

## Consultation Questionnaire Exemption No. 1(a-e) (renewal request)

*Exemption for „ Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):*

- (a) For general lighting purposes < 30 W: 2,5 mg may be used after 31 December 2012*
- (b) For general lighting purposes  $\geq 30$  W and < 50 W: 3,5 mg may be used after 31 December 2011*
- (c) For general lighting purposes  $\geq 50$  W and < 150 W: 5 mg*
- (d) For general lighting purposes  $\geq 150$  W: 15 mg*
- (e) For general lighting purposes with circular or square structural shape and tube diameter  $\leq 17$  mm: 7 mg may be used after 31 December 2011 “*

### Abbreviations and Definitions

CFL	Compact Fluorescent
Hg	Mercury
LED	Light emitting diode
LEU	LightingEurope
Mpcs	Million pieces
NARVA	NARVA Lichtquellen GmbH + Co. KG

### Background

The Oeko-Institut and Fraunhofer IZM have been appointed within a framework contract<sup>1</sup> for the evaluation of applications for the renewal of exemptions currently listed in Annexes III of the new RoHS Directive 2011/65/EU (RoHS 2) by the European Commission.<sup>1</sup>

LightingEurope (LEU) and NARVA Lichtquellen GmbH + Co. KG (NARVA) have submitted a request for the renewal of the above mentioned exemption, which has been subject to a first completeness and plausibility check. The applicant has been requested to answer additional questions and to provide additional information, available on the request webpage of the stakeholder consultation (<http://rohs.exemptions.oeko.info/index.php?id=228>).

Both applicants apply for the renewal of Ex. 1 entries a-e, with the current wording formulation listed in Annex III of the RoHS Directive and requesting the maximum available duration allowed (based on Art. 5(2) of the Directive)

According to the applicants:

LightingEurope provide data estimating a “total volume of CFL lamps in EU 28 of 342 Mpcs in 2013”. Additional data provided estimate a this quantity to decrease to 222 Mpcs by 2016 and to 93 Mpcs by

<sup>1</sup> Contract is implemented through Framework Contract No. ENV.C.2/FRA/2011/0020 led by Eunomia

2020. The total amount of CLFs is understood to breakdown in between the various types addressed in the Ex. 1 entries as follows:

- < 30 W: 85% of total market share
- $\geq 30$  W and < 50 W: 10%
- $\geq 50$  W and < 150 W: 3%
- $\geq 150$  W : 0.5%
- With circular or square structural shape and tube diameter  $\leq 17$  mm: *“Total amount of lamps in exemption 1(e) entering European market in 2013 was approximately: 3 mio lamps. Market volume is 600 Mpcs (market volume in pieces taken from McKinsey report)<sup>2</sup>. The estimation of lamps in this category is 0.5 % of the EU CFL market.”*

LEU explains that *“The average amount of mercury within fluorescent technology per lamp has been considerably reduced”*, and provide information to show how the Hg quantity has decreased along the years. It can also be understood from their application that a substance-substitute for Hg in low pressure fluorescent lamps is not available. Research for such a substitute was performed in the past, however it is explained that *“With the arrival of the first energy efficient LED white light sources and the perspective of further improvements, research into alternative gas discharges has stopped at most companies and universities“*.

LEU explains substitutes to be in the form of Hg free technologies. Halogens are said to provide substitutes in some cases, whereas it can be understood that the various developments in LED technologies, which have already allowed for substitution in some cases, are expected to generate a wider range of alternatives that shall allow for complete phase-out in the future. *“This change mainly concerns the new installs market, i.e. new luminaires and lighting systems are now frequently based on LED technology”*. However, LEU claims *“for the current installed base of luminaires and lighting systems operating with discharge lamps, a typical refurbishment cycle in shops and offices is on average 7 and 12 years respectively. LEDs in many cases are not suitable drop-in replacements”*. It is explained that the LED technology developments are also addressing one-on-one replacements (i.e., drop.in or retrofit replacement), however various limitation are described to explain why such alternatives are not sufficiently market ripe for the full range of applications, including the following (see application for additional aspects and explanations):

- Lack of standards for LEDs which aim to replace CFLs with external ballast that would reassure users that LED alternatives are compatible with existing installations;
- Differences in directionality of available LED alternatives, in comparison with CFL counterparts (i.e., omni-directionality in comparison with directionality);
- Changes in light distribution when an LED alternative is applied to an installation originally manufactured for CFL lamps;
- Non-compatibility of LED alternatives with installations originally manufactured for CFL lamps in terms of differences in size / geometry / weight / etc.
- Non-compatibility of LED alternatives with installations originally manufactured for CFL lamps in terms of thermal performance and heat dissipation needs;

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<sup>2</sup> Quoted by LEU as „McKinsey, Lighting the way : Perspectives on the global lighting market, Second edition, Aug. 2012“

- Non-compatibility of LED alternatives with installations originally manufactured for CFL lamps in terms of drivers and control gears;

Some of these aspects are also raised to explain why it can be difficult for a customer to choose between LED alternatives and to know when technical “retrofitting” changes are needed to ensure the compatibility of the LED with the existing installation.

Against this background, LEU do not expect LED alternatives to allow for a full phase-out of Ex. 1(a-e) lamps within the coming 5 years, and thus request a renewal of the exemption.

For details, please check the applicant’s exemption request at:

<http://rohs.exemptions.oeko.info/index.php?id=229>

The objective of this consultation and the review process is to collect and to evaluate information and evidence according to the criteria listed in Art. 5 (1) (a) of Directive 2011/65/EU (RoHS II), which can be found under:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT>

If you would like to contribute to the stakeholder consultation, please answer the following questions:

## General Questions

1. The applicants have requested the renewal of Ex.1, entries a-e, with the current wording formulation:

*„Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):*

*(a) For general lighting purposes < 30 W: 2,5 mg may be used after 31 December 2012*

*(b) For general lighting purposes ≥ 30 W and < 50 W: 3,5 mg may be used after 31 December 2011*

*(c) For general lighting purposes ≥ 50 W and < 150 W: 5 mg*

*(d) For general lighting purposes ≥ 150 W: 15 mg*

*(e) For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 7 mg may be used after 31 December 2011 “*

and with the maximum validity period possible (according to Art.5.2 stipulations).

- a. Do you agree with the scope of the exemption entries 1(a-e) as proposed by the applicants? To support your views, please provide detailed technical argumentation / evidence in line with the criteria in Art. 5(1)(a) to support your statement.
  - b. Please suggest an alternative wording and explain your proposal, if you do not agree with the proposed exemption wording or with the wording of one or more of the entries.
2. The applicant provided estimations for the amount of Hg placed on the market each year through CFL applications.
    - a. Do you agree to the estimations provided? IF not please explain why and support your views with relevant information and data.
    - b. Please evaluate CFL sales as a percentage of all sales of domestic lamps. Please provide an estimation as to how this breaks-down among the various CFL sub-categories that fall under Ex. 1(a-e).

- c. Please provide estimation for each exemption entry, as to how the market share is distributed between private consumer uses and commercial-consumer uses;
3. According to the applicant the total amount of mercury entering the EU market in compact fluorescent lamps covered by this exemption will decrease significantly between 2013 and 2020. The main reason for this is explained to be the increased penetration of LED alternatives. Furthermore the lighting market is also explained to be rapidly changing from discharge lamp technology to LED technology and LEU state that major development efforts are no longer being performed for discharge lamp technology against this background.
  - a. Do you agree with this expectation?
  - b. What stages can be observed in the transition process from discharge lamps to LEDs - please provide an estimated time or time range for each stage.
  - c. Please also clarify aspects that may prevent or slow down the implementation of a certain stage – for example, how shall the supply of the CFL product range influence the development of more efficient LEDs or the market penetration of such alternatives in light of the price comparability?
  - d. Assuming that in the EU a total phase-out of mercury would be implemented for lamp relevant uses, please specify when such a phase-out could be completed in terms of the availability of Hg-free substitutes?
  - e. LEU maintain that a renewal of the exemption will have a positive effect on the efforts to further innovate in LED, as CFL is the benchmark to be outperformed by LED. Do you agree with this statement? Please explain in detail why or why not;
4. What is the currently best available LED technology (BAT) in terms of energy efficiency on the market – please provide information concerning performance parameters such as Energy Efficiency Index (EEI) and indicate the unit price?

#### **Questions Regarding Ex. 1(a)**

5. The LED technology developments are also addressing one-on-one replacements, but according to LEU this will not result in a situation which would allow for full replacement of the current Ex. 1(a) discharge lamp portfolio within the timeframe of the exemption.
  - a. Please clarify for what range of lamps falling under this entry retrofit alternatives exist (i.e. alternatives that can replace discharge lamp in existing installations with no need for technical changes of the luminaire) – please clarify in which cases LEDs provide such alternatives and in which cases halogen lamps;
  - b. Please clarify where retrofit LEDs are expected to become available over the following 5 years;
  - c. Please provide information and data as to the annual replacement / retrofitting / rewiring shares of installations of the luminaire park; If actual data is not available please provide a rough estimation, explaining the assumptions made to arrive at the various conclusions;

### Questions Regarding Ex. 1(b-d)

6. LEU explains in the applications for these entries that “*One of the main characteristics of the lamps in this category is that they emit high lumen packages...*” – from 2000 lumen and up depending on the entry – “*...The LED development in these high lumen packages is focussing typically on new luminaire solutions instead of retrofit lamps. As a result, not many replacement solutions for this specific category in LED are available in the market.*”
- a. For each of these entries, please clarify what range of the scope of lamps falling under the entry are considered to have high lumen packages;
  - b. What is the estimated percentage of the market volume for CFLs in the relevant Ex. 1(b-d) category (e.g.  $\geq 30$  W and  $< 50$ , etc.) for which fully compatible drop-in substitutes in LED technology are not yet available?
  - c. Can you confirm that substitution is only a problem on the level of existing installations whereas otherwise alternative luminaire solutions are available on the market? If not please clarify in what cases development of alternative luminaires is still relevant;
  - d. Please provide if possible appropriate information figures of the annual retrofitting rate – if relevant, please provide information in the context of the relevant use group (i.e. residential buildings, office buildings, street lighting, etc.)
  - e. Please provide estimations regarding the retrofitting costs.
  - f. LEU claim– that there is currently no performance standard specified and electrical interface for linear LED lighting and the lumen output of common CFLs (with external control gear). This makes it difficult to know for a customer which ballast is used and which LED lamp to apply as retrofit. Please clarify the relevant parameters for comparing LEDs and CFLs to clarify the performance required from LEDs to achieve a comparable lumen package.

**Please note that answers to these questions are to be published as part of the available information relevant for the stakeholder consultation to be carried out as part of the evaluation of this request. If your answers contain confidential information, please provide a version that can be made public along with a confidential version, in which proprietary information is clearly marked.**