

Country:	Austria
Technology:	Laundry Dryers
Sub Category:	Vented and condenser electric models

Introduction

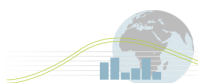
The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent set of products.

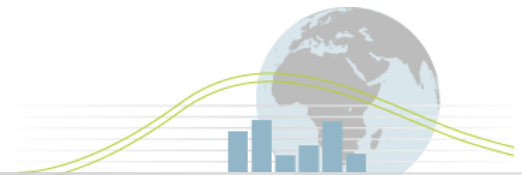
The summary definition for this product is:

<p>Laundry Dryers defined as: <i>'An energy using appliance for use in households designed to remove the moisture of a (given) load of clothing or other textiles.'</i></p>			
<p>Data will be analysed for the following types of laundry dryer:</p>			
Laundry Dryers	Heat source	Electrical	
	Mode of drying	Tumble dryer	
	Air usage	Vented (fresh air is heated, passed through textiles and exhausted from the appliance)	Condenser (noting whether air condenser, or heat pump condenser) (air used for the drying process is dehumidified by cooling and re-circulated)
Functionality	Layout	Noted whether top loader or front loader.	
	Capacity (dry load)	Less than 10 kg. Full analysis only for appliances with capacity between 4 kg and 10 kg.	
	Wash capability	Washer dryers are excluded from the analysis.	
	Automation	To be noted whether the appliance has moisture sensor, load sensor or just timer /manual control.	

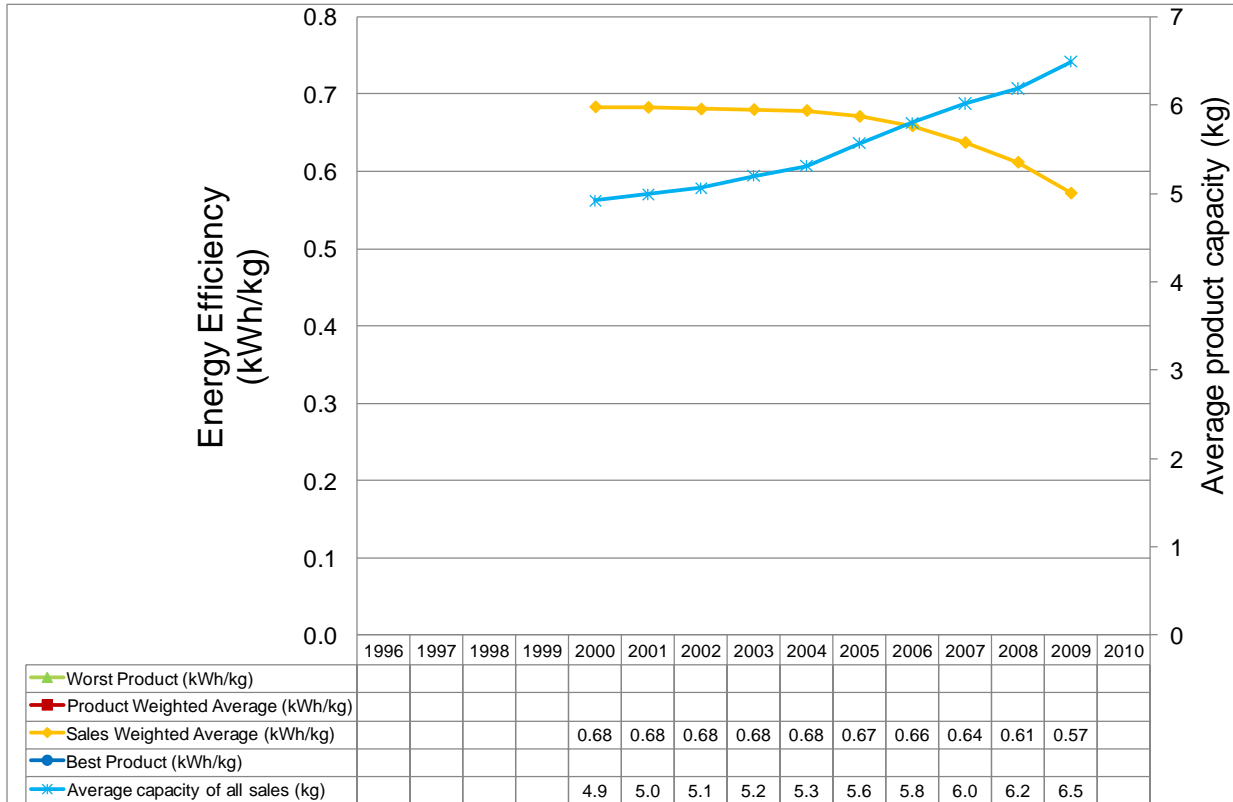
The detailed product definitions can be found at the Annex website:

<http://mappingandbenchmarking.iea-4e.org/matrix>



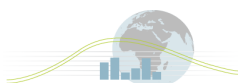


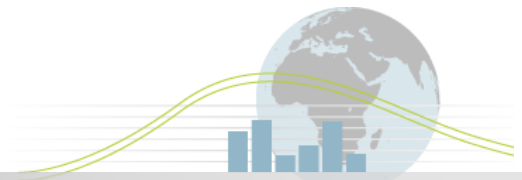
Energy Efficiency of New Laundry Dryers Austria



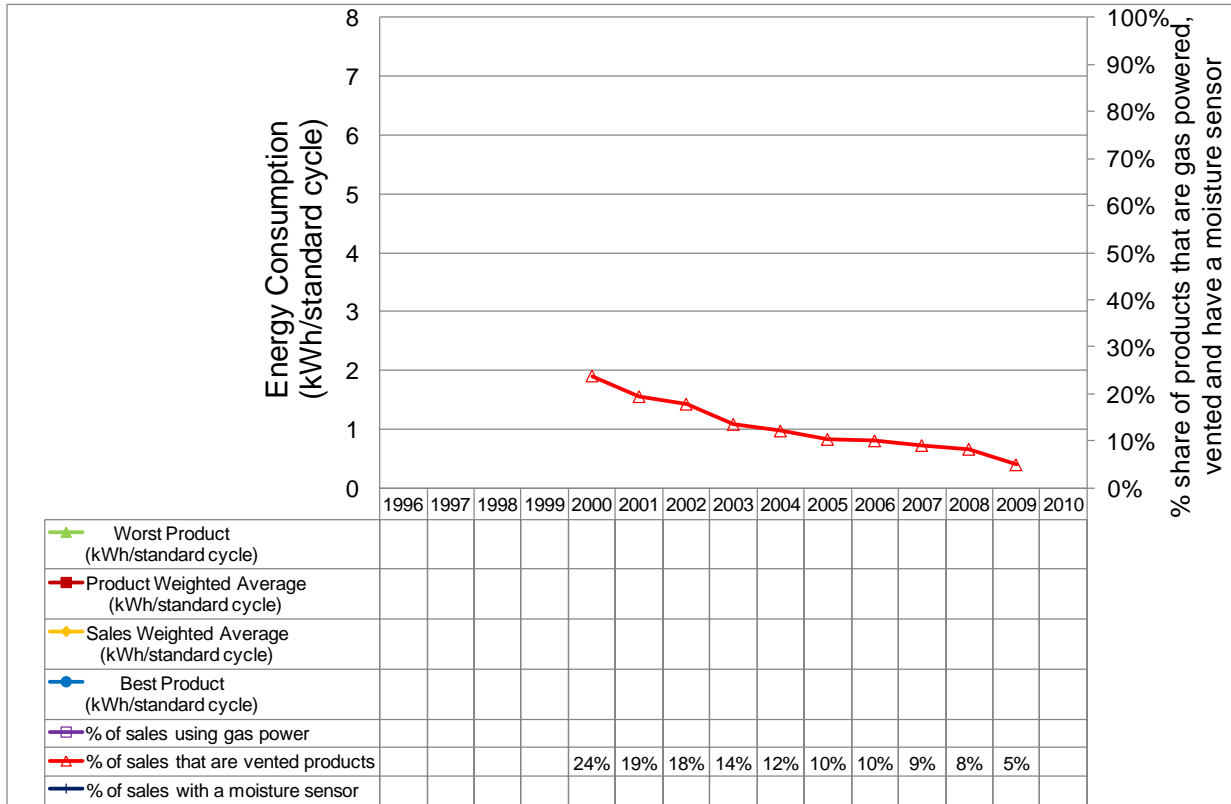
Key notes on Graph (see notes section 1)

- Energy efficiency results are calculated from the percentage of sales by energy label in Austria. Assumptions are taken about average efficiency of the average model in each energy label and as a result, this data should be used with caution.
- Average capacity results are based on a dataset that covers 90% of the market and therefore, while the dataset is considered representative, this data should be used with caution.



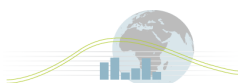


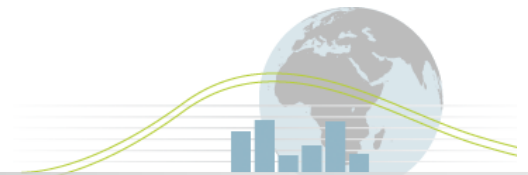
Energy Consumption of New Laundry Dryers Austria



Key notes on Graph (see notes section 2)

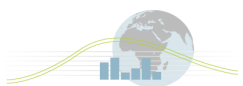
- No data on Unit Energy Consumptions was available to the Annex at the time of publication.
- The data for the percentage of sales that are vented products are based on a dataset that covers 90% of the market and therefore, while the dataset is considered representative, this data should be used with caution.

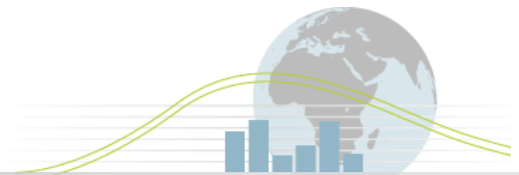




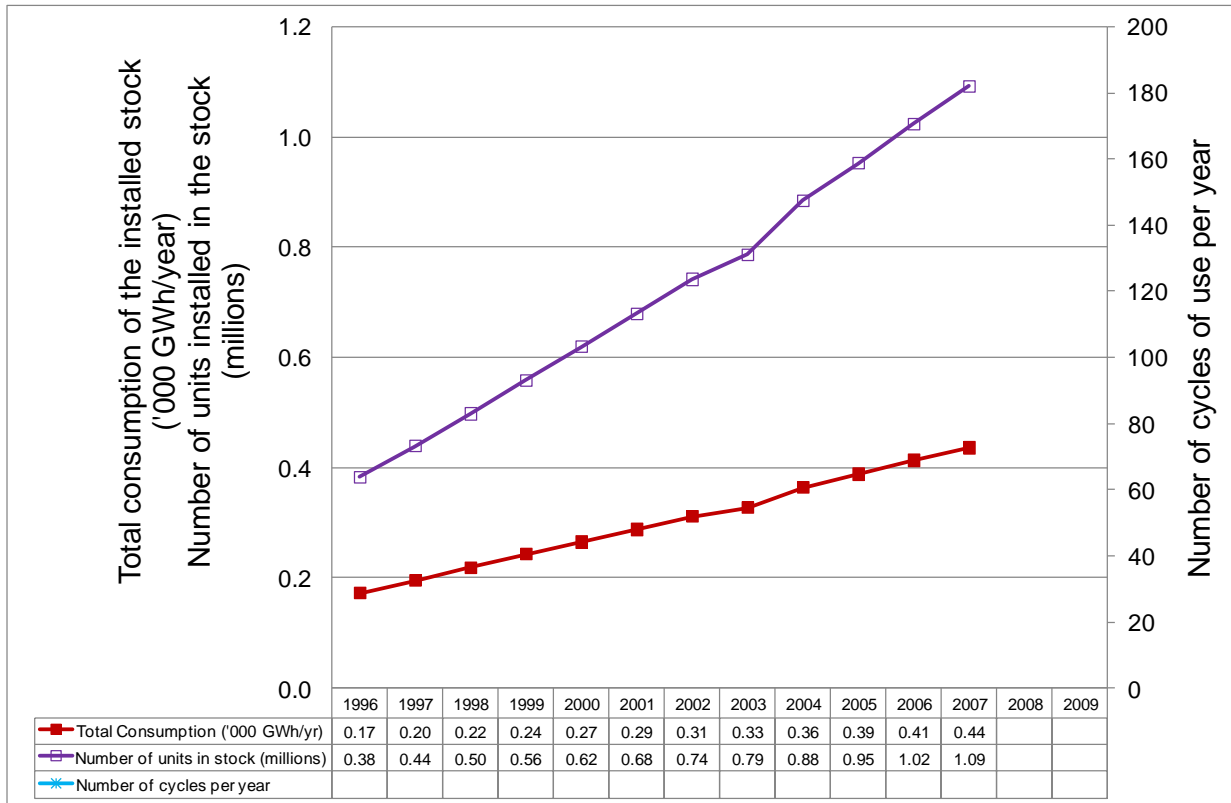
Energy Efficiency in the Installed Laundry Dryers Stock Austria

No data on the efficiency of units installed in the stock was made available to the Annex at the time of publication.



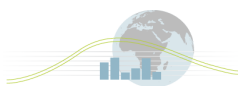


Energy Consumption in the Installed Laundry Dryers Stock Austria



Key notes on Graph (see notes section 4)

- Stock data is an extract of data gathered for Austria for the ODYSSEE project. The ODYSSEE projects relies on databases that contain detailed data on the energy consumption drivers by end-use and sub-sector as well as energy efficiency and CO₂ related indicators.
- Details of the make-up of the ODYSSEE dataset and any assumptions made are not known. Therefore stock data should be used with caution.



Major Policy Interventions (See notes Section 5)

There is one directly relevant regional policy:

1. EU energy labels for electrically heated laundry dryers were established in 1996¹, allocating a label A to G based on drying a cotton load sized to the maximum capacity of the appliance. The label class thresholds are different for vented and condensing dryers, with condensing dryers allowed to consume slightly more energy within each label class (see section 5 Notes on Policy Interventions for further information). Changes were made to the test methodology for tumble dryers that underpins the EU label scheme in 2005, reducing the starting moisture content and adjusting the ambient temperature and humidity. In order to ensure that products did not shift classes as a result of these changes, the calculation of the efficiency index C was adjusted to compensate. There are no EU energy label requirements for gas tumble dryers.

There have been no EU regulatory minimum standards nor an EU ecolabel category for laundry dryers in Europe up to time of publication in December 2010.

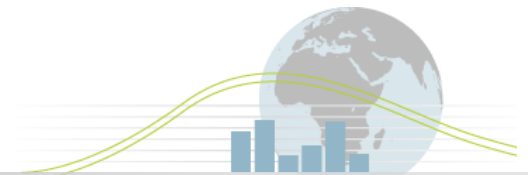
However, a new EU ecodesign regulation and a revised EU energy label for laundry dryers are expected during early 2011, following a three year ecodesign study² and policy consultation process. It is not yet decided whether or not the new ecodesign regulation will include MEPS. The new energy label will include additional energy classes A+, A++ and A+++ above the existing classes.

Other relevant national policies include:

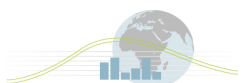
- There are also programmes in Austria which aim to improve energy efficiency by granting subsidies for suitable measures for the household sector. These subsidies have usually been designed as a contribution towards investment costs or as a loan with reduced interest rates.
- For purchasing energy efficient electrical appliances subsidies can be obtained from some regional electrical utilities. These subsidies are granted to all customers of the respective utility, regardless of whether the customer is the owner of a private household, an enterprise or a public institution.
- The most innovative and popular measure in Austria is the long-term program for active climate protection (klima: aktiv), that was launched in 2004 from the Environmental Ministry (Lebensministerium). The program's main focus lies on increasing the market share of energy efficient products and services. The overall goal is to reduce the greenhouse gas emissions (<http://www.klimaaktiv.at>) The programme features usage and buying advice regarding laundry dryers.
- As part of the initiative klima: aktiv, the program of "Top products" – Platform for energy efficient appliances provides information on best and worst available products

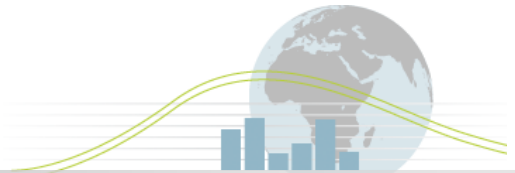
¹ Under Commission Directive 95/13/EC of 23 May 1996.

² See <http://www.ecodryers.org/>.



in the market (<http://www.topprodukte.at>), for household and commercial users. Laundry dryers are a featured product.





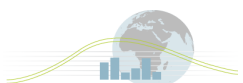
Cultural Issues (See Notes Section 6)

In 2007 the Austrian Statistics Agency initiated a project called “Electricity and Gas Daily Book” with the aim to look into more detail the consumption household energy.

From this 2008 Micro-census it is known that the laundry dryers have somewhat a larger capacity than washing machines, with over 20% having a capacity of at least 6 kg, 70% with 4,5 to 5,5 kg and only 4% with a capacity of less than 4,5 kg of laundry. About half of the devices are equipped with a humidity sensor.

Only 8% of the products are older than 10 years, 44% are 5 to 10 years old, and the remaining are 5 or less years old. Laundry dryers is a group of relatively new products and only about 14% of the studied households has one, which might indicate that their penetration will continue to increase in households in the coming years³.

³ Strom- und Gastagebuch 2008: Strom- und Gaseinsatz sowie Energieeffizienz österreichischer Haushalte. Auswertung Gerätebestand und Einsatz”. Statistik Austria/ Direktion Raumwirtschaft, Energie, Wien 2009



Notes on data

Section 1: Notes on Product Efficiency

1.1 Test methodologies, Performance Standards and Labelling Requirements

Laundry dryers in Europe are tested to EN61121 as amended in 2005. This test methodology is also the basis of EU energy labelling for laundry dryers. The key elements of the test methodology including those that impact on energy consumption are summarised in the table below:

Test methodology	IEC61121:2005
Capacity metric	kg dry weight of load
Ambient temperature for test	23°C±2°C
Ambient relative humidity for test	55%
Test cloths	All 100% Cotton
Load during test	Rated capacity
Initial moisture content	60% remaining moisture content
Final moisture content	0% remaining moisture content
Metric for efficiency arising from local test	kWh/cycle and kWh/kg

Significant changes were made to test methodology in 2005 that affect the energy consumption and efficiency data derived from it:

- The initial moisture content was changed to 60% (previously 70%)
- The ambient test temperature was changed to 23°C (previously 20°C)
- The ambient humidity was changed to 55% (previously 65%)

The calculation of the applicable EU energy label was modified, however, at the same time to compensate for the energy advantage gained by vented dryers due to the increased temperature and reduced humidity of the air they draw in from the test room. This compensation also means that labels earned after 2005 should be directly comparable to those earned afterwards. In this analysis therefore, data based on EU energy label or energy efficiency index should be continuously comparable. In contrast, kWh/cycle data as declared on the energy label, and kWh/kg efficiency data derived from the test methodology will not be comparable before and after 2005 without normalisation.

The EU energy label requires an A to G classification, declaration of kWh per cycle and classification as vented or condensing. A declaration of noise performance is optional.

1.2 Product Efficiency Graphic

1.2.1 Data Source:

- Data source is GfK information on the percentage of sales by energy label class over time.

1.2.2 Data Clarifications

The table below shows the percentage of sales of **all** laundry dryers (ie electric dryers of compact and standard sizes both vented and condensing) by energy label:

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
A					0.1	2.6	4.0	5.9	10.4	21.9
B					0.7	2.8	11.6	29.1	43.0	50.2
C	76.6	81.0	87.7	92.3	95.5	92.6	83.0	63.1	43.8	27.1
D	8.2	6.9	5.2	2.5	1.3	1.2	0.9	0.6	0.2	0.1
E	0.1	0.2	0.1	0.0		0.0				
F	0.0	0.0	0.0							
G	0.7	0.3	0.0	0.0	0.0	0.0	0.0			
UNKNOWN	14.4	11.6	6.9	5.2	2.4	0.7	0.4	1.3	2.5	0.6

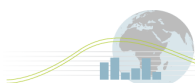
The table below shows the percentage of sales of **condenser** laundry dryers by energy label:

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
A					0.1	2.9	4.5	6.5	11.4	23.1
B					0.7	3.1	12.9	32.0	46.8	52.8
C	80.5	83.7	90.0	93.2	95.9	92.2	82.0	60.3	41.1	23.5
D	7.1	5.8	4.6	2.2	1.3	1.2	0.3	0.3	0.2	0.1
E	0.2	0.2	0.1	0.0						
F										
G										
UNKNOWN	12.2	10.3	5.3	4.5	1.9	0.6	0.3	0.9	0.6	0.5

The table below shows the percentage of sales of **vented** laundry dryers by energy label:

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
A										
B										
C	64.0	69.7	77.0	86.2	92.6	96.0	92.9	90.7	74.9	95.8
D	11.5	11.6	8.2	4.2	1.1	1.5	6.1	4.2	0.9	0.3
E	0.0	0.1				0.2				
F	0.2	0.1	0.1							
G	2.8	1.4	0.3	0.1	0.2	0.1	0.2			
UNKNOWN	21.5	17.0	14.4	9.4	6.2	2.2	0.8	5.1	24.2	3.8

In order to develop an average market energy efficiency from the energy label class data assumptions have to be made about the typical energy efficiency of machines in each label



category for each type of product and over time. No data on this was available to the Annex at the time of publication and so the following assumptions have been made:

1. Typical machines in the A label categories have an energy efficiency that is the average of the minimum requirement to achieve the A label and the best performing product in the EU in that year. In 2009, the best performing product is taken from the Annex analysis on this. However, as no reliable data is available on the best performing product in the EU in earlier years, it is assumed that the energy efficiency of this product worsens by 2% per annum from the 2009 baseline.
2. Typical machines in the labels B-F have an energy efficiency at the mid-point of that label range⁴.
3. Typical machines in the G label category have an energy efficiency 5% worse than the minimum requirement to achieve the F label.

Other data limitations:

Whilst the data supplied is believed to be representative of the whole market, it is believed to cover only a proportion of the market over as shown below:

- Energy label data: covers approximately 77-90% of market
- Capacity data: covers approximately 90% of market
- % vented data: covers approximately 90% of market

1.2.3 Glossary of energy metrics for laundry dryers:

The key metrics for laundry dryers and the key calculations undertaken in the wider Annex analysis are described below. Some metrics and/or calculations are not relevant to all data sets due to absence of data or for other reasons. Metrics marked with * have not been include in the analysis for this mapping.

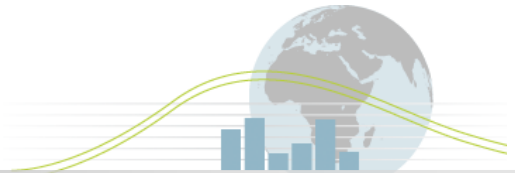
Declared Unit Load Capacity: Unit load capacity in kg is defined by local regulations and declared by manufacturers (Unit kg).

(Note: This capacity is defined using the mixture of materials defined in the local regulations which is not necessarily in line with the mixture of material used elsewhere (for local load mix, refer to Section 1.1 on “Notes on Data”).

Unit Energy Consumption (UEC): Unit Energy Consumption is the energy consumed by the unit to complete one drying cycle as defined by local test conditions (Unit: kWh/cycle).

Sales Weighted UEC of New Models: Value calculated by [Sum of (UEC multiplied by sales volume of Model in year) for all Models] divided by [Sum of (sales volume of all Models in year)]. Unit kWh/cycle.

⁴ There is anecdotal evidence that products gravitate to the minimum requirement end of a label's range over time but this is not confirmed by a review of the Annex data to date and therefore it is considered more reasonable to assume this mid-point unless evidence to contrary exists.

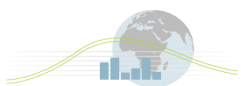


Product Weighted UEC of New Models: Value calculated by [Sum of (Model UEC for all models sold in year)] divided by [Sum of (Number of Models sold in year)]. (Unit kWh/cycle).

Unit Energy Efficiency (UEE): Value calculated by dividing UEC by Declared Unit Load Capacity (Unit: kWh/kg/cycle).

Sales Weighted UEE of New Models: Value calculated by [Sum of (UEE multiplied by sales volume of Model in year) for all Models] divided by [Sum of sales volume of all Models in year]. Unit kWh/kg/cycle. In the case of this analysis, the same approach is taken but using the [Sum of (Typical UEE of Label multiplied by % of total sales of that label in year) for all Models] divided by [Sum of % market share of all Models for which label data was available in that year].

Product Weighted UEE of New Models: Value calculated by [Sum of UEE for all models sold in year] divided by [Number of Models sold in year]. (Unit kWh/kg/cycle).



Section 2: Notes on Product Consumption

2.1 Test methodologies, Performance Standards and Labelling Requirements

No further information available.

2.2 Product Consumption Graphic

No further information available.

Section 3: Notes on Efficiency of Stock

No further information available.

Section 4: Notes on Consumption of Stock

Sources:

Data included in the stock is an extract of data gathered for Austria for the ODYSSEE project (www.odyssee-indicators.org).

Section 5: Notes on Policy Interventions

5.1 Requirements of Commission Directive 95/13/EC with regard to energy labelling of household electric tumble dryers of 23 May 1995.

A new EU energy labelling regulation for electric tumble dryers is expected in early 2011, but this section describes the current requirements. The energy efficiency of each appliance is based on the specific energy consumption (C) in kWh per kg of load measured for a dry cotton cycle according to the conditions and test methodology described in Notes section 1.1.

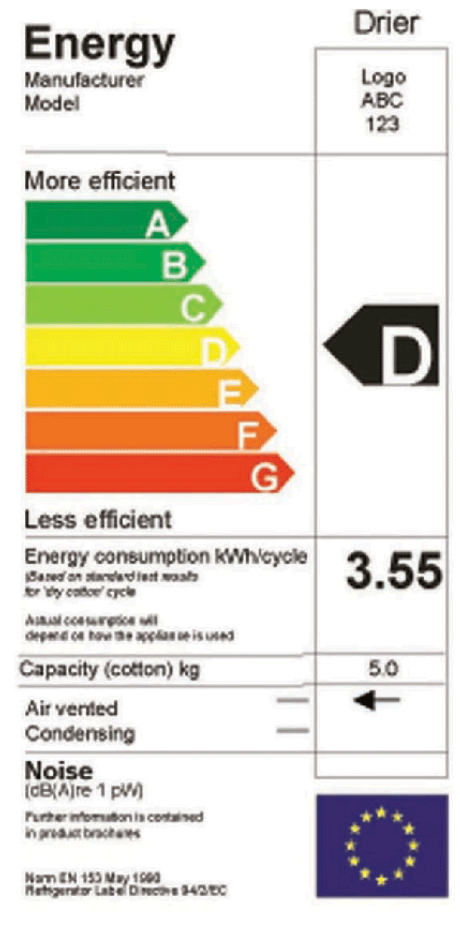
For air **vented dryers**, the energy efficiency class is determined in accordance with the following table:

Energy efficiency class	Energy consumption C
A	$C \leq 0.51$
B	$0.51 < C \leq 0.59$
C	$0.59 < C \leq 0.67$
D	$0.67 < C \leq 0.75$
E	$0.75 < C \leq 0.83$
F	$0.83 < C \leq 0.91$
G	$C > 0.91$

For **condenser dryers**, the energy efficiency class is determined in accordance with the following table:

Energy efficiency class	Energy consumption C
A	$C \leq 0.55$
B	$0.55 < C \leq 0.64$
C	$0.64 < C \leq 0.73$
D	$0.73 < C \leq 0.82$
E	$0.82 < C \leq 0.91$
F	$0.91 < C \leq 1.00$
G	$C > 1.00$

The label itself is shown below⁵



Section 6: Notes on Cultural Issues

None.

⁵ Source from: http://www.clasponline.org/clasp_online_worldwide.php?programinfo=54