

ERRA Renewable Energy Committee

DH in Europe
24. January 2024

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E-Control

Agenda

- The European framework
- Some data and statistics
- Recommendations

The overall targets in Europe

- Climate neutral economy by 2050
- 55% GHG reduction by 2030
- Increase of the midterm RES-target from 32% to 40%
- Increase of the energy efficiency target from 32,5% to 39% (equals a reduction of the energy consumption by 9% compared to 2020)

Major cornerstone to achieve the targets:

→ **Decarbonisation of the heating and cooling sector**

→ District heating and cooling represents one of the major infrastructural transitions

→ **Supported by the relevant directives:**

→ Renewables

→ Energy Efficiency

→ **Support by all EU energy- and investment-policies**

→ Fit for 55 package

→ Green deal

→ Etc.

New models and challenges for DHC systems

(Source: European Commission, Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive)

Traditional DHC model (70s-90s)

- **Long term concessions** linking large scale production, supply and grid management within a unique contract
- Vertical integration, **no transparency on embedded costs**
- **Centralised production**, often coal or gas based, with or without CHP, unchallenged during the contract
- Grid as a closed, **“one way” system**
- **Mandatory connection**, regardless of efficiency of alternative supply proposals
- **Supply driven** development
- **Low consumer information**, no cooperative dialogue to stakeholders

New models

- **Mid term concessions + service contracts**, often separating production contracts and supply from grid operation
- **Full transparency on the value chain** at various levels
- **Decentralised production**, constantly reshaped with respect to environmental targets and cost effectiveness
- Grid as enabler to **energy exchanges**
- Conditional connection, can be challenged by efficient standalone solutions
- **Demand driven** development
- **Customer/stakeholder information as enabler to the model**

Some keywords:

- Sector coupling
- Smart technologies
- Smart services
- Flexibility
- Power-to-X

Heating and cooling in the RED II

- Article 19 - Guarantees of origin for energy from renewable sources
- Article 22 – Energy Communities
 - DH as a part of energy communities
- Article 23 – Mainstreaming renewable energy in heating and cooling
 - Specific targets
 - More monitoring
 - More transparency
 - More information
- Article 24 – district heating and cooling
 - More information and transparency
 - More consumer rights
 - More efficiency in DH systems
 - Increase of Renewables
 - Increase of Waste Heat
 - Connection of third-party-suppliers

Heating and Cooling in the Energy Efficiency Directive

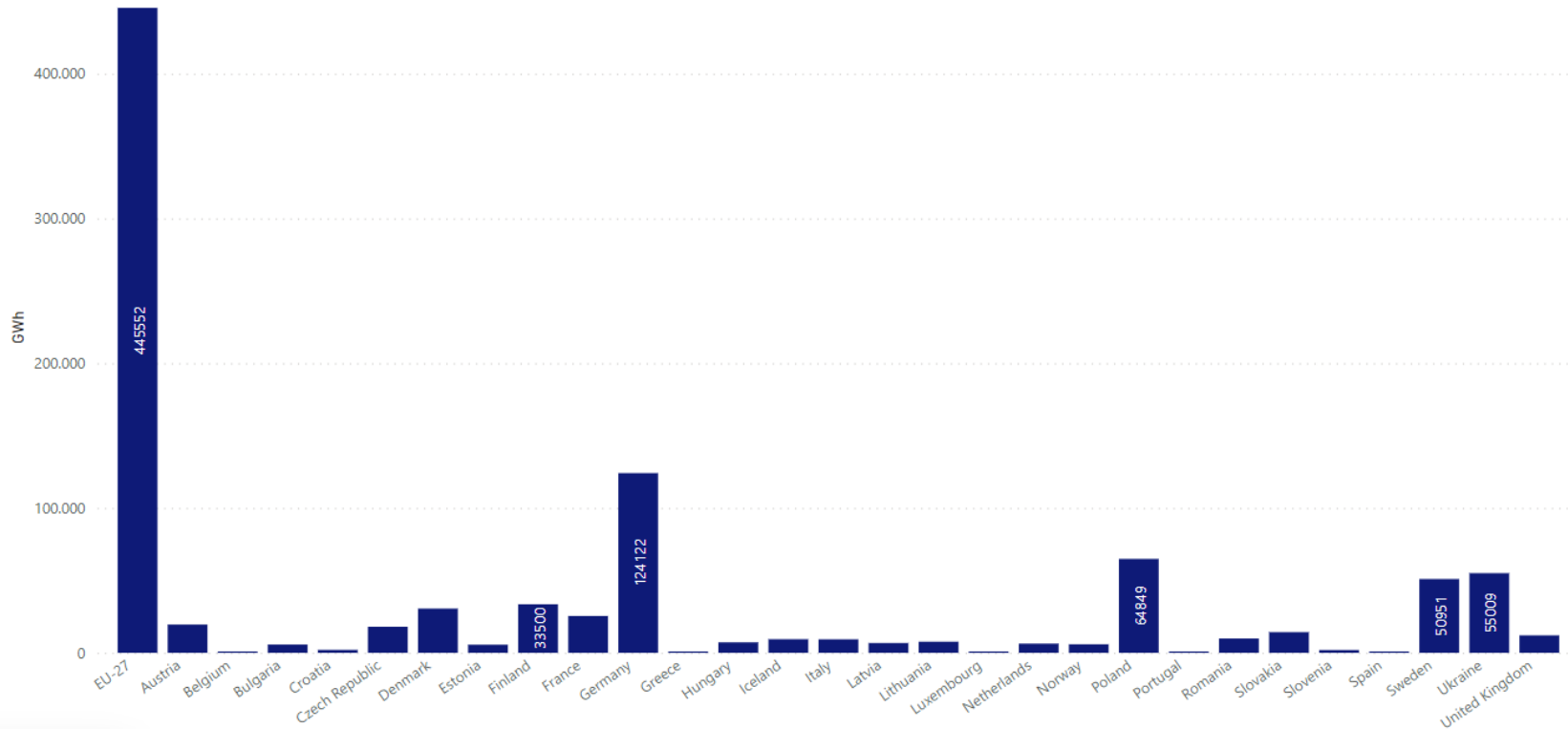
- Article 9b – Sub-metering and cost allocation for heating, cooling and domestic hot water
 - In multi-apartment and multi-purpose buildings with a central heating or central cooling source or supplied from a district heating or district cooling system, individual meters shall be installed to measure the consumption of heating, cooling or domestic hot water for each building unit, where technically feasible and cost effective in terms of being proportionate in relation to the potential energy savings.
- Article 10a – Billing and consumption information for heating, cooling and domestic hot water
 - Where meters or heat cost allocators are installed, Member States shall ensure that billing and consumption information is reliable, accurate and based on actual consumption or heat cost allocator readings
- Article 11a – Cost of access to metering and billing and consumption information for heating, cooling and domestic hot water
 - Member States shall ensure that final users receive all their bills and billing information for energy consumption free of charge and that final users have access to their consumption data in an appropriate way and free of charge

Heating and Cooling in the Energy Efficiency Directive

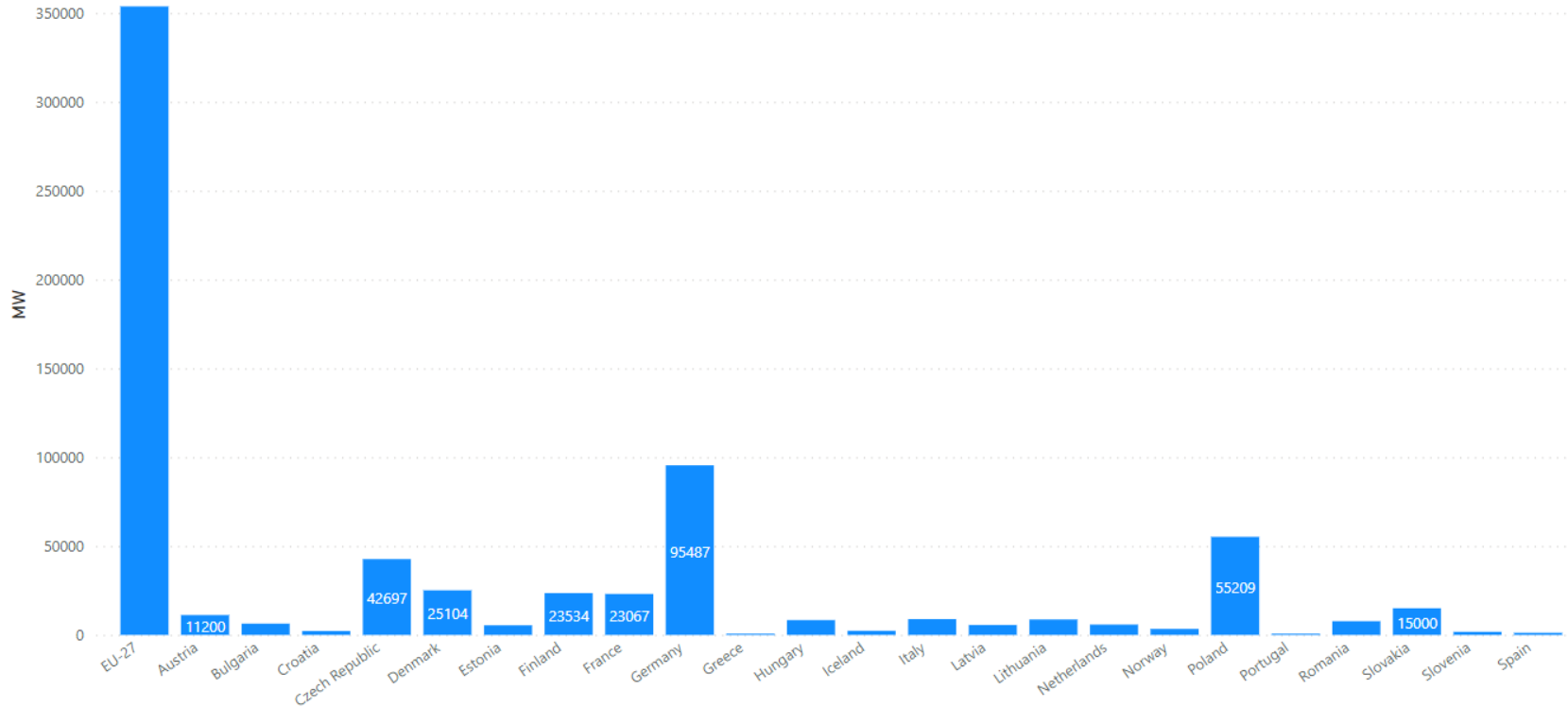
- Article 14 – Promotion of efficiency in heating and cooling
 - Member States shall carry out and notify to the Commission a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling.
 - Member States shall adopt policies which encourage the due taking into account at local and regional levels of the potential of using efficient heating and cooling systems, in particular those using high-efficiency cogeneration. Account shall be taken of the potential for developing local and regional heat markets.
 - Member States shall carry out a cost-benefit analysis covering their territory based on climate conditions, economic feasibility and technical suitability
- ANNEX II: Methodology for determining the efficiency of the cogeneration process

Assessment
- Potentials
- Available technologies
- Available primary energy sources
- Available waste heat
- Demand
- Quantification of need for investments

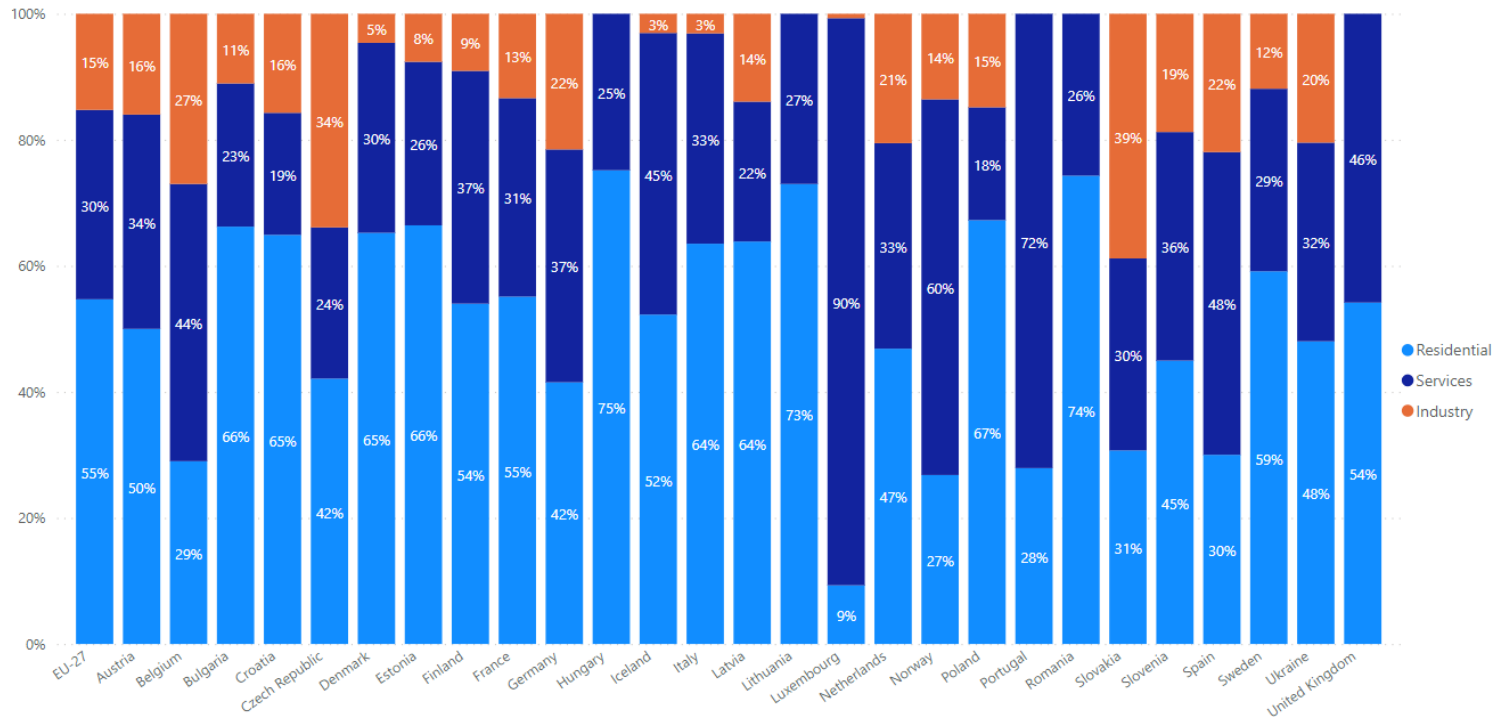
DH in Europe – final energy consumption in 2018



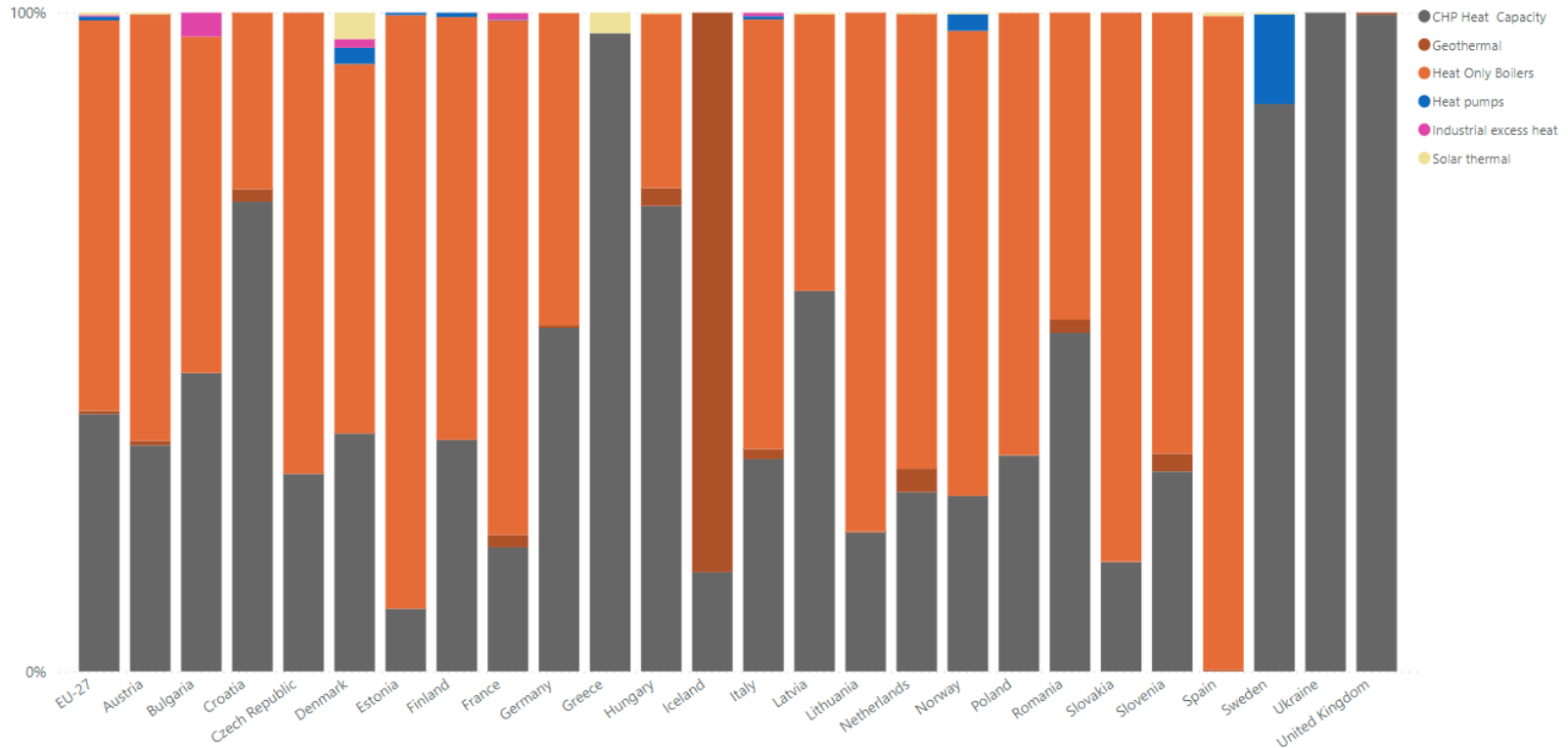
DH in Europe – total installed capacities in MW



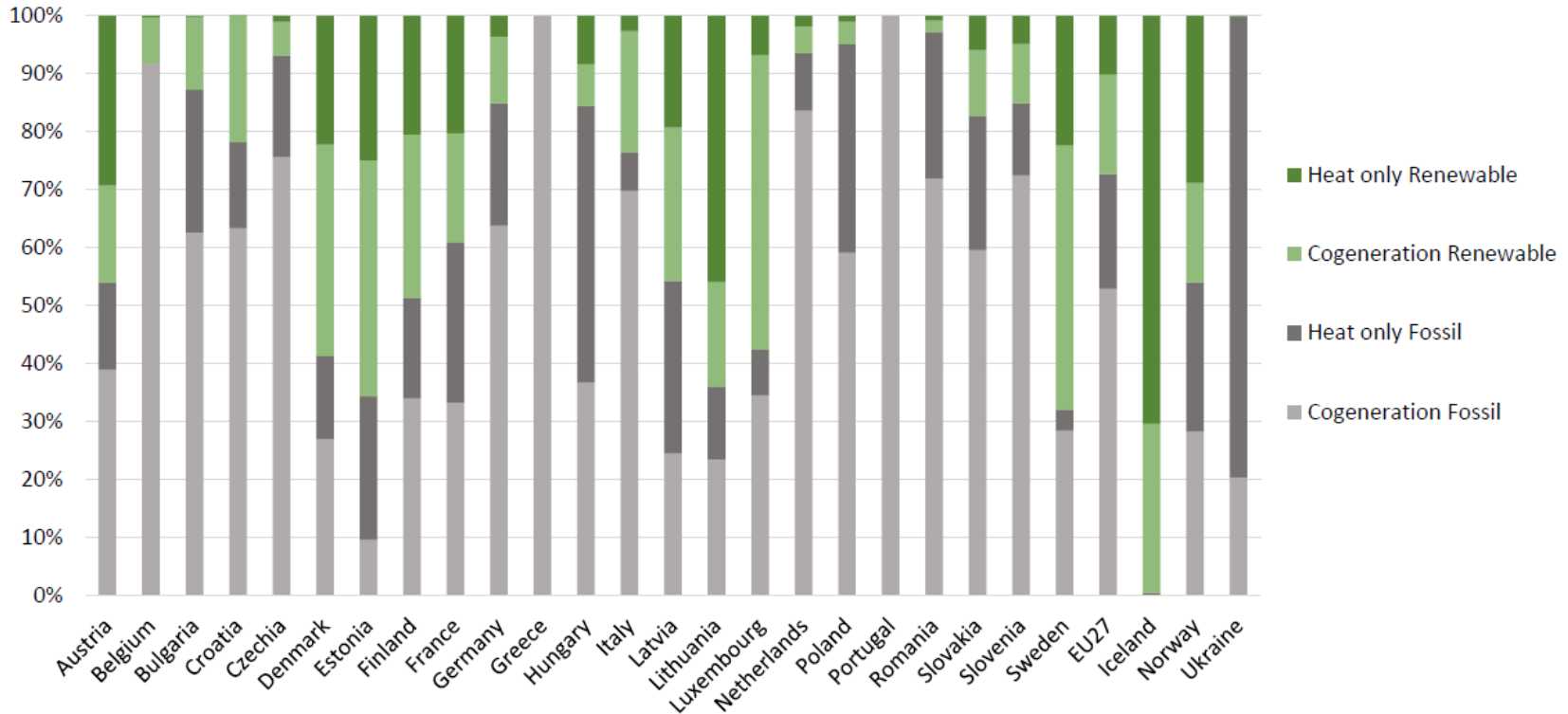
DH in Europe – share of DH consumption per sector



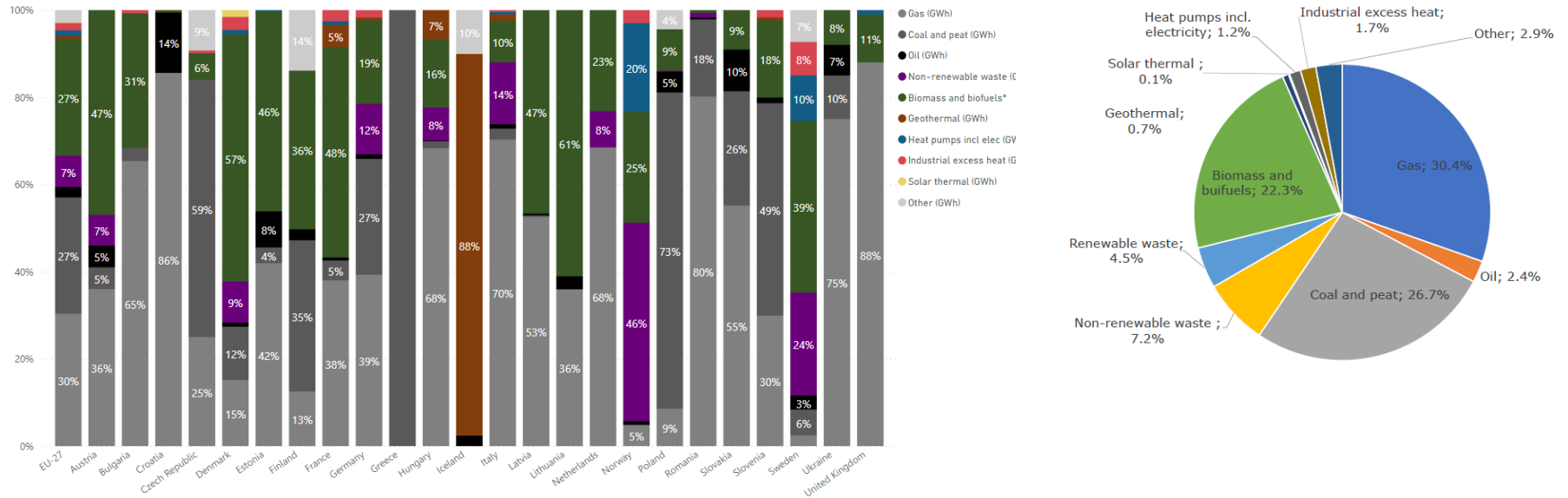
DH in Europe – share of DH installed capacities per technology



DH in Europe – share of of gross heat production per type and fuel and generation



DH in Europe – District heating fuel supply mix (GWh)



DH in Europe – Incentives/support for DHC

RES and generation

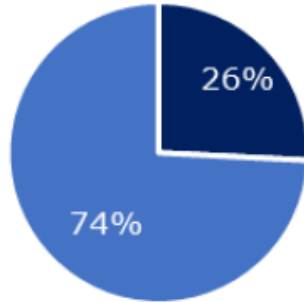


Connection of end users



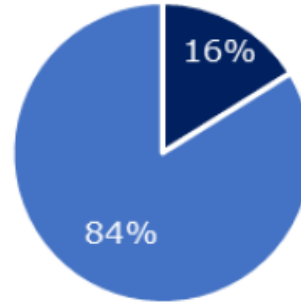
DH in Europe – Incentives/support for DHC

Support of renewables



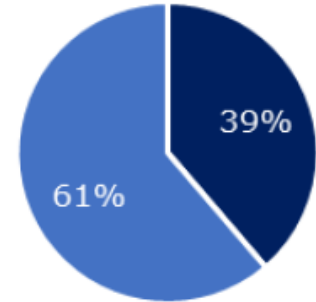
- 1. No specific support program
- 2. Specific support program

Support of CHP



- 1. No specific support program
- 2. Specific support program

Support of grid infrastructure



- 1. No specific support program
- 2. Specific support program

Source: European Commission, Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive

DH in Europe – Regulations

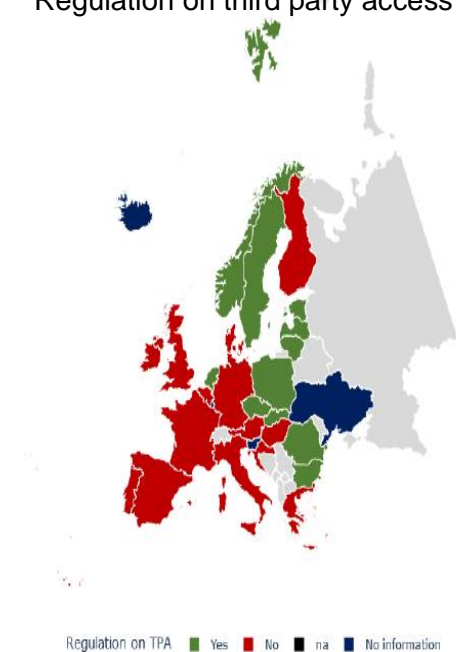
- DHC Systems are natural monopolies
- DHC are mostly integrated companies/services with generation, grid operation and distribution – NO unbundling

Regulation on prices



- **Two main price models:**
 - Ex-post- price control on request for liberalised prices
 - Cost-plus model in countries with explicit price regulation

Regulation on third party access (TPA)

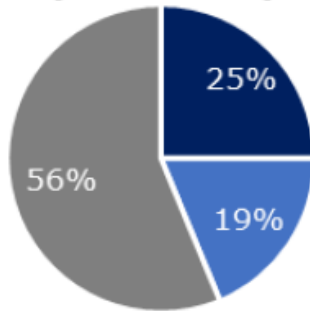


- **If TPA is regulated:**
 - Significant differences in regulation in place
 - Usually technical or economic limits for the access

Source: European Commission, Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive

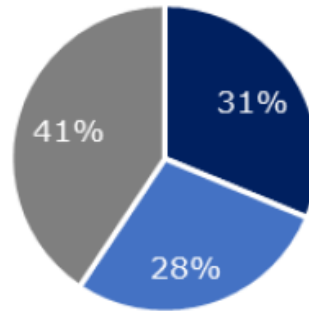
DH in Europe – Regulations

Owner- and operatorship



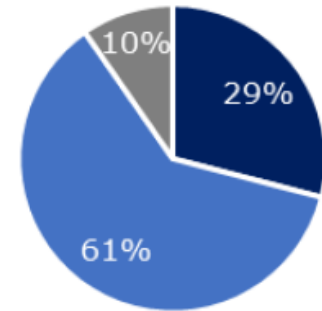
- 1. No specific regulation
- 2. Register or monitoring
- 3. Licences or concession

Prices



- 1. No specific regulation
- 2. Price calculation rule
- 3. Price control/approval of price

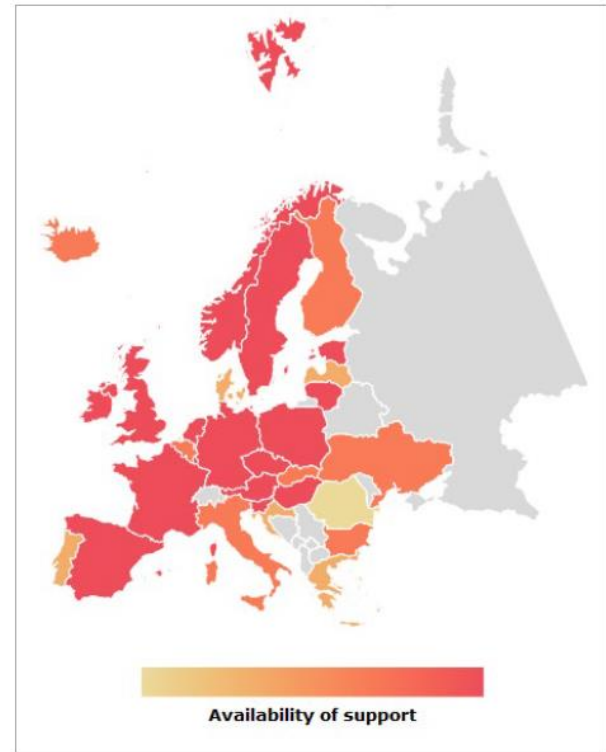
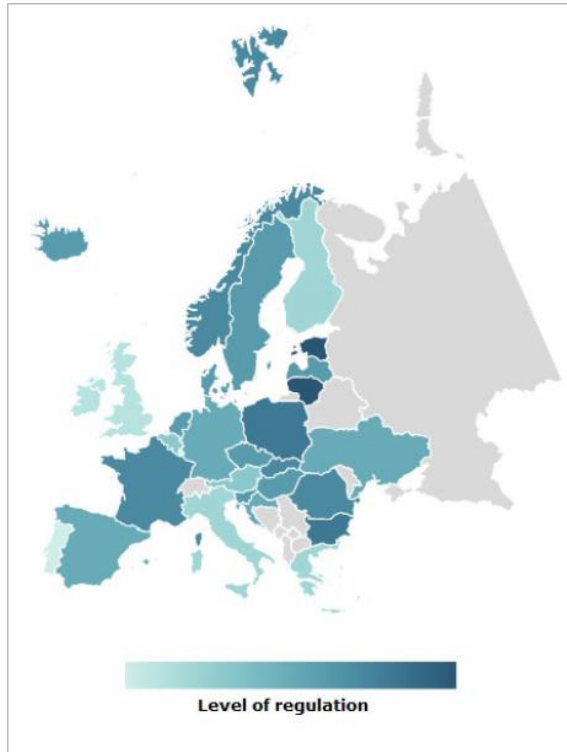
Metering



- 1. No specific regulation
- 2. Regulations for heat meter
- 3. Regulations for smart meter

Source: European Commission, Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive

Summary regulations and support systems



Source: European Commission, Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive

Recommendations for future DHC systems (and decarbonisation of heating sector)

(Source: European Commission, Overview of District Heating and Cooling Markets and Regulatory Frameworks under the Revised Renewable Energy Directive; TU Wien, Potenzial für eine effiziente Wärme- und Kälteversorgung)

- Assessment of potentials, available technologies, available energy sources, etc.
- Strategic long-term local/urban heat planning
- Identifying sector synergies
- Implementation of a reliable and sustainable regulatory framework
- Implementation of support schemes
- In addition stable and sufficiently strong price signals (e.g. CO2 taxes, taxes on non-recovered waste heat, reduced VAT, etc.)
- Obligation to DHC companies to develop long-term decarbonisation plans
- Possible RES and waste heat quota obligations
- Incentives (and legal framework) for higher customer participation
- Incentives (and legal framework) for energy communities
- Improving transparency – especially for price setting and real time demand



**THANK YOU
FOR YOUR ATTENTION!**