Service Contract to DGTREN

Preparatory study on the environmental performance of residential room conditioning appliances (airco and ventilation)

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Economic and Market analysis

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SUMMARY

To be done

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1 DEFINITION OF PRODUCT, STANDARDS AND LEGISLATION

The draft report of task 1 is available online on http://www.ecoaircon.eu.

2 ECONOMIC AND MARKET ANALYSIS

Introduction

This section provides a draft for the market analysis or task 2 of the MEEuP methodology for "residential room air conditioning appliances: airco and ventilation".
According to the MEEuP methodology, this report should enable: "To place the product group within the total of EU industry and trade policy (subtask 2.1). To provide market and cost inputs for the EU-wide environmental impact of the product group (subtask 2.2). To provide insight in the latest market trends so as to indicate the place of possible Eco-design measures in the context of the market structures and ongoing trends in product design (subtask 2.3, also relevant for the impact analyses in Task 4). And finally, to provide a practical data set of prices and rates to be used in a Life Cycle Cost (LCC) calculation (Subtask 2.4)."

The technical product types identified in table 2.1 inside air conditioner cooling only and reversible categories are: single duct, double duct, window and through the wall package, (single) split package, multi-split package, central air conditioners (US type) and mini-chillers, all with cooling capacity inferior to 12 kW. The technical description of these products has been undertaken in task 1. In available market study sources, there may exist different technical categories, generally grouping several categories. It is for instance the case of moveable air conditioners in part 2.1.2 that group single duct air conditioners, double duct air conditioners and mobile split air conditioners. As far as possible, market data are disaggregated at the lowest technical product type level.

Table 2-1: Air conditioner scope for lot 10 study

Categories	Products included	Scope limits
Cooling only air conditioners	**Single duct Double duct Window and through the wall package Split package Multi-split package Central air conditioners (US type) Mini-chillers**	**Cooling power <= 12 kW**
Reversible air conditioners	**Single duct Double duct Window and through the wall package Split package Multi-split package Central air conditioners (US type)**	

2.1 Generic economic data

The objective has been assigned in the MEEuP methodology "to place the product group within the total of EU industry and trade policy" by gathering the following information, "EU Production, Extra-EU Trade, Intra-EU Trade, Apparent EU-consumption. Data should relate to the latest full year for which at least half of the Member States have reported. Preferably data should be in physical volume and in money units and split up per Member State. Information for this subtask should be derived from official EU statistics so as to be coherent with official data used in EU industry and trade policy."

As stated in the MEEuP case study report for air conditioners, Prodcom contains no relevant information. Some market research reports give estimates of national imports and exports but not whether these are to or from other Member States.

Information can be found in (IEA, 2006) and states that 12 % of Chinese production of air-conditioners with export destination (about 28 M units in 2005 and 2006) is to Europe, meaning about 3 million units in 2005 and 2006.

In 2004, the sum of main countries production amounted to about 1500000 units (Bsria, 2005), mostly in Italy and Spain. Manufacturers indicate that almost all production has nowadays been relocated in China. Following the heat wave sharp increase in demand, local brands have known product shortage. 2003 demand was supplied partly in 2004 only and explains higher sales figures in 2004 than in 2003, for instance in France (Clim'Info, 2004). This is a reason for manufacturers either to increase product stock in Europe, or even to rebuild plants in Europe. In (ClimPratique, 2006), Daikin explains they manufacture now in Europe about 71 % of the products sold on the European market and almost all air conditioners in our scope. But this seems to be the only exception.

Mini-chillers (reversible and non reversible) are thought to be manufactured mainly in Europe, largely in Italy, France and Spain but also, for reversible heat pumps, in Germany and Sweden.

2.2 Market and stock data

This study addresses the market for room conditioning products that predominantly serve single rooms. Among the technical product types, ducted single split packages, ducted or not multi-split package, central air conditioners (US type) and mini-chillers can also serve several rooms. The limitation to products with a cooling power limit of 12kW or less eliminates most of these multi-room applications. Nevertheless, at the margin, there is competition between single-room products and larger, centralized systems to provide the underlying service for cooled space. This means that the total area of cooled space is not an adequate measure of the size of the actual or potential market for products within the scope of this study. It also means that policy measures that address only the products covered by the study potentially alter the relative costs of the two classes of system and therefore their share of the total market. Of the total European market for cooled space, about half is served by products within the scope of the present study (Adnot, 2003). The remainder is served by centralised systems using air, water or refrigerant to distribute cooling to several rooms.

The underlying market driver is comfort – represented by m2 of cooled space. But demand depends on climate and building design and is constrained by wealth and legislation – all of which vary between countries. So while the products on the market are essentially the same throughout Europe, the markets themselves are definitely national.

The European market for air-conditioning is relative young and still growing substantially. The installed stock is far from the saturation levels seen in other parts of the world and the sales figures show no signs of approaching market saturation - See appendix D for a summary of the mature Japanese market. There are very few relevant statistics on the stock of installed products, but rather more on sales – though these are not comprehensive. This report first summarises recent sales data (2002 or the nearest available year) (BSRIA market data, 2002 and 2005), then discusses the dynamics

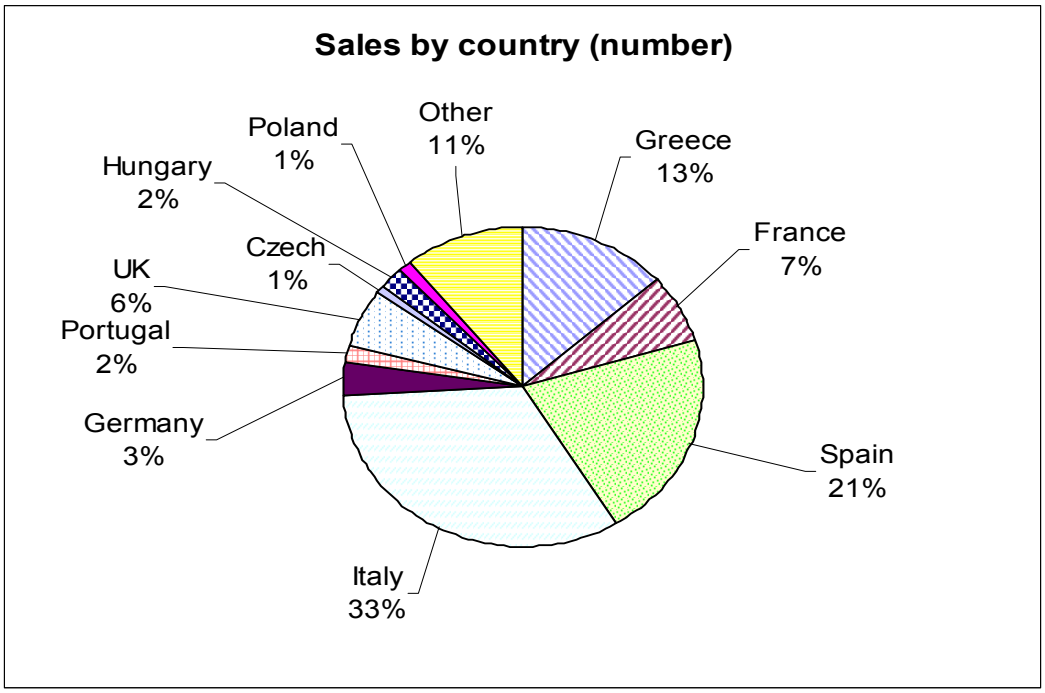
of the air-conditioning market before using the sales data and other information to model future national markets, present and future stock levels.
Market research figures are reported by number or by value. For the analysis required in this study we need to convert these into cooling capacities. (These ultimately have to be mapped onto floor areas but the required cooling capacity per square meter of cooled space obviously varies with climate, building design and use).

2.2.1 The Current Market

From market research and other sources, we have information on sales in nine countries: France, Germany, Greece, Portugal, Spain, United Kingdom, Hungary, Czech Republic, Poland. Based on industry information, we believe that this covers 85 % to 90 % of sales of products that fall within the scope of this study.

2.2.1.1 Sales by Country

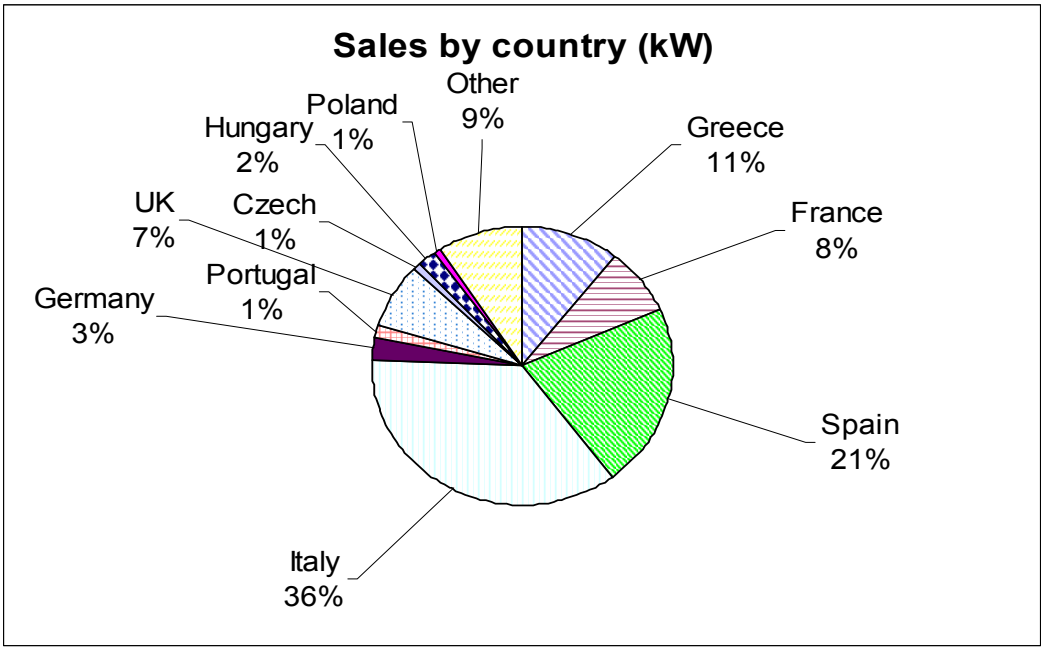
Figure 2-1: Air conditioner sales by country (shares in numbers), EU-27 all types within the scope (<12kW)



- By numbers sold, Italy, Spain and Greece are the largest markets.

As might be expected, climate, population and economic structure interact such that in terms of numbers of products sold, Italy is the largest market, followed by Spain, and Greece. However, when adjusted for the product mix (different categories of air conditioners, different cooling capacities) and expressed in terms of kW installed, Italy and Spain between them account for more than half of all sales. The annual additional cooling capacity is about 12.6 GW. At an EER of, say, 2.5, this represents an additional connected electrical load of about 5 GW – equivalent to more than 6 new 750 MW power stations each year.

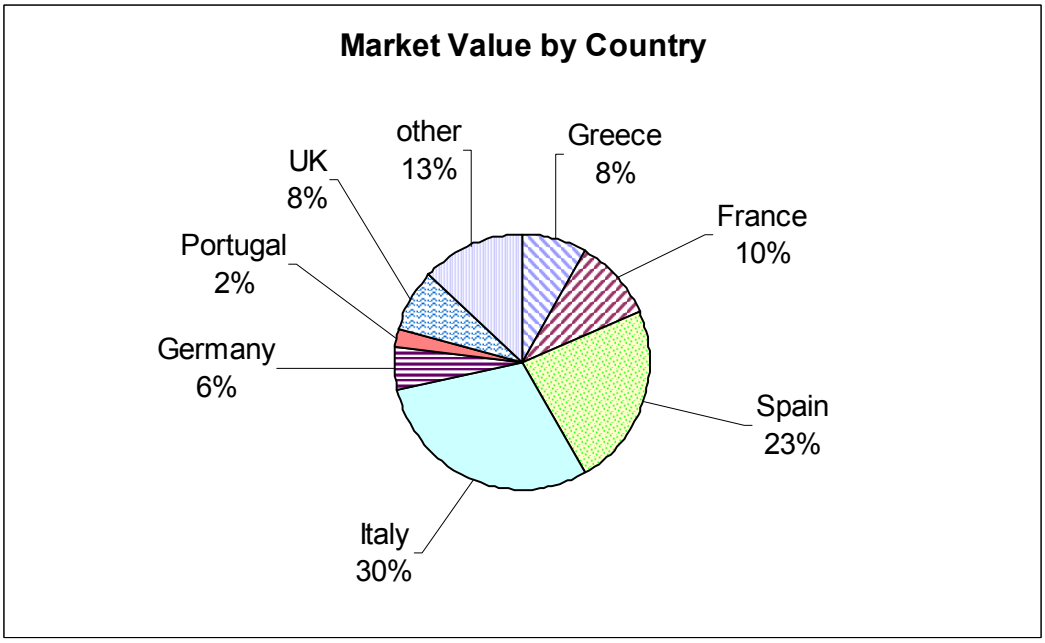
Figure 2-2: Air conditioners' sales by country (shares in cooling capacity) , EU-27 all types within the scope



- Spain and Italy account for more than half the sales, expressed in kW cooling

The total annual value of the market is approximately 3 billion Euros. The distribution between countries is broadly similar to the distribution of cooling capacity – although, of course, also reflecting the differences in pricing.

Figure 2-3: Air conditioners' sales by country (shares in euros) EU-27 all types within the scope (<12kW)

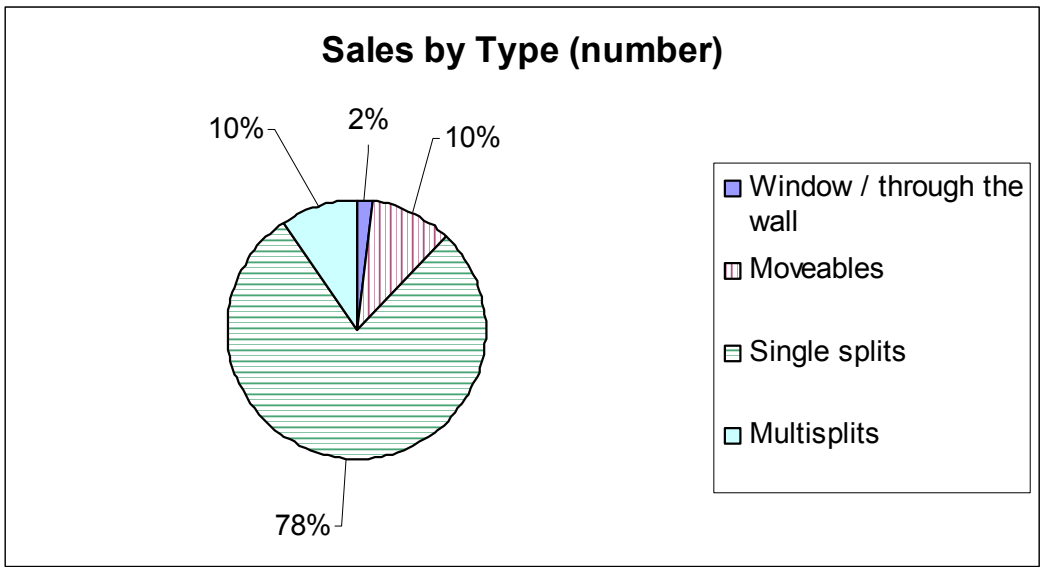


- Italy and Spain account for over half the market by value.

2.2.1.2 Sales by product type

There are several types of product within the market. In terms of numbers sold, the market is dominated by single split package air conditioners, with a substantial number of moveables (it groups single duct, double duct and mobile split air conditioners).
Sales of moveables might be somewhat under-represented, since it is difficult to track web-based sales. However, CECED estimates are very similar, (CECED, 2006).

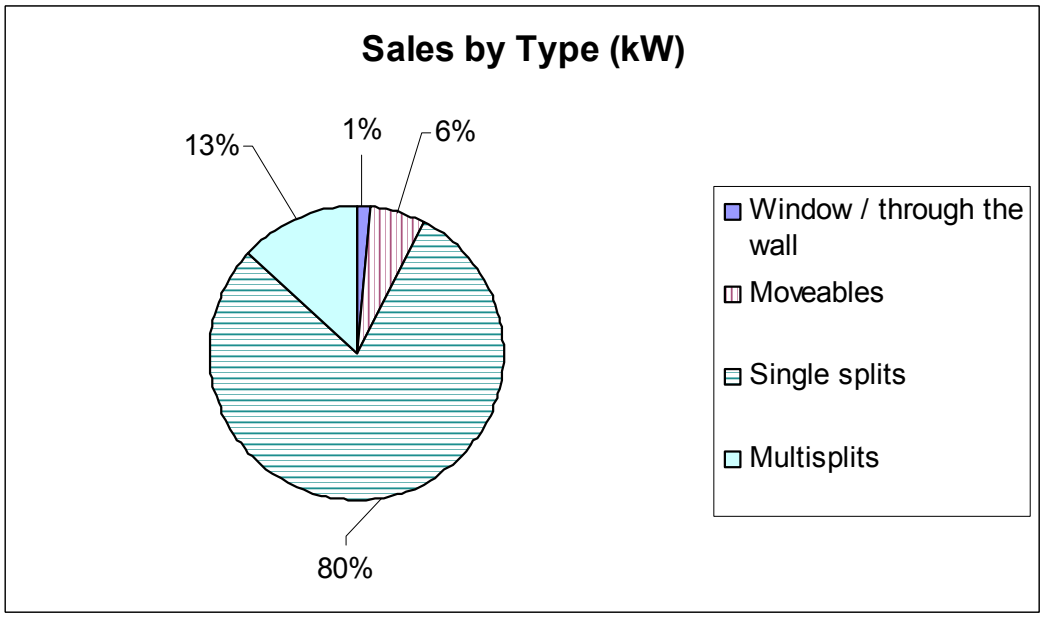
Figure 2-4: Air conditioners' sales by technical type (shares in numbers), EU-27 (<12kW)



- Single split packages are by far the most numerous products sold.

When expressed by kW cooling capacity, the proportion accounted for by moveables falls, while the importance of multi split packages increases somewhat. However, the dominant type of air-conditioner remains the single split package type. Window/wall package air conditioner sales are on the decrease.

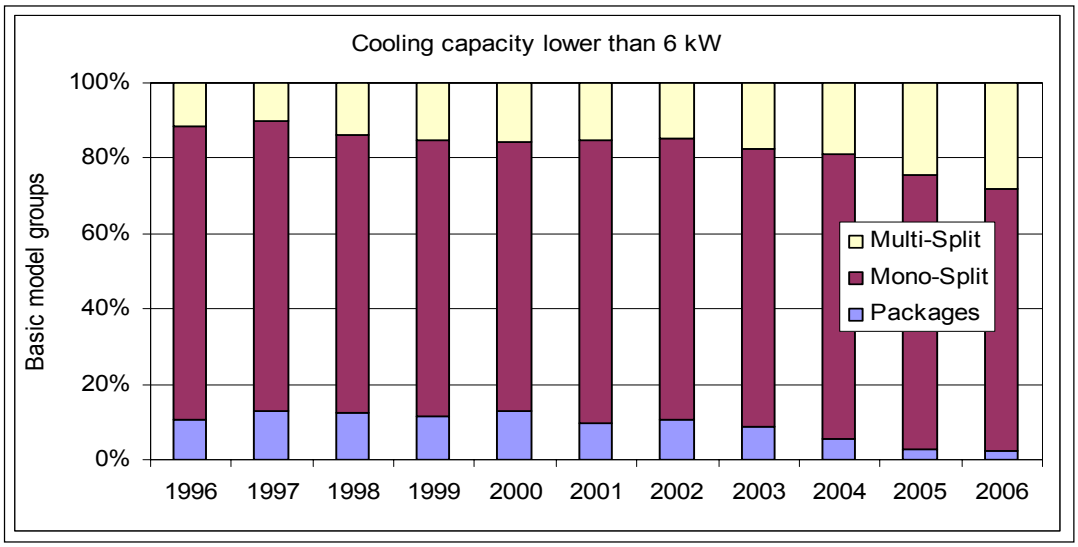
Figure 2-5: Air conditioners' sales by technical type (shares in cooling capacity), EU-27 (<12kW)

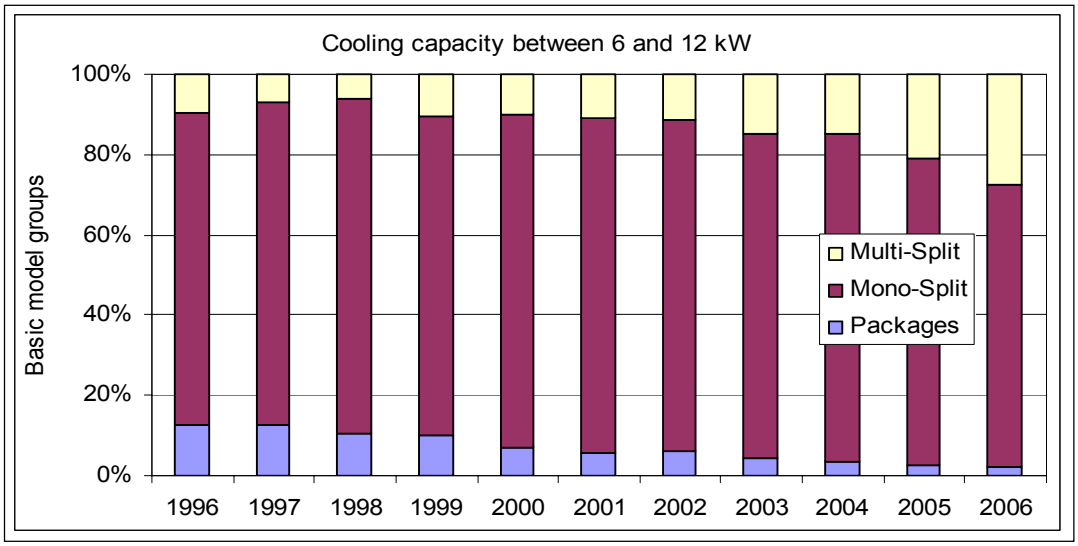


- In terms of total cooling capacity, single split packages account for over three-quarters of the market.

Analysis of Eurovent-Certification public database clearly shows the fall, in number of models in the catalogue (See Appendix D for more detail on the interpretation of these data) in the shares of window/wall packaged units and the increase in multi split packages models have doubled from 1996 to 2006. On this point, there is no clear difference for units with cooling capacity inferior to 6 kW and ranging between 6 kW and 12 kW.

Table 2-2: Non moveable air conditioners by type, in number of models, Eurovent-Certification (<12kW)





- The importance of single split air conditioners increases on the market place thus reflected in the number of models available by technical category.

Central US style ducted air conditioners are a much smaller market; the total market size of these products was inferior to around 60 000 units in 2004 (BSRIA, 2005) with hardly 20 000 units with cooling capacities inferior to 12 kW.

Concerning mini-chillers, the total chiller market in 2004 was about 100 000 units with around 60 000 units with cooling capacity inferior to 100 kW. As mentioned in the Market analysis of the task 2

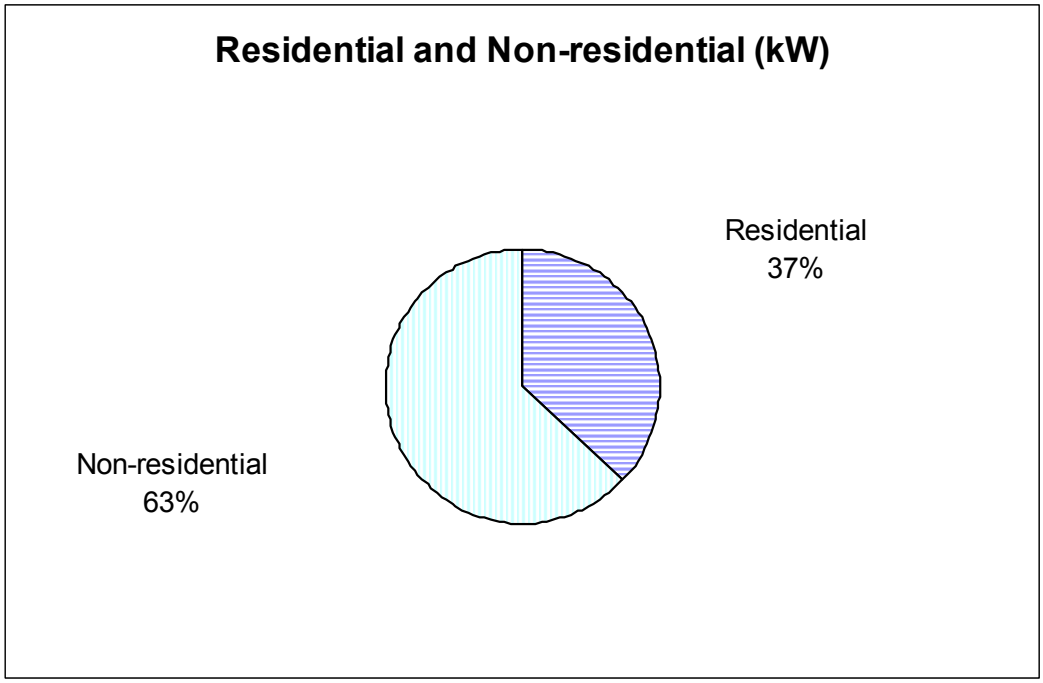
report for boilers (VHK, 2006), the market for small capacity reversible chillers is expanding rapidly in some Member State driven by incentive programs on heat pumps. The share of cooling only mini-chillers (that lie within lot 10 study scope proposed) is estimated to be less than 20 % of this total figure (BSRIA market data), or 15 000 to 20 000 units.

2.2.1.3 Sales by market sector

Although the same products are available throughout Europe, their application varies from country to country, reflecting differences in climate, income, economic structure and building traditions.

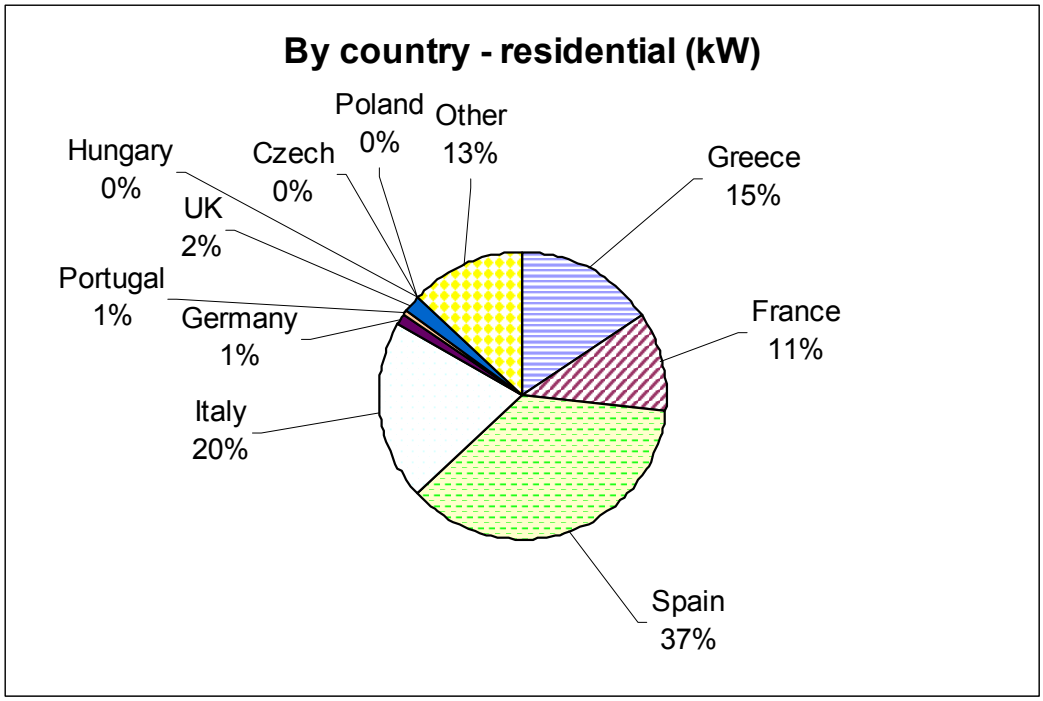
The most fundamental market segmentation is between applications in housing and other buildings. In terms of kW of cooling, non-residential applications account for over 60% of sales.

Figure 2-6: Air conditioners' sales by sector (shares in cooling capacity), EU-27. All types within study scope (<12kW)



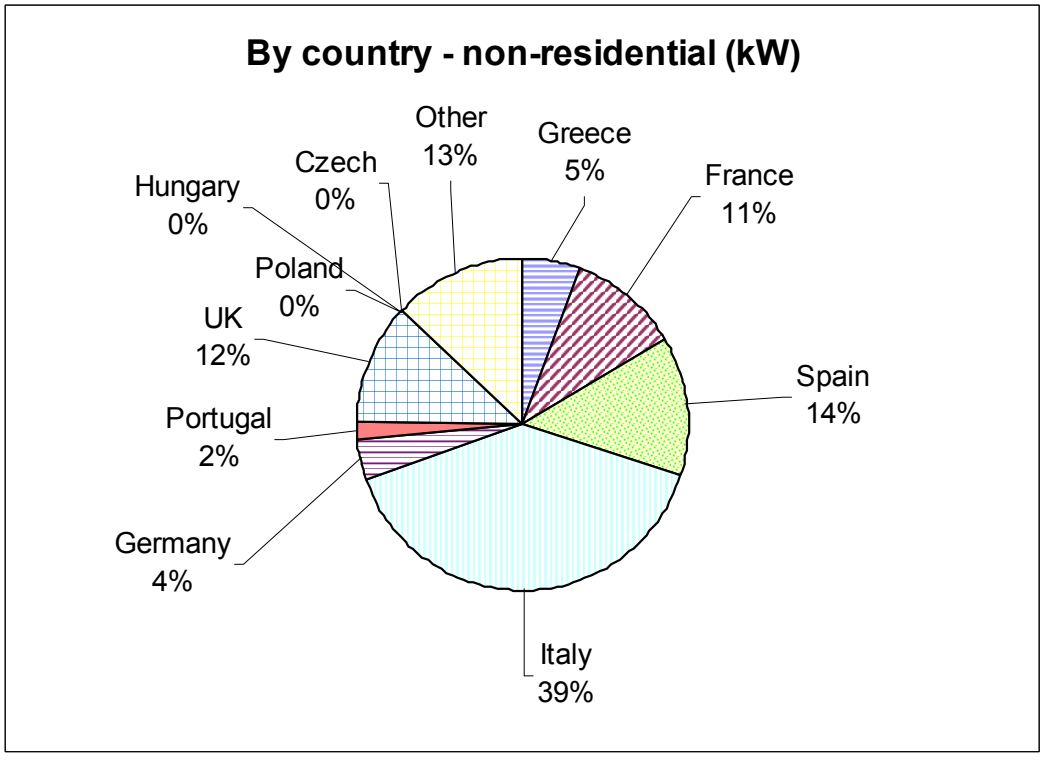
- In terms of installed cooling capacity, nearly two-thirds of the total is in non-residential buildings

Figure 2-7: Air conditioners' residential sales by countries (shares in cooling capacity), EU-27, all types within study scope (<12kW)



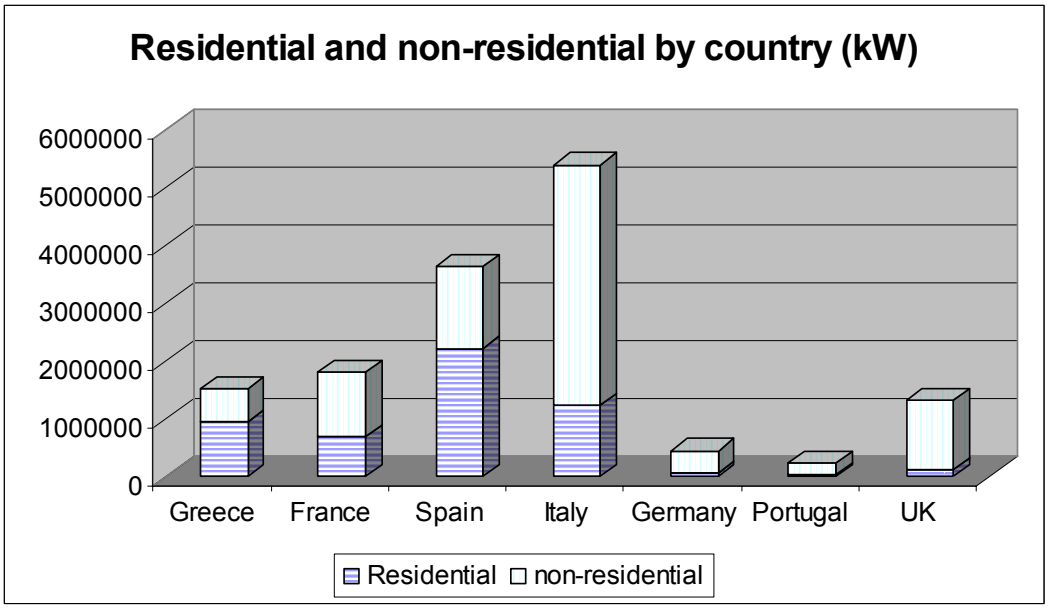
- Spain and Italy account for more than half of residential sales (by cooling capacity)

Figure 2-8: Air conditioners' non-residential sales by countries (shares in cooling capacity), EU-27, all types within study scope (<12kW)



- Italy alone accounts for nearly 40% of non-residential sales (by capacity)

Figure 2-9: Residential and non-residential sales by country (shares in cooling capacity), EU-27. All types within study scope (<12kW)

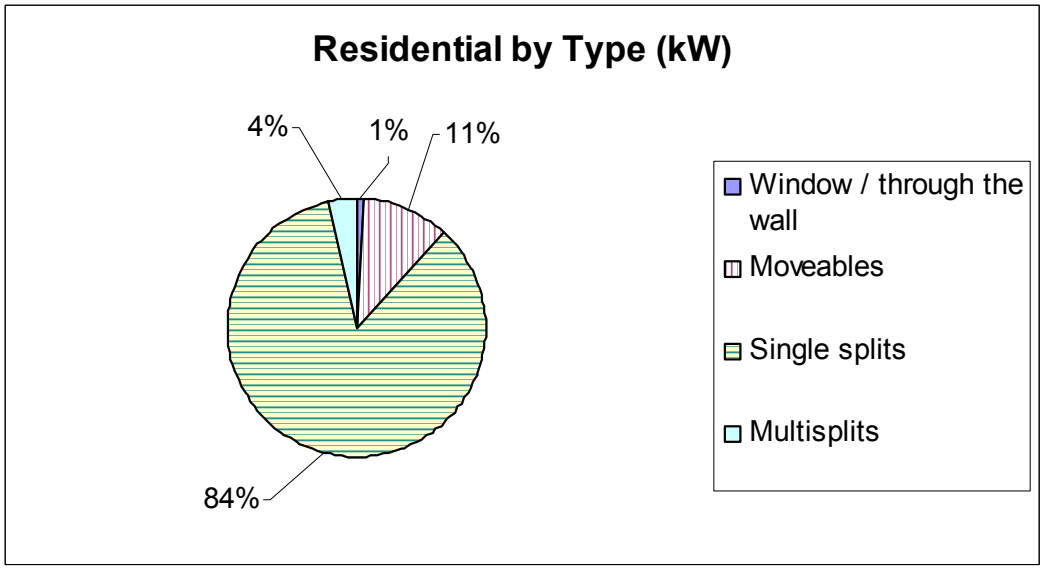


- The relative importance of the two market sectors varies considerably between countries

As can be seen, the distribution of sales across countries is significantly different for the residential and non-residential markets. Italy (and on a lesser scale the UK) becomes relatively more important in the non-residential market, while the residential markets are more important in Greece and Spain. A substantial proportion of the residential multi-splits are in Spain, but they only form a small proportion of sales in what is a large national market. Likewise, many of the non-residential multi-split air conditioners are in Italy – but there are far more single-split in that market.

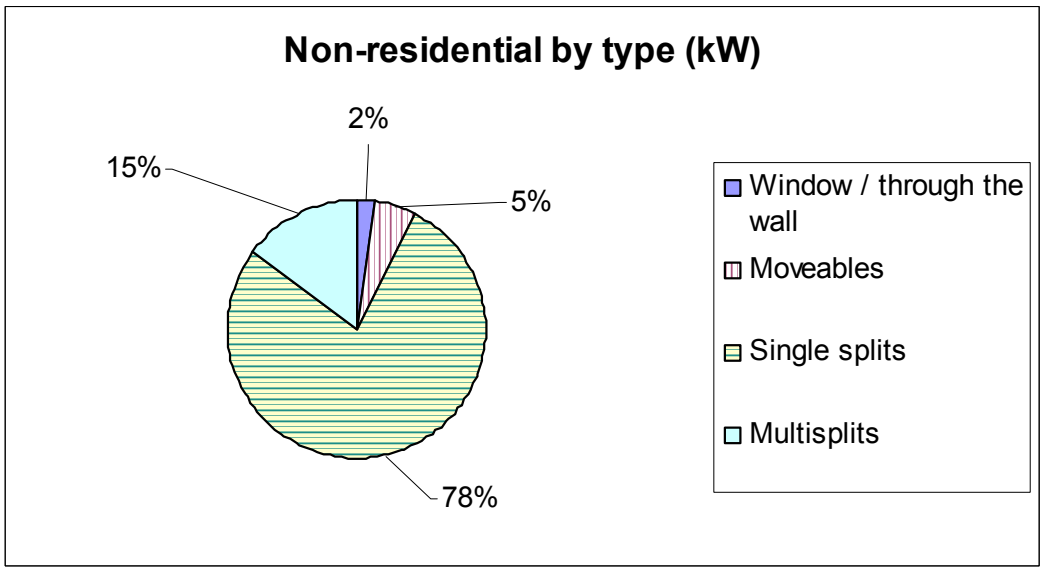
This is very much in line with comments from (CECED, 2006): "Destination of air conditioners varies a lot depending on latitudes:
− Northern and central Europe: air conditioners are mostly installed in offices and light commercial buildings. The market for "renting" portable units is quite significant.
− Southern France and Mediterranean area: installations in private dwellings are also relevant.
This explains well the high sale volumes recorded in these countries."

Figure 2-10: Air conditioners' residential sales by type (shares in cooling capacity), EU-27, All types within study scope. (<12kW)



- The residential market is dominated by single-split units. The remainder of units are mostly moveables

Figure 2-11: Air conditioners' non-residential sales by type (shares in cooling capacity), EU-27. All types within the study scope. (<12kW)



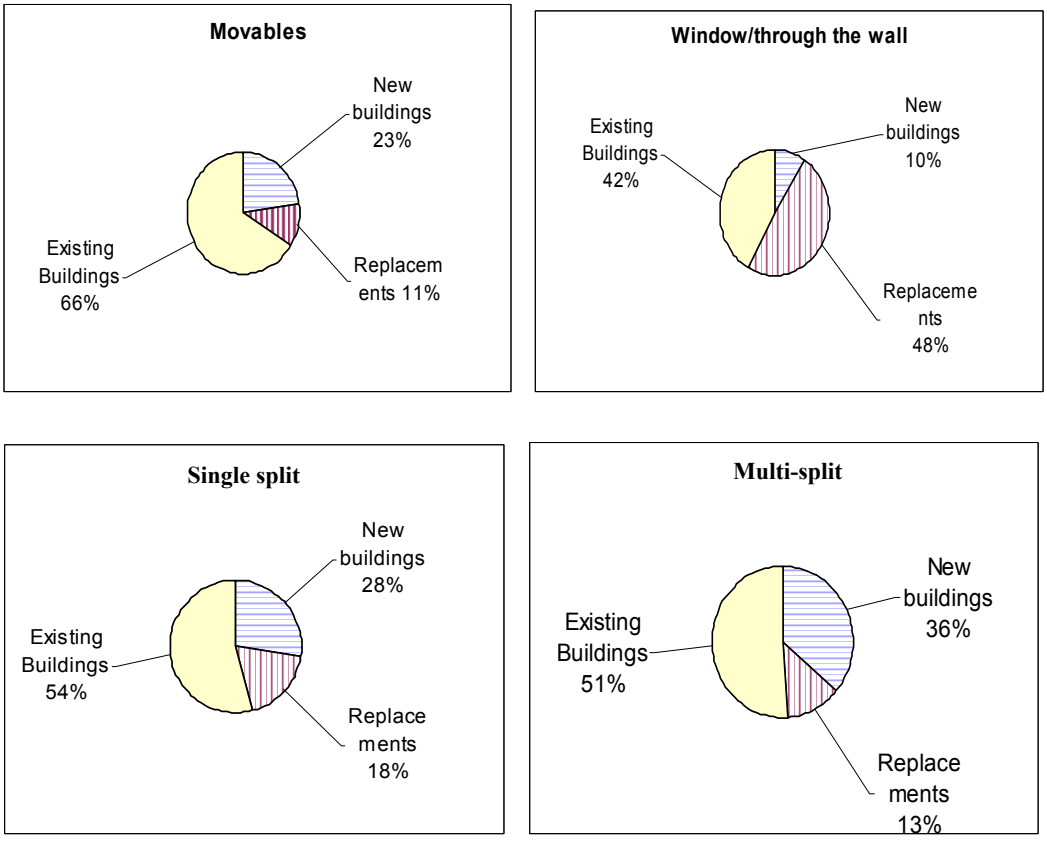
- The non-residential market is also dominated by single-splits, but the remainder are mostly multi-splits

Unsurprisingly, the mix of technical types differs between the two market sectors. In both sectors, single-split air conditioners predominate, but multi-splits are more common in the non-residential sector while moveables are mainly confined to the residential sector. In France, Germany and the UK, moveables dominate the residential markets for air-conditioning. In the latter two countries this market is, however, very small.

2.2.1.4 Sales by application

As can be seen below, different types of products have different application profiles. About 50% of window / through the wall units are replacements, with very few going into new buildings. This is a small but relatively mature market. Moveables, on the other hand predominantly go into existing buildings (in practice mostly into housing), with very few replacements. Slightly more than 50% of splits and multi-splits are installed in existing buildings with rather more than half the remainder going into new buildings – the replacement market for this dominant type is still rather small.

Figure 2-12: Air conditioners' sales destination by type (shares in cooling capacity), EU-27 (<12kW)



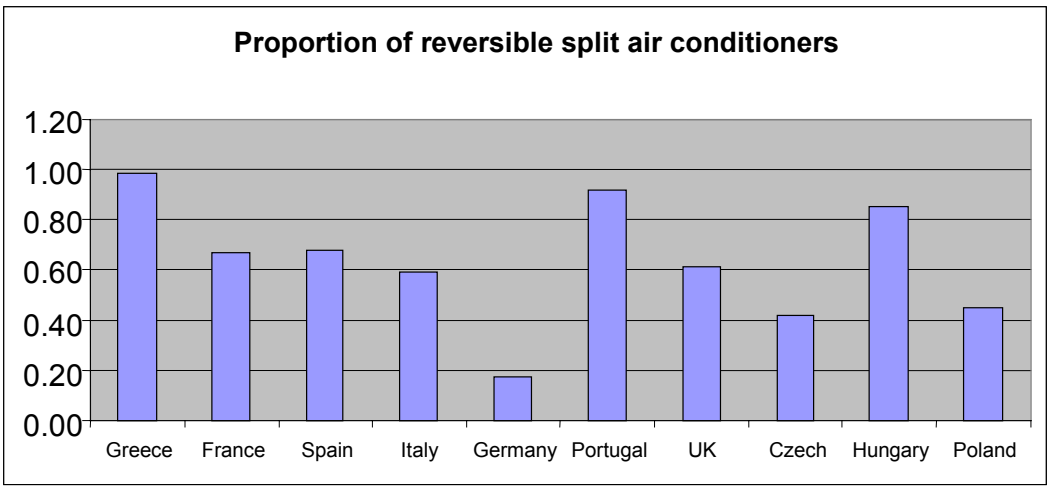
- Over half the market (by capacity) for single and multi-split units is in existing buildings
- Two thirds of the market (by capacity) for moveable units is in existing buildings
- Nearly half of the market (by capacity) for window/wall units is for replacements

2.2.1.5 Sales by reversibility type

Reversible window/wall, split and multi-split air conditioners

We have sales figures for reversibility by country for seven countries for single and multi-split air conditioners. In all countries except Germany 40% or more of products are reversible. Germany stands out as exceptional – in the UK, with a similar climate and concentration of sales into the non-residential market, the figure is close to 60%.

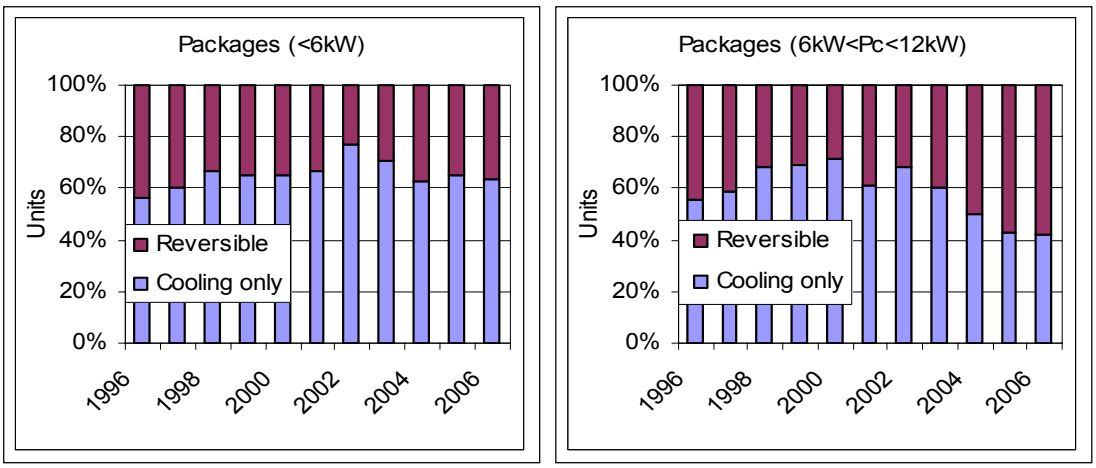
Figure 2-13: Proportion of reversible split and multi-split air conditioners (shares in numbers of outside units) in 10 European countries (<12kW)

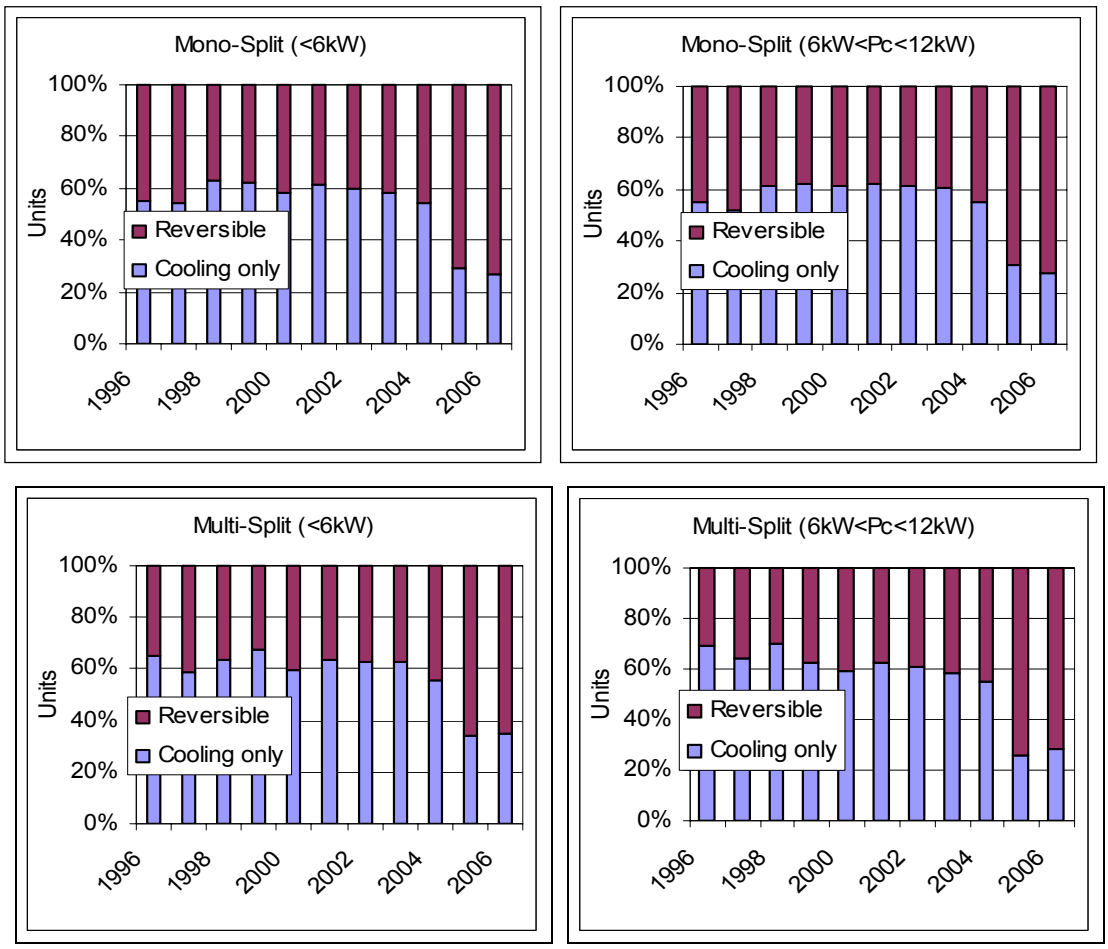


- In most countries the majority of split and multi-split air conditioners are reversible.

Eurovent-Certification database shows that between 1996 and 2006, air conditioners have become increasingly reversible. Incentives for heat pumps in several European countries and the growing part of Asian appliances on the market certainly have contributed to this trend. With the exception of packages with cooling capacity inferior to 6 kW, there has been a sharp increase of reversibility in 2004 with reversibility representing between 60 % and 80 % of the market for the different product type. These figures below, even if only indicative (see Appendix D for more details), underlines a market trend in good agreement with recent quantitative sales data. For instance, (Clim'Info, 2006) indicates that 92 % of split and multi-split 2006 French sales were reversible appliances versus about 87 % in 2005 (cooling capacity inferior to 17 kW). Similar figures are reported by stakeholders in Italy from a survey led on direct sales to end-user (CECED, 2007). However, there is little information concerning the real use made of reversibility by end users.

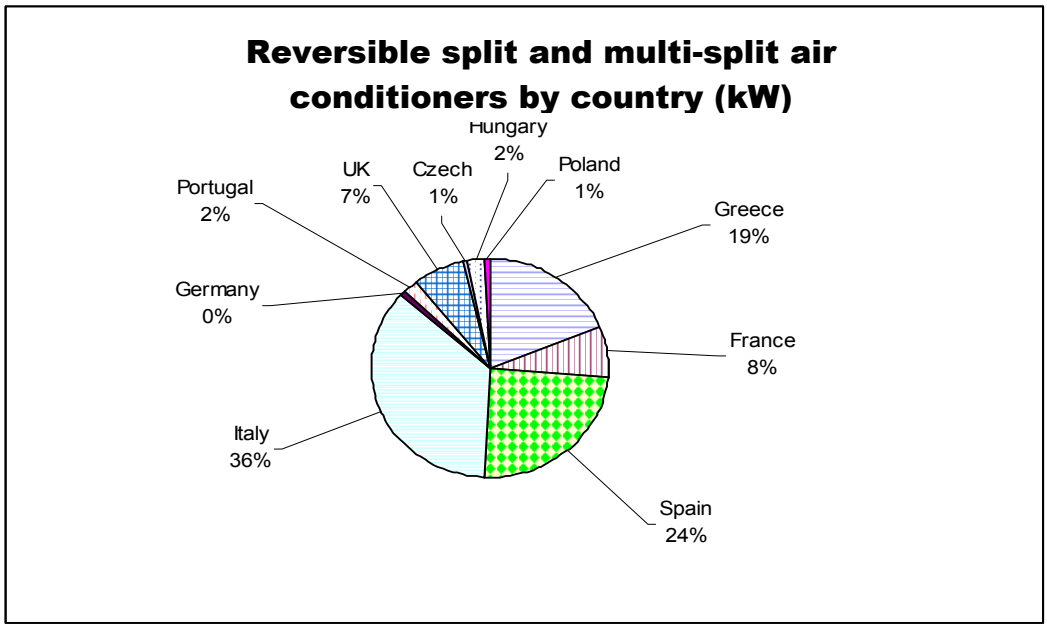
Table 2-3: Non moveable air conditioners reversible share, in number of models, Eurovent-Certification





- In all categories except for window/wall packages (< 6kW), the proportion of sales that are reversible is growing – in some cases rapidly.

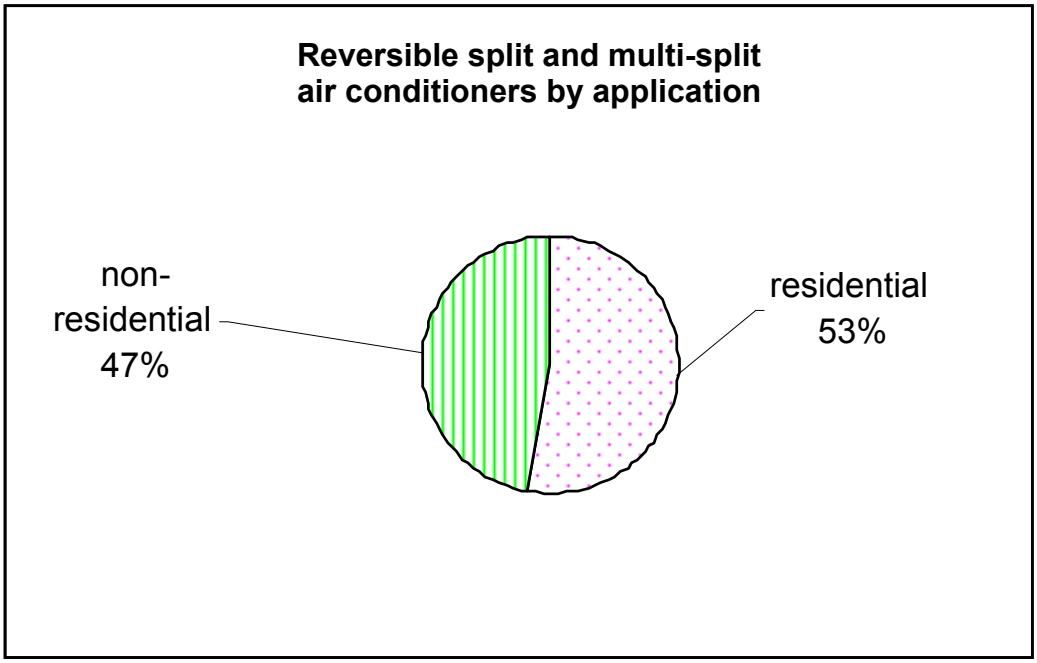
Figure 2-14: Reversible split and multi-split air conditioners by country (<12kW)



- 80% of sales of single and multi-split air conditioners by capacity are in Italy, Spain and Greece.

The overwhelming majority of sales of reversible air conditioners are in southern Europe, especially Italy, Spain and Greece. These are countries in which there are areas which may favour room heaters because of relatively low heating demands or limited access to natural gas networks. There do not appear to be any split or multi-split air conditioners now on the market with electric resistance heaters, although such products might exist within the stock.

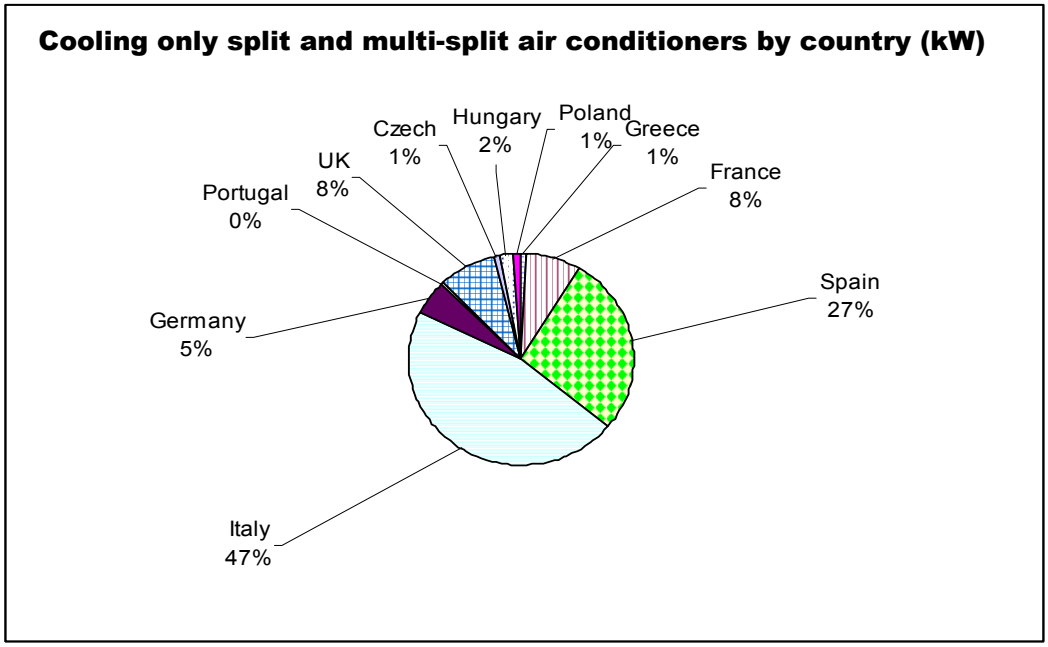
Figure 2-15: Application of reversible split and multi-split air conditioners (EU-27) (<12kW)



- Reversible single and multi-split air conditioners are used in similar numbers in residential and non-residential applications.

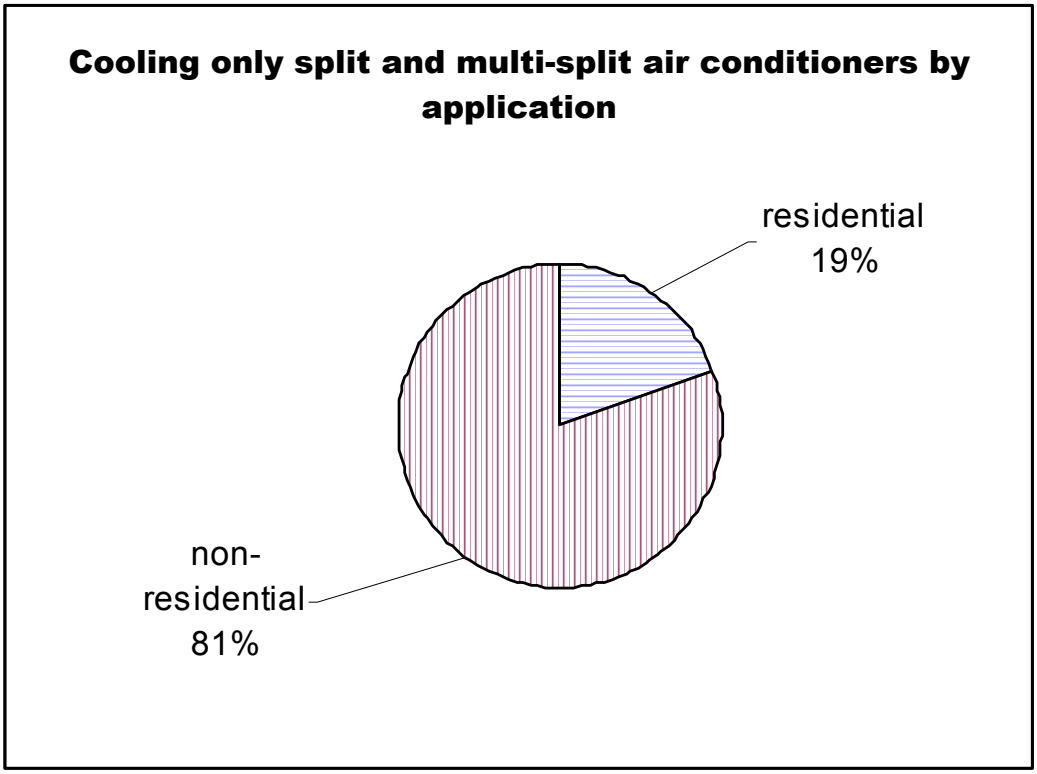
Cooling-only split and multi-split air conditioners

Figure 2-16: Cooling-only single and multi-split air conditioners by country (<12kW)



- About three-quarters of the market by capacity for cooling-only single and multi-split air conditioners is in Italy and Spain.

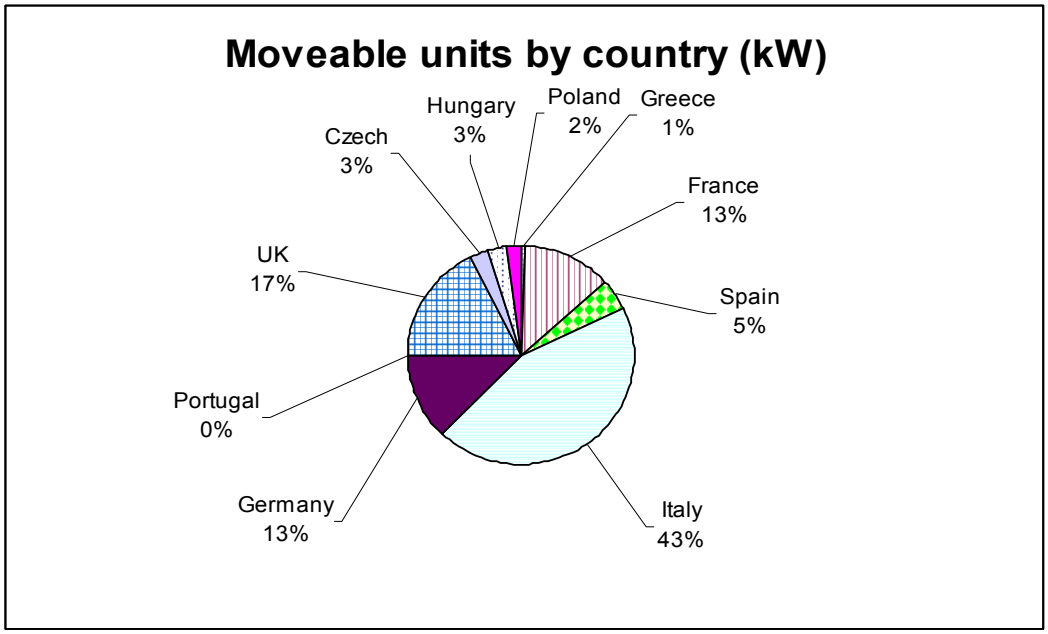
Figure 2-17: Cooling-only single and multi-split air conditioners by application (EU-27) (<12kW)



- A large majority of the cooling-only split and multi-split air conditioners market is for non-residential applications.

Moveable units

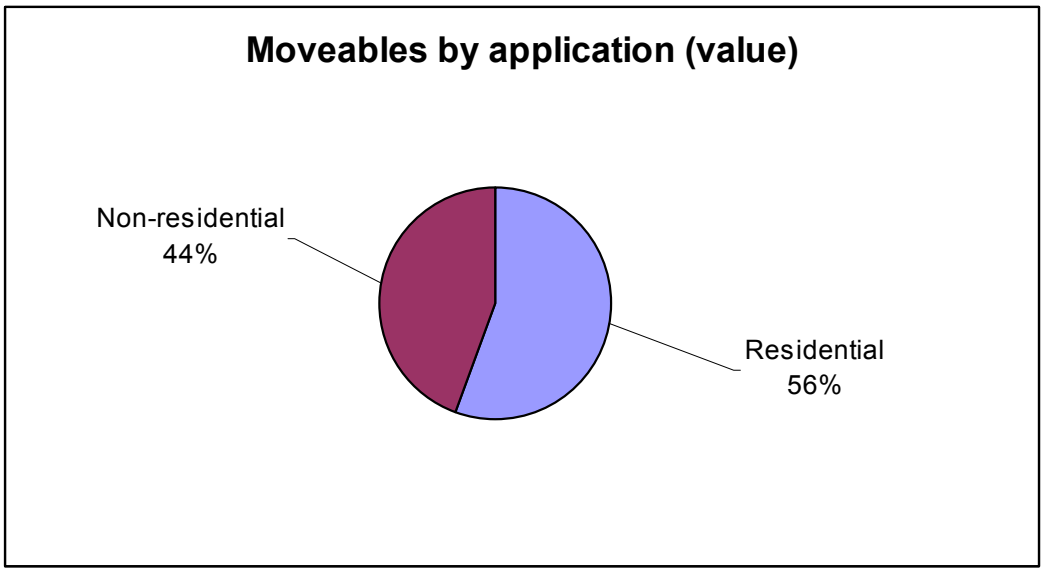
Figure 2-18: Moveable units by country



- The largest market by capacity for moveable units is Italy.

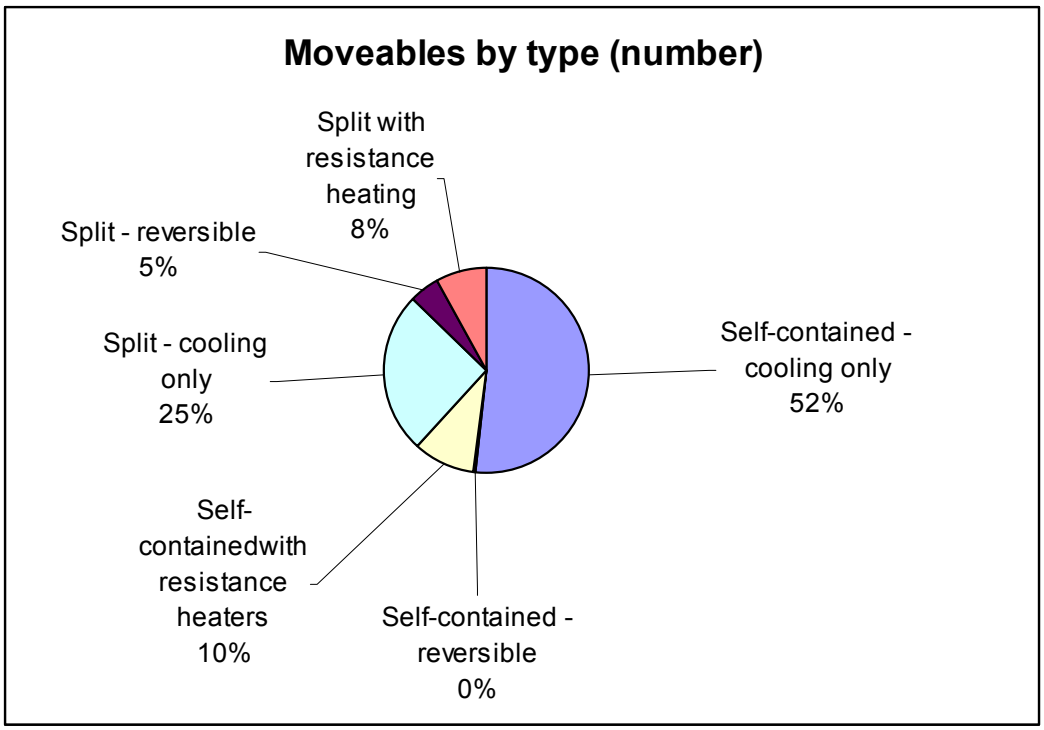
Moveables appear to have a particularly small market share in Spain, but the larger more northerly countries of the UK, France and Germany account for a bigger share of the European market than for other types of air conditioner. Together they account for over 40% of sales by capacity. This perhaps reflects the less demanding summer climates (but still with a need for occasional cooling) of large parts of these countries.

Figure 2-19: Moveable units by application EU-27



- By product value, slightly more than half of moveables are used in dwellings.

Figure 2-20: Moveable units by type EU-27



- Just over half the market by number consists of self-contained (*), cooling-only units.

(*) Self-contained here means single duct and double duct moveable appliances by opposition to moveable split units.

Most moveables sales are of self-contained units and most do not provide heating. However, nearly 40% are split air conditioners. Where heating is provided, it is almost always by electric resistance heaters.

2.2.2 Market Dynamics

The market for air conditioners – as for any product - is determined by desire and affordability. Desire is influenced amongst other things by climate; affordability by income.

According to (Macneil and Letschert, 2007), air-conditioning ownership stays at around 5% to 10% of households (irrespective of climate) until average GDP per household reaches about $12,000 per annum (not PPP corrected). Between household income levels of about $12,000pa and $30,000pa, market penetration starts to rise rapidly and this accelerates above $30,000pa until it reaches a climate-dependent saturation level. All European countries are above the lower threshold, and most are above the upper one – they are in the rapid market expansion phase. Only Bulgaria and Romania are currently below this second threshold, though Latvia, Lithuania, Estonia and Poland are only slightly above it.

(Sailor and Pavlova, 2003) observed, while the initial stages of the market may depend on income, in the USA residential market saturation is correlated with climate. They developed an empirical regression between cooling degree-days and market saturation in US cities. We have calculated cooling degree days (using US definitions) for several European cities and determined the saturation levels that are consistent with the US experience.

Table 2-4: Possible saturation levels residential air conditioning, by country, EU 27

Country	Year	Total Households (1 000)	Average household size	GDP per capita (PPP)	GDP per household (PPP)	Cooling degree days (US definition)	saturation % (Mcneil and Letchert correction to Sailor and Pavlova)	saturation (residential) thousands at 1system per household	Estimated stock in 2000, thousands (all system types)
Austria	2001	3 310.6	2.4	$32,962	$79,109	173.0	0.31	1 037.2	
Belgium	1998	4 178.7	2.4	$31,549	$75,718	102.0	0.22	901.7	
Bulgaria	2001	2 956.6	2.7	$9,205	$24,854	430.0	0.58	1 701.0	
Cyprus	2000	217.0	3.1	$20,669	$64,074	1 091.0	0.88	190.2	
Czech Republic	1998	3 731.1	2.7	$19,475	$52,583	108.0	0.22	837.8	
Denmark	2002	2 456.1	2.2	$34,718	$76,380	40.0	0.12	293.2	
Estonia	2001	569.0	2.4	$16,461	$39,506	38.0	0.12	66.1	
Finland	2002	2 295.4	2.2	$30,818	$67,183	48.0	0.13	304.1	
France	1999	23 810.0	2.4	$29,203	$70,087	241.0	0.40	9 412.0	385.1
Germany	1998	37 532.0	2.2	$30,150	$66,330	122.0	0.24	9 179.7	178.2
Greece	1991	3 203.8	3.0	$21,529	$64,587	923.0	0.83	2 662.6	1 411.1
Hungary	2001	3 837.0	2.6	$16,627	$43,230	256.0	0.41	1 580.9	
Ireland	2001	1 290.6	3.0	$40,003	$120,009	19.0	0.08	108.6	
Italy	1991	19 909.0	?	$29,414		600.0	0.69	13 756.7	1 395.7
Latvia	2000	802.8	2.7	$12,886	$34,792	58.0	0.15	119.3	
Lithuania	2001	1 330.0	2.6	$14,198	$36,915	68.0	0.16	218.5	
Luxembourg	2000	163.1	?	$66,821		99.0	0.21	34.5	
Malta	1995	119.5	3.2	$20,015	$64,048	1 043.0	0.87	103.4	
Netherlands	1998	6 758.0	2.3	$30,363	$69,835	68.0	0.16	1 110.5	
Poland	1995	12 501.0	3.1	$13,275	$41,153	100.0	0.21	2 660.9	
Portugal	1991	3 145.7	3.0	$19,949	$59,847	345.0	0.50	1 579.7	43.1
Romania	2001	7 767.5	2.8	$8,258	$23,122	290.0	0.45	3 481.7	
Slovakia	1991	1 778.0	2.9	$16,110	$46,719	158.0	0.29	522.3	
Slovenia	1991	640.0	3.1	$21,695	$67,255	189.0	0.33	213.5	
Spain	1998	12 626.0	3.2	$24,803	$79,370	702.0	0.74	9 401.8	2 718.0
Sweden	1990	3 830.0	2.1	$29,537	$62,028	45.0	0.13	488.7	
United Kingdom	2001	24 818.0	2.4	$30,309	$72,742	66.0	0.16	4 000.3	345.3

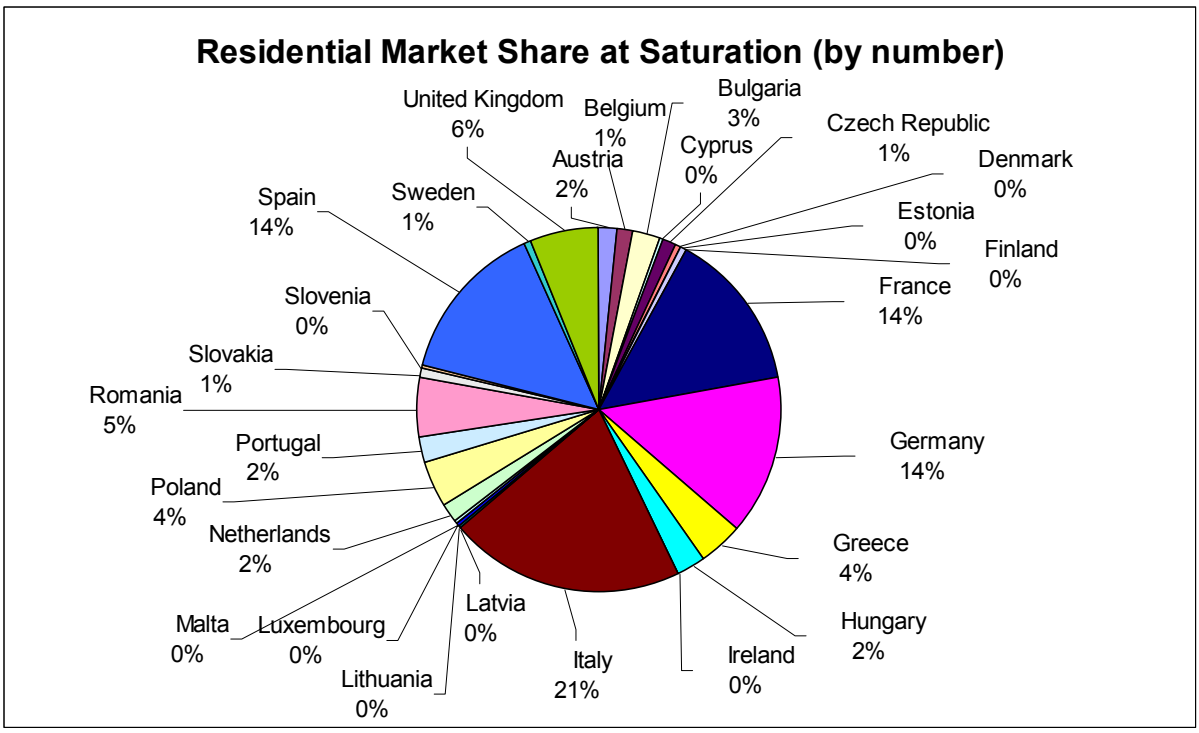
We have compared these figures to estimates of the current stock of residential air-conditioners in countries for which we have sales figures. Current (2000) ownership varies between 2% (Germany) and 53% (Greece) of the market saturation estimates.

There are several caveats to these estimates. In the US, residential cooling systems are predominantly central systems serving several rooms, whereas we have estimated the number of units (split or moveable) per household. True market saturation may be with ownership levels of more than one unit per household - in Japan, average ownership (including non-owners) is around 2.4 air conditioners per dwelling, with around 85% of households owning at least one air-conditioner.

Thus the ultimate stock level could easily be twice as high as the extrapolation from US figures. Clearly, the current market penetration is well below market saturation levels and is likely to remain so for some time.

The national partition of the estimated residential cooling stock at saturation is shown below. This shows some differences from the current market, notably the relatively smaller impact of Greece (high penetration but relatively few households) and the higher one of Germany (relatively low penetration but many households). Over 60% of the estimated stock is in four countries: Italy, Spain, Germany, France).

Figure 2-21: Residential market share at saturation (shares in number of units), EU 27



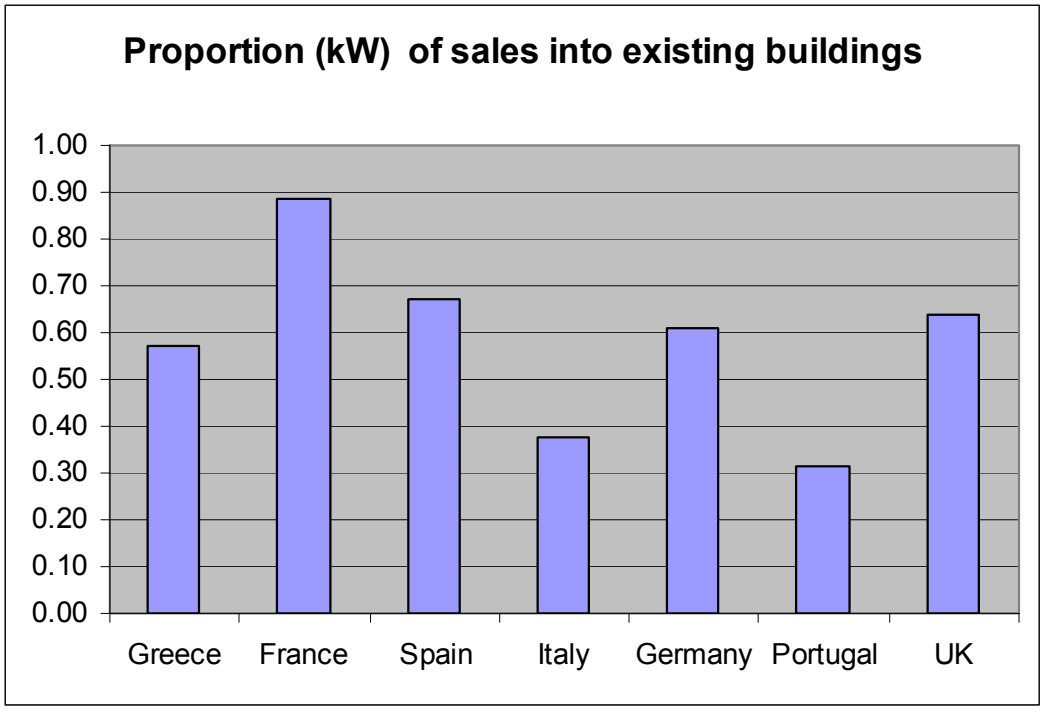
- Extrapolating from US markets, air-conditioning ownership could be dispersed between more countries. The largest ownership would be in Italy, Spain, Germany and France.

We may expect the motivations for making a first purchase to be different from those for replacing an existing product. Second and subsequent purchases will, at the least, be made with some experience of performance and operating cost. To some extent, this will also be the case for additional purchases – for a second room, for example.

The non-domestic market probably has different dynamics but there is little reliable information on these. The current level of sales suggests that climate is less influential, with relatively high levels of sales (relative to residential use) in moderate climates. In the USA and Japan and, as far as can be ascertained in Europe, market penetration into non-domestic buildings is higher than into dwellings. (According to IEA quoting Cenerg, USA is 80% commercial 65% residential; Japan 100% 85%, Europe 27% 5%).

In a mature market, all sales would be for replacements or for new buildings – there would be no first-time sales into existing buildings. Sales figures demonstrate that this is far from being the case.

Figure 2-22: Proportion of sales into existing buildings (shares in kW) in seven countries



- A substantial proportion of sales are first-time sales into existing buildings

2.2.3 Market Modelling

This section describes the market model which has been developed to generate estimated numbers of room air conditioning product for the different following quantities,

- production,
- sales,
- installed stock, and
- disposals,

for each Member State for any given year.

The model considers two types of air conditioners, moveables and split systems, where split systems include through the wall/window products and single and multisplit systems, but excludes vrf systems and larger packaged units such as roof top units and US style ducted splits and also close control systems. It looks at the market share for three building types, housing, retail and other commercial.

The modelling approach is based on empirically matching sales data to the Bass model of technology diffusion and using this to generate predictions of past and future sales. The Bass model has been used successfully to generate the technology uptake rates for a variety of electronic products including air conditioning in the US, and is therefore appropriate to use for the uptake of room air-conditioners. This requires parameters which relate to technical innovation and market imitators which are used to generate the rate of market diffusion for a given year of introduction. A description of the Bass diffusion model is provided in Appendix A.

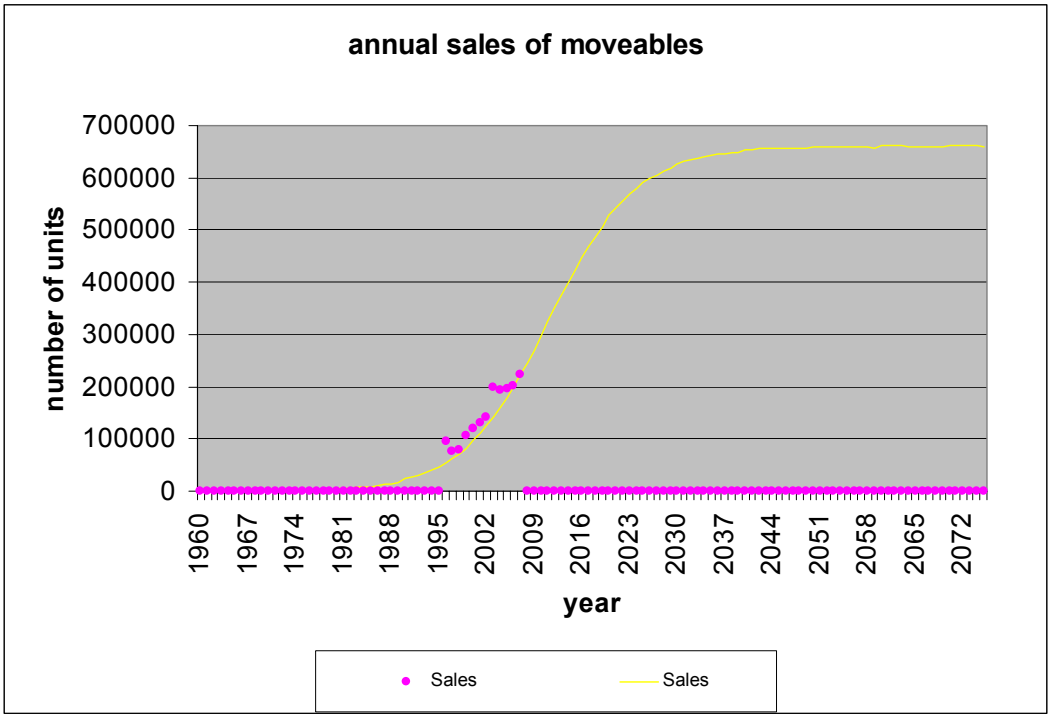
For room air conditioners we have assumed the technical innovation value used for air conditioning for the US market is appropriate across the European market and have varied the market imitators value to match the actual to predicted sales. For each country the model also requires the year of introduction to the market and the % market saturation (for a specified year) where the market saturation is the number of products installed in year X/estimated maximum number of products installed at market saturation. An example of this sales estimation procedure for the Italian moveables market is shown below.

Table 2-5: Bass model sales estimation procedure for the Italian moveables market

Italy moveables		
p	innovation (based on US value)	0.0007
q	imitation	0.1487
m	ultimate market potential	6,600,000
% sat	market saturation at base year	30%
life	of product	10
year	of introduction	1980
base year to match		2003

	Actual	Predicted	s curve		First-time	Replacement							
Year	Sales	Sales	s curve	replacemen	sales	1st	2nd	3rd	4th	5th	6th	7th	8th
1960	0	0		0.00	0	0	0	0	0	0	0	0	0
1961	0	0		0.00	0	0	0	0	0	0	0	0	0
1962	0	0		0.00	0	0	0	0	0	0	0	0	0
1963	0	0		0.00	0	0	0	0	0	0	0	0	0
1964	0	0		0.00	0	0	0	0	0	0	0	0	0
1965	0	0		0.00	0	0	0	0	0	0	0	0	0
1966	0	0		0.00	0	0	0	0	0	0	0	0	0
1967	0	0		0.00	0	0	0	0	0	0	0	0	0
1968	0	0		0.00	0	0	0	0	0	0	0	0	0
1969	0	0		0.00	0	0	0	0	0	0	0	0	0
1970	0	0		0.00	0	0	0	0	0	0	0	0	0
1971	0	0		0.00	0	0	0	0	0	0	0	0	0
1972	0	0		0.00	0	0	0	0	0	0	0	0	0
1973	0	0		0.00	0	0	0	0	0	0	0	0	0
1974	0	0		0.00	0	0	0	0	0	0	0	0	0
1975	0	0		0.00	0	0	0	0	0	0	0	0	0
1976	0	0		0.00	0	0	0	0	0	0	0	0	0
1977	0	0		0.00	0	0	0	0	0	0	0	0	0
1978	0	0		0.00	0	0	0	0	0	0	0	0	0
1979	0	0		0.00	0	0	0	0	0	0	0	0	0
1980	0	4400		0.00	4400	0	0	0	0	0	0	0	0
1981	0	5101		0.00	5101	0	0	0	0	0	0	0	0
1982	0	5913		0.00	5913	0	0	0	0	0	0	0	0
1983	0	6852		0.00	6852	0	0	0	0	0	0	0	0
1984	0	7937		0.00	7937	0	0	0	0	0	0	0	0
1985	0	9192		0.00	9192	0	0	0	0	0	0	0	0
1986	0	10640		0.00	10640	0	0	0	0	0	0	0	0
1987	0	12310		0.00	12310	0	0	0	0	0	0	0	0
1988	0	14235		0.00	14235	0	0	0	0	0	0	0	0
1989	0	16450		0.00	16450	0	0	0	0	0	0	0	0
1990	0	23395		0.19	18995	4400	0	0	0	0	0	0	0
1991	0	27017		0.19	21916	5101	0	0	0	0	0	0	0
1992	0	31174		0.19	25261	5913	0	0	0	0	0	0	0
1993	0	35934		0.19	29083	6852	0	0	0	0	0	0	0
1994	0	41376		0.19	33439	7937	0	0	0	0	0	0	0
1995	0	47582		0.19	38390	9192	0	0	0	0	0	0	0
1996	95057	54638		0.19	43998	10640	0	0	0	0	0	0	0
1997	75000	62635		0.20	50325	12310	0	0	0	0	0	0	0
1998	78750	71666		0.20	57431	14235	0	0	0	0	0	0	0
1999	106987	81821		0.20	65371	16450	0	0	0	0	0	0	0
2000	119932	97585		0.24	74190	18995	4400	0	0	0	0	0	0
2001	130000	110935		0.24	83918	21916	5101	0	0	0	0	0	0
2002	142000	125736		0.25	94562	25261	5913	0	0	0	0	0	0
2003	198000	142038		0.25	106103	29083	6852	0	0	0	0	0	0
2004	194040	159862		0.26	118485	33439	7937	0	0	0	0	0	0
2005	195980	179189		0.27	131608	38390	9192	0	0	0	0	0	0
2006	201860	199956		0.27	145319	43998	10640	0	0	0	0	0	0
2007	222046	222046		0.28	159411	50325	12310	0	0	0	0	0	0
2008	0	245285		0.29	173619	57431	14235	0	0	0	0	0	0
2009	0	269441		0.30	187620	65371	16450	0	0	0	0	0	0
2010	0	298630		0.33	201044	74190	18995	4400	0	0	0	0	0
2011	0	324422		0.34	213488	83918	21916	5101	0	0	0	0	0
2012	0	350268		0.36	224533	94562	25261	5913	0	0	0	0	0
2013	0	375812		0.38	233775	106103	29083	6852	0	0	0	0	0
2014	0	400711		0.40	240849	118485	33439	7937	0	0	0	0	0
2015	0	424652		0.42	245462	131608	38390	9192	0	0	0	0	0
2016	0	447372		0.45	247416	145319	43998	10640	0	0	0	0	0
2017	0	468669		0.47	246623	159411	50325	12310	0	0	0	0	0
2018	0	488404		0.50	243120	173619	57431	14235	0	0	0	0	0
2019	0	506499		0.53	237058	187620	65371	16450	0	0	0	0	0
2020	0	527324		0.57	228694	201044	74190	18995	4400	0	0	0	0
2021	0	542788		0.60	218366	213488	83918	21916	5101	0	0	0	0
2022	0	556733		0.63	206464	224533	94562	25261	5913	0	0	0	0
2023	0	569218		0.66	193405	233775	106103	29083	6852	0	0	0	0
2024	0	580312		0.69	179601	240849	118485	33439	7937	0	0	0	0
2025	0	590090		0.72	165439	245462	131608	38390	9192	0	0	0	0
2026	0	598634		0.75	151262	247416	145319	43998	10640	0	0	0	0
2027	0	606029		0.77	137360	246623	159411	50325	12310	0	0	0	0

Figure 2-23: Bass model sales estimation procedure for the Italian moveables market



Curve matching is achieved by altering the value of the imitation parameter p to match predicted total sales to actual sales.

Having established product sales data the modelling procedure goes on to use a cohort sales model to generate the installed stock and product removals from the sales data based on the typical product lifetime and the average time delay between production and installation to calculate the number of units produced in each year. The resultant stock modelling results for the German moveables market is shown below:

Table 2-6: Stock estimation procedure for the German moveables market

Market model for Moveables in Germany																			
	production	installation	removal	total stock	year installed ->		1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
	no units	no units	no units	no units															
year	no. installations - 2 years	Actual and predicted sales	Installations for 10 years ago	sum of products installed in previous 10 years	COP units installed	COP stock of units													
1975					2.00	-													
1976					2.00	-													
1977					2.00	-													
1978	633				2.00	-													
1979	800				2.00	-	-												
1980	1,010	633		633	2.00	2.00	-	633											
1981	1,275	800		1,433	2.00	2.00	-	633	800										
1982	1,607	1,010		2,443	2.00	2.00	-	633	800	####									
1983	2,025	1,275		3,718	2.00	2.00	-	633	800	####	1,275								
1984	2,550	1,607		5,325	2.00	2.00	-	633	800	####	1,275	1,607							
1985	3,206	2,025		7,351	2.00	2.00	-	633	800	####	1,275	1,607	2,025						
1986	4,024	2,550	633	9,900	2.00	2.00	-	633	800	####	1,275	1,607	2,025	2,550					
1987	5,041	3,206	800	13,106	2.00	2.00	-	633	800	####	1,275	1,607	2,025	2,550	3,206				
1988	6,933	4,024	1,010	17,131	2.00	2.00	-	633	800	####	1,275	1,607	2,025	2,550	3,206	4,024			
1989	8,648	5,041	1,275	22,172	2.00	2.00	0	633	800	####	1,275	1,607	2,025	2,550	3,206	4,024	5,041		
1990	10,749	6,933	1,607	28,472	2.00	2.00	0	0	800	####	1,275	1,607	2,025	2,550	3,206	4,024	5,041	6,933	
1991	13,302	8,648	2,025	36,321	2.00	2.00	0	0	0	####	1,275	1,607	2,025	2,550	3,206	4,024	5,041	6,933	8,648
1992	16,373	10,749	2,550	46,060	2.00	2.00	0	0	0	0	1,275	1,607	2,025	2,550	3,206	4,024	5,041	6,933	8,648
1993	20,021	13,302	3,206	58,088	2.00	2.00	0	0	0	0	0	1,607	2,025	2,550	3,206	4,024	5,041	6,933	8,648
1994	80,000	16,373	4,024	72,854	2.00	2.00	0	0	0	0	0	0	2,025	2,550	3,206	4,024	5,041	6,933	8,648
1995	40,000	20,021	5,041	90,849	2.00	2.00	0	0	0	0	0	0	0	2,550	3,206	4,024	5,041	6,933	8,648
1996	45,000	80,000	6,933	168,299	2.50	2.24	0	0	0	0	0	0	0	0	3,206	4,024	5,041	6,933	8,648
1997	47,000	40,000	8,648	205,093	2.50	2.29	0	0	0	0	0	0	0	0	0	4,024	5,041	6,933	8,648
1998	53,000	45,000	10,749	246,069	2.50	2.34	0	0	0	0	0	0	0	0	0	0	5,041	6,933	8,648
1999	45,000	47,000	13,302	288,028	2.50	2.37	0	0	0	0	0	0	0	0	0	0	0	6,933	8,648
2000	47,000	53,000	16,373	334,094	2.50	2.40	0	0	0	0	0	0	0	0	0	0	0	0	8,648
2001	47,000	45,000	20,021	370,446	2.50	2.42	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	47,000	47,000	80,000	406,696	2.50	2.44	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	47,500	47,000	40,000	440,394	2.50	2.46	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	79,411	47,000	45,000	471,021	2.50	2.48	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	82,010	47,500	47,000	498,500	2.50	2.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	83,997	79,411	53,000	497,911	2.50	2.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	85,606	82,010	45,000	539,921	2.50	2.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	87,662	83,997	47,000	578,918	2.50	2.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	89,168	85,606	47,000	617,524	2.50	2.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	90,619	87,662	47,000	652,186	3.00	2.57	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	91,923	89,168	47,500	696,354	3.00	2.63	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	92,948	90,619	79,411	739,973	3.00	2.68	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	93,591	91,923	82,010	784,896	3.00	2.73	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	93,832	92,948	83,997	830,844	3.00	2.77	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	93,748	93,591	85,606	876,935	3.50	2.86	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	93,496	93,832	87,662	891,356	3.50	2.96	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	93,257	93,748	89,168	903,095	3.50	3.06	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	93,801	93,496	90,619	912,594	3.50	3.16	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	94,079	93,257	91,923	920,245	3.50	3.25	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	94,538	93,801	92,948	926,384	3.50	3.30	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	95,045	94,079	93,591	931,295	3.50	3.35	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	95,430	94,538	93,832	935,214	3.50	3.40	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	95,563	95,045	93,748	938,335	3.50	3.45	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	95,396	95,430	93,496	940,817	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	94,988	95,563	93,257	942,789	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	94,479	95,396	93,801	944,353	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	94,035	94,988	94,079	945,594	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	94,418	94,479	94,538	946,577	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	94,566	94,035	95,045	947,355	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	94,924	94,418	95,430	947,971	3.50	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0

The estimated split between the residential, retail and other commercial markets is based on market research data for the most recent year available and, for this preliminary results at least, it has been assumed that this split will remain constant in future years.

The percentage of moveables and split systems that are reversible were based on market research data relating to the total proportion of current sales which are reversible within different countries. The projected proportion of reversible sales in future years was estimated based on a linear extrapolation of the Eurovent trends data shown in Figure 15.

Using this method the uptake of moveable and split system room air conditioning units was modeled explicitly for the following countries:

- France
- United Kingdom
- Spain
- Germany
- Italy
- Portugal
- Greece
- Hungary

- Poland
- Czech Republic

For EU Member States where sales data is not readily available the market uptake rates were estimated assuming the market will be similar in Member States with similar average cooling demand. A map of cooling indices was used to determine the likely cooling demand and prorated based on population.

As a reality check the market saturation levels implied by the modelling assumptions were generated. These are shown below for moveables and split systems

Table 2-7: Market saturation estimate of moveable air conditioners*, EU-27

Country	All Moveables				
	population	market entry	market saturation	at base year	market saturation
	Millions	year	%	year	no units
France	61.4	1980	30%	2005	3,215,455
United Kingdom	60.7	1980	30%	2005	4,219,153
Spain	44.7	1980	50%	2000	315,705
Italy	58.8	1980	30%	2003	8,907,273
Germany	82.3	1980	50%	2005	1,082,784
Greece	11.1	1980	80%	2005	37,188
Portugal	10.6	1980	100%	2000	2,364
Poland	38.1	1980	100%	2008	34,262
Czech Republic	10.3	1980	100%	2005	63,713
Hungary	10.1	1980	100%	2008	22,795
Cyprus	0.8	1980	80%	2005	2,680
Belgium	10.5	1980	30%	2005	549,874
Denmark	5.4	1980	30%	2005	282,792
Estonia	1.4	1980	30%	2005	73,317
Finland	5.3	1980	30%	2005	368,394
Bulgaria	7.7	1980	30%	2003	1,166,429
Ireland	4.2	1980	30%	2005	291,935
Latvia	2.3	1980	30%	2005	120,449
Lithuania	3.4	1980	30%	2005	178,054
Luxembourg	0.5	1980	30%	2005	26,184
Malta	0.4	1980	30%	2003	60,594
Netherlands	16.4	1980	30%	2005	858,851
Austria	8.3	1980	30%	2005	434,662
Romania	21.6	1980	30%	2003	3,272,059
Slovakia	5.4	1980	30%	2003	818,015
Slovenia	2.0	1980	30%	2003	302,968
Sweden	9.1	1980	30%	2005	632,525

*standard unit size 2.2 kW cooling

Table 2-8: Market saturation estimate of split air conditioners*, EU-27

Country	All Split systems				
	population	market entry	market saturation	at base year	market saturation
	Millions	year	%	year	no units
France	61,4	1975	30%	2005	18 642 055
United Kingdom	60,7	1975	30%	2005	11 281 068
Spain	44,7	1975	50%	2005	29 610 041
Italy	58,8	1975	55%	2005	21 693 588
Germany	82,3	1975	50%	2005	2 076 774
Greece	11,1	1975	80%	2005	6 474 118
Portugal	10,6	1975	50%	2005	1 644 757
Poland	38,1	1975	50%	2006	940 795
Czech Republic	10,3	1975	50%	2006	610 922
Hungary	10,1	1975	50%	2006	1 877 927
Cyprus	0,8	1975	80%	2005	466 603
Belgium	10,5	1975	30%	2005	3 187 974
Denmark	5,4	1975	30%	2005	1 639 529
Estonia	1,4	1975	30%	2005	425 063
Finland	5,3	1975	30%	2005	985 003
Bulgaria	7,7	1975	80%	2005	2 840 827
Ireland	4,2	1975	30%	2005	780 568
Latvia	2,3	1975	30%	2005	698 318
Lithuania	3,4	1975	30%	2005	1 032 296
Luxembourg	0,5	1975	30%	2005	151 808
Malta	0,4	1975	80%	2005	147 575
Netherlands	16,4	1975	30%	2005	4 979 311
Austria	8,3	1975	30%	2005	2 520 017
Romania	21,6	1975	80%	2005	7 969 073
Slovakia	5,4	1975	80%	2005	1 992 268
Slovenia	2,0	1975	80%	2005	737 877
Sweden	9,1	1975	30%	2005	1 691 231

* Standard unit size 3.5 kW cooling

2.2.4 Market and stock estimates

Market modelling adjustment

Market modelling has been compared with sales forecast supplied by manufacturers based on linear projections of the past year trends up to 2010. It appeared that on the short term, this model underestimated the sales in Italy and Spain, and overestimated the sales for presently small markets in central and northern Europe. This has been taken into account in what follows and final results have been made compatible with industry estimates of 2010 sales; this was necessary because average operating conditions are computed with 2010 sales estimate and used to establish reference seasonal performance indices.

It should be added however that the final figures used may underestimate growth of air conditioning in central and northern countries, if we refer to the model above based on climate and standard of living. Also, the increasing demand for heat pumps could contribute to increase the demand in non traditional air conditioning countries.

Final results

A summary of results for all countries are presented for both moveable and split system are included below and full results all Member States are included in Appendix B

The summary tables below show the estimated sales and installed stock of room air conditioning units for all EU Member States.

Table 2-9: Sales of air conditioners in 2005, EU-27 in numbers of units (real units)

Number of standards units	Moveables			Reversible split units			Cooling only split units		
	Residential	Office	Retail	Residential	Office	Retail	Residential	Office	Retail
austria	9198	1204	1028	387	2250	1189	60	351	185
belgium	11636	1524	1300	5010	29116	15380	781	4538	2397
bulgaria	12832	6416	12047	41673	78861	11754	6495	13192	1966
cyprus	192	0	19	21347	4262	4236	3423	1023	1017
czech republic	2795	2516	525	386	9672	2858	72	1806	534
denmark	5984	784	669	2577	14974	7910	402	2334	1233
estonia	1551	203	173	668	3882	2051	104	605	320
finland	7795	1021	871	956	5957	3147	267	1153	609
france	68040	8910	7605	31331	182081	96182	4883	28378	14990
germany	23750	21375	4459	376	9188	2997	1538	37589	12261
greece	2660	0	263	226908	45300	45026	36387	10878	10812
hungary	1750	1575	329	1556	37747	9749	250	9064	2341
ireland	6177	809	690	758	4721	2494	212	914	483
italy	58000	29000	29000	587317	304312	86679	91537	50906	14500
latvia	2549	334	285	1287	7477	3949	201	1165	616
lithuania	3768	493	421	1622	9428	4980	253	1469	776
luxembourg	554	73	62	239	1386	732	37	216	114
malta	667	333	626	2165	4097	611	337	685	102
netherlands	18174	2380	2031	7825	45477	24023	1220	7088	3744
poland	2945	386	329	1450	7638	4630	746	4082	2475
portugal	1	0	56	7199	39637	11271	1122	6631	1885
romania	35996	17998	33795	116901	221220	32972	18220	37006	5516
slovakia	8999	4500	8449	29225	55305	8243	4555	9252	1379
slovenia	3333	1666	3129	10824	20483	3053	1687	3427	511
spain	431	0	0	506409	209255	47398	81209	50249	11382
sweden	13384	1753	1496	1641	10228	5403	459	1980	1046
uk	89279	11691	9978	16013	99777	52706	4480	19320	10205
Total	392439	116943	119636	1624050	1463732	491621	260937	305302	103399
PER TYPE	629017			3579403			669639		

Table 2.10: Sales of air conditioners in 2030, EU-27 in numbers of units

Number of standards units	Moveables			Reversible split units			Cooling only split units		
	Residential	Office	Retail	Residential	Office	Retail	Residential	Office	Retail
austria	29453	3857	3096	1396	8114	4286	0	0	0
belgium	37260	4879	3917	18065	104984	55456	0	0	0
bulgaria	41032	20516	36231	60486	115595	17229	0	0	0
cyprus	238	0	22	31090	6634	6593	0	0	0

czech republic	2909	2618	514	945	23684	6998	0	0	0
denmark	19162	2509	2014	9291	53992	28520	0	0	0
estonia	4968	651	522	2409	13998	7394	0	0	0
finland	25002	3274	2628	3817	22180	11717	0	0	0
france	217885	28533	22904	112969	656519	346796	0	0	0
germany	47209	42488	8337	3764	91974	30001	0	0	0
greece	3305	0	307	330479	70512	70086	0	0	0
hungary	851	766	150	3916	101504	26215	0	0	0
ireland	19813	2595	2083	3025	17577	9285	0	0	0
italy	256366	128183	128183	1239947	648817	184807	0	0	0
latvia	8162	1069	858	4639	26958	14240	0	0	0
lithuania	12065	1580	1268	5850	33995	17957	0	0	0
luxembourg	1774	232	187	860	4999	2641	0	0	0
malta	2132	1066	1882	3142	6005	895	0	0	0
netherlands	58197	7621	6118	28216	163974	86617	0	0	0
poland	2149	281	226	4627	24700	14974	0	0	0
portugal	1	0	69	16454	91495	26018	0	0	0
romania	115103	57552	101636	169676	324266	48330	0	0	0
slovakia	28776	14388	25409	42419	81066	12082	0	0	0
slovenia	10658	5329	9411	15711	30025	4475	0	0	0
spain	685	0	0	1162027	513175	116238	0	0	0
sweden	42928	5621	4513	6553	38083	20117	0	0	0
uk	286342	37497	30100	63928	371517	196249	0	0	0
Total	1274426	373105	392584	3345701	3646341	1366216	0	0	0
PER TYPE	2040114			8358259			0		

Table 2-11: Installed stock of air conditioners in 2005, EU-27 in numbers of units

Number of standards units	**Moveables**			**Reversible split units**			**Cooling only split units**		
	Residential	**Office**	**Retail**	**Residential**	**Office**	**Retail**	**Residential**	**Office**	**Retail**
austria	116641	15274	6943	2651	15404	8137	895	5202	2748
belgium	147558	19323	8783	34293	199290	105272	11581	67302	35551
bulgaria	148407	74203	74203	249971	472278	70390	83768	164947	24584
cyprus	2537	0	134	145112	28608	28435	53242	13516	13434
czech republic	46827	42144	4683	2512	62962	18602	985	24684	7293
denmark	75887	9938	4517	17636	102492	54140	5956	34612	18284
estonia	19674	2576	1171	4572	26572	14036	1544	8974	4740
finland	74119	9706	4412	6498	41075	21697	3487	17236	9105
france	862860	112994	51361	214450	1246270	658324	72421	420875	222321
germany	425484	382935	42548	2722	66497	21691	15505	378811	123566
greece	35201	0	1853	1542482	304088	302248	565938	143670	142801
hungary	23871	21484	2387	10652	255190	65906	3850	118889	30705
ireland	58736	7692	3496	5150	32550	17194	2763	13659	7215
italy	1031315	515657	515657	3653700	1889974	538334	1274703	686982	195678
latvia	32322	4233	1924	8806	51175	27032	2974	17282	9129
lithuania	47781	6257	2844	11104	64532	34088	3750	21793	11512
luxembourg	7027	920	418	1633	9490	5013	551	3205	1693
malta	7709	3855	3855	12986	24534	3657	4352	8569	1277
netherlands	230471	30181	13719	53562	311273	164425	18088	105119	55528
poland	49863	6530	2968	11473	60459	36652	5364	29347	17791
portugal	20	0	779	54814	301241	85661	20343	116390	33097
romania	416310	208155	208155	701218	1324832	197458	234984	462707	68964

slovakia	104077	52039	52039	175305	331208	49365	58746	115677	17241
slovenia	38547	19274	19274	64928	122670	18283	21758	42843	6386
spain	6992	0	0	3443506	1404838	318208	1264387	663841	150366
sweden	127261	16665	7575	11158	70525	37254	5987	29594	15633
uk	848872	111162	50528	108847	687999	363425	58407	288701	152502
Total	4986367	1673196	1086225	10551739	9508025	3264929	3796329	4004428	1379142
PER TYPE	7745788			23324694			9179900		

Table 2-12: Installed stock of air conditioners in 2030, EU-27 in numbers of units

Number of standards units	**Moveables**			**Reversible split units**			**Cooling only split units**		
	Residential	**Office**	**Retail**	**Residential**	**Office**	**Retail**	**Residential**	**Office**	**Retail**
austria	524991	68749	31249	15462	89855	47464	0	0	0
belgium	664146	86971	39532	200041	1162532	614091	0	0	0
bulgaria	722336	361168	361168	716483	1369263	204081	0	0	0
cyprus	4555	0	240	370596	79072	78593	0	0	0
czech republic	53822	48439	5382	10991	275480	81392	0	0	0
denmark	341561	44728	20331	102878	597874	315818	0	0	0
estonia	88553	11596	5271	26672	155004	81879	0	0	0
finland	446427	58461	26573	42264	245614	129742	0	0	0
france	3883670	508576	231171	1250963	7269936	3840238	0	0	0
germany	902864	812578	90286	43631	1066006	347725	0	0	0
greece	63200	0	3326	3939294	840502	835416	0	0	0
hungary	18708	16837	1871	45544	1180612	304910	0	0	0
ireland	353772	46327	21058	33492	194638	102815	0	0	0
italy	4513107	2256554	2256554	14687648	7685484	2189108	0	0	0
latvia	145480	19051	8659	51368	298522	157690	0	0	0
lithuania	215057	28162	12801	64775	376439	198848	0	0	0
luxembourg	31626	4141	1882	9526	55359	29242	0	0	0
malta	37524	18762	18762	37220	71131	10602	0	0	0
netherlands	1037332	135841	61746	312445	1815765	959151	0	0	0
poland	47238	6186	2812	53821	287292	174165	0	0	0
portugal	19	0	731	192513	1070479	304401	0	0	0
romania	2026293	1013147	1013147	2009874	3841050	572486	0	0	0
slovakia	506573	253287	253287	502469	960262	143121	0	0	0
slovenia	187620	93810	93810	186099	355653	53008	0	0	0
spain	13099	0	0	13595519	6004055	1359969	0	0	0
sweden	766506	100376	45625	72566	421715	222765	0	0	0
uk	5112851	669540	304336	707907	4113984	2173152	0	0	0
Total	22708928	6663286	4911611	39282061	41883576	15531875	0	0	0
PER TYPE	34283826			96697512			0		

Table 2-13: Sales of air conditioners in 2005, EU-27 in kW cooling

kW cooling	**Moveables**			**Reversible split units**			**Cooling only split units**		
	Residential	**Office**	**Retail**	**Residential**	**Office**	**Retail**	**Residential**	**Office**	**Retail**
austria	24098	3156	2693	2155	12521	6614	336	1951	1031
belgium	30485	3992	3407	29308	170323	89971	4568	26546	14022
bulgaria	38099	19050	35769	215329	407484	60733	33560	68165	10160
cyprus	448	0	44	78989	15769	15674	12667	3787	3764
czech republic	7008	6308	1316	2090	52383	15477	390	9780	2889
denmark	15678	2053	1752	15073	87595	46271	2349	13652	7212

estonia	4065	532	454	3908	22710	11996	609	3539	1870
finland	20424	2675	2283	5592	34846	18407	1565	6747	3564
france	178265	23344	19924	171382	995982	526113	26711	155229	81998
germany	59553	53598	11182	2858	69831	22779	11692	285674	93185
greece	6218	0	614	1095967	218798	217474	175751	52541	52223
hungary	4388	3949	824	7646	185451	47895	1226	44533	11501
ireland	16185	2119	1809	4432	27614	14587	1240	5347	2824
italy	172207	86104	86104	3034741	1572418	447882	472981	263039	74923
latvia	6678	874	746	6420	37309	19708	1001	5815	3072
lithuania	9871	1293	1103	9490	55152	29133	1479	8596	4541
luxembourg	1452	190	162	1396	8111	4284	218	1264	668
malta	1979	990	1858	11186	21168	3155	1743	3541	528
netherlands	47615	6235	5322	45776	266028	140525	7135	41462	21902
poland	7385	967	825	7552	39795	24125	3888	21269	12894
portugal	2	0	113	30586	168408	47889	4767	28172	8011
romania	106876	53438	100339	604040	1143073	170368	94143	191217	28500
slovakia	26719	13360	25085	151010	285768	42592	23536	47804	7125
slovenia	9896	4948	9291	55930	105840	15775	8717	17705	2639
spain	1032	0	0	2896661	1196937	271116	464513	287425	65104
sweden	35067	4592	3919	9602	59830	31605	2687	11585	6120
uk	233910	30631	26143	93672	583667	308313	26208	113014	59698
Total	1065602	324397	343083	8592789	7844811	2650461	1385679	1719399	581965
PER TYPE	1733082			19088061			3687043		

Table 2.14: Sales of air conditioners in 2030, EU-27 in kW cooling

kW cooling	**Moveables**			**Reversible split units**			**Cooling only split units**		
	Residential	**Office**	**Retail**	**Residential**	**Office**	**Retail**	**Residential**	**Office**	**Retail**
austria	77168	10105	8112	7769	45147	23848	0	0	0
belgium	97622	12784	10262	105674	614123	324402	0	0	0
bulgaria	121828	60914	107574	312540	597292	89023	0	0	0
cyprus	557	0	52	115043	24546	24397	0	0	0
czech republic	7294	6565	1288	5118	128274	37899	0	0	0
denmark	50206	6575	5278	54347	315835	166835	0	0	0
estonia	13016	1705	1368	14090	81883	43254	0	0	0
finland	65505	8578	6886	22326	129749	68538	0	0	0
france	570858	74755	60008	617943	3591157	1896977	0	0	0
germany	118376	106538	20905	28610	699000	228009	0	0	0
greece	7725	0	718	1596215	340574	338513	0	0	0
hungary	2134	1921	377	19237	498683	128792	0	0	0
ireland	51910	6798	5457	17693	102820	54313	0	0	0
italy	761174	380587	380587	6406963	3352519	954920	0	0	0
latvia	21384	2800	2248	23148	134522	71059	0	0	0
lithuania	31611	4140	3323	34218	198859	105044	0	0	0
luxembourg	4649	609	489	5032	29244	15448	0	0	0
malta	6329	3164	5588	16236	31028	4625	0	0	0
netherlands	152477	19967	16028	165053	959202	506684	0	0	0
poland	5390	706	567	24108	128687	78014	0	0	0
portugal	2	0	138	69911	388741	110543	0	0	0
romania	341752	170876	301766	876736	1675521	249727	0	0	0
slovakia	85438	42719	75441	219184	418880	62432	0	0	0
slovenia	31644	15822	27941	81179	155141	23123	0	0	0

spain	1640	0	0	6646794	2935358	664883	0	0	0
sweden	112471	14728	11823	38334	222777	117679	0	0	0
uk	750217	98243	78862	373961	2173266	1147996	0	0	0
Total	3490374	1051598	1133084	17897462	19972828	7536978	0	0	0
PER TYPE	5675056			45407268			0		

Table 2-15: Installed stock of air conditioners in 2005, EU-27 in kW cooling

kW cooling	**Moveables**			**Reversible split units**			**Cooling only split units**		
	Residential	**Office**	**Retail**	**Residential**	**Office**	**Retail**	**Residential**	**Office**	**Retail**
austria	305599	40019	18190	14747	85702	45271	4980	28942	15288
belgium	386601	50626	23012	200601	1165790	615812	67745	393697	207965
bulgaria	440633	220316	220316	1291633	2440321	363716	432838	852300	127030
cyprus	5930	0	312	536950	105856	105215	197008	50013	49710
czech republic	117418	105676	11742	13605	340999	100750	5334	133689	39499
denmark	198823	26036	11835	103166	599549	316703	34840	202473	106953
estonia	51547	6750	3068	26747	155439	82108	9033	52493	27729
finland	194192	25430	11559	38014	240277	126923	20398	100826	53260
france	2260694	296043	134565	1173041	6817095	3601031	396145	2302188	1216097
germany	1066900	960210	106690	20685	505377	164851	117834	2878966	939101
greece	82282	0	4331	7450187	1468747	1459860	2733480	693928	689729
hungary	59857	53872	5986	52335	1253736	323796	18916	584096	150851
ireland	153888	20152	9160	30124	190408	100580	16164	79900	42206
italy	3062067	1531034	1531034	18879129	9765735	2781640	6586552	3549720	1011091
latvia	84684	11090	5041	43941	255363	134892	14839	86238	45554
lithuania	125185	16393	7451	64957	377494	199406	21936	127483	67341
luxembourg	18410	2411	1096	9552	55514	29324	3226	18747	9903
malta	22890	11445	11445	67098	126770	18894	22485	44275	6599
netherlands	603834	79073	35942	313320	1820853	961839	105811	614917	324821
poland	125031	16373	7442	59777	314990	190956	27947	152900	92692
portugal	40	0	1558	232893	1279901	363953	86433	494515	140620
romania	1236061	618031	618031	3623283	6845575	1020293	1214194	2390866	356345
slovakia	309015	154508	154508	905821	1711394	255073	303549	597717	89086
slovenia	114450	57225	57225	335489	633850	94472	112425	221376	32995
spain	16745	0	0	19696853	8035672	1820148	7232296	3797171	860091
sweden	333423	43663	19847	65269	412552	217924	35023	173117	91446
uk	2224044	291244	132384	636721	4024588	2125930	341662	1688814	892092
Total	13600245	4637620	3143769	55885939	51029546	17621361	20163093	22311365	7686095
PER TYPE	21381634			124536845			50160553		

Table 2-16: Installed stock of air conditioners in 2030, EU-27 in kW cooling

kW cooling	**Moveables**			**Reversible split units**			**Cooling only split units**		
	Residential	**Office**	**Retail**	**Residential**	**Office**	**Retail**	**Residential**	**Office**	**Retail**
austria	1375477	180122	81874	86025	499932	264082	0	0	0
belgium	1740061	227865	103575	1170180	6800468	3592249	0	0	0
bulgaria	2144681	1072341	1072341	3702158	7075155	1054510	0	0	0
cyprus	10647	0	560	1371300	292585	290815	0	0	0
czech republic	134957	121462	13496	59526	1491987	440816	0	0	0
denmark	894889	117188	53267	601807	3497384	1847442	0	0	0
estonia	232008	30382	13810	156024	906729	478966	0	0	0
finland	1169638	153167	69621	247230	1436771	758954	0	0	0

france	10175216	1332469	605668	6842768	39766547	21006102	0	0	0
germany	2263932	2037539	226393	331596	8101649	2642709	0	0	0
greece	147731	0	7775	19026789	4059623	4035059	0	0	0
hungary	46909	42219	4691	223756	5800301	1498013	0	0	0
ireland	926883	121378	55172	195918	1138574	601435	0	0	0
italy	13399825	6699913	6699913	75892931	39711865	11311398	0	0	0
latvia	381156	49913	22688	256325	1489626	786874	0	0	0
lithuania	563448	73785	33539	378915	2202056	1163204	0	0	0
luxembourg	82860	10851	4932	55723	323832	171059	0	0	0
malta	111412	55706	55706	192320	367541	54780	0	0	0
netherlands	2717810	355904	161774	1827710	10621684	5610750	0	0	0
poland	118448	15511	7050	280407	1496789	907398	0	0	0
portugal	38	0	1463	817944	4548210	1293330	0	0	0
romania	6016248	3008124	3008124	10385273	19847187	2958107	0	0	0
slovakia	1504062	752031	752031	2596318	4961797	739527	0	0	0
slovenia	557060	278530	278530	961599	1837703	273899	0	0	0
spain	31372	0	0	77766366	34343195	7779024	0	0	0
sweden	2008247	262985	119539	424490	2466909	1303109	0	0	0
uk	13395669	1754195	797361	4141048	24065583	12712295	0	0	0
Total	62150688	18753577	14250892	209992447	229151680	85575906	0	0	0
PER TYPE	95155157			524720033			0		

The following charts show how sales and the installed stock of air conditioning units are expected to increase.

Figure 2-24: Sales of air conditioning units by type – 2005 - 2030 – EU 27, nb of units

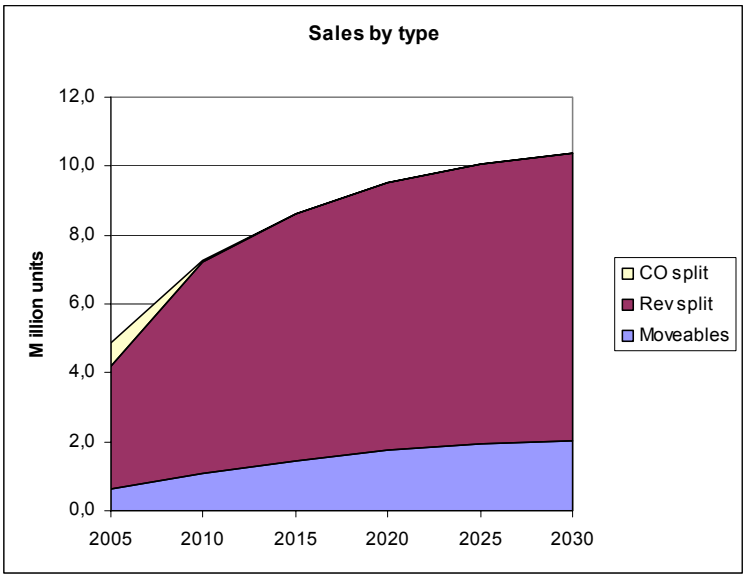


Figure 2-25: Sales of air conditioning units by country – 2005 - 2030 – EU 27, nb of units

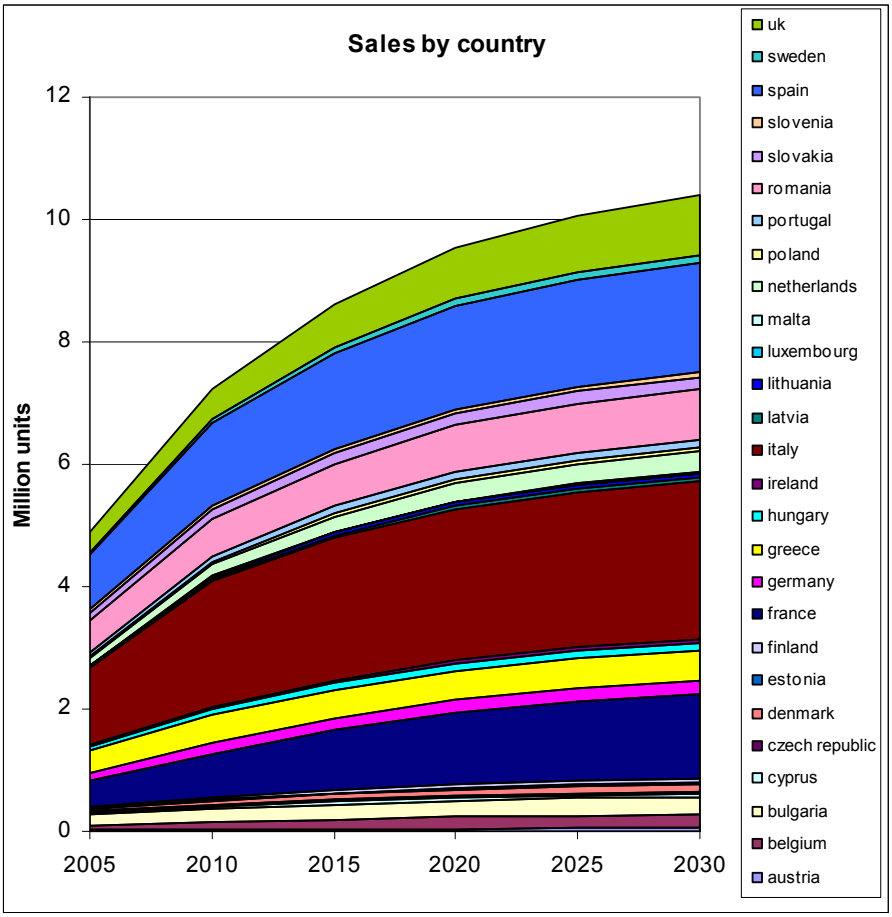


Figure 2-26: Sales of air conditioning units by sector – 2005 - 2030 – EU 27, nb of units

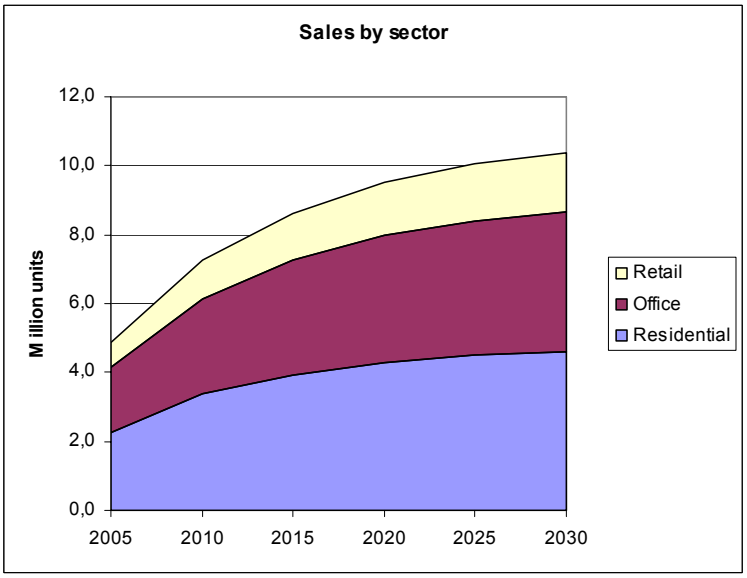


Figure 2-27: Stock of air conditioning units by type – 2005 - 2030 – EU 27, nb of units

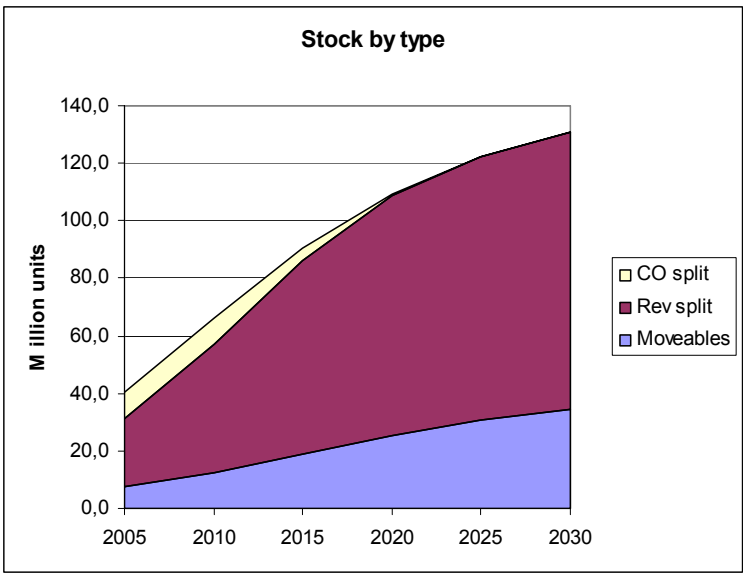


Figure 2-28: Stock of air conditioning units by country – 2005 - 2030 – EU 27, nb of units

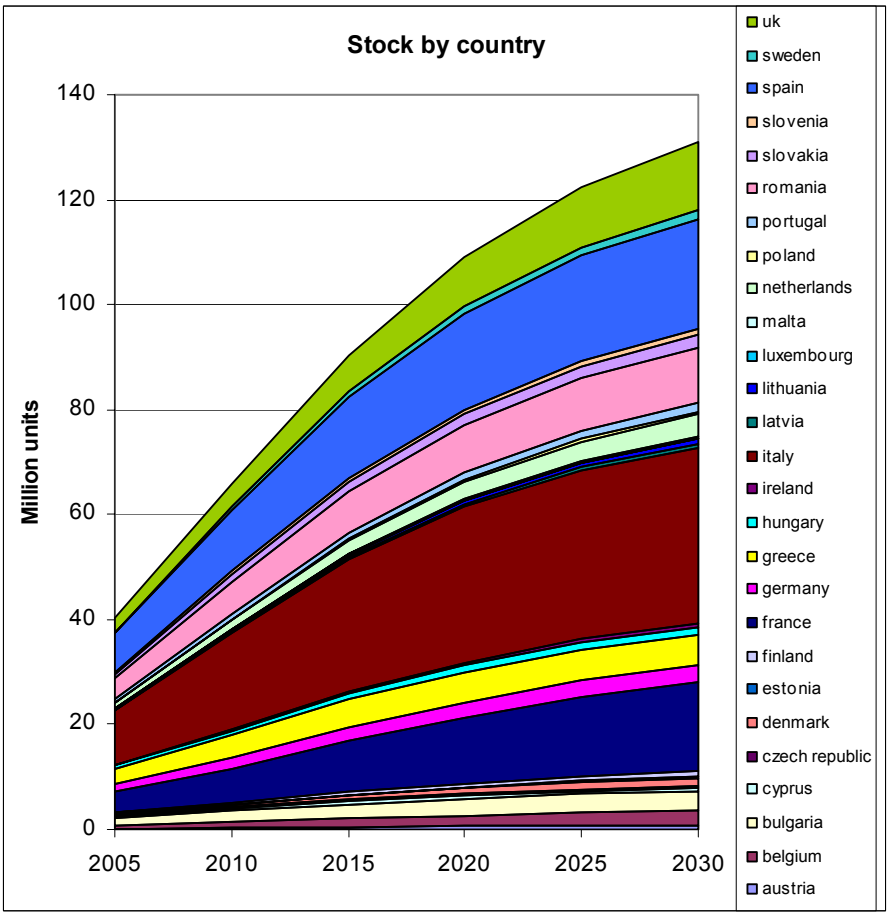


Figure 2-29: Stock of air conditioning units by sector – 2005 - 2030 – EU 27, nb of units

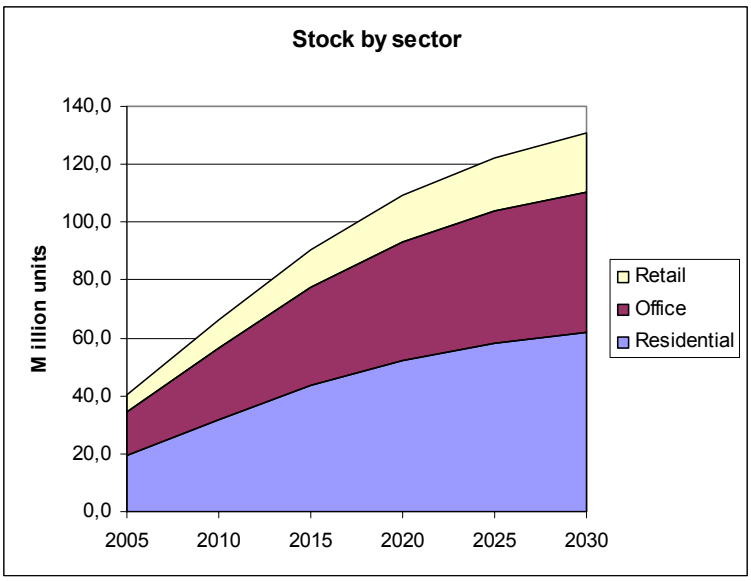


Figure 2-30: Sales of air conditioning in GW (cooling capacity) by type – 2005 - 2030 – EU 27

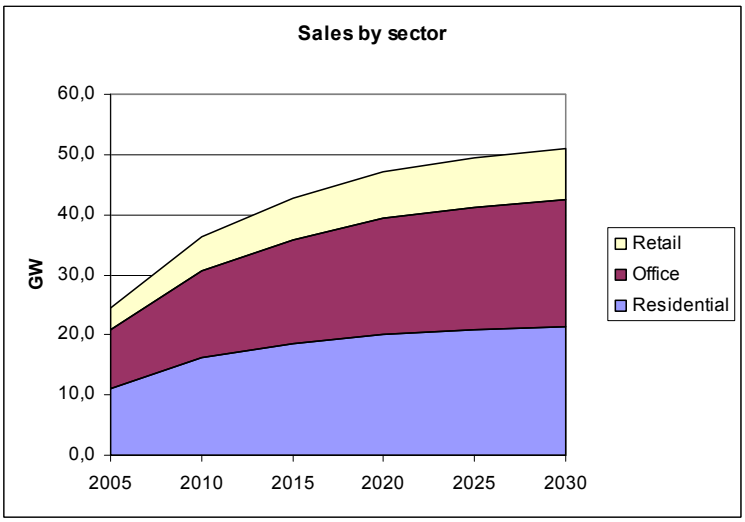


Figure 2-31: Sales of air conditioning in GW (cooling capacity) by country – 2005 - 2030 – EU 27

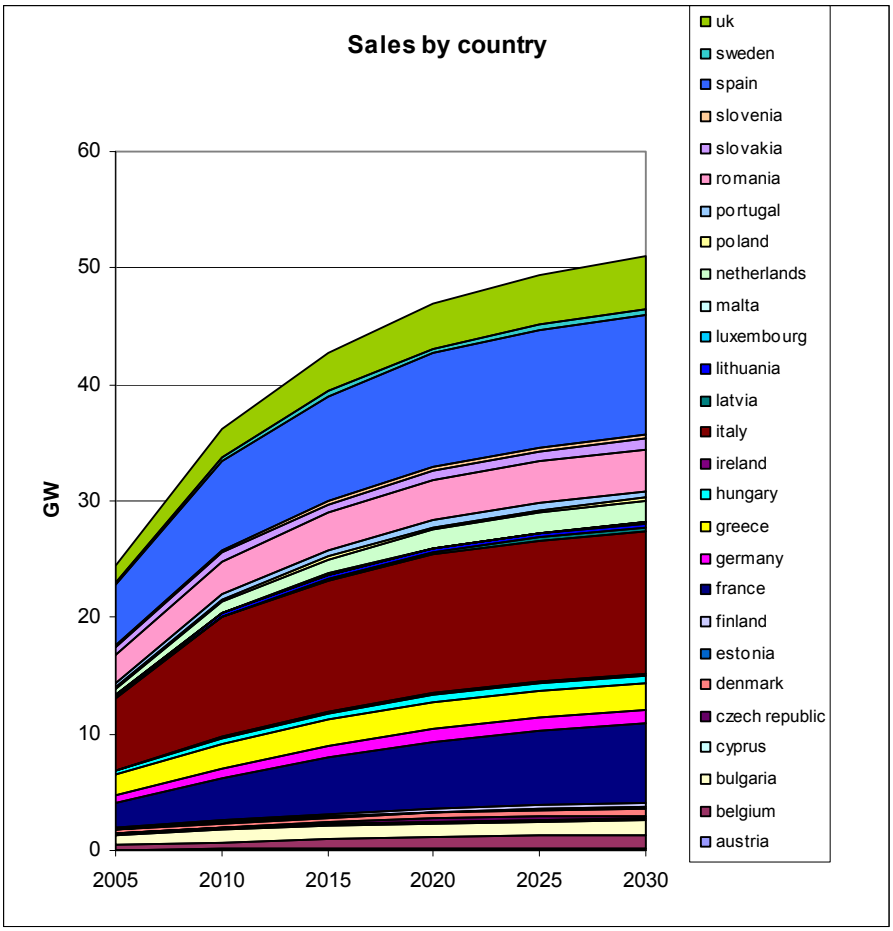


Figure 2-32: Sales of air conditioning in GW (cooling capacity) by sector – 2005 - 2030 – EU 27

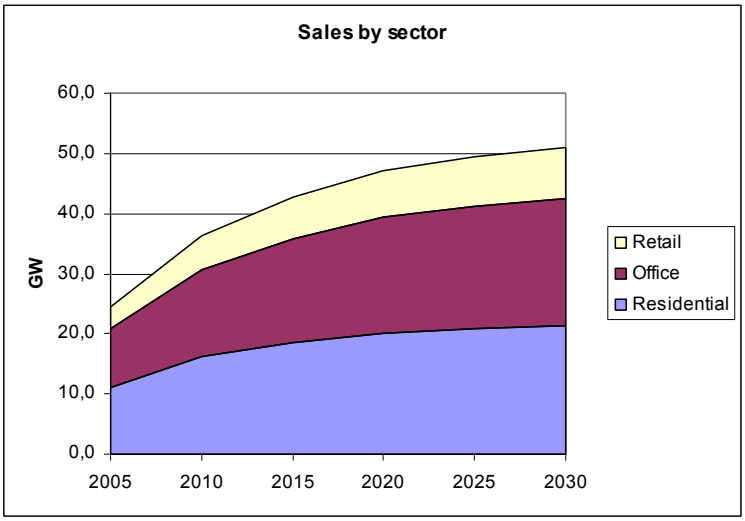


Figure 2-33: Stock of air conditioning in KW by type – 2005 - 2030 – EU 27

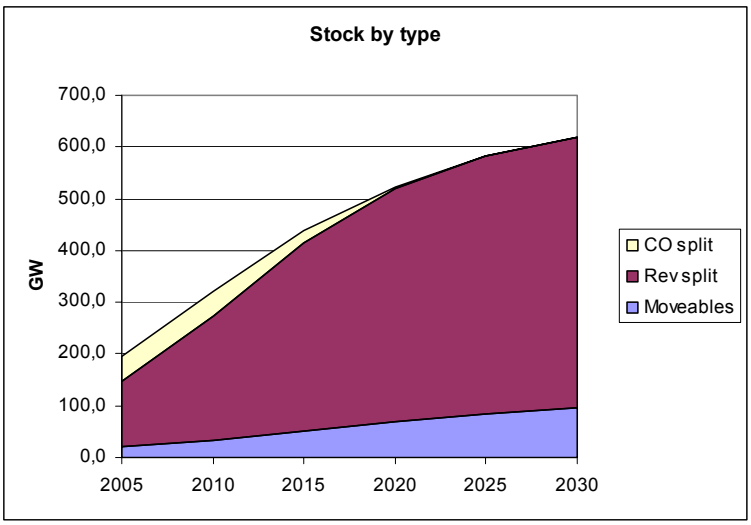

Stock by type
700,0
600,0
500,0
400,0
300,0
200,0
100,0
0,0
GW
2005
2010
2015
2020
2025
2030
CO split
Rev split
Moveables

Figure 2-34: Stock of air conditioning in GW (cooling capacity) by country – 2005 - 2030 – EU 27

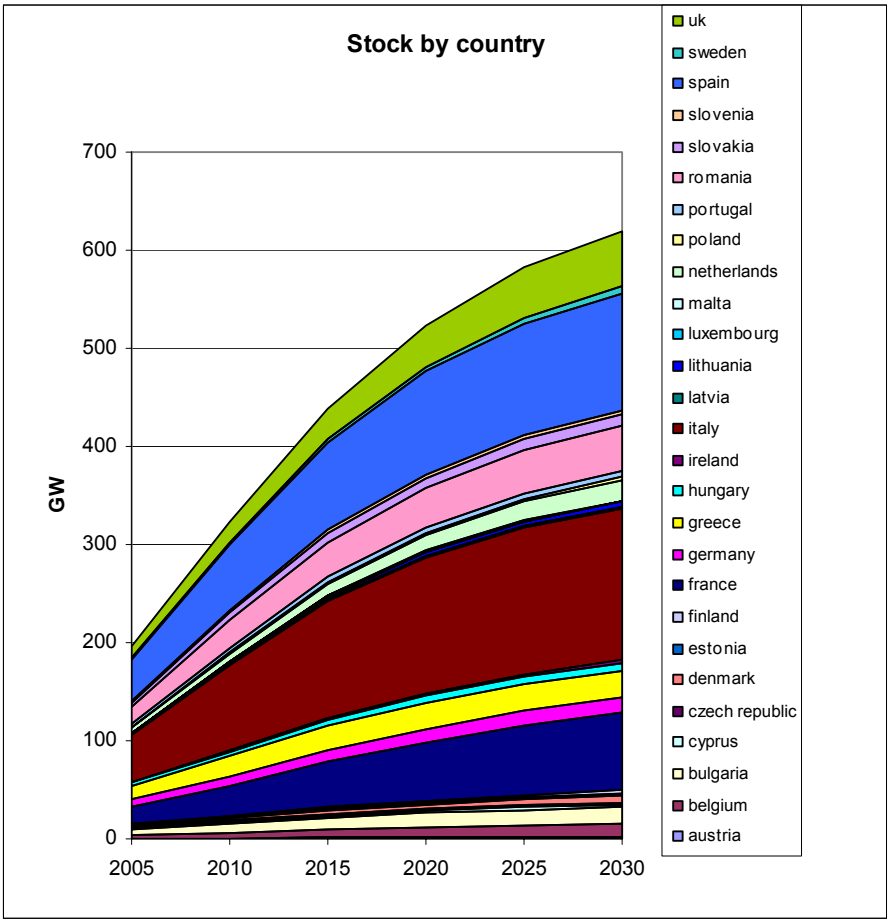
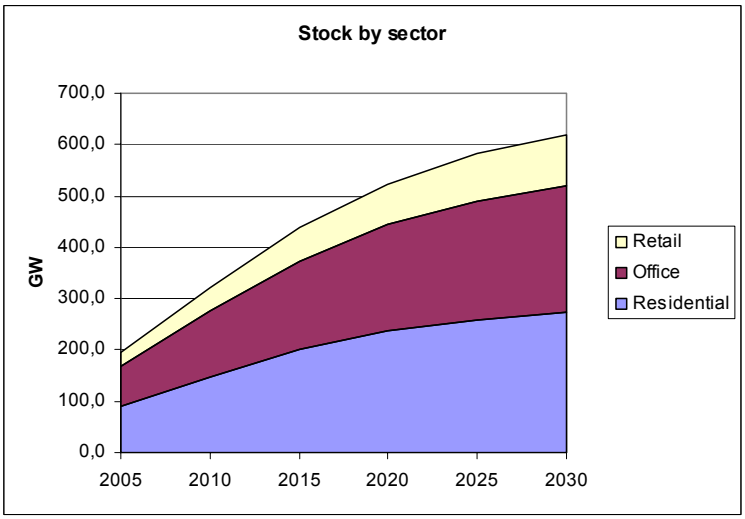


Figure 2-35: Stock of air conditioning in GW (cooling capacity) by sector – 2005 - 2030 – EU 27



2.3 Market trends

Air conditioners are often an impulse purchase. Most of the consumers think about buying an air conditioner when they face sudden heat waves. As a result, sales vary widely along the year, by geographical area and by year based on climate. Furthermore, as seen before, there is an increasing proportion of directly purchased air conditioners like single ducts and mobile splits that only need to be plugged in and can operate immediately. On the contrary, fix split require an installation that has to be performed by a professional installer and as a result cannot operate directly after the purchase. The latest category does not correspond to impulse purchase. However, effects of heat waves can be even seen on the purchase of fix units.

2.3.1 Latest consumer tests

Since the EERAC study (Adnot, 1999), no survey focused especially on air conditioners have been led (to our knowledge) in Europe. It is rather doubtful that those results, ageing 10 years already, may fully apply now. In more advanced markets, as for instance in Japan, surveys have shown that air conditioner end users looked for more comfort and more energy efficiency. But here again, results of this survey are thought not to reflect the nowadays European market.
The only related study identified was led by the Market Transformation Program about tolerances (MTPROG, 2005). This enquiry was concerned by the value of the labelling accuracy to the end-users in UK.

A market research survey was commissioned by the Market Transformation Programme (MTP) in early 2005 asking general and specific questions about energy labels on white goods. A summary of the key results is given below:
(i) ***53%*** *(1021) had seen the label before on new appliances,* ***39%*** *(756) had not. The remainder could not remember.*
(ii) Those who had seen the label before were asked How important has this label been to you in the past when choosing a new appliance?
Results: Important (net) ***71%***
Not important (net) ***27%***
Don't know ***2%***
(iii) All interviewees (1915) were asked How accurate do you think the label is?
Results: Accurate (net) ***60%***
Not accurate (net) ***6%***
Don't know ***34%***
(iv) All interviewees (1915) were asked How much would it matter if an appliance rated, say, A, could perform as a B appliance under certain conditions, or the other way round?

Results: "I want my appliance to do what it says on the label" ***40%***
"Provided it gives me a rough guide between high and low efficiency models it doesn't matter that much" ***21%***
"Neither, I'm not that bothered" ***40%***

(v) The 695 interviewees (36% of the 1915) who said they would take more notice of a label when buying a new appliance where asked why they said that; the answers they gave were unprompted. Interestingly, whilst ***10%*** *identified saving energy as a reason, far more (****93%****) identified cutting bills/cheaper to run as a reason.*
Overall, it is difficult to draw clear conclusions as to whether consumers are concerned about the accuracy of energy label declarations. Whilst the results of (iv) suggest that 61% of all interviewees are not particularly concerned this needs to be judged in the context that only 53% of the interviewees had seen the label previously. Implicitly, the 36% who were likely to take more notice of the label were concerned about accuracy since 93% of them spontaneously identified that the label declaration was related to them being able to save money.
One clear conclusion that can be drawn is that despite being in existence for almost 10 years, the energy label has yet to be recognised by almost half the adult population of Great Britain.

Two market control actions were undertaken in Italy and Spain by manufacturer associations. Information supplied by (CECED, 2007) is presented hereafter.
In Italy, (UNC, 2006), reports the test of 3 single ducts and 2 split units amongst the cheapest models with no brand of direct importation that besides declared labels of A to C were ranked E or F when tested at the IMQ Clima test laboratory in Italy. (CECED, 2007) reports that similar tests led in Spain for 15 popular cheap units with no brand exhibited a gap of 3 classes in labelling when comparing results between declared values and measured values.

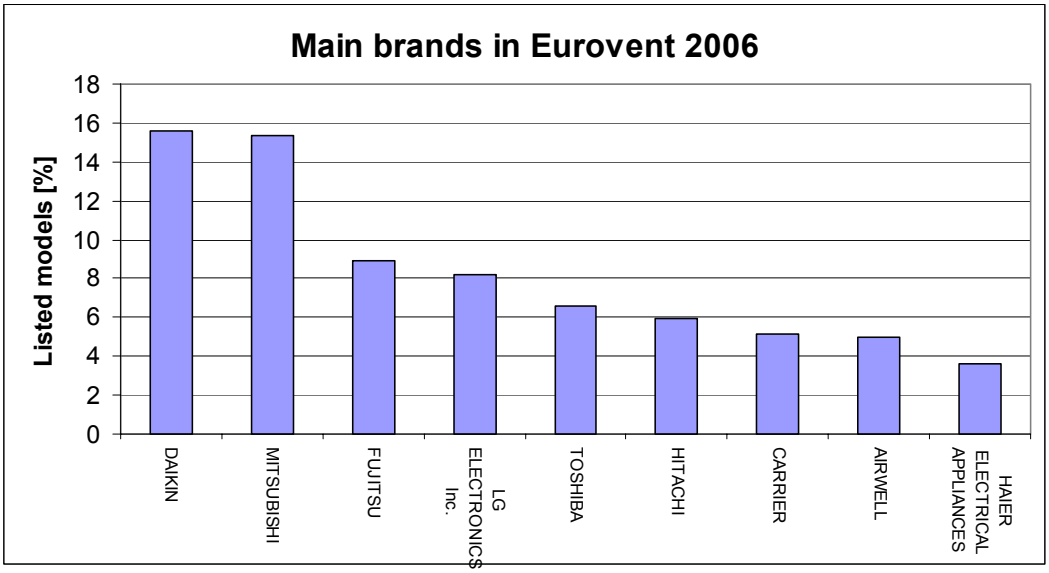
Similar assessment, whereas figures are not provided, have been reported in 2007 in the Which review.

2.3.2 Market and production structure and identification of the major players

Concerning market structure, most information was already supplied in previous paragraphs. Concerning production, most products are imported with only a small part, still to be defined, manufactured or more certainly assembled in Europe. This applies to all air conditioner categories except mini-chillers that are thought to be manufactured mainly in Europe.

The single and multi-split air conditioners' market is nowadays dominated by Asian brands. The five largest brands in the Eurovent directory– by number of models - are from Asia among which 4 from Japan: Mitsubishi (Japan), Daikin (Japan), LG Electronics (Korea), Hitachi (Japan), Toshiba (Japan). Of course the number of models do not correlate fully with the sales of different manufacturers and some as Fujitsu or Midea (not represented on the graph) may be underestimated.

Figure 2-36: Non moveable air conditioners brands (From Eurovent database in number of models)



To get a full picture by country of origin of the brands is not an easy task because brands may be subsidiary companies of international holdings. The attempt on the Eurovent catalogue would give the following synthetic table. The results are in good agreement with BSRIA market research information of 2005.

Japan	Korea	US	UE	Israel	China
60%	13%	10%	7%	6%	5%

- The dominant brands are Asian. Japanese and Korean brands are thought to represent more than 70 % of market sales of single and multi-split air conditioners.

Concerning moveable air conditioners, Italian brands used to supply the whole European market but cheaper Asian (mostly Chinese) products entered the market since 2003 -the year of the heat wave, through direct importation.

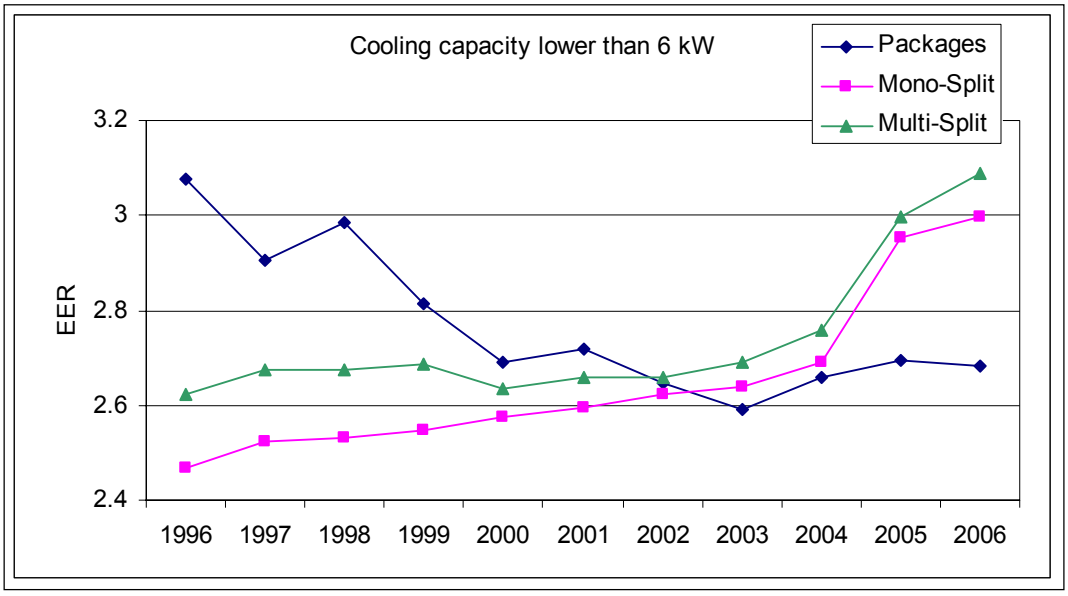
2.3.3 General trends in product-design and product-features

We are looking here in product design not as a complete technical description of products but rather marketing orientated. When designing new products, manufacturers cannot focus only on a single item but have to comply with several criteria to address end users' needs, often contradictory: for instance, increasing efficiency and reducing the indoor and / or outdoor noise. One important point is the multiplication of functions of air treatment, as already mentioned in task 1 draft report, air purifying, humidity control, even air change control for some products. The environmental impact of this tendency will be investigated in further tasks.
To illustrate main features for non moveable air conditioners, we report hereafter statistics issued from the Eurovent-Certification directory; it is not an exact representation of the market, but, as reported in Appendix D, its representativeness seems enough to highlight main product-design trends.
Similar level of information is lacking concerning moveable products and is still to be developed concerning mini-chillers.

Energy efficiency

Regarding the evolution of fix air conditioners in terms of energy efficiency ratio, it appears that packages are loosing efficiency when split units are more efficient with a noticeable increase in 2005, after the adoption of the voluntary scheme to remove G class air conditioners from the Eurovent certified products. For package and mono-split air conditioners, energy efficiency is slightly higher in the 0 – 6 kW capacity range. Above Eurovent-Certification commitment, no clear trend appears along the year concerning EER. At this point, it may be interesting to compare the graphs below to the evolution of the Japanese market residential air conditioners efficiency reported in Appendix C.

Figure 2-37: Non moveable air conditioners average EER by type, Eurovent-Certification, 2006



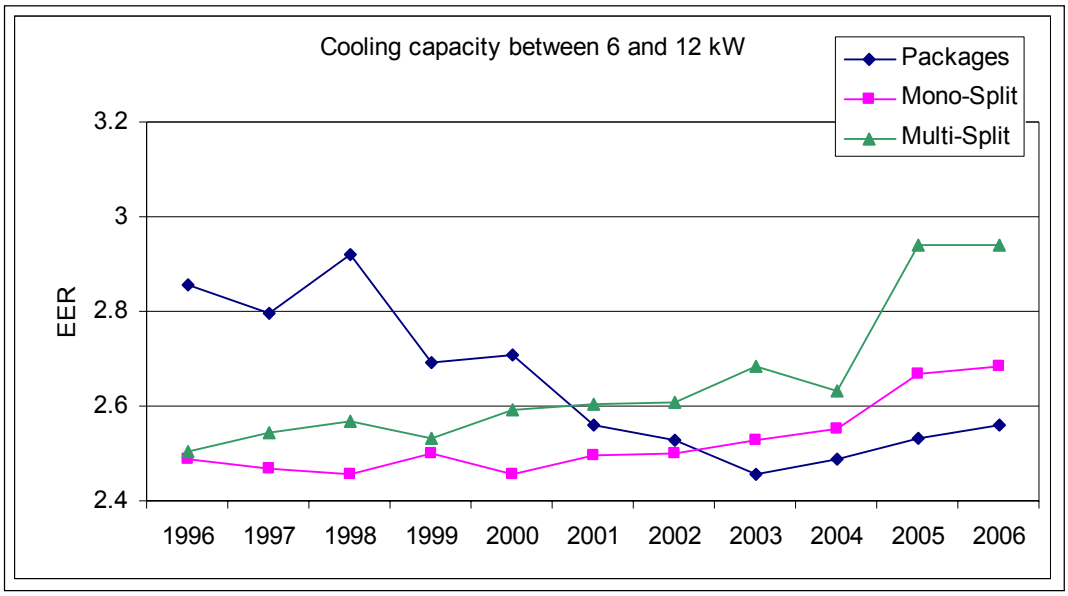
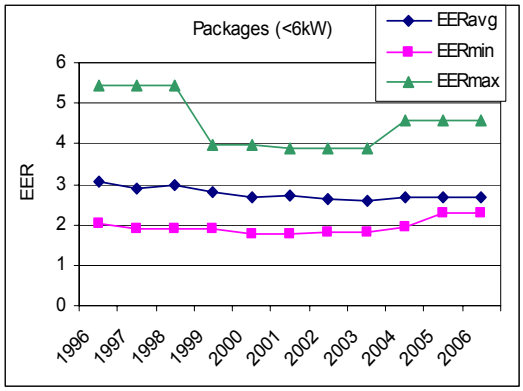
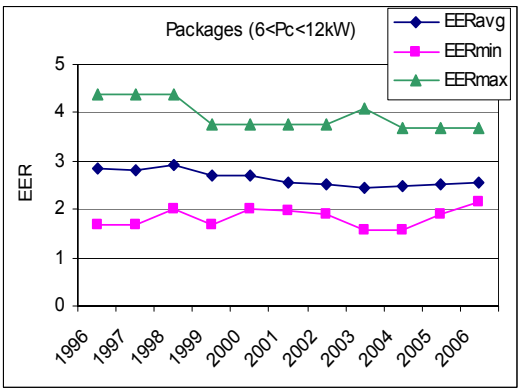
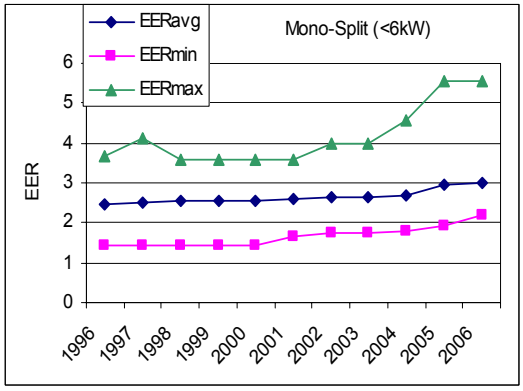
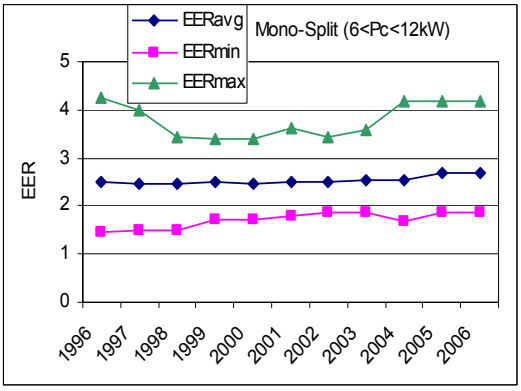


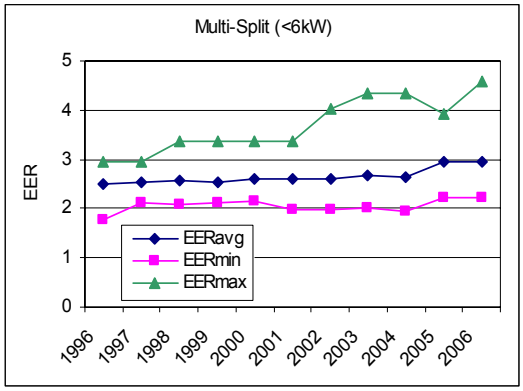
Figure 2-38: Non moveable air conditioners per type, min, max and average EER, Eurovent-Certification, 2006

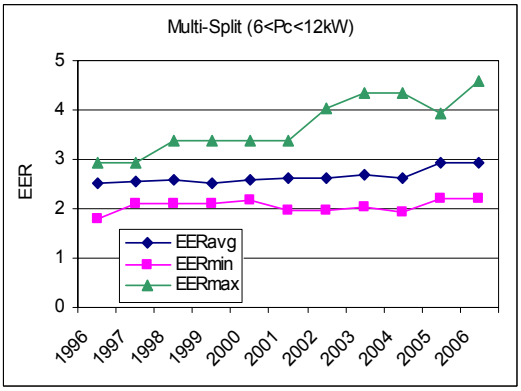






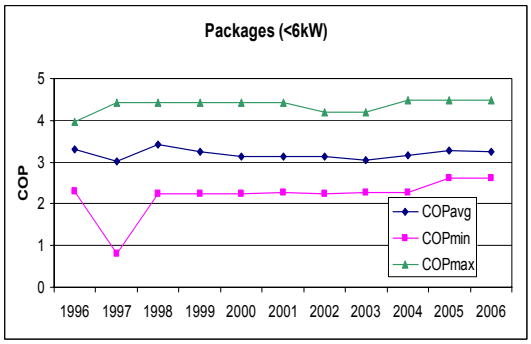


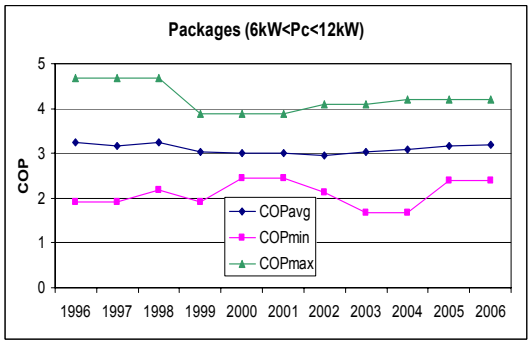


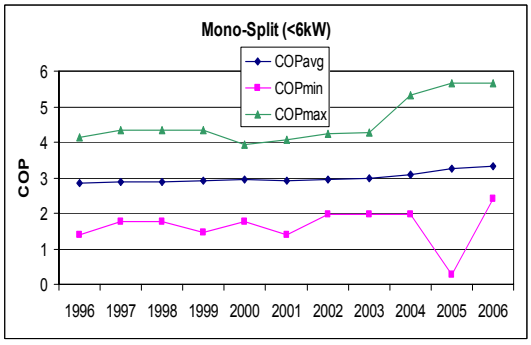


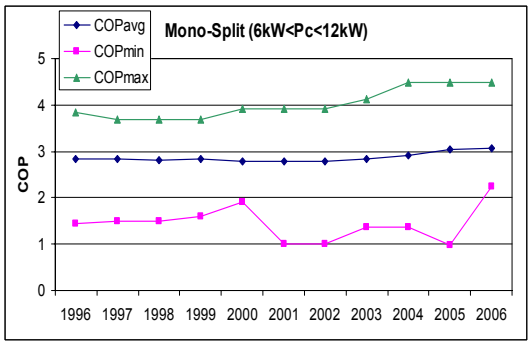
The parallel investigation gives similar results in terms of COP in the heating mode for reversible units.

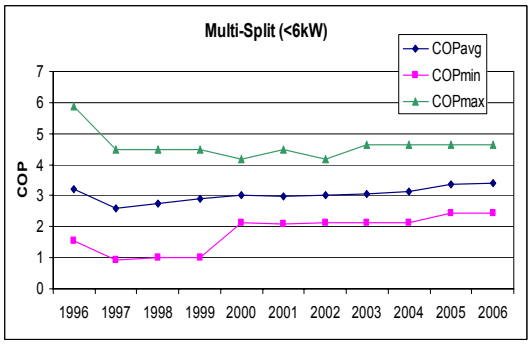
Figure 2-39: Non moveable air conditioners per type, min, max and average COP, Eurovent-Certification, 2006

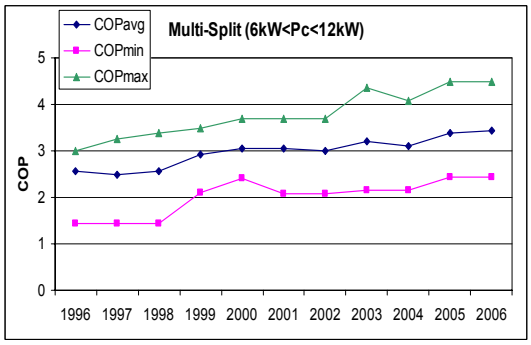








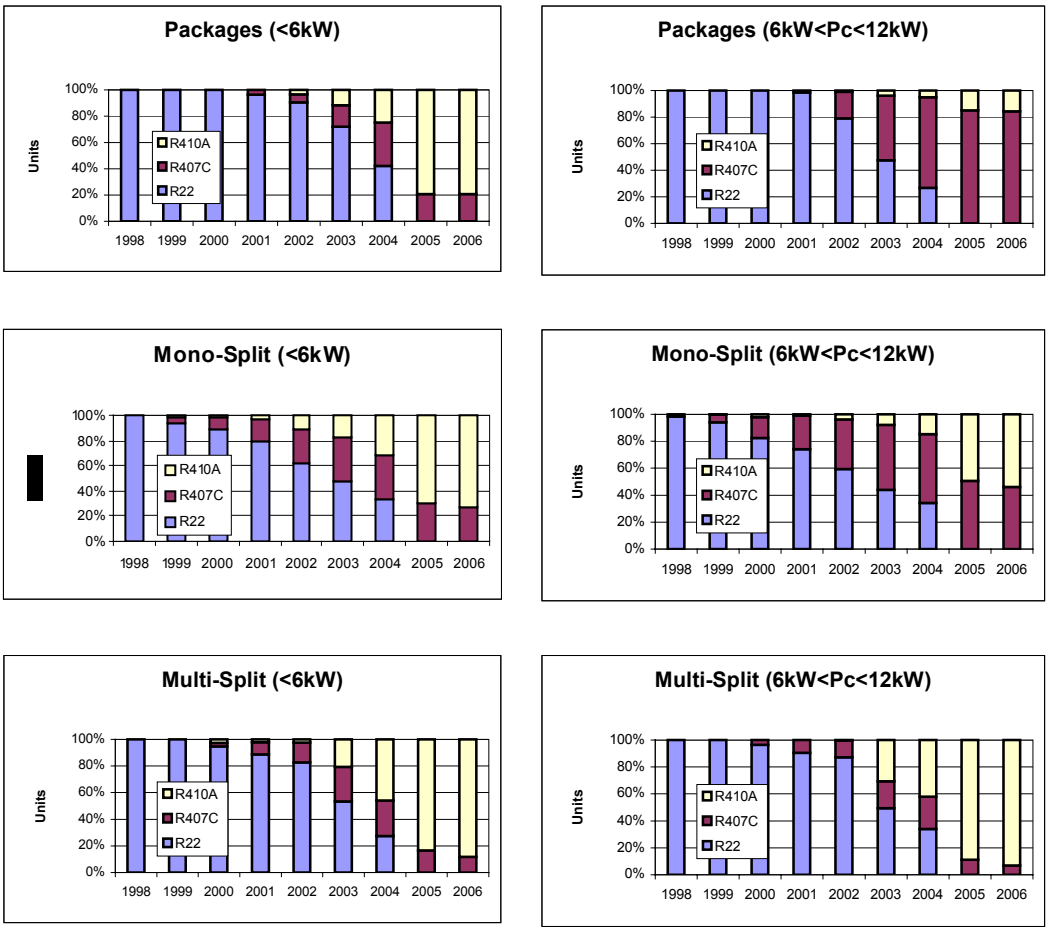




Refrigerant fluid

With the ban of HCFC refrigerant fluids, no air conditioner sold after 2004 uses R22. First R407C gradually replaced R22 and is now loosing market shares to the profit of another refrigerant mixture, R410A. R410A represents today more than 60 % of the market with significant differences according to different product types. It is to be noted that only Europe and Japan have made the complete transition from R22 to HFC refrigerant mixtures.
Manufacturers have marketed HFC refrigerant fluids as environmentally friendly for the atmospheric ozone layer for a few years now. With the increasing pressure on global warming, some manufacturers begin to develop small appliances (single duct) with propane. Nowadays safety legislation as it is presently prevents the penetration of propane to larger capacity products.

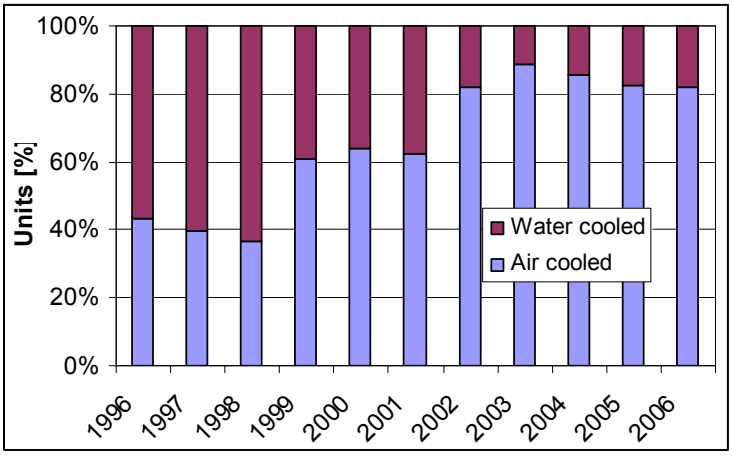
Figure 2-40: Non moveable air conditioners per refrigerant fluid type, in number of models, Eurovent-Certification, 2006



Condensation fluid

Another obvious trend is the decreasing part of water cooled units (water to air). The fact that they require either a water loop (difficult to implement) or imply important water consumption levels have seemed to work in their disfavor. Water cooled split and multi-split are absent of the market. Water cooled packages share are largely decreased as shown below. Remaining water cooled packages are thought to be mainly installed as parts of water loop heat pump central air conditioning systems, also called Californian water loop systems in the USA.

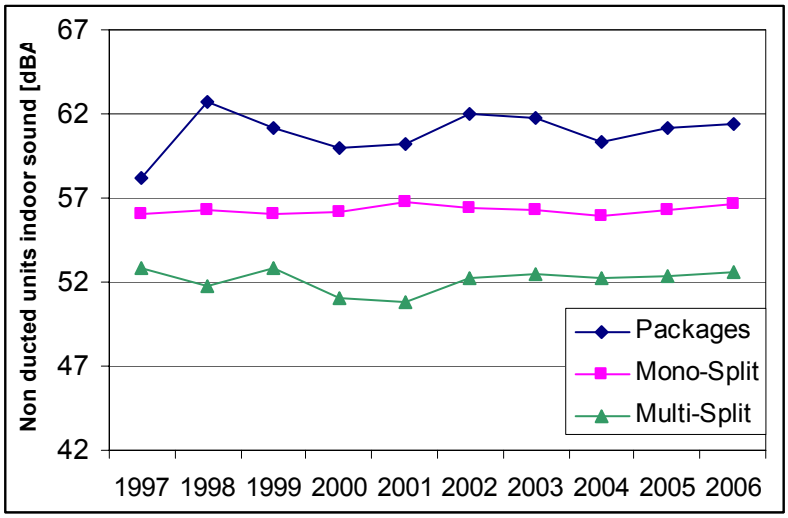
Figure 2-41: Non moveable air conditioners, share of water cooled and air cooled package air conditioners (Cooling capacity < 12 kW), in number of models, Eurovent-Certification, 2006



Noise

Noise is an important issue for end users and air conditioner manufacturers have triggered off important efforts to reduce it. It is an issue inside the building because it may limit the use of the air conditioner to living or working rooms and oppose to its use in bedrooms. Outside the building, noise is also an issue in a growing number of local legislation.
Efforts have not improved until now the performance of the whole market for non moveable air conditioners (as shown below). In fact, almost all programmable air conditioners do propose a silent mode operation (at reduced fan speed indoor) with lower fan speed but that is not the mode that is tested to determine the noise level for the labelling directive.

Figure 2-42: Non moveable air conditioners, average indoor noise level per type, Eurovent-Certification, 2006



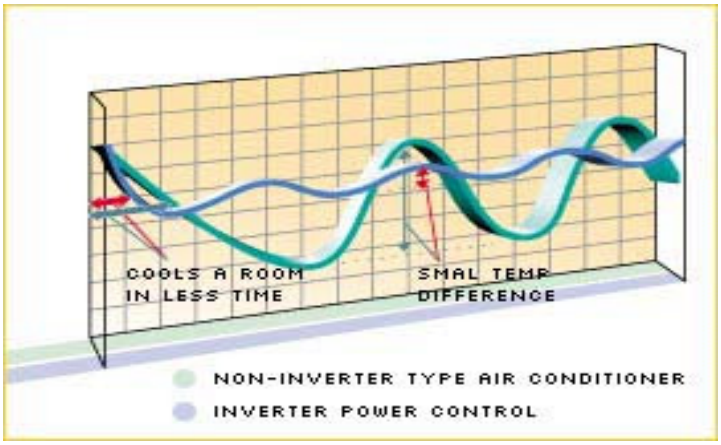
Concerning noise, the main difference is between units whose compressor is located inside the room (packages and moveables) and split units for which the compressor is located outside.
State-of-the-art models in terms of noise like the indoor units Haier HSU-09RU03 or Mitsubishi SRK20ZFX-S (Clim Pratique, 2006) that reach 20db inside in silent mode operation.

Inverter

The inverter technology is marketed as an improvement concerning three main points:
- thermal comfort, the temperature is maintained more precisely within a given temperature range around the set point,
- overcapacity at starting that enables to achieve comfort conditions more rapidly; when inverter is switched on, compressor operates at maximum speed so that room is cooled faster than with standard on-off compressor units; of course it is possible only if speed can be increased above the standard full load frequency (published rating for cooling capacity), which is generally the case;
- energy efficiency, because of larger heat exchange areas at low loads as compared to full load.

The first two points are generally summarised in a figure as the one below.

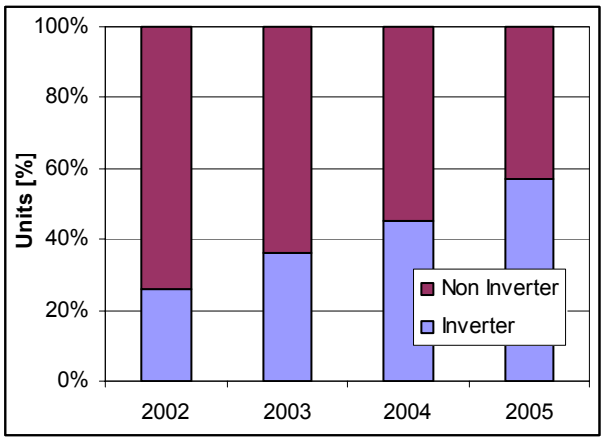
Figure 2-43: Marketing inverter comfort gains, example



Whereas energy efficiency of inverters is generally translated either by a figure of potential energy savings from 30 % to 70 % or also, several manufacturers present the capacity range that can be supplied thanks to the frequency range of the product, with associated cooling (heating) capacity and electric power.

The share of sales of split air and multi-split air conditioners over the whole sales has been increasing dramatically over the past few years. For instance, the figures below gives the share of inverter technology for the split and multi-split market in France. 2006 statistics show the trend has been maintained with 62 % of inverter driven units. This gives more than half of the split and about 80 % of multi-split units.

Figure 2-44: Increased shares of inverter technology in France for Multi and mono splits. [Clim-Info]



It is to be noted that there is no inverter driven product for moveable air conditioners and hardly a few for window/wall appliances. Hence, in order to struggle versus inverter advantages, manufacturers have worked on the concept of quick starting or fast cooling; overcapacity at starting can be obtained, even for on-off units either by allowing higher fan speed at start-up or for instance for single duct, by vaporising water on the condenser.

Comfort control

In terms of thermal comfort, manufacturers propose improvement like a precise temperature control within the range of 0.1°C, dehumidification and humidification, or comfortable airflow.

Increasing air quality is often promoted. A growing part of air conditioners are equipped with several layers of filters to clear and filter the air:

- static air filters
- active carbon filters

Air-plasma purifiers are advertised to remove nasty smells, particles of dust, cigarette smoke, miniature particles of dust, pollens, spores of must, bacteria and microbes up to 0.01 micron size.
Some manufacturers also propose to supply rooms with fresh and natural oxygen (Coolwex). An external unit of the air conditioner supplies the air and sends it through a special membrane which lets through mainly oxygen molecules and prevents the filth, bacteria and other harmful particles to enter the room. It raises the oxygen level to 32 % (coolwex).
New air conditioners not only aim at improving thermal comfort but also at improving comfort in a more comprehensive way (general well-being). New appliances appear like ideal (or “essential”) for people who suffer from respiratory diseases and allergies.

Aesthetical design

There is a trend to apply colour and luxury finishing to the product. Manufacturers aim at making room air conditioners a real piece of furniture for interior. Innovative design: elegant and stylish design with rounded angles. They fit to any interior. The frame colour can be chosen by the buyer.

2.4 Consumer expenditure base data

2.4.1 Overview

This section provides data on expenditure on room air conditioners in each of the EU Member States. Three types of expenditure are considered:

- initial installation costs,
- running costs and
- disposal costs.

Where initial installation costs comprise the purchase price and installation costs, running costs include electricity consumption, and repair and maintenance costs, whilst disposal costs include disposal taxes and tariffs.

Additionally information on the interest and inflation rates in the EU Member States are also presented.

2.4.2 Product and Installation costs

Average product prices per kW installed capacity for both moveable and split systems from market research reports are have been obtained for a number of EU Member States. Shown below. These countries are believed to account for around 80 % of the current market for room air conditioners. In instances where no direct product price data has been made available product prices will be estimated based on their proximity to countries for which we do know the price. The estimated weighted average price is 177 Euro/kW for moveables and 195 Euro/kW for split systems.

Table 2-8: Product price data for seven EU member states, in euro / kW and euro / unit

Cost	Product type	Greece	France	Spain	Italy	Germany	Portugal	UK	Czech	Hungary	Poland
Euro per unit	Movables	872	545	484	471	566	695	382	335	596	335
	Single-split	493	1030	652	712	1216	847	449	570	600	530
Euro/kW	Movables	323	202	179	174	210	258	141	124	221	124
	Single-split	141	294	186	204	347	242	128	163	171	151

Data on product price by system type and country are also provided in the figure below.

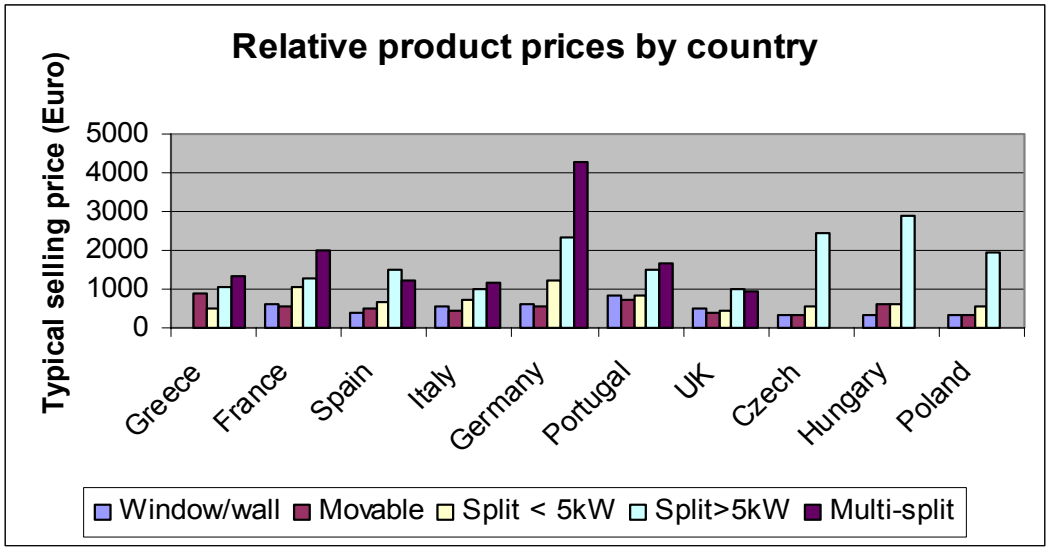
These prices refer to the price of the whole system, recorded at the first point of distribution. They therefore represent manufacturers selling prices (including discounts from list prices) including ancillaries, such as controls, where applicable.

The prices for moveable room air conditioners include both monobloc “portable” units and DIY split systems. From information provided by CECED for Italy, and from inspection of price lists in the UK, we estimate that the price per kW of monobloc units is about 80% of the value for moveables in the table, and the price per kW of DIY mobile splits around 150% of the tabulated value for moveables.

Direct comparisons between countries need to be made with caution because the same category may not refer to identical products in each country. For example, the low price of small split systems in Greece could reflect smaller than average systems, low-cost (and perhaps lower performance) equipment, differences in discounting to meet market conditions, different distribution costs or lower taxation. Similarly, the high cost of moveables in Greece (or of multi-split systems in Germany) may result from equivalent market differences.

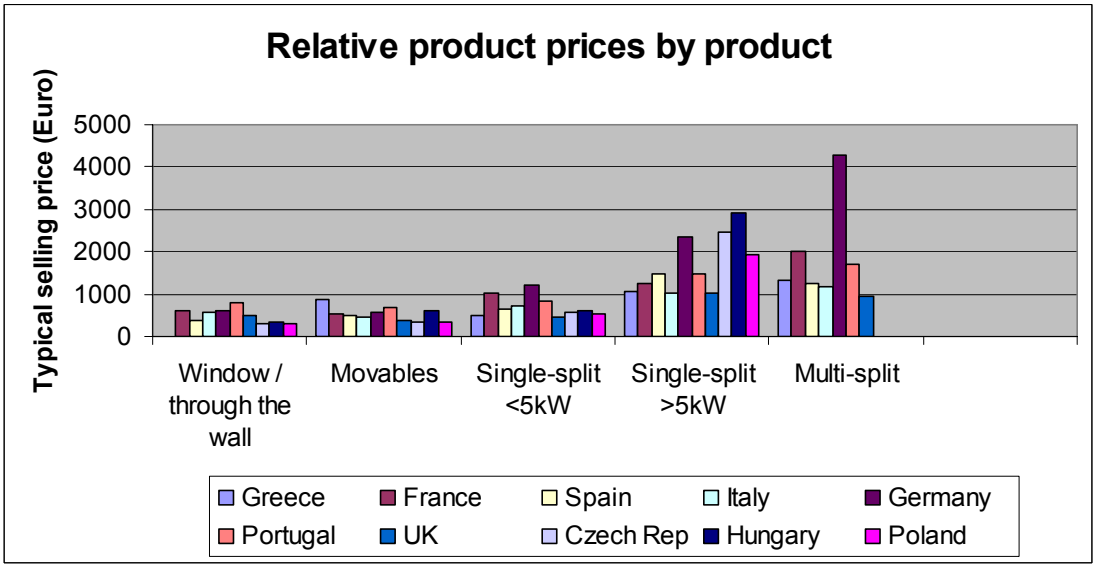
What is clear is that there are differences, sometimes substantial. Broadly speaking, German prices are higher than average and Italian and UK ones lower. In the Czech Republic, Hungary and Poland prices of larger split systems appear to be relatively high, but form only a small part of the market – other products are relatively inexpensive.

Figure 2-45: Product price data for ten EU member states (<12kW)



- There are significant price differences between countries

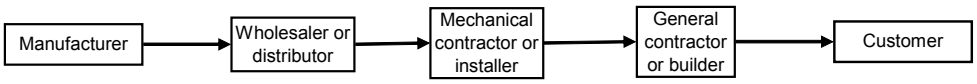
Figure 2-46: Relative product prices by product in ten EU member states



- Price differences are most marked for split systems

Price to the customer will be affected by the distribution chain and the mark-ups at each stage.

The full distribution chain is illustrated below

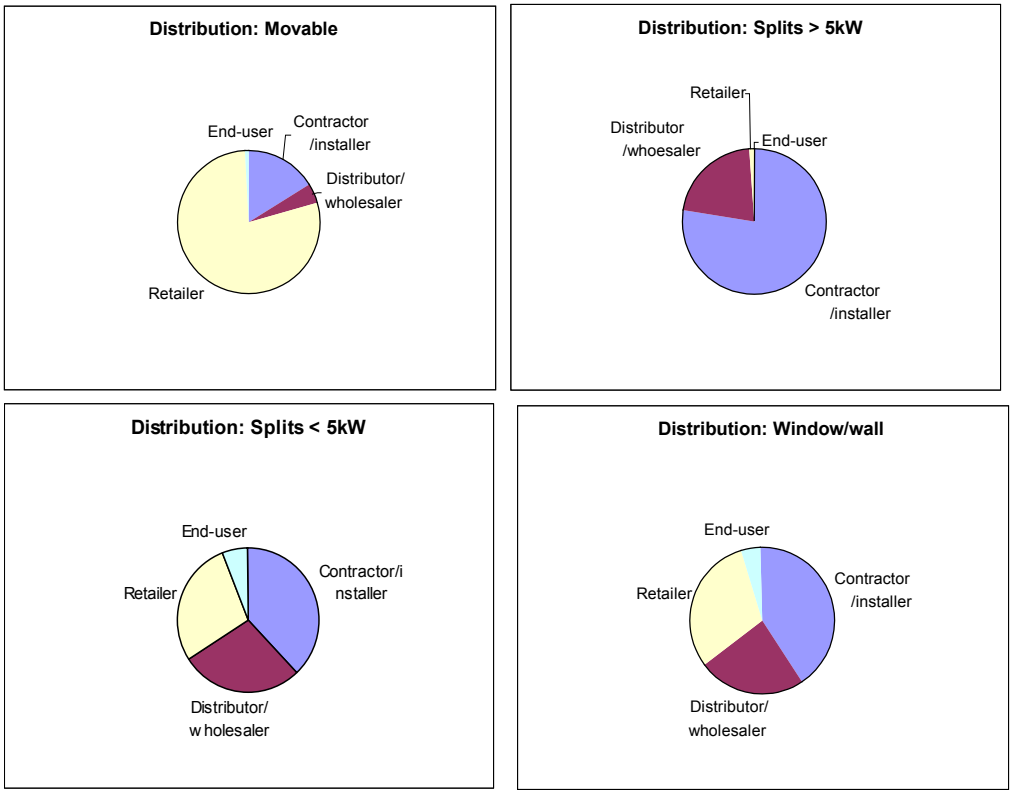


However, not all links in the chain may be present and, typically, the same product will be sold through parallel chains of differing length. For example, some manufacturers sell directly to installers, and installation in existing buildings will often not involve a general contractor.

Omitting some links in the supply chain should reduce costs to the extent that they remove multiple handling of equipment. However, where different supply chain routes exist in parallel, the mark-up of the remaining links may be increased to offset additional services supplied..

The figures below show the proportions of sales reported to be through the main types of distribution route

Figure 2-47: Distribution routes by type of air conditioners (in number of units), EU 27 All products in study scope (<12kW)



Moveable units are overwhelmingly sold through retailers, larger splits via contractors and installers and other types of system by a mixture of contractors, installers, retailers and wholesalers. Only a small proportion of systems are sold directly to end-users. It is not easy to define the term “end-user” – in the non-residential market it could refer to companies with in-house technical staff: for the residential sector, it presumably has a more literal meaning.

The importance of different distribution routes varies between countries. In Germany and the UK, a relatively high proportion of sales are made through intermediaries: contractors, installers, wholesalers or distributors. This probably reflects the predominantly non-residential nature of these markets (although German prices tend to be above average and UK ones below). On the other hand, Germany has a relatively high proportion of sales of moveables directly to end-users. Portugal also has relatively high use of contractors and installers as a distribution route. France has a broadly similar structure, though with more use of distributors and wholesalers for split systems. In Spain and Greece, on the other hand, retailers play a much more important role, including the distribution of smaller split systems.

Most moveable room air conditioners are sold directly to the customer and we have taken the manufacturers’ selling price to be the price to the customer.

There is little published information on distribution chain mark-ups, especially for existing buildings. Values (excluding taxes) based on US experience[1] [2] are shown in the table below:

Indicative US mark-ups on manufacturers' prices		
Distribution Route	**Commercial**	**Residential**
Installer only	1.53	1.53
Wholesaler and installer	2.08	2.08
Installer and builder	1.90	2.19
Wholesaler, installer and builder	2.58	2.97

Limited information from the UK [3] suggests that installation costs for split systems in new buildings are of the order of 1000 to 1100 Euro per unit.

2.4.3 Running costs

Electricity prices provide a key element of the running costs for room air conditioners. Previous studies (Adnot, 1999), (Adnot, 2003), had adopted a marginal approach: installation of an air conditioner does not change the tariff in average for small units and then electricity cost only includes the electricity price and not tariff costs. In reality, air conditioners have a part in the power subscription, lower than ovens but higher than lighting. The common approach to EuP studies is to use average electricity costs including tariff costs, with or without taxes depending on the type of end-user (residential commercial ..) and different types of subscription (typical consumption and power kW installed as computed by Eurostat). We will then adopt this common hypothesis.

With the range of cooling capacity 0 – 12 kW, both residential and tertiary air conditioners are targeted. Prices are presented in the two tables below.

Table 2-9: Electricity prices data in the EU in the residential area, in euro (taxes included), (Eurostat, 2007)

	Households - Dc (Annual consumption: 3 500 kWh of which night 1 300)			**Households - Dd (Annual consumption :7 500 kWh of which night 2 500)**			**Households - De (Annual consumption: 20 000 kWh of which night 15 000)**		
	2005s01	**2006s01**	**2007s01**	**2005s01**	**2006s01**	**2007s01**	**2005s01**	**2006s01**	**2007s01**
eu27	**0.1336**	**0.1397**	**0.1528**	**0.1267**	**0.1328**	**0.1451**	**0.0969**	**0.1022**	**0.114**
be	0.1481	0.1442	0.1581	0.1381	0.1378	0.1486	0.1011	0.0922	0.1143
bg	0.0644	0.066	0.066	0.068	0.069	0.0675	0.0711	0.0721	0.069
cz	0.0868	0.0985	0.1067	0.0723	0.0787	0.0866	0.0535	0.0651	0.0711
dk	0.2278	0.2362	0.2579	0.2155	0.2231	0.2425	0.2094	0.2165	0.2348
de	0.1785	0.1832	0.1949	0.1655	0.1696	0.1806	0.1026	0.1087	0.1245
ee	0.0678	0.0731	0.075	0.0658	0.0697	0.0725	0.0615	0.0651	0.0679
ie	0.1436	0.149	0.1662	0.1285	0.1346	0.1512	0.0867	0.0942	0.1067
gr	0.0688	0.0701	0.072	0.078	0.0811	0.0853	0.0594	0.0619	0.0652
es	0.1097	0.1147	0.1225	0.1007	0.1052	0.1131	0.0719	0.0752	0.084
fr	0.1194	0.1194	0.1211	0.1162	0.1162	0.1174	0.0959	0.0959	0.0969
it	0.197	0.2108	0.2329	0.1862	0.2	0.2197	:	:	:
cy	0.1074	0.1431	0.1376	0.1061	0.1417	0.1362	0.0729	0.1081	0.1029

[1] L Dale et al, An Analysis of Price Determination and Markups in the Air-Conditioning and Heating Equipment Industry, LBNL-52791, Lawrence Berkeley Laboratory, 2004

[2] G. Rosenquist et al, Consumer Life-cycle Cost Impacts of Energy-Efficiency Standards for Residential-type Central Air Conditioners and Heat Pumps, ASHRAE Transactions, AC-02-5-1, 2002

[3] SPON's Mechanical and Electrical Services Price Book, 36th edition, Spon Press, 2005

lv	0.0828	0.0829	0.0688	0.0668	0.0668	0.0688	0.051	0.051	0.0567
lt	0.0718	0.0718	0.0776	0.0734	0.0734	0.0792	0.0536	0.0536	0.0594
lu	0.1478	0.1603	0.1684	0.1352	0.1461	0.1552	0.0932	0.1007	0.1058
hu	0.1064	0.1075	0.1222	0.1089	0.1112	0.1258	0.082	0.0844	0.0995
mt	0.0764	0.0949	0.0987	0.0954	0.1201	0.1252	0.1119	0.1417	0.1478
nl	0.1955	0.2087	0.218	0.1923	0.2054	0.223	0.1376	0.1555	0.17
at	0.1413	0.134	0.1545	0.1335	0.1278	0.1409	0.109	0.1065	0.113
pl	0.1064	0.119	0.1184	0.1043	0.1164	0.1159	0.0722	0.0808	0.0811
pt	0.1381	0.141	0.15	0.1228	0.126	0.133	0.0894	0.091	0.097
ro	0.0779	0.0943	0.1017	0.071	0.0919	0.0991	0.0642	0.0714	0.0771
si	0.1033	0.1049	0.1064	0.0924	0.094	0.0968	0.0724	0.0736	0.0764
sk	0.1338	0.1448	0.1537	0.1045	0.1104	0.1211	0.0791	0.0872	0.0941
fi	0.1057	0.1078	0.116	0.089	0.091	0.0993	0.0682	0.0712	0.0777
se	0.1397	0.1435	0.1714	0.1304	0.1323	0.1557	0.1195	0.1223	0.1423
uk	0.0877	0.102	0.1316	0.088	0.1031	0.1317	0.0571	0.0659	0.0865

Table 2-10: Electricity prices data in the EU in the industry, in euro (taxes included), (Eurostat, 2007)

	Industry - Ia (Annual consumption: 30 MWh; maximum demand: 30 kW; annual load: 1 000 hours)			**Industry - Ib (Annual consumption: 50 MWh; maximum demand: 50 kW; annual load: 1 000 hours)**			**Industry - Ic (Annual consumption: 160 MWh; maximum demand: 100 kW; annual load: 1 600 hours)**		
	2005s01	**2006s01**	**2007s01**	**2005s01**	**2006s01**	**2007s01**	**2005s01**	**2006s01**	**2007s01**
eu27	0.1373	0.1473	0.1552	0.1376	0.1449	0.1543	0.1167	0.1256	0.1345
be	0.152	0.153	0.1653	0.1462	0.1515	0.1619	0.1331	0.158	0.1565
bg	0.0588	0.0654	0.0675	0.0593	0.0649	0.067	0.0583	0.0649	0.0649
cz	0.099	0.1292	0.153	0.0934	0.1233	0.1336	0.0871	0.1177	0.1318
dk	0.1239	0.1305	0.1537	0.1187	0.1261	0.1537	0.1131	0.1199	0.1472
de	0.207	0.218	0.212	0.19	0.2018	0.2022	0.1509	0.1629	0.1706
ee	0.0667	0.0721	0.0733	0.0631	0.0681	0.0693	0.0621	0.0641	0.0665
ie	0.1815	0.1839	0.1992	0.1791	0.1813	0.1965	0.1497	0.1537	0.2062
gr	0.1028	0.1074	0.1122	0.1024	0.1069	0.1117	0.0945	0.0988	0.1032
es	0.1266	0.1323	0.1387	0.1266	0.1323	0.1387	0.099	0.104	0.1164
fr	:	0.1121	0.1137	:	0.1093	0.111	:	0.1005	0.1021
it	0.1512	0.1648	0.1824	0.1557	0.1708	0.1927	0.1346	0.1482	0.1673
cy	0.2118	0.2512	0.1482	0.2101	0.2492	0.1478	0.1592	0.1978	0.1895
lv	0.0759	0.0759	0.0791	0.0757	0.0757	0.079	0.0541	0.0542	0.0597
lt	0.087	0.0896	0.1032	0.0884	0.0909	0.1028	0.077	0.077	0.0842
lu	:	:	:	:	:	:	:	:	:
hu	0.1345	0.1337	0.1436	0.1345	0.1337	0.1433	0.1318	0.1486	0.1622
mt	0.1064	0.1345	0.1476	0.1059	0.1341	0.1472	0.0798	0.1013	0.1112
nl	0.1773	0.1927	0.2133	0.1693	0.1858	0.2067	0.1441	0.1547	0.169
at	0.1497	0.1355	0.1647	0.1487	0.1358	0.1625	0.1327	0.1292	0.1423
pl	0.1052	0.1123	0.11	0.1184	0.1112	0.1084	0.1008	0.1082	0.1039
pt	0.1241	0.134	0.1421	0.1121	0.129	0.1355	0.0933	0.1072	0.1127
ro	0.1079	0.1156	0.1201	0.1833	0.1128	0.1178	0.1583	0.1137	0.1159
si	0.1268	0.1363	0.158	0.126	0.1358	0.158	0.0912	0.0923	0.112
sk	0.126	0.1576	0.1698	0.1141	0.1334	0.1476	0.1053	0.1179	0.1358
fi	0.0818	0.083	0.0822	0.0862	0.0872	0.0861	0.0836	0.0826	0.0817

se	0.0703	0.083	0.09	0.0682	0.0809	0.0881	0.0576	0.0696	0.0778
uk	0.093	0.1184	0.1435	0.1166	0.1322	0.1567	0.1008	0.1179	0.1271

These prices represent average costs to consumers. For **residential** area, average electricity price is to be represented by Dc or Dd rates for dwellings having an air conditioner, rather Dd whether it is reversible. The average electricity cost for 2006 is of **0.14 euro / kWh**.

For the tertiary sector, Lot 12 kept a 0.105 euro/kWh electricity rate. As air conditioners are more likely to be installed in **small tertiary**, we will keep the industry 1a rate, which is around **0.147 euro / kWh**. Lower prices in Eastern Europe translate lower purchase powers (values in PPS are available from Eurostat) than in Western Europe. When adjusted for purchasing powers, electricity price pass over the average EU 27 price.

We will keep an average price of **0.145 euro / kWh** for both sectors.

Recently, electricity price increased as high as 5 % yearly. However, a long term electricity price increase (computed between 1990 and 2005) of 1.5 % per year has been calculated in the Lot 1 report for electric heat pumps, and mainly translates the recent sharp increase.

Consumer energy tariffs have to balance simplicity of structure and consumer acceptance against true cost-reflectance. However, they may not truly reflect the fixed costs associated with distribution and transmission.

In many countries, the installation of cooling increases the peak demand on the electricity supply system. The capital cost of a new gas-fired CCGT plant is about € 650 per kW (DTI), (at an EER of 2.5, this is equivalent to about € 260 per kW of cooling power) which is not normally reflected explicitly in domestic electricity tariffs. However, there will be some diversity of demand. Also, in more northerly countries, peak electricity demand does not occur in the summer and in these countries (and, in principle, elsewhere if there is transmission capacity available) this cost will not be incurred. On the other hand, where the generation system is summer-peaking, there may be additional transmission and distribution costs in addition to the generation costs.

The other way round, the large development of heat pumps in replacement of boilers is likely to put pressure on electric utilities in winter.

Finally, for cooling only and reversible air conditioners, electricity subscription is likely to increase not only because of electricity price increase but also because of overcosts linked to peak power increase in summer and in winter.

We will keep the approach adopted by lot 1 to include a long term electricity price (low) increase of 1.5 % yearly. Over a product life of 12 years, this leads to an average electricity price of **0.158 euro/kWh**.

Individual values to be used by country are shown in the table hereunder.

Table 2-11: national electricity prices - first semester 2006 prices and 1.5 % long term increase, EU 27

Other running costs relate to **repair and maintenance** and including the cost of replacing refrigerant that has leaked from the system. According to prEN 15459:2006(E) annual preventative maintenance including operation, **repair and servicing costs for air conditioners are typically 4 % of the initial investment (including installation costs)**.

2.4.4 Disposal costs

For air conditioners included in the scope of application of the WEEE directive, a fee of 13 euros per unit is generally observed for air conditioners. This value cannot be considered as a disposal cost, nevertheless, it is paid by the end-user when buying the unit. Stakeholders[4] quoted the Netherlands' experience where this fee was suppressed because of the low return rate of air conditioners.

2.4.5 Economic Indicators

Following the MEEuP methodology, discount rate is to be calculated as the difference between interest rates and inflation rates. The MEEuP indicates an average discount rate of **2 %**. Maximum and minimum values in the different EU members in 2006 as indicated by Eurostat are respectively – 2.6 % and + 3.9 %. National values are reported in the table below.

[4] In the minute of the Second stakeholder meeting.

	Interest rate	Inflation rate	Discount rate
	Aver value 2006	Aver value 2006	Aver value 2006
Belgium	3.8%	2.3%	1.5%
Germany	3.8%	1.8%	2.0%
Greece	4.1%	3.3%	0.8%
Spain	3.8%	3.6%	0.2%
France	3.8%	1.9%	1.9%
Ireland	3.8%	2.7%	1.1%
Italy	4.1%	2.2%	1.9%
Luxembourg	3.9%	3.0%	0.9%
Netherlands	3.8%	1.7%	2.1%
Austria	3.8%	1.7%	2.1%
Portugal	3.9%	3.0%	0.9%
Finland	3.8%	1.3%	2.5%
Czech Republic	3.8%	2.1%	1.7%
Denmark	3.8%	1.9%	1.9%
Cyprus	4.1%	2.2%	1.9%
Latvia	4.0%	6.6%	-2.6%
Lithuania	4.0%	3.8%	0.2%
Hungary	7.2%	4.0%	3.2%
Malta	4.3%	2.6%	1.7%
Poland	5.2%	1.3%	3.9%
Slovakia	4.5%	4.3%	0.2%
Sweden	3.7%	1.5%	2.2%
United Kingdom	4.4%	2.0%	2.4%
Estonia	4.2%	4.4%	-0.2%
Slovenia	3.8%	2.5%	1.3%
Bulgaria	7.2%	7.4%	-0.2%
Romania	7.2%	6.6%	0.6%

Table 2-12: national yearly average discount rates (2006), EU 27

Conclusions

No detailed economic data on EU production, EU export, intra EU trade and export have been identified so far further to sales statistics. However, it is clear that a very important part of units sold on the EU market is produced in China. Also, for split and multi-split units, main brands on the European market are from Asia (Japan, Korea and China).

A very comprehensive market and stock representation is available now for major technical categories in the scope. It is proposed to exclude mini-chillers from the scope of the study based on the market sales figures identified. This technical segment is about 20 000 units a year in the whole Europe. Central air conditioners (ducted style) are mainly used in the commercial sector according to BSRIA market research data with about 20 000 units sold in the range of cooling capacities between 0 and 12 kW. Both systems could be included in a study to come dedicated to central air conditioning systems, mini-chillers being generally considered together with larger capacity chillers by manufacturers.

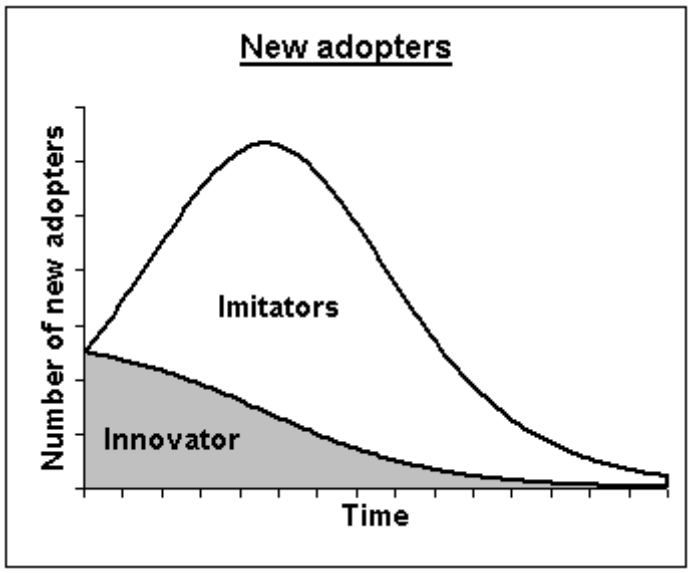
Market trends show the rapid development of the market towards reversibility and also the rapidly increasing share of inverters.

Consumer survey showed that tolerances and consequences on the EU labeling scheme was a matter of concern. Consumer survey also worries that cheap units imported with no brands advertise high energy classes while they have very low efficiency levels.

Product prices have been identified by category of products, including installation costs for fix units. Electricity rate of 0.158 euro / kWh will be used. Maintenance cost of 4 % is extracted from EN standard 15459. Discount rate is set to 2 % according to the MEEuP.

Appendix A - Bass diffusion model

Source of this appendix: Wikipedia page on the Bass model



The **Bass diffusion model** was developed by Frank Bass and describes the process how new products get adopted as an interaction between users and potential users. The model is widely used in forecasting, especially product forecasting and technology forecasting.

Frank Bass published his paper "A new product growth for model consumer durables" in 1969 [1] Prior to this, Everett Rogers published *Diffusion of Innovations*, a highly influential work that described the different stages of product adoption. Bass contributed some mathematical ideas to the concept. [2]

This model has been widely influential in marketing and management science. In 2004 it was selected as one of the ten most frequently cited papers in the 50-year history of *Management Science* [3]. It was ranked number five, and the only marketing paper in the list. It was subsequently reprinted in the December 2004 issue of Management Science.[3]

Model formulation

$$\frac{f(t)}{1-F(t)} = p + qF(t)$$

Where:

$f(t)$ is the rate of change of the installed base fraction
$F(t)$ is the installed base fraction
m is the ultimate market potential
p is the coefficient of innovation
q is the coefficient of imitation

Sales $S(t)$ is the rate of change of installed base (i.e. adoption) $f(t)$ multiplied by the ultimate market potential m:

$$S(t) = mf(t)$$

$$S(t) = m\frac{(p+q)^2}{p}\frac{e^{-(p+q)t}}{(1+\frac{q}{p}e^{-(p+q)t})^2}$$

The time of peak sales t^*

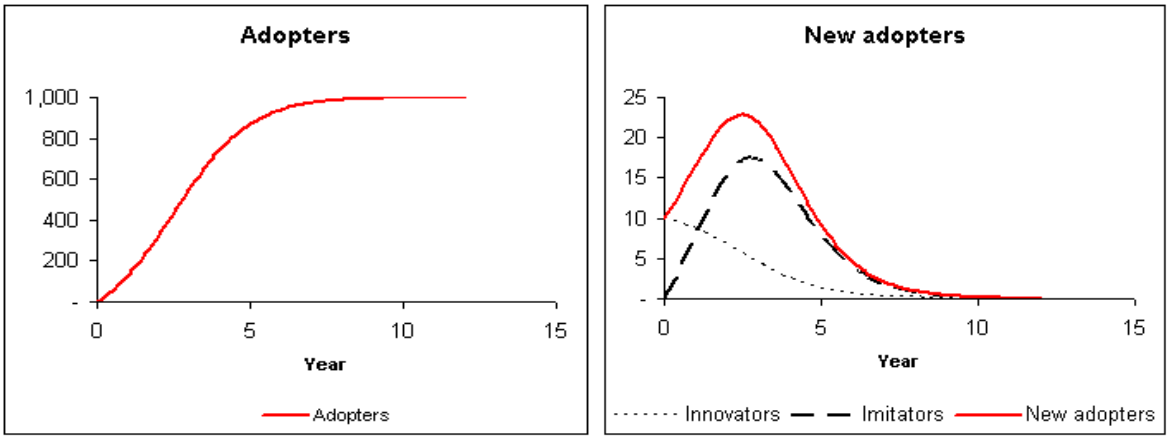
$$t^* = \frac{Ln\frac{q}{p}}{(p+q)}$$

Explanation

The coefficient p is called the coefficient of innovation, external influence or advertising effect. The coefficient q is called the coefficient of imitation, internal influence or word-of-mouth effect.

Typical values of p and q:

- The average value of *p* has been found to be 0.03, and is often less than 0.01
- The average value of *q* has been found to be 0.38, with a typical range between 0.3 and 0.5



Extensions to the model

Generalised Bass model (with pricing)

Bass found that his model fit the data for almost all product introductions, despite a wide range of managerial decision variable, e.g. pricing and advertising. This means that decision variable can shift the Bass curve in time, but that the shape of the curve is always similar.

Although many extensions of the model has been proposed, only one of these reduces to the Bass model under ordinary circumstances.. This model was developed in 1994 by Frank Bass, Trichy Krishnan and Dipak Jain:

$$\frac{f(t)}{1-F(t)} = (p+qF(t))x(t)$$

where $x(t)$ is a function of percentage change in price and other variables

Successive generations

Technology products succeed one another in generations. Norton and Bass extended the model in 1987 for sales of products with continuous repeat purchasing. The formulation for three generations is as follows:

$$S_{1,t} = F(t_1)m_1(1 - F(t_2))$$
$$S_{2,t} = F(t_2)(m_2 + F(t_1)m_1)(1 - F(t_3))$$
$$S_{3,t} = (m_3 + F(t_2))(m_2 + F(t_1)m_1)$$

where $m_i = a_i M_i$

M_i is the incremental number of ultimate adopters of the *i*th generation product
a_i is the average (continuous) repeat buying rate among adopters of the *i*th generation product
t_i is the time since the introduction of the *i*th generation product

$$F(t_i) = \frac{1 - e^{-(p+q)t_i}}{1 + \frac{q}{p}e^{-(p+q)t_i}}$$

It has been found that the p and q terms are generally the same between successive generations.

[1] Bass, Frank (1969). "A new product growth for model consumer durables". Management Science 15 (5): p215-227.
[2] Management Science 50 Number 12 Supplement, Dec 2004 ISSN 0025-1909 p1833-1840
[3] Management Science 15(5) p215

Appendix B - Air Conditioners, sales and stock detailed results by country

Total Number of Room Air Conditioning Units for austria

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	9198	15028	20956	25444	28019	29453
		Stock	116641	181143	289502	382775	469415	524991
	Office	Sales	1204	1968	2744	3332	3669	3857
		Stock	15274	23721	37911	50125	61471	68749
	Retail	Sales	1028	1660	2286	2742	2983	3096
		Stock	6943	10782	17232	22784	27941	31249
Reversible Split	Residential	Sales	387	740	981	1181	1312	1396
		Stock	2651	5071	8460	11352	13754	15462
	Office	Sales	2250	4299	5703	6861	7626	8114
		Stock	15404	29470	49162	65971	79931	89855
	Retail	Sales	1189	2271	3013	3624	4028	4286
		Stock	8137	15567	25969	34848	42223	47464
Cooling Only Split	Residential	Sales	60	0	0	0	0	0
		Stock	895	831	436	52	0	0
	Office	Sales	351	0	0	0	0	0
		Stock	5202	4827	2535	305	0	0
	Retail	Sales	185	0	0	0	0	0
		Stock	2748	2550	1339	161	0	0
Total	Residential	Sales	9645	15767	21937	26624	29332	30850
		Stock	120186	187045	298398	394179	483169	540453
	Office	Sales	3806	6267	8447	10193	11295	11971
		Stock	35880	58019	89609	116401	141402	158604
	Retail	Sales	2402	3931	5299	6367	7011	7382
		Stock	17827	28899	44541	57794	70164	78714
TOTAL sales			15853	25965	35684	43184	47638	50204
TOTAL stock			173894	273963	432547	568374	694735	777771

Total Cooling Capacity (kW) of Room Air Conditioning Units for austria

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	24098	39372	54904	66662	73411	77168
		Stock	305599	474595	758495	1002870	1229868	1375477
	Office	Sales	3156	5156	7190	8730	9613	10105
		Stock	40019	62149	99327	131328	161054	180122
	Retail	Sales	2693	4348	5990	7185	7814	8112
		Stock	18190	28250	45149	59695	73206	81874
Reversible Split	Residential	Sales	2155	4116	5460	6569	7301	7769
		Stock	14747	28214	47067	63159	76524	86025
	Office	Sales	12521	23919	31732	38175	42428	45147
		Stock	85702	163965	273528	367050	444719	499932
	Retail	Sales	6614	12635	16762	20165	22412	23848
		Stock	45271	86612	144487	193889	234916	264082
Cooling Only Split	Residential	Sales	336	0	0	0	0	0
		Stock	4980	4622	2427	292	0	0
	Office	Sales	1951	0	0	0	0	0
		Stock	28942	26859	14106	1695	0	0
	Retail	Sales	1031	0	0	0	0	0
		Stock	15288	14188	7451	895	0	0
Total	Residential	Sales	26588	43488	60364	73231	80712	84937
		Stock	325326	507431	807989	1066322	1306392	1461502
	Office	Sales	17628	29075	38922	46905	52042	55252
		Stock	154663	252973	386960	500073	605773	680054
	Retail	Sales	10338	16983	22752	27350	30227	31960
		Stock	78750	129049	197087	254479	308123	345955
TOTAL (Sales kW)			54555	89547	122038	147486	162980	172149
TOTAL (Stock kW)			558739	889453	1392037	1820873	2220288	2487511

Total Number of Room Air Conditioning Units for belgium

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	11636	19011	26510	32188	35446	37260
		Stock	147558	229157	366237	484233	593839	664146
	Office	Sales	1524	2490	3472	4215	4642	4879
		Stock	19323	30009	47960	63412	77765	86971
	Retail	Sales	1300	2099	2892	3469	3773	3917
		Stock	8783	13640	21800	28823	35348	39532
Reversible Split	Residential	Sales	5010	9571	12697	15275	16977	18065
		Stock	34293	65608	109448	146870	177948	200041
	Office	Sales	29116	55622	73789	88772	98662	104984
		Stock	199290	381281	636056	853531	1034142	1162532
	Retail	Sales	15380	29381	38978	46892	52117	55456
		Stock	105272	201406	335987	450865	546270	614091
Cooling Only Split	Residential	Sales	781	0	0	0	0	0
		Stock	11581	10747	5644	678	0	0
	Office	Sales	4538	0	0	0	0	0
		Stock	67302	62457	32802	3942	0	0
	Retail	Sales	2397	0	0	0	0	0
		Stock	35551	32992	17327	2082	0	0
Total	Residential	Sales	17427	28582	39207	47463	52423	55325
		Stock	193431	305513	481330	631782	771787	864187
	Office	Sales	35178	58111	77260	92987	103304	109863
		Stock	285915	473746	716818	920884	1111906	1249504
	Retail	Sales	19078	31481	41870	50361	55890	59373
		Stock	149607	248038	375115	481771	581618	653623
TOTAL sales			71683	118174	158338	190811	211617	224561
TOTAL stock			628953	1027297	1573263	2034437	2465311	2767314

Total Cooling Capacity (kW) of Room Air Conditioning Units for belgium

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	30485	49808	69457	84332	92869	97622
		Stock	386601	600392	959542	1268691	1555857	1740061
	Office	Sales	3992	6522	9096	11043	12161	12784
		Stock	50626	78623	125654	166138	203743	227865
	Retail	Sales	3407	5501	7578	9089	9886	10262
		Stock	23012	35738	57116	75517	92611	103575
Reversible Split	Residential	Sales	29308	55988	74274	89356	99311	105674
		Stock	200601	383789	640241	859146	1040945	1170180
	Office	Sales	170323	325371	431642	519288	577144	614123
		Stock	1165790	2230378	3720740	4992902	6049422	6800468
	Retail	Sales	89971	171873	228009	274307	304868	324402
		Stock	615812	1178165	1965427	2637428	3195520	3592249
Cooling Only Split	Residential	Sales	4568	0	0	0	0	0
		Stock	67745	62868	33018	3968	0	0
	Office	Sales	26546	0	0	0	0	0
		Stock	393697	365355	191883	23059	0	0
	Retail	Sales	14022	0	0	0	0	0
		Stock	207965	192993	101359	12181	0	0
Total	Residential	Sales	64361	105796	143731	173687	192181	203297
		Stock	654947	1047048	1632801	2131805	2596802	2910241
	Office	Sales	200861	331894	440738	530332	589306	626907
		Stock	1610113	2674355	4038277	5182099	6253166	7028333
	Retail	Sales	107400	177373	235587	283396	314754	334663
		Stock	846788	1406896	2123902	2725126	3288130	3695824
TOTAL (Sales kW)			372622	615063	820056	987415	1096240	1164867
TOTAL (Stock kW)			3111848	5128299	7794979	10039030	12138098	13634399

Total Number of Room Air Conditioning Units for bulgaria

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	12832	19553	27805	34527	38637	41032
		Stock	148407	241906	364713	508563	635705	722336
	Office	Sales	6416	9777	13902	17264	19318	20516
		Stock	74203	120953	182356	254281	317853	361168
	Retail	Sales	12047	18139	25483	31259	34548	36231
		Stock	74203	120953	182356	254281	317853	361168
Reversible Split	Residential	Sales	41673	53401	57499	59314	59665	60486
		Stock	249971	447085	600151	677657	705351	716483
	Office	Sales	78861	102054	109885	113354	114026	115595
		Stock	472278	848434	1143810	1294895	1347988	1369263
	Retail	Sales	11754	15210	16378	16895	16995	17229
		Stock	70390	126454	170478	192996	200910	204081
Cooling Only Split	Residential	Sales	6495	0	0	0	0	0
		Stock	83768	81084	37819	4139	0	0
	Office	Sales	13192	0	0	0	0	0
		Stock	164947	161120	76139	8407	0	0
	Retail	Sales	1966	0	0	0	0	0
		Stock	24584	24014	11348	1253	0	0
Total	Residential	Sales	61000	72954	85303	93841	98302	101518
		Stock	482146	770075	1002683	1190359	1341056	1438819
	Office	Sales	98469	111830	123787	130617	133344	136111
		Stock	711428	1130507	1402306	1557583	1665841	1730431
	Retail	Sales	25767	33349	41861	48153	51543	53460
		Stock	169178	271421	364183	448531	518762	565249
TOTAL sales			185236	218133	250951	272611	283189	291089
TOTAL stock			1362752	2172004	2769171	3196472	3525659	3734498

Total Cooling Capacity (kW) of Room Air Conditioning Units for bulgaria

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	38099	58055	82554	102514	114716	121828
		Stock	440633	718241	1082866	1509970	1887467	2144681
	Office	Sales	19050	29028	41277	51257	57358	60914
		Stock	220316	359120	541433	754985	943734	1072341
	Retail	Sales	35769	53856	75661	92809	102575	107574
		Stock	220316	359120	541433	754985	943734	1072341
Reversible Split	Residential	Sales	215329	275928	297102	306481	308299	312540
		Stock	1291633	2310147	3101055	3501538	3644635	3702158
	Office	Sales	407484	527324	567789	585713	589186	597292
		Stock	2440321	4383964	5910209	6690884	6965224	7075155
	Retail	Sales	60733	78595	84626	87297	87815	89023
		Stock	363716	653404	880882	997237	1038126	1054510
Cooling Only Split	Residential	Sales	33560	0	0	0	0	0
		Stock	432838	418972	195417	21386	0	0
	Office	Sales	68165	0	0	0	0	0
		Stock	852300	832529	393422	43438	0	0
	Retail	Sales	10160	0	0	0	0	0
		Stock	127030	124084	58637	6474	0	0
Total	Residential	Sales	286989	333983	379657	408995	423015	434368
		Stock	2165104	3447359	4379337	5032894	5532102	5846839
	Office	Sales	494699	556352	609066	636970	646544	658206
		Stock	3512937	5575614	6845064	7489307	7908958	8147495
	Retail	Sales	106662	132450	160287	180106	190390	196597
		Stock	711062	1136608	1480952	1758696	1981860	2126851
TOTAL (Sales kW)			888350	1022785	1149009	1226071	1259949	1289171
TOTAL (Stock kW)			6389103	10159581	12705354	14280897	15422919	16121185

Total Number of Room Air Conditioning Units for cyprus

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	192	221	236	237	241	238
		Stock	2537	3679	4129	4413	4532	4555
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	19	22	23	23	23	22
		Stock	134	194	217	232	239	240
Reversible Split	Residential	Sales	21347	28844	30543	30586	31000	31090
		Stock	145112	245349	322600	359219	367667	370596
	Office	Sales	4262	6154	6517	6526	6614	6634
		Stock	28608	49915	67607	76577	78447	79072
	Retail	Sales	4236	6117	6477	6486	6574	6593
		Stock	28435	49613	67197	76114	77972	78593
Cooling Only Split	Residential	Sales	3423	0	0	0	0	0
		Stock	53242	48722	20299	2323	0	0
	Office	Sales	1023	0	0	0	0	0
		Stock	13516	12958	5825	695	0	0
	Retail	Sales	1017	0	0	0	0	0
		Stock	13434	12880	5789	690	0	0
Total	Residential	Sales	24962	29065	30779	30823	31241	31329
		Stock	200891	297750	347028	365955	372199	375151
	Office	Sales	5285	6154	6517	6526	6614	6634
		Stock	42124	62873	73431	77272	78447	79072
	Retail	Sales	5272	6139	6500	6509	6597	6616
		Stock	42002	62687	73204	77037	78211	78833
TOTAL sales			35519	41358	43796	43858	44452	44578
TOTAL stock			285017	423310	493664	520264	528857	533056

Total Cooling Capacity (kW) of Room Air Conditioning Units for cyprus

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	448	517	552	553	563	557
		Stock	5930	8600	9652	10315	10594	10647
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	44	50	53	53	53	52
		Stock	312	453	508	543	558	560
Reversible Split	Residential	Sales	78989	106731	113017	113176	114706	115043
		Stock	536950	907852	1193702	1329199	1360461	1371300
	Office	Sales	15769	22772	24114	24148	24474	24546
		Stock	105856	184698	250161	283355	290273	292585
	Retail	Sales	15674	22635	23968	24001	24326	24397
		Stock	105215	183581	248647	281641	288516	290815
Cooling Only Split	Residential	Sales	12667	0	0	0	0	0
		Stock	197008	180283	75111	8598	0	0
	Office	Sales	3787	0	0	0	0	0
		Stock	50013	47949	21553	2570	0	0
	Retail	Sales	3764	0	0	0	0	0
		Stock	49710	47659	21423	2555	0	0
Total	Residential	Sales	92104	107247	113569	113729	115270	115599
		Stock	739888	1096734	1278465	1348112	1371055	1381947
	Office	Sales	19556	22772	24114	24148	24474	24546
		Stock	155868	232648	271714	285925	290273	292585
	Retail	Sales	19482	22685	24021	24054	24379	24449
		Stock	155237	231693	270578	284738	289074	291375
TOTAL (Sales kW)			131141	152705	161704	161931	164123	164594
TOTAL (Stock kW)			1050994	1561075	1820757	1918776	1950402	1965908

Total Number of Room Air Conditioning Units for czech republic

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	2795	2902	2686	2909	2687	2909
		Stock	46827	52589	52484	53769	52917	53822
	Office	Sales	2516	2612	2417	2618	2419	2618
		Stock	42144	47331	47235	48392	47625	48439
	Retail	Sales	525	538	492	527	481	514
		Stock	4683	5259	5248	5377	5292	5382
Reversible Split	Residential	Sales	386	675	805	885	925	945
		Stock	2512	4589	7191	9353	10417	10991
	Office	Sales	9672	16917	20172	22175	23172	23684
		Stock	62962	115015	180243	234421	261095	275480
	Retail	Sales	2858	4998	5960	6552	6846	6998
		Stock	18602	33982	53254	69261	77142	81392
Cooling Only Split	Residential	Sales	72	0	0	0	0	0
		Stock	985	925	427	53	0	0
	Office	Sales	1806	0	0	0	0	0
		Stock	24684	23183	10691	1337	0	0
	Retail	Sales	534	0	0	0	0	0
		Stock	7293	6849	3159	395	0	0
Total	Residential	Sales	3253	3577	3491	3793	3612	3854
		Stock	50324	58103	60101	63175	63334	64812
	Office	Sales	13993	19529	22590	24793	25591	26302
		Stock	129790	185529	238169	284150	308720	323919
	Retail	Sales	3916	5537	6452	7079	7327	7511
		Stock	30578	46090	61661	75033	82434	86774
TOTAL sales			21162	28642	32533	35665	36530	37668
TOTAL stock			210692	289722	359932	422358	454487	475506

Total Cooling Capacity (kW) of Room Air Conditioning Units for czech republic

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	7008	7276	6735	7293	6738	7294
		Stock	117418	131868	131603	134826	132689	134957
	Office	Sales	6308	6549	6062	6564	6064	6565
		Stock	105676	118681	118442	121344	119420	121462
	Retail	Sales	1316	1350	1235	1321	1205	1288
		Stock	11742	13187	13160	13483	13269	13496
Reversible Split	Residential	Sales	2090	3656	4359	4792	5007	5118
		Stock	13605	24853	38948	50654	56418	59526
	Office	Sales	52383	91623	109253	120101	125500	128274
		Stock	340999	622919	976191	1269613	1414077	1491987
	Retail	Sales	15477	27071	32279	35485	37080	37899
		Stock	100750	184045	288421	375115	417798	440816
Cooling Only Split	Residential	Sales	390	0	0	0	0	0
		Stock	5334	5009	2310	289	0	0
	Office	Sales	9780	0	0	0	0	0
		Stock	133689	125556	57900	7239	0	0
	Retail	Sales	2889	0	0	0	0	0
		Stock	39499	37096	17107	2139	0	0
Total	Residential	Sales	9489	10932	11094	12085	11745	12412
		Stock	136357	161730	172860	185769	189107	194484
	Office	Sales	68471	98172	115315	126665	131565	134839
		Stock	580364	867157	1152533	1398196	1533497	1613448
	Retail	Sales	19682	28421	33514	36805	38285	39187
		Stock	151991	234328	318689	390736	431066	454312
TOTAL (Sales kW)			97641	137524	159922	175556	181595	186438
TOTAL (Stock kW)			868713	1263215	1644082	1974701	2153671	2262244

Total Number of Room Air Conditioning Units for denmark

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	5984	9777	13634	16554	18230	19162
		Stock	75887	117852	188351	249034	305403	341561
	Office	Sales	784	1280	1785	2168	2387	2509
		Stock	9938	15433	24665	32612	39993	44728
	Retail	Sales	669	1080	1488	1784	1941	2014
		Stock	4517	7015	11211	14823	18179	20331
Reversible Split	Residential	Sales	2577	4922	6530	7856	8731	9291
		Stock	17636	33741	56288	75533	91516	102878
	Office	Sales	14974	28606	37949	45654	50741	53992
		Stock	102492	196087	327115	438959	531844	597874
	Retail	Sales	7910	15110	20046	24116	26803	28520
		Stock	54140	103580	172794	231874	280939	315818
Cooling Only Split	Residential	Sales	402	0	0	0	0	0
		Stock	5956	5527	2903	349	0	0
	Office	Sales	2334	0	0	0	0	0
		Stock	34612	32121	16870	2027	0	0
	Retail	Sales	1233	0	0	0	0	0
		Stock	18284	16967	8911	1071	0	0
Total	Residential	Sales	8962	14699	20164	24409	26961	28453
		Stock	99479	157121	247541	324916	396919	444439
	Office	Sales	18092	29886	39734	47822	53128	56501
		Stock	147042	243641	368649	473598	571838	642602
	Retail	Sales	9812	16190	21533	25900	28743	30535
		Stock	76941	127563	192916	247768	299118	336149
TOTAL sales			36865	60775	81431	98131	108832	115489
TOTAL stock			323462	528324	809107	1046282	1267874	1423190

Total Cooling Capacity (kW) of Room Air Conditioning Units for denmark

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	15678	25616	35721	43370	47761	50206
		Stock	198823	308773	493479	652470	800155	894889
	Office	Sales	2053	3354	4678	5679	6254	6575
		Stock	26036	40435	64622	85442	104782	117188
	Retail	Sales	1752	2829	3897	4674	5084	5278
		Stock	11835	18379	29374	38837	47628	53267
Reversible Split	Residential	Sales	15073	28794	38198	45954	51074	54347
		Stock	103166	197377	329267	441846	535343	601807
	Office	Sales	87595	167334	221988	267063	296817	315835
		Stock	599549	1147051	1913523	2567778	3111132	3497384
	Retail	Sales	46271	88392	117262	141072	156789	166835
		Stock	316703	605913	1010791	1356392	1643410	1847442
Cooling Only Split	Residential	Sales	2349	0	0	0	0	0
		Stock	34840	32332	16981	2041	0	0
	Office	Sales	13652	0	0	0	0	0
		Stock	202473	187897	98683	11859	0	0
	Retail	Sales	7212	0	0	0	0	0
		Stock	106953	99254	52128	6264	0	0
Total	Residential	Sales	33100	54409	73919	89325	98836	104552
		Stock	336830	538482	839726	1096357	1335498	1496696
	Office	Sales	103300	170688	226665	272742	303072	322409
		Stock	828058	1375383	2076828	2665079	3215914	3614571
	Retail	Sales	55234	91221	121159	145746	161873	172113
		Stock	435491	723546	1092292	1401493	1691038	1900709
TOTAL (Sales kW)			191634	316318	421743	507813	563781	599074
TOTAL (Stock kW)			1600379	2637411	4008846	5162930	6242450	7011976

Total Number of Room Air Conditioning Units for estonia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	1551	2535	3535	4292	4726	4968
		Stock	19674	30554	48832	64564	79178	88553
	Office	Sales	203	332	463	562	619	651
		Stock	2576	4001	6395	8455	10369	11596
	Retail	Sales	173	280	386	463	503	522
		Stock	1171	1819	2907	3843	4713	5271
Reversible Split	Residential	Sales	668	1276	1693	2037	2264	2409
		Stock	4572	8748	14593	19583	23726	26672
	Office	Sales	3882	7416	9839	11836	13155	13998
		Stock	26572	50837	84807	113804	137886	155004
	Retail	Sales	2051	3918	5197	6252	6949	7394
		Stock	14036	26854	44798	60115	72836	81879
Cooling Only Split	Residential	Sales	104	0	0	0	0	0
		Stock	1544	1433	753	90	0	0
	Office	Sales	605	0	0	0	0	0
		Stock	8974	8328	4374	526	0	0
	Retail	Sales	320	0	0	0	0	0
		Stock	4740	4399	2310	278	0	0
Total	Residential	Sales	2324	3811	5228	6328	6990	7377
		Stock	25791	40735	64177	84238	102905	115225
	Office	Sales	4690	7748	10301	12398	13774	14648
		Stock	38122	63166	95576	122785	148254	166600
	Retail	Sales	2544	4197	5583	6715	7452	7916
		Stock	19948	33072	50015	64236	77549	87150
TOTAL sales			9558	15757	21112	25441	28216	29941
TOTAL stock			83860	136973	209768	271258	328708	368975

Total Cooling Capacity (kW) of Room Air Conditioning Units for estonia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	4065	6641	9261	11244	12383	13016
		Stock	51547	80052	127939	169159	207448	232008
	Office	Sales	532	870	1213	1472	1622	1705
		Stock	6750	10483	16754	22152	27166	30382
	Retail	Sales	454	733	1010	1212	1318	1368
		Stock	3068	4765	7615	10069	12348	13810
Reversible Split	Residential	Sales	3908	7465	9903	11914	13241	14090
		Stock	26747	51172	85365	114553	138793	156024
	Office	Sales	22710	43383	57552	69238	76953	81883
		Stock	155439	297384	496099	665720	806590	906729
	Retail	Sales	11996	22916	30401	36574	40649	43254
		Stock	82108	157089	262057	351657	426069	478966
Cooling Only Split	Residential	Sales	609	0	0	0	0	0
		Stock	9033	8382	4402	529	0	0
	Office	Sales	3539	0	0	0	0	0
		Stock	52493	48714	25584	3075	0	0
	Retail	Sales	1870	0	0	0	0	0
		Stock	27729	25732	13515	1624	0	0
Total	Residential	Sales	8581	14106	19164	23158	25624	27106
		Stock	87326	139606	217707	284241	346240	388032
	Office	Sales	26781	44253	58765	70711	78574	83588
		Stock	214682	356581	538437	690947	833755	937111
	Retail	Sales	14320	23650	31412	37786	41967	44622
		Stock	112905	187586	283187	363350	438417	492777
TOTAL (Sales kW)			49683	82008	109341	131655	146165	155316
TOTAL (Stock kW)			414913	683773	1039331	1338537	1618413	1817920

Total Number of Room Air Conditioning Units for finland

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	7795	12888	17915	21679	23818	25002
		Stock	74119	142335	236877	327193	400091	446427
	Office	Sales	1021	1688	2346	2839	3119	3274
		Stock	9706	18639	31020	42847	52393	58461
	Retail	Sales	871	1423	1955	2336	2535	2628
		Stock	4412	8472	14100	19476	23815	26573
Reversible Split	Residential	Sales	956	2022	2683	3227	3587	3817
		Stock	6498	12710	21929	30999	37596	42264
	Office	Sales	5957	11752	15590	18755	20845	22180
		Stock	41075	77219	129272	180271	218489	245614
	Retail	Sales	3147	6208	8235	9907	11011	11717
		Stock	21697	40790	68286	95225	115413	129742
Cooling Only Split	Residential	Sales	267	0	0	0	0	0
		Stock	3487	3339	1565	232	0	0
	Office	Sales	1153	0	0	0	0	0
		Stock	17236	15788	6941	1002	0	0
	Retail	Sales	609	0	0	0	0	0
		Stock	9105	8340	3666	529	0	0
Total	Residential	Sales	9019	14910	20598	24906	27405	28819
		Stock	84104	158384	260370	358424	437687	488691
	Office	Sales	8131	13439	17936	21594	23964	25455
		Stock	68017	111646	167232	224119	270882	304075
	Retail	Sales	4627	7631	10190	12244	13546	14345
		Stock	35214	57602	86052	115230	139228	156315
TOTAL sales			21777	35980	48723	58744	64916	68618
TOTAL stock			187336	327631	513655	697774	847797	949081

Total Cooling Capacity (kW) of Room Air Conditioning Units for finland

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	20424	33767	46937	56798	62404	65505
		Stock	194192	372917	620617	857245	1048239	1169638
	Office	Sales	2675	4422	6147	7438	8172	8578
		Stock	25430	48834	81271	112258	137269	153167
	Retail	Sales	2283	3729	5121	6122	6643	6886
		Stock	11559	22197	36942	51026	62395	69621
Reversible Split	Residential	Sales	5592	11829	15692	18879	20982	22326
		Stock	38014	74351	128276	181334	219926	247230
	Office	Sales	34846	68743	91195	109713	121936	129749
		Stock	240277	451710	756205	1054531	1278094	1436771
	Retail	Sales	18407	36312	48173	57954	64411	68538
		Stock	126923	238609	399454	557041	675135	758954
Cooling Only Split	Residential	Sales	1565	0	0	0	0	0
		Stock	20398	19530	9155	1359	0	0
	Office	Sales	6747	0	0	0	0	0
		Stock	100826	92352	40600	5861	0	0
	Retail	Sales	3564	0	0	0	0	0
		Stock	53260	48784	21446	3096	0	0
Total	Residential	Sales	27581	45595	62630	75676	83386	87831
		Stock	252603	466798	758048	1039938	1268165	1416869
	Office	Sales	44268	73165	97342	117151	130108	138327
		Stock	366533	592897	878076	1172650	1415363	1589938
	Retail	Sales	24254	40042	53294	64076	71054	75424
		Stock	191742	309590	457842	611163	737530	828575
TOTAL (Sales kW)			96103	158802	213266	256903	284549	301582
TOTAL (Stock kW)			810879	1369285	2093966	2823752	3421058	3835382

Total Number of Room Air Conditioning Units for france

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	68040	111168	155021	188221	207277	217885
		Stock	862860	1340024	2141617	2831612	3472541	3883670
	Office	Sales	8910	14558	20300	24648	27143	28533
		Stock	112994	175479	280450	370806	454738	508576
	Retail	Sales	7605	12277	16914	20286	22064	22904
		Stock	51361	79763	127477	168548	206699	231171
Reversible Split	Residential	Sales	31331	59853	79402	95524	106167	112969
		Stock	214450	410284	684439	918457	1112806	1250963
	Office	Sales	182081	347833	461441	555137	616987	656519
		Stock	1246270	2384351	3977599	5337585	6467042	7269936
	Retail	Sales	96182	183738	243749	293243	325915	346796
		Stock	658324	1259499	2101109	2819502	3416121	3840238
Cooling Only Split	Residential	Sales	4883	0	0	0	0	0
		Stock	72421	67208	35297	4242	0	0
	Office	Sales	28378	0	0	0	0	0
		Stock	420875	390577	205129	24651	0	0
	Retail	Sales	14990	0	0	0	0	0
		Stock	222321	206317	108357	13021	0	0
Total	Residential	Sales	104254	171020	234423	283745	313444	330854
		Stock	1149732	1817515	2861354	3754311	4585348	5134633
	Office	Sales	219369	362391	481741	579785	644131	685051
		Stock	1780139	2950407	4463179	5733042	6921779	7778511
	Retail	Sales	118777	196015	260663	313529	347979	369700
		Stock	932006	1545579	2336943	3001071	3622820	4071409
TOTAL sales			442400	729426	976827	1177059	1305553	1385606
TOTAL stock			3861876	6313501	9661475	12488424	15129947	16984553

Total Cooling Capacity (kW) of Room Air Conditioning Units for france

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	178265	291259	406156	493139	543065	570858
		Stock	2260694	3510862	5611037	7418824	9098059	10175216
	Office	Sales	23344	38141	53187	64578	71116	74755
		Stock	296043	459756	734779	971513	1191412	1332469
	Retail	Sales	19924	32166	44314	53149	57808	60008
		Stock	134565	208980	333990	441597	541551	605668
Reversible Split	Residential	Sales	171382	327395	434327	522518	580734	617943
		Stock	1173041	2244251	3743883	5023958	6087050	6842768
	Office	Sales	995982	1902648	2524081	3036600	3374921	3591157
		Stock	6817095	13042400	21757468	29196588	35374718	39766547
	Retail	Sales	526113	1005046	1333309	1604040	1782753	1896977
		Stock	3601031	6889459	11493067	15422674	18686182	21006102
Cooling Only Split	Residential	Sales	26711	0	0	0	0	0
		Stock	396145	367627	193076	23202	0	0
	Office	Sales	155229	0	0	0	0	0
		Stock	2302188	2136455	1122058	134840	0	0
	Retail	Sales	81998	0	0	0	0	0
		Stock	1216097	1128551	592711	71227	0	0
Total	Residential	Sales	376358	618654	840483	1015657	1123799	1188801
		Stock	3829881	6122740	9547997	12465985	15185109	17017984
	Office	Sales	1174556	1940790	2577268	3101178	3446036	3665913
		Stock	9415326	15638611	23614305	30302940	36566131	41099016
	Retail	Sales	628035	1037212	1377623	1657189	1840561	1956985
		Stock	4951694	8226990	12419768	15935498	19227733	21611769
TOTAL (Sales kW)			2178949	3596656	4795374	5774024	6410397	6811698
TOTAL (Stock kW)			18196900	29988341	45582069	58704422	70978972	79728769

Total Number of Room Air Conditioning Units for germany

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	23750	43831	46796	46901	47781	47209
		Stock	425484	598330	772733	874723	898329	902864
	Office	Sales	21375	39448	42116	42211	43003	42488
		Stock	382935	538497	695459	787251	808496	812578
	Retail	Sales	4459	8132	8578	8492	8545	8337
		Stock	42548	59833	77273	87472	89833	90286
Reversible Split	Residential	Sales	376	2166	3199	3528	3669	3764
		Stock	2722	12699	24493	34975	41269	43631
	Office	Sales	9188	52929	78156	86203	89636	91974
		Stock	66497	310269	598431	854525	1008289	1066006
	Retail	Sales	2997	17265	25494	28119	29239	30001
		Stock	21691	101208	195205	278741	328898	347725
Cooling Only Split	Residential	Sales	1538	515	0	0	0	0
		Stock	15505	13324	7325	2901	352	0
	Office	Sales	37589	12572	0	0	0	0
		Stock	378811	325533	178955	70885	8593	0
	Retail	Sales	12261	4101	0	0	0	0
		Stock	123566	106187	58374	23122	2803	0
Total	Residential	Sales	25665	46512	49995	50429	51450	50973
		Stock	443710	624353	804551	912599	939950	946495
	Office	Sales	68152	104949	120272	128413	132639	134462
		Stock	828244	1174299	1472845	1712660	1825378	1878584
	Retail	Sales	19718	29498	34072	36611	37784	38338
		Stock	187805	267228	330852	389335	421534	438011
TOTAL sales			113534	180960	204338	215453	221873	223773
TOTAL stock			1459759	2065880	2608248	3014595	3186862	3263091

Total Cooling Capacity (kW) of Room Air Conditioning Units for germany

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	59553	109907	117340	117603	119812	118376
		Stock	1066900	1500312	1937627	2193367	2252561	2263932
	Office	Sales	53598	98916	105606	105843	107831	106538
		Stock	960210	1350280	1743864	1974031	2027305	2037539
	Retail	Sales	11182	20391	21508	21294	21426	20905
		Stock	106690	150031	193763	219337	225256	226393
Reversible Split	Residential	Sales	2858	16464	24312	26815	27883	28610
		Stock	20685	96514	186150	265812	313642	331596
	Office	Sales	69831	402262	593987	655140	681234	699000
		Stock	505377	2358047	4548075	6494388	7662993	8101649
	Retail	Sales	22779	131216	193755	213703	222215	228009
		Stock	164851	769181	1483555	2118430	2499622	2642709
Cooling Only Split	Residential	Sales	11692	3911	0	0	0	0
		Stock	117834	101262	55666	22050	2673	0
	Office	Sales	285674	95547	0	0	0	0
		Stock	2878966	2474053	1360058	538725	65308	0
	Retail	Sales	93185	31167	0	0	0	0
		Stock	939101	807021	443643	175729	21303	0
Total	Residential	Sales	74104	130282	141652	144418	147695	146986
		Stock	1205420	1698087	2179444	2481229	2568876	2595528
	Office	Sales	409103	596725	699593	760983	789065	805538
		Stock	4344553	6182380	7651998	9007144	9755606	10139187
	Retail	Sales	127146	182774	215263	234997	243641	248915
		Stock	1210642	1726233	2120960	2513496	2746181	2869102
TOTAL (Sales kW)			610353	909780	1056508	1140398	1180401	1201439
TOTAL (Stock kW)			6760615	9606700	11952402	14001869	15070663	15603817

Total Number of Room Air Conditioning Units for greece

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	2660	3068	3276	3283	3345	3305
		Stock	35201	51047	57293	61231	62883	63200
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	263	300	316	313	315	307
		Stock	1853	2687	3015	3223	3310	3326
Reversible Split	Residential	Sales	226908	306602	324662	325117	329513	330479
		Stock	1542482	2607959	3429113	3818352	3908158	3939294
	Office	Sales	45300	65418	69271	69368	70306	70512
		Stock	304088	530577	718631	813986	833858	840502
	Retail	Sales	45026	65022	68852	68948	69881	70086
		Stock	302248	527367	714282	809061	828813	835416
Cooling Only Split	Residential	Sales	36387	0	0	0	0	0
		Stock	565938	517894	215769	24698	0	0
	Office	Sales	10878	0	0	0	0	0
		Stock	143670	137743	61915	7383	0	0
	Retail	Sales	10812	0	0	0	0	0
		Stock	142801	136910	61540	7339	0	0
Total	Residential	Sales	265956	309670	327937	328400	332858	333784
		Stock	2143621	3176899	3702175	3904280	3971041	4002494
	Office	Sales	56178	65418	69271	69368	70306	70512
		Stock	447759	668320	780545	821369	833858	840502
	Retail	Sales	56101	65321	69168	69261	70196	70393
		Stock	446902	666963	778838	819622	832122	838742
TOTAL sales			378234	440409	466376	467030	473360	474689
TOTAL stock			3038281	4512182	5261558	5545272	5637022	5681738

Total Cooling Capacity (kW) of Room Air Conditioning Units for greece

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	6218	7172	7657	7674	7818	7725
		Stock	82282	119322	133922	143127	146989	147731
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	614	700	739	731	736	718
		Stock	4331	6280	7049	7533	7736	7775
Reversible Split	Residential	Sales	1095967	1480887	1568116	1570316	1591549	1596215
		Stock	7450187	12596441	16562615	18442640	18876403	19026789
	Office	Sales	218798	315967	334579	335048	339579	340574
		Stock	1468747	2562688	3470987	3931553	4027536	4059623
	Retail	Sales	217474	314055	332554	333021	337524	338513
		Stock	1459860	2547181	3449984	3907763	4003166	4035059
Cooling Only Split	Residential	Sales	175751	0	0	0	0	0
		Stock	2733480	2501426	1042164	119290	0	0
	Office	Sales	52541	0	0	0	0	0
		Stock	693928	665299	299048	35662	0	0
	Retail	Sales	52223	0	0	0	0	0
		Stock	689729	661273	297238	35446	0	0
Total	Residential	Sales	1277936	1488059	1575773	1577990	1599368	1603940
		Stock	10265949	15217189	17738701	18705056	19023392	19174520
	Office	Sales	271338	315967	334579	335048	339579	340574
		Stock	2162675	3227987	3770035	3967215	4027536	4059623
	Retail	Sales	270311	314756	333293	333752	338260	339231
		Stock	2153919	3214734	3754271	3950742	4010902	4042834
TOTAL (Sales kW)			1819585	2118782	2243645	2246790	2277206	2283745
TOTAL (Stock kW)			14582543	21659910	25263006	26623013	27061830	27276977

Total Number of Room Air Conditioning Units for hungary

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	1750	851	1155	851	1155	851
		Stock	23871	24379	22267	18706	19488	18708
	Office	Sales	1575	766	1040	766	1040	766
		Stock	21484	21941	20041	16836	17539	16837
	Retail	Sales	329	158	212	154	207	150
		Stock	2387	2438	2227	1871	1949	1871
Reversible Split	Residential	Sales	1556	2260	3335	3666	3831	3916
		Stock	10652	15446	25311	36508	43041	45544
	Office	Sales	37747	64318	86452	95036	99309	101504
		Stock	255190	425431	689895	969652	1117061	1180612
	Retail	Sales	9749	16611	22328	24545	25648	26215
		Stock	65906	109874	178176	250427	288497	304910
Cooling Only Split	Residential	Sales	250	537	0	0	0	0
		Stock	3850	6949	6404	2970	367	0
	Office	Sales	9064	8183	0	0	0	0
		Stock	118889	160330	131183	49635	5589	0
	Retail	Sales	2341	2113	0	0	0	0
		Stock	30705	41407	33880	12819	1444	0
Total	Residential	Sales	3556	3648	4490	4517	4986	4767
		Stock	38374	46773	53983	58184	62896	64252
	Office	Sales	48387	73267	87492	95802	100349	102270
		Stock	395563	607701	841119	1036123	1140190	1197449
	Retail	Sales	12418	18882	22539	24699	25855	26365
		Stock	98998	153719	214282	265117	291890	306781
TOTAL sales			64361	95798	114521	125019	131189	133402
TOTAL stock			532935	808194	1109384	1359424	1494976	1568482

Total Cooling Capacity (kW) of Room Air Conditioning Units for hungary

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	4388	2134	2897	2134	2897	2134
		Stock	59857	61130	55836	46907	48867	46909
	Office	Sales	3949	1921	2607	1921	2607	1921
		Stock	53872	55017	50252	42216	43980	42219
	Retail	Sales	824	396	531	386	518	377
		Stock	5986	6113	5584	4691	4887	4691
Reversible Split	Residential	Sales	7646	11103	16385	18012	18822	19237
		Stock	52335	75885	124354	179362	211459	223756
	Office	Sales	185451	315994	424736	466910	487900	498683
		Stock	1253736	2090123	3389428	4763862	5488077	5800301
	Retail	Sales	47895	81610	109694	120586	126007	128792
		Stock	323796	539805	875369	1230337	1417376	1498013
Cooling Only Split	Residential	Sales	1226	2637	0	0	0	0
		Stock	18916	34138	31463	14591	1801	0
	Office	Sales	44533	40202	0	0	0	0
		Stock	584096	787692	644497	243855	27460	0
	Retail	Sales	11501	10383	0	0	0	0
		Stock	150851	203433	166451	62979	7092	0
Total	Residential	Sales	13260	15875	19282	20146	21718	21372
		Stock	131108	171153	211652	240860	262127	270666
	Office	Sales	233933	358116	427343	468831	490507	500604
		Stock	1891704	2932833	4084177	5049933	5559517	5842519
	Retail	Sales	60221	92389	110225	120973	126525	129169
		Stock	480633	749351	1047404	1298007	1429355	1502704
TOTAL (Sales kW)			307413	466380	556850	609950	638751	651145
TOTAL (Stock kW)			2503445	3853338	5343233	6588799	7250999	7615888

Total Number of Room Air Conditioning Units for ireland

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	6177	10213	14197	17179	18875	19813
		Stock	58736	112794	187714	259285	317053	353772
	Office	Sales	809	1337	1859	2250	2472	2595
		Stock	7692	14771	24582	33954	41519	46327
	Retail	Sales	690	1128	1549	1852	2009	2083
		Stock	3496	6714	11173	15434	18872	21058
Reversible Split	Residential	Sales	758	1602	2126	2557	2842	3025
		Stock	5150	10072	17377	24565	29793	33492
	Office	Sales	4721	9313	12354	14863	16519	17577
		Stock	32550	61193	102442	142856	173142	194638
	Retail	Sales	2494	4919	6526	7851	8726	9285
		Stock	17194	32324	54114	75462	91460	102815
Cooling Only Split	Residential	Sales	212	0	0	0	0	0
		Stock	2763	2646	1240	184	0	0
	Office	Sales	914	0	0	0	0	0
		Stock	13659	12511	5500	794	0	0
	Retail	Sales	483	0	0	0	0	0
		Stock	7215	6609	2905	419	0	0
Total	Residential	Sales	7147	11816	16323	19737	21717	22837
		Stock	66649	125512	206331	284034	346847	387264
	Office	Sales	6444	10650	14213	17112	18990	20171
		Stock	53901	88474	132524	177604	214661	240965
	Retail	Sales	3667	6047	8075	9703	10735	11367
		Stock	27905	45647	68192	91315	110332	123872
TOTAL sales			17257	28513	38611	46552	51443	54376
TOTAL stock			148455	259632	407047	552953	671839	752102

Total Cooling Capacity (kW) of Room Air Conditioning Units for ireland

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	16185	26758	37196	45010	49453	51910
		Stock	153888	295519	491810	679326	830680	926883
	Office	Sales	2119	3504	4871	5894	6476	6798
		Stock	20152	38699	64404	88959	108780	121378
	Retail	Sales	1809	2955	4058	4851	5264	5457
		Stock	9160	17590	29274	40436	49445	55172
Reversible Split	Residential	Sales	4432	9374	12435	14960	16627	17693
		Stock	30124	58920	101653	143699	174281	195918
	Office	Sales	27614	54476	72268	86942	96629	102820
		Stock	190408	357959	599256	835666	1012829	1138574
	Retail	Sales	14587	28776	38175	45926	51043	54313
		Stock	100580	189087	316549	441428	535012	601435
Cooling Only Split	Residential	Sales	1240	0	0	0	0	0
		Stock	16164	15477	7255	1077	0	0
	Office	Sales	5347	0	0	0	0	0
		Stock	79900	73185	32174	4645	0	0
	Retail	Sales	2824	0	0	0	0	0
		Stock	42206	38659	16995	2453	0	0
Total	Residential	Sales	21857	36132	49631	59970	66080	69602
		Stock	200176	369916	600717	824102	1004961	1122801
	Office	Sales	35080	57980	77139	92836	103105	109618
		Stock	290460	469843	695834	929270	1121609	1259951
	Retail	Sales	19220	31731	42233	50777	56307	59770
		Stock	151946	245336	362818	484318	584458	656607
TOTAL (Sales kW)			76157	125843	169003	203583	225491	238990
TOTAL (Stock kW)			642583	1085094	1659369	2237690	2711027	3039359

Total Number of Room Air Conditioning Units for italy

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	58000	122167	173721	215723	241401	256366
		Stock	1031315	1568688	2235184	3177468	3971845	4513107
	Office	Sales	29000	61083	86861	107862	120700	128183
		Stock	515657	784344	1117592	1588734	1985923	2256554
	Retail	Sales	29000	61083	86861	107862	120700	128183
		Stock	515657	784344	1117592	1588734	1985923	2256554
Reversible Split	Residential	Sales	587317	1094697	1178700	1215909	1223120	1239947
		Stock	3653700	7836487	11787554	13891726	14459438	14687648
	Office	Sales	304312	572813	616769	636238	640012	648817
		Stock	1889974	4074642	6153099	7268064	7566070	7685484
	Retail	Sales	86679	163158	175678	181224	182299	184807
		Stock	538334	1160608	1752629	2070212	2155095	2189108
Cooling Only Split	Residential	Sales	91537	0	0	0	0	0
		Stock	1274703	1227666	617911	84847	0	0
	Office	Sales	50906	0	0	0	0	0
		Stock	686982	668957	341029	47186	0	0
	Retail	Sales	14500	0	0	0	0	0
		Stock	195678	190543	97138	13440	0	0
Total	Residential	Sales	736854	1216864	1352421	1431632	1464520	1496313
		Stock	5959718	10632841	14640650	17154041	18431283	19200755
	Office	Sales	384218	633896	703629	744100	760712	777000
		Stock	3092613	5527943	7611720	8903984	9551993	9942038
	Retail	Sales	130179	224242	262539	289086	302999	312990
		Stock	1249669	2135495	2967358	3672386	4141017	4445662
TOTAL sales			1251251	2075001	2318589	2464818	2528231	2586303
TOTAL stock			10302000	18296279	25219728	29730410	32124293	33588455

Total Cooling Capacity (kW) of Room Air Conditioning Units for italy

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	172207	362724	515794	640502	716740	761174
		Stock	3062067	4657579	6636465	9434190	11792770	13399825
	Office	Sales	86104	181362	257897	320251	358370	380587
		Stock	1531034	2328789	3318233	4717095	5896385	6699913
	Retail	Sales	86104	181362	257897	320251	358370	380587
		Stock	1531034	2328789	3318233	4717095	5896385	6699913
Reversible Split	Residential	Sales	3034741	5656437	6090492	6282753	6320013	6406963
		Stock	18879129	40492116	60907780	71780302	74713738	75892931
	Office	Sales	1572418	2959797	3186921	3287524	3307021	3352519
		Stock	9765735	21054189	31793839	37555004	39094839	39711865
	Retail	Sales	447882	843059	907752	936408	941961	954920
		Stock	2781640	5997006	9056053	10697045	11135646	11311398
Cooling Only Split	Residential	Sales	472981	0	0	0	0	0
		Stock	6586552	6343503	3192827	438413	0	0
	Office	Sales	263039	0	0	0	0	0
		Stock	3549720	3456585	1762139	243814	0	0
	Retail	Sales	74923	0	0	0	0	0
		Stock	1011091	984562	501922	69447	0	0
Total	Residential	Sales	3679930	6019161	6606286	6923255	7036753	7168137
		Stock	28527748	51493197	70737072	81652905	86506509	89292756
	Office	Sales	1921560	3141159	3444818	3607775	3665391	3733106
		Stock	14846489	26839563	36874210	42515914	44991224	46411778
	Retail	Sales	608909	1024421	1165649	1256659	1300331	1335507
		Stock	5323764	9310358	12876207	15483587	17032031	18011310
TOTAL (Sales kW)			6210399	10184740	11216753	11787689	12002476	12236750
TOTAL (Stock kW)			48698001	87643119	120487490	139652406	148529764	153715844

Total Number of Room Air Conditioning Units for latvia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	2549	4164	5807	7051	7764	8162
		Stock	32322	50196	80223	106070	130079	145480
	Office	Sales	334	545	760	923	1017	1069
		Stock	4233	6573	10505	13890	17034	19051
	Retail	Sales	285	460	634	760	827	858
		Stock	1924	2988	4775	6314	7743	8659
Reversible Split	Residential	Sales	1287	2458	3260	3922	4359	4639
		Stock	8806	16847	28105	37714	45695	51368
	Office	Sales	7477	14283	18948	22795	25335	26958
		Stock	51175	97908	163330	219175	265553	298522
	Retail	Sales	3949	7545	10009	12041	13383	14240
		Stock	27032	51718	86277	115776	140275	157690
Cooling Only Split	Residential	Sales	201	0	0	0	0	0
		Stock	2974	2760	1449	174	0	0
	Office	Sales	1165	0	0	0	0	0
		Stock	17282	16038	8423	1012	0	0
	Retail	Sales	616	0	0	0	0	0
		Stock	9129	8472	4449	535	0	0
Total	Residential	Sales	4036	6622	9067	10973	12124	12801
		Stock	44102	69803	109778	143959	175774	196847
	Office	Sales	8976	14828	19708	23719	26352	28027
		Stock	72690	120519	182259	234077	282588	317573
	Retail	Sales	4850	8005	10643	12801	14209	15098
		Stock	38085	63178	95502	122624	148018	166350
TOTAL sales			17861	29455	39418	47493	52685	55926
TOTAL stock			154877	253500	387538	500660	606379	680770

Total Cooling Capacity (kW) of Room Air Conditioning Units for latvia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	6678	10910	15214	18473	20343	21384
		Stock	84684	131514	210185	277904	340807	381156
	Office	Sales	874	1429	1992	2419	2664	2800
		Stock	11090	17222	27524	36392	44629	49913
	Retail	Sales	746	1205	1660	1991	2165	2248
		Stock	5041	7828	12511	16542	20286	22688
Reversible Split	Residential	Sales	6420	12264	16270	19573	21754	23148
		Stock	43941	84068	140243	188194	228017	256325
	Office	Sales	37309	71272	94550	113749	126422	134522
		Stock	255363	488559	815019	1093683	1325112	1489626
	Retail	Sales	19708	37648	49945	60086	66781	71059
		Stock	134892	258074	430522	577722	699971	786874
Cooling Only Split	Residential	Sales	1001	0	0	0	0	0
		Stock	14839	13771	7233	869	0	0
	Office	Sales	5815	0	0	0	0	0
		Stock	86238	80030	42032	5051	0	0
	Retail	Sales	3072	0	0	0	0	0
		Stock	45554	42275	22203	2668	0	0
Total	Residential	Sales	14098	23174	31484	38046	42097	44532
		Stock	143465	229353	357661	466967	568823	637481
	Office	Sales	43998	72701	96543	116168	129086	137322
		Stock	352691	585811	884575	1135126	1369741	1539540
	Retail	Sales	23526	38853	51605	62077	68946	73307
		Stock	185487	308177	465236	596932	720257	809561
TOTAL (Sales kW)			81622	134728	179631	216291	240129	255161
TOTAL (Stock kW)			681643	1123342	1707472	2199026	2658821	2986583

Total Number of Room Air Conditioning Units for lithuania

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	3768	6156	8584	10423	11478	12065
		Stock	47781	74203	118591	156799	192291	215057
	Office	Sales	493	806	1124	1365	1503	1580
		Stock	6257	9717	15530	20533	25181	28162
	Retail	Sales	421	680	937	1123	1222	1268
		Stock	2844	4417	7059	9333	11446	12801
Reversible Split	Residential	Sales	1622	3099	4111	4946	5497	5850
		Stock	11104	21245	35440	47558	57621	64775
	Office	Sales	9428	18011	23894	28745	31948	33995
		Stock	64532	123462	205961	276381	334865	376439
	Retail	Sales	4980	9514	12621	15184	16876	17957
		Stock	34088	65217	108796	145994	176888	198848
Cooling Only Split	Residential	Sales	253	0	0	0	0	0
		Stock	3750	3480	1828	220	0	0
	Office	Sales	1469	0	0	0	0	0
		Stock	21793	20224	10622	1276	0	0
	Retail	Sales	776	0	0	0	0	0
		Stock	11512	10683	5611	674	0	0
Total	Residential	Sales	5643	9255	12696	15369	16975	17915
		Stock	62635	98928	155859	204577	249912	279832
	Office	Sales	11391	18817	25018	30110	33451	35575
		Stock	92582	153404	232113	298191	360046	404601
	Retail	Sales	6178	10194	13558	16308	18098	19225
		Stock	48444	80317	121466	156002	188333	211649
TOTAL sales			23212	38266	51271	61786	68524	72715
TOTAL stock			203661	332649	509437	658770	798291	896082

Total Cooling Capacity (kW) of Room Air Conditioning Units for lithuania

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	9871	16128	22491	27307	30072	31611
		Stock	125185	194413	310709	410814	503801	563448
	Office	Sales	1293	2112	2945	3576	3938	4140
		Stock	16393	25459	40688	53797	65974	73785
	Retail	Sales	1103	1781	2454	2943	3201	3323
		Stock	7451	11572	18495	24453	29988	33539
Reversible Split	Residential	Sales	9490	18129	24051	28934	32158	34218
		Stock	64957	124274	207316	278200	337068	378915
	Office	Sales	55152	105358	139770	168150	186885	198859
		Stock	377494	722218	1204811	1616749	1958861	2202056
	Retail	Sales	29133	55654	73831	88823	98719	105044
		Stock	199406	381501	636424	854024	1034740	1163204
Cooling Only Split	Residential	Sales	1479	0	0	0	0	0
		Stock	21936	20357	10692	1285	0	0
	Office	Sales	8596	0	0	0	0	0
		Stock	127483	118305	62134	7467	0	0
	Retail	Sales	4541	0	0	0	0	0
		Stock	67341	62493	32821	3944	0	0
Total	Residential	Sales	20841	34258	46541	56242	62230	65829
		Stock	212078	339044	528716	690299	840869	942364
	Office	Sales	65041	107470	142715	171726	190823	202998
		Stock	521370	865982	1307633	1678013	2024835	2275841
	Retail	Sales	34777	57435	76285	91766	101920	108367
		Stock	274198	455566	687740	882422	1064728	1196743
TOTAL (Sales kW)			120658	199163	265542	319734	354973	377195
TOTAL (Stock kW)			1007646	1660592	2524089	3250733	3930432	4414948

Total Number of Room Air Conditioning Units for luxembourg

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	554	905	1262	1533	1688	1774
		Stock	7027	10912	17440	23059	28278	31626
	Office	Sales	73	119	165	201	221	232
		Stock	920	1429	2284	3020	3703	4141
	Retail	Sales	62	100	138	165	180	187
		Stock	418	650	1038	1373	1683	1882
Reversible Split	Residential	Sales	239	456	605	727	808	860
		Stock	1633	3124	5212	6994	8474	9526
	Office	Sales	1386	2649	3514	4227	4698	4999
		Stock	9490	18156	30288	40644	49245	55359
	Retail	Sales	732	1399	1856	2233	2482	2641
		Stock	5013	9591	15999	21470	26013	29242
Cooling Only Split	Residential	Sales	37	0	0	0	0	0
		Stock	551	512	269	32	0	0
	Office	Sales	216	0	0	0	0	0
		Stock	3205	2974	1562	188	0	0
	Retail	Sales	114	0	0	0	0	0
		Stock	1693	1571	825	99	0	0
Total	Residential	Sales	830	1361	1867	2260	2496	2635
		Stock	9211	14548	22920	30085	36752	41152
	Office	Sales	1675	2767	3679	4428	4919	5232
		Stock	13615	22559	34134	43852	52948	59500
	Retail	Sales	908	1499	1994	2398	2661	2827
		Stock	7124	11811	17863	22941	27696	31125
TOTAL sales			3413	5627	7540	9086	10077	10693
TOTAL stock			29950	48919	74917	96878	117396	131777

Total Cooling Capacity (kW) of Room Air Conditioning Units for luxembourg

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	1452	2372	3307	4016	4422	4649
		Stock	18410	28590	45692	60414	74088	82860
	Office	Sales	190	311	433	526	579	609
		Stock	2411	3744	5984	7911	9702	10851
	Retail	Sales	162	262	361	433	471	489
		Stock	1096	1702	2720	3596	4410	4932
Reversible Split	Residential	Sales	1396	2666	3537	4255	4729	5032
		Stock	9552	18276	30488	40912	49569	55723
	Office	Sales	8111	15494	20554	24728	27483	29244
		Stock	55514	106208	177178	237757	288068	323832
	Retail	Sales	4284	8184	10858	13062	14518	15448
		Stock	29324	56103	93592	125592	152168	171059
Cooling Only Split	Residential	Sales	218	0	0	0	0	0
		Stock	3226	2994	1572	189	0	0
	Office	Sales	1264	0	0	0	0	0
		Stock	18747	17398	9137	1098	0	0
	Retail	Sales	668	0	0	0	0	0
		Stock	9903	9190	4827	580	0	0
Total	Residential	Sales	3065	5038	6844	8271	9151	9681
		Stock	31188	49859	77752	101515	123657	138583
	Office	Sales	9565	15804	20988	25254	28062	29853
		Stock	76672	127350	192299	246767	297770	334683
	Retail	Sales	5114	8446	11218	13495	14988	15936
		Stock	40323	66995	101138	129768	156578	175992
TOTAL (Sales kW)			17744	29289	39050	47020	52202	55470
TOTAL (Stock kW)			148183	244205	371189	478049	578005	649257

Total Number of Room Air Conditioning Units for malta

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	667	1016	1444	1794	2007	2132
		Stock	7709	12567	18946	26419	33024	37524
	Office	Sales	333	508	722	897	1004	1066
		Stock	3855	6283	9473	13209	16512	18762
	Retail	Sales	626	942	1324	1624	1795	1882
		Stock	3855	6283	9473	13209	16512	18762
Reversible Split	Residential	Sales	2165	2774	2987	3081	3100	3142
		Stock	12986	23225	31177	35203	36642	37220
	Office	Sales	4097	5301	5708	5889	5923	6005
		Stock	24534	44074	59419	67267	70025	71131
	Retail	Sales	611	790	851	878	883	895
		Stock	3657	6569	8856	10026	10437	10602
Cooling Only Split	Residential	Sales	337	0	0	0	0	0
		Stock	4352	4212	1965	215	0	0
	Office	Sales	685	0	0	0	0	0
		Stock	8569	8370	3955	437	0	0
	Retail	Sales	102	0	0	0	0	0
		Stock	1277	1247	590	65	0	0
Total	Residential	Sales	3169	3790	4431	4875	5107	5274
		Stock	25047	40004	52087	61837	69665	74744
	Office	Sales	5115	5809	6431	6785	6927	7071
		Stock	36957	58728	72847	80913	86537	89893
	Retail	Sales	1339	1732	2175	2501	2678	2777
		Stock	8788	14100	18919	23300	26949	29364
TOTAL sales			9623	11332	13036	14162	14711	15122
TOTAL stock			70792	112831	143853	166051	183151	194000

Total Cooling Capacity (kW) of Room Air Conditioning Units for malta

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	1979	3016	4289	5325	5959	6329
		Stock	22890	37311	56253	78440	98050	111412
	Office	Sales	990	1508	2144	2663	2980	3164
		Stock	11445	18656	28126	39220	49025	55706
	Retail	Sales	1858	2798	3930	4821	5329	5588
		Stock	11445	18656	28126	39220	49025	55706
Reversible Split	Residential	Sales	11186	14334	15434	15921	16016	16236
		Stock	67098	120008	161094	181898	189332	192320
	Office	Sales	21168	27393	29496	30427	30607	31028
		Stock	126770	227738	307024	347578	361830	367541
	Retail	Sales	3155	4083	4396	4535	4562	4625
		Stock	18894	33943	45760	51805	53929	54780
Cooling Only Split	Residential	Sales	1743	0	0	0	0	0
		Stock	22485	21765	10152	1111	0	0
	Office	Sales	3541	0	0	0	0	0
		Stock	44275	43248	20438	2257	0	0
	Retail	Sales	528	0	0	0	0	0
		Stock	6599	6446	3046	336	0	0
Total	Residential	Sales	14909	17350	19722	21247	21975	22565
		Stock	112473	179084	227498	261449	287382	303732
	Office	Sales	25699	28901	31640	33089	33587	34193
		Stock	182490	289642	355588	389055	410855	423247
	Retail	Sales	5541	6881	8327	9356	9890	10213
		Stock	36938	59045	76933	91361	102954	110486
TOTAL (Sales kW)			46148	53132	59689	63692	65452	66970
TOTAL (Stock kW)			331901	527770	660018	741865	801191	837464

Total Number of Room Air Conditioning Units for netherlands

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	18174	29693	41406	50274	55364	58197
		Stock	230471	357922	572028	756326	927519	1037332
	Office	Sales	2380	3888	5422	6583	7250	7621
		Stock	30181	46871	74908	99043	121461	135841
	Retail	Sales	2031	3279	4518	5418	5893	6118
		Stock	13719	21305	34049	45019	55209	61746
Reversible Split	Residential	Sales	7825	14949	19832	23859	26517	28216
		Stock	53562	102474	170948	229397	277938	312445
	Office	Sales	45477	86876	115251	138653	154101	163974
		Stock	311273	595524	993459	1333134	1615231	1815765
	Retail	Sales	24023	45891	60880	73241	81402	86617
		Stock	164425	314577	524780	704209	853222	959151
Cooling Only Split	Residential	Sales	1220	0	0	0	0	0
		Stock	18088	16786	8816	1059	0	0
	Office	Sales	7088	0	0	0	0	0
		Stock	105119	97552	51234	6157	0	0
	Retail	Sales	3744	0	0	0	0	0
		Stock	55528	51530	27064	3252	0	0
Total	Residential	Sales	27219	44642	61238	74132	81880	86413
		Stock	302121	477182	751792	986783	1205458	1349777
	Office	Sales	54945	90764	120673	145237	161351	171595
		Stock	446573	739946	1119601	1438334	1736692	1951606
	Retail	Sales	29798	49170	65397	78660	87295	92735
		Stock	233672	387412	585893	752480	908432	1020897
TOTAL sales			111961	184577	247309	298029	330526	350743
TOTAL stock			982365	1604540	2457287	3177597	3850581	4322280

Total Cooling Capacity (kW) of Room Air Conditioning Units for netherlands

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	47615	77796	108485	131718	145053	152477
		Stock	603834	937755	1498714	1981575	2430100	2717810
	Office	Sales	6235	10188	14206	17249	18995	19967
		Stock	79073	122801	196260	259492	318227	355904
	Retail	Sales	5322	8591	11836	14196	15441	16028
		Stock	35942	55819	89209	117951	144649	161774
Reversible Split	Residential	Sales	45776	87448	116009	139565	155115	165053
		Stock	313320	599442	999995	1341904	1625857	1827710
	Office	Sales	266028	508199	674184	811079	901445	959202
		Stock	1820853	3483638	5811441	7798437	9448622	10621684
	Retail	Sales	140525	268449	356128	428441	476175	506684
		Stock	961839	1840181	3069809	4119411	4991097	5610750
Cooling Only Split	Residential	Sales	7135	0	0	0	0	0
		Stock	105811	98194	51571	6197	0	0
	Office	Sales	41462	0	0	0	0	0
		Stock	614917	570649	299703	36016	0	0
	Retail	Sales	21902	0	0	0	0	0
		Stock	324821	301437	158314	19025	0	0
Total	Residential	Sales	100526	165243	224494	271283	300168	317530
		Stock	1022965	1635390	2550279	3329677	4055957	4545520
	Office	Sales	313725	518387	688391	828328	920440	979169
		Stock	2514843	4177088	6307404	8093945	9766849	10977587
	Retail	Sales	167749	277040	367965	442637	491616	522713
		Stock	1322602	2197437	3317332	4256387	5135746	5772525
TOTAL (Sales kW)			581999	960670	1280849	1542247	1712223	1819411
TOTAL (Stock kW)			4860410	8009915	12175015	15680009	18958553	21295632

Total Number of Room Air Conditioning Units for poland

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	2945	2149	2917	2149	2917	2149
		Stock	49863	48776	49414	47235	49208	47238
	Office	Sales	386	281	382	281	382	281
		Stock	6530	6387	6471	6185	6444	6186
	Retail	Sales	329	237	318	232	311	226
		Stock	2968	2903	2941	2812	2929	2812
Reversible Split	Residential	Sales	1450	2671	3941	4332	4527	4627
		Stock	11473	18728	30172	43143	50863	53821
	Office	Sales	7638	15651	21037	23126	24166	24700
		Stock	60459	103807	168323	235956	271827	287292
	Retail	Sales	4630	9488	12753	14020	14650	14974
		Stock	36652	62931	102042	143044	164790	174165
Cooling Only Split	Residential	Sales	746	634	0	0	0	0
		Stock	5364	7912	7433	3528	433	0
	Office	Sales	4082	1991	0	0	0	0
		Stock	29347	39837	32524	12151	1360	0
	Retail	Sales	2475	1207	0	0	0	0
		Stock	17791	24150	19717	7366	825	0
Total	Residential	Sales	5141	5454	6858	6482	7444	6777
		Stock	66701	75415	87019	93905	100505	101058
	Office	Sales	12106	17924	21419	23408	24548	24981
		Stock	96336	150032	207318	254293	279631	293477
	Retail	Sales	7434	10933	13072	14251	14961	15200
		Stock	57411	89985	124700	153222	168543	176976
TOTAL sales			24681	34311	41349	44141	46953	46958
TOTAL stock			220447	315432	419037	501419	548679	571512

Total Cooling Capacity (kW) of Room Air Conditioning Units for poland

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	7385	5389	7314	5390	7315	5390
		Stock	125031	122307	123906	118441	123390	118448
	Office	Sales	967	706	958	706	958	706
		Stock	16373	16016	16226	15510	16158	15511
	Retail	Sales	825	595	798	581	779	567
		Stock	7442	7280	7375	7050	7345	7050
Reversible Split	Residential	Sales	7552	13915	20533	22572	23587	24108
		Stock	59777	97571	157198	224773	264996	280407
	Office	Sales	39795	81543	109605	120488	125904	128687
		Stock	314990	540836	876962	1229333	1416219	1496789
	Retail	Sales	24125	49434	66446	73043	76327	78014
		Stock	190956	327871	531640	745258	858554	907398
Cooling Only Split	Residential	Sales	3888	3305	0	0	0	0
		Stock	27947	41219	38725	18380	2258	0
	Office	Sales	21269	10374	0	0	0	0
		Stock	152900	207551	169450	63307	7086	0
	Retail	Sales	12894	6289	0	0	0	0
		Stock	92692	125823	102725	38379	4296	0
Total	Residential	Sales	18824	22608	27848	27962	30901	29498
		Stock	212756	261097	319829	361593	390644	398855
	Office	Sales	62031	92623	110562	121194	126862	129393
		Stock	484262	764403	1062637	1308150	1439463	1512300
	Retail	Sales	37844	56318	67244	73624	77106	78580
		Stock	291091	460974	641741	790686	870194	914448
TOTAL (Sales kW)			118699	171550	205654	222779	234869	237471
TOTAL (Stock kW)			988109	1486475	2024206	2460429	2700301	2825604

Total Number of Room Air Conditioning Units for portugal

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	1	1	1	1	1	1
		Stock	20	16	18	19	19	19
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	56	72	69	71	67	69
		Stock	779	634	716	731	755	731
Reversible Split	Residential	Sales	7199	12351	14394	15612	16162	16454
		Stock	54814	92846	134891	167823	184139	192513
	Office	Sales	39637	68679	80036	86812	89871	91495
		Stock	301241	512774	748307	933074	1023914	1070479
	Retail	Sales	11271	19530	22759	24686	25556	26018
		Stock	85661	145813	212789	265329	291160	304401
Cooling Only Split	Residential	Sales	1122	0	0	0	0	0
		Stock	20343	18009	7118	915	0	0
	Office	Sales	6631	0	0	0	0	0
		Stock	116390	103921	41722	5406	0	0
	Retail	Sales	1885	0	0	0	0	0
		Stock	33097	29551	11864	1537	0	0
Total	Residential	Sales	8321	12352	14395	15613	16163	16455
		Stock	75177	110872	142028	168756	184159	192532
	Office	Sales	46268	68679	80036	86812	89871	91495
		Stock	417631	616695	790029	938480	1023914	1070479
	Retail	Sales	13213	19602	22828	24757	25623	26086
		Stock	119537	175998	225369	267598	291915	305133
TOTAL sales			67802	100634	117258	127182	131657	134037
TOTAL stock			612345	903564	1157426	1374833	1499988	1568144

Total Cooling Capacity (kW) of Room Air Conditioning Units for portugal

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	2	2	2	2	2	2
		Stock	40	33	37	38	39	38
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	113	145	138	141	134	138
		Stock	1558	1268	1432	1463	1510	1463
Reversible Split	Residential	Sales	30586	52477	61155	66333	68670	69911
		Stock	232893	394481	573121	713038	782364	817944
	Office	Sales	168408	291802	340054	368845	381841	388741
		Stock	1279901	2178655	3179379	3964409	4350368	4548210
	Retail	Sales	47889	82977	96698	104885	108580	110543
		Stock	363953	619523	904089	1127320	1237071	1293330
Cooling Only Split	Residential	Sales	4767	0	0	0	0	0
		Stock	86433	76518	30245	3886	0	0
	Office	Sales	28172	0	0	0	0	0
		Stock	494515	441536	177266	22968	0	0
	Retail	Sales	8011	0	0	0	0	0
		Stock	140620	125555	50407	6531	0	0
Total	Residential	Sales	35354	52479	61157	66335	68672	69913
		Stock	319365	471031	603402	716962	782403	817981
	Office	Sales	196580	291802	340054	368845	381841	388741
		Stock	1774416	2620191	3356645	3987378	4350368	4548210
	Retail	Sales	56012	83122	96836	105026	108715	110680
		Stock	506131	746346	955928	1135314	1238581	1294792
TOTAL (Sales kW)			287947	427403	498046	540206	559227	569335
TOTAL (Stock kW)			2599912	3837568	4915976	5839654	6371352	6660983

Total Number of Room Air Conditioning Units for romania

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	35996	54850	77997	96855	108384	115103
		Stock	416310	678593	1023091	1426618	1783278	2026293
	Office	Sales	17998	27425	38999	48428	54192	57552
		Stock	208155	339297	511545	713309	891639	1013147
	Retail	Sales	33795	50883	71484	87686	96913	101636
		Stock	208155	339297	511545	713309	891639	1013147
Reversible Split	Residential	Sales	116901	149800	161295	166386	167373	169676
		Stock	701218	1254162	1683540	1900959	1978646	2009874
	Office	Sales	221220	286280	308248	317979	319865	324266
		Stock	1324832	2380022	3208609	3632432	3781369	3841050
	Retail	Sales	32972	42668	45943	47393	47674	48330
		Stock	197458	354728	478224	541393	563591	572486
Cooling Only Split	Residential	Sales	18220	0	0	0	0	0
		Stock	234984	227457	106090	11610	0	0
	Office	Sales	37006	0	0	0	0	0
		Stock	462707	451974	213586	23582	0	0
	Retail	Sales	5516	0	0	0	0	0
		Stock	68964	67364	31834	3515	0	0
Total	Residential	Sales	171116	204650	239292	263242	275757	284779
		Stock	1352512	2160212	2812721	3339188	3761923	4036167
	Office	Sales	276225	313706	347247	366407	374057	381817
		Stock	1995694	3171293	3933741	4369323	4673008	4854196
	Retail	Sales	72282	93551	117427	135079	144587	149966
		Stock	474577	761389	1021604	1258217	1455230	1585632
TOTAL sales			519623	611907	703966	764728	794401	816562
TOTAL stock			3822784	6092893	7768065	8966728	9890161	10475996

Total Cooling Capacity (kW) of Room Air Conditioning Units for romania

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	106876	162856	231581	287572	321802	341752
		Stock	1236061	2014805	3037649	4235759	5294713	6016248
	Office	Sales	53438	81428	115790	143786	160901	170876
		Stock	618031	1007402	1518825	2117879	2647357	3008124
	Retail	Sales	100339	151076	212244	260348	287744	301766
		Stock	618031	1007402	1518825	2117879	2647357	3008124
Reversible Split	Residential	Sales	604040	774033	833430	859739	864838	876736
		Stock	3623283	6480412	8699063	9822497	10223911	10385273
	Office	Sales	1143073	1479247	1592759	1643038	1652782	1675521
		Stock	6845575	12297874	16579289	18769232	19538810	19847187
	Retail	Sales	170368	220473	237391	244885	246338	249727
		Stock	1020293	1832926	2471046	2797444	2912145	2958107
Cooling Only Split	Residential	Sales	94143	0	0	0	0	0
		Stock	1214194	1175298	548182	59993	0	0
	Office	Sales	191217	0	0	0	0	0
		Stock	2390866	2335407	1103626	121853	0	0
	Retail	Sales	28500	0	0	0	0	0
		Stock	356345	348079	164489	18162	0	0
Total	Residential	Sales	805059	936889	1065011	1147311	1186639	1218488
		Stock	6073538	9670514	12284894	14118248	15518624	16401521
	Office	Sales	1387728	1560674	1708549	1786824	1813683	1846397
		Stock	9854472	15640684	19201739	21008965	22186167	22855311
	Retail	Sales	299207	371549	449635	505234	534081	551492
		Stock	1994668	3188407	4154360	4933485	5559502	5966231
TOTAL (Sales kW)			2491994	2869112	3223195	3439369	3534404	3616377
TOTAL (Stock kW)			17922678	28499605	35640992	40060698	43264293	45223064

Total Number of Room Air Conditioning Units for slovakia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	8999	13713	19499	24214	27096	28776
		Stock	104077	169648	255773	356655	445819	506573
	Office	Sales	4500	6856	9750	12107	13548	14388
		Stock	52039	84824	127886	178327	222910	253287
	Retail	Sales	8449	12721	17871	21922	24228	25409
		Stock	52039	84824	127886	178327	222910	253287
Reversible Split	Residential	Sales	29225	37450	40324	41597	41843	42419
		Stock	175305	313540	420885	475240	494661	502469
	Office	Sales	55305	71570	77062	79495	79966	81066
		Stock	331208	595006	802152	908108	945342	960262
	Retail	Sales	8243	10667	11486	11848	11918	12082
		Stock	49365	88682	119556	135348	140898	143121
Cooling Only Split	Residential	Sales	4555	0	0	0	0	0
		Stock	58746	56864	26523	2903	0	0
	Office	Sales	9252	0	0	0	0	0
		Stock	115677	112994	53397	5896	0	0
	Retail	Sales	1379	0	0	0	0	0
		Stock	17241	16841	7958	879	0	0
Total	Residential	Sales	42779	51162	59823	65810	68939	71195
		Stock	338128	540053	703180	834797	940481	1009042
	Office	Sales	69056	78426	86812	91602	93514	95454
		Stock	498924	792823	983435	1092331	1168252	1213549
	Retail	Sales	18070	23388	29357	33770	36147	37491
		Stock	118644	190347	255401	314554	363807	396408
TOTAL sales			129906	152977	175991	191182	198600	204140
TOTAL stock			955696	1523223	1942016	2241682	2472540	2618999

Total Cooling Capacity (kW) of Room Air Conditioning Units for slovakia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	26719	40714	57895	71893	80450	85438
		Stock	309015	503701	759412	1058940	1323678	1504062
	Office	Sales	13360	20357	28948	35947	40225	42719
		Stock	154508	251851	379706	529470	661839	752031
	Retail	Sales	25085	37769	53061	65087	71936	75441
		Stock	154508	251851	379706	529470	661839	752031
Reversible Split	Residential	Sales	151010	193508	208357	214935	216209	219184
		Stock	905821	1620103	2174766	2455624	2555978	2596318
	Office	Sales	285768	369812	398190	410760	413196	418880
		Stock	1711394	3074469	4144822	4692308	4884703	4961797
	Retail	Sales	42592	55118	59348	61221	61584	62432
		Stock	255073	458232	617762	699361	728036	739527
Cooling Only Split	Residential	Sales	23536	0	0	0	0	0
		Stock	303549	293824	137045	14998	0	0
	Office	Sales	47804	0	0	0	0	0
		Stock	597717	583852	275906	30463	0	0
	Retail	Sales	7125	0	0	0	0	0
		Stock	89086	87020	41122	4540	0	0
Total	Residential	Sales	201265	234222	266253	286828	296660	304622
		Stock	1518384	2417628	3071223	3529562	3879656	4100380
	Office	Sales	346932	390169	427137	446706	453421	461599
		Stock	2463618	3910171	4800435	5252241	5546542	5713828
	Retail	Sales	74802	92887	112409	126308	133520	137873
		Stock	498667	797102	1038590	1233371	1389875	1491558
TOTAL (Sales kW)			622999	717278	805799	859842	883601	904094
TOTAL (Stock kW)			4480669	7124901	8910248	10015175	10816073	11305766

Total Number of Room Air Conditioning Units for slovenia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	3333	5079	7222	8968	10036	10658
		Stock	38547	62833	94731	132094	165118	187620
	Office	Sales	1666	2539	3611	4484	5018	5329
		Stock	19274	31416	47365	66047	82559	93810
	Retail	Sales	3129	4711	6619	8119	8973	9411
		Stock	19274	31416	47365	66047	82559	93810
Reversible Split	Residential	Sales	10824	13870	14935	15406	15498	15711
		Stock	64928	116126	155883	176015	183208	186099
	Office	Sales	20483	26507	28542	29443	29617	30025
		Stock	122670	220372	297093	336336	350127	355653
	Retail	Sales	3053	3951	4254	4388	4414	4475
		Stock	18283	32845	44280	50129	52184	53008
Cooling Only Split	Residential	Sales	1687	0	0	0	0	0
		Stock	21758	21061	9823	1075	0	0
	Office	Sales	3427	0	0	0	0	0
		Stock	42843	41849	19776	2184	0	0
	Retail	Sales	511	0	0	0	0	0
		Stock	6386	6237	2948	325	0	0
Total	Residential	Sales	15844	18949	22157	24374	25533	26368
		Stock	125233	200020	260437	309184	348326	373719
	Office	Sales	25576	29047	32153	33927	34635	35353
		Stock	184786	293638	364235	404567	432686	449463
	Retail	Sales	6693	8662	10873	12507	13388	13886
		Stock	43942	70499	94593	116502	134743	146818
TOTAL sales			48113	56658	65182	70808	73556	75608
TOTAL stock			353961	564157	719265	830253	915756	970000

Total Cooling Capacity (kW) of Room Air Conditioning Units for slovenia

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	9896	15079	21443	26627	29796	31644
		Stock	114450	186556	281264	392200	490251	557060
	Office	Sales	4948	7540	10721	13314	14898	15822
		Stock	57225	93278	140632	196100	245126	278530
	Retail	Sales	9291	13988	19652	24106	26643	27941
		Stock	57225	93278	140632	196100	245126	278530
Reversible Split	Residential	Sales	55930	71670	77169	79605	80078	81179
		Stock	335489	600038	805469	909490	946658	961599
	Office	Sales	105840	136967	147478	152133	153035	155141
		Stock	633850	1138692	1535119	1737892	1809149	1837703
	Retail	Sales	15775	20414	21981	22675	22809	23123
		Stock	94472	169715	228801	259023	269643	273899
Cooling Only Split	Residential	Sales	8717	0	0	0	0	0
		Stock	112425	108824	50758	5555	0	0
	Office	Sales	17705	0	0	0	0	0
		Stock	221376	216241	102188	11283	0	0
	Retail	Sales	2639	0	0	0	0	0
		Stock	32995	32230	15230	1682	0	0
Total	Residential	Sales	74543	86749	98612	106233	109874	112823
		Stock	562365	895418	1137490	1307245	1436910	1518659
	Office	Sales	128493	144507	158199	165447	167934	170963
		Stock	912451	1448211	1777939	1945275	2054275	2116233
	Retail	Sales	27704	34403	41633	46781	49452	51064
		Stock	184691	295223	384663	456804	514769	552429
TOTAL (Sales kW)			230740	265659	298444	318460	327260	334850
TOTAL (Stock kW)			1659507	2638852	3300092	3709324	4005953	4187321

Total Number of Room Air Conditioning Units for spain

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	431	636	679	680	693	685
		Stock	6992	9561	11527	12689	13033	13099
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
Reversible Split	Residential	Sales	506409	872256	1016490	1102553	1141400	1162027
		Stock	3443506	6361481	9499838	11851266	13004130	13595519
	Office	Sales	209255	385206	448903	486909	504065	513175
		Stock	1404838	2686885	4131177	5229713	5742886	6004055
	Retail	Sales	47398	87252	101680	110289	114175	116238
		Stock	318208	608602	935747	1184574	1300812	1359969
Cooling Only Split	Residential	Sales	81209	0	0	0	0	0
		Stock	1264387	1189859	500647	66208	0	0
	Office	Sales	50249	0	0	0	0	0
		Stock	663841	655803	298111	40967	0	0
	Retail	Sales	11382	0	0	0	0	0
		Stock	150366	148545	67525	9279	0	0
Total	Residential	Sales	588049	872891	1017169	1103233	1142093	1162712
		Stock	4714885	7560901	10012012	11930163	13017163	13608618
	Office	Sales	259504	385206	448903	486909	504065	513175
		Stock	2068679	3342688	4429288	5270680	5742886	6004055
	Retail	Sales	58780	87252	101680	110289	114175	116238
		Stock	468573	757147	1003271	1193854	1300812	1359969
TOTAL sales			906332	1345349	1567752	1700432	1760333	1792125
TOTAL stock			7252137	11660736	15444571	18394697	20060861	20972642

Total Cooling Capacity (kW) of Room Air Conditioning Units for spain

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	1032	1523	1626	1630	1660	1640
		Stock	16745	22897	27608	30390	31213	31372
	Office	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
	Retail	Sales	0	0	0	0	0	0
		Stock	0	0	0	0	0	0
Reversible Split	Residential	Sales	2896661	4989302	5814323	6306601	6528805	6646794
		Stock	19696853	36387671	54339072	67789244	74383624	77766366
	Office	Sales	1196937	2203376	2567722	2785122	2883252	2935358
		Stock	8035672	15368981	23630331	29913958	32849308	34343195
	Retail	Sales	271116	499083	581611	630854	653081	664883
		Stock	1820148	3481204	5352470	6775765	7440646	7779024
Cooling Only Split	Residential	Sales	464513	0	0	0	0	0
		Stock	7232296	6805995	2863701	378710	0	0
	Office	Sales	287425	0	0	0	0	0
		Stock	3797171	3751193	1705196	234333	0	0
	Retail	Sales	65104	0	0	0	0	0
		Stock	860091	849677	386241	53078	0	0
Total	Residential	Sales	3362206	4990824	5815949	6308230	6530466	6648434
		Stock	26945895	43216563	57230381	68198344	74414837	77797739
	Office	Sales	1484362	2203376	2567722	2785122	2883252	2935358
		Stock	11832843	19120175	25335527	30148290	32849308	34343195
	Retail	Sales	336221	499083	581611	630854	653081	664883
		Stock	2680239	4330881	5738711	6828843	7440646	7779024
TOTAL (Sales kW)			5182789	7693284	8965282	9724206	10066799	10248676
TOTAL (Stock kW)			41458977	66667619	88304619	105175477	114704791	119919958

Total Number of Room Air Conditioning Units for sweden

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	13384	22128	30760	37222	40896	42928
		Stock	127261	244386	406713	561784	686949	766506
	Office	Sales	1753	2898	4028	4874	5355	5621
		Stock	16665	32003	53260	73567	89958	100376
	Retail	Sales	1496	2444	3356	4012	4353	4513
		Stock	7575	14547	24209	33440	40890	45625
Reversible Split	Residential	Sales	1641	3472	4606	5541	6159	6553
		Stock	11158	21823	37651	53224	64552	72566
	Office	Sales	10228	20177	26767	32202	35790	38083
		Stock	70525	132584	221958	309522	375141	421715
	Retail	Sales	5403	10658	14139	17010	18906	20117
		Stock	37254	70036	117246	163500	198163	222765
Cooling Only Split	Residential	Sales	459	0	0	0	0	0
		Stock	5987	5732	2687	399	0	0
	Office	Sales	1980	0	0	0	0	0
		Stock	29594	27107	11917	1720	0	0
	Retail	Sales	1046	0	0	0	0	0
		Stock	15633	14319	6295	909	0	0
Total	Residential	Sales	15485	25600	35366	42763	47054	49481
		Stock	144406	271942	447051	615407	751501	839072
	Office	Sales	13961	23075	30795	37077	41146	43705
		Stock	116784	191694	287135	384809	465099	522091
	Retail	Sales	7945	13102	17496	21022	23259	24630
		Stock	60462	98901	147750	197849	239053	268390
TOTAL sales			37391	61777	83657	100862	111459	117815
TOTAL stock			321652	562537	881936	1198065	1455652	1629554

Total Cooling Capacity (kW) of Room Air Conditioning Units for sweden

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	35067	57976	80591	97521	107147	112471
		Stock	333423	640291	1065588	1471874	1799806	2008247
	Office	Sales	4592	7592	10554	12771	14031	14728
		Stock	43663	83848	139541	192745	235689	262985
	Retail	Sales	3919	6403	8793	10511	11406	11823
		Stock	19847	38113	63428	87612	107131	119539
Reversible Split	Residential	Sales	9602	20310	26943	32414	36026	38334
		Stock	65269	127660	220247	311347	377609	424490
	Office	Sales	59830	118030	156581	188375	209363	222777
		Stock	412552	775578	1298389	1810610	2194463	2466909
	Retail	Sales	31605	62348	82712	99506	110593	117679
		Stock	217924	409688	685855	956428	1159193	1303109
Cooling Only Split	Residential	Sales	2687	0	0	0	0	0
		Stock	35023	33533	15718	2334	0	0
	Office	Sales	11585	0	0	0	0	0
		Stock	173117	158567	69710	10063	0	0
	Retail	Sales	6120	0	0	0	0	0
		Stock	91446	83761	36823	5316	0	0
Total	Residential	Sales	47356	78286	107534	129935	143173	150805
		Stock	433715	801484	1301554	1785554	2177415	2432737
	Office	Sales	76007	125623	167134	201145	223394	237505
		Stock	629331	1017992	1507640	2013418	2430152	2729894
	Retail	Sales	41643	68751	91505	110017	121998	129501
		Stock	329217	531561	786106	1049356	1266325	1422648
TOTAL (Sales kW)			165007	272660	366173	441097	488565	517811
TOTAL (Stock kW)			1392263	2351037	3595300	4848328	5873892	6585278

Total Number of Room Air Conditioning Units for uk

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	89279	147604	205178	248281	272789	286342
		Stock	848872	1630135	2712910	3747283	4582176	5112851
	Office	Sales	11691	19329	26869	32513	35722	37497
		Stock	111162	213470	355262	490716	600047	669540
	Retail	Sales	9978	16301	22386	26759	29038	30100
		Stock	50528	97032	161483	223053	272749	304336
Reversible Split	Residential	Sales	16013	33870	44933	54056	60079	63928
		Stock	108847	212894	367299	519224	629726	707907
	Office	Sales	99777	196835	261125	314147	349147	371517
		Stock	687999	1293405	2165281	3019495	3659634	4113984
	Retail	Sales	52706	103975	137935	165943	184432	196249
		Stock	363425	683223	1143778	1595004	1933149	2173152
Cooling Only Split	Residential	Sales	4480	0	0	0	0	0
		Stock	58407	55922	26213	3892	0	0
	Office	Sales	19320	0	0	0	0	0
		Stock	288701	264437	116253	16782	0	0
	Retail	Sales	10205	0	0	0	0	0
		Stock	152502	139685	61409	8865	0	0
Total	Residential	Sales	109772	181474	250111	302337	332868	350271
		Stock	1016125	1898951	3106422	4270398	5211902	5820758
	Office	Sales	130788	216165	287993	346659	384869	409015
		Stock	1087861	1771312	2636795	3526992	4259681	4783524
	Retail	Sales	72889	120276	160322	192702	213470	226349
		Stock	566455	919939	1366670	1826922	2205897	2477489
TOTAL sales			313449	517915	698426	841699	931207	985634
TOTAL stock			2670442	4590202	7109887	9624312	11677481	13081771

Total Cooling Capacity (kW) of Room Air Conditioning Units for uk

			2005	2010	2015	2020	2025	2030
Moveables	Residential	Sales	233910	386722	537567	650495	714707	750217
		Stock	2224044	4270953	7107825	9817882	12005301	13395669
	Office	Sales	30631	50642	70396	85184	93593	98243
		Stock	291244	559291	930787	1285675	1572123	1754195
	Retail	Sales	26143	42708	58652	70109	76079	78862
		Stock	132384	254223	423085	584398	714601	797361
Reversible Split	Residential	Sales	93672	198130	262843	316213	351444	373961
		Stock	636721	1245368	2148592	3037303	3683710	4141048
	Office	Sales	583667	1151429	1527502	1837664	2042406	2173266
		Stock	4024588	7566036	12666247	17663146	21407773	24065583
	Retail	Sales	308313	608226	806881	970719	1078871	1147996
		Stock	2125930	3996649	6690762	9330301	11308345	12712295
Cooling Only Split	Residential	Sales	26208	0	0	0	0	0
		Stock	341662	327125	153336	22765	0	0
	Office	Sales	113014	0	0	0	0	0
		Stock	1688814	1546877	680044	98169	0	0
	Retail	Sales	59698	0	0	0	0	0
		Stock	892092	817115	359223	51856	0	0
Total	Residential	Sales	353790	584853	800409	966708	1066151	1124178
		Stock	3202427	5843446	9409753	12877951	15689011	17536717
	Office	Sales	727312	1202071	1597897	1922848	2135999	2271509
		Stock	6004646	9672204	14277078	19046990	22979896	25819778
	Retail	Sales	394155	650934	865533	1040828	1154951	1226858
		Stock	3150406	5067987	7473070	9966555	12022947	13509656
TOTAL (Sales kW)			1475256	2437857	3263839	3930384	4357100	4622545
TOTAL (Stock kW)			12357479	20583637	31159901	41891496	50691853	56866151

Appendix C - Air conditioners, Japanese Market

The Japanese market for residential air conditioners is mature, unlike the rapidly growing European market.

Although there is an overlap in capacities of equipment for residential and commercial use, the markets – and the products offered are distinct. Typically they are sold through different routes (via stores to households and through agents or distributors to businesses); developed to match the differing customer needs in terns of balancing cost, performance and installation method; and – in the case of at least one manufacturer – manufactured in separate factories. Residential indoor units are overwhelmingly wall-mounted, while commercial units are predominantly cassette-type. Most residential units are below 3 kW cooling capacity, while most commercial units are over 8 kW. But less than 30 kW. About half the commercial units sold have capacities below 12kW.

The residential market is large, competitive and subject to demanding energy-efficiency targets. There is competition between several strong manufacturers, each with substantial design and development teams who design all significant components of the product – bought-in components are rare.

Residential sales are around 7M units per annum, ownership is over 2 units per household with around 85% of households owning at least one unit. (Sales of air conditioners to businesses are less than 1M per year).

A significant market started in the 1970s but only really started to grow a decade later. Nevertheless many owners are buying for a second or third time. Their decision is not whether or not to make a first purchase, but which model to buy to replace an existing unit or whether to buy an additional one. This is more akin to the European car market and the manufacturers' sales propositions have some similarities with this. In particular, there are both basic models and "high-range" models available. The latter tend to have additional consumer features (including – in Japan – high energy efficiencies).

Product life for residential units is estimated to be about 12 years based on analysis of recycled products. For commercial units it is thought to be about 10 to 15 years. From official figures of household numbers, historical air-conditioning ownership and sales we can estimate that the average product life is about 10 or 11 years.

Official statistics show that 62% of replacement purchases are the result of breakdown, 13% as upgrades, 16% because of moving house and 10% other reasons. If we assume that "upgrades" and "moving house" are independent of "failure", this implies a typical in-use life of around 8 years before replacement for upgrade, and 6 years before replacement because of moving house. However, according to one manufacturer, 53% of sales are for replacement (26% extra unit, 21% first purchase). The replacement sales broke down as 16% because of failure. 24% where "old and unsatisfied (problems with noise, odour, high consumption), 13% other.

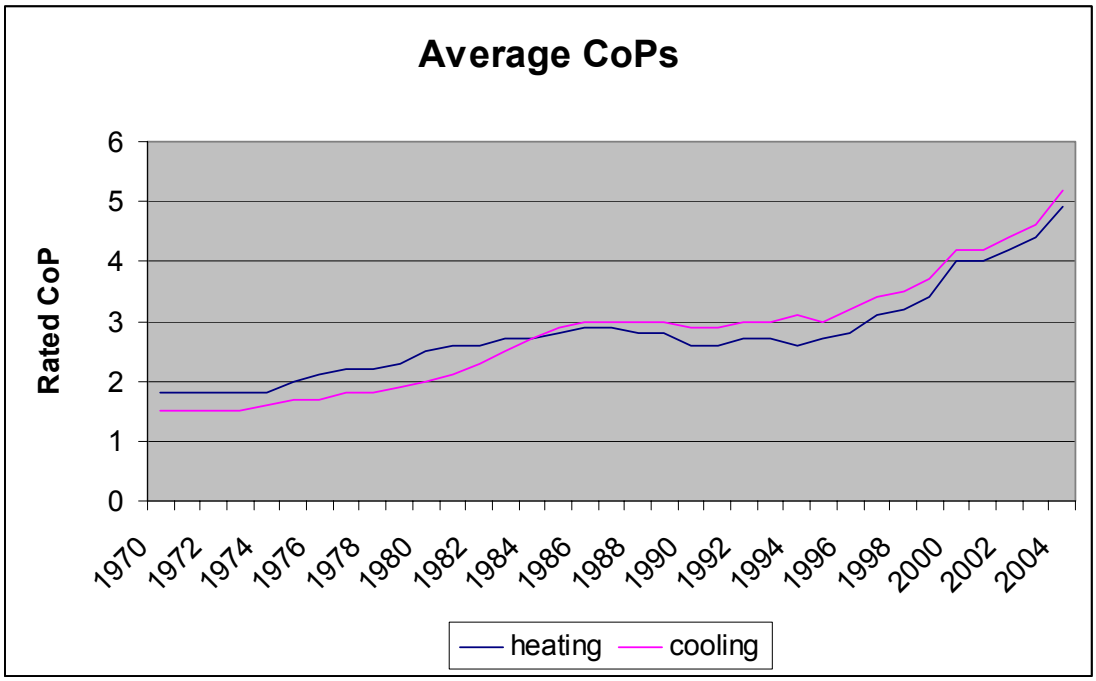
The high ownership notwithstanding, there is significant dissatisfaction with the comfort conditions provided, with around 25% of users being unhappy about temperature distribution and 10 to 15% unhappy about moisture levels. To some extent, the temperature problems are likely to result from unit location without appreciation of likely air distribution.

Under the influence of the rather demanding "top-runner" programme, average efficiencies have moved well ahead of European practice.

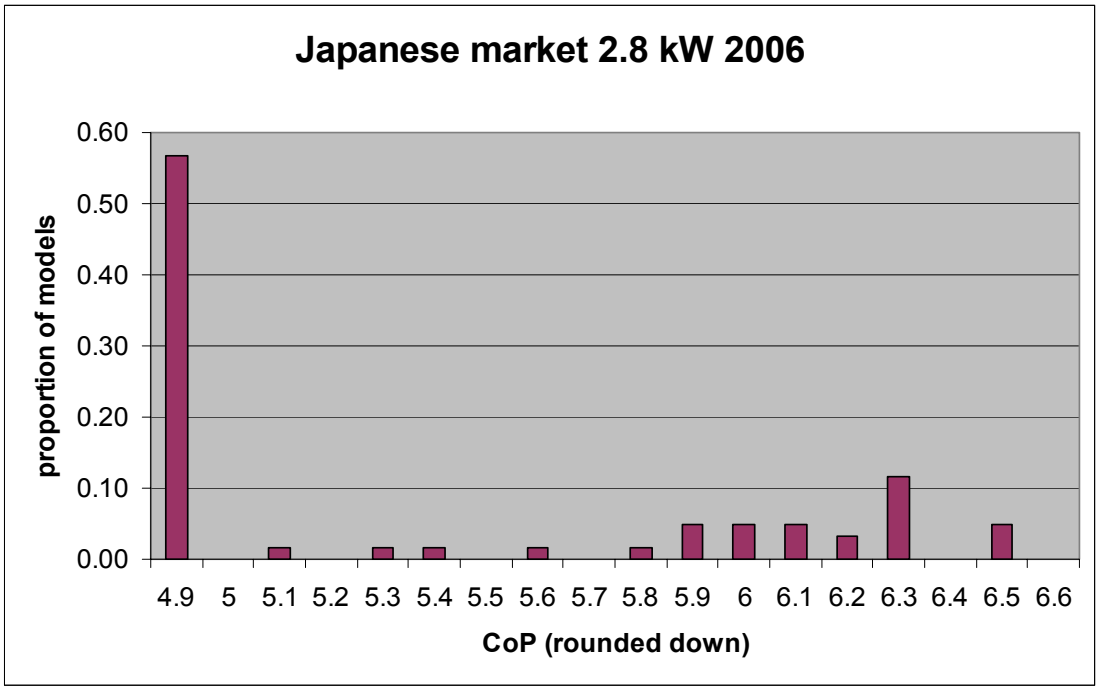
The principle of the top-runner programme is that the future requirement for sales-weighted performance is set by the best-performing model on the market. Currently the performance index used is an average of the cooling and heating efficiencies at rated output. (Heating and cooling demands are both important over much of Japan and products invariably have heat pump capability). However this basis is changing to a seasonal performance calculation that includes part-load performance.

The frequency of model redesign is important when considering new regulations. This varies with the market. For small capacity residential units where competition is intense, a "new" model each year is typical – but this probably represents a significant redesign about every three years. For the less competitive sectors (larger residential units, commercial market), models have longer production lives – typically 5 to 10 years.

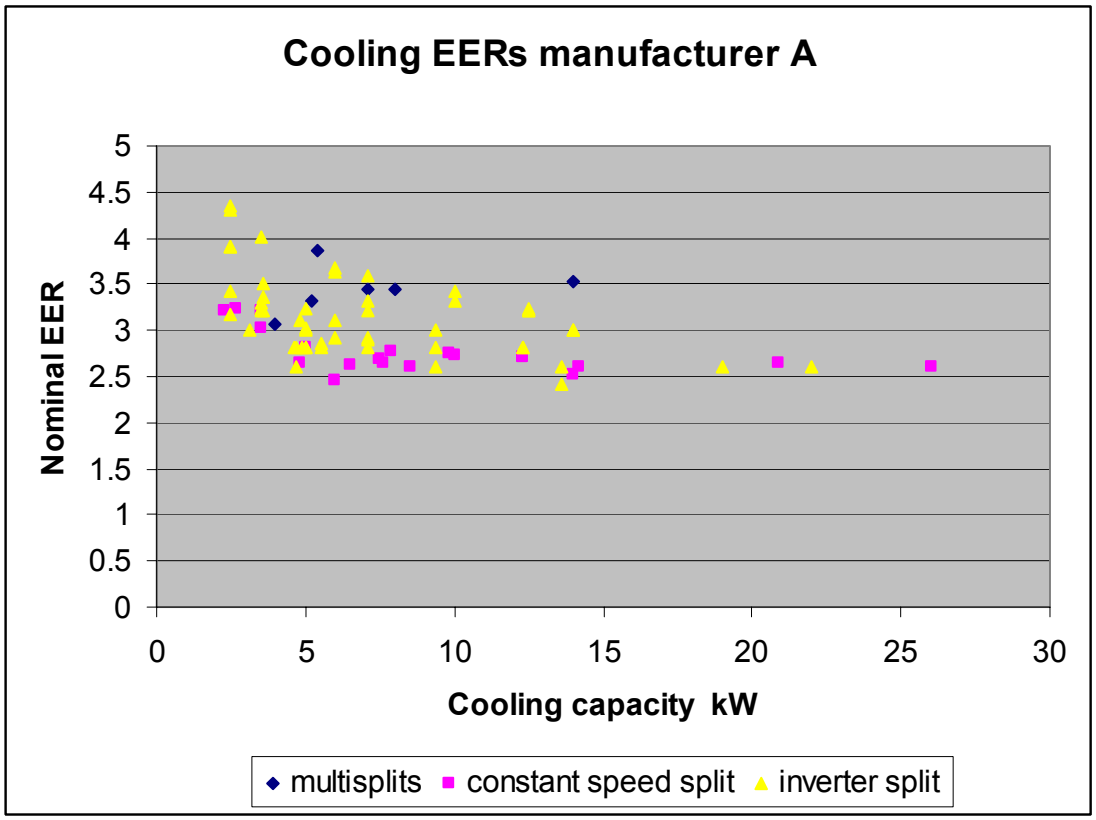
Currently, the top-runner programme requires manufacturers to achieve market-averaged performance figures of 5.27 (up to 2.5kW capacity), 4.9 (2.5 to 3.2 kW) and 3.65 (larger units). In order to achieve this, in 2004 production of some 70 or so lower-performing models accounting for sales of around 2 million units stopped. The trend in average performance shown below largely reflects the proportion of products that use inverter-controlled variable speed compressors. Key dates were 1979 when efficiency targets were introduced and 1999 when air conditioners were included in the "top runner scheme".



The chart below shows the number of models achieving particular ratings for the 2.8 kW size of unit. It is taken from official statistics. Clearly the performance of the majority of the models is close to the minimum requirements although about half have significantly higher performance.



The chart below illustrates – using information from one manufacturer's catalogue – how the most efficient products use inverter-driven compressors and are targeted at the residential market (that is, the smaller ratings). It also shows that the use of an inverter does not guarantee better performance (at rated output) than a fixed speed compressor.



Manufacturers plausibly claim that their best products are now close to the practicable technical and economic limits of performance. Products have become larger and heavier as the result of the targets (though more sophisticated design and engineering is now reducing this somewhat). Market prices

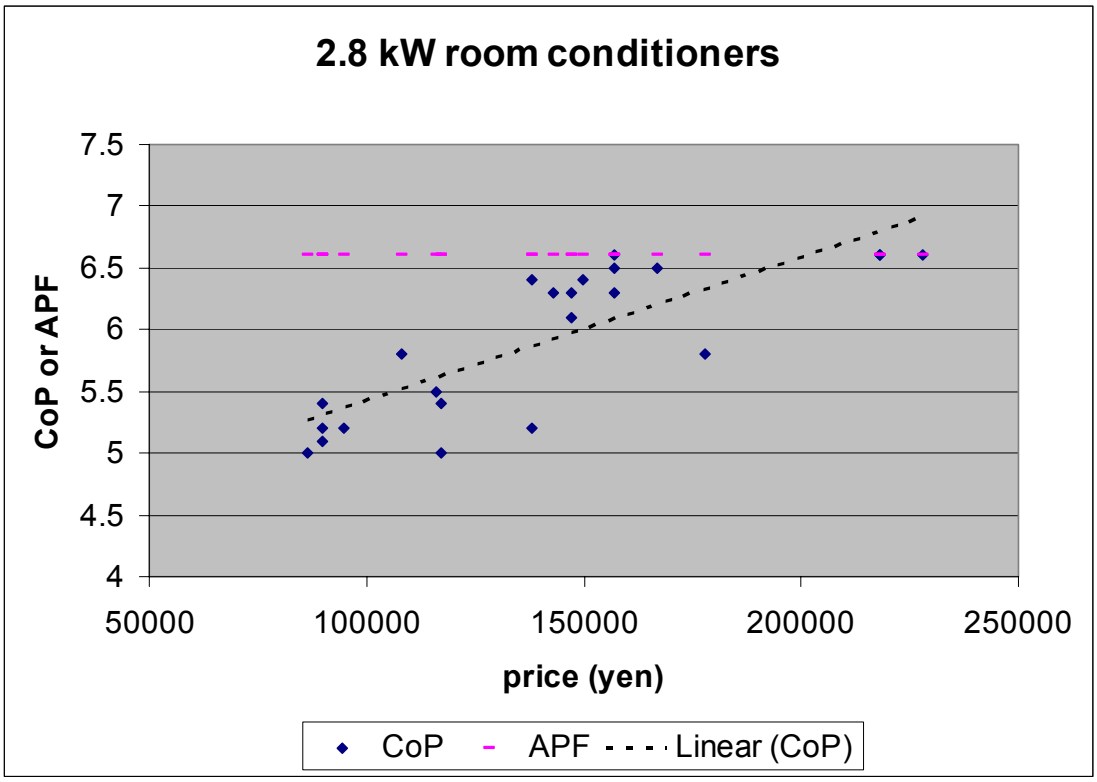
have not fully reflected the increase in manufacturing cost because of increased overseas manufacturing and improved production processes. About 40% of residential units are manufactured overseas, mainly in China.

The next revision to the regulations changes the basis to calculated annual efficiency, in the form of APF (annual performance factor) which requires some part-load testing. In practice, most products are already more efficient at part-load than at full load so this change does not in itself impose a more demanding target (though it does add an extra testing burden).

Proposed values are
Up to 3.2 kW: APF of 5.8 for units that have defined (restricted) dimensions, 6.6 for physically larger ones)
3.2 to 4 kW: APF of 4.9 and 6.0 for limited size and no restriction respectively

The figure below shows information collected from one retail store for the popular 2.8kW size of unit. It can be seen that the retail price is broadly correlated to the CoP figure (the current energy efficiency measure), with the most expensive units more than twice the cost of the basic models. The top of the range models have additional features such as self-cleaning filters as well as better energy efficiency, so not all the cost increase can be ascribed to energy efficiency – nevertheless there is a clear trend and an apparent substantial cost increase.

However, the new (and more logical) Annual Performance Factor is also stated for each model: and even the base models satisfy the apparently more demanding new regulations. This is (presumably) because the principal (and most cost-effective) measure to improve performance is to use inverter-controlled variable speed compressors which result in higher efficiency at part load than at full load. We infer that high annual efficiency (as opposed to high efficiency at maximum output) is achievable at lower costs.



Additional information on the Japanese market can be found in (IEA, 2006):

- Fig 3 shows that the price differentials with EEI that we noted on the basis of shop prices are general
    - and have been in place since at least 2001
    - Fig 20 suggests that about 20 to 25% of the extra price is associated with additional features – so 75% - 80% reflects the cost (or market value) of better efficiency
- Fig 4 shows the trend in average EER (but doesn't really explain that it is driven by regulation – though page 11 mentions this)

Concerning recycling, it is estimated that 40 % to 50 % are recovered, the rest are exported and recycled overseas. But local recycling is expected to increase because of restrictions on exporting hazardous substances. Some manufacturers (at least) are now designing with disassembly in mind.

Appendix D - Eurovent-Certification catalogue treatment

Eurovent public database

For window/wall package, single split package and multi split package air conditioners from 1996 to 2006, this data base contains the following information on products:

- reversibility (yes/no),
- refrigerant fluid type,
- capacity (heating/cooling),
- cooling media type (air/water),
- EER,
- COP (for reversible units).

All these characteristics are given for every air conditioner model listed in the Eurovent-Certification directory.

Representativeness

In order to compute statistics on this data base of certified models, it is useful to establish how far this catalogue is representative of the actual sales in Europe.

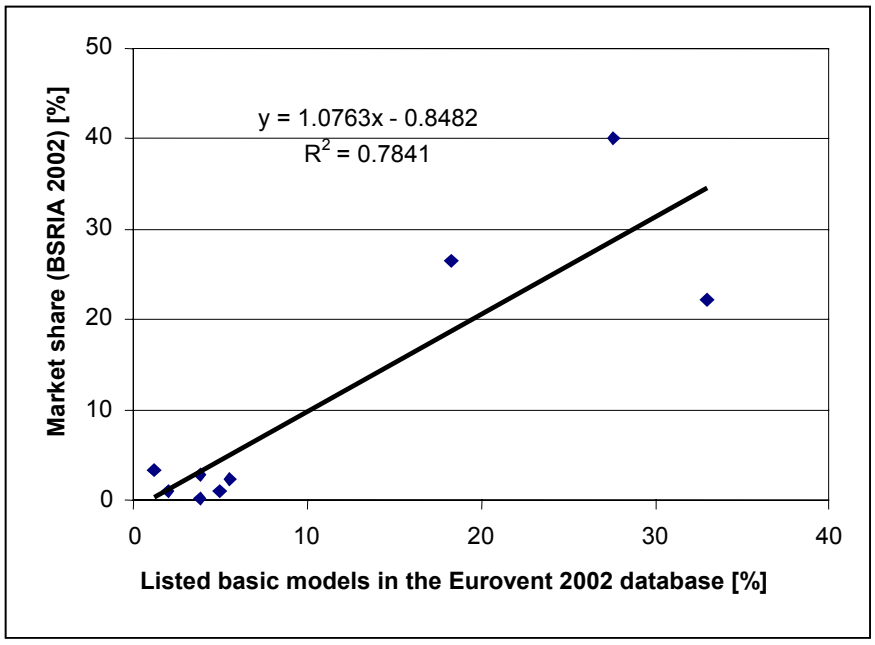
As stated in the task 1 and task 2 reports, several factors limit the representativity of this data base:

- Moveable equipment are not included,
- Eurovent-Certification air conditioner manufacturers are supposed to represent about 90 % of European manufacturers (in sales),
- A part of the total sales, varying according to years, estimated to amount to 10 % of air conditioning sales (Clim'Info, 2006), correspond to online sales of directly imported products.

Then, sales may not be proportionate to the number of products in the catalogue. In order to determine how far general technical trends observed in numbers of certified products could translate real market features, we compared the sales from (BSRIA, 2002) market research study and the number of models by cooling capacity range.

The first attempt to compare sales figures and number of models show that sales do not correlate when all the models listed in the catalogue are kept. Hence, the catalogue models have been filtered to avoid repetitions of the same model under different brand names. The resulting database amounts to about one third of the total number of models of the original. This filter greatly improves the correlation between numbers of filtered models and sales figures.
The sales numbers for the year 2002 (BSRIA, 2002) split by cooling capacity and product type have been compared to the basic model groups as explained above. Results are shown hereafter.

		% of the database
Packages	<3.5kW	5
	3.51-5kW	2
	>5.01kW	4
Mono Split	<3.5kW	28
	3.51-5kW	18
	5.01-7kW	33
Multi Split	<3.5kW	1
	3.51-5kW	6
	5.01-7kW	4



According to this graph, the representativeness is not perfect but seems enough to identify main market trends. Namely, packages (wall/window air conditioners) are over numbered in models as regards to their sales. Nevertheless, it appears that the trends that are figured out with Eurovent-Certification data base give a correct idea of general market trends. However, it must be clear that specific percent values only remain indicative and that absolute figures cannot be extracted of this analysis.

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