Student housing in Slagelse

IEA PVPS

Introduction

In the renovation process of the student housing, the architects (KANT Architecter, U. Bay-Smidt, J. Rossback) entered into a cross-disciplinary collaboration with the PV provider and the manufacturers. As the project was quite far into the construction process, it was possible to set the exact prices along the way, something that would not have been possible during the consultancy phase. All the parties involved, throughout the entire process, took ownership of the project. (KANT Architecter) The renovation of the building, including PV, received funding from Landsbyggefonden, which is a fund that is supported by all the social housing associations and offers loans and subsidies for renovation works in the individual housing association.

Source: Successful Building Integration of Photovoltaics – A Collection of International Projects

Aesthetic integration

The applied renovation strategy considerably transformed the building appearance covering the red bricks of the existing façade with a dark surface made of natural slate and BIPV modules. The modules are integrated as small horizontal bands coplanar with the rest of the façade slates. The fixing system of the façade elements is not visible. Different BIPV modules are integrated on the railings of five balconies, in harmony with the dark building aspect.

Technology integration

150 m^2 of photovoltaic modules (solar cells from Gaia Solar) are installed on the façade in the same way as the natural slates, using a plug-and-play solution (Zappa façade system) developed by KOMPROMENT. The modules and the slates are secured by stainless steel hooks so that possible defective parts can be replaced quickly and efficiently. 40 m^2 of semi-transparent modules (spaced out cells) are mounted as traditional railing panels on a structure that hides the PV cabling system.

Decision making

The task was to transform a former school building from the 1970s into 144 modern student housing units. The building had to meet the current requirements for energy efficiency, ventilation and interior climate. One of the solutions that were meant to contribute towards lowering the electricity consumption involved installing PV panels on the flat roof. At the same time, it turned out that there were damp issues in the brick façade that were not fixable. As a result, it became necessary to create a new building envelope. The architects proposed two BIPV options: a glass screen mounted on the existing façade, or a new façade using slate or tile shingles mounted on the exterior of the current façade, which could be insulated. The second option was chosen as easier from a maintenance point of view. The façade solution, besides being functional and aesthetically pleasing, could also act as a demonstration model, a good way for the client to teach the new generation, the young people living in the student housing units about solar energy. (KANT Architecter)

Lessons learnt

The co-operation between the architects, the PV supplier company and the manufactures was important for the development of an architectural and economical well-integrated solution. It allowed to have a direct dialogue with precise price settings during the construction process that would not have been possible during the consultancy phase.

To match the module size of the PV with the slate module and the current façade division was a challenge in this project. With existing buildings, it can be difficult to make the PV modules to fit without a number of adaptations that add extra costs. It is important to continue to develop more flexible modules to make integration of PV into existing buildings easier. (KANT Architecter)

PROJECT DATA

Project type	Renovation
Building use	Residential
Building address	Slotsalléen 55, Slagelse, Danimarca

BIPV systems

BIPV SYSTEM DATA

Architectural system	facciata ventilata, balaustra
Integration year	2017
Active material	silicio monocristallino
Module transparency	Opaque
Module technology	Glass layers, recognizable PV, standard modules
System power [kWp]	20
System area [m²]	150 (facciata), 40 (balaustra)
Modules orientation	sud
Modules tilt [°]	90

BIPV SYSTEM COSTS

Stakeholders

Main building designer

KANT Architecter

BIPV components producer

Gaia Solar A/S
Hammerholmen 9-13, 2650 Hvidovre, Denmark
info@gaiasolar.dk +45 36777976
https://gaiasolar.dk/

Apartments before the renovation © KANT Architecter

Semi-transparent BIPV modules in the balustrades © KANT Architecter

Slates and solar slates © KANT Architecter

Proposal 1 - Glass façade © KANT Architecter

Proposal 2 - Slate façade © KANT Architecter

BIPV façade © KANT Architecter

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