



## Domestic Refrigerated Appliances Actions and Assumptions: Denmark 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. Removal of all models for which the "end date" field is shown as prior to 1996
- b. Allocation of model availability for any given year based on the “Start Date” and “End Date” inclusive.
- c. Allocation of market wide sales data by energy label to individual models in any given year using the following formula:

*Sales of model x = [Total Sales of ALL MODELS in "Type" category with Energy Label N] / [Count of ALL MODELS in category with Energy Label N]*

*Where:*

*Type Categories: Fridge w/ icebox, Fridge, Combined fridge/freezer, Chest freezer, Upright freezer*

*Energy label categories: A++, A+, A, B, Other*

No sales data was available for 2011 and so 2010 sales data has been used as a proxy for 2010.

## 2.1.2 Pre-processing

The pre-processing of data:

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

Field-Field Type-Freez rating	Mapping and Benchmarking Category	EU type	Configuration
Chest freezer-blank	Freezer	9	Chest
Combined fridge/freezer- .	Fridge Freezer	7	Unknown
Combined fridge/freezer-blank	Fridge Freezer	7	Unknown
Combined fridge/freezer- ****	Fridge Freezer	7	Unknown
Fridge-blank	Refrigerator	1	Refrigerator
Fridge w/ icebox- Uden *	Refrigerator with Freezer	4	Refrigerator with Freezer
Fridge w/ icebox- *	Refrigerator with Freezer	4	Refrigerator with Freezer
Fridge w/ icebox- **	Refrigerator with Freezer	5	Refrigerator with Freezer
Fridge w/ icebox- ***	Fridge Freezer	6	Unknown
Fridge w/ icebox- ****	Fridge Freezer	7	Unknown
Fridge w/ icebox- .	Refrigerator with Freezer	4	Refrigerator with Freezer
Fridge w/ icebox-blank	Refrigerator with Freezer	4	Refrigerator with Freezer
Upright freezer-blank	Freezer	8	Upright

## 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 methodology requires knowledge of the compartment defrost type to allocate a factor for the extra functionality. In the Danish dataset this is known for the majority of models. 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 average of the known defrost types across all years. The weighting given is shown in the table below:

	ALL models	Refrigerators	Refrigerators with a Freezer compartment	Fridge freezers	Freezers
% of models with auto defrost in all years	67.6%	100.0%	52.4%	100.0%	0.0%
Factor allocated to models with unknown defrost type	1.1352	1.2	1.1048	1.2	1

### **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.