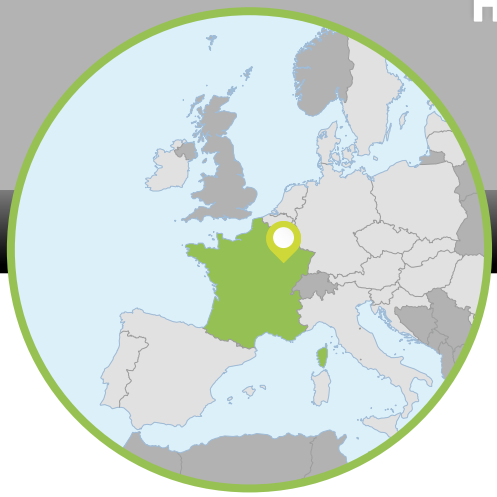
European Commission

INNOVATION FUND

Driving clean innovative technologies towards the market

Helexio® line: Demonstrating the manufacture of innovative BIPV roof components

The Innovation Fund is 100% funded by the EU Emissions Trading System



Project summary

The objective of the Helexio® line project is to develop the first full-scale plant to manufacture a 'ready to plug-in' Building-Integrated-Photovoltaic (BIPV) roofing steel envelope for the European non-residential buildings market. This unique technology combining in one component steel roof + photovoltaic (PV) solutions brings lightweight, flexible and easy-to-implement solutions adaptable to all types of roof, there by addressing key market barriers in this sector, while being economically viable. These innovative components once implemented in buildings will replace significant grid electricity by solar electricity, leading to significant reduction of greenhouse gas (GHG) emissions.

COORDINATOR
ArcelorMittal Construction

LOCATION
Contrisson, France

SECTOR
Solar Energy

AMOUNT OF INNOVATION FUND GRANT
EUR 3 733 140

RELEVANT COSTS
EUR 6 221 900

STARTING DATE
01 October 2021

PLANNED DATE OF ENTRY INTO OPERATION
April 2024

Innovation in the product, in the process and in the business model

Non-residential building roofs constitute a huge potential in Europe for the development of PV capacities especially renovation market. This market is currently poorly addressed due to several barriers. In particular, existing solutions are too heavy and generate high constraints in the structure; they are not adapted to retrofit solutions; or they require the involvement of multiple players, making the implementation long and more complicated. Finally, existing solutions also involve a still high percentage of non-recyclable components.

The project is bringing a contribution to address these barriers and demonstrating high innovation in three aspects: (1) in the development of a new BIPV product, (2) in the associated manufacturing process for large size modules; and (3) in a new business model.

1. The new BIPV product will be the first of its kind to be deployed into the non-residential buildings market. The product, thanks to the innovative integration of the photovoltaic function directly onto the roof results in improved energy performance, reduced weight, greater ease of installation and a lower carbon footprint.
2. The designed manufacturing process, which is based on the integration of silicon solar cells over steel substrates, will enable the production of longer length modules (up to 12m long), which represents significant advancements beyond the state-of-the-art.
3. The business model will be innovative based on the nature of the product, bringing a roof and a solar system at the same time. The product will be distributed based on two approaches to simplify the value chain: through established solar project developers active in roofing applications and through subcontracting / partnering with value chain players to develop renovation solar roof projects.

Multiple benefits compared to existing solutions

The Helexio® panel modules present multiple benefits compared to existing PV solutions: they include a 'plug and play' feature that eases the installation of the overlapping modules; they are lightweight in nature (meaning that no structural reinforcement is required for roof renovation); they meet high safety and insulation standards (for example, resistance in case of fire); and, they offer flexibility in length (12 metres representing 60% of the conventional roof length on the market for non-residential buildings).

The modules will also be cost competitive compared to conventional technology and will lead to significant GHG emissions reduction from conventional electricity generation. The renewable electricity produced based on BIPV modules manufactured from the project once deployed on buildings will help avoid around 170 000 tCO_2 net absolute GHG emissions during the first ten years of operation.

This project builds on a smaller-scale project that was financed by the LIFE+ programme between 2012 and 2017 – the LIFE PHOSTER project), which allowed ArcelorMittal Construction to run and demonstrate pilot line to produce BIPV components.

Scale up potential in multiple non-residential buildings market segments and countries

By focusing on two market segments (agricultural and industrial building renovation) and four countries (the Netherlands, Germany, Spain, and France), ArcelorMittal Construction is planning to secure volume ramp-up in the short to medium term (220 000m^2 at the end of the project). The site capacity can also be significantly increased in the long term based on the development of a second production line. This will enable the company to target new European markets.