Revision of the EU GREEN PUBLIC PROCUREMENT CRITERIA for ROAD LIGHTING

EEB comments to the JRC's 3rd Technical Report

Draft 24 April 2018

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Background

The European Commission (EC) is revising the EU Green Public Procurement (GPP) criteria for Road Lighting. In March 2018, the Joint Research Centre (JRC) of the EC published the 3rd Technical report including their final draft proposal for the updated GPP criteria.[1]

The criteria themselves 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. In addition, the JRC produced a draft guidance document for procurers regarding the procurement of road lighting.

Based on the discussions in one in-person meeting and two webinars of the Ad hoc Working Group (ADHWG), including two previous rounds of written consultation, the EEB has provided input to the JRC's final proposal on the revised GPP criteria for road lighting in consultation with its member organisations and other environmental NGOs.

Our appraisal of the final draft GPP criteria proposal

The EEB appreciates that some of its previous recommendations for improvement have been incorporated into the GPP criteria proposal. We also welcome the development of the additional guidance document for green public procurement of road lighting. Nevertheless, our comments from 20 October 2017 submitted on 2nd technical report remain still valid.

With regard to the latest changes and compromises proposed for the final EU GPP criteria set on road lighting and traffic signals, we have to raise some major concerns regarding the significant lowered ambition on the luminaires efficacy for road lighting and the inappropriate approach for product lifetime testing. The newly proposed values for the energy efficiency requirements create a pass-rate of nearly 90% of the 2018 models in the US DOE's Lighting Facts database – and this level is meant to last for 2 years. Practically, nearly all new LED based products would become eligible for GPP through this approach, i.e. the criteria will have no market pull-effect towards better performances at all.

However, we can support the chosen approach to tackle light pollution and the new requirements proposed for labelling LED luminaires. Please find below and attached our more detailed analysis of the new JRC proposal.

[1] http://susproc.jrc.ec.europa.eu/Street_lighting_and_Traffic_signs/documents.html

Important outstanding issues

Energy efficiency (TS1)

The EEB is deeply concerned about the new approach that has appeared in this latest draft of the Technical Report. The basis for the JRC's new draft is flawed from a technical basis, and the levels of ambition presented are unacceptable and will not advance the efficacy of street lamps, and worse – award the GPP accolade for business as usual practice.

Concerning Table 7 and Figure 11 in the report, and the spreadsheet that the JRC shared with the data from the Lighting Facts database, the EEB does not agree with the findings on the "Shane data" analysis tab. There are two problems with how you have presented these findings, particularly in the context of the current regulation and the implication that efficacy varies so dramatically with LED luminaire light output. This simply is not true, as we show in the spreadsheet we are submitting as an Annex to these comments and with the two contrasting figures that we present below.

There are two factors that are contributing to the erroneous finding in the JRC's third report:

1) The analysis includes outdated models that are no longer offered on the market, some going back to 2012 when efficacies and light output levels of street lighting luminaires were significantly lower. This lowers the average efficacy values, especially at the lower lumen packages, creating a steeply climbing curve as shown in your diagram (see Figure 1 below).
2) The analysis also combines all CCT values, however the metric of "efficacy" incorporates lumens, which are a function of the human eye's response curve. Thus efficacy is not a linear function across the full colour spectrum. When comparing efficacies, one should compare CCT values within a range (e.g., 3700K-4300K; or 4700K-5300K).

Please note by comparing the two figures below, there is a stark difference between the JRC finding and the EEB findings, using the same source data. The difference is that we have corrected for these two issues. Please note that we use exactly the same Y-axis scale for comparability.

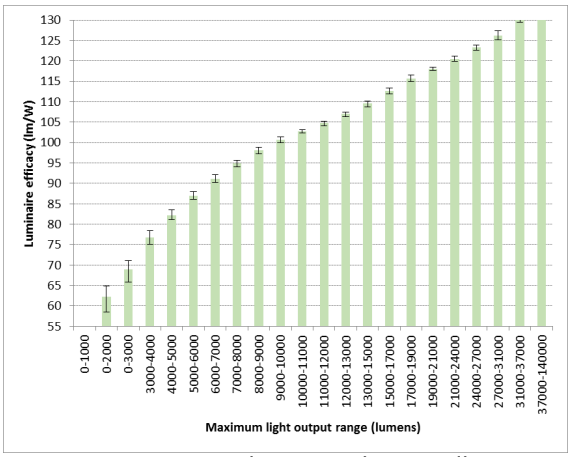

Figure 1. JRC Analysis, combining all CCT values, 2012-2017 models (n=7894)

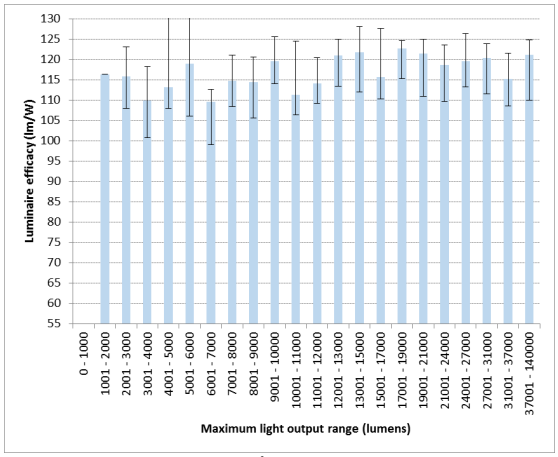

Figure 2. EEB Analysis, 4700-5300K CCT, 2016 and 2017 models only (n=1058)

It is also important to note that in the EEB analysis (see Figure 2) the efficacy of LEDs does not vary significantly with the lumen output range. This is consistent with the physics of LED luminaires – because to produce more light from an LED street light, you simply add more LEDs of the same efficacy to the system. If you want less light output, you use less LEDs in your module.

Thus, EEB calls again for the efficacy values that were recommended in the second technical report and which we commented on in our last set of comments. There is no justification for scaling efficacy with lumen output (this was true of conventional technologies, but NOT LED technology) and there is no need to scale efficacy with CCT as we demonstrated in our last set of comments.

The values that the EEB presented in our last analysis are better levels for the JRC to adopt, based on trend analysis of a time series of LED street light luminaire data, and using 2017 values for the point of departure for projecting the future. The levels presented in the suggested Tiers 1, 2 and 3 are even being met by some products on the market today, and will achieve the appropriate pass rate in the future for the GPP Core Criteria (67% pass rate) and the GPP Comprehensive Criteria (33% pass rate).

The EEB strongly urges the JRC to review the analysis we have presented and submit in conjunction with these comments that demonstrates the error in the current analysis. We strongly urge the JRC to adopt the levels that we proposed in our last set of comments which the EEB reproduces here for convenience. In order to study the analysis underpinning these recommendations, we direct the JRC to our previous set of comments from January 2017. The EEB is available to discuss this further with the JRC, but as proposed in this third technical report, the TS1 – Energy Efficiency Values are unacceptable.

Table 1. EEB recommended street light luminaire efficacy

Criteria	2016 database 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

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

The EEB downloaded a new set of data from the US DOE's Lighting Facts database and looked at the pass-rates of all the models entered in 2018 relative to the JRC proposal with the EEB proposal from our previous comments (reproduced above in Table 1). We found that the percentage of models placed on the market in 2018 that pass the JRC's proposed GPP core criteria (89%) and GPP comprehensive criteria (49%) is much too high, and even too high with the EEB proposal (80% pass the core criteria and 41% pass the comprehensive criteria). The target percentages are 67% pass-rate for core criteria and 33% pass for the comprehensive criteria.

Table 3. Comparison of JRC's and EEB's Tier 1 street light luminaire efficacy values using 2018 models only

Criteria	JRC Proposal for Tier 1	EEB Proposal for Tier 1	JRC Pass Rate of 2018 models (n=650)	EEB Pass Rate of 2018 models (n=650)
Core (Target 67% pass rate)	0-1000 84 lm/W 1000-3000 100 lm/W 3000-11000 108 lm/W >11000 119 lm/W	120 lm/W	89%	80%
Comprehensive (Target 33% pass rate)	0-1000 90 lm/W 1000-3000 110 lm/W 3000-11000 120 lm/W >11000 130 lm/W	130 lm/W	49%	41%

Thus, EEB still recommends that the efficacy requirement of the Street Lighting luminaire (i.e., not the source only, but the whole system) would have to meet our recommended criteria in order to be classified as Core or Comprehensive criteria under the GPP scheme. The models being purchased would then represent approximately the top 80% and top 40% of the market respectively.

Product Lifetime (TS 10)

The EEB is very concerned about the use of IEC 62722-2-1 as it does not offer the same standard for lifetime testing as can be determined by using the combination of LM-80 and TM-21 or IES LM-84 and IES TM-28. The LED luminaire standard IEC 62722-2-1 refers to the LED module standard IEC 62717 which treats lumen maintenance simply as saying that it's a 6000h test and it classifies the products as a 9 if they retain 90% lumen maintenance and above at 6000h, an 8 if they retain 80-90% maintenance and a 7 if it is between 70 and 80%. The standard tells nothing about projecting longer-term life, which is absolutely essential for street lighting luminaires. Furthermore, if looking at industry literature, the JRC can find that IES LM-80 and TM-21 are used today when projecting lifetime – it is accepted practice globally, even if the IEC has not yet adopted this method of product lifetime forecasting (yet).

The language in the draft specification offers a choice between using IEC 62722 and the IES LM-80/TM-21 combination, but this is not appropriate as it will not yield the assurances necessary for long life service of street lighting. For this reason, EEB comments again that the JRC should 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, ≥ 95.8% of initial (based on L70 ≥ 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.

The EEB acknowledges the following compromises as acceptable:

Light pollution

- The requirements on the CEN flux code 3 to prevent glare, added to in the criterion on zero upward light output (TS6);

- The addition of minimum G-index values to limit blue light content (i.e., the higher the G value, the less significant blue light becomes), complementing the maximum values for CCT and dimming provisions (TS7);

Product Lifetime

- The requirements proposed for labelling of LED street light luminaires (TS14, CPC8);

Traffic Signals

- The chosen approach Life Cycle Cost, LED lamp product lifetime, spare parts and warranty (TS1, TS2).

Final remarks and need for clarification

The EEB acknowledges the efforts undertaken by the JRC to address also environmental concerns and public annoyance related to light pollution. We would like to point out in this regard the compromises proposed to prevent upward light output, to promote dimming and to use a minimum G-index instead of generic CCT values. Nonetheless, the experience with applying LED road lighting technologies in cities all over the world shows that lower lighting levels and lower CCT values remain an important aspect to consider for public acceptance.

We think that the proposed CCT values of <3000 K for the core criteria and <2700 K for the comprehensive criteria give municipalities a good indication for urban residential areas but may not be suitable for the lighting of main roads or priority areas for safety. On the other hand, outdoor lighting in ecological sensitive areas and areas with intrinsically dark landscapes (such as national parks, rural residential or special protection areas) may require a procurement for innovation approach rather than simply adopting the generic EU GPP criteria as developed in the latest JRC report.

Therefore, the EEB suggests clarifying in which cases the different requirements for TS7 on Ecological light pollution and annoyance would apply. The formulation currently being used seems to refer only to dimming: *"When deemed necessary due to specific local ecological impact, light levels shall be dimmed to less than 50%/ 30% or even switched off during curfew hours."* We assume that the same condition should apply also to the use of the G-Index ≥1.5 / ≥2.

When it comes to the alternative CCT values (<3000 K/ <2500K), the justification for introducing this criterion was originally broader than addressing potential ecological impacts but also referring to annoyance. On the other hand, applying these requirements universally across all applications for road lighting would effectively exclude the vast majority of the models available on the market today from being eligible for the proposed EU GPP criteria. The JRC should critically review the formulations proposed and may want to include additional information in the guidance document.

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