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Identification of Representative Thermal Networks

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Goals

Identification of Swiss thermal network archetypes and selection of representative cases based on

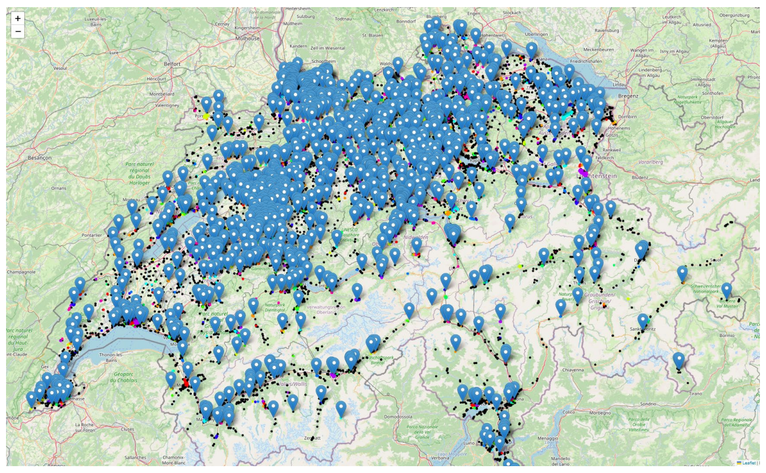
- demand-side / district characterization
- supply-side / network characterization

to enable the structured development of decarbonization measures for thermal networks

Problem

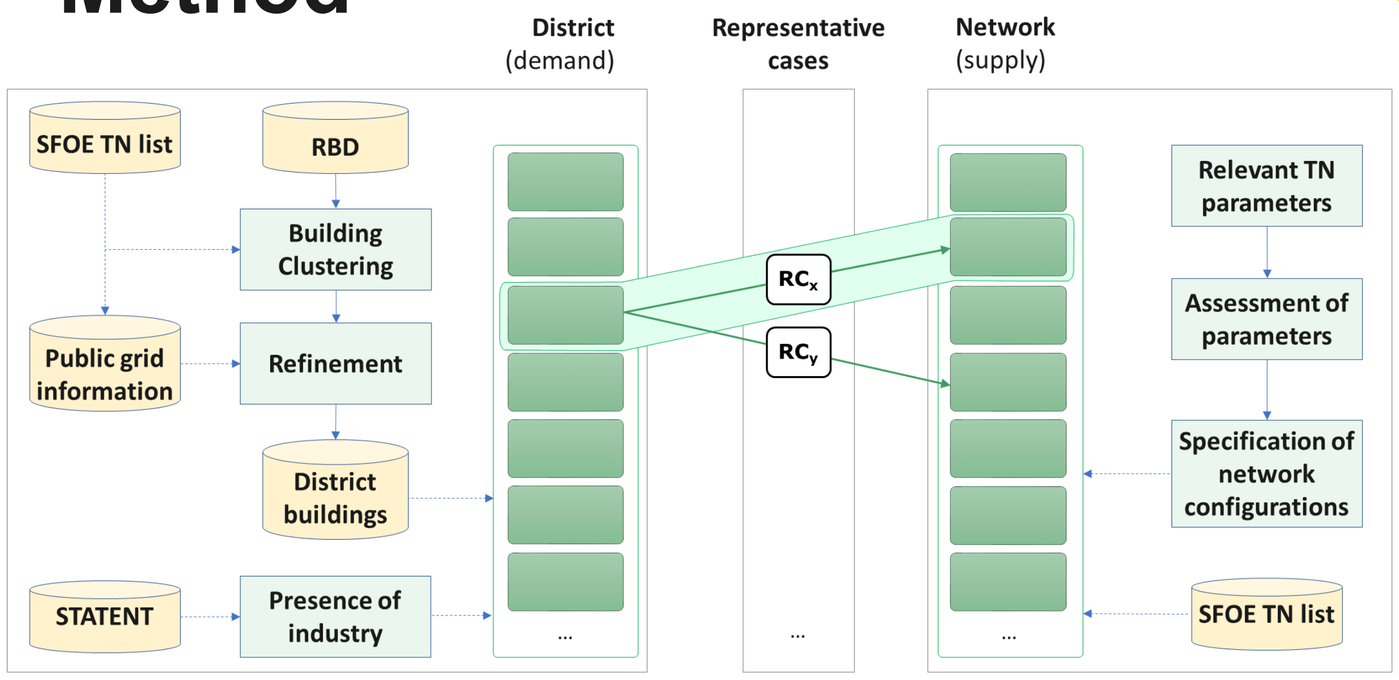
- Existing thermal networks are not fossil-free
- High number and variety of thermal networks make it difficult to define general decarbonization pathways
- Current methods characterizing thermal networks focus on single parameters

Introduction



- There is a strong necessity to decarbonize existing thermal networks
- A structured breakdown of the variety of thermal networks would help identifying relevant levers for decarbonization of and with thermal networks

Method



- Geospatial identification of building clusters
- K-Medoid grouping to identify archetypical thermal network districts and corresponding representative cases
- Qualitative assessment of relevant network configurations regarding decarbonisation pathways (considering direct CO_2 emissions, efficiency of resource use and socio-economic motivation patterns towards grid transformation)

Results

- 47 configurations of thermal networks defined by 8 parameters (main energy source, peak load supply, network temperature, thermal power, energy & fluid flow direction, use of seasonal storage and type of energy services provided) and their categories.
- 8 representative districts have been identified based on similar building properties. This analysis is currently being extended to include energy and exergy demand as well as supply properties.

Core partners

Associate partners

Cooperative partners: