

Bringing down costs of multifunctional building-integrated photovoltaic (BIPV) solutions and processes along the value chain, enabling widespread nZEBs implementation

PROJECT PURPOSE

Building-integrated photovoltaic (BIPV) technology has the potential to significantly contribute to the achievement of the demanding energy efficiency targets set by the EU, however, its market uptake has been hindered in the past years by the difficulties of the industry in providing holistic solutions complying with key demands from decision makers and end-users.

This market deployment depends critically on the achievement of ambitious targets in terms of significant cost reduction, flexibility of design, high performance, reliability in the long-term, aesthetics, standardization and compliance with legal regulations.

In this context:

BIPVBOOST aims at bringing down the cost of multifunctional buildingintegrated photovoltaic (BIPV) systems, limiting the overcost with respect to traditional, non-PV, construction solutions and nonintegrated PV modules, through an effective implementation of short and medium-term cost reduction roadmaps addressing the whole BIPV value chain and demonstration of the contribution of the technology towards mass realization of nearly Zero Energy Buildings.











BIPVBOOST will address challenges these by implementing shortand medium-term cost reduction roadmaps along the BIPV value chain, at 4 levels:



Digitalized process and energy management system along the value chain

standardization activities supporting the qualification of **BIPV** systems for a massive implementation in the building skin

METHODOLOGY

EXPECTED IMPACT

Roadmaps for cost reduction development & nZEBs energy targets and environmental assessment



50% reduction of additional cost of BIPV modules in 2020 and **75%** reduction in 2030

From 15% to 25% in our high scenario, reaching an annual development of up to 3 GWp by 2025 and of 9.3 GWp by 2030

Workforce linked to BIPV could increase from 20% to 44% during the 2020-2030 decade

PROPOSED INNOVATIONS

Automated BIPV manufacturing line development

- Tabber-welding for c-Si,
- Tabber-welding for back-contact cells
- Self-configurable string lay-up equipment
- Semi-manual string interconnection station
- Automatic and self-configurable in-line electroluminescence quality control

Multifunctional BIPV products

- Coloured c-Si based solutions for ventilated façades
- a-Si patterning solutions for skylights, ventilated façades and curtain walls
- Bifacial modules for balustrades
- Back-contact modules for walkable floors, curtain walls

Building skin solutions

- Multifunctional BIPV opaque façade cladding solution
- Enhanced frameless façade systems with CIGS on metal modules
- Enhanced roof and façade systems with CIGS on metal modules
- Glass-glass plug&play façade systems

Digitalized process

• BIM-based tool supporting process design, manufacturing and installation

DEMO SITES

Demo 1: Puertollano, Spain

Balustrades based on glass-glass bifacial modules and walkable floors based on back-contact solar cells.



Demo 2: Aretxabaleta, Spain

Building-integration of glass façade with c-Si technology and different configurations to demonstrate automated production in façade configuration.

Demo 3: Saint-Denis, Belgium

Building integration of metal based roofing shingles in a residential single-dwelling building & passive house.

Demo 4: Morbegno, Italy

Building integration of multifunctional **BIPV** opaque façade cladding systems in a residential multi-family dwelling with a twin building to support performance assessment.





- Cloud-based BEMS including demand response and storage management
- Fault detection and diagnosis tool
- Augmented reality app for pre-design stage





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