Webinar 9:
Existing heat planning policies in Europe

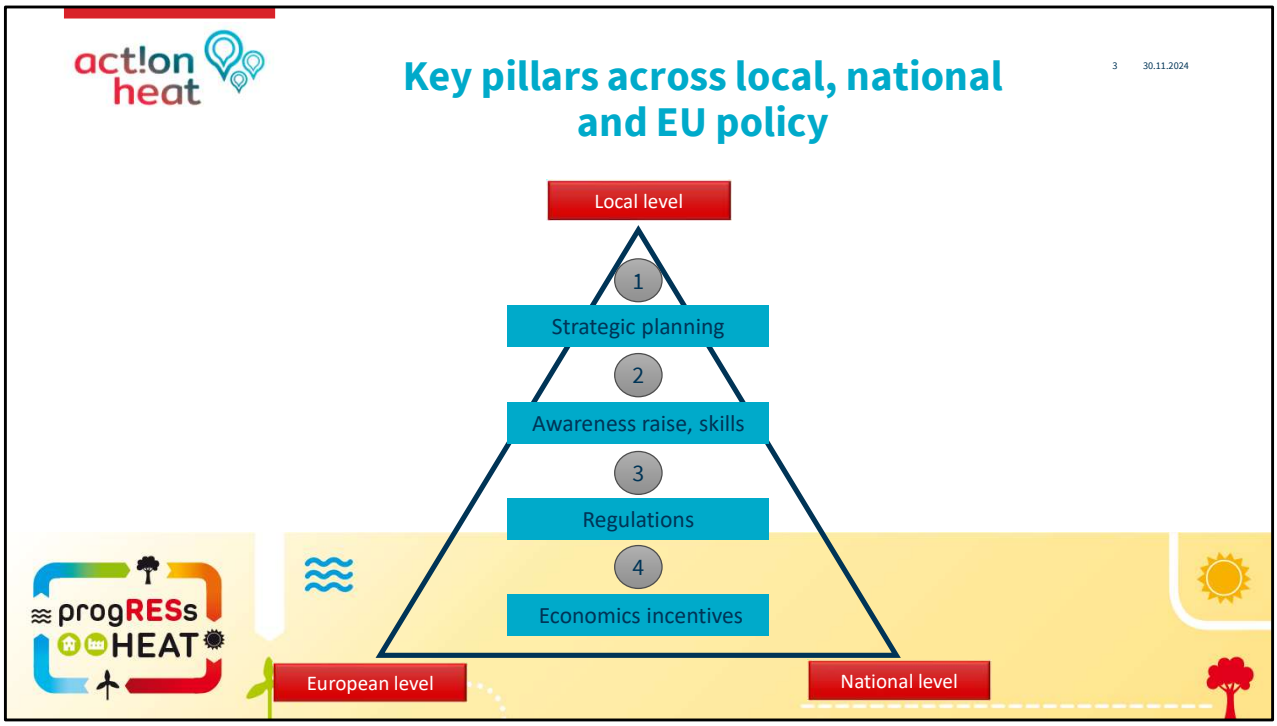
Act!onHeat SF1

- Serial 3:
    - Webinar 9
        - Strategical Heating & Cooling planning
        - Group support for municipalities and stakeholders

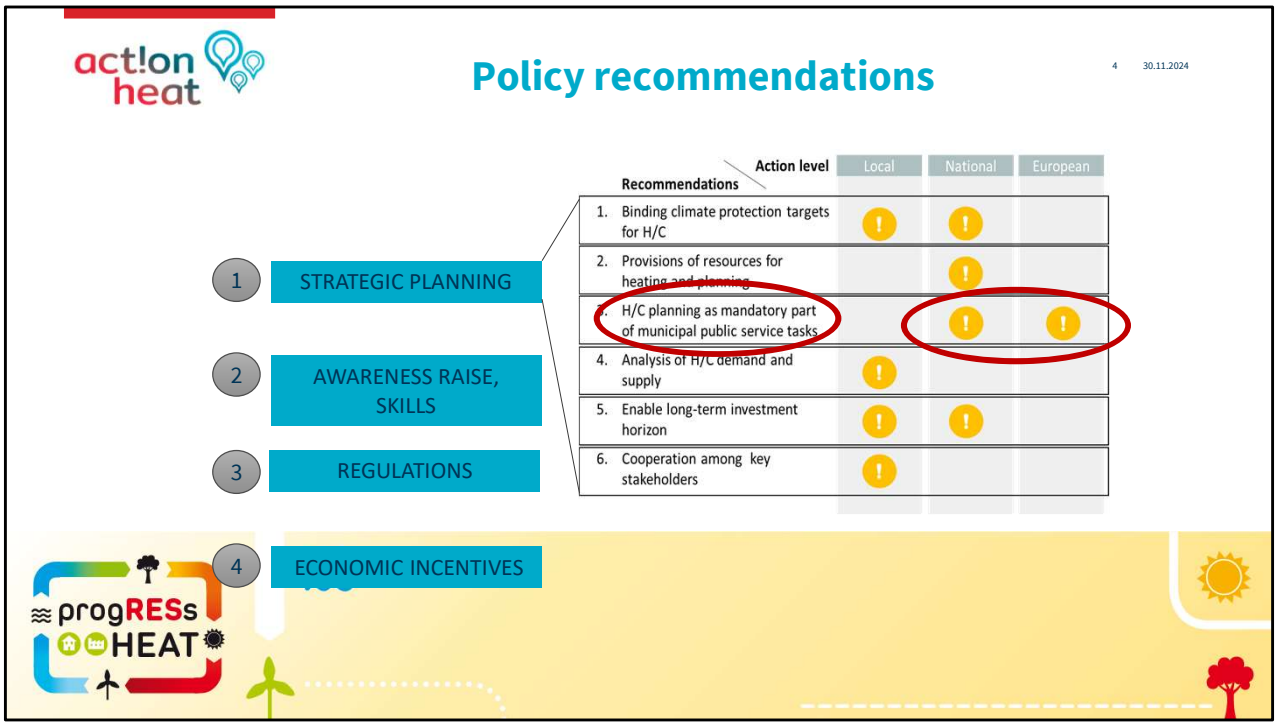
- Presented by:
    - e-think / Austria

The discussion explored current heat planning policies in Europe, with a focus on zoning policies and best practices across various countries. It examined how these practices align with the Energy Efficiency Directive (EED) to support sustainable heating and cooling systems. The webinar was led by Marcus Hummel.

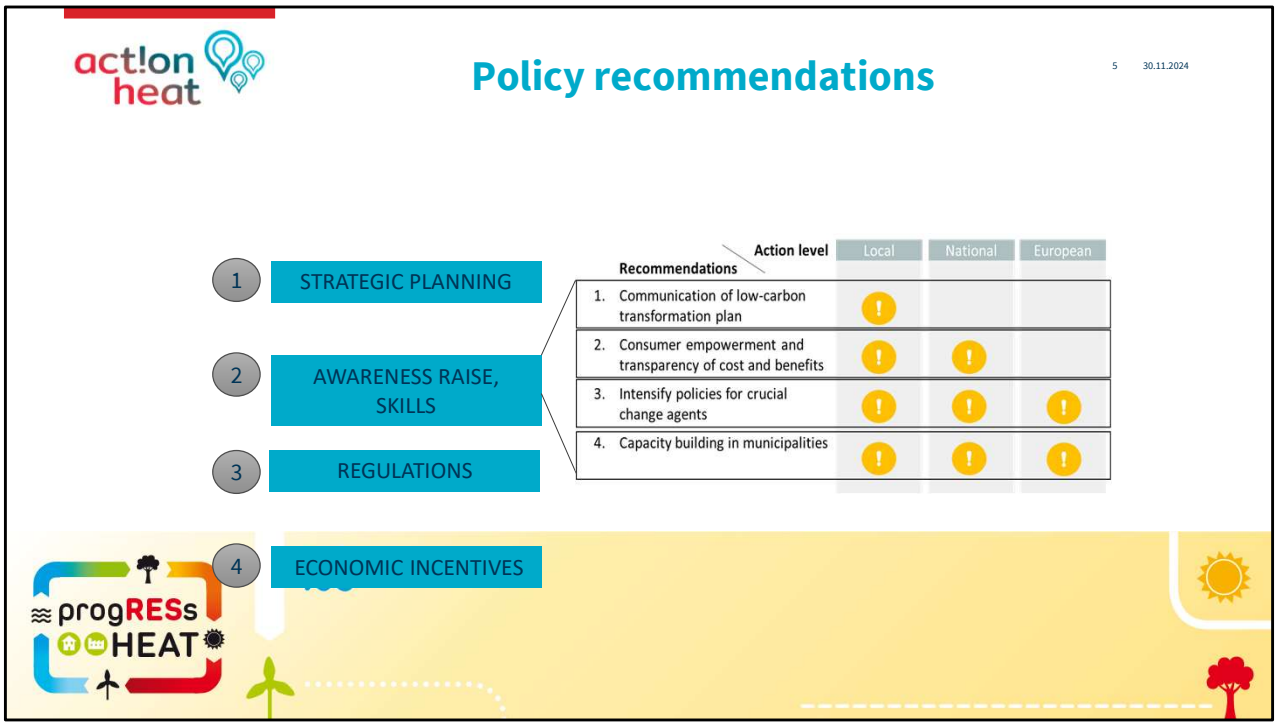
Content



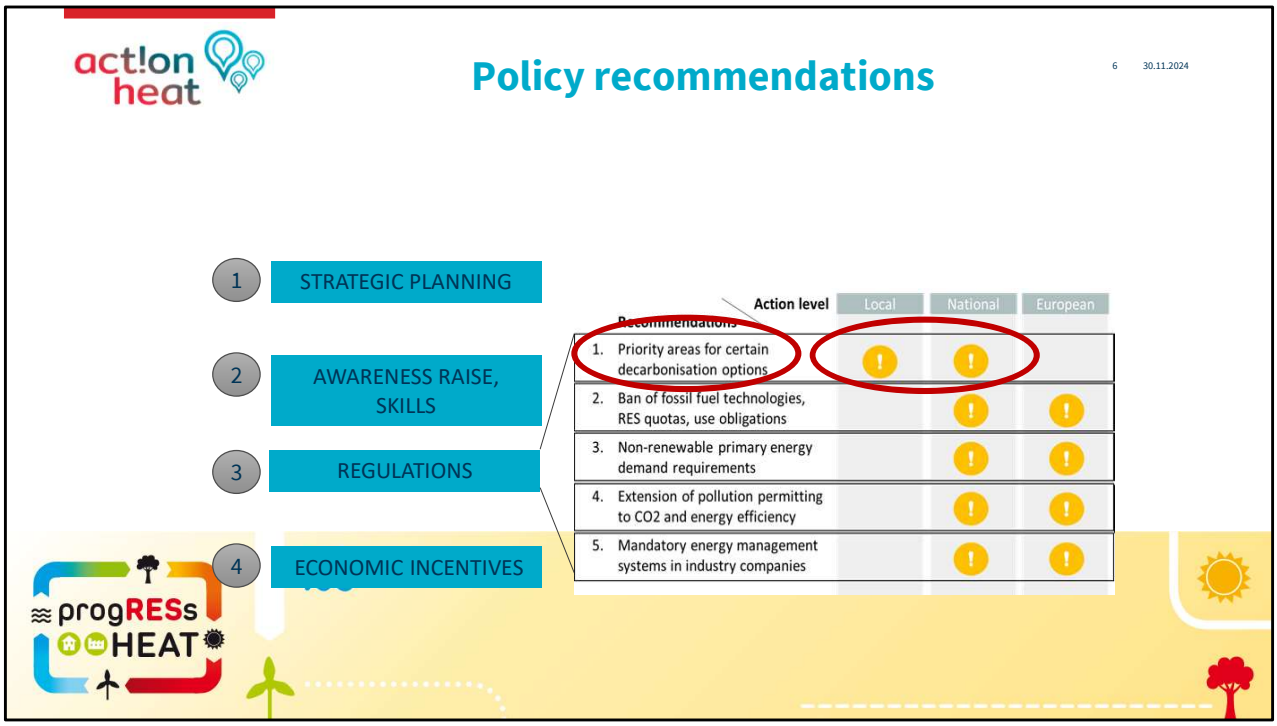
- Emphasis on strategic planning, regulations, awareness-raising, and economic incentives to drive effective heat planning.
- Collaboration is essential across local, national, and EU levels to align policies and maximize impact.
- Zoning policies, combined with mandatory connection requirements, can significantly improve district heating networks.



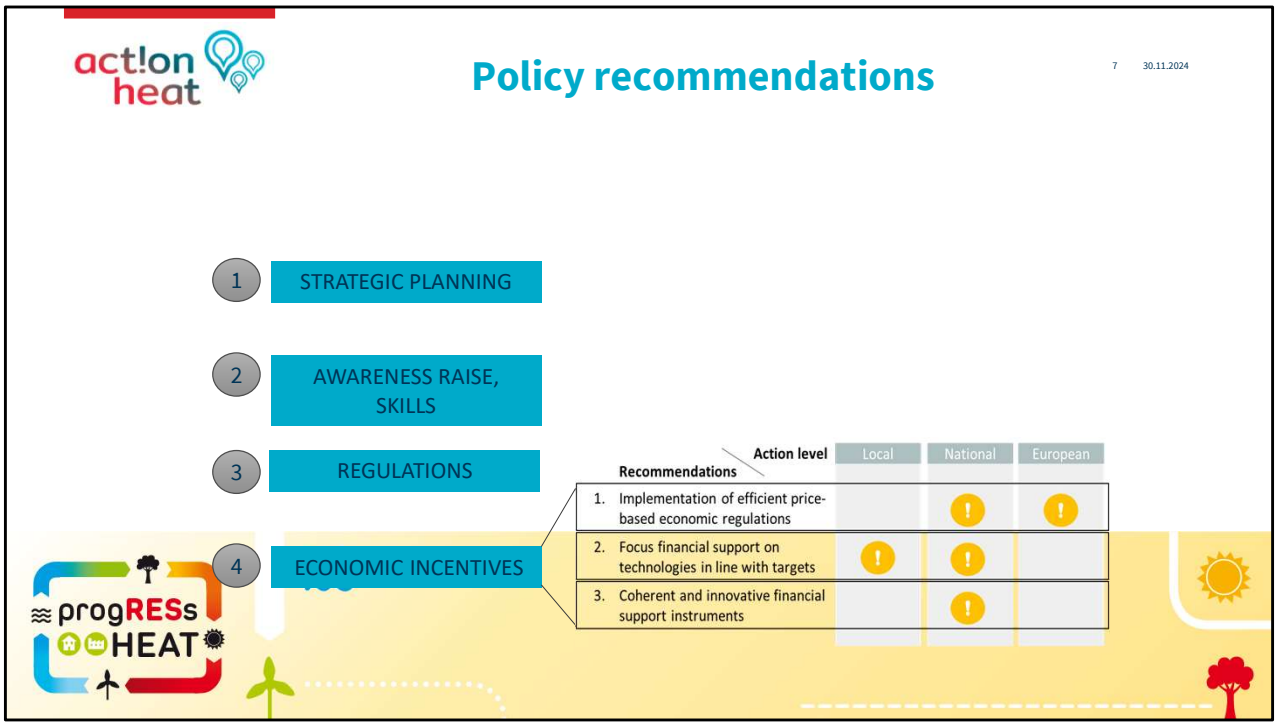
- Heating and cooling (H&C) planning should be a mandatory responsibility for municipalities.
- Establishes a structured approach to meet local energy needs efficiently and sustainably.
- Ensures alignment with national and EU-level policies for cohesive action.
- Helps municipalities prioritize energy efficiency and integrate renewable sources in H&C supply.



- Raising awareness is crucial to gain public support for sustainable heating and cooling (H&C) initiatives.
- Skill development programs are needed for local authorities to implement effective H&C planning.
- Educating stakeholders helps promote energy-efficient technologies and practices.
- Strong awareness and skills create a foundation for successful and long-lasting H&C solutions.



- Regulations are essential to align heating and cooling (H&C) planning with environmental and energy objectives.
- National-level designation of priority areas for district heating should be implemented locally.
- A strong regulatory framework ensures consistent standards and compliance across all regions.
- Clear regulations support the long-term sustainability and effectiveness of H&C systems.



- Economic incentives are crucial to encourage investments in sustainable heating and cooling (H&C) systems.
- Financial support can make it easier for municipalities and consumers to transition to district heating and cooling.
- Incentives help accelerate the adoption of energy-efficient and renewable technologies.
- Well-designed incentives drive progress towards decarbonized and resilient H&C systems.

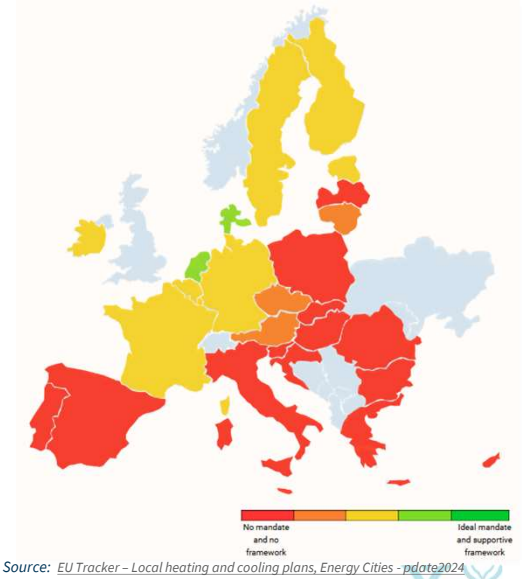
Selected overall conclusions to make DH renewable and efficient

- ***Policy packages needed*** *taking into account all 4 pillars of action and 3 levels of regional scope*
- ***Long-term targets*** *and long-term* ***analysis / planning*** *is crucial at national and local level taking into account all possible options (efficiency, RES-H/C, RES-E for heating)*
- ***DH*** *is the* ***only way to decarbonise densely populated areas*** *with limited efficiency potentials & DH* ***facilitates the integration of RES****, excess heat and power-to-heat in the system*
- ***Zoning*** *(definition of DH priority areas)* ***is a promising approach to reach low costs of DH*** *even with decreasing heat demand (through high connection rates)*
- *Clear indication that* ***DH as public service cheaper than profit-oriented DH***
- ***Integration / information of consumers / end-users is very important*** *for successful conversion to efficient and renewable DH*

Content

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*

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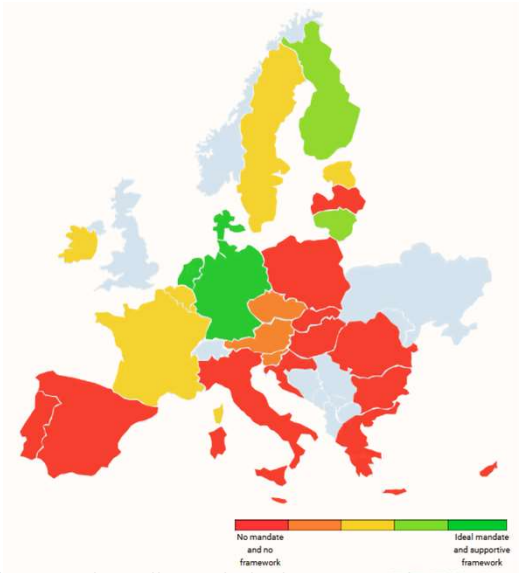
- H&C planning across Europe shows significant disparity; some countries lack clear policies and support frameworks.
- Technical and financial assistance are essential, as legislation alone is insufficient for effective implementation.
- Cooling planning remains a gap in many countries, with limited integration into broader H&C strategies.
- Spatial dimensions, such as zoning for district heating, are critical but often missing, reducing plan effectiveness.

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**

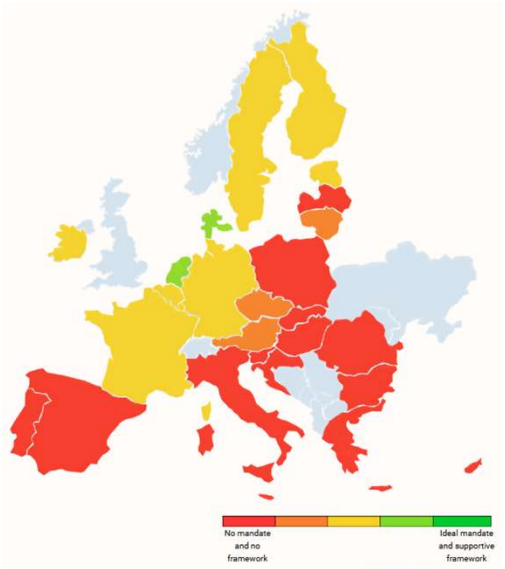


Source: *EU Tracker – Local heating and cooling plans, Energy Cities - pdate2024*

- Some countries have a long tradition of H&C planning, often driven by energy security rather than climate protection.
- Recent years have seen new obligations introduced in countries like the Netherlands and Germany.
- Strong incentives exist in regions like Flanders, Luxembourg, and France, but nearly half of EU countries lack a legal framework.
- Comprehensive legal frameworks are essential to establish consistent and effective H&C planning.

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 geo**data** for planning purposes



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

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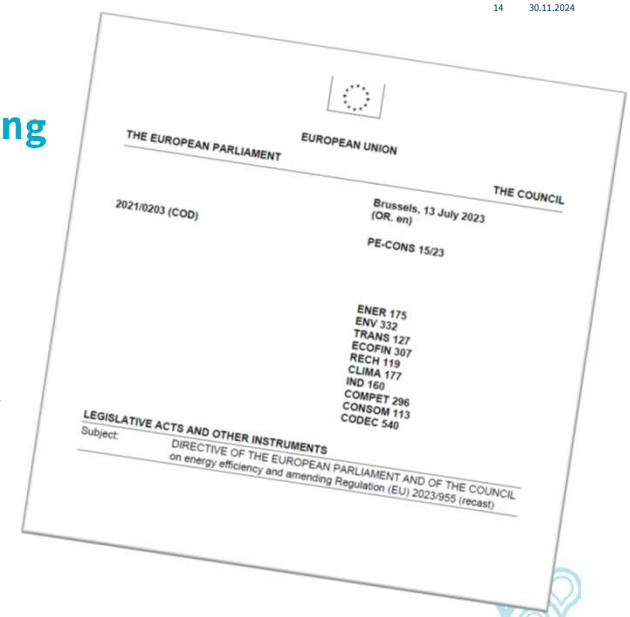
- Countries with H&C planning obligations often provide technical and organizational support frameworks.
- Financial support is typically project-focused, with limited funding for planning activities.
- A lack of staff and expertise in municipalities remains a significant barrier across Europe.
- Access to reliable energy-related and geospatial data is crucial for effective planning but is often insufficient.

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

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



EUROPEAN UNION

THE EUROPEAN PARLIAMENT

THE COUNCIL

2021/0203 (COD)

Brussels, 13 July 2023
(OR. en)

PE-CONS 15/23

ENER 175
ENV 332
TRANS 127
ECOFIN 307
RECH 119
CLIMA 177
IND 160
COMPET 296
CONSOM 113
CODEC 540

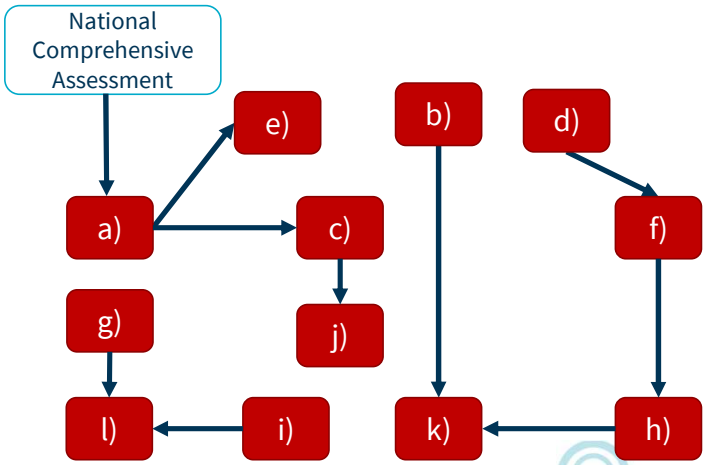
LEGISLATIVE ACTS AND OTHER INSTRUMENTS

Subject: DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on energy efficiency and amending Regulation (EU) 2023/955 (recast)

- Article 25(6) of the EED mandates local H&C plans for municipalities with populations over 45,000.
- These plans must estimate and map potential for energy efficiency, waste heat recovery, and renewable energy integration.
- Transposition into national law is required by September 2025 to align with EU regulations.
- Clear guidelines are needed to ensure consistency and compliance across regions.

Local heating and cooling (H&C) plans Requirements and Interconnections

	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
j).2	include the monitoring of the progress
k)	replace inefficient H&C appliances in public buildings
l)	assess potential synergies with the plans of neighboring authorities



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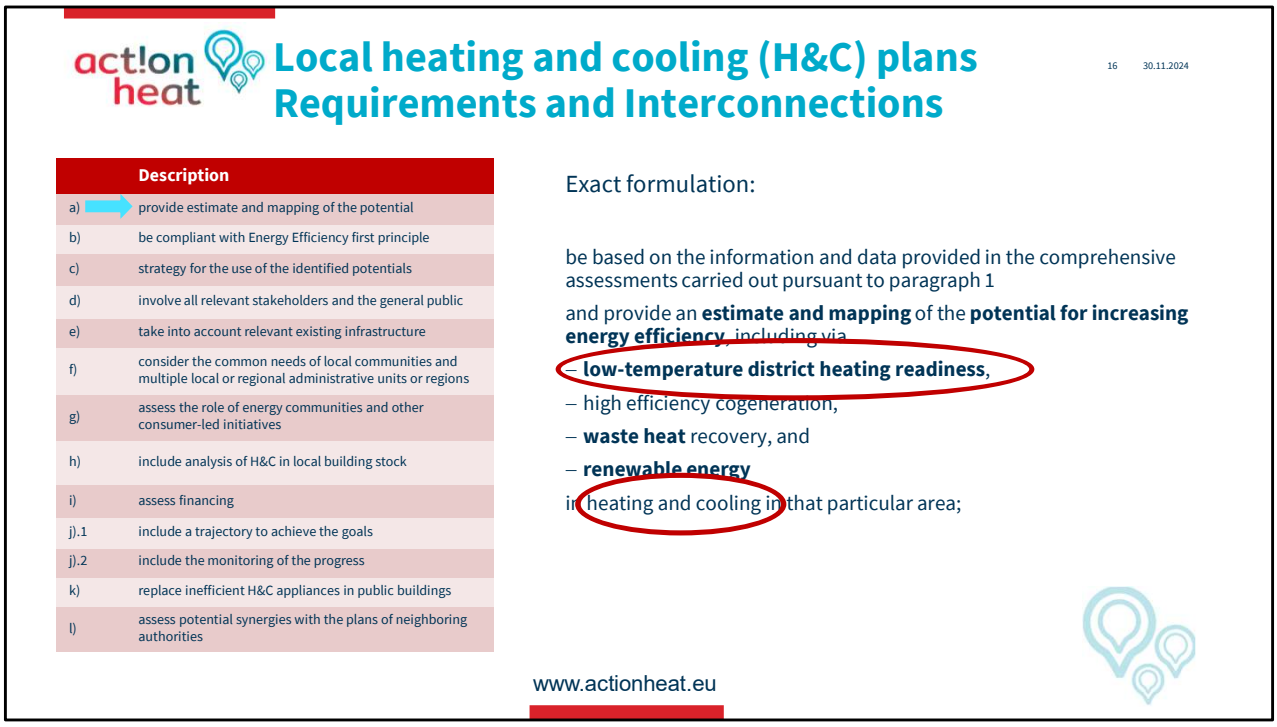
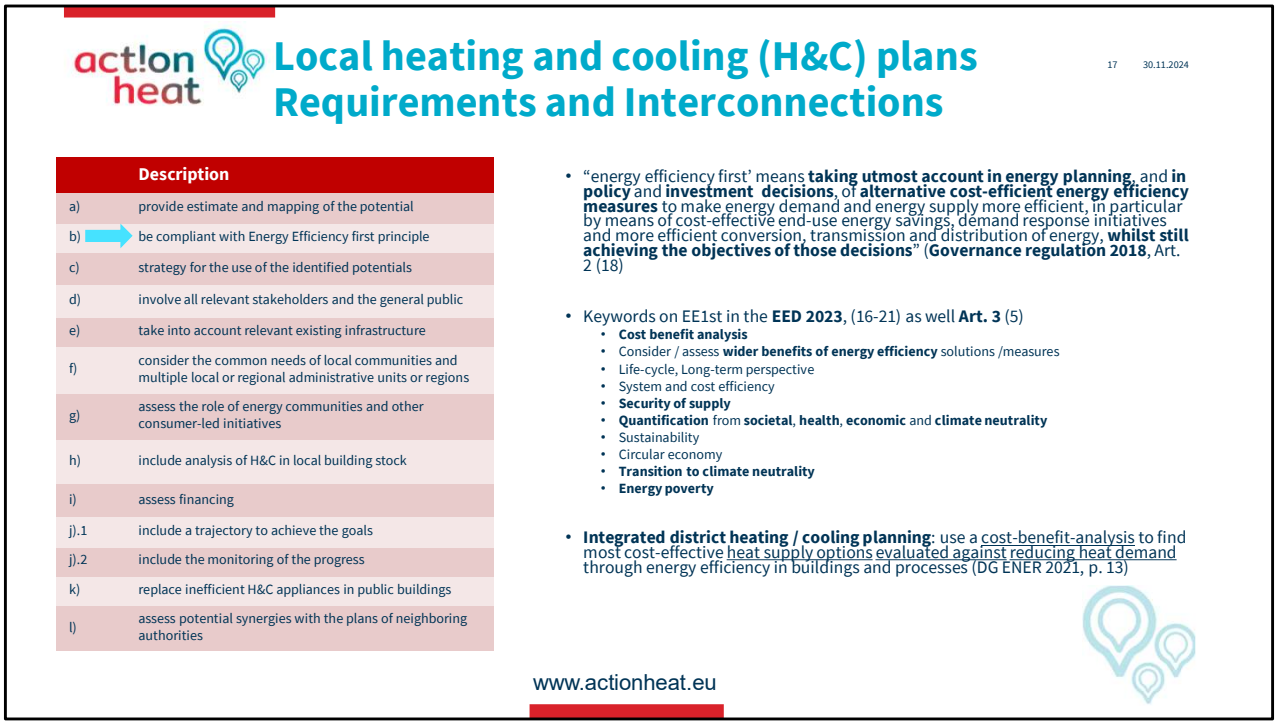
- Plans must address energy efficiency improvements, renewable energy integration, and district heating readiness.
- Regular comprehensive assessments should be conducted to ensure compliance with EED Article 25.
- Plans should include top-down calculations and identify energy efficiency as a top priority.
- Cooling requirements, often overlooked, must be explicitly included in H&C plans.



- Prioritize energy efficiency in H&C planning before exploring new energy supply options.
- Implement cost-effective measures to reduce energy demand and improve system efficiency.
- Use cost-benefit analyses to evaluate societal, economic, and environmental benefits of efficiency measures.
- Ensure energy efficiency is central to achieving climate neutrality and reducing energy poverty.



- Effective H&C plans require active involvement of all stakeholders, including local energy communities.
- Strategies should move beyond city-led initiatives, incorporating consumer-driven contributions.
- Engage stakeholders early to align expectations and ensure practical implementation of plans.
- Combine technical assessments with participatory planning to enhance acceptance and success.

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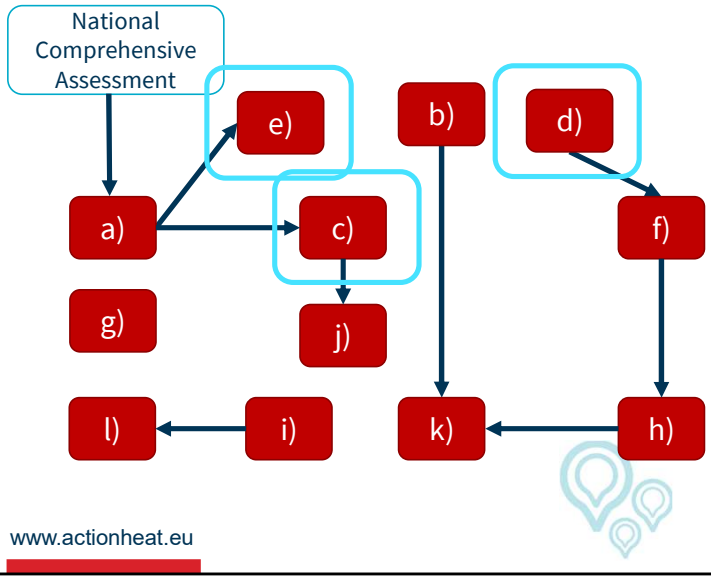

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- Identifying energy potential must be complemented by strategic planning to ensure effective implementation.
- Infrastructure development should align with actionable strategies, prioritizing efficiency and sustainability.
- Stakeholder engagement is critical to designing infrastructure that meets community and policy needs.
- Incorporating diverse inputs ensures robust infrastructure planning for heating and cooling systems.

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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**

- Local energy communities are often overlooked in H&C planning but have great potential to contribute
- Empower consumer-led initiatives to support the transition to sustainable heating and cooling systems.
- Encourage collaboration between local authorities and energy communities to create robust plans.
- Integrate community-driven solutions to enhance inclusivity and effectiveness in H&C planning.

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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**;

- Reliable data, particularly geospatial and energy-related, is crucial for effective H&C planning.
- Addressing data gaps helps align planning efforts with energy efficiency and sustainability goals.
- Accurate data enables targeted interventions for vulnerable households and worst-performing buildings.
- Enhanced data collection supports better decision-making and energy poverty alleviation.

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Exact formulation:

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

- Identify funding mechanisms to support the shift to renewable heating and cooling systems.
- Develop strategies to make financing accessible for consumers and municipalities.
- Prioritize financial support for vulnerable households to ensure an equitable transition.
- Link financing solutions to long-term H&C plans to sustain momentum in decarbonization efforts.

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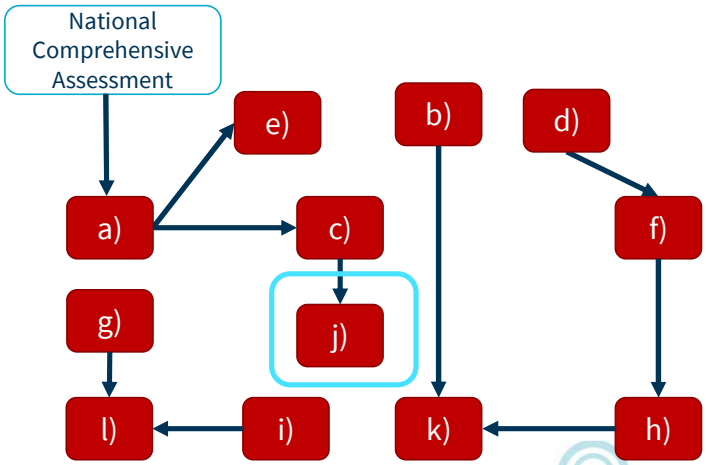

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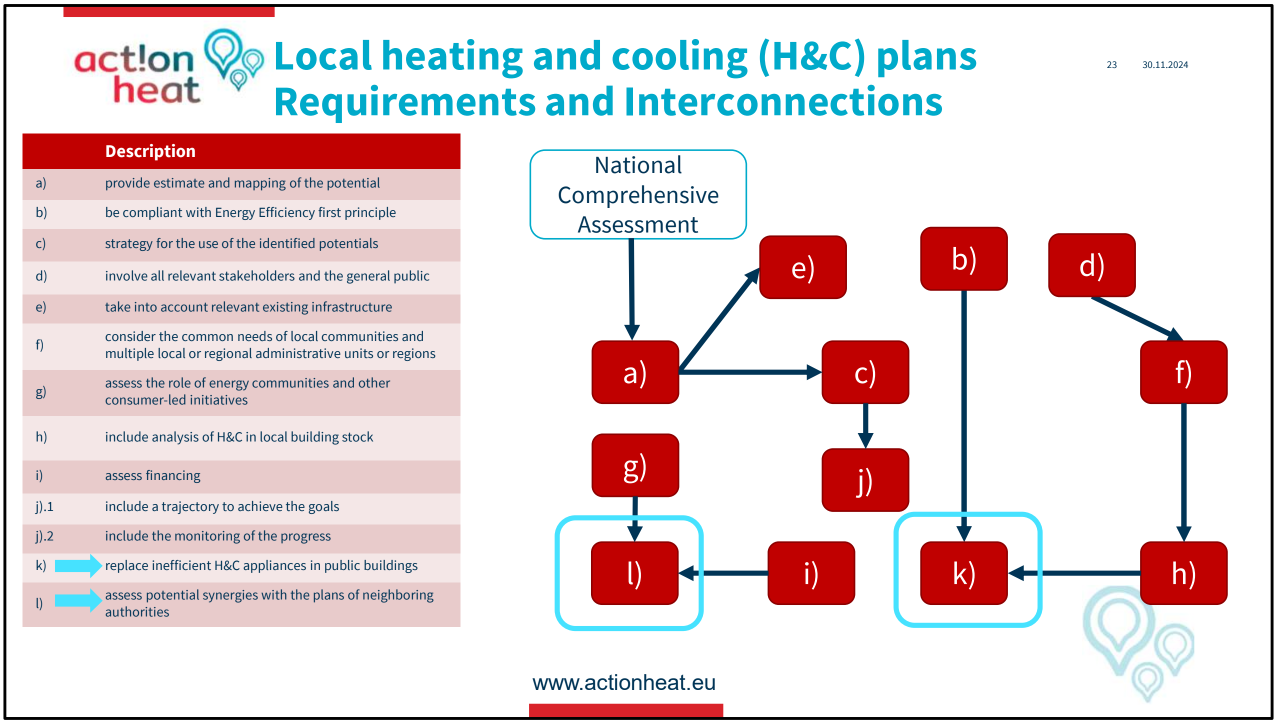
- Develop clear roadmaps with milestones to track progress towards decarbonization goals.
- Transition from target setting to actionable trajectories with defined steps and timelines.
- Monitoring and evaluation mechanisms are crucial to ensure compliance and adapt plans as needed.
- Incorporate feedback loops to improve planning based on real-world outcomes.



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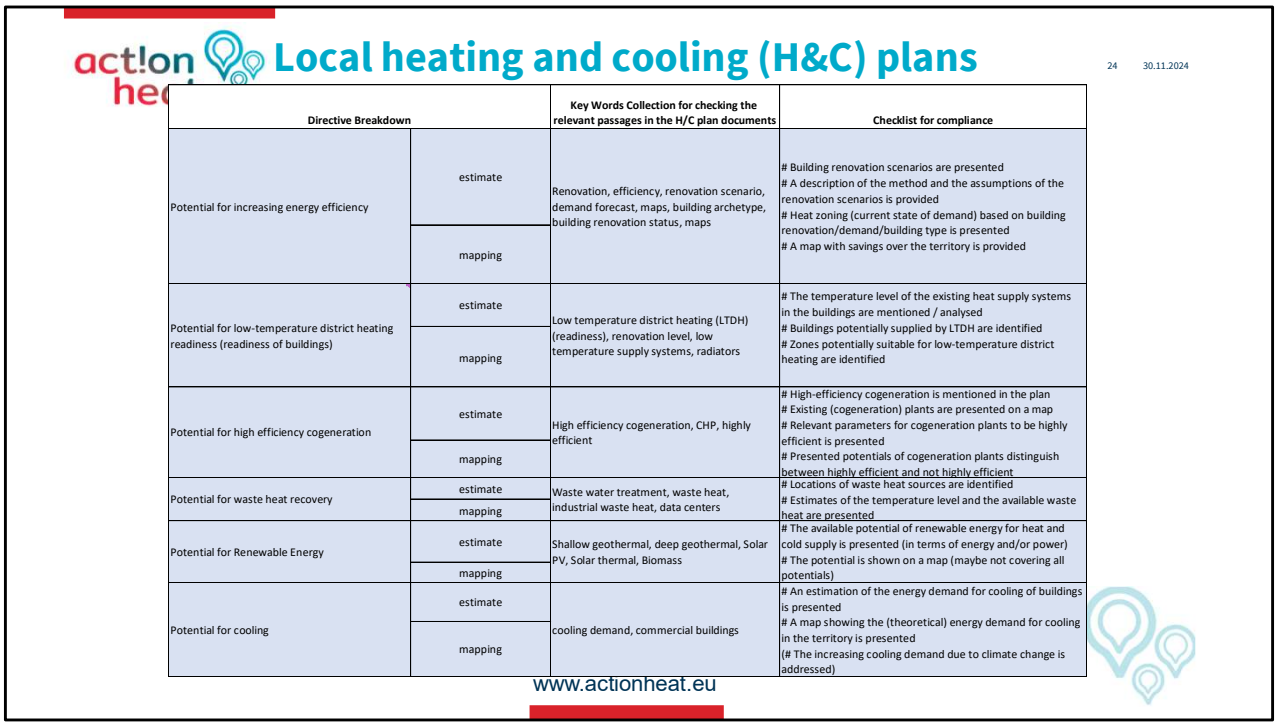
- Public buildings offer an accessible starting point for municipalities to implement H&C plans.
- Targeting public buildings can demonstrate the feasibility of energy efficiency measures.
- These projects set an example for broader community adoption of sustainable practices.
- Prioritize retrofitting and renewable energy integration in public infrastructure to drive decarbonization.



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		

- A checklist was developed to ensure compliance with regulatory requirements.
- Include mapping and estimation of energy efficiency potential and renewable integration.
- Address energy poverty and prioritize measures for vulnerable households.
- Standardized checklists simplify evaluations and improve plan consistency across regions.

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**

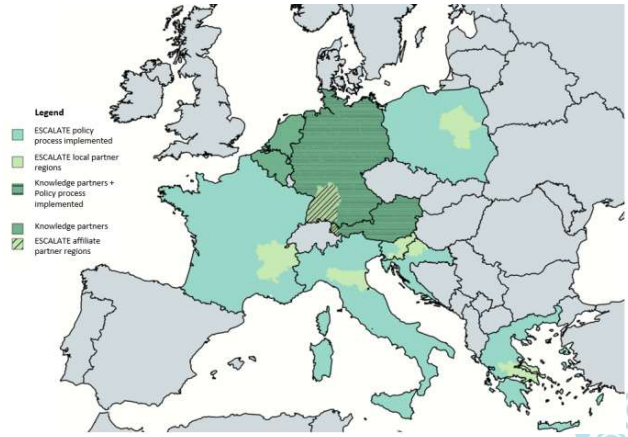
- It makes sense to **provide assistance from the regional (/national) level**:
  - Provision of **guidelines** for the implementation / interpretation of the requirements
  - **Draft text to be included** in the heat plans
  - **Framework agreements** for heat planning
  - Involvement of the regional energy agency

- Strong guidance is essential to ensure municipalities meet regulatory requirements.
- Provide frameworks at national and regional levels to support effective H&C planning.
- Include clear guidelines on interpreting and implementing compliance criteria.
- Assistance from energy agencies can help municipalities align plans with policy goals

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



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- Update heating and cooling (H&C) plans to reflect the latest regulations and priorities.
- Ensure plans are comprehensive, addressing energy efficiency, renewable integration, and zoning.
- Emphasize the role of municipalities in implementing detailed, actionable strategies.
- Align planning processes with evolving technological and policy landscapes.

Content

1. Recommended policies for H&C planning
2. Overview of current situation in Europe
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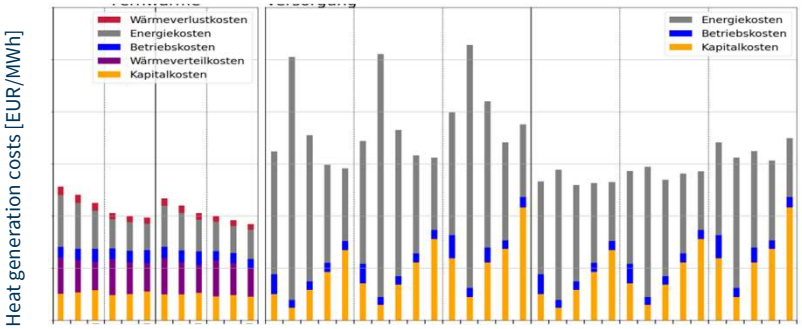
Structure of the chapter

- 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

- Need to understand the difference between zoning and priority zones

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



District heating supply scenarios

Decentralised supply scenarios

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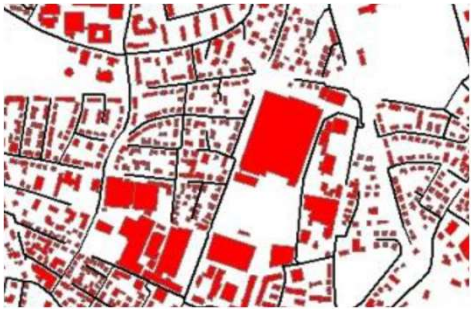
- District heating (DH) is often the most cost-effective option in densely populated areas.
- Reduces distribution costs and integrates renewable energy sources effectively.
- Enables CO_2-neutral heat supply where alternative options are limited.
- Provides a scalable solution for decarbonizing heating in urban regions.

Heat distribution costs

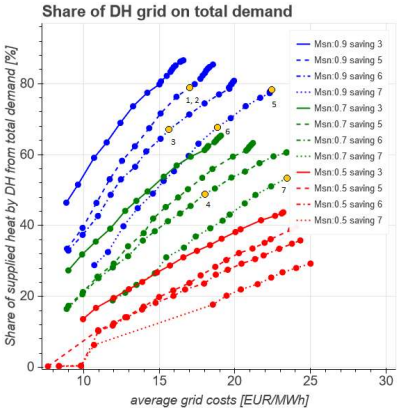
- Costs for heat distribution:
  - Capital costs for pipeline construction
    - Transmission lines (for large networks), distribution lines, and house connection lines
    - Costs depend on dimension, type of pipe and effort of laying
  - Operating costs (pumping power, maintenance of the network)
- 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

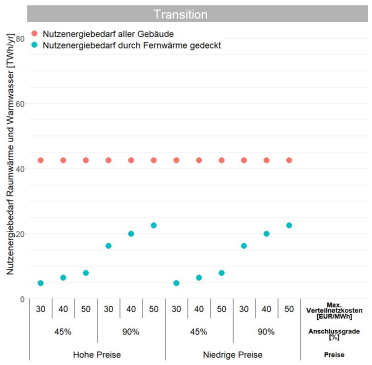
- Heat supply costs decrease with higher connection rates and shorter trench lengths.
- Increasing connections improves economic viability and reduces per-unit costs.
- Renovations that lower heat demand impact the profitability of DH systems.
- Achieving high connection rates is key to making DH systems cost-effective.

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 Kälteversrogung, Studie im Auftrag des BMK (2021)

- Higher connection rates significantly lower heat supply costs for consumers.
- Increased connections enable the use of advanced and cost-efficient technologies.
- High-density connections improve network efficiency and reduce operational costs.
- Connection rates directly influence the economic potential of district heating systems.

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_2-neutral heat supply
  - Possibly no potential / no possibility of CO_2-neutral supply, except district heating
  - For example, heat pumps cannot be implemented (space, noise)
  - For example, no prospect of CO_2-neutral gas (at acceptable prices)
- Enabling the economically viable use of CO_2-neutral potentials
  - For example, deep geothermal energy

- Zoning identifies areas where district heating (DH) is most feasible and cost-efficient.
- Priority areas ensure high connection rates, making expensive technologies more viable.
- Proper zoning reduces costs for consumers while enabling CO_2-neutral heat supply.
- Supports efficient infrastructure planning by focusing on economically viable regions.

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

- Zoning defines areas where district heating (DH) is the most efficient heat supply option.
- Mandatory connections legally require buildings to join DH networks in designated zones.
- Zoning supports strategic infrastructure planning, while mandatory connections ensure utilization.
- Both approaches aim to increase connection rates and reduce system costs.

Identification of areas where DH makes sense (zoning)

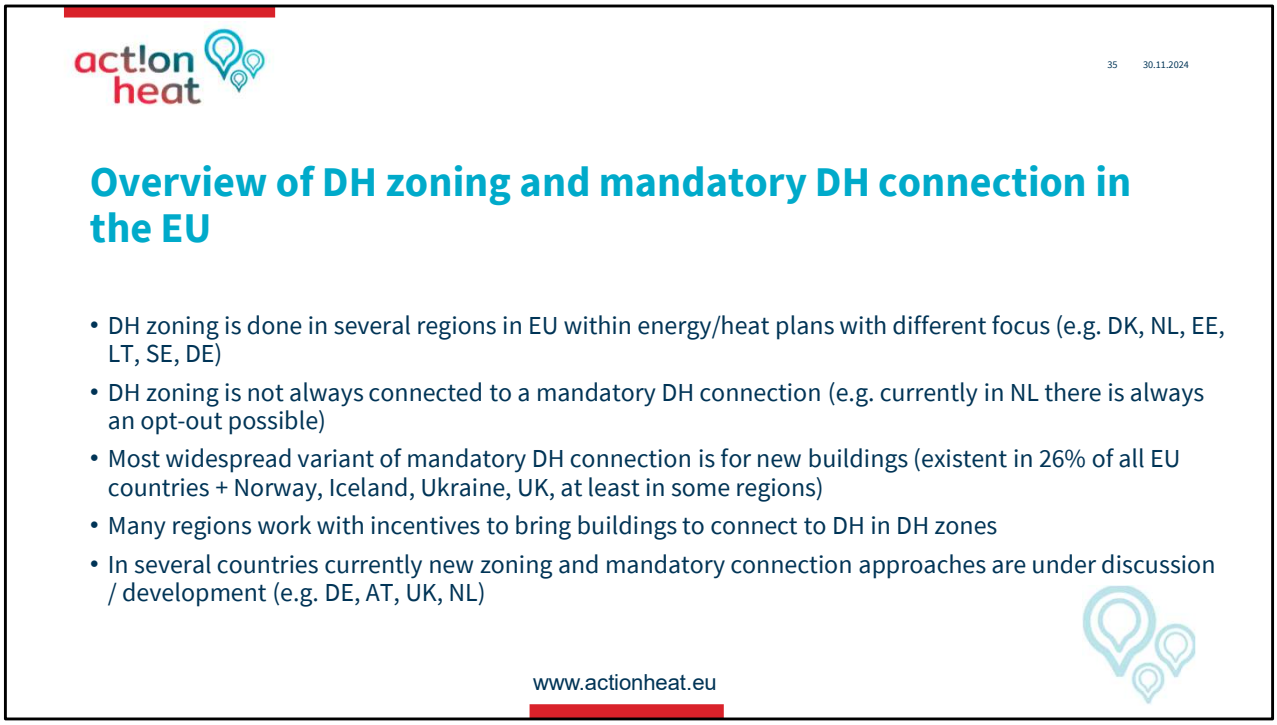
- Database
  - Heat demand measured vs. estimated
  - Costs incurred (e.g. installation costs, or installation of heat pumps, ...)
- Methodology
  - What costs are being used?
  - What depreciation periods, interest rates, etc.?
  - What is the alternative being compared against?

→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

- Reliable data, including heat demand and installation costs, is critical for zoning assessments.
- Methodologies should consider depreciation periods, interest rates, and alternative options.
- Standardized methods increase transparency and acceptance among stakeholders.
- Address uncertainties with robust assumptions and clear communication.



- District heating (DH) zoning is integrated into heat plans in several EU regions, such as Denmark and Germany.
- Mandatory connections are not always required but exist for new buildings in some countries.
- Incentives are widely used to encourage connections in designated DH zones.
- New zoning and mandatory connection policies are under discussion in many EU countries.

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?

- Mandatory connections ensure district heating (DH) supports public benefits, including climate protection and energy security.
- DH must provide the most cost-efficient and sustainable solution for society.
- Regulatory frameworks define when mandatory connections are required, balancing feasibility and public interest.
- Clear provisions ensure DH systems align with environmental and economic goals.

District heating must increase the common good

- Climate and resource protection (e.g., Germany, EEWärmeG, Switzerland, MuKEn)
- 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)

- Countries link mandatory district heating (DH) connections to broader societal benefits.
- These include environmental protection, public health improvements, and economic efficiency.
- DH enhances energy security by leveraging renewable energy and reducing dependency on imports.
- Policies must balance public interest with cost-effectiveness for mandatory connections.

District heating must be the cheapest solution

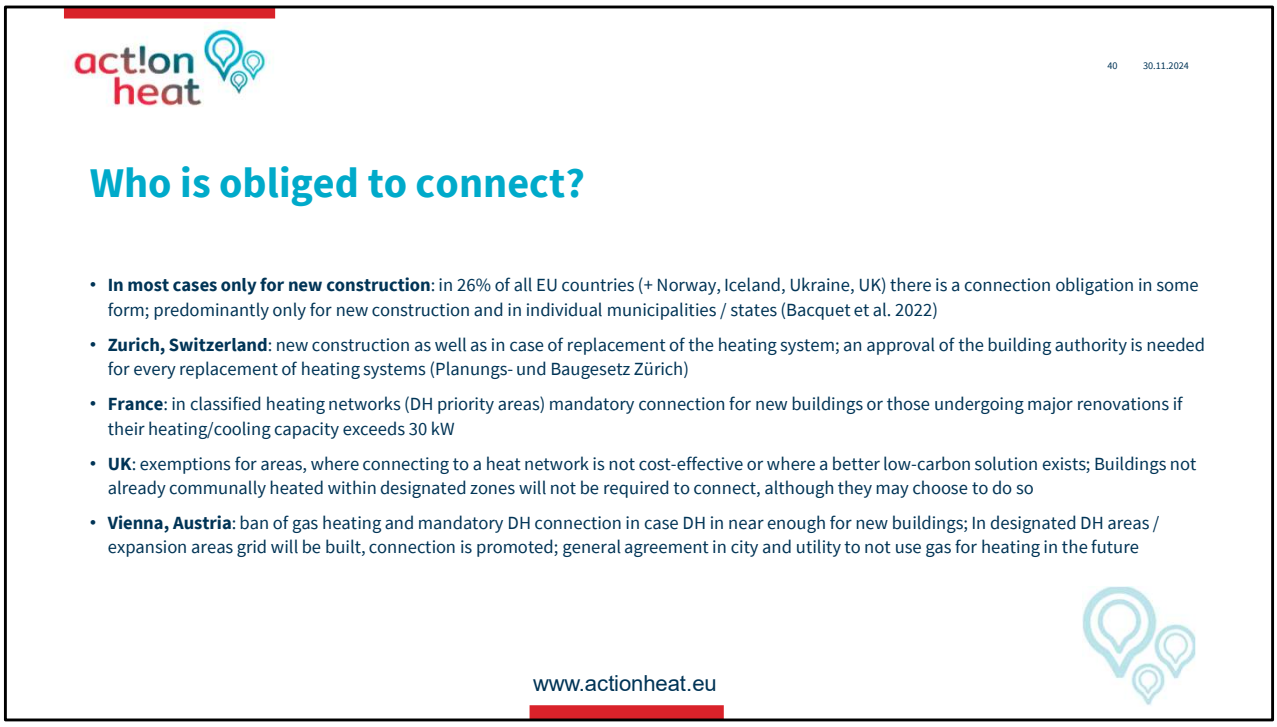
- A mandatory connection should generally not result in additional costs for consumers compared to an alternative solution.
- **Denmark / UK**: a standardized method derives regions, where DH is the cheapest heat supply option (Danish Heating Supply Act, UK Energy Act 2023)
- **France:** a DH connection 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)

- Countries differ in their approach to mandatory district heating (DH) connections.
- Some focus on environmental and health benefits, while others prioritize energy security and cost-efficiency.
- Regulatory frameworks must align with national priorities while ensuring fairness and sustainability.
- A tailored approach considers local contexts and common good principles.

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)

- Authorities and DH operators must ensure reliable and affordable heat supply in mandatory connection zones.
- Municipal DH providers, like those in Denmark, often operate under non-profit obligations.
- Transparent commitments from DH operators build trust and ensure compliance with regulations.
- Clear pricing and service conditions are essential for consumer confidence.



- Mandatory district heating (DH) connections primarily apply to new buildings in most EU countries.
- Some countries, like Switzerland, extend obligations to heating system replacements in existing buildings.
- Policies often require cost-effectiveness studies to justify mandatory connections.
- Clear exemptions are defined for areas where DH is not feasible or cost-effective.

Challenge: Approval and definition of alternatives

- In climate and resource protection, other alternatives than DH with CO_2-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

- Mandatory DH connections must account for technical feasibility and economic viability.
- Alternatives to DH must be clearly defined, balancing climate and resource protection goals.
- Existing buildings pose challenges due to diverse heating systems and retrofit costs.
- Policies should avoid overly broad exceptions to maintain the economic viability of DH systems.

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

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

act!on heat

Thank you very much for the interest!

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