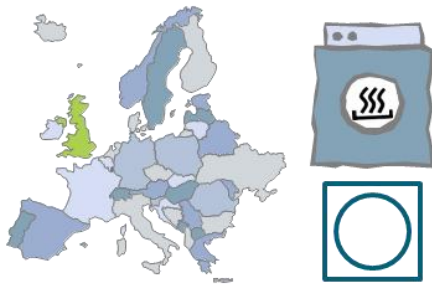
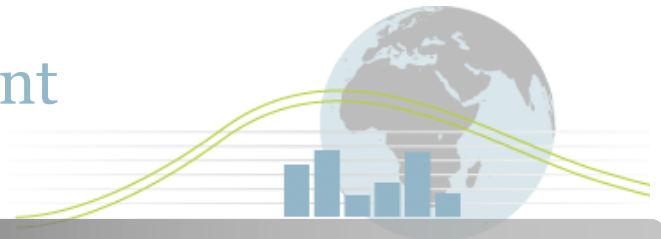


4E

Mapping Document



Country: UK

Technology: Laundry Dryers

Sub Category: Vented and condenser electric models

Introduction

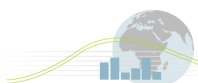
The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent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

The summary definition for this product is:

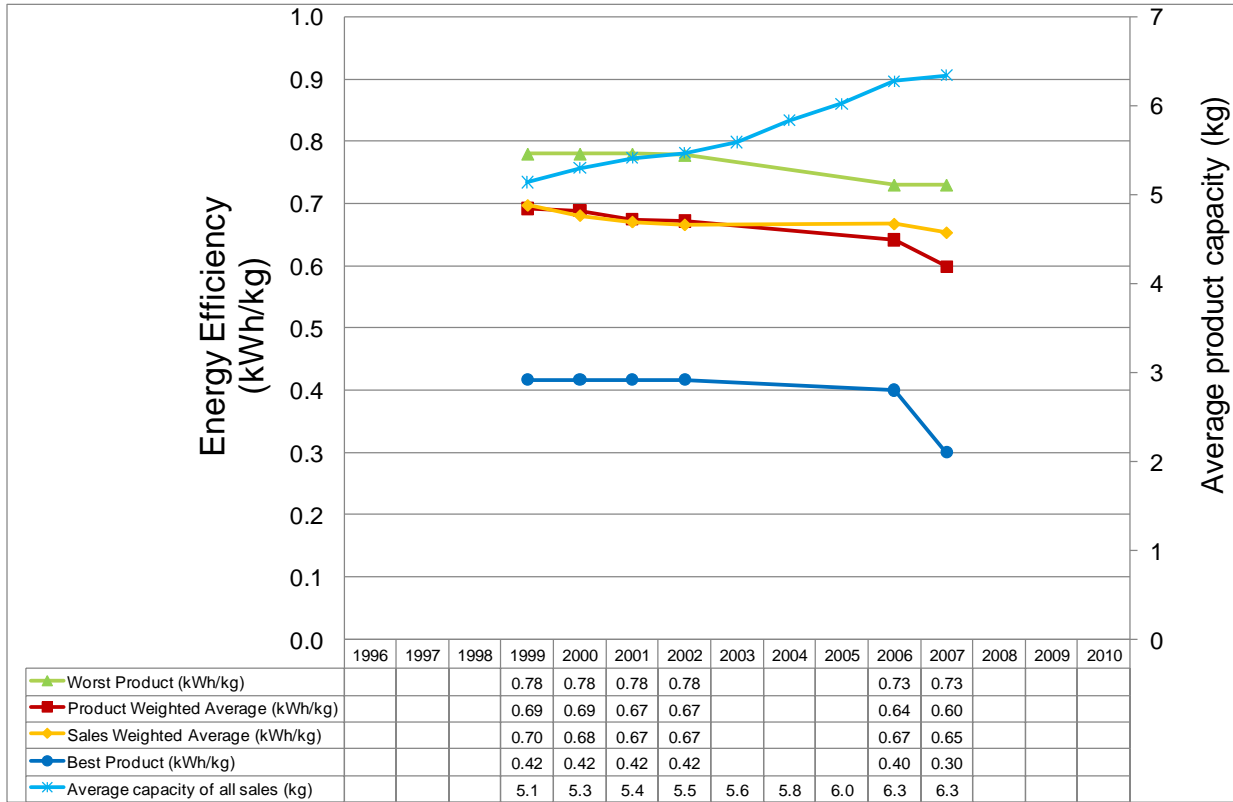
<p>Laundry Dryers defined as: <i>'An energy using appliance for use in households designed to remove the moisture of a (given) load of clothing or other textiles.'</i></p>			
<p>Data will be analysed for the following types of laundry dryer:</p>			
Laundry Dryers	Heat source	Electrical	
	Mode of drying	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>

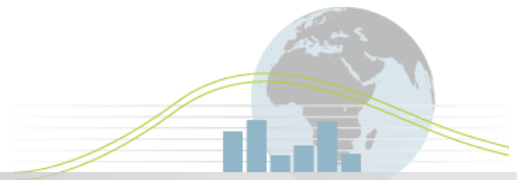


Energy Efficiency of New Laundry Dryers UK

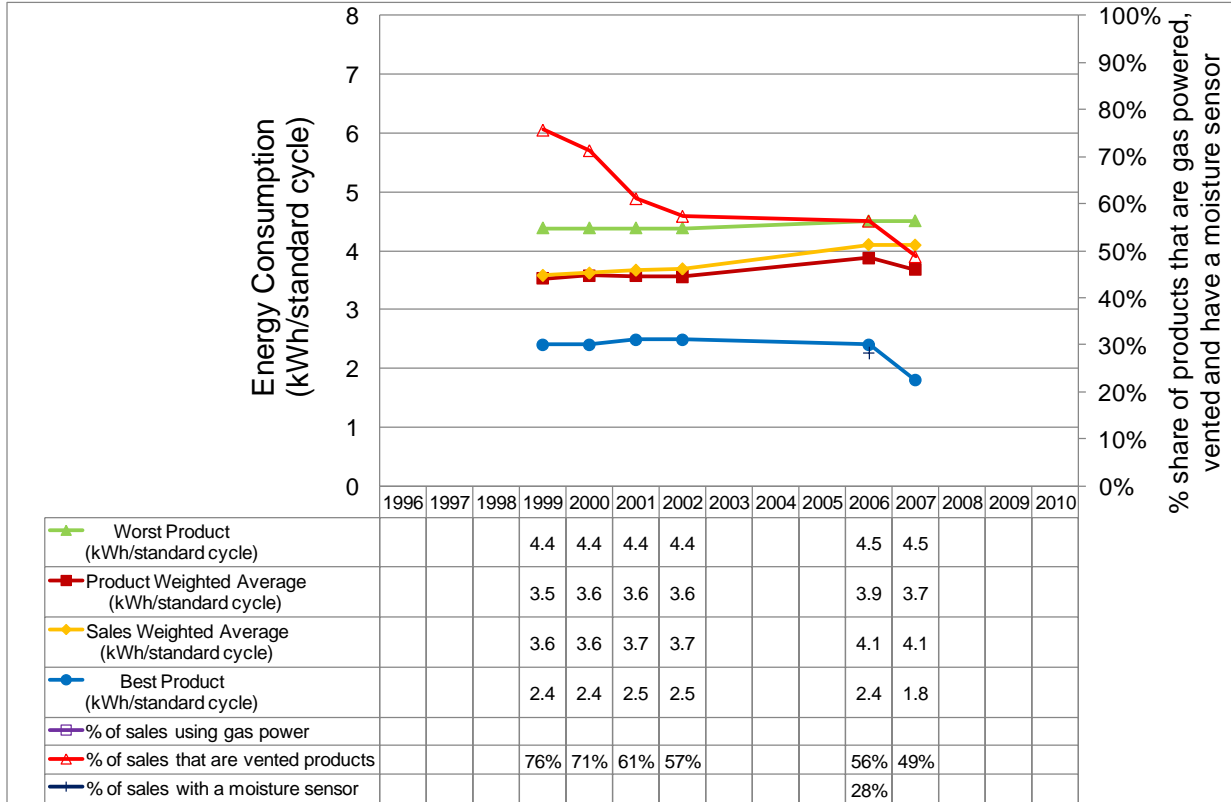


Key notes on Graph (see notes section 1)

- Results are calculated from a database of all laundry dryer sales in the UK.
- Some data points are calculated using only a partial data set because products were excluded due to issues with data quality. Examples include no energy data or energy data not aligning with the information on product energy label. Results for 2006 and 2007 in particular are based on less than 50% of the dataset and therefore should be viewed with caution.

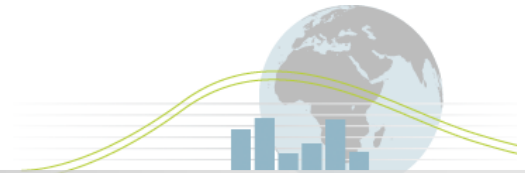


Energy Consumption of New Laundry Dryers UK



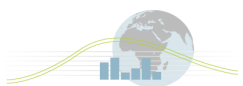
Key notes on Graph (see notes section 2)

- Results are calculated from a database of all laundry dryer sales in the UK which resulted in analysis being based on around 250 to 750 products per year.
- Some data points are calculated using only a partial data set because products were excluded due to issues with data quality. Examples include no energy consumption data or energy consumption data not aligning with the information on product energy label. Results for 2006 and 2007 in particular are based on less than 50% of the dataset and therefore should be viewed with caution.

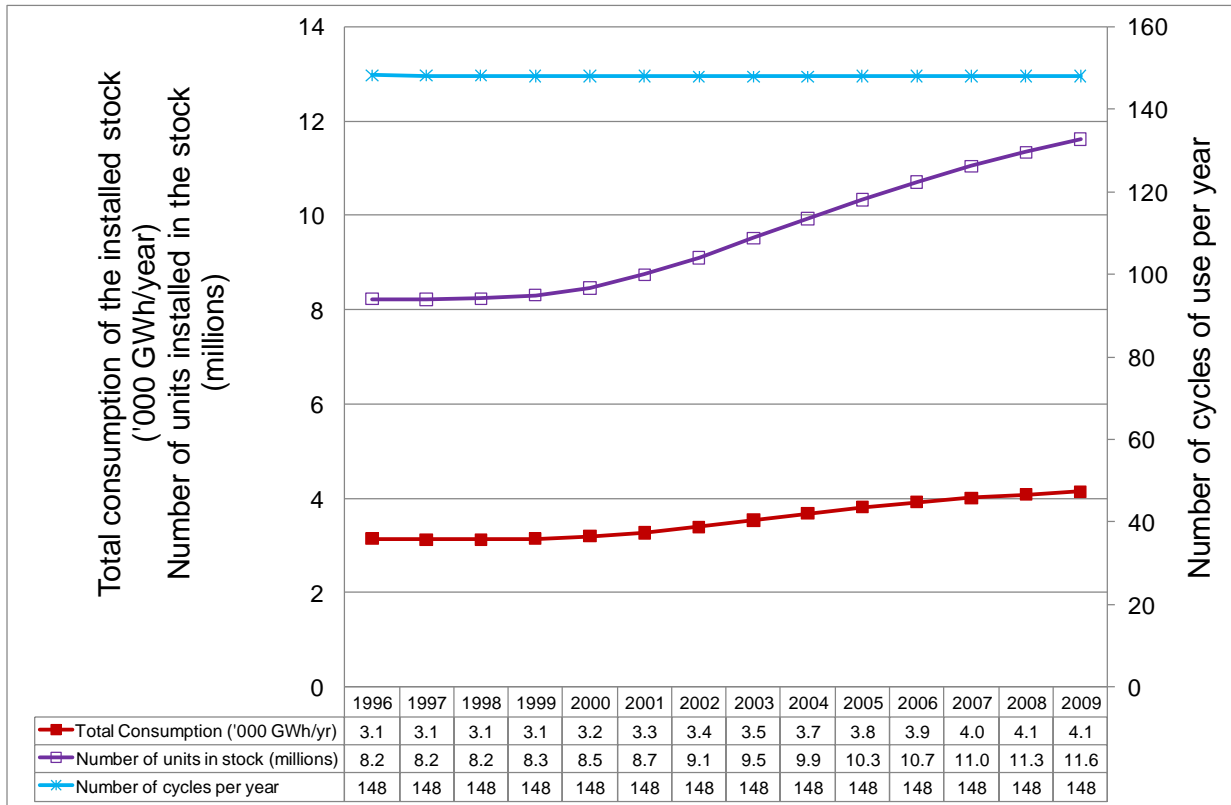


Energy Efficiency in the Installed Laundry Dryers Stock UK

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 UK



Key notes on Graph (see notes section 4)

- Energy consumption is calculated from the UK Government’s Market Transformation Programme’s “What-If?” tool¹ which is used to provide projections of annual energy consumption based on assumptions including average number of cycles per year (also shown here), product efficiency and stock.
- Number of units in stock is taken from Market Transformation Programme Government Standards evidence base for 2009-10.

¹ <http://efficient-products.defra.gov.uk/cms/product-data/>

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 1996², 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 has been no EU regulatory minimum standard 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 study³ 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.

There is one directly relevant national initiative in the UK:

2. The UK has a national product endorsement scheme called 'Energy Saving Trust Recommended'⁴ with a category for laundry dryers that meet certain efficiency requirements designed to distinguish the top 20% of the market. The scheme has covered electric tumble dryers and since 2003 and gas dryers were added in 2007.

² Under Commission Directive 95/13/EC of 23 May 1996.

³ See <http://www.ecodryers.org/>.

⁴ <http://www.energysavingtrust.org.uk/business/Business/Energy-Saving-Trust-Recommended>

Cultural Issues (See Notes Section 6)

In the UK around 45%⁵ of households own a tumble dryer. Household penetration is still increasing slightly. In the 5 years from 2003 to 2007 the percentage of homes owning one increased by 5% although this growth is thought to have levelled off. Sales of tumble dryers tend to reflect weather patterns with periods of high rainfall, for example the summer of 2007, linked to higher levels of sales.

Around 10 years ago the market was dominated (around 80% sales) by vented tumble dryers. Over recent years condenser dryers have become more popular and now account for around 50%⁶ of sales. This shift is thought to be primarily as they avoid the need for an air exhaust hose to the outside and so positioning in the home is more flexible.

As with washing machines, there has been a tendency for the capacity of tumble dryers to increase to cope with the larger loads in washing machines. While 5-6 kg capacity is most common, machines with a capacity of 7kg and above are now almost as popular⁷.

UK government makes the assumption that tumble dryers are used around 148 times per year. This is around 60% of the number of times that a washing machine is used for those households owning a tumble dryer.

⁵ Mintel Laundry and Dishwasher Appliances, Market Intelligence February 2008, 44.6%

⁶ Mintel Laundry and Dishwasher Appliances, Market Intelligence February 2008, 53% driers sales condenser

⁷ Mintel Laundry and Dishwasher Appliances, Market Intelligence February 2008 (pg 29)

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:

Product and sales data 1999-2007 originally sourced from GfK and purchased by the UK Government's (DEFRA) Market Transformation Programme – this data remains confidential and will not be published.

1.2.2 Data Clarifications

The data used for this analysis included declared values for kWh/cycle, kWh/kg and declared energy label class. This was cross-compared as an integrity check, and anomalies were rejected. Hence energy efficiency data did not have to be assumed from a declared energy label class (as required for some products which introduces uncertainties).

Original Data Limitations

All data:

For all years, some data appears to have inappropriate looking consumptions. The labelling directive required manufactures to provide consumption of programmes other than the cotton dry cycle used to give the EEI. It could be the case that values from these programmes (which require less drying) have been recorded in error instead of the cotton programme. Where discrepancies between the recorded UEE and energy label show that this is clearly the case, the products have been removed from the analysis. Some products with marginally dubious consumptions have been included but as a result, the whole dataset is considered to be indicative only.

Specific year limitations

2003-5 Data:

- Data does not include energy consumption data and therefore cannot be analysed. Whilst data labels can be used to estimate average efficiencies, this approach would give inconsistent results to years in which product by product data is available and is therefore not undertaken.

2006-7 Data

- Two energy consumption figures can be recorded in these years, one for clothes spun at 800rpm by the washing machine and one for clothes spun at 1400rpm. The 800rpm energy consumption result is the test methodology result but some data for this appears to have been recorded in the 1400rpm energy consumption field in the database. Where the error appears to be consistent with the energy label an assumption has been made that the 1400rpm result can be used. This leads to an additional uncertainty for UEC and UEE in these years.

Proportion of data set excluded

The following data was removed from the full GfK dataset by the UK as the models listed either had no energy data and could not be analysed or because the energy data was believed to be incorrectly reported.

Year	Number of models in dataset	Number of models included	% of all Models Included
1999	525	424	81%
2000	736	551	75%
2001	510	404	79%
2002	256	201	79%
2003	249	0	0%
2004	280	0	0%
2005	319	0	0%
2006	310	94	30%
2007	301	52	17%

In order to indicate a Worst performing product that reflects the broad market (as opposed to representing perhaps a single unusual or wrongly reported product), the 'energy consumption of worst product' is in fact the energy consumption of the product at the 'worst 5%' point of a ranked list in the dataset.

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.

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.

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 (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.

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:

- **Stock consumption and number of washes per year:** The UK Government Market Transformation Programme's *What-If? Tool*⁸ using 2008 model data.
- **Number of units in stock:** Market Transformation Programme evidence base for 2009/2010 (Government Standard Briefing Notes (GSBN) and associated models⁹).

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 section 1.1.

⁸ The What-if? tool presents a range of scenarios on the future energy consumption until 2020 for nearly 30 domestic and commercial products. This includes a Reference scenario, an Earliest Best Practice scenario and a Policy scenario. <http://efficient-products.defra.gov.uk/cms/product-data/>

⁹ Available from <http://efficient-products.defra.gov.uk/cms/product-strategies/subsector/wet-appliances>

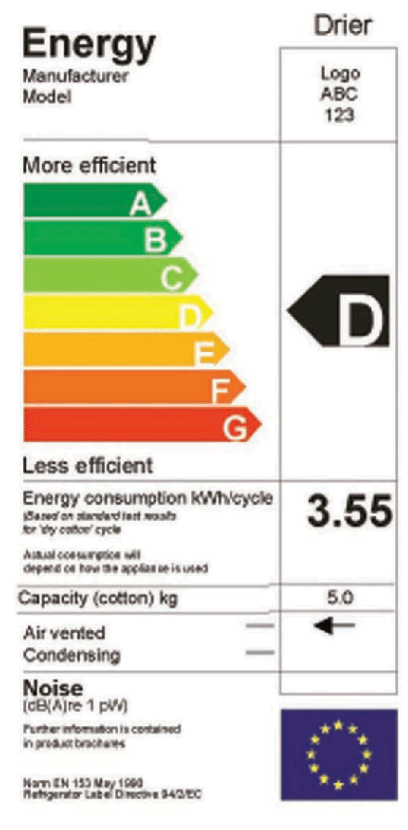
For air **vented dryers**, the energy efficiency class is determined in accordance with the following table:

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	$C > 0.91$

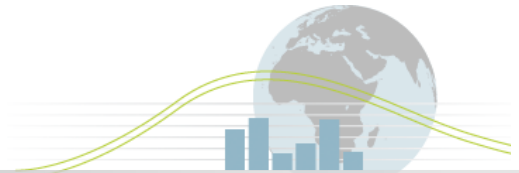
For **condenser dryers**, the energy efficiency class is determined in accordance with the following table:

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 below¹⁰



¹⁰ Source from: http://www.clasponline.org/clasp_online.worldwide.php?programinfo=54



Section 6: Notes on Cultural Issues

UK government makes the assumption that tumble dryers are used around 148 times per year. The exact number of washes from the “What If?” tool is:

1996	148.22
1997	148.18
1998	148.12
1999	148.06
2000	148.02
2001	148.00
2002	147.99
2003	147.99
2004	147.99
2005	148.00
2006	148.00
2007	148.00
2008	148.00
2009	148.00

