Figure: Power Tower Linz, Energie AG – modules: ertex solar, photo: Gabi Eder Architect: Kaufmann, Weber & Hofer

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

Johannes Eisenlohr, Operating Agent Task 15, Fraunhofer ISE

PVSEC-30, Jeju, Republic of Korea / November 10th 2020

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.

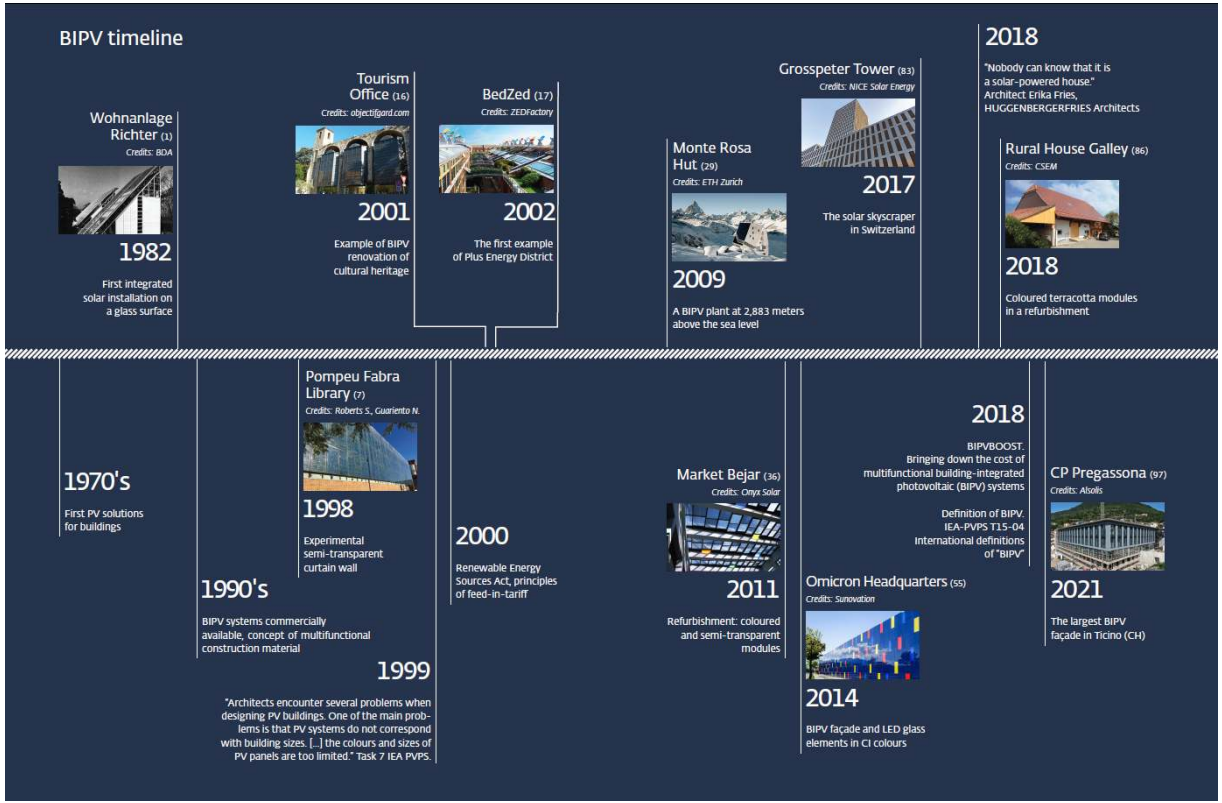
SonnenparkPLUS
Wetzikon-arento AG
Architekturbüro

© ertex solar (partner within IEA PVPS Task 15)

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/

University of Applied Sciences and Arts of Southern Switzerland
SUPSI

BECQUEREL INSTITUTE

PVPS

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

Upcoming Task 15 Publication

Edited by Tjerk Reijenga, BEAR-iD. Webinar upcoming.

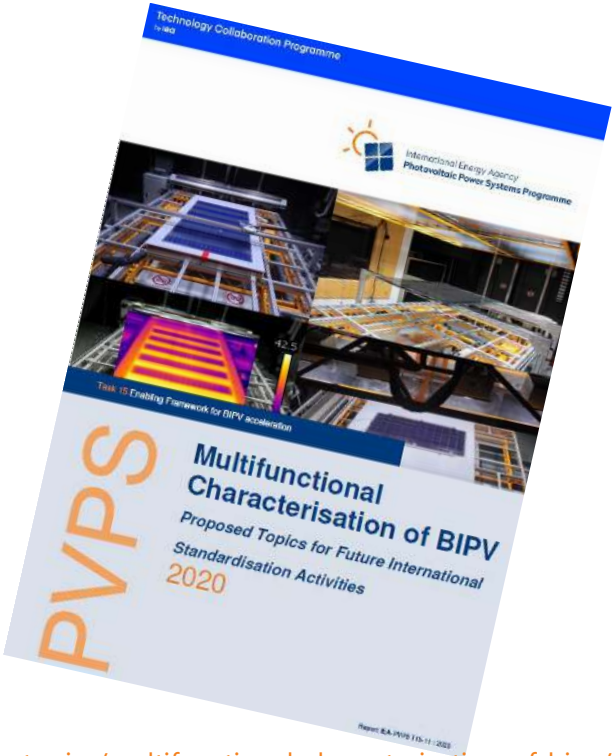
Business Cases for BIPV

- 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 realiability
- 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
  - …

Soltech

https://soltechenergy.com/en/

"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

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

https://iea-pvps.org/key-topics/iea-pvps-15-r07-coloured-bipv-report/

Colored BIPV

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

Credits: Solaxess

SOLAXESS
white solar technology

PVPS

Thank you for your attention

Johannes Eisenlohr, Fraunhofer ISE

johannes.eisenlohr@ise.fraunhofer.de

Fraunhofer ISE

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