



Environmental NGOs response to the Consultant's final report (20/02/09) and EC proposal reviewing the exemptions on mercury in lamps (RoHS)

Brussels, 3 April 2009

Dear Member State Expert,

With this note we would like to draw your attention to the revised proposed exemptions under the RoHS directive Annex review, for lamps containing mercury as these are discussed in the final Consultant's report on "Adaptation to scientific and technical progress under Directive 2002/95/EC." (20 February 2009) and also proposed by the European Commission, in view of your discussion at the Technical Adaptation Committee, 7 April 2009.

Before entering into the details of the report, the NGOs would like to point out that, although we overall welcome that maximum mercury limits allowed for lamps-containing mercury have been generally reduced and new categories of lamps will now be regulated, a few categories of lamps are either, to our view, classified under the wrong category or are not covered at all by the proposal.

Furthermore, we like to express serious concerns on the limits set for important categories such as the CFLs and linear fluorescent lamps (T5, T8); the Consultant's recommendation was hampered by the fact that industry submitted very limited or no data and at the end the extensive NGOs-provided information, was not considered as a basis for the proposed limits, as also acknowledged by the consultant.

We would therefore now urge you to consider our comments and make respective proposals in view of including all important lamp categories in the exemptions and tightening the limits set, considering that a transition period is given to industry to adapt to the new situation.

The main issues not correctly reflected, to our view, in the Consultant's report, are the following (these are analysed further down in the document):

- **U-shaped T8s:** These should fall under Exemption 2b (non-linear tri-band phosphor lamps), with an 8 mg Hg/ lamp limit. They are widely used in the US and are also found in the EU. Unfortunately, as written, only T5 non-linear tri-phosphor lamps are listed in the exemption. Many models of U-bent T8 fluorescent lamps made by GE, Philips and Sylvania and sold in the US can meet this limit.
- **Long length T8 lamps (>1800mm or 6-foot T8):** Similarly, in exemption 2a (Mercury in straight lamps for general purposes), there is no limit set for long-length T8 lamps. These often have more mercury than shorter T8 models; a specific limit should be set for these lamps since they are considered a general purpose lamp. The consultant now proposes that these should fall under Exemption 4b, and have no limit. Our data has shown that at least two major manufacturers are close to meeting a limit of 8 mg for such lamps.
- **Metal Halide HIDs:** No mercury limits have been proposed for any metal halide lamps in the proposed exemptions. Data from the US demonstrates that mercury limits of 10 mg for metal halides of ≤ 100 watts, and 30 mg for models >100 watts up to 250 watts can easily be met with ceramic metal halide technology. Data from a European lamp manufacturer that was included in the Consultant's report is consistent with our recommendation.
- **Standard (single burner) cycling HPS lamps** should have their own low-mercury limits, rather than being put together with double-burner that typically have much higher mercury content levels. The NGO have proposed certain limits for this category.
- **Non-cycling HPS Lamps** should have their own low-mercury limits rather than being able to meet the higher-mercury limits that Cycling and Specialty HPS lamps (high CRI and double burner) can meet. The NGO have proposed certain limits for this category.

- **Cold cathode CFLs(CC-CFLs):** It should be made clear that cold cathode CFLs are considered a CFL for General Lighting Purposes and fall in exemption 1. Like conventional CFLs, CC CFLs are designed to light spaces. It makes sense that they fall under the limits set for other CFLs based on their wattages and not be considered a CFL “For Special Purposes. NGOs have provided substantial data showing much lower levels of mercury in CCFLs., thereby justifying a lower limit below the 3.5 mg limit proposed for conventional CFLs (or below the 2 mg as in NGO proposal).

Furthermore we would like to draw your attention to the fact that our recommendations have been based on available data provided by lamp manufacturers offering products in the EU and US markets as presented in this and previous submissions¹. Using this data, for each lamp category discussed, we have recommended a maximum mercury limit value that two or more of the main lamp manufacturers are meeting already today. Our recommendations are also conservative because we typically add an extra 10% or more to manufacturers’ reported mercury content levels .to account for fluctuations in total mercury content; scientific studies report that this is reachable by using modern dosing technologies such as “pills” or strips of mercury amalgam, which should be encouraged because they are also safer for factory workers and reduce mercury waste at factories where lamps are manufactured.

Finally, we shared the frustration of the Consultant in establishing achievable, state-of-the-art mercury content limits under the RoHS Directive because of the lack of data provided by European lamp manufacturers. Recommendations made from the Consultant in many cases are based on very little information. The Commission and Member States should not allow the final mercury-content limits to be established in the dark.

To address these concerns, we strongly propose the following:

- The Commission and Member States should require manufacturers interested in selling mercury-containing lamps in Europe to provide data on the maximum mercury content in each model in milligrams, the dosing method used, as well as the margins/accuracy of dosing; furthermore it is imperative that industry is asked to provide data on the market segment; we repeatedly asked for that in 2008 but we never got any response – also mentioned in the report²
- Lamp manufacturers should be required to print the mercury content of each lamp model on the product package. This will help ensure compliance with this Directive and assist consumers in choosing low-mercury models among those available on the market.
- The new maximum limits for mercury in lamps should be adopted, using available data and a consistent methodology similar to our recommendation rule (described above).

Contrary to our provided data and recommendations, we regret that the consultant and the Commission have mostly supported the proposed ELC mercury limits for the different categories. NGOs believe, based on available data, that much lower mercury content levels in fluorescent and high-intensity discharge (HID) lamps than in the proposed exemptions can be reached without undermining lamp performance, lifetime and energy efficiency.

The Commission and Member States have now the opportunity to drive the market to the right direction. We would therefore urge you to propose maximum mercury limits on each type of mercury-containing lamp on the basis of the proposed NGO recommendation rule.

In the following pages, you can find our further comments on the different sections of the consultant’s report

Thank you in advance for addressing our concerns.

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¹ Updated revised environmental NGOs response to stakeholder consultation on mercury containing lamps (10/11/2008), http://zeromercury.org/EU_developments/081110NGOs-RoHSconsultation-Review-of-AnnexHg-in-lamps.pdf

Environmental NGOs response to the draft consultant’s report (29/10/2008) on proposals for new exemptions on mercury in lamps (10/11/2008), http://zeromercury.org/EU_developments/081110E-NGOs_response_draftOEko_rep_Hg_lamps-final.pdf

² (page. 21 points 4 and 5);

Further comments on the Consultant's final report proposing mercury limits to mercury-containing lamps.

Lamp Classification System

The EEB and GPI generally agree with the classification system that has been proposed by the ELC because it largely calls out the various different types of lamps in categories that are familiar to both lamp manufacturers and the general public. Our research has found that there are substantial differences in the mercury content of different types of lamps. This classification system allows for different mercury content limits to be set on each lamp category based on actual data on lamp models that are currently available in the European, US and global marketplace.

That said, we have the following recommended amendments to the proposed classification system, which have been further discussed in our comments on the Consultant's draft report of 29/10/08.

1. **NGOs believe that to the greatest extent practicable, all models of mercury-containing lamps should be subjected to some mercury limit.** Our biggest concern is that several mercury-containing lamp types do not have any proposed mercury limits under the proposed RoHS revisions even though data from the US and Europe support including them, for example long-length T8s and u-bent T8s, and many specialty lamps for which sufficient mercury content data exists to set limits:
 - **Long-length T8s (>1800mm/6-foot):** In exemption 2a (Mercury in straight lamps for general purposes) a limit of 3,5 mg and 3mg respectively is proposed for linear tri-band phosphor lamps (T8s and T5s) with a normal lifetime as long as they are not longer than 6 foot (183 cm). But no limit was set for T8 fluorescent lamps that are longer than 183 cm. A specific limit should be set for this category; NGOs proposed an 8mg limit and presented data showing that two companies can meet this limit today . Industry argued that those types of lamps are rarely sold in Europe; but it would be prudent to set a mercury limit nonetheless in case they enter the market over the next several years. 8-foot T8s are one of the most popular lamp types used in the US and could easily start being used in the EU. It is important to set limits on this lamp type because some models still use old dosing technologies that result in up to 65 mg of mercury in the lamp. These are general purpose lamps and should not be allowed to fall under the specialty lamp category. where there is no exemption set.
 - **U-shaped T8s:** Unfortunately, as written only T5 non-linear tri-phosphor lamps are listed in exemption 2b (non-linear tri-band fluorescent lamps) and a limit of 8 mg limit has been proposed, however no limit has been set at all for T8 non-linear tri-band fluorescent lamps (which are U-shaped). NGO proposed a limit for 8mg and our data shows that three major manufacturers (GE, Sylvania and Philips) can meet such a limit. Like the 8-foot T8s, u-bent models are very popular in the US; they are already being used to some extent in Europe and could be sold in the future, so a mercury limit is justified. These are general purpose lamps and should not be allowed to fall under the specialty lamp category.
2. **There are some technical mistakes in the classification system** – as summarized in Table 1, and consequently further down the text. For example:
 - a. P.2 Exec. Summary table. 2b assigns an 8 mg limit on T9 non-linear tri-band phosphor lamps – however, T9 lamps rarely if ever contain tri-band phosphors; instead, these circular fluorescents usually are halophosphates. T9s should fall under halophosphates of all shapes and the limit of 8mg/lamp.
 - b. There are two limits set on HPS lamps over 405 watts: 25 mg and 40 mg.
3. **There are some ambiguities in the classification which may cause some lamp manufacturers to be confused about which category specific lamps belong.** For example:
 - a. 2b assigns an 8 mg limit to T5 non-linear tri-band phosphor lamps; all models fitting that description are circular and are already covered under the CFL category and have a limit of 5 mg. So this category should be deleted since it creates confusion.
 - b. It is not clear whether cold cathode CFLs are included under Exemption 1 and have a limit

of 3.5 mg, which is easily achievable according to data from several manufacturers (and is consistent with the levels established in Exemption 3 for straight cold cathode fluorescent lamps.

4. Within non-linear fluorescents, each specific shape should be evaluated separately.
5. Within each category, there should be more detailed information about what types of products fall within the general purpose and special purpose designations.

General Considerations on Hg Limit Values

In our view, the proposed mercury limits are generally set too high and can be reduced.

Industry's claim that the variance in the dosing can have a 40% margin (p.19) does not show good accuracy and is contrary to our scientific evidence. With precise low-mercury dosing technologies, such as mercury capsules or amalgam strips, it is possible to achieve a high level of dosing accuracy and produce lamps with very low mercury content. Even amounts below 1.5 mg can be dosed with a variability of less than 10%³. From communication with one major lamp manufacturer, they mentioned that there can be a small variation of +/- 0.3 mg in the nominal values.

The safety margin ELC claimed is needed for market surveillance does not make sense. If a known quantity of mercury is added to a lamp using accurate modern dosing methods - even considering a safety margin how can it be possible that a lamp contains more mercury when it is tested than the amount added initially? Industry further argues that additional mercury is needed because some part may bond to the glass over time. But modern lamp manufacturing methods have devised coatings that prevent significant amounts of mercury from sticking to the glass. Lamp manufacturers already take this into consideration and no additional mercury is needed than the amounts we have presented based on actual mercury content of lamps currently on the market – plus a small (10-20% margin of safety). Allowing higher safety margins rewards inaccurate dosing methods that also unnecessarily expose workers and the environment to mercury emission.

Contrary to those of industry representatives, the NGO's arguments presented in this and previous documents are supported by scientific evidence. This is highlighted numerous times by the consultant: "ELC has not provided hard fact data supporting its request for a high variance compared to the NGO information which is at least supported by a scientific source." (page 20). On page 31 when discussing exemption 1: "[...]A comparison and the finding of a compromise are hindered due to the fact that hard fact data is lacking in most of the cases. Only environmental NGOs have done extensive data research...."

Industry representatives also claim that higher mercury content is required to maintain lamp performance over time and that the longer the burning time, the higher the amount of mercury is needed. However, they have not presented any data showing that modern low-mercury lamps have reduced lifetimes, lower lumen output or other performance problems. NGOs have presented several cases –based on data from the US and EU market -- where lamps with lower mercury content have equal performance in these areas. We have reviewed mercury lamp data to determine whether there was a trade-off between efficiency and **lamp-life** and have not found any. For example, Philips Alto II T8 Fluorescent lamps all contain less than 2 mg of mercury and include models that last 24,000, 30,000, 36,000 and 40,000 hours with no difference in lumen output.

NGOs support, in principle, the allowance of additional amounts of mercury for lamp models with extraordinary lamp life since that will reduce the number of lamps that must be manufactured and recycled over time. For example, we support allowing a 5 mg limit on lamps with a very long lamp life, such as the Osram XT and XXT, which last 75,000 and 90,000 hours, respectively. We believe that the definition of long life that has been established under the proposed RoHS Directive revision -- of >25,000 hours – is too short. Additional mercury has not been demonstrated to be necessary at that rated life. We could support the increased mercury-content of 5 mg only for lamps that have a rated life of 40,000 hours or more.

³ 13 Corazza et al.- Mercury dosing solutions for fluorescent lamps, Journal of Physics, 4 July 2008.

Considering the above, we urge the European Commission and Member States to look carefully at the NGOs submissions and the Consultant's comments and establish lower maximum mercury levels than those proposed at the Oeko report.

LED as a Possible Substitute

Despite the provision of data from NGOs and research, such as the Swedish study, the NGOs regret that the Consultant's recommendations do not really emphasize and promote LEDs (or other mercury free technologies) as a possible substitute for lighting applications in general.

Considering the rapid developments of this technology, fluorescent lamp technology should only be seen as an interim development. The target should be mercury-free and energy-efficient lamps. LEDs have the ability to replace many low-wattage fluorescent lamps with more efficient products that are also much longer lasting and mercury-free. Therefore, the limits and expiry dates set for mercury use should drive the market in that direction and further innovation.

Further to our data submitted on 10 November 2008(page 41-42)⁴, it is clear that mercury-free efficient LED lamps are becoming more and more available for different applications in the market. The US Energy star programme recently came out with new standards for LED which are commercially available⁵.

As discussed extensively in our submissions, in areas of low-wattage applications where LEDs are currently utilized last longer and are equally or more efficient than fluorescent lamps, these should be preferred and no exemption should be granted for those applications. They can often replace low-wattage CFLs and linear fluorescents such as T2s used in exit sign; are increasingly, replacing high-pressure sodium (HPS) lamps in street lights, and are also used widely in traffic signals (replacing incandescent), backlighting for electronics and in vehicles.

Substitution on Application Level

We welcome the conclusion of the Consultant that exemptions for certain applications should not be granted if better, safer, environment friendly alternatives are available (p.26). The annex of the RoHS Directive could include exemptions which address these particular products/applications (e.g., exit signs, neon signs, and laptop and LCD screens). It has to be noted that the exemptions on mercury in lamps will be addressed to lamp manufacturers, whereas exemptions on other product/applications will be addressed to the respective manufacturers.

As a result, an exemption from the mercury-in-lamps related exemptions could be proposed in cases where certain products/applications, which fall under the RoHS directive, can use mercury-free and more energy-efficient lamps/lighting technologies.

We would, therefore, propose that for exit signs, neon-lit products, and laptop and LCD screens, the following text should be included in the Annex:

Exemptions [1, 2a,2b, etc,] ⁶ of this annex shall not apply to fluorescent-lit exit signs and exit sign retrofit kits, neon signs, laptops and other products containing LCD screens.
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We call on you this wording to be included in the Annex.

Transition Period/Expiry Date

The new requirements indicating maximum mercury content per lamp type should be implemented as soon as possible.

The EuP Implementing measures for domestic and street lighting have now been approved (Regulations 244/2009 and 245/2009, 18 March 2009). Inefficient non-clear (non-transparent, frosted) lamps will be phased out as of September 2009, whereas inefficient clear (transparent)

⁴ http://www.zeromercury.org/EU_developments/081110NGOs-RoHSconsultation-Review-of-AnnexHg-in-lamps.pdf

⁵ http://www.energystar.gov/index.cfm?c=ssl_res.pt_ssl

⁶ Mercury in lamps related exemptions

lamps will be phased out progressively, starting with the highest wattage (100W incandescent bulbs and above) in 2009. Starting September 2009, lamps equivalent in light output to 100W transparent incandescent bulbs and above will have to be at least class C (improved halogens instead of incandescent bulbs). By the end of 2012, the other wattage levels will follow, and the most commonly used bulbs, the 60W, will remain available until September 2011 and 40 and 25W bulbs until September 2012⁷.

Therefore, the mercury requirements should be applicable as soon as possible to follow these developments –most importantly for CFLs, linear fluorescent T5s, and T8s. HIDs should also follow the same transition period or soon after, since they are widely used and contain high amount of mercury, respectively.

On the basis of the above, and considering that a significant part of the market is already reaching the mercury limits proposed, we consider that the transition period for the discussed exemptions should be by 2010, and not by 2012 as proposed by the Consultant. Expiry date should then be set by 2014 at the latest.

As it has been discussed many times, LED/OLED or other mercury-free technology is developing rapidly for more and more applications. By 2014, it is expected that technology could readily replace many existing mercury-containing lamp applications. As a result, extending the expiry date until 2014 will delay the implementation of environmentally preferable lighting technology.

Comments on the Proposed Exemptions

We have, noticed that the Consultant has unfortunately adopted, almost fully at the end, the proposed ELC mercury-content limits and exemptions—contrary to the data and recommendations we provided. Our comments follow the order of exemptions proposed, and refer to main categories; further details on remaining categories can be found in our position papers (10 November 2008):

Exemption 1: Mercury in Compact Fluorescent Lamps (CFLs)

The ELC, until now, has not provided data to justify their 3,5 mg exemption proposals for general purpose CFLs. This mercury limit is questioned by the Consultant (pages 30). The EEB and GPI have provided a substantial amount of evidence showing the wide availability of both pin-based and screw-in models of CFLs with 2 mg of mercury or less. Moreover, the availability of low-mercury dosing "pills", capsules, and strips, make it easy for CFL manufacturers to offer products that can meet a 2 mg limit. An article published on 4 July 2008 in the *Journal of Applied Physics*, reported: "With this [mercury capsule] technology it is possible to achieve a high dosing accuracy and lamps with very low Hg content are produced; even amounts below 1.5 mg can be dosed with a variability lower than 10%." ⁸

We are concerned also about the proposals for above 50W general purpose lamps, as well as those for special purpose ones. It is really unfortunate that although not supported by mercury-content and market data, the Consultant, and now also the EC, has chosen to follow the ELC requirements, contrary to the ones suggested by the NGOs, supported by market data as well as the EuP, and Swedish study.

Especially for general purpose CFLs below 50 watts, we urge the European Commission and Member States, to re-consider this limit and adopt lower mercury content limits, notably a maximum of 2mg of mercury per lamp.

Second, as discussed earlier, we feel that this category needs clarification about what constitutes a "special purpose" CFL so that manufacturers do not unnecessarily use that exemption. It should be made crystal clear that cold cathode CFLs, which tend to have less mercury than conventional CFLs, do not fall in the special purpose category. This would not be justified based on the data and because they are used for general illumination, typically as replacements for low-wattage incandescent lamps. NGOs have provided substantial data showing that much lower levels of mercury are contained in CCFLs, thereby justifying a far lower maximum limit to be set – far below

⁷ <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/113&format=HTML&aged=0&language=EN&guiLanguage=en>

⁸ Corazza et al. - Mercury dosing solutions for fluorescent lamps, *Journal of Physics*, 4 July 2008.

5mg (if considered special purpose VFL) and even below 3.5 mg -limit proposed for conventional CFLs (or even below the 2 mg as in NGO proposal)⁹.

Exemption 2: Mercury in Linear and Non-Linear Fluorescent Lamps Used for General Purpose Lighting

Once more mercury content and market data have not been provided by the ELC although repeatedly requested by the NGOs and the Consultant . This hampers a clear judgment on the maximum mercury level that should be allowed.

NGOs believe that the limits proposed for T5 linear fluorescent (3mg/lamp) and T8 (3.5 mg/lamp), are still rather high, contrary to what we proposed (2 mg). Lamps already exist in the market with much lower content e.g. Philips T5 – 1.4mg, and T8 – 1.7mg, also consistent with what Osram(EU) and Sylvania (US) have been already able to meet. The argument that the market will not be possibly supplied by T5s if lower mercury limits were to be set (p.35) has not been supported by data but is only a statement.

In this category, our further concerns related to the non-correctly addressed, to our view, **long length T8s and U-shaped T8s, as these were discussed previously.**

Long-length lamps (≥ 1800 mm) (e.g. long T8 fluorescents), should not be automatically considered special purpose lamps. They fall under the category of general purpose lighting in the manufacturers' catalogues, and should have their own limit. We have proposed an 8 mg limit based on data indicating that at least two major manufacturers are currently close to meeting that limit and therefore the technology is well established.

Mercury Content of Standard-Output 8-foot T8s

Brand	Mean Lumens	Rated Life (LS/3)	Models	Max Mercury Content (mg)
Philips	5490	24,000	F96T8/TL800/PLUS/ALTO	4.4 mg
	5190	24,000	F96T8/TL700/PLUS/ALTO	
Sylvania	5795	18,000	FO96/800XP/ECO	8.5 mg
	5428	15,000	FO96/800/ECO	
	5130	15,000	FO96/741/ECO 24	
GE	5650	15,000	F96T8/SPX (Not ECO)	31-65 mg
	5650	24,000	F96T8/XL/SPX (Not ECO)	

Mercury Content of High-output 8-foot T8s (US)

Brand	Mean Lumens	Rated Life (LS/3)	Rated Life (PS/3)	Models	Max Mercury Content (mg)
Philips	7625	24,000	No info	F96T8/TL800/HO/PLUS/ALTO	4.4 mg
Sylvania	7710	18,000	No info	FO96/800/HO/ECO	9.5 mg
GE	7800	18,000	No info	F96T8/SPX/HO (Not ECO)	50-100 mg

Furthermore the proposed **2b exemption on T9 non-linear tri-phosphor lamps should be deleted.** The limit of 15 mg proposed is not justified and T9 lamps rarely if ever contain tri-band phosphors; instead, these circular fluorescents are usually halophosphates, and therefore T9 non-circular should fall under halophosphates of all shapes, and under the proposed limit of 8mg. .

Finally, our earlier comments on **life-time** become very relevant in this particular section. We support the recommendation that “long life” be defined (p.26) since the absence of any definition of “standard lifetime” and “long lifetime” has caused much confusion under the existing RoHS exemptions. On the basis of our findings, as earlier stated, there is no trade off between efficiency and lamp life – and lamps with life time >25000 hours are found to contain less than 2mg of mercury. For example, Philips Alto II T8 Fluorescent lamps all contain less than 2 mg of mercury and include models that last 24,000, 30,000, 36,000 and 40,000 hours with no difference in lumen output. Therefore we believe that the definition of long life that has been established under the proposed RoHS Directive revision - of >25,000 hours – is too short. We could support the increased mercury-content of 5 mg only for lamps that have a rated life of 40,000 hours or more.

⁹ See data/tables on p. 16-17 of the 10/11/2009 Updated Revised NGOs Responseto the stakeholder consultation on mercury-containing lamps, http://www.zeromercury.org/EU_developments/081110NGOs-RoHSconsultation-Review-of-AnnexHg-in-lamps.pdf

More information supporting our proposals for long lifetime, long-length lamps, halophosphates and induction lamps is available in our submissions of 10 November 2008. (see p.3-6 of NGOs comments to draft report).

Exemption 3 – Mercury in Straight Fluorescent Lamps for Special Purposes (adjusted to now cover only mercury in cold-cathode fluorescent lamps (CCFLs))

Although we are concerned about the higher (than the NGO proposed) levels of mercury recommended for the CCFLs, without overall industry analysis, we welcome the fact that mercury limits have now been set until 2012, in view of examining further developments. Our additional comments on LED developments should also be considered as an alternative to CCFLs in several applications such as backlighting, as discussed at the relevant section above.

In addition to the comments we have already provided, we recommend an exemption be added to ensure that laptop and LCD screens are mercury-free by 2012 at the latest.

Exemption 4a: High-intensity Discharge Lamps

While EEB and GPI think that this proposal represents a small improvement over the current system, which completely exempts all HID lamps from any mercury limits, we believe that the Commission should go much further to establish mercury limits on all types of HID lamps except for mercury vapour lamps used for general lighting, which we agree should be completely eliminated due to poor energy efficiency and light quality concerns.

(Exemption 4a-I) Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes:

The Consultant has essentially adopted the ELC's proposal for this category, although stating (p.41) that these are largely not supported by any data, which recommends the following:

(Exemption 4a-I) Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes:

- not exceeding in lamps with improved colour rendering index(CRI) > 60
P ≤ 155 W: 30 mg per burner
155 < P ≤ 405 W: 40 mg per burner
P > 405 W: 40 mg per burner
- not exceeding in other High Pressure Sodium (vapour) lamps, (CRI ≤ 60),
P ≤ 155 W: 25 mg per burner
155 < P ≤ 405 W: 30 mg per burner
P > 405 W: 40 mg per burner

Within the HPS category, the limits have been set for the entire category to accommodate the older technology rather than setting limits that can foster innovation.

We are most concerned that the way the exemption is proposed, it appears that standard single burner HPS cycling lamps be allowed to have significantly more mercury than necessary under the proposed limits – largely because they are being lumped in with other specialty HPS models such as the double-burner models – that typically have much higher mercury content levels.

Therefore for the low CRI category (CRI ≤ 60), we propose, instead, that **lower mercury limits be set on additional categories of HPS lamps: standard cycling (single burner) lamps, and non-cycling** models, since they have substantial lower mercury levels (1/20th of other HPS technologies) and are more long-lasting. As also mentioned by the consultant (p.43) data is available for these categories as well as the double-burner low CRI HPSs.

Standard cycling HPS lamps are typically available in regular and low-mercury ("Eco" models. Some companies, including Philips and GE in the US, have already phased out the high-mercury models completely. Our proposed mercury-content levels for **standard cycling HPS lamps** would be the following:

- **HPS (cycling) lamps (excluding high-CRI and double-burner models) <= 150W, shall not contain more than 15 mg/ lamp**
- **HPS (cycling) lamps (excluding high-CRI and double-burner models) > 150W shall not contain more than 30 mg/lamp**

As it can be seen from above, NGOs could accept the Consultant's/ELC proposal of 30 mg for cycling HPS lamps of wattages >155 to 405. At least two US manufacturers can currently meet a 30 mg limit on these.

However, we also support including the 30 mg limit on the wattages above 405 watts, contrary to the 40mg proposed, since at least two manufacturers can meet that limit as well.

See in the Annex of this document a table showing which standard cycling HPS lamps would be allowed to be sold if the NGO proposed mercury limits are adopted.

Therefore the Consultant's currently proposed limits for low CRI HPS should apply only to double burner models.

Although there had been no reference to non-cycling models in the debate until now, the industry provided table (p. 43), chose to compare EU models with non-cycling US models. Even if the argument that EuP efficiency levels may not be met for the higher wattage (> 150W) non-cycling HPS lamps, the NGOs initial recommendation of a 5mg limit HPS should be considered at least for those models that do meet the EuP energy-efficiency levels, which currently includes models of 150 watts or less.

Finally, we further urge the Commission and Member States to set separate, lower mercury limits for **Non-cycling HPS lamps**, because this subcategory of HPS lamps contains dramatically lower mercury levels. While it is true that some of the non-cycling HPS lamps do not meet the EuP efficiency ratings, many of the low-wattage models (below 100W) do and some of the medium-wattage models are very close – and are likely to improve over time. These have less mercury and last longer, so there are environmental benefits. It is not unreasonable to assume that these models could enter the EU marketplace in the future due to these benefits and therefore should have a mercury limit established as we propose below:

HPS Non – cycling, below 400W , shall not contain more than 10 mg Hg

HPS Non cycling, above 400W, shall not contain more than 25 mg.

In Annex II, examples of non-cycling lamps that meet this limit can be found.

(Exemption 4a-II) High Pressure Mercury (vapour) lamps (HPMV):

We are happy to see that exemption for the HPMV for general purpose has not been included in the Consultant's recommendations since this class of lamps has both high mercury content and low efficiency. Given, however, that data has not been provided by industry – we would rather propose, as the Consultant mentions, that the exemption on special purpose HPMV lamps is also deleted and industry submits separate notification for exemption if these are still needed. This would not cause hardship since higher quality light is emitted with less energy usage by other HID and fluorescent replacements. This measure could take place immediately and therefore neither the exemption nor the proposed expiry date are needed.

We agree with the Consultant recommendation that all mercury vapour lamps and luminaires should be labelled: 'For specialty applications only, not for general illumination' as it was decided in the US by NEMA, the US lamp manufacturers association.

We further strongly urge the Commission to also eliminate the exemption for luminaires containing mercury vapour lamps since they do not represent BAT. In fact, they represent the worst available

technology. In the United States, ballasts for mercury vapour lamps have been banned from manufacture and import as of January 1, 2008 due to energy efficiency concerns, under the 2005 Energy Policy Act¹⁰.

(Exemption 4a-III) Metal Halide lamps (MH)

We agree with the ELC that each type of HID lamp should be treated differently under the RoHS Directive. However, we feel that it is imperative that all HID – including all metal halide lamps -- have some mercury limit established. The proposal to give a blanket exemption to all metal halides leaves a huge gap. We understand that the mercury content of metal halides is not as well understood as that of fluorescent lamps. Although we agree with the ELC that more mercury is needed as the wattage of metal halides increases., the analysis fails to acknowledge that there is a subcategory of metal halide lamps that should be encouraged through the RoHS Directive because they are lower in mercury content as well as longer in rated life and higher in efficiency. This category of metal halides includes ceramic metal halides and other “pulse” start models and excludes high-mercury, less-efficient probe start metal halides.

The data on metal halides provided in the final Consultant’s report (p. 44) by one lamp manufacturer , support the mercury limits we proposed. (e.g., a 10 mg limit on metal halides between 25 and 100 watts). The NGOs have provided mercury content information on categories of metal halide lamps that was supplied by US manufacturers (Philips, Sylvania and General Electric), which are the same companies that make the same categories of lamps in Europe. The Commission can, therefore, use this data, as we did, as a guide as to what is technologically available within this lamp category, and propose:

Proposed limits for Metal Halide Lamps

Wattages	Proposed Mercury Limit	Companies that can meet this
<25	2.5 mg	Sylvania, Philips
>25 <100	10 mg	Sylvania, Philips, GE
>100 <200	15 mg	Sylvania, Philips,
>200 <400	25 mg	Philips. Sylvania
>400	No limit	All

We are, therefore, opposed to the proposed blanket RoHS exemption for metal halide lamps; instead, the Commission should set mercury limits that represent the best available technology within the metal halide family of lamps. EEB and GPI reviewed the lamp catalogues of several ELC members and found a very large number of ceramic and other pulse start metal halides within these wattages. Further data on this family of lamps can be found in our earlier submissions¹¹.

Our recommendation for setting mercury limits for metal halide lamps, is consistent with the direction of the EuP regulation adopted on 26 September 2008 on tertiary lighting. By following the above recommendation, the Commission would have the opportunity to accelerate the adoption of more environmentally – low mercury/high efficiency lighting equipment.

Exemption 4b: “Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex”

Special purpose fluorescent lighting should be carefully defined to prevent this category from being abused.

From the list of lamp types included in the definition provided by ELC (adopted by the Consultant), we consider that special purpose lamps should be strictly identified and defined. Only models that need additional mercury should be granted higher limits since some currently on this list could be considered as linear or non-linear fluorescent lamps and could be falling under the exemptions as proposed above (e.g. aquaria lights). The need for potentially higher mercury limits must be documented and justified as to why they cannot meet limits in other categories.

¹⁰ See “Effects of EPA 2005 on Mercury Vapor Lamp Ballasts and Lighting Systems: Frequently Asked Questions,” Prepared by Lighting Systems Division, National Electrical Manufacturers Association, Rosslyn, Virginia 22209; Date to be determined; www.eyelighting.com/LSD_37_EPACT_2005_for_Hg_Ballasts_V2_0_01-14-2008.pdf.

¹¹ See p. 39-41 in Updated Revised NGOs response to the consultation.

For example, from data we collected on lamps such as aquarium lamps, cold climate lamps, UV, lamps used as appliance lamps, exit and 'neon' sign, it can be seen that these can either be linear fluorescent lamps that would fall in the identified respective categories of e.g. T5, T8, or should be directly replaced by LEDs (see p.29-35 of NGO comments¹²).

Long-length lamps (≥ 1800 mm) (e.g. long T8 fluorescents), should not be automatically considered special purpose lamps. They fall under the category of general purpose lighting in the manufacturers' catalogues, and should have their own limit. (see exemption 2 above)

For more information

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¹² http://zeromercury.org/EU_developments/081110NGOs-RoHSconsultation-Review-of-AnnexHg-in-lamps.pdf

ANNEX I

**DATA FROM US LAMP MANUFACTURERS OF CYCLING SINGLE BURNER HPS LAMPS (highlighted grey contain more mercury than non-highlighted equivalent models)
(Compiled by Green Purchasing Institute)**

Watts	OEM	Lamp Description	Lamp Model #	Mercury Content (mg)	NGO Mercury Proposal	ELC Mercury Proposal	Rated Life (Hours)	Notes
50	GE	LU50	44975	11-30	15	25	24,000+	Lucalox standard model – want to set limit to eliminate this model
50	PH	50S68/ALTO	36867-0	17.7	15	25	24,000+	Ceramalux ALTO
50	SY	LU50/ECO	67510	10.8	15	25	24,000+	Ecologic
70	GE	LU70	44033	11-30	15	25	24,000+	Lucalox standard model – want to set limit to eliminate this model because old dosing method used and mercury is too high
70	GE	LU70/ECO	45760	1-10	15	25	24,000+	Ecolux, low-mercury
70	PH	C70S62/ALTO	36869-6	17	15	25	24,000	Ceramalux – want to set limit to eliminate this model; mercury much higher than other brands
70	SY	LU70/ECO	67512	10.8	15	25	24,000+	Ecologic
100	GE	LU100	44037	11-30	15	25	24,000+	Lucalox standard model – want to set limit to eliminate this model because old dosing method used and mercury is too high
100	GE	LU100/ECO	45761	1-10	15	25	24,000+	Ecolux, low-mercury
100	PH	C100S54/ALTO*	36872-0	22.1	15	25	24,000+	Ceramalux – want to set limit to eliminate this model; mercury twice as high as other brands
100	SY	LU100/ECO	67514	11	15	25	24,000+	Ecologic, low-mercury
150	GE	LU150/55	44043	10-50	15	25	24,000+	Lucalox standard model – want to set limit to eliminate this model because old dosing method used and mercury is too high
150	GE	LU150/55/ECO	45762	1-10	15	25	24,000+	Ecolux, Low-mercury
150	PH	C150S55/ALTO	36874-6	22.1	15	25	24,000+	Ceramalux – want to set limit to eliminate this model; mercury much higher than other brands
150	SY	LU150/55/ECO	67516	10.8	15	25	24,000+	Ecologic

150	GE	LU150/55/ECO	45762	1-10	15	25	24,000 +	Ecolux, Low-mercury
150	PH	C150S55/ALTO	36874-6	22.1	15	25	24,000 +	Ceramalux – want to set limit to eliminate this model; mercury much higher than other brands
150	SY	LU150/55/ECO	67516	10.8	15	25	24,000 +	Ecologic

*Philips 100-watt HPS lamp listed in its European lamps catalog lists on only 16 mg of mercury.
See http://www.prismaecat.lighting.philips.com/FredhopperPDFWebServiceInter/docts/54831751-2b66-415f-9c74-9f559ebe82ec/MASTER_SON_T_PIA_Plus_100W_220_E40_1SL.pdf

Watts	OEM	Lamp Description	Lamp Model #	Mercury Content (mg)	Revised NGO Mercury Proposal*	ELC Mercury Proposal	Rated Life (Hours)	Notes
200	GE	LU200	44206	10-50	30	30	24,000+	Lucalox standard model – want to set limit to eliminate this model because old dosing method used and mercury is too high
200	GE	LU200/ECO	45763	11-30	30	30	24,000+	Ecolux
200	PH	C200S66/A LTO	36877-9	31	30	30	24,000+	Ceramalux, ALTO
200	SY	LU200/ECO	67576	14.4	30	30	24,000+	Ecologic
250	GE	LU250	44047	10-50	30	30	24,000+	Lucalox standard model – want to set limit to eliminate this model because old dosing method used and mercury is too high
250	GE	LU250/ECO	45764	11-30	30	30	24,000+	Ecolux, made with no lead solder
250	PH	C250S50/A LTO*	36879-5	31.9	30	30	24,000+	Ceramalux, ALTO
250	SY	LU250/ECO	67578	10.8	30	30	24,000+	Ecologic
400	GE	LU400	44054	11-30	30	30	24,000+	Lucalox standard model
400	GE	LU400/ECO	45765	11-30	30	30	24,000+	Ecolux, made with no lead solder
400	PH	C400S51/A LTO**	36881-1	31	30	30	24,000+	Ceramalux, ALTO
400	SY	LU400/ECO	67533	10.8	30	30	24,000+	Ecologic
1000	GE	LU1000/ECO	44058	11-30	30	40	24,000+	Made with no lead solder; no LU1000 available; all TCLP-compliant
1000	PH	C1000S52/ALTO	36883-7	44	30	40	24,000+	Ceramalux, ALTO
1000	SY	LU1000/ECO	67307	18	30	40	24,000+	Ecologic

*Philips equivalent model in its European catalog reports only 15 mg of mercury.
See http://www.prismaecat.lighting.philips.com/FredhopperPDFWebServiceInter/docts/54be9f9d-683f-4d25-8b13-4122ec8baecd/MASTER_SON_T_PIA_Plus_250W_220_E40_1SL.pdf

** Philips equivalent model in its European catalog reports only 20 mg of mercury for this model.
See http://www.prismaecat.lighting.philips.com/FredhopperPDFWebServiceInter/docts/2bad0d50-a00e-4021-adfb-dcbebf5f166b/MASTER_SON_T_PIA_Plus_400W_220_E40_1SL.pdf

ANNEX II

Examples of Non-cycling HPS lamps that meet the NGOs proposed limit:

50-watt HPS Non-cycling Lamps (Low-mercury)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	4,000	30,000	C50S68/ALTO NC HPS	Requested from manufacturer
Sylvania	4,000	30,000	LU70/PLUS/ECO	<6 mg

70-watt HPS Non-cycling Lamps (Low-mercury)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	6,300	30,000	C70S62/ALTO NC HPS	1.2 mg
GE	6,300	30,000	LU70/ECO/NC	2.0 mg
Sylvania	6,300	30,000	LU70/PLUS/ECO	<6.0 mg

100-watt HPS Non-cycling Lamps (Low-mercury)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	10,000	30,000	C100S54/ALTO NC	2
GE	10,500	30,000	LU100/ECO/NC	2
Sylvania	10,000	30,000	LU100/PLUS/ECO	0.9

150-watt HPS Non-cycling Lamps (Low-mercury)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	16,000	30,000	C150S55/ALTO NC HPS 12PK	2
GE	16,000	30,000	LU150/55/ECO/NC	4
Sylvania	16,000	30,000	LU150/55/PLUS/ECO	<6

250-watt HPS Non-cycling Lamps (Low-mercury)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	28,500	30,000	C250S51/ALTO NC HPS	3.5
GE	29,000	30,000	LU250/ECO/NC	5.0
Sylvania	29,000	30,000	LU100/PLUS/ECO	<6

400-watt HPS Non-cycling Lamps (Low-mercury)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	50,000	30,000	C150S55/ALTO NC HPS 12PK	5.4
GE	54,000	30,000	LU400/ECO/NC	7.0
Sylvania	50,000	30,000	LU400/PLUS/ECO	6.0

1000-watt HPS Non-cycling Lamps (25 mg limit)

Brand	Initial Lumens	Rated Life (Hours)	Models	Max Mercury Content
Philips	130,000	30,000	C1000S52/ALTO NC HPS	44
GE	140,000	24,000	LU1000/ECO/NC	25.0
Sylvania	130,000	30,000	LU1000/PLUS	15