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Lot 22

**Domestic and commercial ovens (electric,
gas, microwave), including when
incorporated in cookers**

Task 2: Economic and Market Analysis

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In association with

ERA
TECHNOLOGY

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Contents

2.	Task 2 – Economic and Market analysis	5
2.1.	Generic economic data	5
2.2.	Market and stock data	8
2.2.1.	Domestic appliances	8
2.2.1.1	Sales data	9
2.2.1.2	Stock data	25
2.2.2.	Commercial ovens used in restaurants	32
2.2.2.1	Sales data	32
2.2.2.2	Stock data	34
2.2.3.	Commercial ovens used in bakeries	41
2.2.3.1	Stock data	42
2.2.3.1	Sales data	47
2.2.4.	Summary	49
2.2.4.1	Domestic appliances	49
2.2.4.2	Restaurant ovens	50
2.2.4.3	Bakery ovens	50
2.3.	Market trends	52
2.3.1.	Domestic market structure	52
2.3.2.	Main manufacturers of domestic ovens	55
2.3.3.	Technology trends	57
2.4.	Consumer expenditure base data	60
2.4.1.	Average consumer prices	60
2.4.2.	Running costs	61
2.4.3.	Repair and Maintenance costs	68
2.4.4.	Disposal costs	69
2.4.5.	Interest and inflation rates	69
2.5.	Conclusions of task 2	72
	Annex 1 – Eating out Market	73
	Annex 2 – Data used in Figures	74

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2. TASK 2 – ECONOMIC AND MARKET ANALYSIS

The purpose of this task is to present the economic and market analysis related to domestic and commercial ovens within the scope of the lot 22 Ecodesign preparatory study. The aim is firstly to place this product group within the context of EU industry and trade policy. Secondly, it provides market (sales and stock) and cost inputs for the assessment of EU-wide environmental impact of the product group. Thirdly, it aims at providing insights into the latest market trends in order to identify market structures and ongoing trends in product design. This market data will serve as an input for subsequent tasks such as base-case analysis and improvement potential (Tasks 5 and 7 respectively). Finally, the data on consumer prices and rates is provided to be used later in the study in Life Cycle Cost (LCC) calculations.

2.1. GENERIC ECONOMIC DATA

The domestic and commercial oven sector is very fragmented and produces equipment and components with a multitude of applications. Although the study analyses all products covered in Lot 22, individual tailored approaches are needed for different product segments identified in Task 1.

Prodcom data is based on products whose definitions are standardised across the European community and thus allows comparability between Member States data. Ovens are classified under the following Prodcom codes:

- Domestic ovens
 - NACE 27.51 – “Manufacture of electric domestic appliances”
 - NACE 27.52 – “Manufacture of non-electric domestic appliances”
- Commercial ovens
 - NACE 28.21– “Manufacture of ovens, furnaces and furnace burners”
 - NACE 28.93– “Manufacture of machinery for food, beverage and tobacco processing”.

The general classification according to NACE is further split into more categories in Prodcom as presented in Table 2-1. However, sufficient criteria are not available to distinguish different types of products, thus Prodcom data needs to be supplemented by other economic data. In addition, as some ovens are included in range cookers, there could be an overlap with hobs (analysed in the lot 23 Ecodesign preparatory study).

The different categories covering appliances in Lot 22 are listed in Table 2-1 with imports, exports and production data for year 2008 according to Eurostat. The

apparent consumption given in Table 2-2 provides information on the total quantity sold by manufacturers in the EU. It is calculated as follows:

$$\text{Apparent consumption}_{EU-27} = \text{Imports}_{EU-27} - \text{Exports}_{EU-27} + \text{Production}_{EU-27}$$

Apparent consumption can be both calculated in Euros or in physical units, though some unit data is incomplete for some categories.

Table 2-1: Main Eurostat data for ovens at EU level in 2008¹

	Export		Import		Production	
	M€	1000 units	M€	1000 units	M€	1000 units
Microwave ovens 27.51.27.00	74.6	511	567.5	16,026	348.0	2,106
Domestic electric cookers with at least a hob and an oven 27.51.28.10	23.9	1,193	149.0	1334	1,226.5	4,629
Domestic electric ovens for building in 27.51.28.70	40.0	1,664	89.3	661	1,795.2	7,616
Domestic electric ovens (excluding those for building-in, microwave ovens) 27.51.28.90	103.4	1,377	193.9	10,626	148.3	2,696
Iron or steel gas domestic cooking appliances and plate warmers, with an oven (including those with subsidiary boilers for central heating, separate ovens for both gas 27.52.11.13	303.9	1,520	89.6	840	743.1	3,301
Electric bakery and biscuit ovens 28.21.13.30	67.5	NA	2.5	NA	242.3	113
Electric infra red radiation ovens 28.21.13.57	7.1	433	4.7	157	17.0	1,400
Bakery ovens, including biscuit ovens, non-electric 28.93.15.30	121.6	NA	11.0	NA	267.7	28
Non-domestic equipment for cooking or heating food (excluding non- electric tunnel ovens, non- electric bakery ovens, non- electric percolators) 28.93.15.80	561.2	NA	165.0	NA	1,200.0	996

¹ Table 1-3 in Task 1 refers to 28.93.17.13, but this category was excluded from the scope of the Lot 22 study.

Table 2-2: Apparent consumption of ovens at EU level in 2008 based on Eurostat data¹

	Apparent consumption	
	M€	1000 units
Microwave ovens 27.51.27.00	840.9	17,620
Domestic electric cookers with at least a hob and an oven 27.51.28.10	1351.6	4,770
Domestic electric ovens for building in 27.51.28.70	1844.5	6,613
Domestic electric ovens (excluding those for building-in, microwave ovens) 27.51.28.90	238.8	11,946
Iron or steel gas domestic cooking appliances and plate warmers, with an oven (including those with subsidiary boilers for central heating, separate ovens for both gas 27.52.11.13	528.9	2,620
Electric bakery and biscuit ovens 28.21.13.30	177.3	NA
Electric infra red radiation ovens 28.21.13.57	14.7	1,124
Bakery ovens, including biscuit ovens, non-electric 28.93.15.30	157.1	NA
Non-domestic equipment for cooking or heating food (excluding non-electric tunnel ovens, non-electric bakery ovens, non-electric percolators) 28.93.15.80	803.7	NA

In all product groups the physical apparent consumption was more than 200,000 units/year; the criterion on number of units placed on the EU-27 as specified in the Article 15 of the Ecodesign Directive is fulfilled. In terms of units, the highest apparent consumption is microwave ovens (Prodcom category: 27.51.27.00) with 17.6 million units per year and domestic electric ovens (excluding those for building-in) with 11.9 million units per year. In terms of value, the most significant apparent consumption concerns built-in ovens with 1.48 billion Euros, followed by electric cookers and microwave ovens with 1.13 and 0.84 billion Euros respectively.

According to Prodcom data, it appears that built-in ovens are produced (within EU-27) in mainly 5 Member States: Germany, Spain, Italy, France and Portugal, where Germany has the highest production of units and Portugal the lowest. Prodcom data in Table 2-1 indicates that a large proportion (89%) of ovens (not built-in or microwave) placed on the EU market are imported into the EU. However, data is confidential for production of most EU countries, especially Eastern Member States, which makes any

analysis quite incomplete. Electric range cookers, according to the available data seem to be produced mainly in Poland, Italy and Germany, but data is confidential for some MS as well. Likewise, it is hard to base any analysis on Eurostat for microwave ovens; they appear to be manufactured in Portugal and UK although a large proportion (91% of those placed on EU market) are imported into EU (often sold under EU brands), but data is confidential for many Member States.

Category 27.51.28.90 “Domestic electric ovens (excluding those for building-in, microwave ovens)” will include electric portable ovens (without hobs) and consumption of this category is high at 11.9 million in 2008. This category excludes microwave ovens, built-in ovens and ovens with at least a hob (i.e. range cookers and some types of portable oven which also have hotplates). The precise number of portable ovens is however not known with any accuracy.

Eurostat has the advantage of being the official EU source that is also used and referenced in other EU policy documents regarding trade and economic policy. However, as this classification is not detailed enough and does not cover all the products identified in Task 1, Prodcom/Eurostat does not serve as a useful market data source for this study and it was necessary to investigate other sources of sales and stock data. Manufacturer’s databases and market surveys provided information to complete the market analysis in the following sections. Additional information gathered through the questionnaires sent to stakeholders namely manufacturers, industry associations, experts, Member States’ representatives, etc is also presented.

2.2. MARKET AND STOCK DATA

The two main categories of products in Lot 22, domestic and commercial appliances, are treated separately in this section. In general, the volume of sales for domestic appliances can be measured in millions of units while the sales in the commercial sector are measured in thousands of units. Installed units and consumer expenditure are also measured in different scales. Moreover, commercial ovens covered by Lot 22 are sold to different type of clients. The appliances sold to restaurants and catering are different from the ones sold to bakeries. The two markets follow specific trends, and are not directly influencing each other. All these factors account for a clear distinction in the market as proposed here.

2.2.1. DOMESTIC APPLIANCES

The sales data of domestic appliances is presented first, followed by the estimates on the number of installed products or stock. The information for the market analysis of domestic appliances at EU level and presented in this section comes from two main sources:

- a market survey bought to GfK Retail and Technology GmbH. This market survey included the calculated quantities sold in the GfK Retail Panel, and a

“Total Market coverage ratio”, estimated by GfK. The calculated sales were divided by the coverage ratio to determine the sales within Western and Eastern Europe. These are the sales in EU-27 to end-users, regardless whether the end-users are private consumers or professionals and regardless whether the end-users are residents of EU-27 or not. BIO Intelligence Service is allowed to publish values after analysis, only in an aggregated manner. However, the values presented have been validated by GfK Retail and Technology GmbH.

- a product database from the European Committee of Domestic Equipment Manufacturers (CECED), which was sent as part of the questionnaire replies

2.2.1.1 SALES DATA

■ EU level

➤ PER TYPE OF APPLIANCE

The number of domestic ovens sold in the market in 2007 is presented in Figure 2-1 according to the two main categories identified in Task 1: built-in appliances (built-in ovens and ovens from built-in cookers) and free-standing appliances (range cookers and free-standing ovens). Microwave ovens are presented as a separate category in Figure 2-2. Figure 2-1 presents the sales in 2007 for Western Europe and Eastern Europe. GfK Retail Panel covered all European Member States except Cyprus, Luxembourg and Malta.

The energy source of the cooking appliance (gas, electric or mixed) is also included in the figure to present their share in the total market.

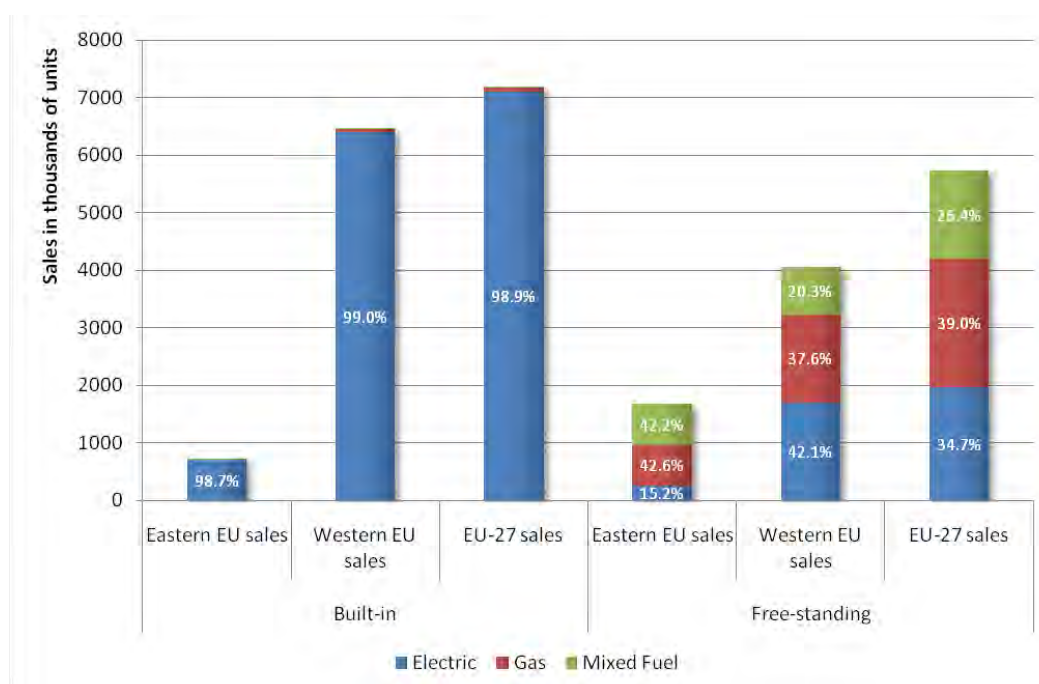


Figure 2-1: Estimated sales of domestic ovens in the EU in 2007 per type of appliance and energy source (Source: GfK Retail and Technology GmbH)

Most of the built-in ovens sold in 2007 were powered by electricity. There was no significant difference between the Eastern EU and Western EU market except for the volume of sales that is higher in Western Member states. For range cookers, electricity was the first energy source in Western EU with 42.1% of the market, while Eastern EU sales showed a preference of gas over electricity (42.6% of range cooker sales in Eastern EU are gas cookers, only 15.2% are electric cookers). Mixed fuel cookers had also a larger market share in Eastern EU (42.2%) than in Western EU (20.3%).

According to GfK Retail and Technology GmbH data, built in appliances have a higher volume of sales than free-standing ones in Western EU while a preference of free-standing over built in appliances is clearly present in Eastern EU. The first observation for Western EU contradicts the figures presented in Table 2-3 from a study carried out in 2006². This may arise from the fact that the category of built-in cookers are included in the 'built-in' category in Figure 2-1 and in the 'Range cookers' category in Table 2-3.

Table 2-3: Percentage of sales per type of appliance in the former EU-15 and in 10 new MS²

Sales per type of appliance		Former EU-15	10 new MS
Type of appliance (2006)	Range Cookers	50%	82%
	Built-in ovens	50%	18%

According to Table 2-3, there are significant differences between the former EU-15³ and new MS in terms of oven market. While the sales seem to be balanced between range cookers and built-in appliances in the former EU-15, they are strongly range cooker-driven in new MS. Built-in ovens represent 50% of total sales in the EU-15 and about 18% in new Member States, while for range cookers the share is 50% and 82% respectively.

Concerning microwave ovens, there are three main types in the current market:

- Microwave only
- Microwave oven with quartz halogen or radiant grill option
- Combined ovens that provide both conventional heating and microwave cooking

The estimated sales breakdown by microwave oven types for the year 2008 is presented in Table 2-4. The share of microwave ovens with specific features reaches 45% with the remaining 55% corresponding to the sales of conventional microwave ovens.

² Bertoldi, P., & Atanasiu, B. (2007). "Electricity consumption and efficiency trends in the enlarged European Union".

³ EU-15 MS: AT, BE, DE, DK, EL, ES, FI, FR, IE, IT, LU, NL, PT, SE, UK.
EU-10 MS: BG, CZ, EE, LV, LT, HU, PL, RO, SI, SK

Table 2-4: Sales breakdown in the EU-27 per type of microwave oven in 2008
(Source: CECED)

Type of Appliance	Market share of sales
Conventional microwave oven	55%
Combined oven	10%
Microwave with grill	35%

Figure 2-2 presents information on the market of microwave ovens by type of appliance and shows the share between built-in and free standing products for the year 2007. The sales are presented for Western Europe and Eastern Europe. GfK Retail Panel covered every European Member State except Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Luxembourg and Malta.

This data are in line with that presented in Table 2-4 for 2008. From the figure, the built-in microwave oven market is negligible compared to the free-standing one. Combined ovens represent 11% of microwave ovens sales in Western EU, but are close to zero in Eastern EU. Conventional microwave ovens are the appliance most sold in the EU-27.

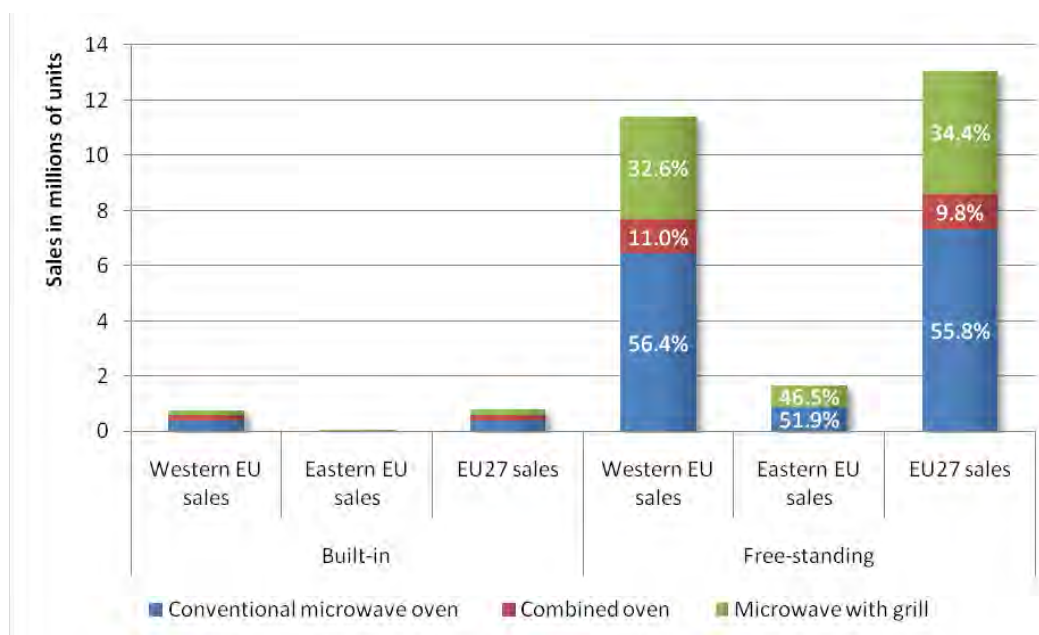


Figure 2-2: Estimated sales of domestic microwave ovens in EU in 2007 (Source: GfK Retail and Technology GmbH)

➤ PER ENERGY SOURCE

The electrical oven market is more dominant in the former EU-15 than in new MS. In the latter, the mixed fuel market (mainly range cookers) is more developed. According to Figure 2-4, between 2004 and 2005, the sales of gas ovens seemed to have shrink

everywhere in Europe. This tendency is confirmed by GfK Retail and Technology GmbH data for 2007.

In 2006, electric ovens represented 97% of built-in ovens sales in the EU-15. For range cookers in the former EU-15 the share of electric ones is 34.5% and for gas ones about 44%, the rest being mixed range cookers. This does not include microwave ovens which have an increasing penetration, but are not yet widely used to cook major meals.

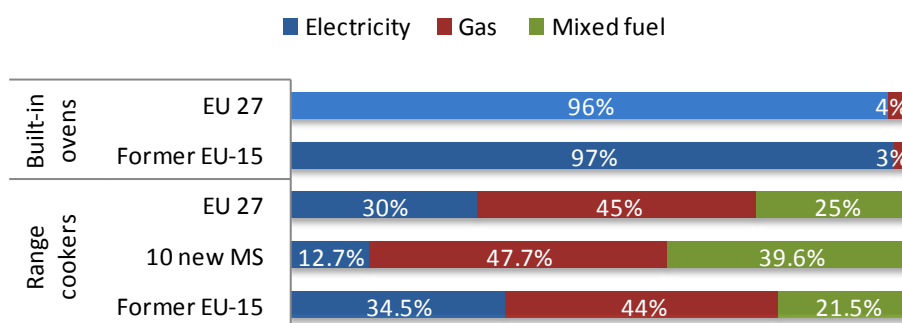


Figure 2-3: Percentage of sales of built in ovens per energy source in the former EU-15, 10 new MS and EU-27 in 2006 (Source: CECED)

Figure 2-4 presents the share of free standing ovens sales by energy type in the years 2004, 2005 and 2007 in order to find a trend or a change in preference for certain energy type. The figure shows that the trend in the sales of the years under analysis is not very variable, and the shares of different energy types remain more or less constant.

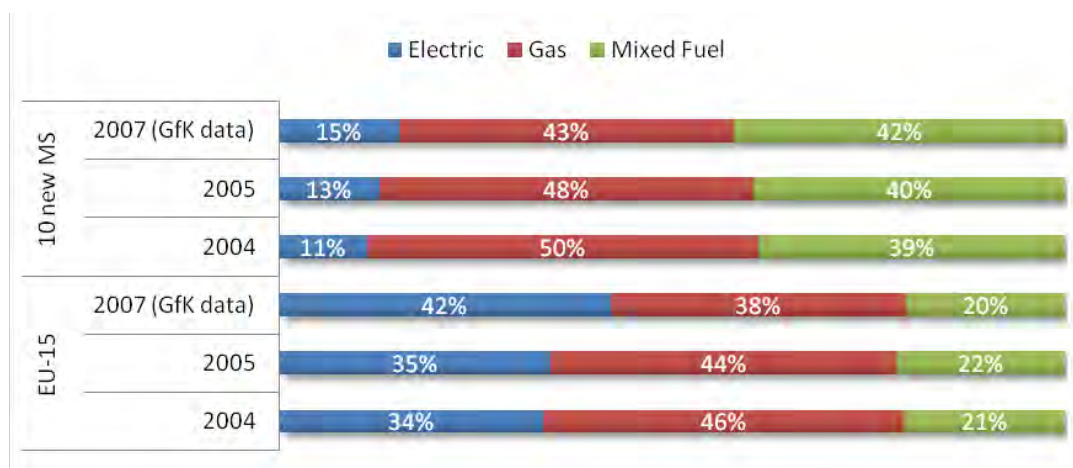


Figure 2-4: Cookers sales in 10 MS of Western Europe (lower) and 6 MS of Eastern Europe (higher) in 2004, 2005² and 2007

➤ PER ENERGY CLASS

According to Figure 2-5 below, the sales of electric ovens according to their energy label can vary quite a lot, for instance the sales of A-class ovens in 2005 range from 23.3% in Spain and UK to 67.4% in France. Globally, the sales of efficient appliances are higher in Western Europe than in Eastern Europe.

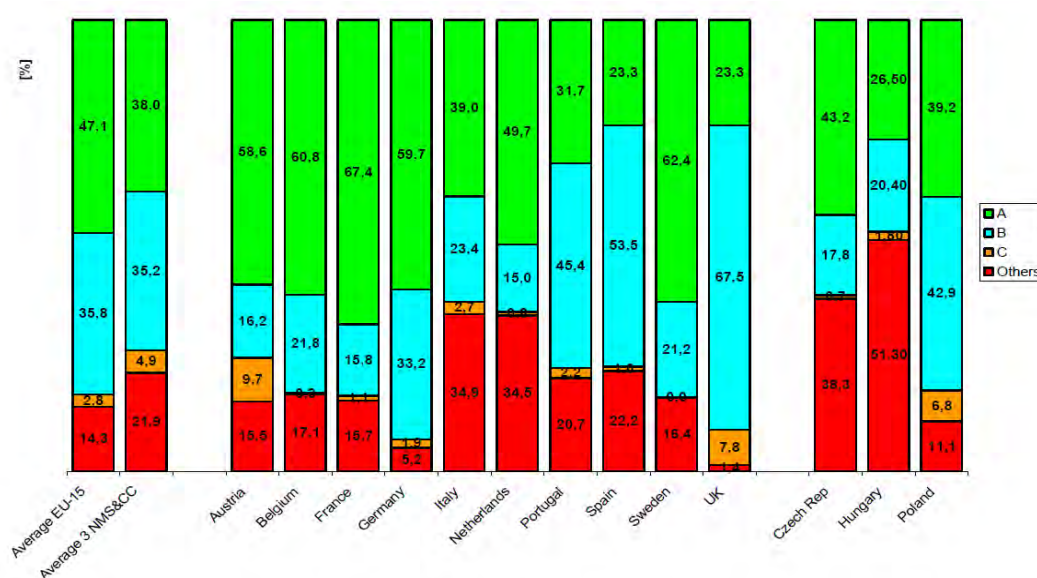


Figure 2-5: Sales per environmental performance in 2005²

The evolution of sales according to the energy class in several Member States is shown below. The sharp increase of A class appliances for ovens and cookers is noticeable over the years, as shown in Figure 2-6: 77% of the sales of ovens and 60% of the sales of the cookers in these 8 countries had an A-label in 2008⁴. It is important to notice that A+ cookers do not actually exist. The reference to A+ models in Figure 2-6 reflects a misuse of the energy label by one manufacturer in Poland.

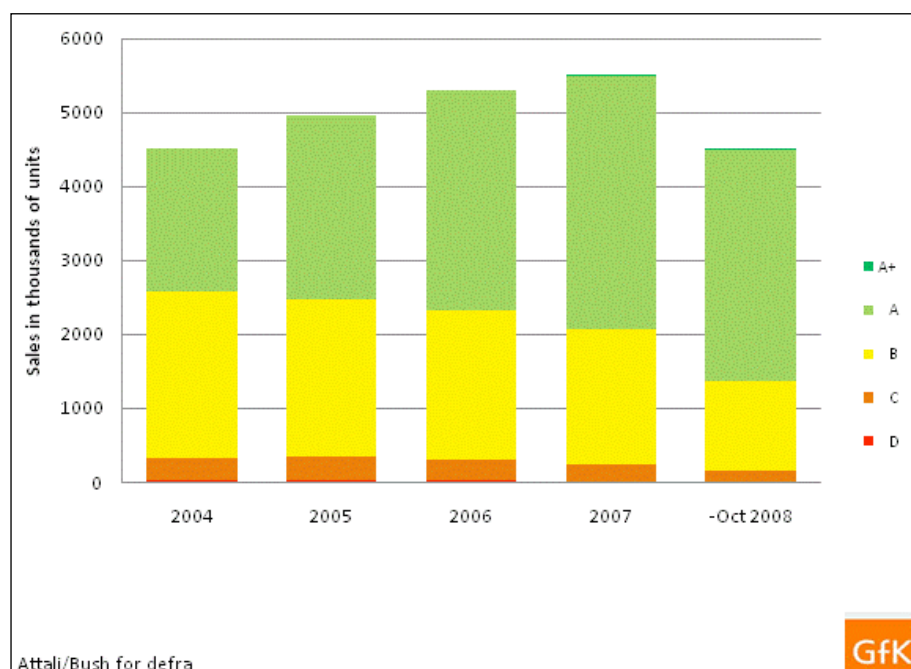


Figure 2-6: Evolution of sales (in thousand units) of oven and cookers in France, Denmark, Italy, Poland, Portugal, UK, Netherlands and Germany according to the energy class⁴

⁴ Market Transformation Programme (2009), "Factors influencing the penetration of energy efficient electrical appliances into national markets in Europe".

Estimations based on data from different MS regarding the market share of products with different energy classes are presented in Figure 2-7, they were also verified with CECED. At EU level, approximately 65% of domestic electric ovens sold were of A energy class and 28% were B class. Lower categories represented less than 10% of sales.

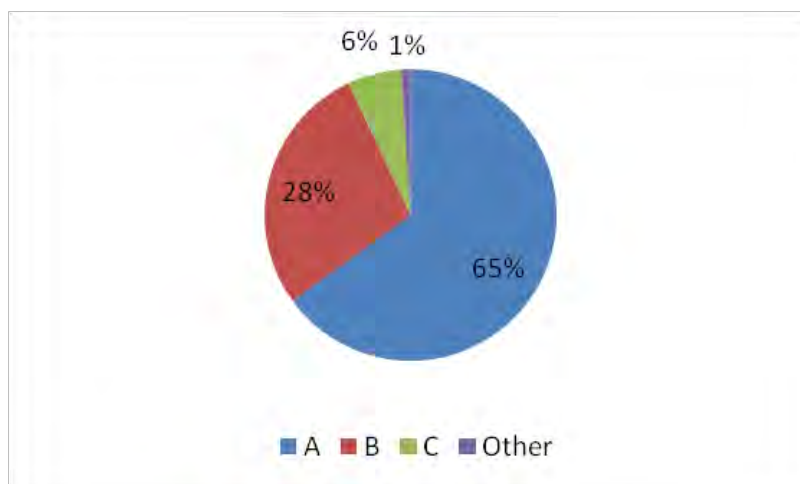


Figure 2-7: Domestic electric ovens sales breakdown by energy class in EU-27 in 2008 (Source: CECED)

The previous analysis of the EU-27 market provides an idea of the situation at an aggregated level. Since local differences are sometimes important in terms of preferences or use, a vision of the market at a MS level is presented next.

➤ PER VOLUME

In the database analysed in the Save II study⁵, supposed to be representative of the sales in 2000, most electric and gas ovens have a cavity size between 40 and 65 litres (see Figure 2-8 and Figure 2-9).

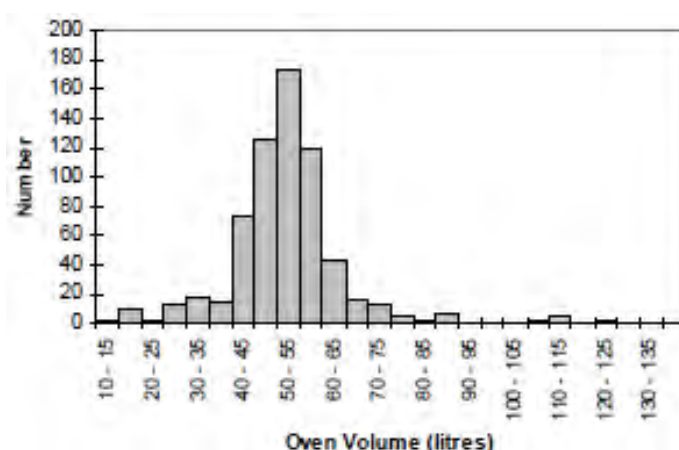


Figure 2-8: Distribution of free-standing appliances based on oven useful volume⁵

⁵ TTS Institute (2000), "Efficient Domestic Ovens", Save II Project. Retrieved July 2010, from www.ceecap.org/img_assets/File/Ovens_st.pdf

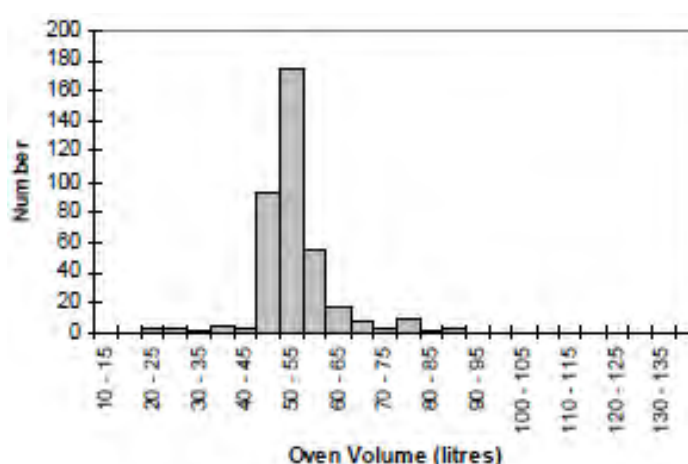


Figure 2-9: Distribution of built-in appliances based on oven useful volume⁵

According to the previous figures, the average volume of a domestic oven sold in EU in 1999-2000 was about 52 L (based on number of models). According to CECED (mentioned in the SAVE II study), the average for the same time period was rather around 49 L. This slight difference can be due to the geographical scope as the number and name of Member States considered in each study is not similar.

The CECED 2009 database indicated an average volume of 54 L (for both electric and gas appliances), still based on number of models, i.e. an increase of 10% compared to the CECED database of 2000 (or 4% compared to the WG database mentioned in the SAVE II study).

This evolution, even if based on number of models and not on sales, can be explained by several factors, of which one related to the energy label. Indeed, some experts, as well as some manufacturers, mentioned that it was “easier” for a “big” oven to have a more efficient energy class.

■ Member State level

The markets of UK, France, the Netherlands, Spain, Germany, Poland and Portugal are described below. This data was gathered from existing publications and from the responses to a questionnaire published on the Lot 22 website.

➤ UK

○ Per type of appliance

General trends for the UK market include:

- The sales of cooking appliances comprise 52% ovens compared to 48% cookers, with ovens sales on the rise in 2008⁶.
- Self-cleaning ovens are also more and more popular. Pyrolytic cleaning represents less than 5% of the market but sales have increased by over 57% in 2007 and catalytic ovens by more than 12%⁷. Pyrolytic ovens are popular in

⁶ MTP (2008), “Historical microwave oven use and options to increase usage in the future”.

some EU States such as France but uncommon in others such as UK (according to CECED).

- Fan-forced or convection ovens remain the most popular cooking appliances (recording 65% of volume and 25% growth over 2006 and 2007).
- In 2007, multifunctional ovens (fan-forced ovens combining several functions) account for a 25% volume share.
- Steam ovens had a very slow up-take, accounting for only 0.3% of built-in oven sales to March 2008⁷.

The UK sales breakdown for microwave ovens is detailed in Table 2-5.

Table 2-5: Sales breakdown per type of microwave oven in the UK in 2007⁶

Conventional microwave oven	68%
Combined oven	14%
Microwave with grill	18%

○ Per energy source

Sales of electric ovens are growing fast, with a growth of nearly 5% for multifunctional ovens and fan ovens by around 14% in 2007 compared to 2006. Electric ovens account for 96% of built-in ovens, while gas takes the remaining share. In 2008, 70% of built-in ovens were single ovens (growing at a rate of 15% between 2006 and 2007), but the double oven market (two cavities generally using the same fuel), representing 30% of market in volume, is growing at an annual rate of 16%⁷. The importance of the double oven seems to be a specificity of the UK market.

Figure 2-10 gives an overview of the sales between 1998 and 2008, and predictions until 2020 for the three categories of domestic ovens:

⁷ Ryland, A. (2008). Built-in ovens - Magic in the oven. Retrieved July 2010, from The Independent Electrical Retailer: http://www.independentelectricalretailer.co.uk/news/fullstory.php/aid/549/Built-in_ovens_-_Magic_in_the_oven.html

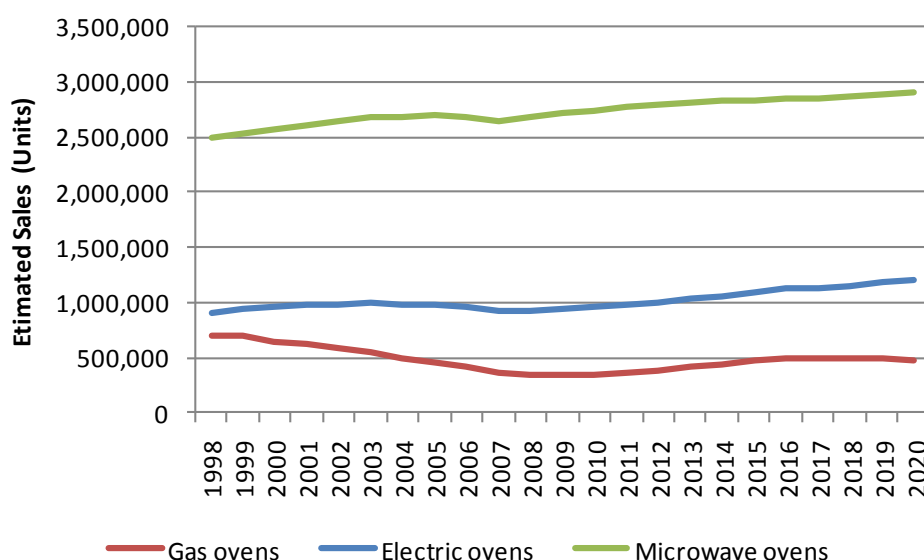


Figure 2-10: Evolutions of sales of gas, electric and microwave ovens in the UK⁸

From Figure 2-10, the following trends can be observed:

- Oven sales are shifting towards electric ovens since 1998; gas oven sales represented around 43% in 1998 shrinking by almost half in 2008.
- Microwave sales have been increasing slightly from 1998 until 2008 in an almost saturated market.

The following trends are expected for UK:

- A constant increase in electric ovens sales to around 1.2 million units in 2020.
- A slight increase in gas oven sales stabilising from 2015 at around 500 thousand units sold.
- Microwave sales are expected to maintain a slight increase until 2020 to reach 2.9 million units.

○ Per energy class

Figure 2-11 below shows the breakdown of ovens and cookers sales in the UK by energy class. It is noticeable that sales are shifting towards more efficient devices⁹.

⁸ MTP's online What if? Tool. Retrieved October 2009, from: <http://www.mtprog.com/>

⁹ Market Transformation Programme (2009), "Factors influencing the penetration of energy efficient electrical appliances into national markets in Europe".

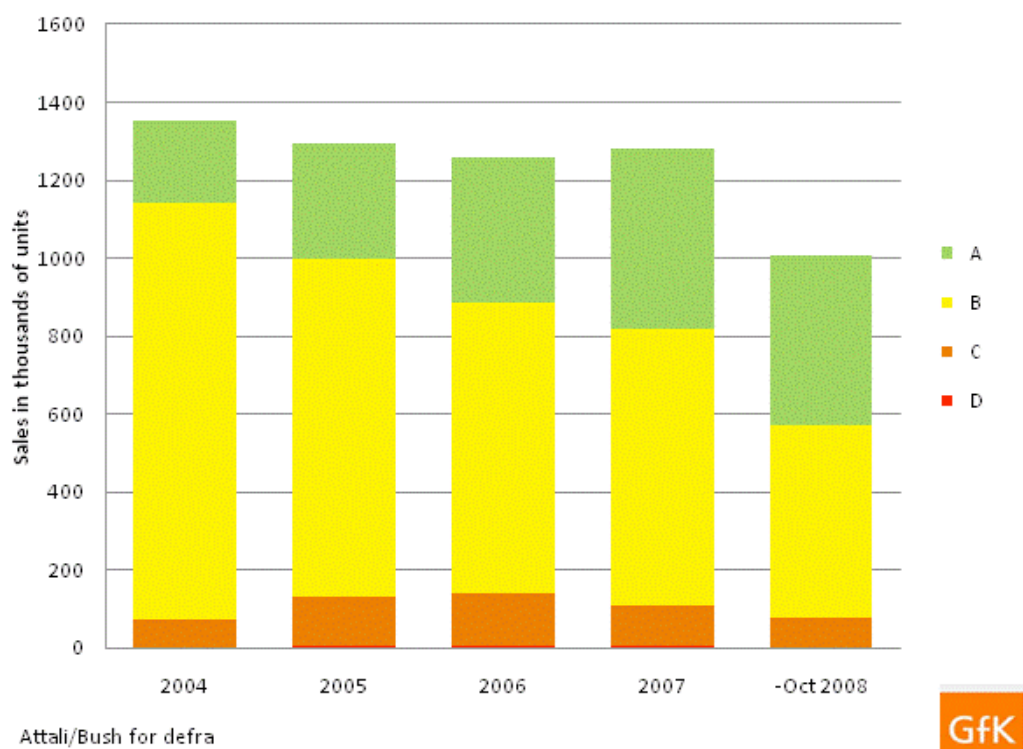


Figure 2-11: Sales breakdown of ovens and cookers in UK according to the energy class⁹

The share of A class appliances is lower than in most of the countries in Europe, with 59% of A-class ovens and 27% of A-class cookers in 2008.

➤ FRANCE

○ Per type of appliance

The French market also presents a high penetration of self-cleaning ovens, especially of the pyrolytic type. As in the UK, the oven market seems to be fairly mature as the number of sales of built-in ovens and range cookers has not changed significantly between 2001 and 2008. This means that the market is fairly saturated. However, in comparison with the UK market, the sales of microwave ovens keep increasing with an average annual growth rate of about 4% between 2001 and 2008. As clearly shown in Table 2-6, the composition of the sales has shifted from a free-standing oven (including range cooker) driven market to a built-in oven market; sales of free-standing ovens/built-in ovens changed from 58%/42% to 45%/55% within 8 years¹⁰.

Table 2-6 : Evolution of sales in France of range cookers, built-in ovens, and microwave ovens between 2001 and 2008¹⁰

Sales (in thousand units)	2001	2002	2003	2004	2005	2006	2007	2008
Range cookers	890	825	810	780	757	757	740	730

¹⁰ GIFAM (Groupe Interprofessionnel des Fabricants d'Appareils électroménagers). (n.d.). *Les ventes de l'électroménager*. Retrieved July 2010, from online database : <http://www.gifam.fr/index.php?id=80>

Built-in ovens	630	645	665	730	800	840	870	890
Microwave ovens	1,580	1,750	1,820	1,965	1,925	2,007	2,010	2,126

Table 2-7 shows the segmentation of the French market for built-in ovens. Natural convection ovens represent around 10% of the market, whereas forced convection ovens represent the remaining 90%. As seen in Task 1, this is largely due to the fact that fan-forced convection ovens are more efficient than their natural convection counterparts.

Table 2-7: Product segmentation in 2007 in France¹⁰

Natural convection ovens with catalytic cleaning process	6.0 %
Natural convection ovens with pyrolytic cleaning process	4.3 %
Fan-forced oven with catalytic cleaning process	20.3%
Fan-forced oven with pyrolytic cleaning process	68.4 %
Other	1.0 %

In 2007, fan-forced ovens with pyrolytic cleaning process presented the highest market share. Basically, all built-in oven sales represent self-cleaning ovens, either pyrolytic or catalytic. Pyrolytic ovens represent up to 72.7% of the built-in oven sales, with catalytic ovens representing 26.3%. This means that other ovens without a cleaning process represent about 1% of the built-in oven sales.

- Per energy source

Table 2-8 presents the breakdown of sales of range cookers in 2007 by energy source. Most of the range cookers use gas (48%) versus electricity (24.5%), the rest being mixed range cookers most of which have an electric oven with gas or mixed fuel hob.

Table 2-8: Segmentation of range cookers per type of fuel in 2007 in France¹⁰

Gas range cookers	48%
Electric range cookers	24.5%
Mixed range cookers	27.5 %

- Per energy class

75 % of the ovens sold in France were A-labelled appliances¹⁰ in 2008.

➤ THE NETHERLANDS

- Per type of appliance

As shown in Table 2-9, in 2004, free-standing ovens were dominating the market whereas in 2008, the sales of built-in ovens and free-standing ovens are similar. In terms of sales value, built-in ovens are more expensive than the free-standing ones as derived from the figures in Table 2-9. The microwave market is saturated with almost constant sales every year.

Table 2-9: Ovens sales in the Netherlands between 2004 and 2008¹¹

Sales (in 1000 units)	2004	2005	2006	2007	2008
Free-standing ovens	109	113	101	102	105
Built-in ovens	85	82	101	107	105
Microwave ovens	496	486	473	500	505
Sales (in millions Euros)	2004	2005	2006	2007	2008
Free standing	55	61	54	54	53
Built-in ovens	71	64	68	74	73
Microwave ovens	148	160	159	160	159

The microwave ovens market is divided as in Table 2-10 below. Combined microwaves represent the vast majority of microwave ovens sold on the Dutch market in 2008, 35% for conventional oven and 6% for microwave with grills.

Table 2-10: Microwave ovens sales in the Netherlands between 2006 and 2008¹¹

Microwave sales (in % of units sold)	2006	2007	2008
Conventional Microwave oven	37	37	35
Combined Microwave oven	56	58	59
Microwave with grill	7	5	6

○ Per energy source

Table 2-11 presents the estimated sales figures of domestic ovens in the Netherlands in 2008. Electricity is the preferred energy source on the Dutch domestic ovens market, with sales far higher than gas and mixed fuel appliances.

Table 2-11: Estimated sales figures of domestic ovens in the Netherlands in 2008¹¹

Appliance	Sales (in 1000 units)
Gas ovens	117
Electric ovens	926
Mixed (electric ovens + gas hobs in range cookers)	26

○ Per energy class

The share of A class cookers sold in the Netherlands is around 55% in 2008¹².

¹¹ VLEHAN, Vereniging Leveranciers Huishoudelijke Apparaten Nederland. Retrieved December 2010 from: www.vlehan.nl/boek2009/

¹² Market Transformation Programme (2009), "Factors influencing the penetration of energy efficient electrical appliances into national markets in Europe".

➤ SPAIN

○ Per type of appliance

The same trends as in the other MS (e.g. France and UK) can be observed in Spain: the sales of ovens are quite constant and mainly due to replacement meaning that the market is mature. Built-in ovens are largely dominating the market in Spain. The sales of range cookers are decreasing, as shown in Table 2-12. The large decrease of built-in oven sales in 2008 and 2009 is more than likely due to economic recession.

Table 2-12: Evolution of ovens sales in Spain¹³

Sales (in 1000 units)	2005	2006	2007	2008	2009
Range cookers	162	146	124	103	83
Built-in ovens	1,130	1,152	1,127	940	729

○ Per energy source

Estimated 2008 sales figures of domestic ovens in Spain are presented in Table 2-13.

Table 2-13: Estimated sales figures of domestic ovens in Spain in 2008¹³

Appliance	Sales (in 1000 units)
Gas ovens	117
Electric ovens	926
Mixed (electric ovens + gas hobs in range cookers)	26

➤ GERMANY

The sales value related to the German market encompasses ovens and range cookers in general (see Table 2-14)¹⁴.

Table 2-14: Range cooker/oven sales in Germany between 2005 and 2008

Sales (in Million Euros)	2005	2006	2007	2008
Ovens and range cookers	975	1,029	980	995

➤ POLAND

75% of the ovens and the cookers sold in Poland were A-class devices in 2008¹².

¹³ ANFEL (Asociación Nacional Fabricantes Electrodomésticos Línea Blanca). (n.d.). *Estadísticas*. Retrieved July 2010, from www.anfel.org/estadisticas.cfm?anual=1

¹⁴ ZVEI (Zentralverband Elektrotechnik- und Elektronikindustrie e.V.). (n.d.). Retrieved July 2010, from www.zvei.org

➤ PORTUGAL

○ Per type of appliance

Sales of ovens are much higher than the sales of cookers in Portugal (90% in Portugal versus 54% in EU-8¹²).

○ Per energy class

72% of the ovens and 36% of the cookers sold in Portugal were A-class devices in 2008.

➤ COMMON TRENDS IN THE MEMBER STATES

The situation in various Member States presents singularities, such as the choice of fuel or the type of device preferred, however the following trends can be observed:

- The oven market is fairly saturated in the EU-15
- The microwave oven market is reaching saturation in some Member States and progressing slowly in some others
- The share of sales is shifting towards more built-in ovens and fewer cookers
- The share of sales of electric ovens is shifting towards more efficient appliances.

■ **Forecast on sales of domestic ovens until 2025**

➤ CONVECTION OVENS

The following assumptions were made to estimate the evolution of the sales until 2025:

- The global sales of convection ovens will carry on growing until 2025. In 2025, the sales will be 5.5% higher than in 2007. This value is rather consistent with the estimated evolution of the number of households in the EU.
- Sales of built-in appliances (ovens and cookers) will increase, while free-standing appliances will be less and less sold. For instance, free-standing electric cookers will be more and more replaced by built-in electric cookers.
- The total cookers sales (both built-in and free-standing) will decrease in favour of built-in electric ovens.
- Sales of gas and mixed appliances will decrease whereas electric appliances' sales will rise.

The resulting forecast is presented in Table 2-15 and Figure 2-12. The percentage in the "growth" column refers to an annual growth factor, which was considered constant for the periods 2007-2010, 2010-2015, 2015-2020 and 2020-2025.

Table 2-15: Forecasts on the sales of domestic ovens in the EU-27 from 2007 to 2025

	BI electric oven		BI electric cooker		FS Electric cooker	
	Sales	Annual growth	Sales	Annual growth	Sales	Annual growth
2007	5,319,980		1,729,381		1,941,723	
2010	5,481,181	1.0%	1,792,389	1.2%	1,884,051	-1.0%
2015	5,760,776	1.0%	1,902,545	1.2%	1,791,714	-1.0%
2020	6,054,634	1.0%	2,049,581	1.5%	1,686,761	-1.2%
2025	6,363,481	1.0%	2,207,981	1.5%	1,587,955	-1.2%

	FS gas cooker		FS Mixed cooker		TOTAL
	Sales	Annual growth	Sales	Annual growth	Sales
2007	2,183,426		1,476,157		12,650,668
2010	2,105,762	-1.2%	1,476,157	0.0%	12,739,542
2015	1,982,413	-1.2%	1,476,157	0.0%	12,913,606
2020	1,866,289	-1.2%	1,454,148	-0.3%	13,111,412
2025	1,756,967	-1.2%	1,432,466	-0.3%	13,348,849

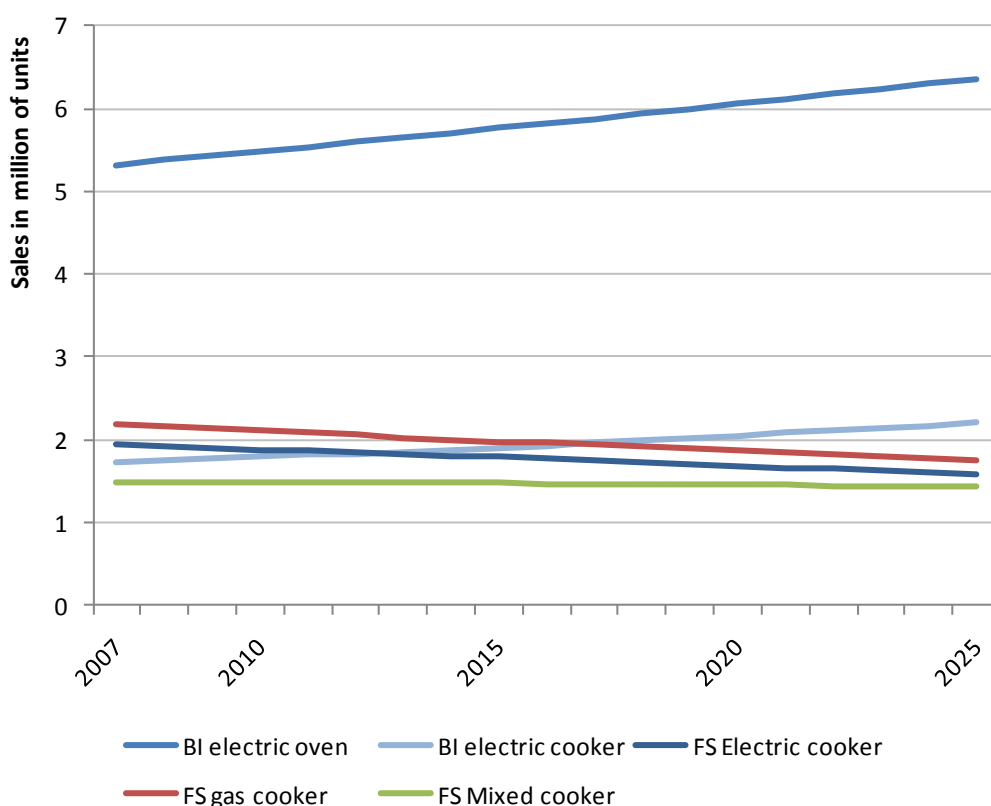


Figure 2-12: Forecasts on the sales of domestic ovens in the EU-27 from 2007 to 2025

➤ MICROWAVE OVENS

Microwave sales were supposed to carry on growing in the EU-27. The annual growth rate will decrease from 2010 to 2025 as the market is reaching saturation.

Table 2-16: Forecast on microwave ovens' sales from 2007 to 2025

	Conventional microwave oven		Combined oven		Microwave with grill		TOTAL
	Sales	Annual growth	Sales	Annual growth	Sales	Annual growth	Sales
2007	7,699,677		1,485,986		4,685,875		13,871,538
2010	8,219,118	2.2%	1,586,235	2.2%	5,001,997	2.2%	14,807,349
2015	8,681,224	1.1%	1,675,418	1.1%	5,283,226	1.1%	15,639,868
2020	9,034,074	0.8%	1,743,516	0.8%	5,497,964	0.8%	16,275,553
2025	9,170,401	0.3%	1,769,826	0.3%	5,580,929	0.3%	16,521,156

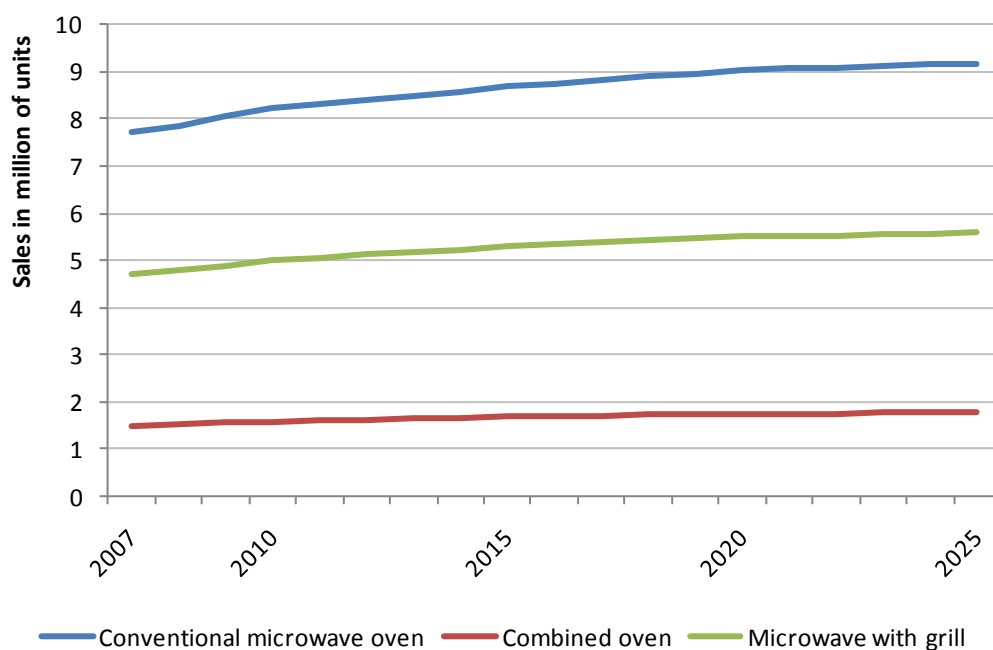


Figure 2-13: Forecast on microwave ovens' sales from 2007 to 2025

2.2.1.2 STOCK DATA

■ EU level

➤ PER TYPE OF APPLIANCE

As seen in the sales data section (section 2.2.1.1), the sales of built-in ovens are increasing in comparison with free-standing ovens (including range cookers); the stock is shifting towards more integrated units.

➤ PER ENERGY SOURCE

Most households across the EU have one oven, though there is a wide variation in terms of fuel type. According to a study published in 2000 under the Save II Project¹⁵, in 1998, approximately 61% are fuelled by electricity and 38% by gas. There are variations across MS, with some countries like Finland or Sweden predominantly using electricity and others like Spain favouring gas, as shown in Table 2-17 below. In total, in 1998, there were about 89 million electric ovens and 55 million gas ovens in operation in the EU-15 minus Greece, Portugal and Luxemburg. The type and features of the ovens are changing, thus having an influence on the oven energy consumption.

Table 2-17: Input data for ovens stock model in 1998¹⁵

Member State	Households (in millions)	Electric ownership (%)	Gas ownership (%)
AU	3.2	79.9	19.1
BE	3.8	50.3	62.1
DK	2.4	88.0	10.4
FI	2.3	99.0	1.0
FR	23.2	51.1	48.3
GE	37.7	79.9	19.1
IR	1.2	44.4	67.8
IT	21.8	60.9	38.5
NL	6.7	63.5	20.3
SP	15.1	12.0	85.0
SW	4.2	97.3	3.0
UK	24.3	56.7	41.2
EU-12	145.9	60.9	37.8

At EU level, the situation has changed since 1998, and the percentage presented in Table 2-17 are no more representative of the share in 2008. As highlighted in Figure 2-14, the ownership of electric appliances increased continuously (77% in 1995, 87%

¹⁵ TTS Institute (2000), "Efficient Domestic Ovens", Save II Project. Retrieved July 2010, from www.ceecap.org/img_assets/File/Ovens_st.pdf

forecasted in 2010). Thus, it is likely that in 2008, the gas ownership is lower than the figures presented in Table 2-17 for most MS, while the electric ownership is higher.

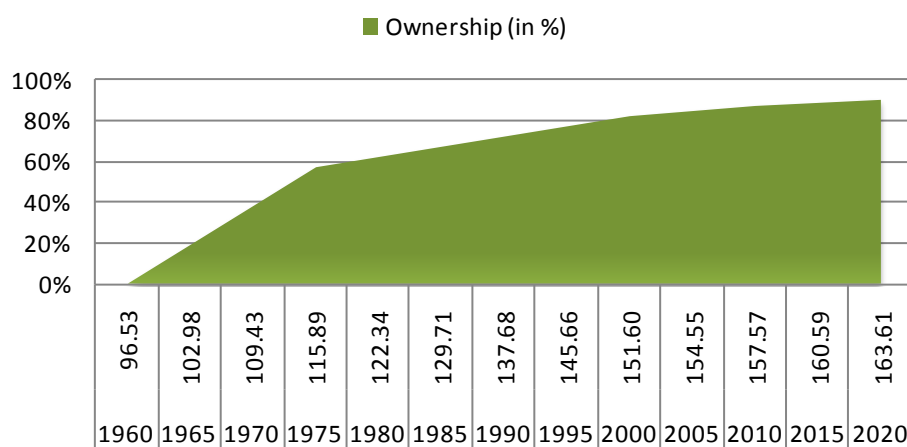


Figure 2-14: Electric oven ownership in % and millions of households across the EU-15 between 1960 and forecast up to 2020¹⁶

General trends can be observed at the EU-level, but every market has its particularities. These together with information on sales growth rates for some MS, are presented next.

■ Member State level

Spain, Germany and the UK provide data on their current stock of ovens as presented below.

➤ UNITED KINGDOM

○ Per energy source

Figure 2-15 gives an overview of the stocks between 1998 and 2008, and gives predictions until 2020 according to the three categories:

- Electric ovens
- Gas ovens
- Microwave ovens

This data is illustrated in below.

¹⁶ CECED (2006), "Energy Consumption of Domestic Appliances in European Households".

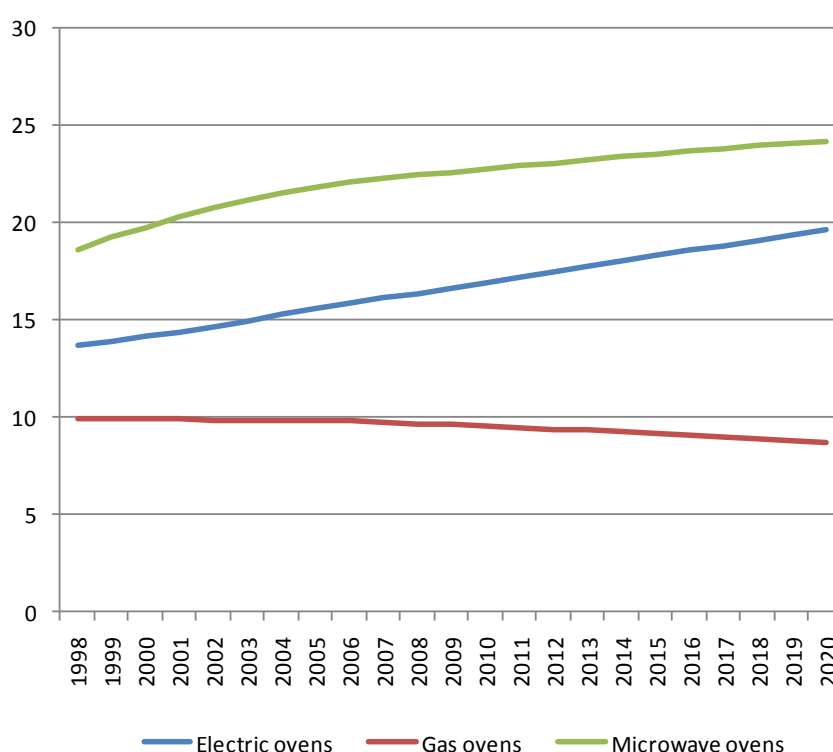


Figure 2-15: Evolution of the stock of gas, electric and microwave ovens in million units in the UK¹⁷

From Figure 2-15 the following trends can be observed:

- The stock of gas ovens has remained quite constant (small decline) between 1998 and 2008, whereas the electric oven stock has increased by 20% in the same period.
- The stock of microwave has been increasing each year since 1998 and appears to be beginning to saturate.

The following forecasts are expected:

- A stock of gas ovens that decreases until 2020.
- The trend towards more electric ovens leads to almost 70% of the oven stock being electric by 2020, in comparison with 58% in 1998.
- The microwave ovens stock is expected to keep increasing at a slower pace, with an average annual growth rate of about 0.6% between 2008 and 2020 (24.2 million units in 2020 compared to 22.4 million units in 2008).

Other general trends (not directly derived from Figure 2-15) include:

- In 2006 the ownership of microwave ovens was 82.7%, compared to 70.6% in 1998, but that has fallen slightly from the peak of 83.6% in 2001¹⁸. The long

¹⁷ MTP's online What if? Tool. Retrieved October 2009, from: <http://www.mtprog.com/>

¹⁸ MTP (2008), "Historical microwave oven use and options to increase usage in the future".

term reason for growth has been factors such as a fall in oven prices, a rise in the number of one-person households, and the growth in the ready-meal market.

➤ SPAIN

Spain has a long tradition of gas-cooking with gas ovens representing about 85% of the oven stock in 1998¹⁹. However, this share is likely to be lower nowadays as the situation has evolved towards more electric appliances in Europe.

➤ GERMANY

○ Per appliance type²⁰

Table 2-18 gives an overview of the ownership rate of different cooking appliances. It seems that the oven market is almost mature, whereas the microwave oven market is still growing. This currently represents a stock of about 34 million for built-in ovens and range cookers and 29 million for microwave ovens (assuming there were about 40 million households in Germany in 2008).

Table 2-18: Evolution of ownership rate of different cooking devices in Germany

Year	2000	2005	2008
Built-in ovens/Range cookers	82%	84%	85%
Microwave ovens	63%	70%	72%

○ Per energy source

The German market has always been electric-oriented, with 80% of electric ovens ownership in 1998 (see Table 2-18). Since then, the situation overall has evolved towards more electric ovens.

➤ COMMON TRENDS IN THE MEMBER STATES

As seen in the previous section on sales, the situation in the different Member States present singularities, such as the choice of the fuel or the type of device preferred; these differences in sales trends result in the following differences in stock:

- The stock of gas appliances is decreasing while the stock of electric appliances is sharply building up.
- The microwave oven market is reaching saturation in some Member States (for instance the UK, the Netherlands) and progressing slowly in some others (for instance France, Germany). Therefore, the stock is slowly increasing.

¹⁹ TTS Institute (2000), "Efficient Domestic Ovens", Save II Project. Retrieved July 2010, from www.ceecap.org/img_assets/File/Ovens_st.pdf

²⁰ ZVEI (Zentralverband Elektrotechnik- und Elektronikindustrie e.V.). (n.d.). Retrieved July 2010, from www.zvei.org

■ Estimation of the stock in 2007 and forecasts

➤ CONVECTION OVENS

No published figures are available concerning the global stock of convection ovens at EU level. A first approach to estimate this stock is to multiply the annual sales by the average lifetime of the appliances, which was estimated at 19 years for this type of appliance. However, with this approach, the sales would be considered to have been constant for the past 19 years, which is unrealistic. Therefore, modifications to these results have been made according to the following assumptions (see Table 2-19):

- The number of households in the EU-27 being around 205 millions in 2008²¹. A global stock of 240 million appliances would mean that around 20% of EU households have more than one oven. Therefore, the global stock has been reduced to 215 million units. This also reflects the fact that global sales have increased in the last 19 years.
- The sales of gas appliances were considered to have strongly decreased for the past 19 years, thus the stock of gas ovens was considered to be higher than the results obtained with the basic approach.
- On the contrary, built-in appliances sales were considered to have increased in the past years, hence, the basic results were reduced.

Table 2-19: Estimate of the ovens' EU stock in 2007

	BI electric oven	BI electric cooker	FS Electric cooker	FS gas cooker	FS Mixed cooker	TOTAL
Sales x lifetime	101,079,627	32,858,247	36,892,728	41,485,101	28,046,992	240,362,694
Corrected stock	95,000,000	15,000,000	35,000,000	50,000,000	20,000,000	215,000,000

The following assumptions were made to estimate the evolution of the stocks until 2025:

- The global penetration rate of convection ovens will remain constant until 2025. The stock should increase in a comparable manner as the number of households in the EU.
- The stock of free-standing appliances will carry on decreasing, toward more built-in ovens.
- The decrease in the stock of mixed-fuel cookers will be slower than for gas appliances.
- Consumers interested in buying an electric cooker will tend to prefer a built-in version to a free-standing one.

²¹ Population statistics (Eurostats). Average size of households in the EU-27 in 2008 (INSEE).

The resulting forecasts are presented in Table 2-20 and Figure 2-16. The percentage in the “growth” column refers to an annual growth rate, which was considered constant for the periods 2007-2010, 2010-2015, 2015-2020 and 2020-2025.

Table 2-20: Forecasts on convection ovens’ stock from 2007 to 2025

	BI electric oven		BI electric cooker		FS Electric cooker	
	Stock	Annual growth	Stock	Annual growth	Stock	Annual growth
2007	95,000,000		15,000,000		35,000,000	
2010	97,878,595	1.0%	15,454,515	1.0%	33,960,465	-1.0%
2015	103,893,957	1.2%	16,648,902	1.5%	31,488,704	-1.5%
2020	110,279,008	1.2%	17,935,596	1.5%	29,196,846	-1.5%
2025	115,904,346	1.0%	18,850,491	1.0%	27,765,910	-1.0%

	FS gas cooker		FS Mixed cooker		TOTAL
	Stock	Annual growth	Stock	Annual growth	Stock
2007	50,000,000		20,000,000		215,000,000
2010	49,253,744	-0.5%	20,301,503	0.5%	216,848,821
2015	48,034,652	-0.5%	21,337,083	1.0%	221,403,298
2020	45,680,476	-1.0%	20,808,964	-0.5%	223,900,889
2025	43,441,678	-1.0%	20,808,964	0.0%	226,771,389

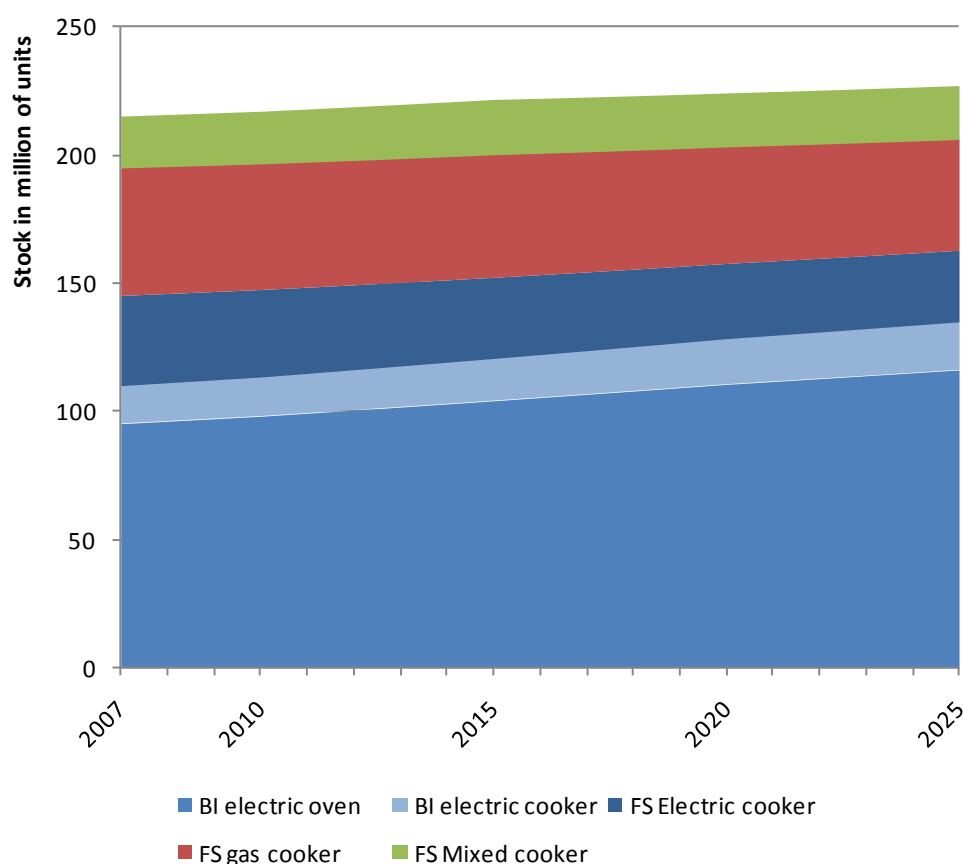


Figure 2-16: Forecasts on convection ovens' stock from 2007 to 2025

➤ MICROWAVE OVENS

The stock of microwave ovens was determined by multiplying the sales in 2007 by the average lifetime of 9 years. No modification was made to this basic approach, as no information is available on the trends between the three main types of microwave ovens.

It was assumed that this stock will increase following the number of households in the EU. The ownership rate will increase a little until 2015, and will then stay stable.

Table 2-21: Forecast on microwave ovens' stock from 2007 to 2025

	Conventional microwave oven		Combined oven		Microwave with grill		TOTAL
	Stock	Annual growth	Stock	Annual growth	Stock	Annual growth	Stock
2007	69,297,094		13,373,874		42,172,878		124,843,846
2010	71,821,845	1.2%	13,861,135	1.2%	43,709,393	1.2%	129,392,373
2015	73,635,437	0.5%	14,211,146	0.5%	44,813,110	0.5%	132,659,693
2020	74,746,616	0.3%	14,425,596	0.3%	45,489,352	0.3%	134,661,563
2025	75,497,078	0.2%	14,570,430	0.2%	45,946,069	0.2%	136,013,576

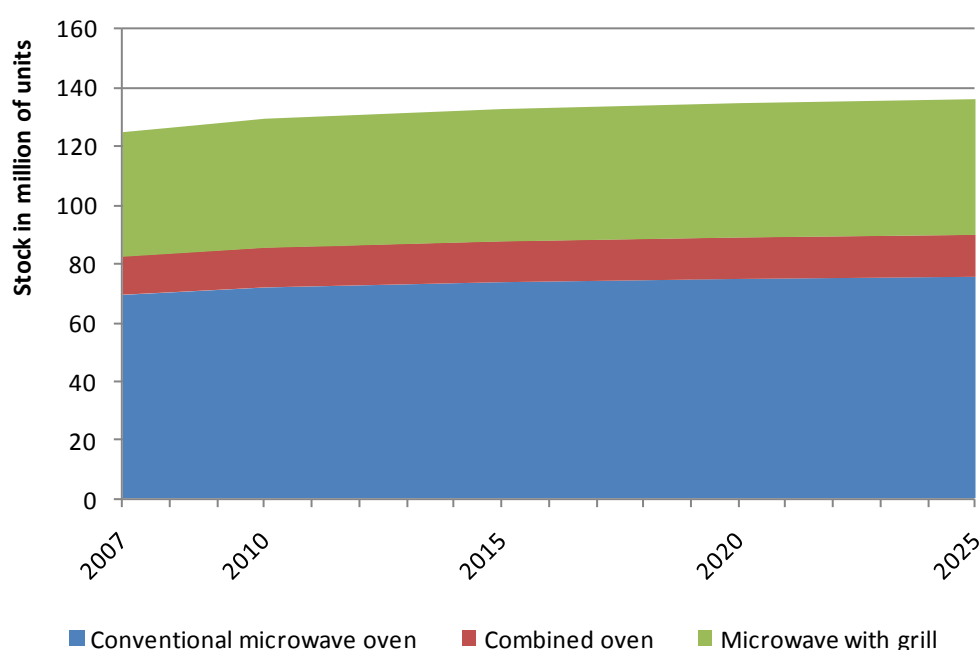


Figure 2-17: Forecast on microwave ovens' stock from 2007 to 2025

2.2.2. COMMERCIAL OVENS USED IN RESTAURANTS

2.2.2.1 SALES DATA

■ Sales in 2007

Information on the trade of commercial cooking appliances is not available for the EU in general. A report from the UK Catering Equipment Suppliers' Association (CESA)²² providing some information on the UK market, mentions that sales of commercial cooking appliances represented about £ 184 million (around 276 million Euros) in 2006, with about 195,000 units sold, all categories (appliances covered by this study and other types of commercial cooking appliances).

Combination Steam Ovens (combi-steamer) are well known and used in commercial kitchens. This category of commercial ovens appears to be the most representative in

²² CESA Catering Equipment Suppliers' Association (2007). "The UK Market for Foodservice Equipment".

the market. Manufacturers of this type of product are located mainly in Germany, Rational AG being the leader, with around 50% of the market.

The German catering equipment manufacturers association (HKI) provided an estimation of the production of some commercial appliances for the European single market in Germany for the years 2007 and 2008 presented in Table 2-22. HKI also estimated the split by energy type to be 88% for electric ovens and 12% gas ovens.

Table 2-22: Production of commercial appliances for the European single market in Germany for 2007 and 2008.

Type of commercial appliance	Estimation of the production for 2007 and 2008	Trend between 2007 and 2008
Electric combi-steamers	Much less than 70,000	Increasing
Gas combi-steamers	Much less than 15,000	Stable
Electric oven	Much less than 1,500	Increasing
Gas oven	Much less than 500	Increasing

These figures can give an idea of the sales of commercial ovens in the EU, but are not representative of the real sales. Domestic gas appliances are indeed in average less used in Germany (see section 2.2.1.2), thus it is likely that the commercial sector followed the same trend, and so, at the EU level, gas appliances could represent a higher share than in the figures presented in Table 2-22.

Combi-steamers are the most representative category of commercial ovens, with sales figures being much higher than other types of commercial ovens according to HKI. The estimations by HKI being vague, sales figures for 2007 were estimated by cross-checking information with some manufacturers in bilateral discussions and are presented in Table 2-23.

Table 2-23: Sales of combi-steamers in the EU-27 in 2007

Electric combi-steamer	Gas combi-steamer
41,000	9,200

■ Forecasts on sales until 2025

Forecasts on the sales of combi-steamers are presented in Table 2-24. The percentage in the “growth” column refers to an annual growth factor, which was considered constant for the periods 2007-2010, 2010-2015, 2015-2020 and 2020-2025. In accordance with HKI information on the trend between 2007 and 2008, the sales of electric combi-steamers are expected to grow until 2025, while the sales of gas appliances are expected to remain stable.

Table 2-24: Forecasts on the sales of combi-steamers in the EU-27 from 2007 to 2025

	Electric combi-steamer		Gas combi-steamer	
	Sales	Annual growth	Sales	Annual growth
2007	41,000		9,200	
2010	42,242	1.0%	9,200	0.0%
2015	43,959	0.8%	8,838	-0.8%
2020	45,746	0.8%	8,362	-1.1%
2025	46,901	0.5%	7,754	-1.5%

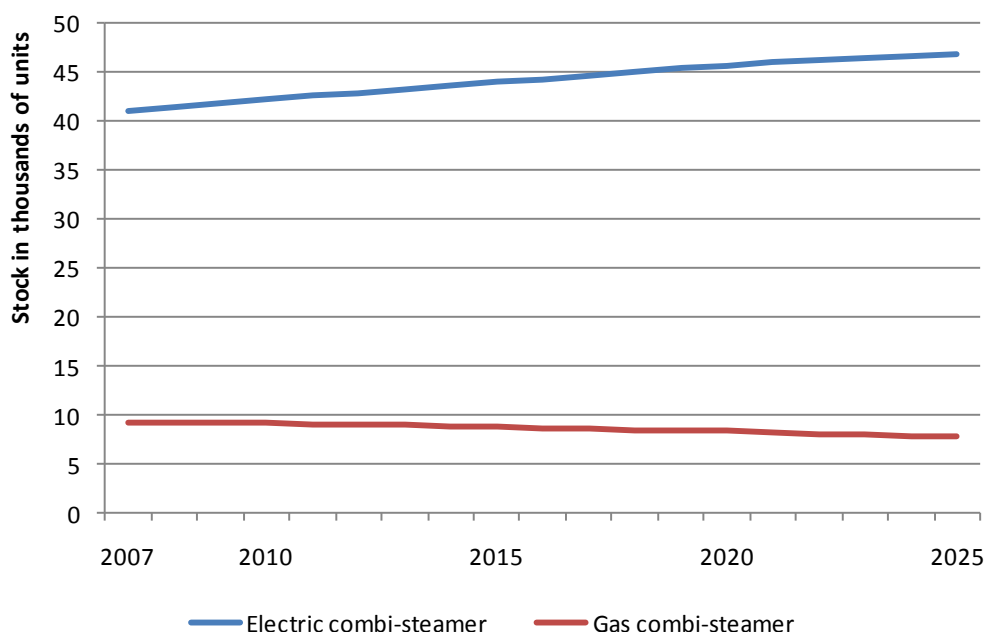


Figure 2-18: Forecasts on the sales of combi-steamers in the EU-27 from 2007 to 2025

2.2.2.2 STOCK DATA

Information about the stock of commercial appliances used in restaurants and covered by the DG ENER Lot 22 study is scarce. Globally, the commercial cooking equipment market can be assumed to be linked to the restaurant industry. Therefore, this market is presented in the following section. Then, an estimation of the commercial ovens used in restaurants, made together with the major manufacturers, is presented.

■ Restaurant industry

The restaurant sector can be divided into two categories. Foodservice outlets of each category have specific needs, do not buy the same equipment and do not use it the same way:

- The profit sector or commercial sector: institutions which have to cook dishes in a short time (restaurants, quick service, pubs, hotels and lodging and leisure)

- The cost sector, non-commercial sector or institutional sector: institutions which cook big amount of food and serve it at scheduled time (staff catering, health care, education and services).

The European Modern Restaurants Association (EMRA) provides data about the number of meals eaten in the EU in 2005, which is presented in Table 2-25.

Table 2-25: Number of meals eaten in the EU in 2005²³

	Million of meals	Percentage
Total meals eaten in EU in 2005	498,605	
At home	441,764	88.6%
Out of home	56,841	11.4%
<i>In commercial restaurants</i>	<i>35,900</i>	<i>7.2%</i>
<i>In institutional restaurants</i>	<i>20,941</i>	<i>4.2%</i>

The stock of commercial cooking appliances is likely to follow the same trend as the number of foodservice outlets. Eurostat provides statistics about the number of hotels and restaurants (NACE code H55) in the Member States, presented in Table 2-26.

Table 2-26: Number of hotels, restaurants, bars, canteens and catering in the EU between 2004 and 2007²⁴

Member State	2004	2005	2006	2007	Evolution 2004-2007
Austria	52,565	53,036	54,221	54,318	3.33%
Belgium	:	:	:	44,985	:
Bulgaria	:	:	22,771	22,194	:
Cyprus	:	7,364	6,818	6,957	:
Czech Republic	52,040	51,688	51,354	50,286	-3.37%
Denmark	14,145	14,627	14,894	15,322	8.32%
Estonia	1,765	1,885	2,011	2,071	17.34%
Finland	13,635	13,860	14,074	14,372	5.41%
France	253,443	255,198	256,311	251,484	-0.77%
Germany	:	:	:	:	:
Greece	100,838	102,215	109,015	111,786	10.86%
Hungary	34,997	32,997	31,964	33,698	-3.71%
Ireland	16,625	17,164	:	13,332	-19.81%
Italy	277,424	281,639	293,529	291,367	5.03%

²³ EMRA (European Modern Restaurants Association). *General Brochure*. Retrieved November 2010, from: www.studiocohen.com/emradef/documents/EMRABrochure.pdf

²⁴ Eurostat, 2007, *Food-act 12: Regional distribution of hotels and restaurants*. Retrieved November 2010 from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=food_act12&lang=en

Member State	2004	2005	2006	2007	Evolution 2004-2007
Latvia	4,448	4,879	4,842	4,609	3.62%
Lithuania	3,225	3,879	4,315	4,562	41.46%
Luxembourg	:	:	2,927	2,906	:
Malta	:	:	:	:	:
Netherlands	39,725	40,215	40,200	39,705	-0.05%
Poland	58,594	59,171	58,345	59,496	1.54%
Portugal	68,618	95,744	92,593	94,956	38.38%
Romania	17,444	19,509	20,899	22,382	28.31%
Slovakia	1,260	1,720	1,981	2,200	74.60%
Slovenia	7,313	7,278	:	7,667	4.84%
Spain	301,890	306,166	311,097	308,878	2.31%
Sweden	:	26,099	26,702	27,617	:
United Kingdom	165,411	168,052	168,338	170,109	2.84%
Weighted growth rate for MS where data is available both in 2004 and 2007					+4.52%

At the EU level, the number of foodservice outlets is growing between 2004 and 2007, with an increase in 16 Member States. There was no data available for Belgium, Germany and Malta.

This sector suffered from the 2008 economic crisis, and statistics more recent than 2007 are not yet available. This trend might not be representative for the current situation. However, this crisis can be considered as an exceptional phenomenon, therefore the number of outlets could carry on increasing until 2025.

Thanks to stakeholders, information about the commercial sector was gathered at Member State level, for France, Germany and the United Kingdom. The information described in the following paragraphs will be used to estimate the stock at EU level.

➤ FRANCE

To advise its clients from the catering industry, the French natural gas supplier Gaz de France (now GDF-Suez) can make a simulation of the gas consumption. According to the number of meals served and the type of institution (including its specificities like if a meal is served directly after cooking (direct service) or if it is stored in a refrigerator and then reheated (deferred cold link). In 1999, the capacity of ovens per kitchen presented in Table 2-27 was used. Neither information regarding microwave ovens nor more recent data is available.

Table 2-27: Equipment of commercial kitchens used in GDF's simulations in 1999

Type of Institution	Number of meals per day	Distribution mode	Appliances	Capacity
Education	7000	Deferred Cold Link	6 Combi-steamers	20 GN 1/1
	5000	Deferred Cold Link	5 Combi-steamers	20 GN 1/1
	2500	Deferred Cold Link	2 Combi-steamers	20 GN 1/1
		Direct	3 Combi-steamers	20 GN 1/1
	1000	Deferred Cold Link	1 Combi-steamer	20 GN 1/1
		Direct	1 Combi-steamer	20 GN 1/1
			1 Combi-steamer	10 GN 1/1
	500	Direct	1 Combi-steamer	20 GN 1/1
Restaurant	200	Direct	1 Combi-steamer	10 GN 1/1
	150	Direct	1 Combi-steamer	10 GN 1/1
	100	Direct	1 Convection oven	6 GN 1/1
	50	Direct	1 Convection oven	6 GN 1/1
	25	Direct	1 Combi-steamer	5 GN 1/1
Company	1500	Direct	2 Combi-steamers	20 GN 1/1
			1 Combi-steamer	2x4 GN 1/1
	1000	Direct	1 Combi-steamer	20 GN 1/1
			1 Combi-steamer	10 GN 1/1
Vacation Centre	500	Direct	3 Combi-steamers	10 GN 1/1
	1500	Direct	2 Combi-steamers	20 GN 1/1
	1000	Direct	1 Combi-steamer	20 GN 1/1
Communities	500	Direct	1 Combi-steamer	20 GN 1/1
	1500	Direct	2 Combi-steamers	20 GN 1/1
	1000	Direct	1 Combi-steamer	20 GN 1/1
Health Care Institutions	7000	Deferred Cold Link	6 Combi-steamers	20 GN 1/1
	5000	Deferred Cold Link	6 Combi-steamers	20 GN 1/1
	2000	Deferred Cold Link	2 Combi-steamers	20 GN 1/1
	1000	Deferred Cold Link	1 Combi-steamer	20 GN 1/1
	500	Direct	1 Combi-steamer	10 GN 1/1
	200	Direct	1 Combi-steamer	6 GN 1/1
	120	Direct	1 Combi-steamer	6 GN 1/1

This data gives information about the capacity of the appliances used in France. It seems that combi-steamers and ovens which can contain less than 10 GN 1/1 are only used in small institutions. The most common capacity seems to be 20 GN 1/1; however there are many more small institutions than big ones, and stakeholders considers that 10 GN 1/1 is the average capacity of the majority of the combi-steamers on the market.

The French Observatory for hotels and restaurants published a report²⁵ detailing the number of foodservice outlets and the number of meals served in France in 2008, presented in Table 2-28.

Table 2-28: Structure of the commercial sector in France in 2008, in number of food outlets and meals served²⁵

Activity	Number of foodservice outlets (in thousands)		Number of meals served (in millions)	
Traditional commercial restaurants	92.4	30%	1,210	16%
Hotels restaurants	18.3	6%	210	3%
Cafés	36.6	12%	435	6%
Meals in transports	:		215	3%
Contracted catering in education	7.3	2%	430	6%
Contracted catering in companies	6.5	2%	340	5%
Contracted catering in health care	6.0	2%	420	6%
Self-operated catering	55.9	18%	2,300	31%
Quick-service restaurants (sandwiches, pastries, hamburgers, etc.)	24.1	8%	1,320	18%
Alternative food stores (bakeries, delicatessens, butchers, ...)	63.0	20%	630	8%
Total France	310.1		7,510	

A stakeholder provided information about the share of gas and electricity in France: the market share between gas and electricity remain globally stable, and the commercial sector is traditionally attached to gas. Electricity is preferred for new installations, but for a renovation of a restaurant already using gas, most of the time there is no switch in energy. Even if the price of gas is increasing, it remains cheaper to run than electricity, which could explain this choice.

Gas is the main energy source in French commercial kitchens: 75-80% of hobs are using gas, as well as 60-65% of ovens. However, in cooking schools, students are training to use electric appliances, and fewer young cooks are used to cooking with gas appliances, and thus this distribution is likely to change in the future years towards more electric appliances.

➤ GERMANY

For Germany, DEHOGA Bundesverband, the German hotel and restaurant association, published a report presenting the number of companies from the restaurant industry paying taxes in Germany, provided by the German Federal Statistics Office. Table 2-29 presents this data.

²⁵ Fafih, (2008), *Portrait sectoriel*. Retrieved November 2010, from www.fafih.com/uploaded_files/docs/portrait-national-hotellerie-restauration-2008.pdf

Table 2-29: Number of companies from the restaurant industry²⁶

	2002	2003	2004	2005	2006	2007	2008
Hotels	11,339	11,137	11,069	11,061	11,141	11,156	11,067
Inns	19,697	18,932	18,292	17,948	17,556	17,062	16,675
Pensions	6,727	6,447	6,247	6,177	6,130	6,039	6,049
Hotels and motels	3,680	3,610	3,600	3,597	3,585	3,608	3,595
Recreation, vacation homes	427	417	417	419	386	385	379
Holiday centres	192	191	194	199	219	216	213
Holiday homes/apartments	3,441	3,367	3,372	3,391	3,465	3,588	3,784
Other	3,040	3,005	3,031	3,041	3,099	3,173	3,214
Restaurants (with/without operator)	91,774	91,012	90,455	89,482	88,012	86,359	85,343
Pubs	46,574	45,017	44,247	42,744	41,495	39,929	38,549
Bars, discos, etc	4,116	3,980	3,994	4,066	4,138	4,184	3,691
Cafés	9,653	9,619	9,714	9,912	10,229	10,301	10,321
Ice cream parlor	6,794	6,833	6,878	6,869	6,822	6,769	6,664
Snack bars	24,638	25,699	26,429	27,737	28,202	28,466	28,625
Other drinks influenced cuisine	7,211	7,202	7,394	7,534	7,637	7,492	8,352
Lease canteens	4,915	4,766	4,702	4,656	4,593	4,477	4,731
Caterer	3,643	4,208	4,836	5,560	6,119	6,590	6,502
Total Germany	247,861	245,442	244,871	244,393	242,828	239,794	238,217

There are fewer and fewer companies in the restaurant industry in Germany each year, with a 4% decrease between 2002 and 2008. However, a single company can own more than one foodservice outlet, and part of this decrease could be due to a change in the structure of the market, with more restaurants owned by chains, and less independent restaurants. The actual number of outlets is likely to be higher, but unavailable in Germany.

➤ UNITED KINGDOM

The CESA report²⁷ provides information on the size and the structure of the sector in the UK for the year 2006, as presented in Table 2-30, which represent a number of prepared meals of 8.7 billion per year.

²⁶ DEHOGA Bundesverband. (2010). Zahlenspiegel 1 Quartal 2010, Retrieved November 2010 from: www.dehoga-bundesverband.de/fileadmin/Inhaltsbilder/Daten_Fakten_Trends/Zahlespiegel_und_Branchenberichte/Zahlenspiegel/Zahlenspiegel_1_Quartal_2010.pdf

²⁷ CESA Catering Equipment Suppliers' Association (2007). "The UK Market for Foodservice Equipment".

Table 2-30: Structure of the commercial sector in the UK in 2006, in number of food outlets and meals served²⁸

	Number of foodservice outlets (in thousands)		Number of meals served (in millions)	
Restaurants	26.6	10%	750	9%
QSR (Quick Service)	29.8	11%	2,034	23%
Pubs	51.0	19%	1,125	13%
Hotels	46.6	18%	645	7%
Leisure	19.2	7%	537	6%
Staff Catering	20.4	8%	1,061	12%
Health Care	31.6	12%	1,050	12%
Education	34.6	13%	1,230	14%
Services	3.1	1%	249	3%
Total UK	262.9		8,682	

CESA report that 70 – 75% of commercial ovens and hobs sold in UK are gas, 25 – 30% electric although the proportion of gas appliances is decreasing.

■ Estimation of the current stock of commercial ovens used in restaurants

According to stakeholders, most of the ovens currently sold in the EU are combi-steamers. Static and forced-convection ovens are nowadays less and less used. Moreover, for ovens designed for specific purpose, like pizza ovens, the number of appliances in use in the EU is much lower than combi-steamers. Therefore, only the stock of combi-steamers will be estimated.

Combi-steamer market is dominated by a few manufacturers. Specifically, most European manufacturers acknowledge that 50% of the combi-steamers currently in use in the EU were manufactured by Rational AG.

The combi-steamers stock estimate which will be used in this study is presented in Table 2-31. This stock estimation

Table 2-31: Stock estimates of commercial ovens used in restaurants

Appliance	Stock - 2007
Electric combi-steamer	400,000
Gas combi-steamer	80,000

■ Forecast on stock until 2025

The global stock of combi-steamers is expected to grow from 480,000 units in 2007 to almost 500,000 in 2025, representing 3.6% growth in 18 years. The stock of gas

²⁸ See Annex 1 for detailed information about categories.

appliances is expected to carry on decreasing, while the number of electric combi-steamers in stock will be growing. The stock of combi-steamers in the EU-27 is presented in Table 2-32. The percentage specified in the “Annual growth” column is considered constant for the periods 2007-2010, 2010-2015, 2015-2020 and 2020-2025.

Table 2-32: Forecasts on the stock of combi-steamers in the EU-27 from 2007 to 2025

	Electric combi-steamer		Gas combi-steamer	
	Stock	Annual growth	Stock	Annual growth
2007	400,000		80,000	
2010	406,030	0.5%	79,760	-0.1%
2015	416,283	0.5%	77,786	-0.5%
2020	424,675	0.4%	73,230	-1.2%
2025	431,084	0.3%	66,194	-2.0%

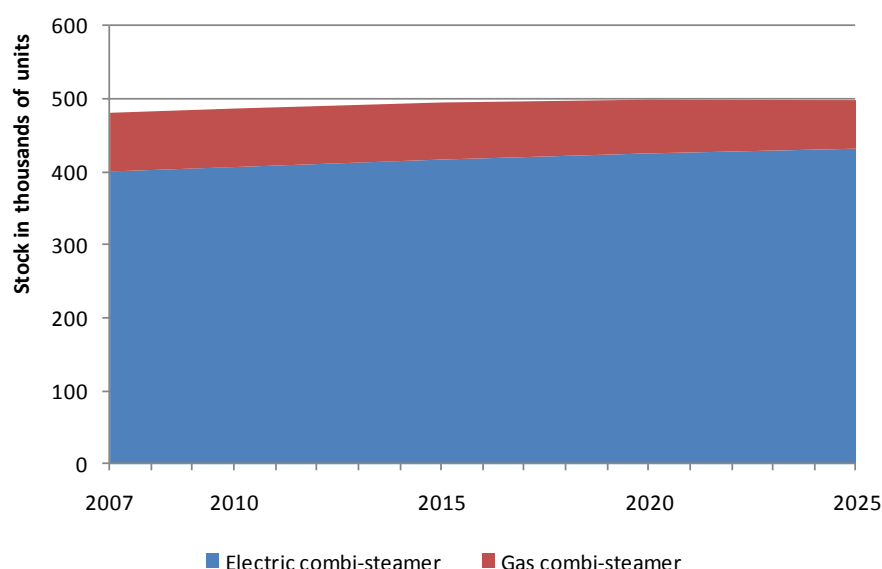


Figure 2-19: Forecasts on the stock of combi-steamers in the EU-27 from 2007 to 2025

2.2.3. COMMERCIAL OVENS USED IN BAKERIES

Data about the commercial bakery ovens market is even scarcer than the restaurants one. At the opposite of the combi-steamers market, for which there are a few number of manufacturers producing a large percentage of the products sold in the EU, there are many manufacturers of bakery ovens, selling relatively small volumes, mainly in their country. Therefore, manufacturers do not have a clear view of the global EU market, and it is difficult to estimate precisely the sales and stock at the EU level.

Some information is available on the European BVP market (Bread, Viennoiserie and Patisserie), which is linked to the baking equipment market. However, it encompasses both artisanal and industrial production methods. Industrial ovens are excluded from the scope of DG ENER Lot 22, thus a clear distinction between the production modes has to be made to deduct information about bakery ovens from the data available on

the BVP market. In this section, the term “bakery oven” will refer to an oven used for baking which is covered by the scope of the study.

2.2.3.1 STOCK DATA

■ EU BVP production

GIRA published a mini market report²⁹ providing some data about the European BVP market. Some information is also available in a study proposal³⁰ available on their website. Table 2-31 and Figure 2-20 include compiled data from these two sources.

Table 2-33: BVP market in EU-27 in 2006, by Member State

Member state	Per capita BVP consumption (kg/year)	BVP consumption in 2006* ('000t)	Percentage craft production	BVP craft production** in 2006 ('000t)
Germany	98	8,079	33%	2,684
France	83	5,229	60%	3,120
Italy	63	3,701	69%	2,560
Poland	84	3,205	44%	1,404
Spain	71	3,107	47%	1,468
United Kingdom	48	2,900	11%	309
Romania	133	2,874	29%	836
Czech Republic	133	1,363	20%	275
Hungary	95	957	21%	205
Netherlands	57	931	18%	168
Bulgaria	114	880	16%	137
Greece	77	857	63%	539
Portugal	68	719	57%	409
Belgium	69	725	38%	276
Austria	77	636	26%	166
Slovakia	106	571	19%	107
Sweden	55	498	3%	14
Denmark	64	347	5%	18
Lithuania	91	310	23%	72
Ireland	67	282	3%	7
Finland	48	252	10%	25
Latvia	54	124	25%	31
Slovenia	54	108	27%	29
Cyprus	119	91	38%	34
Estonia	48	65	2%	1
TOTAL		8383,458		3669,236

*: BVP consumption calculated from the consumption per capita and Eurostat's population statistics for 2006.

**: Craft production: production by artisan bakers and retailers in-store

²⁹ GIRA. (2007). *Gira European BVP & BVP Companies Panorama 2006-2011*. Retrieved November 2010 from: www.supports.ch/evaluation/gira/wp-content/uploads/2010/03/Gira-BVP-Panorama-Mini-Market-Report1.pdf

³⁰ GIRA. (2009). *Bake-off Bakery Markets in the EU 2009/2010 – 2014*. Retrieved November 2010 from: <http://www.supports.ch/evaluation/gira/wp-content/uploads/2010/04/Gira-Bake-off-Proposal-2009.pdf>

Table 2-24 shows the difference in eating behaviour between the European Member States. The BVP consumption per capita ranges from 48 kg/year in Estonia, in Finland or in the UK to 133 kg/year in Czech Republic and in Romania. As well, the structure of the market is very different. 98% of the BVP consumed in Estonia is produced industrially, whereas in Italy, craft production is the most common production method (69%).

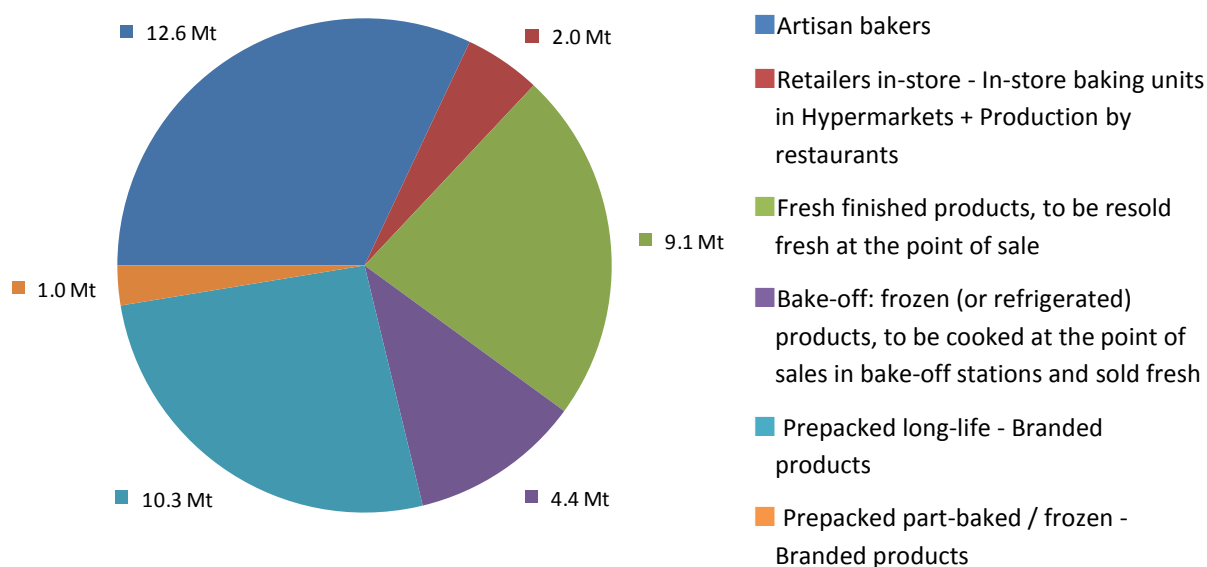


Figure 2-20: BVP production in the EU-27 in 2006 per production method.

Figure 2-20 presents both industrial and commercial BVP production modes. Four types of baking ovens are used in the EU, as presented in Task 1:

- Deck ovens: mainly used by artisan bakers, but also by retailers in-store and to produce fresh finished product.
- Rack ovens: used for the production of fresh finished products, by artisan bakers and by retailers in-store.
- In-store convection ovens: mainly used in bake-off production.
- Tunnel ovens: these industrial ovens are used in the production of branded products, and are not under the scope of Lot 22.

It is clear that in-store convection ovens are commercial appliances, and tunnel ovens are used in the industry. However, it is more difficult to classify deck and rack ovens, as they are used both to bake B2B products, and B2C products. The purpose of the following section will be to estimate the stock of each appliance used in each sector.

■ Stock of bakery ovens

A raw estimate of the bakery ovens' stock can be calculated from the BVP production. The average daily production of the three main types of bakery ovens was estimated in cooperation with manufacturers. It is then possible to calculate the annual production for one oven, by multiplying this daily production by the number of working days per year. Dividing the total EU production of BVP by the annual production per oven can

give a raw estimate of the number of ovens running in the EU in 2006. This calculation is presented in Table 2-34.

Table 2-34: Estimate of the bakery ovens' stock in the EU in 2006

	Artisan bakers	Retailers in store	Fresh finished	Bake-off	Prepacked	TOTAL
Daily production (kg)						
Rack ovens	380	400	480	180	480	
Deck ovens	300	300	350	0	350	
In-store ovens	0	0	0	160	0	
Working days per year	312	312	312	312	312	
Annual production per oven (t)						
Rack ovens	118.6	124.8	149.8	56.2	149.8	
Deck ovens	93.6	93.6	109.2	0.0	109.2	
In-store ovens	0.0	0.0	0.0	49.9	0.0	
EU Annual production (Mt)	12.6	2.0	9.1	4.4	11.3	39.4
Rack ovens	45% 5.7	60% 1.2	60% 5.5	2% 0.1	5% 0.6	13.0
Deck ovens	55% 6.9	40% 0.8	40% 3.6	0% 0.0	5% 0.6	11.4
In-store ovens	0% 0.0	0% 0.0	0% 0.0	98% 4.3	0% 0.0	4.3
EU stock						
Rack ovens	47,824	9,615	36,458	1,567	3,773	99,237
Deck ovens	74,038	8,547	33,333	0	5,174	121,093
In-store ovens	0	0	0	86,378	0	86,378

In Task 1, a commercial oven is defined as an oven which is designed to heat and bake product that are supplied to the end-customers. This distinction between commercial and industrial ovens is not compatible with GIRA's classification, which is made according to the production method. Some production methods are indeed used for Business to Business products as well as for Business to Consumer products. Especially, both rack ovens and deck ovens are used for commercial and industrial purposes. The share between industrial and commercial is presented in Table 2-35.

Table 2-35: Stock of bakery ovens used for commercial and industrial applications

	Share	Rack oven	Deck oven	In-store oven
Artisan bakers		47,824	74,038	0
Commercial	100%	47,824	74,038	0
Industrial	0%	0	0	0
Retailers in store		9,615	8,547	0
Commercial	100%	9,615	8,547	0
Industrial	0%	0	0	0

	Share	Rack oven	Deck oven	In-store oven
Fresh finished		36,458	33,333	0
<i>Commercial</i>	40%	14,583	13,333	0
<i>Industrial</i>	60%	21,875	20,000	0
Bake-off		1,567	0	86,378
<i>Commercial</i>	100%	1,567	0	86,378
<i>Industrial</i>	0%	0	0	0
Prepacked		3,773	5,174	0
<i>Commercial</i>	0%	0	0	0
<i>Industrial</i>	100%	3,773	5,174	0
TOTAL Commercial		73,590	95,919	86,378
TOTAL Industrial		25,648	25,174	0
Share commercial		74%	79%	100%

It will be assumed that the stock of appliances used for commercial purpose is made up of appliances under the scope of Lot 22, whereas only bigger ovens are used for industrial purposes. Therefore, in the following, the “Total commercial” will be used as stock.

■ Stock per energy source

The approach used to estimate the stock of bakery ovens only allow to have a raw estimate of the total number of ovens, regardless of their energy source. However, the energy source of an oven has an influence on its environmental impact. Consequently, the stock of appliances must be estimated for each source of energy.

According to manufacturers, most in-store ovens are electric. The share of gas in-store ovens will therefore be considered as negligible.

Concerning deck ovens, both gas and electricity are used. Some deck ovens are even powered with oil, but they will not be considered in this study. The preference for one energy source or another is very dependent on the Member State. In some countries, gas appliances are historically preferred, whereas in some others, gas never was widely used. In France, manufacturers consider that 55% of deck ovens are electric, and 45% are powered with gas. In Italy, due to the high cost of electricity, there are more gas ovens than electric ones.

According to manufacturers, 40% of rack ovens are powered with electricity, and 60% with gas.

Considering all this information, the stock of bakery ovens in the EU in 2006 was estimated. Given the uncertainty in the estimation approach, stocks were rounded.

Table 2-36: EU Stock of bakery ovens in 2006

	Rack oven	Deck oven	In-store oven
Electric	30,000	53,000	85,000
Gas	45,000	43,000	< 2,000

■ Forecasts on stock until 2025

As shown in Figure 2-21, GIRA predicts that there will be less and less artisan bakers in the EU. In the opposite, bake-off production is likely to increase.

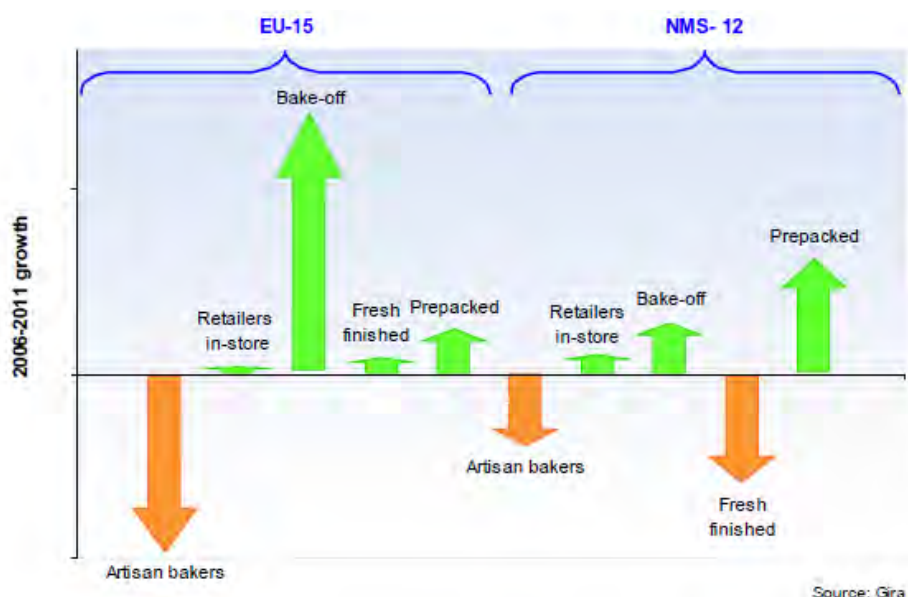


Figure 2-21: Growth in BVP Production methods in EU-15 and NMS-12 for the period 2006-2011³¹

Deck ovens being mainly used by artisan bakers, it is likely that the stock of deck ovens will decrease in the coming year, while the stock of in-store ovens will rise. According to manufacturers, new bakeries tend to buy electric ovens. Gas ovens are only renewed, but many of them are replaced with electric ovens. Therefore, it is assumed that the global stock of deck ovens will decrease from 150,000 in 2006 to less than 137,000 in 2025, with a electric / gas ratio rising (53% / 47% in 2006, 91% / 9% in 2025). Forecasts on the stock of bakery ovens in the EU-27 from 2006 to 2025 are presented in Table 2-37 and Figure 2-22. The percentage of “Annual growth” is considered constant for the periods 2006-2010, 2010-2015, 2015-2020 and 2020-2025.

³¹ GIRA. (2007). *Gira European BVP & BVP Companies Panorama 2006-2011*. Retrieved November 2010 from: www.supports.ch/evaluation/gira/wp-content/uploads/2010/03/Gira-BVP-Panorama-Mini-Market-Report1.pdf

Table 2-37: Forecasts on the stock of bakery ovens in the EU-27 from 2006 to 2025

	Electric deck oven		Gas deck oven		Electric rack oven		Gas rack oven		Electric in-store oven	
	Stock	growth	Stock	growth	Stock	growth	Stock	growth	Stock	growth
2006	53,000		43,000		30,000		45,000		85,000	
2010	58,502	2.5%	36,522	-4.0%	31,841	1.5%	47,761	1.5%	95,668	3.0%
2015	69,482	3.5%	24,071	-8.0%	34,302	1.5%	51,453	1.5%	106,665	2.2%
2020	78,613	2.5%	14,214	-10.0%	36,953	1.5%	55,429	1.5%	116,045	1.7%
2025	82,623	1.0%	7,501	-12.0%	39,809	1.5%	59,713	1.5%	122,570	1.1%

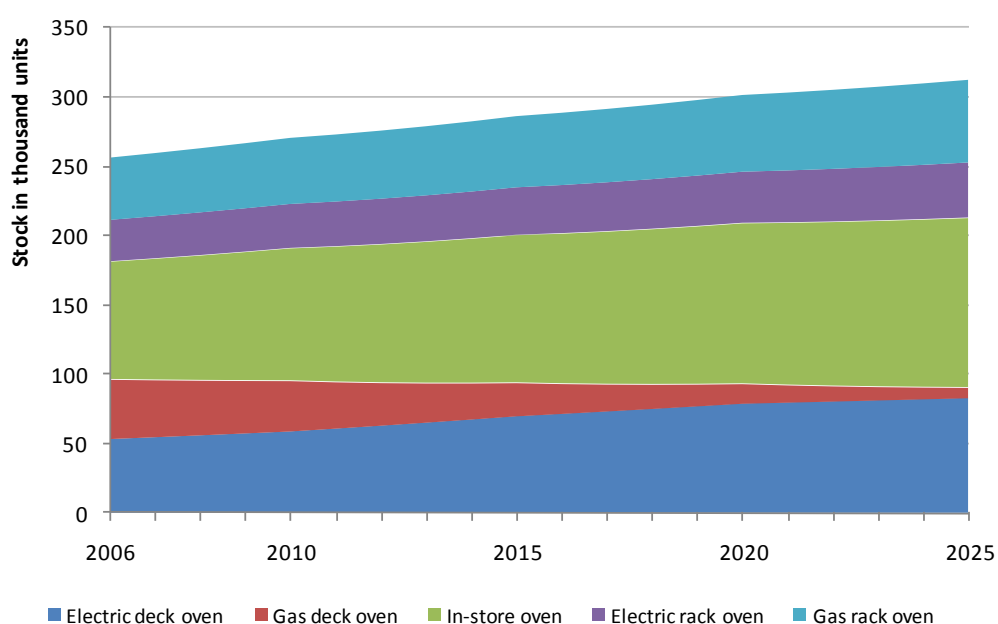


Figure 2-22: Forecasts on the stock of bakery ovens in the EU-27 from 2006 to 2025

2.2.3.1 SALES DATA

No sales figure concerning bakery ovens is available. Manufacturers can give figures for their own production, but are unable to provide any estimate of the global EU market. The share of the manufacturers which were contacted for the purpose of this study is too low for them to be the basis of an estimate. Therefore, the sales figures were obtained by dividing the calculated stock by the estimated average lifetime.

■ Sales of bakery ovens in 2006

Table 2-38 presents the sales of bakery ovens in the EU-27 in 2006. The percentage of electric appliances in sales was increased compared to electric appliances in stock. There is indeed a shift towards more electric appliances, which is occurring currently.

Table 2-38: Estimate of bakery ovens' sales in the EU-27 in 2006

	Electric deck oven	Gas deck oven	Electric rack oven	Gas rack oven	Electric in-store oven
Stock (units)	53,000	43,000	30,000	45,000	85,000
Lifetime (years)	15	15	10	10	8
Stock / lifetime (units)	3,533	2,867	3,000	4,500	10,625
Estimated sales (units)	4,500	1,900	3,000	4,500	10,625

■ **Forecasts on sales of bakery ovens until 2025**

The global sales of deck ovens were assumed to slightly decrease from 2006 to 2025, with more and more electric deck ovens. The sales of in-store ovens will carry on increasing until 2025. Forecasts on sales of bakery ovens are presented in Table 2-39 and Figure 2-23.

Table 2-39: Forecasts on the sales of bakery ovens in the EU-27 from 2006 to 2025

	Electric deck oven		Gas deck oven		Electric rack oven		Gas rack oven		Electric in-store oven	
	Sales	growth	Sales	growth	Sales	growth	Sales	growth	Sales	growth
2006	4,500		1,900		3,000		4,500		10,625	
2010	4,776	1.5%	1,614	-4.0%	3,184	1.5%	4,776	1.5%	11,959	3.0%
2015	5,273	2.0%	1,064	-8.0%	3,430	1.5%	5,145	1.5%	13,333	2.2%
2020	5,681	1.5%	628	-10.0%	3,695	1.5%	5,543	1.5%	14,506	1.7%
2025	5,971	1.0%	331	-12.0%	3,981	1.5%	5,971	1.5%	15,321	1.1%

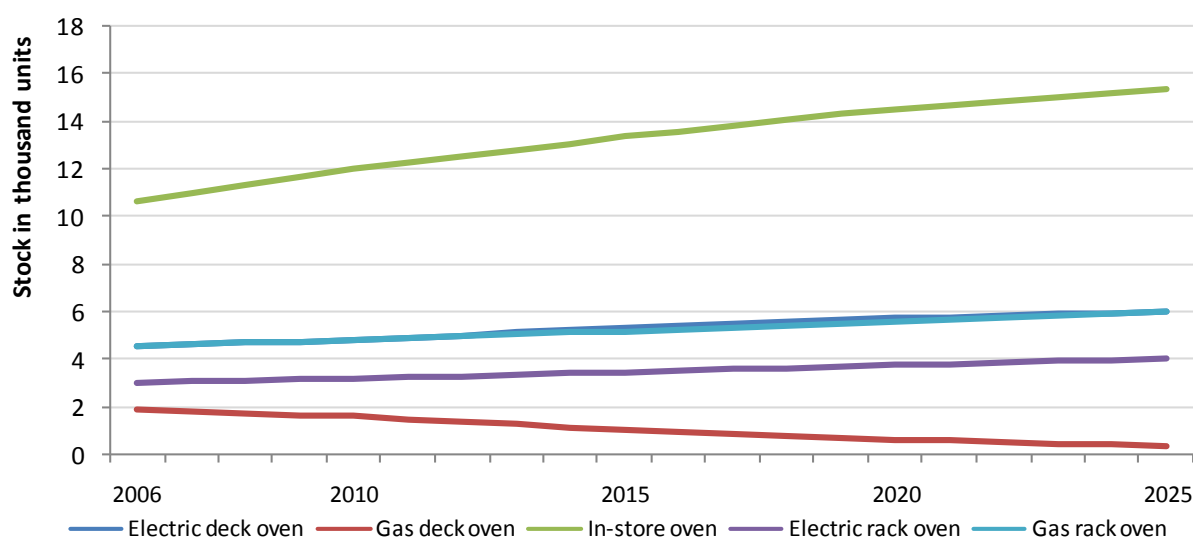


Figure 2-23: Forecasts on the sales of bakery ovens in the EU-27 from 2006 to 2025

2.2.4. SUMMARY

This section presents a summary of the sales and stock data and provides estimates of the future number of sales and the installed stock for 2010, 2015, 2020 and 2025.

2.2.4.1 DOMESTIC APPLIANCES

The estimations for sales were calculated from the available data for the year 2007, using a constant annual growth rate. The stock for 2007 was calculated by multiplying the 2007 sales by the average product life of the products (9 years for microwave ovens, 19 years for other types of ovens).

Table 2-40: Summary of domestic ovens sales in the EU-27 in 2007 and estimates until 2025

	2007	2010	2015	2020	2025
BI electric oven	5,319,980	5,481,181	5,760,776	6,054,634	6,363,481
BI electric cooker	1,729,381	1,792,389	1,902,545	2,049,581	2,207,981
FS Electric cooker	1,941,723	1,884,051	1,791,714	1,686,761	1,587,955
FS gas cooker	2,183,426	2,105,762	1,982,413	1,866,289	1,756,967
FS Mixed cooker	1,476,157	1,476,157	1,476,157	1,454,148	1,432,466
Conventional microwave oven	7,699,677	8,219,118	8,681,224	9,034,074	9,170,401
Combined microwave oven	1,485,986	1,586,235	1,675,418	1,743,516	1,769,826
Microwave with grill	4,685,875	5,001,997	5,283,226	5,497,964	5,580,929

Table 2-41: Summary of domestic ovens stocks in the EU-27 in 2007 and estimates until 2025

	2007	2010	2015	2020	2025
BI electric oven	95,000,000	97,878,595	103,893,957	110,279,008	115,904,346
BI electric cooker	15,000,000	15,454,515	16,648,902	17,935,596	18,850,491
FS Electric cooker	35,000,000	33,960,465	31,488,704	29,196,846	27,765,910
FS gas cooker	50,000,000	49,253,744	48,034,652	45,680,476	43,441,678
FS Mixed cooker	20,000,000	20,301,503	21,337,083	20,808,964	20,808,964
Conventional microwave oven	69,297,094	71,821,845	73,635,437	74,746,616	75,497,078

Combined microwave oven	13,373,874	13,861,135	14,211,146	14,425,596	14,570,430
Microwave with grill	42,172,878	43,709,393	44,813,110	45,489,352	45,946,069

The level of confidence in this market data is high as the 2007 sales come from GfK Retail and Technology. The estimations of the stock and the forecast until 2020 are simplistic but are thought to be representative enough to be used as input in this study.

2.2.4.2 RESTAURANT OVENS

Table 2-42 and Table 2-43 present the market figures that will be used in this study for restaurant ovens. Details about the calculation method are available in Table 2-24 and Table 2-32 respectively.

Table 2-42: Summary of restaurant ovens sales in the EU-27 in 2007 and estimations until 2025

	2007	2010	2015	2020	2025
Electric combi-steamer	41,000	42,242	43,959	45,746	46,901
Gas combi-steamer	9,200	9,200	8,838	8,362	7,754

Table 2-43: Summary of restaurant ovens stocks in the EU-27 in 2007 and estimations until 2025

	2007	2010	2015	2020	2025
Electric combi-steamer	400,000	406,030	416,283	424,675	431,084
Gas combi-steamer	80,000	79,760	77,786	73,230	66,194

No sales or stock figures are available concerning commercial appliances used in restaurants. They were estimated only for combi-steamers, together with the manufacturers which have the biggest market share. The other types of ovens used in restaurants are thought to be sold in lower volume.

2.2.4.3 BAKERY OVENS

Table 2-44 and Table 2-45 present the market figures that will be used in this study for restaurant ovens. Details about the calculation method are available in Table 2-39 and Table 2-37 respectively.

Table 2-44: Summary of bakery ovens sales in the EU-27 in 2006 and estimations until 2025

Appliance	2006	2010	2015	2020	2025
Electric deck oven	4,500	4,776	5,273	5,681	5,971
Gas deck oven	1,900	1,614	1,064	628	331
Electric rack oven	3,000	3,184	3,430	3,695	3,981
Gas rack oven	4,500	4,776	5,145	5,543	5,971
Electric in-store oven	10,625	11,959	13,333	14,506	15,321

Table 2-45: Summary of bakery ovens stocks in the EU-27 in 2006 and estimations until 2025

Appliance	2006	2010	2015	2020	2025
Electric deck oven	53,000	58,502	69,482	78,613	82,623
Gas deck oven	43,000	36,522	24,071	14,214	7,501
Electric rack oven	30,000	31,841	34,302	36,953	39,809
Gas rack oven	45,000	47,761	51,453	55,429	59,713
Electric in-store oven	85,000	95,668	106,665	116,045	122,570

No sales or stock figures are available concerning commercial appliances used in bakeries. An estimate was made from statistics available on the BVP market (Bread, Viennoiserie, Pastry). However, manufacturers who gave information to support this estimate do not have a clear vision of the global EU market, therefore it may be questionable.

2.3. MARKET TRENDS

2.3.1. DOMESTIC MARKET STRUCTURE

Some information about the market structure for large white goods is available for Belgium, Portugal, Spain and the UK. For France, information about built-in ovens and range cookers is presented.

■ Belgium³²

Figure 2-12 shows the market share of the distribution channels for white goods in Belgium in 2003. In Belgium, most white goods are purchased in retail chains or cooperative shops (43%). Department stores or hypermarkets comes second with 22%, followed by the other specialised shops (20%).

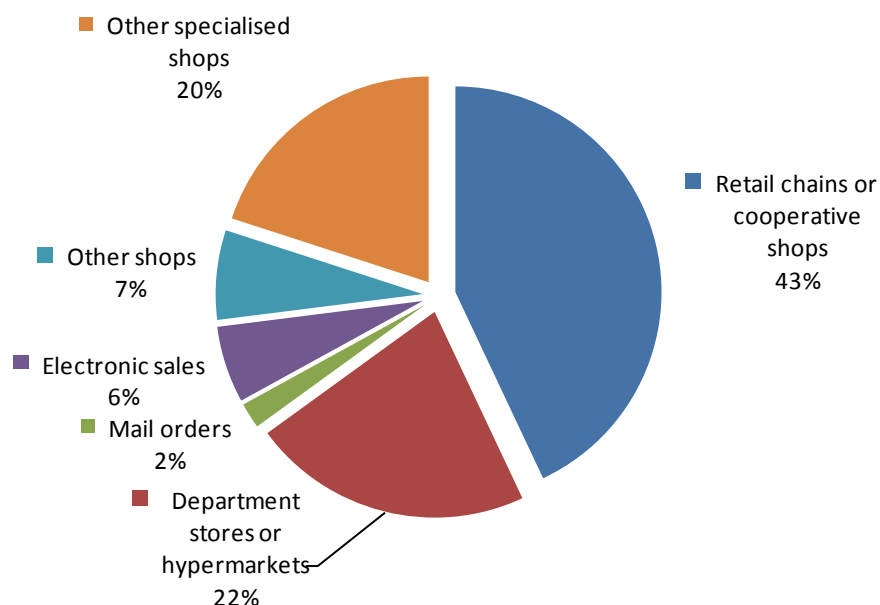


Figure 2-24: Market share of the distribution channels in Belgium in 2003

■ France

Table 2-46 shows the market share of the sales outlets for domestic ovens in terms of value, for the French market in 2008. Differences appear between free-standing appliances, such as range cookers, and built-in ovens. Indeed, free-standing ovens are mainly purchased in specialised retailers, whereas built-in ovens are often bought through kitchen manufacturers that integrate them as part of a kitchen.

³² Source: "Comanda ancora l'indipendente", Apparecchi Elettrodomestici, March 2004, pp. 73-74

Table 2-46: Sales outlets for range cookers and built-in ovens in France in 2008³³

	Supermarkets and online shops	Large specialised retailers	Small independent stores	Kitchen manufacturers and retailers	Hypermarkets
Built-in ovens	6.3%	24.8%	22.4%	43.2%	3.3%
Range cookers	6.4%	52.8%	29.8%	2.1%	8.9%

■ Portugal³⁴

There were about 6,780 shops selling household appliances (of which 1,050 were specialised shops) in Portugal in 2003. Refrigerators, ovens and dishwashers are sold also by kitchen furniture shops. Hypermarkets generally offer a complete range of white goods, and department stores a large range, even if not always complete, making large distribution a major player. Voluntary unions and purchasing groups are still a novelty for the country. Figure 2-25 presents the market share of the main distribution channels in Portugal.

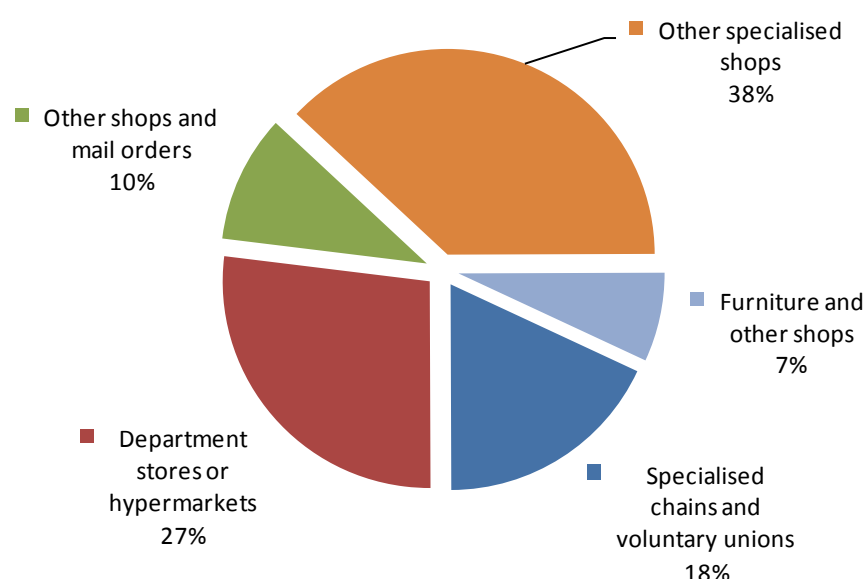


Figure 2-25: Market share of the main distribution channels in Portugal in 2003

■ Spain³⁵

The Spanish distribution system for white goods was made out of 9,379 specialised shops in 2005, of which 8,120 were part of purchase groups or large distribution

³³ GIFAM (Groupe Interprofessionnel des Fabricants d'Appareils électroménagers). (n.d.). *Les ventes de l'électroménager*. Retrieved July 2010, from online database : <http://www.gifam.fr/index.php?id=80>

³⁴ Source: "L'avanzata dei centri commerciali", *Apparecchi Elettrodomestici*, March 2004, pp. 83-84

³⁵ Source: "Salto verso la modernità", *Apparecchi Elettrodomestici*, February 2006, pp. 86-87

chains. Independent shops were about 6% are decreasing. The share of the different distribution channels is presented in Figure 2-26.

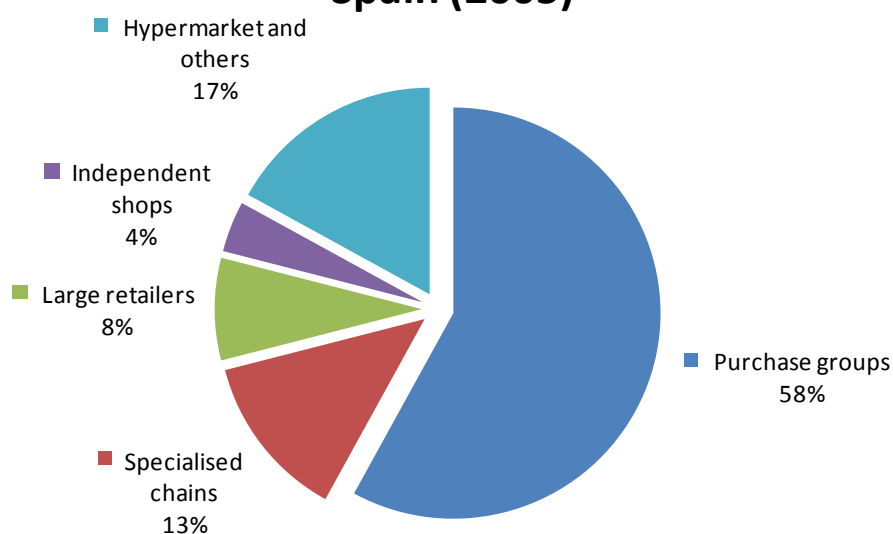


Figure 2-26: Market share of the different distribution channels for white goods in Spain in 2005

■ UK³⁶

The market share of the different distribution channels for white goods in the UK in 2005 is presented in Figure 2-273.

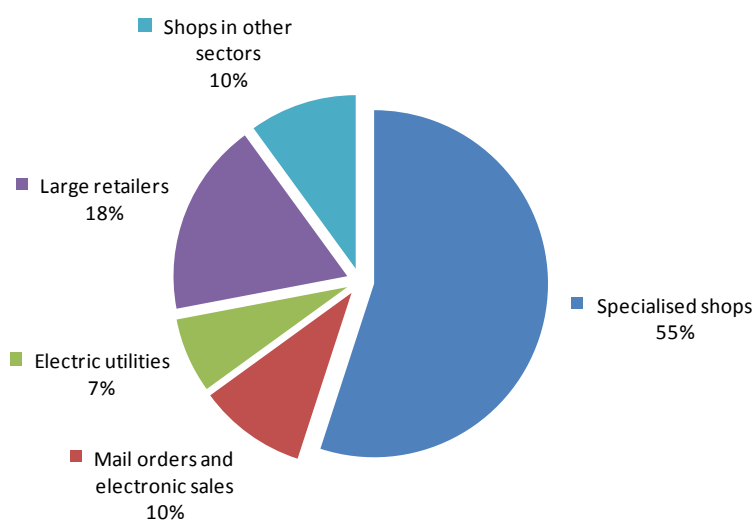


Figure 2-27: Market share of the different distribution channels for white goods in the UK in 2005

³⁶ Source: "Una pluralità di canali per la vendita dell'eldom", Apparecchi Elettrodomestici, September 2006, pp. 80-81

2.3.2. MAIN MANUFACTURERS OF DOMESTIC OVENS

The domestic oven market appears concentrated; in 1999, the two or three leading manufacturers were covering between 40% to 80% of the market (e.g. General Domestic Appliances and Electrolux in UK, Bosch-Siemens and Electrolux in Germany). The situation is likely to be similar nowadays, even though the number of brands has increased due to more competition, especially from Asian manufacturers. An estimation of the market share of electric oven manufacturers is presented in Figure 2-28.

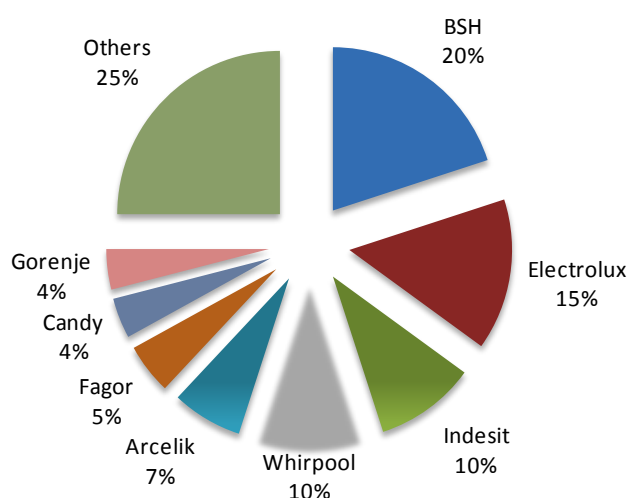


Figure 2-28: Estimated market share of electric oven manufacturers³⁷

An important aspect to be taken into consideration is the relative importance of Original Equipment Manufacturers (OEM), which are producers of appliances for other brands. OEMs are in general small and medium size companies. According to CECED, in 1999, 25% of the European cooking products were not manufactured by the brand, but by an OEM.

Table 2-47 indicates the number of manufacturers present in some Member States and Table 2-48 the number of brands under which the manufacturer is distributed. It is interesting to note that while in Italy and France there is a large number of producers, in Sweden there is only one (data from 2000). Some manufacturers are producing the 4 different types of appliances (mainly in France and in Italy), while others are working on a much specialised market segment and producing only one type (as in Sweden or Finland for instance). Some manufacturers are only national producing and selling only in one country, e.g. in Germany or UK.

³⁷ Estimation by CECED.

Table 2-47: Manufacturers in some MS per type of appliance, in 1999³⁸

	Type of appliance	AU	FR	FI	DE	IT	NL	SE	UK
Built-in ovens	Electric	0	17	1	9	8	4	0	5
	Gas	2	4	0	3	8	0	0	4
Free-standing ovens	Electric	0	9	1	7	11	4	1	5
	Gas	2	11	0	4	11	4	0	4
Total		2	23	1	9	12	7	1	6

Table 2-48: Brands in some MS per type of appliance, in 1999³⁸

	Type of appliance	AU	FR	FI	DE	IT	NL	SE	UK
Built-in ovens	Electric	0	29	3	13	14	6	0	6
	Gas	7	5	0	4	12	0	0	5
Free-standing ovens	Electric	0	22	5	9	17	6	3	6
	Gas	7	25	0	4	17	6	0	9
Total		7	43	5	13	20	9	3	11

Table 2-49 indicates the number of factories per country and a rough estimate of their production. The information about production is a minimum value of production. Production may vary from 30,000 to 300,000 units per factory. Size of factories is quite variable: from 50 to more than 3,000 employees. More factories are installed in Italy, Germany, and UK. Some manufacturers also own factories outside the EU (in Eastern Europe or in Turkey)³⁸. Most built-in ovens factories manufacture electric ovens and most free-standing ovens factories manufacture gas ovens.

Table 2-49: Factories present in some Member States in 1999

	AU	FR	FI	DE	IT	NL	SP	SE	UK
Factories	2	7	1	7	20	2	*	1	9
Thousands of units produced	*	953	80	1,766	4,775	*	1,774	378 (for year 1990)	1,065 (for year 1997)

*: no information

³⁸ TTS Institute (2000), "Efficient Domestic Ovens", Save II Project. Retrieved July 2010, from www.ceecap.org/img_assets/File/Ovens_st.pdf

2.3.3. TECHNOLOGY TRENDS

Concerning domestic built-in ovens, features such as fan function, multifunction (the combination of several cooking modes in an oven) and rapid-cook facilities have been adopted by low and mid class market. Fan forced convection mode remains the most popular cooking method (recording 65% of volume and 25% growth in UK over the last two years), while multifunction accounts for a 25% volume share³⁹.

As described below, flexibility and choice in terms of both style and technology are regarded as absolutely key to current customers⁴⁰. Currently, the increase of sales in built-in ovens is due to flexibility of installation, a range of options and advanced cooking functions and systems.

Preferences mainly depend on what the customer is looking for: either low end products performing the basic functions of ovens or more sophisticated appliances performing different kinds of functions with higher prices. Table 2-50 shows CECED's analysis of consumer preferences according to their choice of product price range. In ovens at the low end of the price range, technological features and functionality of the product are less considered than in the case of the high end products.

Table 2-50: Consumer preferences in domestic oven choices

Criteria	Level of consideration by customers			
	Very Low	Low	High	Very High
Technology/performance	*		X	
Functionality	*		X	
Size			*X	
Fuel Used				*X
Design		*	X	
Price		X		*

X: high end ovens

*: low end ovens

■ Towards more convenience

Changing lifestyles, increasing market for ready meals, the trend towards more single household is shifting the market towards appliances which provide more convenience.

■ Towards more elaborated services

Together with more convenience, another trend is the purchase of more elaborated services. Societal changes together with deteriorating economic climate are stimulating 'a home-eating' interest in some countries. There is a clear trend towards cooking

³⁹ Ryland, A. (2008). "Built-in ovens - Magic in the oven". Retrieved July 2010, from The Independent Electrical Retailer: http://www.independentelectricalretailer.co.uk/news/fullstory.php/aid/549/Built-in_ovens_-_Magic_in_the_oven.html

⁴⁰ KBB magazine (Kitchen, bathroom, bedroom) (2009), "Focus: Built-in ovens". Retrieved July 2010 from: www.kbbreview.com/Default.aspx?LocID=088new16g.RefLocID=08800I00q.Lang=EN.htm

elaborate dishes, while at the same time, keeping the convenience aspect to cook easily in the evening. Therefore, clever cooking features such as rotisseries, multifunction ovens, thermostatic grills, triple-crown wok burners and griddle plates are all growing massively in popularity. An 'intelligent' and easy to operate oven has a key role to play in this situation. In fact, ovens are being equipped with increasingly sophisticated electronics, display to provide the consumer with improved information and control. More top-of-the-range models feature fully automated cooking programmes which ensure higher performance cooking. Models in the built-in market are extremely advanced, with many boasting time-saving, pre-programmed cooking settings, self-clean modes, state-of-the-art controls (e.g. touch controls) or hide-away doors. More and more ovens have an Intelligent Control System (ICS) that can, for example, weigh the food, sense its density, or adjust automatically the time and temperature of the cooking⁴¹. With such ICS, there is no need to preheat the oven, or set any times or temperatures as the oven sets all the cooking parameters. The most recent innovations, such as steam ovens, are still considered growth areas in a market impacted by the economic situation.

■ Towards multi-cooking

The combination of the first two trends in one single appliance, i.e. more elaborated services and more convenience at the same time, is naturally a solid base for the development of multi-cooking. This translates into the use of several cooking appliances, comprising a single oven complemented by other compact cooking appliances, such as steam ovens, combination microwaves or warming drawers. Multiple cooking allows an increased level of flexibility in both the kitchen design and cooking requirements to accommodate all tastes and styles. Specialist options such as steam ovens and combination microwaves are growing in popularity as they offer more versatility. Ease of use and electronic controls are two other important features. The concept of an integrated kitchen with furniture and built-in appliances sold together as a complete package was first introduced to the UK for example in the late Seventies.

➤ THE GROWING PENETRATION OF MICROWAVE OVENS

As more and more people eat ready meals, an increase in the sales of microwave ovens is observed, in order to match their lifestyle. This was confirmed by the previous data for the French market (see Table 2-6). This is also the case in UK where ownership for microwave ovens was 82.7% in 2006, compared to 70.6% in 1998⁴².

Over time, microwave oven power levels have increased so that nowadays the majority have power ratings over 850 W, and 1000 W is not uncommon. This is assumed to imply shorter cooking times, but can lead to uneven heat distribution throughout the food as there is less time for heat to diffuse during a shorter cooking cycle. Currently, the majority of new microwave ovens are touch control and many have digital clocks and displays. These features are commonly found in the UK market. Recent microwave

⁴¹ Example of ovens equipped with ICS: Electrolux's Inspiro , De Dietrich 'Smart Chef' of Hotpoint

⁴² MTP (2008), "Historical microwave oven use and options to increase usage in the future".

oven designs and innovations include a microwave oven with a round cavity to increase capacity whilst minimising use of space on the counter top, internet enabled microwave ovens that can be networked with other kitchen appliances and store recipes in their memory, a combined microwave oven and toaster, and a car battery-operated microwave oven. Because of their speed and convenience, microwave ovens have become a part of most modern kitchens as evidenced by the market saturation in several MS.

Another aspect dealing with convenience and technological advancements is related to oven-cleaning functions. GfK Retail and Technology GmbH data shows that, in the UK for example, 60% of built-in ovens do not have a self-cleaning function, and pyrolytic cleaning accounts for only 6% of built-in ovens, although it is growing fast (30% of sales between March 2006 and March 2008). In France, as seen before, pyrolytic ovens and catalytic ovens already account for 99% of the built-in ovens market.

➤ THE GROWING PENETRATION OF BUILT-IN OVENS

While in the past, range cookers and free-standing ovens were leading in terms of cooking capabilities, technology and capacity, now built-in ovens drive product innovation, with the additional benefit of their streamlined, design-led looks. Built-in models are increasing their market share mainly due to the number of new build properties that are sold with fitted kitchens. The sales of built-in ovens have also benefited from the fact that the products themselves have become more mainstream, which has led to a level of competition with increased pressure on manufacturers to develop production processes and create innovative features to make their products stand out from the multitude available on the market. As they are no longer only for the top-end kitchen projects and, as the number of players in the market has increased, this has led manufacturers to differentiate themselves by delivering feature-packed products. Although the built-in market has declined significantly in 2008 because of economic recession, it has been boosted somewhat by consumers who are choosing to improve rather than move during the current recession. Therefore, the replacement market remains buoyant⁴³.

In some markets (e.g. Spain, Italy, France), the proportion of built-in appliances is relatively low, the market for built-in ovens should thus keep developing.

➤ THE GROWING INTEREST IN IMPROVED APPEARANCE

One of the key selling points for built-in appliances is that their design and aesthetics go hand-in-hand with the current trend for sleek and integrated kitchen design. The majority of buyers simply want a quality appliance that will blend seamlessly with their fitted kitchen, so aesthetics and controls are of optimum importance in product development and are a key factor in driving sales.

⁴³ KBB magazine (Kitchen, bathroom, bedroom) (2009), "Focus: Built-in ovens". Retrieved July 2010 from: www.kbbreview.com/Default.aspx.LocID-088new16g.RefLocID-08800I00q.Lang-EN.htm

2.4. CONSUMER EXPENDITURE BASE DATA

2.4.1. AVERAGE CONSUMER PRICES

■ Domestic appliances

Ranges of product prices for different categories of ovens in the EU are presented in Table 2-51. The average price was included in the market survey bought to GfK Retail and Technology GmbH (see section 2.2.1. . Prices vary between different countries. The factors influencing this difference are the brand, retailer and technology. For microwave ovens, in France and Italy prices are higher than in the rest of Europe. Microwave ovens' price ranges from below 100€ to over 1500€; however the average price remains around 100€ due to the high volume of sales in the lower price range.

Table 2-51: Observed average appliance prices (VAT included - 2007)

Appliance		Product price range (€)		
		Low range	High range	Average price
Type of energy source	Gas ovens	200	600	330
	Electric ovens	350	1,500	493
Type of appliance	Microwave ovens	50	1,500	117
	Free-standing	300	1,500	411
	Built-in	300	1,500	489

The installation price of domestic ovens was considered to be negligible.

■ Restaurant ovens

Manufacturers of commercial appliances were invited to fill up a questionnaire on the appliances they produce. Table 2-52 presents the average price, calculated from the results of the questionnaire. However, these prices are negotiable, and it is not uncommon that clients obtain a high discount.

Table 2-52: Restaurant oven purchase and installation prices (VAT included)

Appliance	Size	Average purchase price (€)	Average installation price (€)
Electric combi-steamer	10 GN 1/1	11,900 €	200 €
Gas combi-steamer	10 GN 1/1	13,200 €	300 €

■ Bakery ovens

The average European prices of bakery ovens presented in Table 2-53 were calculated on a small sample of manufacturers. Therefore, it may be unreliable. There are important variations in price according to the Member State.

Table 2-53: Bakery ovens purchase and installation prices (VAT included)

Appliance	Average purchase and installation price (€)
Deck oven (electric or gas)	35,000 €
Rack ovens (electric or gas)	15,000 €
Electric in-store oven	14,400 €

2.4.2. RUNNING COSTS

The most significant running cost for ovens is energy use. The latest electricity and gas rates for households in Member States, from mid-2007 to mid-2009 are presented below, according to the different consumption classes. The EU average will be used in Life Cycle Cost (LCC) calculations at a later stage of the study (Task 5 and Task 7).

■ Electricity rate

Electricity costs have to be taken into account for cooking appliances. The evolution of electricity rates between 2007 and 2009 as well as the rates depending on the customer's consumption are given as reported by Eurostat in Figure 2-29.

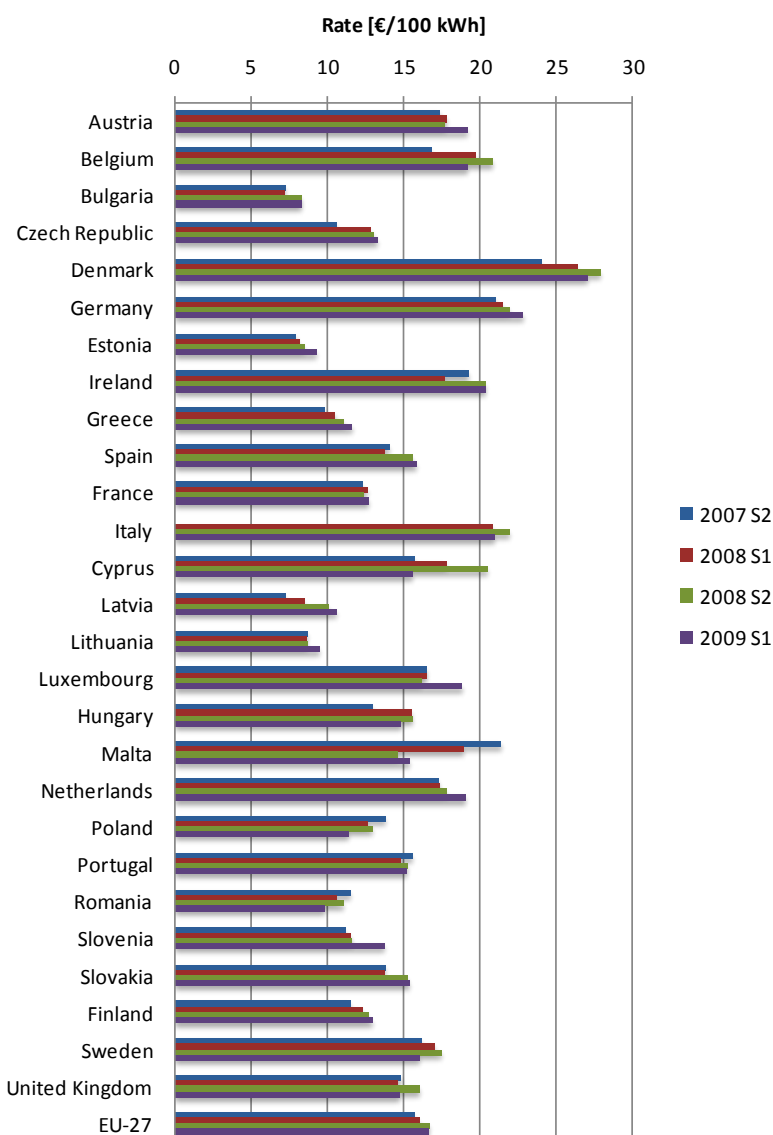


Figure 2-29: The evolution of electricity rates between mid -2007 and mid-2009 for domestic customers (2500-5000 kWh) in EU-27 (taxes included)⁴⁴

⁴⁴ Eurostat (2009), "Environment and Energy, Data in focus, 48/2009".

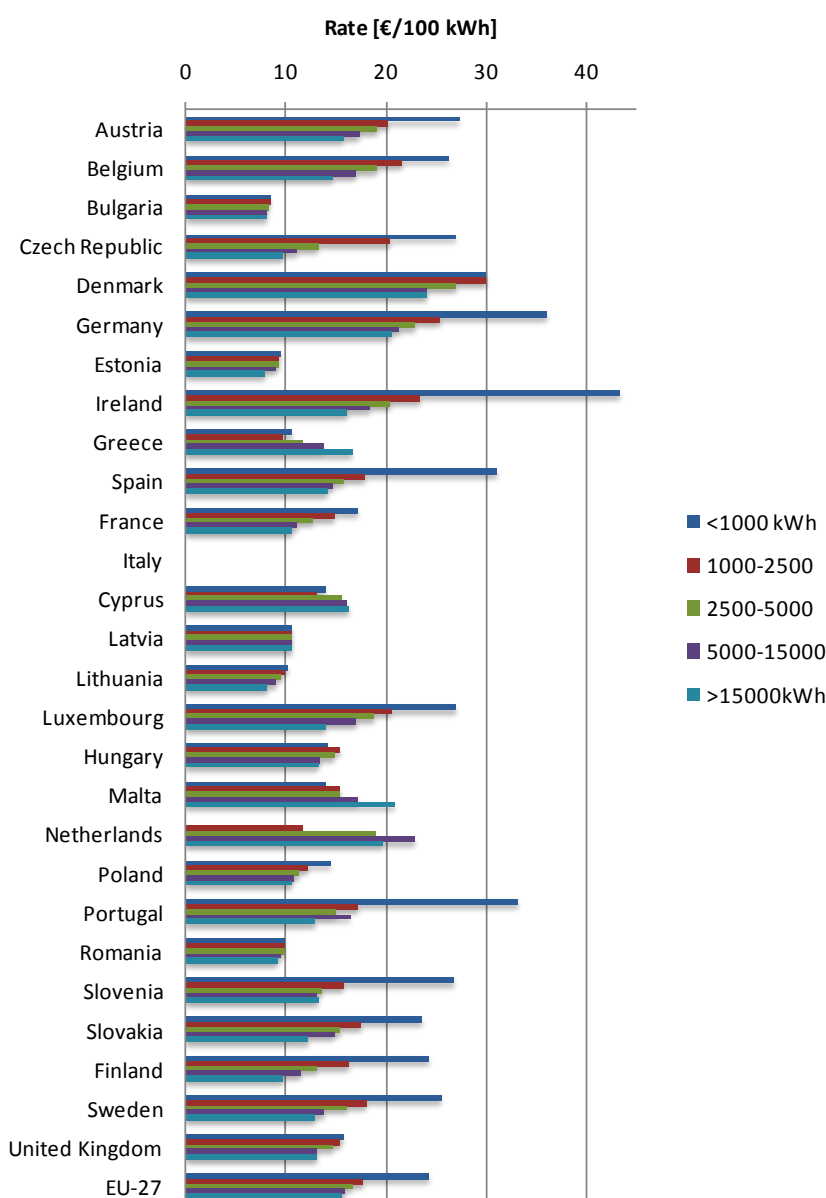


Figure 2-30: Electricity rates in the first semester of 2009 according to customer's consumption in EU-27 (taxes included)

The average electricity consumption of a European household in 2007 was 4000 kWh/household⁴⁵ which means an estimation of the rates in the category [2500-5000 kWh] can be used, that is a rate of 16.58 €/100 kWh. For commercial applications, the higher category (>15 000 kWh) will be used, that is to say an estimation of the rate of 15.54 €/100 kWh.

⁴⁵ Enerdata Energy Efficiency/CO₂ Indicators available at: www.worldenergy.org/documents/ueur27.pdf

■ Natural gas rates

Natural gas costs have to be taken into account for cooking appliances. The evolution of the natural gas rates between 2007 and 2009 as well as the rates depending on the customer's consumption as reported by Eurostat are presented in Figure 2-31 and Figure 2-32.

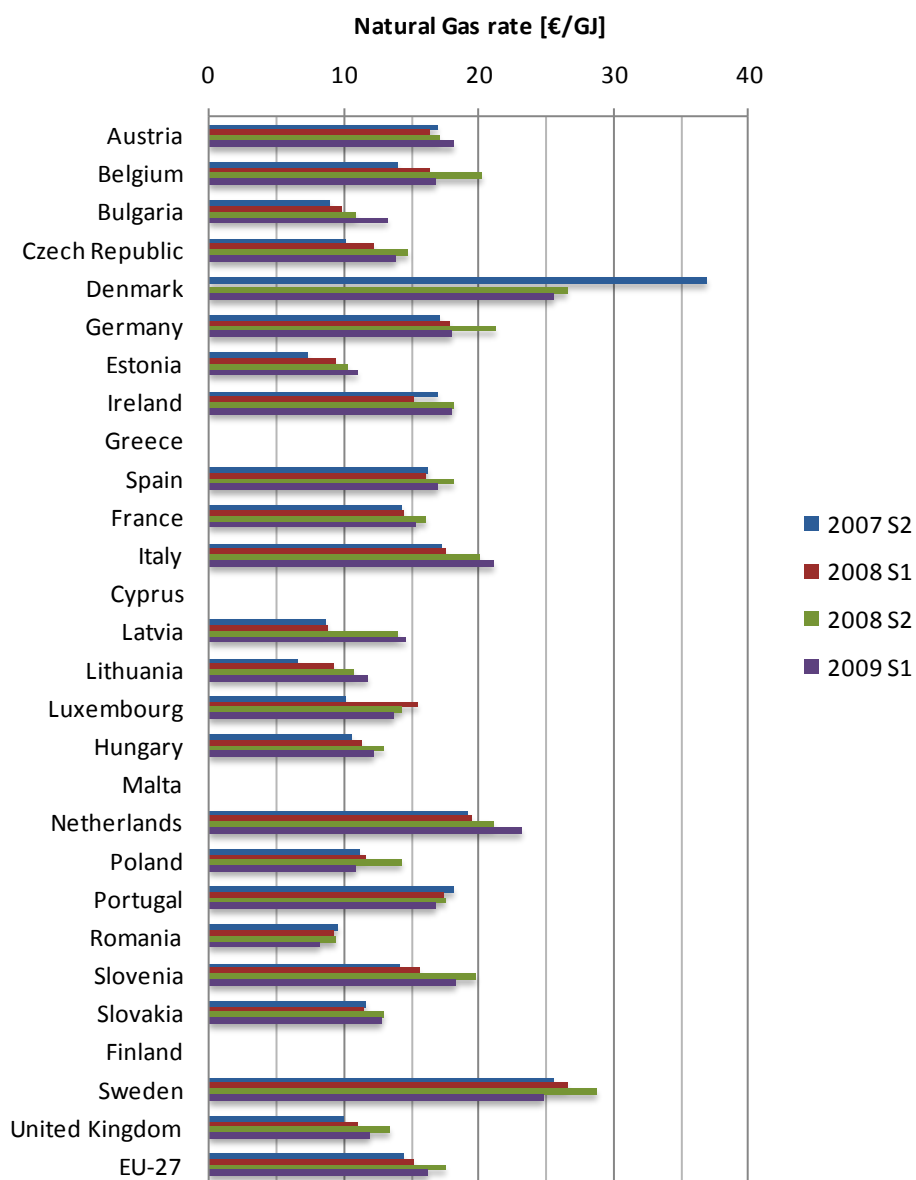


Figure 2-31: Natural gas rate for consumers in the range between [20-200 GJ] between mid-2007 and mid-2009 in EU-27 (taxes included)

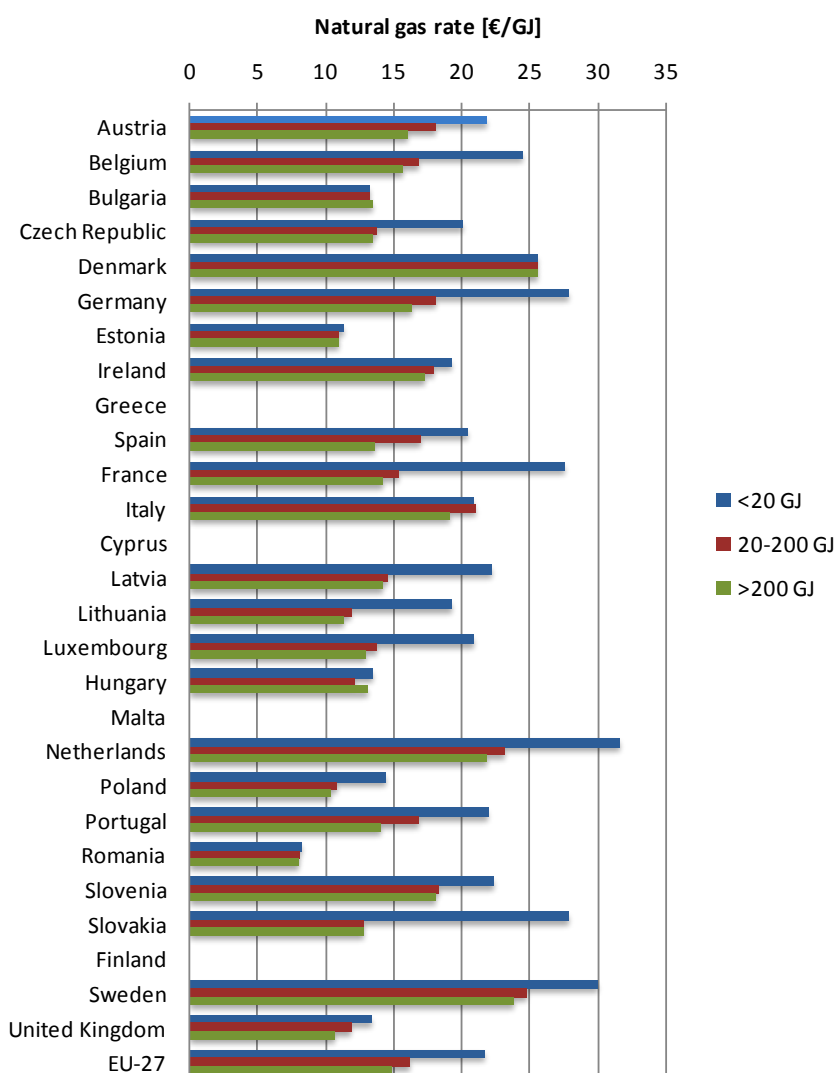


Figure 2-32: Natural gas rate according to the customers consumption in EU-27 (taxes included)

The annual consumption of a European household is around 84 GJ⁴⁶ which means rates of the category [20-200 GJ] should be used for households, that gives an estimation of the rate of 16.21 €/GJ. For commercial applications, the higher category (>200 GJ) will be used, which means an estimation of a rate of 14.81 €/GJ.

■ Water rates

Commercial appliances cooking with steam consume water. The cost of water to consumers is often obscure and difficult to evaluate as it is often based on a variable rate which corresponds to consumption. Figure 2-33 shows the estimated water prices for major city centres and estimates for national averages for countries in Europe from a study completed by the OECD in 2003. City data is for 1998 and national data is for 1996.

⁴⁶ Eurostat (2006), "Gas prices for EU households and industrial consumers on 1 January 2006".

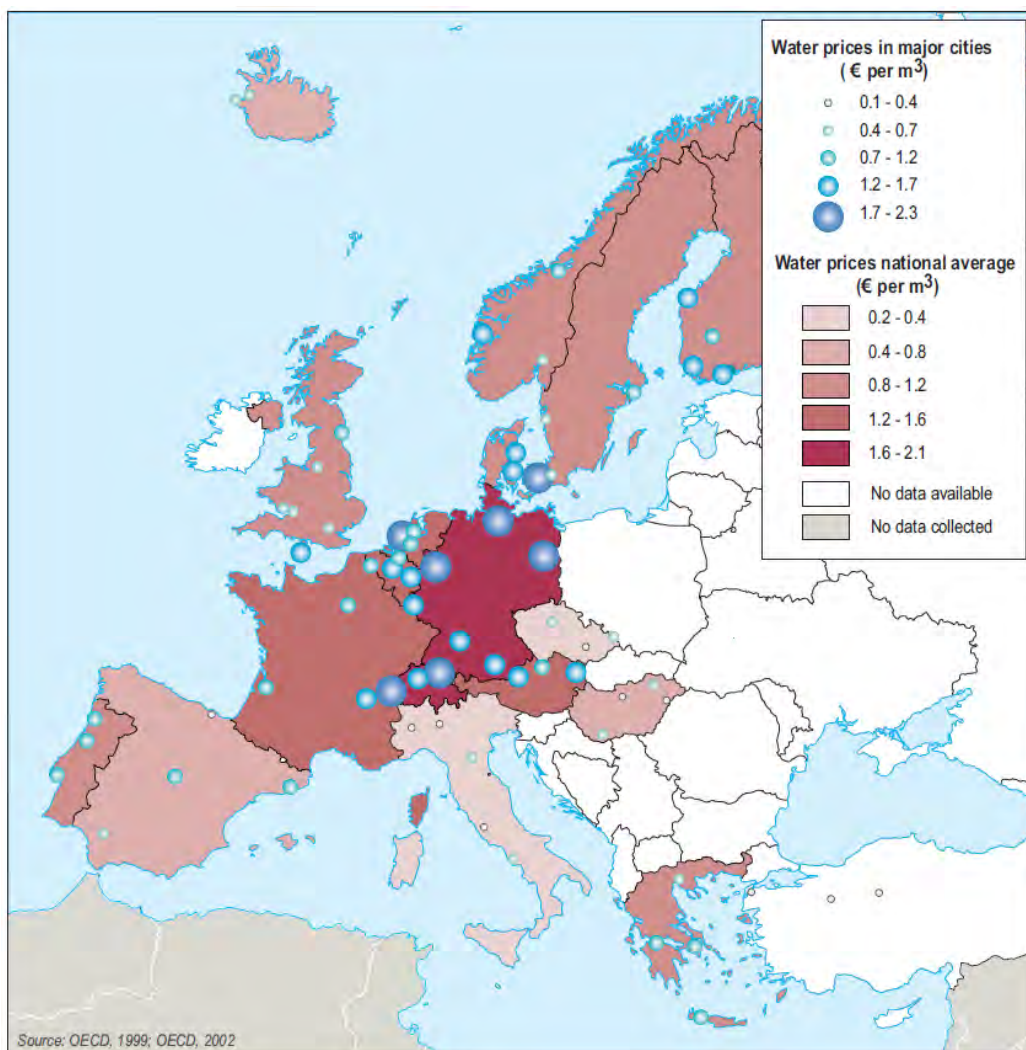


Figure 2-33: Water prices in Europe⁴⁷

A more recent indication of water prices in France is shown in Figure 2-34 where a breakdown in the cost of water to consumers is given over 15 years.

⁴⁷ OECD 2003 – Water Indicators

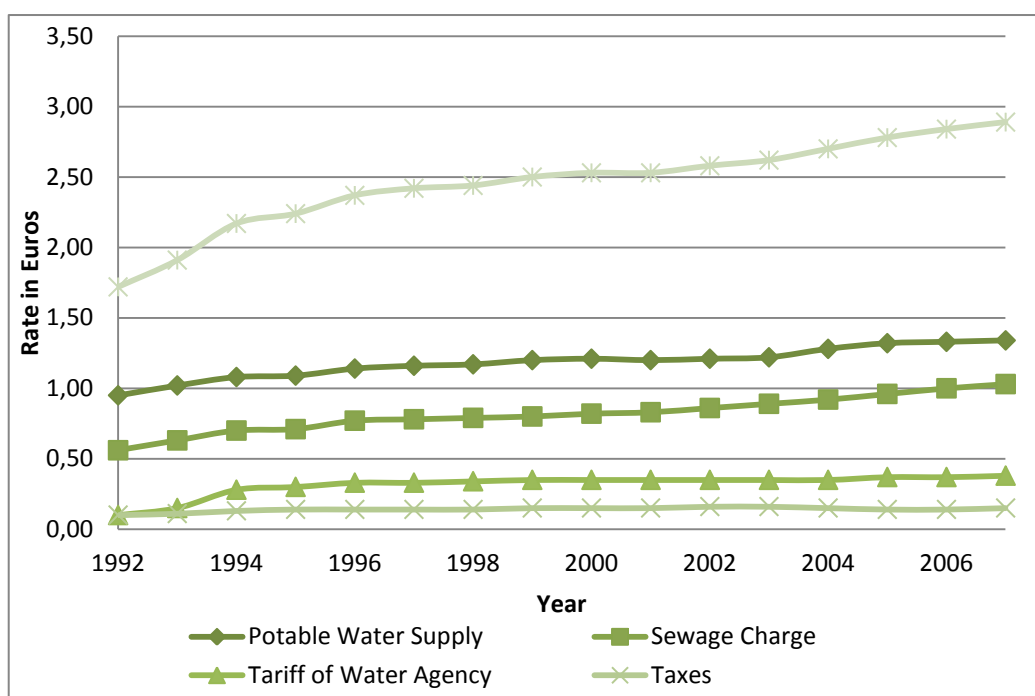


Figure 2-34: Water cost break down in the Rhône region of France for 15 years

A final water tariff to the consumer can be observed at 2.90 euros/m³ with an average increase of 0.064 euros/m³ per year, suggesting a current water tariff in this region of France of 3.08 euros/m³.

The preparatory study for Lot 14 (domestic dishwashers and washing machines) proposed a water rate of 3.70 euros/m³ for domestic water use in 2008 across Europe.

Furthermore, BIPE analysed the water rate for eight major European cities in 2006. The relevant information is presented in Table 2-54.

Table 2-54: Water consumption and effective rate for eight European cities⁴⁸

City	Annual water consumption per capita (m ³)	Average persons per household	Average water bill per household (euros)	Effective water rate (euros/m ³)
Amsterdam	57	2.3	506	3.86
Athens	61	2.7	171	1.04
Berlin	43	1.8	360	4.65
London	54	2.4	312	2.41
Madrid	61	2.9	207	1.17
Paris	52	1.9	229	2.32
Rome	104	2.6	229	0.85
Stockholm	77	2	302.5	1.96

⁴⁸ Consumption, persons per household and average water bill per household taken from: BIPE, Analysis of Drinking Water and Wastewater Services in Eight European Capitals : the Sustainable Development Perspective, 2006

Based on the population of the above cities, the weighted average water rate for the eight cities cited by BIPE is 2.38 euros/m³.

Based on the above presented sources, a water rate extrapolated from the weighted average of the eight largest cities in Europe to the year 2010 based on the evolution of water price experienced in France over 15 years gives a water price of **2.64 euros/m³** for the EU-27.

To summarise, the following energy rates in Table 2-55 will be used:

Table 2-55: Summary of the rates used for gas and electricity in this study

	Electricity rate (€ / 100 kWh)	Gas rate (€ / GJ)	Water rate (€ / m ³)
Domestic use	16.58	16.21	2.64
Commercial use	15.54	14.81	2.64

2.4.3. REPAIR AND MAINTENANCE COSTS

■ Domestic ovens

Repair and maintenance cost for domestic ovens are supposed to be negligible compared to their whole life cycle cost. Microwave ovens are believed to be replaced when they are broken.

■ Restaurant ovens

Manufacturers were asked through a questionnaire to give information about the average cost of repair and maintenance for the appliances they produce. This information is presented in Table 2-56.

Table 2-56: Average repair and maintenance cost of restaurants ovens

Appliance	Size	Average repair and maintenance cost (€)
Electric combi-steamer	10 GN 1/1	700 €
Gas combi-steamer	10 GN 1/1	900 €

■ Bakery ovens

No information regarding the repair and maintenance costs of deck ovens are available. For in-store ovens, in average 5000€ are spent for repairing and maintenance over their lifetime, as shown in Table 2-57.

Table 2-57: Average repair and maintenance cost of bakery ovens

Appliance	Average repair and maintenance costs (€)
Electric deck oven	6,000 €
Gas deck oven	8,000 €
Electric rack oven	3,650 €
Gas rack oven	5,475 €
Electric in-store oven	2,500 €

2.4.4. DISPOSAL COSTS

The different end-of-life practices for ovens will be analysed in Task 3, Section 3.2.

Under the Directive 2002/96/EC on Waste of Electrical and Electronic Equipment, consumers can dispose of such appliances without charge. Eventually, the costs of WEEE collection and treatment are likely to be integrated in the product prices, but as to the current situation, the disposal of existing stock of appliances is free to the consumer.

In some countries such as France, a “visible fee” that indicates the cost of disposal and recycle incurred by the manufacturer is published according to the WEEE categories. The WEEE directive does not allow manufacturers to charge a separate fee for end of life costs as this must be free to the user. Visible fees are published by other EU States but as showing this is voluntary, most retailers do not display these fees. In the Category I “Large household appliances” and Category II “Small household appliances”, the following fees are applied to different items as shown in Table 2-58 below.

Table 2-58: Visible fee in France for products covered by Lot 22⁴⁹

Type of appliance	Visible fee
Built-in oven, Steam oven	6 €
Range cooker	6 €
Microwave oven	2 €
Toaster oven	1 €

2.4.5. INTEREST AND INFLATION RATES

Table 2-59 and Table 2-60 show interest and inflation rates for the EU-27 as published by Eurostat and the European Central Bank (ECB).

⁴⁹ www.eco-systemes.com/documents/Bareme_EcoParticipations.pdf

Table 2-59: Interest rates for EU-27⁵⁰

Member State	2006	2007	2008
Austria	3.79%	4.29%	4.27%
Belgium	3.81%	4.33%	4.42%
Bulgaria	4.18%	4.54%	5.38%
Czech Republic	3.80%	4.30%	4.63%
Denmark	3.81%	4.29%	4.30%
Germany	3.76%	4.22%	4.00%
Estonia	5.01%	6.09%	8.16%
Ireland	3.77%	4.31%	4.53%
Greece	4.07%	4.50%	4.81%
Spain	3.78%	4.31%	4.37%
France	3.80%	4.30%	4.24%
Italy	4.05%	4.49%	4.69%
Cyprus	4.13%	4.48%	4.60%
Latvia	4.13%	5.28%	6.43%
Lithuania	4.08%	4.55%	5.61%
Luxembourg	3.91%	4.56%	4.61%
Hungary	7.12%	6.74%	8.24%
Malta	4.32%	4.72%	4.81%
Netherlands	3.78%	4.29%	4.23%
Poland	5.23%	5.48%	6.07%
Portugal	3.91%	4.43%	4.53%
Romania	7.23%	7.13%	7.70%
Slovenia	3.85%	4.53%	4.61%
Slovakia	4.41%	4.49%	4.72%
Finland	3.78%	4.29%	4.30%
Sweden	3.70%	4.17%	3.90%
United Kingdom	4.38%	5.06%	4.51%
EU-27	4.08%	4.57%	4.55%

⁵⁰ Eurostat, Interest Rates, Long-term interest rates, Maastricht criterion interest rates, EMU convergence criterion series

Table 2-60: Inflation rates for EU-27⁵¹

Member State	2006	2007	2008
Austria	1.70%	2.20%	3.20%
Belgium	2.30%	1.80%	4.50%
Bulgaria	7.40%	7.60%	12.00%
Czech Republic	2.10%	3.00%	6.30%
Denmark	1.90%	1.70%	3.60%
Germany	1.80%	2.30%	2.80%
Estonia	4.40%	6.70%	10.60%
Ireland	2.70%	2.90%	3.10%
Greece	3.30%	3.00%	4.20%
Spain	3.60%	2.80%	4.10%
France	1.90%	1.60%	3.20%
Italy	2.20%	2.00%	3.50%
Cyprus	2.20%	2.20%	4.40%
Latvia	6.60%	10.10%	15.30%
Lithuania	3.80%	5.80%	11.10%
Luxembourg	3.00%	2.70%	4.10%
Hungary	4.00%	7.90%	6.00%
Malta	2.60%	0.70%	4.70%
Netherlands	1.70%	1.60%	2.20%
Poland	1.30%	2.60%	4.20%
Portugal	3.00%	2.40%	2.70%
Romania	6.60%	4.90%	7.90%
Slovenia	2.50%	3.80%	5.50%
Slovakia	4.30%	1.90%	3.90%
Finland	1.30%	1.60%	3.90%
Sweden	1.50%	1.70%	3.30%
United Kingdom	2.30%	2.30%	3.60%
EU-27	2.20%	2.30%	3.70%

⁵¹ Eurostat, Prices, Harmonized indices of consumer prices (HICP), HICP (2005=100) - Annual Data (average index and rate of change)

Even if the discount rate (interest rate minus inflation rate) is about 0.85% in 2008, we propose to use for this study a discount rate of 4%, as requested by DG ENER for the preparatory studies they manage.

2.5. CONCLUSIONS OF TASK 2

This task presented the economic and market analysis related to domestic and commercial ovens for the purpose of the lot 22 Ecodesign preparatory study.

Data for the domestic sector is comprehensive and demonstrates that units in all categories are sold in a number of units above the required criteria of 200,000 units per year as set in the Ecodesign Directive.

In general, the volume of sales in the Western EU MS is higher than in Eastern EU MS. In terms of number of appliances, microwave ovens account for the largest portion of sales, followed by built-in ovens and range cookers. Conventional free-standing microwave ovens are the appliance most sold in the first category; built-in ovens powered by electricity lead the sales in the second category; whereas the sales of range cookers have similar proportions being powered by electricity, gas or mixed.

In addition, the stock of gas appliances is decreasing while the stock of electric appliances is sharply building up and microwave ovens are reaching saturation in some Member States.

Data for the commercial sector is sparse and difficult to obtain. The number of units sold in the market is lower than the threshold established by the Ecodesign Directive, however the intensity of use studied in Task 3 can demonstrate the relevance to include the products under the study.

The accuracy of the figures presented in this task can be challenged but they are believed to provide a robust estimate for the purpose of this study. They show the yearly sales of products in the different categories of Lot 22 and the importance of certain products in some categories over others.

The data presented in Task 2 will form the basis for selecting the most representative products on the European market and eventually formulating the base-case(s) in Task 5. Further, product price and life time are also key inputs for the Life-Cycle-Cost analysis using EcoReport in Tasks 5 and 7.

ANNEX 1 – EATING OUT MARKET

Various terms are used to describe the eating out market. Sector groupings are defined as follows:

- Profit sector or Commercial sector includes: Restaurants, Quick Service, Pubs, Hotels and Lodging, and Leisure
- Cost sector or Non-commercial sector or Institutional sector includes: Staff Catering, Health Care, Education, and Services

These sectors are defined in more detail as follows:

Category	Details	
Restaurants	<ul style="list-style-type: none"> • European • Ethnic 	<ul style="list-style-type: none"> • Other including In-Store, Roadside Restaurants, Pizza,
Quick Service	<ul style="list-style-type: none"> • Fast Food • Cafes 	<ul style="list-style-type: none"> • Take Aways
Pubs	<ul style="list-style-type: none"> • Tenanted and Leased • Managed Branded • Managed Unbranded 	<ul style="list-style-type: none"> • Freehouse • Wine Bar • Night Club
Hotels and Lodging	<ul style="list-style-type: none"> • Hotels • Bed & Breakfast • Holiday Camps 	<ul style="list-style-type: none"> • Youth Hostels • Caravan Parks
Leisure	<ul style="list-style-type: none"> • Visitor Attractions • Entertainment • Clubs 	<ul style="list-style-type: none"> • Events and Mobile Caterers • On Board Travel
Staff Catering	<ul style="list-style-type: none"> • Self-Run Canteens • Contracted Canteens • National Government Canteens <p>Note: Self-run Canteens and Contracted Canteens when combined are described as Business and Industry (B&I)</p>	<ul style="list-style-type: none"> • Local Authority Canteens/Civic Centres • Off Shore Catering
Health Care	<ul style="list-style-type: none"> • State Hospitals • Independent Hospitals 	<ul style="list-style-type: none"> • Care Homes
Education	<ul style="list-style-type: none"> • State Schools • Independent Schools 	<ul style="list-style-type: none"> • Further/Higher Education
Services	<ul style="list-style-type: none"> • Police Stations • Fire Stations • Armed Forces • Prisons 	<ul style="list-style-type: none"> • Young Offenders Institutions • Welfare Services • Voluntary Services

ANNEX 2 – DATA USED IN FIGURES

This Annex contains tables providing the data used to produce some of the figures presented in the report.

■ **Figure 2-10: Evolutions of sales of gas, electric and microwave ovens in the UK**

Table 2-61: Electric, Gas, Microwave sales in UK 1998-2008 and forecast until 2020⁵²

Year	Gas ovens	Electric ovens	Microwave ovens
	Estimated Sales (Units)		
1998	690,018	907,794	2,503,935
1999	693,066	938,177	2,541,536
2000	651,153	959,663	2,574,663
2001	623,762	970,402	2,602,098
2002	589,632	980,050	2,636,102
2003	552,799	991,291	2,677,229
2004	501,367	981,526	2,688,463
2005	453,564	973,066	2,694,864
2006	413,630	968,292	2,690,678
2007	357,429	923,693	2,636,987
2008	341,897	929,418	2,677,992
2009	339,323	941,216	2,715,154
2010	348,565	958,606	2,746,760
2011	367,327	980,789	2,773,494
2012	388,542	999,439	2,786,488
2013	416,766	1,028,127	2,805,792
2014	444,438	1,058,533	2,823,170
2015	468,462	1,089,535	2,839,351
2016	486,399	1,119,990	2,855,141
2017	488,065	1,130,830	2,848,443
2018	490,123	1,156,676	2,864,104
2019	483,827	1,179,118	2,880,688
2020	470,007	1,197,703	2,897,534

⁵² MTP's online What if? Tool. Retrieved October 2009, from: <http://www.mtprog.com/>

■ **Figure 2-15: Evolution of the stock of gas, electric and microwave ovens in million units in the UK**

Table 2-62: Oven stocks in the UK 1998-2008 and forecast until 2020⁵²

Year	Gas ovens		Electric ovens		Microwave ovens
	Stock (millions of units)	Percentage of ovens (excluding microwave ovens)	Stock (millions of units)	Percentage of ovens (excluding microwave ovens)	Stock (millions of units)
1998	9.96	42.1%	13.70	57.9%	18.65
1999	9.96	41.7%	13.93	58.3%	19.23
2000	9.93	41.2%	14.16	58.8%	19.78
2001	9.90	40.7%	14.41	59.3%	20.27
2002	9.87	40.2%	14.68	59.8%	20.73
2003	9.86	39.7%	14.97	60.3%	21.17
2004	9.84	39.2%	15.26	60.8%	21.54
2005	9.82	38.7%	15.56	61.3%	21.86
2006	9.79	38.2%	15.86	61.8%	22.13
2007	9.74	37.7%	16.12	62.3%	22.29
2008	9.68	37.1%	16.38	62.9%	22.45
2009	9.61	36.6%	16.65	63.4%	22.61
2010	9.55	36.1%	16.92	63.9%	22.77
2011	9.48	35.5%	17.20	64.5%	22.93
2012	9.40	35.0%	17.47	65.0%	23.08
2013	9.33	34.5%	17.74	65.5%	23.23
2014	9.25	33.9%	18.01	66.1%	23.38
2015	9.16	33.4%	18.29	66.6%	23.53
2016	9.08	32.8%	18.57	67.2%	23.68
2017	8.98	32.3%	18.84	67.7%	23.81
2018	8.88	31.7%	19.10	68.3%	23.94
2019	8.78	31.2%	19.37	68.8%	24.07
2020	8.68	30.6%	19.64	69.4%	24.20

- **Figure 2-14: Electric oven ownership in % and millions of households across the EU-15 between 1960 and forecast up to 2020**

Table 2-63: Electric oven ownership across the EU-15 and forecast⁵³

Year	Households (in millions)	Ownership (in %)
1960	96.53	0.0%
1965	102.98	19.0%
1970	109.43	38.0%
1975	115.89	57.0%
1980	122.34	62.0%
1985	129.71	67.0%
1990	137.68	72.0%
1995	145.66	77.0%
2000	151.60	82.0%
2005	154.55	84.5%
2010	157.57	87.0%
2015	160.59	88.5%
2020	163.61	90.0%

- **Figure 2-28: Estimated market share of electric oven manufacturers**

Table 2-64: Estimated market share of household appliance manufacturers⁵⁴

Manufacturers share of the market	
BSH	20%
Electrolux	15%
Indesit	10%
Whirlpool	10%
Arcelik	7%
Fagor	5%
Candy	4%
Gorenje	4%
Others	25%

⁵³ CECED (2006), "CECED Report on Energy Consumption of Domestic Appliances in European Households".

⁵⁴ CECED (2001); Report on Energy Consumption of Domestic Appliances in European Households, [www.ceced.org/IFEDE/easnet.dll/GetDoc?APPL=1&DAT_IM=20429B&DWNLD=Stock_Model_Report\[1\].pdf](http://www.ceced.org/IFEDE/easnet.dll/GetDoc?APPL=1&DAT_IM=20429B&DWNLD=Stock_Model_Report[1].pdf)

■ Figure 2-29: The evolution of electricity rates between mid -2007 and mid-2009 for domestic customers (2500-5000 kWh) in EU-27 (taxes included)

Table 2-65: The evolution of electricity rates between mid -2007 and mid-2009 for domestic customers (2500-5000 kWh) in EU-27 (taxes included)⁵⁵

Member State	Rate [€/100 kWh]			
	2007 S2	2008 S1	2008 S2	2009 S1
Austria	17.4	17.79	17.72	19.09
Belgium	16.83	19.72	20.81	19.16
Bulgaria	7.21	7.11	8.23	8.23
Czech Republic	10.63	12.74	12.99	13.23
Denmark	24.01	26.35	27.85	26.98
Germany	21.05	21.48	21.95	22.82
Estonia	7.86	8.14	8.5	9.22
Ireland	19.18	17.69	20.33	20.3
Greece	9.84	10.47	10.99	11.54
Spain	14	13.66	15.57	15.77
France	12.22	12.53	12.32	12.73
Italy	-	20.79	21.95	20.93
Cyprus	15.73	17.8	20.4	15.58
Latvia	7.29	8.42	10.03	10.52
Lithuania	8.7	8.6	8.65	9.51
Luxembourg	16.45	16.45	16.09	18.82
Hungary	12.96	15.48	15.53	14.83
Malta	21.38	18.9	14.62	15.35
Netherlands	17.2	17.3	17.8	19
Poland	13.8	12.59	12.95	11.31
Portugal	15.62	14.82	15.25	15.08
Romania	11.41	10.61	11.03	9.76

⁵⁵ Eurostat (2009), "Environment and Energy, Data in focus, 48/2009". Retrieved October 2009 from: <http://epp.eurostat.ec.europa.eu/>. Note: these rates have been updated since then. As a sensitivity analysis will be conducted in Task 8, these figure are kept.

Member State	Rate [€/100 kWh]			
	2007 S2	2008 S1	2008 S2	2009 S1
Slovenia	11.16	11.47	11.56	13.65
Slovakia	13.77	13.65	15.27	15.4
Finland	11.49	12.23	12.73	12.96
Sweden	16.13	16.98	17.46	16.02
United Kingdom	14.81	14.58	16.03	14.66
EU-27	15.65	16.01	16.73	16.58

■ Figure 2-30: Electricity rates in the first semester of 2009 according to customer's consumption in EU-27 (taxes included)

Table 2-66: Electricity rates in the first semester of 2009 according to customer's consumption in EU-27⁵⁶ (taxes included)

Member State	Rate [€/100 kWh]				
	<1000 kWh	1000-2500	2500-5000	5000-15000	>15000kWh
Austria	27.27	20.08	19.09	17.39	15.72
Belgium	26.28	21.56	19.16	17.02	14.59
Bulgaria	8.44	8.33	8.23	8.13	8.13
Czech Republic	26.93	20.38	13.23	11.02	9.62
Denmark	29.90	29.90	26.98	24.02	24.02
Germany	35.99	25.28	22.82	21.22	20.58
Estonia	9.45	9.39	9.22	8.87	7.80
Ireland	43.30	23.31	20.30	18.37	16.12
Greece	10.49	9.72	11.54	13.69	16.64
Spain	30.97	17.79	15.77	14.67	14.18
France	17.08	14.78	12.73	11.08	10.50
Italy	29.35	17.10*	20.93*	26.07*	29.28*
Cyprus	13.93	13.10	15.58	16.08	16.28
Latvia	10.53	10.52	10.52	10.51	10.48
Lithuania	10.11	9.81	9.51	8.97	8.08

⁵⁶ Eurostat, <http://nui.epp.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

Member State	Rate [€/100 kWh]				
	<1000 kWh	1000-2500	2500-5000	5000-15000	>15000kWh
Luxembourg	26.84	20.52	18.82	17.00	13.93
Hungary	14.11	15.34	14.83	13.46	13.30
Malta	14.00	15.35	15.35	17.05	20.90
Netherlands	-	11.70	19	22.90	19.60
Poland	14.47	12.13	11.31	10.72	10.52
Portugal	33.09	17.13	15.08	16.37	12.84
Romania	9.82	9.80	9.76	9.41	9.16
Slovenia	26.79	15.67	13.65	12.96	13.29
Slovakia	23.49	17.43	15.4	14.84	12.16
Finland	24.29	16.32	12.96	11.47	9.60
Sweden	25.50	17.95	16.02	13.72	12.89
United Kingdom	15.78	15.33	14.66	13.09	13.09
EU-27	24.25	17.64	16.58	15.85	15.54

* means provisional.

■ Figure 2-31: Natural gas rate for consumers in the range between [20-200 GJ] between mid-2007 and mid-2009 in EU-27 (taxes included)

Table 2-67: Natural gas rate (including taxes) for consumers in the range between [20-200 GJ] between mid-2007 and mid-2009 in EU-27⁵⁷ (taxes included)

Member States	Rate [€/GJ]			
	2007 S2	2008 S1	2008 S2	2009 S1
Austria	16.95	16.27	17.11	18.03
Belgium	13.89	16.26	20.24	16.82
Bulgaria	8.98	9.85	10.86	13.14
Czech Republic	10.06	12.2	14.69	13.75
Denmark	36.89	-	26.57	25.55
Germany	17.04	17.81	21.17	18
Estonia	7.3	9.3	10.3	10.96

⁵⁷ Eurostat (2009), "Environment and Energy, Data in focus, 49/2009".

Member States	Rate [€/GJ]			
	2007 S2	2008 S1	2008 S2	2009 S1
Ireland	16.85	15.09	18.05	17.89
Greece	-	-	-	-
Spain	16.15	15.98	18.14	16.98
France	14.32	14.46	16.06	15.29
Italy	17.15	17.47	19.99	21.04
Cyprus	-	-	-	-
Latvia	8.65	8.7	13.88	14.54
Lithuania	6.52	9.15	10.63	11.8
Luxembourg	10.12	15.48	14.28	13.68
Hungary	10.62	11.24	12.93	12.16
Malta	-	-	-	-
Netherlands	19.14	19.37	21.03	23.13
Poland	11.15	11.56	14.3	10.8
Portugal	18.13	17.37	17.48	16.78
Romania	9.51	9.21	9.33	8.11
Slovenia	14.14	15.51	19.77	18.28
Slovakia	11.57	11.42	12.92	12.83
Finland	-	-	-	-
Sweden	25.56	26.53	28.82	24.77
United Kingdom	9.91	10.99	13.29	11.84
EU-27	14.44	15.11	17.46	16.21

■ Figure 2-32: Natural gas rate according to the customers consumption in EU-27 (taxes included)

Table 2-68: Natural gas rate according to the customers consumption in EU-27⁵⁸ (taxes included)

Member States	Rate [€/GJ]		
	<20 GJ	20-200 GJ	>200 GJ
Austria	21.82	18.03	16.00

⁵⁸ Eurostat

Member States	Rate [€/GJ]		
	<20 GJ	20-200 GJ	>200 GJ
Belgium	24.44	16.82	15.65
Bulgaria	13.24	13.14	13.48
Czech Republic	19.98	13.75	13.49
Denmark	25.55	25.55	25.55
Germany	27.88	18	16.35
Estonia	11.30	10.96	10.90
Ireland	19.20	17.89	17.20
Greece	-	-	-
Spain	20.46	16.98	13.66
France	27.55	15.29	14.15
Italy	20.83	21.04	19.08
Cyprus	-	-	-
Latvia	22.26	14.54	14.20
Lithuania	19.22	11.8	11.30
Luxembourg	20.82	13.68	12.91
Hungary	13.45	12.16	13.02
Malta	-	-	-
Netherlands	31.53	23.13	21.73
Poland	14.41	10.8	10.35
Portugal	21.91	16.78	14.00
Romania	8.19	8.11	7.94
Slovenia	22.39	18.28	18.06
Slovakia	27.78	12.83	12.84
Finland	-	-	-
Sweden	29.92	24.77	23.85
United Kingdom	13.27	11.84	10.61
EU-27	21.69	16.21	14.81

