Final Minutes 2nd Stakeholder meeting Ecodesign Light Sources study (Lot 8/9/19)

Date: 17 June 2015
Location: Berlaymont building, Schumann room, Brussels.
Time: 9:30 - 15:30h.

Study team:
Chair: René Kemna, VHK (RK). Presentations: Leo Wierda, VHK (LW). Technical experts: Stuart Jeffcott, Jeffcott Associates (SJ), Paul van Tichelen, VITO (PvT).
Policy Officer: Ruben Kubiak, European Commission DG ENER (RKU)
Total 26 participants (see Annex).
Meeting recorded on audio-file strictly for facilitating the writing of minutes.

Meeting documents (Task 4/5/6 reports) published on project website May 2015.
Agenda: Discussion on Time schedule and Task 4 in the morning, Task 5/6 and AOB in the afternoon.
Presentation slides (76) published 27.6.2015 on project website www.ecodesign-lightsources.eu .

Deadline for written comments on the Task 4/5/6 reports is 15 July 2015.
Deadline for stakeholder input to Task 7 (scenario analysis) is 30 August 2015.

Minutes

Welcome, agenda and announcements by RK.
LW presents slides of the Introduction, Task 4, 5 and 6.

[Introduction and time schedule]

Mike Scholand (MS,CLASP) asks when the Task 7 report is expected to be issued and what opportunities stakeholders will have to comment on it.
RK: The final report of the study, including Task 7, is scheduled for October 2015. The Commission prefers to discuss that report in a Consultation Forum (CF), not in a stakeholder meeting (SM). This anyway guarantees the democratic process. Stakeholders are invited to provide their input for the Task 7 scenario analysis before the end of August.
RKU: The Commission wants to avoid to discuss the same topic twice, i.e. first in a SM and then in a CF. The SM's serve to get the input data for the scenario analyses right. Once you have these data, the Task 7 activities and conclusions follow more or less automatically. The full study will be presented to the CF together with a first opinion of the Commission and maybe a draft of a new regulation. At that point the CF can comment on the entire study.
Floris Akkerman (FA, BAM, DE) asks the EC to provide sufficient time between the publishing of the final report and the convocation of the CF so that industry and member states can seriously study it and issue their comments.
RKU responds that normally documents are made available one month before the CF; in this case it might be a bit earlier. The EC intends to have the CF before the end of 2015, but this also depends on when the study will finish (contractual deadline is October).

[Task 4, LED technology and time-line for efficacy and price]

Kees van Meerten (KvM, LightingEurope, LE) (*in reaction to the statement in the presentation that Philips is slowing down LED activities* [1]) explains that LED-chip production in Lumileds was spinned-off, but Philips Lighting, as a separate company, remains strongly involved in LED lighting technology and is not slowing down LED lighting production. Philips will not have its own brand of LED-chips, but even today Philips is using chips from Lumileds as well as from other brands.

In the opinion of MS , the concern raised in the presentation that the halogen phase-out, with associated loss in revenues for industry, will lead to a slowdown in investments in LED R&D and thus to a slowdown in efficacy improvements, is not valid. There are only few manufacturers that have revenues from both halogens and LEDs, while many have interests only in LEDs, so the loss of halogen revenues cannot be expected to have an influence on LED improvements.

KvM asks if the study team can be more specific on how the projection for LED efficacy was derived.

LW answers that the trend of the US DoE curve was more or less accepted, but the curve was lowered to make it pass through the point that was identified as current average for all LEDs (89 lm/W in 2014/2015). The proposed projection is intended to represent the average efficacy of new sold LEDs in each year, not the best available efficacy that seems to be represented by the US DoE curves. It is important that stakeholders agree with this curve, so the study team is open to change the curve based on comments.

PvT adds that the conviction of the study team that the projected efficacies can be met is also based on the announcement of Philips and Osram that 200 lm/W LED tubes have already been realized in laboratory.

Otmar Franz (OF, LightingEurope) explains that these tubes use special phosphors and special chips and reach these high efficacies under special conditions. What manufacturers can do, and what they have to do to stay in business, are different things and should not be mixed up when defining projections.

MS notes that major American lamp manufacturers have been directly involved in the process that led to the US DoE projections, so these are not just data invented internally by government officials. Even if the American market is different from the European market, LED technology is global, and the US DoE data are a good base for EU-projections.

Peter Bennich (PB, Sweden) says that the proposed efficacy line seems reasonable, also considering the results of testing performed in Sweden before Christmas 2014 that already showed efficacies up to 134 lm/W.

KvM observes that the efficacy projection and the price projection should be considered together. High-power chips reach high efficacies, but lower prices are also necessary and therefore mid-power chips and low-power chips are increasingly being applied. However these chips also have lower efficacy. This ongoing trend towards low-power chips is missing in the report. Some of the low prices on the current market are introduction prices, and these lamps are typically based on lower-lifetime and lower-efficacy chips.

[1] This statement has been removed in the version of the presentation that is published on the website.

RK clarifies that the proposed curves assume a lifetime of 20,000 hours, which is rather modest as compared to average claims by manufacturers. The study team does not have indications on trends towards lower efficacies and lower lifetimes, just the opposite. Does LE have any evidence for this?

OF remarks that residential users have no sensibility for a difference in lifetime between e.g. 10,000 h and 20,000 h, so the study team should not expect to see complaints. In the non-residential sector this might be different, but also there it is too early to already have complaints on lifetimes.

KvM adds that LE does not say that LED efficacy is going down; in general it is going up. However, in order to enable lower prices, the LED-chips being used are not those having the highest possible efficacy. LightingEurope has its own projections on LED efficacies and will present the study team with input on this topic by mid-July.

RK observes that the Task 4 report was issued a month ago and that stakeholders already had the time to form an opinion. It would be important to reach a consensus on the projections during this meeting. Otherwise, if, latest mid-July, there is no clear evidence of the contrary, the study team will consider the proposed curves as best possible estimates and use them in the Task 7 scenario analysis.

KvM reacts that there are too many reports to be read and commented in a too short time. In a preliminary reaction the efficacy curve seems rather ambitious. LE will most likely not propose a curve that is half of the one proposed by the study team. However, the two LED projection curves are probably the most important ones of the entire study and deserve a close examination. The contents should be more important than the process-times here. Therefore LE asks sufficient time to seriously study the topic and come up with good information.

MS notes that there is an offer in the US Home Depot retail stores now for 2 lamps at 5 US dollars. True that this is an introductory price, but after 90 days it will be 1 lamp for 5 dollars and that is less than half of what the study team proposal assumes, while efficacy is in line with the proposal. The curves proposed by the study team seem excellent.

Yifaat Baron (YB, Oeko-Institut) suggests to present two price options in the scenarios – one high price/high efficacy, one low price/low efficacy. This would make it easier for stakeholders to comment.

RK answers that this could be done as part of a sensitivity analysis, but a choice will have to be made soon and this will for sure be somewhere in the middle. In addition the proposal graphs already indicate a range for the current average values and shifting the curves in that interval already gives a good idea of the uncertainties we are dealing with.

RK concludes that the study team had hoped to reach a consensus on the LED timeline during this meeting. Clearly this was not possible, which is a pity. Therefore, the team will await the feedback from the industry and from other stakeholders before 15 July 2015, and then autonomously decide on whether the proposed timeline has to be amended. There is no space in the time-schedule for a second discussion with the stakeholders.

[Task 4, Other new lighting technologies]

Andrea Harrer (AH, BAM, DE) asks how standby energy consumption and energy consumption of non-lighting functions of smart lamps will be regulated. Lighting is exempted from the horizontal regulation on network standby. Will these aspects be integrated in the new lighting regulation or will that be limited to the lighting efficacy ?

LW expects most of these aspects to be handled in the eco-design study on smart appliances, but there is no information yet on what type of regulation they have in mind.

PvT: the EC and the CF will have to decide what to do with these hybrid products that have different functions and that would fall in different eco-design product categories.

RKU: lamps integrated into other products, e.g. refrigerators, are considered in current regulations and that might continue to be the case. In addition a study is ongoing on lighting systems that will cover aspects related to control devices and sensors, including smart lamps. Lamps in a refrigerator have an illumination function, but nobody would buy a refrigerator for that function. For smart lamps, e.g. a lamp with integrated loudspeaker, this is somewhat different. The EC has no solution for this yet, but the number of products challenging such a solution is still small, so for the moment we would regulate only the lighting function and then see what the future brings.

PB raises the topic of the security of smart lamps, i.e. the possibility to hack into the WiFi system through the lamps. Associated to that the topic of data protection, i.e. smart lamps reporting back usage data to someone else than the user. Will these aspects be handled in a lighting regulation?

RKU: these topics are not related to energy efficiency and have to be addressed elsewhere.

MS observes that there is no testing standard for the light generation efficacy of smart lamps that can produce different light colours. At which colour point should the lamp be tested? The EC might need to issue a mandate to look into this matter. The IEA 4E SSL Annex is looking at this issue through a project headed by Casper Kofod in Denmark, so keep an eye on information from there.
RK suggests to take the white colour in the centre of the range, but the remark from MS has been noted and will be taken into account.

[Task 4, Classic lighting technologies, Linear Fluorescent Lamps and their LED retrofits]

OF asks if eco-design studies also have to consider light quality aspects or if they only address energy efficacy.

RK answers that possible negative impacts of energy efficient products on consumers and industry are explicitly included in the studies. Functionality of lighting and light quality are certainly being taken into account.

OF points out that a LED tube cannot generally be retrofitted into a fluorescent lamp luminaire without affecting the light quality, in particular when the existing luminaire involves indirect lighting. Directional LED tubes that emit in a 120-150 degree angle will not deliver this indirect light and thus will not satisfy the light planning for the room.

LW answers that LE-members are also offering plug-and-play LED retrofit tubes, so they must be useful for some applications.

OF confirms that for some applications LED tubes are an adequate substitute, but not for all.

PB confirms that the light distribution problem of LED tubes exists. Maybe the future regulation could address this by means of information requirements. Anyway, 360 degree emitting LED tubes are now also becoming available.

Catherine Lootens (CL) reports that in 2010 several tests have been performed at KU Leuven regarding LED tubes. Negative impacts from the difference in light distribution have been found, in addition to aspects related to the colour of the light, glare, contrast and visual comfort in general. The consumer should be made aware of these aspects. In addition the substitution of LFL's by LED tubes has been noticed to lead to insurance problems in some cases in Belgium.

MS notes that there has been considerable progress in LED tubes since 2010 and that tests might have to be repeated. At the Light and Building fair of 2014, Osram presented prototype LED tubes that emit over 360 degrees, and the Task4 report announces that these tubes should come to the market in 2015. So maybe the directionality and insurance problems have already been solved ?

OF cannot guarantee that this type of LED tube will actually come to the market this year.

RK specifically invites the lighting designers to comment on the topic of LFL substitution by LED tubes in their written comments.

[Task 4, Classic lighting technologies, High-Intensity Discharge lamps and their LED retrofits]

PB: in Sweden LED for street lighting is certainly coming, but metal halide lamps are also often used by municipalities because they are brighter. If you don't need dimmability, that is an option.

CL misses plasma lamps in the study. They are used e.g. as an alternative to HID-lamps in street lighting applications.

LW asks if there are any data on how widespread the use of plasma lamps actually is.

CL does not have these data but knows they are being applied in Belgium. In addition induction lamps are not mentioned in the study. There has been a wave of induction lighting coming into Belgium, even if these lamps were confusingly publicized, hiding a promise of lower energy use for the same lighting quality in an overall marketing 'mist' difficult to understand for consumers. Both types of lamps should at least be addressed in the reports.

Anders Peder Øbro (APØ, Danish Energy Agency, DEA) has seen plasma lamps and induction lamps being publicized in Denmark for road lighting. A future regulations should at least mention them and clarify if they are included or not.

PB: induction lamps have also been seen on the market in Sweden, but they had EMC problems and do not seem to be popular anymore. Induction lamps are not a problem in Sweden.

RK: when they first came to the market the advantage of induction lamps was their long product life of 60,000 hours. However, nowadays it seems easier and cheaper to realize these long lifetimes using LEDs, and induction lamps do not seem to have other advantages.

KvM confirms this and also clarifies that PHILIPS stopped selling induction lamps years ago (PHILIPS sold the production unit of these lamps). Third parties still produce and sell these lamps. Typical niche applications: warning lights on oil rigs, high buildings etc..

[Task 4, Classic lighting technologies, Other lamp types and their LED retrofits]

No comments.

[Task 4, Packaging, Bill-of-Materials and End-of-Life]

CL asks if the study team is aware of the CYCLED project on recycling of products containing LEDs.

LW and PvT answer that they have considered some of the CYCLED publications during the study.

RK welcomes additional information and CL promises to forward it to the study team.

KvM observes that many different classic lighting types have been distinguished, while there is a single bill-of-materials for 1000 lm LEDs. This has implications during the use of the data in Task 5. More granularity is required within the LED technology. KvM suggests to subdivide at least in a linear LED lamp, a consumer LED lamp and a professional LED lamp.

RK points out that LCA data are not widespread and what is presented in the reports is the best the study team was able to do. If LE has additional information that enables a further breakdown, this would be welcome. The topic will be further discussed after the Task 5 presentation.

MS signals the existence of a 2012 US DoE LCA on the Philips Luxeon Rebel LED with remote phosphor on the plastic bulb. The result is compared with the LCA for a CFL, for an incandescent lamp and for an assumed 2017 LED version.

LW answers that he is aware of this study.

RK tries to temper the enthusiasm on the possibilities of LCA's. Subdividing in more types of LEDs maybe could make the study look more credible to people that don't know the details, but the reality is that the composition of LEDs is changing every month and that many details, such as the (now) much discussed quantum dots with 50 atoms of Cadmium, are not included. Another example is that we are now considering only one type of substrate, while many different types are being used. In addition, any eco-design measures will most likely not have any effects before 2020 and we don't know what the composition of LEDs will be then. So we should not exaggerate with the level of detail and precision required in the LCA's.

[Task 5, Environment and Economics]

KvM repeats his remark made during the Task 4 discussion that he would have preferred to see a further category breakdown of the LEDs, distinguishing at least LEDs for typical consumer applications from

LEDs for professional applications. In addition the large LCC difference between directional halogen lamps (category HL MV X) and comparable GLS lamps is not realistic (*see presentation slide 59*).

As regards the last point LW answers that the HL MV X is an atypical base case, being the collector of all halogen lamps not contained in the other halogen base cases. There are many relatively cheap and small lamps with GU10 cap in there but also relatively expensive and large PAR lamps so that is it difficult to compute average prices and characteristics. LW also noted the LCC peak value for HL MV X and promises to check the underlying data.

As regards the choice of the study team to have a single LED base case, LW explains that this derives mainly from a data availability problem. The study team already had problems finding LCA data for this one base case, and those problems would increase when further splitting the category. In particular the detailed breakdown on the bill-of-materials presented problems for LEDs. For one LED filament lamp the study team performed own weight measurements in laboratory, but it was not feasible, given time and resources, to do this for all LED lamp types. Additional input from industry would be welcome on this point.

KvM remarks that consequently the reliability of the data and outcome presented for LEDs is questionable. Is it the role of the industry to provide material breakdown data? He expected the study team to determine the material breakdown for several LED lamp types in laboratory and then to divide these data between typical consumer products and typical professional products.

RK clarifies that the LED outcomes in the report, in particular as regards the small substances, have been based for a large part on data from an Oekopol study, and they probably invested 50-100k euros in breaking down this one lamp, without having the actual information that industry has. There is a wide variety of material compositions being used for LED lamps, e.g. different substrate types, and compositions are rapidly changing in time. It is highly speculative to say what the composition of LED lamps will be in some years from now. The best the study team could ever do, even given infinite resources, is to give a plausible, indicative LCA, but it is not an exact science. Consequently it is not so easy to state if outcomes are reliable or not.

KvM understands this, and it also clear that whatever the outcome is, LEDs will be beneficial from the LCA point of view. However, the reports suggest reliability, and the Commission will base policy decisions on these reports, so it would be preferable to indicate that due to the lack of information we should be careful in comparing LCA's for LED lamps to LCA's for other lamp types.

RK answers that if it is not already clear from the reports, it can be further clarified that the LED data are indications, that not every BoM for LEDs exactly looks like this, and that there is a spread in the results.

As regards further differentiation within the LED category, RK answers that even given more resources, the study team would probably not be able to increase the quality of the data in the available time. If industry wants a further category split up, input on this will have to come from them. Any such information would be welcome and would be taken into account.

KvM answers that LE will see what they can provide.

CL agrees with the conclusions of the report that LFL's use more phosphors than LED lamps, but the study should differentiate between remote phosphor LEDs and use of phosphors directly on the die or

package. This makes a large difference for the rare-earth-material (REE) content. At the University of Gent research is ongoing to develop other phosphor types that use less REE.

RK: this example further confirms the existence of the spread in LED material composition mentioned before. Another example is that Blue LEDs with phosphors are different from RGB LEDs. Regarding phosphors, even if we would exactly know their composition, there is anyway a lack of data on the environmental impacts of the materials involved, e.g. Yttrium.

[Task 6, Design Options]

CL asks if in the substitution options for LFL the lumen equivalence at end-of-life was considered. After say 50,000 h of life LED lamps will only have 70-80% of their initial lumens while LFL T5 have at least 90% after 20,000 h.

LW answers that, for all lamp types, the study team tried to choose the lifetimes such that maintained lumens at the end-of-life are equivalent for the compared options.

CL notes that in the LFL design options the high-efficiency (HE) and long-life (XL) versions were considered, but was the ECO-version also taken into account ? LW answers that he is aware of the ECO-versions and their characteristics. It may also be that ECO-characteristics have been used for e.g. the HE-option. This can be verified through the references in the report.

APØ observes that the report gives the impression that LEDs should payback within the lifetime of the lamps they replace. Rather, the payback within the entire lifetime of the LEDs should be considered.

LW answers that he will take this suggestion into consideration for the final version of the report, taking also into account the written comments that DEA already delivered.

APØ asks to start the curves for the 2020 LED option at 5 years and not at 0 years, because this option does not exist at 0 years. It is confusing to present the 2015 and 2020 curves together in a single graph.

LW explains that intentionally the years on the graph are not 2015, 2016, etc., but 0, 1, 2 etc. The graph intends to show what payback times would be possible in 2020 if it is assumed that characteristics of the classic technologies remain the same while a 2020 LED with the projected characteristics would then be available. For the 2015 situation the graph should be interpreted without the 2020 LED curve, reading year zero as 2015; for the 2020 situation the graph should be interpreted without the 2015 LED curve, reading year zero as 2020.

RK adds that the million-lumen-hour basis may seem simplistic, but it actually is a good measure for representing the life-cycle costs. The further you look into the future, the more complex life-time calculations for LEDs become. You have to discount future purchases and energy costs while lamp price and electricity cost developments are actually unknown. There are a lot of assumptions involved and that will give a wide spread in results. It is well possible to consider longer time-spans, but not necessarily more exact.

[Any other business]

On behalf of the study team RK explicitly invites stakeholders to provide inputs and ideas as regards the scenario analyses in Task 7. Suggestions on that would be very welcome. Stakeholders are invited to be

creative in this, but also to try to have their suggestions supported by others. Having these inputs before 30 August would enable the study team to perform the right calculations. This is also in the interest of the stakeholders themselves and would make future decisions in the Consultation Forum easier.

KvM asks if it is possible to extend this deadline to mid-September, because there are holidays in between that make it difficult to have a combined industry answer by the end of August. The contents of the proposals, and of the study, should be more important than maintaining a strict deadline. RK outlines the activities the study team and the Commission have to perform after receiving the input from the stakeholders, concluding that mid-September is too late. The contractual deadline for the study of October 2015 is not so easy to change. Stakeholders should really try to provide their inputs by the end of August. If this is really not possible, let the study team know and we will see what can be done but there are no guarantees.

Francisco Zuloaga (Topten, FZ) announces that Topten intends to submit comments on the Task 4, 5, 6 reports before 15 July 2015, but some of these comments will be related to energy labels for luminaires. Is this the right occasion to give comments on this topic, or would it have to be postponed to the lighting systems study ?

RK answers that the people working on the light sources study and the lighting systems study are the same, only in a different hierarchy, so comments will arrive anyway. If the topic of energy labels for luminaires will be subject of a new regulation on light sources is still to be seen.

RKU recommends to submit the comments now, within the timetable of the light sources study. The Commission anyway intended to reconsider the energy labelling directive in the light of the outcomes of this study. The sooner the comments are available, the better.

CL wonders how the current study is related to the eco-label.

RK answers that there is no mandate in the current study to work on the eco-label. The Commission is obviously free to use the results of the light sources study for any considerations on the eco-label.

CL informs that DG Environment very recently communicated that there will be no new eco-label criteria for light sources; the current criteria remain valid until the end of 2015.

RK thanks all and wishes a good trip home.

LW/VHK 29.6.2015

ANNEX

2nd Stakeholder meeting Ecodesign Light Sources study (Lot 8/9/19)
Date: 17 June 2015, Time: 9:30 - 15:30h.
Location: Berlaymont building, Schumann room, Brussels
Participants

First Name	Surname	Company / organisation name	Nationality
Floris	Akkerman	Federal Institute for Materials Research and Testing	German
Martin	Bachler	OSRAM GmbH	German
Yifaat	Baron	Oeko-Institu e.V	Israeli
Peter	Bennich	Swedish Energy Agency	Swedish
Chiara	Briatore	LightingEurope	Italian
Otmar	Franz	LightingEurope	Germany
Nicolas	Fuentes Colomer	International Association of Lighting Designers (IALD)	Spanish
Simonetta	Fumagalli	ENEA	Italian
Andrea	Harrer	BAM Federal Institute for Materials Research and Testing	German
Casper	Kofod	Energy piano - consultant for DEA	Danish
Catherine	Lootens	KU Leuven, Light&Lighting Laboratory - Groen Licht Vlaanderen	Belgium
Nicole	Loysch	Neonlite International LTD	Belgium
Félix	Mailleux	CECED	Belgium
Kees	van Meerten	Lighting Europe / PHILIPS Lighting	Dutch
Christoph	Mordziol	Umweltbundesamt (Federal Environment Agency)	German
Anders Peder	Øbro	ÅF Lighting / Representing DEA	Denmark
Laura	Pereira	ICF International	Brazilian
Michael	Scholand	CLASP	United Kingdom
Bram	Soenen	Belgian Administration Environmental Product Policy	Belgian
Fabrizio	Tironi	LightingEurope/Flos	Italian
Francisco R.	Zuloaga	Topten	Spanish
René	Kemna	VHK	Dutch
Leo	Wierda	VHK	Dutch
Paul	van Tichelen	VITO	Belgium
Stuart	Jeffcott	Jeffcott Associates	British
Ruben	Kubiak	European Commission	German