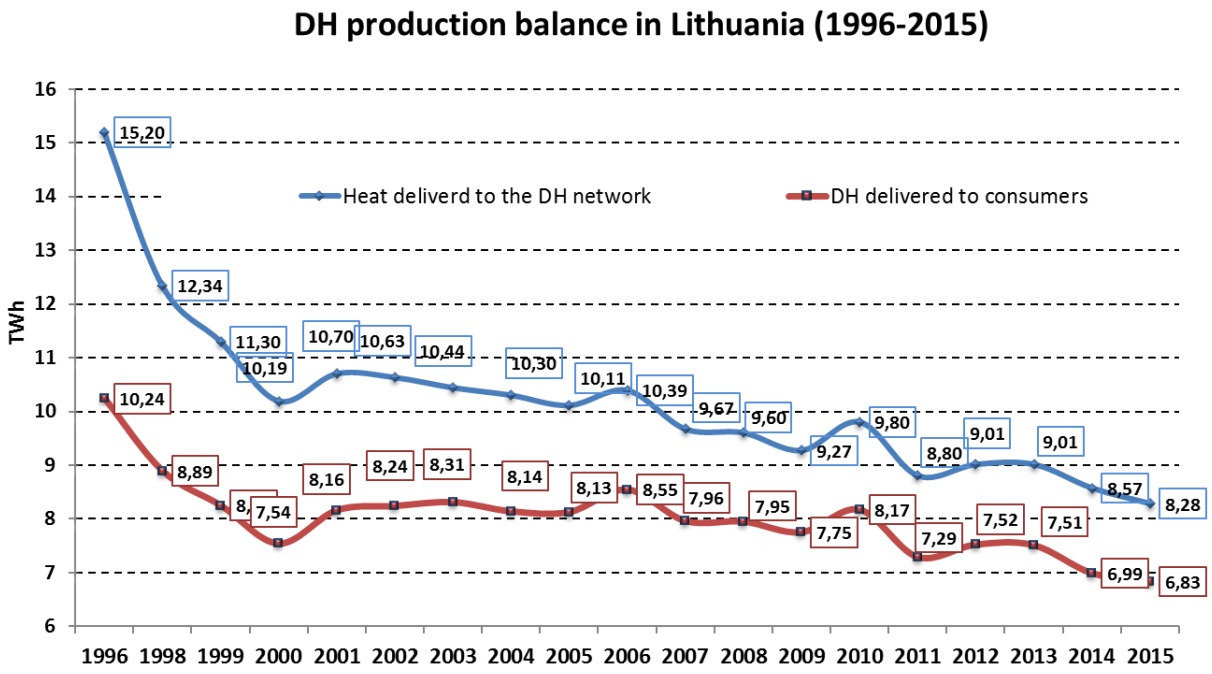
LITHUANIAN DISTRICT HEATING SECTOR IN 2015

Lithuanian District Heating Association

District heating market and consumers

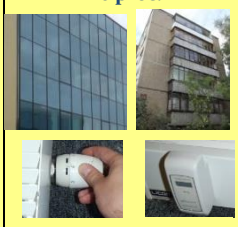
The year 2015 witnessed the lowest level of total district heating supplies (DH) ever recorded over the period of Lithuania's independence – total supplies of heat energy to consumers amounted to 6.88 TWh, being by 1.6% less year-on-year. Although heat consumption was going down, the total number of DH consumers grew by 14% in 2015 and stood at 692,261 at the end of the year. Hence, relative heat consumption per final consumer decreased by more than 1.7%. This can be explained not only by rather cold winter seasons over the last years, but also by the impact of the accelerating renovation of building stock. At the end of 2015, out of 17 thousand multi-apartment buildings with district heating, newly built multi-apartment buildings (built after 1993) amounted to 1,330 (7.8%) and completely renovated buildings reached 1,400 (8.2%), as compared to less than half of this number at the end of 2014 (649). The number of partially renovated housing stock also grew from 903 to 1,121 in 2015.



Note: A period until 2012 covers the analysis of the data provided by LDHA members only; the years 2013, 2014 and 2015 include other heat suppliers, too (Visaginas, Skuodas, Kretinga, Nemėžis). Therefore, the quantities of heat production and supplies to consumers cannot be compared with earlier years.

Main consumers of district heating are residential consumers (private individuals) accounting for 72.6% of total consumers. The remaining share of the market is more or less equally distributed between budgetary agencies and business entities. Taking into account that one apartment is occupied by several residents, it is obvious that DH is the main type of heating and hot-water production in Lithuania. Recent rapid replacement of natural gas by bio-fuel results in a reduction in prices for district heating. However, one of

the sorest problems remains persisting in the heat sector, i.e. heat energy inefficiency. In Lithuania, the average annual heat consumption in buildings is 209 kWh/m^2, whereas the neighbouring Nordic countries use about 128 kWh/m^2 per year for the heating of buildings. Although most of DH technical indicators and heat prices are similar in the Baltic and Nordic countries, the size of heating bills is mainly determined by slow renovation of multi-apartment buildings.

Type of Multyfamily apartment house		2015/2016 heating season (average heat price forecast ~ 6,2 euro ct/kWh with VAT)		
		Total share of apartments houses (%)	**Amount of heat consumption for heating 1m^{2}of flat per month**	**Amount of heat consumption for heating standard 60 m^2 flat (payments per month)**
I	**Apartment houses with low consumption of heat** (modern construction, renovated houses with individual heating regulating systems)	**4 proc.** 	**~9** kWh/m^2	**~540** kWh/60m^2 **(~35 Eur/month.)**
			113 thous flats 0,323 mio. inhabitants	
II	**Apartment houses with low or avarage consunmption of heat** (modernized or other energy saving dwellings)	**16 proc.** 	**~15** kWh/m^2	**~900** kWh/60m^2 **(~56 Eur/month)**
			46 thous flats 0,13 mio. inhabitants	
III	**Apartment house with large consumption of heat** (dwellings constructed up to 1992, poor heat insulation, depreciated, no energy saving measures are installed)	**60 proc.** 	**~21** kWh/m^2	**~1260** kWh/60m^2 **(~78 Eur/month.)**
			420 thous flats 1,20 mio. inhabitants	
IV	**Apartment house with very large consumption of heat** (old construction dwellings with very poor heat insulation, depreciated, no energy saving measures are installed)	**20 proc.** 	**~35** kWh/m^2 **and more**	**~2100** kWh/60m^2 **(~130 Eur/month.)**
			121 thous flats 0,34 mio. inhabitants	

There are 17000 multifamily apartment houses (700 thous flats) connected to DH networks:

- 420 thous apartments in old, uninsulated multi-apartment buildings
- 120 thous apartments of extremely poor quality
- 112 thous apartments in partially renovated multi-apartment buildings
- 70 thous apartments in newly built and renovated multi-apartment buildings

Such a situation with multi-apartment buildings results not only in heating bills variation up to 10 times among different buildings, but also in that a part of heat consumers are simply deprived of high-quality service they pay for. Poorly organised maintenance of multi-apartment buildings in Lithuania often discredits the quality of DH service, too.

Lithuanian DH entities proved their abilities to handle the technological heat distribution chain through the modernisation of group heat substations and their replacement with automatic individual substations. At the end of 2015, there were only 5 group heat substations left out of formerly existing 600. This technological solution enabled more accurate regulation, allowed saving that way about 15% of heat in buildings, and reduced overall heating costs due to lower heat transmission losses, lower repair costs, etc. This achievement not only saves millions euro for DH consumers, but is also found impressive by other post-Soviet countries where this process is only in its early stages. As a matter of fact, the modernisation of heat and hot-water supply systems has come to a standstill since imposition of a statutory ban for major heat suppliers to simultaneously function as supervisors of building heating and hot-water systems. So far, it looks like neither the administrators nor associations of multi-apartment buildings are capable of performing the modernisation of internal systems in buidlings. There are issues to think about for national authorities while planning the implementation of the Energy Efficiency Directive in Lithuania. At this stage, there exist different individual heat substations in Lithuania.

There are 4,800 elevator-type heat substations still left in Lithuania (out of formerly existing 26,980). It is estimated that full automation of heat substations, balancing of all domestic heating and hot-water systems, and installation of individual meters and regulation devices would allow saving approx. 858 GWh of heat for about EUR 50 million a year. An average Soviet-type flat of 60 m^2 would pay monthly by some EUR 20 less (currently such flat pays about EUR 80 on average per month).

Currently, out of 17,000 multi-apartment buildings 859 (5.1%) have heat meters in apartments and 732 (4.3%) buildings are equipped with heat distribution devices (heat cost allocators). The Law on Heat Sector was amended in 2011 whereby major heat supply entities were not allowed to act as the supervisor of the heating and hot-water systems of a building. This amendment not only halted the modernisation of consumption systems in a number of cities/towns, but also caused many problems in the area of maintenance of these facilities. The issue of the ownership of heat substations remains open in a number of buildings; occupants are reluctant to provide funds for the maintenance and repair of heat substations; heat suppliers are suffering financial loss; and the quality of heat supply is consequently declining.

The absence of an efficient system of managing multi-apartment buildings is accompanied by confused processes of heat distribution, hot-water supply, domestic systems supervision and other related processes. Such a tricky situation is difficult to understand for ordinary consumers who don’t receive clear answers about responsibility/accountability and quality standards; there is little concern about energy saving or delivery of higher-quality services. This situation not only jeopardises the image of the DH service, but also results in financial losses. For instance, DH entities suffered ~7% of commercial losses in supplying hot water in 2015: out a total of 12.84 MIO m^3 of purchased water, only 11.95 MIO m^3 were sold.

In 2015, there was little progress in improving the legal regulation of heat and hot-water supplies to multi-apartment buildings. Much focus went on heat distribution methods, but there is little sense in doing this when heat is unevenly distributed to apartments – some of them are overheated, while others are freezing; readings of heat and water meters are taken at different times; some apartments have oversized heating systems (using neighbours' heat); consumers have no opportunity to regulate energy consumption; etc. Solving of the aforementioned problems was expected to be facilitated by transposing the Energy Efficiency Directive (2012/27/EU) into Lithuania's legislation. Unfortunately, there actually are no signs of application of the Directive for saving heat energy in multi-apartment houses. Although the Lithuanian District Heating Association (LDHA) has conducted a number of studies justifying energy saving opportunities, proposed an implementation action plan and repeatedly applied to national authorities, this did not change the attitude of indifference and, often, irresponsibility towards the residents of multi-apartment houses. It will take several decades to renovate multi-apartment buildings at current paces. The modernisation of domestic heating and hot-water systems could go much faster in terms of providing consumers with the high-quality heating service without waiting for large, complex renovation projects. It is possible to combine these two processes by implementing the modernisation of heating and hot-water systems in multi-apartment buildings with five and more years left until the anticipated implementation of complex renovation.

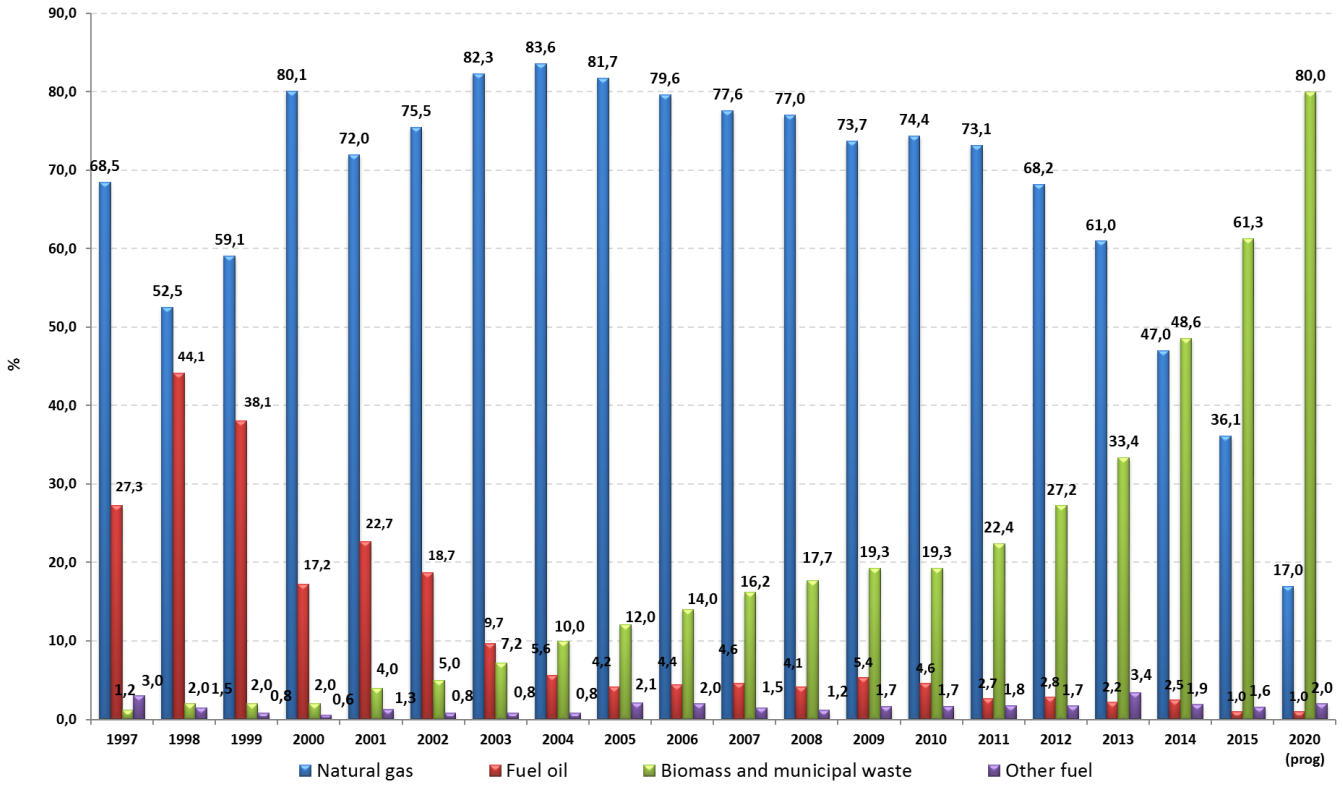
Heat production

In 2015, new boilers having a thermal input of about 250 MW bio-fuels were installed in the Lithuanian DH sector. The boilers will reduce the need for imported, expensive natural gas even more and contribute to lower heating prices. This will increase revenues for Lithuanian entities engaged in the production and installation of bio-fuel boilers or fuel supplies for such installations.

New biomass boilers installed in Utena DH company and Mazeikiai DH company. In 2015 there was constructed over 30 biomass based boilers in HOB houses of DH companies

In 2015, the DH sector recorded one more impressive achievement – local chipped wood waste and other low-value firewood accounted for more than half of the fuel used for producing heat (58.5%). Added to other types of siolid fuel, bio-fuel accounted for 61.3% of the last year's fuel balance. The structure of primary fuel has dramatically changed in the Lithuanian DH sector over the past few years. In 2015, the

overall fuel consumption was 755,786 tonnes of oil equivalent (t_{oe}), of which 442,144 t_{oe} was bio-fuel, while natural gas amounted only to 272,199 t_{oe}. Municipal waste (20,619 t_{oe}) exceeded the use of fuel oil (6,879 t_{oe}). It should be noted that local peat consumption exceeds that of imported coal. Roughly, the Lithuanian DH sector produces almost 2/3 of heat from local, cheaper fuel. This means energy independence, fuel diversity, cheaper heat, etc. Saved funds can be used to satisfy other residential needs, increase domestic consumption, raise the stands of living and contribute to the budget of Lithuania. Extensive use of renewable sources for heat production helps in tackling climate change problems and will facilitate the implementation of the Paris Agreement signed by Lithuania last year. EU's aid allocation to bio-fuel facilities can be looked at as one of the best investments of the state into the country's economy.

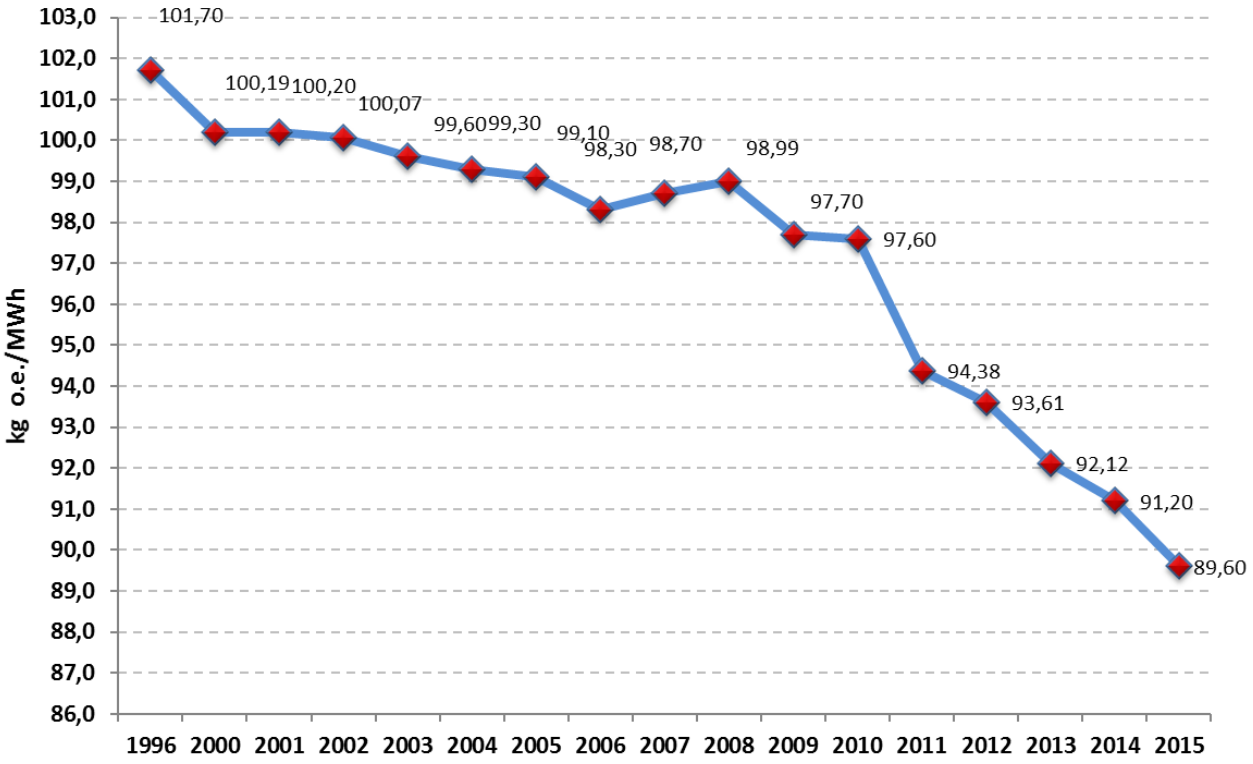


The structure of primary fuel in DH production 1997 – 2015

In 2015, a total of 5921 GWh of heat was generated in own sources of heat suppliers, including 535 GWh of waste heat recovered with condensing economisers instead of being otherwise released into the environment. In some Lithuanian cities and towns, bio-fuel installations are controlled and heat is produced by independent heat producers. They generated and delivered to the DH systems a total of 2427 GWh of heat last year.

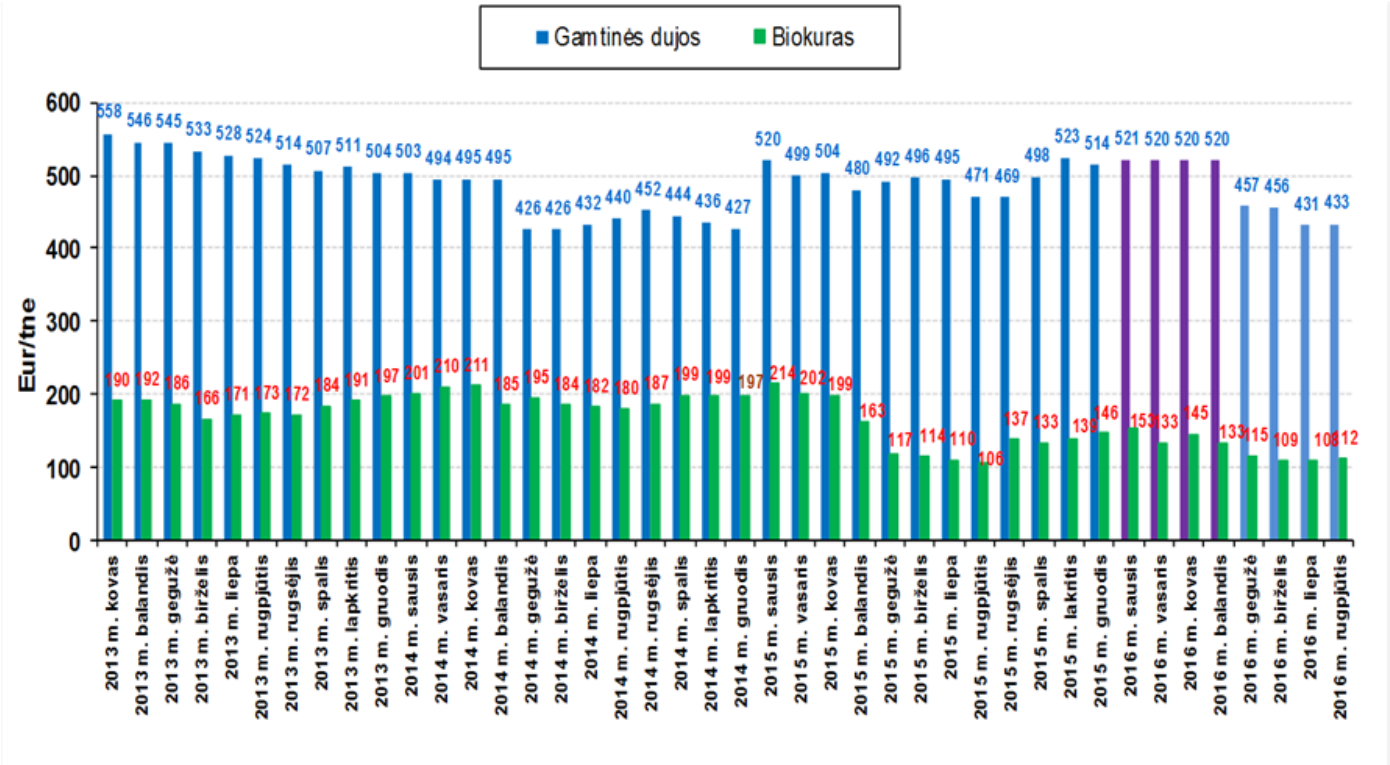
The replacement of imported natural gas with cheap, mainly local renewable bio-fuels not only reduces heat prices, but also creates considerable economic benefits and increases energy security. The replacement of Soviet-time boiler fleet with modern installations using bio-fuels improves energy efficiency of the sector. If heat is produced using efficient installations, fuel savings are more or less equal to the quantities lost in

transportation of the heat to consumers through pipelines. In 1996, production of one MWh of heat required about 101.7 kg of fuel in oil equivalent, as compared to 89.6 kg_{oe} at the net calorific value in 2015.



Comparative fuel consumption of DH sector (1996-2015)

The choice of fuel mainly depends on its final acquisition price. Although public statistics employs various manipulations to hide the costs of the natural gas infrastructure, the final price for gas fuel is nonetheless about three times higher than that for bio-fuels delivered to a boiler house.



The average price of natural gas and biofuel for DH production in Lithuania Eur/ t_{ne} excl. VAT

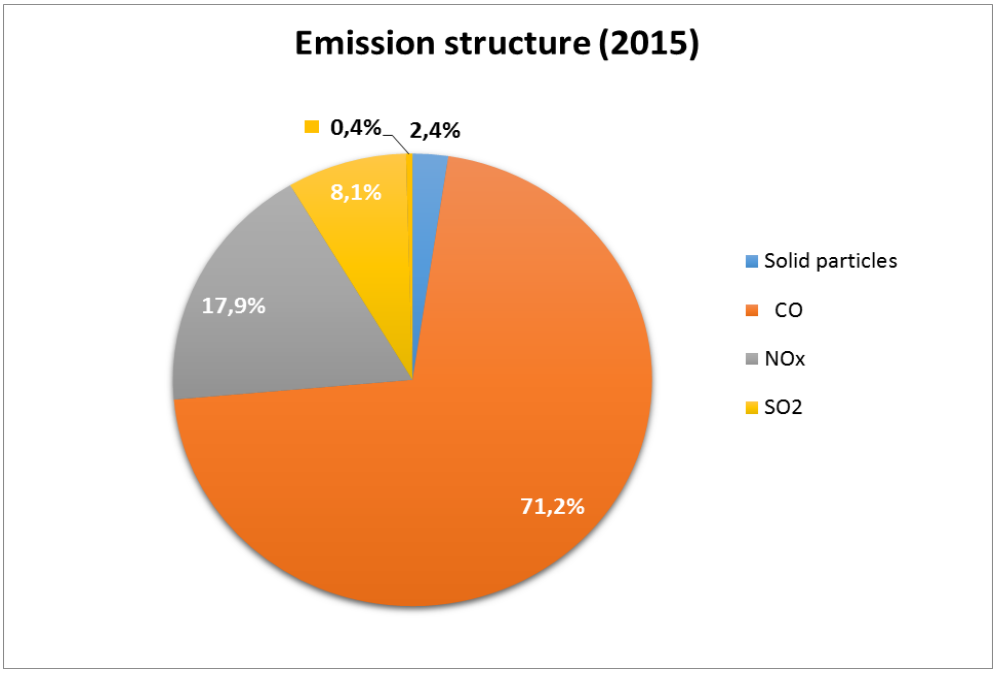
Natural gas acquired directly from transmission networks is a bit cheaper (excl. distribution costs). In the latter case, the price for natural gas was about 387–388 EUR/t_{oe}, but only a few heat producers have access to such natural gas. In 2015, 53% of bio-fuel for heat production was bough from the energy exchange.

It was the authorities' decision that 2015 was the last year for buying up "quota" electricity above the market prices from fossil fuel powered combined heat and power plants using. Therefore, this is probably the last year for producing large quantities of cogeneration-derived heat (2,760 GWh) which accounted for 33% of total heat produced within the DH sector. It's a paradox that the authorities, on the one hand, impose a binding order on CHP plants to buy natural gas from the liquefied natural gas (LNG) terminal at a price fixed by the State (which is by several times above the price for natural gas offered in the free market) and, on the other hand, cancel electricity quotas claiming that power production is not competitive. At the end of the year, Vilnius CHP-3 was shut down; other large CHP plants continue operating on a fragmentary basis only. Electric output generated by CHP plants using bio-fuels and waste (67.8 MW) is too low to have a significant influence on the adequacy of the power system. Lithuanian energy-shaping institutions should find ways how to integrate large CHP plants that are still operating into the electricity balancing or reservation markets. These plants have an aggregate capacity of 655 MW. In addition, cogeneration is far more efficient than the separate generation of power and heat (and heat emission into a lake (in Elektrėnai)). Combining cogeneration advantages with market instruments would enable profitable operation of such plants. In 2015, the total power generation by CHP plants in the Lithuanian DH sector amounted to 850 GWh. 423 GWh of electricity was produced using fossil fuel bought at subsidised prices although the threshold set by the Government of the Republic of Lithuania was 600 GWh. As a result, heat suppliers suffered losses, because prices for buying subsidised electricity set by the National Commission for Energy Control and Prices were based on the 600 GWh subsidised electricity quota. Supplies of "green" power amounted to 230 GWh and the remaining quantities were sold in the market.

Due to unclear DH reliability standards and out-of-date reservation procedure, DH systems continue to have excess capacity. The total installed heat production capacity is above 10,000 MW, as compared to the maximum capacity of 2,997 MW needed in the DH systems in 2015. It should be noted that the summer minimum amounts to 364 MW (basically constituting heat transfer loss). Extremely uneven and unpredictable demands for heat in the DH systems make it difficult to implement the principles of sustainable competition in heat production. Although there are quite many competing heat producers in large cities, the competition is not effective during the coldest months when price levels mainly depend on the installations controlled by the heat suppliers themselves.

The increasing usage of solid fuels in heat production raises environmental concerns that are getting more and more relevant. DH sector's statistics shows that carbon monoxide is the most common pollutant

originating from smoke emissions. This pollutant is not even regulated by new Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants setting emission limit values for combustion plants with a total rated thermal input equal to or greater than 1 MW and less than 50 MW. In the context of implementing this directive, it might be necessary to install additional smoke cleaning systems in some boiler facilities to reduce emissions of particulate matters and nitrogen oxides. The composition of emissions of pollutants into the air in the Lithuanian DH sector is shown below in Figure 8.



The growing use of bio-fuels increases ash quantities from bio-fuel. In 2015, bio-fuel ashes in DH entities amounted to 16.5 thousand tonnes.

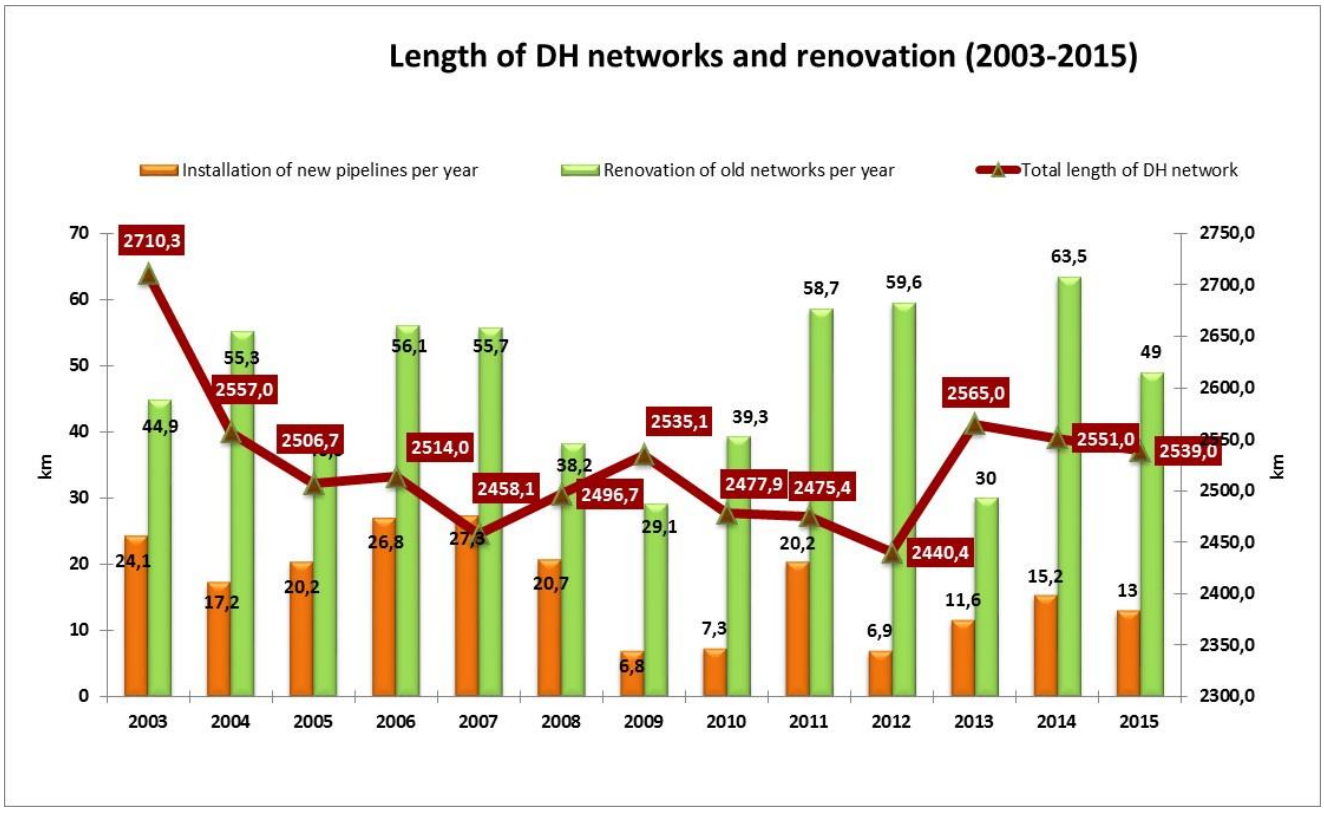
Large boiler and power plants operating within the DH systems can ensure high-quality combustion of solid fuels and disperse smoke high in the air in accordance with the strictest environmental requirements. Operation of such plants is regularly monitored by sophisticated devices and controlled by various institutions. National and international studies have demonstrated that smoke emissions from the combustion of firewood in small, primitive boilers (the majority of which are in rural areas) contain hundreds of times higher quantities of carcinogenic and other environmental and human health hazards compared to the burning of the same fuel in large boilers to produce the same quantity of heat.

Last year, Lithuanian society paid great attention to air pollution caused by heating with firewood in densely populated urban quarters

Following the Nordic example, DH technology is the best urban heating alternative which ensures not only comfort, but also clean air in residential areas. It is obvious that DH systems, although accessible in all Lithuanian cities and towns, remain underestimated and underused in Lithuania.

Heat transfer

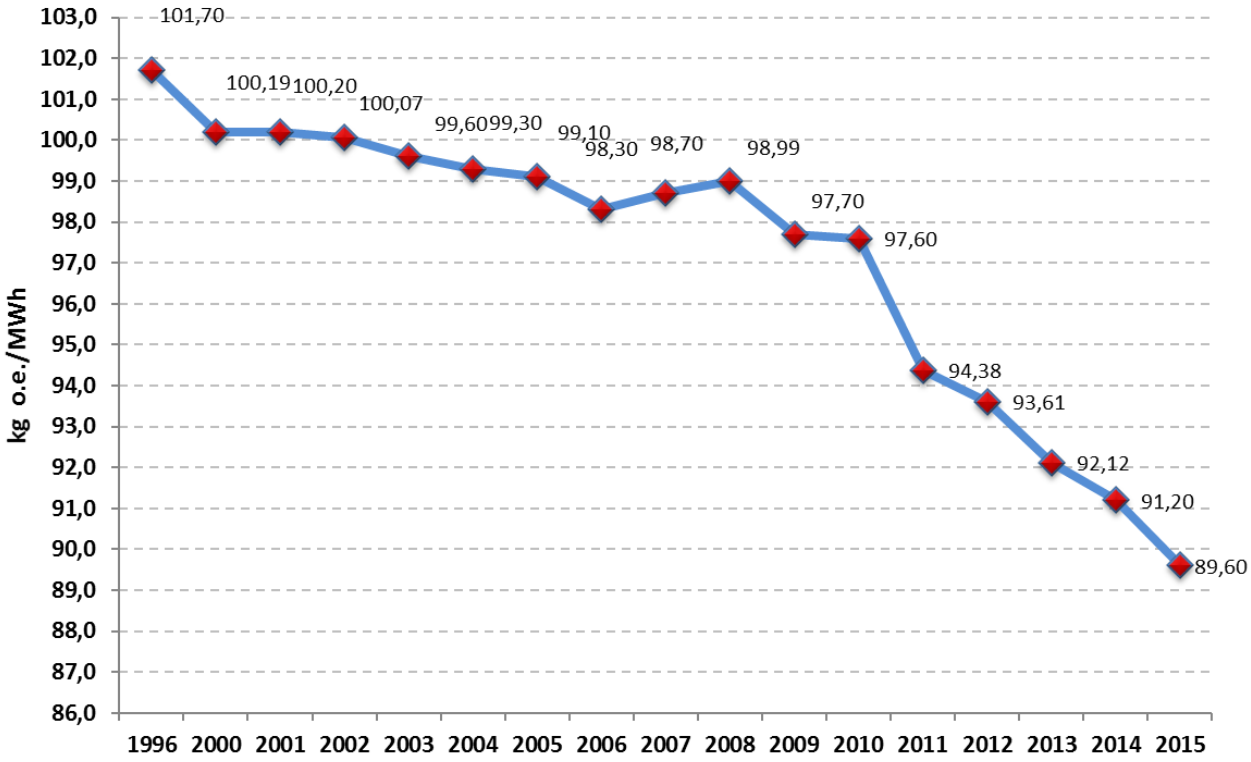
In Lithuania, the total length of DH pipelines is approx. 2775 km, including sections that are not controlled by heat suppliers. In 2015, 49.2 km of pipes were replaced and 12.8 km of new pipes were installed mainly to connect new consumers or optimise the configuration of the networks. The length of pipelines operated by heat suppliers, the replaced and added pipe sections are shown in the diagram below (Fig. 11).



Note: A period until 2012 covers the analysis of the data provided by LDHA members only; the years 2013, 2014 and 2015 include other heat suppliers, too (Visaginas, Skuodas, Kretinga, Nemėžis). Therefore, the total length of heat networks increased in 2013 - 2015.

The worst sections of the DH networks have been basically replaced; the number of consumers is more or less stable, as is the length of the pipelines over the last decade. From the economic point of view, the replacement of pipelines is slowing paying back (especially when the value of heat loss went down after a reduction in prices for heat). Therefore, efforts are taken to use more EU funds for this purpose. Allocations for the modernisation and development of heat supply networks during the programming period 2014–2020 should amount to EUR 69.5 million. Unfortunately, these funds were not yet available in 2015. On the other hand, in the conditions when profits from heat supply depend, according to the current regulation, on the value of the assets used, profit-seeking entities are not motivated to use EU aid, because the value of their assets (which is the basis for calculating normative profit) is reduced with the amount of subsidy. This is an obvious controversy of the regulatory systems. The criteria of normative profit should naturally promote efficient investments, improve the reliability of DH systems, enhance their development, and minimise total heat supply cost.

The technical efficiency of heat transfer systems can be characterised by several indicators. The key one is heat transfer loss. In 2015, a total of about 1.32 TWh of heat was lost in the pipelines. This accounts for 16.1% of heat supplied to the DH networks. It should be noted that this indicator amounted to 1.41 TWh in 2014. Accordingly, a reduction of ~6% (from 1.41 TWh to 1.32 TWh) in relative heat transfer loss characterise, to a certain degree, the progress made in the heat transfer sector over a year. Achievements are even more impressive in the area of sealing DH systems. In 2015, a total of 815,990 m^3 of water was used to refill the pipelines as compared to 1,008,000 m^3 in 2014. It means a 19% saving in water for refilling. Power consumption for the circulation of hot water also decreased in the DH sector from 31,629 MWh in 2014 to 29,571 MWh in 2015.



Comparative fuel consumption of DH sector (1996-2015)

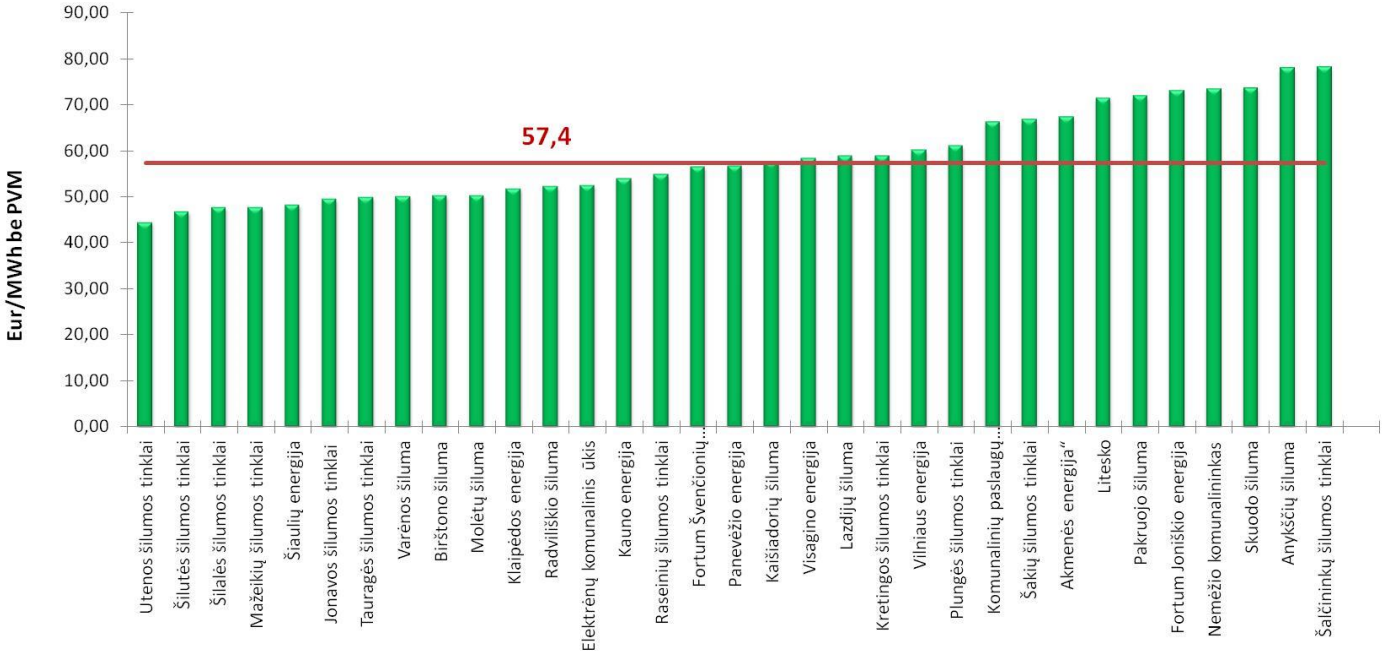
About 312 km of pipelines used for heat transfer are owned by other entities or have no owner at all. The total length of pipelines used in the Lithuanian DH sector would be 8,330 km if natural pipelines were recalculated as single pipes with a diameter of 100 mm.

Unfortunately, no efforts of heat suppliers can prevent the DH pipelines from ageing, metal corrosion and fatigue that lead to lower performance. As requirements for the quality and reliability of the DH networks are set and monitored by the public authorities, it is a high time for them to pay attention to this problem. In the situation of the changed pipeline configuration, boiler facilities built in inadequate locations by new independent heat producers, imbalanced hydraulic and temperature regimes, competition in the area of heat production and poor technical supervision, many DH systems would not be able to ensure reserve heat supply where necessary.

Heat prices and the economy of the DH sector

Regulated revenues of the DH sector dropped down from EUR 576 million in 2012 to EUR 395 million in 2015 mainly as a result of the replacement of expensive natural gas with cheaper local bio-fuel and improved performance efficiency. It means that consumers of district heating annually paid for heat energy by about EUR 181 million less during that period (31% difference vs. 8.5% reduction in heat sales). In comparison with 2014 when annual quantities of sold heat were similar, heating bills were cut by EUR 114 million or 14% in 2015. It means, this amount of money ended up in consumers' pockets and can be used for other needs. Funds saved from not paying for imported gas undoubtedly increase domestic consumption, contribute to the budget and economic growth in Lithuania.

In 2015, the average price for heat in the Lithuanian DH sector was 5.75 ct/kWh (excl. VAT) and is similar to price levels in the neighbouring countries.

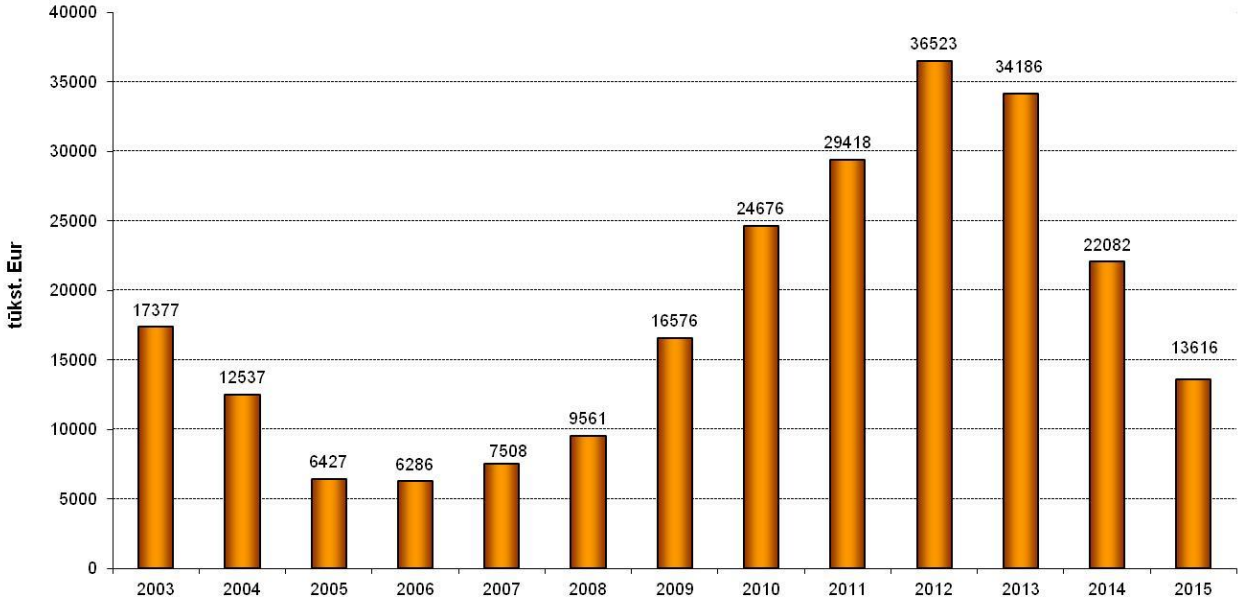


Average heat prices applied by individual DH entities in payments for heat sold in 2015

The heat price is probably most influenced by fuel used for district heating. Entities using bio-fuels to produce heat on a large scale offer lower heat prices compared to those predominantly using fossil fuels. One of the explanations to this is State's priority to promoting lower-capacity bio-fuel boilers and no allocations of EU funds in the 2007-2013 programming period for converting large-capacity fossil-fuel boilers into boilers based on bio-fuels.

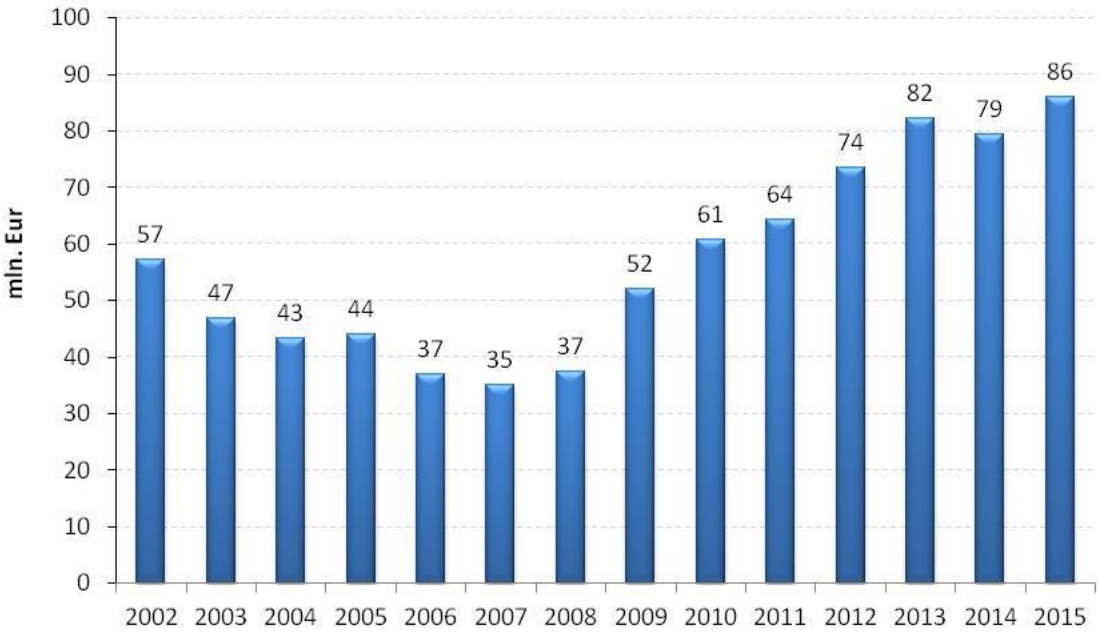
Prices among various DH entities differ by up to 2 times, while heat consumption per area unit differs by up to 8–10 times in different buildings. This is obviously indicative of the major constituent in heating bills. However, there is no entity/body that would be really responsible and accountable for heat consumption in apartment buildings; national control system does not exist either.

Cheaper heat and lower heat consumption determine lower heating and hot-water costs, thereby saving state compensations to socially disadvantaged groups. Benefits of this type have recently decreased even by 2.5 times. Probably, this has to do not only with decreasing heating costs, but also with better control of benefit applicants by municipal authorities which were commissioned with the distribution of funds for heating compensations.



Compensation for heating and hot water for low-income families 2003 – 2015

Despite a significant decrease in prices for district heating, consumers are nonetheless late with payments for heating and hot water. In 2015, domestic consumers and budgetary agencies accounted for the majority of indebted heat consumers (51% and 37%, respectively). Business representatives seem to be the most disciplined in paying for supplied heat – they accounted for only 12% of indebted consumers.

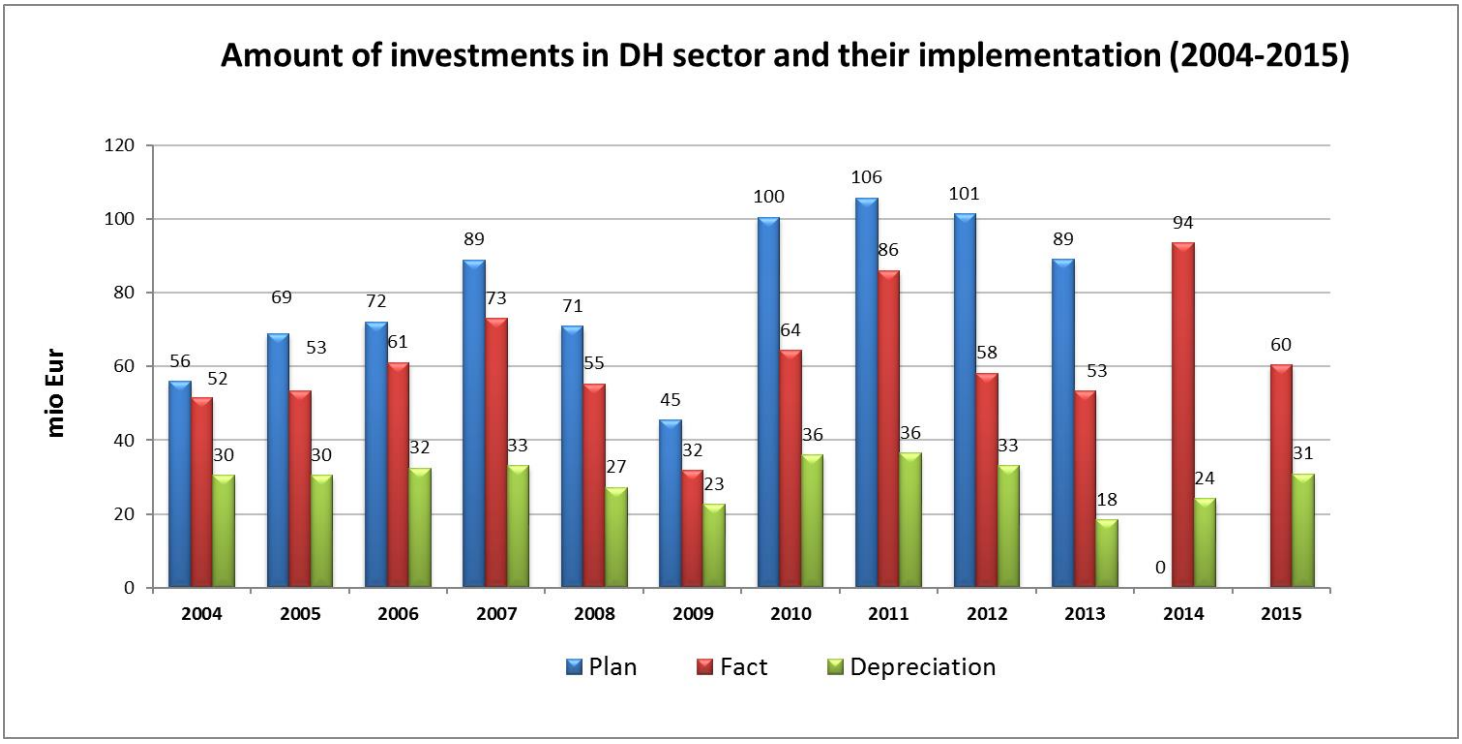


Pastaba: iki 2012 m. buvo vertinami tik LŠTA narių duomenys, nuo 2013 m. įvertintos ir kitos ŠT įmonės (Visagino, Skuodo, Kretingos, Nemėžio).

The dynamics of indebted consumers 2002-2015

In 2015, great passions continued about Gazprom's reimbursement of overpayments for natural gas bought in Lithuania in 2013–2014. The Government set such a procedure for reimbursing the overpayments that only consumers continuing to use gas received the reimbursement. Accordingly, consumers who overpaid for gas earlier and reduced gas consumption or replaced gas with bio-fuel thereafter are not reimbursed proportionally. This problem has been raised and discussed in various institutions, but it remains unresolved. Some heat suppliers and their consumers simply feel cheated. In addition, this procedure of "reimbursing" the overpayments distorted the natural gas market. In 2015, it became obvious that the natural gas market is concentrated in UAB Lietuvos Energija.

It should be noted in this context that there is a high need for investments in the DH sector. Replacement of ageing pipelines or a new bio-fuel boiler, measures to ensure reliability are not dramatically cutting heat prices, but such projects are vital. Heat suppliers invest much more than account as depreciation costs. Therefore, heat suppliers accumulate all available resources to fund necessary projects. The proposed legal separation of heat production from heat transfer may put individual pipeline operators in a situation where they simply will not be capable of ensuring the reliable heat transmission process.



The Lithuanian DH sector is regulated in detail by the State. Therefore, the sector's performance is highly dependent on regulatory and pricing principles, as well as on state-aid instruments. The National Commission for Energy Control and Prices has paid great attention to the detailed specification and regulation of costs accounting, but there is little progress made in boosting activity of heat suppliers and their economic motivation to implement new technologies, improve reliability, develop the market and/or offer new services. The current regulation, which is based on "non-permitting", "banning", "deprivation" and other similar principles that are not adequate any longer in the economic circumstances existing in the

heat sector, requires a radical revision. All what energy regulator has to do is to guide sector's efforts in the right direction instead of replacing shareholders or administrations.

Lithuanian DH sector-specific issues in 2015

Last year, discussions were further continued on the effectiveness of competition in heat production. Although competing producers installed quite many boilers based on bio-fuels, price levels in winter months mainly depend on the installations controlled by heat suppliers themselves. Efforts are taken to strike the optimal balance between competition and regulation in the area of heat production.

The reduction in heat prices could have been even more tangible had the compulsory purchase of expensive natural gas from the liquefied gas terminal not been introduced in 2015. Due to variations in the procedure and pricing of natural gas purchases, unclear and outdated requirements for the use of reserve fuels, DH entities face difficulties in shaping rational long-term strategies and planning investment. The principles of the National Energy Strategy which are being currently deliberated bring even more confusion for the likelihood of making the development of DH systems irrational, preventing the development of cogeneration and reducing the reliability of heat supply.

In parallel with strategic searching, the Lithuanian DH sector continued tackling persistent problems that definitely do not contribute to improving heat supply and making this sector more attractive for consumers. In this regard, we can mention the following problems:

1. Uncertainties about the ownership, maintenance, modernisation of heat substations and non-reimbursed return of investments (~EUR 100 million).
2. Supervision (maintenance) of internal heating and hot-water systems in apartment buildings, responsibility and shaping motivation for saving energy.
3. Uncertainties in application of Energy Efficiency Directive 2012/27/EU with regard to multi-apartment buildings.
4. The lack of legal regulation and consistency in the implementation of modern heat and hot-water meters and regulation devices in multi-apartment buildings ensuring the consumers' right to receive the desired quantity of heat energy and accurate heating bills.
5. The unresolved controversy with heat suppliers who are obliged to supply heat and issue heating bills to apartments without having access to the domestic systems and installation, as well as possibilities to ensure high-quality heat supply.
6. Taking into account the expansion of mixed heat supply methods, it is necessary to introduce two-component pricing.
7. Unregulated relationships between heat suppliers and water suppliers in the area of supplying hot water to consumers.
8. Unclear (non)operation of CHP plants within DH systems in the future.

9. Reimbursement of overpayment for natural gas to consumers (max. ~4 million euro reimbursed out of 34 million euro).
10. Setting solid fuel composition and quality standards; prevention of pollution caused by individual heating.
11. DH entities were put under a binding obligation to buy all fuels from the energy exchange without creating a system of reliable bio-fuel supplies (reservation of bio-fuels is not ensured in case of any disruption of supply of bio-fuels from the energy exchange).
12. Optimisation of excess capacities of heat supply entities taking into account the changed structure of fuels and new heat producers.
13. Providing leeway and shaping motivation to connect old and new consumers to DH systems.
14. Preparedness to implement new environmental directives in the Lithuanian DH sector.

The aforementioned and other issues specific to the Lithuanian DH sector are always on the agenda of LDHA activities, including relevant studies, analysis of international experiences, various discussions. Unfortunately, various political or business interests, often superficial and short-sighted approach to the heating sector which is the most important one for Lithuanian people impede the development of the sustainable and consumer-attractive heat supply system. District heating should be integrated to a maximum extent into the complex energy infrastructure of modern cities and towns, and perform various functions needed in a society, as set out in the recent framework strategy for heating and cooling published by the European Commission. Taking into account DH sector developments in the advanced neighbouring countries, Lithuanian heat suppliers should proceed to the next stage of development: to implement flexible integrated power plants facilitating accumulation of excess and cheap heat flows, to move towards low-temperature heating systems, to modernise heat substations so that they not only deliver heating but cooling as well, to exchange energy with consumers, to implement smart grids and devices, to develop cogeneration and trigeneration facilities.