

# Revision of the EU Green Public Procurement Criteria for Street Lighting and Traffic Signals

**EEB comments on the 1<sup>st</sup> draft of the JRC technical report and GPP criteria proposal**

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Carsten Wachholz and Michael Scholand

## **Contact**

Carsten Wachholz, EEB, Brussels – [carsten.wachholz@eeb.org](mailto:carsten.wachholz@eeb.org)

Michael Scholand, N14 Energy Limited, London – [mscholand@n14energy.com](mailto:mscholand@n14energy.com)

## Summary

The European Commission (EC) is revising the EU Green Public Procurement (GPP) criteria for Street Lighting and Traffic Signals. In October 2016, the Joint Research Centre (JRC) of the EC published the draft Technical report including proposals for draft GPP criteria and a comprehensive draft working document (Preliminary Report).<sup>1</sup>

Based on the discussions of these documents at the 1<sup>st</sup> AHWG meeting on 22 November 2016 in Seville, this paper provides recommendations and comments on the revision of the GPP criteria on behalf of the EEB. EU GPP criteria are formulated either as Selection criteria (SC), Technical specifications (TS), Award criteria (AC) or Contract performance clauses (C). For each set of criteria there is a choice between two levels of environmental ambition: core criteria and comprehensive criteria.

The EEB has consulted the draft criteria set for Street Lighting and Traffic Signals together with its member organisations and other environmental NGOs. We agree with the JRC's conclusion that the most important parameters that have to be considered in the revised GPP criteria set have to be related to system efficacy of the lighting system, energy efficiency and product lifetime. But we also recommend that the proposal should be improved with regard to the following points of concerns which are outlined in further detail in this position paper:

- Do not require compliance with the illumination levels as set out in the industry standard EN 13201 that are significantly higher than what can be found in many existing installations across Europe.
- Increase the level of ambition for the GPP criteria in order to target the top 75% of the LED models currently available on the market in 2016 for the core criteria and the top 50% for the comprehensive criteria.
- Make the efficacy requirements dynamic through a tiered approach starting in 2018, increasing them by approximately 17 lm/W every two years.
- Sharpen the requirements on the qualifications needed to design and install street lighting systems.
- Ensure that all luminaires eligible for GPP have zero upward light emissions.
- Broaden the evidence case for the criteria proposal on limiting adverse effects through light pollution and consider additional requirements in the core and comprehensive criteria to limit blue light emissions.
- Provide a spreadsheet template for the life cycle cost (LCC) calculation.
- Ensure compatibility with and promote adequate use of dimming and other types of control gear.
- Address product lifetimes through criteria on luminous flux maintenance, maximum early failure rates and minimum rated luminaire lifetime.
- Keep a criteria on zero mercury content included in the GPP criteria set.

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<sup>1</sup> [http://susproc.jrc.ec.europa.eu/Street\\_lighting\\_and\\_Traffic\\_signs/documents.html](http://susproc.jrc.ec.europa.eu/Street_lighting_and_Traffic_signs/documents.html)

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## General comments

- The EEB congratulates the JRC and their team of experts for preparing both well-researched draft preliminary and technical reports as well as a very good first draft of the revised GPP criteria.
- The EEB agrees with the JRC's general conclusion after reviewing Life Cycle Assessment (LCA) studies that energy-in-use should remain the main focal point of the revised GPP criteria set for street lighting (see technical report, page 8). The second most important LCA aspect is manufacturing, which is expected to increase in relative importance as LED technology already lasts longer and is more efficient than any high-intensity discharge (HID) light source available. Thus, the most important parameters that have to be considered in the GPP criteria set have to be related to system efficacy, energy efficiency and lifetime for both street lighting and traffic signals.
- The EEB acknowledges environmental and health concerns over light pollution in general and blue light content of LED lamps in particular. This caused EEB to conduct analysis on commercially available 2016 street light models. Our analysis of 2016 street light luminaires shows that the relationship between efficacy and correlated colour temperature (CCT) is only 3 lm/W per 1000K CCT. Please see for more details below in the relevant section on lighting equipment. Because highly efficient warm-white LED luminaires are already available, we can conclude that GPP should push the market for street lighting solutions further into that direction. In the future there should be no reason to compromise between further increasing lighting efficacy and limiting blue light content compared to existing installations.
- If adequate luminaires are installed and excessive lighting levels are avoided, functional/ directional street lighting should not cause a major contribution to light pollution with potentially negative effects on humans or natural ecosystems. It is up to municipalities to ensure that also private or commercial outside lighting installations or illumination of buildings and sites are designed to limit light pollution and might be completely banned in ecologically sensitive areas. We encourage decision makers to carefully analyse potential impacts of their choices for street lighting on light pollution and consider additional criteria for their respective situations, going beyond what can be captured by GPP.
- Because of the fast moving development of the technology for street lighting, the efficacy values in the revised GPP criteria set cannot be static and must continue to be strengthened further over the six year cycle of these criteria. The EEB has prepared some analysis which presents our findings, using published performance data from street lighting systems spanning the years 2011, 2012, 2013, 2014, 2015 and 2016. Therefore, we suggest increasing the efficacy requirement for GPP in form of a tiered approach by approximately 17 lm/W every two years (see graphs and data later in these comments). The EEB is willing to make its analysis and experts available for further consultation if this would be helpful to the JRC team.

- The EEB believes that the new GPP criteria – both core and comprehensive – should only be allowed to be applied to LED technology. The market is already shifting significantly over to LED because they offer better system efficacies, longer lifetimes and can be more easily controlled than HID sources. Thus, the GPP criteria taking effect only in 2018 and running for six years should be exclusively tied to LED, and incentivise public procurers towards the better LED products in the market. We suggest targeting the top 75% of the models on the market for the core criteria and top 50% of the market for the comprehensive criteria. Additional criteria to be set on light pollution would further differentiate the market towards better quality street lighting.
- Two ideas were raised by EEB during the first AHWG meeting in Seville that are not reflected accurately in the meeting minutes, and which we believe could benefit public procurers and achieve the objectives of the GPP scheme overall. These two ideas are discussed below and the EEB offers to make itself and its experts available for further consultation and discussion to more fully explore these ideas and perhaps identify approaches whereby they could be implemented effectively:
  1. The EEB recommends that the JRC investigate mechanisms and implementing agents that could enable the creation of a facility to combine orders from multiple public procurers and thus achieve 'bulk' procurement status (and pricing) from the suppliers. During the Seville workshop, several municipalities expressed concern over capital costs and that budgets were a constraint to purchasing street lights. We suggest that the Commission engages with stakeholders (manufacturers, municipalities, energy service companies, environmental non-profit organisations (like [Les Eco Maires](#), or [ICLEI – the International Council on Local Environmental Initiatives](#), etc.) to discuss and explore possible ways to develop a bulk procurement facility that would offer discounted prices if purchase orders could be merged and/or delayed for a limited period of time while sufficient orders are built up. The GPP Advisory Group could collect best practices and provide expertise/ guidance how such an entity could be set up exclusively national or perhaps regional, and would accelerate take-up of the EU GPP criteria by lowering first-cost barriers for municipalities.
  2. The EEB recommends that the JRC develops concept for a GPP street lighting qualification / certification system for organisations that design, procure and install LED street lighting systems with demonstrated high competency and that meet the EU GPP core criteria as a minimum standard. With such a GPP street lighting certification, these entities could offer municipalities turn-key solutions which meet the GPP core or even comprehensive criteria. This certification would also help to achieve the goals of high-quality GPP, and the entities would directly market the EU GPP criteria to municipalities and other public procurers, highlighting the benefits of green procurement and accelerating its take-up. Thus, GPP criteria for lighting design are important, but some kind of official scheme for accreditation or certification to these criteria would accelerate take-up and increase the impact.

- During the 1<sup>st</sup> AHWG meeting in Seville, some participants called for the GPP criteria to require illumination levels in the industry standard document EN 13201. The EEB however recommends that this should not (!) be included as a requirement of the GPP scheme because the standard calls for levels of illumination that are significantly higher than can be found in many existing installations across Europe (and indeed, elsewhere in the world).
- In addition to exacerbating the problem of light pollution, municipalities that significantly increase lighting levels when meeting the EU GPP criteria could end up with many complaints from residents and road-users due to the increased light level. The standard, largely drafted by industry representatives, calls for levels of illumination levels that would require more equipment and higher-output installations, and current practice / field experience has shown that these higher levels of illumination recommended in the standard may not be so critical. Therefore, the EEB recommends that the JRC investigates and compares the typical practice for illumination levels in a small sample of European cities with the levels recommended in the industry standard to better understand this potential problem.

## Guidance on considering renovation beyond relamping

(Relates to Chapter 3.2. in the JRC's draft Technical report and criteria proposal)

- The EEB agrees that it should be recommended that a redesign of the installation with new luminaires should be considered, especially for installations with HID lamps that do not satisfy the GPP requirements. The procurer should make this consideration on basis of a calculation of the life cycle costs (LCC).
- We also agree that one-for-one relamping will result in sub-optimal (and potentially unsafe/non-compliant) optical output on the road surface, and thus should not be allowed under the GPP.
- The EEB suggests that system losses in the baseline (i.e., including ballast losses and optical losses of the baseline system) are taken into account when considering the renovation.
- Finally, we agree that a 20-year lifetime installation is reasonable and should be used for the life-cycle cost street lighting calculation, ensuring that all operation and maintenance costs (including lamp replacement costs) are taken into account. A stakeholder at the AHWG meeting in Seville offered concrete guidance and promised to follow-up with JRC on the LCC calculation and therefore we look forward to reviewing the proposed LCC method in the next drafts of the criteria and technical report.

## Draft EU GPP Criteria Proposal for street lighting design

### 1) Selection Criteria

- The EEB does not believe the current proposal for core and comprehensive criteria on the competency of the design team is sufficient with “*at least three years of experience in lighting design and/or having a suitable professional qualification in lighting engineering or membership of a professional body in the field of lighting design.*” This formulation weakens and compromises the criteria, and may result in un-qualified individuals carrying out the work.
- Taking into account the complexity and importance of street lighting installations being planned and carried out in a professional and competent way, our suggestion would be as follows:
  - **Core criteria:** “*Where a new lighting system is being designed or an existing system is being renovated, the tenderer shall demonstrate that the design will be undertaken by personnel with at least three years of experience in street lighting design and at least one year experience in LED street lighting design.*”
  - **Comprehensive criteria:** “*Where a new lighting system is being designed or an existing system is being renovated, the tenderer shall demonstrate that the design be undertaken by personnel with at least three years of experience in LED street lighting design.*”

The EEB notes that the publication of these criteria may stimulate companies with an interest in the street lighting market to ensure their staff are qualified in time to meet the EU GPP criteria.

- We agree that three years should be sufficient time, but of course it would depend on how many projects the experts have overseen during that time. In a worst-case scenario, the lighting designer could have been working with one municipality for three years and still have not completed a single installation, yet could demonstrate compliance with three years. Thus, the EEB recommends that that JRC interviews a few street lighting design companies to find out what would be typical practice and consider adding a minimum number of projects in addition to the time period.
- For verification of the proposed criterion on lighting design, the EEB believes that the JRC should add a requirement for the tenderer to provide assurance that the individuals named are actually going to do the work and aren't simply being named to secure approval. Some kind of formal, legal statement that the applicant must sign and date, affirming and committing their organisation to the information provided in the application.

### 2) Technical specifications

#### **Efficacy**

- The EEB supports the use of both the power density indicator (PDI) and the annual energy consumption indicator (AECI) in TS1.

- However, EEB is concerned that the point values for PDI discussed in section 4.2.3.1.1 (Rationale) fail to take into account the range of efficacies and CCT of existing 2016 street lighting systems. Due to the fact that LED technology has advanced considerably between 2014 and 2016, we find it concerning that for the seven roads analysed, core criteria values are being suggested which are less ambitious than the LED values reported in the standard (Annex A of EN 13201-5:2016).
- Therefore, we recommend that the JRC adds an efficacy dimension to the core and comprehensive criteria evaluation for the PDI values recommended, whereby the core criteria should remove 25% of the products on the market (i.e., only be available to the top 75% of models) and the comprehensive criteria should remove 50% of the market (i.e., only be available to the top half of models offered). As suggested in the general comments, these PDI values would need to change over the time period of performance, assuming an evolution in efficacy as outlined in our analysis presented in these comments: i.e., 17 lm/W every two years – 2018, 2020 and 2022 (see Tables 1 and 2 below).
- For AECI, the EEB is unclear on the basis for the setting of the CL factor. We understand that in the standard, CL is set to 1.1 for LED technology, but then it is proposed that the core CL factor should be 0.85 and the comprehensive CL factor should be 0.75 in order to require that the systems incorporate some energy savings from dimming. This seems to be a reasonable approach, however it is unclear how these two values were selected and we wonder what is actually typically used in the best-in-class LED systems installed today? We request that the JRC includes one or two case studies from recent LED installations and/or provide more explanation around the derivation of these values.
- It is also unclear to us how the efficacy (lumens/watt) of the LED system is taken into account in this metric of AECI. Due to the fact that the AECI is kWh/m<sup>2</sup>.y, this metric will be highly dependent on efficacy and we do not support using only one efficacy value for LED systems for all six years of the GPP criteria. The EEB requests that JRC provide some analysis around efficacy and its relationship to the AECI and we recommend that three levels of AECI be offered, taking effect in three tiers - 2018, 2020 and 2022 – which correspond to the efficacy values in our Tables 1 and 2 in these comments.
- Regarding the consultation question “Should tiers be implemented to account for future LED developments?” our answer for both PDI and AECI is a resounding “YES!”

### **Light pollution**

- The JRC proposes core and comprehensive criteria (TS2) that allow for a maximum light proportion going above the horizontal of 1%. We do not (!) agree with this recommendation. The EEB feels strongly that all luminaires should be zero cut-off – in other words, no upward light emission. This is easily achievable with LED luminaires, and it is actually difficult to find LED luminaires with upward light output if they are designed and installed correctly.



- The EEB calls on the JRC to further research and discuss issues around CCT and the impact on people and the environment in more detail as they are of concern to our members and there is a lack of clarity in the documentation. We recognise that impact is a function of two factors - intensity of and duration of the exposure. Thus, JRC should broaden the evidence base for this criteria proposal, including scenarios. More research is emerging related to impacts on e.g. aquatic ecosystems, bats and birds or insects which react to different parts of the light emission spectrum. Therefore, we call on the JRC to study this topic in more depth and provide a sound justification for its recommendations together with the updated version of the criteria proposal.
- Nonetheless, the EEB appreciates the JRC's recognition that there can be a negative impact on biodiversity that results from street lights with higher CCT values. Therefore, we insist that the lighting design must take into account the relative sensitivity of the installation due to its location in the first place. Our recommendation based on the current explanations in the draft preliminary and technical report is to limit CCT at least in the comprehensive criteria (TS2) as an expression of the precautionary principle. We support the proposed limitation to  $\leq 3000$  K at this stage but invite the JRC to investigate the implications of setting a stricter value such as 2700 K. In the final set of criteria, it should be made very clear that the CCT criterion alone is not sufficient to prevent adverse effects of outdoor lighting and that additional requirements in particular with regard to adequate lighting levels should be taken into account for the layout of the street lighting system.
- The EEB does not support the JRC's proposal to limit colour rendering index (CRI) in the comprehensive criteria (TS2), indeed quite the opposite should be implemented here. With improved colour rendering, human eye performance also improves and lower levels of illuminance can result which will have less impact on biodiversity.

### 3) Award criteria

- We recommend that the JRC develops and provides a generic template for the LCC calculation which applicants can use when submitting their proposals for consideration under GPP. The verification criteria for AW1 include LCC calculations to be clearly presented in a spreadsheet – however, the term 'clear' is subjective and may cause confusion and/or additional work during the implementation of the GPP criteria due to this ambiguity and lack of a starting point. Applicants should still be allowed to submit their own LCC calculation spreadsheets (note: some may already have them and not want to adapt to a new approach). However, the JRC should also provide a working template that includes all the input parameters and thus would standardise applications that use this template, greatly facilitating the review and award procedure.

## Draft EU GPP Criteria Proposal for street lighting installation

### 1) Selection criteria

- The EEB does not believe the current proposal for core and comprehensive criteria on the competences of the installation team is sufficient with “*at least three years of experience in lighting design and/or having a suitable professional qualification in lighting engineering or membership of a professional body in the field of lighting design.*” This formulation weakens and compromises the criteria, and may result in un-qualified individuals obtaining certification.
- Taking into account the complexity and importance of street lighting installations being planned and carried out in a professional and competent way, our suggestion would be as follows:
  - **Core criteria:** “*Where a new lighting system is being designed or an existing system is being renovated, the tenderer shall demonstrate that the design will be undertaken by personnel with at least three years of experience in street lighting design and at least one year experience in LED street lighting design.*”
  - **Comprehensive criteria:** “*Where a new lighting system is being designed or an existing system is being renovated, the tenderer shall demonstrate that the design be undertaken by personnel with at least three years of experience in LED street lighting design.*”

The EEB notes that the publication of these criteria may stimulate companies with an interest in the street lighting market to ensure their staff are qualified in time to meet the EU GPP criteria.

- We agree that three years should be sufficient time, but of course it would depend on how many projects the experts have overseen during that time. In a worst-case scenario, the lighting designer could have been working with one municipality for three years and still have not completed a single installation, yet could demonstrate compliance with three years. Thus, EEB recommends that that JRC interviews a few street lighting design companies to find out what would be typical practice and consider adding a minimum number of projects in addition to the time period.
- For verification of the proposed criterion on lighting design, the EEB believes that the JRC should add a requirement for the tenderer to provide assurance that the individuals named are actually going to do the work and aren't simply being named to secure approval. Some kind of formal, legal statement that the applicant must sign and date, affirming and committing their organisation to the information provided in the application.

### 2) Technical specifications for installations

- EEB supports the JRC's proposal to use the provision of instructions with the installation of new or renovated systems including:

- Disassembly instructions for luminaires;
- Instructions on how to replace light sources (where applicable), and which lamps can be used in the luminaires without decreasing the energy efficiency;
- Instructions on how to operate and maintain lighting controls;
- For daylight linked controls, instructions on how to recalibrate and adjust them.
- For time switches, instructions on how to adjust the switch off times, and advice on how best to do this to meet visual needs without excessive increase in energy consumption.

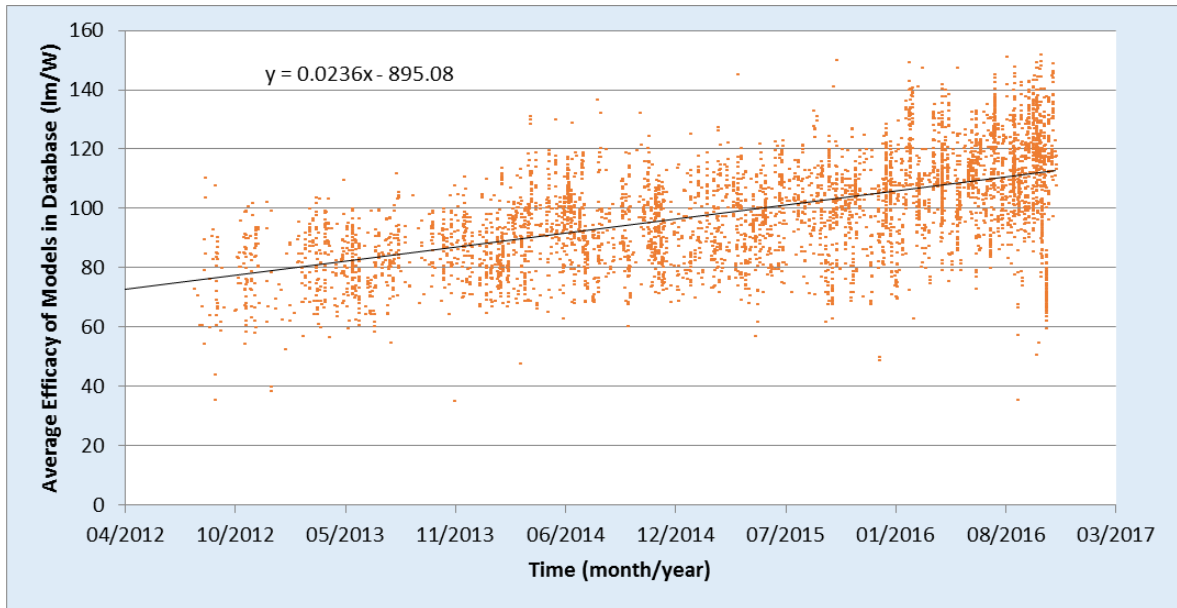
### 3) Contract performance clauses

- The EEB supports the JRC's proposal for contract performance clauses (CP1+2) surrounding the commissioning and demonstration of successful operation of the system. This is critical to the 'turn-key' concept and optimisation of energy savings potential of GPP endorsed projects.
- We also support the JRC's proposal around the reduction and recovery of waste – both in the core and comprehensive criteria (CP3).

## Draft EU GPP Criteria Proposal for street lighting equipment

### 1) Technical specifications on efficacy, lumen maintenance and life time of light sources

- For LED street light equipment luminaires, the EEB supports the adoption of highly ambitious efficacy requirements to qualify for GPP. The draft criteria proposed by the JRC of 105 lm/W for core criteria and 120 lm/W for comprehensive criteria (TS1) are, however, not ambitious enough have an effect on the market when applied in 2018 and fall well short of reasonable GPP criteria during the following 6 years until the GPP criteria are due to be revised again by 2024.
- Therefore, the EEB strongly recommends that the JRC adopt a three-tier solution spanning the six years of these GPP criteria, as follows:
  - Tier 1: 1 Jan 2018 – 31 Dec 2019
  - Tier 2: 1 Jan 2020 – 31 Dec 2021
  - Tier 3: 1 Jan 2022 – 31 Dec 2023
- Having three tiers enables the GPP criteria to follow the technology trend, which we have calculated based on a database of over 5600 street light luminaires from the US DOE's Lighting Facts database, spanning from 2010 to present. We prepared a scatter plot and applied a curve fit to models spanning from 2012 through 2016 finding that efficacy has increased on average of around 8.6 lm/W per year.



- Next, we considered what the level of ambition should be, based on just those models that were entered in 2016 (n=2,277 models). If the efficacy threshold were set at 80 lm/W in 2016, then 2,185 of the 2,277 models would comply, equating with a 96% pass-rate. If the efficacy threshold were set at 102 lm/W in 2016, the pass-rate would be 75%. An efficacy threshold of 112 lm/W achieves a pass-rate of 50%. We therefore consider these to be reasonable pass-rates for the GPP core criteria (75% pass) and the comprehensive criteria (50% pass), if they are projected forward using the 17 lm/W performance improvement every two years over the six year period (note: this also applies to Tier 1, as that takes effect in 2018 and we are analysing models that were placed on the market in 2016). The table below summarises the EEB’s recommended efficacy values for LED luminaires, in the green shaded boxes, rounded slightly:

**Table 1. EEB recommended street light luminaire efficacy**

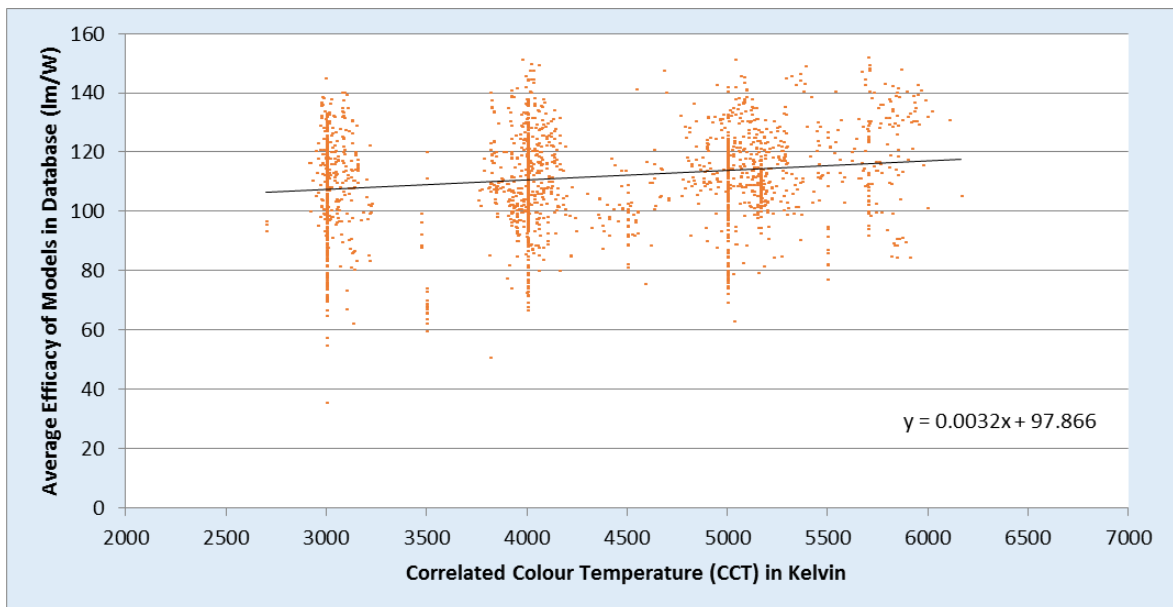
Criteria	2016 data-base efficacy	Tier 1 (1 Jan 2018 - 31 Dec 2019)	Tier 2 (1 Jan 2020 - 31 Dec 2021)	Tier 3 (1 Jan 2022 - 31 Dec 2023)
Core	102 lm/W	120 lm/W	137 lm/W	155 lm/W
Comprehensive	112 lm/W	130 lm/W	147 lm/W	165 lm/W

- Next, we considered what the level of ambition should be, based on just the light module (light source) efficacy. For this proposal, we have aligned with the JRC recommended value as our Tier 1 level (this is approximately 20 lm/W higher than the tier 1 for the system efficacy requirements in Table 1) and we have added our anticipated efficacy progression based on our analysis of the street light luminaires placed on the market between 2010 and 2016:

**Table 2. EEB recommended street light module (light source) efficacy**

Criteria	JRC values	Tier 1 (1 Jan 2018 - 31 Dec 2019)	Tier 2 (1 Jan 2020 - 31 Dec 2021)	Tier 3 (1 Jan 2022 - 31 Dec 2023)
Core	140 lm/W	140 lm/W	157 lm/W	175 lm/W
Comprehensive	160 lm/W	160 lm/W	177 lm/W	195 lm/W

- Thus, EEB recommends that the efficacy requirement of the Street Light luminaire (i.e., not the source only, but the whole system) would have to meet these criteria in order to be classified as a Core or Comprehensive criteria. The models being purchased would then represent approximately the top 75% and top 50% of the 2016 market respectively.
- We have also looked into the link between CCT and efficacy, and we do not consider it to be sufficiently significant to warrant any adjustment to our recommendations above, which is using a complete set (all CCT values) of 2016 models. The figure below shows the slope of efficacy with CCT - essentially, there is an impact of 3 lm/W per 1000 degrees of CCT. Thus, shifting from 5000K to 3000K would only affect the efficacy of the 2016 models by 6 lm/W, thus there is no reason to adjust the values presented in our recommendation above which is derived from a full set of 2016 models in the database.



- Regarding luminous flux, the EEB recommends that the JRC harmonise with the IEA 4E SSL Annex Quality and Performance Tiers published in November 2016 for Street Lighting. Here, the luminous flux maintenance is required to be: At 6,000h,  $\geq 95.8\%$  of initial (based on  $L70 \geq 50,000h$ ). The test method cited for this measurement should be IES LM-84 and IES TM-28, as this is expected to be adopted widely in 2017 and is the updated standard of the old

combination of IES LM-80 and IES TM-21. Please see [this link](#) for further information on this criterion.

- Regarding the lifetime questions in the draft criteria, we recommend that the JRC reviews the product lifetime in [the IEA 4E SSL Annex quality and performance tiers for street lights](#) for further information on lifetime. The EEB therefore recommends that the JRC sets 3 criteria addressing lifetime:
  - Luminous flux maintenance: At 6,000h,  $\geq 95.8\%$  of initial (based on  $L70 \geq 50,000h$ )
  - Maximum early failure rate: Either no failures at 3,000 hours or  $\leq 10\%$  failures at 6000 hours with a sample size of 10 units
  - Minimum rated luminaire lifetime: At 50,000h  $< 50\%$  have failed
- The EEB does not support the maximum CRI criterion proposed by JRC. Where is the logic behind limiting colour rendering? Perhaps this was a typo in the document and JRC was intended to be no less than 70? Irrespective of that, we strongly recommend that a minimum requirement be established for CRI with  $Ra \geq 70$ . That is fit for purpose, will be acceptable to the public and is harmonised with the IEA 4E SSL Annex Tiers.
- Finally, we believe that test results must be provided by an accredited laboratory under the [International Laboratory Accreditation Cooperation \(ILAC\)](#) system, but it does not have to be third-party certified. It would be acceptable to be self-reported, as long as the laboratory has accreditation.
- The EEB supports the proposed criteria from the JRC on compatibility with dimming and other controls (section 4.4.2.1.2.2).
- The EEB supports the proposed criteria from the JRC on warranty, service agreements and spare parts (section 4.4.2.1.3.2). The EEB firmly agrees that it is important that luminaires are easy to maintain and repair, and not necessarily only with proprietary equipment which can be expensive, but normal tools including those listed in the criteria.
- The EEB supports the JRC's proposal to have an ingress protection (IP) rating of 65 for all road classes (section 4.4.2.1.4.1). This will help to ensure the lifetime of the luminaire.

## 2) Technical specifications on failure rate of control gear

- The EEB supports the proposed criteria (TS2) – both the derivation from the preliminary report which identified the higher quality units and then establishing the criteria at a failure rate of  $< 0.2$  per 1000 hours for core criteria and  $< 0.1$  per 1000 hours for comprehensive criteria. This will ensure a long service life and the achievement of anticipated payback periods and resource efficiency gains. Furthermore, the LCA studies reviewed had found that manufacturing was the second most important product performance criteria after energy-in-use, thus having these criteria is both necessary and appropriate.

## Draft EU GPP Criteria Proposal for traffic signals

### 1) Technical specifications

- The EEB agrees that the operating wattage requirements – inclusive of the power demand from the signal head power circuit (i.e., the 'driver') – for traffic signals are adequate.
- We also agree that the lumen maintenance and failure rate requirement of minimum 16000 hours is adequate for this application.
- The EEB does not believe there is a need to have Core and Comprehensive criteria, as these requirements are already focusing (correctly) on ensuring energy-efficient traffic signal modules are installed. Duty cycle and dimming should not apply because that could impinge on safety.

## Draft Proposal for discarding previous EU GPP Criteria

### 1) Efficiency of ballast and control gear

- The EEB can support the HID ballast and/or LED control gear requirements being removed from the technical specification and award criteria only if system efficacy is adopted. In other words, yes – if the PDI equation is included and EN 13201-5:2015 is followed, taking into account the losses of the ballast/driver. In case the revised GPP criteria end up being based on light source efficacy only, then we would seek to have driver efficiency included. That is because we insist it's the system performance which matters overall, and ideally, the street light luminaire including driver, light source and optics could all be included the criteria.

### 2) Packaging of lighting equipment

- The EEB accepts that it would be reasonable to remove the packaging requirement for lighting equipment. This is obviously not a 'hot spot' for environmental impact of this product category from a life cycle perspective. Most municipalities / installers will already have recycling schemes in place for separating waste anyway into paper, plastic, etc.

### 3) Mercury content

- The EEB feels strongly that mercury content should continue to be included as a criterion and applicants must report on mercury content when demonstrating compliance with GPP criteria.
- Although mercury is not used in LED light sources, we think it should form part of the EU GPP criteria because HID sources using mercury are still commercially available on the market – and they will be during the duration of this GPP criteria set. A GPP criterion on zero mercury content would clearly differ-

entiate GPP products from the rest of the market, and remove any risk of municipalities or manufacturers including mercury-containing products such as metal halide or high pressure sodium<sup>2</sup> lamps.

#### 4) Points for the percentage of dimming

- There are two pathways to save energy in street lighting – the first is to have a more efficacious source and the second is to control it. With existing market trends, we can expect the efficacy of LED lighting to increase and the penetration in the market to continue, however if dimming is not valued by the GPP, then it may become more difficult to capture the additional (second pathway) to saving energy – namely controls.
- While the points system may not be ideal, the EEB does insist that for the Comprehensive Criteria lighting controls should constitute part of the solution. Dimming to levels as low as 0% may not be necessary, but offering recognition for dimming to reasonable levels that are commonly used in the market would continue to enable this criterion to be used.

#### 5) Packaging for traffic signals

- The EEB accepts that it would be reasonable to remove the packaging requirement for traffic signals. This is obviously not a 'hot spot' for environmental impact of this product category from a life cycle perspective. Most municipalities / installers will already have recycling schemes in place for separating waste anyway into paper, plastic, etc.

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<sup>2</sup> High pressure sodium lamps generally contain 10 to 50 mg of mercury. Source:  
[http://www.iar.unicamp.br/lab/luz/ld/Arquitetural/Sa%FAde/imerc\\_fact\\_sheet\\_mercury\\_use\\_in\\_lighting.pdf](http://www.iar.unicamp.br/lab/luz/ld/Arquitetural/Sa%FAde/imerc_fact_sheet_mercury_use_in_lighting.pdf)