Cost-effective and innovative solar energy integration in stock and new buildings
- how to generate revenue with your building façade and roof

Overview on the current state of play of BIPV and highlight contributions from BIPVBOOST project

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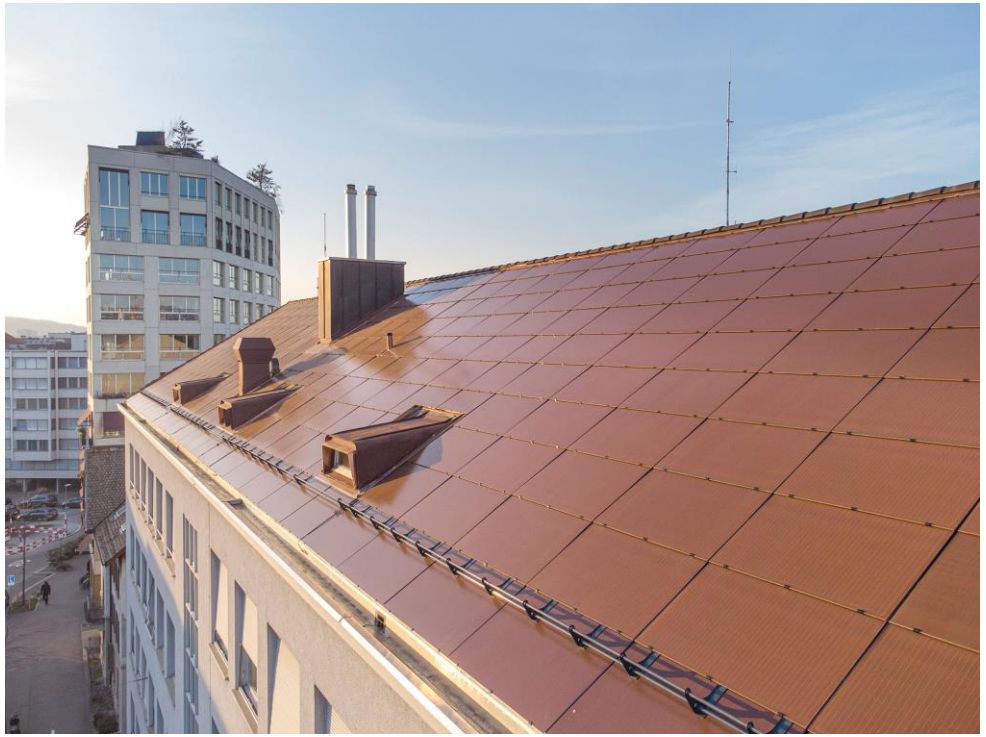
Where are we coming from?

How has the BIPV sector progressed?

First roof integrated solution in UK, 1994.
Credits: Gb-Sol

Aesthetics: from bluish/black to a broad palette of colours

Credits: 3S Solar Plus



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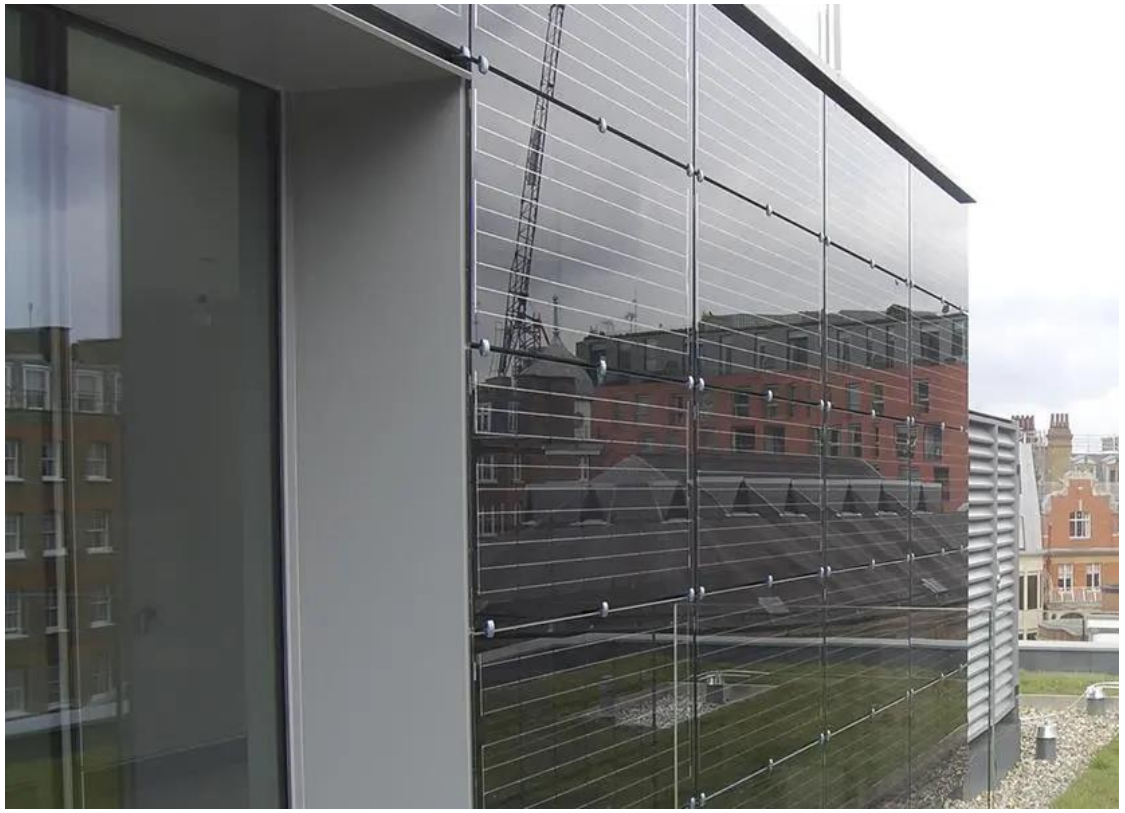
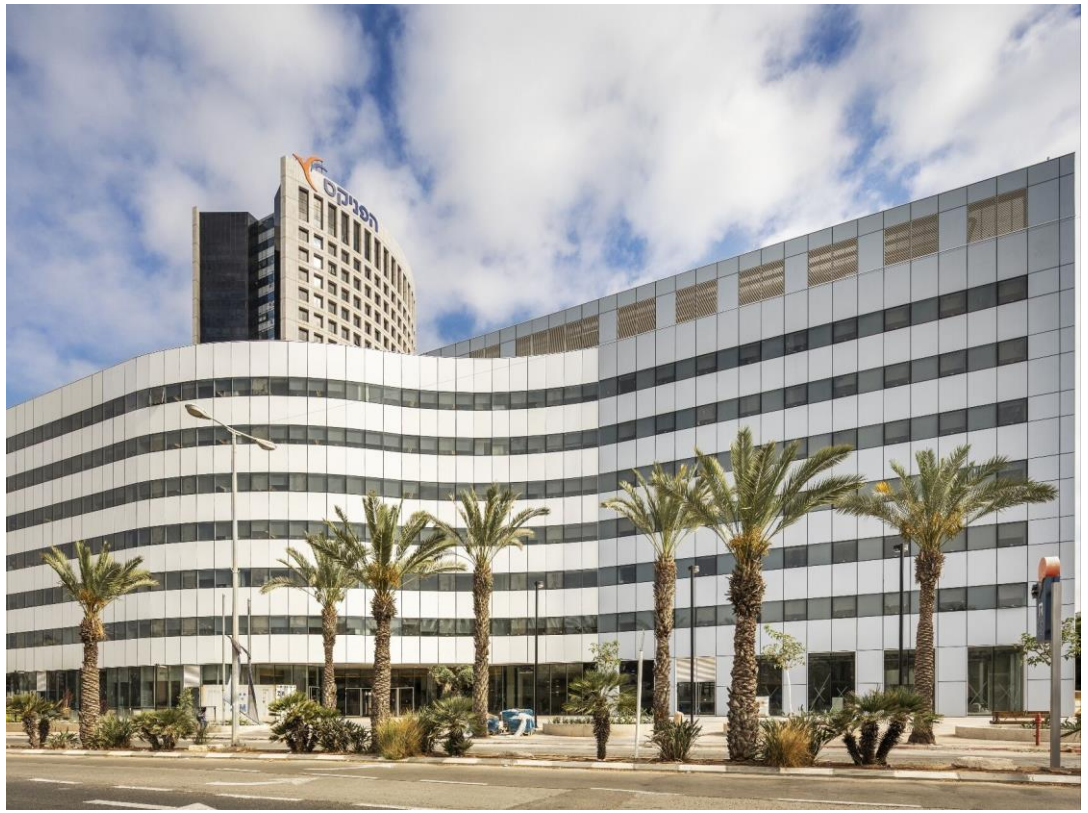
Aesthetics: from bluish/black to a broad colour palette



Credits: ONYX Solar



Credits: ONYX Solar

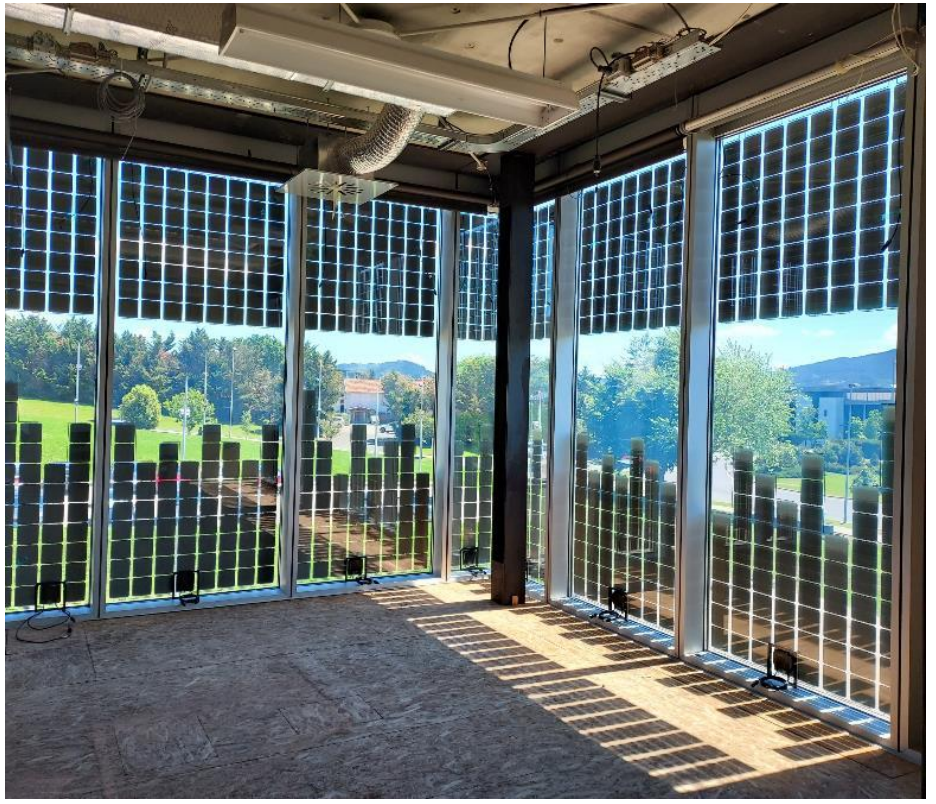
Customization: from manual to fully automated processes

Credits: ISSOL

Credits: BIPVBOOST project

Customization: from manual to fully automated processes

Credits: TECNALIA, PVsites project



Credits: TECNALIA, BIPVBOOST project

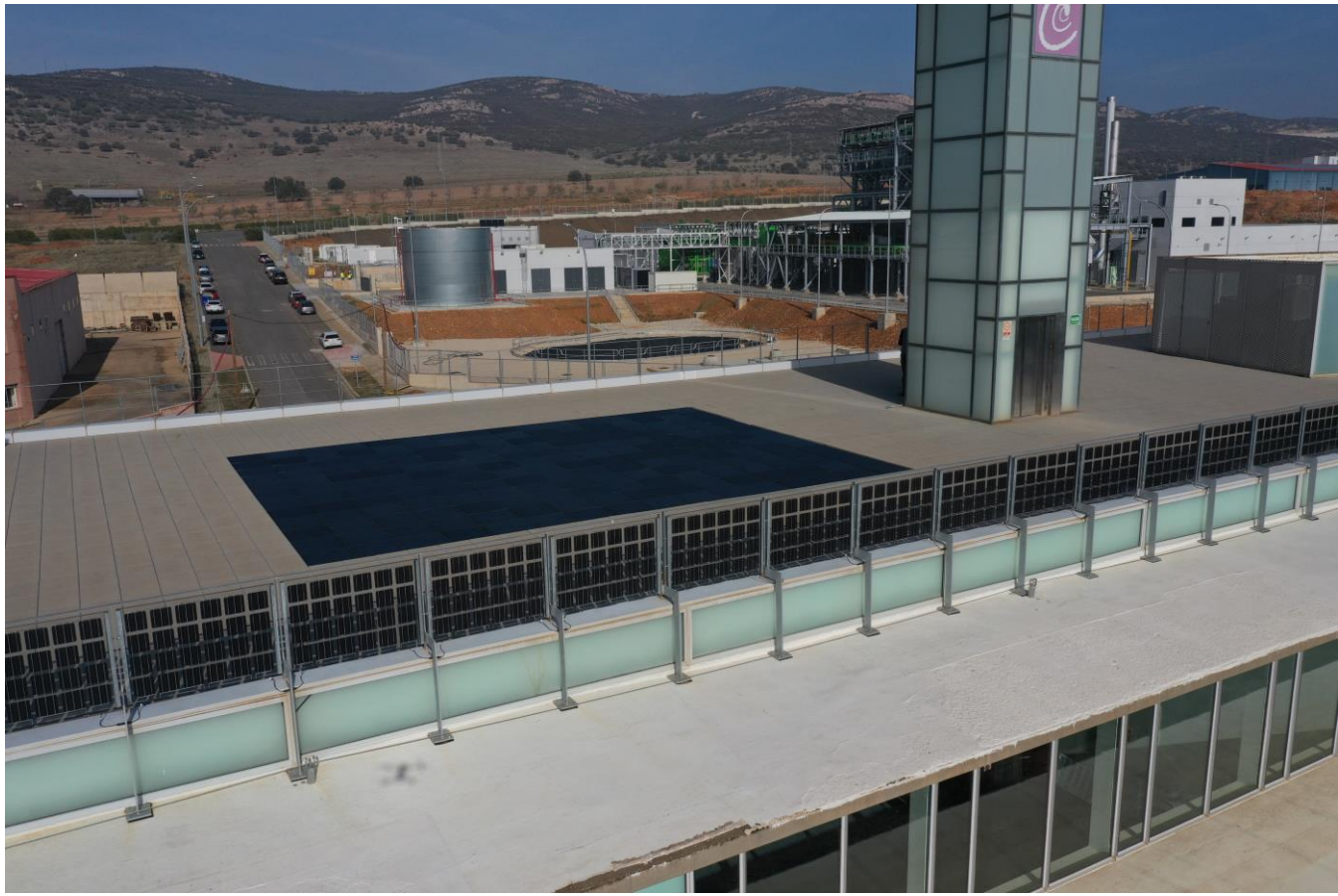
Where is the BIPV sector standing today?

Credits: TECNALIA, PVsites project

Current state of play at a glance

- **Growing market:**
  - growing demand and favorable framework. Strong wind tails
  - Increasing interest in BIPV from key stakeholders in the construction value chain
- **Evolving technology:**
  - Robust and reliable
  - Higher efficiencies
  - Broader product portfolios, including colour
  - Higher automation, improved quality and continuous cost-reduction
- **Ongoing standardisation initiatives**
- **Improved interaction between PV and construction workflows**
- **Cost-competitiveness already a reality in certain segments**

Highlight contributions from BIPVBOOST to the current state of play



Credits: ISFOC

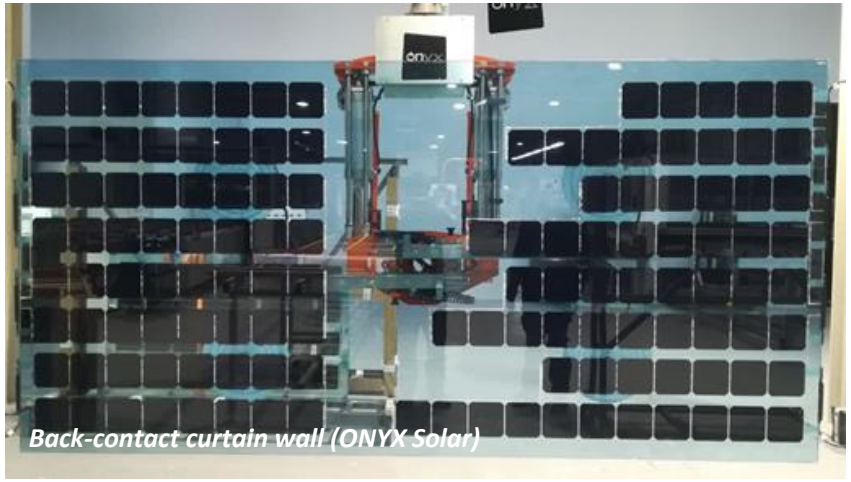
Flexible manufacturing line for BIPV

- **Flexible tabber-stringer** based on c-Si technology
- **Automatic string lay-up**, compatible with XL formats (3 x 2 m) and accurate and **free** string **positioning** onto the module
- I**n-line quality** control at string and module level, prior to the lamination process
- Two operation modes, standard and customized. Compatible with full / half-cells / bifacial cells and **customized string length and cell distances** (incl. variable cell distances within a string)
- Enhanced flexibility in design, higher productivity and quality, and module cost reduction

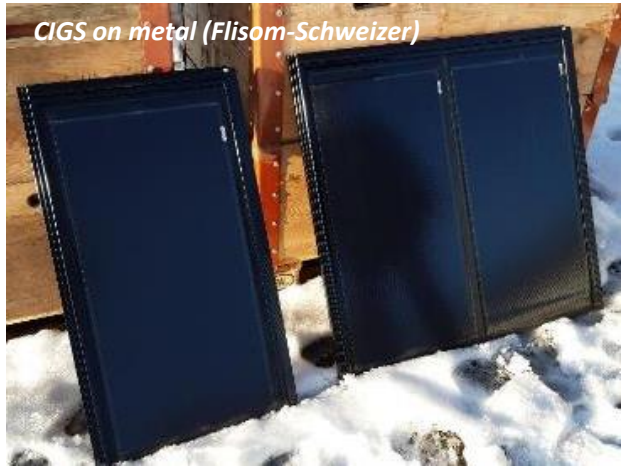
BIPV manufacturing line developed by Mondragón Assembly, at ONYX facilities

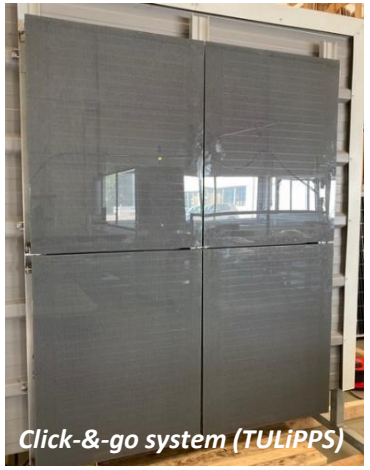
Portfolio of low-cost and aesthetical BIPV solutions

- Advanced **glass-glass** BIPV products based on c-Si, back contact and a-Si technologies for different applications
- Multifunctional BIPV façade cladding system with **integrated insulation**
- Cost effective BIPV roof and facades systems for **CIGS on metal**
- Low-cost **Click-&-Go substructure** for easy and fast installation of BIPV modules


Back-contact curtain wall (ONYX Solar)

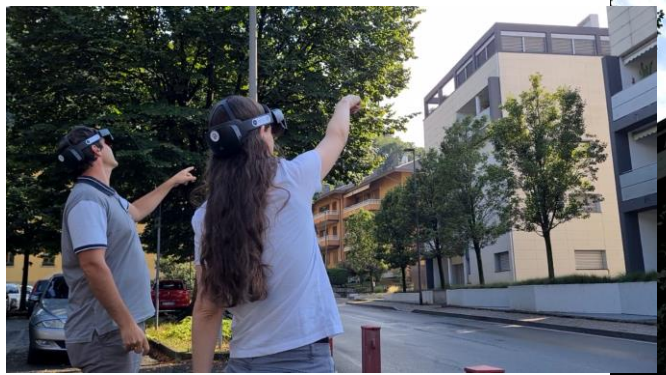

Veture kit (PIZ)

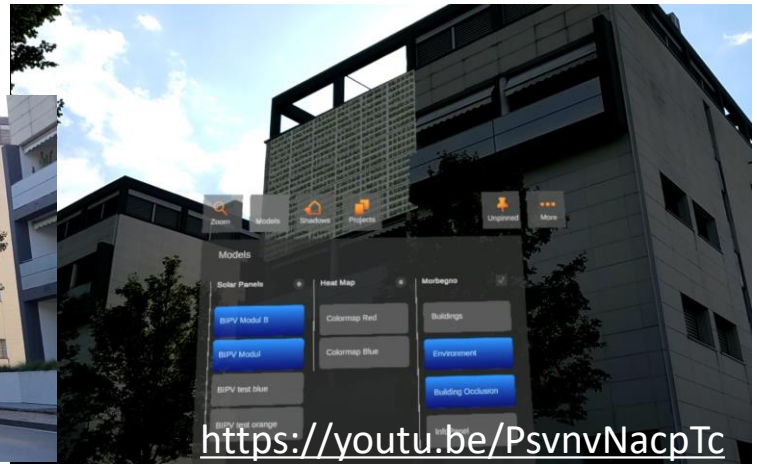

CIGS on metal (Flisom-Schweizer)


Click-&-go system (TULiPPS)

Data-driven strategies for cost reduction along the value chain, from design to installation

- **BIM-based collaborative platform for a data-driven cost reduction along the BIPV process**
- **Cloud-based energy management system for tertiary buildings, including BIPV generation, storage and manageable loads**
- **Failure detection and diagnosis tool for BIPV**



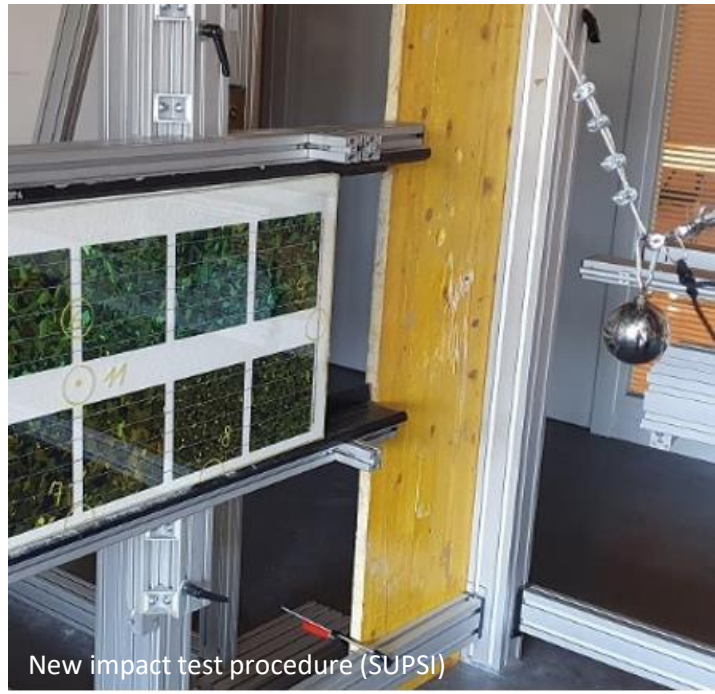


https://youtu.be/PsvnvNacpTc

Standardisation of BIPV

Analysis of missing gaps in the currently **fragmented standardisation framework**, proposing new combined PV-construction testing procedures and equipment in the following categories:

1. Energy efficiency (g and U values)
2. Energy performance in non-conventional scenarios (e.g. partial shading)
3. Mechanical performance of BIPV elements
4. Fire reaction of BIPV components/systems

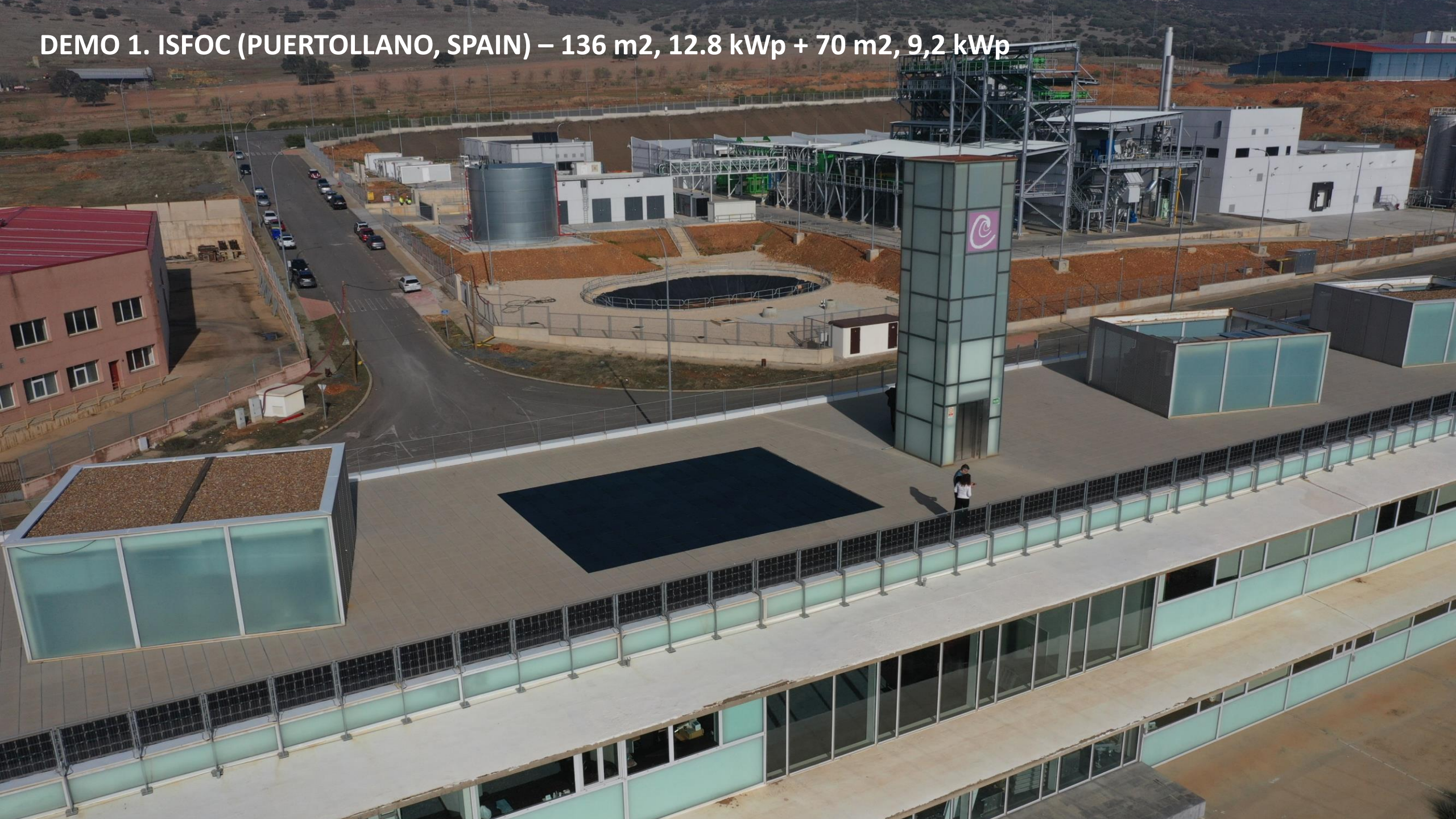

New impact test procedure (SUPSI)

Direct feedback towards ongoing standardisation initiatives

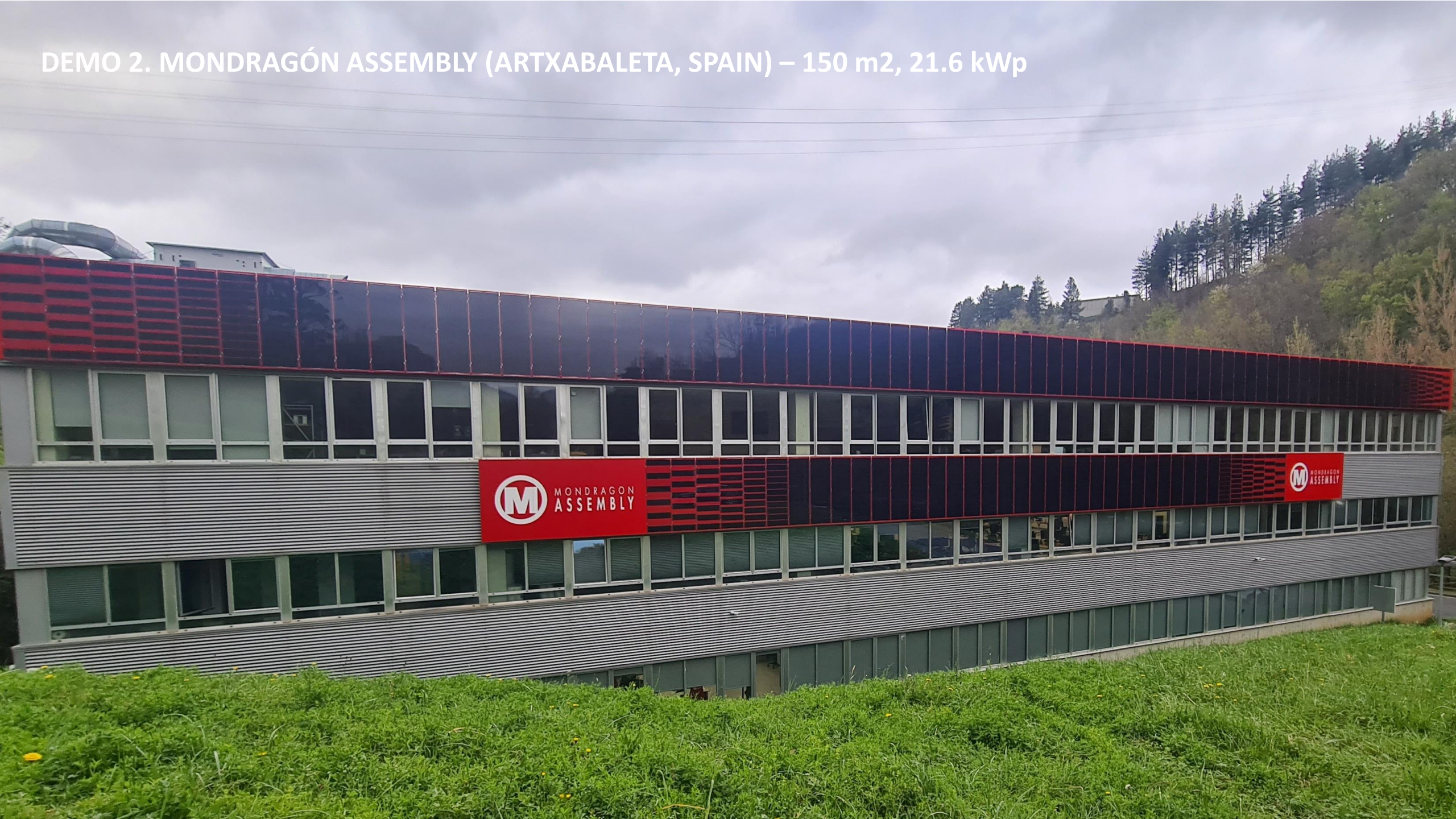
- Revision de EN 50583
- TC 82/JWG11 (IEC/ISO)

Public report on **standardisation SoA and missing gaps**: https://bipvboost.eu/public-reports/

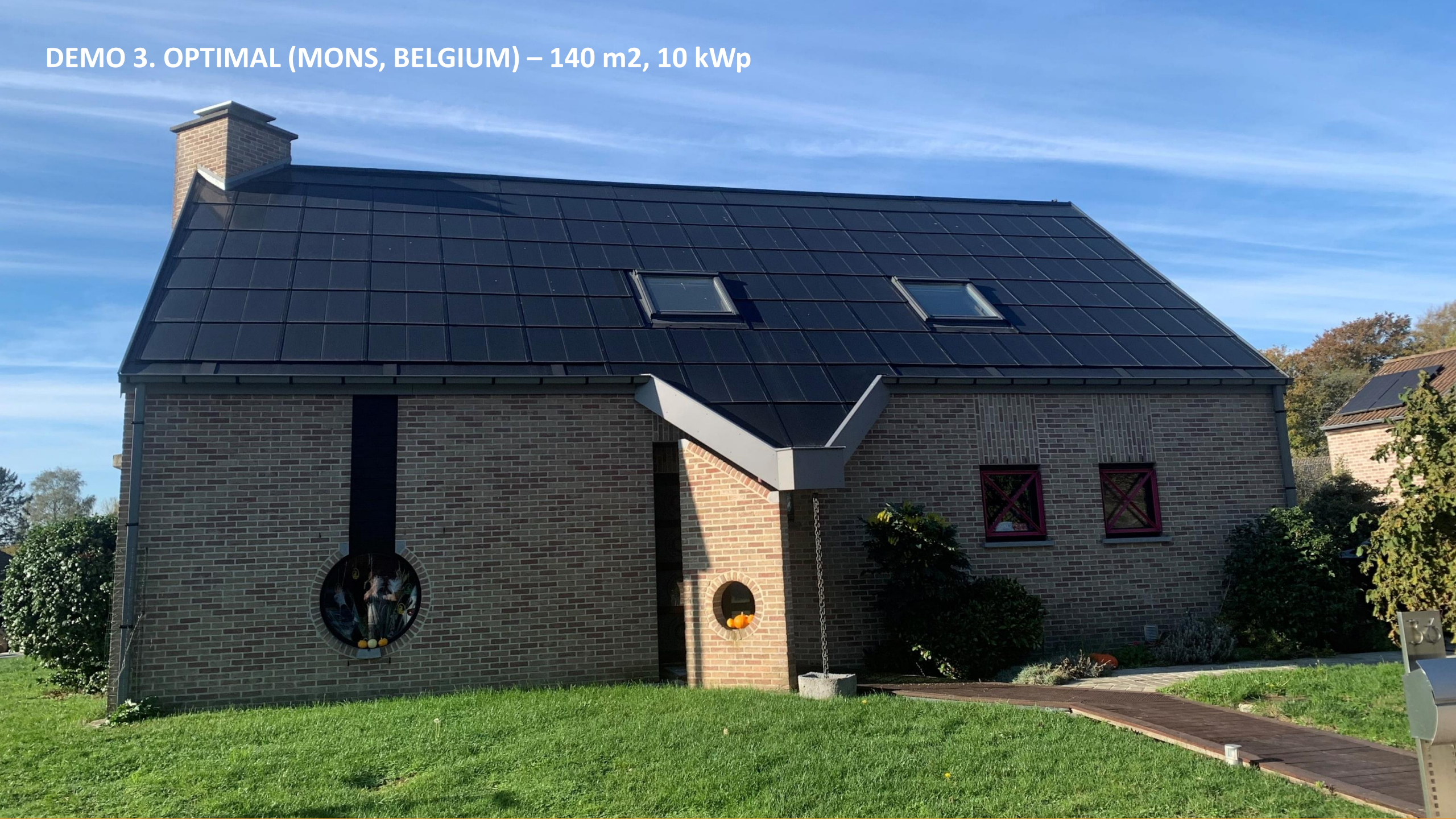
DEMO 1. ISFOC (PUERTOLLANO, SPAIN) – 136 m2, 12.8 kWp + 70 m2, 9,2 kWp



DEMO 2. MONDRAGÓN ASSEMBLY (ARTXABALETA, SPAIN) – 150 m2, 21.6 kWp

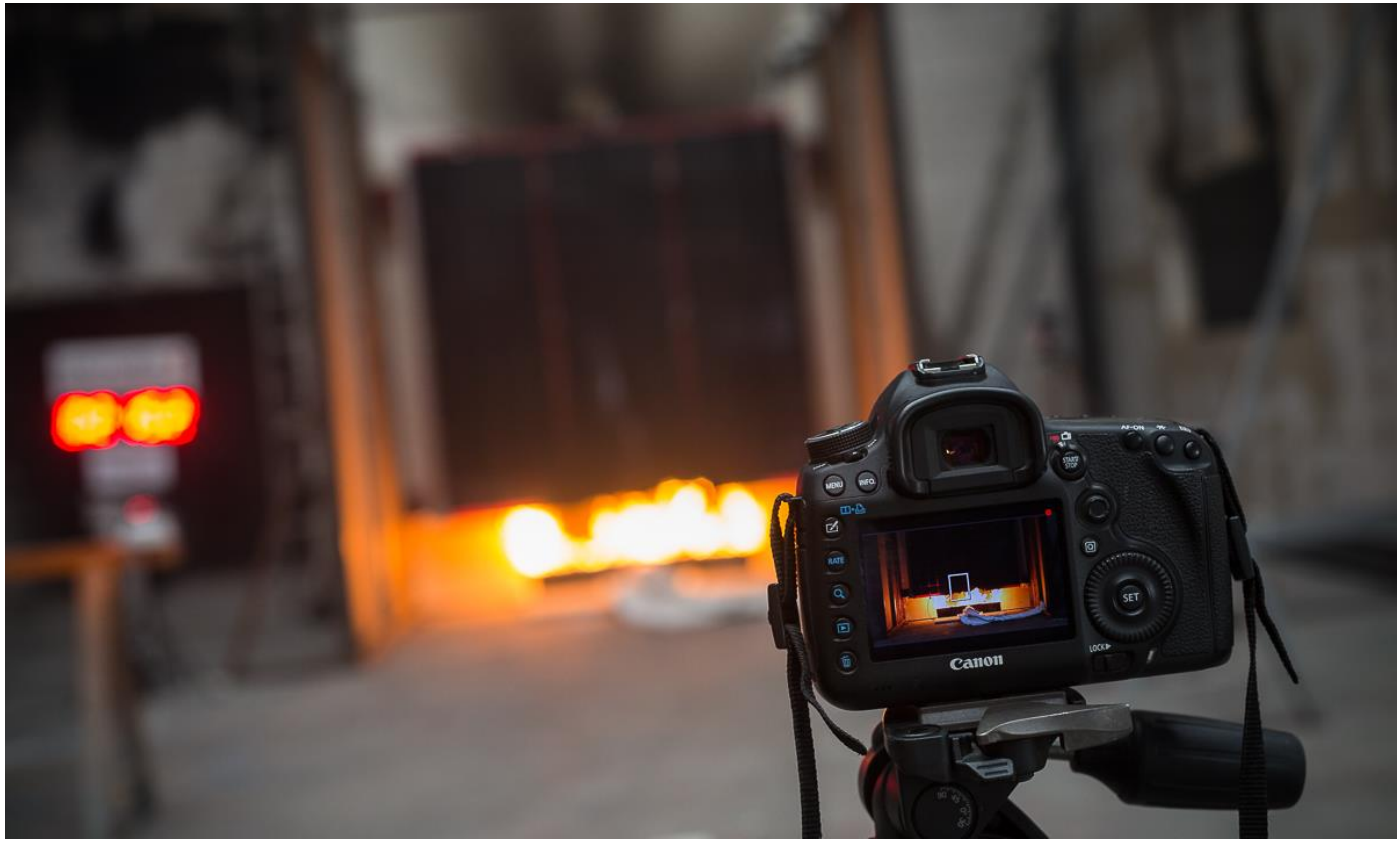


DEMO 3. OPTIMAL (MONS, BELGIUM) – 140 m2, 10 kWp



DEMO 4. PIZ (MOGBEGNO, ITALY) – 60 m2, 9.8 kWp

Which are the current challenges for BIPV?



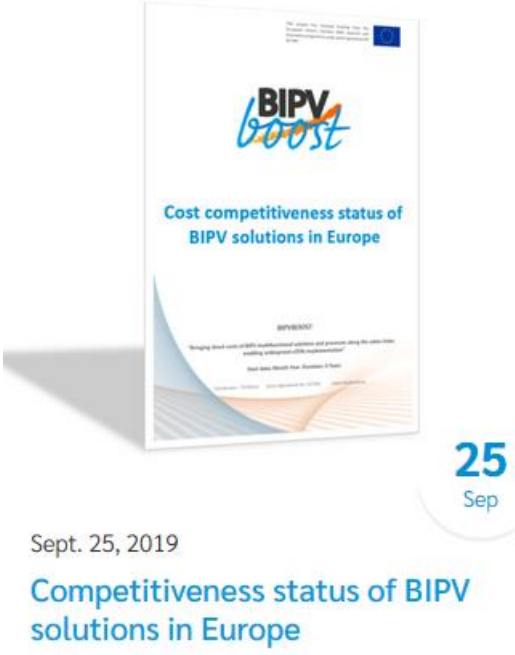
A few topics for further discussion…

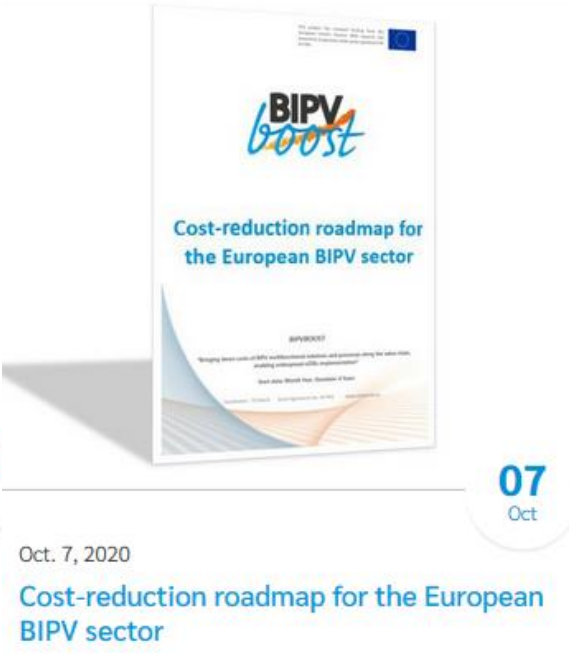
- **Adaptation of the industry to upcoming PV technological innovations and trends**
  - New cell formats
  - Interconnection technologies
  - Encapsulation materials & processes
- **More and bigger players are needed to foster competition and drive costs-down**
  - Mass-market adoption, especially in the residential sector
  - Economies of scale
  - Cost-competitiveness in all segments
- **Re-skilling the construction sector for a faster technology adoption**
- **Standardisation and upcoming more restrictive fire regulations**

Public material available on the website

- **Cost-competitiveness status of BIPV in Europe**
- **Cost-reduction roadmap for the European BIPV sector**
- **Market and stakeholder analysis**
- **Potential contribution of BIPV systems to nZEB**
- **Standardisation of BIPV**
- **Information modelling/management**

https://bipvboost.eu/public-reports/





Upcoming webinars

- **Digitalization innovations for BIPV: 27th of April 12.00-13.00h (CET)**
- **Standardisation activities and results: 9th of May 12.00-13.00h (CET)**
- **Overall project results and cost-reduction impacts: tbd**

Save the dates!

New projects

Seamless-PV

Website: seamless-pv.eu

Thank you

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