



**SOLARCHITECTURE**  
sun as a building material



# Bunner-Bapst House



## Address

Via Chigiosch 12, 7158 Waltensburg/Vuorz, Switzerland,



## Location

46°46'43" N | 9°07'29" E



## Altitude

988 MAMSL

with the support of

SWISSOLAR 



**SUPSI**

**ETH** zürich

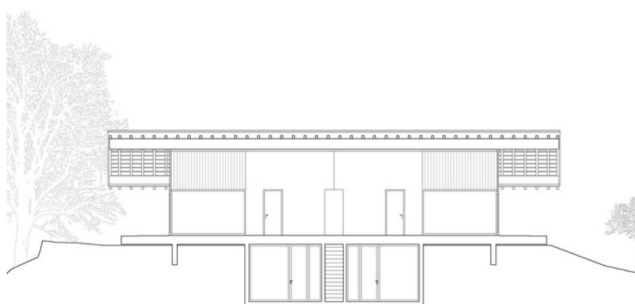




# Plus Energy Building

In 2019, the Brunner-Bapst family built a PlusEnergie single-family home with the highest self-energy supply of all Swiss solar prices to date. The generous, east-west oriented gable roof protects against wind and weather and produces 40,200 kWh per year, an energy surplus of 817%.

With its clean lines, large glass facades and wooden materials, this new house blends in well with the picturesque landscape. The PV installation, which covers the entire roof, adopts a modern design, which is designed to resemble homogeneous coloured scales.



Longitudinal section.



The house's appearance is in keeping with the townscape and also blends in with the picturesque landscape.

## Energy

			Energy production
Active solar surface	270m <sup>2</sup>	-	<b>40200</b>
Active solar surface ratio	>25%	-	kWh
Peak power	48 kWp	-	Source: Repower
Building skin application	Solar tiles	-	Self-consumption
			%
Storage	-	-	



## Building characteristics

### Building typology

Residential

### Construction type

New

### Year of construction

2019

### Energy reference surface

148.5 m<sup>2</sup>

### Energy Index

33.1 kWh/m<sup>2</sup>yr (heating and electricity)

### Energy labelling

-



The roof and glass facades render this discrete PEB both understated and eye-catching.

## BIPV module

### Product

Megasol M330-60-b GG LEVEL

### Manufacturer

Megasol Energie AG

### Cell technology

Mono-crystalline

### Cell colour

Black

### Front glass type/customization

3.2mm high-transmission,  
tempered/toughened, nano-finished,  
antireflective glass

### Dimensions

1700x1016 mm (modular dimension)

### Nominal power

310 Wp

### Specific power

179 Wp/m<sup>2</sup>

### Weight

32.6 kg

### Specific weight

18.9 kg/m<sup>2</sup>





# Building skin

## Roof

### Application

Solar tiles integrated in a pitched roof

### Description

Wooden gable roof insulated with 36 cm of mineral wool

### U value

0.10 W/m<sup>2</sup>K

### Fastening system

The support hooks are screwed to the roof batten. The sealing rails are hooked in and then the solar modules are installed using an assembly method. Subsequent dismantling is possible without restriction.

### Other

-



The building is made of wood and glass.

## Facade

### Application

None

### Description

Timber framed wall with 16 cm insulation layer

### U value

0.16 W/m<sup>2</sup>K

### Fastening system

-

### Other

-

## Glass surface

### Application

Windows

### Description

Triple glazing with wooden frame

### U value

0.90 W/m<sup>2</sup>K

### g value

n/a

### Other

-



The roof is detailed with copper elements. Photo source: Solpic AG.





## Costs

### Total cost of the building

n/a

### Price per m<sup>3</sup>

n/a



The PV roof features a total of 3 rows of snow stoppers as it is located at about 1000m above sea level and it is exposed to the wind beside having high snow loads.

## Parties involved

### Owner

Arnold Brunner & Ursula  
Bapst Brunner

### Architect

Bearth & Deplazes  
Architekten AG  
Bearth Deplazes Lander

### Photovoltaic Installer

Solpic AG

### Carpenter

Bearth Ienn SA

### Photo

Schweizer Solarpreis 2020

## Awards & recognitions

### Awards

– Norman Foster Solar  
Award 2020

### Publications

– Holzbauten räumen  
dieses Jahr einmal mehr  
Solarpreise ab – Lignum  
Holzwirtschaft Schweiz of  
26.10.2020  
– Eigenheim oder  
Strand? – Hochparterre of  
30.10.2020



Aerial view of the building