

Overview of National DHC Market

Country

Lithuania

Summary of the National DH market

The year 1947 can be considered as the beginning of cogeneration in Lithuania. Steam from Petrašiūnai power plant situated near Kaunas city was used for technology purposes and premises heating in the neighbouring industries. The use of District heating technology – heat supply via network to industrial and residential consumers started in Vilnius in 1957. At the beginning only surplus heat from electricity production was used for building heating. Later DH systems were built in all cities and towns, and even in larger villages. Primary idea of surplus heat use from electricity production was changed and in most cases heat is produced in heat only boiler-houses. Large CHP plants were constructed just in two cities – Vilnius and Kaunas. Old power plant in Klaipėda was reconstructed to CHP plant. Electricity production was concentrated in Elektrėnai condensing power plant, using fossil fuel and later in Ignalina nuclear power plant. Cheap and abundant electricity from this nuclear plant somewhat blocked construction of new CHP plants, because they weren't able to produce electricity at competitive price.

DH sector is a largest Energy sector In Lithuania supplying heat to residential buildings, industry, commercial and service sectors. More than a half of residential area is heated from DH systems. The share of apartments connected to DH in towns and cities is more than 70%.

Heat supplied via DH networks makes 28.6 PJ per year (2008) and slightly decreased (-2.2%) during the past 3 years. Generally, heat demand is rather stable and yearly fluctuation of heat sales well correspond with climate factor (number of degree days). Nevertheless, heat demand in buildings is diminishing because of implemented heat saving measures (changed windows, tightening) and started building renovation. Newly built and renovated house uses much less heat than old ones. Initially this effect is not considerable because of small share of newly built and renovated buildings in total building stock, and likely will grow with increased renovation scope. Diminishing of heat consumption in buildings is partially counterweighted by new connected consumers, mainly block residential houses and tertiary sector buildings constructed in DH zones¹.

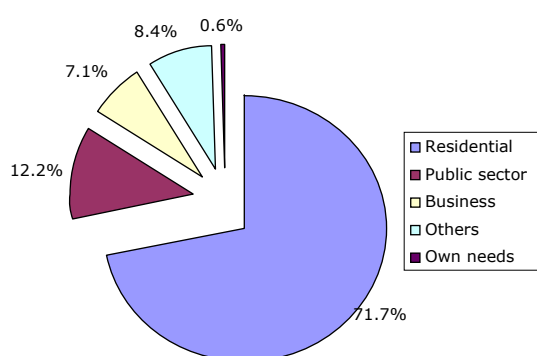


Fig. 1. DH heat sales structure 2008.

¹ DH zone – means town area, where DH system is in place, and DH is foreseen as default heat source in Special heat supply plan elaborated by municipality.

Total number of consumers increased by more than 150 thousands during 2001-2008 - from 477 562 to 627 866 (or by 32%). However, larger number of consumers not always means increase in heated area and heat sales. Often it is result of organizational restructuring, when building property is allotted among several owners. In DH zones newly built houses usually become connected to the network. Statistical data on residential floor area heated from DH was refined in 2007 including single-family houses and for the year 2008 the figure is app. 35 million m². Consequently, average annual heat consumption in residential buildings was 157 kWh/m² (565 MJ/m²) in 2008.

Residential building stock in Lithuania includes 1 324 670 dwellings. 50,9% of them are heated from DH systems, 24,6% - from local boiler houses, and the rest 24.5% uses stoves, electricity, heat pumps, etc.

The length of DH routes decreased considerably from more than 3500 km in 1997 to 2500 km in 2008. Unused network parts appeared with bankruptcy or/and disconnection of large industrial consumers. Some parts of networks after disconnection of big consumers became very inefficient and were disconnected establishing autonomous heating sources for remaining buildings. New DH routes are built according as new consumers connected. Totally 20 km routes were built in 2008, in addition to 35 km renovated. The rate of DH network rehabilitation (40-56 km/a or 1,5-2% of total network length annually) is insufficient and routes are aging, promising high investment needs in future.

Heat losses in networks decreased from 26,5% in 2000 to 16,7% in 2008 and further reduction can be achieved only by improving pipes insulation (routes rehabilitation) and by using advanced technologies with lower heat carrier temperature and real-time network dispatch management. The later requires technical changes in old fashion building substations.

Annual turnover of the DH sector increased by 24% during 2008 compared to 317 MEur in 2007. The main reason – higher heat tariffs applied because of increased fuel (mainly natural gas) prices. Tough use of alternative fuels increases, the main fuel remains natural gas imported from Russia (Fig. 2.).

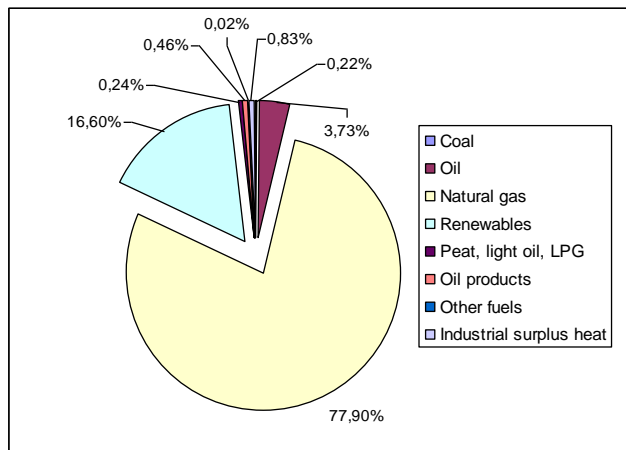


Fig. 2. Fuel mix in DH production.

The weighted average of heat price delivered to consumers was rather stable in 2000-2005 when natural gas price was comparatively low and stable. Heat prices went up with increased international oil prices and followed natural gas prices, which in case of Lithuania and Gazprom contract are bounded using certain formulae. (Table 1)

Table 1. Average heat tariff in Lithuania.

Year		2000	2005	2006	2007	2008	2009
Average heat tariff	Eur/MWh	32.44	32.73	34.67	40.03	51.47	68.93
	Eur/GJ	9.01	9.09	9.63	11.12	14.30	19.15

However average heat price do not reflect price difference in the individual DH systems. The highest and lowest heat tariff differs 2 times. Lower prices are in large cities and systems using

more and cheaper wood fuel.

The largest heat amount is produced in CHP plants (45%), followed by DH boiler houses (35%) and the rest is purchased from independent producers (Fig. 2). Major independent heat producer is Kaunas CHP plant selling 76% of total heat supplied to 9 DH companies by 18 independent producers.

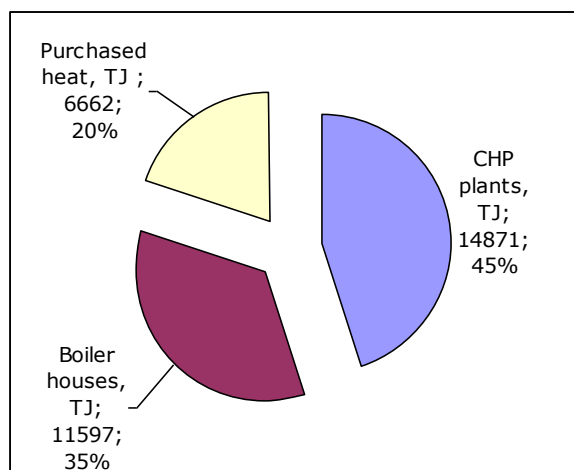


Fig. 3. DH heat supply sources

The National Energy strategy (NES), adopted by Parliament in 1999 declared main statements related to DH supply as 1) construction of CHP plants in DH systems using natural gas and being able supply electricity at competitive price with Ignalina NPP, 2) modernize DH systems enabling consumers to control their heat consumption, 3) increasing use of local energy resources, including renewables.

Revised NES was adopted in 2002, in which several essential statements for DH sector were included: 1) requirement to prepare municipal Heat supply plans defining heat provision zones (DH zone, natural gas heating, etc.), 2) establish third party access regulation to DH networks, thus allowing competition in heat generation between DH companies and independent heat producers, 3) regulations for electricity purchase quotas and prices from CHP plants, 4) new milestones for renewables.

The National Energy Efficiency program 2006-2010 adopted by Lithuanian Government contains data on estimated Energy saving potential in residential buildings, which is 36% of present energy needs. The national target in CHP expansion - 35% of total electricity generation in the country is produced in DH CHP plants by the year 2020.

The latest updated NES adopted in 2007 sets more attention to DH development, as earlier targets were reached only partially. No major changes happened in building energy consumption, insufficient scope of DH network rehabilitation, slow growth of indigenous resources use. New targets for heat sector includes: 1) preparing of long-term heat provision plans in municipalities, 2) construction of 400 MW total capacity CHP plants in large cities before 2020, use of municipal waste for heat (and electricity) production in 5 largest cities, among them – in Vilnius already in 2010, change up to 75% pipelines in DH networks before 2015.

Latest initiative from Lithuanian heat suppliers addresses significant increase of usage of indigenous energy sources, including biomass, municipal waste and others, seeking 70-80 % share of local fuel in total heat production by year 2020.

There is no National target set for expansion of DH supply sector. Municipalities together with DH companies are responsible for heat supply to consumers in their territory ensuring least cost and environmentally friendly heat supply.