

# Case Study

## SOLVATEC

### Residential Rooftops Frenkendorf



Frenkendorf, Switzerland



Solar Frontier modules with northern orientation on several flat-pitch rooftops in Frenkendorf/Switzerland. (Image: Solvatec AG)

#### Site Overview

Location	Frenkendorf, Switzerland
Coordinates	47.50° N 7.71° E
Average global irradiance	1,080 kWh/m <sup>2</sup> /yr
Average temperature	9.0 °C, 48.2 °F
Average precipitation	795 mm/yr, 31.3 in/yr

#### Technical Overview

Date onstream	September 2012
System capacity	137 kWp
Panel type	SF145-L (145 W)
Number of installed panels	946
Tilt angle, orientation	5°, 175° N
Expected output	126,000 kWh/yr
Total CO <sub>2</sub> reduction	82,000 kg/yr, 180,777 lbs/yr
Inverter	Kostal Piko Series

#### Financing Bank

Private Investment

*"The conditions for a PV installation on the flat-pitch rooftops of these residential buildings were rather poor. Thanks to the unique properties of the Solar Frontier CIS thin-film modules, we could compensate for these challenging conditions and yield almost the same output compared to an optimally oriented crystalline installation at the same location."*

*Dominik Müller,  
CEO and founder of Solvatec*

The Solvatec AG, based in Basel, Switzerland was founded in 1998 and is a leading company for consulting, planning, marketing and implementation of photovoltaic systems. The experienced team of PV specialists pays special attention to the aesthetic and functional integration of solar installations into overall building structure.

After only four months of construction, several residential rooftop installations were installed and connected to the grid in the Swiss town of Frenkendorf in September, 2012. The total installation of 946 Solar Frontier thin-film modules was installed on flat-pitch rooftops with a tilt angle of only five degrees and a northern orientation. Due to legal requirements and the central location of the buildings, this project had to be realized almost without tilting the modules. Despite these challenging conditions, the 35 homeowners involved in this project expect an annual output of about 126,000 kWh, avoids associated CO<sub>2</sub> emissions of 82 tons.

The technical challenges of this project were the flat rooftop tilt angle with only five degrees and the northern orientation. Due to their good low-light behavior, CIS thin-film modules can compensate for such location disadvantages. Initial analysis of the first month's yields of 13,000 kWh convinced all parties of the project and proved another challenge that could be overcome - further raising the profile of photovoltaic technology in the town.

#### About Solar Frontier

Solar Frontier is committed to creating the world's most ecological, economical solar energy solutions. Our proprietary CIS technology (denoting key ingredients copper, indium, and selenium) has the best overall potential to set the world's most enduring standard for solar energy. For more information visit [www.solar-frontier.com](http://www.solar-frontier.com) and [www.solar-frontier.eu](http://www.solar-frontier.eu)