

## Kaunas leading decarbonization process

Kaunas with almost 300 thousand inhabitants is the second largest city in Lithuania. It is not only a city of old traditions, but also a large centre of business, industry and innovations.

Kaunas city municipality takes a very responsible approach to preserving and developing the district heating supply system, which is a great opportunity to move away from fossil fuel combustion and to solve climate change and urban air pollution problems.

Kaunas DH company supplies heat and hot water to residents and business buildings of Kaunas for more than 50 years already. The total length of heating pipelines consists of approximately 448 km. Annually, several kilometres of pipelines are replaced by pre-insulated pipes, new pipelines are built for connection of new consumers as well.

Approximately 90 % of inhabitants are served by district heating in the city. Kaunas takes care on the living and working conditions of inhabitants, of their wellbeing and even health because DH technology provides very good possibilities to keep the city air clean.

Annual heat demand amounts to 1440 GWh. Starting from 2012 up to 2018, the city actively replaced the usage of fossil fuel (natural gas) with usage of local renewable biomass. The overall investments into heat production facilities and replacement of trunk pipelines amounted to approx. 60 million Eur during this period. Significant part of these funds was a financial support from European Union Structural Funds and Lithuanian Environmental Investment Fund. State promotion assisted very much to speed up the conversion from the usage of natural gas to renewable fuels.

Some biomass boiler-houses and CHP plants in Kaunas were built by independent investors and operators. Recently almost 38% of heat supplied to consumers is produced in own heat production facilities of Kaunas DH company. The rest of heat is purchased from 11 independent heat producers (IHP) who win monthly auctions. According to regulations all heat producers must participate in these auctions in order to ensure best available heat prices for consumers.

A major part of the recent investments was assigned for modernization of heat supply networks and renewal of heat production boilers (fuel conversion from natural gas to biomass), implementation of latest technologies: the reconstruction of heat generation facilities by installing economizers, automation of boiler-houses of integrated network, systems of electronic services, system of remote reading of heat meters, data transmission, etc.

- Reconstruction of heat supply networks reduced heat supply losses from 18% (in 2013) to 16% (in 2018).
- The share of renewables in the overall fuel structure for DH production increased from 11% up to 80 % over the past 5 years.
- A part of the funds was allocated for connecting new objects to the district heating networks. Approximately 5 – 9 MW consumption capacities of new customers are connected annually, which makes about 3 % increase in heat supply volume. There is a tendency that not only new customers are connected to DH systems, but also those who have previously disconnected are coming back. Such consumer behaviour is influenced by reduced heat prices mainly as a result of the replacement of expensive natural gas with cheaper local biomass and improved energy performance efficiency. The average heat price for consumers dropped by more than 41% in Kaunas during the period of 2012–2018.

The DH supply systems in Kaunas are constantly being improved by introducing new technologies and making the system more attractive to citizens, public and business sectors.

One of the national goals of Lithuanian National Energy Strategy is to produce heat with zero CO2 emissions by 2050, i.e. to produce heat from renewables only. Following this objective Kaunas will seek to use local renewable resources prudently, install less polluting technologies, follow the environmental legislation and apply preventive measures to minimize the negative impact on the environment.

A construction of the one of the largest waste to energy CHP plant (24 MWe and 70 MWth) will be completed in Kaunas at the end of 2020. The plant will utilize municipal waste after the sorting process in the region and turn it into useful energy, which will significantly reduce methane and other greenhouse gas emissions from landfills. It is planned that the construction of the modern high- efficiency Kaunas CHP plant will satisfy approximately 40% of Kaunas district heat demand and will increase the Lithuania's renewable power generation capacity by 10%.

Kaunas city municipality understands and actively seeks to create an integrated complex energy-utility system that will make meaningful use of renewable waste and environmental energy, gradually stopping the release of greenhouse gases in the city. Future development projects will be:

- ESCO contracts with Kaunas municipal institutions on energy savings, as well as non-use of fossil fuel for heat production;
- ESCO contracts on energy savings and indoor heating systems modernization in residential buildings (in the planning phase);
- Supply of surplus heat from Kaunas CHP plant to the users of Kaunas FEZ by constructing a new DH network (connection of new consumers);
- Contract with the "Isle of Science" for the construction of an absorber heat pump on DH system to produce cold.
- Usage of solar energy technologies, heat pumps and heat storage facilities for the production of district heat.
- Installation of district cooling systems utilizing the heat currently released into the environment is also planned.
- Connection of surrounding small urban districts to the main DH network. This will make energy supply system more efficient and more green.

**After all, we are all connected!**

