

Preparatory Study – 3rd Consultation Comments Form (Options and Feasibility of EU Ecolabel and Green Public Procurement Criteria)



International Thin-Film Solar Industry Association (PVthin) a.i.s.b.l.

The international, not-for-profit industry coalition PVthin has the objective and purpose to strengthen global energy security, help create sustainable energy infrastructures, as well as to promote the social, economic and environmental benefits of thin-film solar photovoltaic technologies.

General Remarks

1. The JRC report should reference the existing GPP criteria for the purchase of energy. These criteria focus on the share of renewable energy present in the energy purchased, seeking to reward renewables rich energy mixes.
 2. Public authorities tends to purchase renewable electricity via (often technology specific) tenders. They do not hold auctions to buy the hardware & components (PV modules and inverters) that go into new renewable energy generation systems. How will GPP criteria for PV systems align with existing GPP criteria for electricity, which already seek to value solar energy?
 3. GOs & verification: GPP criteria for energy (both core and comprehensive) rely on guarantee of origins to certify the renewable energy share of the energy procured. However not all EU renewable, or solar, electricity comes with a GO. A number of member states require that GOs be sold separately for installations, which benefit from public support such as feed in tariffs or guaranteed electricity-pricing set via auctions.
 4. What would be the certification/ verification criteria for PV modules or inverters? How would these be compatible with separate obligations linked to an ecolabel for the same components, but sold to be part of smaller systems?
 5. When considering GPP/Ecolabel criteria for utility scale / commercial scale PV systems, reference should be made to the IECRE conformity assessment & rating system for certification (or equivalent), requiring a minimum rating of AA-, which in view of the industry would be expected to represent the top 20 % of the PV systems passing the above criteria. It could also be considered to introduce the rating scheme for minimum requirements under Eco-Design, i.e. requiring a BBB- minimum rating to improve the overall performance of the installed PV systems in the EU market and to reflect investment grade requirements.
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No.	Contact Person/organisation	Reference: - document - section - page	Subject of the comment	Comment
1	Andreas Wade, President, PVthin	Webinar presentation (29.April 2019) Ecolabel Slide 9	Aim of the Ecolabel	<p>The Ecolabel regulation means to “avoid the proliferation of environmental labelling schemes,” therefore, the JRC preparatory study should put more emphasis on the need to harmonize and adjust the development of any future ecolabel- or GPP-criteria with the existing NSF 457 Sustainability Leadership Standard for PV modules and inverters. NSF457 will become the basis for an (internationally applicable) EPEAT listing for these two products by the end of 2019. Future EU Ecolabeling or GPP criteria for PV modules or inverters avoid being at odds with international initiatives covering the same international commodities.</p>
2	Ibid.	Ibid.	Focus on hazardous substances	<p>As mentioned in the previous stakeholder consultation (Comments 6 to 9 in the attached) any policy recommendation with regard to developing criteria on hazardous substance use should be accompanied with an up-to-date survey on compatible products available on the market. Given the current REACH candidate list, it is highly unlikely that 10 to 20 % of the identified BAT products on the market would fulfil the Art. 6(6) / 6(7) requirements or a requirement derived from the RoHS directive.</p> <p><u>The preparatory study should state clearly that it will be necessary to go through the Ecolabel derogation process for PV modules.</u></p>

3	Ibid	Ibid. Slides 11, 12, 13	Module, Inverter & System Scope	<p>The proposed module and system scopes are not consistent with one another. The module scope “shall include street furniture that incorporates solar photovoltaic cells, but it does not include street lighting equipment.” The system scope covers “products which are only designed for use in street lighting, urban furniture, electric vehicles are excluded”. Hence the system scope excludes urban furniture, whereas the module scope includes it. Since a PV module would not work outside of the system, this inconsistency should be addressed.</p> <p>In addition – and with regard to the additional comments on the distinction between B2B and B2C applications – the scopes provided in slides 11, 12 and 13 would not allow for an a-priori distinction between B2B and B2C applications as the components produced are not differentiated for the application cases – hence a differentiation later on would need to be reflected in the scope as well.</p>
4	Ibid.	Ibid. Slide 14	Questions on Ecolabel scope	<p>Most EU Member States consider PV Modules (and Inverters) as “dual use” equipment under the various transpositions of the WEEE Directive. This classification ensures the financing of producer compliance schemes. However, from a technical codes perspective, PV modules, inverters and systems are to a large extent B2B, as installation by a professional is a pre-requisite.</p> <p>The market penetration of PV ‘Do it yourself’ (DIY) kits is currently minimal – if an Ecolabel were to be recommended for this kind of application, a thorough market survey on potential uptake would be a necessary pre-requisite. Additionally, OEM manufacturers of PV modules and inverters would most likely not differentiate their products based on the planned sales channel or application. This means that any criteria developed on component level would need to be applicable to the different application cases of the component. The differences in components for sub 5kW systems would probably be minimal – as the modules are a commodity and the inverters as well.</p>
5	Ibid.	Ibid. Slide 15	Possible contribution to EU policy objectives – RoHS	<p>The RoHS Directive 2011/65/EU formulates the following <u>scope exclusion</u>:</p> <p><u>Art. 2 (4) (i): This Directive does not apply to photovoltaic panels intended to be used in a system that is designed, assembled and installed by professionals for permanent use at a defined location to produce energy from solar light for public, commercial, industrial and residential applications;</u></p> <p>The Directive provides the following justification for the scope exclusion in recital 17:</p>

				<p><i>The development of renewable forms of energy is one of the Union's key objectives, and the contribution made by renewable energy sources to environmental and climate objectives is crucial. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (4) recalls that there should be coherence between those objectives and other Union environmental legislation. Consequently, this Directive should not prevent the development of renewable energy technologies that have no negative impact on health and the environment and that are sustainable and economically viable.</i></p> <p>The justification given by the RoHS Directive still holds legally, as does the EU political objective to ensure consistency between EU environment, climate and energy policies.</p> <p>As such, it would be inconsistent, and inappropriate, for Ecolabel and GPP laws, as they apply to PV panels, to refer to RoHS thresholds which do not apply to this class of products, which are excluded from the RoHS Directive. This is especially the case for the PV panels which have been identified as Best Available Technologies (BAT) by the JRC screening study.</p>
6	ibid.	ibid.	Possible contribution to EU policy objectives – WEEE	<p>the differentiation between B2B and B2C photovoltaic panels under Eco-Label and/or GPP would be detrimental for the policy objectives of the WEEE Directive. Many Member States classify PV modules as dual use products to ensure a level playing field when it comes to the financial responsibilities of producers in end of life collection and recycling. Introducing a change to that classification through eco-labelling and/or GPP would confuse matters and might entail .</p>

7	Ibid.	Ibid. Slide 16	NSF/ANSI 457	Please add: for inverters (2019)
8	Ibid.	Ibid. Slide 21	Technical Analysis - Modules	<p>Please also refer to comments previously given on the task 4 report.</p> <p>It would be beneficial to clarify, whether the identification of the base case, BAT point and BNAT point all refers to the same functional unit (i.e. the unit used for the establishment of the resource use and emission profile of the base case). Assuming this is the case (i.e. the functional unit being identical), the differentiation of crystalline silicon based technologies and thin film technologies is somewhat confusing and seems arbitrary, given that all technologies resource use and emission profiles should be measured to the same performance unit (i.e. life time energy yield). Please clarify the reasoning behind this differentiation and potentially adjust the Base Case / BAT / BNAT tables to reflect this.</p> <p>The technical analysis presented on this slide as well as the draft report seem to suggest that two different “classes” of BAT and BNAT will be introduced - applying different measures and scales for the different PV cell and module technologies. If that is the case, this should be explained and justified in the report and all subsequent policy recommendations, as the criteria development will be informed by LCA metrics, which are significantly different between the identified BAT options presented here.</p> <p>It is our understanding, that this kind of differentiation would be a complete novelty compared to previous preparatory studies, where the functional unit and performance characteristics have determined the scope and differentiation between base case, BAT and BNAT based on the LCA-informed resource use and emission profile. The introduction of different BAT and BNAT performance classes will also make it very challenging and difficult to ensure comparability at system level.</p>

9	Ibid.	Ibid. Slide 23	Hot spot analysis - Modules	<p>Referring to comments made during the previous consultation, the methodology used for the preparatory study's hot spot analysis should be clearly presented. It is still unclear how consistent these findings are with those of the PEFCR for PV electricity, , since this slide seems to aggregate a huge number of processes into 4 categories.</p>
10	Ibid	Ibid. Slide 33	Summary of findings of the evaluation	<p>Regarding the potential uptake evaluation, it should be clearly stated, that the consortium which was proposing the introduction of an eco-label is hardly representative of the industry currently selling PV modules on the European market. The consortium was comprised of 3 research institutes (CEA INES, Fraunhofer ISE and ENEA) and 2 industry players, one of which is bankrupt and one of which has a minority market share in the EU.</p> <p>we suggest that the potential uptake be assessed thoroughly through a comprehensive industry survey – as done for the EPEAT listing. As the PV value chain is global, close alignment between an EU Ecolabel and the existing NSF457 / future EPEAT label would likely yield the best results.</p> <p>Regarding the evaluation of the alignment with legislation and standards, the preparatory study should also highlight the issues which might arise with regard to RoHS and REACH and should align with EU political priorities such as energy policy and climate change mitigation prior to recommending a path forward.</p> <p>In the case of the Eco-Label, the study should make an explicit reference to its derogation process, as this process will need to be triggered for a number of PV technologies, which were identified as BATs.</p>

11	Ibid.	Ibid. Slide 34	Issues for discussion	<p>(1) Proposed focus on residential kits/packages (<5-10 kW) This proposal seems arbitrary since the components will not be different from those used in larger systems. It seems unrealistic to assume that the label would be awarded to a specific “kit”, whereas as OEM manufacturers would not differentiate component manufacturing.</p> <p>(2) Existing criteria of relevant ecolabels and schemes . The preparatory study, and following policy recommendations, should explicitly reference the Ecolabel derogation process Art. 6(6) and 6(7) and that it will be required for a number of BAT and potentially BNAT technologies, where chemical is not possible.</p> <p>(3) EU Ecolabel criteria should reflect environmental hotspots Strong recommendation to align with the NSF457 standard which developed its sustainability criteria based on the PEF hotspot analysis.</p>
		Webinar Presentation Green Public Procurement Slides 36ff		
12	Ibid.	All slides	Missing reference to existing GPP for electricity	<p>The presentation (and the draft report) fail to reference the existing GPP criteria for the purchasing of electricity. It would be beneficial if the preparatory study could specify the interface between the existing GPP for the purchasing of electricity and potential new GPP for Solar PV systems (or components) purchasing – as the later (if implemented) would introduce different environmental performance tiers for solar electricity generation, which is currently not reflected in the existing GPPCs for purchasing of electricity. Questions which should be addressed in the preparatory study in:</p> <ul style="list-style-type: none"> - Will the existing GPPCs be modified? - Will additional GPPCs for other (renewable) generation technologies be developed in the future to complement the solar PV GPPCs and allow for a comprehensive assessment under the framework of the GPPCs for electricity purchasing? - The available Technical Background Document for the electricity GPPC also did not identify additional issues with PV electricity generation and

				<p>does not recognize / refer to the hotspots identified by the preparatory study team. Currently, for solar PV, the only remark made is regarding land use:</p> <p><i>“In the case of solar, wind, hydropower and geothermal, plants are placed where they can best take advantage of the resource. This may present a number of potential environmental impacts. For example large scale generation using solar panels requires large areas of land. If the land is not barren this could have ecological impacts, as well as raising concerns of land use issues.” (Green Public Procurement Electricity – Technical Background Report, BRE 2011, p.8, available at: http://ec.europa.eu/environment/gpp/pdf/tbr/electricity_tbr.pdf)</i></p> <p>Will this background report be updated and the GPP for electricity be revised while GPPCs for PV modules / inverters / systems are developed? The preparatory study should make a clear link and explain the process required to align the GPPs.</p>
13	Ibid.	Ibid. Slide 40	Contribution to EU policy objectives	<p>The preparatory study should also reference the level of use/ uptake of the existing GPPCs for electricity. This information would be useful to assess what the likely uptake of GPPCs for PV modules and inverters is likely to be and how both GPPCs could be either complimentary or at odds with one another.</p> <p>How have the existing GPPCs increased the deployment of solar energy? How have these GPPCs helped to decarbonize the existing building stock through increase purchase of Renewable Electricity? What share can be attributed to Solar PV?</p>
14	Ibid.	Ibid. Slide 42	Existing public procurement practices	<p>Please include reference to GPPCs for electricity and provide data / statistics on influence of GPPs on electricity purchasing / share of solar energy purchased / terms and conditions used (i.e. have there been any specific criteria listed in electricity purchasing regarding the environmental impact of Solar PV). What was the overall use of the GPP in the last 8 years?</p>

15	Andreas Wade, President, PVthin	Ibid	Chapter 2.1.1./p.10/3 rd paragraph and following	<p>Despite having commented on this paragraph in previous draft reports – see 1st stakeholder consultation comments provided in BATIS (Comments 1 & 3) - the paragraph still fails to reference non-silicon thin-film PV technologies commercially available. Please correct this in the final reports:</p> <p><i>This sentence and the subsequent paragraph requires a major addition and correction. The differentiation of PV technologies goes well beyond the classification into crystalline silicon and amorphous. As the scope of the preparatory study also covers other PV technologies, this should be reflected in the formulation. Suggest to change the formulation to enable a clear classification of commercially available and implemented technologies - as depicted in the attachment provided. We would propose to classify the technologies into 1st, 2nd and 3rd generation technologies, making clear that the 1st and 2nd generation technologies are dominating the market (hence are subject to this study) and 3rd generation technologies can be regarded as R&D. The provided classification is not only misleading, it is also wrong, as thin-film PV technologies utilizing compound semiconductors such as chalcogenides and chalcopyrites also develop multicrystalline semiconductor structures on the sub- or superstrates used for deposition. Please correct the classification.</i></p>
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16	Ibid.	Ibid. p. 11, 1 st paragraph	Correction needed	<p>Please correct this statement and refrain from non-factual statements on technology evolution.</p> <p>Thin-film technology development did not stop, the latest efficiency improvements clearly demonstrate that the module efficiencies obtained are equal to those of poly-crystalline technologies and have a clear trajectory towards mono-crystalline efficiencies as well.</p> <p>The currently reported cell efficiencies of CdTe PV modules are equal to, or better, than those of multi-crystalline silicon cell / module efficiencies. Record efficiencies are at similar levels. Please correct this statement. Furthermore, it should be noted, that the unit of analysis is the kWh of produced electricity, hence referencing the cell efficiency as a parameter when evaluating the resource use and emissions profile is misleading. The reference should be made according to the yield. In this case, the yield at real operating conditions must be taken into consideration and not at standard test conditions. If done, the kWh of produced electricity will be very similar to all other PV technologies – again, disqualifying this statement.</p>
17	Ibid.	2.1.2 Product Scope and definition, p.13, last paragraph	Reference missing	<p>Last sentence in 2.1.2 is referring to “section x” – there is no section x in the document – please correct and provide the correct reference.</p>

18	Ibid.	Ibid., 2.1.2.1 / 2.1.2.3, p. 14 & p. 16	Inconsistency in scope for PV modules and PV systems	<p>There is an inconsistency in the scope definition for PV modules and PV systems, which – if not corrected – would lead to contradictions.</p> <p>The module scope “shall include street furniture that incorporates solar photovoltaic cells, but it does not include street lighting equipment.” The system scope mentions that “products which are only designed for use in street lighting, urban furniture, electric vehicles are excluded”.</p> <p>Hence the system scope excludes urban furniture, whereas the module scope includes it. Since the module would not work outside of the system, this inconsistency should be addressed.</p>
19	Ibid.	Ibid., 2.3.2 / Market Leaders at Member state level / Table 3, p. 19f	Missing GPPs for Electricity	<p>Table 3 should also include the effect of the 2011 GPPs for Electricity purchasing – was there any measurable effect of introducing those GPPs in 2011 on renewable energy deployment in general and PV deployment in particular? Please adjust.</p>
20	Ibid.	Ibid., 2.5.1., Existing GPP criteria sets used in the EU, p. 27f	Include data on uptake / adoption of EU GPP for green electricity	<p>Data on the uptake and implementation of the GPPs for green electricity in the various EU Member States would be extremely valuable here since those criteria have been in place since 2012. Please includedata / statistics on that, as this could be very informative for thepolicy instrument discussion.</p> <p>It would also be helpful to clarify whether the 2012 GPP will be adjusted in case PV GPPs were to be developed, since the technical background document identifies a number of issues and criteria for other RES. Would criteria developed for PV become a subset of the Green Electricity GPP? Since PV modules / inverters / systems would most likely be purchased in the context of generation capacity tenders this question should be addressed.</p>

21	Ibid.	Ibid., 3.1.1 PV Modules, p.30f, figure 4	Cumulative global shipments of PV modules	<p>The figures presented in Figure 4 are not correct for CdTe thin-film technology cumulative shipments. According to the internal inventory of registered installations using First Solar CdTe thin-film technology, by end of 2016 approximately 4.5 GWp of systems were installed in Europe - including utility scale as well as large commercial and industrial scale systems. Next to First Solar, a number of other CdTe PV manufacturers were present in the European Market since the year 2000, including Antec Solar, Calyxo, CNBM Roth&Rau/CTF Solar and Abound Solar - all with nameplate capacities in the range of 30 to 100 MWp p.a. over a number of years. Hence the overall installed capacity of CdTe thin film technology accross all sections is much closer to 5 or 6 GWp cumulatively by end of 2016 in Europe and probably to around 10 GWp cumulatively globally. Please correct this figure.</p>
22	Ibid.	Ibid., 3.4.2.1. Findings from an OJEU tenders search, p. 47	Include statistics on application of GPP for electricity purchasing	<p>It would be very informative for further discussions to understand to what extend the 2012 GPPC for electricity purchasing have been applied. Please include data on this in the final report. It would also be useful to have a discussion on how the GPP Cfor electricity procurement could be combined with the GPPC for PV – in case the tenders will only procure green electricity.</p>
23	Ibid.	Ibid., 6.1.1. Hazardous substances in solar photovoltaic modules	General remark on need for derogation	<p>The preparatory study should make it clear, that in case of alignment of potential eco-label criteria with RoHS, a derogation process will be required, and will be sought, by industry actors representing specific BATs. RoHS compliance is impossible for the identified BAT thin-film CdTe, which has been identified as the PV module technology with the lowest overall resource use and emission profile across all PV technologies investigated. A derogation will become a necessity should the eco-label be aligned with the RoHS criteria onthe use of Cd compounds in homogenous materials. A PV technology cannot substitute its semiconductor.</p> <p>We strongly suggest that this be stated clearly in the report's evaluation section. An open discussions about the Ecolable derogation process is essential to an informed decision on what policy tools are the best suited, and additional work is required.</p> <p>We recommend a reference be made to the recent discussions on this very point surrounding the adoption of a Blue Angel label for PV in Germany. Parties failed to agree on the point of chemical composition in this case.</p>

24	Ibid.	Ibid., 6.1.2. REACH Candidate List Substances, p. 73f.	Missing substances	<p>Despite having commented on this extensively in the previous stakeholder consultation round (see comments number 8 on Task 5 preliminary report), this section fails to reference the comprehensive overview of candidate list substances commonly used in commercial PV modules today. Please revise and update according to the comment and potential additional product survey data.</p> <p>Please add the following SVHC substances which are included in the candidate list as per ECHA inventory (and relevant for the product categories investigated, see EPIA Substance Survey attached):</p> <div data-bbox="1144 469 1229 549" data-label="Image"> </div> <p>EPIA sustainability working group web</p> <p>Lead (Pb) EC No.: 231-100-4 CAS No.: 7439-92-1 Date of Inclusion: 27/06/2018 Reason for Inclusion: Toxic for reproduction (Article 57c) Decision: ED/61/2018</p> <p>Lead monoxide (lead oxide) EC No.: 215-267-0 CAS No.:1317-36-8 Date of Inclusion: 19/12/2012 Reason for Inclusion: Toxic for reproduction (Article 57c) Decision: ED/169/2012</p> <p>Diarsenic trioxide EC No.: 215-481-4 CAS No.: 1327-53-3 Date of Inclusion: 28/10/2008 Reason for Inclusion: Carcinogenic (Article 57a) Decision: ED/67/2008</p>
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25	Ibid.	Ibid., 7.1, Table 19 Summary table of hotspots to be translated into criteria for EU Ecolabel	Remarks on Measures & Verification / scoping improvement potential and technical requirements	PV tech	Hotspots LCA	Measures and verification	Scoping improvement potential	Technical requirement	Precedent
				Si Tech	Ingot/Wafer production	Post-industrial / post-consumer recycled content requirement for semiconductor	Reduction of primary energy & GWP from silicon production	Definition of minimum post consumer / post industrial recycled content requirement	NSF 457 optional criteria on recycled content
				Thin film	Extraction of Cadmium and Tellurium	Referenced claims might be questionable regarding homogenous materials definition applied		Regarding the proposal of a RoHS like information requirement, this should be applied across all technologies, as materials used will change and RoHS materials are also subject to change – imposing this only on thin-film would be discriminatory and not technology neutral	
				Thin film	Flat glass production	All the requirements and improvement potentials identified should be applicable to Si tech as well			
26	Ibid.	Ibid., 7.1, Table 20 General criteria area proposals and benchmark methods for Ecolabel	Comment on hazardous substances	Proposing content limitations on lead, cadmium and phthalates will trigger the need for derogations when it comes to BAT thin-film CdTe and BNAT Perovskite on Silicon tandems – this should be clearly mentioned in the table.					

27	Ibid.	Ibid., 7.2.1 Contribution to EU policy objectives, Table 21, p. 87f. & 7.3.1 Table 22, p. 92f.	Contribution to RoHS Directive policy objective - question	<p>The RoHS Directive 2011/65/EU formulates the following scope exclusion:</p> <p>Art. 2 (4) (i): This Directive does not apply to photovoltaic panels intended to be used in a system that is designed, assembled and installed by professionals for permanent use at a defined location to produce energy from solar light for public, commercial, industrial and residential applications;</p> <p>The Directive provides the following justification for the scope exclusion in recital 17:</p> <p>The development of renewable forms of energy is one of the Union's key objectives, and the contribution made by renewable energy sources to environmental and climate objectives is crucial. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (4) recalls that there should be coherence between those objectives and other Union environmental legislation. Consequently, this Directive should not prevent the development of renewable energy technologies that have no negative impact on health and the environment and that are sustainable and economically viable.</p> <p>The RoHS' directive's stress on its regulatory coherence with the EU's climate objectives, should also apply in the case of the Ecolabel and GPP criteria.</p> <p>We would recommend to highlight this in Table 21 and adjust the rating from "moderate to strong" to "unknown" or "uncertain".</p>
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