

District heating in Castelnovo del Garda, Italy

This case study is part of a project catalogue produced by [ReUseHeat](#) to provide inspiration on how to utilize excess heat from urban sources for heating and cooling purposes. The catalogue contains 25 existing or planned projects out of which 12 cases are Danish and 13 cases are from other European countries^[2].

Facts about this case

Installed heating capacity: 1320 kW

Heating source: Low temperature industrial residual heat (30 °C)

Temperatures: Residual heat is cooled from 30 to 25 °C. District heating water is heated from 40 to 63 °C

Funding received: € 1.3 M

Period: 2011-2014

Organization: Hiref

Link to web page: <http://hiref.it/>

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Source: www.siderweb.com^[1]

Description

The municipality of Castelnovo del Garda near lake Garda in northern Italy received funding in 2012 to establish a district heating system in the town. The district heating network is mainly powered by residual heat from a nearby industry. The first phase of the district heating network was inaugurated in March 2014.

The district heating project desired to exploit residual heat recovered from the local industry Air Liquide. The excess heat is extracted through a heat pump and delivered to a newly established district heating network, supplying both a public school and a sports centre. Air Liquide is a multinational company producing industrial gasses. In Castelnouvo del Garda, the company delivers oxygen for the steel industry. Many of their processes have cooling needs and accordingly produce excess heat, which can be extracted instead of being emitted to ambient air.

The system is composed of two screw compressors and the refrigerant is R134a. Total capacity of the excess heat delivered from Air Liquide is approximately 1.32MW. District heating network temperatures are increased from the return flow of 40 degrees Celsius to approximately 63 degrees Celsius through the heat pump system. Temperatures on the cold side of the heat pump is cooled from 30 to 25 degrees Celsius. Electricity consumption is approximately 300 kW, meaning that the system can reach a COP of 4.4.

The excess heat is distributed through 3300m of pipeline, before it reaches the end-users. The main sections of the district heating network are designed with up to five times the capacity which can be taken from Air Liquide. The route of the network is hereby optimized with future expansion possibilities to residential housings in mind. A second phase of the district heating project in Castelnouvo del Garda is to expand the grid with 3500m of pipeline and construct a biomass power station with cogeneration of heat and electricity. The total scope of the project is to connect a further of 200,000m³ of public and private sector buildings.

Heat recovered at Air Liquide will lead to energy savings equivalent to 140 ton of oil every year, corresponding to around 327 ton tons of CO₂-equivalents being saved.^[2]

References

1. [Siderweb](#)
2. Handbook - 25 cases of urban waste heat recovery