



Aktiv Energy Tower Fronius

Introduction

In 2007 Fronius initiated an architecture competition for an innovative renewal and redevelopment of the existing company location and building structures of the former industrial district near the train station of Wels. Arch. Heinz Plöderl's concept of rear-ventilated curtain wall with PV-cells enclosed vertical glazing to create a BIPV semi-transparent facade, whose design and installation were assigned to ertex solartechnik GmbH.

Source: [Successful Building Integration of Photovoltaics – A Collection of International Projects](#)

Aesthetic integration

The Aktiv Energy Tower is located in a former industrial district of Wels with existing brickstone buildings constructed at the beginning of the 20th century. The project was the last step of a redevelopment and renewal of this former industrial district surrounding the railway station in Wels to take on a new guise as the Fronius global sales hub. The innovative character of Fronius International company, which is a specialist in welding technologies, as well as in the field of innovative solar energy and battery technologies, is translated into the building's design by the architect who decided to use strongly identity-driven design elements, as the innovative BIPV technology (Arch. Heinz Plöderl).

Energy integration

The office building is built under the main aspect of passive house standard. About 630 m² of BIPV façade elements are installed in the building. Next to the BIPV façade, also a roof mounted PV system is used. The energy for heating and cooling is provided by geothermal heat pumps.

Technology integration

The laminated safety glass modules are produced using glass-glass technology and achieve maximum environmental resistance thanks to double-sided glass encapsulation. The monocrystalline silicon cells show a module transparency of about 63%, realized with increased distance between the cells inside the modules and therefore allow ideal light conditions into the interior of the office environment. In addition to the aspect of yield optimization, the BIPV façade has been designed with the best possible interior lighting quality in mind. For this reason, the screening of the modules is provided with generous gaps, which increase further the field of vision. The BIPV façade is optimally ventilated and ideally accessible for maintenance and/or emergency exits through a footbridge structure behind the BIPV façade, also following the safety requirements of construction regulation.

Decision making

The main driving forces for the realization of the BIPV façade in the Fronius office building was the architect himself, who was strongly supported by the customer Fronius. At the end of 2010 the architect considered to integrate vertically movable sunshades with solar cells into the façade of the new designed Fronius building. Several options and technologies have been investigated and compared with each other in the development phase. In this phase, the company ertex solartechnik GmbH provided a lot of

samples with different layouts to help the architect and the customer in the decision-making process. Next to crystalline silicon cell technologies, also the thin film technologies were considered because of their very homogenous appearance. Also semi-transparent cells (with small holes in the wafer) were considered as an option. In the end both, thin film and semitransparent technologies did not meet the customer's expectations regarding the energy output and cost aspects. Also, the initially planned movable solution using sunshades was skipped concerning the high costs and requirements for the structure and also the glass, due to special requirements related the glass thickness, e.g. if the glass is fixed only on the short side of an element, the glass thickness would need to increase dramatically which is amongst others related to the wind loads. Taking into consideration all of these variation possibilities and options, finally, all involved stakeholders, especially the architect and the customer/user were happy to have a "full size" solution from ertex solartechnik GmbH allowing a quick and high quality installation of the BIPV system. (Dieter Moor, ertex solartechnik GmbH.)

Lessons learnt

In general, the BIPV façade of this project brought about profound knowledge of the interaction of BIPV modules and arrangements with sun protection glazing and its impact and influence on the daylight situation of interior office environments. Thus, it provides an important function of the overall building concept.

PROJECT DATA

Project type	renovation
Building use	office
Building address	Froniusplatz 1, Wels, Austria

BIPV systems

BIPV SYSTEM DATA

Architectural system	rainscreen
Integration year	2013
Active material	monocrystalline silicon
Module transparency	semi-transparent
Module technology	glass-glass, recognizable PV, customized modules
System power [kWp]	38.8
System area [m²]	630
Module dimensions [mm]	several
Modules orientation	South, East, West
Modules tilt [°]	90

BIPV SYSTEM COSTS

Stakeholders

Main building designer

Arch. DI Heinz Plöderl

BIPV components producer

Ertex Solartechnik GmbH
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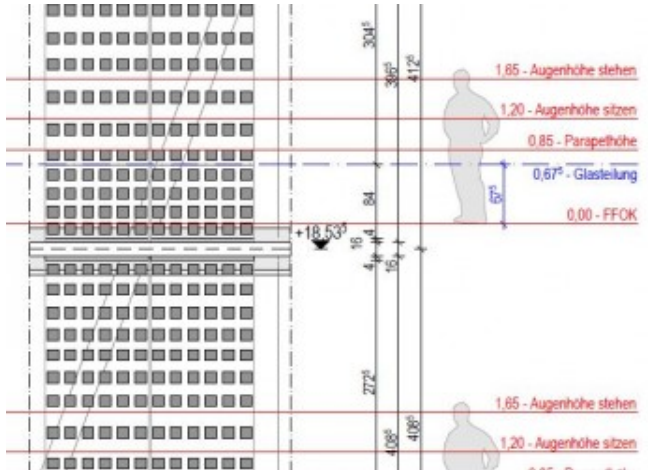
BIPV South-West façades © Dieter Moor, ertex solartechnik GmbH



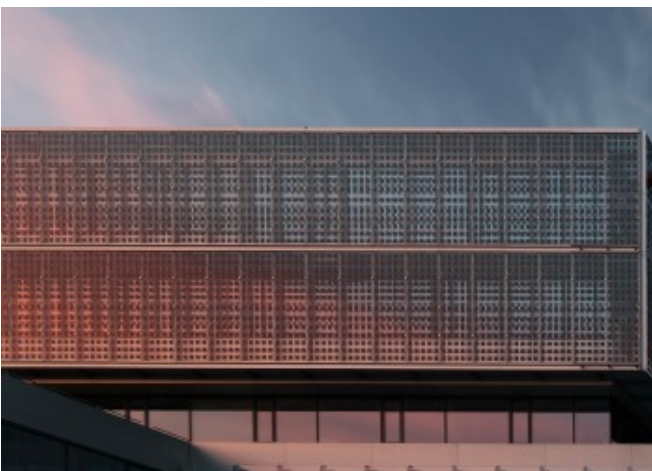
Dummy modules on the North façade © Dieter Moor, ertex solartechnik GmbH



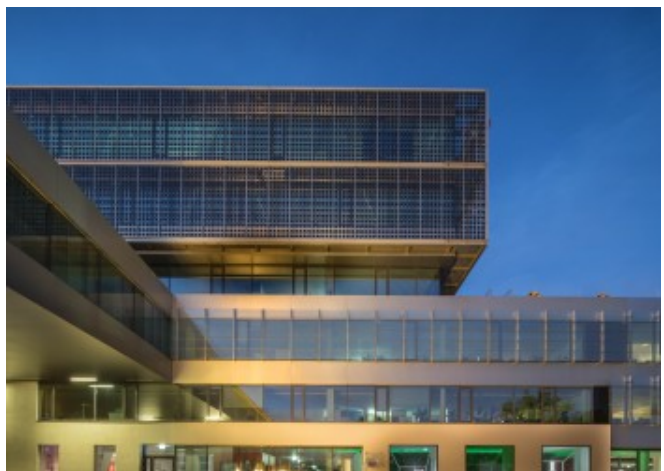
BIPV façade from the inside © Dieter Moor, ertex solartechnik GmbH



Drawing of BIPV façade, designed for viewing to the outside as well © Dieter Moor, ertex solartechnik GmbH



BIPV West façade © Dieter Moor, ertex solartechnik GmbH



Night view of the BIPV façade © Plöderl/PAUAT Architekten

Case study author:

Dieter Moor