



## The Challenge

The Anfora Island is a picturesque fishing village at the heart of the Grado lagoon situated on the north-eastern coast of Italy. Totally off-grid, the owners of the hotel and trattoria "Ai Ciodi" on this island had relied on a diesel generator for the electricity needed in their business and for the island's fresh water pump. By using energy from renewable sources (photovoltaic), they hope that the passing



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tourists will have a more enjoyable stay (tranquillity) and to reduce the ecological footprint on the surrounding nature.

## System components

<b>Solar modules:</b>	TRINA SOLAR 36 x 185Wp
<b>Batteries:</b>	MIDAC 24 x 12OPZS1200, 48Vdc/1200Ah-C10
<b>Inverter/Chargers:</b>	Studer, 2 Xtender, XTH 6000-48, 230 Vac/50Hz
<b>Solar charge controller:</b>	Steca Power Taron 4140
<b>Racking:</b>	Roof mounted
<b>Other:</b>	Studer, 6 remote control, RCC-02 GENSET Diesel Generator: 25kW - 3ph

## Why Studer

Studer products were chosen due to their outstanding quality, technical performance and features. For instance, in this installation the Xtender inverter/charger has been programmed to automatically control the genset. If there is not enough renewable energy for the electrical loads, the Xtender switches on the diesel generator. When there is no need for extra energy the genset is automatically switched off.

## Project outcome

The combined action of the two systems: photovoltaic and diesel generator, guarantee the reliability and continuity of energy, avoiding troublesome and dangerous electrical blackouts.

The idea of using energy from renewable sources (photovoltaic) makes the stay even more enjoyable to passing tourists, helping to spread the photovoltaic technology throughout the Grado Lagoon, a site of high natural value.

After the installation of the photovoltaic system, the diesel generator is only used 3 hours a day instead of the 8 hours prior to the PV system, which is a considerable reduction.

According to the installing company's calculations, this PV hybrid system will pay for itself in about 5-6 years. The system's life is about 30 years and if the system's batteries are used properly (they have an estimated life of 8-9 years) the battery replacements will be repaid by annual cost savings produced by the system.

Other estimated savings that the system will produce during 30 years: Saved operating hours of the diesel generator system: 27 000h, saved litres of fuel: 130 410 litres, saved CO2: 490.78, saved Tonn SOx (Sulphur Oxide): 4.63, saved Tonn NOx (Nitrogen Oxide): 10.91, saved Tonn CO: 1.77, saved Tonn Toe (tonne of oil equivalents): 37.49.

## The Solution

In order to dimension the system properly a thorough calculation of the users' daily energy consumption through technical inspections and interviews was made taking into consideration the different energy needs during the open three seasons; Spring, Summer and Fall. The system is used for lights, cooking, refrigerators, air conditioning, satellite TV etc.

The resulting hybrid system consist of 36 x 185Wp PV panels, built and certified in accordance with EN61215 standards. For storage, 24 lead-acid batteries, OPZS1200 48Vdc/1200Ah-C10, were chosen to guarantee high reliability and low self-consumption. The solar charge controller, Power Taron 4140, automatically manages the flow of energy to and from the battery and ensure maximum control and charge thereof. Then is also installed two inverter/chargers XTH 6000-48 in parallel, each feeding a line of electrical loads. A framework with Multiple insertion switch allows you to switch the two lines into a single inverter if supply fails.

As support to the PV system, there is one diesel generator 25kW in three-phase. The generator also run the fresh water pump for water supply of the whole island.

## The Company

ENERECO srl has over 20 year experience of the Italian and worldwide photovoltaic sector. They specialise in stand-alone photovoltaic and hybrid systems for rural electrification. To reduce their carbon footprint and to live in harmony with the environment is important to them. Their headquarters has a photovoltaic system on both its facade and roof that covers the company's annual electrical energy consumption of 53.000 KWh.

### For more information please contact:

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