



**LIGHTINGEUROPE**  
THE VOICE OF THE LIGHTING INDUSTRY

## 1st Questionnaire Exemption No. 1(g) (renewal request)

***Exemption „1(g): For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg“***

### Abbreviations and Definitions

CFL Compact fluorescent lamp

CFLi Compact fluorescent lamp integrated

CFLni Compact fluorescent lamp non-integrated

LE LightingEurope

Hg Mercury

### Questions to the applicant

1. It is stated that most of the lamps covered by the exemption “*do not have an integrated ballast but are used in luminaires with electronic control gears*”, i.e. the consultants understand most of the lamps covered by the exemption to be non-integrated compact fluorescent lamps (CFLni).

a. Can the exemption be exclusively limited to CFLni?

**Answer LightingEurope:** Long-life lamps is a low volume market, but are of high importance as a technical solution for customers, and they need these lamps.

There are also several types of CFLi lamps under the scope of this exemption. These lamps are used for instance in high ceilings, oil platforms, halls, stairways and emergency lights in luminaires with E27 cap. They are difficult, dangerous and expensive to reach.

b. If so, would the following formulation be suitable for this purpose: “Compact fluorescent lamp with a non-integrated ballast used for general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg”

**Answer LightingEurope:** No, because some CFLi application of long life lamps still exist (see previous answer) and professional users expect that these lamps can be replaced.

c. If not please explain why, seeing as it is understood that LED retrofit lamps for CFLi are also available in longlife versions

**Answer LightingEurope:** Long-life LED lamps exist, but frequently these are not a direct replacement for existing CFLi versions because of differences in shape factor, light distribution, weight of the lamp.

Regarding long-life, non-integrated CFLs, there is no single LED retrofit lamp available that addresses all the parameters of the original CFL in terms of Wattage, colour temperature, socket,

lumen output and switching cycles, not even within a 10% tolerance range. Therefore, in the case of CFL-ni, no LED retrofit (substitute) exists.

The situation is similar for long-life, integrated CFLs. Their LED retrofit equivalents are restricted to limited products of the portfolio that can address all the relevant parameters such as Wattage, colour temperature, socket and lumen output of CFLs, within a 10% tolerance range.

A consequence of customers changing over to LEDs that are not 1:1 retrofits (substitutes) could be disharmonious illumination (mixing CFL and LEDs). CFLs have been tested for decades in real operational environments. The LED lifetime has still to be proven on a large scale in real applications as those described above (1a), time is needed to build the confidence with the customers to make the transition to the new technology.

In general, it can be said that there is no generic incentive to develop 1:1 replacements in LED technology for every individual CFL lamp type, since the market decides between CFLs and LEDs based on the needed technical (electric, lighting etc.) specifications, the total cost of ownership, and/or based on other criteria e.g. environmental, design, company image considerations.

2. The range of lifetimes of lamps falling under this exemption is understood to be between 20,000-60,000 hours. Please confirm this understanding and specify the actual typical lifetimes of lamps placed on the market through this exemption.

**Answer LightingEurope:** We can confirm that lifetime span of 20.000 – 60.000h is typical for CFL non-integrated lamps.

These lamps have been designed for very long lifetime and applications (professional use/ non-household) in areas where lamp replacement is difficult and expensive due to high ceilings, special luminaire design for critical application requirements or too much of a disturbance of running processes during long operating hours. Also, applications where safety of people is at stake e.g. heavy-duty industry halls, chemical industry and oil platforms requiring very reliable long-life specifications. For these applications, the nominal (average) lifetime is always exceeding the minimum requirement of 20 kHrs. The same situation is valid for CFLi, minimum requirement being 20 kHrs, actual lifetimes will differ by manufacturer, whose specifications can be found in their documentation and are publicly available on their websites.

3. In section 10 of the application, reference is made to a confidential comprehensive list of lamps with average mercury content placed on the market through this exemption. Please forward this list, to support the evaluation of this application. The list shall be used for internal purposes and shall remain confidential.

**Answer LightingEurope:** This list did not contain the CFL long-life lamps as at that time the renewal of the exemptions for mercury did not refer to lamps from exemption 1g.

LightingEurope is in the process of updating this list with the additional information. We thank Oeko Institute for understanding that this compiled list should remain confidential.

4. Please estimate for how long the exemption shall be needed, independent of the maximum validity that can be granted for an exemption. In this respect please provide detail as to the estimated stock of luminaires using lamps falling under this exemption and its expected development over time.

**Answer LightingEurope:** The typical application of these lamps is in long lifetime situations where lighting is used as an enabler for (continuous) running operations. (Individual) lamp replacement is difficult and expensive; safety aspects may be involved.

In these kinds of applications, a changeover to LED technology is possible but it is only considered in case of a major overhaul i.e. replacing the entire infrastructure including its lighting. Our prediction is that at least a period of 10 years is expected, assuming a 10-15% annual rate of replacement, and although admittedly, the market is changing rapidly, we envisage a minimum of 5 years.

Within the context of the study on the impact of the new Single Lighting Regulation, the EU consultant VHK developed the Melissa model, in cooperation with stakeholders (among them LightingEurope). In this model, the CFL long-life are not explicitly present. A prediction of the stock of the total number of luminaires equipped with CFL long-life lamps, might be made by taking 2-3% of the predicted total installed CFL luminaires extrapolated over the next years.

5. LED alternatives for CFL lamps tend to consume less energy than their CFL counterparts. Please specify the typical ratio between CFL power supply (wattage) and the power supply of a comparable LED retrofit lamp. Alternatively please give a few examples providing insight as to the range of this ratio for various lamps (for example CFLi versus CFLni or in relation to typical fixtures used for lamps covered by the exemption).

**Answer LightingEurope:** It is not possible to draw generic conclusions as to what the achieved ratio in power would be for all existing lamp types for which no LED replacement is available at all yet.

In relation to non-integrated CFLs, there is no retrofit LED alternative available that addresses all the parameters of the original CFL in terms of Wattage, colour temperature, socket, and lumen output and, switching cycles, not even within a 10% tolerance range.

For 98% of the CFL market there is no LED retrofit lamp available that could be plugged into the existing CFLni sockets. Only 2% of the CFL market has a socket into which a LED lamp can be plugged in, but in this case the lumen output is half of the original. This is a significant compromise for the customer and therefore these LED lamps cannot be considered a true 'retrofit', or substitute. In practice, this would be a downgrade option, that would compromise the lighting needs and potentially the safety of people. The market decides between CFLi, CFLni and LEDs based on the needed technical (electric, lighting etc.) specifications, the total cost of ownership, and/or based on other criteria e.g. environmental, design, company image considerations. Energy efficiency is only one of the parameters taken into account in this complex decision-making process.

6. It is stated that “For many applications the prices of LED-based alternatives for CFL lamps (especially for increased wattages) are still significantly higher...” Please specify the price range of CFL Lamps covered by this exemption. If possible please specify a range for CFLi lamps and for CFLni lamps.

**Answer LightingEurope:** In line with anti-trust laws and the LightingEurope code of conduct, pricing is not discussed within LightingEurope. Oeko Institute is encouraged to collect this information directly from companies.

7. As part of the evaluation, socio-economic impacts shall also be compiled and evaluated. For this purpose, please provide details in respect of the following:

a. Estimations related to the volume of EEE concerned and the amount of mercury to be avoided shall be made on the basis of the Ex. 1(g) market volume being between 2-3% of the total CFL market volume and in relation to data provided in the past for CFL lamps in general. Please specify if the 2-3% value is related to the total CFL market volume or to the market volume relevant for CFL lamps of Ex. 1(a), with a power supply < 30 W.

**Answer LightingEurope:** The 2-3% on page 7 of the exemption request is meant to be read as the percentage of the total CFL market (CFL-i and CFL-ni of all lamp powers).

b. Estimations related to the amount of waste to be generated through a forced substitution shall be made on the basis of the Ex. 1(g) market volume and data specified above. Please further specify what the typical number of lamps per luminaire is for long life lamps falling under Ex. 1(g).

**Answer LightingEurope:** Forced substitution is not advised, as there is a very high risk that customers, manufacturers and society would be significantly impacted in terms of technical feasibility, electrical compatibility, safety, waste generation and economic cost. Lack of a LED substitute impacts operations in for example a traffic tunnel, a chemical plant, an oil platform etc.

Generic system overhaul prevails. For CFLni luminaires the typical amount of CFLni lamps varies between 1 and 4 lamps per luminaire. In our answer to DG Environment dated 20160920 (see table below) we used our best known average value: 1.5 lamps per luminaire with CFL lamps.

Based on data of the Ecodesign Study (lot 8/9/10, “Melisa model” )<sup>1</sup>, the following number of lamps and luminaires or fixtures in EEE are on the EU market in the commercial, industrial and public sector:

Lamp type	lamps in the market	lamps/fixture	fixtures
T5	619.000.000	2,5	247.600.000
T8	1.483.000.000	2,0	741.500.000
CFLni	619.000.000	1,5	412.666.667
<b>Total</b>	<b>2.721.000.000</b>		<b>1.401.766.667</b>

<sup>1</sup> Preparatory Study on Light Sources for Ecodesign and/or Energy Labelling Requirements ('Lot 8/9/19') available at the following link: <http://ecodesign-lightsources.eu/sites/ecodesignlightsources.eu/files/attachments/LightSources%20Task2%20Final%2020151031.pdf>

Some of the lamps can be exchanged by LED replacement lamps, while in most cases a change of the luminaire is expected. Costs are caused by higher prices for LED lamps, costs of the luminaires and labour costs.

c. Please estimate possible impacts on employment in total, in the EU and outside the EU, should the exemption not be granted. Please detail the main sectors which possible impacts are expected – lamp manufacture, supply chain, retail, etc.

**Answer LightingEurope:** For compliance reasons, LightingEurope cannot compile employment-related figures for the lighting industry.

We believe that there will be an additional socio-economic impact on the applications sectors, i.e. the customers of these products, that should also be considered.

d. Please estimate additional costs associated with a forced substitution should the exemption not be granted, and how this is divided between various sectors (e.g. private, public, industry: manufacturers, suppliers, retailers).

**Answer LightingEurope:** CFLni: A major differentiating aspect would be if the assumption is that the entire luminaire would have to be replaced (most plausible situation today, since no CFLni replacement lamps are available.) The replacement costs have been estimated for general CFL luminaires in our earlier answer to DG Environment (dated 20160920 – see table below).

For luminaires for long-life lamps, the replacement costs are more difficult to estimate since these luminaires are installed in places where even lamp replacement is difficult or dangerous and continuous operation is needed. In these applications availability of a full retrofit is important, since insurance and safety aspects are essential in these applications.

Based on data of the Ecodesign Study (lot 8/9/10, “Melisa model”)<sup>2</sup> the following number of lamps and luminaires or fixtures in EEE are on the EU market in the commercial, industrial and public sector:

Lamp type	lamps in the market	lamps/fixture	fixtures
T5	619.000.000	2,5	247.600.000
T8	1.483.000.000	2,0	741.500.000
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<b>Total</b>	<b>2.721.000.000</b>		<b>1.401.766.667</b>

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Lamp type	Retrofit share	product costs	labour costs	total costs
T5	10%	20,0 €	20,0 €	40 €
T8	40%	15,0 €	10,0 €	25 €
CFLni	10%	12,5 €	20,0 €	33 €

#### Replacement LED luminaire:

Lamp type	Retrofit share	product costs	labour costs	total costs
T5	90%	250 €	25,0 €	275 €
T8	60%	250 €	25,0 €	275 €
CFLni	90%	75 €	25,0 €	100 €

#### Total replacement costs:

Lamp type	Retrofit	LED LUM	Total
T5	990.400.000 €	61.281.000.000 €	62.271.400.000 €
T8	7.415.000.000 €	122.347.500.000 €	129.762.500.000 €
CFLni	1.341.166.667 €	37.140.000.000 €	38.481.166.667 €
<b>Total</b>	<b>9.746.566.667 €</b>	<b>220.768.500.000 €</b>	<b>230.515.066.667 €</b>

Taking an estimated time frame of 5 years, we estimate annual costs of **46.103.013.333 €** to the public and commercial sectors in the EU (office, retail, education, healthcare, hotels, restaurants, institutions, warehouse, transportation, production, etc.)

#### Cost explanation:

Luminaire exchange      labour costs: change of luminaire, check of installation (light management functionality), disposal of old luminaire, check of safety and legal conformity

LED lamp replacement      labour costs: change of lamp and re-wiring if necessary, check of installation (light management functionality), disposal of old lamp, check of safety and legal conformity

These are the total costs for society, the costs for CFL long life specific can be found by taking 2-3% of the CFL-ni replacement costs.

The calculated figure is then a lower bound for the costs, since replacing the luminaires for long-life lamps is more expensive: they are located in places that are difficult to reach.