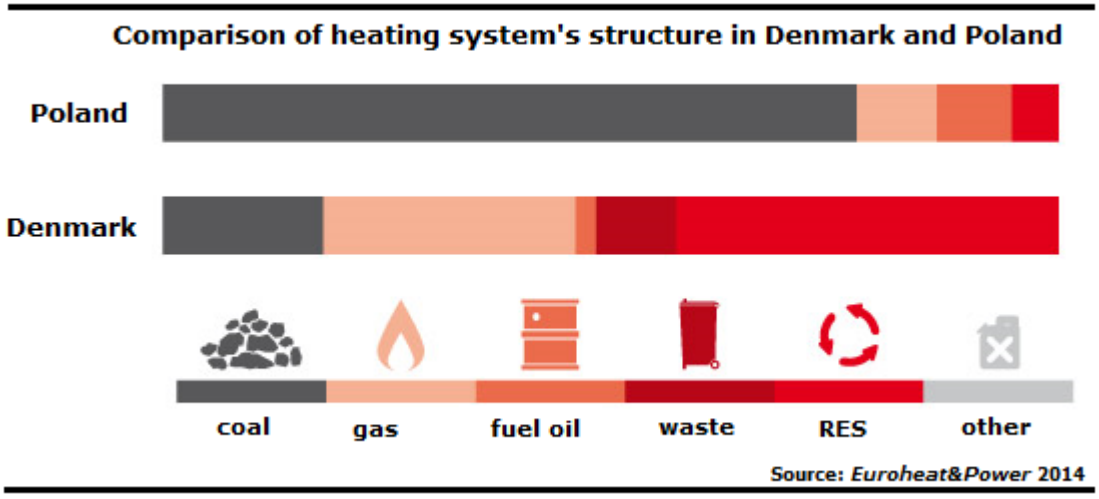
DISTRICT HEATING MARKET IN POLAND

Polish heating industry is undergoing a transformation with regard to implementing European climate and energy policy in areas of emission reduction, use of renewable energy and cogeneration. Simultaneously, the sector is supported by the EU allocation of funds (2014-2020) and governmental policies.

According to census from 2013, 42% of heat is produced within heating system by companies (60% in urban and 4% in rural areas), 38% stands for individual heating, 17% for furnace heating mostly harmful for the environment and 2% from local sources. Poland ranks third in Europe with regard to demand for systemic heat.

In 2015, 451 district heating companies which are operating on the basis of concessions issued by the Energy Regulatory Office (URE) employed over 34 thousand people and maintained an installed thermal power of 56 796 MW. The length of operated heating networks amounted to approx. 20 255 km. The share of heat generated in co-generation with electricity production accounted for 64%. The system is regionally differentiated with the domination of mazowieckie voivodship with the capital city (21%) and under-represented voivodships lubuskie, opolskie, świętokrzyskie (below 2%). The market is dominated by small players with capacities below 50 MW. The majority of companies are limited liability (approx. 75%) and joint-stock (approx. 20%) and 63% of uniform owned companies belonged to state institutions (mostly local authorities). The average net price of heat in 2014 was 65 DKK/GJ.

The structure of energy carriers is vastly different than in Denmark. The heating industry is still heavily relying on fossil fuels with 75.1% heat generated from coal in 2014 (compared to 79.1% in 2002). Renewable energy (particularly biomass) stand for only 7.8%. The diversification is more visible in companies working in cogeneration system – there 28% of heat is produced based on other sources including 9% of biomass. In non-cogeneration companies 87.6% of heat is dependent on coal and 9% on gas.

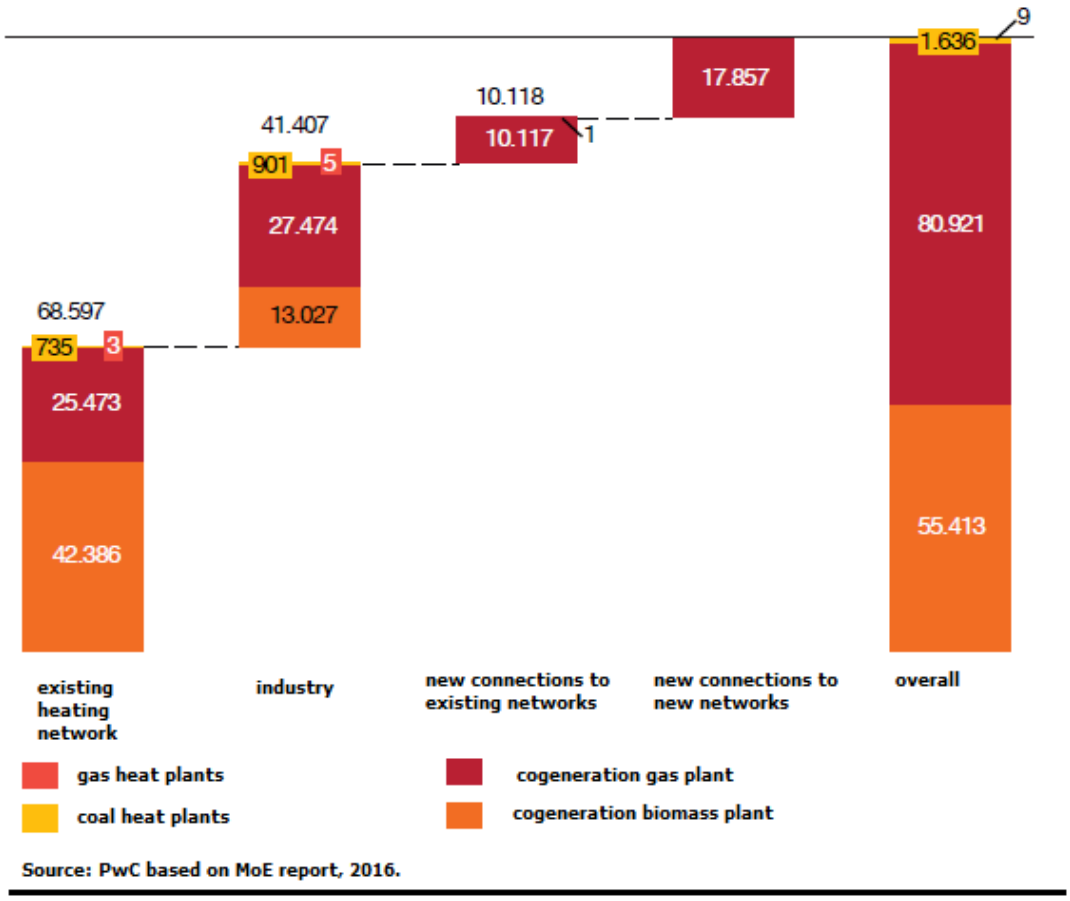


The prices and energy carriers structure in Poland will be relying on EU climate policy till 2030. The EU support for investments in heating and energy sector in Poland for 2014-2020 amounts to 27.4 billion EUR within the Operational Program Infrastructure and Environment and additional 2.85 billion EUR within Cohesion Fund and European Regional Development Fund. The support for individual project can reach up to 70% of eligible costs depending on program, location and company size.

The funds are intended for lowering the emission by i.a. construction of RES installations by companies, reconstruction of heating and cooling network to minimize the losses on transit, change of energy carriers, prioritizing the investments in areas with high pollution level PM10. The support for cogeneration entities with capacity over 20 MW is excluded.

Every third municipality in Poland has their low emission plans. For instance in 2016, Cracow voted anti-smog law to replace by 2019 over 22 thousand furnaces. PwC in report from 2016 indicates the potential of individual heating branch with regard to change of energy carriers for renewable resources and services concerning procurement, installation and exploitation of individual sources.

Potential for heating energy production in cogeneration or by heating plants (GWh)



Source: PwC based on MoE report, 2016.

Ministry of Energy presented in 2016 the analysis of cogeneration potential in Poland, based on EU requirements. According to the prognosis the demand for heating and cooling in Poland in 2025 will grow from 304 TWh in 2015 to 324 TWh, mostly due to 15% increase in the industry, construction and agriculture sector. Currently, over 60% of systemic heat is used by residential buildings. The demand for district cooling will grow by 300% till 2025. The overall capacity of cogeneration sources might reach 11 thousand MW (75% growth). The MoE analysis assumes full conversion from existing coal source for gas and biomass.

In 2016, Ministry of Regional Development organized a conference announcing regulatory framework to support the district cooling, especially to manage the summer surplus in the cogeneration plants. In Zabrze Fortum plans to open an adsorption device powered by

systemic heat and solar collectors to produce cooling and already builds new eco installations in Bytom worth 100 millions DKK. Veolia Energia Warszawa S.A. invested in a smart heating network in the capital city, which enables remote management of three pumping stations, 79 heating chambers and 2.5 thousand nodes (worth 110 millions DKK). Radpec in Radom considers reconstruction of ecological installations for existing cauldrons or cogeneration, as is required to adjust to EU requirements until 2023.

Plans for modernisation

District heating sector in Poland requires fast modernisation. In the perspective of the next 10 years functioning of district heating systems will be threaten by luck of activities limiting environmental impact. Poland has one of most developed district heating network in the EU. It creates favourable conditions from the perspective of environmental impact and effective usage of primary energy.

The Polish government is currently working on the strategies for modernisation of district heating sector and financing models.

The development of effective district heating systems requires new technologies and change of financing models in the investments. The district heating sector is aware of the fact that heat production technologies should be changed into RES, WTE or cogeneration, which would follow recommendation of Directive 2012/27/UE. The co-financing of efficient district heating plants with the public support (EU and national) is only possible in cases of projects based on cogeneration, waste or RES.

Transformation of currently functioning energy systems into effective systems will, in many cases, involve installation of biomass boilers. That will require providing regular availability of sustainable and biomass in a sustainable price.

There are number companies in Poland that are already modernizing, eg district heating plant in Radom and Olsztyn are considering building a huge waste incinerator that would produce electricity and hot water. Incineration plants can be an optimal solution because the EU requires the reduction of waste on landfills.

Modernisation of district heating sector will also include extension of district heating network. The need of new district heating network is driven by the smog problems in Poland, especially in the areas where heating in individual houses is based on home stoves based on coal and waste. The district heating network will help to connect individual houses and limit the emissions.

The heat prices has been growing in Poland in the small cities where there are small district heating operators working on old systems. In the cities over 500 thousand heat costs account for 4.33% of the average disposable income of households, and in cities under 20 thousand the heat cost account for 5.76%. Small heating companies face greater difficulties that the big ones, in accessing capital for investment, and without modernization there is a prospect of lack of access to public aid.

In addition, the promotion of thermomodernisation in buildings - good for reducing costs and reducing emissions - means that demand for heat will fall. If fixed costs of heating systems are maintained, heat prices may increase. As a consequence, customers can disconnect from district heating networks to their own heating sources, which could further reduce air quality.

Poland has optimal conditions for developing effective heating systems due to prevalence of existing networks (large and medium sized cities), stable and predictable demand (basic indicator for cogeneration installations), possibility of waste usage for energy generation (including industrial waste) and because of the scale effect the possibility of effective RES

usage (local biomass, solar and geothermal energy). Danish companies are vastly recognized and appreciated in the green technology area in Poland.

Sources:

1. Ministry of Energy, *The complex analysis of the potential for using high performance cogeneration and effective heating and cooling systems in Poland*, 2015.

2. PwC, *7 temptations of Polish energy sector 2016*, May 2016.

3. Energy Regulatory Office, *Heating sector in Poland in numbers 2014*, August 2015.

4. Forum Energii, *Last call for district heating in Poland*, October 2017.