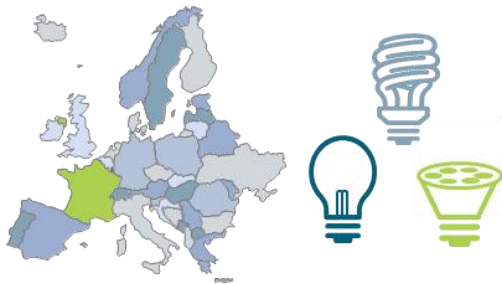
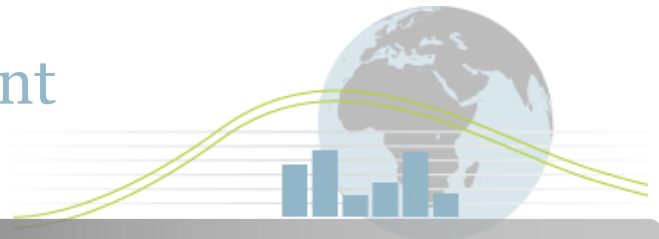


4E

Mapping Document



Country:	France
Technology:	Domestic Lighting
Sub Category:	All domestic lamps

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. The definition ensures that comparisons between the participating countries are performed against a specific and consistent set of products/criteria.

The summary definition for this product is:

“Lighting products that perform the vast majority of illumination applications within the domestic (household) sector¹”

Hence data was sought (where possible) for the following lighting product types (subdivided by wattage buckets):

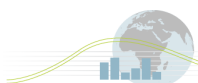
- Mains Voltage Incandescent
- Mains Voltage Halogens (Single and Double Ended)
- Low Voltage (12V) Halogen
- Pin Based and Self Ballasted CFLs
- Linear Tubes (T12, T8 and T5) *
- Retrofit LEDs
- Dedicated LEDs

* NOTE: The subsequent analysis in the associated benchmarking report² excludes linear fluorescent tubes as, for those countries submitting data, these lamps constituted a small proportion of use in the domestic sector.

A full product definition is provided at the annex website².

¹ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as “domestic lighting” irrespective of final installation point.

² see <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=5>



Phase out regulations for domestic lighting - France

French “phase-out” regulations are broadly in line with those elsewhere in Europe³. However, French regulations developed as part of the "Grenelle de l'Environnement"⁴ were enacted slightly before the comparable regulations were finalised for all of Europe. The specific requirements for the EU and the slight variants for France are shown in the following table:

Clear Lamps	Stage	Date	Range	Equivalent to lamps below EU Energy Class
	1	EU Wide: 01. Sept. 2009 France: 30. June 2009	>950lm (~80W GLS) <950lm (Energy Class F&G) 100W	C F&G C
	2	EU Wide: 01. Sept 2010 France: 31. December 2009 France: 30. June 2010	>725lm (~65W GLS) >75W >60W	C C C
	3	01. Sept 2011 France: 31. August 2011	>450lm (~45W GLS) 40W	C C
	4	01. Sept 2012	>60lm (~7W GLS)	C
	5	01. Sept 2013	2013 Increased quality requirements ⁵	C
	Anticipated Review 2014			
	6	01. Sept. 2016	>60lm	B ⁶
Non clear (frosted) lamps		01. Sept. 2009	All Lamps	A

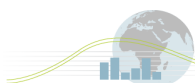
(See notes section 1)

³ Refer EU Mapping Document at <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=5>

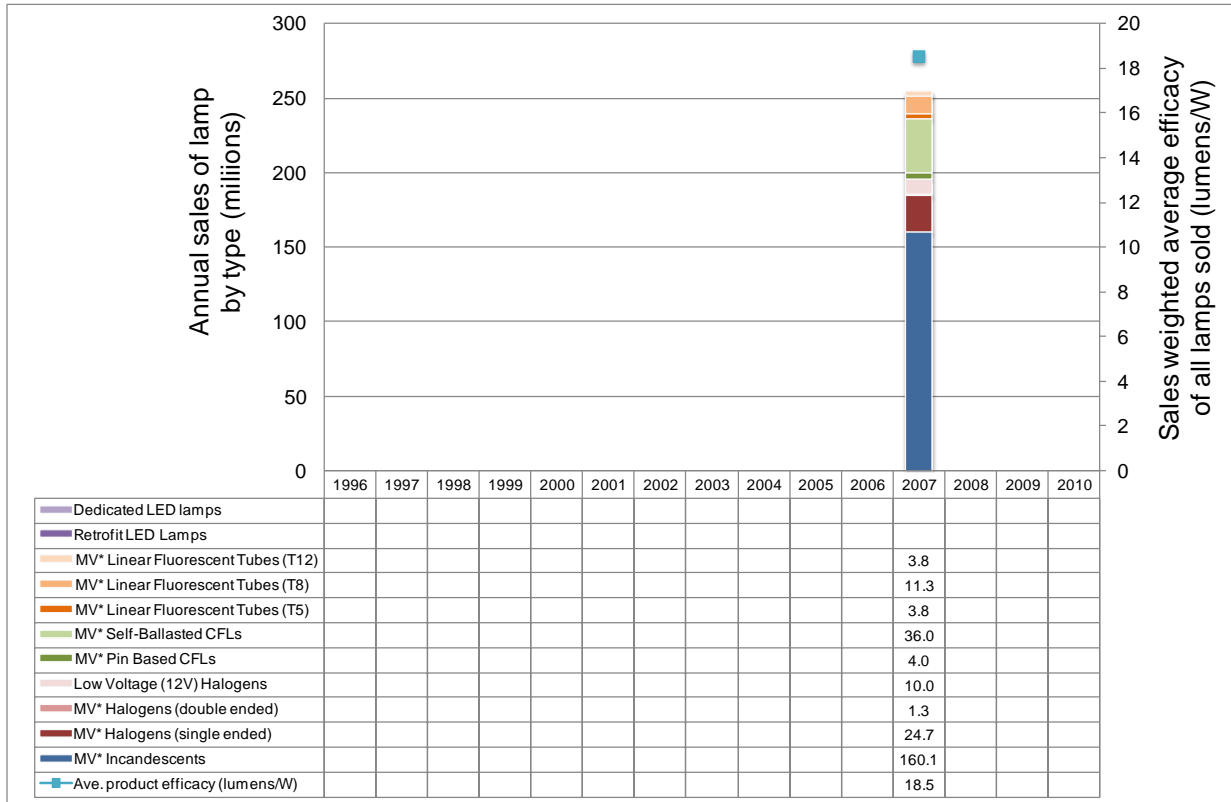
⁴ Refer to <http://www.legrenelle-environnement.fr/> (French) or English overview at <http://www.legrenelle-environnement.fr/-Version-anglaise-.html>

⁵ Incandescent lamps with S14, S15 or S19 caps are included in stage 5 & 6

⁶ Except for clear lamps with G9/R7s caps: EEL C



Sales and average efficacy of all domestic lamps - France



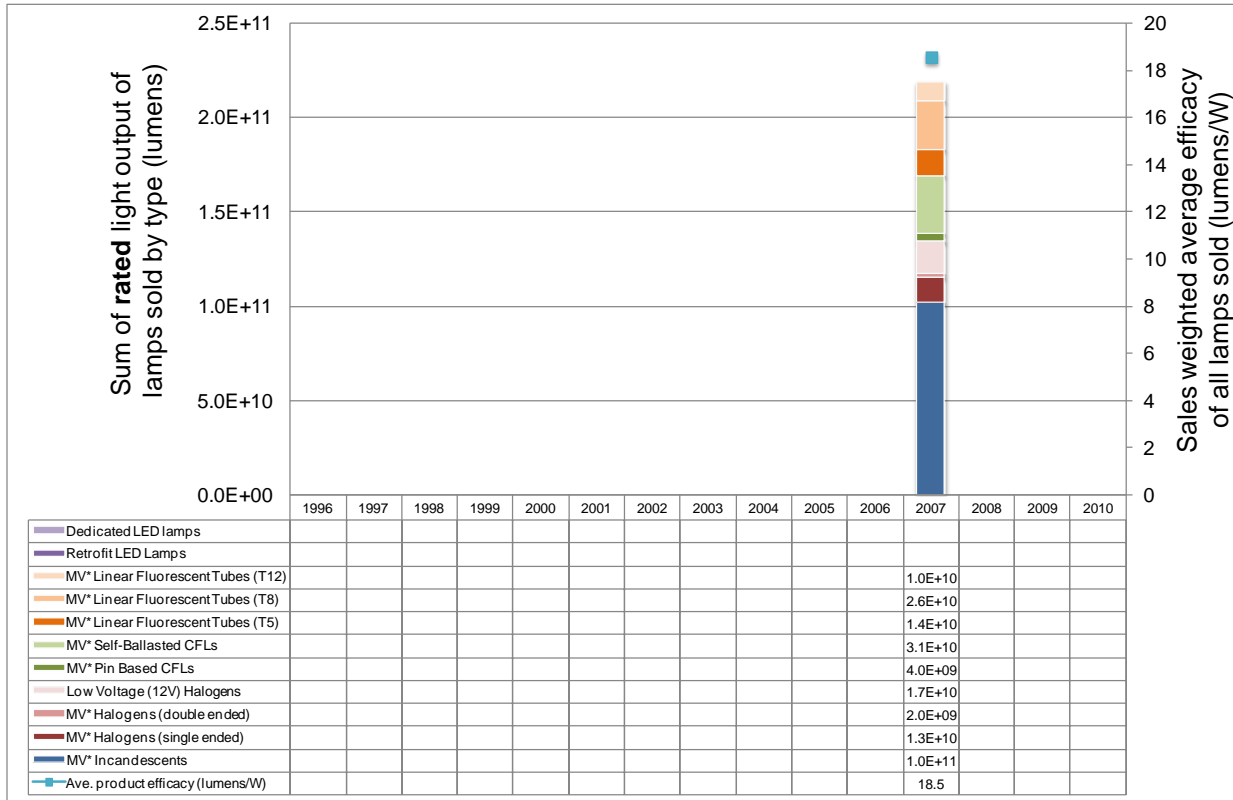
* Mains Voltage

Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling⁷. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

⁷ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Total instantaneous light output of all domestic lamps sales - France



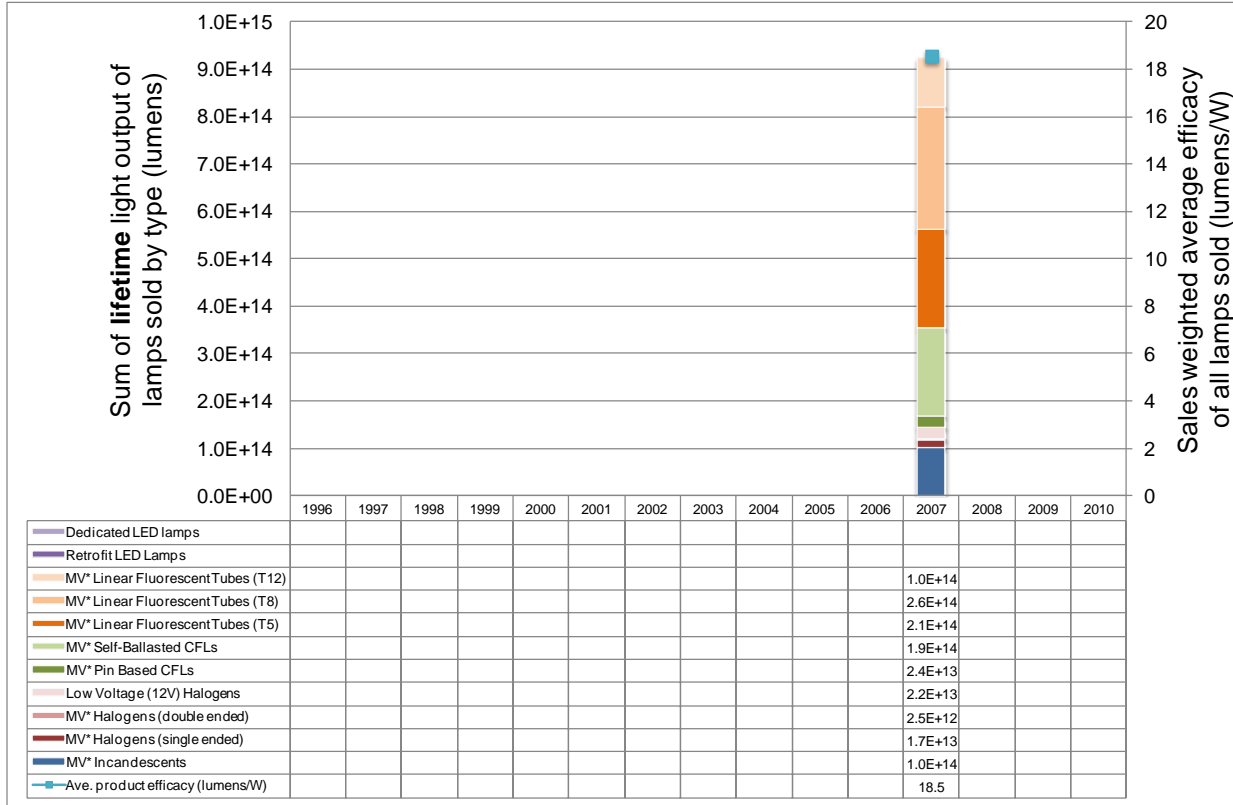
* Mains Voltage

Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling⁸. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Instantaneous light output calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps
- Instantaneous light output is for lamps sold in each year only, *not* all installed stock

⁸ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Total lifetime light output of all domestic lamps sales - France



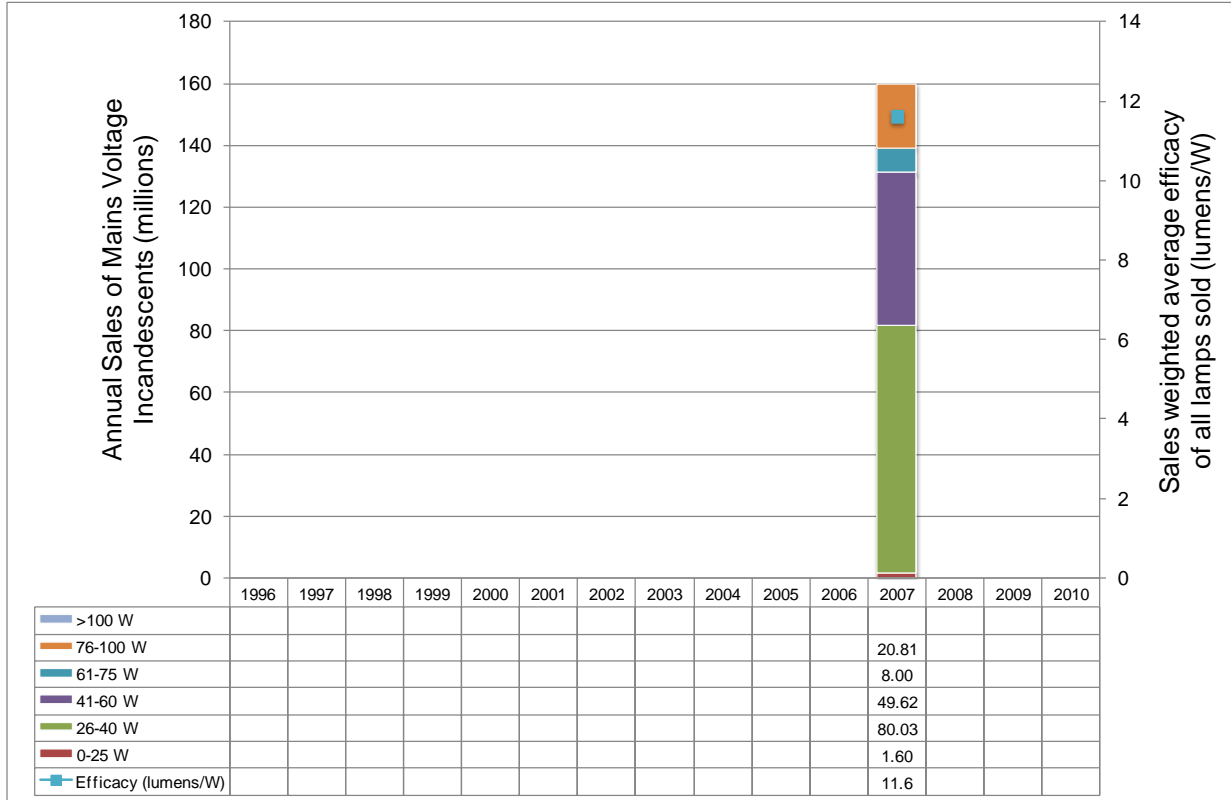
* Mains Voltage

Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling⁹. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Lifetime light output calculated on a sales weighted basis using estimated average global efficacies and lifetimes for each lamp type and associated wattage range for 230V lamps
- Lifetime light output is for lamps sold in each year only, not all installed stock

⁹ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Sales of Mains Voltage Incandescent lamps by wattage range - France

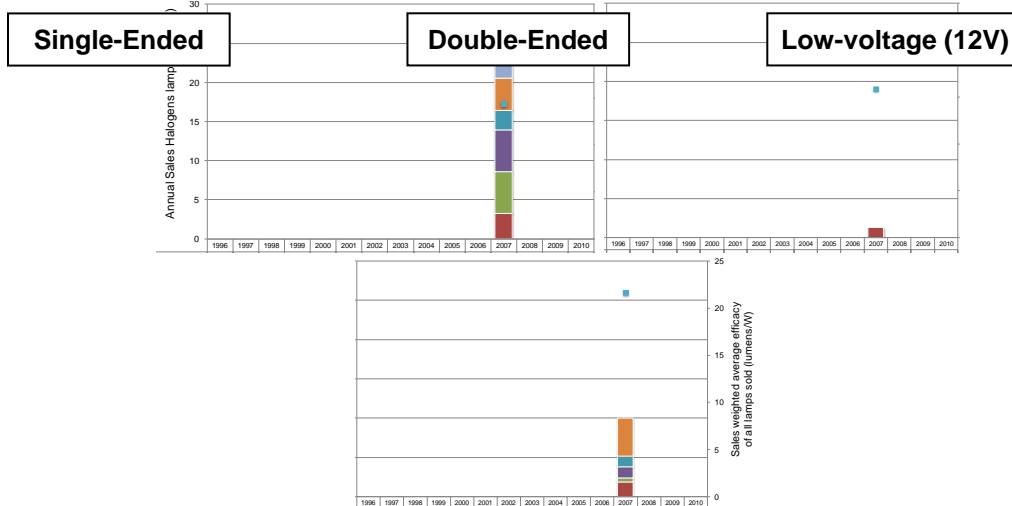
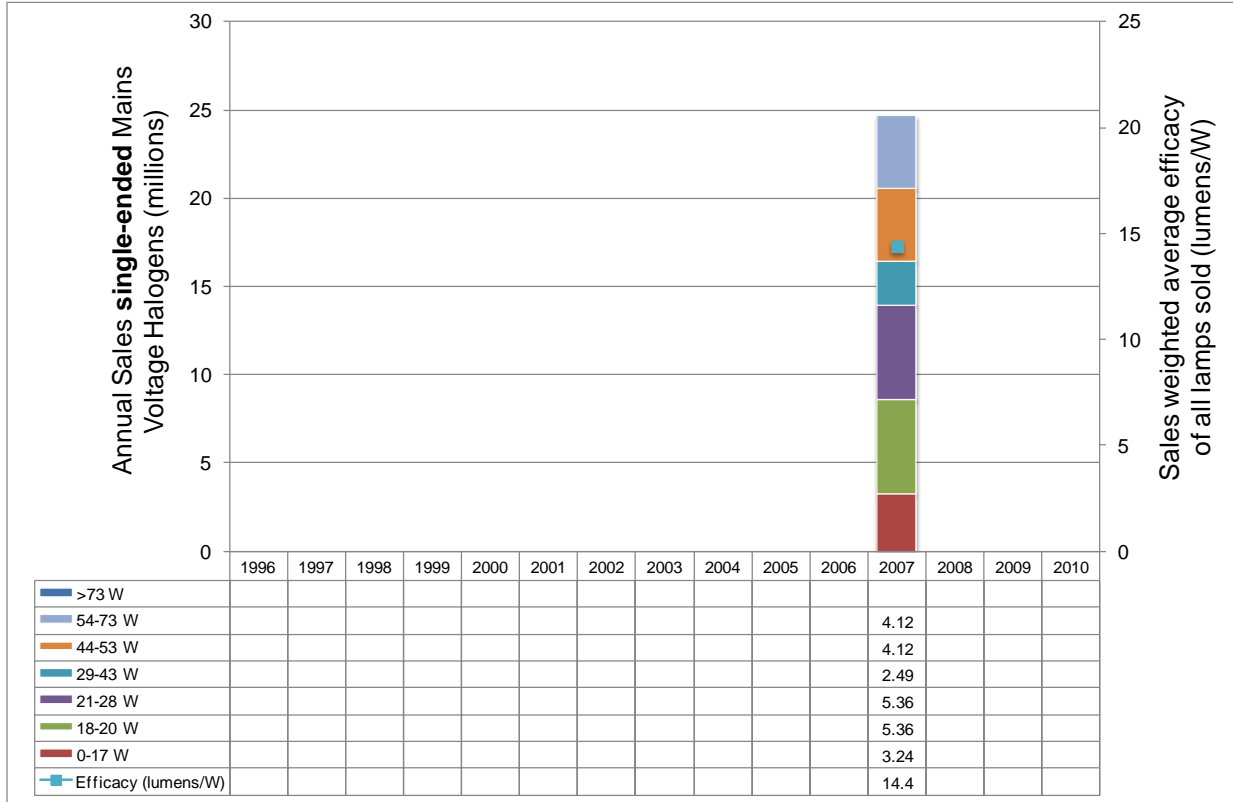


Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹⁰. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

¹⁰ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Sales of single-ended mains voltage halogen lamps by wattage range - France



Key notes on Graph (See notes section 2)

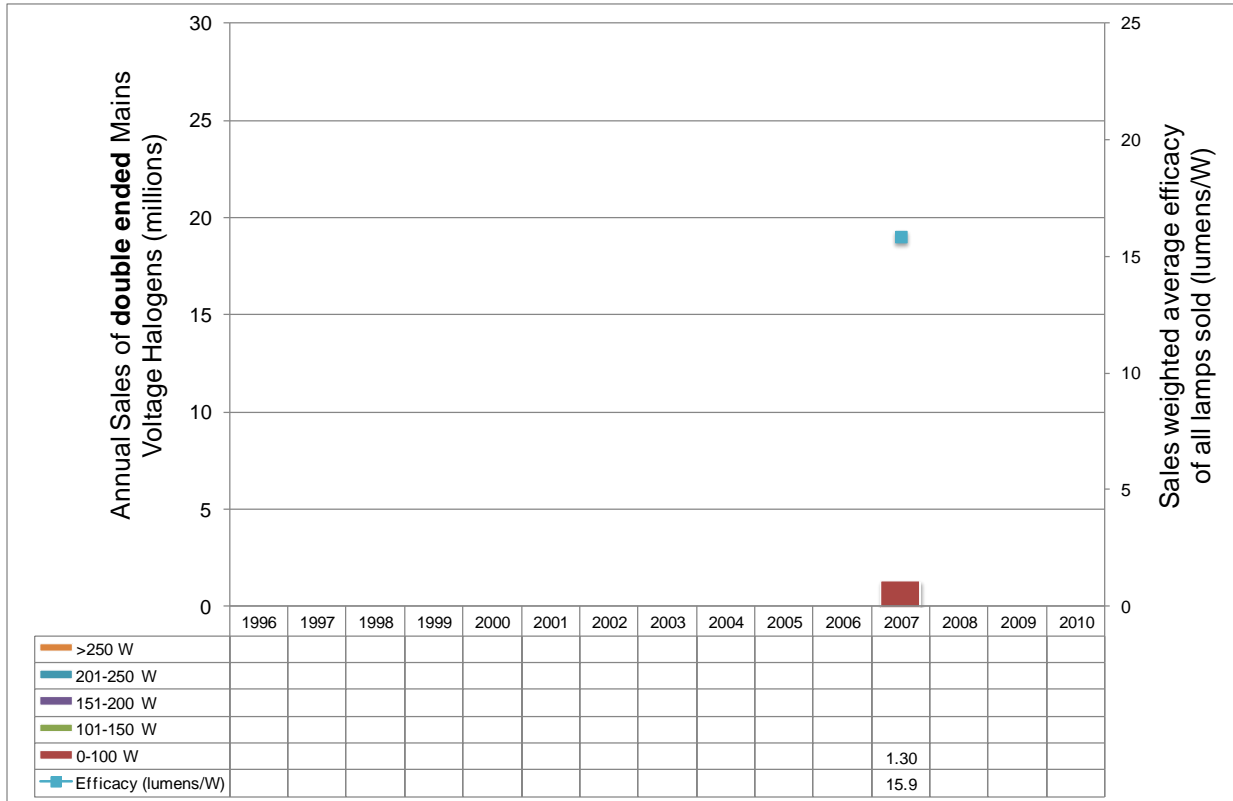
- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹¹. Data is further adjusted to be in line

¹¹ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in

with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution

- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

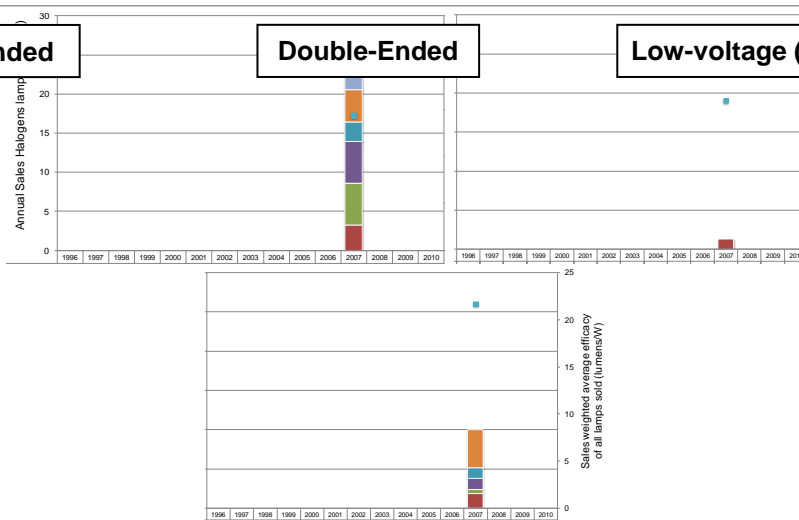
Sales of double-ended mains voltage halogen lamps by wattage range – France



Single-Ended

Double-Ended

Low-voltage (12V)

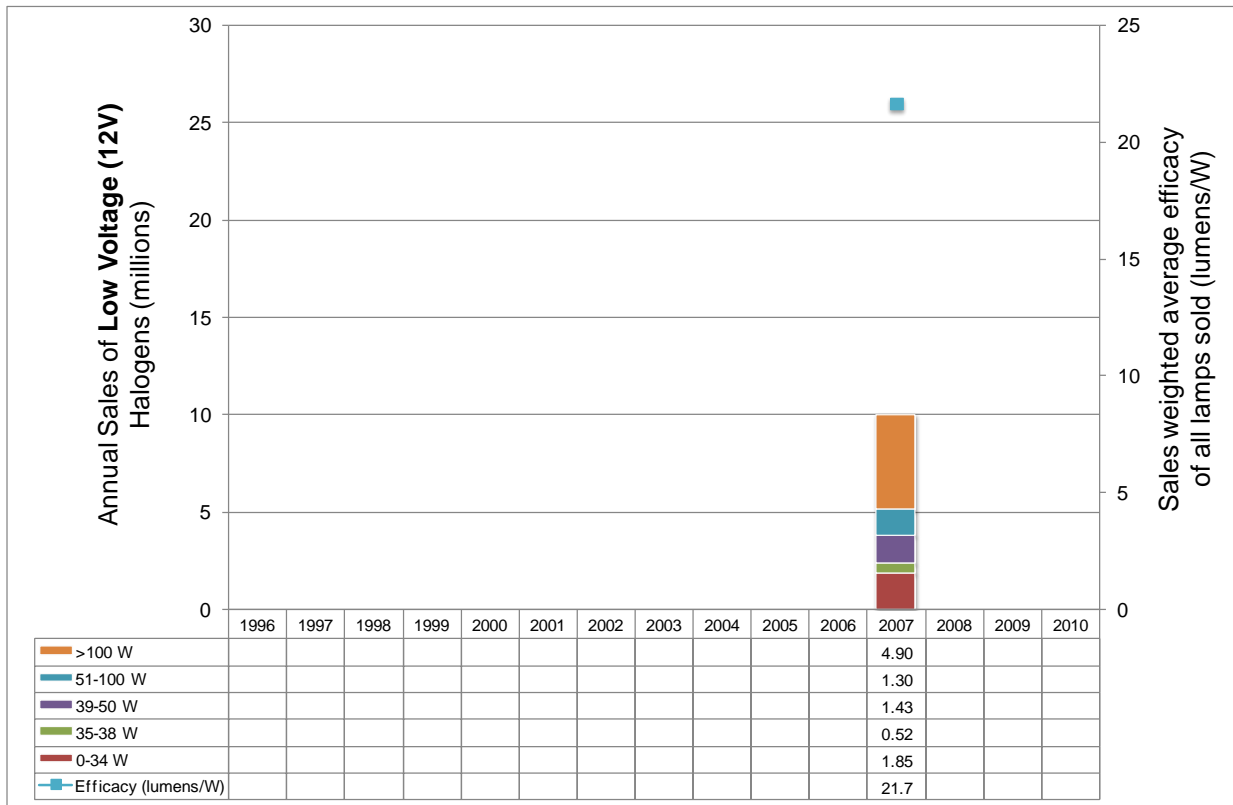


almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as “domestic lighting” irrespective of final installation point.

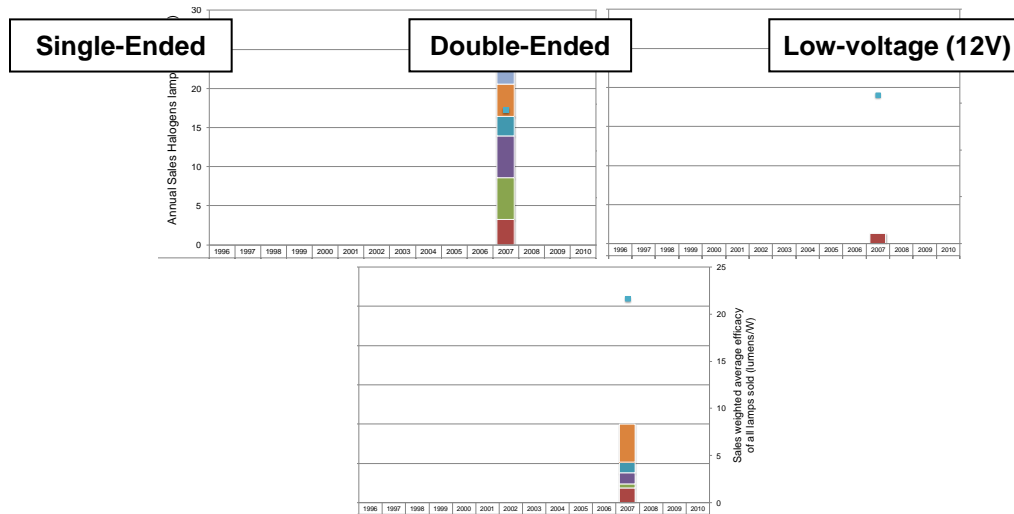
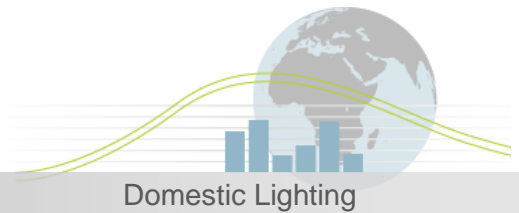
Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹². Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

Sales of low voltage (12V) halogen lamps by wattage range - France



¹² Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

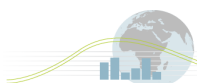


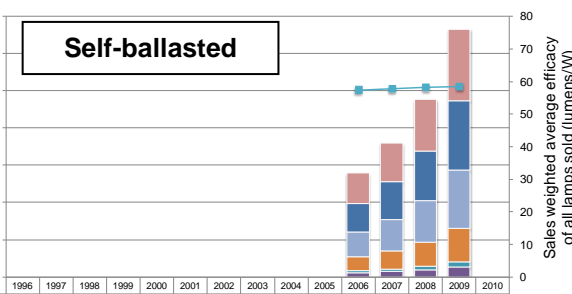
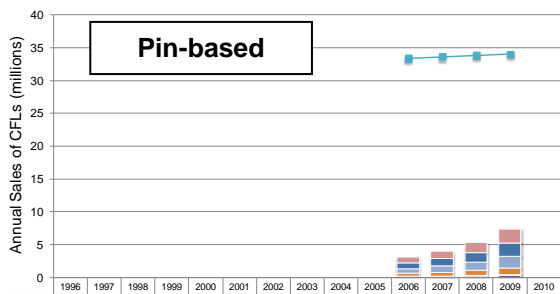
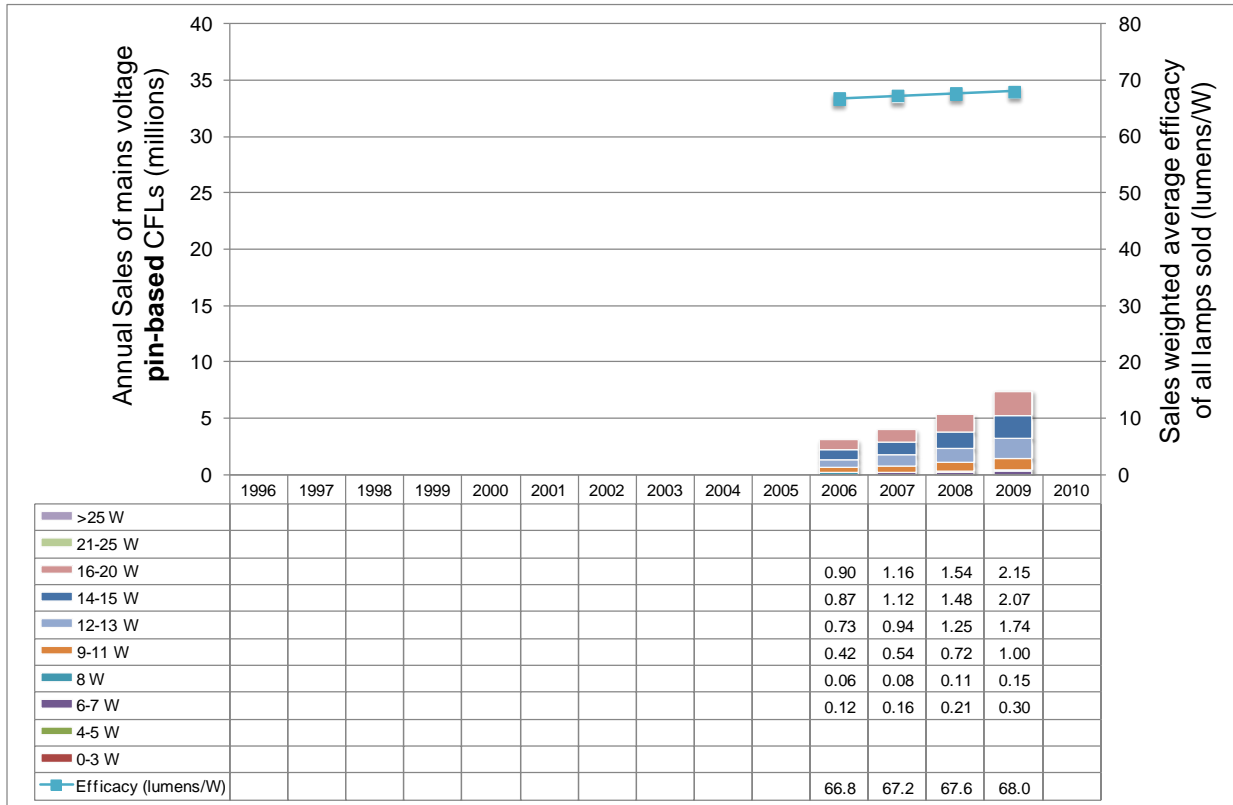
Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹³. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

Sales of mains voltage pin based CFLs by wattage range - France

¹³ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

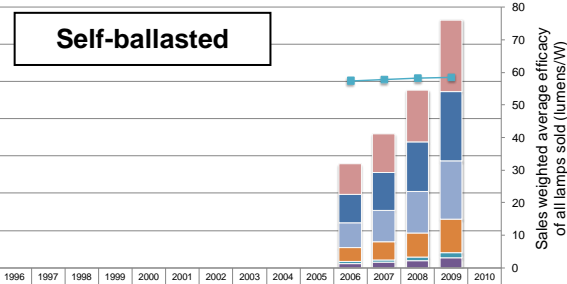
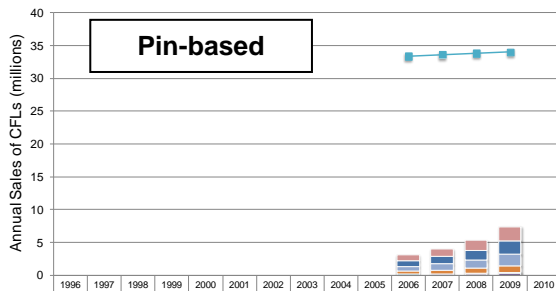
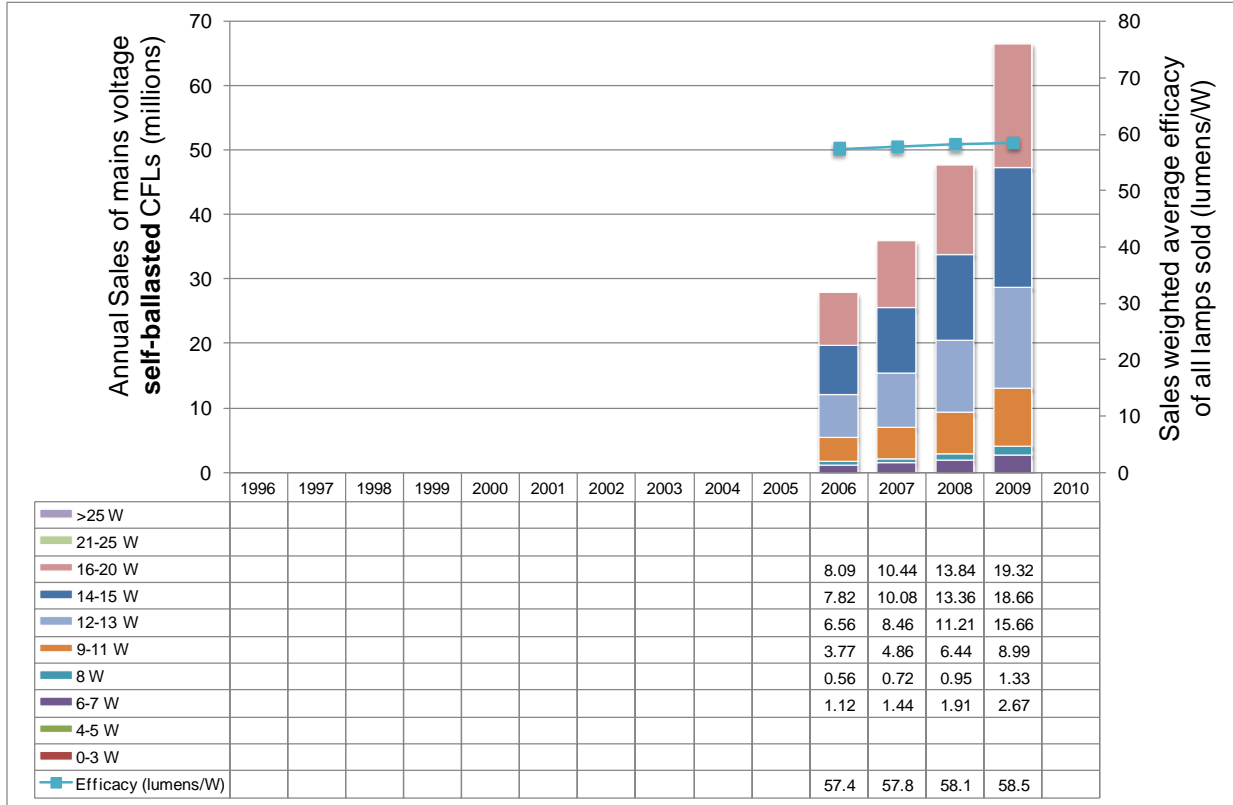




Key notes on Graph (See notes section 2)

- Annual total sales values for all years believed to be accurate. However, breakdown of wattages based on a 2003 study on households hence robustness of individual wattage levels unknown for each year
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

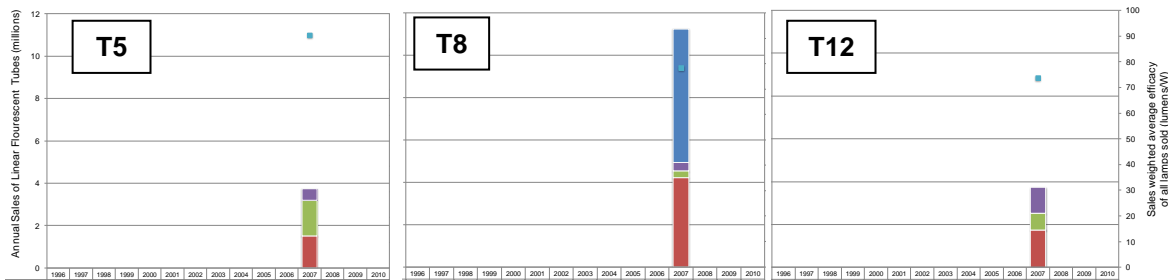
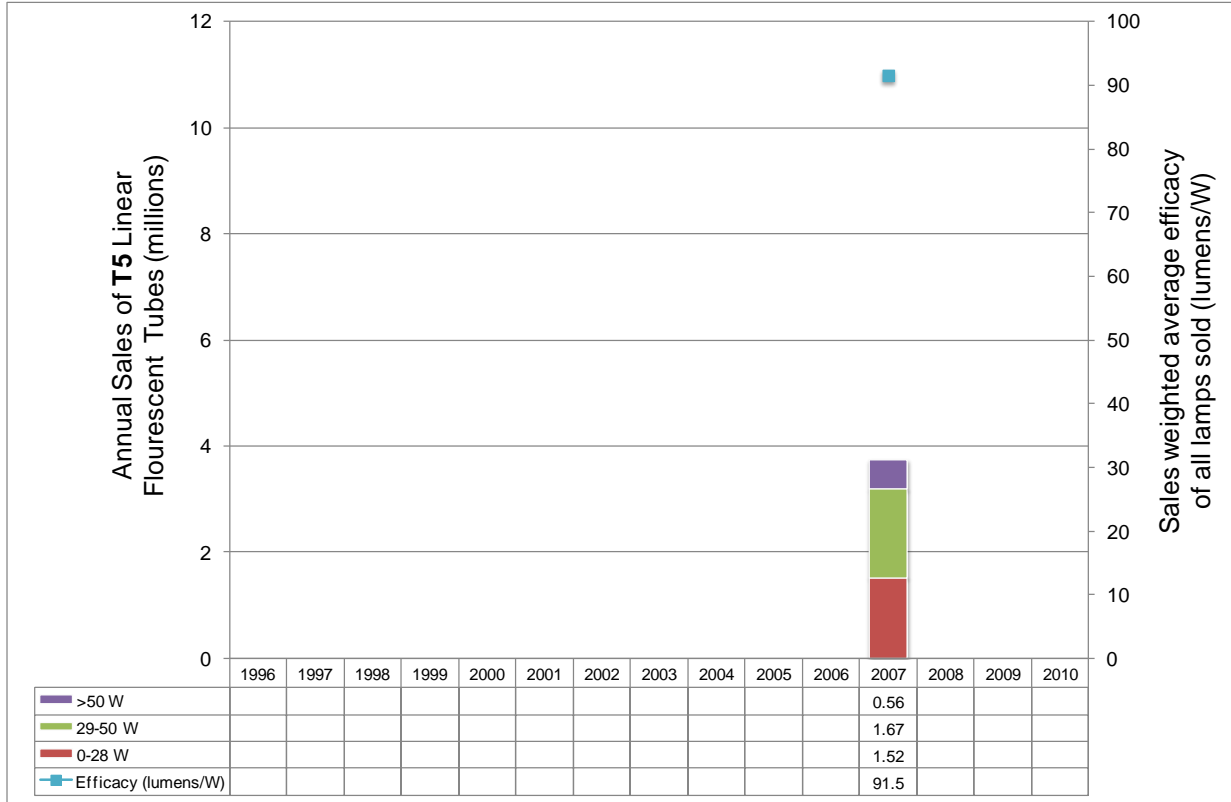
Sales of mains voltage self-ballasted CFLs by wattage range - France



Key notes on Graph (See notes section 2)

- Annual total sales values for all years believed to be accurate. However, breakdown of wattages based on a 2003 study on households hence robustness of individual wattage levels unknown for each year
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

Sales of T5 Linear Fluorescent Tubes by wattage range – France

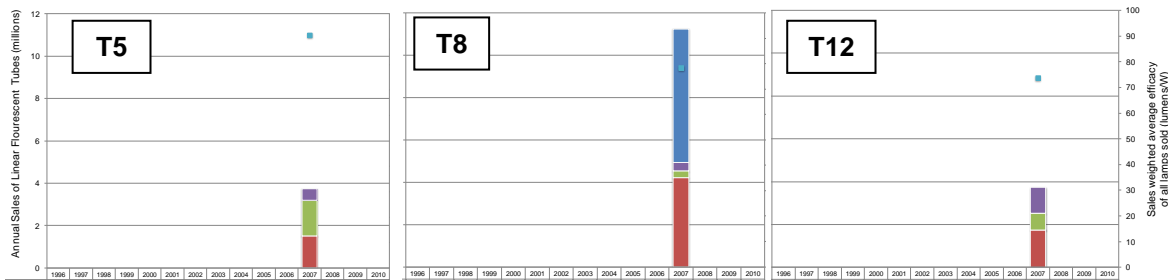
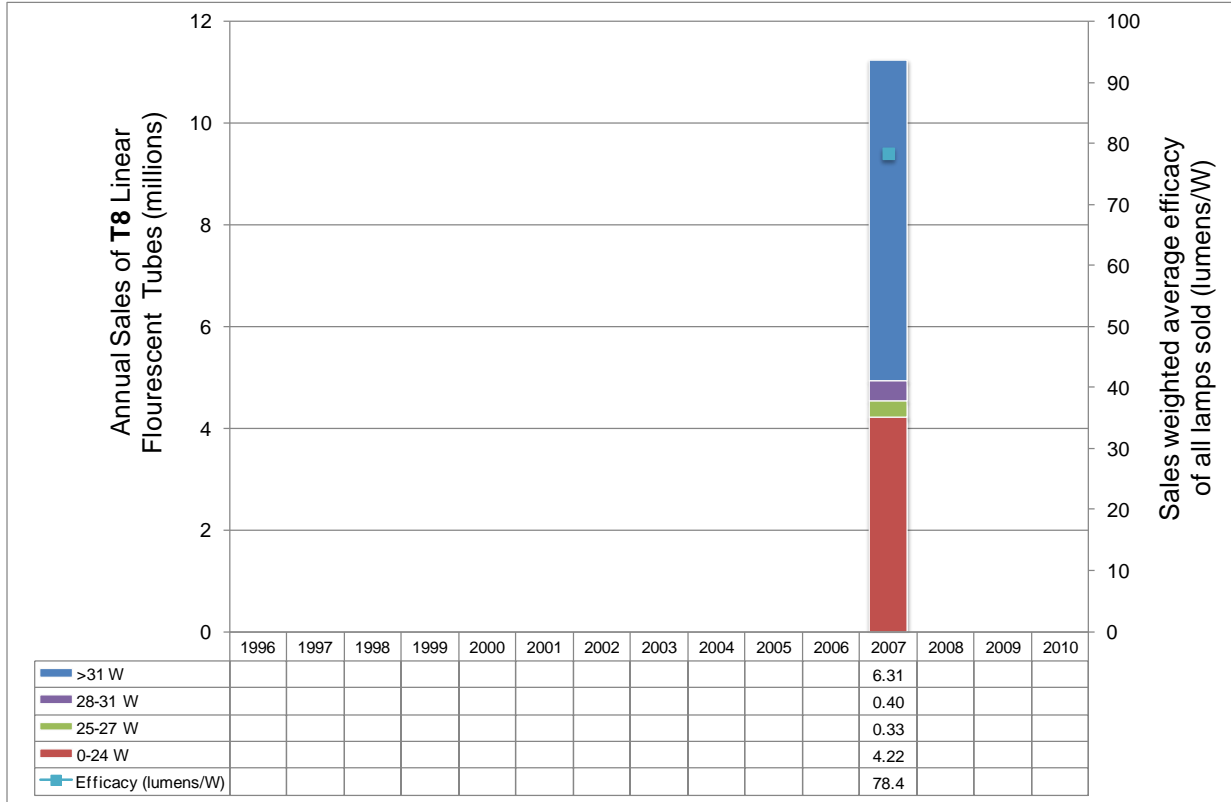


Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹⁴. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

¹⁴ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Sales of T8 Linear Fluorescent Tubes by wattage range - France

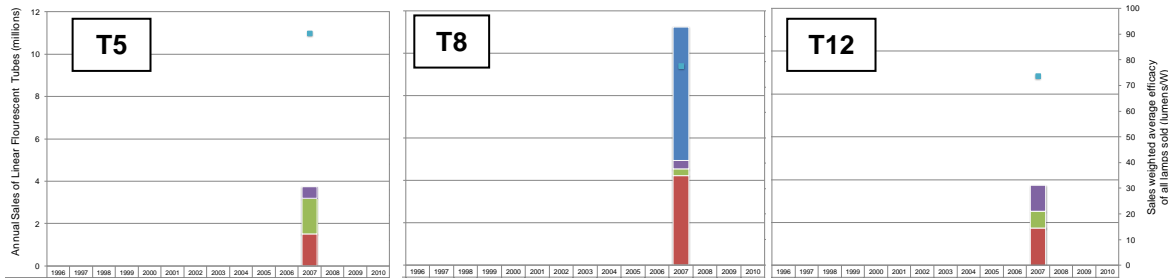
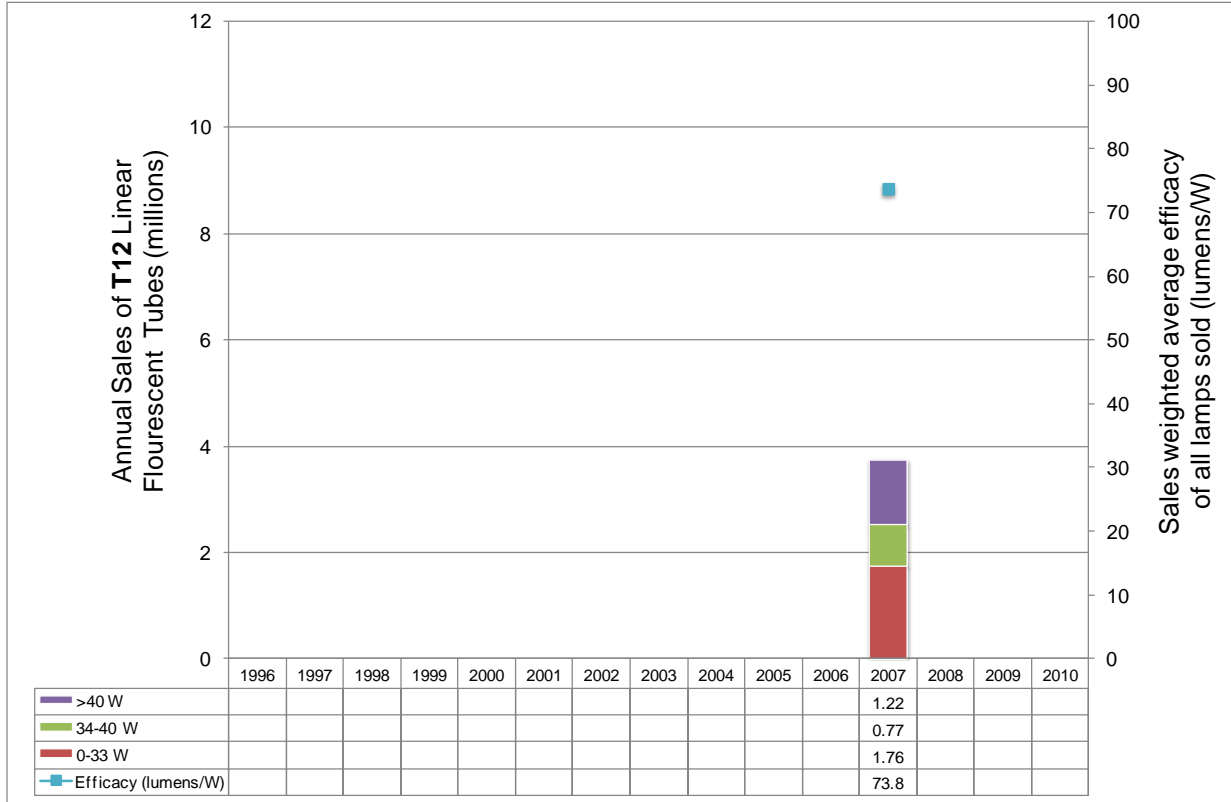


Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹⁵. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

¹⁵ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Sales of T12 Linear Fluorescent Tubes by wattage range - France



Key notes on Graph (See notes section 2)

- Annual sales values based on combined data from a 2003 study on households (to give average wattages of lamps) and 2007 study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling¹⁶. Data is further adjusted to be in line with known time series data for CFLs. Such extensive data manipulation means overall values should be treated with extreme caution
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 230V lamps

¹⁶ Most 'domestic lighting' products are also used in other areas (e.g. hotels, shops, offices, etc). However, given the functionality of these products is virtually the same in all installations, and in almost all participating countries it will be impossible to separate sales to the domestic sector from sales elsewhere, all products shown will be considered as "domestic lighting" irrespective of final installation point.

Sales of LED lamps by wattage range France

No data on the sales of dedicated or retrofit LED lamps in France was available to the Annex at the time of publication.

Major Policy Interventions (See notes Section 3)

Policies actions fall into 2 categories, pan-EU member requirements and national interventions.

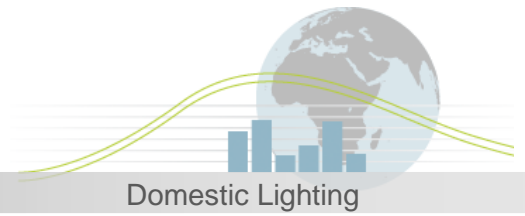
Pan-EU requirements:

- 1) **Mandatory MEPS:** As summarised above, French “phase-out” regulations are broadly in line with those elsewhere in Europe¹⁷. However, French regulations were enacted slightly before the comparable regulations were finalised for all of Europe. See notes section 1
- 2) **Mandatory Product Labelling:** From the 1 July 1999 (with exclusions until 31 December 2000), lighting products within the EU have been required to carry compulsory energy A-G labels (the packaging/labelling requirement is extended by the MEPS noted above)

National Level Interventions

- 3) No known information additional to item 1 above.

¹⁷ Refer EU Mapping Document at <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=5>



Cultural Issues (See Notes Section 4)

No critical cultural information known.

Notes on data

Section 1: Notes on Phase out regulations

1.1 Overview

French “phase-out” regulations are broadly in line with those elsewhere in Europe¹⁸. However, French regulations developed as part of the "Grenelle de l'Environnement"¹⁹ were enacted slightly before the comparable regulations were finalised for all of Europe. The specific requirements for the EU and the slight variants for France are shown in the following table:

Clear Lamps	Stage	Date	Range	Equivalent to lamps below EU Energy Class
	1	EU Wide: 01. Sept. 2009 France: 30. June 2009	>950lm (~80W GLS) <950lm (Energy Class F&G) 100W	C F&G C
	2	EU Wide: 01. Sept 2010 France: 31. December 2009 France: 30. June 2010	>725lm (~65W GLS) >75W >60W	C C C
	3	01. Sept 2011 France: 31. August 2011	>450lm (~45W GLS) 40W	C C
	4	01. Sept 2012	>60lm (~7W GLS)	C
	5	01. Sept 2013	2013 Increased quality requirements ²⁰	C
<i>Anticipated Review 2014</i>				
	6	01. Sept. 2016	>60lm	B ²¹
Non clear (frosted) lamps		01. Sept. 2009	All Lamps	A

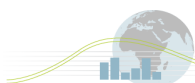
Given the *general* alignment of the French requirement with those of the EU, for detailed information on inclusions and exclusions, readers are referred to the EU Mapping Document at <http://mappingandbenchmarking.iea-4e.org/matrix?type=product&id=5>.

¹⁸ Refer EU Mapping Document at

¹⁹ Refer to <http://www.legrenelle-environnement.fr/> (French) or English overview at <http://www.legrenelle-environnement.fr/-Version-anglaise-.html>

²⁰ Incandescent lamps with S14, S15 or S19 caps are included in stage 5 & 6

²¹ Except for clear lamps with G9/R7s caps: EEL C



Section 2: Notes on Sales and efficacy of all lamps, total light output and sales by product type

2.1 Data Sources and Selection

Two data sets were supplied as follows:

- 1) 2007 data for sales of all lamp types:

Total sales of New products (by type)	Millions
	2007
MV* Incandescents	160.1
MV* Halogens (single ended)	24.7
MV* Halogens (double ended)	1.3
Low Voltage (12V) Halogens	10.0
MV* Pin Based CFLs	4.0
MV* Self-Ballasted CFLs	36.0
MV* Linear Fluorescent Tubes (T5)	3.8
MV* Linear Fluorescent Tubes (T8)	11.3
MV* Linear Fluorescent Tubes (T12)	3.8
Retrofit LED Lamps	#N/A
Dedicated LED lamps	#N/A

Annual 2007 sales values based on combined data from a French 2003²² study on households (to give average wattages of lamps) and 2007²³ study on the sales of each kind of type of lamp which combined import and sales data and extrapolation through modelling. Robustness of combination in estimating overall market unknown.

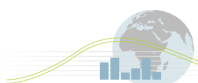
- 2) Estimate of CFL sales for 2006-2010

2006	31	millions
2007	40	millions
2008	53	millions
2009	74	millions
projection : 2010	74	millions

When compared with other countries of *broadly similar* population and cultural background (eg the UK), total French lamp sales in first data set are approximately 3 times higher than the equivalent, eg approximately 650 million in France compared with 220 million in the UK. Such a difference is reflected in the in the French data for CFLs with the second (believed to be more reliable) sales data set for CFLs which is 2.5 times lower than sales in the first data set. Therefore, in consultation with the data supplier, 2007 data for all lamps has been adjusted by 40/103 to bring CFL sales into line with the second data source and overall

²² ADEME – Centre for Sophia-Antipolis confidential study of 100 representative households

²³ REMODECE survey (2007) refer: <http://remodece.isr.uc.pt/>



sales to a level that is believed to be more accurate and in line with other comparable countries. However, such a transformation is clearly based on significant levels of assumption and thus should be treated with extreme caution.

CFL wattages for all years based on 2007 breakdown.

2.2 Additional Manipulations of Data Supplied

Annual sales values based on combination of studies noted in section 2.1 above. The methodology for combining these studies is unknown and hence the robustness of the combination in estimating overall market unknown.

Average efficacies calculated on a sales weighted basis by:

$$\frac{\text{Sum (sales of lamp type a sales * efficacy of lamp type a) + + Sum (sales of lamp type x sales * efficacy of lamp type x)}}{\text{Sum (all lamp sales)}}$$

Instantaneous light output calculated as sales weighted basis by:

$$\frac{\text{Sum (sales of lamp type a sales * efficacy of lamp type a * wattage of lamp type a) + + Sum (sales of lamp type x sales * efficacy of lamp type x * wattage of lamp type n)}}{\text{Sum (all lamp sales)}}$$

Lifetime light output calculated as sales weighted basis by:

$$\frac{\text{Sum (sales of lamp type a sales * efficacy of lamp type a * wattage of lamp type a * lifetime of lamp type a) + + Sum (sales of lamp type x sales * efficacy of lamp type x * wattage of lamp type n * lifetime of lamp type n)}}{\text{Sum (all lamp sales)}}$$

2.2.1 Key assumptions:

Efficacies used for all calculations based on estimated average global efficacies for each lamp type and associated wattage range for 230V lamps.

Lifetimes used for all calculations based on estimated average global lamp life for each lamp type and associated wattage range for 230V lamps.

Tables for efficacy and assumed lifetimes of each lamp type/wattage range for the years 1995-2010 can be viewed in the supporting documents section of the Domestic Lighting area of the Mapping and Benchmarking website – see <http://mappingandbenchmarking.iea-4e.org/matrix>

Section 3: Notes on Policy Interventions

Policies actions fall into 2 categories, pan-EU member requirements and national interventions.

Pan-EU requirements:

- 1) **Mandatory MEPS:** As described in notes section 1
- 2) **Mandatory Product Labelling:** From the 1 July 1999 (with exclusions until 31 December 2000), lighting products within the EU have been required to carry compulsory energy labels.

Full details of the labelling requirement can be found in COMMISSION DIRECTIVE 98/11/EC of 27 January 1998 implementing Council Directive 92/75/EEC with regard to energy labelling of household lamps²⁴

However, calculation of the labelling requirement is described as follows (from Annex IV of the directive):

The energy efficiency class of a lamp shall be determined as follows:

Lamps shall be classified in class A if:

- Fluorescent lamps without integral ballast
(those requiring a ballast and/or other control gear to connect them to the mains)
 $W \leq 0,15 \sqrt{\Phi} + 0,0097 \Phi$
- Other lamps
 $W \leq 0,24 \sqrt{\Phi} + 0,0103 \Phi$
where Φ is the lumen output of the lamp
where W is the power input into the lamp in watts.

If a lamp is not classified in class A, a reference wattage W_R shall be calculated as follows:

$$W_R = \begin{cases} 0,88 \sqrt{\Phi} + 0,049 \Phi, & \text{when } \Phi > 34 \text{ lumens} \\ 0,2 \Phi, & \text{when } \Phi \leq 34 \text{ lumens} \end{cases}$$

where Φ is the lumen output of the lamp.

An energy efficiency index E_i is then set as

$$E_i = \frac{W}{W_R}$$

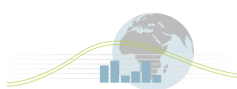
where W is the power input into the lamp in watts.

The energy efficiency classes are then set in accordance with the following table:

Energy efficiency class	Energy efficiency index E_i
B	$E_i < 60 \%$
C	$60 \% \leq E_i < 80 \%$
D	$80 \% \leq E_i < 95 \%$
E	$95 \% \leq E_i < 110 \%$
F	$110 \% \leq E_i < 130 \%$
G	$E_i \geq 130 \%$

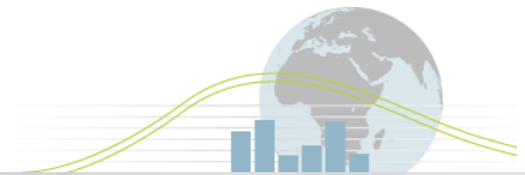
Note the packaging/labelling requirement is extended by the MEPs noted above

²⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:071:0001:0008:EN:PDF>



National Level Interventions

- 3) No major national interventions known



Section 4: Notes on Cultural Issues

No additional Notes

