MEMO/09/368

Brussels, 1 September 2009

FAQ: phasing out conventional incandescent bulbs

On 18 March 2008, the Commission adopted a regulation on non-directional household lamps which would replace inefficient incandescent bulbs by more efficient alternatives (such as improved incandescent bulbs with halogen technology and compact fluorescent lamps) between 2009 and 2012.

The following table of contents provides clickable links (while pressing on the CTRL button) to the main questions relating to this regulation.

Further information on the Ecodesign Directive (2005/32/EC) and its implementing measures can be found here.

For light bulbs: http://ec.europa.eu/lumen or www.e-lumen.eu

I. Timing and ambition, statistics, impact on stakeholders

Timing and level of ambition

I.1. Political motivation for the phase-out

Why is it necessary to phase-out conventional incandescent bulbs?

The European Union remains committed to achieving its objectives in the fight against climate change, including the reduction of primary energy use by 20% compared to business as usual by 2020. Requirements on the energy efficiency of products are a cornerstone of the Community policy aiming to achieve this target.
Lighting may represent up to a fifth of a household's electricity consumption. There is a four to five-fold difference between the energy consumption of the least efficient and the most efficient lighting technologies available on the market. This means that upgrading the lamps could reduce a household's total electricity consumption by up to 10-15% and save easily 50€ / year (taking into account the purchasing cost of lamps).[1]
Thanks to the regulation, EU citizens are expected to save close to 40 TWh (roughly the electrictity consumption of Romania, or of 11 million European households, or the equivalent of the yearly output of 10 power stations of 500 megawatts) and reduce CO_2 emission by about 15 million tons of per year. The regulation is thus expected to reinject about 5-10 billion euros in to the EU economy.

I.2. Phase-out details, presentation of available alternatives

Exactly what will be phased out and when?

Inefficient lamps (conventional incandescent bulbs and conventional halogen bulbs) will be phased out gradually from the EU market starting in September 2009 and finishing in September 2012.

- All inefficient non-clear (= non-transparent, also known as pearl or frosted) lamps will be phased out as from September 2009. Non-clear lamps will be required to be A-class according to the EU lamp energy label (or slightly less efficient for certain lamps such as those with external envelope). In practice, considering currently available technologies, this means that non-clear lamps will be compact fluorescent lamps which save about 80% energy compared to conventional incandescent lamps, or LEDs (for the moment, only with quite low light output). Consumers who for various reasons (aesthetics, size, shape etc.) would prefer another lamp technology can buy clear (transparent) lamps.

[1] Assuming 20 lamps in the household, which are initially all conventional incandescent lamps and changed to compact fluorescent lamps of equivalent light output.

- Inefficient clear (transparent) lamps will be phased out progressively, starting with the highest wattage (100W conventional incandescent bulbs and above) in 2009.
    - From September 2009, lamps equivalent in light output to 100W transparent conventional incandescent bulbs and above will have to be at least class C (improved incandescent bulbs with halogen technology instead of conventional incandescent bulbs).
    - By the end of 2012, the other wattage levels will follow and will also have to reach at least class C. The most commonly used bulbs, the 60W will remain available until September 2011 and 40 and 25W bulbs until September 2012.

Improved incandescent bulbs with halogen technology for luminaires using conventional incandescent bulbs are already available on the market, however their use is not yet widespread. Large manufacturers have them in their product portfolio (such as "HaloLux Classic ES", "EcoClassic30" and "MasterClassic EcoBoost" halogen bulbs).

Detailed phase-out plan

Grey cells indicate the technology in question is still available at the given time, white cells mean that the technology is phased out according to the provisions given in the "Requirement" column.

	Non-clear lamps				Clear lamps							
Date	**Requirement**	Incan-descent	All Halogen	CFL / LED	**Requirement**	Incandescent / Conventional halogen				Halogen C	Halogen B	LED [1]
						≥ 100 W	≥ 75 W	≥ 60 W	60 W >			
Today	None				None							
September 2009 [1]	A[2]				C for ≥ 100W [3]		≥ E[3]	≥ E[3]	≥ E[3]			
September 2010	A[2]				C for ≥ 75W [3]			≥ E[3]	≥ E[3]			
September 2011	A[2]				C for ≥ 60W [3]				≥ E[3]			
September 2012	A[2]				C for all							
September 2013	Second level of functionality requirements [1]											
Review 2014	Review											
September 2016	A[2]				B / C [4]					[4]		

[1] First level of functionality requirements introduced in first stage. LEDs are exempted from all functionality requirements.
[2] Refers to lamp energy label class. Correction factors apply to certain lamps, allowing them to be B-class.
[3] Minimum requirement for all lamps: E class. F and G lamps phased out.
[4] Only special cap halogen lamps are allowed to be class C.

Phased out lamps

A. conventional incandescent lamp (GLS)

This lamp type was first commercialised in 1879 by Thomas Edison and reached the limits of further efficiency improvement in its current form already towards the middle of the last century. The light is produced by a threadlike conductor surrounded by inert gas or vacuum and heated to incandescence by the electric current passing through it. The lamp lasts only for 1000 hours of operation, so one or two years.

Standard conventional incandescent lamp

B. conventional halogen lamps

Improved incandescent lamp technology, first commercialised in the 1980's. Much smaller lamp size, equal or slightly higher efficacy than conventional incandescents due to the replacement of the inert gas by gas containing halogens or halogen compounds. Their market share has been rapidly increasing in the past decade as their small size makes them more versatile for lighting design (luminaires and installations).

Conventional halogen lamps

<u>Available alternatives</u>

A. Conventional low-voltage halogen lamps

Many standard halogen lamps are low voltage lamps, which are more efficient than mains voltage (220 V) lamps. Conventional low voltage lamps (12 V) require a transformer either in the luminaire or integrated into the lamp. They can reach C-class efficiency and therefore will remain available until 2016. They can live up to 4000 hours, four times longer than conventional incandescents.

B. Halogen lamps with xenon gas filling (C-class)

Recent technology. With xenon gas filling, the halogen lamp will use **about 25% less** energy for the same light output compared to the best conventional incandescents, even at mains voltage. They can reach C-class efficiency and therefore will remain available at least until 2016. There exist two versions of this halogen lamp:

a.) only the filling gas is replaced, the socket and the dimensions of the lamp are the same as for conventional halogens above, and therefore can only be used in luminaires with the special halogen sockets. These versions will remain available after 2016 in order to service the existing luminaire stock.

Improved special socket halogen lamps

b.) improved incandescent bulbs with halogen technology, ie the improved halogen capsule is placed in glass bulbs shaped like conventional incandescent lamps with traditional socket, which makes it compatible with all luminaires using conventional incandescent lamps. These are to be replaced by class B or A lamps from 2016 (see next point).

C-class pear-shaped improved incandescent bulb (halogen)

Both versions can live up to 2000 hours, two times longer than conventional incandescent bulbs.

C. Halogen lamps with infrared coating (B-class)

Recent technology. Applying an infrared coating to the wall of halogen lamp capsules considerably improves their energy efficiency, the lamp will use **about 45% less** energy for the same light output compared to the best conventional incandescents. However, for

technical reasons, this is only possible with low voltage lamps, so a transformer is needed, either as a separate unit, or integrated into the luminaire, or integrated into the lamp for an conventional incandescent retrofit solution. As with the Halogen C lamps, both the special socket capsules and improved incandescent bulbs with halogen technology are available in B class, however currently only one manufacturer is producing retrofit bulb-shaped lamps (even though the technology is not protected by patents). Because of the heat coming from the lamp which affects the operation of the integrated transformer, their retrofit lamps are available only up to the equivalent of a 60W conventional incandescent bulb. The lamp can live up to 3000 hours, three times longer than conventional incandescents.

B-class pear-shaped improved incandescent bulb (halogen) with integrated transformer

D. Compact fluorescent lamps (CFLs)

It consists of fluorescent lamp tubes, for which the ballast is not sold as a separate item as for large tubes, but integrated into the lamp, which becomes a standalone retrofit solution to conventional incandescent lamps. It was first commercialised in the 1980's. Its main interest lies in its long lifetime and high efficiency, the lamp will use **between 65% and 80% less** energy (from a third up to the fifth of the energy) for the same light output compared to conventional incandescents. It sometimes comes with an external envelope which hides the tubes and makes it even more similar to light bulbs (though decreasing its efficiency). The envelope also shields off any unwanted ultaviolet radiations and mitigates the risks connected to mercury emissions because of lamp breakage (especially if it is made of non-breakable silicone). CFLs can live between 6000 and 15000 hours, depending on type and use (as opposed to 1000 hours for an incandescent bulb).

Compact fluorescent lamps with bare tubes and with bulb-shaped outer lamp envelope

E. Light-emitting diodes (LEDs) are a fast emerging technology and their efficacy is on par with that of CFLs, however they do not contain mercury and live even longer. LEDs for room illumination are today only in the first phases of commercialisation, but already now they provide replacements for both clear and non-clear light bulbs. They are likely to become alternatives to the full range of lamps in the near future.

Decorative light-emitting diode (LED) lamp with clear bulb

Efficiency of lamp technologies compared with conventional incandescent lamps (E-class)

Lamp technology	**Energy savings**	**Energy class**
Incandescent lamps	-	E, F, G
Conventional halogens (mains voltage 220 V)	0 – 15 %	D, E, F
Conventional halogens (low voltage 12 V)	25%	C
Halogens with xenon gas filling (mains voltage 220 V)	25%	C
Halogens with infrared coating	45%	B (lower end)
CFLs with bulb-shaped cover and low light output, LEDs	65%	B (higher end)
CFLs with bare tubes or high light output, LEDs	80%	A

I.3. Ambition level for frosted lamps

Why go for class A and ban even class C/B frosted bulbs from the market?

During the preparatory process leading to the adoption of the Regulation, the analysis showed that among frosted lamps which diffuse light, there was reason to require the highest level of efficiency corresponding to class A of the EU energy label for lamps.[2] This level of efficiency is achievable by compact fluorescent lamps and by light emitting diode lamps. The type of soft light provided by frosted incandescent bulbs and by compact fluorescent lamps does not

[2] COMMISSION DIRECTIVE 98/11/EC of 27 January 1998 implementing Council Directive 92/75/EEC with regard to energy labelling of household lamps, OJ L71 of 10.3.2009 p. 1-8

differ substantially for the average consumer, therefore the more efficient technology can easily replace the other.
However, sometimes consumers look for the particular light quality/aesthetics delivered by transparent lamps, which provide a bright point-like light, useful e.g. in crystal chandeliers. For these applications, there is a need to keep alternatives to compact fluorescent lamps, which cannot deliver the same type of light. This means leaving less efficient, but still enhanced incandescent bulbs (of the halogen type) on the market, at least as long as there is no more efficient technology that can replace them. Such lamps also provide alternatives for the few situations where the use of compact fluorescent lamps is not recommended due to practical reasons (such as in locations where the light is switched on rarely and for a short time only).
It is true that the phase-out timeline of the Regulation is more ambitious on frosted lamps than on clear lamps. This is done so as to allow manufacturers to better adapt their production to efficient alternatives. A full shift under such a short time would have had a more serious impact on European lamp factories. Even so, 100W clear conventional incandescent bulbs will start to be phased out at the same time as all frosted bulbs, in September 2009. Only the lower wattage clear bulbs will be spared for the moment, with the 75W banned in 2010, the 60W in 2011, and the 40W and less in 2012.

I.4. Ambition level for clear lamps

Why is the minimum efficiency requirement not raised to class A for clear (transparent) lamps too?

The requirement on clear lamps is only raised to class C until 2016 (and to class B beyond 2016), so that other efficient technologies (such as improved incandescent bulbs with halogen technology) can remain on the market. This is necessary because current-day compact fluorescent lamps and light emitting diodes cannot provide the same type of light as the conventional incandescent lamps that are being phased out. However improved incandescent bulbs with halogen technology do, and consumers who are keen on conventional incandescent light quality for aesthetics or health reasons should have access to it.

Why is the minimum efficiency requirement raised to class B for clear (transparent) lamps only in 2016?

This is done in order to ensure continuous supply of lamps for all applications and luminaires. As of today, for Edison socket lamps operated on mains voltage, class B can only be achieved by halogen lamps that come with integrated transformers. These lamps are very new on the market, they do not exist yet with higher lumen outputs (the highest are equivalent to 60W conventional incandescent lamps). Also, because of the size of the integrated transformer, the lamps may be incompatible with some luminaires. For the moment, it is therefore necessary to allow class C lamps on the market, which can be mains voltage halogen lamps without integrated transformer, that can be available in all lumen outputs and in all sizes. As these mains voltage halogen lamps are also rather new products currently sold in small numbers, industry needs to make investments to enlarge their production to supply the market after the conventional incandescent phase-out. However, if the class C halogen lamps were to be phased out earlier than 2016, it would not be worthwhile for the industry to invest into them, so they would skip directly to class B lamps, which have the limitations in functionality outlined above.

I.5. Proportionality of the phase-out - why not voluntary approach or other measures (taxation, ETS)

Is it not disproportionate that the European Commission bans conventional incandescent bulbs from the market? Would it not be better to leave the choice to citizens or to make use of other measures to achieve the switch (such as voluntary restrictions as in the UK, information to the public or taxation)? Isn't the EU's Emissions Trading System (ETS) anyway supposed to take care of the emissions related to electricity generation? Does ETS not affect consumer choices already indirectly, through price mechanisms?

The European Commission did not decide on its own to phase out conventional incandescent bulbs, it is done in agreement with the European Parliament and with the Council of Member States. Regulation 244/2009 was developed by the Commission on a mandate from the Ecodesign Directive (2005/32/EC) of the European Parliament and of the Council of Ministers of the Member States. The request to phase out conventional incandescent bulbs was made by the European Council in 2007 and further reinforced by the European Parliament and by the Council of Energy Ministers in 2008. The Regulation itself was prepared in an open process lasting two years with the formal involvement of stakeholders such as consumer and environmental NGOs. In the framework of their right of scrutiny, both the Council of Ministers and the Parliament decided not to object to the draft Regulation before it was adopted by the Commission in March 2009.

Introducing minimum efficiency requirements for a product group such as light bulbs (rather than relying on a voluntary approach) is not disproportionate in this case. The market has clearly failed to move towards the alternatives to conventional incandescent bulbs, even though they cost much less to the consumers over their entire life cycle. Since 1998, household lamps have to indicate their energy efficiency on the packaging, thanks to implementing measure 98/11/EC of the Energy Labelling Directive (92/75/EEC). In spite of the clear indications provided on the packaging and campaigns in many Member States, consumers have failed to direct their choices to the more efficient lamps offering equivalent service, and have been largely sticking to conventional incandescent bulbs. This is due to the fact that the purchase price difference between conventional incandescent bulbs and more efficient alternatives constitutes a psychological barrier, even if the higher initial investment pays off within a year and brings substantial (but much less visible) savings over the life cycle. Another deterring factor has been the sometimes poor quality of the so-called economic lamps placed on the market without being subject to quality requirements. This market failure can only be tackled with mandatory requirements on the efficiency level and quality of all household lamps placed on the market in the EU. This also serves the interests of the internal market, as voluntary restrictions or taxes introduced in certain Member States or by some retailer groups in Europe would create barriers to the free movement of goods. They would have different efficiency limits and timing of the restrictions. In addition, for taxation to be an effective deterrant, it should multiply by 10 the price of conventional incandescent bulbs.

The European Union's Emissions Trading System (ETS) directly affects the emissions of electricity generation, however there is cost-effective saving potential also in the reduction of electricity use of households, which cannot be directly achieved through ETS. Although the indirect impact of the ETS could translate into an increase in electricity prices and therefore in the use-phase costs of an incandescent bulb, such an increase would have to be multi-fold in

order to become sufficiently visible for convincing in the short term every single consumer to buy a compact fluorescent lamp instead.
Still the main point is that efficient lighting as provided for in the regulation is a way to save energy, to limit CO_2 emissions and to help consumers save money without loss of functionality.

I.6. Alleged intrusion of Brussels into citizens' private lives

How come the bureaucrats of the European Commission are suddenly taking a decision that affects so much the life of every European citizen?

By adopting a regulation aiming to phase out the less energy efficient lamps, the Commission implemented the specific mandate from the European Parliament and the Council of Member States as originally laid down in the Ecodesign Directive (2005/32/EC, see point II.3 of this FAQ). In its Article 16, the Directive specifically requested the Commission to introduce implementing measures on lighting in the domestic sector through this procedure.
The importance of this measure was underlined by the Spring European Council of 2007, which invited the Commission to *"rapidly submit proposals to enable increased energy efficiency requirements (…) on conventional incandescent lamps and other forms of lighting in private households by 2009"* and by the European Parliament in its resolution of 31 January 2008 on the Action Plan for Energy Efficiency, where the European Parliament stressed "*the importance of the Commission's keeping to the proposed timetable for the withdrawal of the most inefficient light bulbs from the market*". Again, in October 2008, the Council of Energy Ministers invited the Commission to "*submit in 2008 a draft Regulation that will launch a gradual process of phasing out until conventional incandescent lamps and all the worst-performing lights are banned.*"
In parallel to these mandates, the Commission's services developed a draft regulation on non-directional household lamps. The procedure started already in December 2006 through a preparatory study. After a thorough technical-environmental-economic analysis of the available household lamps and their improvement potential, which was carried out openly with the involvement of stakeholders, a working document based on these recommendations was discussed with Member States and stakeholders (including a wide range of NGOs and industry) in the Ecodesign Consultation Forum in March 2008.
Building on the opinions expressed in the Forum, and on a parallel impact assessment, the Commission's services prepared the text of the draft regulation, which was fully endorsed in the Regulatory Committee on 8 December 2008, without opposition from any of the Member States.
The Environment Committee of the European Parliament discussed the measure on 17 February 2009 and decided not to object to it. Finally, the European Commission adopted the Regulation on 18 March 2009.
This exhaustive preparatory process has ensured that the interests of European citizens were well represented during the development of the regulation.

I.7. Relation to Emissions Trading System

In the EU's Emissions Trading System, any energy saving made in the household sector will be sold by the electricity generators as CO2 emissions allowance to other sectors

that will then be allowed to emit the CO2 that the private citizens saved. Isn't it therefore pointless to impose energy efficiency rules on household appliances?

The sales of CO2 emissions allowances generated by energy savings in the household sector to other CO2 emitting sectors will not annihilate the savings achieved in households. When setting the targets of the current (2008-2012) and upcoming (from 2013 onwards) trading period of the European Union's Emission Trading System, the energy savings to be realised through mandatory EU legislation are taken into account, and the cap for total authorised emissions is set accordingly lower. For example, the free allowances that were issued in 2008 only covered 92,6% of the emissions. Most of this decrease was due to the fact that fewer allowances were allocated to the power sector than their expected emissions. Furthermore, contrarily to current practice, the electricity generators will not receive free allowances after 2013, which means that any allowances that they sell to other sectors will be the ones that they purchased before. Last but not least, the Ecodesign implementing measures aim also at the reduction of energy use with the aim of contributing to the security of the supply, regardless of the amount of CO2 emitted in energy generation.

Statistical analysis of ambition level

I.8. The quantity of savings compared to other sectors and countries

How do the estimated savings compare to the total electricity consumption the EU? Are they not insignificant, considering that household lighting itself is only a small share of the total consumption? Is it not superfluous to adopt measures that bring so little improvement compared to the whole?

Other sectors and other countries could make more important savings. Why bother with light bulbs?

When comparing the estimated saving potential of the regulation (39 billion kilowatthours per year by 2020) to the electricity consumption of the EU, it may seem insignificant (1,4 % of the total final electricity consumption of the 27 Member States in 2006, which was 2826 billion kilowatthours). However, the total electricity consumption of the EU includes the consumption of all sectors, namely industry, transport, agriculture etc., not just households. It is clear that in order to fight climate change effectively, all sectors need to contribute. The regulation on non-directional household lamps affects lamp types that are primarily used in households (although to some extent also in non-household applications such as restaurants, hotels, shops etc.). Therefore it is fair to compare the estimated savings to the electricity consumption of the household sector in the EU, which was 807 billion kWh in 2006, of which 5% will be saved. But we could also put it differently: by 2020 we will be saving every year the total yearly final electricity consumption of Romania (all sectors combined), or the electricity produced every year by 10 power plants of 500 megawatt capacity each!
The estimates above are based on the assumption that households will be using a mixture of improved incandescent bulbs with halogen technology and compact fluorescent lamps. However, switching to the exclusive use of compact fluorescent lamps and LEDs makes economic sense for households, who would save much more energy and money. If all households switched to the exclusive use of compact fluorescent lamps and LEDs, at the EU level we would be saving 86 billion kilowatthours by 2020, which is 11% of the electricity consumption of households.

The electricity consumption of household lighting is a minor part (3%) of the total energy consumption of a household (heating and water heating included). However, it should also be underlined that the regulation on non-directional household lamps is just one of a series of 30 or more Commission regulations (already adopted or being prepared for adoption in the near future) concerning the energy efficiency of different product groups such as televisions, heating boilers, water heaters, electric motors etc. These regulations all contribute to a combined impact that will make the real difference in terms of our objectives to reduce energy use and combat climate change.

Some figures for EU-27 in 2006:

- Final energy consumption (all fuels, all sectors): 1177 Mtoe (megatons of oil equivalent)
- Final electricity consumption (all sectors): 2826 billion kWh or 243 Mtoe
- Final energy consumption of households (all fuels): 304.9 Mtoe
- Final electricity consumption of households: 807 billion kWh or 69.4 Mtoe
- Electricity consumption of household lighting: 105.89 billion kWh or 9.1 Mtoe = 13% of household electricity consumption, 3% of total household energy consumption, 1.4 % of total electricity consumption (all sectors)

The fact that there is substantial saving potential also in other sectors and other countries in the world does not mean that the EU should not improve the energy efficiency of lighting in households. It is only the combined impact of savings in all sectors and in all countries in the World that can help in fighting climate change. In parallel to the light bulbs measure, the European Commission is preparing energy efficiency legislation on 30+ other products groups (including televisions, heating boilers, water heaters, electric motors etc). We have also legislation in place for improving energy efficiency in other sectors, not to mention the Emission Trading System which addresses the CO2 emissions. On the international scene, the EU is actively encouraging other countries to introduce or reinforce measures to mitigate their emissions.[3]

I.9. Market share of different bulb types

How many conventional incandescent bulbs are in use at present in the EU, compared to energy saving bulbs?

In 2006, there were 5.1 billion lamps installed in EU households. Of these, 4.2 billion lamps were non-directional lamps, the remaining 0.9 billion reflector lamps.

[3] In order to find out more about the European Commission's activities in these fields, you may want to consult the following websites:
http://ec.europa.eu/climateaction/
http://ec.europa.eu/energy/efficiency/

The total stock of lamps affected by this regulation (all sectors including household, tertiary etc.) was 3.9 billion lamps in 2007. 1 billion lamps (25% of the total) were compact fluorescent lamps, and 2.1 billion were incandescent bulbs.

On average, households had 5 compact fluorescent lamps and 10 conventional incandescent bulbs in 2007. The remaining 5 lamps of the average total of 20 were other types (conventional halogens, linear fluorescent tubes etc.)

However, a 2007 survey estimated that only 52% of EU households had any compact fluorescent lamps installed.

Source: Preparatory Study for Eco-design Requirements of EuPs – Domestic lighting, Chapter 2 available at www.eup4light.net

I.10. Assumptions on future light bulb market shares in forecasting

The energy saving potential is claimed to be 40 billion kilowatthours per year due to the phasing out of incandescent bulbs in the EU. This potential must depend strongly on the question with which sort of lighting devices those inefficient lights will be replaced. It must make a difference whether they're replaced for example with halogen lamps (30 % saving potential) or fluorescent lamps (80 % saving potential). How was this calculated?

The scenario analysis that gave this result worked with the worst-case hypothesis that since lower efficiency lamps such as halogens are allowed in the category of transparent lamps, they will always be used instead of compact fluorescent lamps (which are non-transparent). In the non-transparent lamp category, the regulation only allows compact fluorescent lamps (or LEDs), so it was assumed they would be used everywhere where there are non-transparent lamps today. However, it is likely that some consumers will go for compact fluorescent lamps even in places where they now have transparent lamps, because they want more energy efficiency. Vice versa, others may prefer to switch to transparent halogen lamps rather than use compact fluorescent lamps even in places where they now have non-transparent lamps, because they may need instant full light that compact fluorescent lamps cannot produce, or for some other more subjective reason. The two trends are assumed to counterbalance each other, so the total savings estimate provided should be correct. A detailed description of the assumptions can be found in Annex IV of the related Impact Assessment available at: http://ec.europa.eu/energy/efficiency/ecodesign/doc/legislation/sec_2009_327_impact_assesment_en.pdf (the regulation implements Sub-option 2b) and in Chapter 8 of the preparatory study, available on www.eup4light.net.

Industry issues

I.11. Role of the lamp industry

Did the Commission take this decision under the influence and in the interest of lamp companies?

The European Commission did not decide on its own to phase out conventional incandescent bulbs, it is done in agreement with the European Parliament and with the Council of Member States. Regulation 244/2009 was developed by the Commission on a mandate from the Ecodesign Directive (2005/32/EC) of the European Parliament and of the Council of Ministers of the Member States. The request to phase out conventional incandescent bulbs was made by the European Council in 2007 and further reinforced by the European Parliament and by the Council of Energy Ministers in 2008. The Regulation itself was prepared in an open process lasting two years with the formal involvement of stakeholders such as consumer and environmental NGOs. European industry was also consulted, they claimed initially that the provisions of the planned measure would be much too ambitious in terms of timing and requirements. However, the Commission and the Member States decided to maintain the level of ambition, with the support of the other stakeholders. In the framework of their right of scrutiny, both the Council of Ministers and the Parliament decided not to object to the draft Regulation before it was adopted by the Commission in March 2009.

I.12. Risk of shortages

Isn't there a risk that there will be shortages of alternative lamp types when conventional incandescent bulbs will be phased out?

The International Energy Agency has gathered evidence (to be published soon) that the phase-out of conventional incandescent lamps is unlikely to lead to worldwide shortages of compact fluorescent lamps. As most of the compact fluorescent lamps in Europe are imported from third countries, there is very little probability of shortages to occur. When it comes to efficient halogen lamps, the calendar of the phase-out in the regulation has been developed in a way to ensure that lamp manufacturers have the time to convert their conventional incandescent bulb production lines to the production of improved incandescent bulbs (with halogen technology).

I.13. Risk of factory closure

Isn't there a risk that European factories producing conventional incandescent bulbs will be closed and their personnel fired when conventional incandescent bulbs will be phased out?

The calendar of the phase-out in the regulation has been developed in a way to ensure that lamp manufacturers have the time to convert their conventional incandescent bulb production lines to the production of improved incandescent bulbs (with halogen technology).

I.14. Financial support for industry to convert production lines

Is there any financial support foreseen for industry who need to convert their production lines as a result of the regulation?

The Regulation was developed in a way to ensure that manufacturers have sufficient time to carry out the minor retrofitting of their production lines that will allow the production of improved incandescent bulbs with halogen technology (the Edison-capped glass bulbs with a

xenon-filled mains voltage halogen capsule in place of the filament). Those bulbs reach energy label class C and are therefore allowed on the market in the years to come.
There is no specific European support measure accompanying the Regulation to help companies carry out this conversion. The lighting industry will also benefit of the increase of sales of energy saving bulbs. However, existing support programmes could be used in case the conversion is eligible for such support in the region where the company is located. Member States can dedicate funds available under Cohesion Policy to support conversion to the new technologies. For example, in Poland for the period 2007-13, more than €3.5 billion from Cohesion Policy funds will be dedicated to business support, including €183 million specifically allocated to support SMEs for the promotion of environmentally friendly products or processes. Hungary plans to invest some €829 million from Cohesion Policy funds for business support, with €52 million supporting SMEs for the promotion of environmentally friendly products or processes.

You may want to contact the authorities responsible for the management of regional support in your area. Their list is available on:

http://ec.europa.eu/regional_policy/atlas2007/

Consumer issues

I.15. Describing lamp performance in lumens rather than watts

Why does the regulation require that the quantity of lumens produced by the lamp should be displayed in a larger font than the Watts? Do we have to measure the strength of light in lumens instead of watts?

Watts are used to measure the power of a lamp (that is, the electricity it consumes). This is not the same as the quantity of light that a lamp produces, which is measured in lumens.
Using watts instead of lumens to describe the performance of a lamp is the same as using price instead of weight/volume to describe a food product (like saying "a 50-pence milk", instead of "1 liter of milk"). The system works well as long as the power or price needed to obtain the same quantity does not change.
However, a major change is occurring now in the case of lamps. In the past, the majority of the available light bulbs were conventional incandescent bulbs, which for a given quantity of light always used the same power, so you had 25W, 40W, 60W, 75W, 100W lamps etc.
Today, the same quantity of light (around 750 lumens) can be produced by an incandescent bulb using 60 W, a halogen bulb using 42 W, or a compact fluorescent lamp using 15 W. This already causes confusion that manufacturers try to solve by giving equivalence with incandescent bulbs such as "this 15W energy saving lamp is equivalent to a 60W lamp".
In the future, incandescent bulbs will be gradually phased out, starting in September this year and finishing in 2012. Consumers will be left with lamps having all sorts of unfamiliar and incomparable wattages.
Measuring the performance of a lamp in lumens allows direct comparisons of light quantity (which is the service actually offered by the lamp), rather than relying on an awkward wattage-based comparison system between lamps having different energy efficiency. As if we said on a cheap one-liter milk bottle: "this 25-pence milk is equivalent to a 50-pence milk", instead of simply stating its volume. Such complicated information provision also makes it easier to manufacturers to make exaggerated claims.

In fact, since 1998 it has been compulsory to display also the lumens on the packaging of lamps carrying the EU Energy Label, so this information is not new.
From 2010 it will remain compulsory to display the watts, the only change will be that the display of lumens will have to be larger than the display of watts. This is done so that people grow accustomed to comparing lamps based on their real performance (the quantity of light produced) and not their wattage, which has become an unreliable and complicated method of comparison between lamps having different energy efficiency.
During the preparation of the measure, this provision was fully supported by Member States and stakeholders, including consumer organisations.

I.16. Risk of consumer "hamstering" of incandescents

People are likely to stock up conventional incandescent bulbs when they hear about the regulation. Does this not weaken the impact of the measure?

Communication to consumers about available equivalent alternatives to conventional incandescent bulbs (such as improved halogen bulbs) could help prevent much of the stocking of bulbs. Consumers will realise in the end that the alternatives provide substantial savings and have equivalent light quality to conventional incandescents. They might decide not to use their old energy-wasting bulbs, or to install them only in rarely used places such as cellars.
Moreover, the estimate of 15 Mt CO_2 savings was calculated for the year 2020, by then any delaying effect of "hamstering" will have disappeared.

I.17 Communicating the phase-out to consumers

Even the salespeople in the shops are unaware of the upcoming changes. How will people learn about the measure and know which lamps to buy from September 2009?

It is in the best interest of industry and retailers to satisfy their clients at all levels of the distribution chain. The lamp industry has started to take care of information to retailers and to the public and to manage adequate supply of alternative product ranges. The Commission is setting up a central information website for the use of the citizens, the press and the professional organisations available at the addresses www.e-lumen.eu and ec.europa.eu/lumen. Member States and concerned national organisations (consumers, retailers, industry) may want to conduct national information campaigns adapted to local needs.

II. Legal framework (scope, exceptions, timing for adoption, application dates etc.)

II.1. Scope and provisions

Is the phase-out of conventional incandescent bulbs the only provision of the regulation?

No. The regulation covers the so-called "non-directional" lamps typically used in households. These include - among others - halogen lamps and compact fluorescent lamps, not only conventional incandescent bulbs. Non-directional lamps emit light equally in all directions, as opposed to directional lamps (such as reflector lamps/spots) where the light is directed by a reflector in a given angle.
All non-directional household lamps will have to comply with the same minimum energy efficiency requirements. These requirements are set at such level that present-day conventional incandescent bulbs and also conventional halogen lamps cannot fulfil them, therefore they will be phased out.
Alongside minimum energy efficiency requirements, requirements are also set on the functionalities of the concerned lamp types (e.g. lifetime and lighting performance), and on the product information to be displayed to allow the consumers to better select the appropriate lamps for a given purpose among the alternatives to conventional incandescent lamps.

II.2. Special lamps (antique lamps, appliance lamps etc.)

Does the regulation affect lamps not meant for standard household room lighting (lamps for street lighting, for photography, for the partially sighted, for antique luminaires, for ovens, for terrariums etc.)?

In principle, the regulation either allows appropriate alternatives to special lamps or exempts the special lamps, so that no lighting application should be negatively affected.

The aim of the regulation is to cover lamps that are typically used in household lighting, but also when they are marketed for non-household use. Therefore the following cases are possible for lamps not meant for household lighting:

a.) For some of the special applications currently using conventional incandescent bulbs or conventional halogen bulbs (such as antique luminaires), the alternative technologies remaining on the market should be suitable options. Improved incandescent bulbs with halogen technology provide exactly the same type and quality of light as conventional incandescent bulbs or conventional halogens, they come in the same shapes and appearance, and fit into all existing luminaires. They start and provide their full light output as soon as they are switched on, and they are insensitive to frequent switching. Therefore they are also suitable for devices using flashing light.
Modern compact fluorescent lamps come in many sizes and shapes, so their compatibility with existing luminaires (including antique ones) has greatly increased recently. At this stage, LEDs are a smart and aesthetic choice for creating and upgrading decorative lighting installations.
The purchase price of the alternatives is currently higher than that of conventional incandescent lamps, but improved incandescent bulbs with halogen technology should approach current conventional incandescent lamp price levels once their mass production starts. Nevertheless, all alternatives provide substantial savings over the life cycle (varying from one alternative to the other), due to their lower energy consumption.
The regulation also improves the energy efficiency of halogen capsules and linear halogen bulbs without any change that would affect their use (same shape, same size, same lamp cap, same light quality).

b.) All fluorescent lamps (with the exception of self-ballasted compact fluorescent lamps), all high-intensity discharge (HID) lamps and all reflector lamps (spotlights) are excluded from the scope of the regulation. If the given device or application uses fluorescent or HID lamps, they have to fulfil the requirements of the regulation on tertiary sector lighting products, not the requirements of this regulation. Note that most special purpose fluorescent or HID lamps are excluded from the scope of the tertiary sector lighting products regulation. Legislation on reflector lamps (spotlights) is under preparation but will not be adopted before 2010, so those are also unaffected by the current measure.

c.) Some lamps are exempted based on technical parameters, because the parameter makes it very clear that the lamp cannot be used in household room illumination. These lamps are: coloured lamps (defined by chromaticity coordinates), very weak or very strong lamps (below 60 lumens or above 12000 lumens light output, roughly corresponding to Christmas lights and studio/stage lighting lamps) and ultraviolet lamps (based on light spectrum specificities).

d.) For special applications or devices where there is clearly no alternative to conventional incandescent bulbs or conventional halogens (such as oven lamps, infrared lamps, rough service lamps, pet-care lamps etc.), the regulation allows the sales of special purpose lamps not fulfilling the requirements of the regulation, provided the special purpose is clearly stated on the packaging together with an indication that the lamp is not suitable for room illumination. These lamps are often designed to operate under extreme conditions (e.g. high temperatures). In case specific technical parameters of the lamp serve its special purpose, those parameters are to be indicated in the technical documentation file established by the manufacturer for conformity assessment.

II.3. About the Ecodesign Framework Directive (2005/32/EC)

The regulation is said to be implementing the Ecodesign Directive (2005/32/EC). What is that directive about?

The Directive on the Ecodesign of Energy-using Products provides a framework for the Commission, assisted by a committee of experts from the Member States, to adopt environmental performance requirements that products need to meet for being placed on the EU market.
When setting the energy efficiency requirements for household lamps, the Commission has also to take into account other aspects, such as the life-cycle impact of the lamps in major environmental impact categories, their functionalities from the consumer's perspective, health and safety of the users, or the competitiveness of industry.
Such measures have to be preceded by extensive stakeholder consultation and be accompanied by an assessment of the impacts on the lamp industry and on consumers (affordability, aesthetic and quality of lighting).
Before adopting a measure, the Commission asks the opinion of a committee of Member States experts who vote (with the same number of votes as in the Council).

II.4. Scientific evidence used and stakeholder consultation

Is there scientific evidence behind the decision to phase out conventional incandescent bulbs, including on the impact of alternative technologies? Were affected stakeholders consulted?

Before the legislation on phasing out conventional incandescent bulbs was drafted, an extensive technical-environmental-economic study looked into the different lamp technologies involved, in order to determine their improvement potential as regards the environmental impact of lighting over the full life cycle of the products, as well as the potential impact of their use on consumers and on the lamp industry. The study is available from the website www.eup4light.net. Stakeholders, including consumer organisations, green NGOs and industry associations had the opportunity to comment both during the preparatory study and on the early working documents of the Commission in the Ecodesign Consultation Forum.

II.5. Adoption procedure

Is the adoption procedure of the regulation completed?

Yes. On 8 December 2008, a committee of Member State representatives endorsed the draft regulation. The draft was then sent to the European Parliament and to the Council of Member States for scrutiny, who had three months, until 15 March 2009, to endorse or reject it. Since they did not object to it, the European Commission formally adopted it on 18 March 2009. It entered into force 20 days after its publication in the Official Journal of the EU.[4] The first requirements will start applying from 1 September 2009, followed by five further stages in 2010, 2011, 2012, 2013 and 2016.

II.6. No impact on lamps already in store and shops

Will the regulation apply to lamps that are already in stores or in the stocks of the retailers at the date of application of the requirements? What is the transaction date that determines if a non-compliant product can be sold or not?

The regulation will only apply to the products that are "placed on the market" (sold by the manufacturer or imported) after the application date of the requirements. For the first stage requirements, this means that after 1 September 2009, 100 Watt conventional incandescent bulbs that were already on the shelves of the retailers or in retailer stocks before 1 September will continue to be sold until they run out.

In principle, a non-compliant product can still be sold in the EU under the following conditions:

1. in case it is an imported product, the customs procedure on the EU border must have been completed before the application date of the requirements;

[4] COMMISSION REGULATION (EC) No 244/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps, Offical Journal of the EU, issue L76 of 24 March 2009, pp 3-16.

2. in case it is a product manufactured in the EU, the product must have been transferred from the manufacturer to the first reseller in the chain (or in some special cases, from the manufacturer directly to the final user) before the application date of the requirements, either by physical handover or by transfer of ownership.[5]

However, it is ultimately the national market surveillance authorities who are responsible for determining when a product has in practice been transferred from the manufacturer, based on the applicable civil law which may differ from one Member State to the other. Therefore further questions regarding this issue should be addressed to the authorities of the respective countries.

It is not prohibited to produce non compliant lamps in the EU after the deadline if it is for export outside of the EU.

II.7. Lamps sold incorporated into other products

Are non-compliant lamps allowed to be placed on the market if they are incorporated into other products (e.g. luminaires)?

Products placed on the market must comply with the requirements which are applicable at the moment of their placing on the market. Once legally placed on the market, they can continue to be made available on the market and need not be withdrawn from the market when new requirements for the placing on the market enter into force (unless such legislation provides otherwise, e.g. total bans).

Attention should be paid to products legally placed on the market which are integrated into other products.

Therefore there are two possible cases when lamps are integrated into luminaires or into other products:

1. The lamps are "transferred to a [luminaire] manufacturer for further measures (for example assembling, packaging, processing or labelling)".[6] This is not considered as placing on the market, which occurs only when the assembled product itself is placed on the market. In such a case, the lamps have to comply with Commission Regulation 244/2009 at the moment they are first placed on the market as part of a luminaire, as Article 1 of the Regulation states that the ecodesign requirements are applicable also when the lamps "are integrated into other products". The luminaire manufacturer has to fulfil the obligations relating to the placing on the market of the lamps (assuring compliance, affixing the CE marking to the product, establishing a technical documentation and drawing up the EC declaration of conformity).

2. The lamps are placed on the Community market (first made available on the market with a view to distribution or use) by the lamp manufacturer. It is therefore the lamp manufacturer who accomplishes the manufacturer's obligations (assuring compliance, affixing the CE marking to the product, establishing a technical documentation and drawn up the EC declaration of conformity). The lamps are sold (directly or through other operators), inter alia, to a luminaire manufacturer, who decides to resell them integrated into luminaires. In this

[5] Guide to the Implementation of Directives Based on New Approach and Global Approach http://ec.europa.eu/enterprise/newapproach/legislation/guide/index.htm

[6] Guide to the Implementation of Directives Based on New Approach and Global Approach http://ec.europa.eu/enterprise/newapproach/legislation/guide/index.htm

case, the placing on the market of the lamps has taken place when the lamps have left the lamp manufacturer, not when the luminaire manufacturer resells them integrated into luminaires to the end-user.

II.8. Bayonet cap not to be replaced by Edison cap

Is it true that by 2013, electric light bulb holders of the type Bayonet Cap (BC22) will have to be replaced by holders of the type Edison Screw Cap(ES27) due to the Regulation?

This information is wrong. There is no legislation in place directly affecting luminaires (electric light bulb holders) with Bayonet sockets. There is only legislation that affects the light bulbs (lamps) used in such luminaires. However, Commission Regulation 244/2009 does not ban lamps based on lamp caps, as a general rule it imposes minimum energy efficiency and functionality requirements on lamps independently from the cap type.
Actually, the Regulation provides some exemptions from the energy efficiency requirements based on (inter alia) lamp caps, including Bayonet caps (see Article 1.g).
Even as an indirect result, the Regulation does not ban lamps with Bayonet caps, because there exist lamps with Bayonet caps that can fulfil the energy efficiency and functionality requirements, and there is no technical or legal obstacle for expanding their range if needed.
The lamp manufacturers and importers are free to sell Bayonet cap lamps that comply with the requirements of the Regulation, and in all logic they will do so as long as there is demand on the market for Bayonet cap lamps.

III. Compact Fluorescent Lamp issues

III.1. Advantage of using compact fluorescent lamps

A compact fluorescent lamp offers:
- up to 80% energy saving compared to an conventional incandescent bulb
- about 60 € cost savings over its lifetime
- a lifetime of at least 6-10 years (compared to 1-2 years for conventional incandescent bulbs)
- no risk of burning due to the lamp's operating temperature
- a wider choice of colour temperatures (cool or warm light, conventional incandescent bulbs can only be warm light)

III.2. Summary of CFL performance issues and alternative lamps

By banning conventional incandescent bulbs, are you forcing the use of compact fluorescent lamps? Are they not bad alternatives to conventional incandescent bulbs?

The best energy saving lamps (compact fluorescent lamps) today can offer lighting functionalities approaching and in some respect surpassing that of conventional incandescent bulbs (e.g. higher variety of colour temperatures). In order to guarantee a minimum quality for compact fluorescent lamps on the market, the regulation also establishes requirements on

product functionality (lifetime, warmup times, colour rendering etc.). Requirements for adequate information provision on the product functionalities will also ensure that consumers can make informed choices. See the other questions in section III for the details.
Compact fluorescent lamps will not be the only lamps allowed on the market after the phase-out of conventional incandescent bulbs. Compact fluorescent lamps produce similar light to frosted (non-transparent) conventional incandescent lamps, but different light from clear (transparent) lamps which are bright point light sources. In order for such lamps to continue to exist, the regulation allows improved (class C according to the lamp energy label) transparent incandescent bulbs with halogen technology on the market. These provide exactly the same type and quality of light as conventional incandescent bulbs or conventional halogens, they come in the same shapes and appearance, and fit into all existing luminaires. They start and provide their full light output as soon as they are switched on, and they are insensitive to frequent switching. These lamps can be useful also for consumers who are looking for alternatives to compact fluorescent lamps for other reasons (sensitivity to light or aesthetic considerations such as need for small lamps in decorative luminaires).
Improved incandescent bulbs with halogen technology for luminaires using conventional incandescent bulbs are already available on the market and in shops. Large manufacturers have them in their product portfolio (look for lamps such as "HaloLux Classic ES", "EcoClassic30" or "MasterClassic EcoBoost").

Compact fluorescent lamp performance (quantity and quality of light, lifetime etc.)

III.3. Quantity of light

Is it true that compact fluorescent lamps produce less light than conventional incandescents?

Compact fluorescent lamps can produce just as much light as conventional incandescent bulbs. Consumers should check the product packaging to buy lamps of the appropriate power and light output. Currently, exaggerated claims are often made on the packaging about the light output of compact fluorescent lamps (e.g. that a 11-12 Watt compact fluorescent lamp would be the equivalent of a 60 Watt conventional incandescent, which is not true). The regulation will introduce restrictions on equivalence claims made on the product packaging, in order to keep the claims reasonable. Until then, for guaranteed satisfaction, a simplified method could be used to compare wattages when selecting the compact fluorescent lamp, by applying a 1:4 ratio (example: the light output of 15W compact fluorescent lamp is slightly more than the light output from a 60W conventional incandescent). Even with this conversion ratio, compact fluorescent lamps are much more energy efficient than conventional incandescent bulbs.
Nevertheless, it is highly recommended to consider the light output of the lamps instead of their wattage if you want to compare them. It is this quantity (already expressed in lumens on all lamps) that really describes the performance of a lamp, therefore it allows direct comparisons without a need for conversion. For example, a 15 W compact fluorescent lamp typically provides 799 lumens of light and a 60 W conventional incandescent lamp 710 lumens. See also I.15 and III.9.

III.4. Lifetime

Is it true that compact fluorescent lamps have a much shorter life time than generally claimed?

Untrue. There are indeed low quality compact fluorescent lamps that do not reach their normal life time (6000 h), but most respect the claimed values in average domestic use. The regulation introduces requirements on lifetime so that national market surveillance can eliminate free-runners.

III.5. Switching frequency

Is it true that compact fluorescent lamps should not be switched on/off frequently because it shortens their lifetime? For example, does it make sense to install them in a toilet which is used for 5 minutes 10 times a day?

It is true that frequent switching reduces the lifetime of some compact fluorescent lamps. This functionality is also addressed by the regulation, requiring that compact fluorescent lamps should reach the claimed life time while being switched on/off once for every hour of operation. Where frequent on/off switching is likely, dedicated compact fluorescent lamps that can endure up to 1 million switching cycles, or other energy saving light sources insensitive to switching can be used (such as improved incandescent bulbs with halogen technology which will also remain available). If this is a feature consumers are concerned about, they should look out for the information on the product packaging, where the manufacturers will be required to display the number of times the lamp can be switched on before failure.

III.6. Dimmability

Is it true that compact fluorescent lamps cannot be dimmed?

Untrue, there are compact fluorescent lamps on the market that can be dimmed, and there are dimmers that can dim any compact fluorescent lamp. Consumers should carefully read product information concerning dimmability. Improved incandescent bulbs with halogen technology will also remain available and provide full dimmability in all circumstances.

III.7. Starting and warm up times

Do compact fluorescent lamps really take longer to switch on and warm up to full light output than conventional incandescent lamps?

True. In order to guarantee an acceptable level of service with any compact fluorescent lamp, the regulation introduces minimum requirements on switch-on and warm-up times. Switching on a compact fluorescent lamp shall not take more than 2 seconds, and it should reach 60% of its full light output within one minute. However, there are now compact fluorescent lamps on the market that come close to conventional incandescent bulbs for these performance

parameters from the point of view of the average consumer. If these are features consumers are concerned about, they should look out for the information on the product packaging, where the manufacturers will be required to display warmup-times. Improved incandescent bulbs with halogen technology will also remain available and provide full light ouput instantly.

III.8. Shape and light quality

Isn't the shape of compact fluorescent lamps ugly and do they not produce unpleasant light (also in terms of colour rendering, colour temperature and light spectrum)?

Consumers usually find modern quality CFLs perfectly suitable for everyday tasks and aesthetically pleasing. There may be some substandard compact fluorescent lamps on the market, but those will be removed through the functionality requirements of the regulation.
Improved incandescent bulbs with halogen technology will also remain available and produce exactly the same light quality as conventional incandescent bulbs.
Overall, the perception of shape and light quality is quite subjective, however there are parameters that can be measured. On some of these parameters, CFLs are actually doing better than conventional incandescent bulbs and halogens.

Size and shape
Modern CFLs come in a variety of sizes and shapes approaching that of conventional incandescent bulbs. The outer lamp envelope that hides the small twisted lighting tubes has become commonplace, and makes CFLs resemble frosted (non-transparent) conventional incandescent bulbs in appearance.

Colour rendering
In order to ensure proper colour rendering (ability to reproduce the colours of the objects lit) for CFLs, the regulation introduces a minimum requirement on this product parameter.

Colour temperature
CFLs can be produced with different colour temperatures (warm/cold) depending on consumer needs, whereas conventional incandescent lamps can only provide warm white light. The regulation requires the indication of colour temperature on the lamp's packaging, so consumers should watch out for this information.

Light spectrum
If natural daylight is taken as a reference, both conventional incandescent bulbs and compact fluorescent lamps fail to imitate it perfectly, but for different reasons. Natural daylight has a spectrum which is a continuous curve, as strong at the blue and ultraviolet wavelengths as at the yellow and red wavelengths. The light of conventional incandescent bulbs has a continuous spectrum, however it has very little blue component and an extremely high proportion of red and infrared component, therefore it is very yellow and most of it is emitted as heat. The spectrum of compact fluorescent lamps differs from natural daylight in that it is not a continuous curve. They emit a high amount of light at certain wavelengths and almost nothing at adjacent wavelengths. However, in terms of the proportion of light emitted within the blue and red wavelength ranges, there are compact fluorescent lamps that are able to reproduce daylight more precisely than conventional incandescent bulbs.

III.9. Compatibility with luminaires

Is it true that compact fluorescent lamps do not always fit in the luminaires housing conventional incandescent lamps?

Compact fluorescent lamps exist today in many sizes and shapes to replace conventional incandescent bulbs. Where there is indeed too little room for any compact fluorescent lamp to fit in, improved incandescent bulbs with halogen technology could be used to replace conventional incandescent bulbs. Other factors such as a dimmer or other lighting controls may also prevent the use of standard compact fluorescent lamps, in which case a dimmable compact fluorescent lamp or improved incandescent bulbs with halogen technology could be installed. In any case, more efficient alternatives will remain available for all domestic lighting installations, even for those currently using the conventional halogen lamps that are also going to be phased out.

III.10. Working in cold temperatures

Is it true that compact fluorescent lamps do not work in cold temperatures ?

A standard compact fluorescent lamp will indeed lose a substantial part of its light output in cold temperatures. However, there exist compact fluorescent lamps designed specifically for outdoor use which can withstand cold temperatures without losing performance. Consumers should watch out for this information (required by the regulation for display on the packaging) when purchasing compact fluorescent lamps. Improved incandescent bulbs with halogen technology will also remain available and can operate in any ambient temperature.

Compact fluorescent lamp cost issues

III.11. Price

Aren't compact fluorescent lamps much more expensive than conventional incandescent bulbs?

Compact fluorescent lamps are actually much cheaper than conventional incandescent bulbs if you consider also lamp life time and costs related to electricity consumption while using the lamps. During the lifetime of one compact fluorescent lamp you will have used 6-10 conventional incandescent lamps. And the compact fluorescent lamp will consume one fourth / one fifth of the electricity consumed by conventional incandescents, another cost saver. A six-year-life energy-saving bulb would save about €36 during its lifetime (60W conventional incandescent versus 15W compact fluorescent lamp). This is based on an assumption of 3 continuous burning hours per day, for an energy cost of 0,136 €/kWh. The initial difference in the lamp price is paid back in 8 months through electricity savings and because of the distribution of the product cost over a longer lifetime (assuming a price of 4,50 € for the compact fluorescent lamp and 60 cents for incandescent bulb).
If the lamp is to be installed in a location where it will be only rarely used and for short periods (such as attics or cellars), the higher initial investment of purchasing a compact fluorescent lamp rather than another alternative will pay off more slowly, but it will pay off

with time. If a faster return on investment is desired, cheaper but less efficient alternatives can be chosen for that location, such as improved incandescent bulbs (with halogen technology).

Compact fluorescent lamp environmental impact issues

III.12. Ecobalance over the life cycle

More materials and energy are needed to produce a compact fluorescent lamp than an conventional incandescent bulb, and it also results in more waste at the end of life. Does this not outweigh the benefits of its energy efficiency?

According to the technical study ordered by the Commission to prepare for the regulation on household lamps (www.eup4light.net), the impact of energy savings during the use of a compact fluorescent lamp clearly outweigh the environmental impact of its production and its end-of-life. Therefore using them rather than conventional incandescent bulbs reduces the overall energy use and the environmental impact of lighting. The estimate of 39 billion kWh (the full yearly electricity consumption of Romania or 11 million households) energy savings annually by 2020 does not include the production and recycling energy needs. A sensitivity analysis in the study has shown that when these energy needs are also considered, the estimated savings are slightly higher (about 42 billion kWh) – which means that the higher production and recycling energy needs for compact fluorescent lamps are counterbalanced by the fact that during their lifetime they can replace 6 to15 conventional incandescent bulbs (depending on the lifetime of the compact fluorescent lamp).

III.13. No need to remain on to save energy

Is it true that because of high energy use at start-up, compact fluorescent lamps have to remain switched on for 45 minutes before they bring any energy saving at all?

It is not true that energy saving lamps do not provide energy savings when switched on only briefly. The energy use of compact fluorescent lamps in the first 2 to 3 seconds of their operation is slightly higher, but after that their power uptake is stabilised. In practice, they provide energy savings compared to incandescent bulbs right from the moment they are switched on.
Nevertheless, compact fluorescent lamps might not be the proper choices for some applications. If the lamp is switched on both briefly and rarely, the energy savings will counterbalance the higher purchase price of the lamp only very slowly, over several years or even decades. In such a case the much cheaper improved incandescent bulbs with halogen technology should be used.
If the lamp is switched on briefly and frequently, it may reduce the lifetime in the case of some compact fluorescent lamps. This functionality is also addressed by the regulation, requiring that compact fluorescent lamps should reach the claimed life time while being switched on/off once for every hour of operation. Where frequent on/off switching is likely, dedicated compact fluorescent lamps that can endure up to 1 million switching cycles, or other energy saving light sources insensitive to switching can be used (such as improved incandescent bulbs with halogen technology which will also remain available). If this is a feature consumers are concerned about, they should look out for the information on the product packaging, where the manufacturers will be required to display the number of times the lamp can be switched on before failure.

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III.14. Mercury content and the environment

Compact fluorescent lamps contain mercury, a hazardous material, conventional incandescent bulbs do not. If more compact fluorescent lamps are used, does it not mean more mercury pollution in the EU?

Mercury is present in compact fluorescent lamps in such a small amount that during its lifetime a compact fluorescent lamp (CFL) will have saved more mercury emissions from electricity production in coal power plants (compared to the mercury emissions related to the conventional incandescent bulbs' electricity need) than is contained in the CFL itself. Moreover, CFLs should be recycled according to EU legislation already in place.

Mercury is an important component of compact fluorescent lamps (CFLs) that plays a key role in their energy efficiency and also other parameters such as lifetime and warm-up times. There are up to 5 milligrams (0,005 grams) of mercury contained in a CFL (compared to 50 milligrams in button batteries, 500 milligrams in dental amalgam filling or several grams in older thermometers). The 5 mg limit is set in the Restriction on Hazardous Substances Directive (2002/95/EC), which in general forbids mercury in electric and electronic equipment, but provides some exemptions in duly motivated cases. The limit is enforced by Member States equally on all bulbs, whether they are cheap Chinese ones or produced by European manufacturers.

Compact fluorescent lamps have been widely used in European homes in the past decade, they will not be introduced by this regulation. Most office and public buildings, and also most streets have been equipped for the last 50 years with fluorescent and high-intensity discharge lamps containing mercury (often much more than compact fluorescent lamps).

The Waste Electrical and Electronic Equipment Directive (2002/96/EC) provides for the collection and recycling of waste electrical and electronic equipments (WEEE), including lighting equipment such as compact fluorescent lamps. The Directive sets out a collection requirement for all WEEE, a recycling and recovery target for lighting equipment, and specific treatment requirements for gas discharge lamps (including compact fluorescent lamps). According to the requirements, mercury needs to be removed from the collected lamps through treatment, and their recycling should meet an 80% minimum target. If consumers take back their burned-out compact fluorescent lamps to collection points just as they do with batteries, the mercury content will be recycled and not released to the environment.

Member States have to ensure that users of electrical and electronic equipment are given the necessary information about the requirement not to dispose lamps as unsorted municipal waste and to collect such waste separately, as well as about the return and collection system available to them.

Member States are also responsible for ensuring the availability and accessibility of collection facilities. The return should be free of charge to the shop by taking back the old lamp when buying a new one, or if another collection system is in place, it should also be free of charge and providing at least the same comfort. If you consider that the compact fluorescent lamp return and collection system in place near you does not fulfil these criteria, we recommend enquiring with the authorities of your country. While the WEEE Directive is binding for the Member States of the EU, it is the national transposing laws of each Member State which are binding for the economic actors (producers, retailers, municipalities, etc.) in each State.The Commission also proposed to recast the WEEE Directive on 3 December 2008, so that the collection target for all WEEE is increased and the recycling target for gas discharge lamps is

set at the level of 85%. This proposal will now go to co-decision with the Council and the European Parliament.
From a life-cycle perspective, the Regulation is in any case the most eco-efficient solution. Indeed, according to the technical study ordered by the Commission to prepare for the regulation on household lamps (www.eup4light.net), even in the worst possible case that a CFL goes to the landfill, during its lifetime it will have saved more mercury emissions from electricity produ ction in coal power plants (compared to the mercury emissions related to the conventional incandescent bulbs' electricity need) than is contained in the CFL itself, so the overall mercury pollution balance will be positive.Improved incandescent bulbs with halogen technology that do not contain any mercury are and will remain available, however they provide 25-45% energy savings compared to conventional incandescent bulbs, whereas compact fluorescent lamps save up to 80%.
LEDs (light emitting diodes) are a rapidly emerging mercury-free technology, meeting or even surpassing compact fluorescent lamps in efficiency. However, at this stage they are not yet developed enough to be valid alternatives to the full range of household conventional incandescent bulbs (mainly available in low light ouputs only, equivalent to 25W conventional incandescent bulbs). It can be expected that in the next few years they will develop to become replacements for most existing lamps, however there is no absolute certainty about that and we need to act on climate change right away with the products that are already on the market. Nevertheless, the Commission is financing research into LEDs for general lighting through the ongoing and future calls of the EU's 7th Research Framework Programme. The proposed regulation will be revised at the latest 5 years after adoption, and due account will be taken of the state of development of the LED market.

III.15. Power factor

Compact fluorescent lamps cause losses in the electrical distribution grid due to a poor power factor. Conventional incandescents do not. Is this taken into account when assessing their energy efficiency?

According to the technical study ordered by the Commission to prepare for the regulation on household lamps (www.eup4light.net), even if we assume they have a poor power factor, compact fluorescent lamps are overall much more energy efficient than conventional incandescents. Besides, the regulation on household lamps requires a minimum power factor for compact fluorescent lamp lamps.

Long answer:
One of the alternative technologies, compact fluorescent lamps has an influence on the electricity grid on which they are operated. This is characterised by their power factor[7] and results in quantifiable extra energy needed to power a grid operating with such lamps.
However, one has to consider that there exists inductive, reactive power as well as capacitive, reactive power in the electrical grid and the two compensate each other. Motors (e.g.

[7] The power factor of an AC electric power system is defined as the ratio of the real power to the apparent power and is a number between 0 and 1. Real power is the capacity of the circuit for performing work in a particular time. Apparent power includes the reactive power that utilities need to distribute even when it accomplishes no useful work. Low-power-factor loads increase losses in a power distribution system and result in increased energy costs. GLS and halogen lamps (HL) have a power factor equal to 1. For lamps operating on a ballast or electronics such as CFLi's, this power factor can go down to 0.50; the lower the power factor, the higher the electrical current that is needed to result in the same real power. This higher current causes 5% more losses in the electrical grid that feeds the lamp.

refrigerators, elevators, vacuum cleaners, pumps,...) or inductors (magnetic ballasts for fluorescent or high intensity discharge lamps) are typically inductive loads, while many electronic sources (CFL, PCs, TVs, ..) are capacitive. In general the grid tends to be more inductive due to the high amount of motor loads, and in industrial applications power factor compensation capacitors are frequently installed. Hence CFL that are capacitive are unlikely to create strong negative grid influences because they rather compensate inductive loads and are unlikely to dominate the total active power demand of the grid.
The preparatory study already quantified in its modelling the extra power needed when operating a CFL (in the order of 5%), if no inductive loads are present on the grid. The study used such corrected figures in the CFL-related parts of the scenario analysis, so the obtained savings already include a worst-case assumption on the impact of their lower power factor.
A massive switch to lower power factor lamps has never been experimented on the European scale, and some sources have also reported harmonic interference issues in grids with high number of CFLs.
For security, requirements on minimum power factor for CFLs are proposed to be set in the measure.

III.16. Is the heat from incandescent bulbs useful?

Conventional incandescent bulbs produce a lot of heat, compact fluorescent lamps much less. When compact fluorescent lamps replace conventional incandescent bulbs in a room, does the increased heating need in the room negate the energy saving through the lower consumption of lighting?

Though it is accepted that conventional incandescent lamps emit heat, conventional incandescent bulbs are not an efficient way to regulate indoor temperature. The location on the ceiling is inefficient, electrical heating itself is inefficient compared to other forms of heating (e.g. gas or heat pumps), the heating is unnecessary in the summer period and may even result in increased cooling needs, and not all rooms needing lighting need also heating. Because of all these factors, heat from lighting is considered as energy loss rather than useful energy.
Nevertheless, when it comes to quantifying the improvement potential of the switch from conventional incandescent lamps to compact fluorescent lamps, the UK Market Transformation Programme recommends using correction factors[8], to take into account what they call the "heat replacement effect". But even these factors remove only 20 to 30% of the estimated savings in energy costs and CO2 emissions, meaning that the balance of savings achieved is still substantial both for the consumer and for the environment.
conventional incandescent conventional incandescent conventional incandescent conventional incandescent conventional incandescent
Furthermore, the improved incandescent bulbs (with halogen technology) that will remain available only provide 25-45% energy savings compared to conventional incandescent bulbs (whereas compact fluorescent lamps save up to 80%), which means they still radiate much of the energy they use as heat rather than light.

[8] http://www.mtprog.com/cms/product-strategies/subsector/cross-sector
Related briefing notes: BNXS05, BNXS24, BNXS29

Compact fluorescent lamps and health

III.17. Effect on light sensitive people

The light produced by compact fluorescent lamps aggravates the symptoms of people suffering from auto-immune diseases such as lupus and ME. They now use conventional incandescent bulbs in their homes, if these are phased out will they be left in the dark?

The Scientific Committee on Emerging and Newly Identified Health Risks (on a mandate from the Commission services) has been looking into the question of possible health effects of compact fluorescent lamps on people with certain diseases and on the general public, following up to complaints from certain patients' associations. The Committee examined flicker, electromagnetic fields (EMF) and ultraviolet / blue light radiation from the lamps to determine whether they aggravate the symptoms of such patients. In its report[9], the Committee found no evidence that would indicate that either EMF or flicker could be a significant contributor. For the general public, very close exposure to a bare lamp (< 20 cm) for more than 8 hours could eventually affect health by exceeding workplace limits on UV emissions. This is a situation that does not occur in normal use. Hands held very close to halogen lamps or touching conventional incandescent lamps get burnt much more quickly because of the intense heat, so such a situation is not usual anyway with household lamps.
On the other hand, according to the report the symptoms of a maximum of 250.000 people in the EU suffering from diseases accompanied by light sensitivity could be aggravated in the presence of bare compact fluorescent lamps (independent of distance) due to UV and blue light emissions.
Using commonly available compact fluorescent lamps with a second lamp envelope can both solve the problem of light-sensitive patients and prevent overexposure of the general public even in extreme situations. However, the envelope slightly lowers (about 10%) the efficacy of the compact fluorescent lamp, meaning more lamps using more power will be needed for the same light output. Transparent or translucid luminaires that fully cover up the bare lamps have the same effect as a second lamp envelope. Also alternative technologies can be chosen by consumers, such as improved incandescent bulbs (with halogen technology) that have identical light spectrum to conventional incandescent bulbs.
In addition, the ecodesign regulation on non-directional household lamps introduces maximum UV emmission limit values for compact fluorescent lamps.

Light-sensitive people have had scarce experience with improved incandescent bulbs with halogen technology but some of it suggests that those bulbs too aggravate their symptoms. So if neither CFLs nor improved incandescent bulbs help, will they be in the dark if there are no conventional incandescent bulbs left?

During the preparation of the household lamps regulation, the Commission paid utmost attention to the health concerns of the light sensitive part of the EU population. The conclusions of the Scientific Committee for Emerging and Newly Identified Health Risks (SCENIHR) acknowledge that the ultraviolet and blue light emissions of compact fluorescent lamps can aggravate the symptoms for a number of patients. They pointed to the use of double envelope CFLs or other similar technologies (such as transparent or translucid luminaires fully enclosing CFLs) as a possible means to mitigate such effects. (See also III.18).

[9] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_019.pdf

According to technical data available, the light spectrum of improved incandescent bulbs is identical to that of conventional incandescent bulbs, which is possible as they also produce light through an incandescent filament (in some typologies they even appear in the category of "incandescent bulbs"). By contrast, CFLs have a very different technology and light spectrum. Improved incandescent bulbs can be used in the same luminaires and can be dimmed the same way as conventional incandescent bulbs. Therefore there is no reason to suspect that the impact of these lamps on light sensitive people would be different from that of conventional incandescent bulbs. Even if it was the case, the use of luminaires fully enclosing the bulbs and filtering the part of the light causing the aggravation of symptoms would be an appropriate solution for them.
The Commission is committed, however, to keeping this issue under close review over the next three years, during which conventional incandescent bulbs are to be phased out, and, on the basis of further scientific evidence, to propose additional measures if they are deemed necessary.

III.18. No effect on epilepsy and migraine

Is it true that compact fluorescent lamps produce light through high frequency discharges causing flicker and triggering attacks on people suffering from epilepsy or migraine?

The Scientific Committee on Emerging and Newly Identified Health Risks (on a mandate from the Commission services) did not find proper evidence underpinning any negative health effects relating to flicker. The Committee examined flicker, electromagnetic fields (EMF) and ultraviolet / blue light radiation from the lamps to determine whether they aggravate the symptoms of such patients. In its report[10], the Committee found no evidence that would indicate that either EMF or flicker could be a significant contributor. Modern compact fluorescent lamps operate at frequencies so high that they are beyond human perception. Also alternative technologies can be chosen by consumers, such as halogen lamps.
Compact fluorescent lamps provide light that flickers at a frequency of about 60 kHz (60 000 Hz). There is consensus that flicker of such high frequency is not perceptible to the human eye. It is already doubtful whether flicker at 100 Hz can be perceived. It is true that compact fluorescent lamps produce also some weak modulation at 100 Hz, however this is not unique to this lamp type. As SCENIHR writes, also incandescent bulbs emit a low-intensity "flicker" at 100 Hz, simply because this is twice the frequency of the mains voltage electricity network (the power being delivered to the lamp peaks twice per cycle).

III.19. Electromagnetic fields

Is it true that compact fluorescent lamps generate electromagnetic fields and should not be used as bedside lamps or desk lamps where they are too close to the human body?

Short answer:
Compact fluorescent lamps have to comply with the EU requirements on product safety which also include electromagnetic fields. Also alternative technologies can be chosen by

[10] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_019.pdf

consumers, such as improved halogen lamps without integrated transformer, which only generate the same type of electromagnetic fields as conventional incandescent bulbs.

Long answer:
There is no scientific evidence of any link between the electromagnetic fields (EMF) emitted by compact fluorescents lamps and the symptoms of "electrically sensitive" people. EMF emissions from CFLs are within international limits on public exposure to EMF.
Upon request of the European Commission, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) has recently issued an opinion on Light Sensitivity, namely with regard to the possible aggravation of already existing symptoms of patients with certain diseases due to the use of compact fluorescent lamps.[11] The issue of electromagnetic hypersensitivity due to the use of such lamps has been examined.
SCENIHR concluded that it has never been conclusively and convincingly shown that there exist any connections between electromagnetic fields (EMF) and the symptoms that are reported by persons with so-called electromagnetic hypersensitivity, although their symptoms are real and in many cases severe. There is no scientific evidence of correlation between EMF from compact fluorescent lamps, and symptoms and disease states.
SCENIHR also stated in its recent opinion on Health Effects of Exposure to EMF[12] that the emissions from compact fluorescent lamps have been investigated recently and that available results showed compliance with existing limits. The levels decrease drastically beyond 30 cm from the lamps.
In any case, compact fluorescent lamps available on the market have to fulfil the requirements of Directive 2006/95/EC on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.
Also alternative technologies can be chosen by consumers, such as improved incandescent bulbs with halogen technology but without integrated transformer, which only generate the same type of electromagnetic fields as conventional incandescent bulbs.

III.20. Mercury content and health

Compact fluorescent lamps contain mercury, which is a highly toxic substance. Do compact fluorescent lamps represent a danger to health because of that?

Mercury is an important component of compact fluorescent lamps (CFLs) that plays a key role in their energy efficiency and also other parameters such as lifetime and warm-up times. There are up to 5 milligrams (0,005 grams) of mercury contained in a CFL (compared to 50 milligrams in button batteries, 500 milligrams in dental amalgam filling or several grams in older thermometers). The 5 mg limit is set in the Restriction on Hazardous Substances Directive (2002/95/EC), which in general forbids mercury in electric and electronic equipment, but provides some exemptions in duly motivated cases. The limit is enforced by Member States equally on all bulbs, whether they are cheap Chinese ones or produced by European manufacturers.
Compact fluorescent lamps have been widely used in European homes in the past decade, they will not be introduced by this regulation. Most office and public buildings, and also most streets have been equipped for the last 50 years with fluorescent and high-intensity discharge lamps containing mercury (often much more than compact fluorescent lamps).

[11] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_019.pdf
[12] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf

The mercury content cannot escape from CFLs, except in the event of accidental breakage of the lighting tubes. In that case less than 5 milligrams of mercury could be released.
The Ecodesign regulation requires manufacturers to explain on their websites how consumers should clean debris in case the CFL's tubes accidentally break, and to include on the packaging of each lamp the link to online explanations. Such an explanation is already available on the website of the European Lamp Companies Federation.
In short, if the lamp breaks accidentally, if possible air the room before cleaning the lamp with a wet cloth, avoid skin contact with debris and do not use a vacuum cleaner.
Buying commonly available CFLs with an outer non-breakable lamp envelope is another way to address the issue of mercury leakage in case of accidental lamp breakage.
Consumers who would particularly worry about mercury can choose alternative technologies such as improved incandescent bulbs with halogen technology, which do not contain mercury.

III.21 Can compact fluorescent lamps make people ill?

In normal use, compact fluorescent lamps do not make healthy people ill. They could aggravate the symptoms of some pre-existing conditions such as light sensitivity, but with some simple and commonplace precautions this aggravation can be avoided (see III.17). They do not flicker (see III.18) and the electromagnetic fields they emit are within health limits (see III.19).

III.22 Light spectrum and public health (UV, hormones, cancer etc)

Does the specific light spectrum of compact fluorescent lamps make them a threat to public health?

The Scientific Committee on Emerging and Newly Identified Health Risks (on a mandate from the Commission services) has been looking into the question of possible 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 opinion[13], the Committee concluded that for the general public, very close and prolonged exposure to a bare lamp (< 20 cm) could possibly affect health by exceeding workplace limits on UV emissions. According to the United Kingdom's Health Protection Agency, less than 10% of the bare lamps exceed workplace limits in 8 hours of exposure at 20 cms from the lamp[14], and none in 4 hours.[15] This is a situation that is not very likely to occur during normal use, as experience with today's household lamps suggests.

Simplified version of the first paragraph:

The Scientific Committee on Emerging and Newly Identified Health Risks (on a mandate from the Commission services)[16] and also the United Kingdom's Health Protection Agency[17]

[13] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_019.pdf
[14] UK HPA press release on 9 October 2008, available at http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1223534061375
[15] Khazova, M. and O'Hagan, J. B. (Health Protection Agency): "Optical Radiation Emissions From Compact Fluorescent Lamps", in *Radiation Protection Dosimetry* (2008), pp. 1–5
[16] http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_019.pdf
[17] UK HPA press release on 9 October 2008, available at http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1223534061375

have been looking into the question of possible health effects of compact fluorescent lamps on people with certain diseases and on the general public. Based on existing scientific evidence, they both came to the conclusion that in normal use compact fluorescent lamps do not pose risks to the general public. If one remains closer than 30 cm to a lamp for several hours, there might be a risk of slight overexposure to ultraviolet emissions, similar to a suntan. However, even this potential risk can be eliminated by using the commonly available encapsulated (double envelope) compact fluorescent lamps.

During the preparatory process, no other scientific evidence was forwarded to the Commission about potential negative health effects on the general public of the light spectrum of compact fluorescent lamps.
These lamps have been widely used in European homes in the past decade, they will not be introduced by this regulation. Most office and public buildings, and also most streets have been equipped for the last 50 years with fluorescent and high-intensity discharge lamps that have a light spectrum similarly structured to that of compact fluorescent lamps.
Also alternative technologies can be chosen by consumers, such as improved incandescent bulbs with halogen technology that have identical light spectrum to conventional incandescent bulbs. The Commission is committed, however, to keeping this issue under close review over the next three years, during which conventional incandescent bulbs are to be phased out, and, on the basis of further scientific evidence, to propose additional measures if they are deemed necessary.

III.23. Safety issues and signs of end of life

Are compact fluorescent lamps safe for use? Is it normal if there is a bad odour or smoke when they are switched on, or if they emit an audible noise?

Compact fluorescent lamps placed on the EU market have to comply with the product safety legislation of the EU (notably the General Product Safety Directive 2001/95/EC and the Low Voltage Directive 2006/95/EC). Industry and international standardisation organizations established harmonised safety standards for compact fluorescent lamps many years ago and are periodically reviewing them. These standards provide presumption of conformity with product safety legislation in the EU.
Compact fluorescent lamps should be replaced at the first sign of any odour, smoke, audible noise, or in case of erratic behavior such as flashing, flickering that may indicate an electrical component failure. If this happens clearly before the lifetime indicated on the packaging has elapsed, the lamp should be returned to the manufacturer or retailer for possible further analysis.

IV. Other EU measures on household lamps and lighting

IV.1. Legislation on other lighting products

According to its title, the regulation covers "non-directional household lamps". Are there plans to cover other products with EU energy efficiency legislation, such as directional lamps, non-household lamps or lighting products other than lamps?

Directional lamps (reflector lamps or spotlights, as opposed to non-directional lamps that emit light in all directions) are planned to be covered by a similar regulation, planned for adoption in 2010.
Non-household lamps are already covered by a similar regulation targeting lighting products used in the tertiary sector (more specifically office and public street lighting). The technologies covered include most fluorescent tubes and many high-intensity discharge lamps. The regulation is scheduled for adoption by the Commission in 2010.
Among lighting products other than lamps, ballasts are covered in the regulation targeting lighting products used in the tertiary sector, which also contains some provisions for luminaires. Specific and more detailed measures on the efficiency of luminaires are also planned to be adopted by the Commission in 2010.

IV.2. Revising the lamp energy label

Are there plans to revise the existing lamp energy labelling?

Lamps have had to display an A-G scale energy label on their packaging since 1998 (Commission Directive 98/11/EC). It is planned to reexamine the scale taking into account the phase-out of many inefficient lamps and the recent appearance of more efficient lamps, and also to extend the scope of the label to the so-far excluded reflector lamps and low voltage lamps, probably in 2010.