



## SEM Morbegno - High system efficiency with a Unitop 33 C heat pump

### Client / Plant location

Società Elettrica in Morbegno (SEM)  
IT-23017 MORBEGNO / Italy

### Waste heat of gas engines is being utilised

SEM is a cooperative founded in 1897, active in the production and distribution of energy. The company produces electricity in eight hydroelectric plants. In order to diversify the production of energy from renewable sources SEM decided in 2005 to develop a district heating system for the industrial zone and the town of Morbegno. The cogeneration plant for the production of electricity and heat went into operation in 2007, distributing heat to the neighboring villages. Today, the district heating network stretches over 35 km and supplies the town and the industrial area of Morbegno and Talamona with a connected load of more than 75'000 kW.

The cogeneration plant is equipped with 4 gas engine driven generators of 3555 kWe each, two boilers of 7500 kW each, a Unitop 33C heat pump of 3760 kW and heat storage with a capacity of 1000 m<sup>3</sup>. The configuration allows to reach over 88% of the theoretically possible efficiency of a cogeneration plant.

The waste heat transferred from the gas engines to the cooling water and to the oil circuit is exploited and upgraded by the Unitop 33 C heat pump. The hot water produced is fed into the return of the district heating system, thus optimising the overall efficiency of the cogeneration plant.

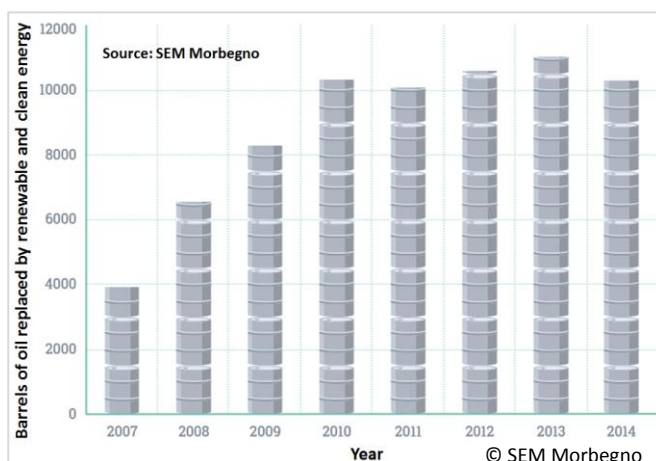
### Environmental benefits

With the exploitation of renewable energy and the continuous development of the district heating network, SEM has realised significant savings of fossil fuels in the Morbegno area, resulting in a considerable reduction of CO<sub>2</sub> emissions. (see graph)

### 1 Unitop 33 C heat pump from Friothersm

The Unitop 33 C heat pump consists of a heavy duty industrial type centrifugal compressor at its heart. Together with the heat exchangers and the sophisticated control system it is especially

adapted to comply to 100% with the client's requirements regarding flexibility of operation modes, high efficiency and operational reliability. The service friendly design allows limiting service and maintenance work to a minimum while the heat pump is operational for decades.



### Main technical data

Operating Seasons:	Autumn - Winter - Spring
Heating capacity:	3'760 kW
Cooling Capacity:	3'030 kW
Hot water in/out:	65 °C / 80 °C
Cold water in/out:	46 °C / 40 °C
COP:	4.2

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