



Domestic Refrigerated Appliances Actions and Assumptions: UK Data

The aim of this document is to detail the actions and assumptions made in interpreting and processing the data specified above during the mapping and benchmarking of domestic refrigerated appliances. It is designed to be read in parallel with the document "Domestic Refrigerated Appliances - Summary Overall Mapping and Benchmarking Approach - IEA 4E". Section numbers in each document should align.

1 Overview of the mapping and benchmarking outputs for domestic refrigerated appliances

No data specific actions.

2 The mapping and benchmarking process for domestic refrigerated appliances

2.1 Data Cleaning and Pre-processing

2.1.1 Data cleaning

- a. The dataset "IEA Refrigerator data" which covers years 2008-2010 did not explicitly distinguish Mapping & Benchmarking product type i.e. between refrigerators, refrigerators with a freezer compartment and fridge freezers. The supplied fields "Freezer Volume" and "Product type/classification" were used to allocate M&B product types based on the following assumptions:

	Freezer Volume	Product type/classification
Refrigerators and refrigerators with a freezer compartment	<14l	Any *
	>14L	0*, *, or **
Fridge freezers	>14L	*** or ****

Fridge data in datasets prior to 2008 did not include a star rating and consequently could not be allocated in the same way. Where the data is labelled as having "no freezer" or where the freezer volume is <14l, it is allocated as a refrigerator of EU type 1 with the freezer rating assumed to be 1*. In other cases, all models are assumed to be fridge freezers¹ of EU type 7 with the freezer rating assumed to be 4*.

In years 2003 and 2004, volume data was only supplied for the whole unit rather than by compartment. This makes it impossible to calculate UEE and EEI for these years and therefore these datasets are excluded from the analysis other than for freezers and for the UEC calculations for "All" models.

¹ Based on an analysis of 2008 data (the closest year for which data was available), the vast majority of units with a freezer compartment volume >14l have a freezer rating of 3* or 4*.

The dataset for 1999 only had freezer and fridge freezer data and therefore is also excluded from the "All" analysis.

All freezer models were taken from a specific freezer dataset that was submitted separately, or from a separate section of a single dataset, and therefore no data cleaning was required.

2.1.2 Pre-processing

The pre-processing of data:

- b. Allocation of Mapping and Benchmarking and EU product types. This allocation was based on the "Type", "Freezer volume" and Freezer rating fields. Allocation for the Refrigerators, Freezers and Refrigerator Freezer Data sets as follows:

Field-Field-Field Type-Freezer volume- Freezer rating	Mapping and Benchmarking Category	EU type
Freezer-All Volumes-Unknown Configuration	Freezer	8
Freezer-All Volumes -Chest	Freezer	9
Freezer-All Volumes -Upright	Freezer	8
Freezer-<14l-Upright	Freezer	8
Fridge freezer->=14l-3*	Fridge freezer	6
Fridge freezer->=14l-4*	Fridge freezer	7
Fridge freezer->=14l-Unknown*	Fridge freezer	7
Fridge freezer-Volume Unknown-3*	Fridge freezer	6
Fridge freezer-Volume Unknown-4*	Fridge freezer	7
Refrigerator-Volume Unknown-1*	Refrigerator	1
Refrigerator-Volume Unknown-2*	Refrigerator	1
Refrigerator-Volume Unknown-No*	Refrigerator	1
Refrigerator-<14l-1*	Refrigerator	1
Refrigerator-<14l-2*	Refrigerator	1
Refrigerator-<14l-3*	Refrigerator	1
Refrigerator-<14l-4*	Refrigerator	1
Refrigerator-<14l-No*	Refrigerator	1
Refrigerator-<14l-U*	Refrigerator	1
Refrigerator with a freezer compartment->=14l-1*	Refrigerator with a freezer compartment	4
Refrigerator with a freezer compartment->=14l-2*	Refrigerator with a freezer compartment	5
Refrigerator with a freezer compartment-Volume Unknown-1*	Refrigerator with a freezer compartment	4
Refrigerator with a freezer compartment-Volume Unknown-2*	Refrigerator with a freezer compartment	5

2.2 Production of Graphical Mapping Outputs

EU adjusted volume test methodology used - see section 2.3.2 for details.

2.3 Normalisation

2.3.1 Normalisation Overview

No data specific actions.

2.3.2 Allocation of declared UEC to compartments

The adaptation of the EU methodology used in this analysis requires knowledge of the compartment defrost type. In the UK this is known for the majority of models. Where in the limited number of cases where the defrost type of a particular model is unknown, the model is allocated a factor based on the model weighted model

weighted average of the known defrost type of models that year. The weighting given is shown in the table below (note all refrigerators are assumed to be manual defrost):

Year	Fridge-freezer % sales	Market average CF Fridge-freezers	Upright freezer % sales	Market average CF Upright freezers	Chest freezer % sales	Market average CF chest freezers
2000	27.40%	1.05	8.3%	1.017	Na	
2001	-		-		Na	
2002	40 %	1.08	6%	1.012	Na	
2003	46%	1.09	11.04%	1.022	Na	
2004	-		-		Na	
2005	56%	1.11	11.04%	1.022	Na	
2006	-		-		Na	
2007	56.8%	1.11	17.7%	1.035	Na	
2008	61.1%	1.12	23%	1.046	Na	
2009	61.9%	1.12	22.3%	1.045	Na	
2010	59.9%	1.12	20.20%	1.040	0.39%	1.00078

2.3.3 Normalisation of “compartment EC” for test temperature variations and calculation of normalised UEC

Normalisation to EU regulations, therefore not applicable in the EU.

2.3.4 Calculation of Normalised UEE

No data specific actions.

2.3.5 Calculation of normalised EEI

No data specific actions.

3 Additional Analysis

Additional analysis will investigate the impact of the use of climate class and the built-in units on the EU EEI. Information on the percentage of built in models and the climate class of models on sale in the UK is as follows:

Proportion of Models that are built-in²:

Year	Refrigerator % sales	Fridge-freezer % sales	Upright freezer % sales
2000	6.1% (branded only)	0.80%	5.4%

² This is all Built In models rather than just those that would qualify for the Built In correction factor in the EU test method. Qualification for that has additional requirements.

2001	-	-	-
2002	7.2%	0.7%	6.2%
2003	11.6%	3.7%	8.6%
2004	12.5%	4.7%	8.8%
2005	13.6%	4.7%	9.0%
2006	12.8%	5.3%	12.2%
2007	15.2%	6.8%	15.8%
2008	15.0%	6.8%	11.9%
2009	14.8%	6.7%	11.9%
2010	14.5%	7.0%	10.8%

Proportion of Models of Varying Climate Class (data available for 2010 only)

2010	Refrigerator % sales	Fridge- freezer % sales	Upright freezer % sales	Chest freezer % sales
T class max	3.1%	20.3%	11.3%	21.6%
ST class max	44.8%	15.3%	37.9%	7.6%
% of all sales with known climate class	44%	51.4%	44.7%	34.2%