

Italy, Geothermal District

Heating systems of the Municipality of Ferrara

General

Region/city/ location	Emilia Romagna – Ferrara - Casaglia	Owner and Operator	Hera S.p.A. – Herambiente – Enel Greenpower
Description	Ferrara, Northern Italy, uses the geothermal source in an integrated system for district heating and cooling, together with the heat produced in a biomass plant for solid wastes and methane gas boilers as back-up. The District heating of Ferrara supplies about 320 buildings for the heat producing and about 85 buildings for sanitary hot water. This DH saves 9 000 m3 of oil equivalent.		

Project

Inhabitants connected	578 connected substations – 5.500.000 m3 connected	Production of heating and/or cooling	Heating only
Installed geothermal capacity	14MW	Comparison with fossil energies	110-120€/MWh
Others uses (drinking water, cascade uses...)	No	Subsurface and surface technical schemes	Subsurface facilities: two geothermal wells and one reinjection well (approx. 1000 m depth) Surface facilities: 29 MWt CHP WTE plant, two integration plants with 3 and 4 natural gas boilers

Financing

Financing	Grant of the Province to the owner - manager
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Technical

<p>Installed capacity (MWth)</p>	<p>154,5 MW</p>	<p>Temperature of the geothermal resource (production - injection)</p>	<p>105°C – 85°C</p>
<p>Operating Temperature of the DH</p>	<p>90°C – 60°C</p>	<p>Geothermal flow rate</p>	<p>400 m3/h</p>
<p>Innovation if any</p>	<p>- Multi-source system (geothermal, WTE and natural gas) - Renewable Energy Pole, project under development: a new pilot plant is planned to heat the west part of the city by using geothermal energy and 1 MWth solar thermal energy. This extension of the DH will allow to cover 40% of the city heat demand and to use 91% RES-heat (56,40% will be from geothermal). The system will produce also 250 kWe and will have 4 stratification storage tanks. This project has been also considered as a best practice example in Interreg IV C Geopower</p>	<p>DH Length (m)</p>	<p>c. 56.000 (double pipe)</p>
		<p>Design of the DH</p>	<p>Eni - Amga – Agea – Hera</p>



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