Seamless-PV

FACTSHEET #3

Vehicle-Integrated PV

The project

Seamless-PV is a Horizon Europe project that drives the implementation of new integrated photovoltaic (IPV) solutions across different market sectors. Its main objective is to develop advanced manufacturing equipment, processes, and digitalization strategies focusing on laminating IPVs based on glass, lightweight composites, and polymers.
Faced with real industrial environments and different market demands and opportunities, Seamless-PV aims to set up 6 pilot lines and 11 different IPV demo cases across Europe including but not limited to PV technologies integrated in noise barriers, buildings, electric vehicles, and agricultural fields.

Photovoltaic integration in electric vehicles

Given the ambition to decarbonize the transport sector by 2050 - which accounted for 31.0% of Europe's final energy consumption in 2022[1] - photovoltaic integration in electric vehicles is emerging as a market with significant growth potential.
In essence, the SEAMLESS-PV project is driven by the 2 main issues that limit the uptake of vehicle-integrated photovoltaic (VIPV) technologies:

- Firstly, currently used integrated photovoltaic technologies laminated on glass are heavier than polymer-based alternatives;
- Secondly, high efficiency PV technologies are essential to reduce costs and develop VIPV solutions adaptable to a wide range of vehicle configurations.

Examples of solar panels on electric vehicles.

1 - https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Final_energy_consumption_in_transport_-_detailed_statistics&oldid=652642. Date last accessed: 31/10/2024.

Within this framework, SEAMLESS-PV aims to scale technologies from the lab and prototype stages to pilot production.
Specifically, the focus will be on the development of new PV laminates for different types of vehicles which will allow higher production volumes at reduced costs; increased automation of the production process; and upscaled manufacturing processes. To this end, procedures such as manual cell interconnections and lay-ups will be automated. Materials and processes will be developed depending on the vehicle the VIPV will be integrated on:

- For electric cargo boxes, e-buses, and/or e-trucks: different polymer compositions will be tested to select the most compatible compositions for high pressure injection processes for VIPV technologies.

- For electric passenger cars: various polymers and material combinations thereof will be tested to select the most compatible laminate for polymer-based VIPV technologies to fit with the existing automotive supply chain and customer requirements.

The design and integration of VIPV on cargo boxes, e-trucks, and e-buses will be led by BRAN with support from TEC. On the other hand, the design and integration of VIPV on passenger cars will be led by LYL with support from TEC.

CONSORTIUM

Seamless-PV-project

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