

Former farm building restored with integrated photovoltaics



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Overview

- Building-integrated photovoltaics (BIPV) are still a niche – both in construction and photovoltaics.
- But this field seems to show more and more the design possibilities BIPV opens up for architects and building owners.
- When renovating a former farm building, the photovoltaic modules were cabled using connectors from Phoenix Contact's SUNCLIX mini range.
- Even the shutters on the windows act as PV modules.

Customer profile

The small village of Nechlin is located about an hour and a half's drive north-east of Berlin in the region of Uckermark. In the heart of the village lies the harvester house, which used to accommodate harvest hands, so-called harvesters.

A few years ago, the former farm building was lovingly restored to create a low-energy house.



The harvester house in Uckermark

Application

Building-integrated photovoltaics or BIPV for short describes the complete integration of photovoltaics into the building envelope. As such, the photovoltaics assume the various functions of the exterior shell such as roofing, (insulating) facade, shading elements, balcony parapets or cladding.

Solar cells can also be integrated into single or double glazing. These elements function primarily as building elements, but can also be used for energy generation.

“During the extensive restoration of the harvester house, classic building materials needed to be replaced by PV components in order to implement an energy-focused concept,” explains renowned solar architect Astrid Schneider, who integrated the PV into the building envelope. “With the addition of photovoltaics, the building elements took on an additional function that turned the old house into an innovative generator of its own energy.”



Solar architect Astrid Schneider is a keen proponent of BIPV

Solution

Schneider not only placed the PV panels along the entire roof cladding but also used the aesthetic glass-glass modules as shading elements above the windows on the south-west facade. If necessary, the solar shutters can be pulled down in front of these, in parallel with the window. They therefore provide both shading and visual cover.

“The architectural challenge here was the optimum integration of the movement mechanism for the shutters together with the safe electrical connection of the modules,” continues Schneider. As such, the supply lines were routed through the profiles in the mechanics. “Since the line can become worn at these sensitive points due to the continuous movement throughout the long service life of the solar modules, which can stretch to over 30 years, I placed reliable connectors at both ends. This makes the modules easy to maintain and the supply line can be easily replaced in the event of a fault.”



The PV shutters can be tilted in parallel to the window

Incidental elements in open spaces or high on the rooftop become more relevant when they appear in visible areas and thereby affect the aesthetics. The modules not only need to be visually pleasing; their connection technology also needs to be hidden. Schneider opted for SUNCLIX mini connectors from Phoenix Contact here, which were specially developed for BIPV with their narrow design. This allows the connection technology to be hidden from view.

The monocrystalline glass-glass modules of the eight solar shutters have a cumulative output of 1160 watts and complement the visual appearance of the building with their wooden frames. The PV inside the elements can only be seen on close inspection. In their initial state, the shutters are located to the side of the windows. To use them as visual cover or as shading elements, they are moved in front of the window by means of a specially designed mechanism and locked from the inside.



With its compact external dimensions, SUNCLIX mini is ideal for building integration

Summary

At the harvester house in Nechlin, solar architect Astrid Schneider was able to demonstrate how easily photovoltaics can be integrated into a historic building. Thanks to the sophisticated connection technology, the installation was designed to be particularly low-maintenance, without affecting the overall aesthetic-visual impression of the building.

“I have been able to use the harvester house project, in which the expectations of all those involved, from planners to leaseholders, were met, as a reference for numerous other exciting projects,” reports Schneider. “Thanks to the EU Buildings Directive, BIPV is being rapidly further developed.”