

# **The shift from the usage of natural gas to renewable biofuel – a true revolution in district heating sector**

**AB Kauno Energija**  
Kaunas, Lithuania

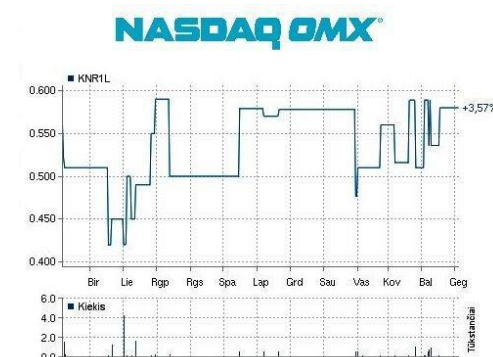
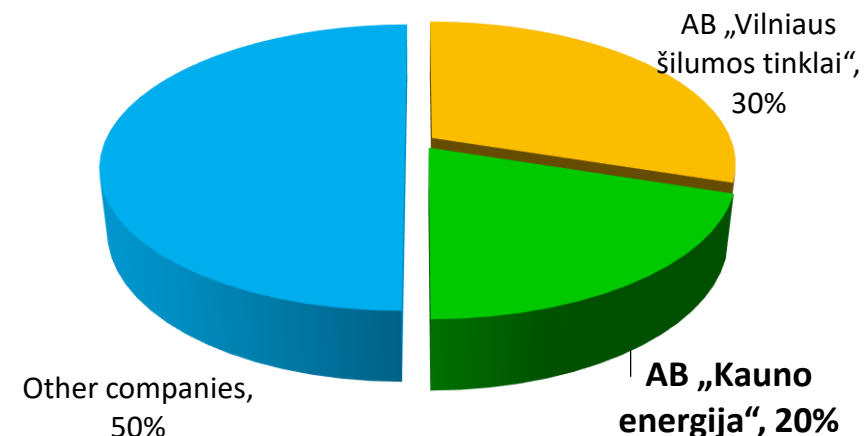
**Reykjavik, 2019**

# AB Kauno Energija Overview

**The second largest** (by number of customers, amount of heat supplied and by turnover) heat production and supplies company in Lithuania. The Company shares approx. 20% of Lithuanian heat supplies market.

**The only district heating company in Lithuania** listed in „Nasdaq Vilnius“ stock exchange.

Lithuanian heat supplies market



# AB Kauno Energija Overview

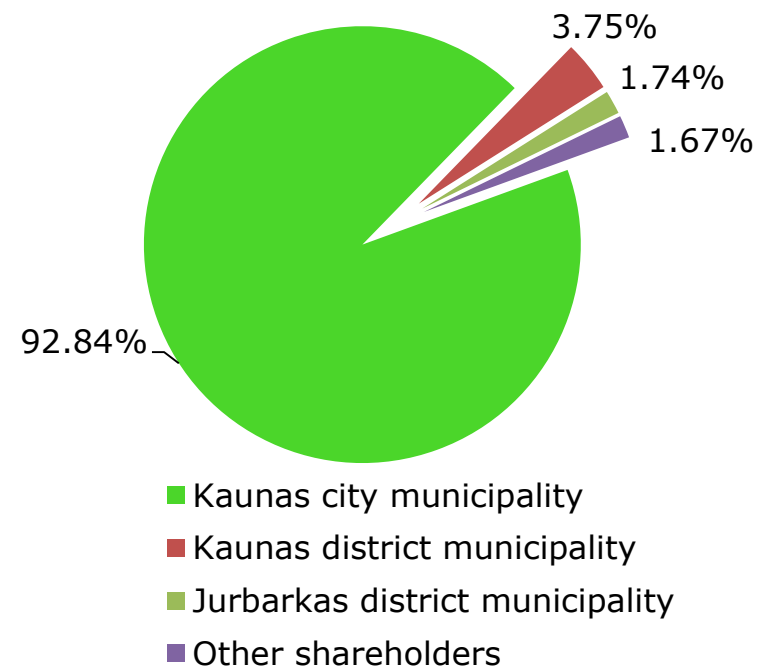
## Ownership structure

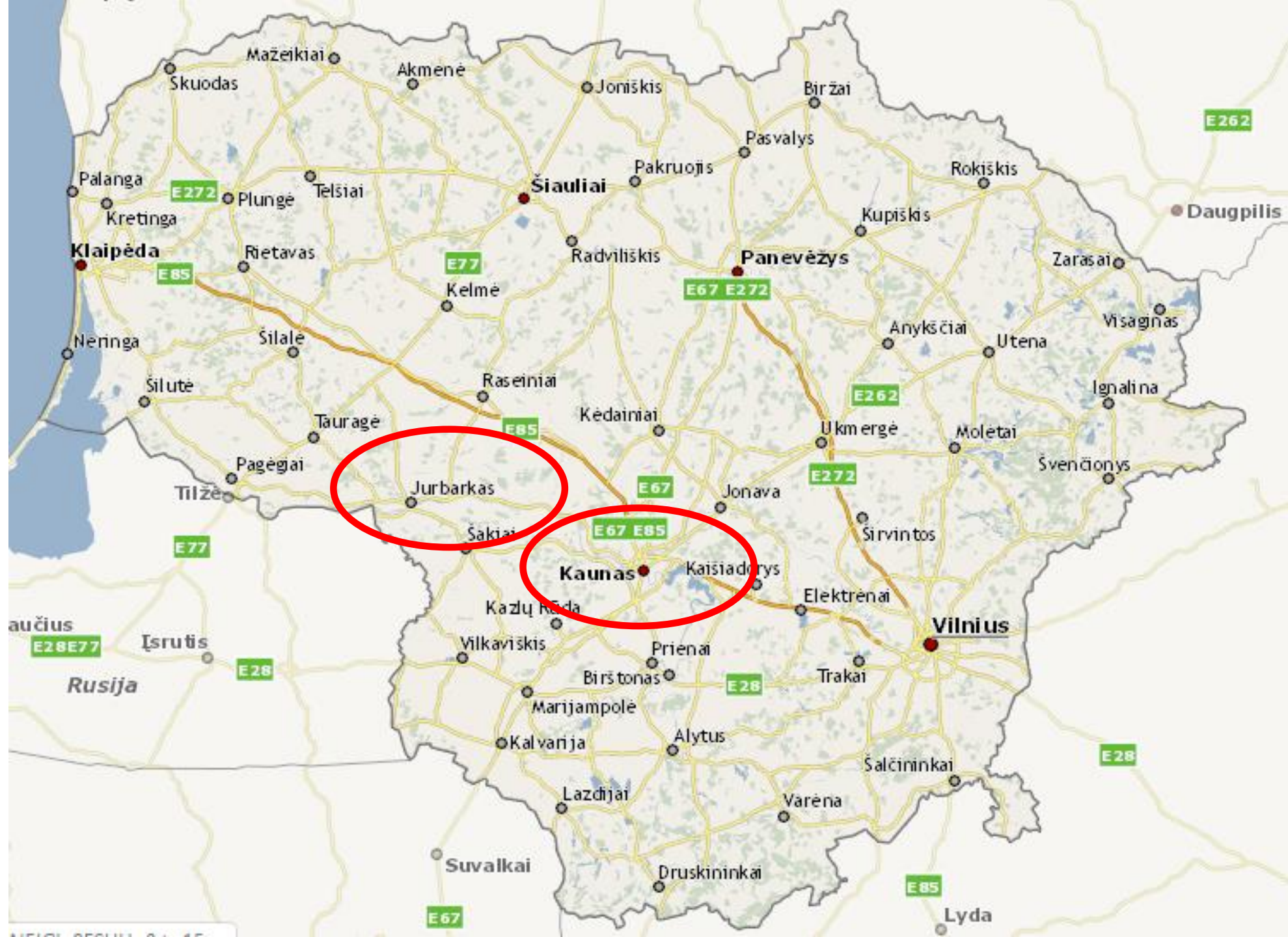
The biggest shareholders of the Company as at 31 December 2018 were as follows:

- Kaunas city municipality - 92,84 % share in the authorised capital;
- Kaunas district municipality - 3,75 % share in the authorised capital;
- Jurbarkas district municipality - 1,74 % share in the authorised capital;
- Other shareholders – 1,67 % share in the authorised capital.

Number of employees as at 31 May 2019 was 422.

**Structure of shareholders as at  
31 December 2018**







**More than 452,6 km of up to 900 mm diameter DH pipelines.**

Company's generation capacities consist of:

- Petrašiūnai power plant (capacity – 314,6 MW),
- 4 boiler-houses in Kaunas integrated network (total capacity – 185 MW),
- 1 boiler-house in Jurbarkas city (capacity – 34,8 MW),
- 7 district boiler-houses in Kaunas district,
- 13 boiler-houses of isolated networks,
- 28 local gas burning boiler-houses (27 burned with gas and 1 with wooden pellets) in Kaunas city,
- 8 local water heating boiler-houses in Sargėnai neighbourhood.

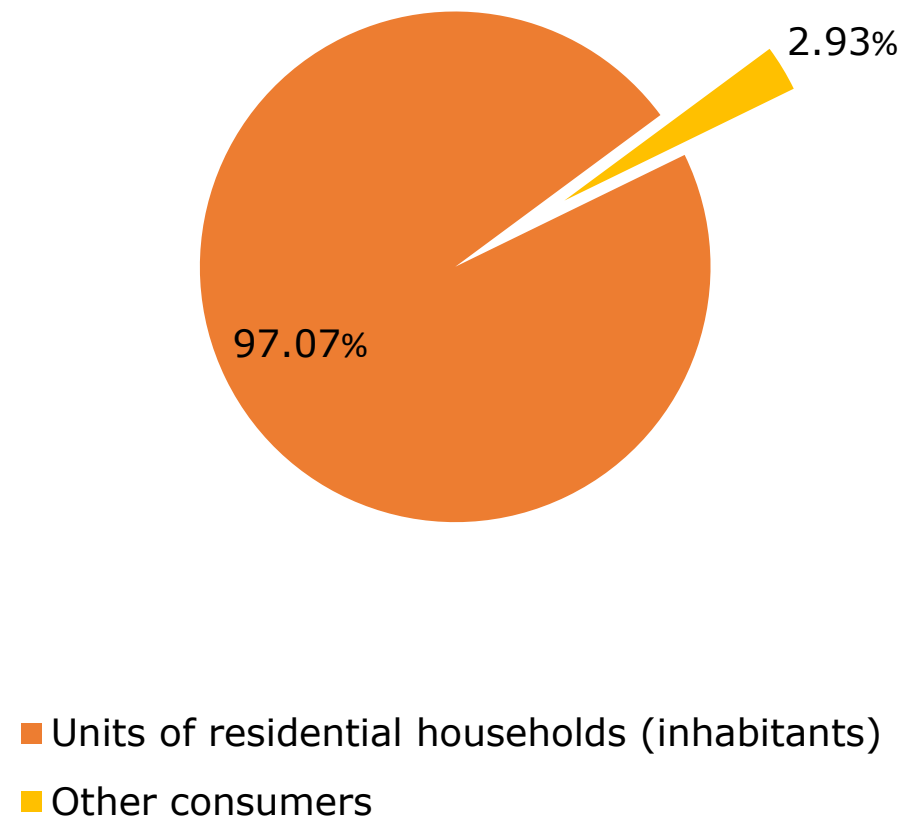
**Total installed heat generation capacity consist of 607 MW (including 41 MW capacities of flue gas condensers).**



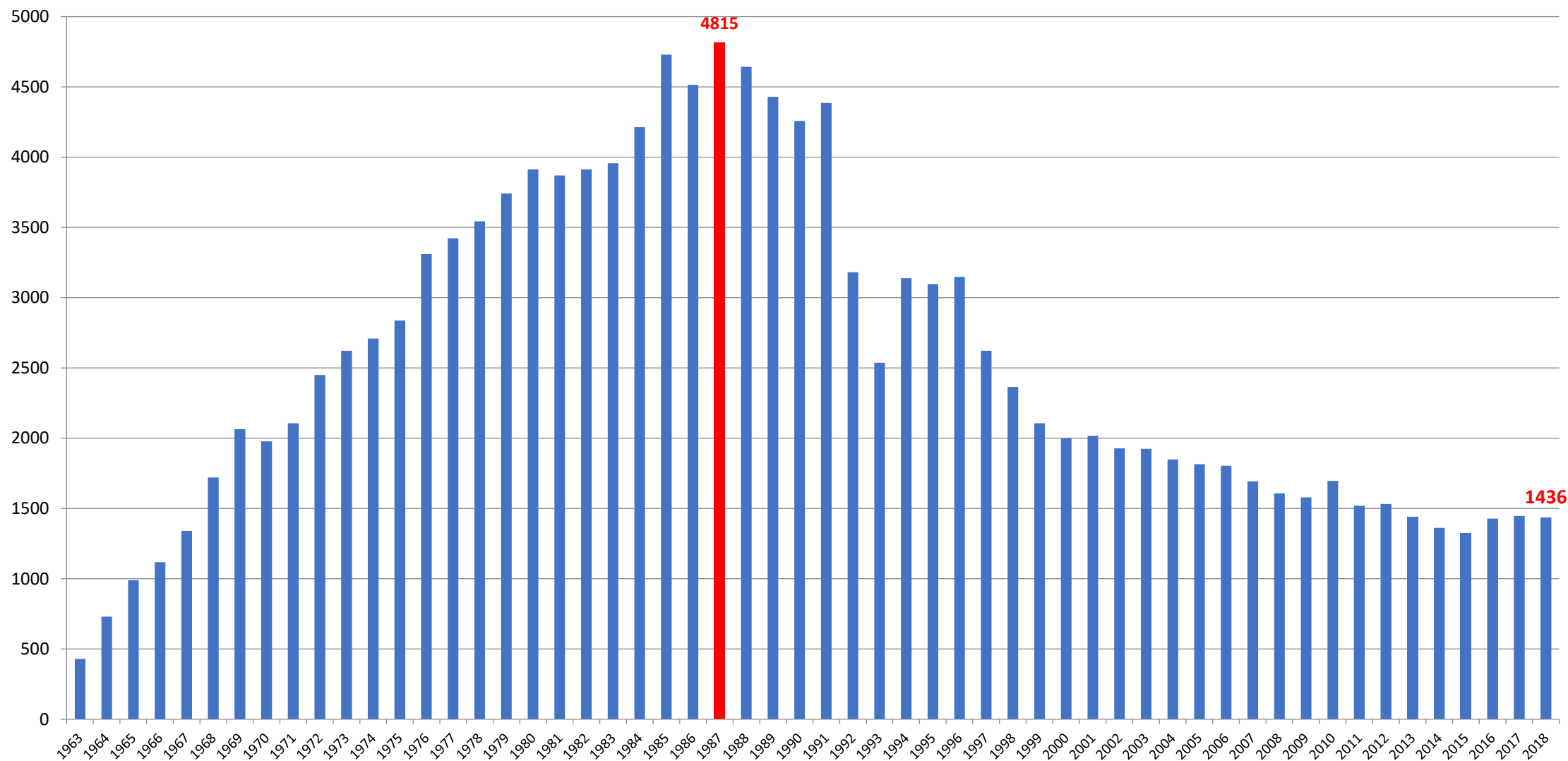
The Company generates and supplies heat to consumers in the cities of Kaunas, Jurbarkas and in Kaunas district.

As at 31 May 2019, the Company supplied heat to 3,529 businesses and organizations as well as to 116,055 households, in total – to 119,584 consumers (objects by addresses).

### Repartition of Company's heat consumers by groups



# DH sales of Kaunas DH company, GWh



# Up to 2012...

In 2003 the main heat and electricity production facility of AB Kauno Energija – Kaunas CHP was sold to Russian gas company Gazprom, so from that time up to 2012 AB Kauno Energija was likely a heat distribution company.

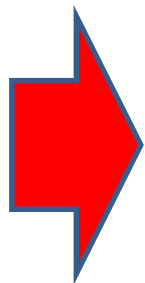
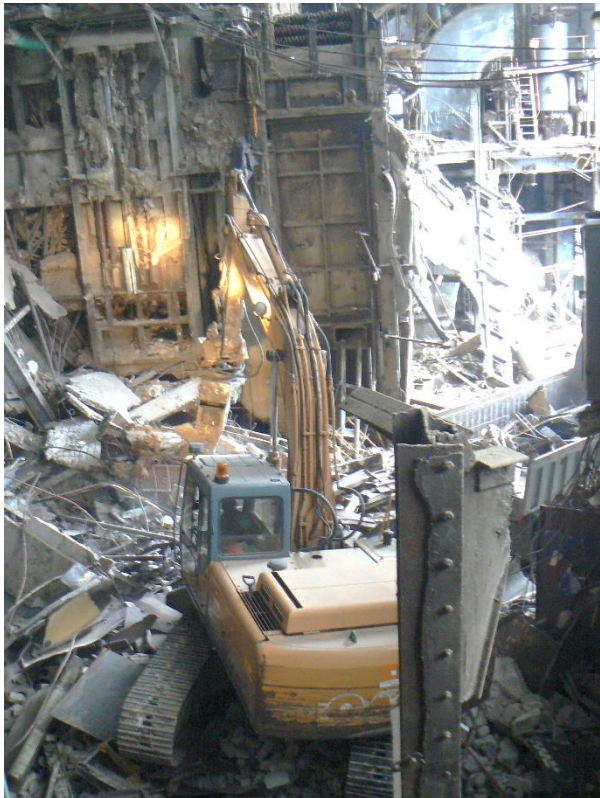


**Up to 2012 mostly natural gas was used for heat and electricity production in Kaunas, Kaunas district and Jurbarkas city. Emissions of CO<sub>2</sub> were 29055 tones in 2012. The heat price for customers due to the price for natural gas reached its peak – 9,1 ct/kWh without VAT in 2012. The costs for heat and hot water for households exceeded 20% of average salary.**



# Major investments during last five years

## **Petrašiūnai power plant**



**Installation of 2 biofuel-based boilers with total capacity of 30 MW (incl. 6 MW flue gas condenser) instead of old steam boiler BKZ-75, construction of biofuel storage in Petrašiūnai CHP plant. Investment – 6,218 million Euros, incl. 1,74 million Euros of EU support.**



# Major investments during last five years

## **Inkaras boiler house**



**Installation of 2  
biofuel combustion  
boilers with total  
capacity of 20 MW  
(incl. 4 MW flue gas  
condenser) in  
Inkaras boiler-  
house and  
reconstruction of  
the building.**

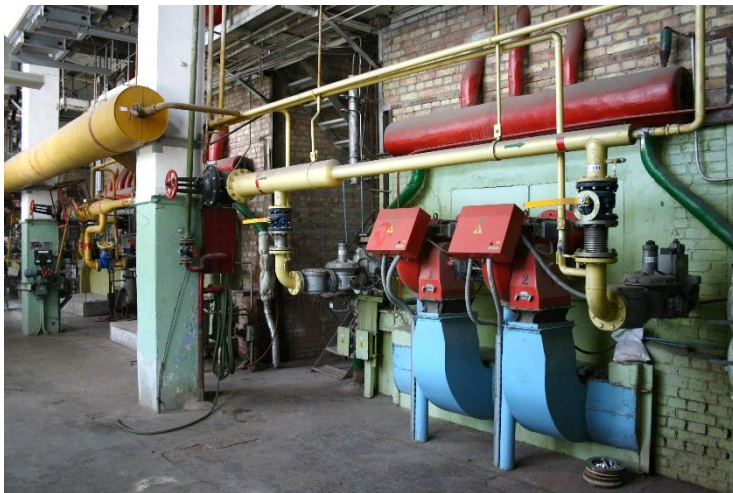
**Investment – 5,792  
million Euros, incl.  
1,74 million Euros  
of EU support.**





# Major investments during last five years

## Šilkas boiler house



Installation of 2 biofuel burned boilers with total capacity of 21 MW (incl. 4 MW of flue gas condenser) in Šilkas boiler-house and reconstruction of the building. Investment – 3,006 million Euros, incl. 1,31 million Euros of EU and Lithuanian Environmental Investments Fund support.





# Major investments during last five years

## Jurbarkas boiler house



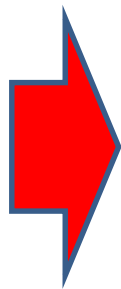
Installation of 1  
biofuel burned  
boiler with total  
capacity of 5 MW  
in Jurbarkas  
boiler-house and  
reconstruction  
of the building.  
Investment –  
1,0 million  
Euros.





# Major investments during last five years

## **Noreikiškės boiler house**



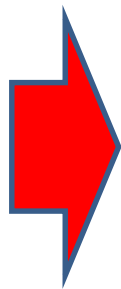
Installation of 1 biofuel burned boiler with total capacity of 5 MW (incl. 1 MW of flue gas condenser) in Noreikiškės boiler-house and reconstruction of the building. Investment – 1,8 million Euros, incl. 0,67 million Euros of Lithuanian Environmental Investments Fund support.





# Major investments during last five years

## **Ežerėlis boiler house**



Installation of 1 biofuel burned boiler with total capacity of 4,3 MW (incl. 0,8 MW of flue gas condenser) in Ežerėlis boiler-house and reconstruction of the building. Investment – 1,32 million Euros, incl. 0,52 million Euros of Lithuanian Environmental Investments Fund support.



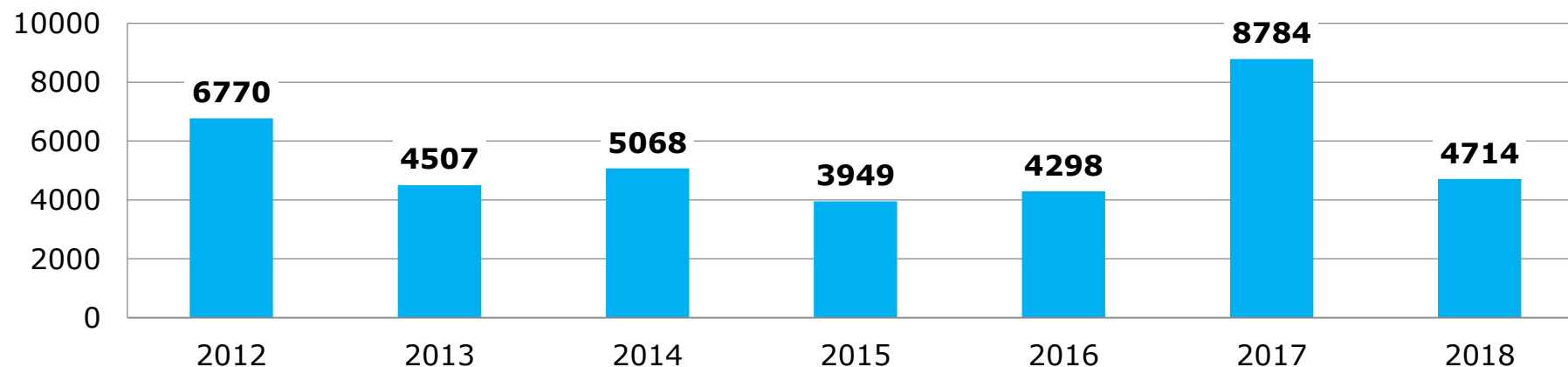
# Major investments during last five years

## Reconstruction of DH networks

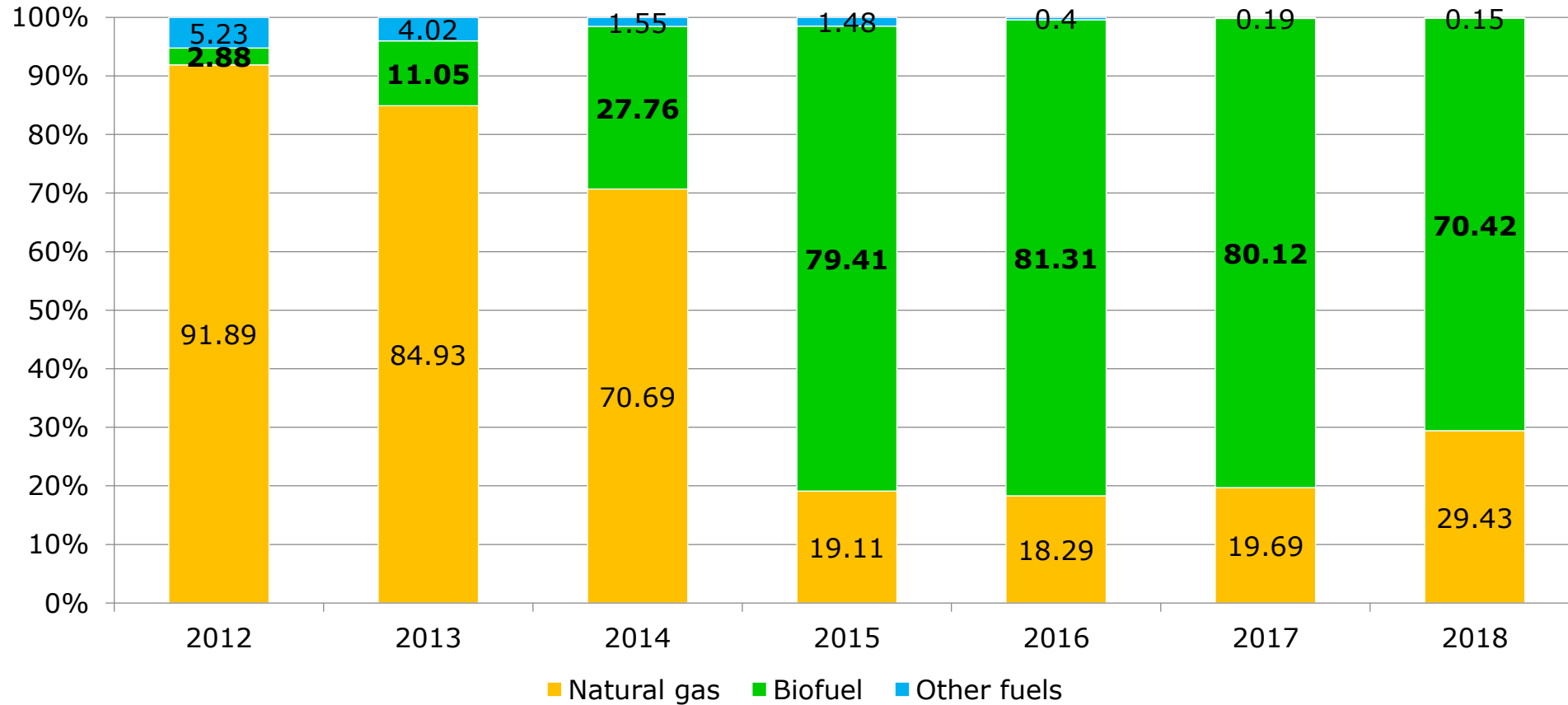


The Company implemented **16 trunk pipeline building and reconstruction projects** in 2012 - 2018 with the total value of more than **14,4 million Euros**, including 7,2 million Euros of EU support.

**Total length of reconstructed and installed trunk pipelines, m**

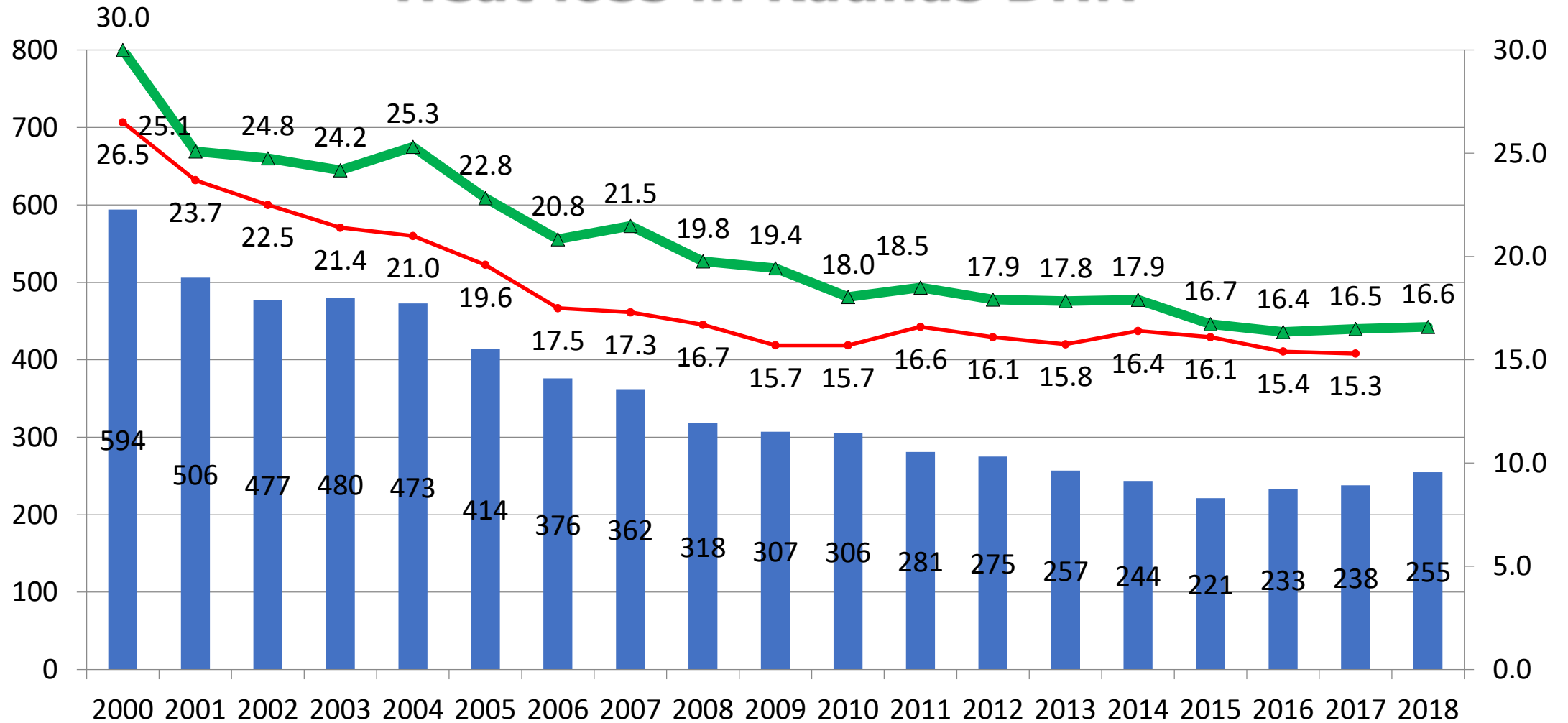


# Fuel balance for heat production in AB Kauno Energija, %



**Usage of natural gas became less than 30%**

# Heat loss in Kaunas DHN

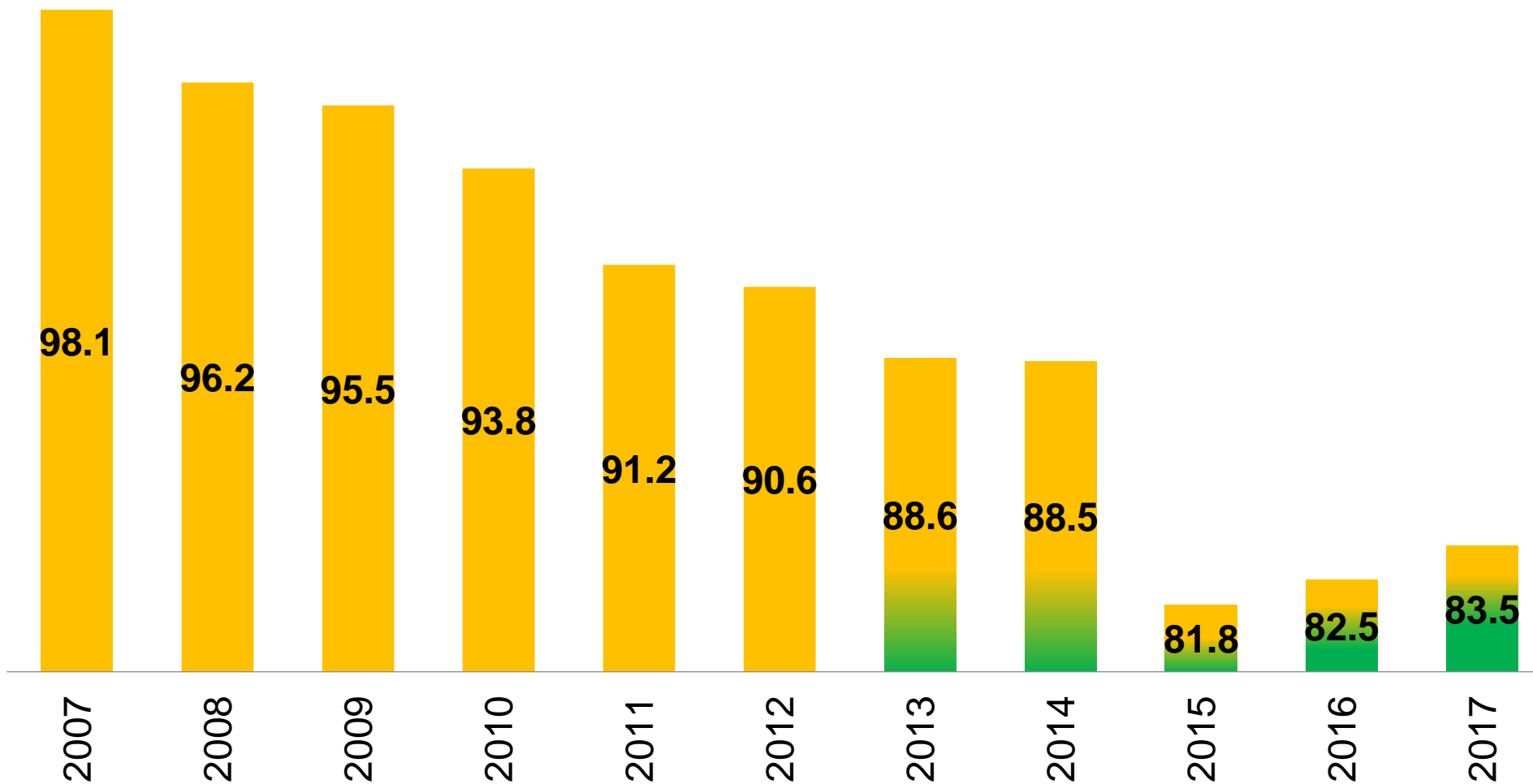


■ Absolut heat loss, thous. MWh

▲ Comparative heat loss, %

● Comparative average heat loss in Lithuania, %

## Fuel usage in AB Kauno Energija in 2007–2017, kg<sub>oe</sub>/MWh





# The heat is purchased every month from 11 IHP

„If at least one IHP operates in the district heating system, predicted amount of heat, required for the needs of consumers, must be produced and (or) purchased in a way of auction. <...>”

*The Law on Heat Sector of the Republic of Lithuania*

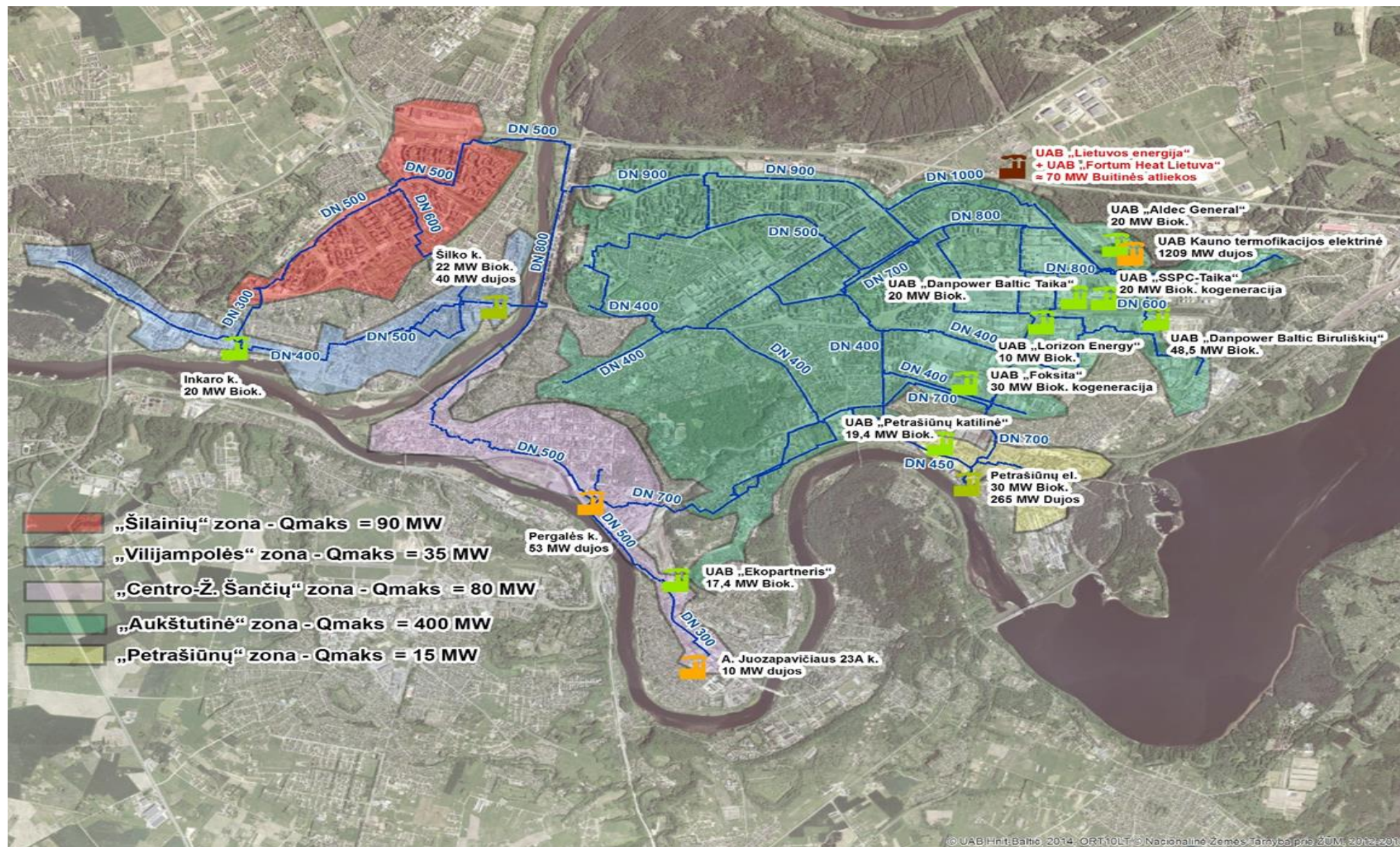


- UAB „Danpower Baltic Taika“ (20 MW, biomass),
- UAB „Danpower Baltic Taika elektrinė“ (CHP, 20 MW<sub>h</sub> + 5 MW<sub>e</sub>, biomass),
- UAB „Danpower Baltic Biruliškių“ (48,5 MW, biomass),
- UAB „Lorizon energy“ (10 MW, biomass),
- UAB „Petrašiūnų katilinė“ (19,2 MW, biomass),
- UAB „Aldec General“ (20 MW, biomass),
- UAB „ENG“ (6,5 MW, biomass),
- UAB „Ekopartneris“ (17,5 MW biomass),
- UAB „Foksita“ (CHP, 30 MWh + 5 MWe, biomass).
- UAB „Ekoresursai“ (2,9 MW, biogas),
- UAB Kauno termofikacijos elektrinė (CHP, 1200 MW<sub>h</sub> + 160 MW<sub>e</sub>, natural gas).

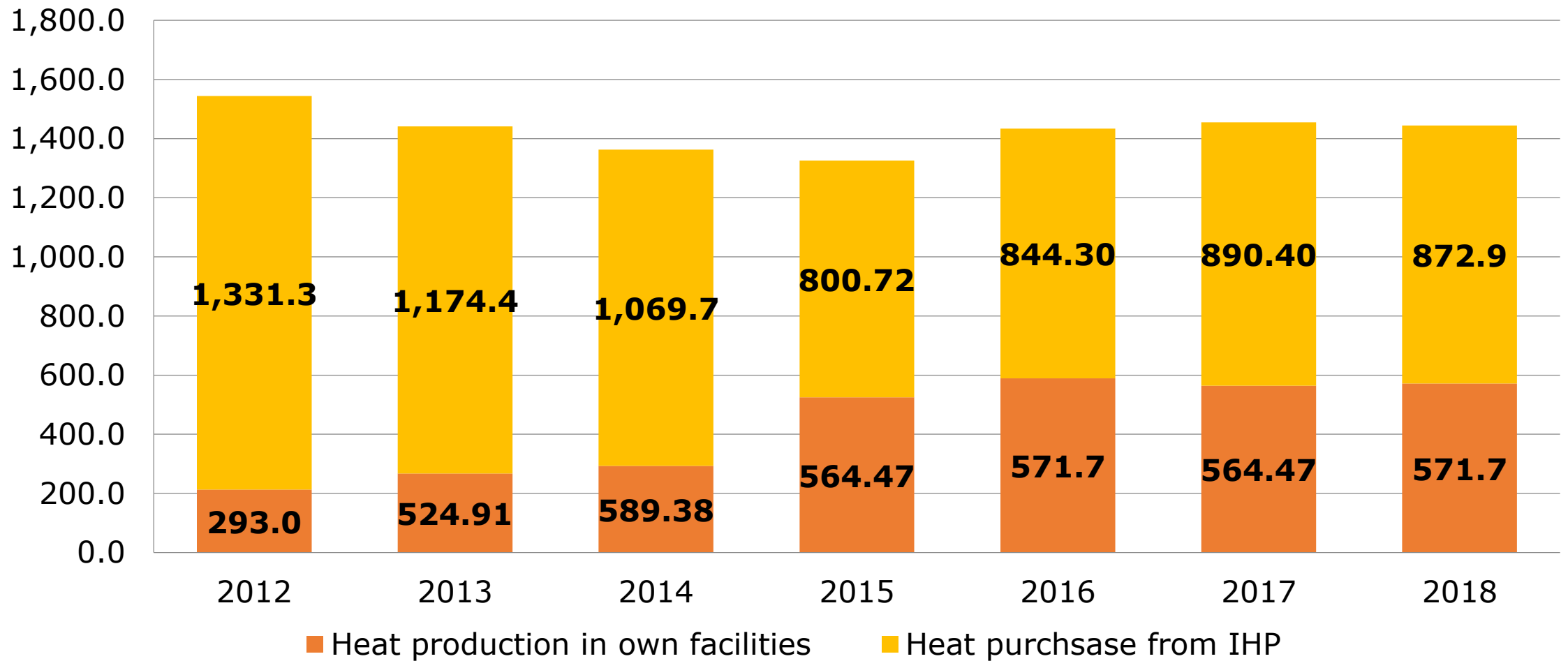




# Locations of AB Kauno Energija and IHP heat production facilities



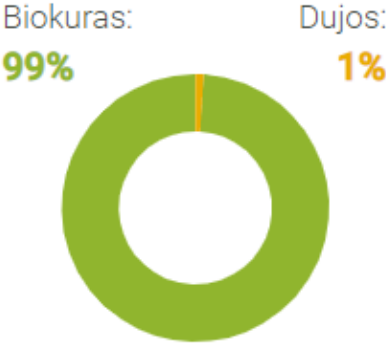
# Heat purchase and production in own facilities in 2012–2018, thousand MWh:



# SUPPLY OF „GREEN“ HEAT

2019-07-17

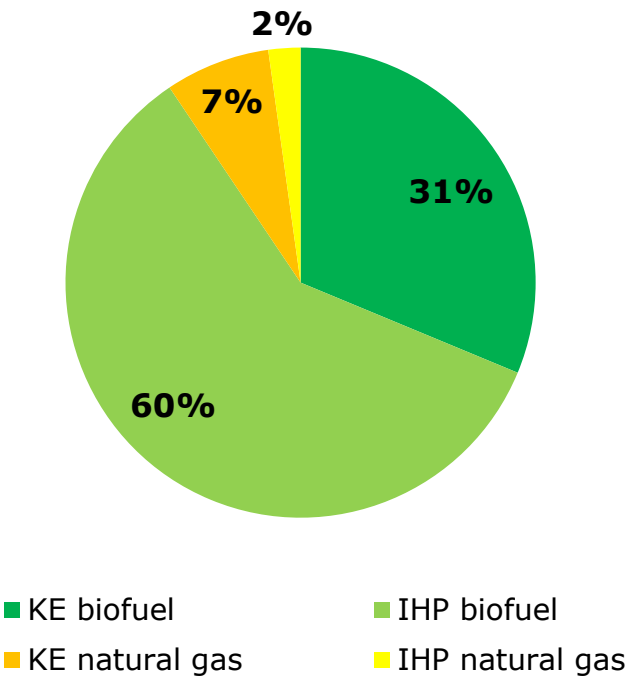
ŠIUO METU KAUNO  
INTEGRUOTAME TINKLE  
ŠILUMAI GAMINTI  
NAUDOJAMAS KURAS



*Real time diagram from  
company's website*

2018

Kaunas integrated  
network

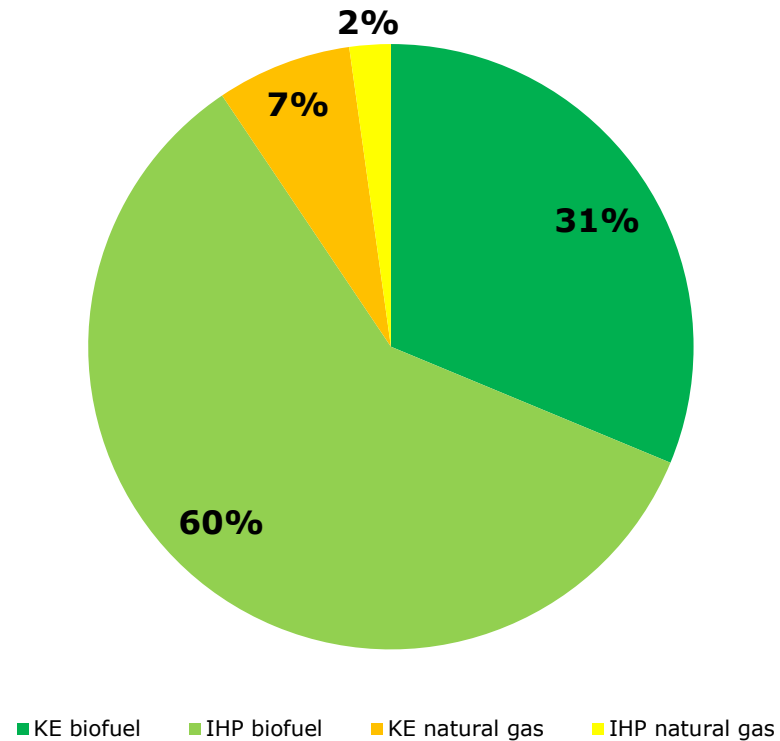


According to the new Technical regulations for construction, that became valid on 1 February 2019, the heat supplied by AB Kauno Energija and some other heat supply companies in Lithuania **is recognized to be largely produced from renewable energy sources and conforms to the new requirements for A++ energy performance class buildings.**

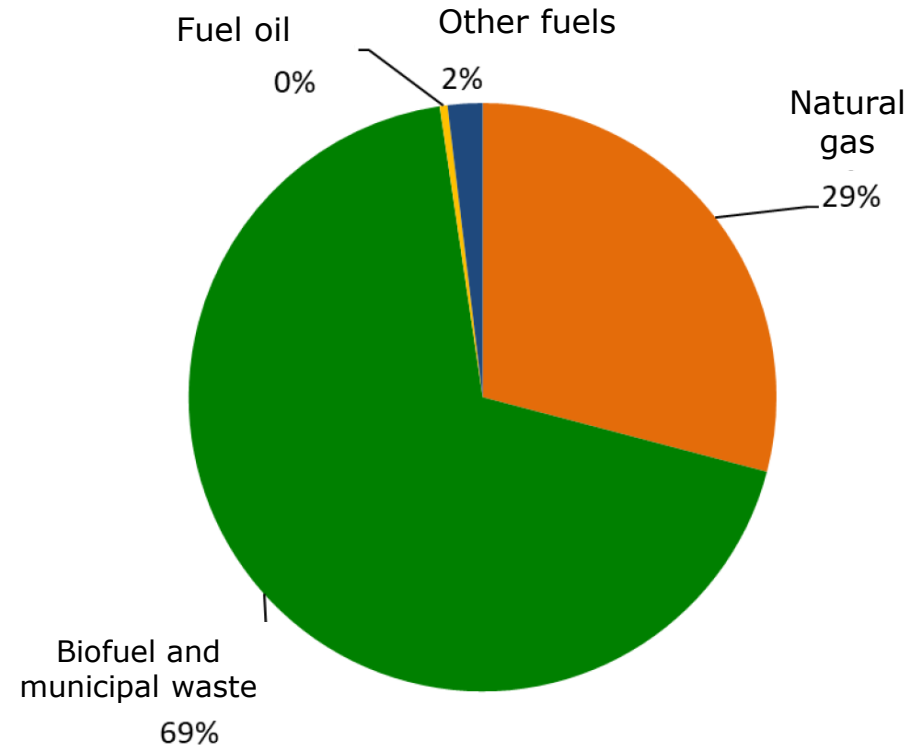


# Amounts of „green“ energy in 2018 in Kaunas and Lithuania

## Kaunas



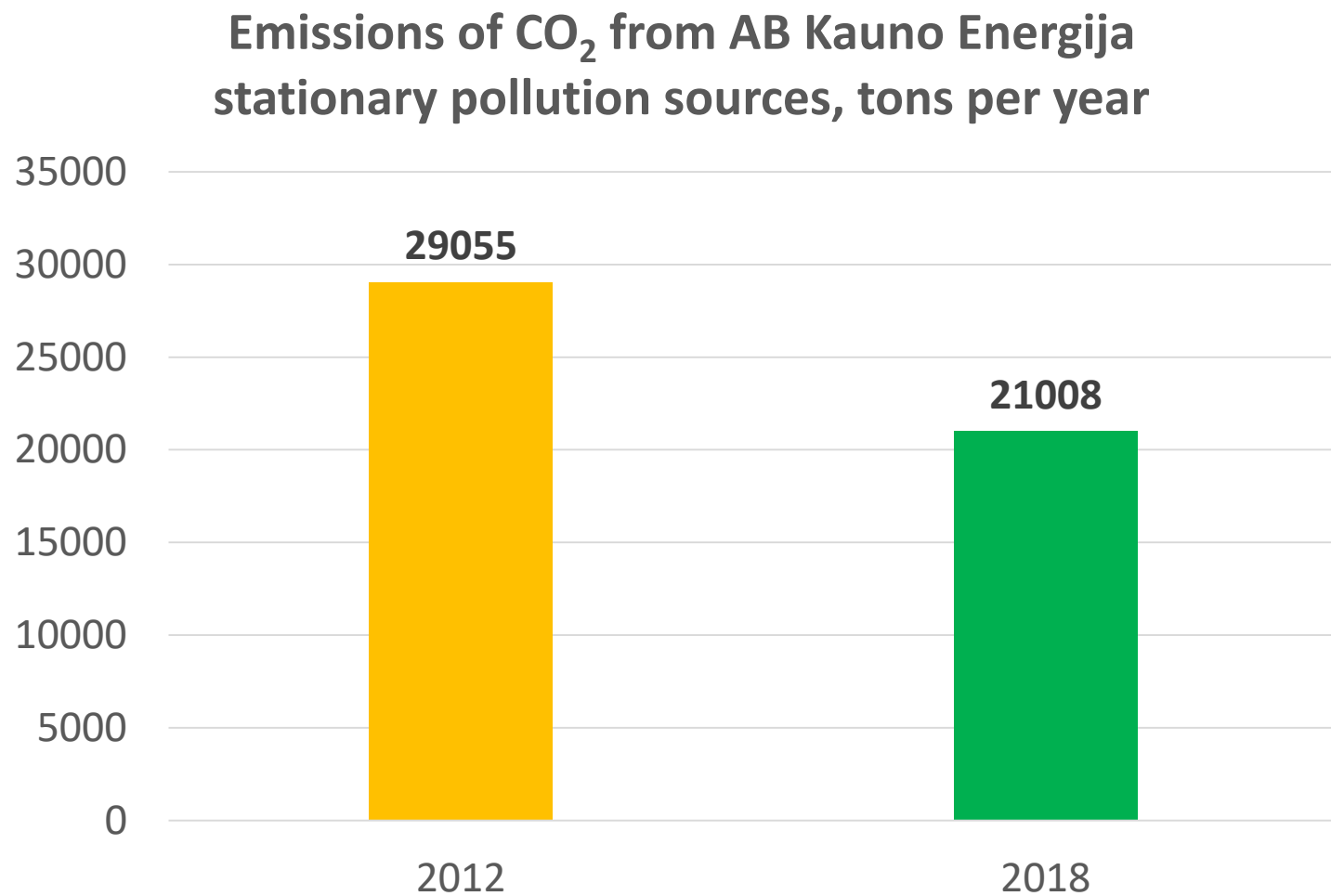
## Lithuania



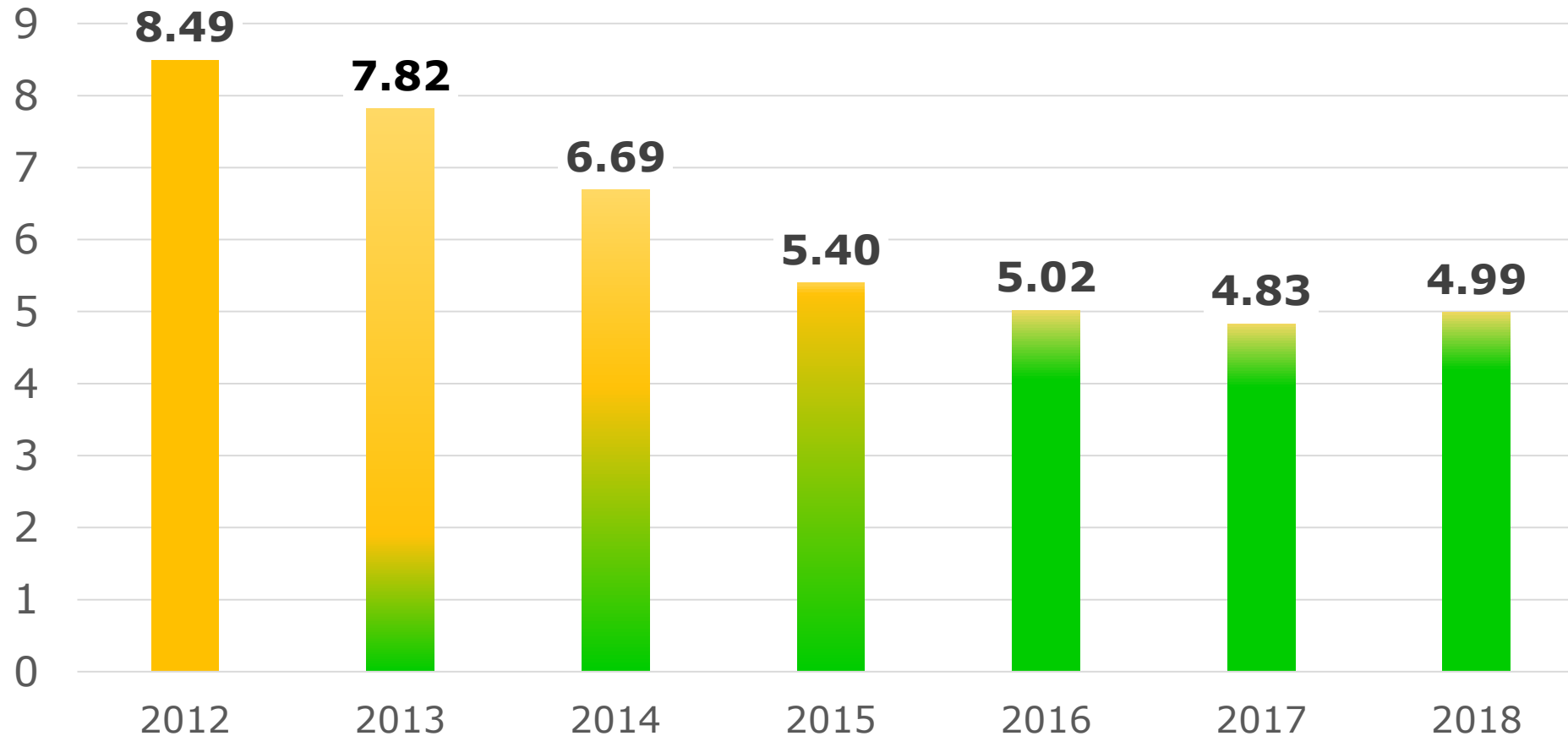
*(LDHA information)*



The replacement of natural gas with renewable biofuels reduced CO<sub>2</sub> emissions from 29055 tons in 2012 to 21008 tons in 2018.



## **Average annual** price for heat for consumers in Kaunas in 2012 – 2018, ct/kWh excl. VAT



**Such a quick shift of a big city from the usage of natural gas to renewable biofuel was a true revolution in district heating sector.**

**Thank you!**