



## Domestic Refrigerated Appliances Actions and Assumptions: EU 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

No data cleaning was undertaken.

##### 2.1.2 Pre-processing

- a. All data was provided as market averages in the form shown in the table below:

Metric	Year
Product Weighted Energy Consumption [kWh]	
Sales Weighted Energy Consumption [kWh]	
Product Weighted Freezer Volume [Litres]	
Product Weighted Fridge Volume [Litres]	
Sales Weighted Freezer Volume [Litres]	
Sales Weighted Fridge Volume [Litres]	
Sales Units With auto defrost %	
Sales Units Without auto defrost %	
Sales Units Built in/under %	
Sales Units With ice-cube dispenser %	
Coverage %	
Number of products	
Sales [Thousand Units]	

- b. Data for refrigerators and refrigerators with a freezer compartment was supplied as two tables for:

1. refrigerators with a 0\*, 1\* or 2\* rated freezer compartment, and
2. refrigerators with a 3\* or 4\* freezer compartment of a volume less than 14 litres.

The results shown for refrigerators and refrigerators with a freezer compartment are the weighted averages of these two tables.

- c. Although not shown in the mappings, the results for "All refrigerated appliances" analysis for the benchmarking report includes a small percentage of models (approx. 2% to 10%) and sales (approx. 0.5% to 3%) that are not included in the M&B sub-category results because these entries did not include data on some characteristic that was necessary to select the sub-category to which they belonged.
- d. Compartments within the various EU unit types were allocated to one of mapping and benchmarking compartment categories based on the table below:

EU GfK Grouping	Compartment Allocations for Fresh, Frozen and "Other Compartment Volumes (T=degC)					
	14°C >= T > 5°C	5°C >= T > =3°C	3°C > T > -2°C	-2°C >= T > -9°C	-9°C >= T > -15°C	T <= -15°C
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
COOLING 0-1-2 Stars <sup>1</sup>		Fresh Volume			Frozen Volume	
COOLING 3-4 Stars		Fresh Volume				Frozen Volume
FREEZERS						Frozen Volume

## 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. As the percentage of sales with auto-defrost is known, the frost free factor (*FFc*) applied for any given M&B sub category in any given year, is calculated by:

$$FFc = 1 + [\% \text{ of } / \text{sales}^2 \text{ with auto defrost} * 0.2]$$

<sup>1</sup> Note that the 0,1 and 2 star frozen compartments are all allocated to the equivalent 2 star temperature range as a breakdown by individual compartment type was unavailable. This is likely to have the effect of analysis slightly overstating the average total adjusted volume of units, and consequently UEE values will appear slightly lower than actual values.

<sup>2</sup> The percentage of *models* with auto-defrost is unknown, therefore the percentage of sales is used as a proxy for calculating product average adjusted volumes, and subsequently UEE and EEI.

### **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.