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> Lot 25 Non-Tertiary Coffee Machines

Task 2: Economic and market analysis – Final version

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2. TASK 2 – ECONOMIC AND MARKET ANALYSIS

The purpose of this task is to assess trade and sales volumes for the defined product group within the EU-27. A clear picture of the product stock available on the EU market will be provided, together with growth and replacement rate forecasts. It will also provide insights into the latest market trends so as to indicate the role of any possible ecodesign measures in the context of the market structures and ongoing trends in product design. Finally, a practical data set of prices and rates needed for Life-Cycle Cost (LCC) calculations (in Tasks 5 and 7) will also be provided.

2.1. GENERIC ECONOMIC DATA

The aim of this subtask is to place the identified product groups (in Task 1) within overall EU industry and trade policy.

PRODCOM statistics have the advantage of being an official EU source that is also used and referenced in other EU policy documents regarding trade and economic policy. PRODCOM data are based on products whose definitions are standardised across the European community and thus allow comparison.

However, as mentioned in section 1.1 under product definition, the PRODCOM category code 29.71.24.30 "Domestic electric coffee or tea makers (including percolators)" groups all the different types of non-tertiary electric coffee machines. As this code also contains tea makers, PRODCOM data will need to be supplemented by other sources of economic data. More importantly, PRODCOM data is not always reliable and so other sources of data will be necessary. This has been seen in several other preparatory studies, for example in Lot 24 on commercial washing machines and dishwashers.

Table 2-1 is an extract of PRODCOM data for "domestic electric coffee or tea makers (including percolators)", both in quantities and value. For some Member States the export quantity is higher than the production quantity, which is zero for several of them (e.g. Denmark, UK). The estimation of apparent consumption as Production + Imports - Exports cannot be considered reliable due to various discrepancies between production and trade datasets.¹ This should be taken into account when reading the tables below; in particular, negative values should be discounted.

¹ See the Eurostat PRODCOM user's guide, available at:

epp.eurostat.ec.europa.eu/portal/pls/portal/!PORTAL.wwpob_page.show?_docname=3 0168.PDF



Table 2-1: Production, trade and consumption of electric coffee and tea makers in
2007, in units (Source: Eurostat)

INDICATORS	Production -	Imports -	Exports -	Apparent Consumption
DECLARANT	Quantity	Quantity	Quantity	(Prod + Imp - Exp)
Austria		1 241 577	207 472	1 034 105
Belgium		2 649 514	1 522 142	1 127 372
Cyprus	0	25 017	1	25 016
Czech Republic		517 300	904 338	-387 038
Denmark	0	840 939	409 856	431 083
Estonia	0	124 080	23 116	100 964
Finland	0	679 046	11 688	667 358
France	450 100	8 610 616	1 334 358	7 726 358
Germany	2 447 979	10 124 664	4 224 427	8 348 216
Greece	0	642 742	14 684	628 058
Hungary	132 192	424 475	149 167	407 500
Ireland		169 275	9 755	159 520
Italy	1 557 805	3 146 773	2 777 173	1 927 405
Latvia	0	165 680	12 562	153 118
Lituania	0	105 659	21 788	83 871
Luxemburg	0	104 948	11 763	93 185
Malta	0	23 537	1	23 536
Netherlands		3 295 423	1 667 690	1 627 733
Poland	318 566	345 762	4 401 444	-3 737 116
Portugal	879 001	576 585	1 249 320	206 266
Slovakia	0	189 515	10 860	178 655
Slovenia		58 746	634 934	-576 188
Spain	116 773	2 567 183	528 297	2 155 659
Sweden	0	1 827 654	707 697	1 119 957
United Kingdom	0	1 990 574	216 474	1 774 100
EU25TOTALS	7 364 594	22 454 608	2 475 557	27 343 645
Bulgaria	0	389 090	3 058	386 032
Romania	0	537 474	1 021 214	-483 740
EU27TOTALS	7 364 594	22 732 962	2 199 948	27 897 608

Notes:

-

- Yellow: Data for this item is confidential and has been suppressed.

EU-25 total is the EU-27 total minus Bulgaria and Romania.



INDICATORS	Production	Imports	Exports	Apparent Consumption -
DECLARANT	Value	Value	Value	Value (Prod + Imp - Exp)
Austria		83 518 780	24 861 230	58 657 550
Belgium		55 833 000	22 760 380	33 072 620
Cyprus	0	809 570	20	809 550
Czech Republic		14 573 510	14 456 220	117 290
Denmark	0	32 297 610	14 181 570	18 116 040
Estonia	0	4 649 920	960 040	3 689 880
Finland	0	18 039 470	969 520	17 069 950
France	10 673 000	224 602 220	77 607 640	157 667 580
Germany	48 270 186	429 952 450	209 669 030	268 553 606
Greece	0	11 168 140	543 170	10 624 970
Hungary	2 508 796	13 226 410	8 939 200	6 796 006
Ireland		5 508 430	297 430	5 211 000
Italy	161 995 000	91 275 630	343 516 980	-90 246 350
Latvia	0	2 895 830	973 280	1 922 550
Lituania	0	3 597 270	1 019 620	2 577 650
Luxemburg	0	6 722 600	1 071 180	5 651 420
Malta	0	254 860	2 000	252 860
Netherlands		98 214 410	52 482 130	45 732 280
Poland		22 771 140	116 903 610	-94 132 470
Portugal	37 150 848	26 033 130	37 930 320	25 253 658
Slovakia	0	5 350 370	374 440	4 975 930
Slovenia		1 566 170	9 057 460	-7 491 290
Spain	15 781 593	75 433 680	22 319 900	68 895 373
Sweden	0	42 269 260	25 229 900	17 039 360
United Kingdom		52 554 110	5 190 850	47 363 260
EU25TOTALS		564 314 730	190 902 160	373 412 570
Bulgaria	0	6 769 430	53 390	6 716 040
Romania		6 643 410	42 641 320	-35 997 910
EU27TOTALS	369 328 860	563 559 550	182 463 230	750 425 180

Table 2-2: Production, trade and consumption of electric coffee and tea makers in2007, in Euros (Source: Eurostat)

In order to provide EU market data on production, exports, imports and sales, publicly available statistics and commercial market analysis reports were consulted.

In particular, relevant information was provided by national industrial associations and European federations, particularly CECED (the European Committee of Domestic Equipment Manufacturers) and its national members such as GIFAM (France), ZVEI (Germany) and VLEHAN (the Netherlands). However, ANIE (Italy), ANFEL (Spain) and EHA (Sweden) were unable to provide relevant information regarding coffee machines. The information is presented in the following section. The level of aggregation of the data varies according to the source.



2.2. MARKET AND STOCK DATA

2.2.1. SALES

The global small electric household appliances market is projected to reach about 575.6 million units by 2010, growing at a compounded annual rate of 2.54%. Coffee Makers are the second-largest segment in the small appliances category after Electric Irons. The Asia-Pacific market is likely to register impressive growth rates during the projection period and by 2010 the small electric household appliances market in the Asia-Pacific region is projected to reach about 174 million units.² According to GFK, around 18.5 million coffee machines were sold in Europe in 2007.³

National sales

National markets are extremely different from each other. Overviews of the French, Dutch and German markets are presented later in this section in order to provide a better understanding of the sector. There are countries such as Italy and Switzerland with very large market shares of espresso machines (i.e. semi-automatic and fully automatic espresso machines) – over 80%. On the other hand there are countries that still have very low (lower than 20%) market shares of espresso machines, such as Germany, France or the Netherlands. In the Netherlands, portioned filter coffee machines are quite popular and have a market share of about 45%, while traditional filter coffee machines account for more than 50% of the stock of household coffee machines in Germany, France and Spain (Figure 2-1).



Figure 2-1: Market shares of selected EU countries by unit sales⁴

² Electric Household Appliances - A Global Strategic Business Report,

www.electronics.ca/presscenter/articles/835/1/Global-Market-for-Major-Electric-Household-Appliancesto-Cross-498-Million-Units-by-2010/Page1.html

³ GFK data purchased by BIO.

⁴ Source: Private stakeholder communication.



Netherlands

The Netherlands VLEHAN (Vereniging Leveranciers Van Huishoudelijke Apparaten) provided relevant information regarding the number and value of the coffee machines sold between 2002 and 2008 (Figure 2-2). The figure shows that while the number of coffee machines sold in the Netherlands went up and down between 2002 and 2008, the value of the coffee machines sold increased gradually year after year, from 98 million euros in 2002 to 145 million euros in 2008.



Figure 2-2: Sales of coffee machines in the Netherlands⁵

In the Netherlands, according to the market figures provided by the VLEHAN, the number of espresso machines sold has increased each year since 2003, and gone from 5% to 18% of the number of coffee machines sold (Figure 2-3), while it went from 17% to 46% of the value of the coffee machines sold over the same period (Figure 2-4).



⁵ Source : VLEHAN





Figure 2-4: Market share in the Netherlands by sales value⁵

France

There is a significant trend towards portioned and automatic espresso machines (capsules and pads) in France as highlighted in Table 2-3.

Table 2-3: Sales growth rates in France in 2008 vs. 2007⁶

	Units	Value
Drip filter coffee machines	-2.8%	-4.5%
Portioned and automatic espresso machines	+3.2%	-1.8%

*Cumulative sales during 8 months in 2008 vs. 8 months in 2007

Despite the dip in 2008, the value of the market has been growing in recent years, with pad coffee machines increasing their market share:

⁶ Source: GIFAM.





Figure 2-5: Coffee machine sales volume in France, 2002-2007⁷

The following chart illustrates the development of the French market over time, showing sales of drip filter coffee machines and espresso coffee machines from 1999 to 2007.



Figure 2-6: Sales of coffee machines in France, 1999-2007⁸

Figure 2-7 presents the ownership ratios for drip filter coffee machines and espresso coffee machines in French households over time. It shows the slight decrease in

⁷ Source: GFK.

⁸ Source: GIFAM.



ownership of drip filter coffee machines in households, while the ownership of espresso coffee machines increases slowly.



Figure 2-7: Ownership of filter coffee machines and espresso coffee machines in France, 2001-2007⁹

A study performed by TNS-SOFRES indicated that the amount of households owning a pad espresso machine almost doubled between 2004 and 2006 (see figure below). In its study, TNS described drip filter coffee machines as products with steady demand, while espresso coffee machines were described as products with potential for short-term growth.

⁹ Source: GIFAM.





The Groupement Interprofessionnel des Fabricants d'Appareils Ménagers (GIFAM) provided figures on sales of espresso and drip filter coffee machines in France by distribution channel: in 2008, the very large general supermarkets (*hypermarchés*) accounted for more than 55% of sales of drip filter coffee machines, while espresso coffee machines were mostly sold in specialised *hypermarchés* (more than 40% of sales).



Figure 2-9: Weight of the distribution channels in France, 2008 (million euros)¹⁰

Furthermore, a survey performed by TNS-SOFRES in 2006 indicated that 11% of coffee machines were bought on the Internet. Coffee machines appear popular gifts, as they

¹⁰ Source: GfK Retail and Technology GmbH via GIFAM.



were offered as such by 42% of the 29% people who offer small electrical appliances as gifts. 11

Germany

The ZVEI (Zentralverband Elektrotechnik- und Eletronikindustrie) provided relevant information regarding the sale of coffee machines as small electric appliances in Germany between 2006 and 2008. In its report, annual sales of drip filter coffee machines appeared to have maintained a level close to 250 million euros between 2006 and 2008, while the turnover generated by sales of espresso machines went from 385 million to 472 million euros over the same period (Figure 2-10). The equipment rate of German households regarding coffee machines was estimated at a constant value of 95% between 2000 and 2008, which was 38 million coffee machines for the year 2008.





Sales by product type

The following table shows the total of 18 European countries' sales figures according to GFK data cited by Topten. Note that the GfK categories do not correspond exactly to those used elsewhere in this study.

¹¹ TNS SOFRES, Béatrice Guilbert, Sandrine Ghesquiers, 16 Septembre 2008, L'équipement des français en petit électroménager, conference GIFAM.
¹² Source VIPEL Zeblauration de la contraction de la

² Source: VREI, Zahlenspiegel des deutschen Elektro-Hausgerätemarktes - 09.06.2009



Sales (1 000s)	2006	2007	Increase
Filter	10 076	10 072	0.0%
Pad-Filter	3 546	3 410	-3.8%
Espresso portioned	1 647	2 356	43.1%
Espresso fully automatic	824	870	5.5%
Espresso piston hand-operated	1 358	1 246	-8.2%
Combi Espresso-Filter	312	284	-8.9%
All Coffee machines	17 763	18 238	2.7%
All Espresso- and Pad-machines	7 375	7 882	6.9%

Table 2-4: Total sales figures of coffee machines of 18 European countries¹³

Drip filter coffee machines still have the highest market share (55%). There is a strong trend towards fully automatic coffee machine and an extremely strong trend towards hard cap espresso coffee machines. Pad-filter coffee machines, espresso piston hand-operated machines and combi espresso filter machines are losing market share. Fully automatic coffee machines and espresso portioned machines (the most relevant ones from an energy perspective) have a market share of 43% and an important growth of 6.9%.

Using the product categorisation defined in Task 1 and for 23 countries, the sales of the domestic coffee machine market are presented in the following figure.

¹³ Nipkow, J. et al. (2010) *Coffee machines: recommendations for policy design*, Topten International Group TIG, Paris, www.Topten.info. Countries included are Austria, Belgium, Switzerland, Germany, France, Great Britain, Spain, Italy, the Netherlands, Portugal, Sweden, Denmark, Finland, Greece, Poland, Hungary, Czech Republic and Slovak Republic. Note that Switzerland is not an EU Member State but is included in the original dataset.





Figure 2-11: Domestic coffee machine sales in Europe by machine type¹⁴

This corresponds to the following total sales estimates for each product category in 23 European countries:

	Unit sales, 2007
Drip filter coffee machine	10 088 075
Pad filter coffee machine	3 438 419
Hard cap espresso coffee machine	2 141 383
Semi-automatic espresso coffee machine	1 242 076
Fully automatic coffee machine	815 048
Combis, others*	800 436
Total	18 525 437

Table 2-5: Sales by product type (units)¹⁵

*Not taken into account in subsequent calculations.

It is interesting to have a look at the markets in value terms as well. Based on typical prices, a different picture emerges. Espresso machines (hard cap, semi-automatic and fully automatic) strongly dominate the market in terms of value.

¹⁴ GfK Retail and Technology GmbH, hot beverage market study, 2007

¹⁵ GfK Retail and Technology GmbH, hot beverage market study, *2007.* Includes Austria, Baltic countries, Belgium, Bulgaria, Czech Republic, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Sweden, Slovakia.











Figure 2-13: Total percentage sales value increase in 18 European countries by product category, 2006-2007¹⁷

¹⁶ GFK data purchased by BIO. See also Table 2-9.

¹⁷ Nipkow, J. et al. (2010) *Coffee machines: recommendations for policy design*, Topten International Group TIG, Paris, www.topten.info.



2.2.2. STOCK DATA

Before assessing the stock of coffee machines, lifetimes of various types of coffee machine were estimated and have been confirmed by CECED and other stakeholders. Table 2-6 presents these estimates.

	Lifetime
Drip filter coffee machine	6
Pad filter coffee machine	7
Hard cap espresso coffee machine	7
Semi-automatic espresso coffee machine	7
Fully automatic espresso coffee machine	10

Table 2-6: Estimated average lifetime of products

In the absence of authoritative empirical data, the stock of each product type can be estimated for a given year by understanding the sales in the preceding years and the lifetimes of the products.

Based on discussions with stakeholders and simple extrapolation, a stock model can be developed to estimate the current stock of non-tertiary coffee machine products in use in Europe today. The stock is determined by summing the sales of the number of preceding years corresponding with the estimated lifetime of the product. The same approach was followed in some other preparatory studies. The sales during the period 2004-2010, estimated on the basis of 2007 sales data and assumed growth rates, are shown in Figure 2-13.



--- Drip filter ---- Pad filter ----- Hard caps ----- Semi-automatic ----- Fully automatic





Based on this information, the stock of non-tertiary coffee machines on the EU-27 market has been estimated as shown in the table below.

	Stock (units)
Drip filter coffee machine	58 820 091
Pad filter coffee machine	22 698 517
Hard cap espresso coffee machine	12 547 263
Semi-automatic espresso coffee machine	9 012 548
Fully automatic coffee machine	7 621 483

Table 2-7: Estimated stock of non-tertiary coffee machines, 2010

This information will be used to estimate the environmental impacts and subsequently, the improvement potential of any regulation on an EU-27 wide basis.

2.3. MARKET TRENDS

The aim of this subtask is to identify different market structures and provide insight into historic and ongoing market trends both in sales/stock and product design. This information will be useful while identifying potential base cases (Task 5), and for evaluating their improvement potential (Task 7). It is important to understand such trends so as to identify the products which are going to be obsolete or of more importance in the near future.

Technological innovations

Technological innovation in this field consists of improvements in materials, size reduction and introduction of microprocessor-based controls to reduce energy use.

The first step is the analysis of general trends in product design and product features. As mentioned before, this analysis is absolutely critical because it will indicate the midterm development and therefore the state-of-the-art in 2012 when Ecodesign requirements may take effect. The second step is to analyse the market trends, taking into account:

- The current level of maturity of the market: relevant for the short- to mid-term market dynamics and likely growth rates of certain technologies;
- Historical developments: show that technology replacement cycles are getting shorter/longer;
- Rate of market adaptation with new technologies;
- Promising technologies that just fail to achieve a breakthrough in the market (for various reasons): mean a direct extrapolation of market developments always has to be read with caution.



Market players and production

The market trends have been estimated based on information provided by stakeholders:

- The overall non-tertiary coffee machine industry is expected to grow throughout the years applicable to the study (1-2% per year);
- Sales of drip filter coffee machines are expected to slowly decline as other products continuously replace their market share (especially capsule machines but also pad filter and fully automatic);
- Capsule machines are expected to have strong growth (12% per year) in the coming 3-5 years and are expected to continue to grow at a moderate pace in the longer term (8% per year after 2015);
- Semi-automatic espresso machines are expected to decline in sales over the coming years (-5% per year) before stabilising from 2015;
- Sales of fully-automatic machines are expected to grow in coming years, though less dramatically than capsule machines (5% per year between 2010 and 2015, 2% per year thereafter).

Figure 2-15 summarises the above trends and sales estimates for the non-tertiary coffee machine market from 2010-2025.



Figure 2-15: Sales estimates for the product types in Lot 25, 2010-2025 (millions)

The corresponding stock throughout this period is given in Figure 2-16, taking into account the lifetimes listed in Table 2-6.





■ Drip filter ■ Pad filter ■ Hard caps ■ Semi-automatic ■ Fully automatic Figure 2-16: Stock estimate by product type, 2010-2025 (millions)

Table 2-8 provides numerical reference points for the sales and stock estimates for key years for Lot 25 products.



			Sales					Stock		
	2010	2012	2015	2020	2025	2010	2012	2015	2020	2025
Drip filter coffee machine	9.24	9.26	8.63	6.48	3.14	58.82	57.12	54.50	45.71	29.42
Pad filter coffee machine	3.53	3.75	4.09	4.75	5.50	22.70	24.72	26.37	30.45	35.30
Hard cap espresso machine	3.01	3.77	5.11	7.51	11.04	12.55	18.60	26.91	42.24	62.06
Semi-automatic espresso machine	1.16	1.04	0.90	0.90	0.90	9.01	8.29	7.32	6.31	6.27
Fully automatic espresso machine	0.82	0.90	1.04	1.14	1.26	7.62	8.01	8.78	10.21	11.57

Table 2-8: Sales and stock estimates for key years for Lot 25 products (millions)



2.4. CONSUMER EXPENDITURE BASE DATA

The total lifetime costs of a coffee machine can be divided into three categories:

- Purchase costs the cost incurred by consumers to purchase the coffee machine;
- Running costs the costs incurred by consumers to operate the coffee machines throughout a typical lifetime of a coffee machine. They may include electricity costs and costs of consumables (coffee beans, water, filters, etc.);
- Repair and maintenance costs the costs incurred by consumers during the use phase of the coffee machine. These can include decalcification or fixing broken parts.

It is expected that the following categories of costs are either not applicable or negligible for coffee machines:

- Installation costs it has been found that non-tertiary coffee machines require no modifications to the location in which they operate;
- Disposal costs consumers do not dispose of these appliances in any special manner, and typically there are no extra costs incurred at the time of disposal

Therefore these costs have not been investigated further in the study.

2.4.1. PURCHASE COSTS

In the context of this study, average appliance consumer prices are of interest as they are required as an input for Life-Cycle Cost (LCC) calculations that will be performed in Task 5. Table 2-9 gives average prices of European coffee machines according to the categorisation given in Task 1, as reported by GfK.

Table 2-9: Average prices for	or coffee machines	according to Ta	ask 1 categories, 2007 ¹⁴
-------------------------------	--------------------	-----------------	--------------------------------------

	Average price (euros)
Drip filter coffee machine	35
Pad filter coffee machine	81
Hard cap espresso coffee machine	156
Semi-automatic espresso coffee machine	103
Fully automatic coffee machine	595

Prices within an appliance category can vary widely. Parameters that are the most critical for fixing the price are the type of material used, the technical features and the design of the appliance. Computerised functions including timers or digital displays can greatly increase the cost of any coffee machine. Aesthetics appears to be an important parameter in particular in the case of upper end machines, because these products are



often considered not simply as a heat source but as a kind of interior decoration as well.

A market study performed in 2008 for the French market showed that the median price of a coffee machine increased by 24% between June 2005 and June 2008. While the average price was 29.98 euros in June 2005, it increased to 40.48 euros in June 2008, and 25% of the coffee machines sold were more expensive than 84.49 euros (Figure 2-17). This equates to approximately an 8% increase per year for the average coffee machine purchased between 2004 and 2008. It should be noted that this does not mean the price of coffee machines necessarily increased, but the purchasing habits of consumers are shifting towards more expensive machines.



Figure 2-17: Prices of electric coffee machines in France¹⁸

In particular, this study stressed the price increase which occurred between June 2007 and June 2008 for pad filter coffee machines and fully automatic coffee machines. During this period, the price index of pad filter coffee machines moved from an index of 100 to 243, while generating a turnover gain close to 22m euros, and the price index of fully automatic coffee machines went from 100 in June 2007 to 766 in June 2008, while generating a turnover gain of more than 100 000 euros¹⁸.

Coffee machine prices are generally highest for espresso (high pressure) coffee machines, which propose the most automatic technologies, as well as innovative designs and functions. For example, the prices of coffee machines designed by Nespresso range from 119 euros to 499 euros according to the type of model (Figure 2-18).

¹⁸ GfK Retail and Technology Conférence PEM GIFAM, Benoit LEHUT-Julie KUNLIN, 16 September 2008, Petit Electroménager; Objectif : Création de Valeur.





Figure 2-18: Market prices of Nespresso coffee machines in France (euros)

2.4.2. RUNNING COSTS

Running costs, understood as costs generated by the use of the appliance, can be split into:

- Energy costs (electricity)
- Consumable costs (water, paper filters, beans, decalcifying/cleaning agents, etc.)

Maintenance costs could also be considered in this category; the different methods of decalcification will be investigated in Task 3. Repair costs may be non-negligible for fully automatic coffee machines but as very little data exists on this, it is proposed to assume repair and maintenance costs of 20% of the purchase price for this type of coffee machine.

Energy costs (electricity)

Electricity costs must be taken into account for coffee machines as they are the means by which potentially large economic incentives to reduce electricity consumption can be quantified.

The average electricity consumption of a European household in 2007 was 4 000 kWh/household which means the rates of the category [2 500-5 000 kWh] should be used.²⁰

¹⁹ See www.nespresso.com/#/fr/fr/machines_cafe/selecteur_machines.

²⁰ Enerdata Energy Efficiency/CO₂ Indicators available at: www.worldenergy.org/documents/ueur27.pdf.



Electricity prices excluding VAT as reported by Eurostat for the last two years by semester are presented in Table 2-10.

	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
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
UK	14.81	14.58	16.03	14.66
EU-27	15.65	16.01	16.73	16.58

	and a set for a discussion of the	
I anie 7-10. Fiertricht	nrices for domest	c consumers (eliros/kwn)
TUNC E IV. EICCUTCIC	prices for domest	

For this study, the effective domestic electricity price will be **0.166 euros/kWh**.

Consumables (water, coffee filters, pads, etc.)

The costs of consumables will be discussed in this section.

Coffee beans

There is a wide variety in the price of coffee beans for domestic users (Base-Case 5) throughout Europe. A typical price in France is 15 euros/kg and in the $\mathrm{UK}^{\mathrm{22}}$ around 13.50 euros/kg.

²¹ Data retrieved from Eurostat website: <u>http://epp.Eurostat.ec.Europa.eu</u>. Household consumers refer to consumer band Dc (annual consumption between 2 500 and 5 000 kWh). ²² Carte Noire Whole Beans, Tesco.



• Ground coffee

There is also a wide variety in the price of ground coffee for domestic users throughout Europe. Example prices for France, UK and Germany are given for some ground coffee brands in Table 2-11, Table 2-12 and Table 2-13.

Example image (not representative of actual product)	Price per kg in euros
A Charles	13.20
CALE NE Truction	6.48
	4.00
	12.36
	27.60

Table 2-11: Example coffee prices found in French supermarkets

Table 2-12: Example coffee prices found in UK supermarkets

Example image (not representative of actual product)	Price per kg in euros
0	12.06
	24.13
AND	10.65



Year	Price per kg
1996	7.16
1997	7.94
1998	8.04
1999	7.12
2000	6.86
2001	6.54
2002	6.12
2003	6.00
2004	5.82
2005	7.22
2006	7.58
2007	-
2008	7.68

Table 2-13: Average German coffee prices over a ten year period²³

An average price of coffee for European consumers is therefore estimated at 12 euros/kg (average of the national averages for samples found), with an estimated range which will be analysed in the sensitivity analysis between approximately 5 euros/kg and 19 euros/kg (however the sample contained prices as low as 4 euros and as high as 27 euros/kg).

As there is a large variation in both the cost of coffee and the amount of coffee used to produce one cup of coffee, there is an extremely wide variation found in the cost of coffee used to produce a single serving of coffee. For the purposes of this study, it is assumed that average 80 mL cup of coffee is produced and it requires 7g (for espresso coffee machines). For drip filter coffee machines, the average quantity of coffee to produce a litre of coffee is 50g.

• 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 2-19 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.

²³ Der Deutsche Kaffeeverband (The German Coffee Association) Facts and Figures (2009) www.kaffeeverband.de/english/396.htm





Figure 2-19: Water prices in Europe²⁴

A more recent indication of water prices in France is shown in Figure 2-20 where a breakdown in the cost of water to consumers is given over 15 years.

²⁴ OECD 2003 – Water Indicators





Figure 2-20: 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 2-14.

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

Table 2-14: Water consumption and effective rate for eight European cities²⁵

²⁵ 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/m^3 .

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 $2.64 \notin m^3$ for the EU-27. This figure will be used in the estimation of LCCs of coffee machines in Task 5 of this study.

• Coffee filters

Based on a sample of French and Italian consumer markets, a price per coffee filter is estimated for the Lot 25 study to be **3 euro cents per filter**. Example products are shown below in Table 2-15.

Example image (not representative of actual product)	Cost in euros
4	2.8 cents per filter
	2.5 cents per filter

 Table 2-15: Examples of coffee filter costs found in France and Italy

Coffee pad filters

Coffee pad filters work under numerous different standards, either open standards similar to the ESE product, or proprietary pads. They offer a large variety of coffee choices, including personalised coffee types. Prices can vary a great deal but generally tend to be lower for open standard styles while proprietary pad systems market themselves as higher quality and thus higher price. Many pad systems also provide tea, hot chocolate and cappuccino options.

ESE (Easy Serve Espresso) is not a brand but an open standard for producing pre-packaged pads that work in most "normal" espresso machines. Because it is an open standard, there are many espresso choices available, but it does not provide tea, coffee or hot chocolate options. Note that the ESE pads may go stale quickly once a package is opened, which is not an issue for the proprietary pad systems.





Figure 2-21: ESE pad open standard espresso pad

Proprietary soft pads exist on the market with a significant market share owned by just a few brands. These proprietary soft pad systems, though marketed to be used specifically with one type of pad system, have been known to accept soft pads from other brands and therefore are somewhat interchangeable.



Figure 2-22: Senseo soft coffee pad²⁶

Based on a sample of French and UK consumer markets, example products are shown below in Table 2-16.

Example image (not representative of actual product)	Cost in euros
Senses	0.13 per pad 0.14 per pad
	0.13 per pad
CAFÉ CA ADHULCON CAFÉ CON CONTRACTOR	0.18 per pad

Table 2-16: Examples of soft pad prices found in France and the UK

As a summary, soft pad systems tend to have only fabric filter material used to encapsulate their coffee products and exist in open standards and proprietary brands. For the purposes of this study:

- A soft pad costs 0.15 euros per pad
- Coffee hard capsules

²⁶ Techlicious - buyer's guide to Single-Serve Coffee and Espresso Makers

http://www.techlicious.com/buyers-guide/single-serve-coffee-and-espresso-makers/ (accessed Oct 12 2009)



In contrast to soft pad systems, hard cap systems only exist in proprietary form (at least until recently) and machines are typically less accepting of other brands. They have a diverse range of physical packaging methods, from hard plastic to aluminium casing.

Based on a sample of French and UK consumer markets, example products are shown below in Table 2-17.

Example image (not representative of actual product)	Cost in euros
TOSSIMO	0.30 per cap (Tassimo disc) 0.28 per cap (Tassimo disc) 0.21 per cap (Tassimo disc)
	0.26 per cap (Tassimo disc)
	0.27 per cap (Nespresso capsule) 0.33 per cap (Nespresso capsule)

Table 2-17: Examples of hard pad prices found in France and UK

In summary, hard cap systems tend to work only for the specific hard cap system for which they were designed. There are many varieties available on the market, which come in various shapes, sizes and materials. For the purposes of this study:

A hard cap costs 0.30

2.4.3. REPAIR AND MAINTENANCE COSTS

Repair is worthwhile only if the costs are low in relation to the purchase price (around one third of the purchase price for simple machines). Repairs are worth it but only if they can be carried out in a short period of time (one or two hours), otherwise the repair costs in relation to the purchase price of the unit are too high.

For drip filter coffee machines, for which the average product price is only about 35 euros (see section 2.4.1), the consumer might prefer to purchase a new appliance rather than change the default components. This statement is even more valid when the coffee machine is no longer under warranty.



Decalcification costs are assumed to be negligible for Base-Case 1 as it only requires vinegar and water. For the other Base-Cases, decalcification is assumed to cost 4 euros once every four months.

Repair costs of 20% of the product price are considered for Base-Case 5 (fully automatic espresso machine) due to its complexity compared to other product types.

2.4.4. INTEREST AND INFLATION RATES

Table 2-18 shows the national inflation and interest rates for the EU-27 for 2007 as published by Eurostat and the European Central Bank (ECB).

Member State	Inflation rate (%) ²⁷	Interest rate (%) ²⁸
Austria	2.9	4.29
Belgium	2.8	4.33
Bulgaria	10.9	4.54
Cyprus	3.4	4.48
Czech Republic	5.1	4.28
Denmark	2.3	4.29
Estonia	9.3	5.69
Finland	2.5	4.29
France	2.5	4.30
Germany	2.7	4.22
Greece	3.7	4.50
Hungary	7.2	6.74
Ireland	3.1	4.31
Italy	2.7	4.49
Latvia	13.8	5.28
Lithuania	8.6	4.55
Luxembourg	3.5	4.56
Malta	2.3	4.72
Poland	3.6	5.48
Portugal	2.6	4.42
Romania	6.7	7.15
Slovakia	2.6	4.49
Slovenia	5.3	4.52
Spain	3.7	4.31
Sweden	2.4	4.17
Netherlands	1.7	4.29
UK	n.a.	5.06
EU-27 average	3.0	4.58

Table 2-18: Interest and inflation rates for EU-27, 2007

²⁷12 month average rates, May 2008-2007 / May 2007-2006. Source: Eurostat,

europa.eu/rapid/pressReleasesAction.do?reference=STAT/08/85&format=HTML&aged=0&language=EN& guiLanguage=en

²⁸ European Central Bank long-term interest rates; 10-year government bond yields, secondary market. Annual average (%), 2007, epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-30-08-410/EN/KS-30-08-410-EN.PDF



The above rates have changed significantly since 2007. For reasons of simplification, the European Commission has provided a general interest rate assumption for this project of **4.0%**. Stakeholders are welcome to comment on this.

2.4.5. SUMMARY OF CONSUMER EXPENDITURE

Table 2-19 summarises the consumer expenditure data presented in the previous sections. This data will be useful in later tasks (Task 5) for estimating life-cycle properties of these products.

Category	Cost items	Units	Reference value for Lot 25
Purchase	Purchase price	€/machine	35-595
Use	Electricity rate	€/kWh	0.166
Use	Water rates	€/m³	2.64
Use	Coffee beans	€/kg	14.25
Use	Ground coffee	€/kg	12
Use	Coffee filter	€/filter	0.03
Use	Coffee pad filter	€/pad	0.15
Use	Coffee hard caps	€/cap	0.30
Use	Interest-inflation rate	%	4.0

Table 2-19: User expenditure base data



2.5. CONCLUSIONS

Task 2 presents the economic and market analysis related to non-tertiary coffee machines as part of the Lot 25 Ecodesign preparatory study. The data presented will form the basis for selecting the most representative products on the European market and for formulating the base cases in Task 5. Product prices and lifetimes are also key inputs for the EcoReport life cycle cost analysis in Tasks 5 and 7. The accuracy and completeness of the figures could probably be improved but as they stand they are robust estimates for the purposes of this study.

Sales data are comprehensive and demonstrate that units in all categories are sold in numbers far above the criterion of 200,0000 units per year set out in the Ecodesign Directive. More than 18 million coffee machines are sold in the European Union every year, of which 10 million drip filter coffee machines and 8 million pad filter and espresso coffee machines. In general, the volume of sales in western EU Member States is higher than in eastern ones.

Drip filter coffee machines still account for the largest number of appliances sold but the espresso portioned category (hard cap espresso machines) is growing by far the fastest, at around 40% per year. The market share of hard cap espresso machines is thus increasing extremely rapidly, while those of all other categories are relatively stable or in slight decline. Sales of drip filter coffee machines are expected to decrease over the coming years, while sales of hard cap espresso coffee machines are expected to continue their rise.

National markets vary strongly. Countries such as Italy, Switzerland or Portugal have a market share of espresso machines of more than 70%. On the other hand, Belgium, Germany and the Netherlands have espresso machine market shares of less than 20%. In Belgium and the Netherlands pad filter coffee machines are quite popular with a market share of about 40%.

Coffee machine prices also vary widely. The most critical parameters are the type of material used, the technical features and the design. Computerised functions including timers or digital displays can greatly increase the cost of any coffee machine. Aesthetics appear to be an important parameter in the case of upper end machines. In general, prices are highest for espresso coffee machines which propose the most automatic technologies, as well as innovative designs and functions.

Electricity costs must be taken into account for coffee machines as they are the means by which potentially large economic incentives to reduce electricity consumption can be quantified. The other main consumables are water and the coffee itself.