

# CASE STUDY



## Innovative solutions for public heating

**Hoštětín (CZ) improved air quality and lowered energy prices thanks to its municipal heating plant!**

*"During its 10-year operation, the municipal heat from biomass replaced nearly 2 700 tonnes of coal and 5.9 GWh of electricity consumed by local households before the heating plant"*  
Mayor Robert Janota

### The Summary

The village of Hoštětín implemented innovative public heating solutions, using biomass, solar and photovoltaic energy. Thanks to a municipal heating plant, the city has also gained control over its energy processes. Thanks to this combination of measures, the village lowered energy costs, increased transparency and improved its decision-making processes.

### The Context

Until the mid-twentieth century, wood was the primary source of energy for heating in the city. Since the 1950s, it was gradually replaced by fossil fuels. Households used coal for heating and later for electricity until the end of the 1990s. In 1997 solar energy started to be used to heat water in several households. Since the construction of a municipal heating plant in 2000, renewables have

been covering most of the heat demand, and starting in 2008 the sun has also been harnessed to generate electricity.

### The Challenges



Credits : Hoštětín municipality

Since Hostětín is situated far away from the planned route of a gas pipeline, the municipality had to provide a different source of heating than most of the neighbouring villages. The first step in implementing the project was to conduct a survey to assess the interest of Hostětín's inhabitants in connecting their households to a heating plant fuelled by biomass; roughly 50 % supported the idea.

The main problem with biomass projects are their cost and long-term availability and sustainability of supply. When the heating plant of Hostětín was under construction, the situation of the biomass market was different than



today, when the demand for and the price of waste wood were lower.

The price of biomass has been increasing over the last ten years, because of the growth in demand; it is also indirectly related to the price increase of other fuels, particularly oil and coal. The purchase price of fuel for Hostětín soared by almost 80 % in seven years. Until 2003 the village obtained its fuel from within 25km; in 2004 this distance doubled as the main supplier closed down. Since then, the supplies have stabilized again: in 2012 the vast majority of fuel came from within 15km, which has significantly reduced the fuel transportation costs.



Credits : Hostětín municipality

## The Model

Operated by the village of Hostětín, the heating plant was commissioned in autumn 2000. The 732 kW hot water boiler is fuelled by combusting wood waste (mainly wood chips and sawdust from the waste wood from surrounding sawmills and forests) which is continuously trucked into the warehouse with a storage capacity of approximately 900m<sup>3</sup>. The heating plant supplies heat to 70 connected consumers out of a total of 86 buildings in Hostětín (i.e. 83 % of all heated buildings in the village). The heat is transported through a 2.8 km long heat distribution line

In 2010 and 2011, after ten years of operation, the municipal heating plant underwent major modernization: the boiler room technology was upgraded, including both the machinery installed and the control system. The overriding objective of the whole technological overhaul was to cut down operating costs and to install a new control system allowing precise setting of combustion parameters. Moreover, the renovation enabled to reduce electricity consumption and heat loss. Additional operating cost savings were achieved through the installation of a photovoltaic power plant, commissioned in 2010, supplying renewable electricity for the operation of the municipal heating plant.

## The People Behind

Hostětín municipality was the driving force behind this project. They wanted to provide the village with an ecological, sustainable and easy-to-operate source of energy.

The operation of the municipal heating plant, which includes the purchase and transport of fuel, operation planning, staff coordination and accounting, is managed by the village of Hostětín. The operation of the boiler room (fuel supply, basic maintenance and minor repairs) is carried out by local residents employed by the village. Reasonable wage costs, which account for approximately 6 % of total expenses, are favourably reflected in the final price of heat, which is both socially and economically acceptable.

## The Clients

According to a survey, the inhabitants of Hostětín are mostly satisfied with the heating plant, perceiving the heating as efficient, easy-to-use and environmentally-friendly. The citizens connected to the heating plant benefit from a



centralized heating system that does not require any operators, fuel preparation, or ash removal. Moreover, the local residents greatly appreciated the improvements in air quality since coal was phased out.

## The Money

The total cost of the project was approximately CZK 36 million (around EUR 1.4 million). It was co-financed by the Dutch government contributing CZK 11.4 million – around EUR 441 000 - paid in the form of guaranteed CO<sub>2</sub> emissions under the European Emissions Trading Scheme. Additionally, the project was also co-financed by domestic sources:

- ✓ the heat distribution networks obtained a grant of approx. 3.2 million CZK (approximately EUR 124 000) from the Czech Energy Agency (Česká energetická agentura);
- ✓ the citizens who wanted their houses to be connected paid CZK 30 000 for a house; a total of 67 connected houses contributed nearly two million CZK (EUR 77 300) to the total cost;
- ✓ a substantial portion of the funds needed (CZK 19.8 million – EUR 766 000) were obtained from the State Environmental Fund of the Czech Republic (Státní fond životního prostředí).

In 2005 Hostětín introduced a two-component energy price. The operating costs form the fixed component of the price, paid in equal shares by all consumers from the same consumption category. The second component of the price reflects the actual amount of the heat consumed. For example, in 2012 the fixed payment for permanent residences was CZK 7 632 (less than EUR 300) with the variable part of the heat price being less than CZK 250 (around EUR 9.50) for a GJ consumed.



Credits : Hoštětín municipality

## The Replication Potential

Hostětín actions can be easily replicated in other cities. Indeed, it has already served as a model for the construction of other biomass heating plants in the region. Nowadays, there are biomass heating plants in Štítná nad Vláří, Slavičín and Brumov-Bylnice, all situated in the close vicinity of Hostětín.

## The Impact

The municipal biomass heating plant has been providing heat to almost the entire village since 2000. Furthermore, the heat generated from local biomass enhances Hostětín's independence from external energy sources.

In comparison with solid fossil fuels, wood chips are a high-quality, clean source of energy. Once the heating plant started its operation, the overall pollutant emissions dropped to 6 % of their original levels. When asked in a survey, many citizens confirmed a subjective improvement of air quality in the village.

To a certain extent, this tool enables to stabilize consumption: households no longer need to provide their houses with additional heating from



other sources. Nevertheless, it is assumed that many households combine heat from the heating plant with heat derived from their own wood from the forests nearby. It is estimated that this option is used by up to 20 % of households, especially at the beginning and end of the heating season. Outside of the heating season, the residents of Hostětín use other sources to heat water for their households – chiefly electricity and solar energy

Beside the positive environmental effect, the biomass heating plant also has a positive impact on the economy in the region. Thanks to the fact that heat is generated locally, using local sources, a considerable amount of money, which would otherwise leave the village, remains in the region.

The municipality of Hostětín, as heating plant operator, has been able to keep the price of heating at a socially affordable level. In 2011 the average price of heat from biomass heating plants was 525 CZK/GJ including VAT. The price of heat in Hostětín (340 CZK/GJ in 2011, 397 CZK/GJ in 2012) is approximately two-thirds of the national average. Thanks to the municipally owned plant, new jobs were created for local residents.

## The Figures

- ✓ EUR 1.4 million invested for the project;
- ✓ 85% households which are satisfied with the service;
- ✓ 2000 construction year of the municipal plant;
- ✓ 2010 year of modernisation of the plant;
- ✓ 70 connected buildings.

*“In about ten years, there are about 15,000 tonnes of carbon dioxide emissions less. The municipal heating plant has significantly improved the air quality in the city” Mayor Robert Janota*

## Next Steps

With regard to future developments, the city expects to see its heat consumption decreasing, thanks to the improvements in the thermal insulation of buildings. The village will focus on connecting the buildings to the existing heat distribution system, and seeking new possibilities for a year-round use of the heating plant.

In addition to the complete replacement of fossil fuels used to operate the heating plant, the inhabitants of Hostětín are also considering other ways to sustainably harness further energy sources. Over the past twelve years, twenty homeowners have invested in thermal insulation of their houses (mainly replacement of windows coupled with thermal insulation of the building envelope).

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