



CommONEnergy



CUSTOMISED PHOTOVOLTAIC HARVESTERS FOR DIRECT FAÇADE INTEGRATION



Photovoltaic modules are usually added to existing buildings. Building Integrated Photovoltaics (BIPV) try to replace conventional material in façades, roofs and any other building components, but conventional solar cells are often not suited for the complex questions arising from the integration of photovoltaic modules into façade elements.

Sunplugged's adaptable thin-film solar modules can be applied in a variety of BIPV products.

Within the framework of the CommonEnergy project, Sunplugged developed a novel flexible thin-film solar module for multi-functional façade systems. The ability to work with a variety of forms, sizes and voltages was a key aspect to focus on, achieved with Sunplugged's novel manufacturing process. Comprehensive know-how and techniques enable the aesthetically-attractive integration of façade elements with PV-active layers into the building skins.

Among the developments, the optimisation of the PV-active layers for their use in façade systems and their lamination to commercially-available façade material allow obtaining a long-term resistant multi-material-composite.

Innovative interconnection and integration concepts are now possible for efficiently-optimised PV-façade-elements and novel approaches for appealing designs of PV in buildings.



USE

The customisable PV-foils can be laminated onto wood and metal façade systems and can be used in a variety of buildings ranging from commercial structures such as shopping centres, to office buildings and residential positive-energy-houses. Even existing façade systems can be retrofitted in a budget-friendly way.



FEATURES

- Made-to-measure photovoltaic integration
- Lightweight- The laminated PV foil adds only 2 kg per sqm
- Average module efficiency between 11-12%
- Compatible with commercially-available façade systems
- Balanced solution in respect to price, performance and design

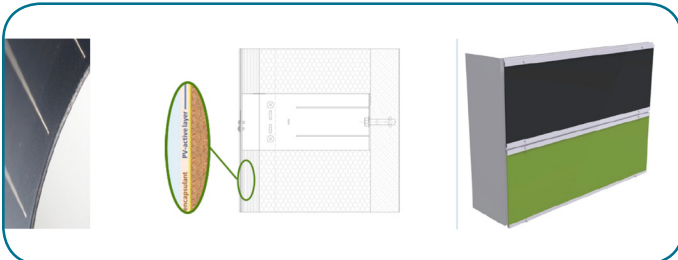
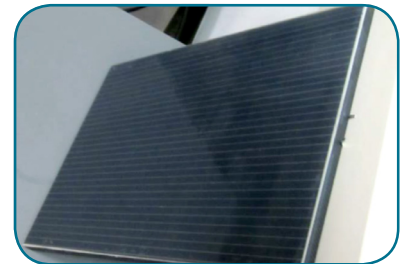
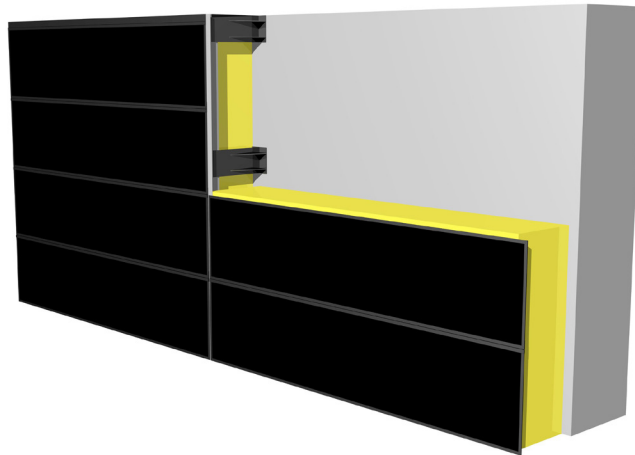


OVERCOMING THE HURDLES OF CONVENTIONAL PHOTOVOLTAIC MATERIAL - FULL FREEDOM OF FAÇADE DESIGN

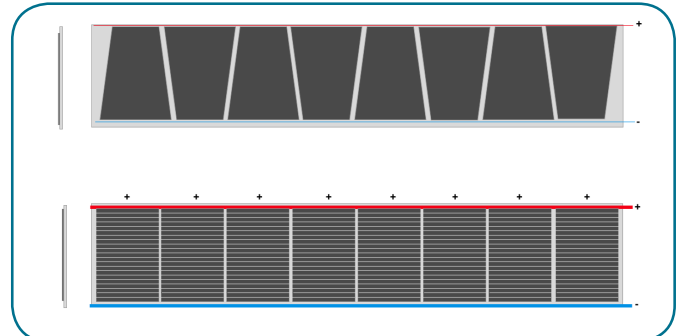
Today the use of silicon solar cells, both mono- or poly-crystalline, covers well the performance requirements but does not satisfy other important requests such as:

- Design and aesthetics
- Shape and geometries: standard solar cells do not fit well every shape of the construction elements used for façades
- Lightweight and even curved solutions: Sunplugged's PV-foil allows to realise curved PV-glasses or other construction material like polycarbonate
- Fully-laminated onto commercially-available façade material

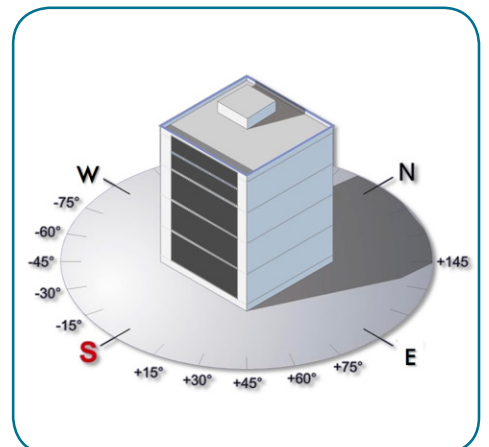
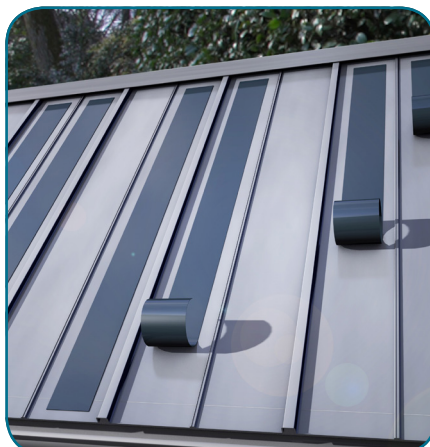
Inspired by a tailor's work: made-to-measure and seamless PV-integration for building façades



The active photovoltaic material (optimised thin-film solar cells from Sunplugged, internally-interconnected as required) are laminated/bonded on standard façade plates to obtain a long-term durable multi-material-composite



Full freedom of design and customisation allows optimised interconnection and wiring concepts to improve energy yields and reduce shading losses





INNOVATIVE POTENTIAL

In January 2015, the BCC Research Energy & Resources Report¹ stated that global building-integrated photovoltaics (BIPV) revenue to photovoltaic manufacturers was valued at about \$1.3 billion in 2013 and increasing to \$1.4 billion in 2014. This is expected to increase to \$1.9 billion by 2019, with a compound annual growth rate (CAGR) of 6.4% for the five-year period, 2014 to 2019.

The building industry is searching for new markets and more individualised components.

⁽¹⁾ <https://www.bccresearch.com/market-research/energy-and-resources/building-integrated-photovoltaics-markets-report-egy072C.html>



BENEFITS



- An active energy-producing building skin reduces the total electrical energy consumption
- Full freedom of façade design
- Amortisation within 6-10 years depending on orientation and location
- Compatible with standard façade systems
- Improved building quality and performance
- Positive image



Investment for PV integration	180 Euro/sqm
Watt peak	120 Watt peak/sqm
Annual energy yield (south facing, location Austria)	90 kWh/sqm
Earnings (self-consumption)	20 Euro/sqm
Amortisation (Austria)	9 years





COMPATIBILITY WITH OTHER TECHNOLOGIES

The PV modules can be applied to commercially-available standard façade systems.



CONTACT DETAILS

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The project *CommONEnergy* (2013-2017) focuses on transforming shopping centres into energy efficient buildings, by developing smart renovation strategies and solutions to support their implementation as well as assess their environmental and social impact.

- 3 demo cases, 8 reference buildings & 23 partners from across Europe
- 25 technologies developed and installed in 4 years
- Up to 75% reduction of energy demand, leading to costs reduction
- A payback time of maximum 7 years



CommONEnergy



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