



A district heating plant in operation for over 30 years: lessons in adaptation, survival and evolution

In 2022, everyone knows what a district heating system is and how it works. However, Rasen's plant can offer us something that others cannot give us as effectively: its history. In operation for almost three decades, the plant in Rasen can show us how one could respond to the constant new challenges thrown in one's way...

The plant was commissioned in 1994 to serve the industrial area and the two residential districts of Niederrasen and Oberrasen, in South Tyrol – Italy. The original plant consisted of two Kolbach boilers for a total power of 5 MWth. Hot water was distributed through a 12 km long network, reaching 40 con-sumers, five of which were industrial. Several reasons contributed to the deci-sion to build the plant. On the one hand, the need to find a use for the large quantity of wood residue produced by the adjacent large sawmill run by Mr Johann Hellweger; on the other hand, the rapid expansion of the hotel indus-try, limited by the costs of heating and the technical efforts to integrate the ev-er-increasing individual heating systems into the hotel complex; finally, the urgent need to prevent that the rapid industrial development would damage the landscape and make Rasen less attractive for tourism. After a very successful start, the district heating network continued to expand, gathering more and more new customers.

Then in 2008, a completely new power generation module was inaugurated, consisting of a compact 600 kW ORC turbine. The new module was sized to the heat demand of the summer period, and the old module was activated in the winter period only, to meet the additional heat demand. That way, the plant was always operated at full power and with maximum efficiency throughout the year. Today, in 2022, the Rasen plant serves almost 400 con-sumers through a 13 km network, producing 13.5 GWh of heat and 5 GWh of electricity. The plant uses 55,000 loose cubic metres of wood chips, most of which come from local sawmills (50%) and forests (40%). In fact, the plant supports the management of local forests through a preferential price of 42 € m⁻³ for the forest residue, which is significantly higher than its current market value. In short: a complete success for the economy, the forests and the envi-ronment.

A set of interviews to the new and old managers has allowed us to explore how the plant management responded to the inevitable changes in the technol-ogy, the economy, the environment and the society during the past thirty years.

First of all, technology: the development of new, more efficient and compact cogeneration plants made it possible to add the production of electricity to that of heat alone, dramatically increasing profitability.



KEY WORDS

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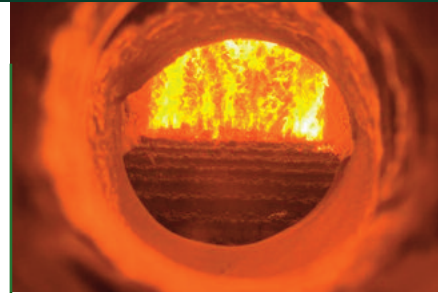
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ADDITIONAL INFORMATION

Today, the production of electricity taps into such a good revenue stream that it would guarantee the financial viability of the plant even in the absence of any heat sales. That depends on the national feed-in tariffs, which support re-newable power production but are also subject to frequent adjustment and are often criticised for their volatility. Indeed, public aid has changed several times in both duration and levels, with adjustments that generally went downwards. However, any reductions of public support have been proportionated to the steady increase of energy prices, so that the profitability of the plant has remained unchanged. Such a compensation mechanism has also worked with heat sales. While climate warming and the increased energy efficiency of buildings have led to a constant reduction in the energy sold to the individual users, the number of users has steadily increased, so that energy sales have grown - not waned.

Finally, a major concern has always been with social acceptability. Most plans to build a new biomass plant meet with the opposition from residents and often have a hard time gaining acceptance. Not so in Rasen. As early as 1992, the plant's promoters organised a trip to Austria for over 40 residents to demonstrate the economic and environmental benefits of wood-fired district heating. Today, it is clear to everyone that the Rasen plant offers competitively priced heating with a much higher environmental performance than the old individual heating systems. Many people still remember the smoke from the many chimneys of houses, hotels and industrial plants, as well as the snow turned yellow from the build-up of particulate matter...Today the smoke is gone, and the snow is white - as it should be!



ABOUT BRANCHES

BRANCHES is a H2020 “Coordinator Support Action” project, that brings together 12 partners from 5 different countries. The overall objective of **BRANCHES** is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.

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