

Country:	Austria
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):

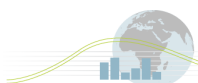
- Mains Voltage Incandescent
- Mains Voltage Halogens (Single and Double Ended)
- Low Voltage (12V) Halogen
- Pin Based and Self Ballasted CFLs
- Linear Tubes (T12, T8 and T5) *
- Retrofit LEDs
- Dedicated LEDs

* 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.

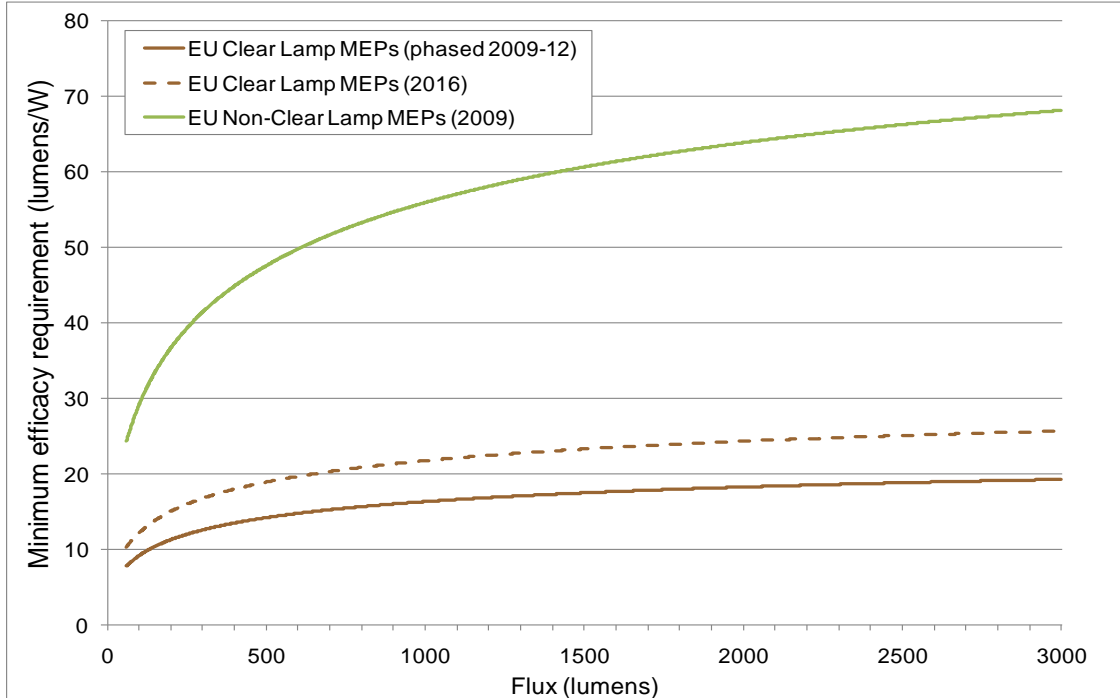
A full product definition is provided at the annex website².

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 - Austria



Key notes on Graph (see notes section 1)

National regulations based on pan EU requirement as follows:

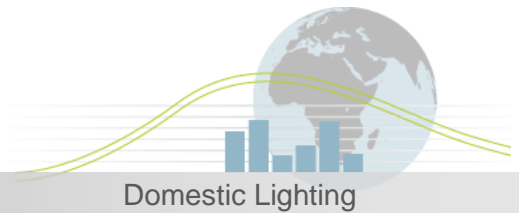
- At the time of preparation, regulations for “domestic lighting” covered only non-directional lighting. Proposals for the regulation of directional lighting are well underway and announcements are expected in the near future.
- Each Ecodesign requirement shall apply in accordance with the following stages (with some exceptions)³:

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

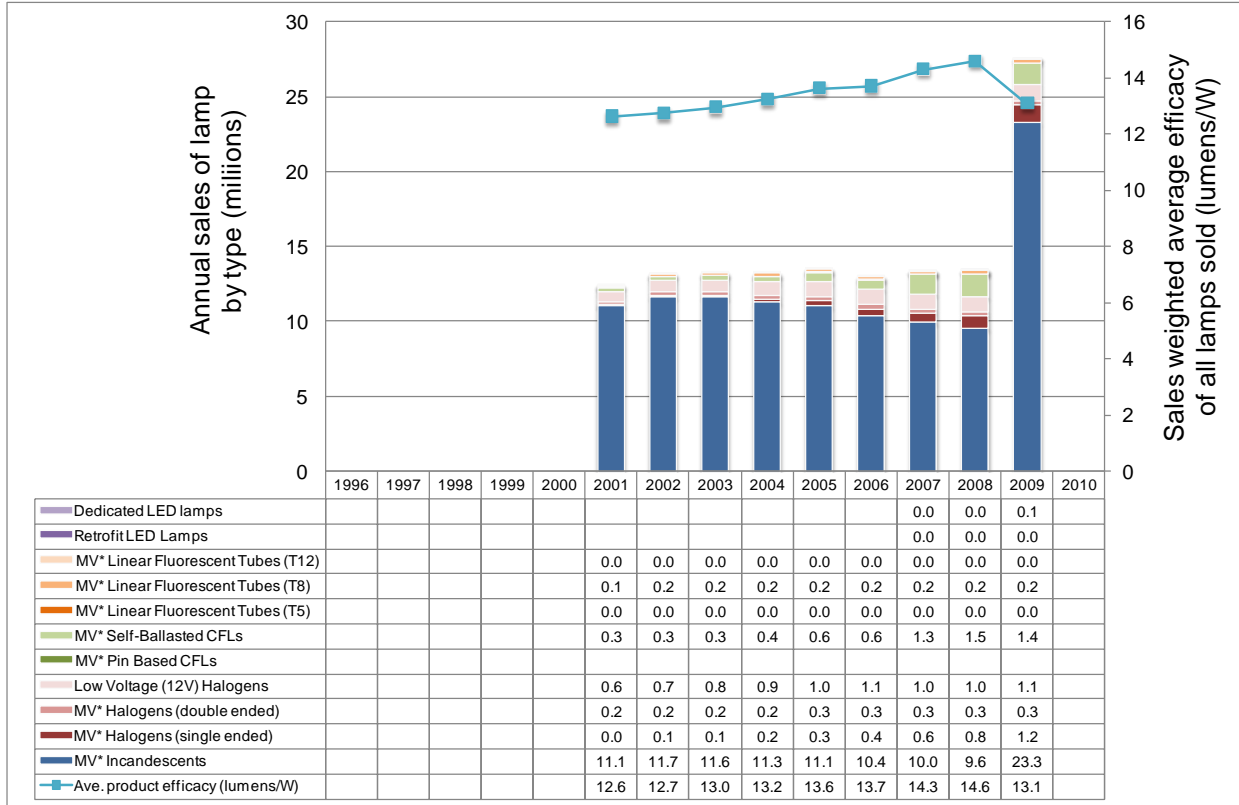
³ Table derived from European Lamp Federation summary information (http://www.elcfd.org/documents/Questions%20and%20answers%20on%20the%20EU%20decision%20to%20phase%20out%20incandescent%20lamps_external_20090318_final.pdf)

⁴ Incandescent lamps with S14, S15 or S19 caps are included in stage 5 & 6

⁵ Except for clear lamps with G9/R7s caps: EEL C



Sales and average efficacy of all domestic lamps - Austria

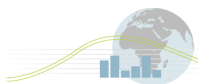


* Mains Voltage

Key notes on Graph (See notes section 2)

- Data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps⁶.
- 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.

⁶ 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 - Austria



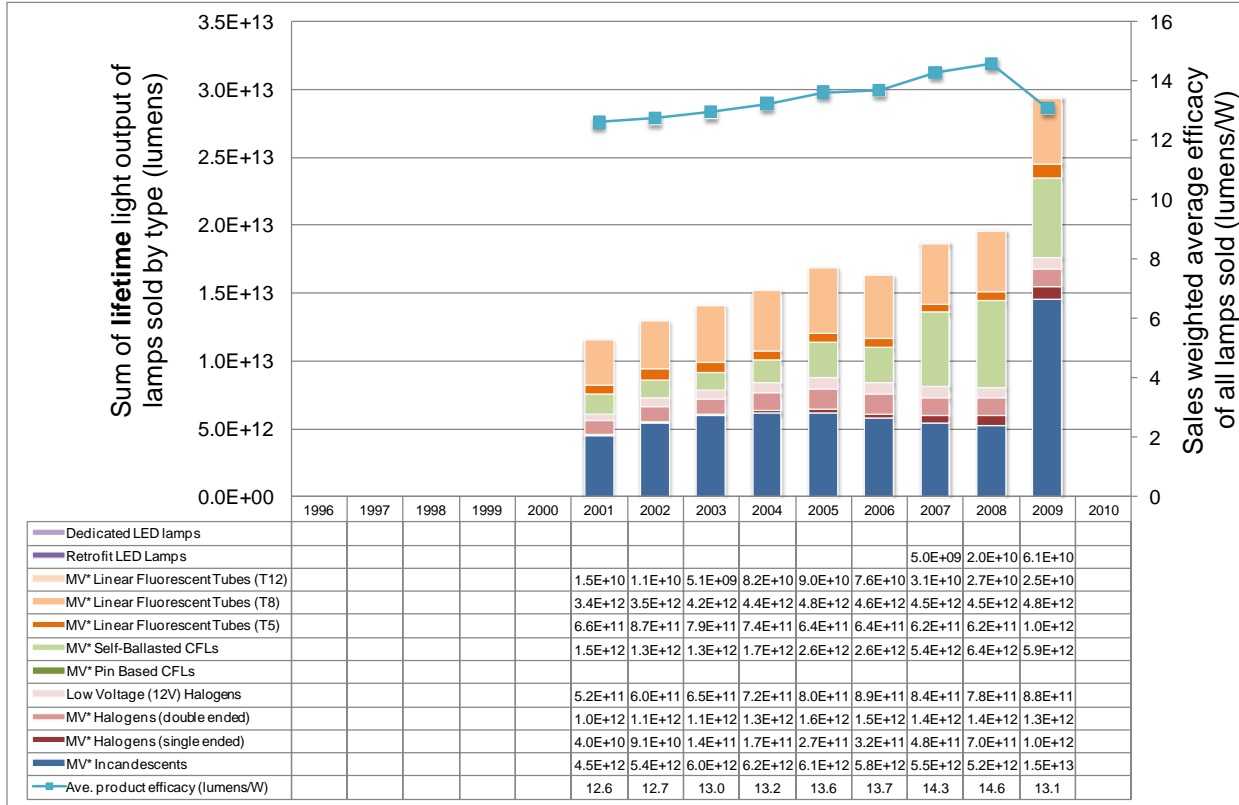
* Mains Voltage

Key notes on Graph (See notes section 2)

- Data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps⁷.
- 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.

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 lifetime light output of all domestic lamps sales - Austria



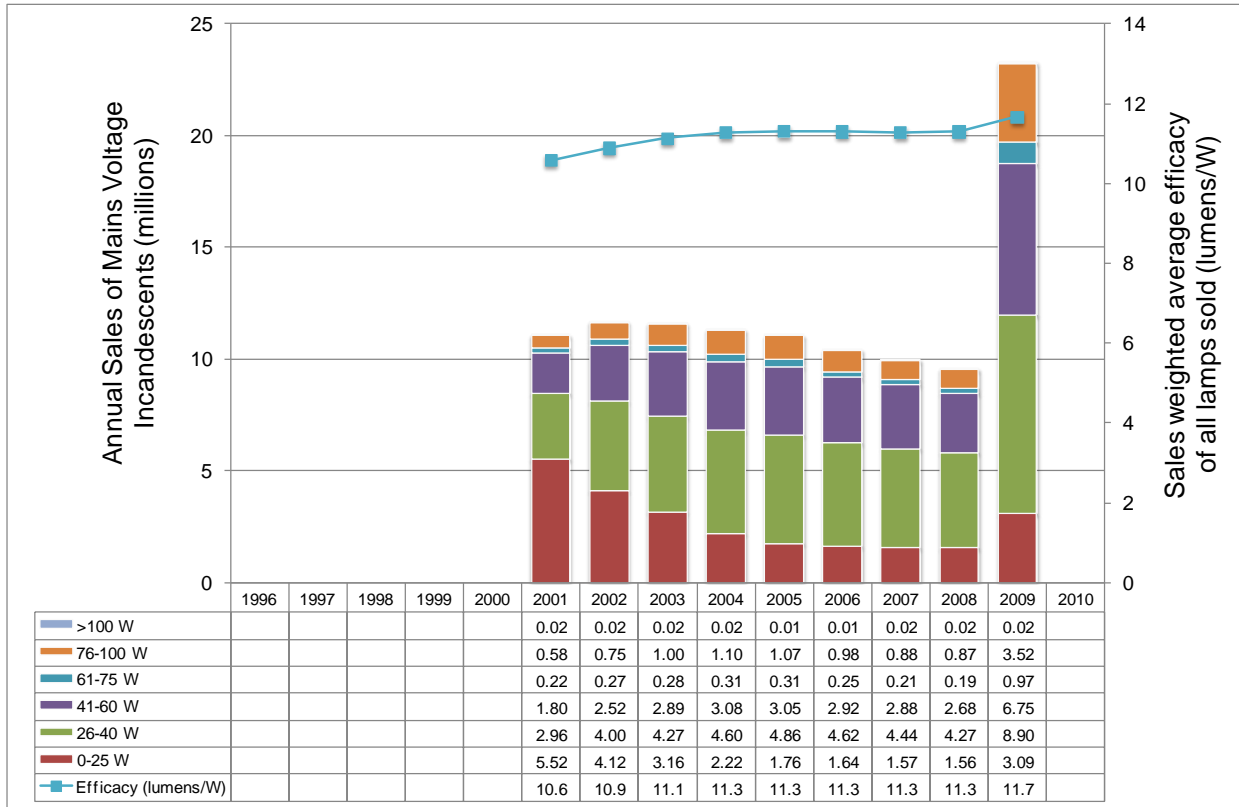
* Mains Voltage

Key notes on Graph (See notes section 2)

- Data shown supplied from GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps⁸.
- 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.

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.

Sales of Mains Voltage Incandescent lamps by wattage range – Austria



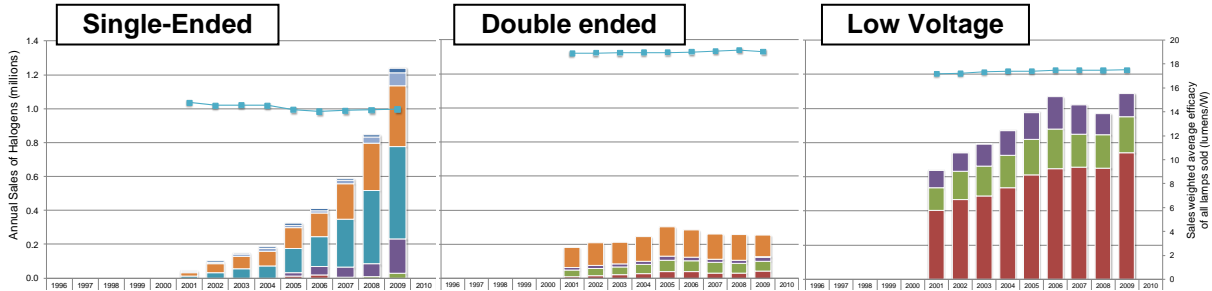
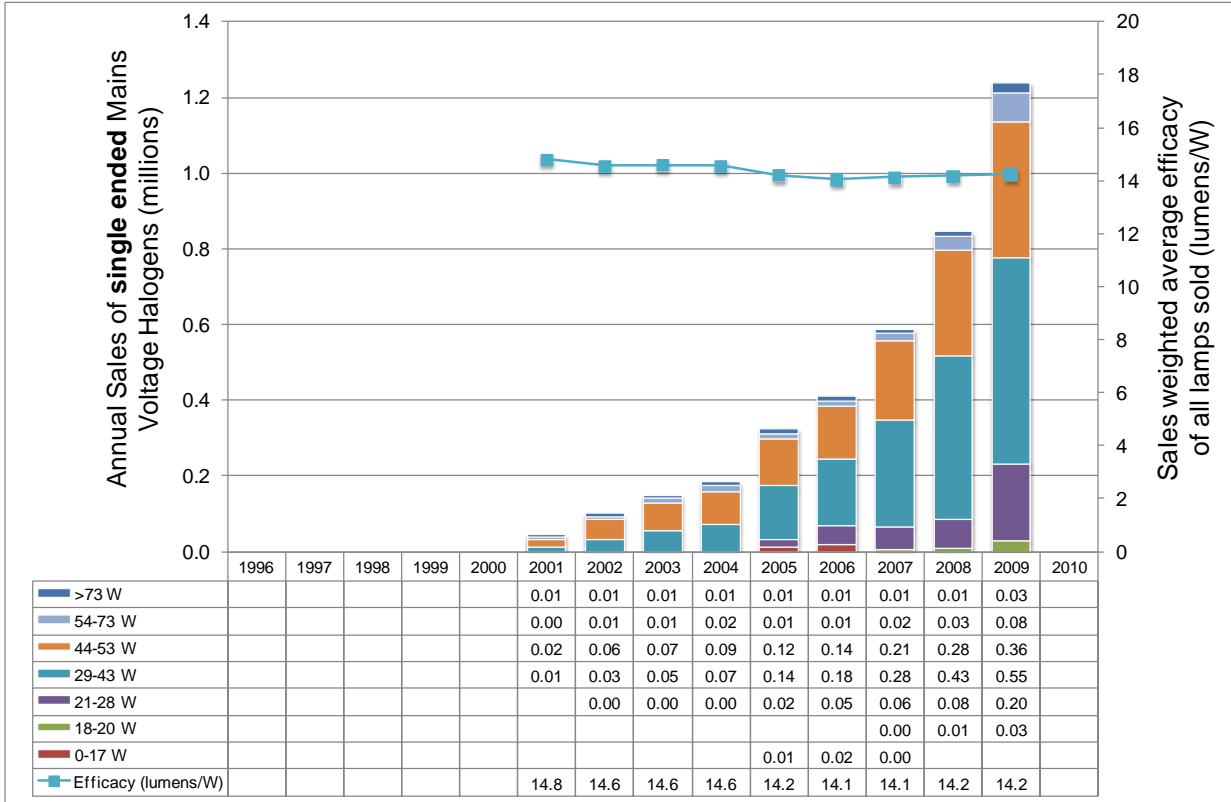
* Mains Voltage

Key notes on Graph (See notes section 2)

- Data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps⁹.
- 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.

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 Single Ended Mains Voltage Halogen lamps by wattage range - Austria

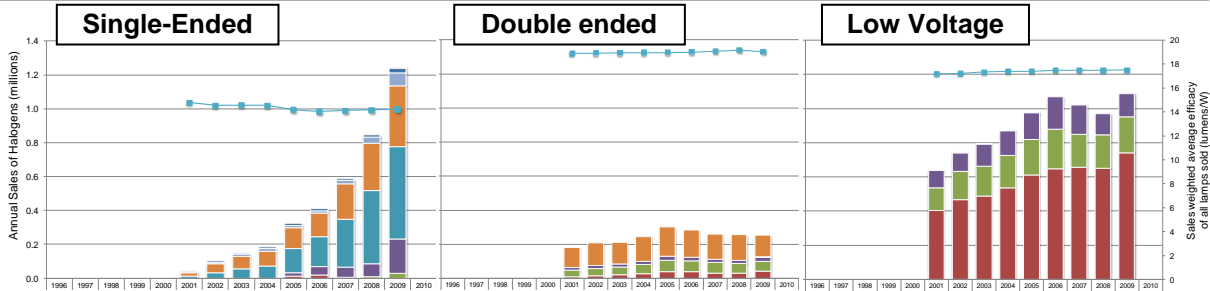
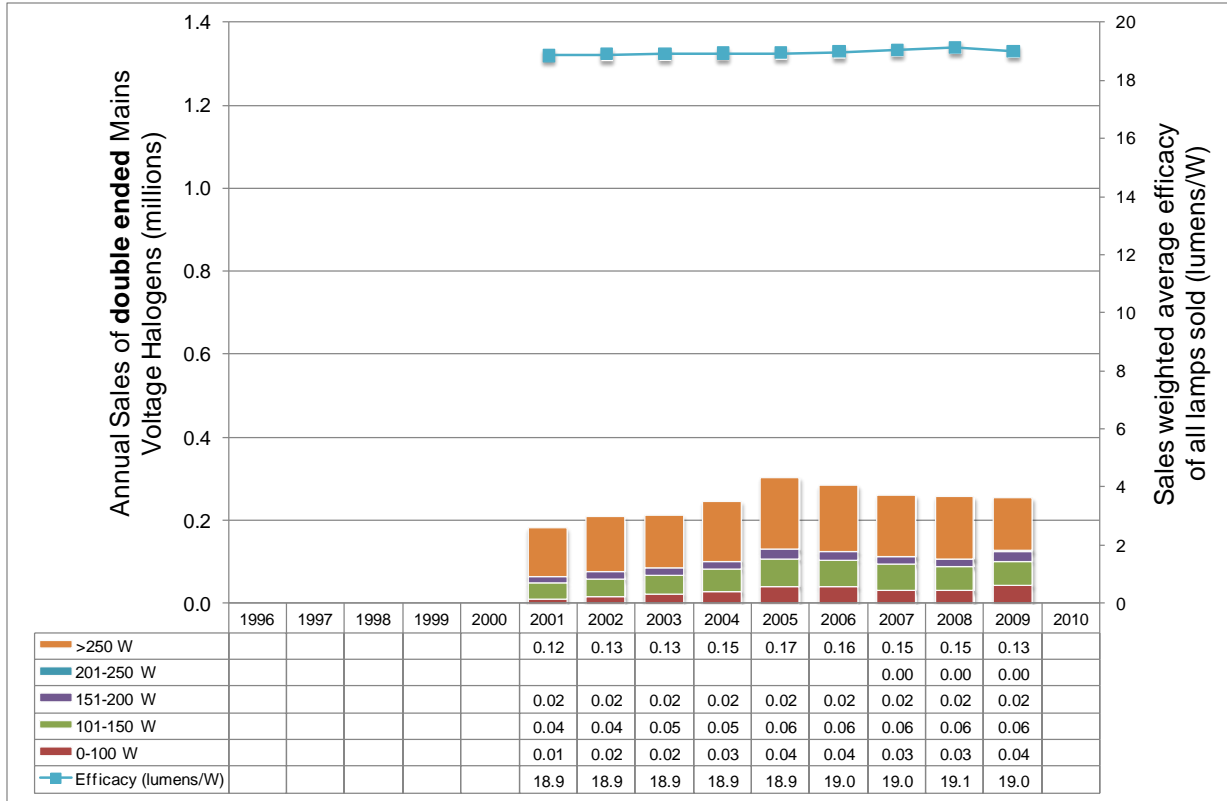


Key notes on Graph (See notes section 2)

- Data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps¹⁰.
- 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 Double Ended Mains Voltage Halogen lamps by wattage range - Austria

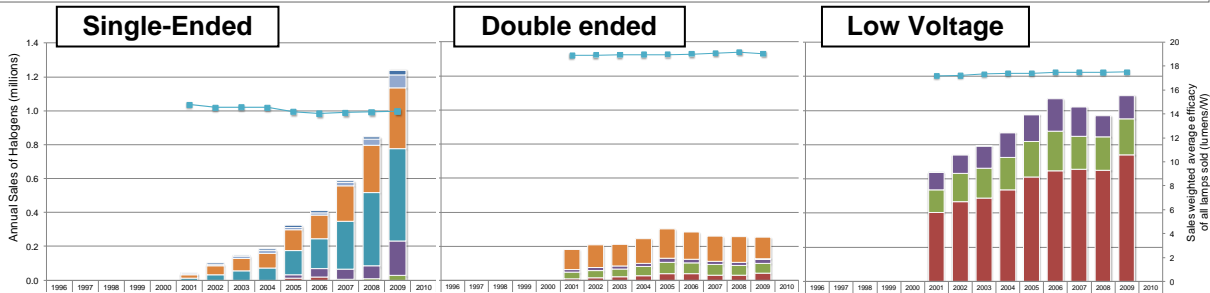
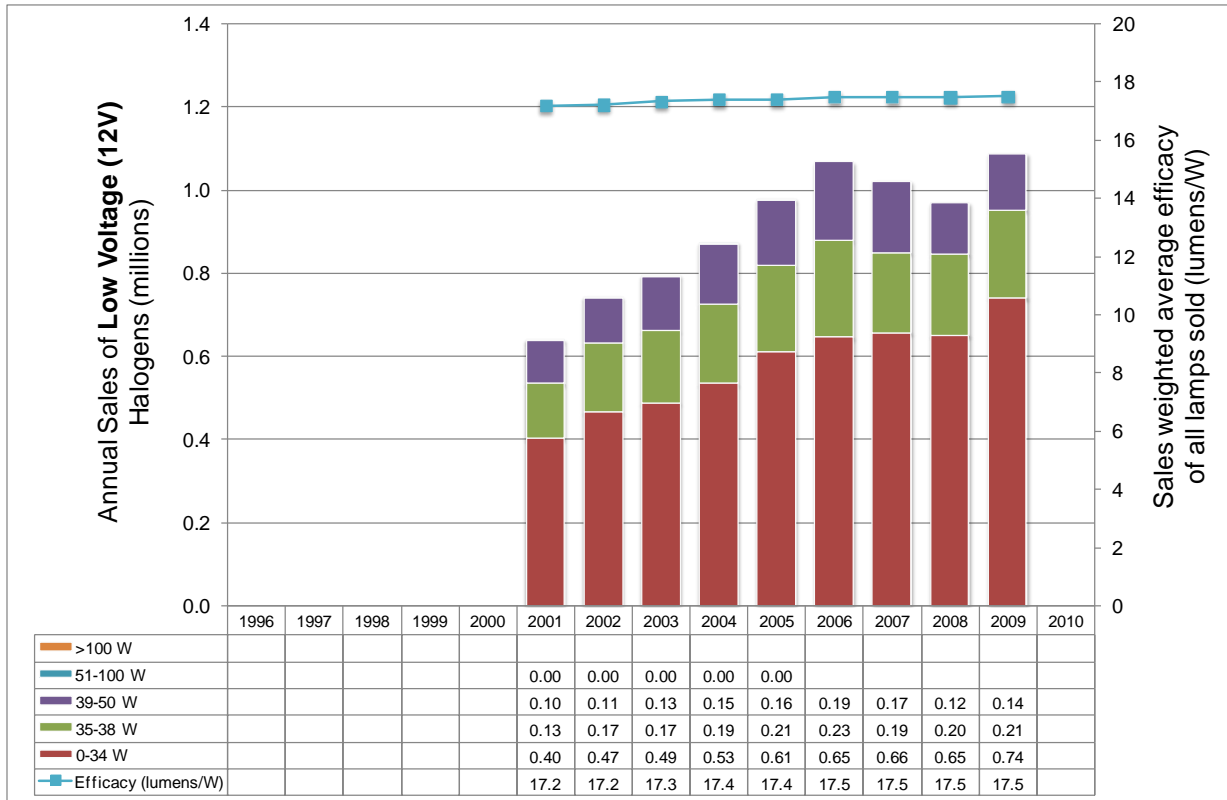


Key notes on Graph (See notes section 2)

- Data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps¹¹.
- 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.

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Sales of Low Voltage (12V) Halogen lamps by wattage range - Austria

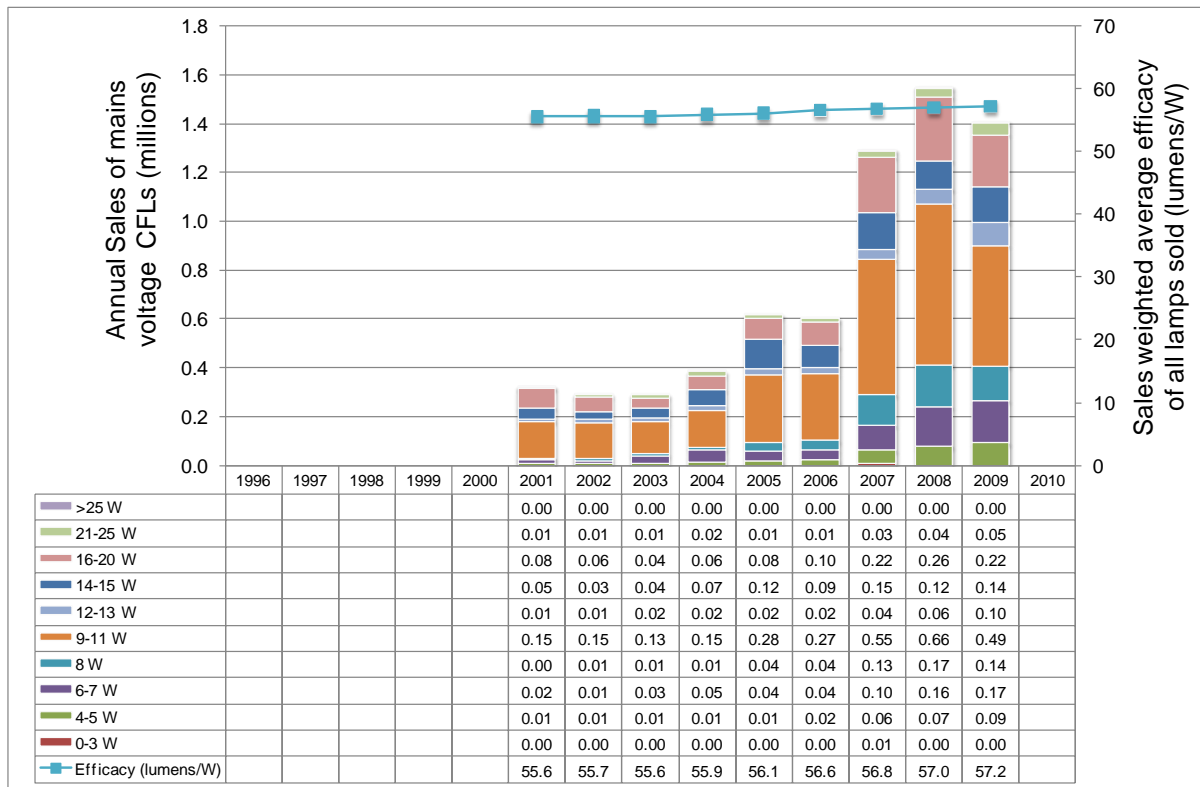


Key notes on Graph (See notes section 2)

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- 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.

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.

Sales of mains Voltage CFL lamps by wattage range Austria

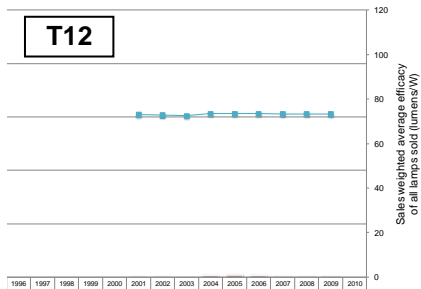
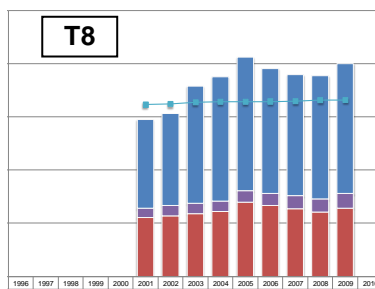
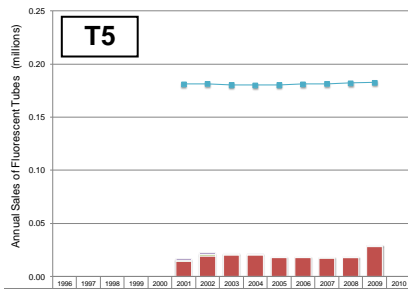
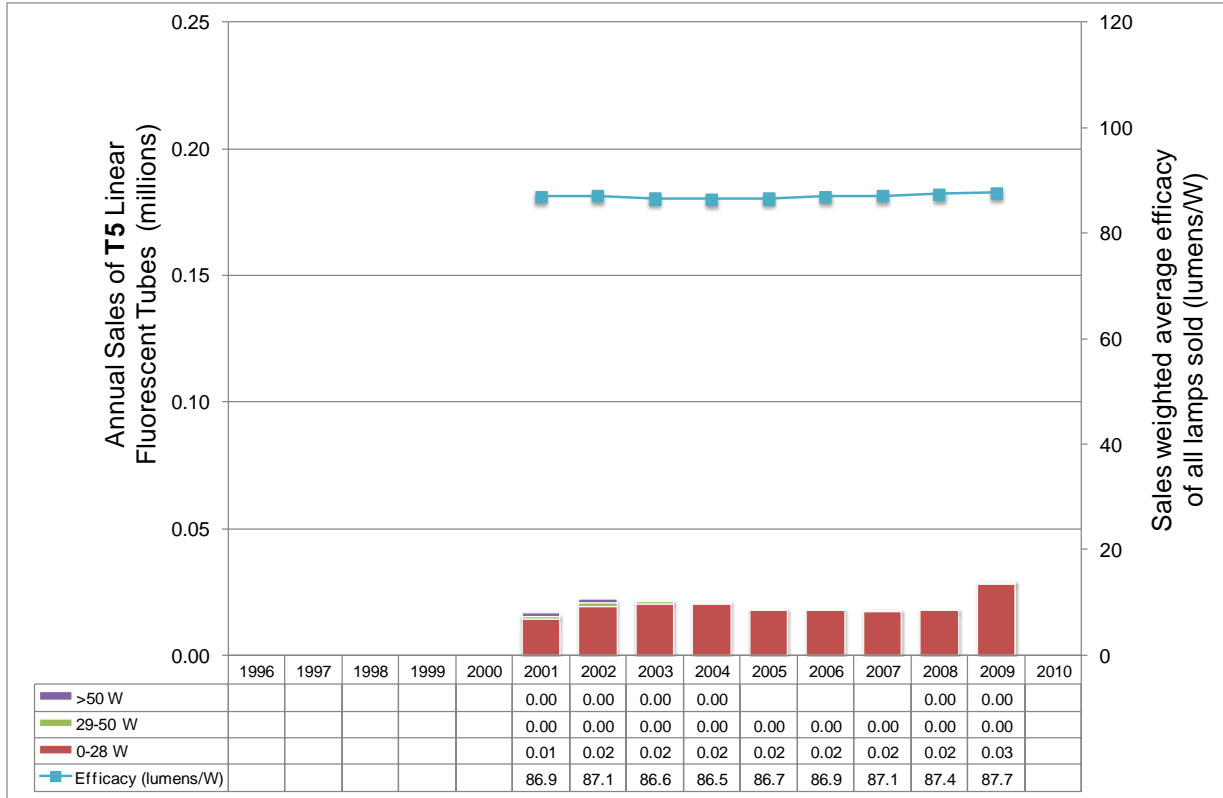


Key notes on Graph (See notes section 2)

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- 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.
- No details of the breakdown of CFL sales between self-ballasted and pin-based lamps was available to the Annex at the time of publication. All lamps were assumed to be self-ballasted for the purpose of the analysis.

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.

Sales of T5 Linear Fluorescent Tubes by wattage range Austria

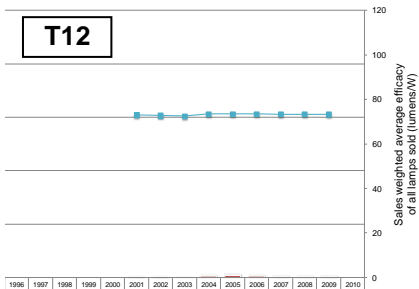
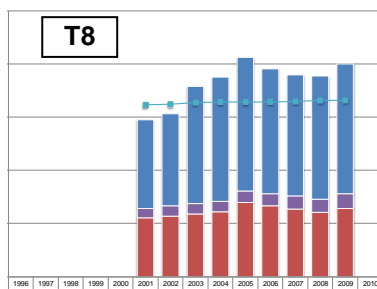
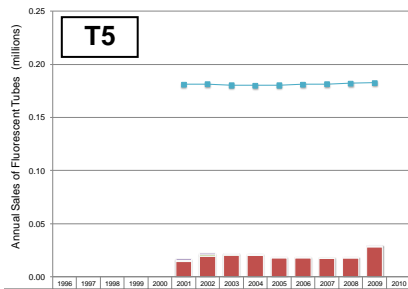
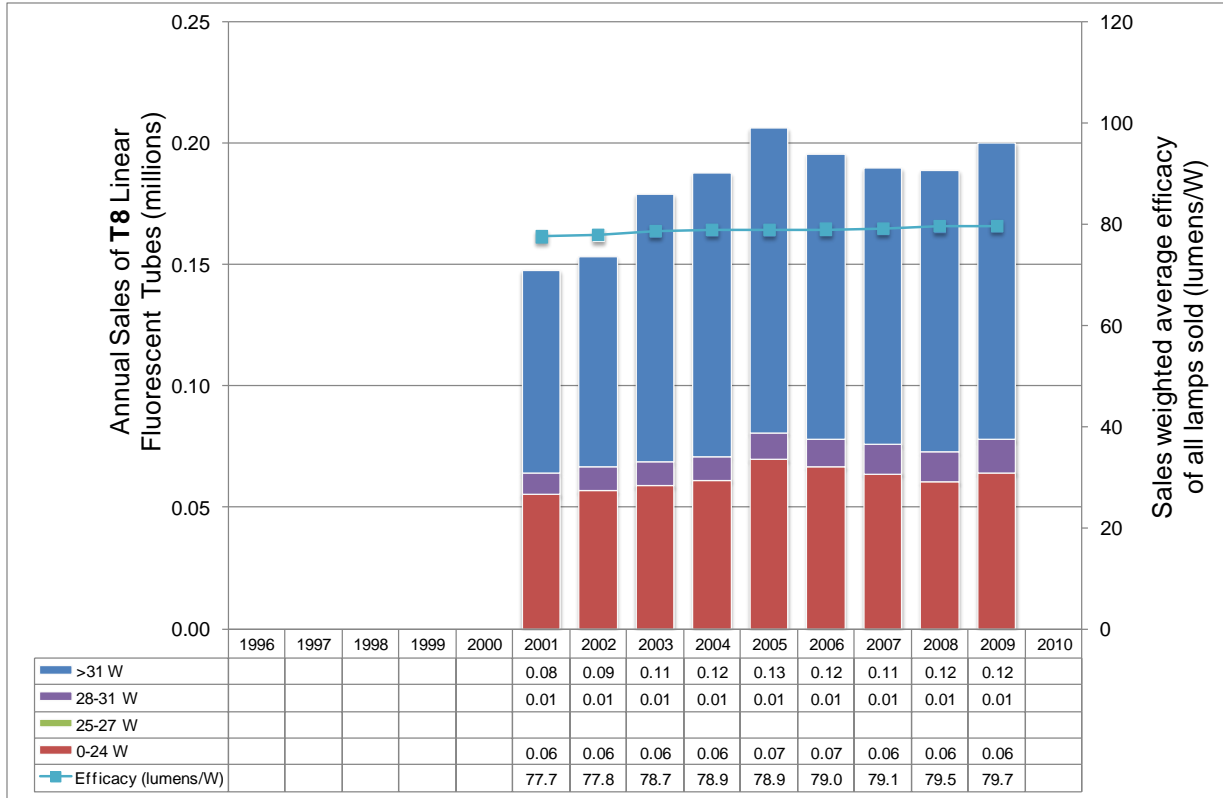


Key notes on Graph (See notes section 2)

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Sales of T8 Linear Fluorescent Tubes by wattage range Austria

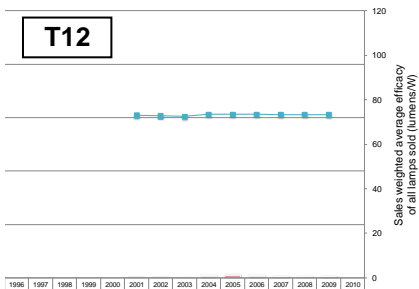
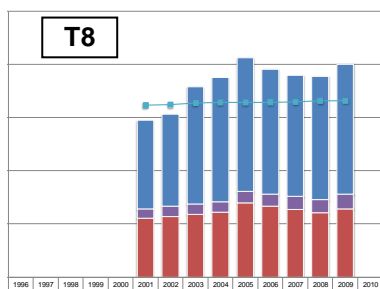
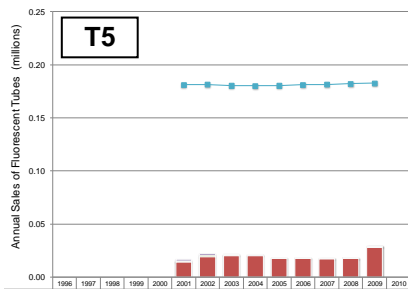
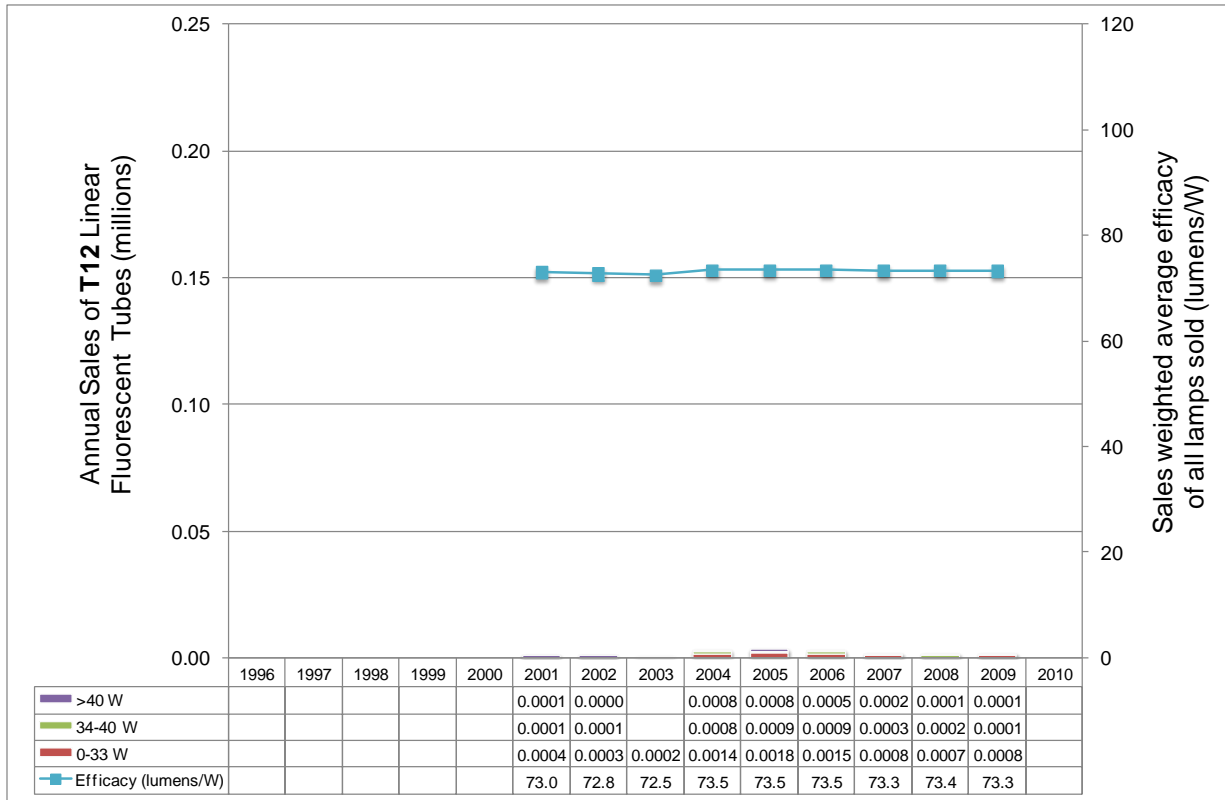


Key notes on Graph (See notes section 2)

- Data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps¹⁵.
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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 Austria

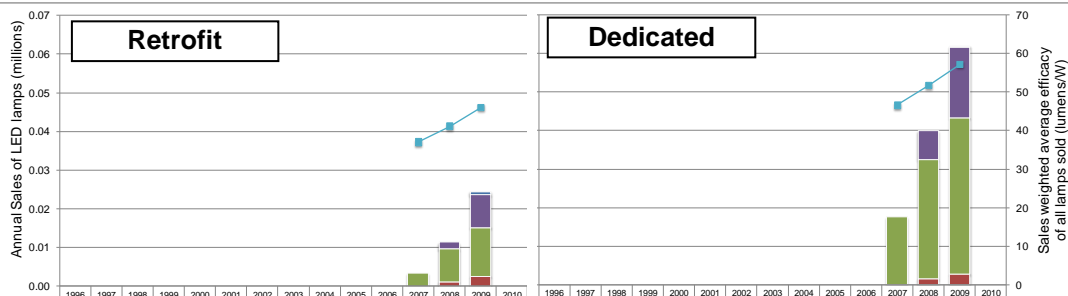
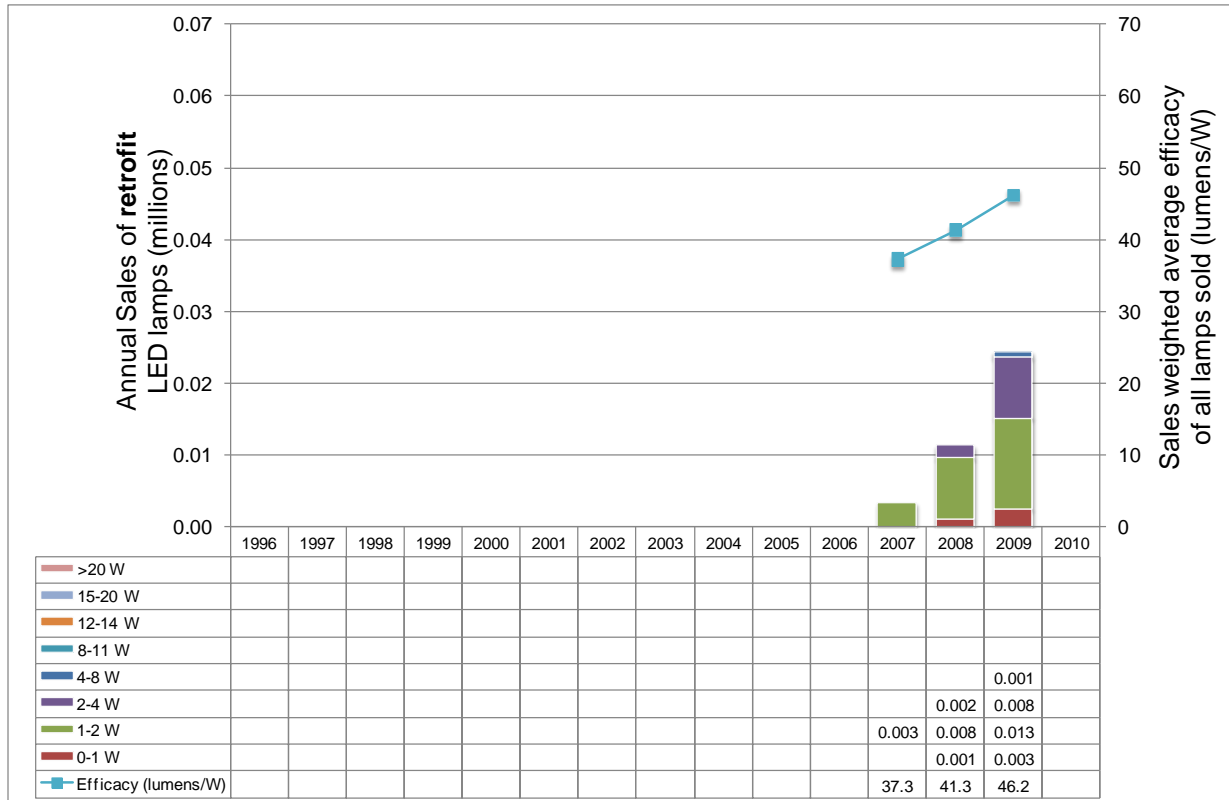


Key notes on Graph (See notes section 2)

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Sales of retrofit LED lamps by wattage range - Austria

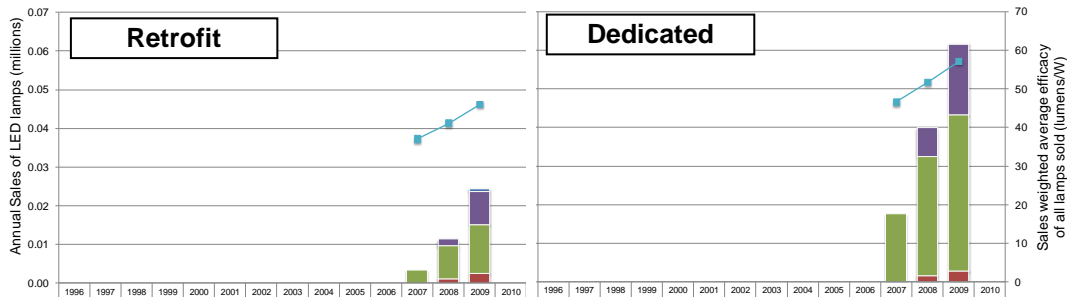
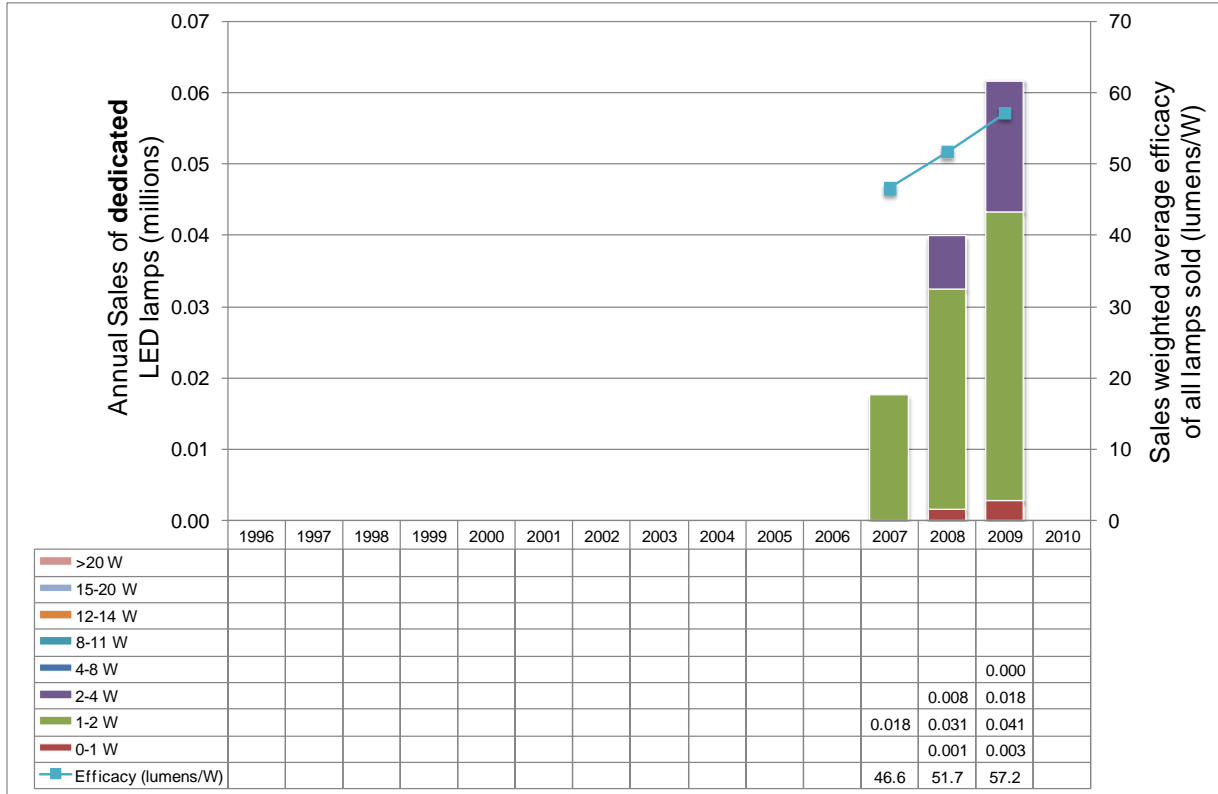


Key notes on Graph (See notes section 2)

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Sales of dedicated LED lamps by wattage range - Austria



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¹⁸ 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.

Major Policy Interventions (See notes Section 3)

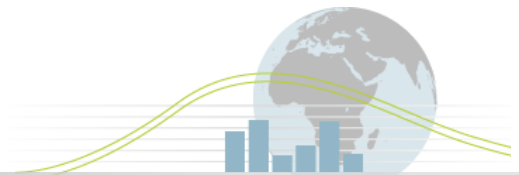
Policies actions fall into 2 categories, pan-EU member requirements and national interventions.

Pan-EU requirements:

- 1) **Mandatory MEPS:** As summarised above and 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 A-G labels (the packaging/labelling requirement is extended by the MEPs noted above)

National Level Interventions

- 3) None reported

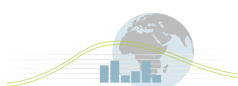


Cultural Issues (See Notes Section 4)

Of relevance to the interpretation of data, it has been reported that the unusual peak in demand for incandescent lamps in 2009 was a result of the ban of 100 Watt light bulbs by the European Union. At this time there was a very negative campaign against CFL in Austria (bad light, mercury,...) and this ban by the EU came up in Austrian media. The net effect was Austrian consumers started hoarding traditional light bulbs (especially 100 + 75 Watt) and sales went up by more than 100%. Even the industry was surprised by this extreme demand for traditional light bulbs in 2009.

Estimated Electricity consumption of lighting for households is given in the table below.

	Electricity Consumption of lighting for Austrian Households											
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
T Joules	4400	4489	4589	4705	4812	4907	5013	5136	5266	5334	5413	5471



Notes on data

Section 1: Notes on Phase out regulations

1.1 Overview

The European Union announcement their intention to “phase-out inefficient lighting” in April 2007.

At the time of preparation, regulations for “domestic lighting” covered only *non-directional lighting*. Proposals for the regulation of *directional lighting* are well underway and announcements are expected in the near future. Separate provisions are in place for street lighting and commercial lighting.

Implementation of regulations is required to occur at the national level (i.e. individual EU member states) by inclusion in their relevant regulatory process within the timescales defined by the European Union.

1.1.1 Regulatory Requirements for Non-Directional Lighting

The Regulation was adopted and published in the EU Commission Official Journal on 18 March 2009 as Commission Regulation (EC) No 244/2009 (attached). It becomes law 20 days after publication in the Official Journal. Key items within this text are as follows¹⁹:

1.1.1.1 Overall requirement

(5) Products subject to this Regulation are designed essentially for the full or partial illumination of a household room, by replacing or complementing natural light with artificial light, in order to enhance visibility within that space. Special purpose lamps designed essentially for other types of applications (such as traffic signals, terrarium lighting, or household appliances) and clearly indicated as such on accompanying product information should not be subject to the ecodesign requirements set out in this Regulation.

(6) New technologies emerging on the market such as light emitting diodes should be subject to this Regulation.

(7) The environmental aspects of the products covered that are identified as significant for the purposes of this Regulation are energy in the use phase as well as mercury content and mercury emissions.

(9) Although the mercury content of compact fluorescent lamps is considered to be a significant environmental aspect, it is appropriate to regulate it under Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

¹⁹ While the official journal reference may be followed, interested parties are recommended to visit the http://www.lightingassociation.com/pdf/EUP_DIM1_FAQ.pdf. The link is to the UK Lighting Associations webpage which reproduces the legislative requirement, but also provides and interpretation of the legislation and associated other material.

(14) ... requirements should not affect functionality from the user's perspective and should not negatively affect health, safety or the environment. In particular, the benefits of reducing the electricity consumption during the use phase should overcompensate potential, if any, additional environmental impacts during the production phase of products subject to this Regulation.

(15) A staged entry into force of the ecodesign requirements should provide a sufficient timeframe for manufacturers to re-design products subject to this Regulation as appropriate.

(20) A review of this measure should take particular note of the evolution of sales of special purpose lamp types so as to verify that they are not used for general lighting purposes, of the development of new technologies such as LEDs and of the feasibility of establishing energy efficiency requirements at the 'A' class level as defined in Commission Directive 98/11/EC of 27 January 1998 implementing Council Directive 92/75 with regard to energy labelling of household lamps

(21) The requirements contained in this measure allow halogen lamps of socket G9 and R7s to remain on the market for a limited period of time, recognising the need to service the existing luminaire stock, to prevent undue costs on consumers and to give time to manufacturers to develop luminaires dedicated to more efficient lighting technologies.

1.1.1.2 *Subject matter and scope (within Article 1)*

... requirements for the placing on the market of non-directional household lamps, including when they are marketed for non-household use or when they are integrated into other products.

1.1.1.3 *Timings (within Article 3)*

Defined within Article 3:

Each ecodesign requirement shall apply in accordance with the following stages:

- Stage 1: 1 September 2009,
- Stage 2: 1 September 2010,
- Stage 3: 1 September 2011,
- Stage 4: 1 September 2012,
- Stage 5: 1 September 2013,
- Stage 6: 1 September 2016.

Defined within Annex II:

Incandescent lamps with S14, S15 or S19 caps shall be exempted from the efficacy requirements of Stages 1 to 4 as defined in Article 3 of this Regulation, but not from Stages 5 and 6

1.1.1.4 *Technical Requirements (Annex 1)*

Defined within Annex II:

The maximum rated power (P_{max}) for a given rated luminous flux (Φ) is provided in Table 1.

The exceptions to these requirements are listed in Table 2 and the correction factors applicable to the maximum rated power are in Table 3.

Table 1

Application date	Maximum rated power (P_{max}) for a given rated luminous flux (Φ) (W)	
	Clear lamps	Non-clear lamps
Stages 1 to 5	$0,8 * (0,88\sqrt{\Phi}+0,049\Phi)$	$0,24\sqrt{\Phi}+0,0103\Phi$
Stage 6	$0,6 * (0,88\sqrt{\Phi}+0,049\Phi)$	$0,24\sqrt{\Phi}+0,0103\Phi$

Table 2

Exceptions

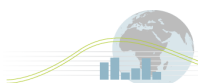
Scope of the exception	Maximum rated power (W)
Clear lamps $60 \text{ lm} \leq \Phi \leq 950 \text{ lm}$ in Stage 1	$P_{max} = 1,1 * (0,88\sqrt{\Phi}+0,049\Phi)$
Clear lamps $60 \text{ lm} \leq \Phi \leq 725 \text{ lm}$ in Stage 2	$P_{max} = 1,1 * (0,88\sqrt{\Phi}+0,049\Phi)$
Clear lamps $60 \text{ lm} \leq \Phi \leq 450 \text{ lm}$ in Stage 3	$P_{max} = 1,1 * (0,88\sqrt{\Phi}+0,049\Phi)$
Clear lamps with G9 or R7s cap in Stage 6	$P_{max} = 0,8 * (0,88\sqrt{\Phi}+0,049\Phi)$

The correction factors in Table 3 are cumulative where appropriate and also applicable to the products covered by the exceptions of Table 2.

Table 3

Correction factors

Scope of the correction	Maximum rated power (W)
filament lamp requiring external power supply	$P_{max}/1,06$
discharge lamp with cap GX53	$P_{max}/0,75$
non-clear lamp with colour rendering index ≥ 90 and $P \leq 0,5 * (0,88\sqrt{\Phi}+0,049\Phi)$	$P_{max}/0,85$
discharge lamp with colour rendering index ≥ 90 and $T_c \geq 5\,000 \text{ K}$	$P_{max}/0,76$
non-clear lamp with second envelope and $P \leq 0,5 * (0,88\sqrt{\Phi}+0,049\Phi)$	$P_{max}/0,95$
LED lamp requiring external power supply	$P_{max}/1,1$



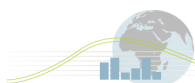
Additional functionality requirements for CFLs (Table 4 Annex II):

Functionality parameter	Stage 1	Stage 5
Lamp survival factor at 6 000 h	≥ 0,50	≥ 0,70
Lumen maintenance	At 2 000 h: ≥ 85 % (≥ 80 % for lamps with second lamp envelope)	At 2 000 h: ≥ 88 % (≥ 83 % for lamps with second lamp envelope) At 6 000 h: ≥ 70 %
Number of switching cycles before failure	≥ half the lamp lifetime expressed in hours ≥ 10 000 if lamp starting time > 0,3 s	≥ lamp lifetime expressed in hours ≥ 30 000 if lamp starting time > 0,3 s
Starting time	< 2,0 s	< 1,5 s if P < 10 W < 1,0 s if P ≥ 10 W
Lamp warm-up time to 60 % Φ	< 60 s or < 120 s for lamps containing mercury in amalgam form	< 40 s or < 100 s for lamps containing mercury in amalgam form
Premature failure rate	≤ 2,0 % at 200 h	≤ 2,0 % at 400 h
UVA + UVB radiation	≤ 2,0 mW/klm	≤ 2,0 mW/klm
UVC radiation	≤ 0,01 mW/klm	≤ 0,01 mW/klm
Lamp power factor	≥ 0,50 if P < 25 W ≥ 0,90 if P ≥ 25 W	≥ 0,55 if P < 25 W ≥ 0,90 if P ≥ 25 W
Colour rendering (Ra)	≥ 80	≥ 80

Additional functionality requirements for lamps excluding CFLs and LEDs²⁰ (Table 5 Annex II)

Functionality parameter	Stage 1	Stage 5
Rated lamp lifetime	≥ 1 000 h	≥ 2 000 h
Lumen maintenance	≥ 85 % at 75 % of rated average lifetime	≥ 85 % at 75 % of rated average lifetime
Number of switching cycles	≥ four times the rated lamp life expressed in hours	≥ four times the rated lamp life expressed in hours
Starting time	< 0,2 s	< 0,2 s
Lamp warm-up time to 60 % Φ	≤ 1,0 s	≤ 1,0 s
Premature failure rate	≤ 5,0 % at 100 h	≤ 5,0 % at 200 h
UVA + UVB radiation	≤ 2,0 mW/klm	≤ 2,0 mW/klm
UVC radiation	≤ 0,01 mW/klm	≤ 0,01 mW/klm
Lamp power factor	≥ 0,95	≥ 0,95

²⁰ Where the rated lamp lifetime is higher than 2 000 h, the Stage 1 requirements for the parameters 'Rated lamp lifetime', 'Lamp Survival Factor' and 'Lumen maintenance' in Tables 4 and 5 are only applicable as from Stage 2.



1.1.1.5 Exemptions/Exclusions

Defined within Article 1:

- a) lamps having the following chromaticity coordinates x and y :
 - $x < 0,200$ or $x > 0,600$
 - $y < -2,3172 x^2 + 2,3653 x - 0,2800$ or $y > -2,3172 x^2 + 2,3653 x - 0,1000$;
- b) directional lamps;
- c) lamps having a luminous flux below 60 lumens or above 12 000 lumens;
- d) lamps having:
 - 6 % or more of total radiation of the range 250-780 nm in the range of 250-400 nm,
 - the peak of the radiation between 315-400 nm (UVA) or 280-315 nm (UVB);
- e) fluorescent lamps without integrated ballast;
- f) high-intensity discharge lamps;
- g) incandescent lamps with E14/E27/B22/B15 caps, with a voltage equal to or below 60 volts and without integrated transformer in Stages 1-5 according to Article 3.

1.1.1.6 Marking Requirements (within Article 3)

Defined within Article 1:

Starting from 1 September 2009: For special purpose lamps, the following information shall be clearly and prominently indicated on their packaging and in all forms of product information accompanying the lamp when it is placed on the market:

- a) their intended purpose; and
- b) that they are not suitable for household room illumination.

Defined within Annex 3:

For non-directional household lamps, the following information shall be provided as from Stage 2, except where otherwise stipulated.

Information to be visibly displayed prior to purchase to end-users on the packaging and on free access websites

The information does not need to be specified using the exact wording of the list below. It may be displayed using graphs, figures or symbols rather than text. These information requirements do not apply to filament lamps not fulfilling the efficacy requirements of Stage 4.

- (a) When the nominal lamp power is displayed outside the energy label in accordance with Directive 98/11/EC, the nominal luminous flux of the lamp shall also be separately

displayed in a font at least twice as large as the nominal lamp power display outside the label;

- (b) Nominal life time of the lamp in hours (not higher than the rated life time);
- (c) Number of switching cycles before premature lamp failure;
- (d) Colour temperature (also expressed as a value in Kelvins);
- (e) Warm-up time up to 60 % of the full light output (may be indicated as ‘instant full light’ if less than 1 second);
- (f) A warning if the lamp cannot be dimmed or can be dimmed only on specific dimmers;
- (g) If designed for optimal use in non-standard conditions (such as ambient temperature $T_a \neq 25 \text{ }^\circ\text{C}$), information on those conditions;
- (h) Lamp dimensions in millimetres (length and diameter);
- (i) If equivalence with an incandescent lamp is claimed on the packaging, the claimed equivalent incandescent lamp power (rounded to 1 W) shall be that corresponding in Table 6 to the luminous flux of the lamp contained in the packaging.

The intermediate values of both the luminous flux and the claimed incandescent lamp power (rounded to 1W) shall be calculated by linear interpolation between the two adjacent values.

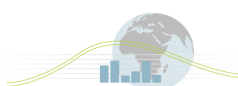
Table 6

Rated lamp luminous flux Φ [lm]			Claimed equivalent incandescent lamp power [W]
CFL	Halogen	LED and other lamps	
125	119	136	15
229	217	249	25
432	410	470	40
741	702	806	60
970	920	1 055	75
1 398	1 326	1 521	100
2 253	2 137	2 452	150
3 172	3 009	3 452	200

(j) The term ‘energy saving lamp’ or any similar product related promotional statement about lamp efficacy may only be used if the lamp complies with the efficacy requirements applicable to non-clear lamps in Stage 1 according to Tables 1, 2 and 3.

If the lamp contains mercury

- (k) Lamp mercury content as X,X mg;
- (l) Indication which website to consult in case of accidental lamp breakage to find instructions on how to clean up the lamp debris.



Information to be made publicly available on free-access websites

As a minimum, the following information shall be expressed at least as values.

- (a) The information specified in [the section above];
- (b) Rated wattage (0,1 W precision);
- (c) Rated luminous flux;
- (d) Rated lamp life time;
- (e) Lamp power factor;
- (f) Lumen maintenance factor at the end of the nominal life;
- (g) Starting time (as X,X seconds);
- (h) Colour rendering.

If the lamp contains mercury

- (i) Instructions on how to clean up the lamp debris in case of accidental lamp breakage;
- (j) Recommendations on how to dispose of the lamp at its end of life.

1.1.1.7 Review Requirements (Article 7)

A review of the regulation is required within 5 years of the date of regulation (i.e. March 2014).

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

2.1 Data Source

Sales data shown derived from data supplied by GfK. GfK report data represents approximately 55% of overall market in all years reported, and this 55% percent provides a robust representation of the market for all domestic (household) sector lamps

Manipulations of Data Supplied

Sales data used as supplied.

Average efficacies calculated on a sales weighted basis by:

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

Instantaneous light output calculated as sales weighted basis by:

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

Lifetime light output calculated as sales weighted basis by:

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

2.1.1 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 1996-2010 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> - and are shown below:

Table of assumed efficacy by lamp type and size overtime

Watts:	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
Main Voltage Incandescent															
0-25	8.7	8.7	8.7	8.7	8.7	8.7	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
26-40	10.2	10.2	10.2	10.2	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
41-60	11.8	11.8	11.8	11.8	11.8	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.6	11.6
61-75	12.5	12.5	12.5	12.5	12.5	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.3	12.3
76-100	13.5	13.5	13.5	13.5	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.3	13.3	13.3
>100	14.8	14.8	14.8	14.8	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.6	14.6	14.6	14.6
Mains Voltage Halogens (single ended)															
0-17	11.5	11.5	11.4	11.4	11.4	11.3	11.3	11.3	11.2	11.2	11.2	11.1	11.1	11.1	11.0
18-20	11.9	11.9	11.8	11.8	11.8	11.7	11.7	11.7	11.6	11.6	11.5	11.5	11.5	11.4	11.4
21-28	12.0	12.0	11.9	11.9	11.9	11.8	11.8	11.8	11.7	11.7	11.6	11.6	11.6	11.5	11.5
29-43	13.5	13.5	13.4	13.4	13.3	13.3	13.3	13.2	13.2	13.1	13.1	13.1	13.0	13.0	12.9
44-53	15.0	15.0	14.9	14.9	14.8	14.8	14.7	14.7	14.6	14.6	14.6	14.5	14.5	14.4	14.4
54-73	17.3	17.2	17.2	17.1	17.1	17.0	17.0	16.9	16.9	16.8	16.8	16.7	16.7	16.6	16.6
>73	18.5	18.4	18.4	18.3	18.3	18.2	18.2	18.1	18.1	18.0	18.0	17.9	17.8	17.8	17.7
Mains Voltage Halogens (double ended)															
0-100	16.0	16.0	15.9	15.9	15.8	15.8	15.7	15.7	15.6	15.6	15.5	15.5	15.4	15.4	15.3
101-150	17.5	17.4	17.4	17.3	17.3	17.2	17.2	17.1	17.1	17.0	17.0	16.9	16.9	16.8	16.8
151-200	17.8	17.7	17.7	17.6	17.6	17.5	17.5	17.4	17.4	17.3	17.3	17.2	17.2	17.1	17.1
201-250	19.0	18.9	18.9	18.8	18.8	18.7	18.7	18.6	18.6	18.5	18.4	18.4	18.3	18.3	18.2
>250	20.0	19.9	19.9	19.8	19.8	19.7	19.6	19.6	19.5	19.5	19.4	19.4	19.3	19.2	19.2
Low Voltage (12V) Halogens															
0-34	17.0	16.9	16.9	16.8	16.8	16.7	16.7	16.6	16.6	16.5	16.5	16.4	16.4	16.4	16.3
35-38	18.2	18.1	18.1	18.0	18.0	17.9	17.9	17.8	17.8	17.7	17.7	17.6	17.6	17.5	17.5
39-50	18.8	18.7	18.7	18.6	18.6	18.5	18.5	18.4	18.4	18.3	18.2	18.2	18.1	18.1	18.0
51-100	21.7	21.6	21.6	21.5	21.4	21.4	21.3	21.2	21.2	21.1	21.1	21.0	20.9	20.9	20.8
>100	23.0	22.9	22.9	22.8	22.7	22.7	22.6	22.5	22.5	22.4	22.3	22.3	22.2	22.1	22.1
Mains Voltage Pin Based CFLs															
0-3	50.0	49.7	49.4	49.1	48.8	48.5	48.2	47.9	47.7	47.4	47.1	46.8	46.5	46.3	46.0
4-5	51.5	51.2	50.9	50.6	50.3	50.0	49.7	49.4	49.1	48.8	48.5	48.2	47.9	47.6	47.4
6-7	59.0	58.6	58.3	58.0	57.6	57.3	56.9	56.6	56.2	55.9	55.6	55.2	54.9	54.6	54.3
8.0	62.0	61.6	61.3	60.9	60.5	60.2	59.8	59.5	59.1	58.8	58.4	58.1	57.7	57.4	57.0
9-11	65.2	64.8	64.4	64.0	63.7	63.3	62.9	62.5	62.2	61.8	61.4	61.0	60.7	60.3	60.0
12-13	69.0	68.6	68.2	67.8	67.4	67.0	66.6	66.2	65.8	65.4	65.0	64.6	64.2	63.8	63.5
14-15	72.0	71.6	71.1	70.7	70.3	69.9	69.5	69.0	68.6	68.2	67.8	67.4	67.0	66.6	66.2
16-20	66.9	66.5	66.1	65.7	65.3	64.9	64.5	64.2	63.8	63.4	63.0	62.6	62.3	61.9	61.5
21-25	74.2	73.8	73.3	72.9	72.4	72.0	71.6	71.2	70.7	70.3	69.9	69.5	69.1	68.6	68.2
Mains Voltage Linear Fluorescent Tubes (T5)															
0-28	87.8	87.5	87.3	87.0	86.8	86.5	86.2	86.0	85.7	85.5	85.2	85.0	84.7	84.4	84.2
29-50	94.0	93.7	93.4	93.2	92.9	92.6	92.3	92.0	91.8	91.5	91.2	91.0	90.7	90.4	90.1
>50	94.0	93.7	93.4	93.2	92.9	92.6	92.3	92.0	91.8	91.5	91.2	91.0	90.7	90.4	90.1
Mains Voltage Linear Fluorescent Tubes (T8)															
0-24	67.2	67.1	66.9	66.8	66.7	66.5	66.4	66.3	66.1	66.0	65.9	65.7	65.6	65.5	65.3
25-27	73.0	72.9	72.7	72.6	72.4	72.3	72.1	72.0	71.8	71.7	71.6	71.4	71.3	71.1	71.0
28-31	79.1	78.9	78.8	78.6	78.5	78.3	78.2	78.0	77.8	77.7	77.5	77.4	77.2	77.1	76.9
>31	84.4	84.2	84.1	83.9	83.7	83.6	83.4	83.2	83.1	82.9	82.7	82.6	82.4	82.2	82.1
Mains Voltage Linear Fluorescent Tubes (T12)															
0-33	73.0	72.9	72.9	72.8	72.7	72.6	72.6	72.5	72.4	72.3	72.3	72.2	72.1	72.1	72.0
34-40	74.0	73.9	73.9	73.8	73.7	73.6	73.5	73.4	73.3	73.3	73.2	73.1	73.0	73.0	73.0
>40	75.0	74.9	74.9	74.8	74.7	74.6	74.6	74.5	74.4	74.3	74.3	74.2	74.1	74.0	74.0
Retrofit LED Lamps															
0-1	48.0	43.6	39.7	36.1	32.8	29.8	27.1	24.6	22.4	20.4	18.5	16.8	15.3	13.9	12.6
1-2	49.6	45.1	41.0	37.3	33.9	30.8	28.0	25.5	23.1	21.0	19.1	17.4	15.8	14.4	13.1
2-4	51.2	46.5	42.3	38.5	35.0	31.8	28.9	26.3	23.9	21.7	19.7	17.9	16.3	14.8	13.5
4-8	54.4	49.5	45.0	40.9	37.2	33.8	30.7	27.9	25.4	23.1	21.0	19.1	17.3	15.8	14.3
8-11	56.0	50.9	46.3	42.1	38.2	34.8	31.6	28.7	26.1	23.7	21.6	19.6	17.8	16.2	14.7
12-14	57.6	52.4	47.6	43.3	39.3	35.8	32.5	29.6	26.9	24.4	22.2	20.2	18.4	16.7	15.2
15-20	60.0	54.5	49.6	45.1	41.0	37.3	33.9	30.8	28.0	25.4	23.1	21.0	19.1	17.4	15.8
>20	64.0	58.2	52.9	48.1	43.7	39.7	36.1	32.8	29.9	27.1	24.7	22.4	20.4	18.5	16.9

Table of assumed average lifetime by lamp type

Basic lamp lifetime (hours)	
Lamp Type	
Main Voltage Incandescent	1000
Mains Voltage Halogens (single ended)	1300
Mains Voltage Halogens (double ended)	1300
Low Voltage (12V) Halogens	1300
Mains Voltage Pin Based CFLs	6000
Mains Voltage Self-Ballasted CFLs	6000
Mains Voltage Linear Fluorescent Tubes (T5)	15000
Mains Voltage Linear Fluorescent Tubes (T8)	10000
Mains Voltage Linear Fluorescent Tubes (T12)	10000
Retrofit LED Lamps	20000
Dedicated LED Lamps	20000

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 lamps²¹

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

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

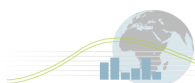
where W is the power input into the lamp in watts.

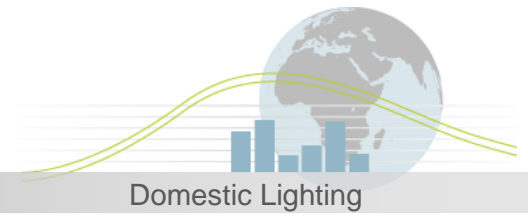
The energy efficiency classes are then set in accordance with the following table:

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

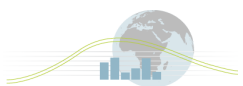
²¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:071:0001:0008:EN:PDF>





National Level Interventions

No know national level interventions



Section 4: Notes on Cultural Issues

National lighting consumption data from the

No additional Notes

Data on Austrian national lighting consumption is from ODYSSEE project (www.odyssee-indicators.org). 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. **However, details of the make-up of the dataset and any assumptions made are not know. Therefore data should be used with caution.**