

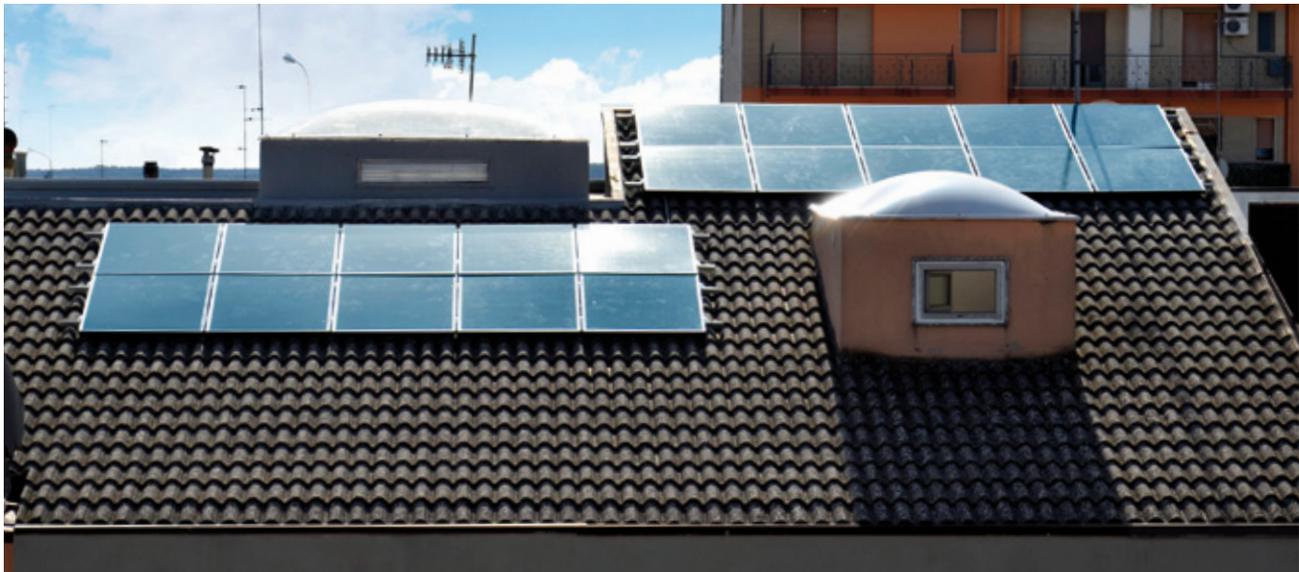
Case Study

TRE

Residential Rooftop Gravina in Puglia III



Gravina in Puglia, Italy



Due to the unfavorable conditions on site, there was only one reasonable option for the installer: Solar Frontier PowerModules. (Image: TreE)

Site Overview

Location	Gravina in Puglia, Italy
Coordinates	40.9° N, 16.3° E
Average global irradiance	1,628 kWh/m ² /yr
Average temperature	16 °C, 60.8 °F
Average precipitation	596 mm/yr, 23.5 in/yr

Technical Overview

Date onstream	November 2012
System capacity	2.90 kWp
Panel type	SF145-L (145 W)
Number of installed panels	20
Tilt angle, orientation	30°, 167° NO
Expected output	1,200 kWh/kWp
CO₂ reduction	2,004 kg/yr, 4,418.1 lbs/yr
Inverter	Power-One model PVI-3.0-TL

Financing Bank

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"The customers roof faces north. In such cases, you either abandon the idea of a photovoltaic installation or you use Solar Frontier PowerModules."

*Ing. Domingo Pace,
Co-owner and designer at TreE*

TreE is an engineering company based in Gravina in Puglia, Italy and is well-known in the area. It was among the first companies in the country to install PV plants, and in the last year has completed mainly rooftop applications.

For this photovoltaic installation on a residential rooftop in Gravina, a total of 20 CIS technology based PowerModules with an output of 145 W each were installed, for a total capacity of 2.90 kW. According to a first performance evaluation in January 2014, the installation delivers 1,200 kWh/kWp per year. With the energy generated, the customer is able to cover about one third of their personal energy needs; the fraction of energy that the company does not use itself at the daily rate is returned to the grid.

In this case, the extremely unfavorable pitch and northeasterly orientation of the roof presented a major challenge. Given these conditions, the CIS modules by Solar Frontier were the best option for the customer. One of the major advantages of these modules is their excellent low-light behavior, thus enabling substantial energy yields even on the north-facing part of the roof, which is exposed to less direct light. Their performance surpasses that of other module technologies by as much as 13.8%. A further crucial criterion was the excellent thermal stability of the Solar Frontier PowerModules, as temperatures in Southern Italy can reach 40°C in the summer. This can heat the modules to temperatures as high as 80°C. The innovative PowerModules of Solar Frontier are less sensitive to temperature and so can produce energy reliably even under these conditions.

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 and www.solar-frontier.eu