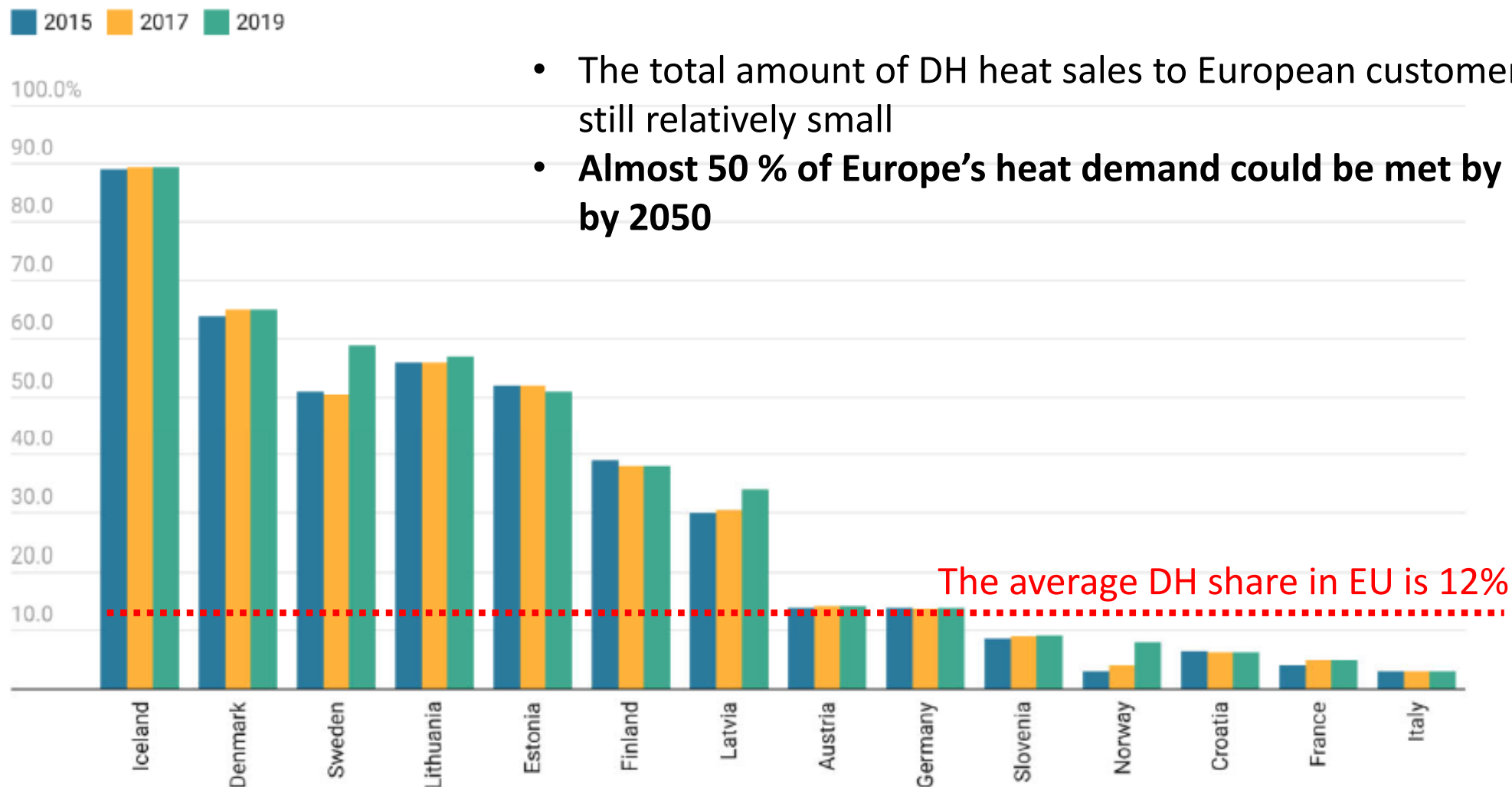


# The challenges for district heating in the Baltic States

**dr. Valdas LUKOŠEVIČIUS**

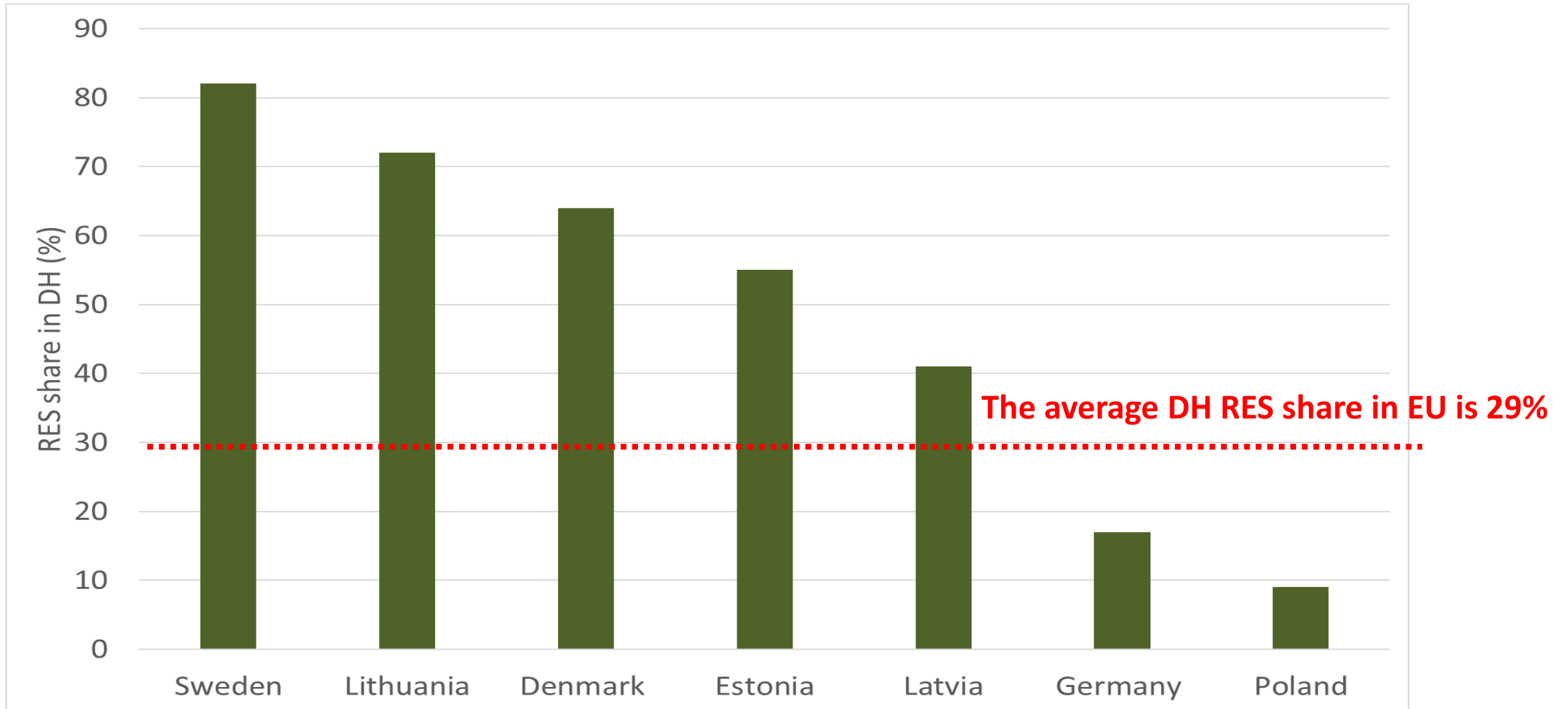
*LDHA president*  
2023-04-18

# DH market share in residential sector in Europe



- The total amount of DH heat sales to European customers is still relatively small
- **Almost 50 % of Europe's heat demand could be met by DH by 2050**

# Renewables share in DH (2020)



# Key facts in 7 EU countries

The largest DH market in Europe is in Germany followed by Poland and Sweden

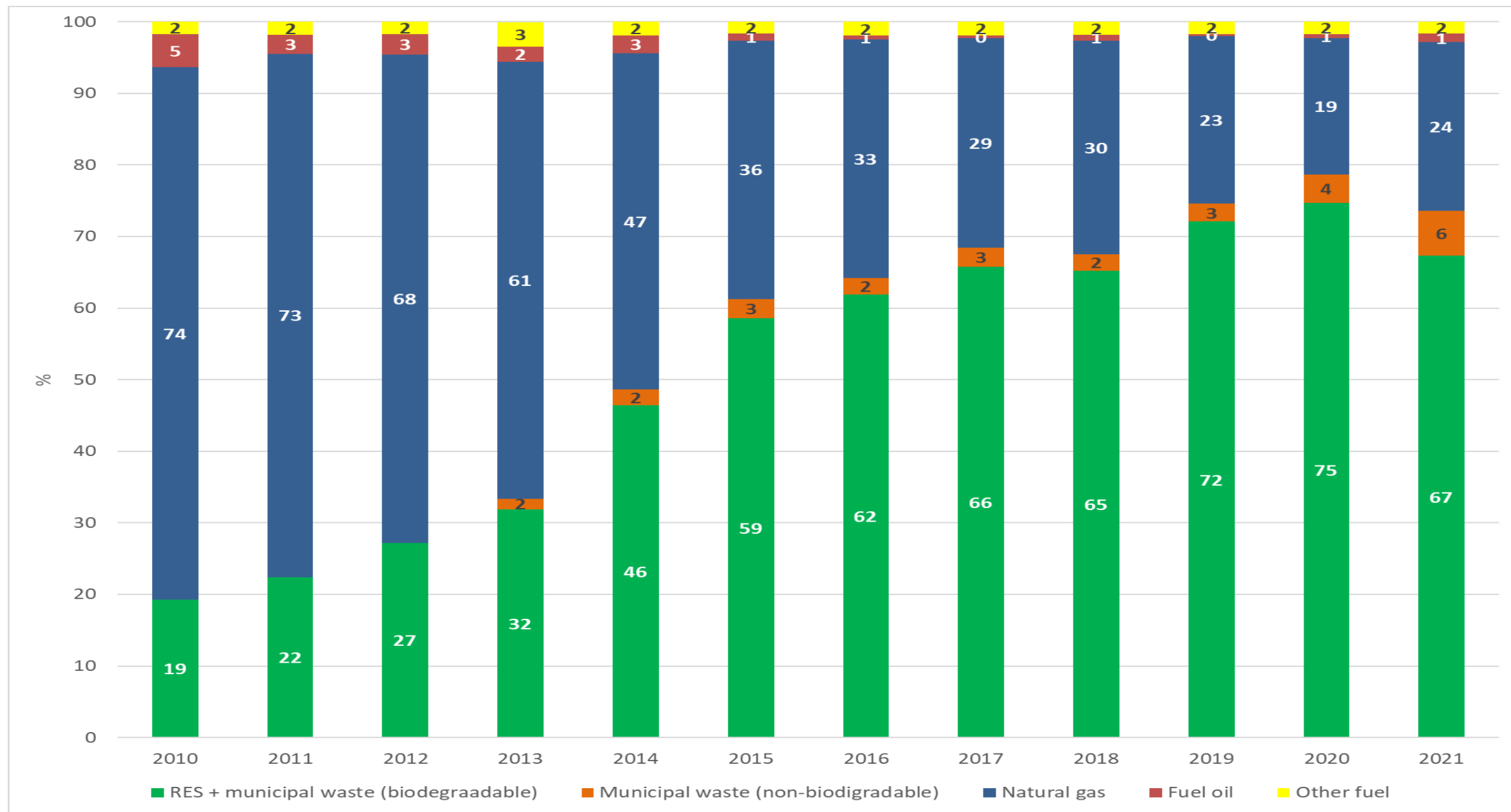
Key facts and figures (2020)	Germany	Poland	Sweden	Denmark	Lithuania	Latvia	Estonia
DH market share in residential sector (%)	14	42	60	65	50	36	51
RES share %	17	9	82	64	72	41	55
Total installed District Heat capacity (in MW <sub>th</sub> )	52000	53000	n.a	10700	7 813	2095	2000
Trench length in km	29500	22000	24700	31000	2840	2000	1650
Heat sales TWh/year	111	60	47	29	8	7	4
Number of District Heating systems	3254	n.a	500	400	357	n.a	239
Number of District Heating operators	900	400	190	n.a	55	54	80

# Key facts in 7 EU countries

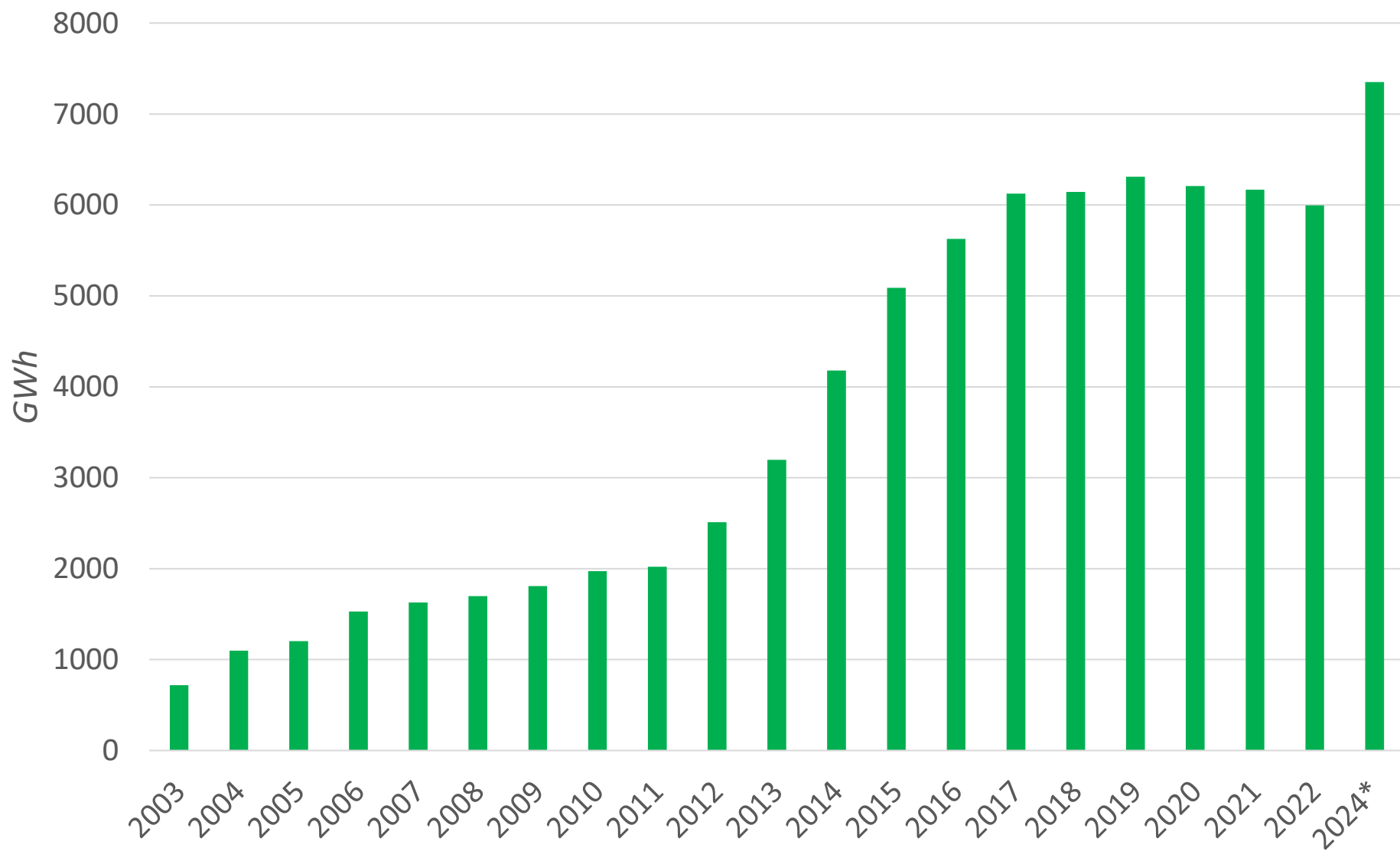
The largest DH market in Europe is in Germany followed by Poland and Sweden

Pagrindiniai rodikliai (2020)	Vokietija	Lenkija	Švedija	Danija	Lietuva	Latvija	Estija
CŠT rinkos dalis gyvenamajame sektoriuje (%)	14	42	60	65	50	36	51
Šilumos gamyba iš AEI (%)	17	9	82	64	72	41	55
Šilumos gamybos šaltinių instaliuota šiluminė galia (MW)	52000	53000	n.a	10700	7813	2095	2000
CŠT trasų ilgis (km)	29500	22000	24700	31000	2840	2000	1650
Realizuotos šilumos kiekis TWh/metus	111	60	47	29	8	7	4
CŠT sistemų skaičius	3254	n.d	500	400	357	n.d	239
Šilumos tiekimo įmonių skaičius	900	400	190	n.d	55	54	80

# Fuel mix for DH production in Lithuania

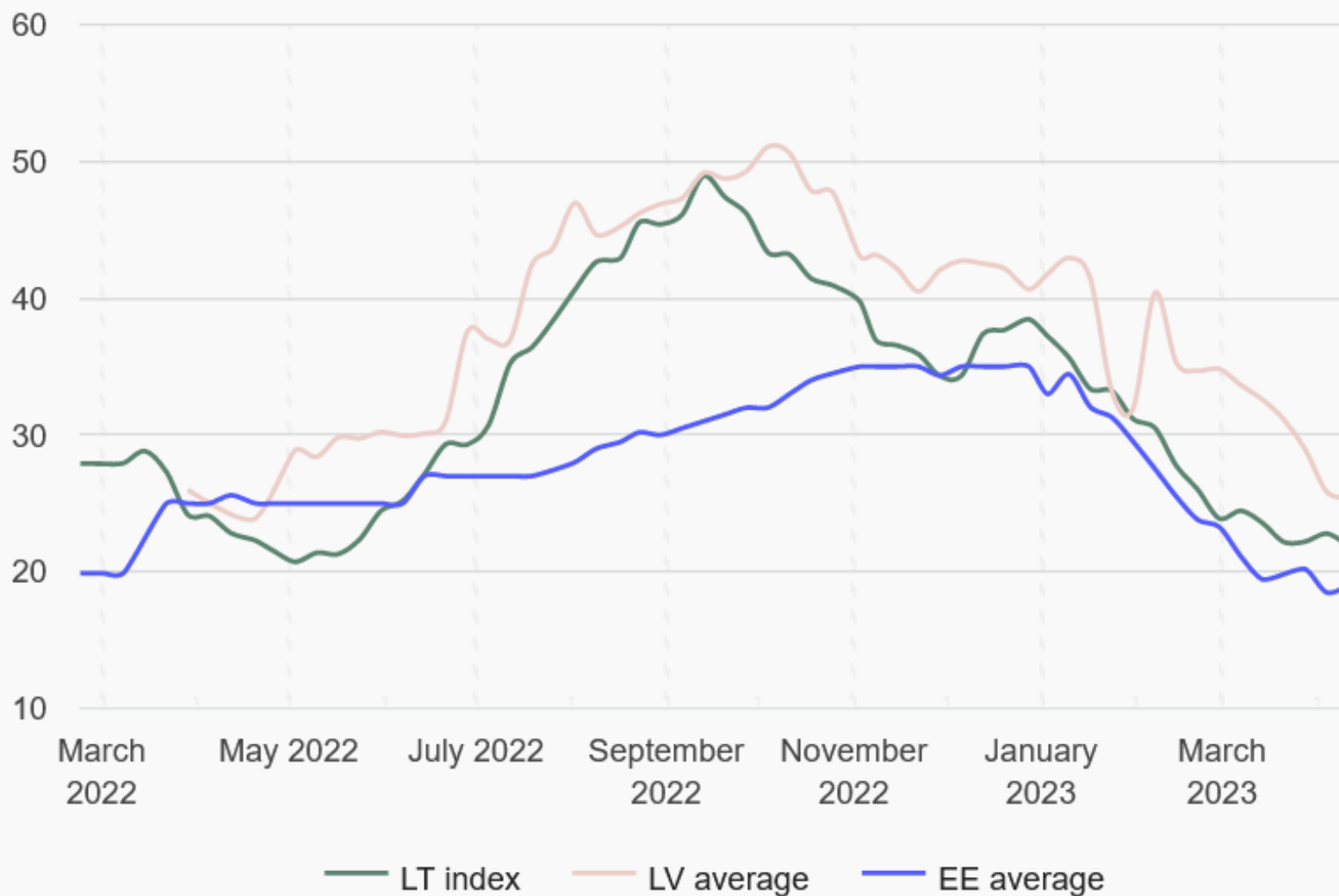


# Biomass inputs (GWh) for DH in Lithuania



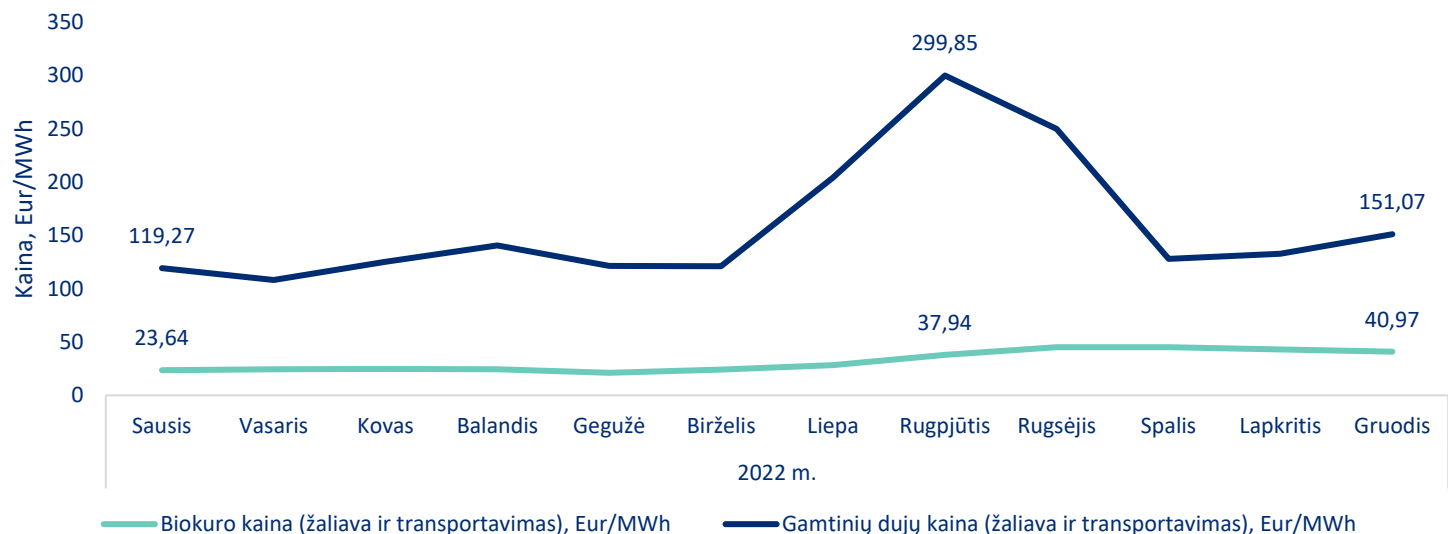
# Wood Chips Spot

EUR / MWh

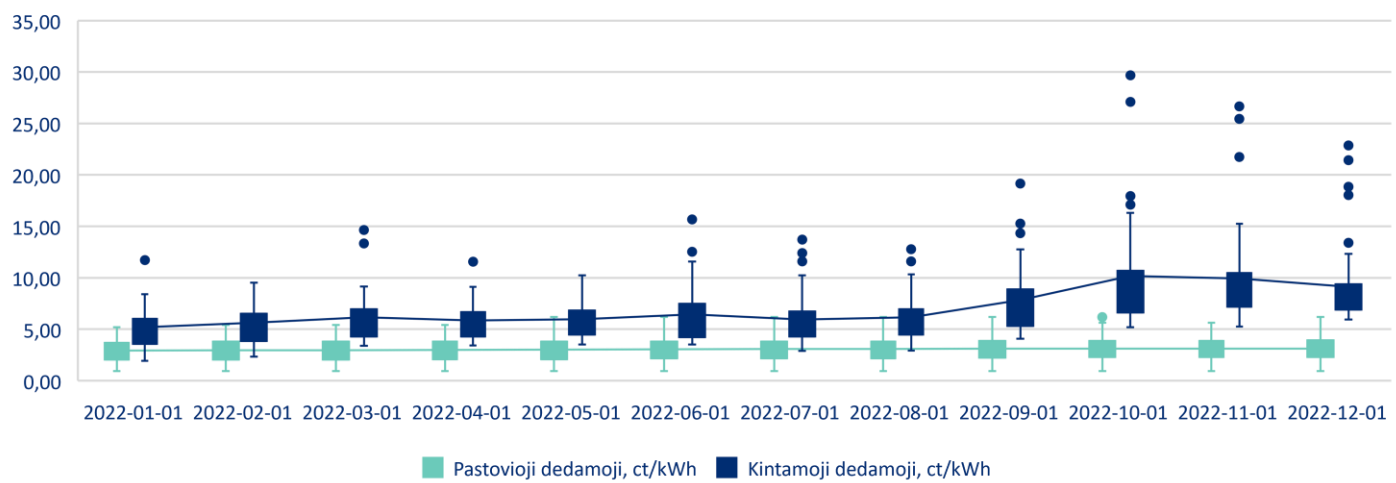




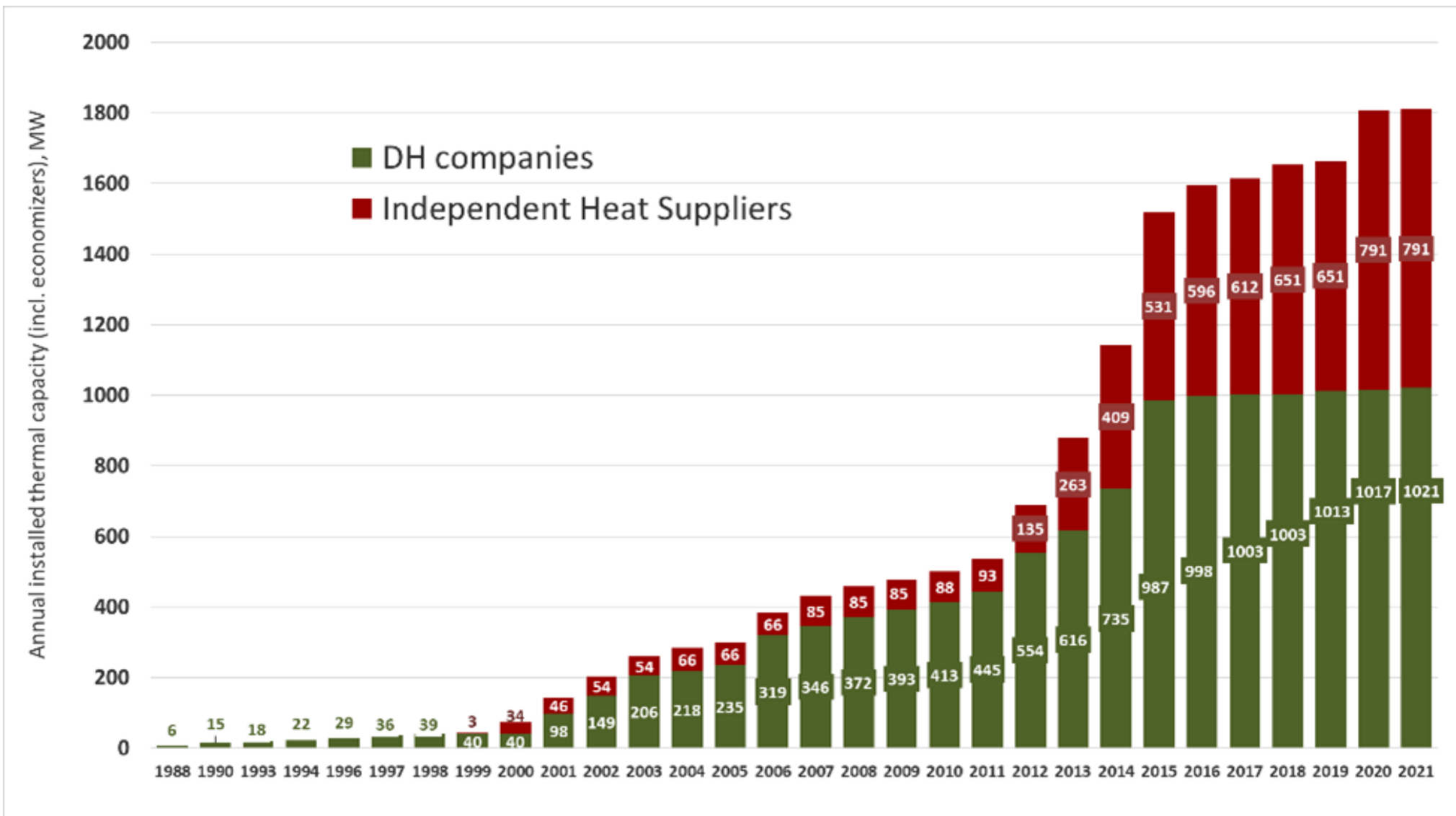
# 2022 energy crisis



- In 2022 fuel prices remained at a record high level
- The price of biofuel used by CŠT companies in the country has almost doubled in a year
- High natural gas prices since the beginning of the year have encouraged companies to look for alternatives
- As the prices of fuel raw materials changed drastically, the gap between the heat prices of individual companies and the average size of the country also increased

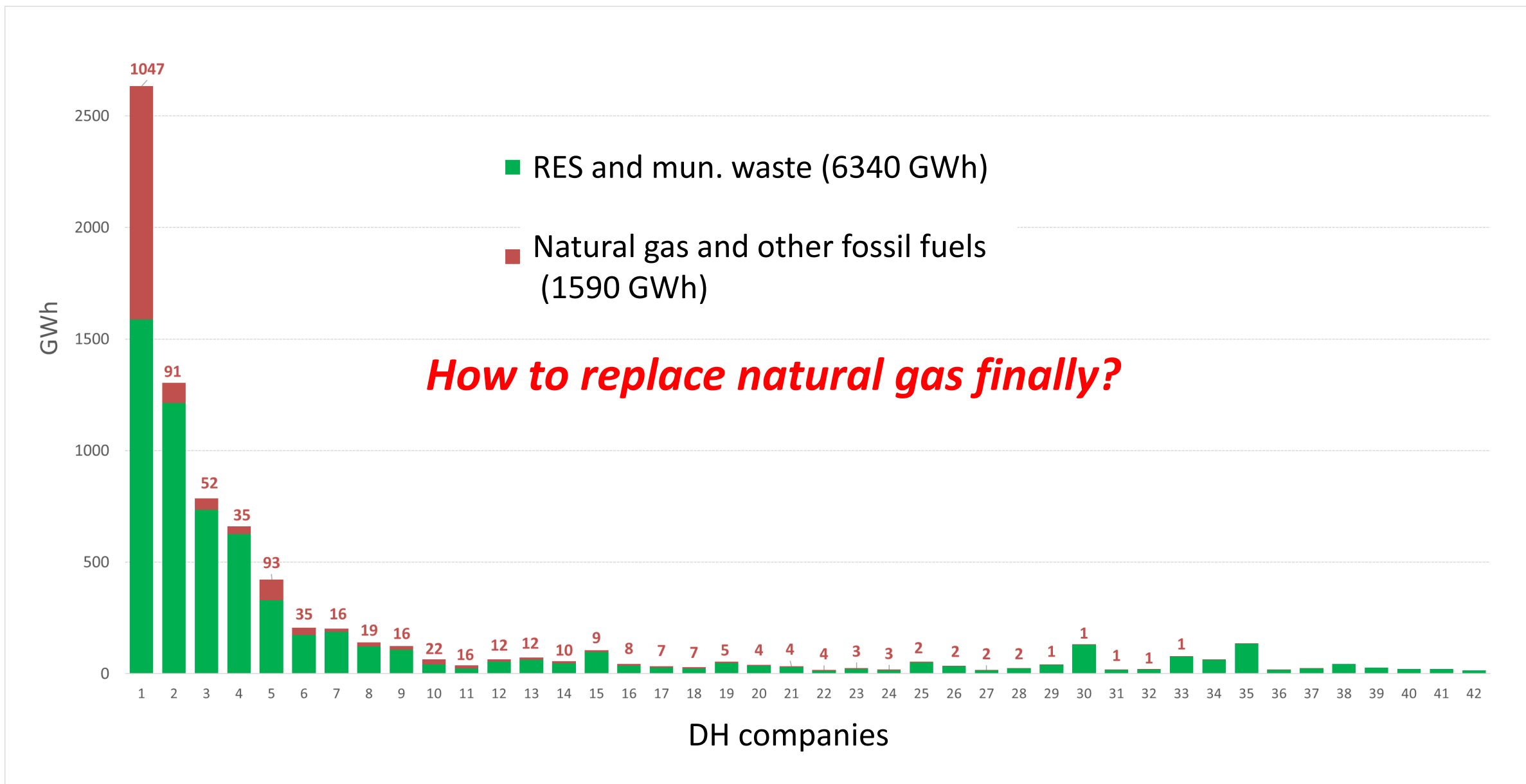


# No biomass anymore?



Installed capacities of biomass in Lithuanian DH sector

# Fuel structure in the separate DH systems in Lithuania



# DH regulatory mechanisms in Baltic countries

## Lithuania



- DH sector is regulated by the Heat Law
- The only country from the Baltic states that uses competition between heat producers- monthly heat auctions.
- Biomass market (biomass exchange and heat trading system BALTPPOOL).

## Latvia



- DH sector is regulated by the Energy Law (no specific Heat Law)
- Heating tariffs in Latvia depend on many factors, including the size of the system, the fuel used, the technical condition of the system, and even political considerations.
- Heat production, transmission and distribution are public services that are regulated by the Public Utilities Commission in Latvia.

## Estonia



- The DH network is regulated by the District Heating Act.
- The DH price limit must be justified, cost-effective and enable the company to fulfil its legal obligations. Only justified sales volumes and profitability expenses may be taken into account when approving the heat energy price for the period of regulation.
- The maximum area price is set by the Competition Authority in accordance with technical indicators.

# Stakeholders and Strategic DH goals in Baltic countries



## Lithuania

- Municipalities owned about 93% of DH companies, while 7% are leased
- 55 licensed DH companies with annual sales of more than 10 GWh are regulated by National Energy Regulation Council. Smaller companies (up to 10 GWh/year) are regulated by municipalities
- According to NECP 2021-2030: increase RES share in the DH supply to **90%** by 2030 and reach **100%** by 2050 (the most ambitious goal among the Baltic states).



## Latvia

- DH systems are mainly owned by local municipalities and, in some cases, private owners.
- DH companies are regulated if annual sales exceeds 5 GWh/year.
- According to the Latvian NECP 2021-2030, the share of RES in DH will increase to **58%** in 2030.
- Large-scale DH solar thermal plant in Salaspils (2019)



## Estonia

- DH operators are mainly private companies.
- According to the National Development Plan of the Energy Sector **80%** of DH in Estonia will be provided using RES by 2030
- District cooling is implemented in Tallinn (2022), Tartu (2015, 2017) and Pärnu (2019)

# Challenges in Estonia DH sector



## Future challenges

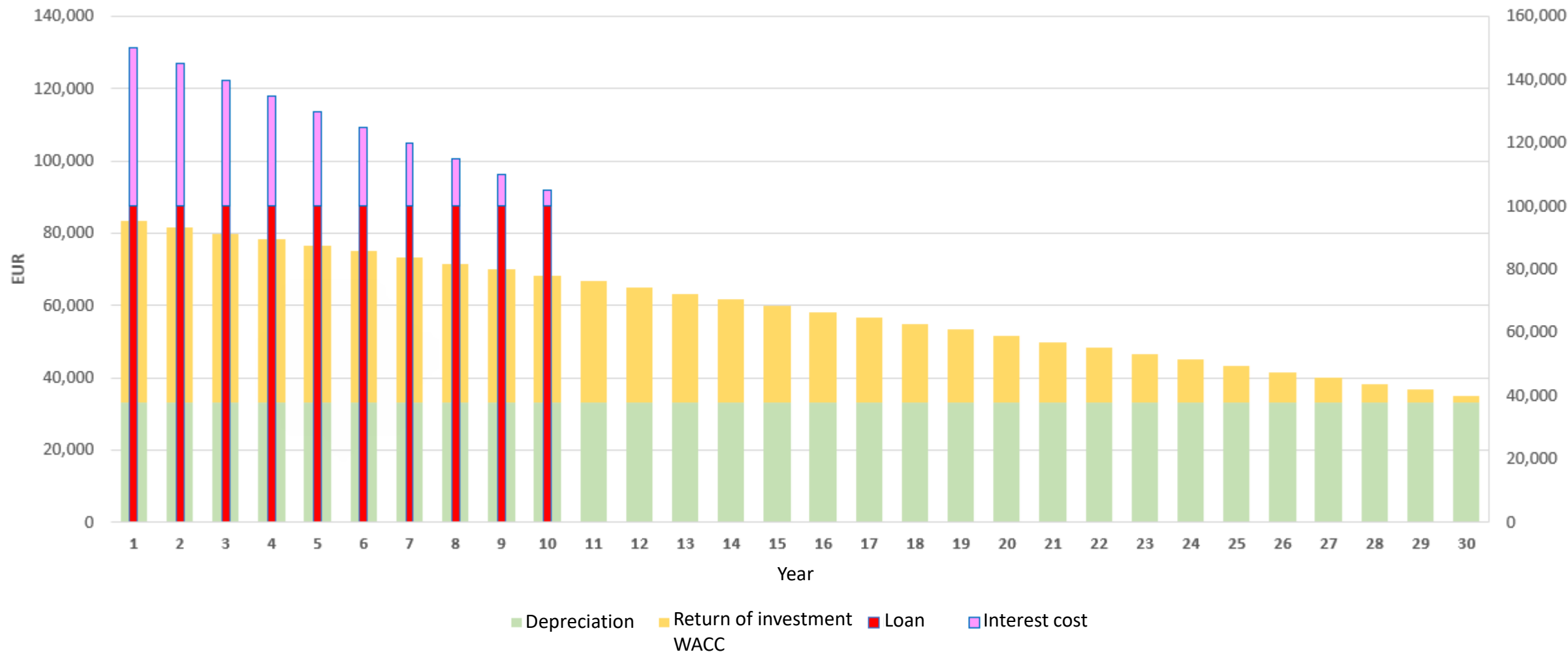
- Several investment support schemes are on preparation (SF, RRF etc)
- New technologies and solutions: heat-pumps (today 8,7MW), heat storages (today 1 pc in Tartu), lower temperatures (mostly depends on buildings).
- Biomass sustainability criteria (first year)
- Public issues against forestry and pellet industry
- Public issues against windfarms and PV (NIMBY issues)
- DH regulation and faster update of WACC guidance

# Regulatory issues in Lithuanian DH sector

- Regulation is not fear for safety of investment
- Status of prosumers and waste heat?
- Mandatory usage of low quality biomass (30 %)
- Complicated and unpredictable regulatory framework
- Compensation to vulnerable heat consumers new rules and challenges
- No investment support for replacement of DH tubes any more?
- VAT 0% for domestic users up to 2024 May

# Regulatory pricing and investment

Investment cash flows (Lithuanian DH companies)





# Updated Heat law

- Planning of investments for 3-10 years
- Auctions for heat production capacities
- Priority for waste heat
- Simplified and more reasonable pricing system

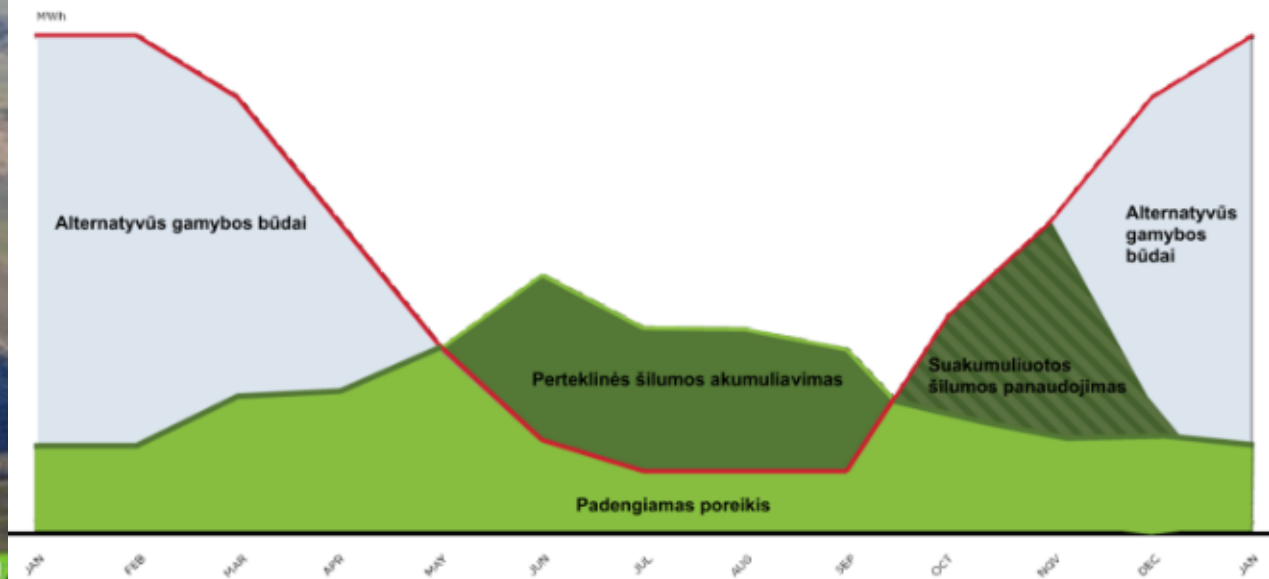
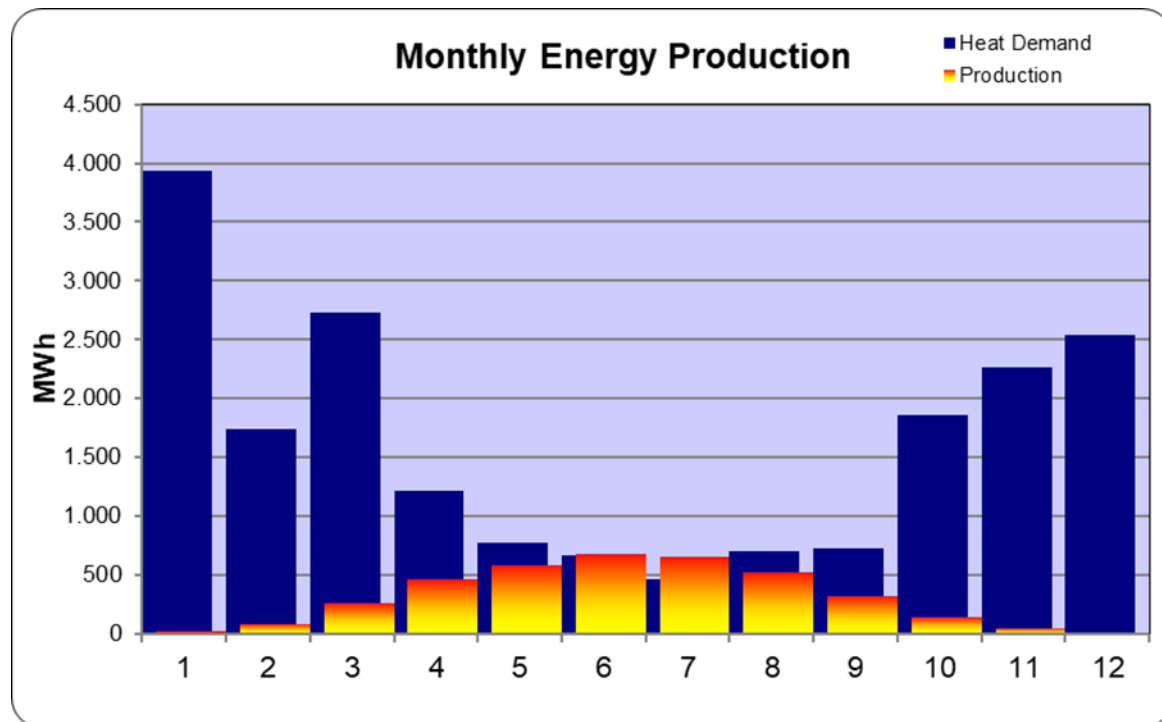
# New phase in development of DH

- **Perspectives of biomass** in the future is not clear?
- **No economic alternatives to biomass** usage so far (*all year around*)
- District heating and **renovation of buildings**
- **Expansion of DH systems** = decarbonization
- **District cooling** (just in Estonia)
- **Role** and capacity **of cogeneration** plants?
- ???

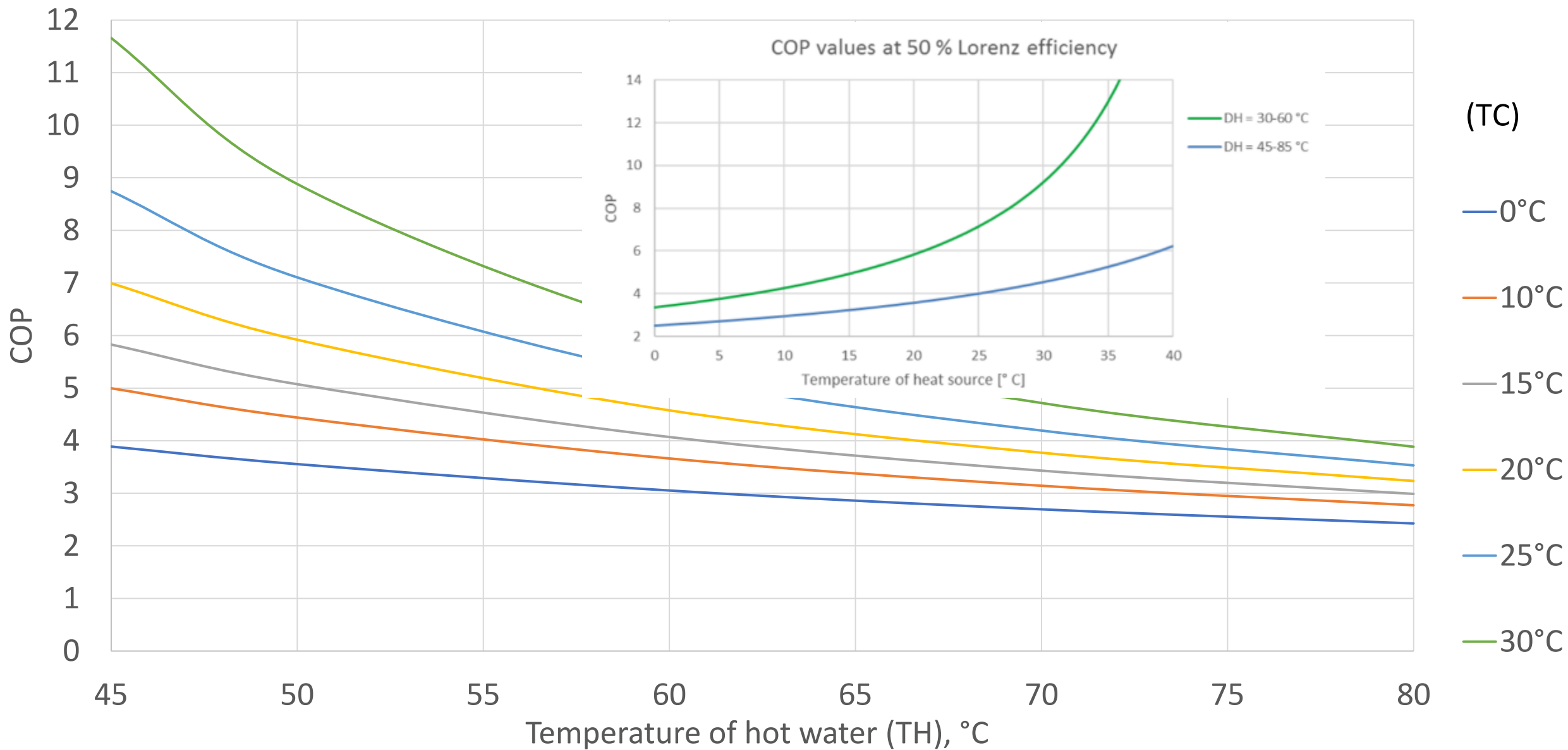
## What to do?

- New EU funds will be available for the period of 2021-2027 years

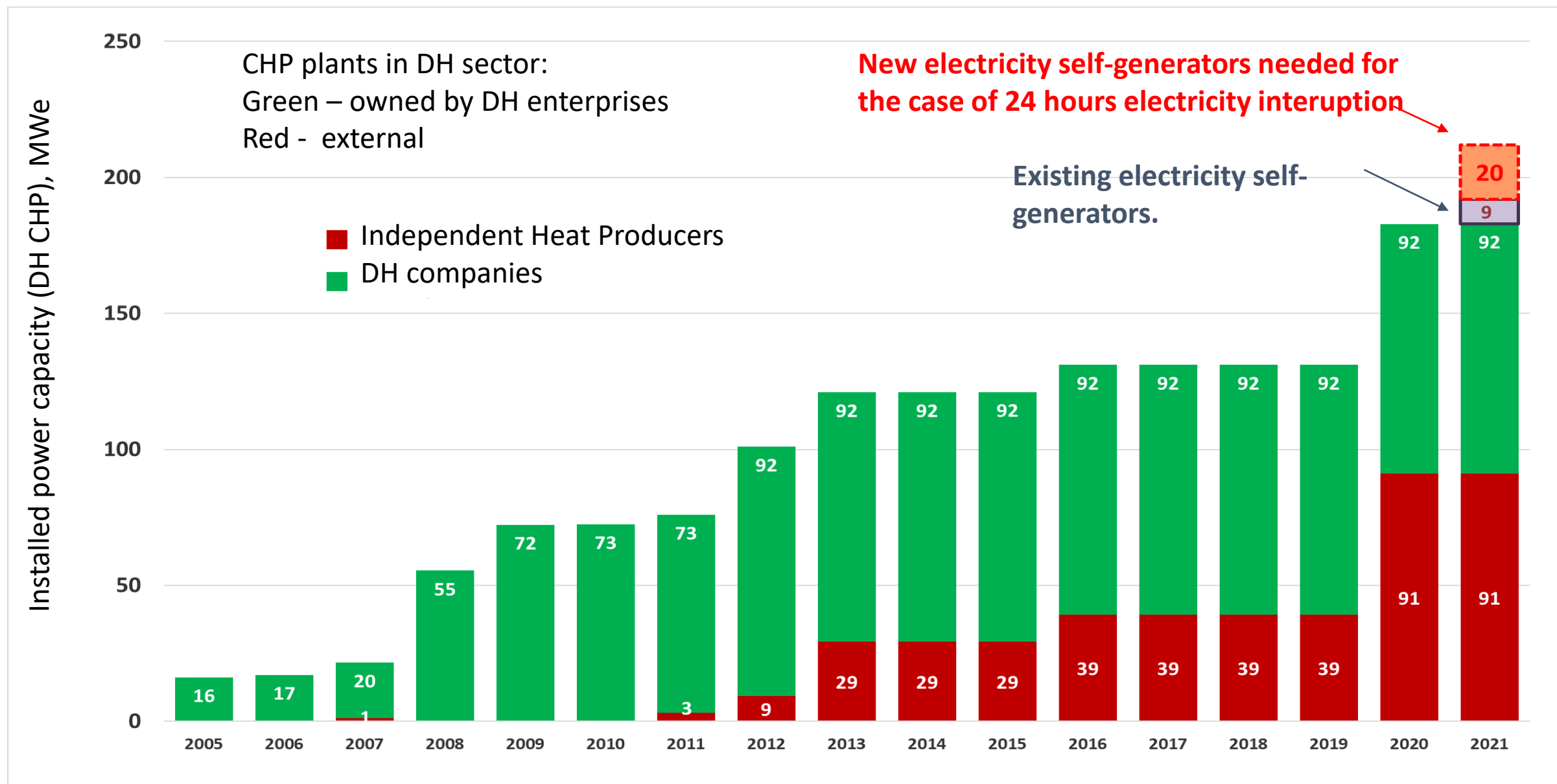
# Solar collectors?



# Heat pumps?



# Electricity generators in Lithuanian DH sector

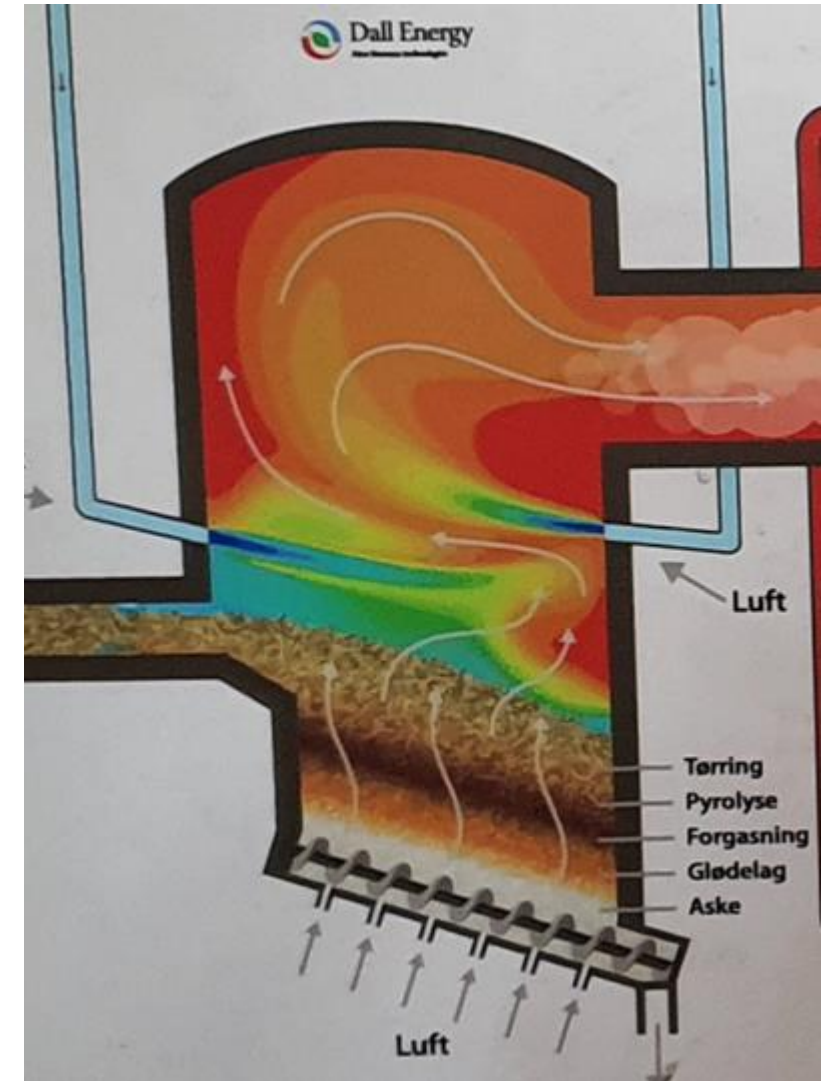


# Cogeneration?

- **Large DH systems – CHP plants already exist. Need more? How to ensure investment return?**
- **Average size DH systems – feasible but shortage of investment resources?**
- **Small DH systems – ORC? Gazifiers + engine + generator?**

# Real investment – biomass firing boilers: new or modernized?

- For poor quality residual biomass
- Deep flue gas heat utilization
- Large turn-down range
- Automatic operation



# Heat Transmission systems

- **Lower temperature regimes - 4 generation of DH**
- **Consolidation of DH systems**
- **Reconnection of old consumers**
- **New DH consumers and systems**
- **Replacement of tubes**
- **SAM...**





# Thank you. Questions...



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