

PL - The Podhale Region Inner Carpathians



General

<p>Owner</p>	<p>Stakeholders of PEC Geotermia Podhalanska SA: NFEPWM* (89%), several local municipalities, other entities</p>	<p>Operator</p>	<p>PEC Geotermia Podhalanska SA</p>
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Description: The Podhale Region is visited by more than 4 million tourists each year. But the area has been affected by intensive pollution caused by burning large quantities of coal. Therefore the geothermal project is crucial to preserve the environment. The geothermal district heating provides heat for housing, public buildings and tourist hotels.

Project

<p>Inhabitants connected</p>	<p>~ 1600 buildings (large >30 kW, small <30 kW heat consumers), ca. 30% of heat market in Zakopane (part from 30 000 inhabitants, public buildings, several hundred thousand tourists in hotels and boarding houses)</p>	<p>Design of the DH</p>	<p>8 production, 2 injection wells were installed since 1967</p>
<p>Others uses (drinking water, cascade uses...)</p>	<p>Part of water cooled in heat exchangers sold to recreation center (swimming pools, space and tap water heating), second recreation centre based on cooled geothermal water expected to be opened in 2014</p>	<p>Production of heating and/or cooling</p>	<p>383 TJ/2012 geoth. (total 513 TJ/2012), no cooling via the net (small scale cooling in operator's office building)</p>
<p>Planning of the operation (from pre-studies to full completion)</p>	<p>ca. 20 years (1981 - 2001)* 1981 - first idea to use geothermal water discovered by exploration well for heating.</p>	<p>Dates of beginning and end of construction</p>	<p>1995, system still under development, optimisation, modernisation, etc.</p>

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Administrative permits

1987 - Elaboration of Project for several drillings and other works to evaluate geothermal parameters and conditions of geothermal exploitation and use in the Podhale region, 1988-1992 - several wells confirmed geothermal water occurrence

License for geothermal water exploitation (production, injection) required (since 2012 issued by regional administration, before - by the minister of environment), EIA required, several permits required acc. to various legal acts

Comparison with fossil energies

37-101 Euro / MWh (net value, including distribution)

Difficulties faced

Slow development project, very long time from initiative since realisation due to economic and political changes in 1989, (devaluation, etc.). Afterwards long and complex administrative procedures, long time to receive exploitation license (now shorter), falling into several regulations typical for mining activities, etc.

Financing

Financing (Bank, funds, PPP...)

World Bank (credit - paid back by other entity in 2004; GEF grant); DEPA grant, USAiD grant, DEPA grant, NFEPWM shares, Voievodship Fund EPWM - loan, Bank Pekao SA - loan, EU funds - e.g. Regional Operational Programs

Investment for geothermal well

Wells (five so far) drilled over a wide span of time (1981 - 2013). The cost of the newest well (TVD 3.5 km, 2013) was ca. 8 mio eur.



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Investment for geothermal heating station

Geothermal heat exchangers station + two deep wells (3.2, 2.9 km) done in 1997-2000 ca. 9 mio eur (acc. to initial value), pipeline production-injection wells and injection pumps' station: 9 mln PLN (2.2. mio Euros)

Cost of the MWh produced

According to the Polish Energy Law the cost of energy production is similar to the price of energy sales (incl. all costs of the energy source and district heating, for heating sources >5MW)

Amount of subsidies

Ca. 50% share of grants/subsidies in total investment costs by 2003

Investment for DH network and substation

Costs of main investments items in 1987-2003 (1 eur=4.1 PLN /2014): Peak Load Plant: ca. 36 mio PLN (now ~9 mio eur), distribution network: 108.5 mio PLN (~27 mio eur/2014). In 2003-2014 new incoming investments (several dozen of mio PLN)

Cost of the MWh sold

47 Euro/MWh (net, including distribution costs)

Technical

Installed capacity (MWth)

Total 80,5 incl.: 40.7 MW geoth., 39.8 MW gas peak

Installed geothermal capacity

40.7 MWth = 40 000.7 kWth

Operating Temperature of the DH

95/70°C

Pay back

Payback period: ca. 20 yrs (1998-2008) - very long due to the specifics of the project

Temperature of the geothermal resource (production - injection)

86 - 60°C

Heat Pump (power in Mwe and COP)

No

DH Length

Approx. 75 km

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(economic change in 1989, devaluation, necessity to build many crucial installations from scratch /wells, geothermal and peak load stations, transmission pipeline 2x14 km, distribution network . 75 km, difficulties to obtain funds in some periods, etc.). But since 2008 positive economic balance, effective ecological impact, social acceptance, heat prices comparable / lower than from coal and gas (!). Growing market demand

Podhale geothermal district heating systems.

