



Umwelt Arena Schweiz



Introduction

The Umwelt Arena is the first Swiss centre of excellence for the environment with the widest integrated PV plant. The arena offers more than 40 different exhibitions for individuals, families and professionals over an area covering 11,000 m². In 2011, the MegaSlate® roof system from 3S Photovoltaics (a member of Meyer Burger Technology Ltd.) was integrated. BE Netz was responsible for the installation. Funds for the realization of the Umwelt Arena were received from leading Swiss partners recognising its strategies with regard to the sustainable energy supply and the importance of the natural habitat.

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

Aesthetic integration

The building roof presents a modern architectonic design. It stretches almost down to the ground, in the manner of a dome and is completely covered with PV modules. The architect René Schmid was looking for a shape that expresses dynamism and athleticism. It is inspired partly by the outstretched wings of a bird and partly by the world of fast cars and speedboats. The photovoltaic panels form the protective shell of the building like a reptile's scales. Its facets and the darkly gleaming panels are reminiscent of a crystal. The architecture of the Umwelt Arena is an example of how ecology and economy can be harmoniously combined in the shape of a modern building.

Energy integration

The PV system was calculated to generate around 540,000 kWh per year, twice the amount of energy that it consumes, with a zero CO₂ balance. Other energy production systems are solar thermal panels and a biogas process based on food waste. The solar thermal system is used to cool the building in summer and heat it in winter with an innovative system. The equipment used for this system and the appliances used in the Umwelt Arena run with the self-generated electricity. Some of the surplus electricity is stored and/or used by neighbourhood properties.

Technology integration

The roof present an octagonal BIPV system with 5,239 modules produced by 3S Swiss Solar Systems and installed on a total of 33 differently oriented trapezoidal surfaces, with slopes ranging from 6° to 62°. The solar modules are frameless, 3,663 of them are standard modules and 1,644 have special shapes.

Decision making

Walter Schmid planned the Umwelt Arena Schweiz as an environmental arena and interactive exhibition on sustainability. With its award-winning construction, the building itself is part of the exhibitions which can be visited with tour guides.

Lessons learnt

This project showed that electricity generation could be successfully integrated in a building, but the obstacles were the fixed shape and the shiny dark blue appearance of the PV modules. Different techniques have been tried and learned to overcome those obstacles, by creating matt finishes to reduce reflection or colours away from the standard blue, black or brown. Today it is much easier, as PV modules come in many different colours, materials and compositions, with more innovations on the way. In the past, PV has influenced architecture in a negative way with its visually unappealing standard modules that often appear as alien elements on roofs and walls. Now, with the new array of options for colours and patterns as well as the aesthetic and structural integration of PV into the building, possibilities for artistic expression are endless. Some of the most spectacular buildings in the world incorporate solar energy in creative ways. Hopefully this will inspire more and more architects, investors and homeowners to embrace solar as a standard building tool. (Arch. René Schmid, René Schmid Architekten AG)

PROJECT DATA

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|-------------------------|--|
| Project type | New construction |
| Building use | Multifunctional |
| Building address | Türliackerstrasse 4, Spreitenbach, Schweiz |

BIPV systems

BIPV SYSTEM DATA

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|------------------------------------|---|
| Architectural system | Opakes Dach |
| Integration year | 2011 |
| Active material | monokristallines Silizium |
| Module transparency | Opaque |
| Module technology | Glass-backsheet, hidden PV, standard and customized modules |
| System power [kWp] | 737 |
| System area [m²] | 5334 |
| Module dimensions [mm] | verschiedene |
| Modules orientation | Norden, Osten, Süden, Westen |
| Modules tilt [°] | verschiedene |
| Annual FV production [kWh] | 540000 |

BIPV SYSTEM COSTS

Stakeholders

Main building designer

René Schmid Architekten

BIPV components producer

Meyer Burger Technology AG
Schorenstrasse 39, Thun, Switzerland
mbtinfo@meyerburger.com +41 33 221 28 00
<https://www.meyerburger.com/en/>



BIPV roof overview © René Schmid Architekten AG



Top view of Umwelt Arena © René Schmid Architekten AG



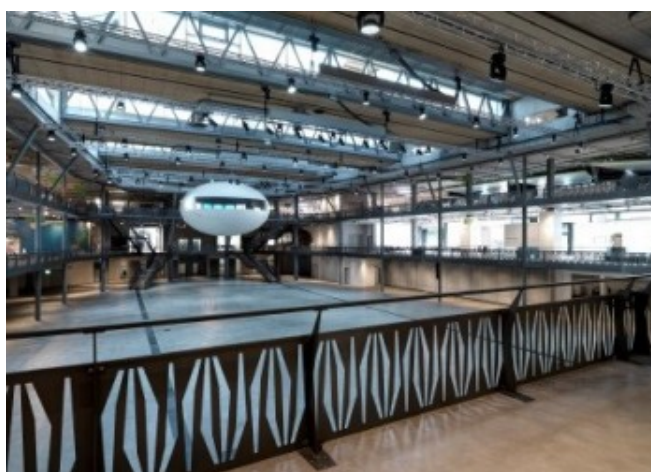
BIPV roof detail © René Schmid Architekten AG



Detail of the roof mounting system with overlapping tiles and watertight construction © René Schmid Architekten AG



Umwelt Arena during construction © René Schmid Architekten AG



View at the interior space for exhibitions © René Schmid Architekten AG

Case study author:

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