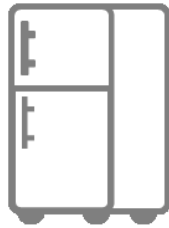
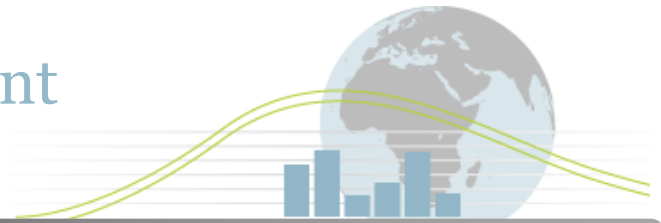


4E

Mapping Document



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

Introduction

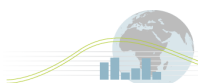
The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent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

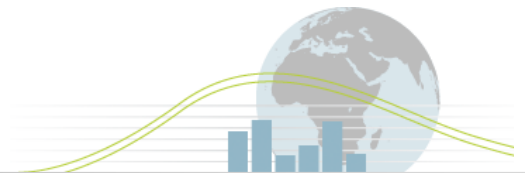
The summary definition for this product is:

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) 			

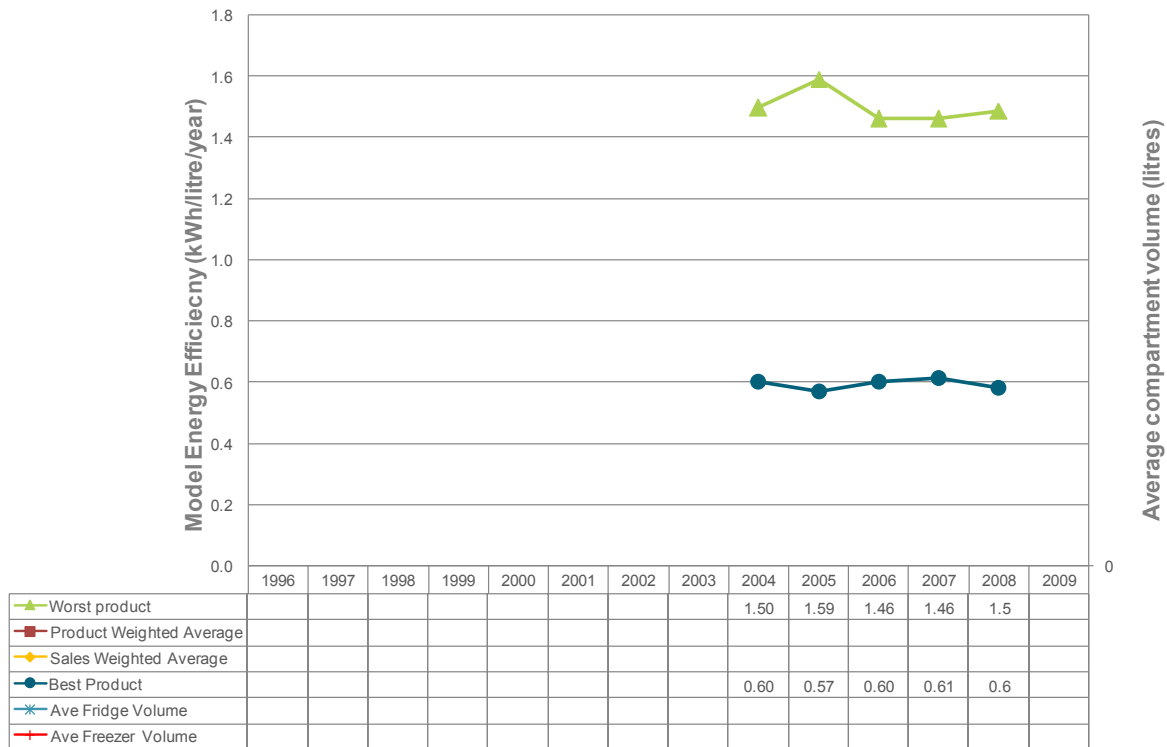
The detailed product definitions can be found at the Annex website:

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





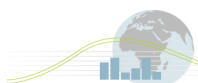
Energy Efficiency of New Fridge Freezers France

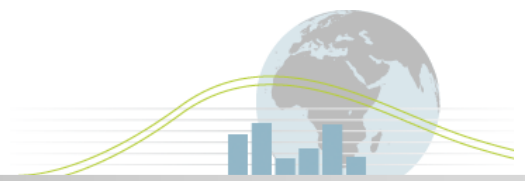


Key notes on Graph (see notes section 1)

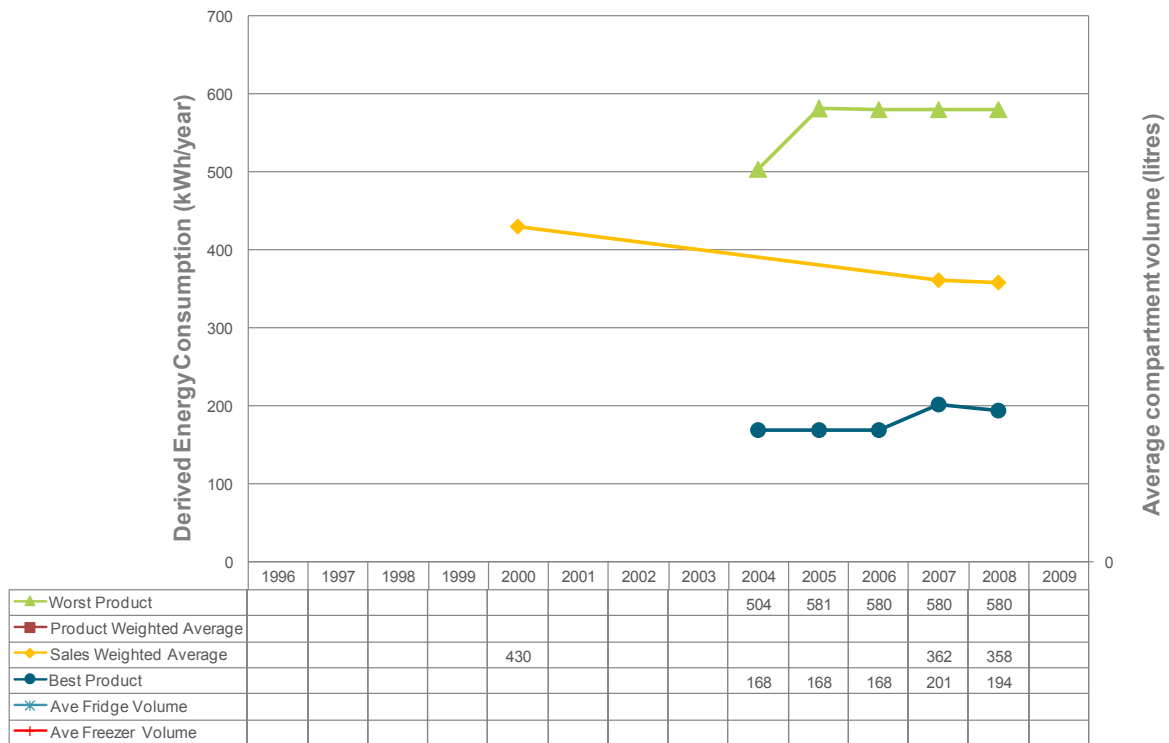
- Data availability limited to information available from TOPTEN¹. TOPTEN is categorisation is based on the Energy Efficiency Index and therefore best and worst data shown here may not be the actual best/worst product in the market as defined by tested consumption divided by adjusted volume used in other.
- Insufficient data was available to present trends in average compartment volume.
- Best and Worst energy efficiency figures are based on performance under local test conditions and adjusted to standardise fridge/freezer volume based on conversion factors used in the EU. No adjustment was made to account for through the door ice-making units as no information was available in the dataset.

¹ <http://www.topten.info/>





Energy Consumption of New Fridge Freezers France

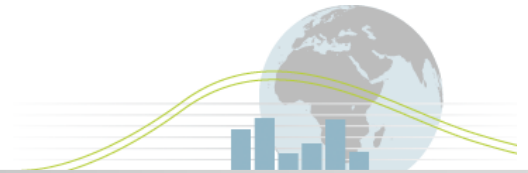


Key notes on Graph (See notes section 2)

- Data availability limited to information available from TOPTEN². TOPTEN is categorised based on the Energy Efficiency Index and therefore best and worst data shown here may not be the actual best/worst product in the market as defined by tested consumption divided by adjusted volume used in mappings of other countries. Insufficient data was available to present trends in average compartment volume.
- The dataset available did not differentiate between refrigerators and combination fridge/freezers. Thus only units with 2 doors have been considered in this analysis as they are likely to be combination fridge/freezer units.
- Sales weighted consumption figures are only based on actual data for the year 2000. Data points for 2007 and 2008 are calculated based on ratios from earlier years.
- Best and Worst energy efficiency figures are based on performance under local test conditions and adjusted to standardise fridge/freezer volume based on conversion factors used in the EU. No adjustment was made to account for through the door ice-making units as not information was available in the dataset.

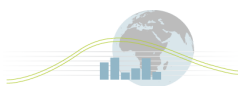
Energy Efficiency in the Installed Fridge Freezer Stock

² <http://www.topten.info/>

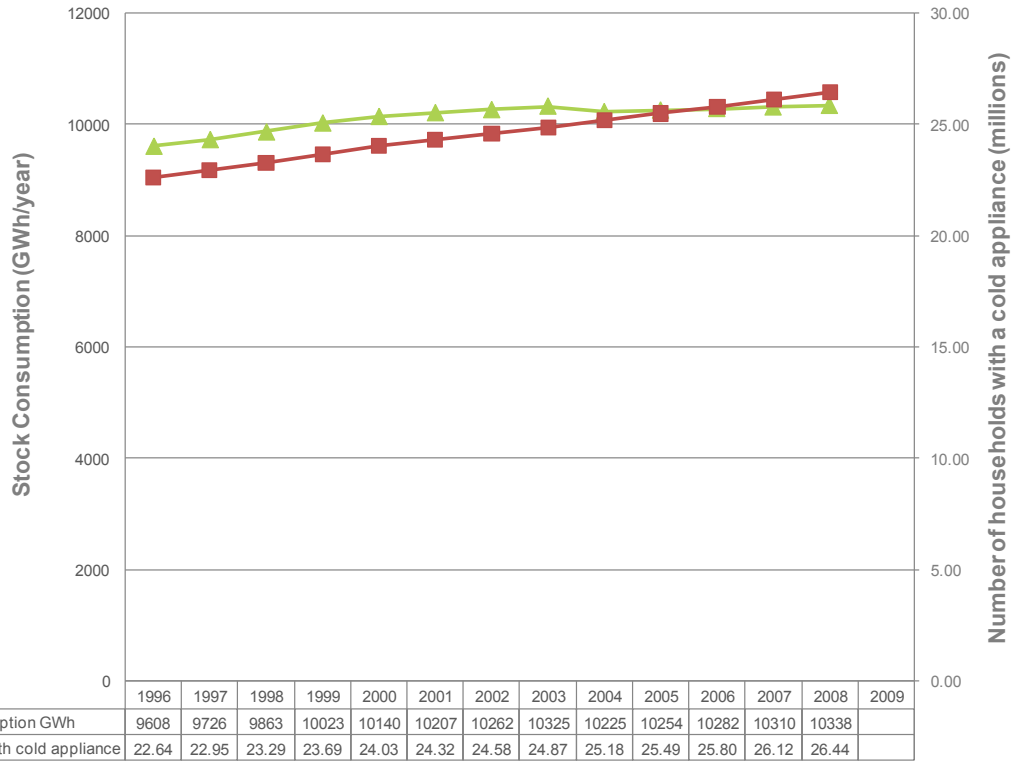


France

Insufficient data available for analysis.



Energy Consumption in the Installed Fridge Freezer Stock France



Key notes on Graph (see Notes Section 4)

- The dataset provided did not distinguish between fridges and fridge freezers and so stock consumption figures presented are actually the total for both. This therefore overestimates the consumption in the stock.
- Number of households with a cold appliance is actually the total of any type – not just fridge freezers combinations. Some houses may have multiple appliances and this will therefore underestimate the number of appliances. Based on other markets, the affect of this increases in recent years i.e. a growing number of houses are purchasing multiple cold appliances.

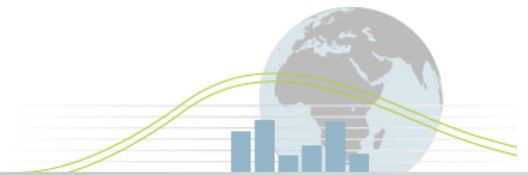
Energy Efficiency of New Freezers France



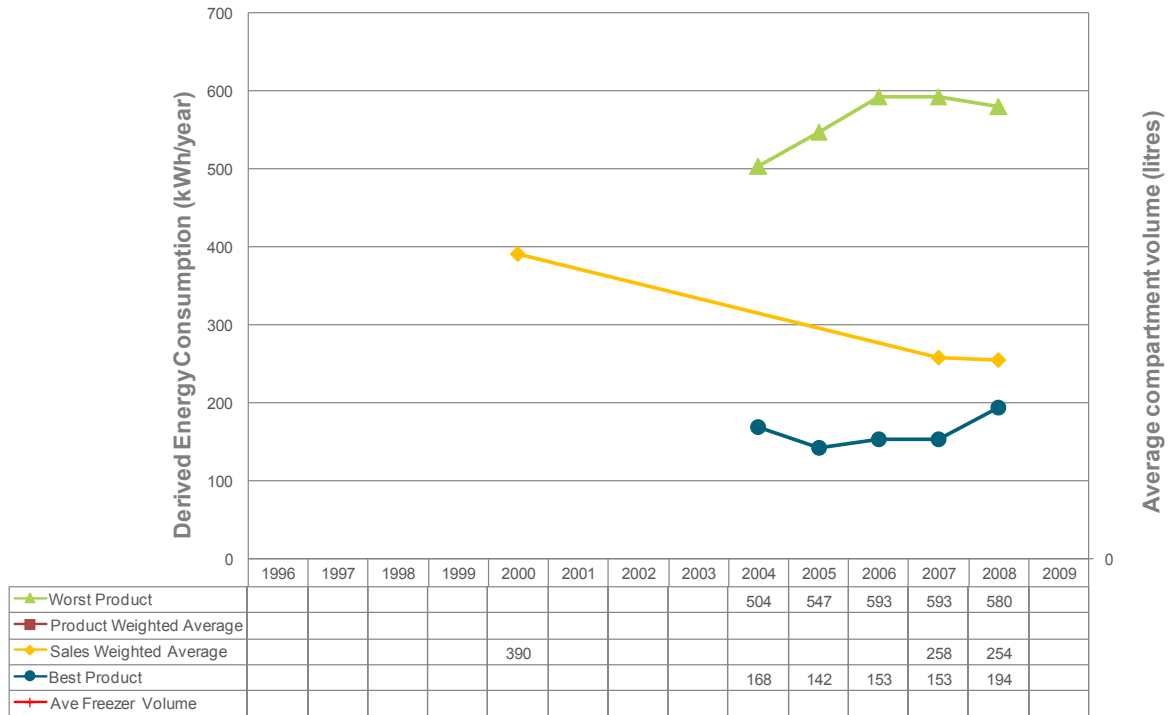
Key notes on Graph (see notes section 1)

- Data availability limited to information available from TOPTEN³. TOPTEN is categorisation is based on the Energy Efficiency Index and therefore best and worst data shown here may not be the actual best/worst product in the market as defined by tested consumption divided by adjusted volume used in mappings of other countries.
- Insufficient data was available to present trends in average compartment volume.
- Energy consumption and efficiency figures are based on performance under local test conditions and are adjusted to a “standardised” refrigerator equivalence volume (based on conversion factor used in the EU).

³ <http://www.topten.info/>

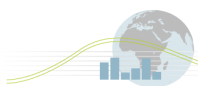


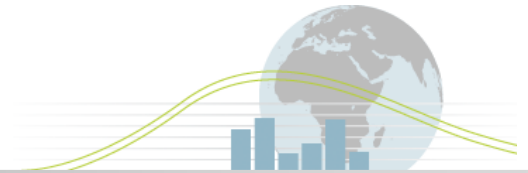
Energy Consumption of New Freezers France



Key notes on Graph (See notes section 2)

- Best and Worst product data is from TOPTEN which is based on the Energy Efficiency Index and therefore both the data shown here may not be the actual best/worst product.
- Insufficient data was available to present trends in average compartment volume.
- Energy consumption and efficiency figures are based on performance under local test conditions and are adjusted to a “standardised” refrigerator equivalence volume (based on conversion factor used in the EU).

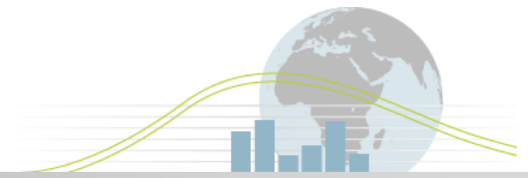




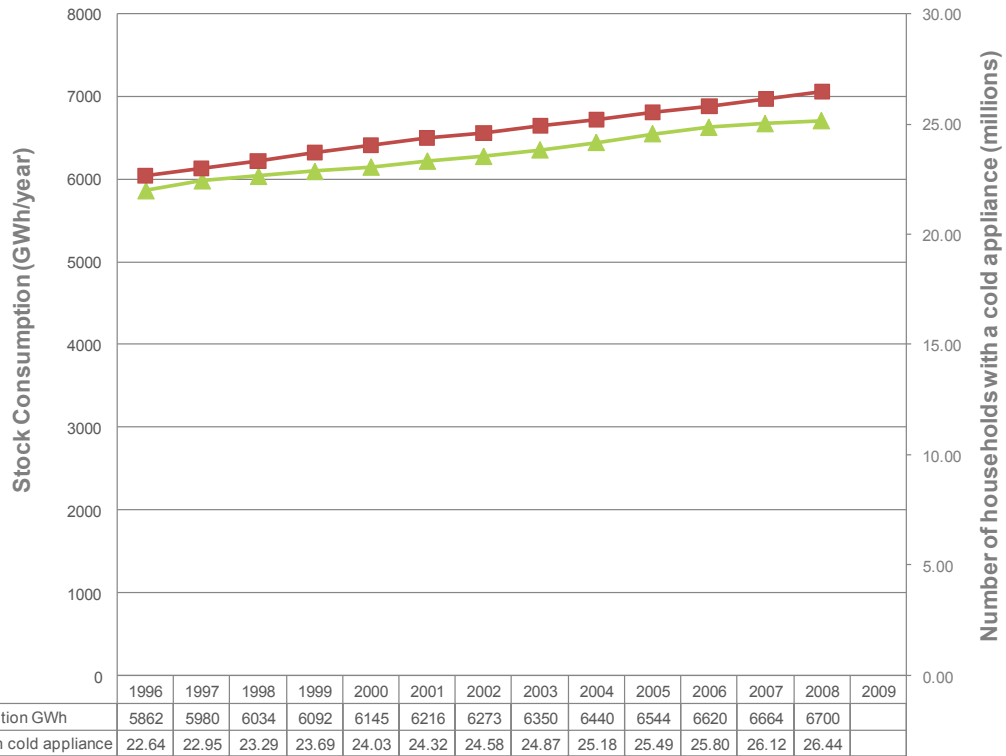
Energy Efficiency in the Installed Freezer Stock France

Insufficient data available for analysis.



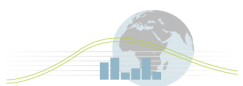


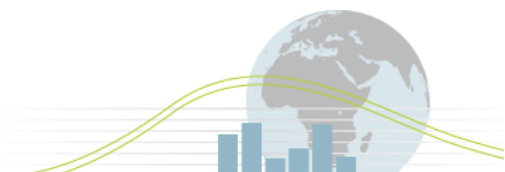
Energy Consumption of the Installed Freezer Stock France



Key notes on Graph (see Notes Section 4)

- Number of households with a cold appliance is actually the total of any type – not just freezers. Some houses will have multiple appliances and this will therefore underestimate the number of appliances and give no indication on the actual number of freezers.





Major Policy Interventions (See notes Section 5)

Policy based on EU requirements:

Policy name	Period in force	Description	Impact <i>Relative impact of policy</i>
EC Energy Label ⁴	1995 – 2010	Defines A to G efficiency classes	All cold appliances to be labelled – improvement in the average efficiency over time
EC MEPS (EuP) ⁵	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 ⁶	2004-2010	Defines A+ and A++ classes	All cold appliances - improvement in the average efficiency over time
Industry Commitment ⁷	2002 - 2010	CECED commitment: only B or better (except chest freezers) on market by end 2004	Improvement in the average efficiency over time

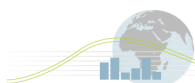
⁴ www.legislation.hmso.gov.uk/si/si1994/Uksi_19943076_en_1.htm.

⁵ www.opsi.gov.uk/si/si1997/19971941.htm

⁶ www.opsi.gov.uk/si/si2007/ukxi_20072037_en_1

⁷ "Voluntary commitment of reducing energy consumption of household refrigerators, freezers and their combinations (2002-2010)" 31st October 2002.

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

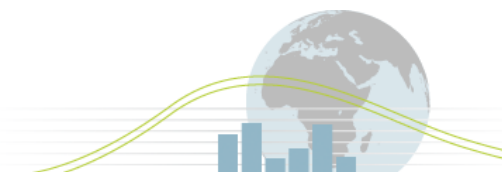


Cultural Issues (See Notes Section 6)

- The age and quantity of stock in France is shown here:

Age of stock appliances (Sofres - 2006)					
Installed stock (Sofres data)	Age	> 15 years	15 years	10 years	5 years
	Fridge/Freezers	5,100	3,800	8,600	5,900
	Freezers	4,000	2,600	4,900	2,900
	Total	9,100	6,400	13,500	8,800

- 15 500 000 cold appliances are more than 10 years, i.e. 41% of the stock
- The REMODECE project reports a decline of 33 % on the annual consumption of refrigerators (of 334 kWh / year in 1995 to 253 kWh / year in 2007) but an increase of 48 % of their average volume (193 liters to 286 liters).
It also reports a decline of the annual consumption of the post "Cold appliances" of 36 % since the French campaign measurement CIEL of 1995 but a 13 % increase in volume for the refrigeration and 24 % for the freezing during these last 10 years.
The average volume of freezers increased by 32 % during these last 10 years.



Notes on data

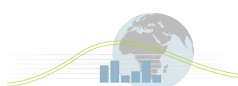
Section 1: Notes on Product Efficiency

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	
Fridge compartment	Mean temp of +5°C (no tolerance because in general, the energy consumption at this temp is obtained by interpolation.)
Freezer compartment (3 or 4 star compartment)	-18°C or colder

1.2 Product Efficiency Graphic

Sources:

2008 best and worst product data: Encodex - Indice d'efficacité énergétique - Octobre 2008 and Topten - France (Sophie Attali - Sept. 2009)

2004-2007 best and worst product data: Topten - France (Sophie Attali - Sept. 2009)

Key calculations undertaken:

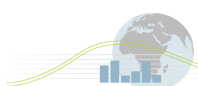
Derived Total Model Volume: based on net volume (as defined in local regulations) with freezer compartment volume multiplied by a correction factor (in France, 2.15 for both Refrigerator Freezers and Freezers) to get equivalent fridge volume. Add this volume to the net fridge volume to establish the net total volume normalised to a refrigerator equivalent. This volume is the Derived Total Volume.

Derived Model Energy Consumption: based on total annual energy consumption under local test conditions, reducing 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).



Section 2: Notes on Product Consumption

2.1 Test methodologies, Performance Standards and Labelling Requirements

Refer to section 1.2

2.2 Product Consumption Graphic

Refer to section 1.3

Additional source:

Sales weighted average data: GIFAM : Groupement Interprofessionnel des Fabricants d'Appareils d'équipement Ménager - Interprofessional grouping of the manufacturers of devices of domestic equipment

Average annual energy consumption for new products

Year product	1980	1985	1990	1995	2000	2007	2008
Fridge 1door	360	330	300	250	210		
Fridge/Freezers	760	610	600	480	430		
Fridge/Freezers annual consumption	560	470	450	365	320	272	269
Upright freezers	700	570	530	500	470		
Freezers	530	410	380	350	310		
Freezers annual consumption	615	490	455	425	390	258	254

All data in kWh/year

Further notes:

- Data availability limited to information available from TOPTEN⁸. TOPTEN is categorised based on the Energy Efficiency Index and therefore best and worst data shown here may not be the actual best/worst product in the market as defined by tested consumption divided by adjusted volume used in mappings of other countries. Insufficient data was available to present trends in average compartment volume
- The dataset available did not differentiate between refrigerators and combination fridge/freezers. Thus from the available product data it was impossible to identify exactly which units belonged to which category. Therefore, units with one door have been excluded as, in almost all cases, the freezer volume *implies* a refrigerator with an ice box or small freezer unit internal to the refrigeration unit rather than a combination fridge-freezer unit. Thus only units with 2 doors have been considered in this analysis

Sales weighted consumption figures for fridge freezers are actual data for the year 2000. Data points for 2007 and 2008 are calculated from actual data for fridges and fridge freezers combined. It is assumed that the ratio between AEC for fridges and fridge freezers in years 1980, 1985, 1990, 1995 and 2000 in the table below (which is constant within a few percent)

⁸ <http://www.topten.info/>

remains constant in years 2007 and 2008.

Average annual energy consumption for new products

Year product	1980	1985	1990	1995	2000	2007	2008
Fridge 1door	360	330	300	250	210		
Fridge/Freezers	760	610	600	480	430		
Fridge/Freezers annual consumption	560	470	450	365	320	272	269
Upright freezers	700	570	530	500	470		
Freezers	530	410	380	350	310		
Freezers annual consumption	615	490	455	425	390	258	254

All data in kWh/year

- Best and Worst energy efficiency figures are based on performance under local test conditions and adjusted to standardise fridge/freezer volume based on conversion factors used in the EU.

Section 3: Notes on Efficiency of Stock

None.

Section 4: Notes on Consumption of Stock

Source: CEREN : Centre d'Etudes et de Recherches économiques sur l'Energie's report : "Evolution des consommations unitaires des residences principales de 1973 à 2007".

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

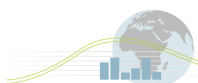
Implementing Agency: National bodies of EU member Countries

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 entered 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

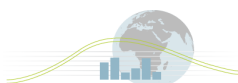
Economy: EU Member Countries

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/>



Section 6: Notes on Cultural Issues

Age of Stock Source: GIFAM : Groupement Interprofessionnel des Fabricants d'Appareils d'équipement Ménager - Interprofessional grouping of the manufacturers of devices of domestic equipment .

Age of stock appliances (Sofres - 2006)					
Installed stock (Sofres data)	Age	More than 15 years	15 years	10 years	5 veras
		Fridge/Freezers	5,100	3,800	8,600
	Freezers	4,000	2,600	4,900	2,900
	Total	9,100	6,400	13,500	8,800

15 500 0000 cold appliances are more than 10 years, it is 41% of the stock

Other Source: REMODECE project it's a UE project financing by Energy Intelligent for Europe programme.

The aim of the REMODECE project was to contribute to an increased understanding of current and impending electricity use by European households resulting from different types of equipment, consumers' lifestyles, and comfort levels.

For more information :

<http://www.isr.uc.pt/~remodece/>