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Freeriding associated with photovoltaic panels management

A paper by the WEEE Forum



Photovoltaic panels (PVs) are in the scope of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) since August 2012. This implies that extended producer responsibility (EPR) is applicable to this type of equipment, and companies placing PVs on the European market should take financial responsibility to ensure proper management of the PVs at their end of life.

From residential to utility-scale installations, the solar PV market is growing considerably in Europe. Many producers placing PVs on the market are not meeting the obligations marked by the WEEE Directive thus, distorting the market and creating a problem for the future management of obsolete panels. The supply chain is complex for PVs and may differ from other traditional electricals sales, with investment entities and landowners involved, making identification of PV producers under the WEEE Directive definition a challenge.

This paper addresses the issue of free riders, i.e., entities that place PVs on the market but do not meet the extended producer responsibilities required by European legislation.

Main message

Significant amounts of photovoltaic panels are placed on the market in Europe every year, and there has been a significant increase of these quantities in the past three years. The WEEE Directive requires producers to take responsibility for the equipment placed on the market when it reaches end of life. This responsibility requires financial and environmental management to secure quality recovery of products and materials. However, free riders -non-compliant companies - are present in most EU Member States (MS). This behavior results in a distortion of the market and unfair competition.

- *The WEEE Forum calls on legislators and policymakers to use environmental permits and other authorizations for large-scale solar PV installations as an instrument to ensure compliance with the WEEE legislation.*
- *Authorities should support the participation of customs agencies and the creation of collaborative work forces involving enforcement officers, competent authorities and PROs in the identification, information, and prosecution of free riders.*
- *Introduce the visible fee to finance the EPR of PVs.*
- *Allow PVs financing as per article 12 of the WEEE Directive (financing of WEEE from private households).*
- *Installers play an important, relevant role in the supply and value chain within the sector. They should be required to take responsibility and ensure that the PV technology they install is properly registered, as well as actively support take-back programmes.*
- *Enforcement officers should perform targeted inspections across the supply chain including installers and (online) sellers.*
- *PROs are invited to open communication channels for reporting free riders.*
- *Online marketplaces should only allow WEEE-compliant producers to sell their products on their platforms and report for non-registered sellers.*
- *Grants, subsidies, and public procurement offers should only be awarded to compliant companies and companies that use compliant equipment.*

Current situation in numbers

In absolute terms, the EU solar fleet now amounts to 164.9 GW, up 19% from 2020, and there is no end in sight to the technology's growth. In 2021, 25 out of the 27 EU Member States installed more solar power than the year before, with a total of 25.9 GW of new solar capacity installed, 34% more than in 2020 (19.3 GW). These figures mark an all-time high, according to the latest market forecast from the industry association SolarPower Europe.

It should be noted that available data on PV panels placed on the market and collected at end of life is scarce¹, but statistics available in Eurostat show collection rates of PVs well below the collection target of 65%.

Figures on the extent of free riders are difficult to find; in Spain for example, an estimated total volume of 300,000 tons is installed, but only 169,000 tons are officially reported.

The characteristics and behavior of PV panels are quite different from other types of (W)EEE². The lifespan of a PV panel is estimated to exceed 20 years and hence the disposal of PV panels is still dealing with low volumes. Although volumes of PVs reaching their end of life are increasing, depending on the specific country, these amounts may only appear after 15-20 years. Resources to cover the collection and proper treatment of these volumes will be needed.

According to the extended responsibility principle set by the WEEE Directive, such resources must come from the companies that placed the PVs on the market and fit the definition of "producer" in the Directive.

It should be noted that PROs are facing unreachable collection targets because there are currently no relevant amounts of solar PV modules arising as waste (compared to the amounts placed on the market).

Factors facilitating freeriding

Complexity of the market structure

In general, there are two main types of PVs installed in Europe:

1. **PVs in large-scale installations, i.e., solar fields or farms (utility scale):** large quantities of PV panels are purchased and installed by companies that must obtain an installation and exploitation license. In this case, the PVs manufacturer may be the manager of the solar field, or simply supply the equipment to the company running the field.
2. **Residential-type installations:** in this case PVs may be sold directly to the user through (mass) retailers, including online retailers. The installation may be conducted by a private user, but in most cases a professional company provides, installs the equipment, and takes care of the regular maintenance of the installation. Panels must be connected to the grid, which is done by local/national electricity service providers.

The above is a simplification of the different scenarios existing in the market; as an example, SolarPower Europe considers the following types of system size for its forecasts of the PV

¹ Issues associated to photovoltaic panels and compliance with EPR legislation. WEEE Forum paper, June 2021.

² However, we can still identify EEE that show long life cycles and may deserve a special consideration in the WEEE legislation, particularly when setting collection targets, such as LEDs, air conditioning equipment and specific non-household equipment.

market: residential (<10 kW); commercial (<250 kW); industrial (1,000 kW); utility-scale (>1,000 kW, ground mounted).

According to SolarPower Europe, utility-scale solar has proven resilient during the pandemic, but takes longer to install than rooftops, which may provide a timely contribution already by next winter. With the high-priced module phase still ongoing, distributed solar is therefore likely to remain a big part of the plan in the EU27 over the next 2 years.

The actors accountable for placing PV solar equipment on the market, and therefore likely to be considered “producers” and liable of the extended responsibility according to the WEEE Directive, may be:

- A retailer or professional supplier of equipment,
- An EU-based PVs manufacturer,
- A company managing a solar field, importing the equipment from a non-EU PVs manufacturer,
- An online seller based or not based in the country where the equipment is installed.

The number of companies that could potentially become “producers” is significant. Hundreds of small installers import small amounts from outside the EU in all MS, and it is extremely difficult to identify and track them.

Producers may come from different sectors: the PV manufacturing industry, the energy sector, importers/retailers and the service segment (e.g., installers).

Lack of information/awareness and enforcement

Under the WEEE Directive, companies subject to producer responsibilities not only must finance the proper management of PVs at end of life, but must also fulfil other legal requirements, such as registering in the national WEEE registers and report the quantities placed on the market. Systems for WEEE take back may be set up by producers individually or collectively (the latter, for example, through extended producer responsibility organisations, PROs).

National competent authorities do not usually conduct campaigns to inform such a variety of potential producers about their responsibilities. PROs, present in almost all MS, often provide information to producers, and organise regular communication campaigns to fight free riders but lack the competence to enforce compliance.

Online sellers present a real challenge, as they are difficult to identify and contact, and enforcement is complex when they are based outside the country or Europe.

Classification of PV panels

PVs may be considered only non-household (professional) equipment, like in Spain and Luxembourg, or may be considered either non-household or household equipment based on certain criteria, like in Switzerland, Italy, and Slovenia. This difference in classification may determine the financial scheme set for the collection for treatment of the PVs at the end of life.

According to article 13 of the WEEE Directive, for historical waste being replaced by new equivalent products, the financing of the costs shall be provided for by producers of those products when supplying them. However, MS may, as an alternative, stipulate users other than private households also be made, partly or totally, responsible for this financing. For other historical waste, the financing of the costs shall be provided for by users other than private households.

Article 13 also states that producers and users other than private households may, without prejudice to the Directive, conclude agreements stipulating other financing methods.

The above, therefore, adds complexity to the assignment of the responsibility of the financing obligations, the enforcement and monitoring.

Good practices for reducing freeriding of PV panels

There is often a lack of alignment and support between EU legislations, which sometimes hinders compliance and enforcement. Similarly, a collaboration between different national bodies such as customs, enforcement agencies, permitting agencies or PROs, is encouraged. The measures suggested in this document will allow different pieces of legislation and national bodies to align with and support circular economy, and different sectors to observe the WEEE legislation.

Introduce visible fee

Eurostat data shows that PVs put on the market are starting to become a relevant stream in some EU countries. For 2019, PVs put on market represent between 10% - 12% of the total EEE put on the market in Spain, Germany, Belgium, and Portugal, and reaches 30% in the Netherlands.

A visible fee would allow for easier identification of non-compliant vendors and producers and help producers prove they meet their EPR obligations.

Involve customs

Good practices are identified in some countries like Norway, where customs authorities play an active role and collaborate with the respective national PROs. In general, customs have access to the identity and contact of the company importing commodities into the national territory, and the type of imported commodities. Therefore, customs could:

- identify the profiles of importers that may be affected by the WEEE legislation,
- inform importers about their obligations,
- verify that importers meet their EPR obligation before import admission,
- collaborate with the competent authorities and/or PROs in the country to ensure that producers importing WEEE meet obligations.

Use permits as a tool

Permitting is an excellent instrument against freeriding, which is a relevant, multi-factorial problem to address urgently.

In most EU countries, the grid connecting companies do not verify whether the producer supplying the PV panels is compliant with the WEEE legislation; nor is it a requirement for grid connection to prove that the producer of PV panels participates in a take-back system (either collective or individual) and reports amounts placed on the market accordingly. This could be a key instrument for assuring greater compliance across the trading system.

To tackle the freeriding issue we call on policy makers to:

- Condition the licensing procedure for grid connections/solar fields to WEEE compliance as a criterion; to obtain the permit, applicants must prove that the installed PVs come from a compliant producer, i.e. registered in the national WEEE register, and either

adhered to a PRO or with an individual scheme established on their own as per article 12.3 of the WEEE Directive.

- In the case whereby producer chooses to fulfil their EPR obligations individually, and considering the long life of PVs, additional proof must be required demonstrating that there is an appropriate financial instrument and ensuring that enough funds are available to finance the management of the PVs whenever they become waste.
- Require an end-of-life plan along with the grid license application. The plan would describe how the PVs would be managed at end of life and provide evidence of the measures in place for proper environmental management (e.g., contracts with recycling facilities, PROs, etc.)

We accept that permitting procedures need to be simplified to accelerate the deployment of renewable energies and thus facilitate the transition to more efficient energy systems. However, we firmly believe that this is an excellent instrument to fight freeriding, a relevant problem that must be addressed urgently to deliver proper end-of-life management for the large number PV panels currently being placed on the European market.

Classify PVs as dual use, household equipment

This will allow PROs to apply the EPR financial scheme for household electricals of Article 12 of the WEEE Directive, which is clearer and more traceable than that for non-household appliances. The WEEE Directive allows different options for financing non-household equipment at the end of life, which adds complexity and makes it difficult to monitor and assign responsibilities. Despite classifying PVs as household equipment from a financial point of view, the collection channels and associated logistics for PVs should be adapted to the type of equipment. Thus, a hybrid situation with 'household financing' and 'non-household logistics' is highly recommended.

Condition to grants and subsidies

Make WEEE compliance a requirement for accessing grants and subsidies offered for the execution of any professional installation of solar PV panels. Grants and subsidies are good means for supporting the use of renewable energies. They contribute to more PVs installed and should therefore include circular economy principles and WEEE legal compliance in their selection criteria.

Registration criteria in Green Public Procurement

Similar to the previous point, including WEEE compliance in the criteria for Green Public Procurement is an excellent way to raise awareness in the PV sector and motivate conformity against WEEE rules.

Good practices for PV installers

- Agencies accrediting PV installers should require evidence that all supplied PVs come from registered producers.
- Curriculum of trainings for the installer certification should include information explaining:
 - a. the WEEE national legislation obligations, including practical information on how to check that purchased PVs are compliant,
 - b. information on the penalties for not meeting this requirement,
 - c. information on access to authorised take-back networks and end-of-life processes upon decommissioning of PV panels.

Good practices for (online) marketplaces and sellers

- Online marketplaces and physical vendors should allow only compliant producers to sell their products through their platforms and facilities and include this requirement in their contractual policies and due diligence strategies.
- (Online) marketplaces should be allowed to report on behalf of smaller entities using their platforms.
- (Online) marketplaces selling PVs should be responsible for checking that their merchants are registered and provide evidence that installers could use for their permit procedures.
- Online marketplaces not assuring proper registration of quantities sold should be deemed responsible for reporting the non-compliant PVs placed on the market through their platforms.
- Consider increasing control points for verification of registration; as an example, when commerce chambers or similar bodies (except local registries) exist in the country, they must require an EEE registration number certification.
- Sellers and online marketplaces should display the National EEE Registration Number on (public) documents like invoices, delivery notes, webpages and seals.

Good practices for enforcement

- Perform regular inspections of (online) marketplaces and other e-commerce modalities to identify non-compliant sellers.
- Inspect existing large-scale installations to check if PV panels installed come from registered vendors.
- Set collaboration schemes with PROs to identify and prosecute free riders. PROs and environmental agencies are encouraged to establish task forces where limitations in inspection resources may be supported by PROs and other stakeholders, particularly through knowledge transfer and information sharing.
- The European WEEE Enforcement Network (EWEN)³ developed a form that facilitates the collaboration between enforcement agencies of the MS (available on the European WEEE Registers network⁴ website). A programme dedicated to promoting, developing, and informing on this initiative would be welcome.
- National WEEE registers should keep information on registered EEE producers updated and public, so that users and enforcers can easily verify whether the manufacturer or supplier of the PVs is duly registered.

Good practices for information sharing and collaboration

- Some PROs offer the possibility to report free riders.
- A simple area on the website of the national registration or environmental agency may invite users to contact the PRO or competent entity, anonymously and in total confidentiality, to report a freeriding activity. An example for inspiration is the above-mentioned compliance form available at the European WEEE Registers Network.
- PROs are encouraged to contact environmental agencies and establish task forces and fluid communication channels to speed up the prosecution of identified free riders.
- PROs and WEEE national legislations should allow for retrospective reporting for freeriders to comply with their WEEE obligations.

³ Network formed by the agencies from several EU countries dealing with the enforcement of the European WEEE Directive.

⁴The European WEEE Registers Network is an independent network of the National Registers in charge of overseeing the national implementation of the WEEE Directive. Form:

https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/weee_complaint_form.pdf

About the WEEE Forum a.i.s.b.l.

The WEEE Forum, set up in 2002, is a Brussels-based international for-impact not-for-profit association speaking for forty-six not-for-profit electrical and electronic equipment waste (WEEE) producer compliance schemes – alternatively referred to as ‘producer responsibility organisations’ (PRO). The PROs are based in Australia, Austria, Belgium, Bosnia, Canada, Czechia, Cyprus, Colombia, Denmark, Estonia, France, Greece, Iceland, India, Ireland, Italy, Lithuania, Luxembourg, Malta, Moldova, the Netherlands, New Zealand, Nigeria, Norway, Poland, Portugal, Romania, Slovenia, South Africa, Spain, Sweden, Switzerland and the United Kingdom. It is the biggest organisation of its kind in the world. In 2021, its member organisations reported collection and proper de-pollution and recycling of more than 3,100,000 tons of WEEE. Members in 2022: Appliances Recycling, ARCwaste, Australia New Zealand Recycling Platform, Cobat RAEE, EcoCómputo, Colelec, Ecologic, ecosystem, Ecotic, ECOTIC, Ecotrel, , EGIO, El-Kretsen, Electrao, ElektroEko, Elektrowin, elretur, Environ, EPA, EPRA, Epron, ERA, Erion WEEE, Fotokiklosi, Karo Sambhav, LightCycle, MoldControl, Norsirk, PV Cycle Italy, PV Cycle UK, Recipo, Recupel, Recyclia, Red Verde, RENAS, Repic, SENS e-Recycling, Stichting Open, SWICO, UFH, Úrvinnslusjóður, WEEE Cyprus, WEEE Ireland, WEEE Malta, WEEE Recycle and ZEOS.

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