


# Existing heat planning policies in Europe - overview and selected examples



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Group Support Webinar



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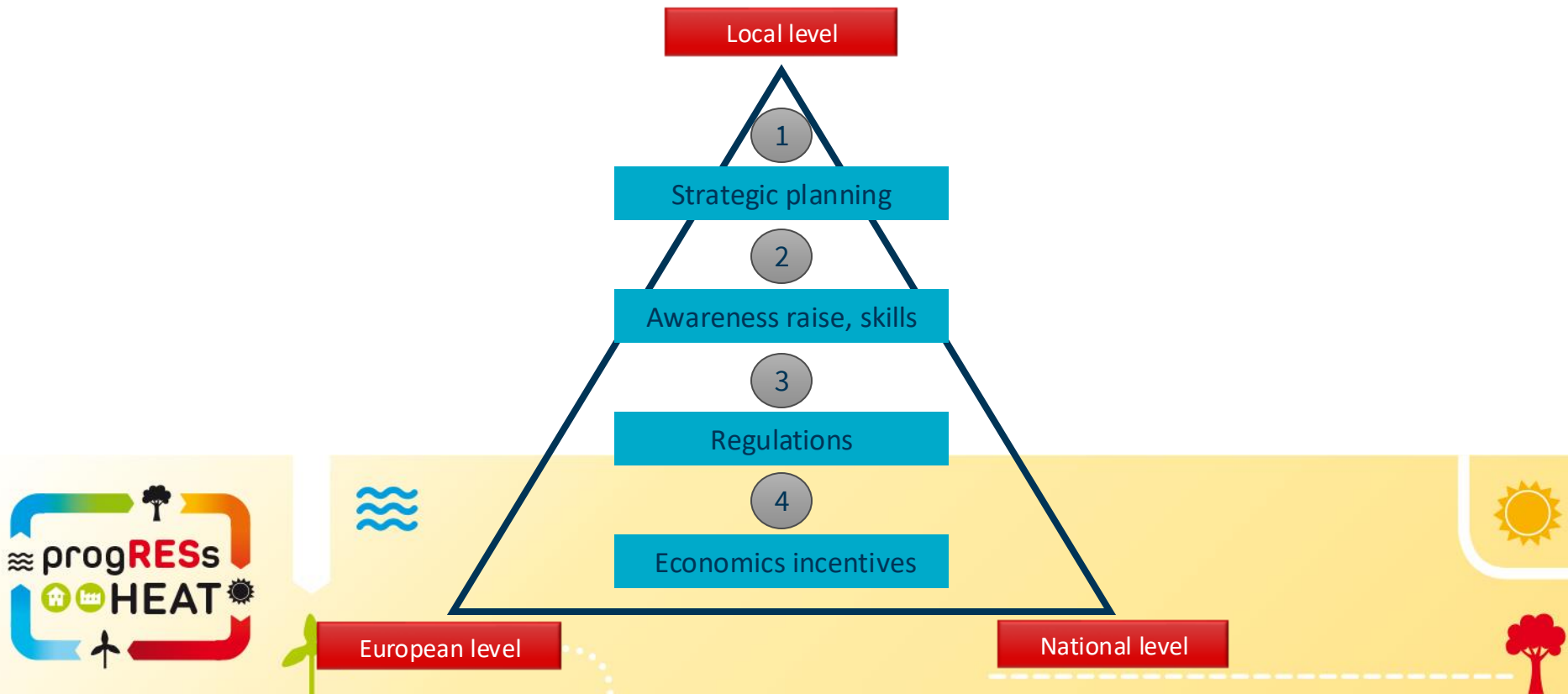


# Content

- 1. Recommended policies for H&C planning**
- 2. Overview of current situation in Europe**
- 3. Mandatory heat planning in the EED2023**
- 4. Special focus on zoning for district heating**
- 5. Discussion**



# Key pillars across local, national and EU policy



		Action level	Local	National	European
1	STRATEGIC PLANNING	Recommendations			
		1. Binding climate protection targets for H/C	!	!	
		2. Provisions of resources for heating and planning		!	
		3. H/C planning as mandatory part of municipal public service tasks		!	!
		4. Analysis of H/C demand and supply	!		
		5. Enable long-term investment horizon	!	!	
2	AWARENESS RAISE, SKILLS	6. Cooperation among key stakeholders	!		
3	REGULATIONS				

4 ECONOMIC INCENTIVES



		Action level		
		Local	National	European
1	STRATEGIC PLANNING			
2	AWARENESS RAISE, SKILLS			
3	REGULATIONS			
<b>Recommendations</b>				
	1. Communication of low-carbon transformation plan	!		
	2. Consumer empowerment and transparency of cost and benefits	!	!	
	3. Intensify policies for crucial change agents	!	!	!
	4. Capacity building in municipalities	!	!	!

4 ECONOMIC INCENTIVES



- 1 STRATEGIC PLANNING
- 2 AWARENESS RAISE, SKILLS
- 3 REGULATIONS
- 4 ECONOMIC INCENTIVES

Recommendations	Action level	Local	National	European
1. Priority areas for certain decarbonisation options		!	!	
2. Ban of fossil fuel technologies, RES quotas, use obligations			!	!
3. Non-renewable primary energy demand requirements			!	!
4. Extension of pollution permitting to CO2 and energy efficiency			!	!
5. Mandatory energy management systems in industry companies			!	!



- 1 STRATEGIC PLANNING
- 2 AWARENESS RAISE, SKILLS
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- 4 ECONOMIC INCENTIVES

Recommendations	Action level		
	Local	National	European
1. Implementation of efficient price-based economic regulations		!	!
2. Focus financial support on technologies in line with targets	!	!	
3. Coherent and innovative financial support instruments		!	



# Content

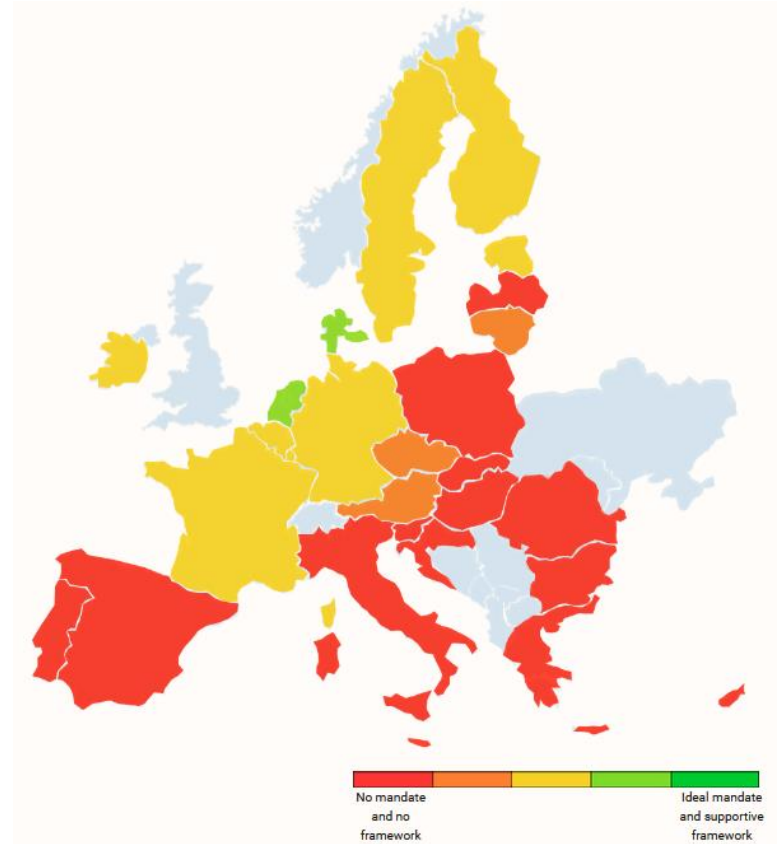
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## Overall assessment

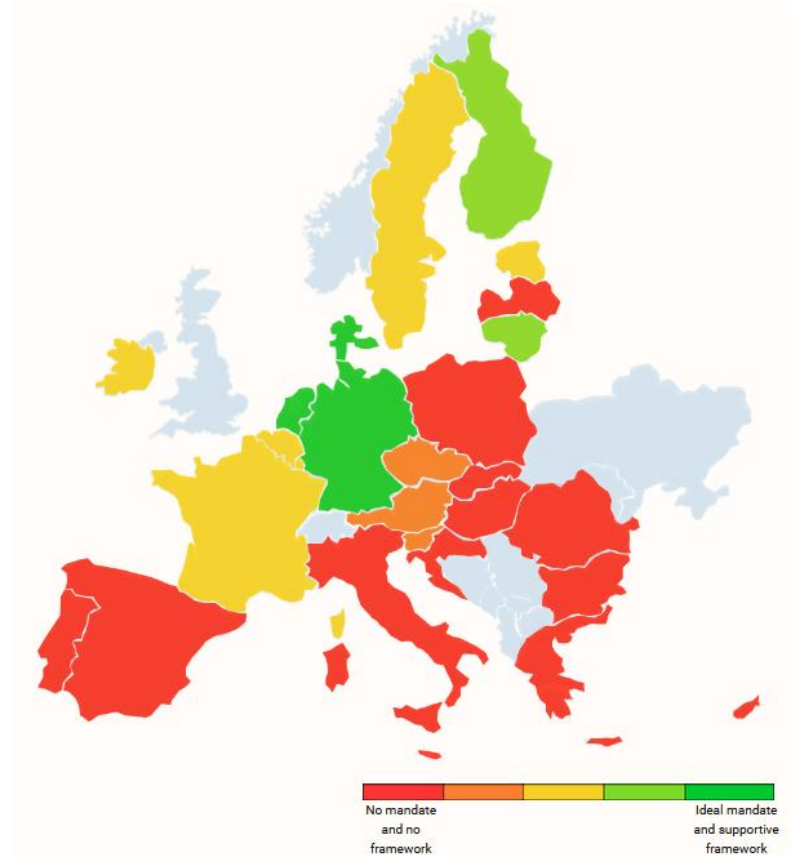
- The **political ground** for effective local heating and cooling planning is **highly uneven** across Europe
- **Support frameworks** are **very important** for an **effective** heating and cooling **planning**
- **Cooling** planning is mostly **no topic still**
- Several energy **planning documents** (e.g. SECAPs) **lack detail** as well as strategic and **spatial** dimensions



Source: *EU Tracker – Local heating and cooling plans, Energy Cities - pdate2024*

## Legal framework assessment

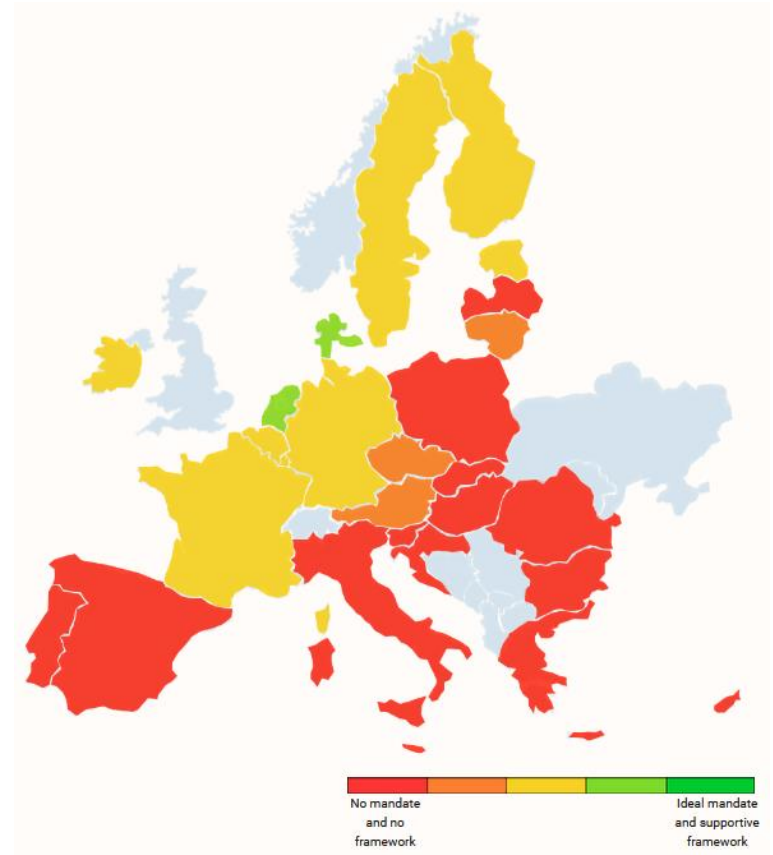
- **In some countries long tradition**, historically with focus on security of supply
- **New obligations in some countries** in recent years (e.g. NL, DE)
- **In some countries strong incentives** implemented (e.g. Flanders, Luxembourg, FR, IE)
- Legal framework for local heating and cooling planning **fully absent in nearly half of EU countries**



Source: *EU Tracker – Local heating and cooling plans, Energy Cities – pdate2024*

## Support framework assessment

- Technical and organisational **support frameworks** exist **in countries with obligations**
- **Financial support usually for projects**, not for the planning activities
- **Lack of staff and skills in municipalities** is barrier in all countries
- Remarkable **limitations in availability of energy-related and geodata** for planning purposes



Source: *EU Tracker – Local heating and cooling plans, Energy Cities - pdate2024*

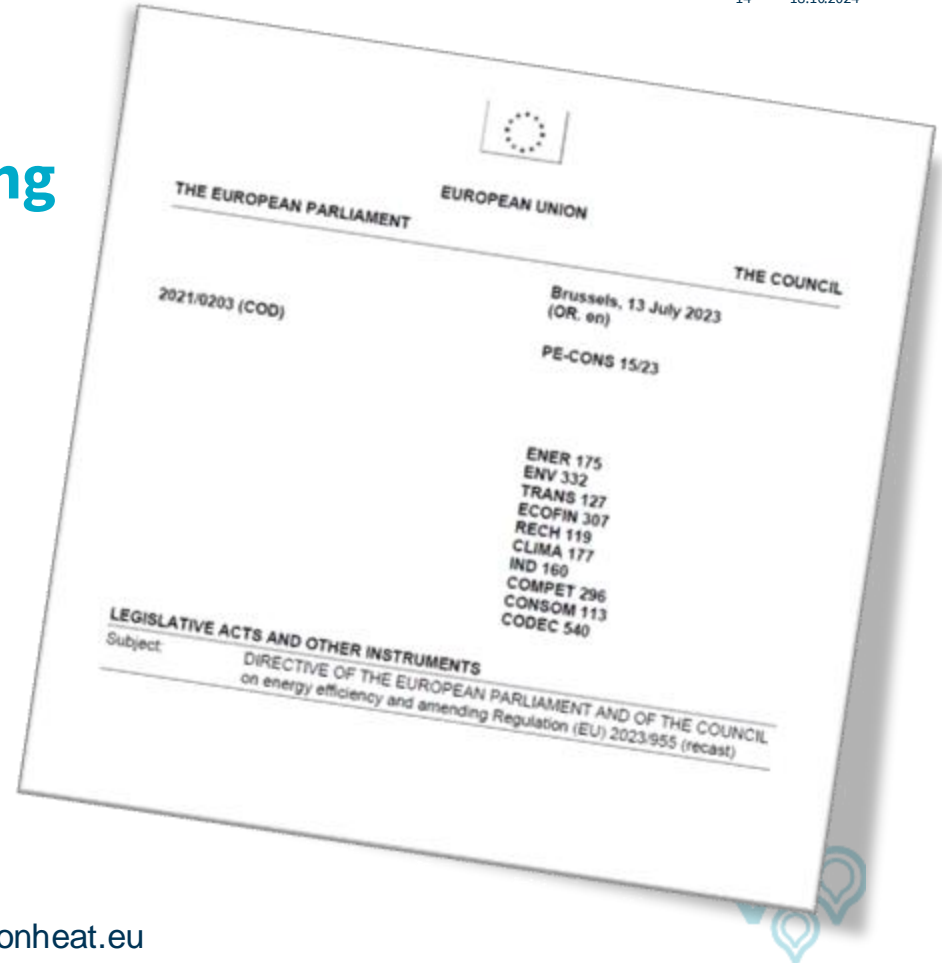
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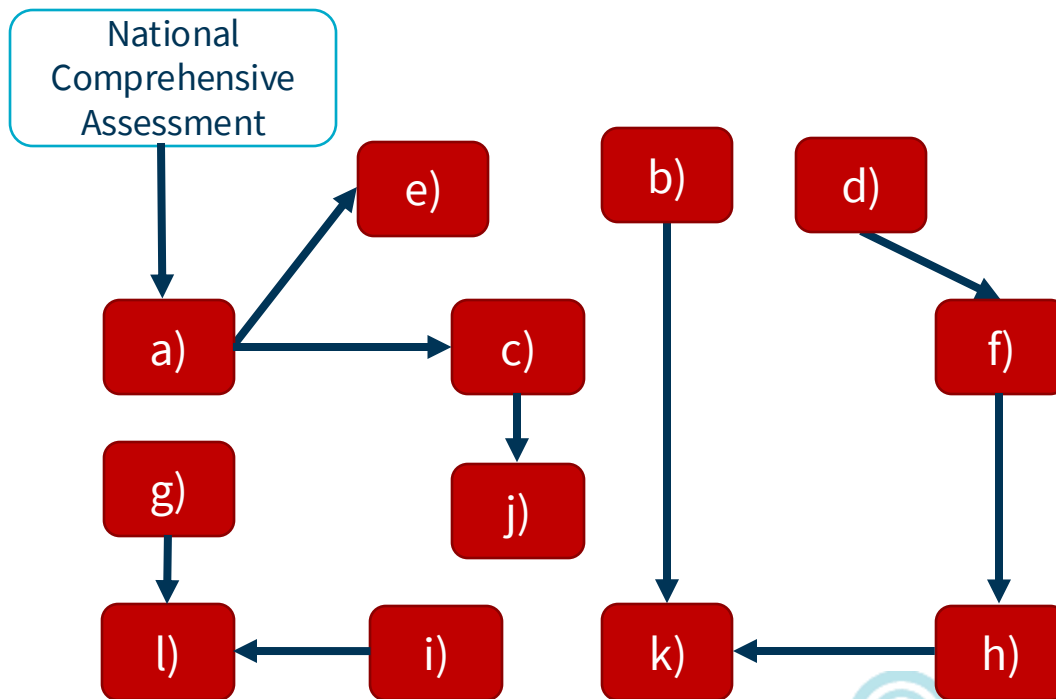


## Requirement for H&C planning

- Article 25 (6)
  - Member States shall ensure that regional and local authorities prepare local heating and cooling plans at least in municipalities having a total population higher than 45 000
- Transposition of the article into national law until September 2025
- Various requirements for the content of the local heating and cooling plans are defined



Description	
a)	provide estimate and mapping of the potential
b)	be compliant with Energy Efficiency first principle
c)	strategy for the use of the identified potentials
d)	involve all relevant stakeholders and the general public
e)	take into account relevant existing infrastructure
f)	consider the common needs of local communities and multiple local or regional administrative units or regions
g)	assess the role of energy communities and other consumer-led initiatives
h)	include analysis of H&C in local building stock
i)	assess financing
j).1	include a trajectory to achieve the goals
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k)	replace inefficient H&C appliances in public buildings
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Exact formulation:

be based on the information and data provided in the comprehensive assessments carried out pursuant to paragraph 1

and provide an **estimate and mapping** of the **potential for increasing energy efficiency**, including via

– **low-temperature district heating readiness**,

– high efficiency cogeneration,

– **waste heat** recovery, and

– **renewable energy**

in heating and cooling in that particular area;



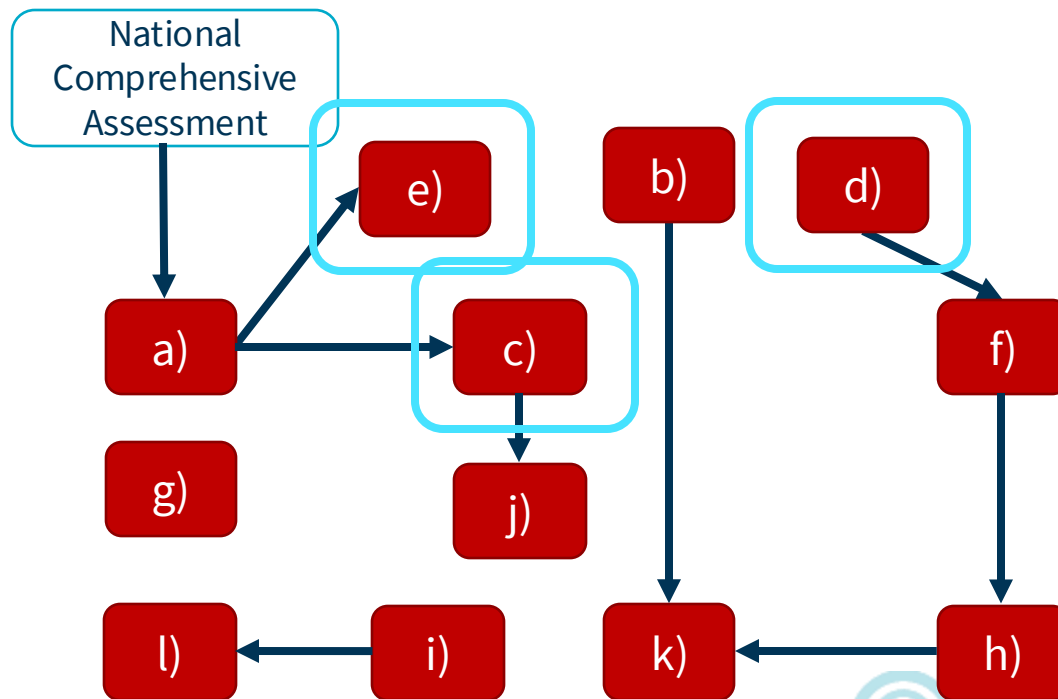
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- “energy efficiency first’ means **taking utmost account in energy planning, and in policy and investment decisions, of alternative cost-efficient energy efficiency measures** to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy, **whilst still achieving the objectives of those decisions” (Governance regulation 2018, Art. 2 (18)**
- Keywords on EE1st in the **EED 2023**, (16-21) as well **Art. 3 (5)**
  - **Cost benefit analysis**
  - Consider / assess **wider benefits of energy efficiency** solutions /measures
  - Life-cycle, Long-term perspective
  - System and cost efficiency
  - **Security of supply**
  - **Quantification** from **societal, health, economic** and **climate neutrality**
  - Sustainability
  - Circular economy
  - **Transition to climate neutrality**
  - **Energy poverty**
- **Integrated district heating / cooling planning**: use a cost-benefit-analysis to find most cost-effective heat supply options evaluated against reducing heat demand through energy efficiency in buildings and processes (DG ENER 2021, p. 13)





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Exact formulation:

consider the **common needs of local communities** and **multiple** local or regional **administrative units** or regions

**assess** the **role of energy communities** and other **consumer-led initiatives** that can **actively contribute to** the implementation of local heating and cooling **projects**



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Exact formulation:

include an **analysis of** heating and cooling **appliances** and systems **in local building stocks**, taking into account the **area-specific potentials for energy efficiency measures** and addressing the **worst performing buildings** and the needs of **vulnerable households**;



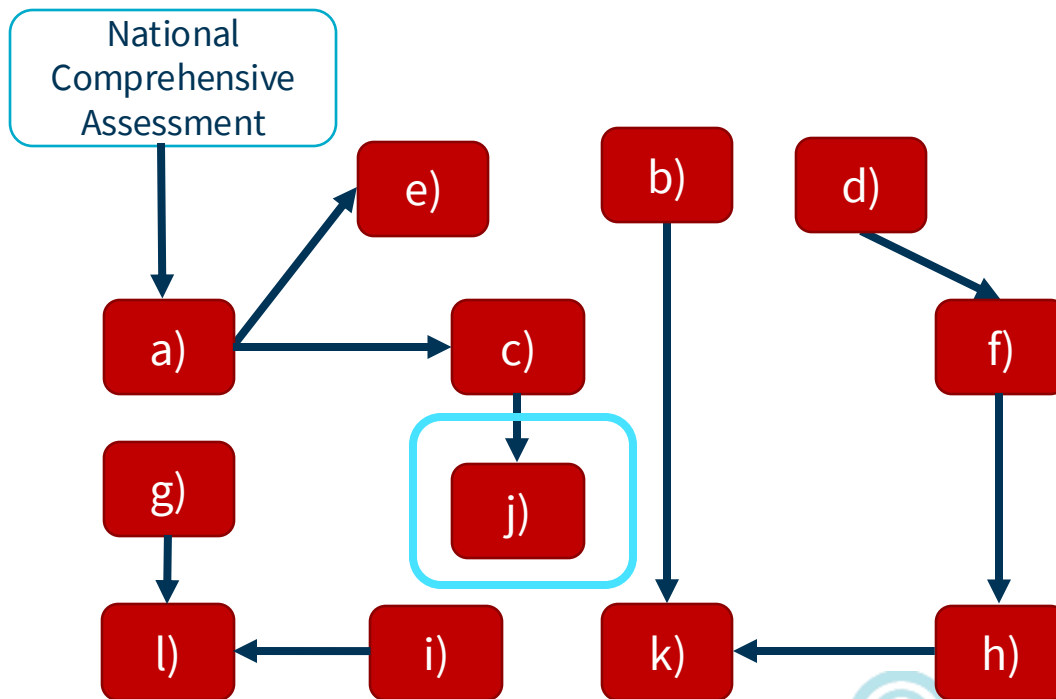
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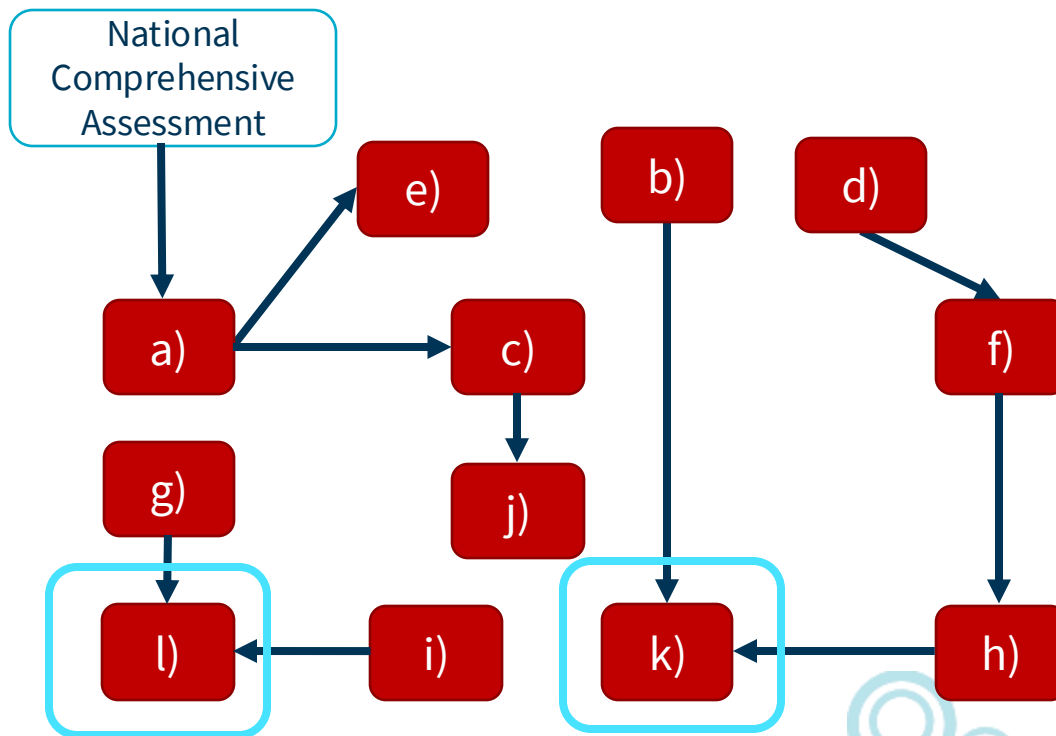
**assess** how to **finance** the **implementation of policies and measures** and **identify financial mechanisms** allowing **consumers** to shift to renewable heating and cooling;



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Directive Breakdown		Key Words Collection for checking the relevant passages in the H/C plan documents	Checklist for compliance
Potential for increasing energy efficiency	estimate	Renovation, efficiency, renovation scenario, demand forecast, maps, building archetype, building renovation status, maps	# Building renovation scenarios are presented # A description of the method and the assumptions of the renovation scenarios is provided # Heat zoning (current state of demand) based on building renovation/demand/building type is presented # A map with savings over the territory is provided
	mapping		
Potential for low-temperature district heating readiness (readiness of buildings)	estimate	Low temperature district heating (LTDH) (readiness), renovation level, low temperature supply systems, radiators	# The temperature level of the existing heat supply systems in the buildings are mentioned / analysed # Buildings potentially supplied by LTDH are identified # Zones potentially suitable for low-temperature district heating are identified
	mapping		
Potential for high efficiency cogeneration	estimate	High efficiency cogeneration, CHP, highly efficient	# High-efficiency cogeneration is mentioned in the plan # Existing (cogeneration) plants are presented on a map # Relevant parameters for cogeneration plants to be highly efficient is presented # Presented potentials of cogeneration plants distinguish between highly efficient and not highly efficient
	mapping		
Potential for waste heat recovery	estimate	Waste water treatment, waste heat, industrial waste heat, data centers	# Locations of waste heat sources are identified # Estimates of the temperature level and the available waste heat are presented
	mapping		
Potential for Renewable Energy	estimate	Shallow geothermal, deep geothermal, Solar PV, Solar thermal, Biomass	# The available potential of renewable energy for heat and cold supply is presented (in terms of energy and/or power) # The potential is shown on a map (maybe not covering all potentials)
	mapping		
Potential for cooling	estimate	cooling demand, commercial buildings	# An estimation of the energy demand for cooling of buildings is presented # A map showing the (theoretical) energy demand for cooling in the territory is presented (# The increasing cooling demand due to climate change is addressed)
	mapping		



## Conclusions on Art. 25 (6) implementation

- Requirements and compliance:
  - **All aspects** integrated in the requirements in Art. 25 (6) **make sense in integrated / strategic heat planning**;
  - A **strict interpretation** of each requirement **might lead to many plans not compliant**;
  - In a first round of developed plans compliance could potentially be met when majority of requirements are integrated at least somehow; in the next round of plans with higher level of detail
  - **Guidance** of how compliance can be achieved and is interpreted **is needed**
- It makes sense to **provide assistance from the regional (/national) level**:
  - Provision of **guidelines** for the implementation / interpretation of the requirements
  - **Draft text to be included** in the heat plans
  - **Framework agreements** for heat planning
  - Involvement of the regional energy agency

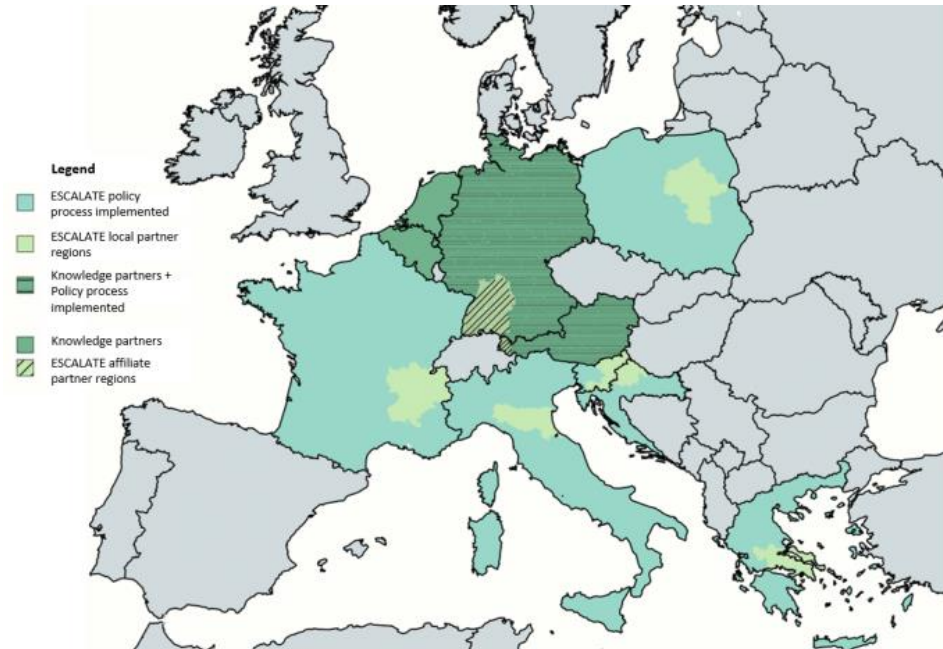




## New LIFE project ESCALATE

ESCALATE local heating and cooling transition plans: Regional multipliers of capacity building and technical support to empower local administrations

- LIFE project, just entered the GA preparation phase
- Directly focusing on LRAs and the implementation of Art. 25(6)
- Involved:
  - 8 local energy agencies
  - 5 knowledge partners
  - 1 communication partner
  - 10 countries



# Content

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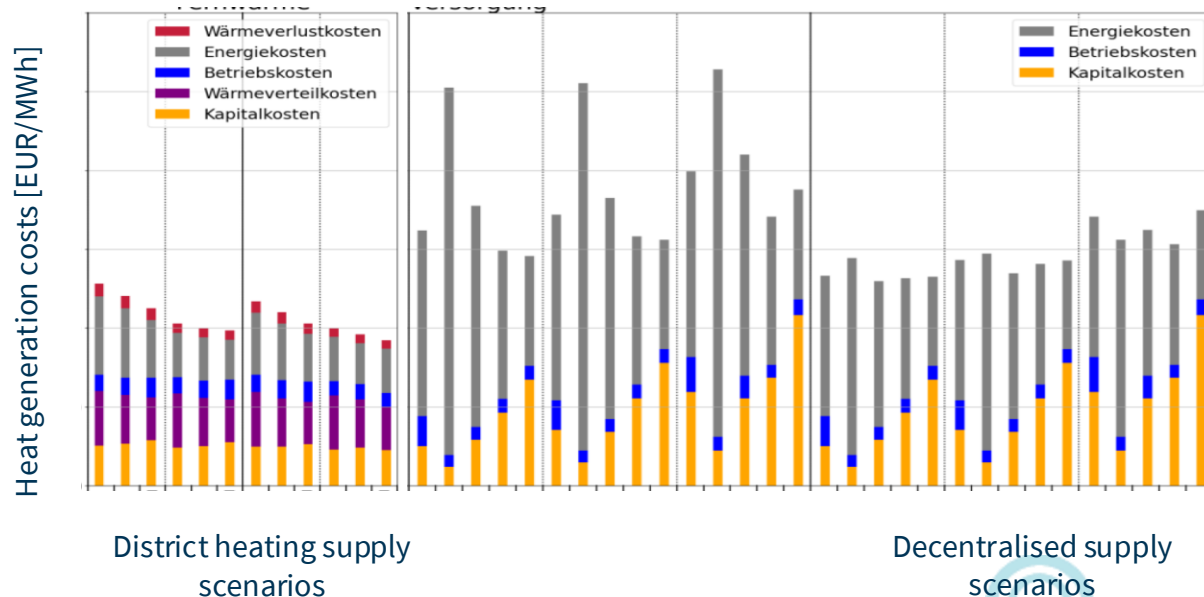
## Structure of the chapter

- Why are DH zones / priority areas meaningful?
- Difference between zoning and priority areas / mandatory connection
- Overview of DH zoning and mandatory DH connection in the EU
- Aspects of regulating mandatory DH connection



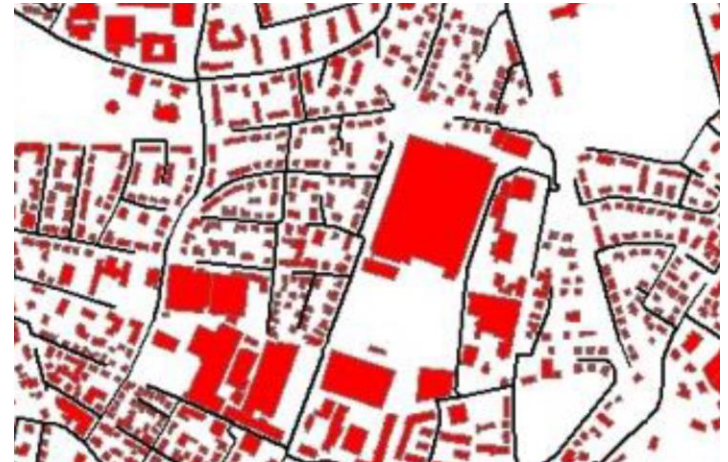
# Why district heating?

- District heating can be the most cost-effective supply option under certain circumstances
- Primarily dependent on distribution costs and availability of locally available energy resources



## Heat distribution costs

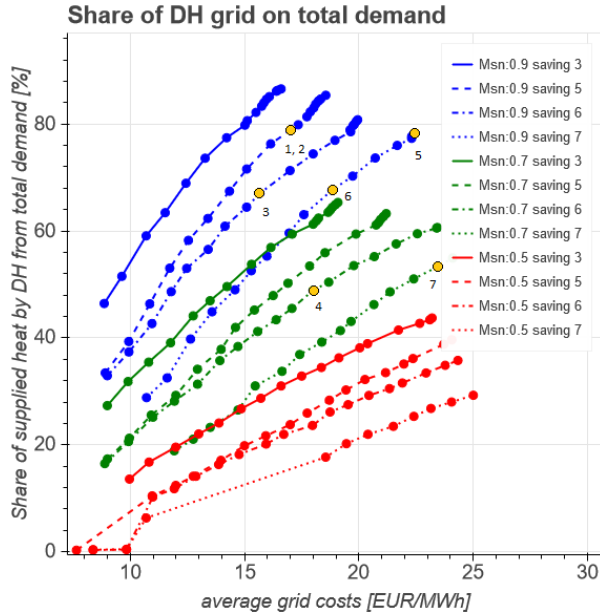
- Costs for heat distribution:
  - Capital costs for pipeline construction
    - Transmission lines (for large networks), distribution lines, and house connection lines
    - Costs depend on dimension, type of pipe and effort of laying
  - Operating costs (pumping power, maintenance of the network)
- Reference value - delivered amount of heat:
  - Total amount of heat delivered to customers at the transfer station



→ The costs per heat supply decrease the more heat consumers per meter of trench length are (can be) connected

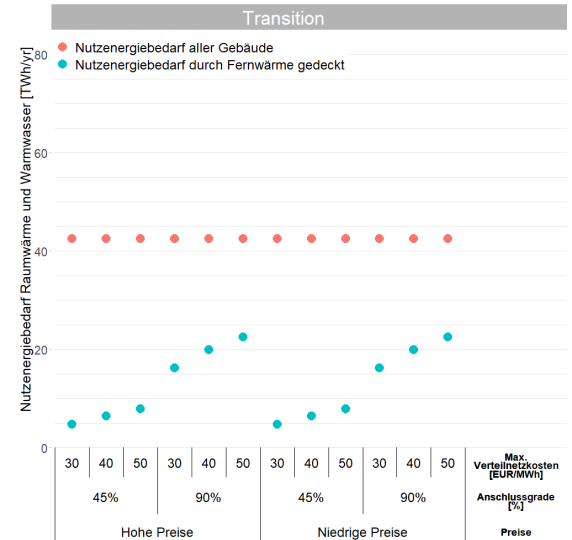


# Heat distribution costs – sensitivity



Source: Hotmaps, Wärme- und Kälteplan der Stadt Frankfurt a.M. (2020)

- Clear influence of the connection rate / market shares on servable areas / economic potential
- Renovations and the resulting reduced heat demand also affect profitability



Source: Potenzial für eine effiziente Wärme- und Kälteversorgung, Studie im Auftrag des BMK (2021)

## Why zoning? Why priority areas?

- Reduction of heat supply costs for heat consumers
  - see previous explanation
- Air quality control
  - To prevent emissions that reduce the quality of life in the inhabited / used area
- Enabling a CO<sub>2</sub>-neutral heat supply
  - Possibly no potential / no possibility of CO<sub>2</sub>-neutral supply, except district heating
  - For example, heat pumps cannot be implemented (space, noise)
  - For example, no prospect of CO<sub>2</sub>-neutral gas (at acceptable prices)
- Enabling the economically viable use of CO<sub>2</sub>-neutral potentials
  - For example, deep geothermal energy



# Difference between zoning and priority areas / mandatory connection

- **DH zoning:**

- identify areas / zones, where the most meaningful heat supply is via district heating

- **DH priority / mandatory DH connection:**

- a building is forced by law to connect to the existing DH system in certain situations





## Identification of areas where DH makes sense (zoning)

- Database
    - Heat demand measured vs. estimated
    - Costs incurred (e.g. installation costs, or installation of heat pumps, ...)
  - Methodology
    - What costs are being used?
    - What depreciation periods, interest rates, etc.?
    - What is the alternative being compared against?
- There are always uncertainties in the data and assumptions
- What is crucial is a method and calculation that is accepted by the actors involved
- A standardized method helps to increase acceptance and reduce transaction costs



# Overview of DH zoning and mandatory DH connection in the EU

- DH zoning is done in several regions in EU within energy/heat plans with different focus (e.g. DK, NL, EE, LT, SE, DE)
- DH zoning is not always connected to a mandatory DH connection (e.g. currently in NL there is always an opt-out possible)
- Most widespread variant of mandatory DH connection is for new buildings (existent in 26% of all EU countries + Norway, Iceland, Ukraine, UK, at least in some regions)
- Many regions work with incentives to bring buildings to connect to DH in DH zones
- In several countries currently new zoning and mandatory connection approaches are under discussion / development (e.g. DE, AT, UK, NL)



## Aspects of regulating mandatory DH connection

- DH must increase the common good
- DH must be the cheapest solution
- DH supply must be guaranteed
- Who is obliged to connect to DH?
- How to define alternative solutions to DH?



## District heating must increase the common good

- Climate and resource protection (e.g., Germany, EEWärmeG, Switzerland, MuKE n)
- Supply from waste heat and renewable resources / highly efficient district heating (e.g., Styria (Austria), StRoG)
- Public health, e.g. air pollution control (e.g., Upper Austria LuftREnTG)
- Most cost-efficient solution for the society (e.g. Danish Heating Supply Act)
- Energy supply security (e.g. LT National Energy independence strategy, Danish Heating Supply Act)



## District heating must be the cheapest solution

- A mandatory connection should generally not result in additional costs for consumers compared to an alternative solution.
- **Denmark / UK:** a standardized method derives regions, where DH is the cheapest heat supply option (Danish Heating Supply Act, UK Energy Act 2023)
- **France:** a DH connection obligation is only possible if a study demonstrates that DH is the most cost-effective supply option (Bacquet et al. 2022)
- **Switzerland:** depends on Canton; In Zürich an xls sheet is used to calculate levelized costs of heat for DH compared to an oil heating for single buildings (Planungs- und Baugesetz Zürich)
- **Estonia:** DH regions are determined via a feasibility analysis developed by the municipality (often outsourced) in collaboration with the local operator and participation of the public; DH price is regulated and needs to be approved by the Competition Authority (EE District Heating Act)

## District heating supply must be guaranteed

- It must be ensured that there is a provider offering services at appropriate prices
- **Denmark:** municipal DH provider with a non-profit obligation (Danish Heating Supply Act).
- **Styria, Austria:** mandatory connection only with a binding commitment from the DH provider, including information on reasonable and specific prices and conditions (StRoG 2010 & Stmk BauG).
- **Estonia:** DH regions are determined by the municipality in collaboration with the local operator (EE District Heating Act)



## Who is obliged to connect?

- **In most cases only for new construction:** in 26% of all EU countries (+ Norway, Iceland, Ukraine, UK) there is a connection obligation in some form; predominantly only for new construction and in individual municipalities / states (Bacquet et al. 2022)
- **Zurich, Switzerland:** new construction as well as in case of replacement of the heating system; an approval of the building authority is needed for every replacement of heating systems (Planungs- und Baugesetz Zürich)
- **France:** in classified heating networks (DH priority areas) mandatory connection for new buildings or those undergoing major renovations if their heating/cooling capacity exceeds 30 kW
- **UK:** exemptions for areas, where connecting to a heat network is not cost-effective or where a better low-carbon solution exists; Buildings not already communally heated within designated zones will not be required to connect, although they may choose to do so
- **Vienna, Austria:** ban of gas heating and mandatory DH connection in case DH is near enough for new buildings; In designated DH areas / expansion areas grid will be built, connection is promoted; general agreement in city and utility to not use gas for heating in the future



## Challenge: Approval and definition of alternatives

- In climate and resource protection, other alternatives than DH with CO<sub>2</sub>-neutral provision always need to be allowed
- What is technically infeasible? What is economically unreasonable?
- Especially for existing buildings this is more challenging
- At the same time: it is crucial that with overly broad exceptions, district heating might no longer be the most economical option





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## Summary

- Many activities ongoing in different countries
- Some countries have strong policies in place
- Many countries still do not have relevant heat planning policies in place
- Open questions in all places
- No one solution fits all



## Room for your questions



# Thank you very much for the interest!



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[www.actionheat.eu](http://www.actionheat.eu)

