



D6.5 Recommendations for public authorities



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Introduction

Heating and cooling (H&C) accounts for about half of Europe's total energy needs with 75% still dependent on fossil fuels. Thus, rapid and significant change is needed to reach the EU 2050 goals and action must be taken at local level involving a variety of stakeholders.

On top of emissions reduction, H&C planning focuses on other challenges of European cities like energy, poverty, energy efficiency, dependency on fossil fuels and stability. However, cities often lack the resources or tools to bring this planning forward.

The aim of the Act!onHeat project is to accelerate the use of strategic heating and cooling planning in cities and regions throughout Europe. The project identified the success factors of strong and efficient existing heating and cooling plans and developed a workflow for strategic H&C planning based on existing open-source tools, Hotmaps and THERMOS.

The present report summarises a set of recommendations for public authorities based on the findings of the project's work and Support Facility. The Act!onHeat Support Facility aimed to boost the optimisation of thermal systems by implementing an accelerated number of district H&C projects across Europe, enabling local authorities, utilities and industries to reach their decarbonisation goals. Several local and regional governments, energy agencies, and city planners received support for the following modules:

- Module 1: on H&C transition strategy development
- Module 2: on project feasibility, including financial studies

Act!onHeat partners implemented the Support Facility along the project lifetime, gaining unique insights on local H&C planning that led to the present set of recommendations for public authorities.

Methodology

Act!onHeat project partners were interviewed on their experiences helping up to 120 local authorities and utilities advance on their H&C planning. These interviews enabled partners to share their findings from the Support Facility in a structured way.

The interview questions were articulated based on the Act!onHeat Workflow, a structured step-by-step approach developed during the project for strategic H&C planning and implementation in cities (see Figure 1). This led to dividing the questions in the following three sections:

- Policy questions: related to the general policy aspects of H&C planning, like mobilising decision-makers, developing the strategy or ensuring constant progress.
- City planning questions: linked to module 1 of the Support Facility. These questions focus on the creation of a working group, data gathering, zoning and scenario planning.
- Implementation questions: linked to module 2 of the Support Facility. These questions focus on the implementation of H&C projects, technical barriers, financing models and evaluation and upscaling of projects. Financing recommendations have been gathered in a separate section.



Figure 1: Act!onHeat Workflow

The specific questions asked in the interviews to project partners can be found in Annex 1.

Policy recommendations

Strategic H&C planning starts with political and technical decision-makers developing a vision and common objectives on the matter that will ultimately lead to a H&C plan. Taking the first steps and involving the right stakeholders can be challenging. These are the policy recommendations from the Act!onHeat experts based on their interview responses:

- **Actors to mobilise in creating a H&C vision:** when starting the process of H&C planning, energy agencies, housing associations, the spatial/urban planning department, utilities and the city council should be involved. The city council represents the citizens, and it's helpful to engage the local community at an early stage, so that they feel listened to and part of the process.
- **Having the local community onboard** highly influences decision-makers and politicians. How deeply to involve citizens at an early stage depends on the socio-demographic structure of each local authority. Small communities with motivated and high-income households might be easier to engage. In any case, it's always beneficial to involve large housing companies which own many houses.
- **First steps in H&C planning:** starting a H&C planning on their own might be difficult to some municipalities, particularly the smaller ones. That is why it can be a good idea to find an umbrella for the topic like other projects or plans where to include the H&C strategy. This can be, for example, a building transition strategy, where H&C could be a subtopic of it. The next step would be to set up a working group of motivated people within the council, which must be formally recognised and suitably resourced. The objective of the H&C planning should be clear to the group (e.g. why are we decarbonising H&C?).
- **Communicate the benefits of H&C planning:** effective communication is key to securing commitment from stakeholders and decision-makers, especially with the use of objective, real data. It is important to know our audience, whether technical or non-technical, and make them feel involved by considering their feedback. This should be a continuous process, not a one-time effort. Communication must focus not only on the short-term elevated costs of the plan, but also on the long-term benefits, like emissions and price reductions, and increase on quality of life. Another benefit to highlight is autonomy, especially in light of events like the European energy crisis. Reduced demands and the use of local renewable energy sources offer certainty compared to the fluctuating costs of fossil fuels.
- **Constant improvement of the H&C plan:** Continuous improvement of the H&C plan is essential, with adaptable KPIs that become more ambitious over time and integrate more renewables. A robust process is key, with clear responsibilities and review timelines stated in the initial plan. Reviews of the plan should happen at least every five years, with interim monitoring depending on data availability. In areas with district heating (DH), monitoring is easier, but for single housing, additional costly data collection methods may be needed. Tools like Digital Twins can aid this process, reducing reliance on consultants.

Recommendations on city planning

This section refers to the steps to be taken before having a H&C plan in place in our municipality. It includes setting up a working group, data gathering and the creation of useful scenarios. These are the recommendations on city planning from the Act!onHeat experts based on their interview responses:

- **Setting up a H&C working group:** selecting the actors to be part of a H&C working group depends on the individual structure of the municipality. There should be a representative from the spatial planning department or similar, also including the building authority (if applicable). Furthermore, other relevant departments like energy, or sustainability are recommendable to be involved. The local utility, housing associations and representatives from the city council should also be part of the working group. Doing a stakeholder mapping exercise with an interest-influence diagram can be useful (see [step 2 of the Act!onHeat workflow](#)).
- **Barriers in the development of a H&C strategy:** the main barriers often involve technical challenges like data gaps, incomplete information on buildings, and limited technical expertise in the municipality. Planners must start analysing the state of the local thermal network, energy demand and availability of renewable sources among other aspects. External consultancies and digital tools can be very helpful in covering these challenges.
- **How to deal with the lack of data:** when there is data scarcity to build the H&C inventory and zoning of the city, making use of online tools can be extremely beneficial. The open source software [Hotmaps](#) gives data estimates for assessing the thermal energy demand on an area, available resources or suitability for a thermal network among others. This helps identify priority areas where to collect more accurate data, reducing the costs of the data gathering. Digital tools like Hotmaps can translate data into visual information which has proven to be useful and effective for political and technical decision-making as well as stakeholder engagement. This presents further benefits, as municipalities can for instance, bring in citizen science, meaning mobilising the public effort to gather knowledge from the local community.
- **Inter-municipal approach:** it is always a good idea for cities to team up, to act as a cluster and collaborate with the region. This helps for example in the data collection and enables the use of regional energy agencies' heat cadastres when available. Network approaches allow local authorities to exchange between each other, applying the lessons learnt and replicating success stories. This results in getting market transparency on costs, energy prices and solutions applied in other cities.
- **Which H&C scenarios to develop during the planning:** the scenarios developed in a municipality should reflect the local objectives. A scenario that is always useful to develop is the “current policies scenario” (or “business as usual”). When there is a target of building refurbishment, renewables or net-zero emissions, these scenarios help to assess the gap to be covered. Scenarios should not only project the heat supply in accordance with the development of the population, but also building retrofit, which is a big uncertainty and can highly influence the energy demand.

Recommendations on project implementation



Strategic H&C planning ultimately leads to the definition and implementation of projects that will help us achieve our goals. Some of the biggest challenges in this section refer to technical or financial barriers, along with the evaluation and upscaling of implemented projects. These are the main recommendations on project implementation from the Act!onHeat experts:

- **Potential challenges to take into account:** municipalities should be aware of the different challenges as well as possible solutions, when it comes to the implementation of projects. Lack of data is one of the most referred barriers, which can be overcome by using digital tools as estimates prioritising areas of interest for a deep dive. Moreover, there is often a lack of knowledge on the available funding and how to bring it forward, for which a research on the EU financing mechanisms is worth it (see next section). Public acceptance can also be difficult. Thus, it is important to engage the local community at an early stage and make them feel part of the project. Modelling the project based only on energy indicators also brings other issues, for example encountering trees on the streets that need replanting and increase of costs. Involving experienced local planners can help alleviate some of these issues.
- H&C projects bring a lot of **uncertainty on costs**. These projects are often planned in phases, which makes it difficult to meet the financial targets at early stages. However, sharing the costs and risks can help overcome the uncertainty, via public-private partnerships. It is also important to not only measure the success of a project in economic terms, as a major part of the impact falls under the social benefits, which adequately communicated can help bring many actors onboard.
- In district H&C projects, **the cost of connections to buildings** is often not well planned. These connections require work to be made in those buildings, bringing additional costs to the project. It should be clear from the beginning who is paying for these works (is each building responsible, or is the project covering the costs). Thus early stakeholder engagement is essential for success.
- **How to overcome technical barriers:** digital tools like [THERMOS](#) can be extremely useful when it comes to district H&C pre-feasibility studies. The open source software THERMOS is a user-friendly tool that provides accurate network options analysis instantly based on modelling, with the option of real data inputs. There are a lot of training webinars and materials available on the THERMOS website for easy learning. The tool can help in understanding the information provided by a consultancy and enables iterating different solutions very quickly and cheaply.
- **Upscaling of projects:** before replicating a H&C project in a new area, the evaluators must decide if the solution was in fact successful and how to measure that. There are many variables to look at in the evaluation of a project, which can include economic aspects, emissions and usage of renewable energy sources, energy prices, energy flows or overall consumer experience. Depending on the outcomes of this assessment the project might be suitable for replication or improvement. However, what worked in city A might not work in city B, as each local context is unique and must be looked at individually. For example, housing prices might influence the attractiveness of a

solution. While the insulation of a building may have a similar cost in two cities, the percentage of this cost with respect to the building's worth varies a lot.

Recommendations on financing

When it comes to the implementation of a H&C project or plan, having the right financing model and funding is key. To assist public authorities and utilities in developing and scaling bankable sustainable H&C solutions within the EU, the following professional financing models and tools can be applied:

- **Use EU Funding Programmes and instruments:** municipalities can leverage grants and subsidies from EU initiatives such as Horizon Europe, LIFE, the European Regional Development Fund (ERDF), and the Just Transition Mechanism as well as facilitating instruments such as the European City Facility, ELENA or JASPERS. These funds and instruments, the ones with a focus on H&C, can reduce upfront capital requirements by financing feasibility studies, research, and initial project development costs.
- **Blended Finance Mechanisms:** these utilise the InvestEU Programme to combine public funds with private investment. This approach mitigates the risk via EU budget guarantees, enhancing the attractiveness of projects to private investors and enabling larger capital mobilisation which is crucial for H&C projects as they are commonly big in size and thus investment.
- **Green Bonds and Sustainable Finance Instruments:** another option is to issue municipal or corporate Green Bonds aligned with the EU Green Bond Standard to raise dedicated capital for sustainable H&C networks. This taps into the growing pool of Environmental, Social and Governance-focused investors seeking beneficial projects.
- **Public-Private Partnerships (PPPs):** H&C projects can establish PPPs under the frameworks provided by the European PPP Expertise Centre (EPEC). This model facilitates risk-sharing between public and private sectors, attracts private sector expertise, and can accelerate project timelines through efficient resource allocation.
- **Energy Service Companies (ESCOs) and Energy Performance Contracting (EPC):** Engage ESCOs to finance, design, build, and operate H&C networks under EPC models. This allows public authorities to implement projects without initial capital expenditure, repaying the investment over time through energy cost savings guaranteed by the ESCO.
- **Risk-Sharing Facilities and Credit Enhancement:** projects can access risk mitigation instruments offered by the European Investment Bank (EIB), such as the EIB's Project Bond Credit Enhancement and European Fund for Strategic Investments (EFSI) guarantees. These tools improve project credit profiles, making them more bankable and appealing to commercial lenders.

Conclusions

While local H&C planning is not easy, there are a few principles that contribute towards the success of the process. Policy, planning and implementation of a H&C strategy works best when pursuing shared governance, integrated finance and cohesive transition.

Cities should be recognized as key actors in governance, playing an active part in shaping national and EU policies regarding H&C. Collaboration and communication across all governance levels and among cities is key, enabling a continuous dialogue between local, national, and EU authorities and ensuring transparency in the market.

Financing is indispensable for successful H&C implementation, and EU and national funding should support local solutions tailored to each context. Funding must enable the long-term investment required by H&C projects, such as a district heating network. Funding programmes should promote solutions that decarbonise the sector and improve its sustainability.

H&C initiatives should engage and support all affected stakeholders, making communities part of the decision-making processes. A good plan should leave no one behind in the transition towards climate neutrality, fighting energy poverty and providing affordable energy costs for all.



Annex 1 - Interview questions

Policy questions:

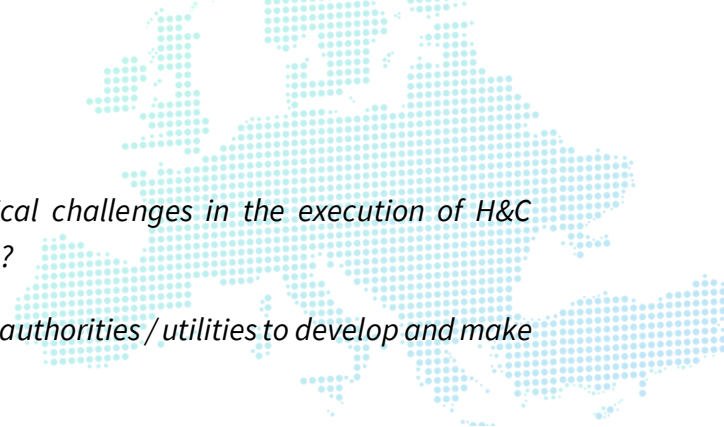
1. *Who should be involved in creating a Heating & Cooling (H&C) vision? How can political commitment be mobilised best?*
2. *What are the essential first steps for public authorities in developing a Heating & Cooling (H&C) strategy?*
3. *What are the most effective ways to communicate the benefits of sustainable H&C solutions to political and technical decision-makers as well as different stakeholder groups?*
4. *Which mechanisms should a public authority use to ensure the constant progress and improvement of their H&C strategies?*
5. *Is there one recommendation that you find important to highlight / give that wasn't asked related to this section?*

City planning questions:

6. *Who should be part of a H&C working group?*
7. *What methods or approaches can be used to identify and engage the key stakeholders to set a H&C working group?*
8. *What are the main solutions for barriers cities face when it comes to the development of a strategic H&C plan?*
9. *How can cities deal with the lack of data for developing a H&C inventory and zoning of the area? Where and how can digital tools help?*
10. *Which scenarios are essential and which are optional?*
11. *Is there one recommendation that you find important to highlight / give that wasn't asked related to this section?*

Implementation questions:

12. *What are the primary challenges faced during the implementation of H&C projects, particularly District Heating (DH) systems?*



- 13. How can public authorities overcome technical challenges in the execution of H&C projects? Where and how can digital tools help?*
- 14. What financing models or tools can help public authorities / utilities to develop and make projects bankable (at scale)?*
- 15. Which criteria should be used to evaluate which projects are successful and should be upscaled / rolled out in other districts?*
- 16. Is there one recommendation that you find important to highlight / give that wasn't asked related to this section?*



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