Key success factors for strategic heating and cooling planning

Strategic Heating and Cooling Plan for Mongolia

Capacity building seminar

Session 1:

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DEPARTMENT OF DEVELOPMENT AND PLANNING
AALBORG UNIVERSITY

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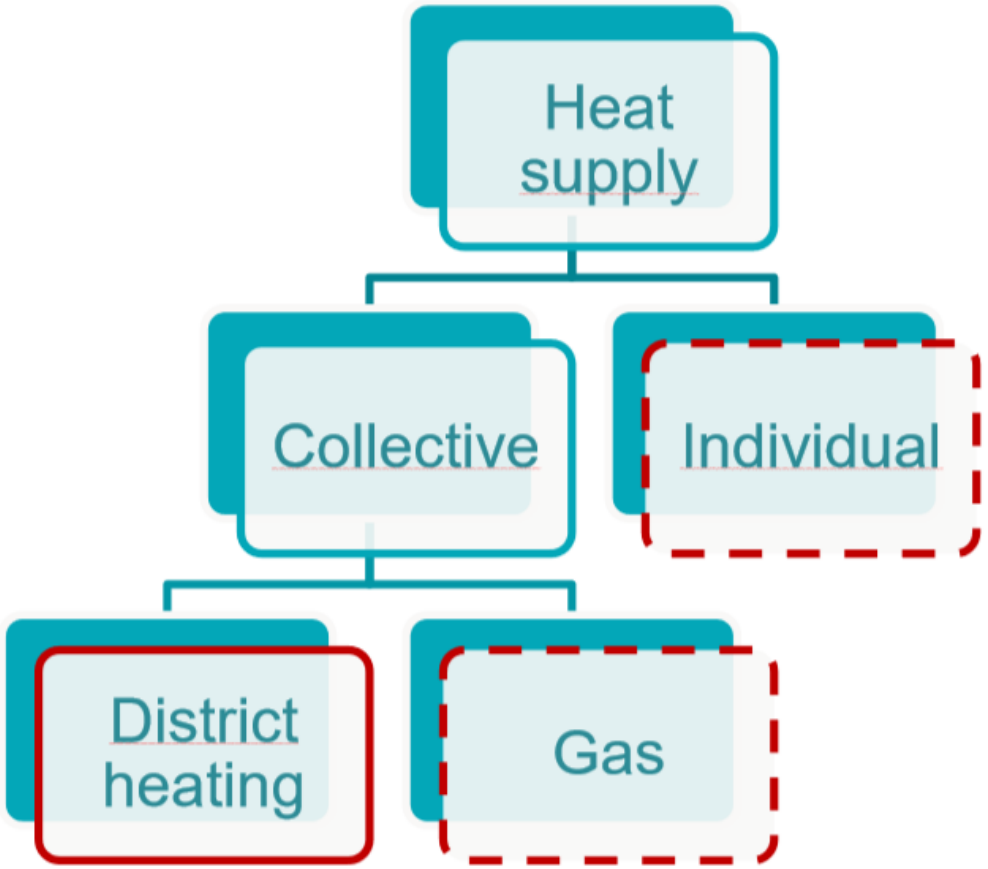
Types of heating infrastructures

Strategic heat planning for collective large-scale infrastructures



Djørup et. al. 2019: Definition & Experiences of Strategic Heat Planning

Heat planning and governance

Heating is a local demand

- Unlike electricity and gas, heating is situated locally
- Often overlooked in national energy policy

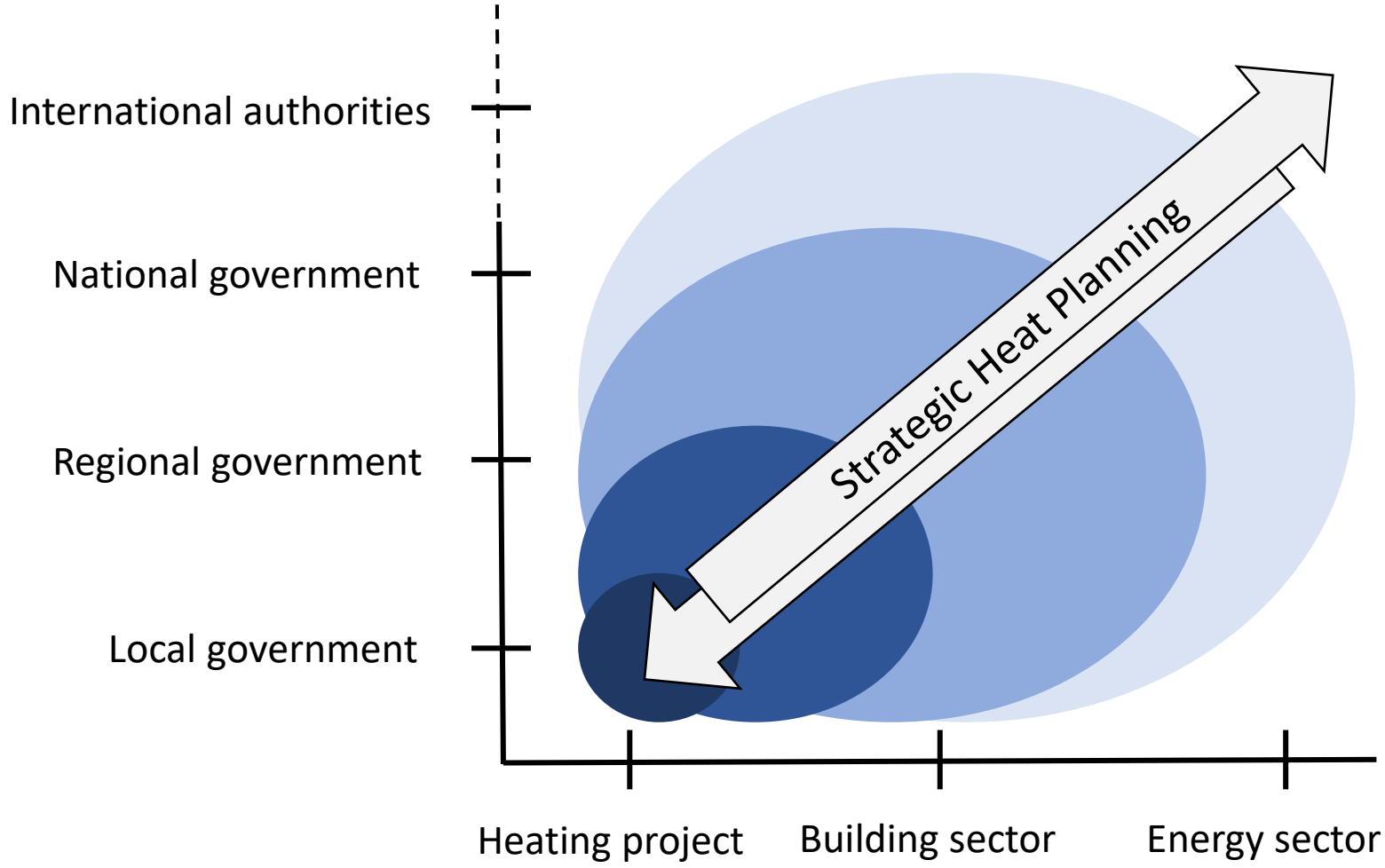
If not treated systematically in energy policy and governance:

- Significant sector coupling and synergies are missed
- Many renewable or efficient heat sources are not considered

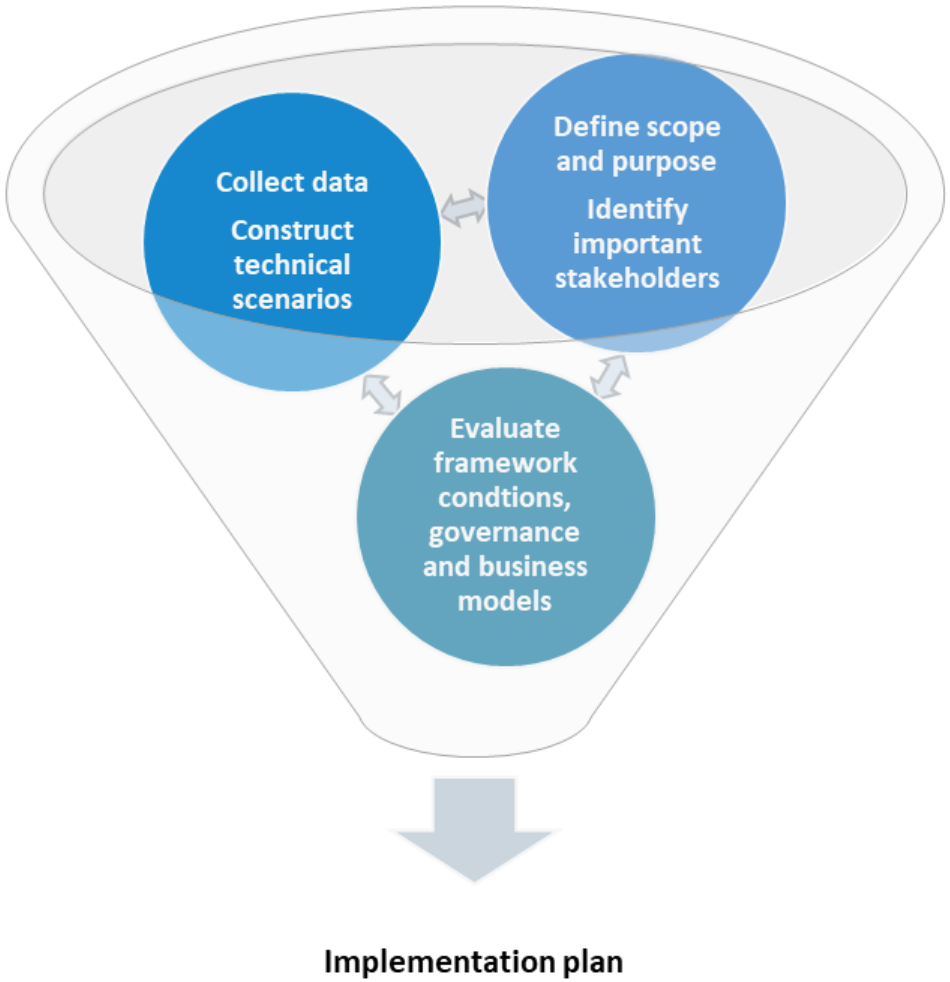
Strategic energy planning

- The purpose of Strategic Energy Planning is to **address issues** with current energy supply and to **formulate strategies** and plans for transitions.
- Strategic heat and cooling planning does differ from planning for other energy carriers due to the **local nature of heating and cooling** supply.
- **Interdisciplinary**: available resources, energy demands, technical potentials, current legislation, the organisation of the energy sector and the related actors, political drivers and barriers should be considered

The context of Strategic heat planning



Key success factors in a Strategic Planning Process



Scope and purpose

- Identify main stakeholders
- Identify drivers for district heating projects

Technical scenarios

- Measure heat demand
- Identify potential heat sources
- Balance heat savings and supply
- Establish scenarios

Evaluate Framework conditions and business models

- Ownership
- Financing
- Pricing
- Regulation

Scope, Purpose and Stakeholders in Strategic Heat Planning

Scope, Purpose and Stakeholders

- Important to identify drivers of the strategic energy planning process:
  - Climate change, energy security, pollution, energy poverty etc..
  - Multiple drivers are likely to exist: important to figure out which ones align

Identification and coordination of stakeholders

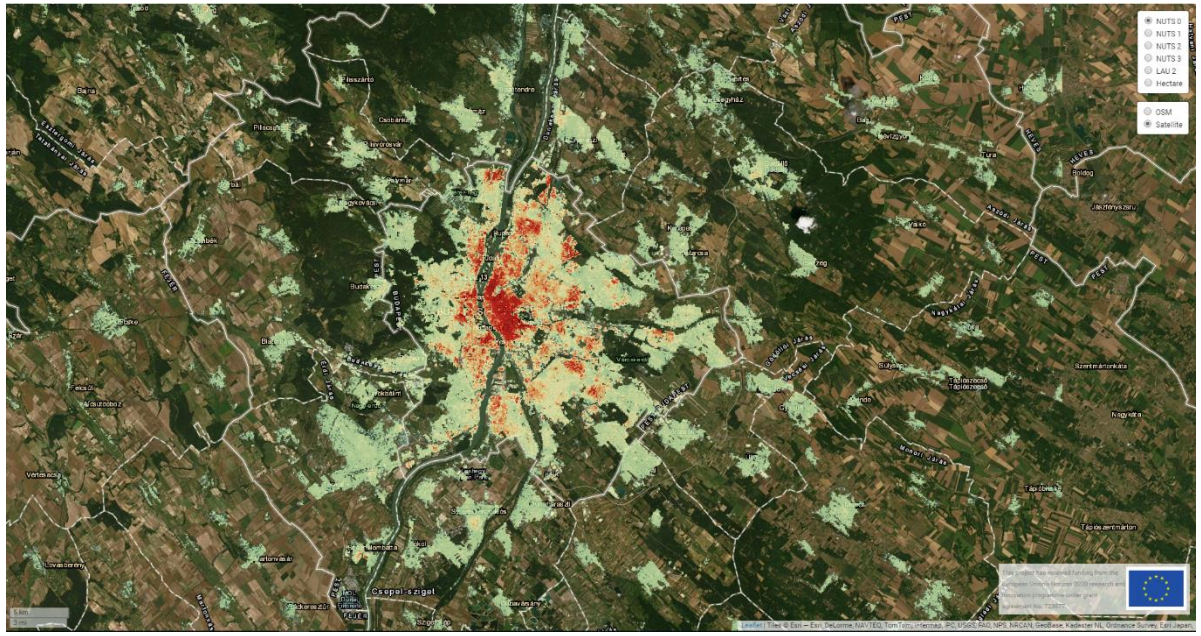
- Who are the main actors engaged in the process
  - Industry, high demand consumers, consumers with special needs
- Identifying opportunities to involve stakeholders that can play a constructive role in realizing heat plans
- Identifying synergies and opportunities for cost-effective district energy systems

Scenario building for strategic heat planning

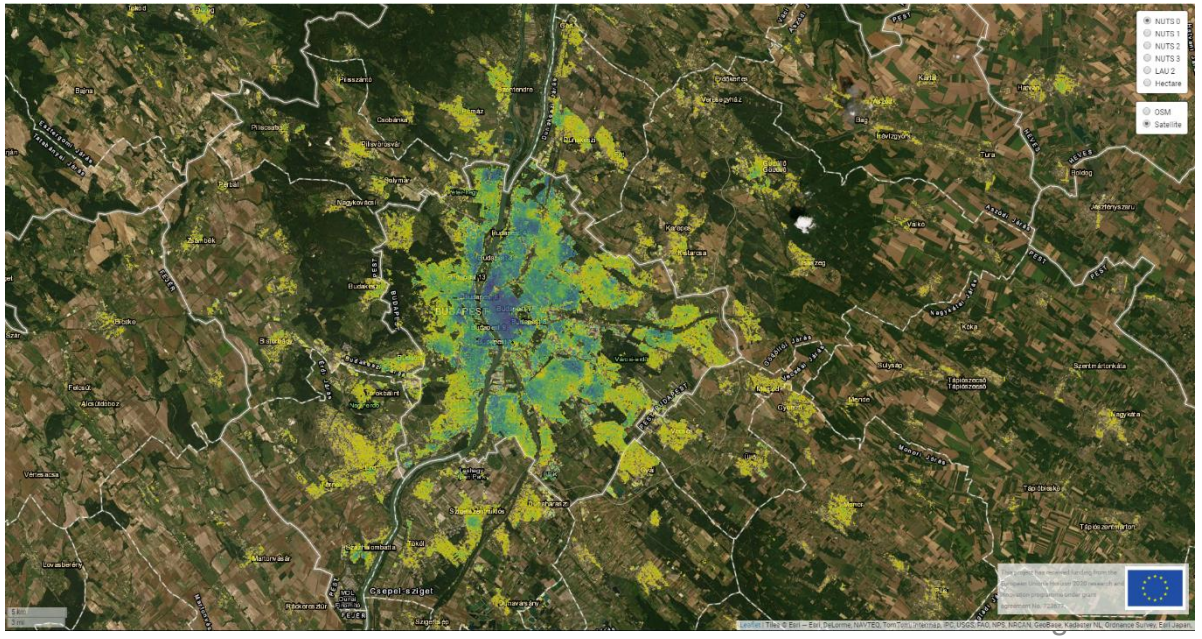
1. Quantify and locate demands

- Measurements of actual demands allow for actual knowledge of distribution of consumption.
- Modelling or estimating demands can be a way forward to provide inputs for decision making – see for example Peta4 and Hotmaps.

Heating demand Budapest



Cooling demand Budapest

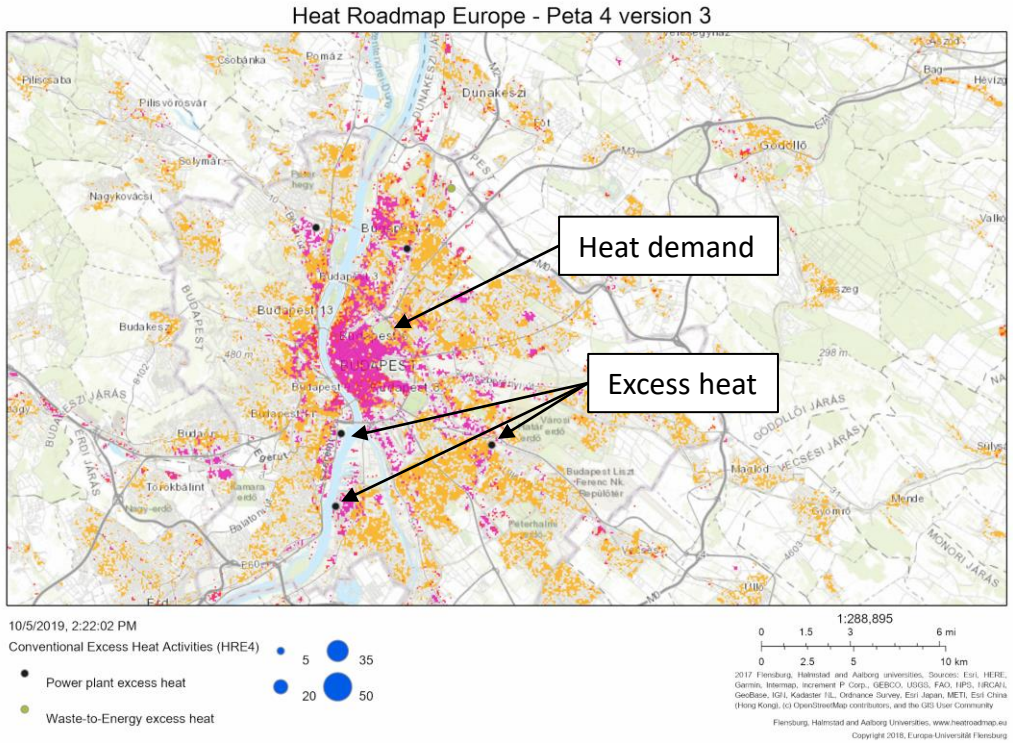


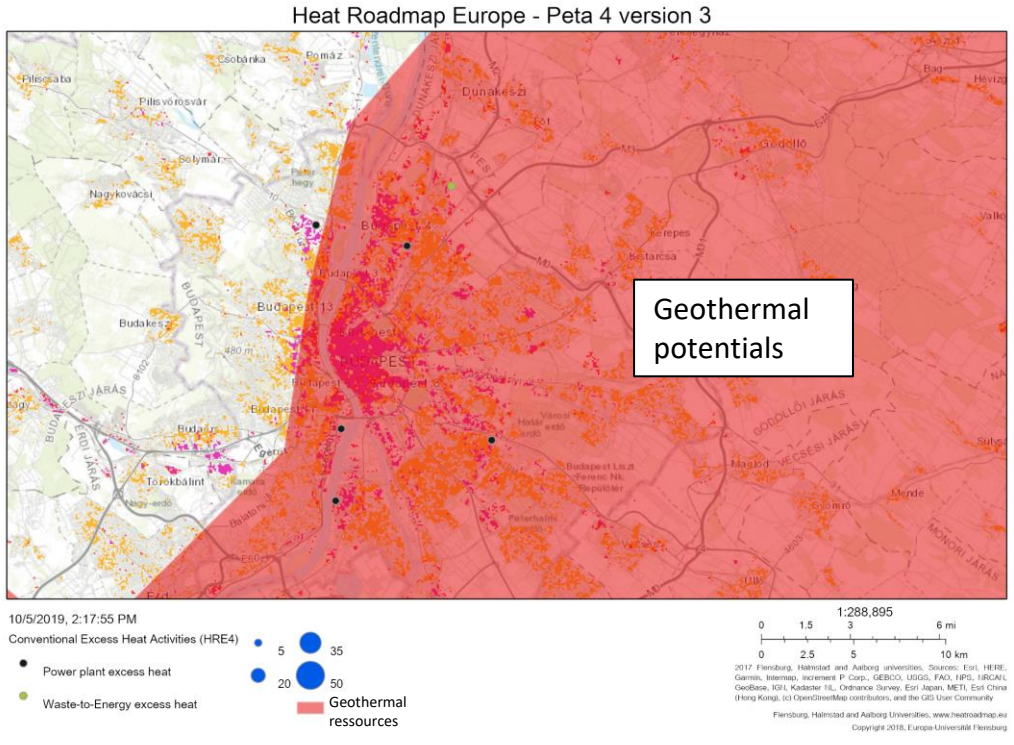
From Hotmaps

Scenario building for strategic heat planning

2. Quantify and locate heat resources

- Strategic heat sources are typically either excess heat or renewable sources
- Low district heating supply temperature enables the use of low temperature geothermal resources
- Strategic heat sources can thus be low-temperature decentralised renewable such as solar thermal, geothermal heat, or excess heat recovered from compressor machines

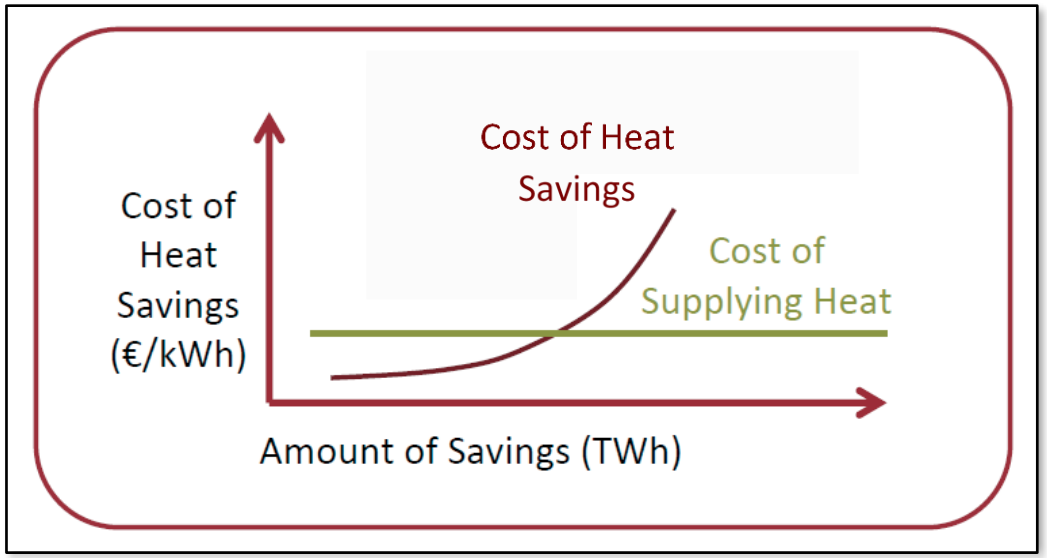


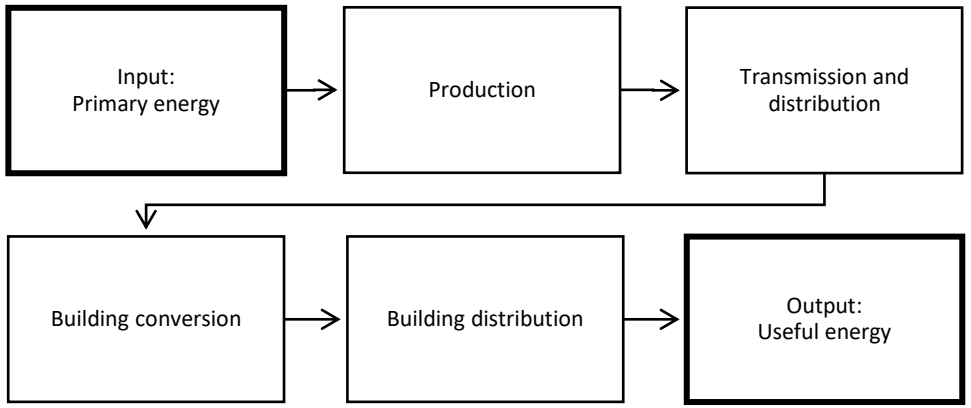


From Peta4

Scenario building for strategic heat planning

3. Quantify and assess heat-saving potentials

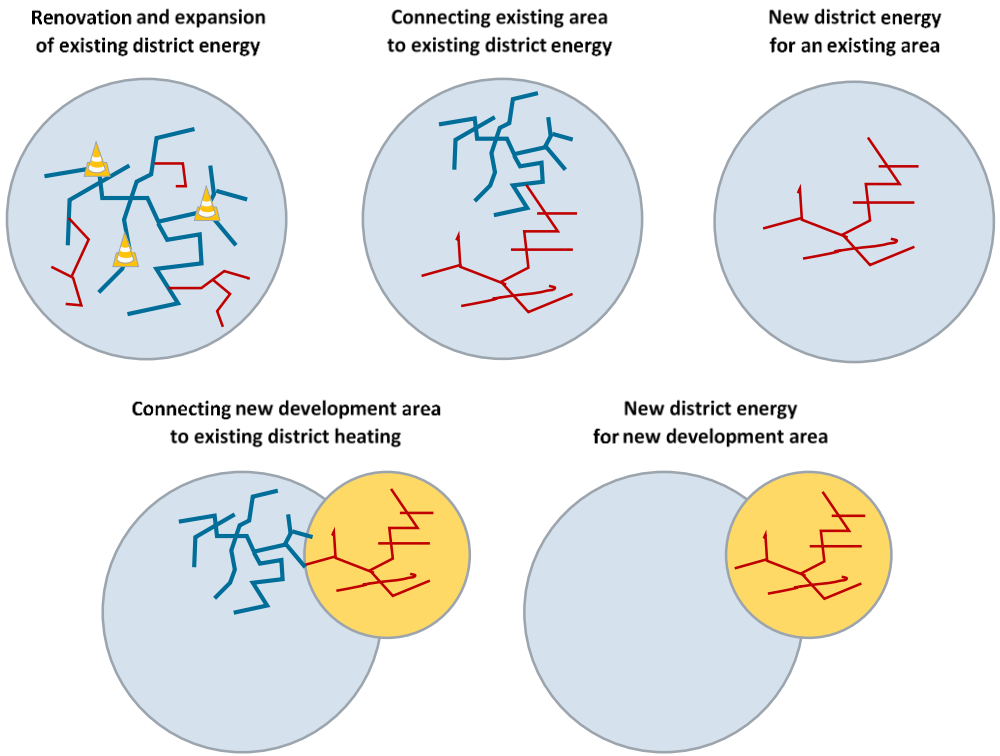




Scenario building for strategic heat planning

4. Establish scenarios for heat supply

- When establishing these scenarios, keep in mind the i)scope, ii) perspective and iii) timeframe of energy systems analysis
- Do not make them too detailed at first! Easy to get lost in technical or legal details. It is important to keep the process moving. Include the level of detail needed to make decisions and move further.



Scenario building for strategic heat planning

Methodological points for scenario building:

- Energy system scope:
  - Include entire energy system to identify synergies
- Data is important:
  - Good quality heating data is vital
- Timeframe:
  - Ensure that scenarios are in line with long-term targets
- Differentiate between socio-economic and business economic prices:
  - Taxation, subsidies, externalities etc. influence the result. Use costs that are relevant to society and not supporting status quo.
- Important to remember that strategic heat planning is not business as usual

Enabling Framework Conditions, Financing and Business Models

Ownership structure

- Interests and monopoly
- Who owns the distribution infrastructure?

Pricing

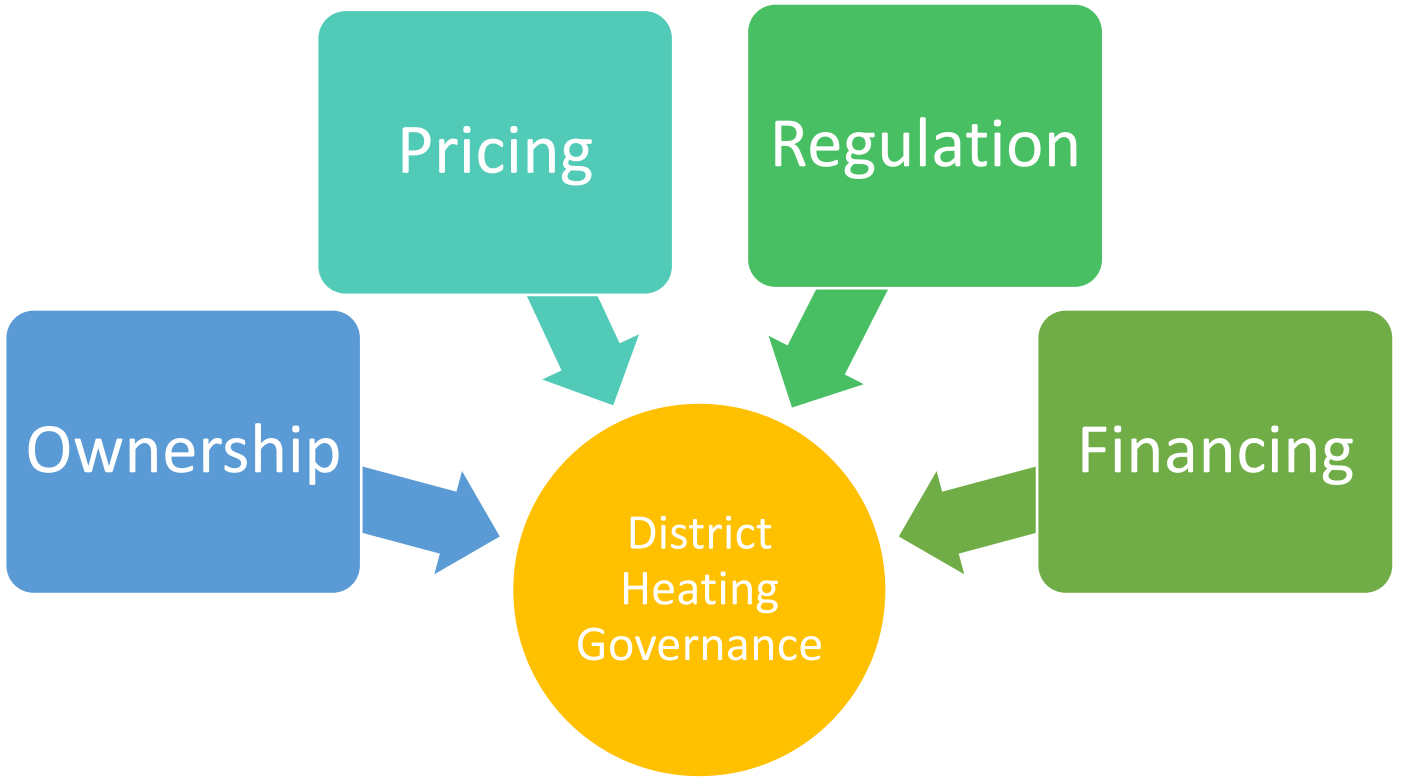
- What heat pricing mechanisms are being used?

Regulation

- Is there specific district heating regulation?

Financing

- Is it possible to ensure a long timeframe for the return on investment?



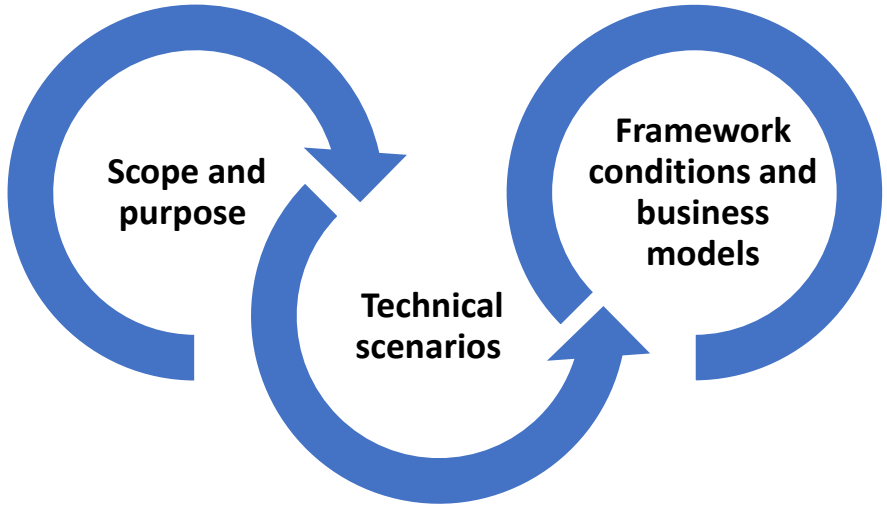
Enabling Framework Conditions, Financing and Business Models

Three typical barriers:

- Challenge 1: Level playing field
  - Recommendations:
    - Fiscal levers
    - Specific district heating legislation
    - Consider district heating grids as infrastructure
    - Consider externalities: decarbonisation, supply security, air quality
- Challenge 2: Lack of governance tools to implement district heating
  - Recommendations:
    - Feed back needs and ideas to national authorities and legislature. Create awareness of lacking tools.
    - Identify what is possible within current regulatory framework
- Challenge 3: Overcoming barriers to investment
  - Recommendations:
    - Picking low-hanging fruits: start with high-demand consumers,
    - Government intervention through economic and financial instrument
    - Capacity building for authorities and heat market stakeholders

Strategic heat planning and the integration of low-temperature renewable energy sources in DHC

Strategic Heat Planning is an iterative, multidisciplinary and continuous process



Key Success Factors:

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