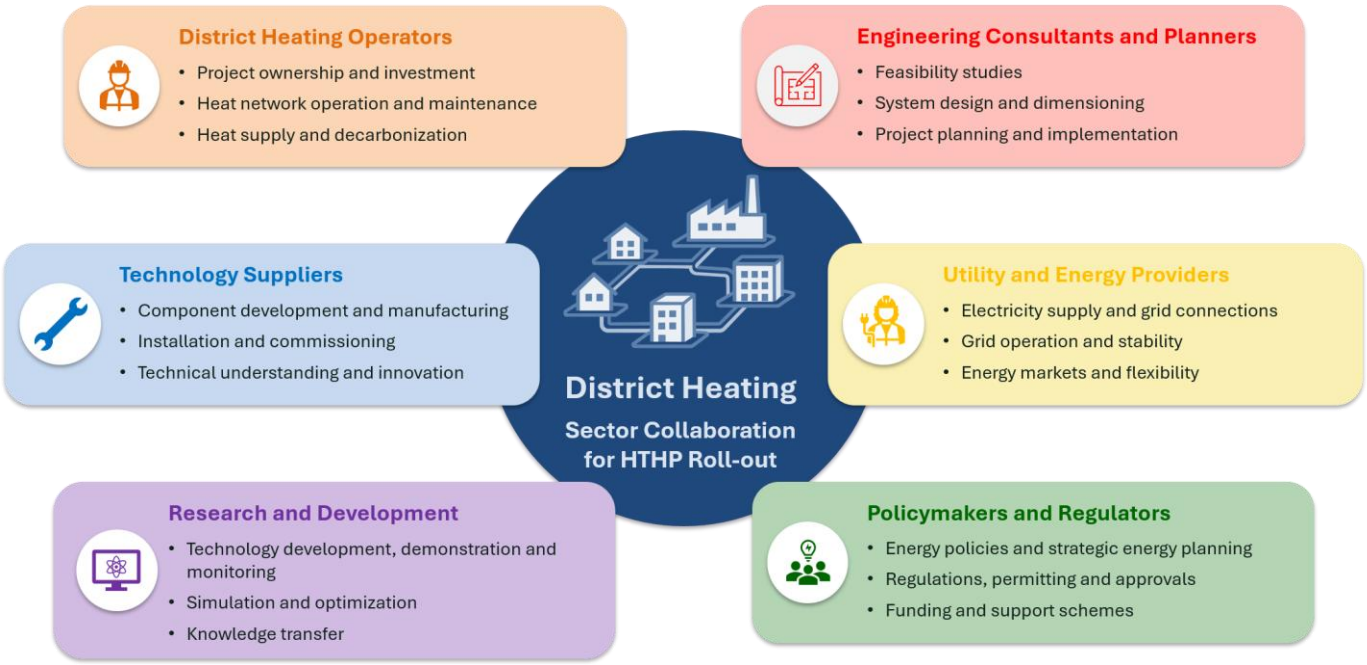
Task 2 – Sector Collaboration: From Barriers to Opportunities: Sector-Specific Stakeholder Perspectives on Industrial Heat Pump Uptake

District Heating Sector



Stakeholder mapping for the integration of large-scale heat pumps into district heating networks

Sector Landscape

The following factors influence and shape heat pump adoption and deployment potential within the district heating sector.

- **Sector organization:** The district heating sector consists of a diverse mix of operators, planners, technology suppliers, consultants, authorities and research organizations. Workshop participants highlighted that successful projects require close cooperation between stakeholders, early market engagement and coordinated planning processes. The sector is still characterized by heterogeneous tendering procedures, varying levels of expertise, and limited standardization across projects. Smaller district heating operators face particular challenges regarding financing and project development resources.
- **Energy prices and tariffs:** Electricity costs and their interaction with district heating operation strongly influence project viability. Dynamic and grid-serving operation of large-scale heat pumps, combined with thermal storage and boilers, can significantly reduce operating costs. Participation in spot and balancing electricity markets is identified as an important opportunity to improve economic performance.
- **Policy and regulation:** Permitting and regulatory procedures remain a major barrier for heat pump deployment. There is a need for faster, less bureaucratic and more standardized permitting processes. Early involvement of authorities was identified as a key success factor. Further support is needed through standardized guidelines, dedicated regulatory expertise and subsidy schemes for demonstration and monitoring projects. Regional differences in authority know-how continue to slow project implementation.

- **Infrastructure:** Limited space and electricity grid connection capacity are key technical challenges, particularly for district heating operators, and can significantly constrain project realization. Flexible operation strategies linking the electricity grid, district heating network, thermal storage, and other sector-coupling options are identified as important solutions. Early access to reliable data on available heat sources, temperature levels, heating demands, and site conditions is essential for effective system planning and design.

Stakeholder Groups:

District Heating Operators
Role: Project owners and operators of district heating systems.
Interests: Reliable heat supply, economic operation, compliance with decarbonization targets.
Perspectives: Concerned about investment costs, refinancing, project risks and long development timelines.
Requirements: Grid connections, space availability, standardized technical solutions, improved permitting procedures and flexible operating concepts.

Technology Suppliers (Manufacturers and Technology Partners)
Role: Supply heat pumps, compressors and key system components.
Interests: Market growth, fair competition and efficient tendering processes.
Perspectives: Complex and poorly specified tenders increase engineering effort and project costs. Excessively strict reference requirements can restrict market access for innovative suppliers.
Requirements: Standardized tender guidelines, functional performance-based specifications, earlier dialogue with customers and opportunities for demonstration projects.

Engineering Consultants and Planners
Role: System design, feasibility studies, integration concepts and techno-economic assessment.
Interests: Reliable planning tools, access to operational data and clear regulatory frameworks.
Perspectives: Lack of standardized planning processes and conflicting standards create uncertainty.

Stakeholder Analysis: Barriers & Solutions

Requirements: Planning guidelines, improved simulation and design tools, access to operational data from reference projects and better knowledge transfer to authorities.

Utility and Energy Providers
Role: Electricity supply and interaction with power markets.
Interests: Grid stability, efficient electricity utilization and flexibility services.
Perspectives: Heat pumps can support electricity systems when operated dynamically and integrated with thermal storage.
Requirements: Smart control strategies, market access for flexibility services and coordination between heat and electricity sectors.

Public Authorities and Regulators
Role: Permitting, environmental assessment and implementation of regulatory frameworks.
Interests: Compliance with environmental objectives, safety requirements and energy transition goals.
Perspectives: Regulatory procedures vary significantly between regions and often prolong project timelines.
Requirements: Improved technical know-how, harmonized permitting approaches, early project involvement and standardized approval procedures.

Research Institutions and R&D Organizations
Role: Technology assessment, demonstration projects, knowledge generation and dissemination.
Interests: Accelerating market uptake and improving system performance.
Perspectives: Knowledge gaps remain regarding operation, planning methodologies and economic evaluation.
Requirements: Demonstration projects, monitoring programs, stakeholder training and stronger knowledge exchange between research, industry and authorities.

Additional Stakeholders: Policy and Administration
Role: Development of funding schemes, strategic planning and market framework conditions.
Interests: Decarbonization of district heating and accelerated heat pump deployment.
Perspectives: Standardization, knowledge transfer and permitting reform are key levers for market growth.
Requirements: Clear responsibilities, coordinated roadmaps and support mechanisms for demonstration and commercialization activities.

During the workshop, two sessions were conducted. In the first session, participants were grouped by stakeholder type

to identify stakeholder-specific barriers hindering the market uptake of large-scale- and high-temperature heat pumps in district heating systems. In the second session, the stakeholder groups were mixed to collaboratively develop potential solutions for overcoming the barriers identified during the first session.

Stakeholder-Specific Barriers and Corresponding Solutions

Barrier	Affected Stakeholder	Solution approach
Tenders are too open on technological criteria, requiring high engineering effort and costs	Manufacturer/ Technology Partner	Development of tender guidelines; Checklist with minimum requirements as part of standardized tender guidelines
Lack of decisiveness among customers	Manufacturer/ Technology Partner	More economically feasible demo projects
Lack of technological understanding on the customer side	Manufacturer/ Technology Partner	Early market research and dialogue with several suppliers
Complexity of tenders (long, but not functional or targeted, often due to a lack of expertise)	Manufacturer/ Technology Partner	Early market research and dialogue with several suppliers; Development of tender guidelines
Selection criteria are too strict, often requiring extensive reference projects	Manufacturer/ Technology Partner	Taking smaller businesses into account and offering potential partnerships
Tenders pre-select a specific technology instead of staying open to different solutions	Manufacturer/ Technology Partner	Checklist with minimum requirements as part of standardized tender guidelines
Lack of standardized planning processes due to missing planning tools and numerous, often conflicting norms	Planners	Development of planning guidelines and tools; Knowledge transfer to local authorities and government bodies
Unrealistic ROI expectations	Planners	More information on different technology lifetimes; ROI approaches tailored to large heat pumps
Missing operational data from demo projects	Planners	NDAs between customer, planner and manufacturer; More subsidies for monitoring/ demo projects
Costs and refinancing, especially challenging for small DHNs	Operators	Standardization and contracting models tailored to small DHNs
Long project timelines, driven by lengthy permitting and case-by-case technical requirements	Operators	Less bureaucratic and standardized permitting (e.g. dedicated regulatory affairs coordinator); Standardized technical solutions
Lack of space and electricity grid connection	Operators	Smart, flexible operation linking the electricity grid, district heating network and sector coupling