



Assessment and Demonstration 5.5

How can we raise public awareness?

Pilot or demonstration projects that concern BIPV in general – but not directly residential renovation – were carried out in parallel with the project, in order to test new technologies and their market feasibility.

Their exposure raises public awareness and interest in the profession and paves the way for widespread adoption of innovation. Hence, several P&D projects to test and demonstrate colored PV modules were developed in collaboration with several industry partners. This sheet proposes an overview of those activities.

Keywords: Pilot & Demonstration; Energy Challenge; Umweltarena Schweiz; Haus Solaris; NEST@empa.

Target audience: Owners & other decision makers; Architects & engineers; Suppliers & companies; Broader public.



Fig. 1 The HSLU glass box was graced by Swiss Solar Pioneer Bertrand Piccard and Stefan Nowak, national program leaders in PV research, during the 15th National PV Conference at Swisstec Convention Center, Lausanne (©HSLU-CC-EASE).

2016 Energy Challenge: The Energy Challenge is a bi-annual Swiss event to raise public awareness of energy efficiency and renewables through exhibition and experiences, traveling across many cities in Switzerland. We designed and supplied a PV glass box (Fig. 1), featuring our colored PV modules designed as Swiss cantonal flags and serving as shelter and charger of the world's fastest Formula Student e-racing car, built in collaboration between ETH and HSLU. The PV glass box was designed as an off-grid PV system with battery storage and remote energy management system. The electrical system worked failure-free over the course of six months and traveling through eight cities, despite some minor water leakage through the roof. The NRP70 website featured this P&D project in their website's news section [1].

2017 "Swissness" PV facade at Umweltarena Schweiz: The Umweltarena is Switzerland's national public exhibition centre for applied energy efficiency and renewables, attracting more than 100,000 visitors annually. We initiated collaboration with Umweltarena and Technology Transfer company ÜserHuus and designed and built a PV facade on the staircase tower framing the entrance (Fig. 2). The PV facade features all cantonal flags and the national flag as PV modules, and hence underlines Umweltarena's claim of being a point of national interest. Since inauguration in June 2017, all systems work properly, validating the technology readiness [2]. The PV facade's electrical and visual performance is monitored remotely and summarized live on a public display in the visitor's center.



Fig. 2 Original staircase tower (left) retrofitted with Swissness PV facade (middle) and collaborators Walter Schmid (Umweltarena, 2.f.l) and Jacqueline Schindler (ÜserHuus) during its inauguration on 22.06.2017 (©HSLU-CC-EASE).

House Solaris in Zürich: Architect Adrian Berger commissioned an Austrian PV manufacturer to build a terra cotta colored PV facade with vertically structured glass surfaces creating reflections resembling the dynamic water surfaces of the nearby lake (Fig. 3). HSLU consulted on its meta-c-print specifications for digital ceramic print, which increased electrical efficiency by 30% for the given terra cotta color [3].



Fig. 3 House Solaris (©HSLU-CC-EASE).



Fig. 4 PV railing at NEST@empa (©HSLU-CC-EASE).

PV railing at NEST@empa: This project [4] features a new generation of our colored PV modules, this time with mono-crystalline PV cells, designed and commissioned by HSLU with support of ÜserHuus (Fig. 4). Three different designs (shutter, ornament and curve) were printed on glass of different finishes and reflection properties (float, silk and satinato). Each PV module is monitored individually so that the visual and electrical impact caused by designs and glass types can be compared. Preliminary results indicate that satinato glass finish provides the best color stability (or rather the least interference of print color with reflected colors), with almost identical electrical performance. This project was jointly developed with the SCCER Future and Energy Efficient Buildings and Districts (FEEBD).

References

- [1] From sun to fuel tank – colorful solar panels and electric vehicle. http://www.nfp70.ch/en/News/Pages/04072016_news_nfp70_energy-challenge.aspx
- [2] Umweltarena – Photovoltaik-Fassade “Swissness” in der Umwelt Arena Schweiz. <http://www.hslu.ch/umweltarena>
- [3] Haus Solaris by Huggenbergerfries Architects. <http://www.hbf.ch/projekte/wohnbauten/wohnhaus-solaris-zuerich/>
- [4] empa – Farbige PV Brüstung am NEST Gebäude. <http://www.hslu.ch/nest-pv>

Contact person

Stephen Wittkopf | HSLU-CC-EASE | stephen.wittkopf@hslu.ch