

Photovoltaic Oriented Building (PVOB)

Partners:
 Schweizerische Eidgenossenschaft Bundesamt für Energie (BFE)
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 Shaping the Future Swiss Electrical Infrastructure



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The direct use of solar energy by the self-consumption in buildings gets increasingly important to minimize negative grid influences. Therefore the BFH PVLab launched the project PVOB that will help to optimize photovoltaic applications in building envelopes to match the user's energy consumption and reduce negative grid influences. One part of the project is to create a database by measuring and evaluating buildings with PV installations on each façades. Other aspects will be cost optimization in planning and realisations processes and improvements of fire prevention.

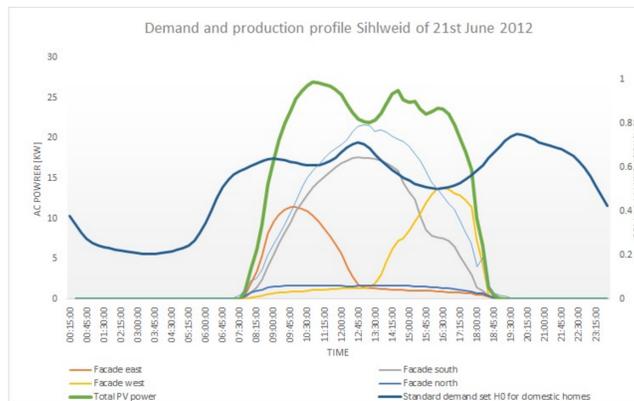
Monitoring of PVOB applications

The BFH PVLab is going to measure different multi-level houses with PV-installations on each façade and further houses with east-west oriented PV installations. PV installations in multiple areas of the building envelope increase the self-consumption of solar energy up to 80%.



PV façade Sihlweid: Multiple areas with PV

These kind of installations provide a longer and more stable production of PV electricity and lower the handling problems of peak PV power in the grid.



Less grid overloads with PVOB.

Profitability of PV façades

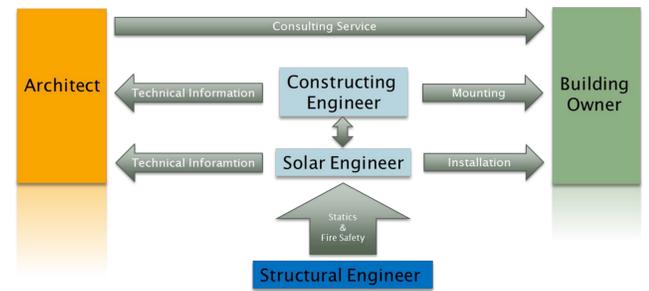
The price level of PV façade panels is already underneath high-end cladding materials for conventional façades. In the assessment of profitability only the additional costs of the electrical components of the PV system should be considered. Façade PV installations with a high rate of self-consumption generate an interest on capital of 1.5% to 2.0% only by reducing the operation costs of the building.

Example	Cladding materials	Price per m ² [CHF]
1	wood	220.-
2	fibre cement	310.-
3	natural stone	360.-
4	coloured glass	145.-
5	aluminium	130.-
6	acryl glass	155.-
7	PV panel crystalline - glass/backsheet	200.-
8	PV panel crystalline - glass/glass translucent	500.-
9	thin film PV panel - fixed dimensions	80.-

Comparison of prices of façade cladding materials

Challenges in the realizations process

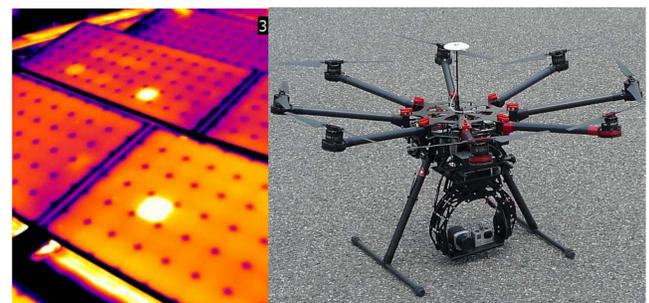
The complexity of planning and realisation of PVOB projects are higher than for standard PV-installations. Technical planning tools and specified products for integrated photovoltaic applications helps to reach professional results.



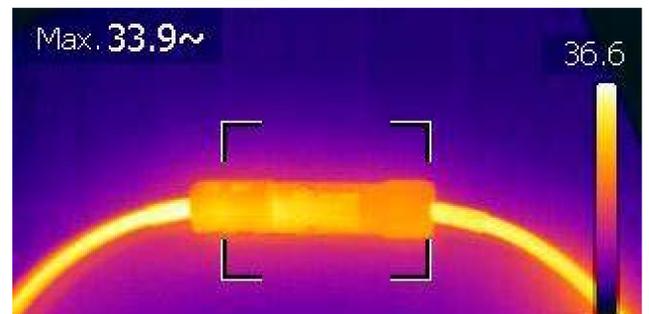
Interfaces in the planning processes of PVOB.

Fire protection of PVOB applications

The combination of electrical components and building material in PV façades creates a higher risk of fire in the envelope of buildings. To achieve improvements of fire prevention the PV-Lab developed a low cost concept of an IR multi-copter drone to detect hotspots in large PV installations and façades. Another ongoing project analyses the operational safety of cross-connected DC connectors. That means DC-connecters of different supplier which were connected directly together.



Hot spot defect analyses with drone and IR-camera.



Operational tests of cross-connected DC-connectors.

Further Information

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BFH PVLab sponsored by:



Nous assurons votre bâtiment.

