# Concept for thermal grids in the city of Zurich

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## Introduction

Until 2040, 60% of the settlement area of the city of Zurich is to be supplied with fossil-free heat through thermal grids. To date, thermal grids have been planned and operated on an area-by-area basis and with three different operators (ERZ, EWZ, Energie360). There are now plans do connect different thermal grids to utilize additional systemic potential. Therefore, a concept for thermal grids in the city of Zurich is developed, to which DeCarbCH was invited to contribute with its technical know-how in spring 2023. In early summer 2023, the city council decided to transfer the responsibility for all thermal grids in the city to one single operator (EWZ). This simplifies the implementation of a city-wide network, but the role of DeCarbCH in this new setting is unclear.

## Process city of Zurich – DeCarbCH

- **June 2022:** In a workshop, the city confirms that a collaboration with DeCarbCH on strategic energy planning would be of direct value.
- **April 2023:** The project "overall concept for thermal grids" is initiated by the energy office with the intention, that DeCarbCH is responsible for the required modelling and simulations.
- **June 2023:** DeCarbCH submits a tentative offer for its contribution to the "overall concept" incl. service fees for Symphony and Planeto (TESSA).
- **July 2023:** The city decides that prior to work on an "overall concept", a white paper should be elaborated with support through DeCarbCH.
- **Sept. 2023:** Idea of a white paper is skipped. Project of an "overall concept" is postponed due to change in responsibilities for thermal grids.
- **2024:** Priority issues for strategic energy planning might be addressed with support of Symphony but possibly outside of the DeCarbCH project.

## Offered procedure (June 2023)

**DeCarbCH suggested a three-step procedure:**

1. **Modelling and optimization:** Model with five hubs using Ehub tool. Technological alternatives and possible thermal connections are modeled, and pareto-optimal solutions identified (costs and $CO_2$).
2. **Sensitivity analyses:** Optimal solutions are tested and evaluated for their robustness using parameters from DeCarbCH WP1. Zurich selects the most suitable variant from the most robust solutions.
3. **Effects on supply areas** for the selected solution: With the TESSA software it is analyzed, how technologies can be integrated, and which additional expansions are necessary, e.g., expansions or new constructions of thermal grids.
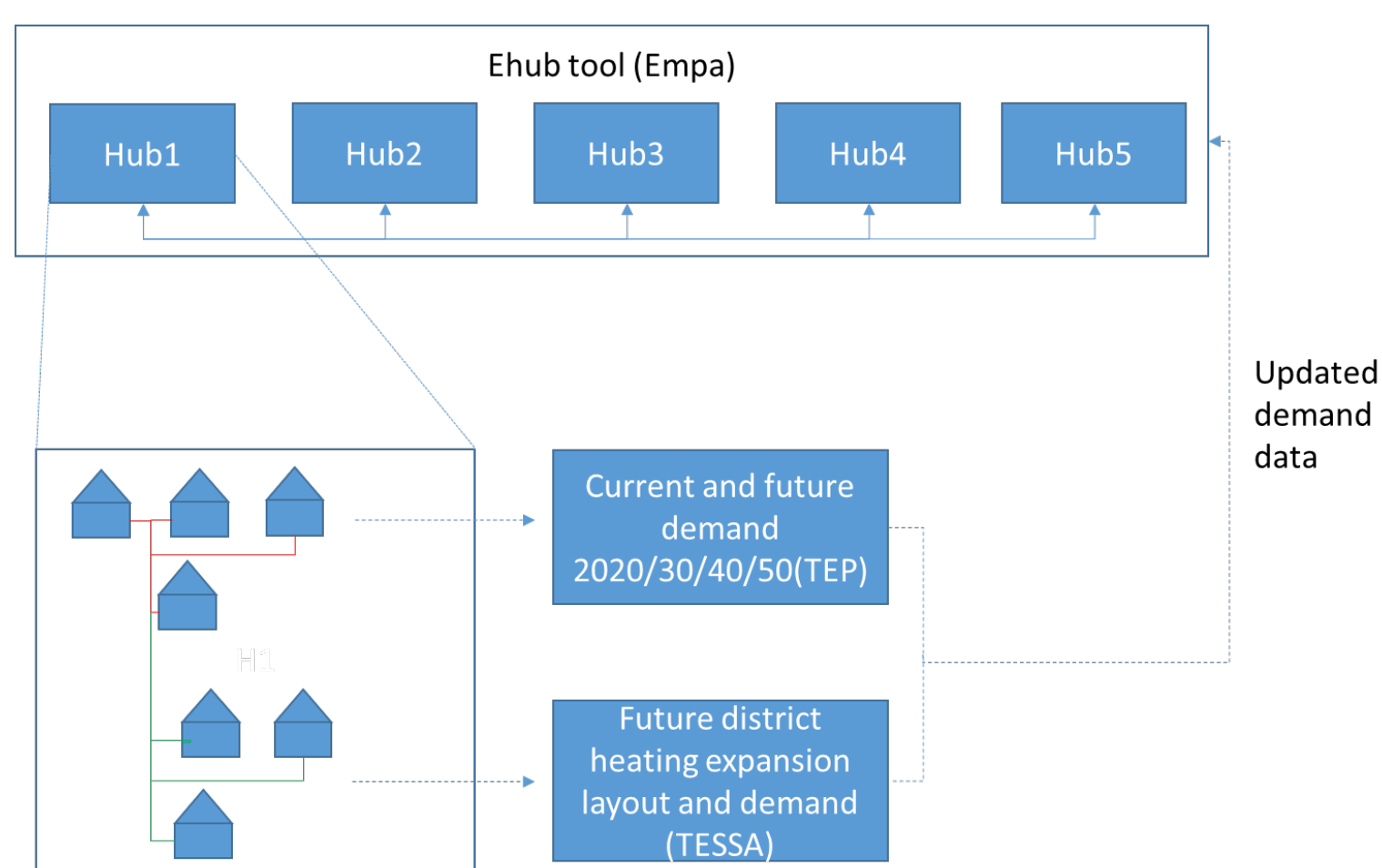


## Priorities for strategic grid planning

**Priority issues which city of Zurich intends to address in 2024:**

- Which energy sources should be used and to what extent? Important to secure the locations required.
- Which thermal grids should be interconnected to optimize existing heat generation for the supply?

**Further issues with lower priority:**

- Options for seasonal storage (low / high temperature, combustibles)
- Concept for peak load and optimization of the overall system (heat, power, negative emissions)
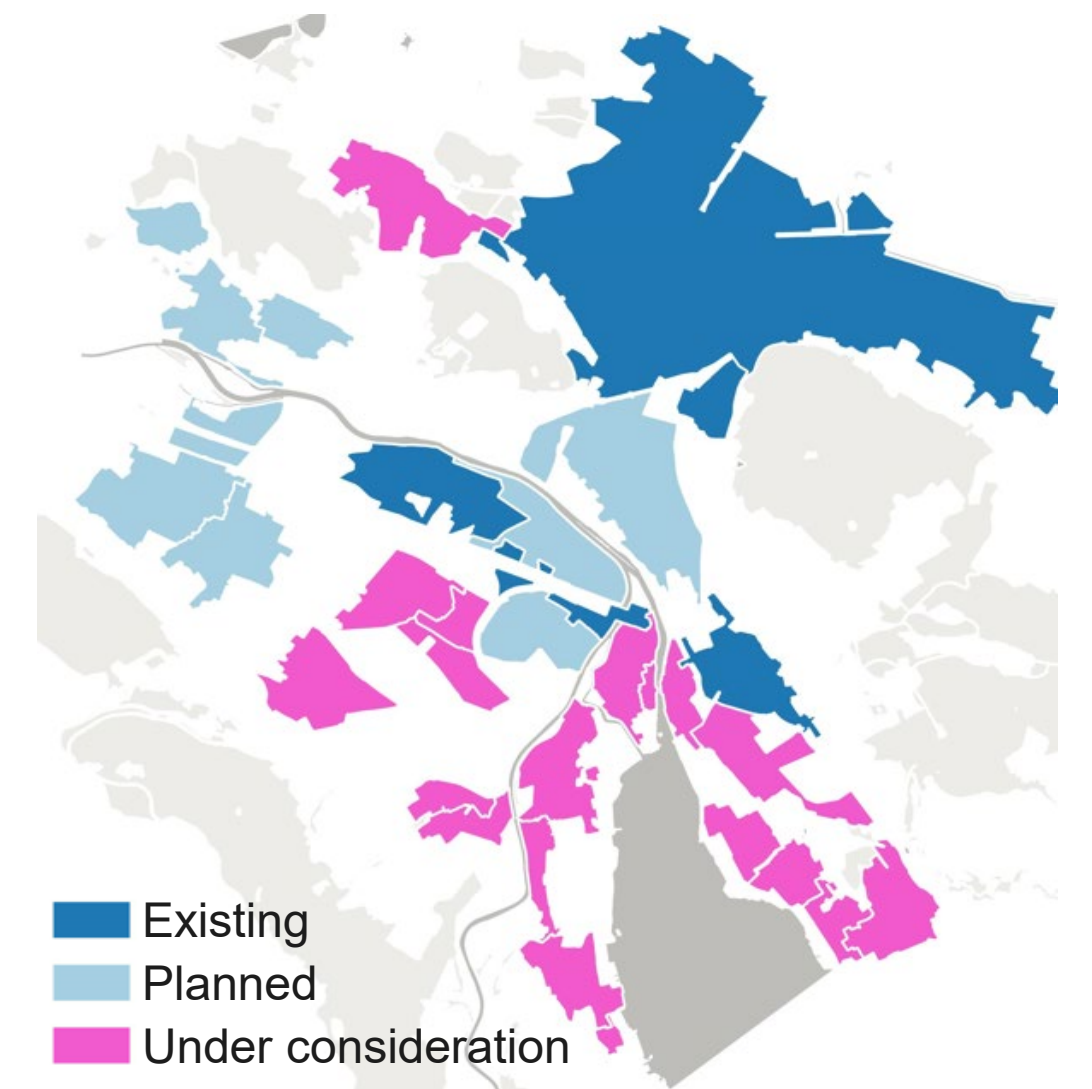- Integration of cooling



Existing
Planned
Under consideration

*Fig.: Municipal energy planning status 2024: Existing and planned thermal grids (Source: Energy office, 29.02.24)*

## Conclusions

The project "concept for thermal grids", for which DeCarbCH had submitted an offer, has significantly changed and is delayed due to reorganization. There will be a clear focus in 2024 on the priority issues "energy sources" and "potential of connected grids". According to the energy office, there is no support from DeCarbCH required for these priority issues. Thus, DeCarbCH should focus on issues with lower priority like peak load, seasonal storage and cooling. The city and EWZ might appreciate any suggestions for these topics, but likely won't have any resources for a collaboration in 2024.