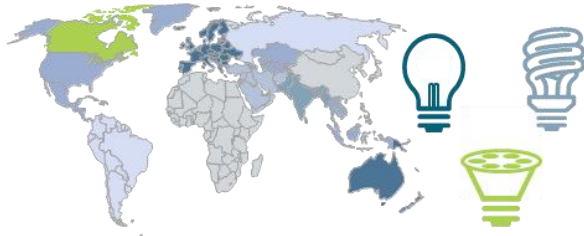
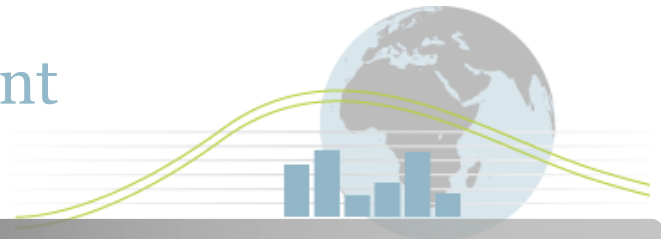


# 4E

## Mapping Document



Country:	Canada
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) sector<sup>1</sup>”*

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

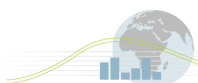
- Mains Voltage Incandescent
- Mains Voltage Halogens (Single and Double Ended)
- Low Voltage (12V) Halogen
- Pin Based and Self Ballasted CFLs
- Linear Tubes (T12, T8 and T5)\*
- Retrofit LEDs
- Dedicated LEDs

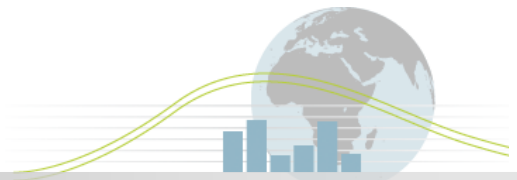
A full product definition is provided at:

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

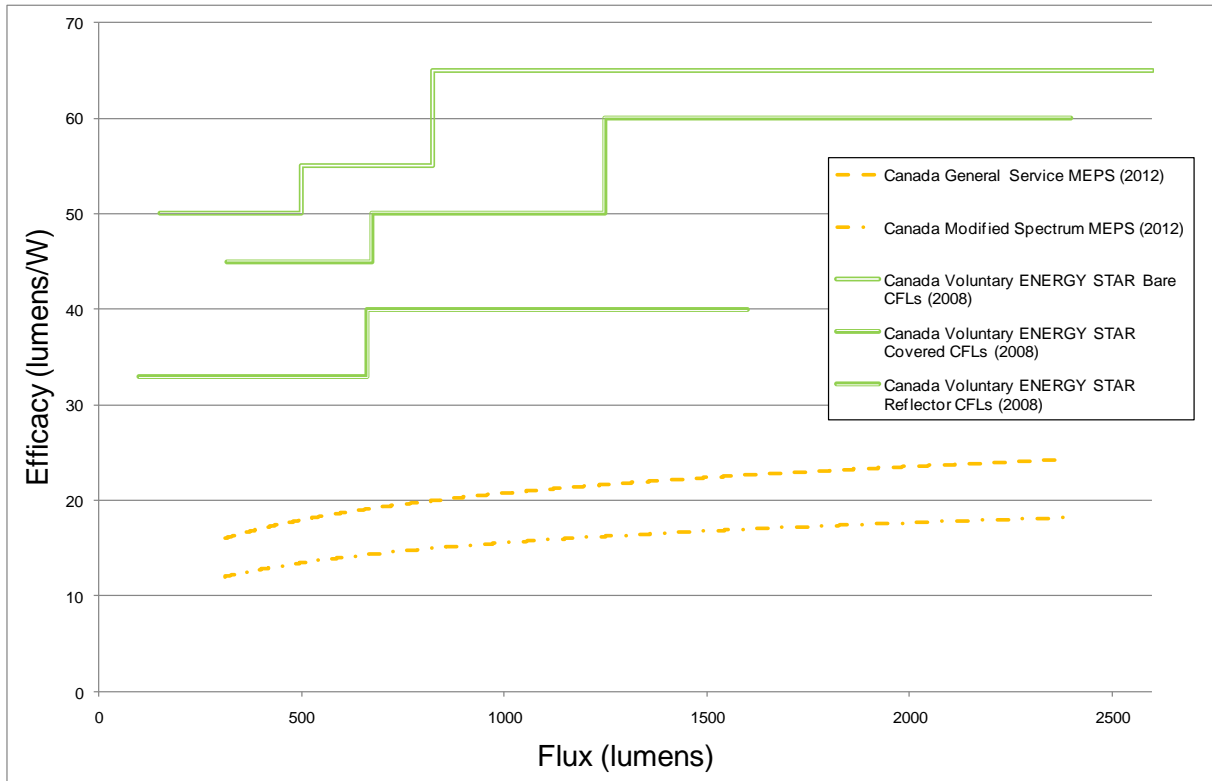
*\* NOTE: In line with the product benchmarking, this Canadian mapping document **excludes** linear fluorescent tubes. However, linear fluorescent tubes are included in the mapping documents for all other countries.*

<sup>1</sup> 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.





## Phase out regulations for domestic lighting - Canada



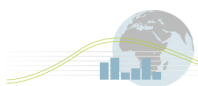
### Key notes on Graph (see notes section 1)

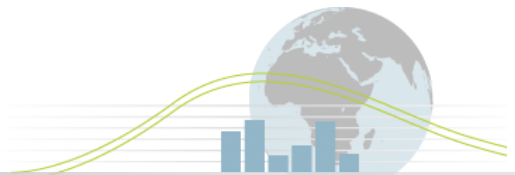
Canada announced their intention to phase-out inefficient lighting in April 2007. Summary details are provided in the table below:

Product Class	Lamp Efficacy	Life	Colour Rendering Index (CRI)
<b>January 1, 2012</b>			
With a luminous flux of at least 1050 lm but no greater than 2600 lm other than modified spectrum lamps	$\geq 4.0357 \times \ln(\text{lumen}) - 7.1345$	$\geq 1000$ hours	$\geq 80$
Modified spectrum lamps with a luminous flux of at least 1050 lm but no greater than 2600 lm	$\geq 75\%$ of the efficacy of the reference standard spectrum lamp	$\geq 1000$ hours	$\geq 80$
<b>December 31, 2012</b>			
With a luminous flux of at least 250 lm but no greater than 1049 lm other than modified spectrum lamps	$\geq 4.0357 \times \ln(\text{lumen}) - 7.1345$	$\geq 1000$ hours	$\geq 80$
Modified spectrum lamps with a luminous flux of at least 250 lm but no greater than 1049 lm	$\geq 75\%$ of the efficacy of the reference standard spectrum lamp	$\geq 1000$ hours	$\geq 80$

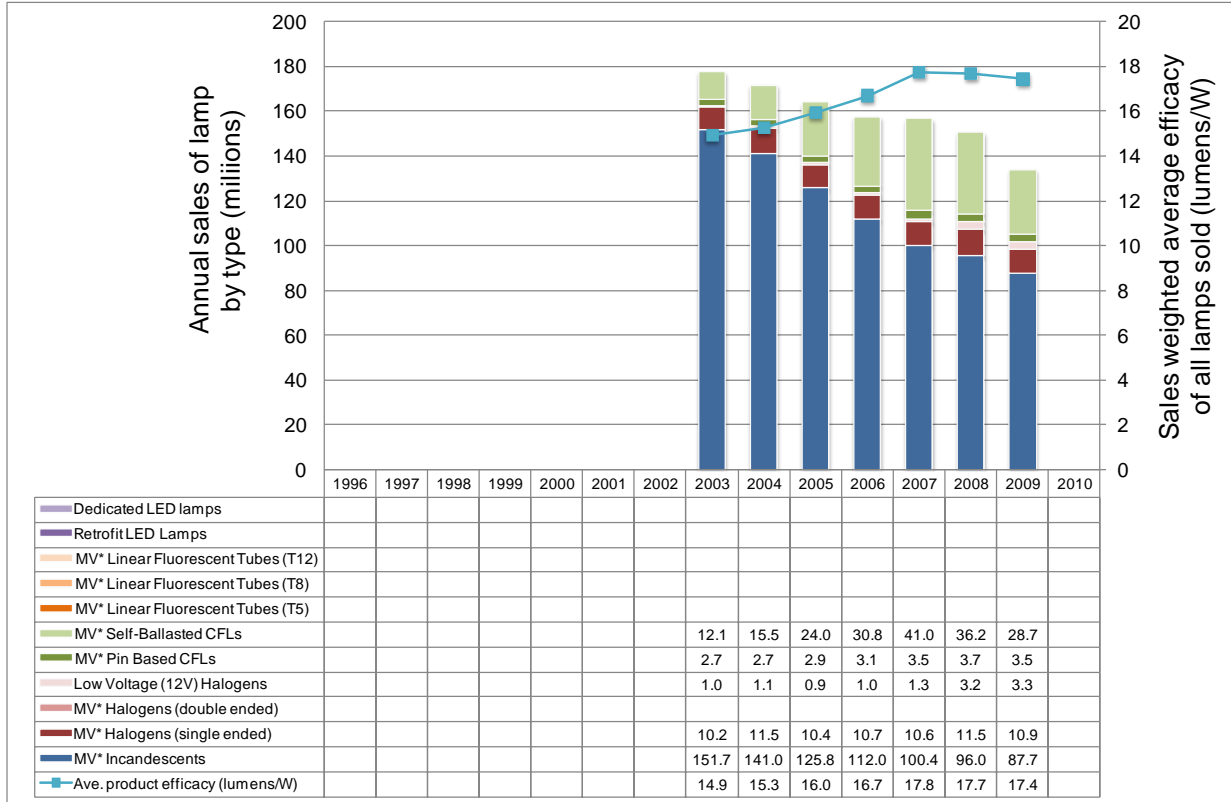
*lm = lumen, ln = natural logarithm*

Note that the CFL standards noted are *not* mandatory but voluntary as part of the ENERGY STAR programme. Various other regulations apply to a number of other lamps (eg reflectors and Tubes). There are also various regulations related to labelling and registration of import. These regulations are outlined in notes section 1.





## Sales and average efficacy of all domestic lamps - Canada

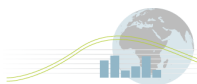


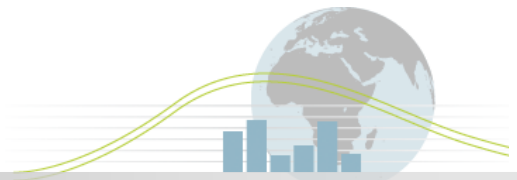
\* Mains Voltage

### Key notes on Graph (See notes section 2)

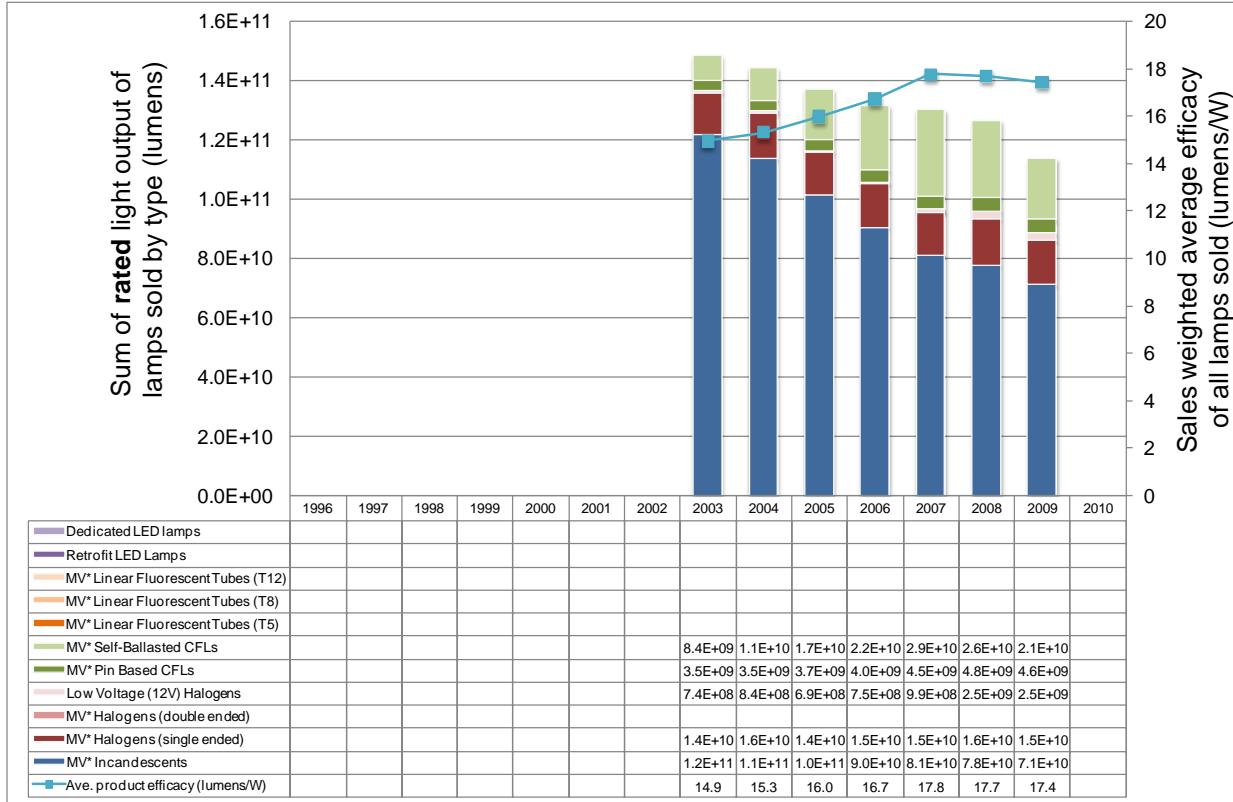
- Sales data supplied by Natural Resources Canada (NRCAN) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCAN are confident that the data represents a reasonable representation of the domestic lamps market<sup>2</sup> over time.
- Linear fluorescent tubes have been excluded from the efficacy and sales calculations.
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps.

<sup>2</sup> 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 - Canada

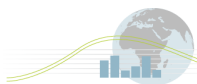


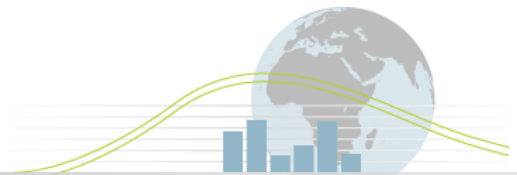
\* Mains Voltage

### Key notes on Graph (See notes section 2)

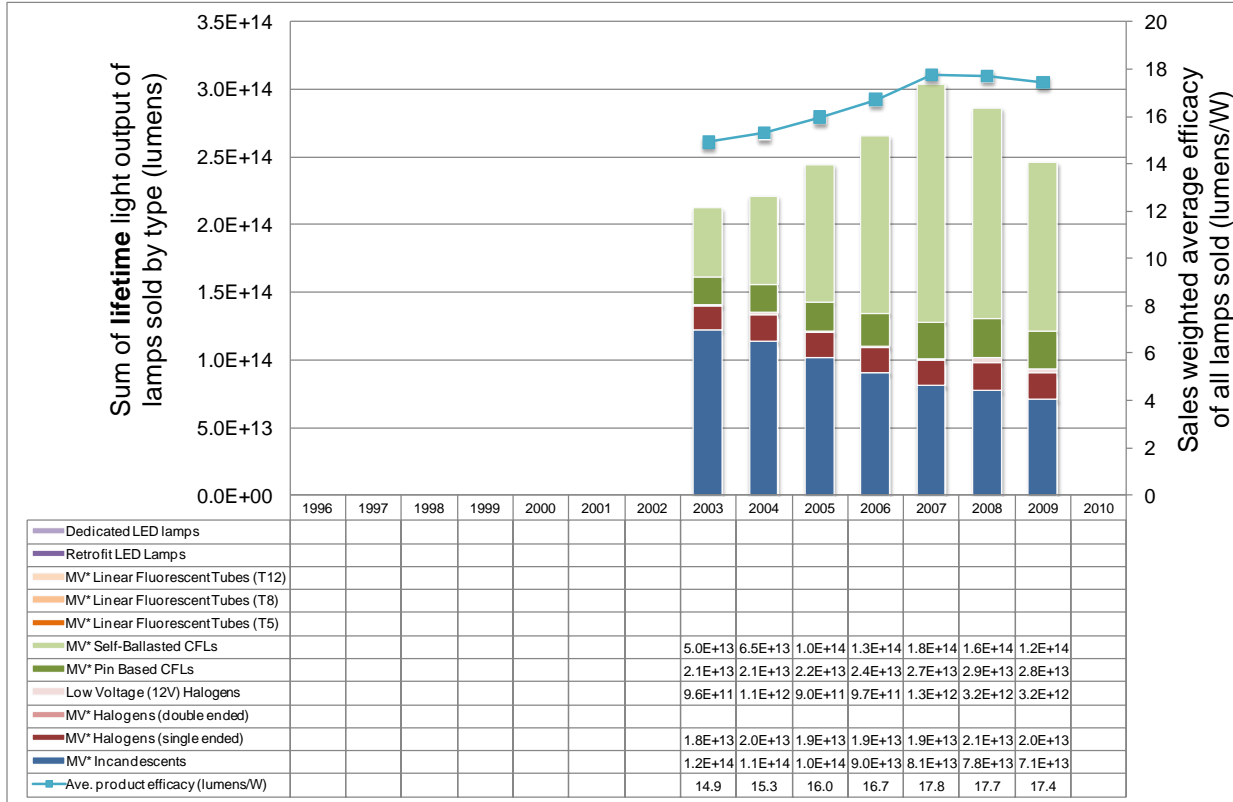
- Sales data supplied by Natural Resources Canada (NRCan) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCan are confident that the data represents a reasonable representation of the domestic lamps market<sup>3</sup> over time.
- Linear fluorescent tubes have been excluded from the efficacy and light output calculations.
- Instantaneous light output calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps.
- Instantaneous light output is for lamps sold in each year only, *not* all installed stock.

<sup>3</sup> 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 - Canada

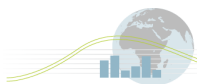


\* Mains Voltage

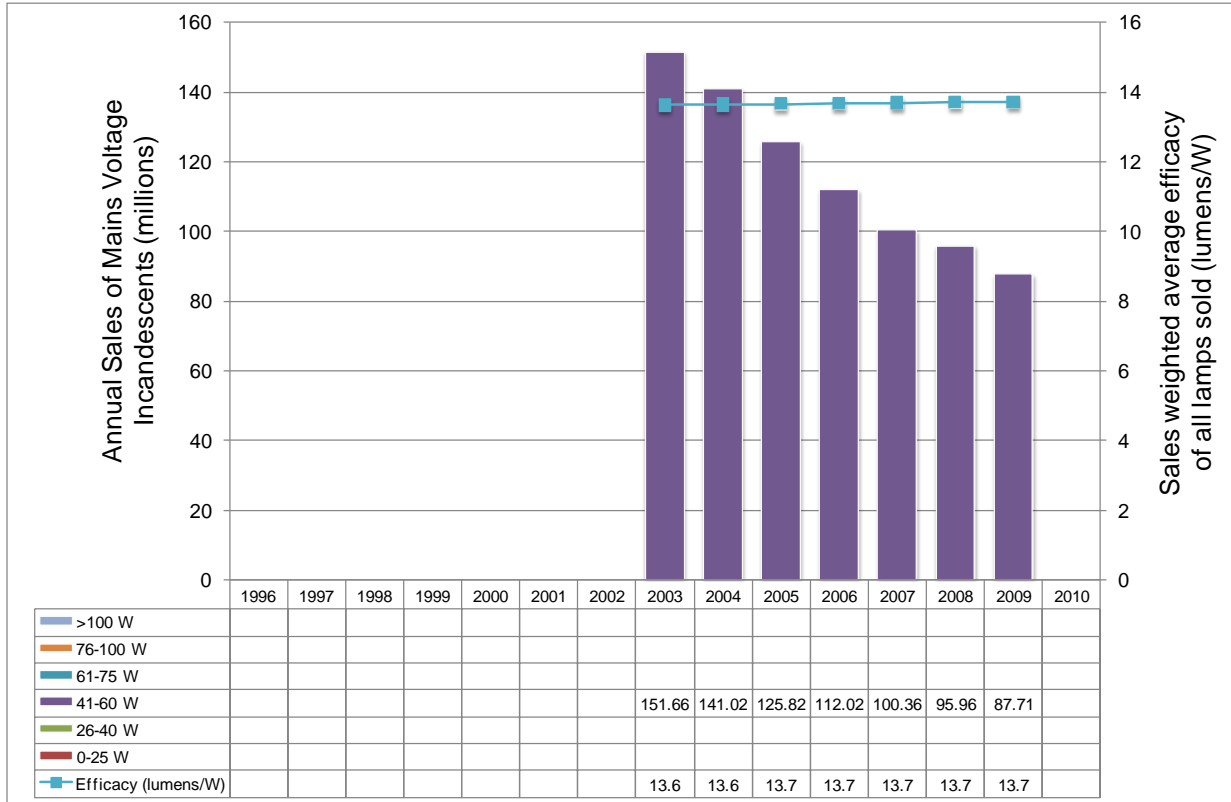
### Key notes on Graph (See notes section 2)

- Sales data supplied by Natural Resources Canada (NRCan) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCan are confident that the data represents a reasonable representation of the domestic lamps market<sup>4</sup> over time.
- Linear fluorescent tubes have been excluded from the efficacy and light output calculations
- 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 110V lamps
- Lifetime light output is for lamps sold in each year only, not all installed stock

<sup>4</sup> 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 – Canada

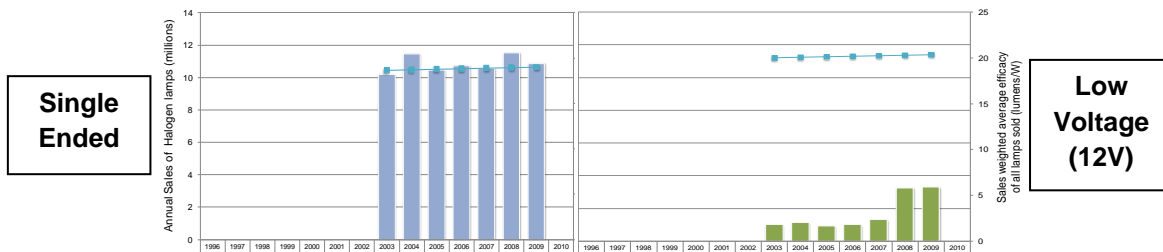
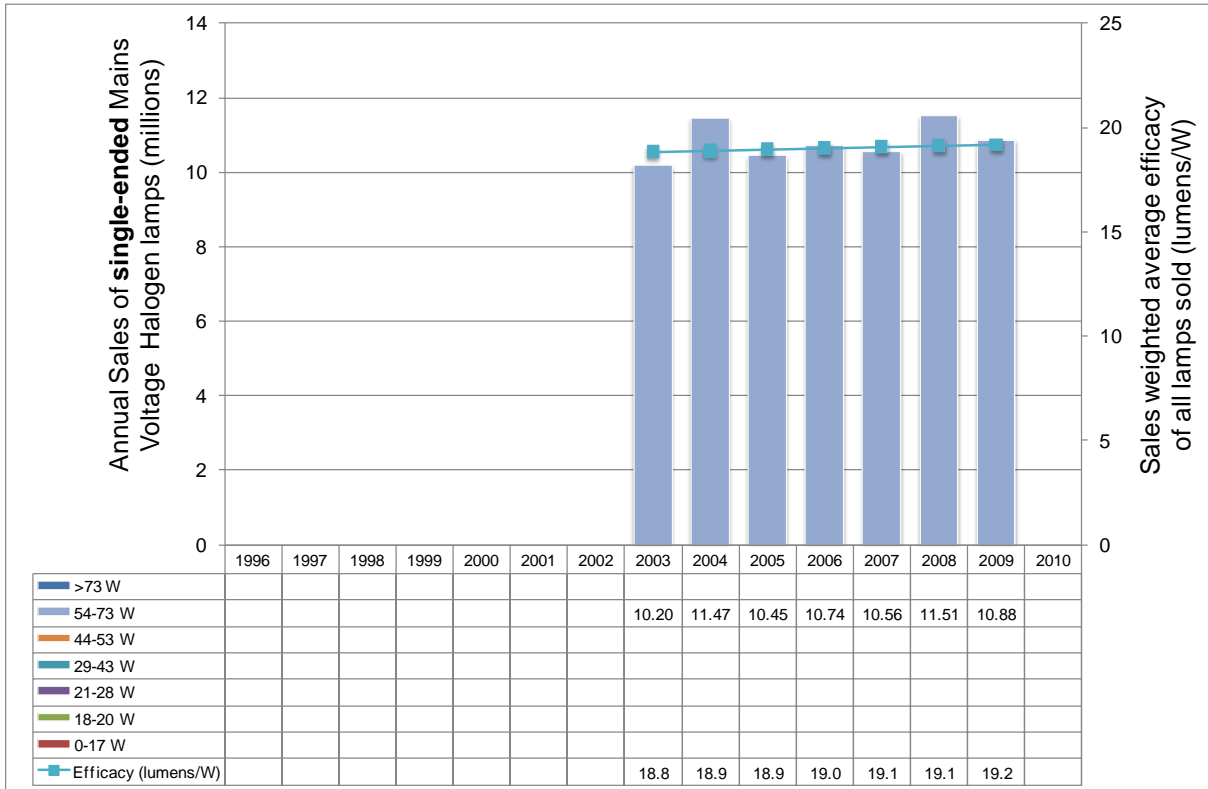


### Key notes on Graph (See notes section 2)

- Sales data supplied by Natural Resources Canada (NRCan) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCan are confident that the data represents a reasonable representation of the domestic lamps market<sup>5</sup> over time.
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps
- A full breakdown of sales by wattage ranges was not available. However, the average wattage of all sales of lamps of this type was provided. Therefore, all lamp sales are assumed to have occurred at this average wattage. This will have an impact on the average efficacy, but this impact is thought to be marginal.
- Incandescent category includes A-line, reflector, decorative and other incandescent lamps.

<sup>5</sup> 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.

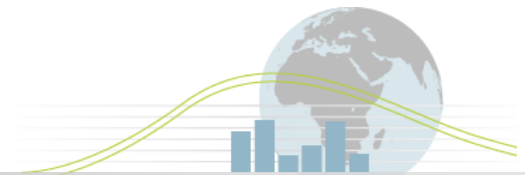
## Sales of Single Ended Mains Voltage Halogen lamps - Canada



### Key notes on Graph (See notes section 2)

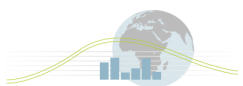
- Sales data supplied by Natural Resources Canada (NRCAN) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCAN are confident that the data represents a reasonable representation of the domestic lamps market<sup>6</sup> over time.
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps
- A full breakdown of sales by wattage ranges was not available. However, the average wattage of all sales of lamps of this type was provided. Therefore, all lamp sales are assumed to have occurred at this average wattage. This will have an impact on the average efficacy, but this impact is thought to be marginal.

<sup>6</sup> 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.



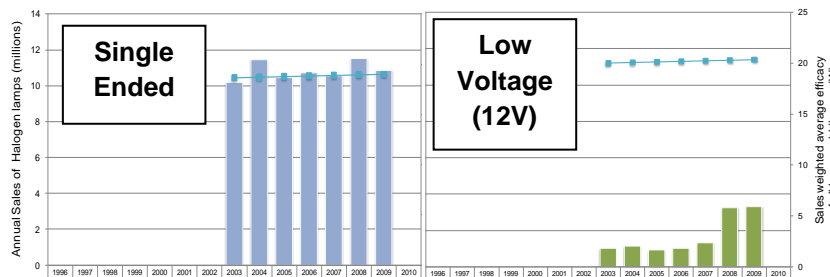
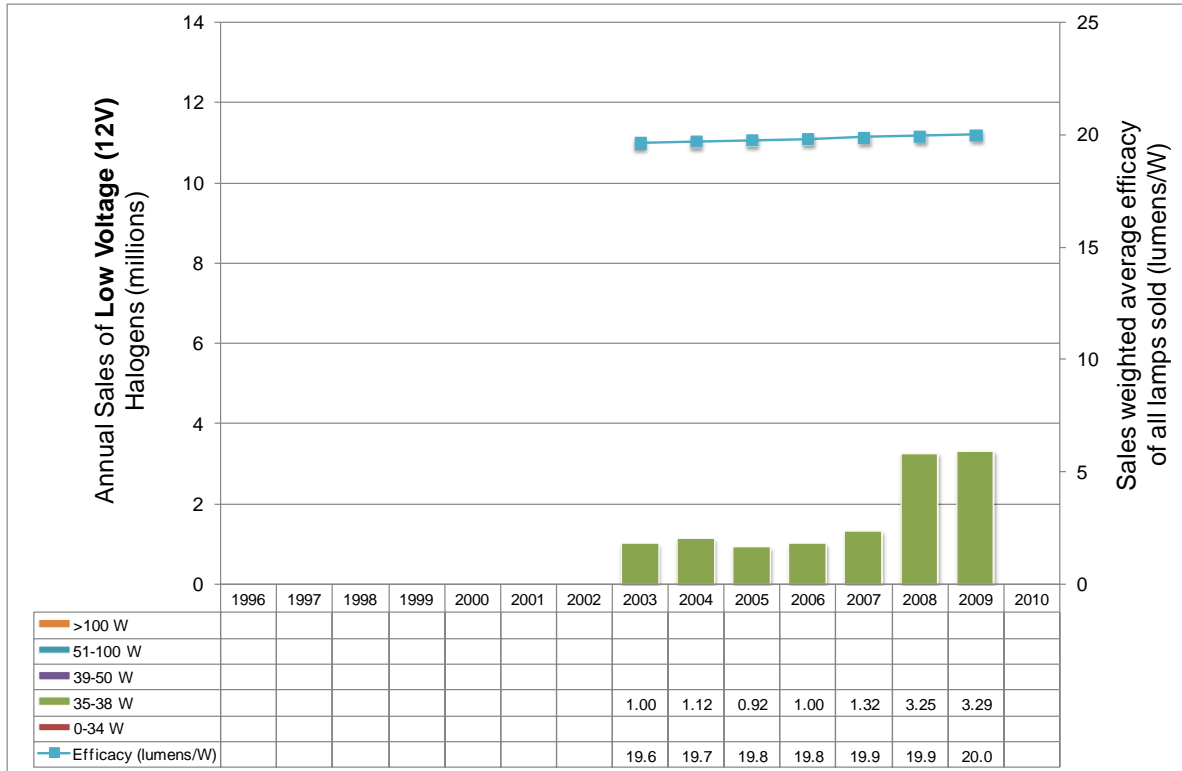
## Sales of Double Ended Mains Voltage Halogen lamps - Canada

No data on the sales of Double Ended Mains Voltage Halogen lamps in Canada was available to the Annex at the time of publication.





## Sales of Low Voltage (12V) Halogen lamps - Canada

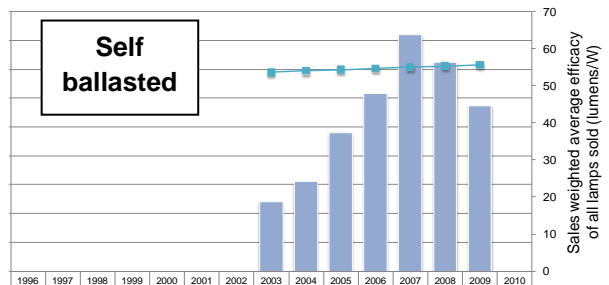
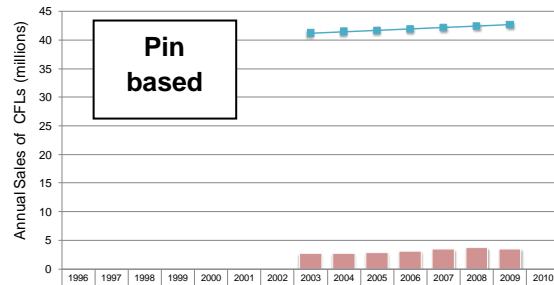
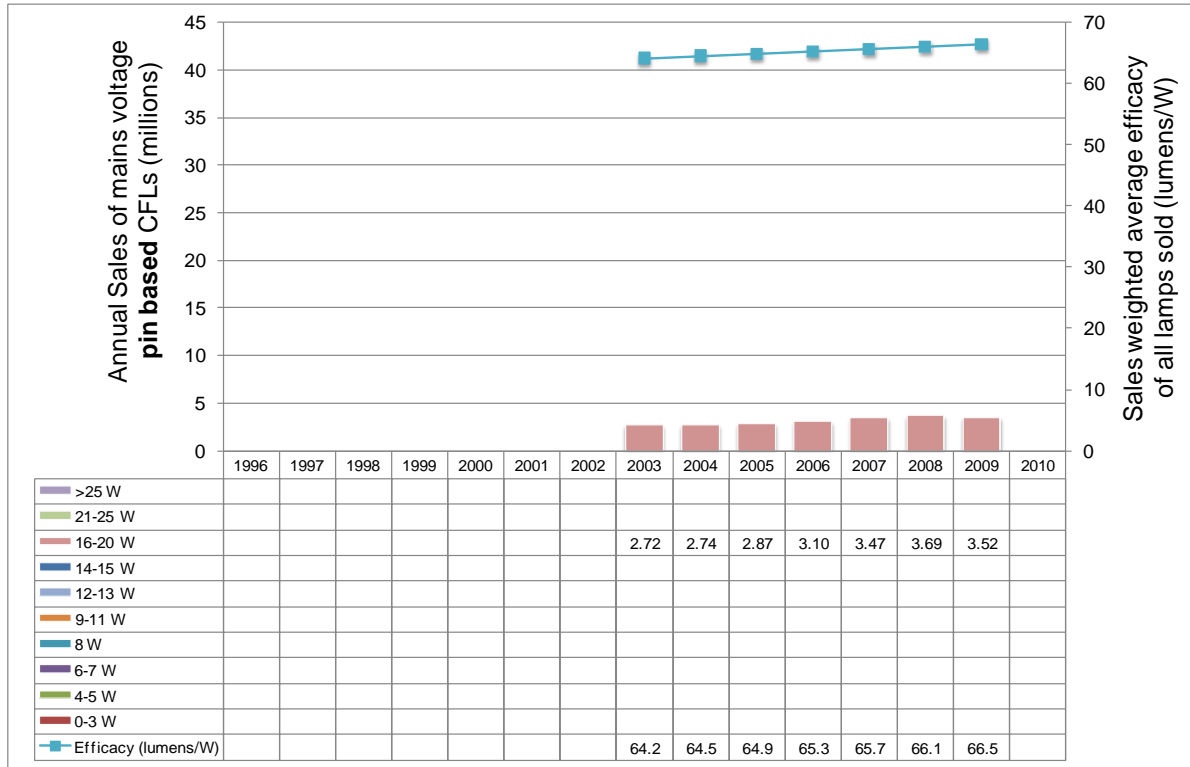


### Key notes on Graph (See notes section 2)

- Sales data supplied by Natural Resources Canada (NRCan) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCan are confident that the data represents a reasonable representation of the domestic lamps market<sup>7</sup> over time.
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps
- A full breakdown of sales by wattage ranges was not available. However, the average wattage of all sales of lamps of this type was provided. Therefore, all lamp sales are assumed to have occurred at this average wattage. This will have an impact on the average efficacy, but this impact is thought to be marginal.

<sup>7</sup> 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 Pin Based CFL lamps - Canada

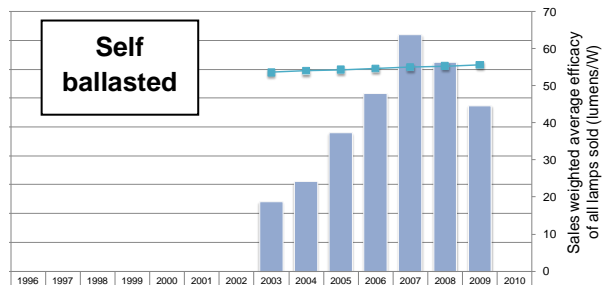
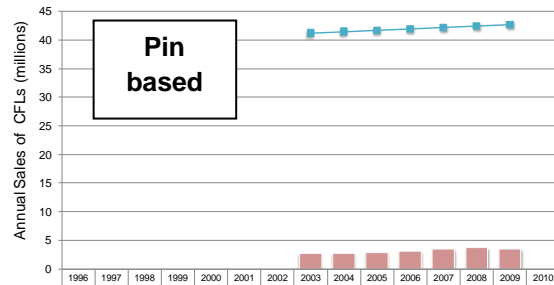
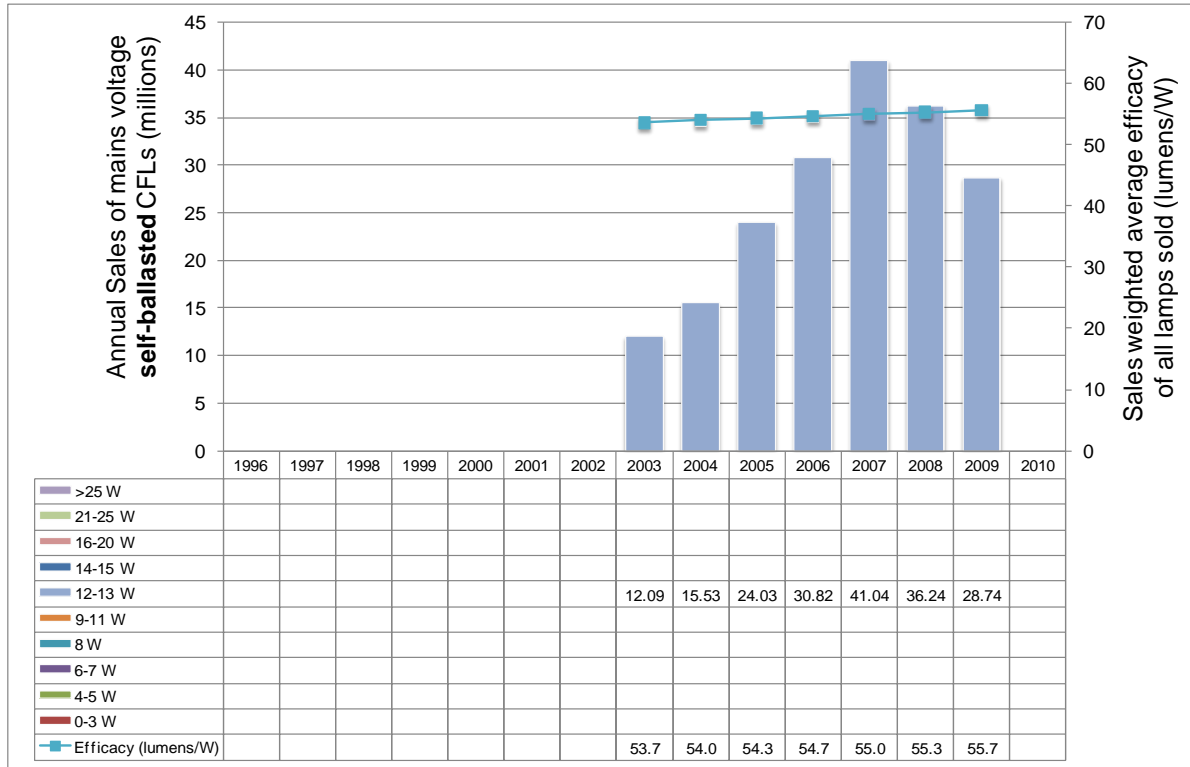


### Key notes on Graph (See notes section 2)

- Sales data supplied by Natural Resources Canada (NRCan) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCan are confident that the data represents a reasonable representation of the domestic lamps market<sup>8</sup> over time.
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps
- A full breakdown of sales by wattage ranges was not available. However, the average wattage of all sales of lamps of this type was provided. Therefore, all lamp sales are assumed to have occurred at this average wattage. This will have an impact on the average efficacy, but this impact is thought to be marginal.

<sup>8</sup> 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.

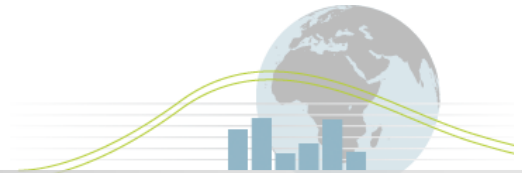
## Sales of Self-Ballasted CFL lamps - Canada



### Key notes on Graph (See notes section 2)

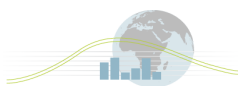
- Sales data supplied by Natural Resources Canada (NRCan) based on aggregated manufacturer data and data from the 2003 and 2007 “Survey of Household Energy Use”. NRCan are confident that the data represents a reasonable representation of the domestic lamps market<sup>9</sup> over time.
- Annual market average efficacies calculated on a sales weighted basis using estimated average global efficacies for each lamp type and associated wattage range for 110V lamps
- A full breakdown of sales by wattage ranges was not available. However, the average wattage of all sales of lamps of this type was provided. Therefore, all lamp sales are assumed to have occurred at this average wattage. This will have an impact on the average efficacy, but this impact is thought to be marginal.

<sup>9</sup> 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 – Canada

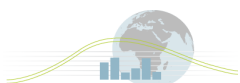
No data on the sales of dedicated or retrofit LED lamps in Canada was available to the Annex at the time of publication.

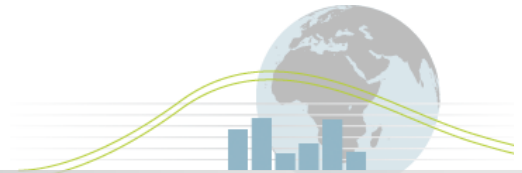


## Major Policy Interventions (See notes Section 3)

Key policy interventions reported over the period are:

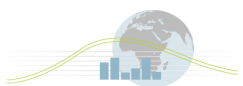
- a. Switch and Save: In 2004, National Resources Canada and its partners (Utilities) launched a major national promotional campaign targeted at encouraging consumers to switch to CFL bulbs
- b. Since the adoption of the CFL ENERGY STAR® program in Canada, most utilities have had on-going incentive programs for CFLs. National Resources Canada reports that in 2010 approximately 90% of CFLs sold within Canada are ENERGY STAR Compliant
- c. A Regulation adopted in 2008 requires the phase out of inefficient incandescent lamps (40-100 W). This was announced in April 2007 and comes into effect in January 2012 (detailed in notes section 1).
- d. The Regulations also require lamp labelling. Phase 1 is in effect; the label requires information on lamp life, wattage, and lumen output. Phase 2 is proposed.
- e. Canadian provinces are also adopting regulations for general service lamps. BC introduced in 2011, and Ontario has proposed adopting the standard – both are to harmonize with the Canadian regulations.





## Cultural Issues (See Notes Section 4)

No significant cultural issues reported.



## Notes on data

### Section 1: Notes on Phase out regulations

#### 1.1 Overview

Canada announced their intention to phase-out inefficient lighting in April 2007.

Product Class	Lamp Efficacy	Life	Colour Rendering Index (CRI)
<b>January 1, 2012</b>			
With a luminous flux of at least 1050 lm but no greater than 2600 lm other than modified spectrum lamps	$\geq 4.0357 \times \ln(\text{lumen}) - 7.1345$	$\geq 1000$ hours	$\geq 80$
Modified spectrum lamps with a luminous flux of at least 1050 lm but no greater than 2600 lm	$\geq 75\%$ of the efficacy of the reference standard spectrum lamp	$\geq 1000$ hours	$\geq 80$
<b>December 31, 2012</b>			
With a luminous flux of at least 250 lm but no greater than 1049 lm other than modified spectrum lamps	$\geq 4.0357 \times \ln(\text{lumen}) - 7.1345$	$\geq 1000$ hours	$\geq 80$
Modified spectrum lamps with a luminous flux of at least 250 lm but no greater than 1049 lm	$\geq 75\%$ of the efficacy of the reference standard spectrum lamp	$\geq 1000$ hours	$\geq 80$
<i>lm = lumen, ln = natural logarithm</i>			

Note that the minimum energy performance levels shown for CFLs in “Phase out regulations for domestic lighting – Canada” graphic refers to the ENERGY STAR voluntary levels only (see <http://oe.nrcan.gc.ca/residential/business/manufacturers/light.cfm?attr=4>). However, National Resources Canada reports that in 2010 approximately 90% of CFLs sold within Canada are ENERGY STAR Compliant

#### 1.2 Requirements<sup>10</sup> (also see section 1.4)

##### 1.2.1 General Service Lamps

##### 1.2.1.1 Energy Efficiency Regulations

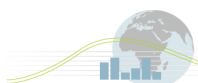
#### Technical requirements

##### Regulatory definition

An electrical device that provides functional illumination and

1. has a luminous flux of at least 250 lumens (lm) but no greater than 2600 lm,

<sup>10</sup> <http://oe.nrcan-rncan.gc.ca/regulations/product/general-service-lamps.cfm?attr=0>



2. has a nominal voltage or voltage range that lies at least partially between 100 volts and 130 volts, and
3. is screw-based

but does not include

4. an appliance lamp,
5. a CFL,
6. a coloured lamp,
7. an explosion resistant lamp, namely, a lamp that is designed and certified to operate in a Class I, Division 1 or Class II, Division 1 environment as defined in the IEC standard CEI/IEC 60079-0 (2007) entitled Explosive atmospheres - Part 0: Equipment - General Requirements,
8. an infrared lamp,
9. a lamp that has a G-shape as specified in ANSI C78.20 and ANSI C79.1, with a diameter of 13 cm or more,
10. a showcase lamp, namely, a lamp that has a T-shape as specified in ANSI C78.20 and ANSI C79.1 and a maximum wattage of 40 W or a length exceeding 25 cm and is marketed as a showcase lamp,
11. a lamp that uses solid state technology, namely, a lamp with a light source that comes from light-emitting diodes,
12. a left-hand thread lamp, namely, a lamp with a base that screws into a lamp socket in a counter-clockwise direction,
13. a plant lamp,
14. an incandescent reflector lamp that has a shape specified in ANSI C79.1,
15. a sign service lamp, namely, a vacuum type or gas-filled lamp that has sufficiently low bulb temperature to permit exposed outdoor use on high-speed flashing circuits and is marketed as a sign service lamp,
16. a silver bowl lamp, namely, a lamp that has a reflective coating applied directly to part of the bulb surface that reflects light toward the lamp base and that is marketed as a silver bowl lamp,
17. a traffic signal module, a pedestrian module or a street light,
18. a submersible lamp,
19. a lamp that has a screw base size of E5, E10, E11, E12, E17, E26/50×39, E26/53×39, E29/28, E29/53×39, E39, E39d, EP39 or EX39 as specified in ANSI C81.61, and
20. a lamp that has a B, BA, CA, F, G16-½, G25, G30, S or M-14 shape or other similar shape, as specified in ANSI C78.20 and ANSI C79.1, and a maximum wattage of 40 W

*Note:*

The definition of general service lamp **excludes** rough service lamps, vibration service lamps, shatter resistant lamps or lamps with E26d screw bases as specified in ANSI C81.61 **only** with regard to minimum energy performance standards. For labeling purposes, these lamps are included in the definition.



### Modified spectrum lamp

An enhanced, modified or full spectrum lamp that is marketed as such, is not coloured and, when operated at its rated voltage and wattage, has colour point chromaticity coordinates on the 1931 chromaticity diagram, as described in the CIE standard CIE 15: 2004 entitled Colorimetry, that lie outside a four-step MacAdam ellipse, as described in the IES standard IES LM-58-94 entitled Guide to Spectroradiometric Measurements, that is centred at the chromaticity coordinates of a reference standard spectrum lamp

### Test standard

- IESNA LM45 for lamp lumen output and wattage
- IESNA LM49 for lamp life
- CIE 13.3 for lamp Colour Rendering Index (CRI)  
(tested at 120 volts regardless of its nominal voltage)

### Compliance date

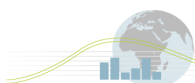
- September 1, 2008 for lamp package labelling
- January 1, 2012 and December 31, 2012 for minimum performance

### EnerGuide label

Lamp package labelling required: light output (lumens), energy used (watts), and life (hours) – see below for more information.

### 1.2.2 Required Performance Levels

Product Class	Lamp Efficacy	Life	Colour Rendering Index (CRI)
<b>January 1, 2012</b>			
With a luminous flux of at least 1050 lm but no greater than 2600 lm other than modified spectrum lamps	$\geq 4.0357 \times \ln(\text{lumen}) - 7.1345$	$\geq 1000$ hours	$\geq 80$
Modified spectrum lamps with a luminous flux of at least 1050 lm but no greater than 2600 lm	$\geq 75\%$ of the efficacy of the reference standard spectrum lamp	$\geq 1000$ hours	$\geq 80$
<b>December 31, 2012</b>			
With a luminous flux of at least 250 lm but no greater than 1049 lm other than modified spectrum lamps	$\geq 4.0357 \times \ln(\text{lumen}) - 7.1345$	$\geq 1000$ hours	$\geq 80$
Modified spectrum lamps with a luminous flux of at least 250 lm but no greater than 1049 lm	$\geq 75\%$ of the efficacy of the reference standard spectrum lamp	$\geq 1000$ hours	$\geq 80$
<i>lm = lumen, ln = natural logarithm</i>			



### 1.3 Labelling, verification, test data, reporting and importing requirements<sup>11</sup>

Dealers of general service lamps, compact fluorescent lamps (CFLs) and general service incandescent reflector lamps, including PAR, R, ER and BR lamps – imported or shipped interprovincially for sale in Canada – have to comply with specific testing and labelling requirements for light output, input wattage and lifetime rating.

#### 1.3.1 Product description

For labelling purposes, the Regulation applies to the following product types:

- **General service incandescent reflector lamps, BR lamps and ER lamps** These reflector lamps are already regulated for minimum energy performance. This includes most R, PAR, ER and BR shaped reflector lamps with a medium screw base and a nominal wattage over 40 W.
- **General service lamps** These are the common incandescent medium screw-based lamps with a luminous flux from 250 lumens to 2600 lumens. It does not include specialty lamps.
- **Compact fluorescent lamp (CFL)** These are integrally ballasted fluorescent lamps with a screw base designed to replace the general service incandescent lamp.

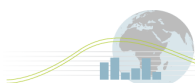
#### 1.3.2 Energy performance test procedures and effective date for labelling

	Power	Luminous flux	Life	Compliance date
General service incandescent reflector lamps	CAN/CSA C862-01: Performance of Incandescent Reflector Lamps			December 12, 2008 for product manufactured as of September 1, 2008
BR and ER lamps	CAN/CSA C862-01	Not required on label	CAN/CSA C862-01	
General service lamps	IESNA LM-45-00: IESNA Approved Method Electrical and Photometric Measurement for General Service Incandescent Lamps		IESNA LM-49-01: IESNA Approved Method for Testing of Filament Lamps	
CFL	CAN/CSA C861-06: Performance of Self-Ballasted Compact Fluorescent Lamps and Ballasted Adapters		IESNA LM-65-01: IESNA Life Testing of Single-Ended Compact Fluorescent Lamps	June 1, 2009

#### 1.3.3 Labelling requirements: Mandatory text on packaging

The Regulations do not prescribe a specific label design. Rather, they require that certain mandatory text be readily visible on the package's principle display panel. The text will be bilingual, with the English text appearing first, followed by the French text. The French and English texts can appear in separate locations on the packaging.

<sup>11</sup> Formal requirements at <http://www.gazette.gc.ca/rp-pr/p2/2008/2008-12-24/html/sor-dors323-eng.html>



### 1.3.3.1 General labelling requirements

For general service lamps, general service incandescent reflector lamps (PAR, R, ER and BR lamps) and CFLs:

1. The principal display panel of the package shall display the following information in the following order:
  - the words **Light Output / Flux lumineux**, followed by the product's luminous flux and the word Lumens (Exception – not required for ER and BR lamps);
  - the words **Energy Used / Consommation d'énergie**, followed by the product's power and the word Watts; and
  - the words **Life / Durée de vie**, followed by the product's life and the words "Hours / Heures".
2. The words **Light Output / Flux lumineux, Energy Used / Consommation d'énergie and Life / Durée de vie** shall be in the same font and be equal in size.
3. The words **Lumens, Watts and Hours / Heures** shall be in the same font and be equal in size, but their size shall not be more than 50% of size of the words referred to in #2.
4. The numerical values indicating a product's luminous flux, power and life shall be in the same font and be equal in size.

### 1.3.3.2 Additional labelling requirements

#### Design voltage considerations

If the design voltage of an energy-using product is other than 120 volts, the information displayed on the principal display panel of its package may correspond to

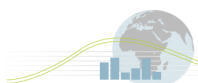
- a voltage of 120 volts, followed by the words at **120 volts / à 120 volts**; or
- its design voltage, followed by the words **at (insert *design voltage*) volts / à (insert *tension spécifique*) volts**. In this case the same information for the product at 120 volts shall be displayed on a panel of its package other than the principal display panel followed by the words **at 120 volts / à 120 volts**.

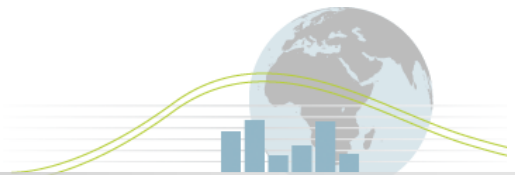
The design voltage of the product shall be displayed clearly and conspicuously on all panels of its package that display information for luminous flux, power and life.

The following statement shall be clearly and conspicuously displayed on the principal display panel of the product's package where it does not display the information at 120 V:

This product is designed for (*design voltage*) volts. When used on the normal line voltage of 120 volts, the light output and energy efficiency are noticeably reduced. See (*appropriate panel*) panel for 120-volt rating.

Ce produit a été conçu en fonction d'une tension de (*tension spécifique*) volts. S'il est employé à la tension normale de 120 volts, son flux lumineux et sa consommation d'énergie s'en trouveront considérablement réduits. Voir le panneau (*panneau en cause*) pour les renseignements correspondant à une tension de 120 volts.





## Multiple lamp types in a single package

If the lamps in a single package are not uniform, the following information shall be displayed on the principal display panel of the package for each type of lamp included in the package:

- its design voltage; and
- the information referred to in the general disclosure requirements 1-4 and additional labelling requirements.

## Three-way lamps

For three-way lamps the information shall be displayed for each level of operation.

### 1.3.4 Verification mark labelling / Performance test data requirements

	Power & Luminous Flux	Life
General service incandescent reflector lamps, BR lamps and ER lamps	Standards Council of Canada (SCC) accredited energy efficiency verification program* or provincial mark	
General service lamps	Can be self-declared for labelling but if asked to provide test data to confirm package information it must be from: SCC accredited verification program or provincial mark <b>or</b> SCC or NVLAP accredited laboratory	
CFLs	SCC accredited verification program or provincial mark <b>or</b> SCC or NVLAP accredited laboratory	SCC accredited verification program or provincial mark <b>or</b> SCC or NVLAP or A2LA accredited laboratory or an ISO 9000 certified laboratory or manufacturing facility

SCC = Standards Council of Canada  
 NVLAP = National Voluntary Laboratory Accreditation Program  
 A2LA = American Association for Laboratory Accreditation

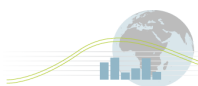
*\*The verification mark of the accredited verification program must be readily visible and affixed to a surface of the product or to the exterior of the product's package.*

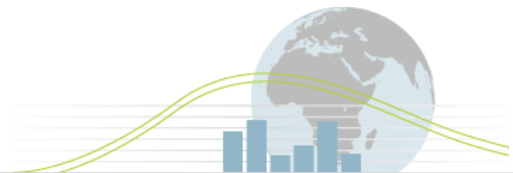
### 1.3.5 Reporting requirements

#### 1.3.5.1 Energy efficiency reporting<sup>12</sup>

For all products, the dealer must submit an energy efficiency report to Natural Resources Canada before the product is imported to Canada or traded interprovincially for the first time.

<sup>12</sup> More information on the current verification, reporting and importing requirements is available in the <http://oee.nrcan-rncan.gc.ca/regulations/guide.cfm?attr=0>.





### Reporting requirements

#### Common reporting requirements

- type of product (e.g. CFL)
- brand name
- model number
- manufacturer
- if required accredited testing or verification organisation as per Regulations

### New product-specific requirements

#### General service incandescent reflector lamps

- initial lumen output
- life (hours)

#### ER and BR lamps

- lamp description
- power (W)
- lamp class
- average lamp efficacy
- lumen output
- life (hours)

#### General service lamps

- lamp description
- power (W) (in the case of three-way lamps, the power at each operating level)
- lumen output (in the case of three-way lamps, the lumen output at each operating level)
- average lamp efficacy
- colour-rendering index (CRI)
- life (hours)
- voltage (V)
- root-mean-square input current (A)

#### CFLs

- power (W) (in the case of three-way lamps, the nominal power at each operating level)
- power factor (percent)
- lumen output (in the case of three-way lamps, the lumen output at each operating level)
- life (hours)

Note: Input voltage must be 120 V, and frequency must be 60 hertz, when testing the electrical performance of the product.

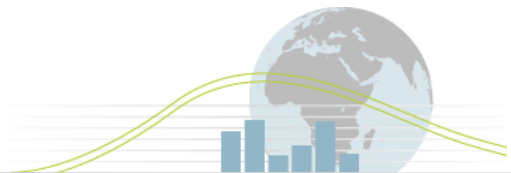
### CFLs and 40% life

If the CFL is marketed and labelled having undergone only 40% of life testing:

- an indication that 40% of the product's life has been verified
- date on which testing for life commenced
- life of the product
- number of hours of life that has been verified
- name of the laboratory or facility that verified 40 % of the product's life

Within 30 days after the day on which the verification with respect to the product's life has been completed





- number of hours of life that was verified
- name of the laboratory or facility that completed the verification with respect to the product's life

### 1.3.6 Importing

Dealers/importers must provide the following information on import documents or via electronic transmissions

- name of product (e.g. CFL)
- model number
- brand name (if any)
- importer's address
- purpose of the importation (i.e. for sale or lease in Canada; for modification; for export)

More information on the current verification, reporting and importing requirements is available in the <http://oee.nrcan-rncan.gc.ca/regulations/guide.cfm?attr=0>.

### 1.3.7 Harmonization

NRCAN attempts, as much as possible, to harmonize energy efficiency regulations with those of other regulatory agencies. The Regulations are mostly harmonized with the U.S. Federal Trade Commission's requirements on labelling of lighting products.

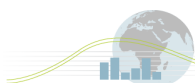
As directive statements are outside of the legislative mandate of the Energy Efficiency Act, in the spirit of consumer education and harmonization with the U.S. Federal Trade Commission requirements, NRCAN encourages dealers to voluntarily insert the bilingual-use statements in their packaging label.

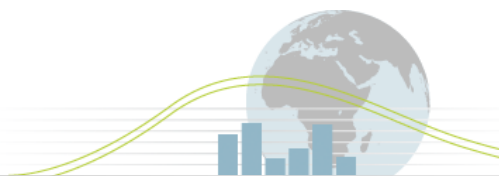
For CFLs, the test standards listed above are harmonized with those referenced in the ENERGY STAR<sup>®</sup> Eligibility Criteria in both the United States and Canada.

## 1.4 Summary of all Lamp Regulations

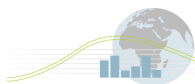
The regulatory requirements outlined above primarily relate to recent revisions to regulate general service and similar lamps. However, there are extensive regulatory requirements for a variety of lamps within Canada that are outlined below.

Year of announcement	Date of enforcement	Description of Lamps Covered	Requirements
<b><u>Minimum Energy Performance Standards</u></b>			
		<b><i>General Service Fluorescent Lamps</i></b>	<b><i>Minimum Average Lamp Efficacy (lm/W)</i></b>
1994	01 February 1996	rapid start straight-shaped; 1200 mm; medium bi-pin base; > 35 W	≥ 75 lm/W
1994	01 February 1996	rapid start straight-shaped; 1200 mm; medium bi-pin base; ≤ 35 W	≥ 75 lm/W
1994	01 February	rapid start straight-shaped; 2400 mm; recessed	≥ 80 lm/W

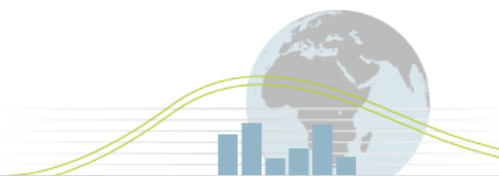




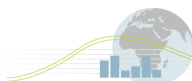
Year of announcement	Date of enforcement	Description of Lamps Covered	Requirements
	1996	double contact base; > 100 W	
1994	01 February 1996	rapid start straight-shaped; 2400 mm; recessed double contact base; ≤ 100 W	≥ 80 lm/W
1994	01 February 1996	rapid start U-shaped; 560-625 mm; medium bi-pin base; > 35 W	≥ 68 lm/W
1994	01 February 1996	rapid start U-shaped; 560-625 mm; medium bi-pin base; ≤ 35 W	≥ 64 lm/W
1994	01 February 1996	instant start straight-shaped; 2400 mm; single-pin base; > 65 W	≥ 80 lm/W
1994	01 February 1996	instant start straight-shaped; 2400 mm; single-pin base; ≤ 65 W	≥ 80 lm/W
		<b>General Service Incandescent Reflector Lamps</b>	<b>Minimum Average Lamp Efficacy (lm/W)</b>
2003	01 July 2003	ER lamps; 50 W	≥ 7.0 lm/W
2003	01 July 2003	ER lamps; 75 W	≥ 6.5 lm/W
2003	01 July 2003	ER lamps; 120 W	≥ 10.0 lm/W
2003	01 July 2003	R, PAR, BR lamps, and ER lamps not covered above; 40-50 W	≥ 10.5 lm/W
2003	01 July 2003	R, PAR, BR lamps, and ER lamps not covered above; 51-59 W	≥ 11 lm/W
2003	01 July 2003	R, PAR, BR lamps, and ER lamps not covered above; 60-85 W	≥ 12.5 lm/W
2003	01 July 2003	R, PAR, BR lamps, and ER lamps not covered above; 86-115 W	≥ 14 lm/W
2003	01 July 2003	R, PAR, BR lamps, and ER lamps not covered above; 116-155 W	≥ 14.5 lm/W
2003	01 July 2003	R, PAR, BR lamps, and ER lamps not covered above; 156-205 W	≥ 15 lm/W
		<b>General Service Lamps</b>	<b>Lamp Efficacy (lm/W)</b>
2008	01 January 2012	luminous flux of > 1050 lm and ≤ 2600 lm, other than modified spectrum lamps	≥ 4.0357 × ln(lumen) – 7.1345
2008	31 December 2012	luminous flux > 250 lm and ≤ 1049 lm, other than modified spectrum lamps	≥ 4.0357 × ln(lumen) – 7.1345
2008	01 January 2012	modified spectrum; luminous flux > 1050 lm and ≤ 2600 lm	≥ 75% of the efficacy of the reference standard spectrum lamp
2008	31 December 2012	modified spectrum; luminous flux > 250 lm and ≤ 1049 lm	≥ 75% of the efficacy of the reference standard spectrum lamp
		<b>Torchiere Lamps</b>	<b>Total Electrical Power (W)</b>
2008	01 January 2010	With no additional sockets	≤ 75
2008	01 January 2010	With one or more additional sockets	≤ 100
		<b>Exit Signs</b>	<b>Maximum Wattage (W)</b>



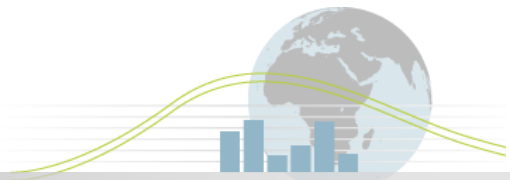




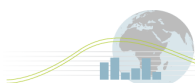
Year of announcement	Date of enforcement	Description of Lamps Covered	Requirements
2004	02 November 2006	Type 1 or 2	5 × (number of words on sign)
2004	02 November 2006	Type 3	5 × (number of words on sign) + 5
		<b>Traffic Signal and Pedestrian Modules</b>	<b>Maximum Wattage (W)/ Nominal Wattage (W)</b>
2008	01 January 2007	Red light with a diameter of 304.	17/11
2008	01 January 2007	Red light with a diameter of 203.	13/8
2008	01 January 2007	Red arrow display	12/9
2008	01 January 2007	Green light with a diameter of 304.	15/15
2008	01 January 2007	Green light with a diameter of 203.	12/12
2008	01 January 2007	Green arrow display	11/11
2008	01 January 2007	Combination of a walking person and a hand display	16/13
2008	01 January 2007	Walking person display only	12/9
2008	01 January 2007	Hand display only	16/13
		<b>Ceiling Fan Lighting</b>	<b>Total electrical power (W)</b>
2008	01 January 2010	w/ integrated lights that have total electrical power > 10 W; ≥ one socket that is not pin-based	≤ 190
2008	01 January 2010	w/ ≥ one socket that is not pin-based	≤ 190
2010	01 June 2009	General Service Incandescent Reflector Lamps: The proposed amendment to the Regulations will apply the current minimum average lamp efficacy levels for PAR, R and BR lamps to all lamps to all regulated incandescent reflector lamps. The ER lamp minimum efficacy levels indicated above will no longer apply.	
<b><u>Minimum Energy Performance Standards– Proposed Only</u></b>			
Proposed		HID ballasts harmonizing with DOE EISA	
Proposed		Mercury vapour ballasts harmonizing with DOE EISA	
Proposed		GSFL harmonizing with DOE June 2010 ruling	
Proposed		Reflector lamps harmonizing with DOE June 2010 ruling	
Proposed		Ceiling Fan lighting component: Tier II at maximum 75 watts	
Proposed		Reflector lamps exemptions to be removed	

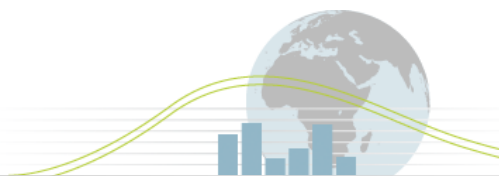




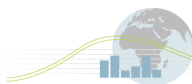


Year of announcement	Date of enforcement	Description of Lamps Covered	Requirements
<b>Labelling</b>			
2008	12 December 2008	General service incandescent reflector lamps, BR lamps and ER lamps (This includes most R, PAR, ER and BR shaped reflector lamps with a medium screw base and a nominal wattage over 40 W)	
2008	12 December 2008	General service lamps (common incandescent medium screw-based lamps with a luminous flux from 250 lumens to 2600 lumens)	
2008	01 June 2009	Compact fluorescent lamps (integrally ballasted fluorescent lamps with a screw base)	
Proposed		New label being proposed (prescribed format includes efficacy)	
<b>ENERGY STAR – Not Regulations – voluntary levels</b>			
		<b>Bare, Covered, Globe, and Outdoor Reflector CFLs</b>	<b>Minimum Efficacy (lm/W) - Medium Screw Base</b>
2008	02 December 2008	Bare lamp, fixed light output, lamp power < 10 W	50
2008	02 December 2008	Bare lamp, fixed light output, lamp power ≥ 10 W, < 15W	55
2008	02 December 2008	Bare lamp, fixed light output, lamp power ≥ 15 W	65
2008	02 December 2008	Bare lamp, dimmable/2-way/3-way, lamp power < 15 W	50
2008	02 December 2008	Bare lamp, dimmable/2-way/3-way, lamp power ≥ 15 W	60
2008	02 December 2008	Covered lamp, no reflector, lamp power < 7 W	40
2008	02 December 2008	Covered lamp, no reflector, lamp power ≥ 7 W, < 15 W	45
2008	02 December 2008	Covered lamp, no reflector, lamp power ≥ 15 W, < 25 W	50
2008	02 December 2008	Covered lamp, no reflector, lamp power ≥ 25 W	60
2008	02 December 2008	Outdoor reflectors, lamp power < 20 W	33
2008	02 December 2008	Outdoor reflectors, lamp power ≥ 20 W	40
		<b>Reflector CFLs for Recessed Downlights/ Indoor Use</b>	<b>Minimum Efficacy (lm/W)</b>
2008	02 December 2008	Reflector CFLs, lamp power < 20 W	33
2008	02 December 2008	Reflector CFLs, lamp power ≥ 20 W	40





Year of announcement	Date of enforcement	Description of Lamps Covered	Requirements
		<b>Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps</b>	<b>System Efficacy per Lamp Ballast Platform (lm/W)</b>
2008	01 August 2008	Indoor fixtures, only electronic ballasts, < 30 total combined lamp and ballast watts	50
2008	01 August 2008	Indoor fixtures, only electronic ballasts, ≥ 30 total combined lamp and ballast watts, and ≤ 24 inches	60
2008	01 August 2008	Indoor fixtures, only electronic ballasts, ≥ 30 total combined lamp and ballast watts, and ≥ 24 inches	70
2008	01 August 2008	Outdoor fixtures, only electronic ballasts, < 15 total combined lamp and ballast watts	40
2008	01 August 2008	Outdoor fixtures, only electronic ballasts, ≥ 15 and < 30 total combined lamp and ballast watts	50
2008	01 August 2008	Outdoor fixtures, only electronic ballasts, > 30 total combined lamp and ballast watts	60
		<i>* Outdoor fixtures may also qualify for ENERGY STAR by compliance through reduced operating time</i>	
2008	01 August 2008	GU-24 Based Integrated Fluorescent Lamps, bare lamps, < 30 total combined lamp and ballast watts	50
2008	01 August 2008	GU-24 Based Integrated Fluorescent Lamps, bare lamps, ≥ 30 total combined lamp and ballast watts	60
2008	01 August 2008	GU-24 Based Integrated Fluorescent Lamps, covered, reflector and dimmable lamps	40
		<b>Decorative Light Strings</b>	<b>Minimum Efficacy</b>
2008	01 March 2008	Decorative Light Strings (DLS)	0.2 W per lamp



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

### **2.1 Data Source**

Sales data supplied by Natural Resources Canada (NRCan) based on:

- Aggregated manufacturer data
- Data from individual manufacturers
- 2003 and 2007 “Survey of Household Energy Use”<sup>13</sup>

Raw data was not made available, but NRCan are confident that the data represents a reasonable representation of the market over time.

Original data included information on linear fluorescent tubes but this has been excluded from the mapping document to ensure compatibility with the benchmarking of lighting products.

### **2.2 Manipulations of Data Supplied**

Sales data used as supplied.

A full breakdown of sales by wattage ranges was not available. However, the average wattage of all sales of lamps of this type was provided. Therefore, all lamp sales are assumed to have occurred at this average wattage. This will have an impact on the average efficacy, but this impact is thought to be marginal.

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:

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

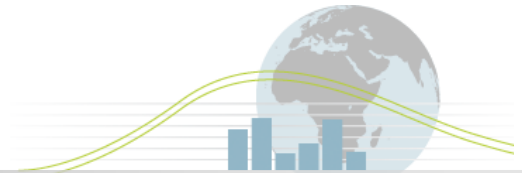
#### **2.2.1 Key assumptions:**

<sup>13</sup> [http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data\\_e/publications.cfm](http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/publications.cfm)

Efficacies used for all calculations based on estimated average global efficacies for each lamp type and associated wattage range for 120V lamps.

Lifetimes used for all calculations based on estimated average global lamp life for each lamp type and associated wattage range for 120V 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**

No additional notes

**Section 4: Notes on Cultural Issues**

No significant cultural issues reported.

