Management of EE Waste from Solar Panels

Zagreb, March 2025

Introduction

According to the Waste Management Act, producers of products are required to pay a fee for waste management when they place a specific type of product on the market for which a fee obligation has been established. This fee finances waste management services and helps achieve the objectives of the extended producer responsibility system.

In Croatia, manufacturers and importers of photovoltaic panels have been regularly paying a fee for the management of electrical and electronic waste (EE waste) for several years or have been subject to customs inspections and assessments. Even so, the infrastructure for the collection and disposal of this waste has yet to be established. Furthermore, investors who experienced damage to photovoltaic modules – either due to weather conditions or during transit – have had to bear the storage costs themselves, as there is no organized system for the collection, processing, or recycling of such waste.

This situation raises concerns about the justification for paying the fee, as the system that should be supported by these fees has not yet become operational.

Current Situation and Comparison

Currently, the fee for the disposal of waste from solar panels is €0.30 per kilogram, which is much higher compared to other EU member states.

Table 1: Comparison of Corresponding Fees in EU Member States[1]

State	Price in €/metric ton
Netherlands	40
Belgium	75
France	75
Slovenia	100
Hungary	140
Croatia	300

Source: Renewable Energy Sources in Croatia (RESC)

At the same time, the entire burden of waste disposal and processing for special categories of waste is borne by businesses in the renewable energy sector (RES), which are already burdened with numerous levies. This practice casts serious doubt on the profitability of further investments in the

[1] The figures in the table are shown per metric ton to allow for comparison, given the differences in billing systems.

renewable energy sector (RES) and requires immediate intervention to ensure the sector's sustainable development and alignment with national and European climate targets.

Impact of the Structure of Photovoltaic Modules on EE Waste Fees

Currently, the fee for the disposal of waste from solar panels is calculated based on the total weight of the modules, despite their structure clearly indicating that most of the weight consists of materials that are not classified as EE waste and are recyclable:

- **Glass (70-80%)**: Easily recyclable and not classified as EE waste.
- **Aluminum frame (10-15%)**: Also easily recyclable and not considered EE waste.
- **EE waste (10-15%)**: Includes silicon, metal conductors (e.g., copper, silver), and plastic components.

Imposing disproportionately high fees for EE waste in the case of photovoltaic modules is not based on the actual share of EE waste, which has significant adverse effects on the renewable energy sector, particularly in the context of solar energy development.

Drawbacks of the Current Fee System

Slowdown of investments in solar power plants: Unjustifiably high fees make investments in solar projects financially unviable, which discourages new investments and reduces the sector's appeal.

Conflicting with the goals of the energy transition: Increasing investment costs in solar energy is inconsistent with Croatia's ambitions to meet EU targets for reducing greenhouse gas emissions and improving energy efficiency. Instead of stimulating investments, high levies create barriers that slow down the transition to sustainable energy.

Undermining the National Energy and Climate Plan (NECP): Under the NECP, Croatia has committed to increasing the share of renewable energy in gross energy consumption while removing barriers and simplifying administrative procedures for investors. The high fees for EE waste, which are not based on actual recycling costs, are contrary to these goals and constitute a serious hindrance to their achievement.

To ensure the continued sustainable development of the renewable energy sector, it is essential to adjust the EE waste fee system, taking into account the actual share of recyclable materials in photovoltaic panels and to provide investors with more favorable conditions for further investment in solar energy. This would also contribute to Croatia's energy independence, reduce costs for end users, and lessen the administrative burden on investors. This measure would align with national and EU climate goals and encourage the achievement of ambitious climate standards.

Why is Adjusting the Fee System Critical for the Renewable Energy Sector?

In order to make the fee system more sustainable and supportive of investments in solar power plants, the fee for the management of EE waste from solar panels needs to be reduced. Comparing fees between EU member states demonstrates that countries are effectively adopting renewable energy sources, including solar power plants, while also maintaining an efficient system for managing post-use waste, with much lower costs for investors.

The fee should be considerably lower and proportional to the actual share of EE waste in the total weight of the panels, reducing the financial burden on investors while achieving recycling and waste reduction goals.

Solar energy plays a key role in the sustainable energy transition, and a fairer fee system would lead to:

- **Reducing the financial burden on investors in solar power plants.**

- **Aligning fees with the actual share of EE waste in photovoltaic modules.**

- **Increasing the competitiveness of the renewable energy sector, which would help accelerate the energy transition and reduce greenhouse gas emissions.**

AmCham Recommendations

The analysis of the current situation and the challenges faced by investors in the renewable energy sector highlights two key issues:

1. **The disproportionately high fee compared to neighboring EU member states, especially compared to Slovenia.** The current fee amount significantly exceeds those typically found in neighboring countries, creating a financial burden for investors in Croatia. Given the lower recycling costs in other EU countries, bringing the fee in line with regional practices is crucial.

2. **The collection of the fee without providing the services outlined in the regulations, resulting in a double cost for investors.** Specifically, liable companies pay the fee to the Environmental Protection and Energy Efficiency Fund while simultaneously bearing additional costs for the disposal of panel waste at their own expense, as the appropriate waste management service has not been established. This situation not only increases the financial burden but also undermines investor confidence in the system.

AmCham proposes the following measures for establishing a fee system that encourages investment and the development of RES:

- ***Reducing the fee for the management of EE waste from solar panels to €0.12/kg or lower***
  The new fee amount should be aligned with the practices of neighboring countries and significantly reduced compared to the current fee. This is especially important given the lower costs and the recent reduction in the fee for the disposal of photovoltaic panels to €106.66 per metric ton. It is worth noting that the original proposed fee was €275.50 per metric ton.

- ***Refunding the fee difference retroactively***
  For all liable companies who have already paid the fee, the difference between the previous and new fee amounts should be refunded.

- ***Suspending the fee payment obligation until a functional system has been established***
  The payment of the fee should be suspended until the solar panel disposal system becomes operational in order to prevent an additional financial burden on investors.

- ***Having the option of paying the fee in installments***
  Introducing the option of paying the fee in installments will help reduce the financial burden on investors, taking into account the long-term obligations in the renewable energy sector.

- ***Further reduction of the fee for large-scale projects (over 375 kW)***
  Further reducing the fee for large-scale solar power projects will increase competitiveness, reduce initial financial burdens, and accelerate the implementation of large-scale energy-efficient projects[2]. This will accelerate the green transition as well as economic growth.

By introducing a fair fee system, Croatia would reinforce its position in meeting European climate targets. At the same time, the development of renewable energy sources would be accelerated, increasing the security and sustainability of the renewable energy sector, with additional support for green investments.

[2] As per the WEEE2 guidelines (*guidance document*) from October 2016, large-scale fixed installations are defined as those with a rated power exceeding 375 kW.

For additional information, please contact: American Chamber of Commerce in Croatia

Andrea Doko Jelušić | Executive Director

T: 01 4836 777 | E: andrea.doko@amcham.hr