

EuRIC reaction on the environmental impact of photovoltaic modules, inverters and systems

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Improving the design of products is a pre-condition to transition towards a circular economy. As it has already been highlighted in the report released by the European Recycling Industries' Confederation (EuRIC) named "[Top 5 Priorities of the Recycling Industry for the Period 2019 -2024](#)", 80% of products' environmental impact are determined at a design stage. Although the above-mentioned fact is also stated in the [new Circular Economy Action Plan](#) (CEAP), the vast majority of products placed on the EU market – and not only – are still designed without any consideration for their end-of-life stage. Design for circularity is of an utmost importance to move towards a more circular economy and needs to be extended to all products' categories, including photovoltaic modules, inverters and systems.

EuRIC thus fully **supports** the necessary '**Environmental impact of photovoltaic modules, inverters and systems**' legislative initiative to keep the already exploited resources - used for the manufacturing of photovoltaics modules, inverters and systems - in the market for as long as possible while at the same time significantly reducing the negative environmental impact that the in-question products are generating when are not designed to support and promote sustainability.

The **top priorities** identified by EuRIC are the following:

1. **Better labelling of PV module technology and ingredients**

EuRIC welcomes the intention of the EU Commission to improve the labelling of Photovoltaic modules placed on the EU market in order to provide more information on the energy yield¹ of the module. This will undoubtedly allow installers and designers as well as private individuals to have immediate and comparable information on the product performance and to be easily able to use this in a purchasing decision.

However, EuRIC would like to express its concern on the fact that in the Discussion Paper – which was released in April 2021 – the **EU COM has not included labelling requirements on the technology of the module used, its components and their location in the module**. EuRIC would like to highlight that the provision of this information is crucial to recyclers and facilities managing PV modules – at the end of their useful life – as this will allow; **(a)** proper storage which might differ depending on the module technology (monocrystalline silicon solar PV, polycrystalline silicon solar PV, thin film solar PV, etc.) and **(b)** easier dismantling which will result in a higher quality of recycled materials.

With regard to the information on the different components included in PV modules, EuRIC is pleased to see that a requirement mentioned in the above-mentioned report is that manufacturers shall declare in grams the content of critical raw materials (**please see below the full requirement**).

¹ **Energy yield:** total amount of energy gained from harvesting the source after deducting the amount of energy that was spent to harvest it.

'The manufacturer shall declare the content in grams of the following critical raw materials and environmentally relevant materials in the PV modules or any product part: Lead, Cadmium, Silicon metal, Silver, Indium, Gallium, Tellurium, Metal solder and contacts, Glass fining agents, Phthalates in power cables

For the encapsulant and backsheet the manufacturer shall also declare as well as the content in grams, the type of polymers used, including whether it is fluorinated or contains fluorinated additives'

Finally, as proper dismantling is key to retrieving most of the materials with the aim to reinject them into the market, EuRIC urges the EU COM to consider introducing a requirement on the tools needed by 'waste' operators during the dismantling process. Although EuRIC is very much aware of the fact that for the disassembly of some – specific - parts a dedicated technology and/or special tools is/are required, it would like recommend that dismantling of the remaining parts should be feasible with commonly available tools.

2. Binding of different PV components

The PV recycling process includes, pre-treatment to remove the frame and junction box, and mechanical compound separation to expose the materials and recover the recyclables (glass, plastics, etc.). For this reason, EuRIC strongly recommends that more focus should be placed on the removability aspect of some key components included in PV modules. This is extremely important, especially in the case of the PV's frame, as it will make possible to "ease" remove and replace key parts allowing an extended lifetime of it. Besides having an extended lifetime of the products in-question, improved removability of the PV's frame will also help in;

- a) **Speeding up the recycling process which is crucial for a fully functional circular economy.** With the current state-of the art technology, the available PV modules have an approximate lifespan of 25 years. Taking into consideration the fact that more and more EU countries are starting to increase the electricity generated by photovoltaics, it can be deduced that European recyclers will have to handle more of these energy converters over time.
- b) **Avoid breaking other components that are located in a very close proximity to the module's frame.** Once these devices reach end of life if they are not given a second life, they end up in recycling facilities. Before entering the recycling process, recyclers make sure to properly disassemble them in order to avoid any possible unintended consequences and to optimise the output of recycling. This however will not be possible to achieve if the components, and more precisely the PV frame - of the aforementioned PVs are not mechanically bound.

Thus, EuRIC recommends to the EU COM to reduce to maximum extend possible gluing practices in the manufacturing process of PV modules. This will not only speed up recycling and avoid damaging other components but it will also result beneficial from an environmental and social viewpoint.

3. End-of-life information on PV modules, inverters and systems

Photovoltaic modules placed on the EU market – and not only – are becoming more and more sophisticated over time. This is strongly linked and connected with technological advancement which not only serves us to advance as society but to also create devices that are less harmful for citizens and the environment. However, more sophisticated devices – usually – means also more information needed by recyclers – at the end-of-life - to ensure their proper and

environmentally sound treatment. **Therefore, EuRIC calls on the EU COM to include a mandatory requirement based on which manufacturers shall provide – electronically - to waste management operators carrying out repair, remanufacturing, preparing for re-use, treatment and recycling activities, end-of-life information which will ensure proper and environmentally sound treatment of PV modules. This information must be made publicly available, updated regularly and complemented, if necessary, upon request.**

EuRIC would like to remind the EU COM that this has already been proposed in article 60 (end-of-life information) of the proposed Regulation on batteries and waste batteries.

4. Binding recycled content targets

For the devices covered by this initiative, binding recycled content targets – for critical raw materials, plastics, metal etc., - should be set in order to stimulate the demand for recycled materials and make the entire value chain more circular. Setting such targets will firstly stimulate end-markets and secondly reward PV modules recyclers as well as producers committed to achieving a more circular economy.

With regard to the policy option considered, EuRIC strongly believes that the most preferred option which will allow us to take a step towards a fully circular economy is either:

- ❖ **option number 5** (a combination of ecodesign requirements and energy labelling) **or**;
- ❖ **option number 6** (a combination of ecodesign requirements, energy labelling and EU Green Public Procurement criteria (with specific reference to the latter, as the procurement of PV systems for grid connected power generation by public authorities could act as a catalyst to increase local residential photovoltaic system installations and to create demand for green solar electricity)).