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Accompanying document to the

Commission Regulation implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps

IMPACT ASSESSMENT SUMMARY

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Introduction

The Ecodesign Framework Directive[1] lists products which have been identified by the Council and the European Parliament as priorities for the Commission for implementation, including "lighting in both the domestic and tertiary sectors" (Article 16). The Spring Council 2007 called for thorough and rapid implementation of the five priorities[2] set by the Energy Council on 23 November 2006[3], based on the Commission's Action Plan on Energy Efficiency. It also explicitly invited the Commission to "rapidly submit proposals to enable increased energy efficiency requirements (…) on incandescent lamps and other forms of lighting in private households by 2009". The emphasis on lighting was further supported by the European Parliament.[4]

Household lamp technologies include traditional incandescent lamps (GLS), halogen lamps, self-ballasted compact fluorescent lamps (CFLs), and to some extent also single and double capped fluorescent lamps without integrated ballast, light emitting diodes (LEDs) and high intensity discharge lamps. These technologies include also control gear and luminaires designed for these lamps.

The approach for developing the regulation on non-directional household lamps and this impact assessment was structured in four steps.

Step 1 - Assessment of the criteria for an ecodesign implementing measure

In order to assess the criteria for ecodesign implementing measures as set out in Article 15(2) of the Ecodesign Directive, the Commission has carried out a technical, environmental and economic study for “domestic lighting” products, which follows the provisions of Article 15(4a) and Annex II of the Directive. During the study, it was decided to examine the lighting technologies not only when used in “domestic lighting” but also when used in the other applications (including HORECA, shop lighting etc.).

With regard to the criteria set out in Article 15(2) of the Ecodesign Directive, the preparatory study has established the following results fornon-directional household lamps sold in the Community:

Article 15 (2a):	Annual sales volume in the Community:	several hundred million (if not billions) of units a year in the EU
Article 15 (2b):	Environmental impact of installed base in 2007 a) use phase energy	 a) 112 TWh

[1] Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC, OJ L 191, 22.7.2005, p. 29., **amended by** Directive 2008/28/EC of the European Parliament and of the Council of 11 March 2008 amending Directive 2005/32/EC establishing a framework for the setting of ecodesign requirements for energy-using products, as well as Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC, as regards the implementing powers conferred on the Commission, OJ L 81, 20.3.2008, p. 48

[2] Brussels European Council 8/9 March 2007, Presidency Conclusions, 7224/07.

[3] TTE (Energy) Council on 23 November 2006, 15210/06.

[4] European Parliament resolution of 31 January 2008 on an Action Plan for Energy Efficiency

	consumption: b) mercury emissions due to lamps: [5]	 b) 2.9 tons of mercury
Article 15 (2c):	Improvement potential of installed base in 2020 compared to Business As Usual: a) use phase energy consumption (applying cost effective existing technology in new products): b) mercury emissions due to lamps:	 a) 87 TWh less consumption per year b) 2.3 tons of mercury less from the installed base

The improvement potential is due to the fact that technical solutions exist which

– reduce the electricity consumption in non-directional household lamps compared to the market average, while providing the same functionality;

– reduce the life cycle cost for the end-user;

– improve the products to such an extent that it leads to wide disparities of electricity consumption of the non-directional household lamps available on the market.

The mercury content of CFL lamps currently sold varies greatly, although variations are not necessarily linked to additional features or performance; therefore there is a technical potential to reduce the mercury content without affecting product functionality.

The electricity consumption of the installed stock of lamps is of the order of the total electricity consumption of the Netherlands, while the improvement potential is comparable to the total electricity consumption of Romania, therefore they are both considered to be significant. The potential of reducing the mercury emissions of the installed base of lamps by almost 75% compared to BAU in 2020 is also considered to be significant.

Step 2 - Consideration of other relevant initiatives

As set out in Articles 15(2) and 15(4c) of the Ecodesign Directive, relevant Community and national environmental legislation are considered, and related voluntary initiatives both on Community and Member State level are taken into account.

Directive 98/11/EC (Energy labelling of household lamps) is relevant to the use phase energy consumption of non-directional household lamps. However, this directive alone has not been able to achieve the desired market switch. The higher upfront cost to the customer is still an obstacle to a more generalised use of energy-saving lighting, despite awareness of life cycle cost savings raised through the energy label.

Directive 2002/95/EC (RoHS) contains provisions on the mercury content of compact fluorescent lamps and it is considered appropriate to leave the setting of mercury content requirements to that Directive. Nevertheless, mercury content benchmarks are identified for

[5] Including the mercury content of both the discarded compact fluorescent lamps and the emissions from the generation of electricity operating the all the lamps within scope. For discarded compact fluorescent lamps 4 mg of mercury / lamp and a recycling rate of 20% is assumed.

the lamp types covered by the Ecodesign implementing regulation also as an input for the review of the RoHS.

No relevant existing Member States legislation at the national or Community level were identified by the preparatory studies or the consultation process; however several draft legislations were being prepared (e.g. Spain, Ireland, Italy). Voluntary initiatives involving retailers to phase out incandescent bulbs are planned or ongoing in some Member States (France, United Kingdom). However, these initiatives address only a limited subset of products, and only a limited number of retailers take part. Their extension to the entire Community is not a realistic option.

Conclusion of Step 1 and Step 2

Non-directional household lamps are sold in large quantities on the Community market. The electricity consumption and the mercury content of these lamps are significant, and cost effective improvement potentials exist, which are linked to wide disparities of the environmental performance of the equipment on the market with identical functionality.

Mercury content is addressed by other relevant Community legislation which needs update. Market forces and existing legislation or initiatives at Community and Member States level do not address properly the electricity consumption of non-directional household lamps.

It is concluded that the criteria for ecodesign implementing measures as set out in Article 15(2) of the Ecodesign Directive are met, and non-directional household lamps shall be covered by an ecodesign implementing measure pursuant to Article 15(1) of the Ecodesign Directive as regards electricity consumption.

Step 3 – Policy objectives and policy options

Further to Annex II of the Ecodesign Directive, the level of ambition for improving the electricity consumption of non-directional household lamps is determined on the basis of an analysis of the least life cycle cost for the end-user. In addition, benchmarks for technologies yielding best performance, as developed in the preparatory study and the discussions with stakeholders during the meeting of the Ecodesign Consultation Forum on 28 March 2008, are considered. The results are reflected in the objectives that the implementing measure aims to achieve.

The impact assessment looked into several options to trigger the market transformation that would enable the realisation of most of the improvement potentials, such as:

- the repeal of existing legislation,
- no EU action,
- self regulation,
- labelling (energy label, ecolabel),
- minimum requirements set out in an Ecodesign implementing regulation.

Their appropriatenesss to achieve the objectives was examined. However, due to the clear mandate of the Legislator for establishing ecodesign requirements for non-directional household lamps, the depth of the analysis for options other than an ecodesign implementing measure is proportionate for an implementing legal act, and the focus is on the assessment of its key elements taking into account the preparatory study and the input from stakeholders.

Step 4 – Impact assessment

An assessment of the proposed implementing measure is carried out, taking into account the criteria set out in Article 15(5) of the Ecodesign Directive, and the impacts on the affected stakeholders.

Main aspects for consideration in the impact analysis

From a consumer's perspective, quality and performance of lamps refer to:

- colour rendering
- lamp start and warm-up times
- lifetime
- aesthetics: bright point light sources are possible only with transparent (clear) glass lamps and are needed in certain lighting installations
- dimmability
- size for compatibility with luminaries

Mercury content is needed for the high efficiency of Compact Fluorescent Lamps (CFLs). It is established that the decrease of mercury emissions resulting from energy savings overweigh the need for mercury in the lamps. The mercury content in CFL lamps remains to some extent a risk factor to the user and to the environment (e.g. broken CFLs that are not properly cleaned up or disposed of).

Other alleged health effects of CFLs

The Scientific Committee on Emerging and Newly Identified Health Risks (on a mandate from the Commission services) looked into the question of health effects of Compact Fluorescent Lamps on people with certain diseases and on the general public, following up to complaints from certain patients' associations. In its report[6], the Committee concluded that the symptoms of about 250.000 people in the EU suffering from diseases accompanied by light sensitivity could be aggravated in the presence of bare CFLs (independent of distance) due to UV and blue light emissions.

Using CFLs with an outer non-breakable lamp envelope (common on the market) can largely solve these problems and also that of mercury pollution in case of lamp breakage, but the envelope slightly lowers (about 10%) their efficacy. Improved halogen lamps offer light that is very similar in spectrum to incandescent bulbs, so that they are unlikely to aggravate the symptoms of patients with light sensitivity. In addition, using appropriate luminaires that filter the problematic part of the light should allow the use of any bulb.

Alleged impact on European industry / jobs

Most incandescent lamps sold today in the EU are produced in the EU, whilst most lamps with integrated electronics (such as compact fluorescent lamps) are produced in third countries (due to their higher labour-intensity). Halogens lamps (class C) can be made on the production lines of incandescent lamps, which will mitigate the loss of jobs resulting from a ban of incandescent bulbs. Overall, about 2-3000 jobs (out of the 50.000 people producing lamps in the EU) are estimated to be at stake as a consequence of the incandescent lamp phase-out. Any job losses should be counterbalanced by the macro-economic benefits of reinjecting 5 billion euros / year into the EU economy through the energy savings realised in each household.

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6 http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_019.pdf

Global CFL production capacity

Building on past trends and considering all possible demand scenarios in Europe and in the world (including where other large countries such as China or India join in the incandescent ban in coming years), it is unlikely that any of the options envisaged for the measure would lead to major production capacity problems. No information from any party has given robustness to allegations on a possible capacity issue.

Affordability to the consumer

The increase in purchase price is significant but affordable and it is not considered to be an obstacle to households: incandescent bulbs cost 60 cents, the price of all the alternatives varies between 2 euros up to 10 euros, and is due to lower in the future (higher competition, drop of excise duties on imported CFLs). All the alternatives to incandescent lamps bring substantial savings to consumers over the life cycle of the product.

Available options and their estimated impacts in 2020

The main available lamp types were examined in detail with respect to the aspects listed above and some further aspects. Based on the findings, several sub-options were created and investigated with alternative levels of ambition and different timings.

The sub-options are presented in the table below, together with the lamp types authorised in the given sub-option, the main consequences of the use of those lamp types and the respective savings potential.

The following should be considered when interpreting the table:

- The remaining problems indicated with "*" and "**" relate to the particular lamp category (being either transparent or frosted) and can be solved by using a lamp of the other technology (e.g. in Sub-option 2b, mercury content issues with CFLs can be solved completely by using halogen lamps).
- The remaining problems that are not marked with stars are applicable to both lamp categories (transparent and frosted).
- The estimate on the net cost saving per household in 2020 compared to business as usual is taking into account also the lifetime of the lamps and the cost of their replacement. The method of calculation is presented in Section 5.

Overview table of available options and their estimated impacts in 2020 compared to business as usual

Sub-option	Lamps allowed		Remaining Problems not solved by the option	EU-27 yearly energy savings in 2020	Net cost saving / household yearly in 2020
	Transparent	Frosted			
1	_	CFLs	No bright point light source available Partial compatibility with existing luminaires Probably no replacement to EU GLS production Often not dimmable Alleged health issues Sub-optimal quality and performance Mercury content	86 TWh	59 €
2a	Halogen B *	CFLs **	Partial compatibility with existing luminaires Probably no replacement to EU GLS production * No equivalent to transparent GLS > 60W * Only one producer currently for GLS retrofit ** Often not dimmable ** Alleged health issues ** Sub-optimal quality and performance ** Mercury content	51 TWh	31 €
2b	Halogen B * Halo socket C	CFLs **	Probably no replacement to EU GLS production * No equivalent to transparent GLS > 60W * Only one producer currently for GLS retrofit ** Often not dimmable ** Partial compatibility with existing luminaires ** Alleged health issues ** Sub-optimal quality and performance ** Mercury content	39 TWh	22 €
2c	Halogen B Halo socket C Halo retro C	CFLs **	** Often not dimmable ** Partial compatibility with existing luminaires ** Alleged health issues ** Sub-optimal quality and performance ** Mercury content	33 TWh	19 €
3	Halogen B Halo socket C Halo retro C	CFLs Halogen B Halo socket C Halo retro C	*This option satisfies all possible comfort criteria, as frosted halogen lamps remain available, offering the same service as frosted incandescents.*	22 TWh	10 €

Conclusion on the options

In the **frosted** lamps category, the analysis has shown that it is cost-effective to allow only class "A" level lamps (= CFLs).

Where consumers look for a particular light quality/aesthetics there is a need to offer alternatives to CFLs. Following the precautionary principle, there is also a need to keep alternatives to CFL lamps for some patients with alleged health issues. This means leaving certain transparent halogen lamps on the market.

The best halogens (class "B") can be considered as an alternative to incandescent for normal screw sockets and for wattages up to 60W.

Leaving halogens retro (class) "C" would provide for wattages above 60W and the possibility to adapt the production lines currently dedicated to incandescent bulbs (mitigating impact on jobs in the EU).

If the special socket halogen lamps were banned in the short term, people would be forced to change their luminaires when they run out of replacement lamps. The impact on luminaire manufacturers (in particular Italian SMEs) would also be significant.

Special socket halogens in class C should be removed from the market in the longer term as more efficient alternatives exist with different lamp caps. It could be considered to phase out luminaires designed for exclusive use with inefficient lamps in a second step that would deal with luminaires and reflector lamps.

Overall, following the assessment of impacts, Option 2b seems to strike the appropriate balance between optimising energy savings, offering sufficient alternatives in terms of functionality and minimising negative economical, social and environmental impacts.

Timing

Staged introduction of requirements (in particular banning incandescent bulbs in several stages) would affect accumulated savings up to 2020 but mitigate impacts on industry and should avoid the risk of supply shortage; the annual savings as from 2020 would remain more or less unchanged.

A possible scenario could be as follows (considering adoption of the measure in March 2009):

Stage	Date	Main result
Stages 1-4	September 2009 – September 2012	Incandescent lamp phase-out in 4 steps, one step each year (100W and above, 75W, 60W, 40W and below), first level of functionality requirements for all lamps in Stage 1
Stage 5	September 2013	Second level of functionality requirements for all lamps
Stage 6	September 2016	Raising the level of the requirements to the maximum planned (class B)

As transparent incandescent bulbs will have to be C class and non-transparent lamps to be A-class, it is essential to reap the large potential savings of the latter as soon as possible, namely from the first stage, and apply the approach of staged phase-out to transparent lamps only. On the other hand, in order to justify sufficient investment to produce class C halogens (for ensuring a smooth transition without supply shortages), the level can be raised to class B around 2016.

The savings estimates in the overview table are based on that timing.

Monitoring of the impacts will mainly be done by market surveillance carried out by Member State authorities ensuring that the requirements are met. The appropriateness of scope, definitions and concepts will be monitored by the ongoing dialogue with stakeholders and Member States. A review of the measure should be planned taking into account market evolution and in particular the development of LED technology.