

PRIVATE HOUSE

Solferino, Mantua - Italy

Detached house

Heating system modernisation

ELFOSystem System

Year 2006



A single-family house built in the early 90s and exclusively for residential use. After ten years, it was purchased by a new owner who carried out some modernisation work on the house. The most relevant intervention concerned the heating system and took place in 2006.

The building covers two floors over a total surface area of 190 m². It is located in Northern Italy, in an area with a continental climate influenced by Lake Garda nearby.

The Challenge

When it was bought by the new owner, the house had an LPG gas boiler and radiator distribution.

Over a brief period, this polluting gas system, with its high consumption and inconvenience in terms of supply, led to the need to lower heating costs, reduce CO₂ emissions to a minimum and free the house from its dependence on the supply of gas.

At the same time, however, the owner wanted to avoid long and invasive renovation work and to maintain the existing heat distribution with radiators.

Therefore, the renovation of the system only involved the boiler and the energy sources connected to it.



Private house – Exterior and interior view

The climate

- Continental climate (2,442 degree days / Climatic area "E", according to Italian regulations)
- Winter project temperature -5°C

The Building

- Built in 1994
- System modernisation 2006
- Detached house with two floors
- 7 rooms

The size

- 190 m² in total

The solution

In order to reach the set objectives, the old LPG gas boiler was substituted by a Clivet ELFOEnergy Vulcan electric air-to-water heat pump for the central heating and 300 litres of sanitary hot water accumulation.

The high temperature heat pump which was installed is able to produce hot water at 60°C with an external air temperature down to -10°C. Thus, it can substitute a boiler even in a climatic area with cold winters, both for heating and for sanitary hot water production, without the help of integrative units.

With the aim of increasing the use of energy from renewable sources, the production of sanitary hot water was integrated by installing solar panels.

The high performance radiators were maintained for distributing the heat, while the number in the living area was doubled.

By adding a hydraulic separator to the central heating and Inverter re-start pumps it was possible to match the heat pump and the radiators, which are characterised by different thermal deltas.

The results

Renewing the system, by substituting the boiler with the Clivet ELFOEnergy Vulcan heat pump, enabled the objectives set by the commissioning customer to be met.

Thanks to the maintenance of the pre-existing heat distribution, and the simple and fast installation of the heat pump, not only was it possible to avoid unwanted renovation work, but it was also possible to modernise the system rapidly while keeping costs low.

In terms of consumption, the consequent energy and financial savings were considerable.

In 2008, the entire heating system had a total cost of around 1,700 Euro, with a 43% annual savings on previously sustained costs for the supply and consumption of LPG gas.

The environmental impact due to the CO₂ emissions has been considerably reduced by moving from an LPG system to one which is totally electric. Considering that an electric system only produces indirect emissions, or rather those from primary energy generators, such as thermoelectric power stations, the annual reduction was 42%.

Finally, the entire modernisation process enabled the traditional comfort of heat distribution by radiators to be maintained.

For further information about Clivet systems:
www.clivet.com



Private House – Exterior view with heat pump and view of the living room/kitchen with heating furniture.

The System

- A Clivet high temperature ELFOEnergy Vulcan 61 air-to-water heat pump, with high efficiency Scroll technology
- 300 litres of sanitary hot water accumulation
- 1 Solar panel (3 m² surface area)
- Distribution by radiators
- Required thermal capacity: 15.2 kW

About ELFOEnergy Vulcan

A range of high temperature heat pumps designed for use in cold climates with radiator distribution. Ideal for heating systems in renovated building where boilers are substituted.

The use of electric heat pumps enables ZERO local CO₂ emissions.