1st BOOSTER press release, April 2021

The BOOSTER project targets the deployment of organic photovoltaic (OPV) technology to the building applied photovoltaic (BAPV) market. OPV is a technology that addresses the challenge of global energy production with an eco-responsible approach. Manufacturing OPV modules via printing techniques features a low energy-payback-time (EPBT) and uses resources that are abundant, easily accessible and non-toxic. Additionally, OPV demonstrates properties (flexibility, lightweight) that make it easily suitable for BAPV.

Within the BOOSTER project, the first Work Package on "Technical and Product Specifications" has recently been completed and its main objectives were to:

- Identify specifications for the advanced materials respecting requirements driven by two project end demonstrators
- Identify specifications of the demonstrators

The main tasks of this work package were to define the materials and standardized tests for the BOOSTER active layers, ETL, HTL and encapsulation frontsheet and backsheet. Concerning the active layer, donor polymers and acceptors, that demonstrated high efficiency OPV cells, were selected. Various ETL and HTL were chosen for their compatibility with these materials. To select the best performing materials, a list of standardized tests was defined. It describes all the validation processes to meet the objectives of efficiency, stability, cost and transferability towards roll-to-roll production lines, to be carried out later in the project.

The aim of the second task was to elaborate a list of specifications for the encapsulation frontsheet and backsheet. These materials should have at least four advantages: 1) they should protect the OPV modules and resist different weather conditions as the demonstrators will be installed outdoor, 2) they have to be compatible with the OPV stack described previously, 3) they should take into account EU regulations and standards especially with respect to integration into buildings and 4) they should be transferable to industrial processes. These specifications will be used within Work Package 3 to develop and deliver suitable permeation barrier films with sufficient outdoor stability to allow a device lifetime of up to 35 years for use in Europe.

In parallel to these materials' specifications, two application scenarios were chosen and described. The first one is a ready-to-stick Building Applied PhotoVoltaics (BAPV) to be installed at the site of project partner ENI and the second one is a textile-integrated OPV film to be installed at a research building of project partner FAU. These realisations will show real BOOSTER products in real production conditions. First of all, the partners tried to identify the best BAPV market targets. For each building component, a study was conducted to identify the most frequent substrate materials. It appears that roofs, canopies and facades are the most used building components. Painted galvanised metal (mainly aluminium and steel) is generally used for roofs and canopies. Facades and glass are also frequent. As a consequence, two sites were identified:

- A canopy at ENI Renewable Energy and Environmental R&D Center in Novara (Italy). The surface for the demonstrator will be of 100 m^2.
- A glass façade at the Lounge Building in Friedrich Alexander University (FAU) in Erlangen (Germany). Here, the surface for the demonstrator will be of 60 m^2.

Concerning this second demonstrator, a student contest was launched at the Technical University of Nürnberg in cooperation with FAU in 2018. The competition winner conceived an installation with several rectangular textile products next to each other: they should facilitate the light filtering inside the building. This concept was the starting point for the definition of the technical specifications of the BOOSTER textile demonstrator to be installed at FAU facilities. BOOSTER textile modules will be composed of an active area enclosed in transparent ETFE material due to the need for avoiding massive light shading through the glass façades inside the building. Regulations and test protocols were finally investigated to monitor these demonstrators and to anticipate the future commercialization of the product. More details about the demonstrators to be built can be found in the technical specifications.

The BOOSTER project consortium is a blend of leading research institutes in their field combined with private companies and SMEs capable of producing large-scale materials, barrier films and Roll-2-Roll manufactured OPVs.

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