From disadvantage to advantage!
Integrating renewable energy into Kecskemét's district heating service

Replacing natural gas with renewable energy is crucial from both climate protection and energy security perspectives. Hungary's geographical location particularly justifies the industrial-scale utilization of renewable energy. For this reason, the biomass heating plant in Kecskemét is of great significance, as it has been the largest district heating development in Hungary in recent years.
As part of the project, a 20+5 MW biomass heating plant utilizing renewable energy was established in the southern industrial area of Kecskemét, on Mindszenti Boulevard. This has enabled the industrial-scale use and integration of renewable energy into the city's district heating system. Starting from the 2023–2024 heating season, the heating and hot water supply for consumers connected to the district heating network — that is, one-third of Kecskemét's population, approximately 40,000 residents and 230 institutions — is now largely provided by renewable energy. This not only enhances energy security but also marks a major shift in Kecskemét's energy management.
Thanks to the comprehensive investment carried out by TERMOSTAR Ltd., Kecskemét now has the opportunity to provide modern, environmentally conscious district heating through the commissioning of the biomass heating plant and its integration into a newly developed district heating pipeline network.

The completed biomass heating plant enables the development of a diversified energy mix that complements natural gas-based technology in a cost-effective manner. The main components of the fuel mix are:

- Wood chips produced from logging residues (such as roots, bark, and small branches) that are by-products of sustainable forestry within a 60 km radius of Kecskemét and are not suitable for industrial wood processing,
- Selectively collected woody urban green biomass,
- And sunflower seed husks.

Thanks to the utilization of logging residues, the area available for afforestation in the affected regions increases by approximately 10%. This is because the space currently occupied by unused residues left on the ground is freed up. Through this investment, sustainable district heating in Kecskemét can be ensured in the long term.

Parallel to the construction of the biomass heating plant, and as part of the comprehensive development, the district heating network in Kecskemét was expanded with approximately 6 kilometers of modern, energy-efficient main pipelines. The new pipeline sections connect the site on Mindszenti Boulevard with the technologically upgraded site on Szultán Street and the facilities on Akadémia Boulevard, forming a unified energy system. At the same time, they make climate-conscious district heating accessible to new areas where demand has significantly increased in recent years.

As a result of the district heating system development, the following were constructed:

- The 20+5 MW biomass-fired heating plant on Mindszenti Boulevard,
- The transmission pipeline connecting the heating plant to Szultán Street,
- The main pipeline linking Akadémia Boulevard — one of Kecskemét's key development areas — with the Nyugati kapu,
- The modernization of the existing heating plant on Szultán Street.

With the implementation of the 20 + 5 MW heating plant included in the investment concept:

- Heat production from renewable energy sources has become possible,
- The risk of dependence on natural gas has been reduced,
- A significant annual reduction in carbon dioxide emissions can be achieved,
- The range of usable fuels has expanded (including wood chips, green biomass, and agricultural by-products),
- The use of diverse fuels allows for price stability and increased energy supply security,
- The competitiveness of district heating has improved,
- New opportunities for future development and expansion have opened up.

Thanks to the comprehensive investment, Kecskemét now has the opportunity to establish an environmentally conscious district heating service through the construction of a modern biomass heating plant and a new district heating pipeline network. The network, connecting the city's southern industrial area with the Széchenyiváros heating plant and extending through the pipeline section built to the Nyugatikapu district, has been transformed into a unified district heating system. This makes the service accessible to industrial facilities, institutions, and residential consumers located along the pipeline route.

The project has created an opportunity to meet the city's district heating demand with renewable energy, reduce dependence on imported gas, and utilize green biomass in the region that is otherwise unsuitable for other uses. In the long term, a renewable fuel-based heating plant has been established, capable of using a broader range of fuel types. In addition to wood chips, such fuels include urban green biomass—primarily composed of woody plants—as well as various agricultural by-products, such as sunflower seed husks.

Construction of the Mindszenti Boulevard site and biomass heating plant:

- As of November 23, 2023, the investment reached 100% completion, resulting in the establishment of a biomass heating plant utilizing renewable energy sources at the company's Mindszenti Boulevard site in the southern industrial area of Kecskemét.
- The site includes a building with a total floor area of nearly 3,000 m². This includes two boiler house buildings, closely connected water treatment and dosing buildings, storage buildings for fuel and vehicles, and a service office building.
- As part of the heating plant, a 20 MW and a 5 MW biomass-fired hot water boiler were installed. All related technological elements were implemented, including: heat distribution system, circulation system, reverse osmosis water treatment, pressure maintenance, backup water supply, flue gas cleaning (bag filter), chimney, and supporting equipment such as a truck scale, laboratory, fuel handling (front loaders), and fuel dosing (wedge conveyors, silos).
- The infrastructure of the site has also been completed. A significant internal road suitable for heavy truck traffic has been built, along with parking areas, sidewalks, and service roads to

assist with transportation. The site has been equipped with utilities and landscaping has been carried out.

District Heating Pipeline Section I between the Mindszenti Boulevard and Szultán Street heating plants:

- The construction was completed on September 15, 2023.
- A 2,121.5-meter-long pipeline was built, of which 2,118 meters is DN350 in diameter, connecting the biomass heating plant on Mindszenti Boulevard with the Szultán Street heating plant. The pipeline crosses the main road (Route 5) and the railway through a horizontal directional drilling method. The pipeline connects to the existing district heating system at the technologically upgraded Szultán Street heating plant, thus forming a unified city-wide network, including future consumer branch connections. The construction also included the installation of a technological data cable along the entire pipeline route.

District Heating Pipeline Section II between Akadémia Boulevard and the Western City Gate:

- The pipeline construction work was completed on November 7, 2023.
- A 3,766.6-meter-long pipeline was built, including 1,923.8 meters with DN300 diameter and 1,810.9 meters with DN250 diameter, connecting the Széchenyiváros heating plant and the Rudolf Kert area. This backbone pipeline, designed for the transportation and distribution of heat produced from renewable fuels, makes climate-conscious district heating accessible to the newly connected areas, benefiting the institutions, buildings, and facilities operating there.
- The new backbone pipeline was constructed with horizontal directional drilling beneath roads and railways, and the creation of branch connections for future consumers. The construction also included the installation of a technological data cable along the entire pipeline route.
- As a result of this development, the Rudolf Kert Family and Child Welfare Service and Center, the Messzi István Sports Hall, and the Mercedes-Benz Factory Basketball Academy were connected to the district heating system.
- The incorporation of different yet technically equivalent elements and the need for modifications to the pipeline route due to unforeseen circumstances required an amendment to the contract, which could only be signed by our company following the review by the relevant authority.

During the construction of the pipelines, special attention was given to the continuous communication with the local residents and businesses. Prior to the works, we provided information about the investment, its benefits, and the expected duration of construction through notifications placed in the area.

Modifications at the Szultán Street Heating Plant:

Several public procurement procedures were initiated for the modifications at the Szultán Street heating plant.

- At the Szultán Street heating plant, we carried out the necessary boiler-house technological modifications and installations to accept and transmit green district heating from the new biomass heating plant.
- In the heat distribution system, the district heating network circulation was redesigned, considering the changed hydraulic properties. The hydraulic system of the boilers installed in

the biomass heating plant integrates with the now expanded service system through the inclusion of heat storage tanks.

- The upgraded heat transfer station includes a complex system of lifting and circulating pumps that help transfer the produced heat into the district heating system, while the hot water distribution/collection system ensures proper heat distribution.
- The connection of the Mindszenti Boulevard boiler system to the district heating network is maintained by a pump group that balances the heat demand and supply.
- During the investment, new pumps were also installed for the existing gas boilers at the Szultán Street heating plant, enabling the operation of all existing heat generation equipment based on demand.
- Due to the changed operation, the electricity demand of the installed units increased. Therefore, we also increased the electrical capacity and expanded the feeding system during the investment. A new power transmission device was installed in the switchgear. Following the expansion, the network is now capable of supplying pumps that operate with frequency converters. Additionally, an automatic control system was established to enable remote operation and connection to the Telekont measurement and data collection system. Furthermore, to ensure reactive power compensation, a new automatic phase correction device was installed.
- The mechanical and electrical modernization of the Szultán Street heat transfer station has been completed. The further upgrading of the building and increasing its energy efficiency will be a key objective in the coming years.

This comprehensive development project enhances Kecskemét's energy security, reduces its reliance on imported gas, and makes use of local renewable energy sources. The expanded district heating system supports sustainable, environmentally friendly heating for the city’s residents and institutions, paving the way for future growth and energy efficiency improvements.