Trends in BIPV development – A summary of IEA-PVPS Task 15

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Outline

• Task 15: Enabling Framework for the Development of BIPV

• Current status of BIPV

• Snapshots on recent results and trends in BIPV from Task 15
What is IEA PVPS Task 15?

IEA PVPS Task 15 – Enabling Framework for the Development of BIPV

Objective:

• Create an enabling framework to accelerate the penetration of BIPV products in the global market of renewables.

• Resulting in an equal playing field for BIPV products, BAPV products and regular building envelope components.

• Respecting mandatory issues, regulatory issues, aesthetic issues, reliability, environmental and financial issues.
Overview Task 15 Subtasks

- **Subtask A: Technical Innovation System (TIS) Analysis for BIPV**
  - Michiel van Noord, RISE, Sweden

- **Subtask B: Cross-sectional analysis: learning from existing BIPV installations**
  - Gabriele Eder, OFI, Austria

- **Subtask C: BIPV Guidelines**
  - Costa Kapsis, University of Waterloo, Canada; Nuria Martin Chivelet, CIEMAT, Spain

- **Subtask D: Digitalization for BIPV**
  - Rebecca Yang, RMIT, Australia

- **Subtask E: Pre-normative international research on BIPV characterization methods**
  - Helen Rose Wilson, Fraunhofer ISE, Germany
New BIPV Status Report (SUPSI, Becquerel)

https://solarchitecture.ch/bipv-status-report-2020/
Status of BIPV

• BIPV has been and still is a niche market

• Several high level trends push BIPV
  • Trend towards zero-energy buildings
  • Large demand of area for PV installations in renewable energy systems
  • Massive price decrease of basic components for BIPV (solar cells, power electronics etc.)

• Several barriers still hinder a large-scale market uptake
  • Knowledge in all relevant stakeholder groups
  • Efficiency, aesthetics, reliability, economics and efficient planning processes simultaneously needed
Successful Building Integration of Photovoltaics
A Collection of International Projects

IEA-PVPS Task 15

Edited by Tjerk Reijenga, BEAR-iD. Webinar upcoming.
Business Cases for BIPV

- New business cases evolving due to massive price decrease of photovoltaic components

- Value proposition not only electricity generation, but also local value creation, sustainability, marketing, architectural design etc.

- Exemplary business models with different revenue streams for
  - Privately owned single-family housing
  - Collective self-consumption in multi-family buildings
  - Commercial buildings

https://iea-pvps.org/key-topics/development-of-bipv-business-cases-guide-for-stakeholders/
Multifunctional Characterisation of BIPV

- BIPV requires multi-functional characterisation
  - Electrical
  - Mechanical
  - Fire Safety
  - Optical/thermal
  - Durability and reliability

- Test methods from different sectors need to be applied and could be aligned step by step in the future
- Test modifications proposed
- Standardization and normative framework very important. Pre-normative work done in Task 15.

https://iea-pvps.org/key-topics/multifunctional-characterisation-of-bipv/
Edited by Helen Rose Wilson and Francesco Frontini, co-authored by Jun-Tae Kim (Kongju National University, Korea) among others
BIPV as multi-functional element

- Hotel Strandkajenin in Örnsköldsvik (North of Sweden), project of Soltech

- 418 black 85W panels and 72 40W semi-transparent panels. The semi-transparent panels are located in front of the windows.

- Multi-functional aspects
  - Energy generation
  - Transparency/daylighting
  - Aesthetics of modules and complete façade
  - Service life
  - ...

“My ambition was to create a meeting place in Örnsköldsvik that feels modern and innovative. It feels good that the property is both energy efficient and stylish in its design.”
- Markus Näslund, founder of the project Strandkajen Örnsköldsvik

https://soltechenergy.com/en/
Colored BIPV

- Colored BIPV as key technology for aesthetical solutions and wider acceptance
- Efficiency still important
- Various technological approaches and solutions available on the market and/or upcoming from research
- Pilot projects demonstrate architectural possibilities

PV modules with MorphoColor technology from Fraunhofer ISE

Colored BIPV

Männedorf(ZH), April 2020
Architect: René Schmid
Modules: Solaxess, ISSOL

Credits: Solaxess
Thank you for your attention

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