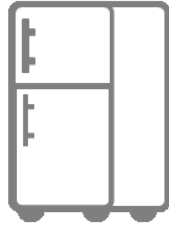
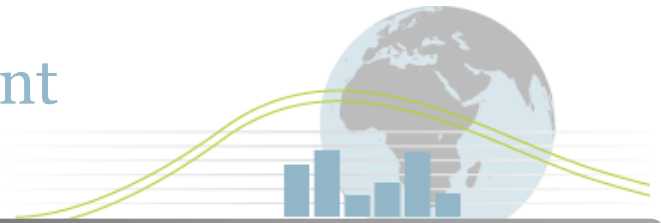


4E

Mapping Document



Country:	Denmark
Technology:	Domestic Cold Appliances
Sub Category:	Freezers and Refrigerator/ Freezers Combinations

Introduction

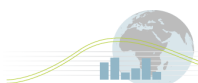
The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent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

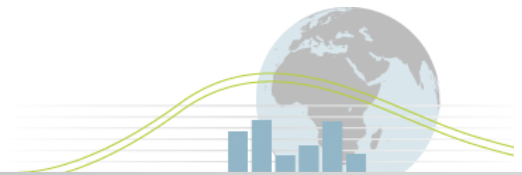
The summary definition for this product is:

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 below -12 (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) 			

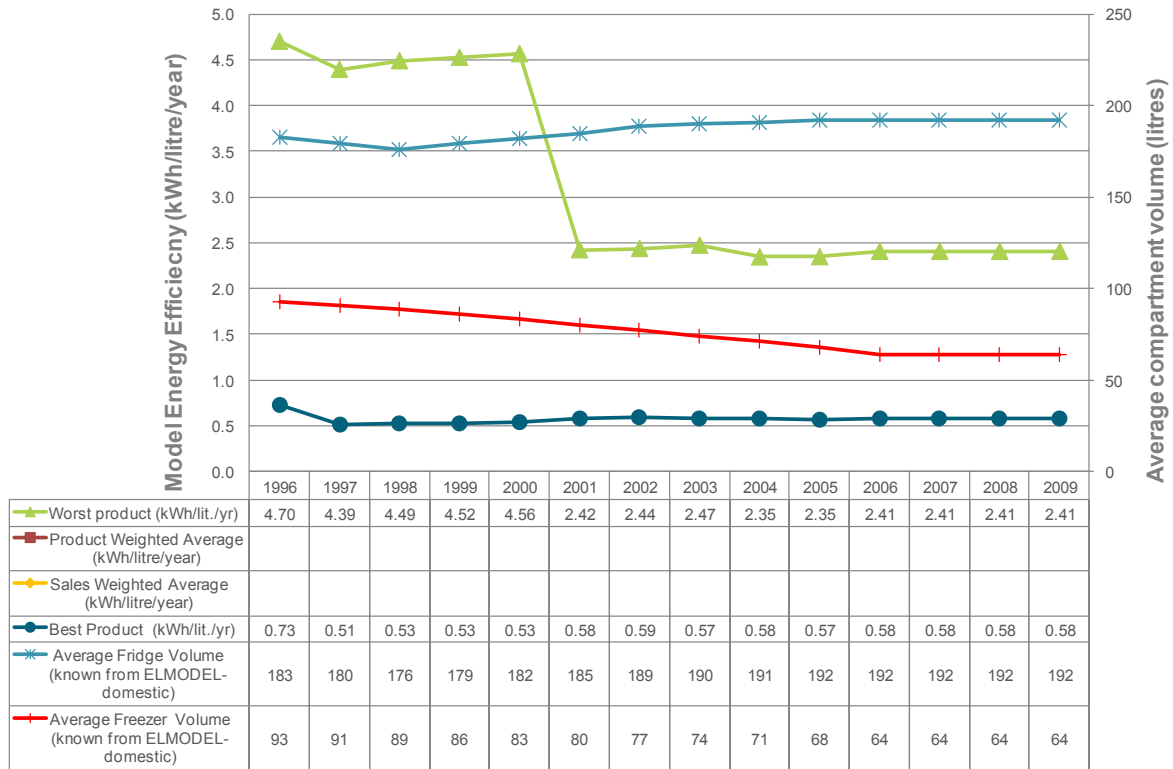
The detailed product definitions can be found at the Annex website:

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





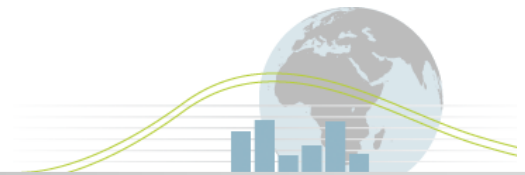
Energy Efficiency of New Fridge Freezers Denmark



Key notes on Graph (See notes section 1)

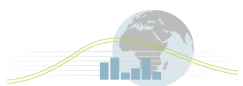
- Best and worst product data is sourced from the Danish Utilities' ELDA database.
- Average volumes are taken from a stock model and are therefore should only be viewed for indicative trends in new model volumes.

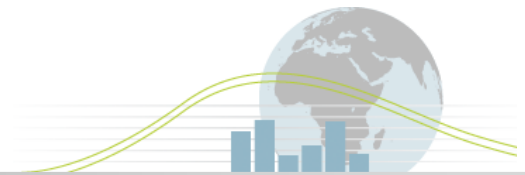




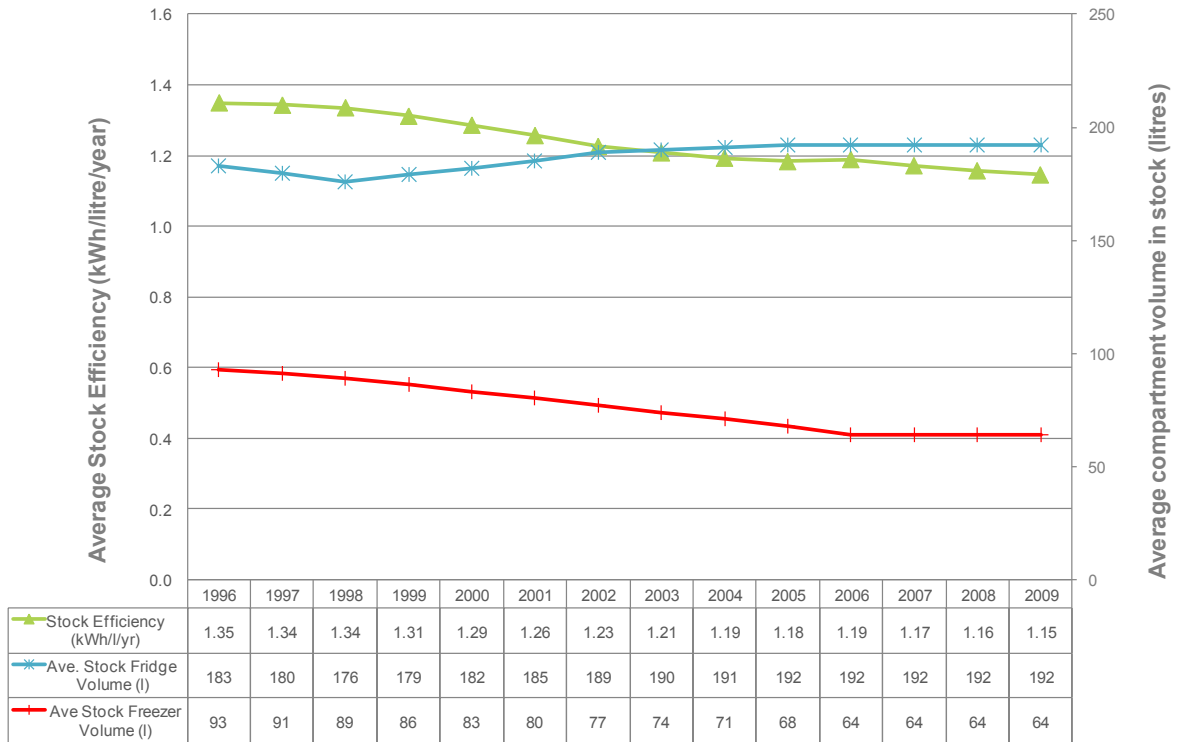
Energy Consumption of New Fridge Freezers Denmark

Insufficient data available for analysis.



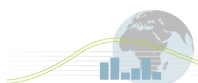


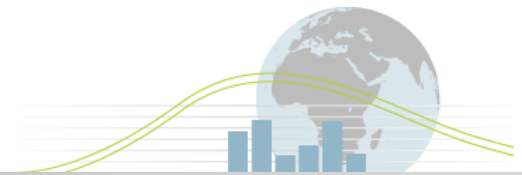
Energy Efficiency in the Installed Fridge Freezer Stock Denmark



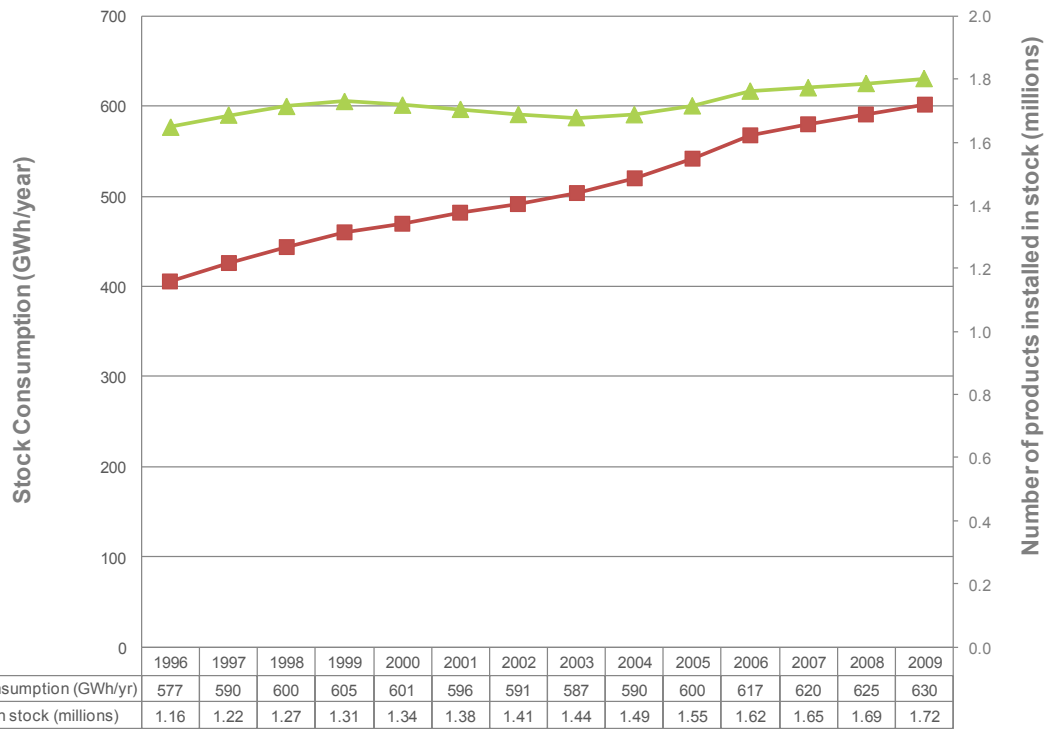
Key notes on Graph (See notes section 3)

- Data derived from the Danish stock model ELMODEL-domestic.



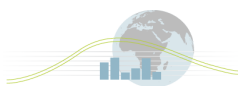


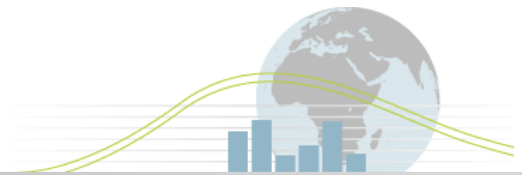
Energy Consumption in the Installed Fridge Freezer Stock Denmark



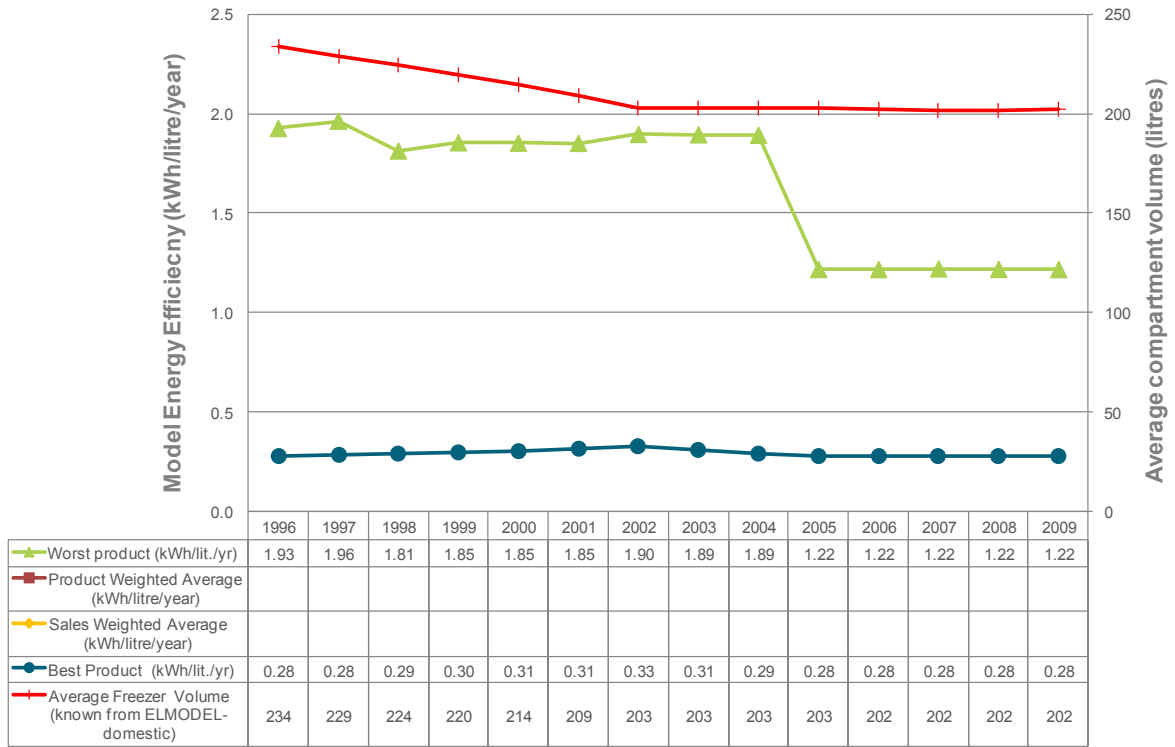
Key notes on Graph (See notes section 4)

- Data derived from the Danish stock model ELMODEL-domestic.



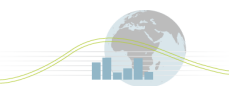


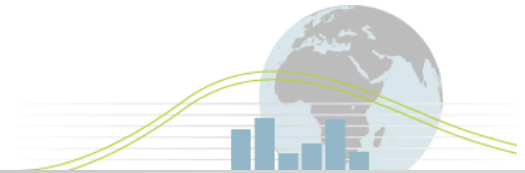
Energy Efficiency of New Freezers Denmark



Key notes on Graph (See notes section 1)

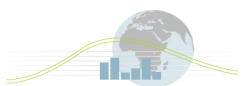
- Best and worst product data is sourced from the Danish Utilities' ELDA database.
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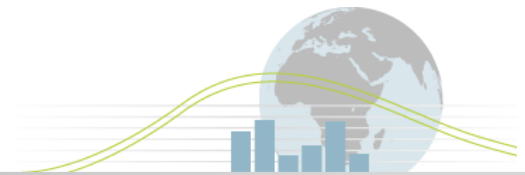




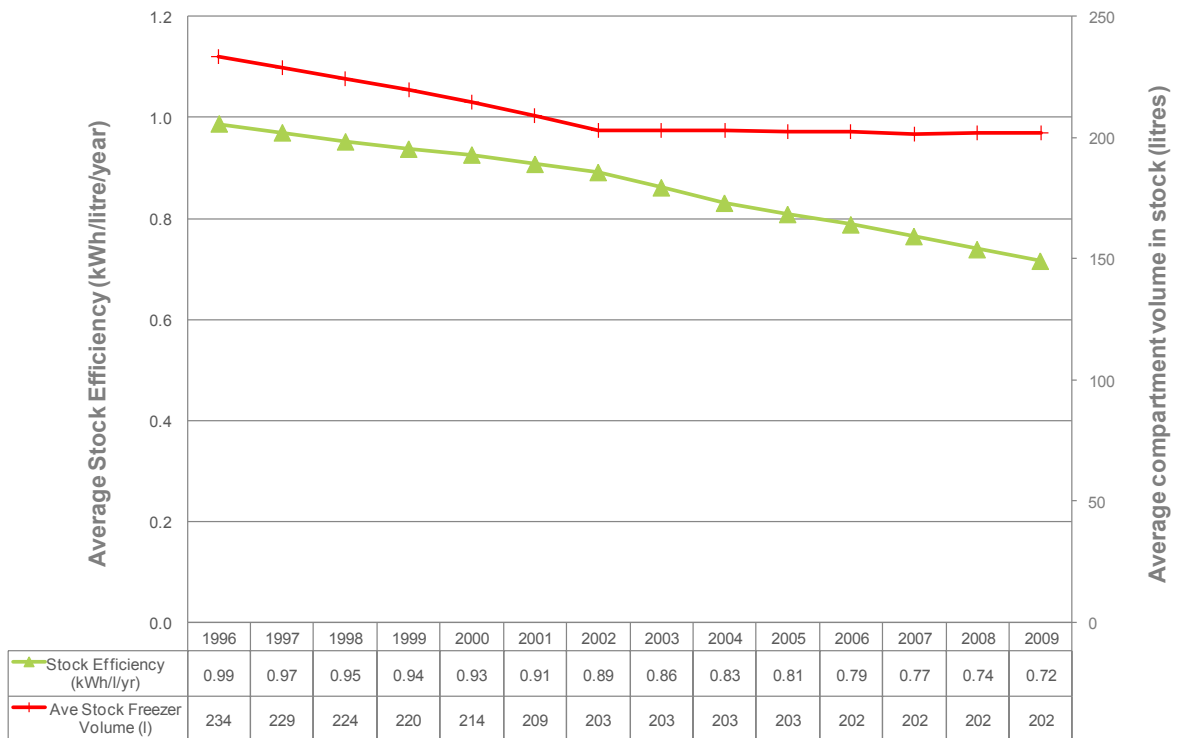
Energy Consumption of New Freezers Denmark

Insufficient data available for analysis.



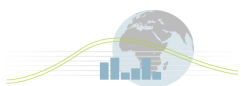


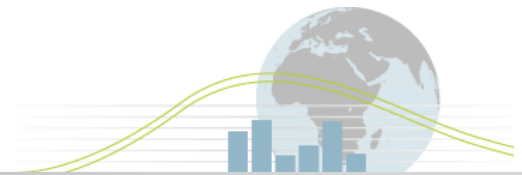
Energy Efficiency in the Installed Freezer Stock Denmark



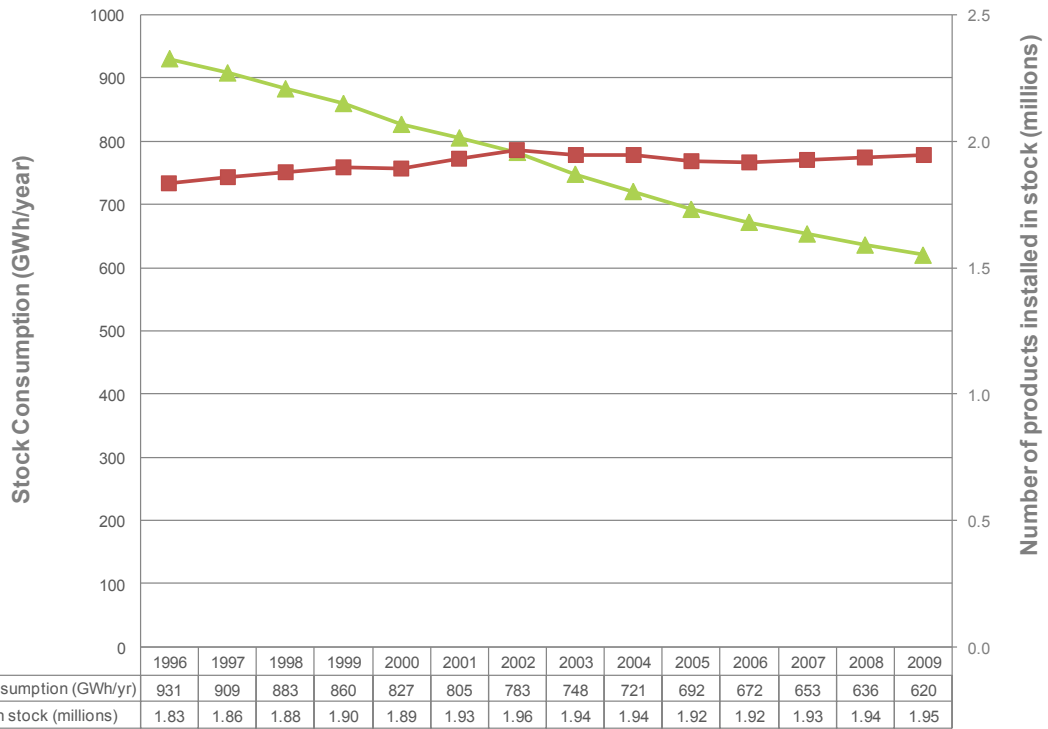
Key notes on Graph (See notes section 3)

- Data derived from the Danish stock model ELMODEL-domestic.



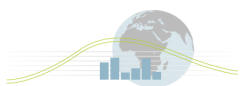


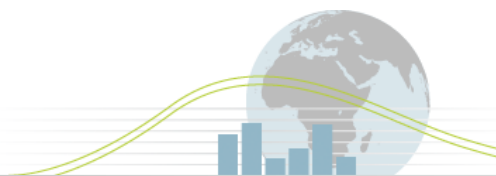
Energy Consumption of the Installed Freezer Stock Denmark



Key notes on Graph (See notes section 3)

- Data derived from the Danish stock model ELMODEL-domestic.





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	1999 – (July) 2010	Limit sales to A, B, C class, plus D & E for chest freezers	All cold appliances - improvement in the average efficiency over time
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

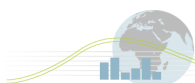
¹ www.legislation.hmso.gov.uk/si/si1994/Uksi_19943076_en_1.htm.

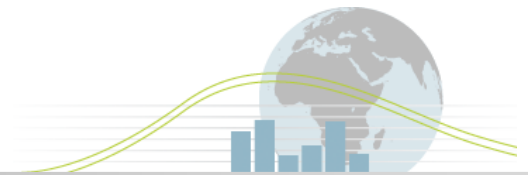
² www.opsi.gov.uk/si/si1997/19971941.htm

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.

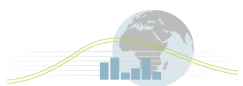
<http://www.cecce.eu/ICECED/easnet.dtl/ExecReq/Redirection?eas:oldfilename=/community/files/296/phpXLy1ow/UICCOLD2002.pdf>

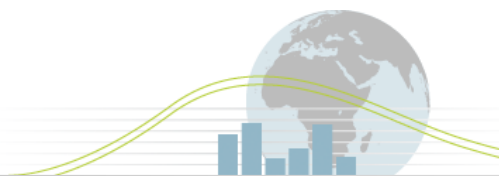




Cultural Issues (See Notes Section 6)

No Information provided.





Notes on data

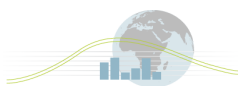
Section 1: Notes on Product Efficiency

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

Sources:

Efficiency data: Danish Utilities' ELDA database.

Volume data: Danish stock model ELMODEL-domestic.

Key calculations undertaken:

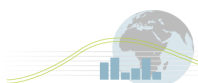
Derived Total Model Volume: based on net volume (as defined in local regulations), multiply freezer by 2.15 (EU standard) to get equivalent fridge volume. Add this volume to the net fridge volume to establish the net total volume normalised to refrigerator. This volume is the Derived Total Volume

Derived Model Energy Consumption: based on total annual energy consumption under test conditions, multiply by factor to correct for external test temperature during test (3% addition in energy consumption for each degree C below 25 and 3% reduction for each degree C above 25). Reduce consumption by 5% if the unit has an ice maker. This energy consumption is the Derived Unit Energy Consumption

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.

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

None

Section 3: Notes on Efficiency of Stock

Source: Danish stock model ELMODEL-domestic.

Section 4: Notes on Consumption of Stock

Source: Danish stock model ELMODEL-domestic.

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 labeling of household electric refrigerators, freezers and their combinations.

The framework directive provides a legal structure for the energy labeling 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 labeling 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

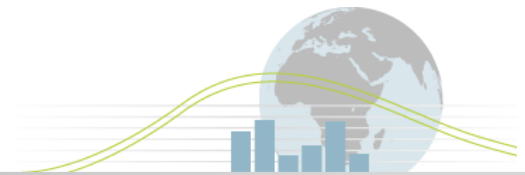
Product: Refrigerator-freezers

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.ceced.org/>

