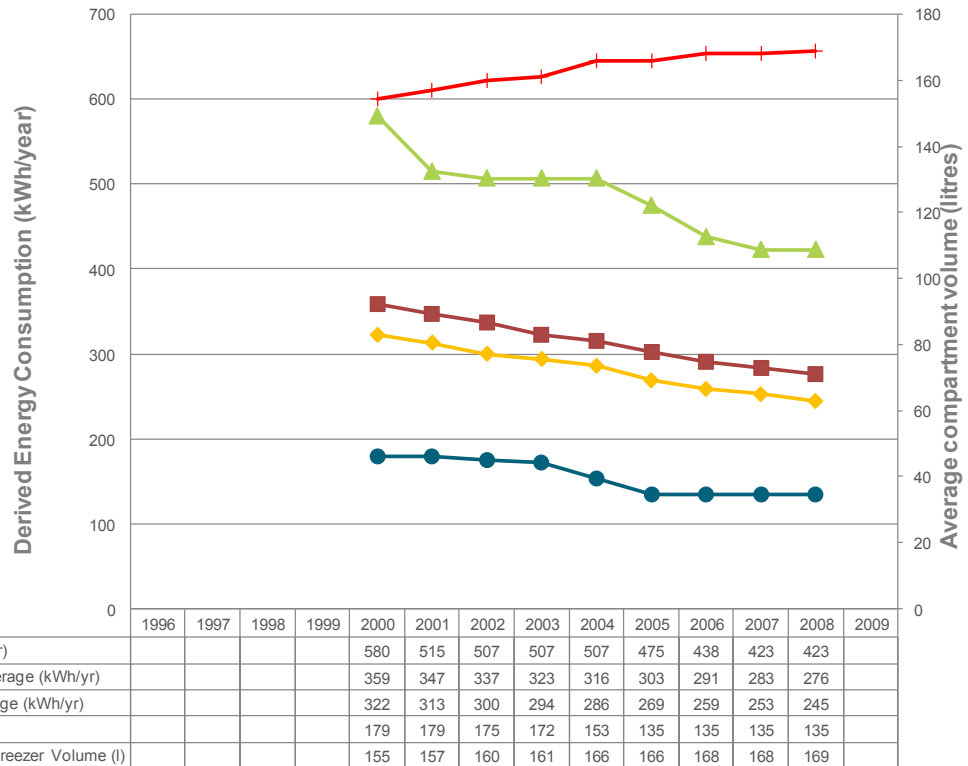
Energy Efficiency of New Freezers European Union



Key notes on Graph (See notes section 1)

- Aggregated data table supplied by GfK based on:
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Energy Consumption of New Freezers European Union

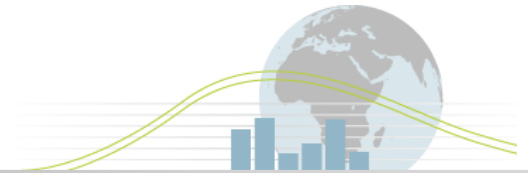


Key notes on Graph (See notes section 2)

- Aggregated data table supplied by GfK based on:
 - Information covering Austria, Belgium, Germany, Spain, France, UK, Italy, Netherlands, Portugal, Sweden, Czech republic, Hungary, Poland, Slovakia. Data covers the years 2000-2004 for “Western European” countries only (ie excluding, Czech Republic, Hungary, Poland and Slovakia) and 2004 – 2008 for all countries listed.
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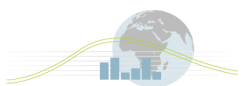
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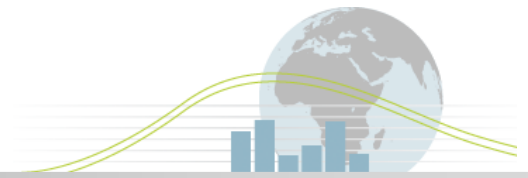
Energy Efficiency in the Installed Freezer Stock



European Union

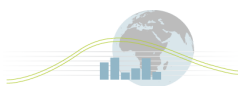
Insufficient data available for analysis.

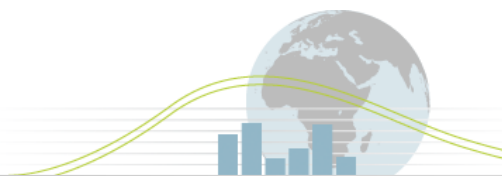




Energy Consumption of the Installed Freezer Stock European Union

Insufficient data available for analysis.





Major Policy Interventions (See notes Section 5)

EU Wide Regulations:

| Policy name | Period in force | Description | Impact |
|---|--------------------|--|--|
| | | | <i>Relative impact of policy</i> |
| EC Energy Label ¹ | 1995 – 2010 | Defines A to G efficiency classes | All cold appliances to be labelled – improvement in the average efficiency over time |
| EC MEPS (EuP) ² Directive 96/57/EC | 1999 – (July) 2010 | Limit sales to A, B, C class, plus D & E for chest freezers | All cold appliances |
| EC Energy Label ³ | 2004-2010 | Defines A+ and A++ classes | All cold appliances - improvement in the average efficiency over time |
| Industry Commitment ⁴ | 2002 - 2010 | CECED commitment: only B or better (except chest freezers) on market by end 2004 | Improvement in the average efficiency over time |
| Directive 96/57/EC will be repealed and is replaced by Regulation 2009/643/EC | July 2010 | Ecodesign requirements for household refrigerating appliances | |

Other relevant interventions in the market

In addition to these EU wide policy interventions, a large number of EU countries undertake national actions to promote cold appliance efficiency. Refer to individual data sheets from countries participating in the Mapping and Benchmarking Annex for further information.

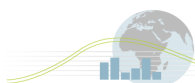
¹ www.legislation.hmso.gov.uk/si/si1994/Uksi_19943076_en_1.htm.

² www.opsi.gov.uk/si/si1997/19971941.htm

³ www.opsi.gov.uk/si/si2007/uksi_20072037_en_1

⁴ "Voluntary commitment of reducing energy consumption of household refrigerators, freezers and their combinations (2002-2010)" 31st October 2002.

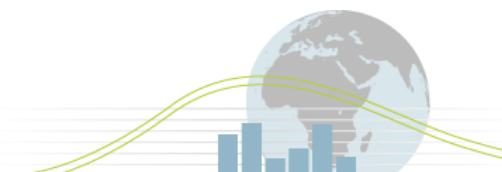
<http://www.cecce.eu/ICECED/easnet.dII/ExecReq/Redirection?eas:oldfilename=/community/files/296/phpXLy1ow/UICCOLD2002.pdf>



Cultural Issues (See Notes Section 6)

Due to the extremely diverse range of cultures within countries the EU (eg household sizes, building types and sizes, national and local income levels, etc), it is impossible to provide any meaningful cultural information other than large scale observations:

- Household numbers are rising in almost all member states, but the number of individuals within households is falling
- Average buying power of households rose in all member states between 1996 and 2008
- Average cold appliance sizes are increasing in almost all areas, with a gradual migration to combination fridge/freezer units taking place



Notes on data

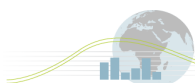
Section 1: Notes on Product Efficiency

1.1 Test methodologies, Performance Standards and Labelling Requirements

Energy consumption is claimed according to the requirements of the EC energy label and the appropriate energy efficiency class allocated according to the calculations given in the energy label directives.

The test standard for EC energy labelling is EN 153 which calls upon the EN ISO 15502.

| Test Standard name | Date in force | Description | Comments |
|--|---------------|---|---|
| EN 153:2005 Methods of measuring the energy consumption of electric mains operated household refrigerators, frozen food storage cabinets, food freezers and their combinations, together with associated characteristics. | 2005 | Energy, temperature and volume of all types of domestic cold appliances are measured in accordance with test standard (BS) EN 153 and used for energy label declarations. EN 153 refers to EN ISO 15502:2005 | Supersedes EN 153:1995 (withdrawn 30 June 2008). Although there is some debate as to which test standard is currently valid under UK law. |
| EN ISO 15502: 2005 Household refrigerating appliances, refrigerator freezers – characteristics and test methods. | 2005 | Defines characteristics and test methods | Prior to this standard there were four test standards for each of the main refrigerating appliance types |



Specific information:

| | |
|---|--|
| External/ambient test temperature | 25 ± 0.5°C (Deviations from 25°C within ± 0.5°C are corrected in accordance with EN 153:2006 Clause 15.2.1.) |
| Internal temperatures for the appliances | |
| <ul style="list-style-type: none"> Fridge compartment | Mean temp of +5°C (no tolerance because in general, the energy consumption at this temp is obtained by interpolation.) |
| <ul style="list-style-type: none"> Freezer compartment (3 or 4 star compartment) | -18°C or colder |

1.2 Product Efficiency Graphic

Key calculations undertaken:

Derived Total Model Volume: based on net volume (as defined in local regulations), multiply freezer by 2.15 (EU standard) to get equivalent fridge volume. Add this volume to the net fridge volume to establish the net total volume normalised to refrigerator. This volume is the Derived Total Volume

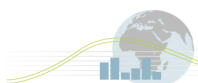
Derived Model Energy Consumption: based on total annual energy consumption under test conditions.

Derived Model Energy Efficiency: Equals Derived Model Energy Consumption divided by Derived Total Model Volume

Sales Weighted Energy Efficiency of New Models: (Sum of (Derived Model Energy Efficiency multiplied by sales volume of Model in year) for all Models) divided by (Sum of sales volume of all Models in year)

Model Weighted Energy Efficiency of New Models (used where no sales data is available): (Sum of Derived Model Energy Efficiency for all models sold in year) divided by (Number of Models sold in year).

Ave Product Volume: is the product weighted average volume of products sold in each year.



1.3 Data Coverage

Aggregated data table supplied by GfK based on:

- Information covering Austria, Belgium, Germany, Spain, France, UK, Italy, Netherlands, Portugal, Sweden, Czech republic, Hungary, Poland, Slovakia. For percentages of markets covered in each individual country please refer to supporting PowerPoint File “GfK_Panelnews_MDA_Total_COVERAGES EU 14_SEP09-OCT09.ppt”
- For Fridge/Freezer combinations data covers the years 2000-2008 for **all** countries.
- For Freezers, data for 2000-2004 covers “Western European” countries only (ie excluding, Czech Republic, Hungary, Poland and Slovakia) and 2004 – 2008 for **all** countries listed.
- Data is reported to cover 57% of total sales in specified countries in 2000, but by 2008 coverage is reported to be over 90% of specified market.
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Section 2: Notes on Product Consumption

2.1 Test methodologies, Performance Standards and Labelling Requirements

Refer to section 1.1

2.2 Product Consumption Graphic

Refer to section 1.2

2.3 Data Coverage

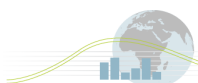
3 Refer to section 1.3

Section 3: Notes on Efficiency of Stock

No data available

Section 4: Notes on Consumption of Stock

No data available



Section 5: Notes on Policy Interventions

Commission Directive 2003/66/EC

Program Type: Mandatory Label

Year Published: 03/07/2003

Economy: EU Member Countries

Year Effective: 2004

Implementing Agency: National bodies of EU member Countries

Description:

The European Commission has now formally adopted a new directive (2003/66/EC) which extends the existing A-G energy labelling scale for domestic refrigeration appliances through the introduction of 2 new high efficiency classes (A+ and A++) from 1 July 2004.

The European Commission has issued a 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.

The framework directive provides a legal structure for the energy labelling of domestic appliances, requiring manufacturers and retailers to attach a label, including the energy performance, to the appliance when displayed for sale. The implementing directives describe what the indication should be for a specific appliance, given an energy consumption measured following a specified European test standard. These directives require EU member states to transpose the legal text into national law and have no legally binding meaning for citizens or companies.

Although a central directive is issued through the European Commission, each country needs to establish national legislation for the program to be enforced. Member States are responsible for all aspects of implementation including compliance, label accuracy, educational and promotional activities. Product suppliers need to provide proof of appliance efficiency and are also responsible for the supply of labels and brochures in appropriate languages.

This Directive shall apply to electric mains operated household refrigerators, frozen food storage cabinets, food freezers and their combinations. Appliances that may also use other energy sources, such as batteries, are excluded.

This directive is the amendment of the framework directive 94/2/EC implementing Council Directive 92/75/EEC for mandatory labelling scheme, which was agreed in 1992 and cancelled the framework directive 79/530/EEC.

The Commission Directive 2003/66/EC directive will enter into force on 1 July 2004.

Directive 96/57/EC Refrigerators, Freezers and Combinations**Program Type:** Minimum Energy Performance Standard - Mandatory**Product:** Refrigerator-freezers**Economy:** EU Member Countries**Year Published:** 03/09/1996**Year Effective:** 03/09/1999**Implementing Agency:** European Commission (EC) -
http://ec.europa.eu/enterprise/eco_design/index_en.htm**Voluntary Commitment on Reducing Energy Consumption of Household Refrigerators, Freezers and their Combinations****Program Type:** Minimum Energy Performance Standard - Voluntary**Product:** Refrigerator-freezers**Economy:** EU Member Countries**Description:** The European Commission has pursued voluntary agreement with the European Federation of Domestic Appliance Manufacturers (CECED) to improve the energy efficiency of household refrigerating appliances.**Year Published:** 31/10/2002**Year Effective:** Applicable from 2002-2010**Implementing Agency:** European Federation of Domestic Appliance Manufacturers -
<http://www.eced.org/>**IMPORTANT NOTE:** *Directive 96/57/EC will be repealed and is replaced by Regulation 2009/643/EC "Ecodesign requirements for household refrigerating appliances" in July 2010*