



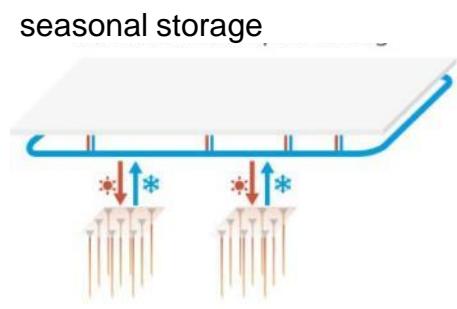
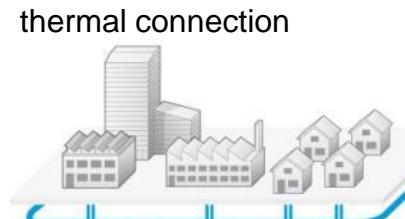
AMSTEIN + WALTHERT

Operational Experience with Low Temperature Networks in Zurich, Switzerland

Matthias Kolb
Geneva, 30.10.2015

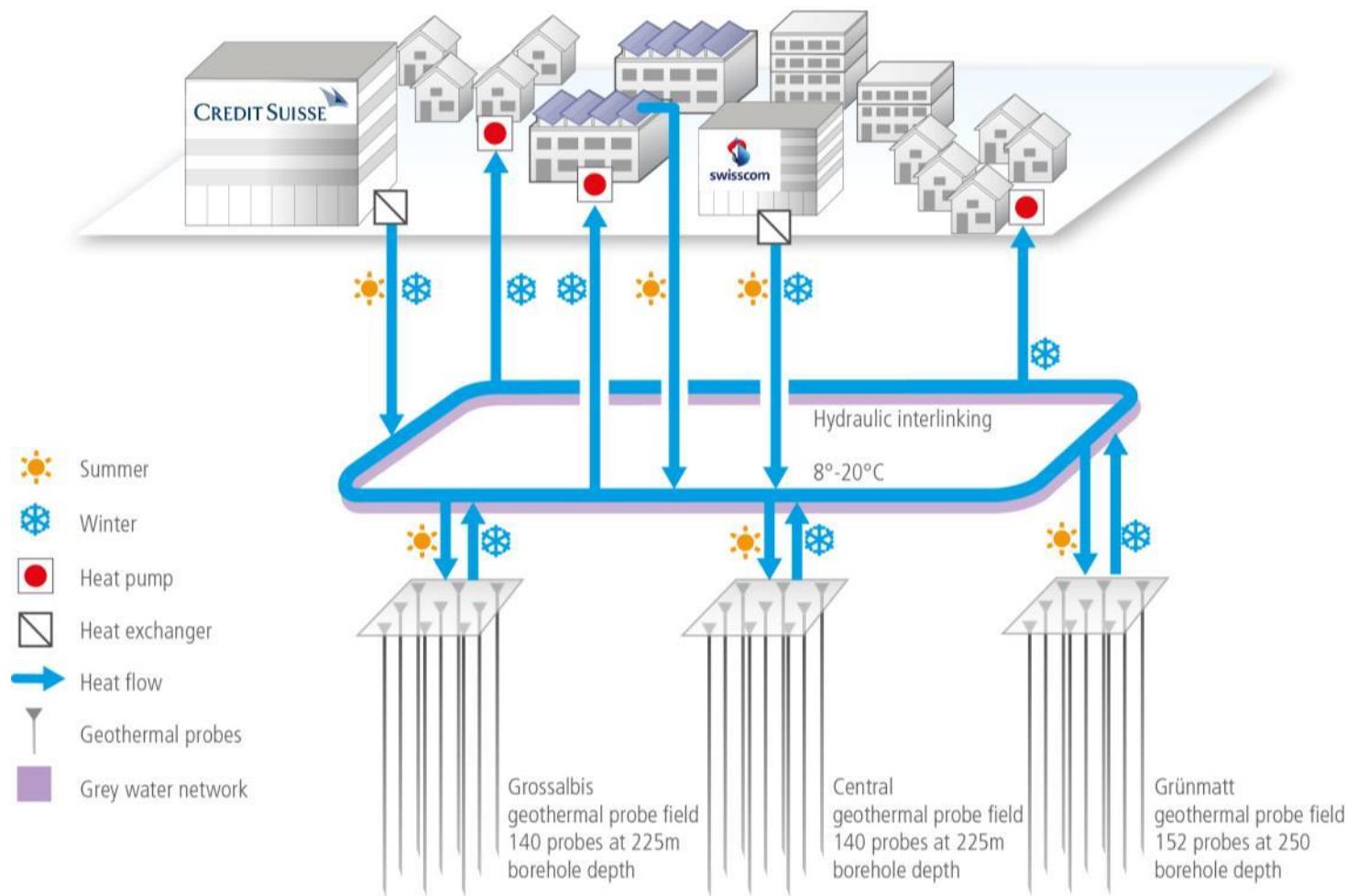


Aim of Thermal Networks



reduction of
CO₂ emissions

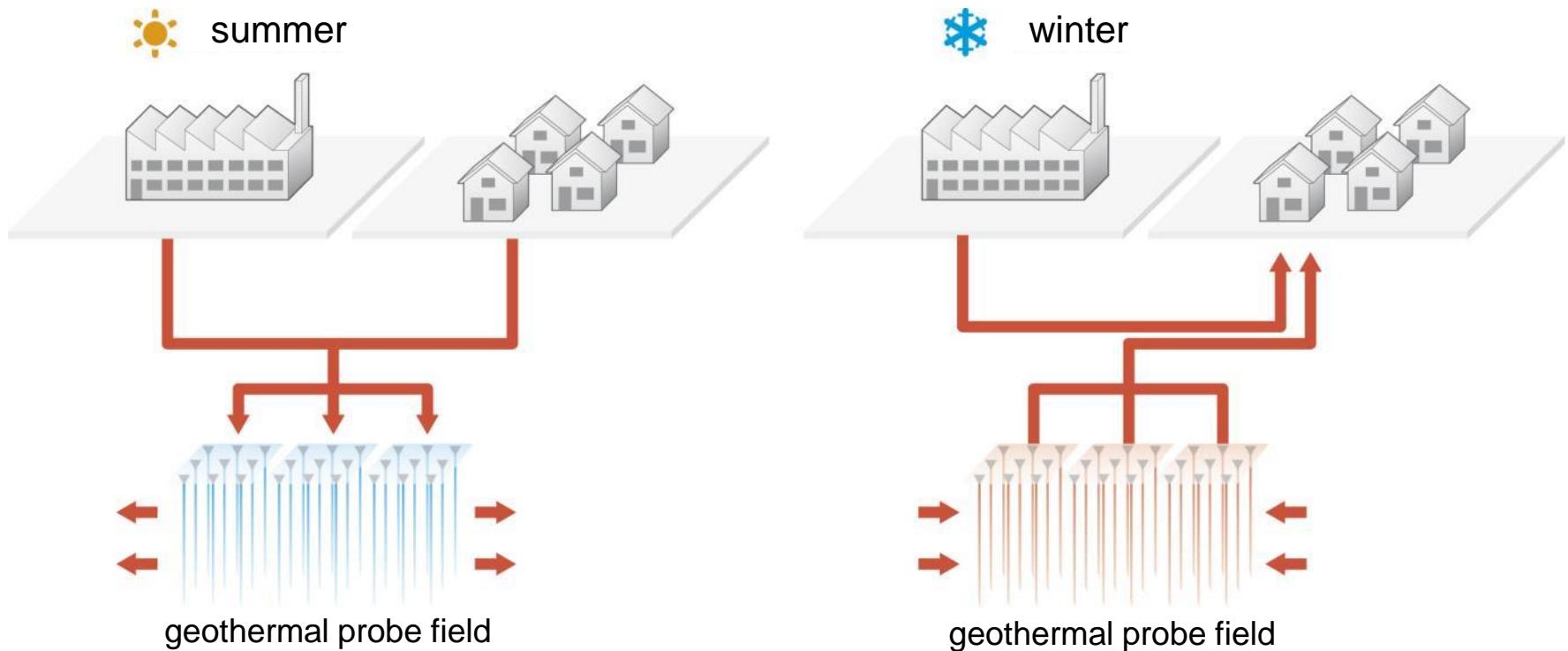
Principle of a Low Temperature Network



Agenda

- 1) Aim of thermal networks
- 2) Principle of low temperature networks with seasonal heat storage
- 3) Implementation examples in Zurich
 - Network ‘Campus Hönggerberg’
(Swiss Federal Institute of Technology)
 - Network ‘Friesenberg’
 - Network ‘Richti Areal’
- 4) Operational Experiences

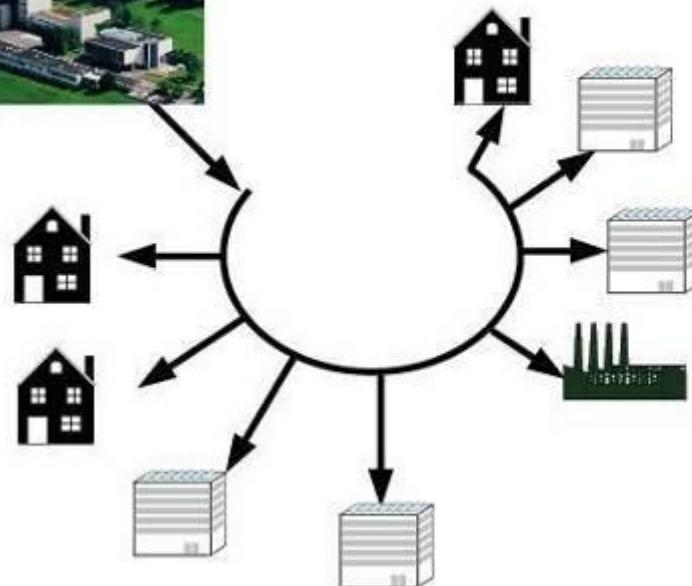
Seasonal Balancing of Heating / Cooling Demand



Bidirectional Network

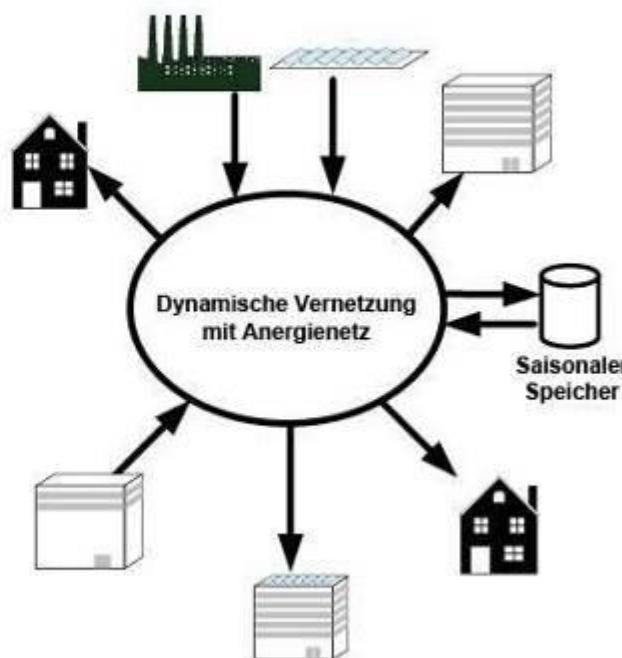
Unidirectional

Bidirectional



'conventional' District Heating

Anergy Network



ETH Hönggerberg



10'000 students

53'000 MWh electricity demand

27'000 MWh heat demand

16'000 MWh cooling demand



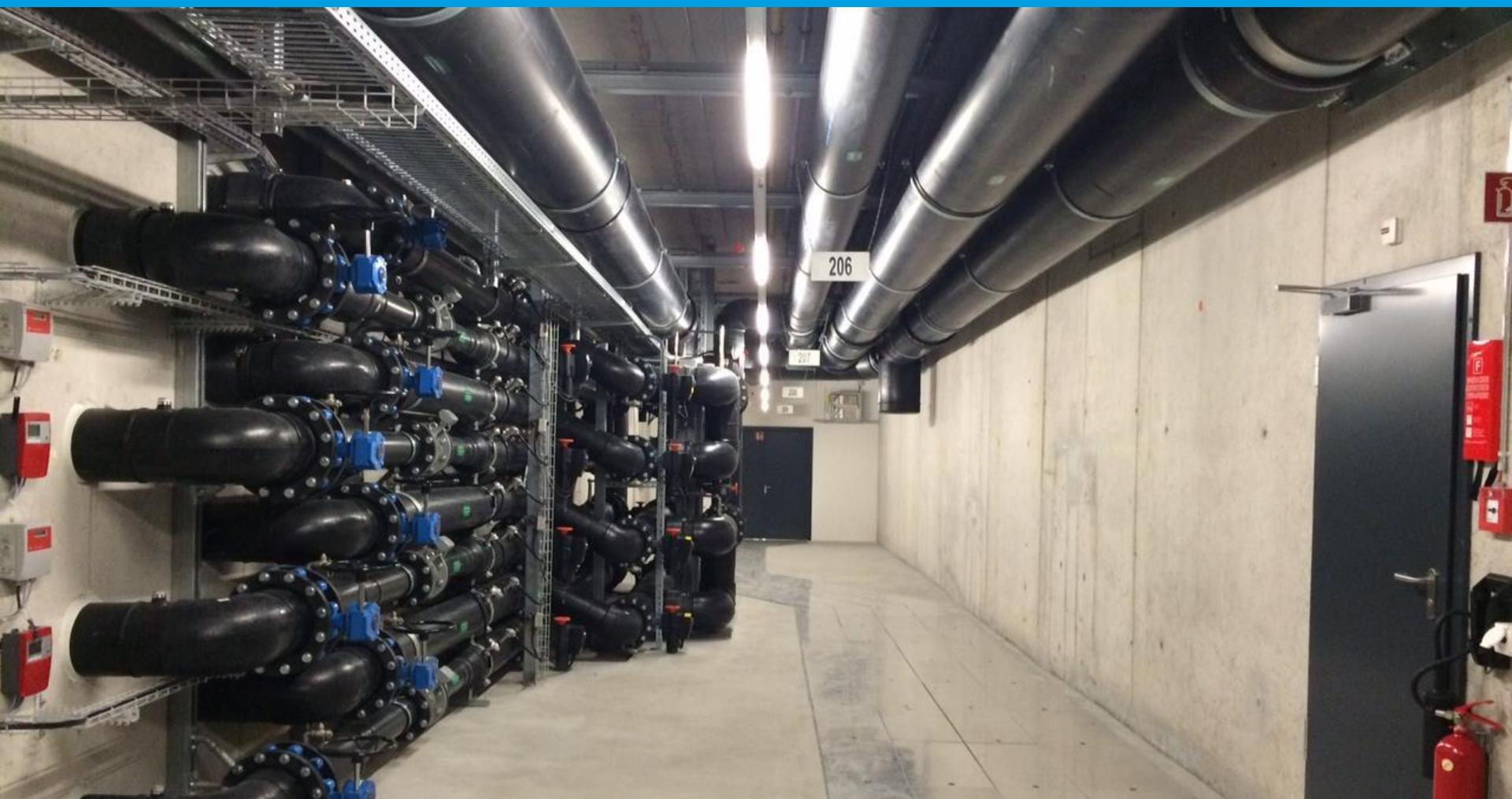
Übersicht

Movie

Anergy Pipes in Media Channel



Plugging Station Bore Hole Field



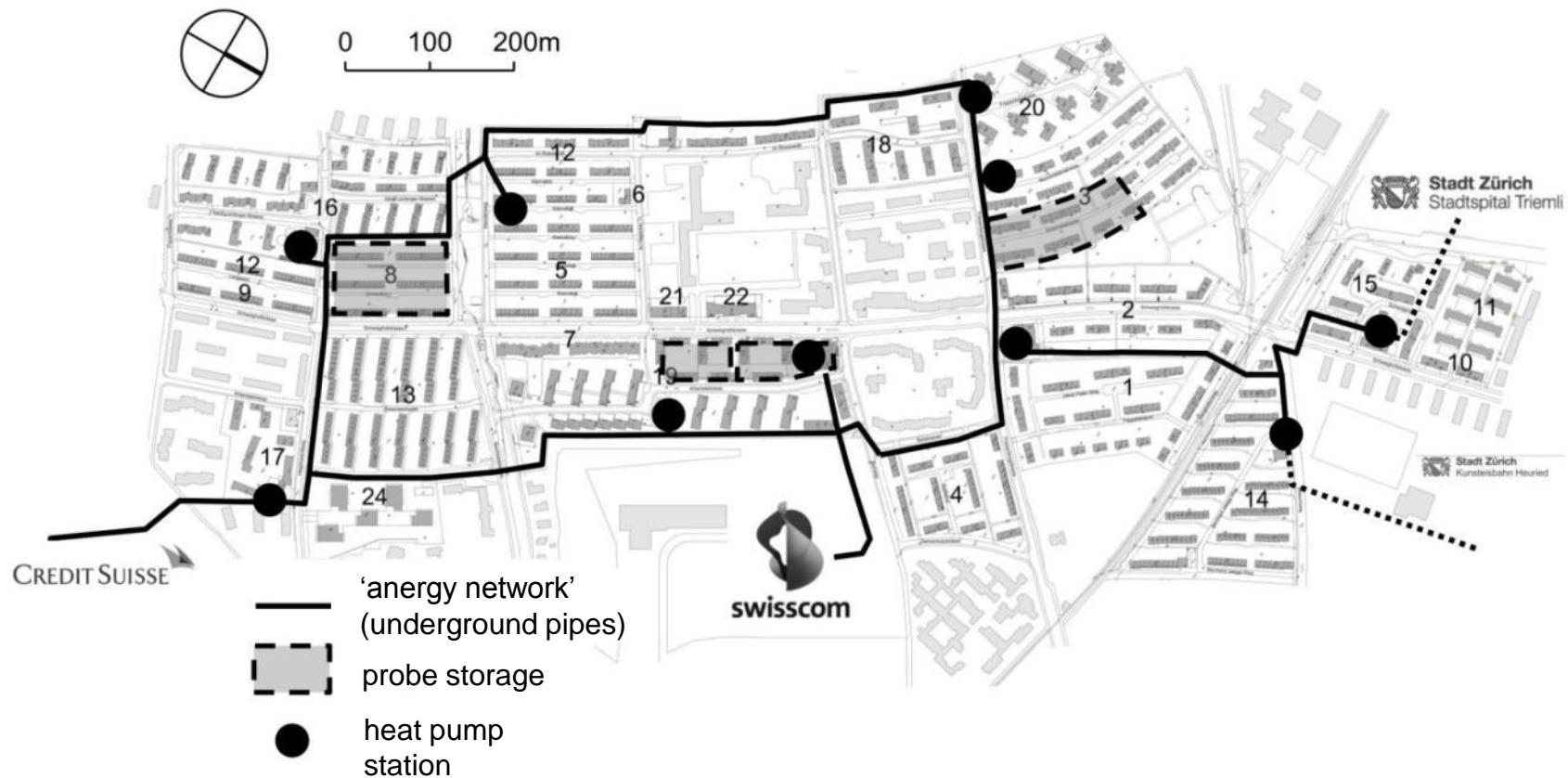
Heat Pump Station



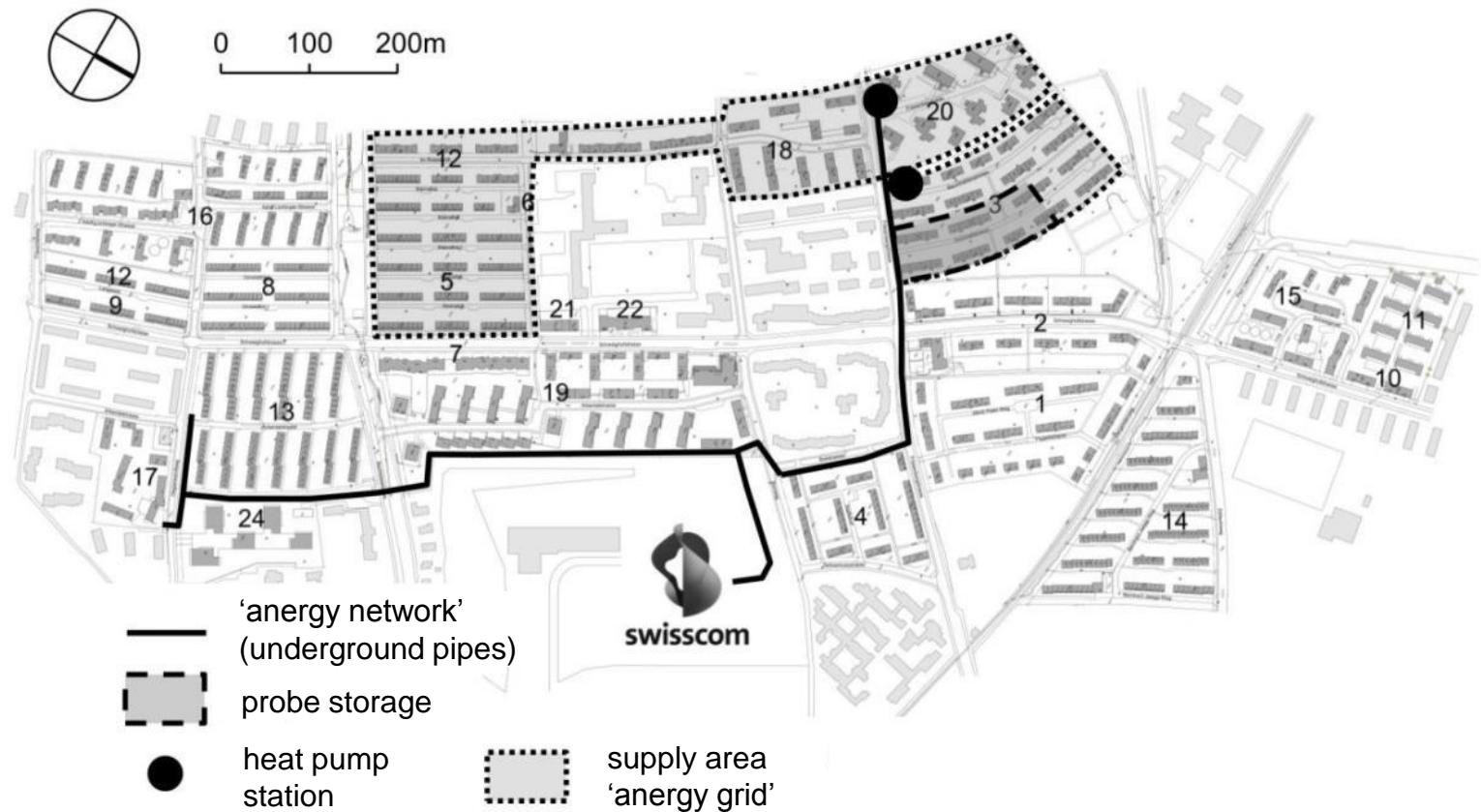
Familienheim-Genossenschaft Zürich (FGZ)



Overview low temperature network FGZ

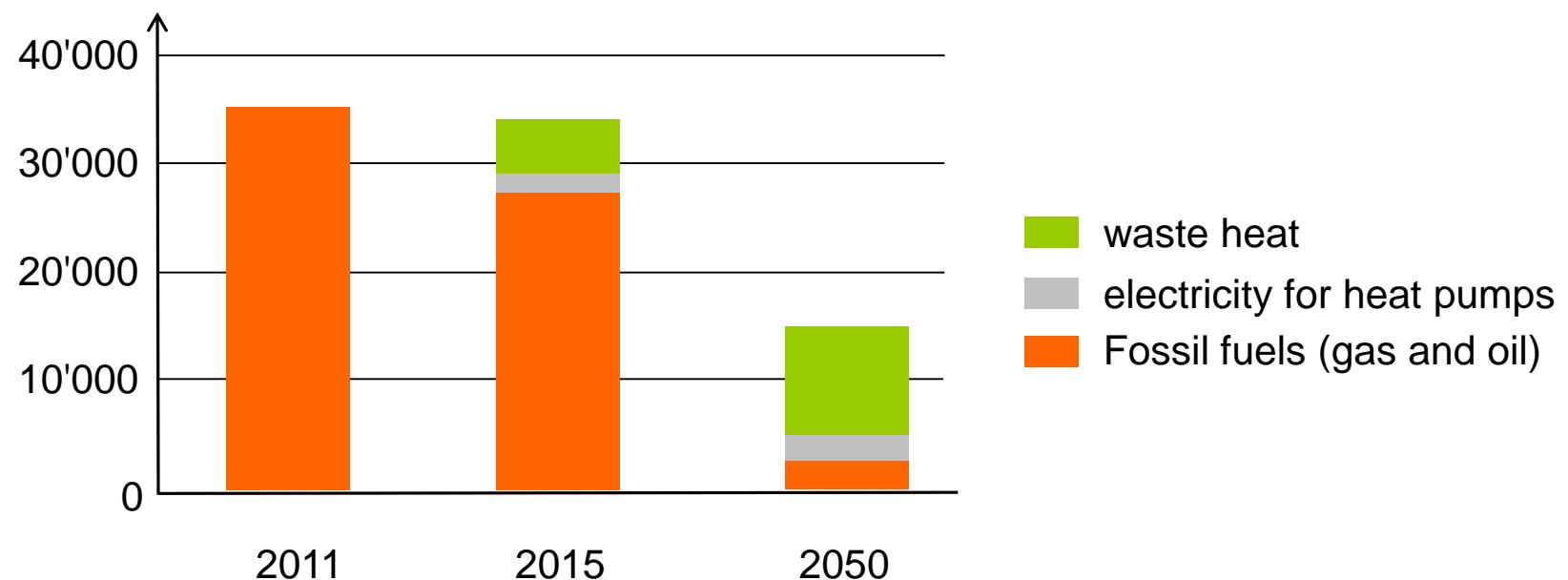


Stage of Implementation (2015)



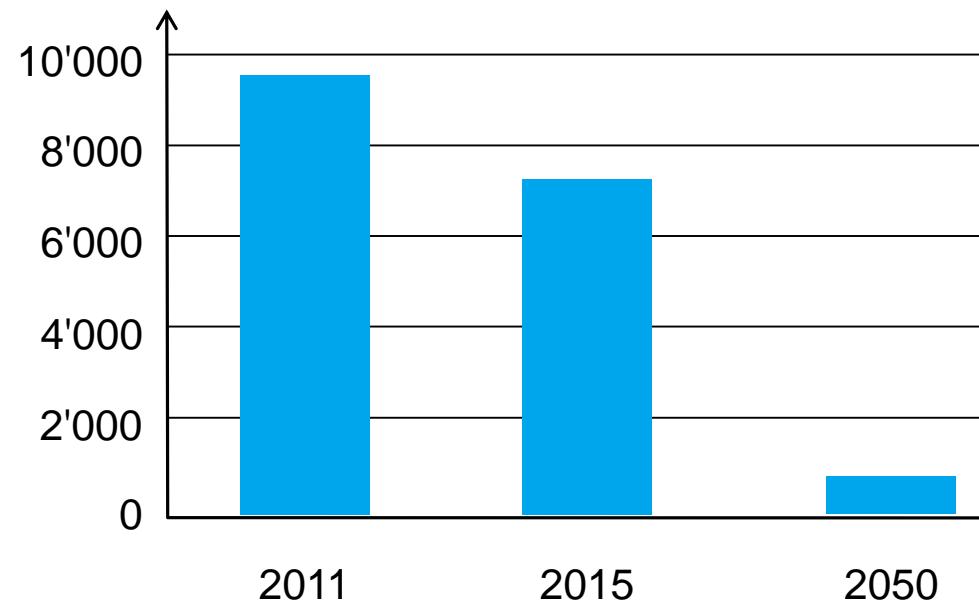
Energy Mix

heat demand in MWh/a



Greenhouse Gas Emissions

CO₂-eq emissions in t/a



Waste Heat from Data Center Swisscom



Heat Exchange Station Swisscom



Heat Exchange Station Swisscom



‘Anergy’ Pipes



‘Anergy’ Pipes



Geothermal Storage



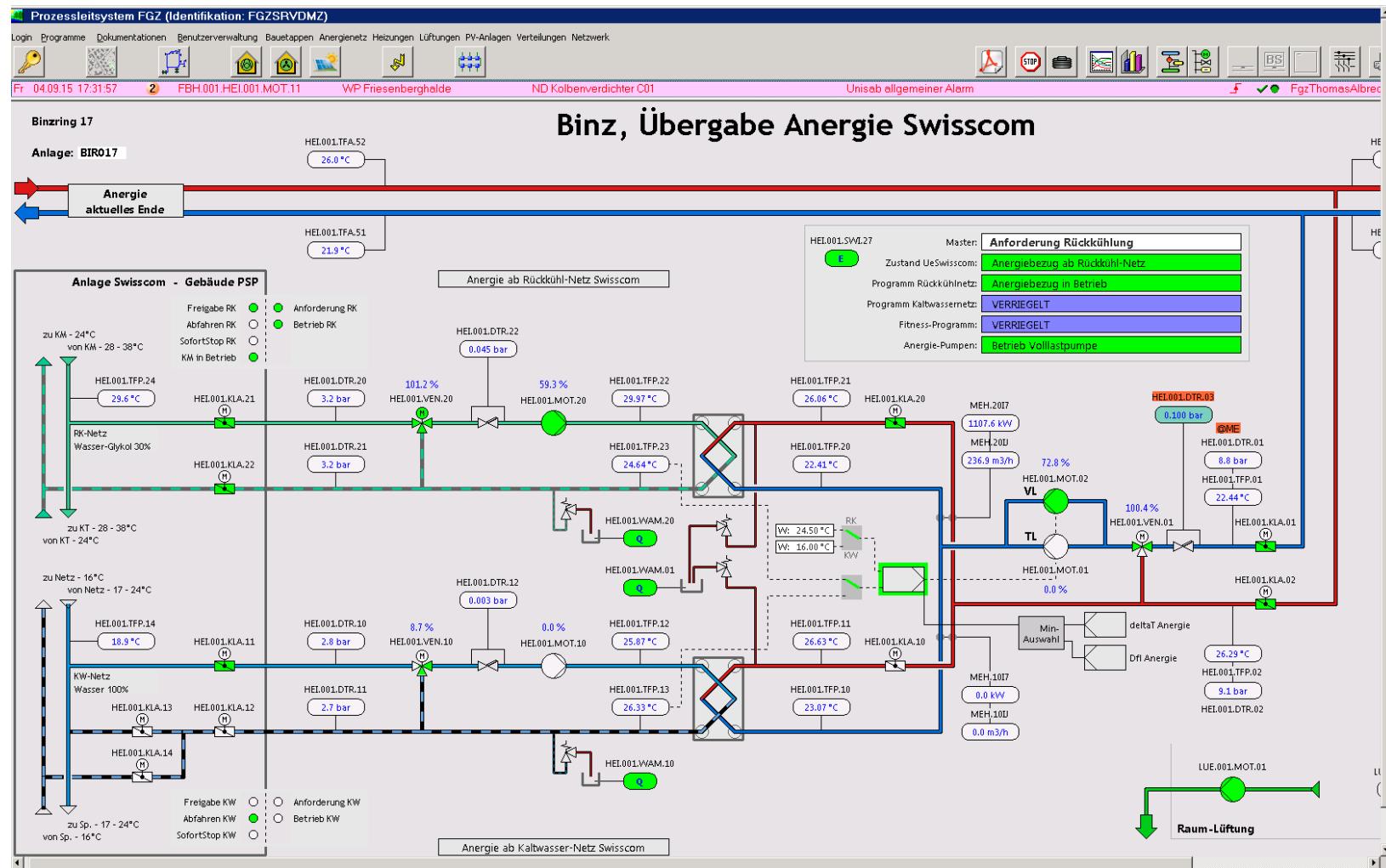
Geothermal Storage



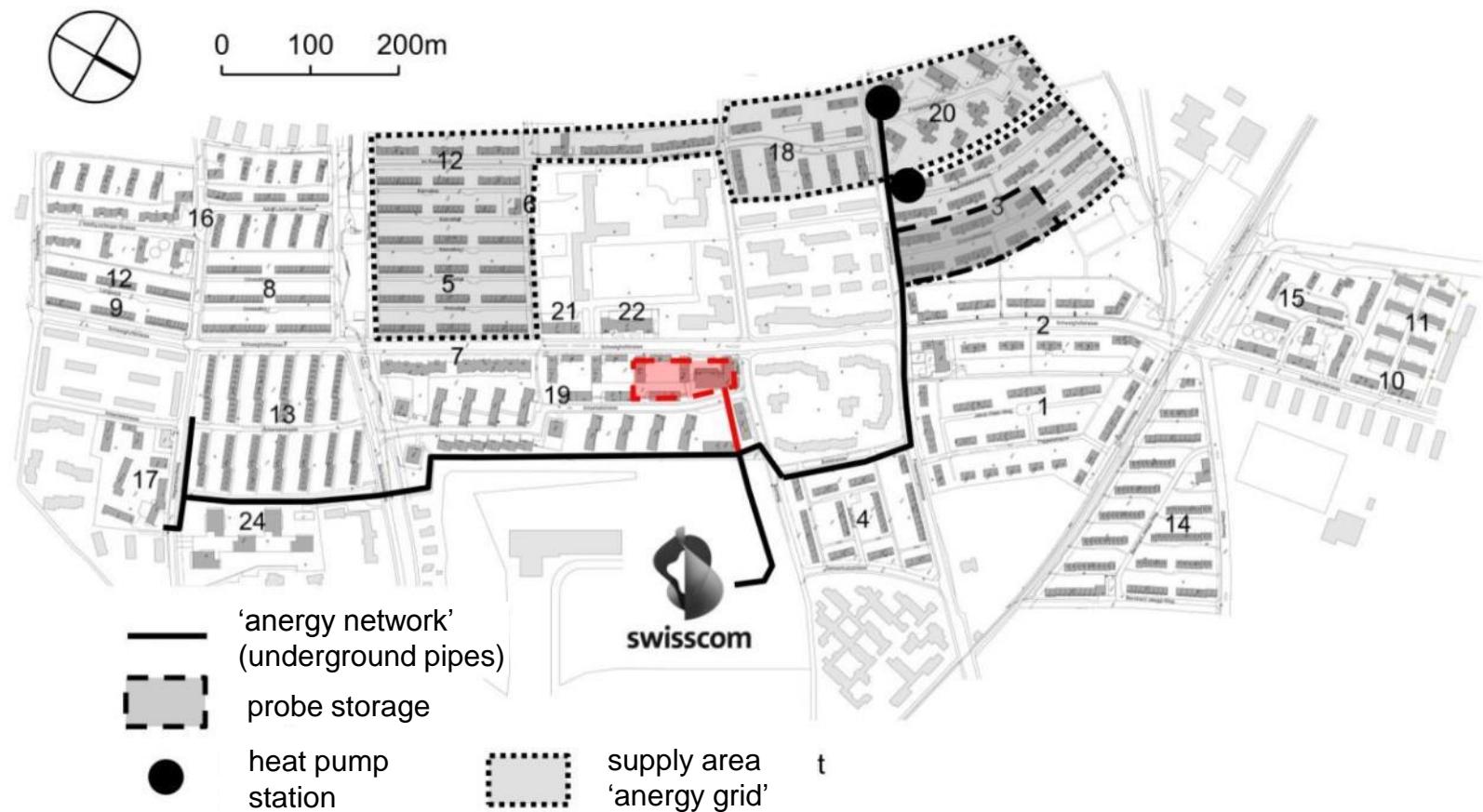
Heat Pump Station



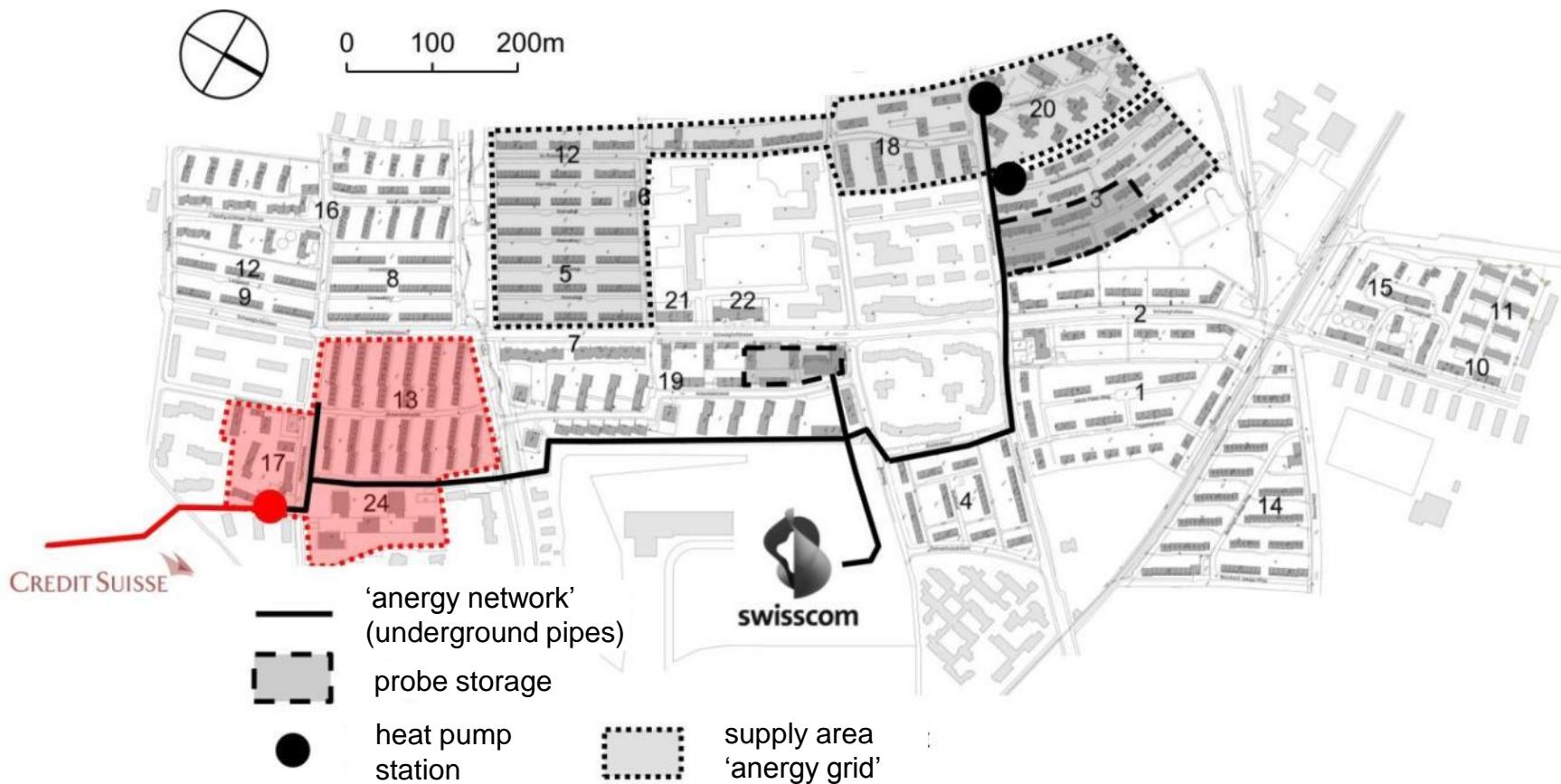
Energy Management System



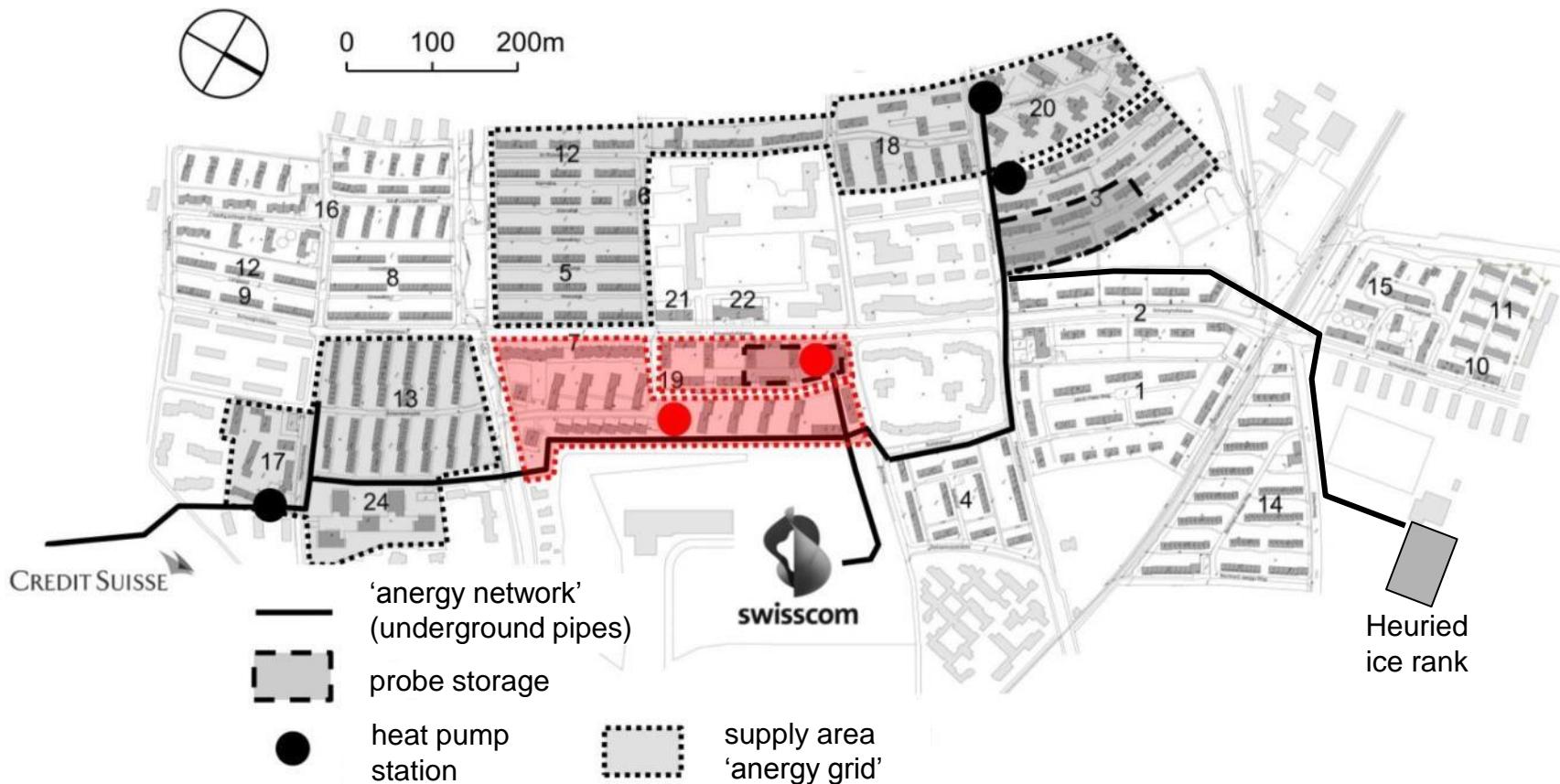
Future Installation by Stages



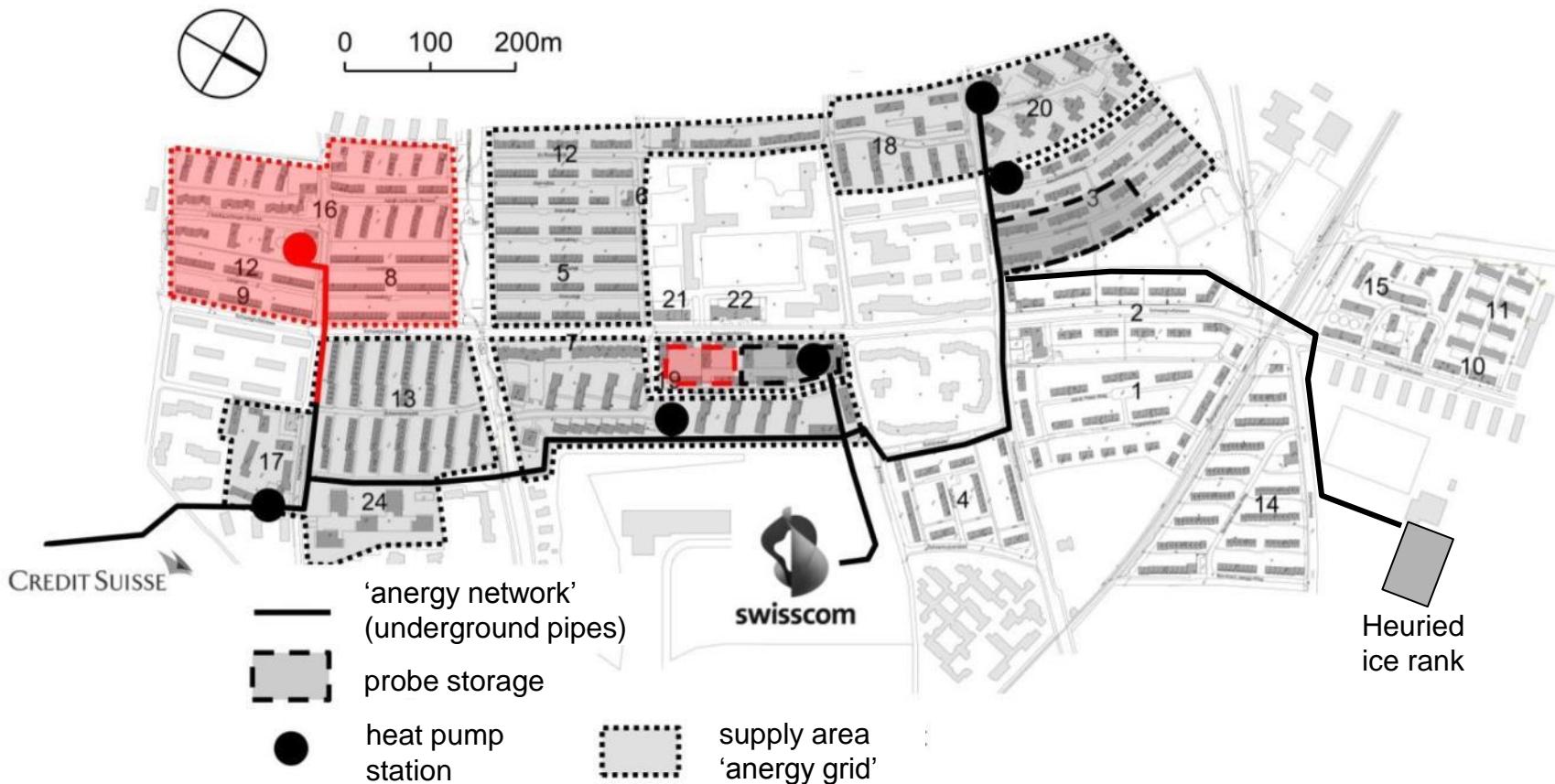
Future Installation by Stages



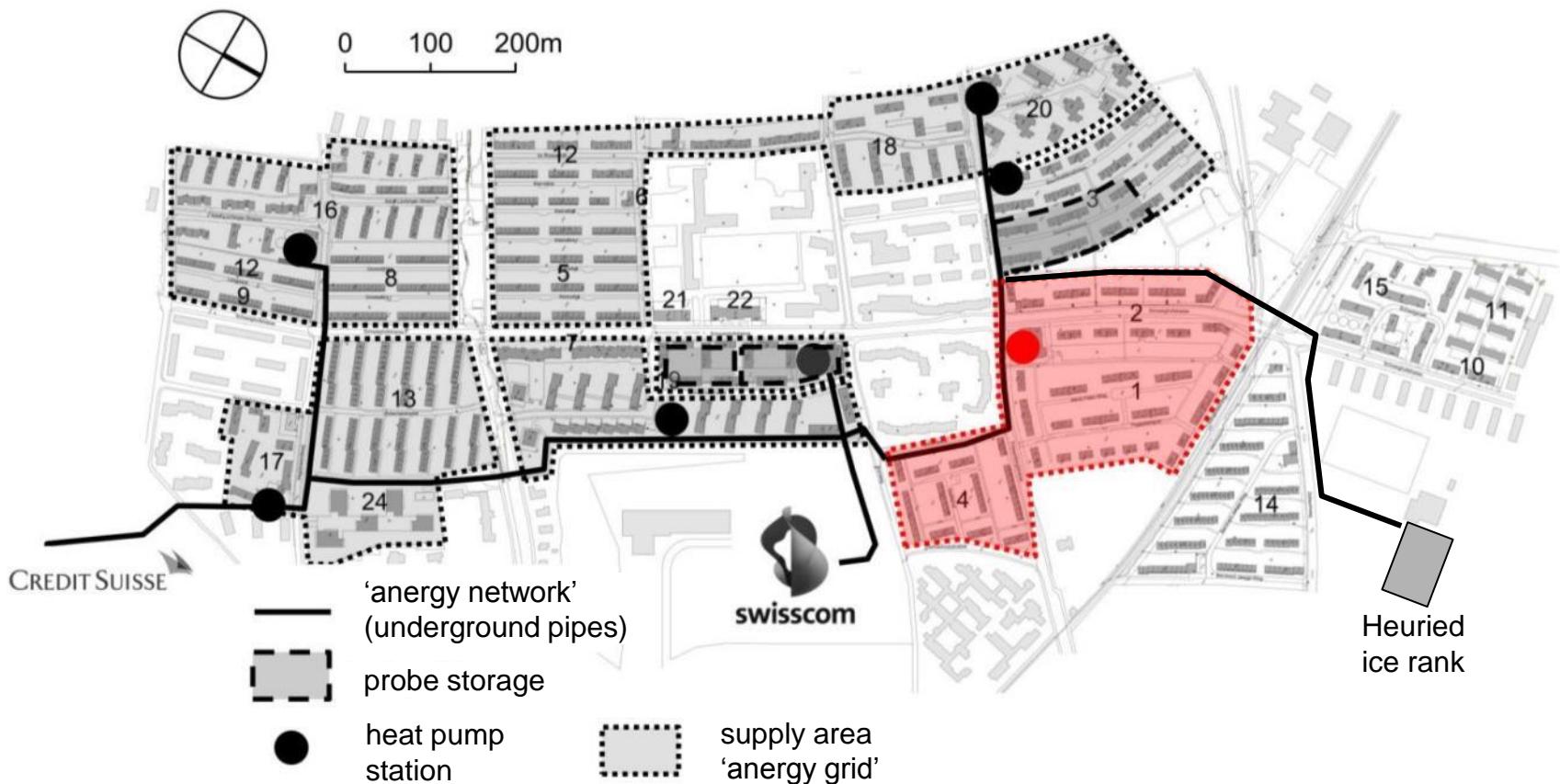
Future Installations



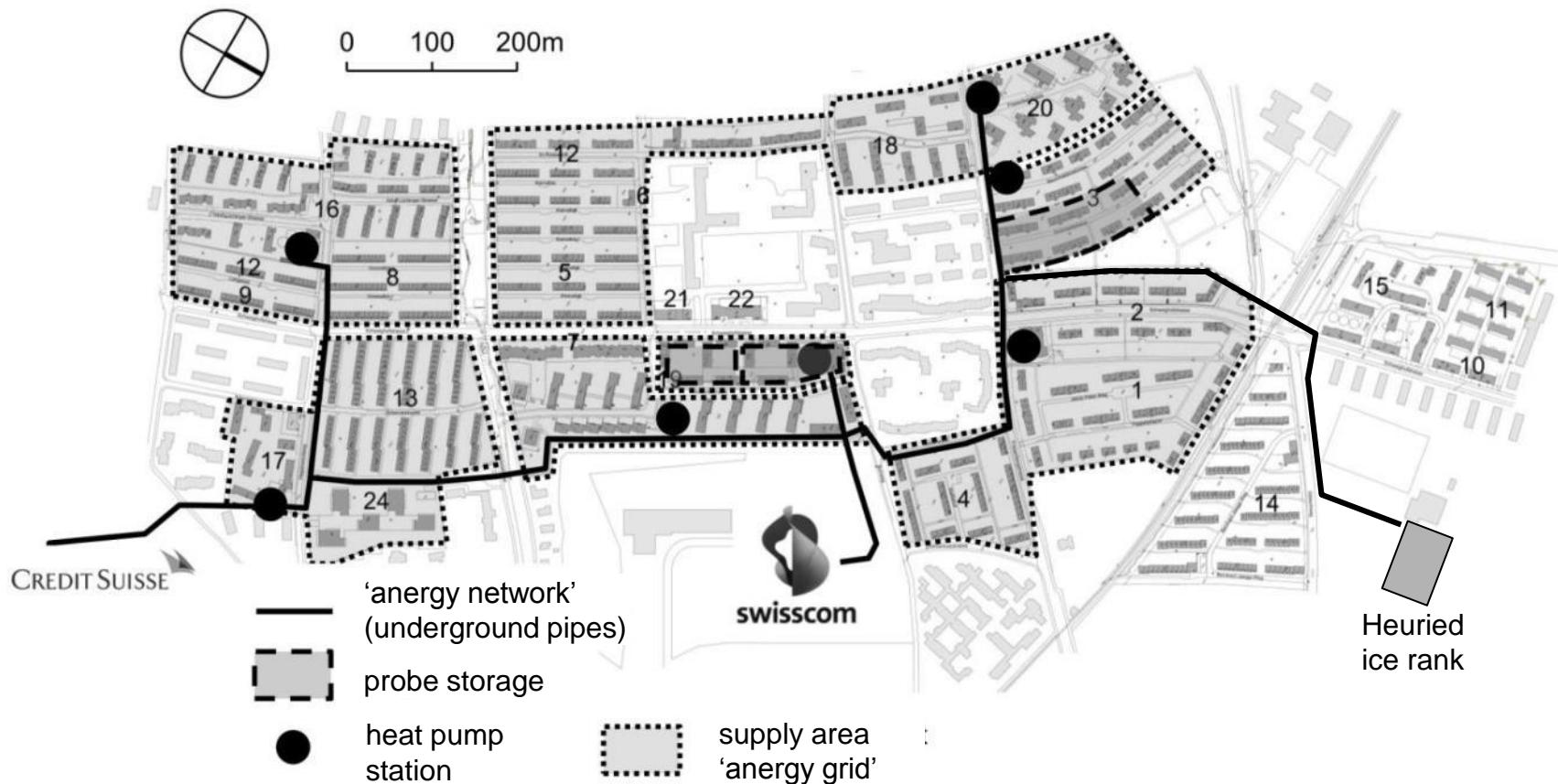
Future Installations



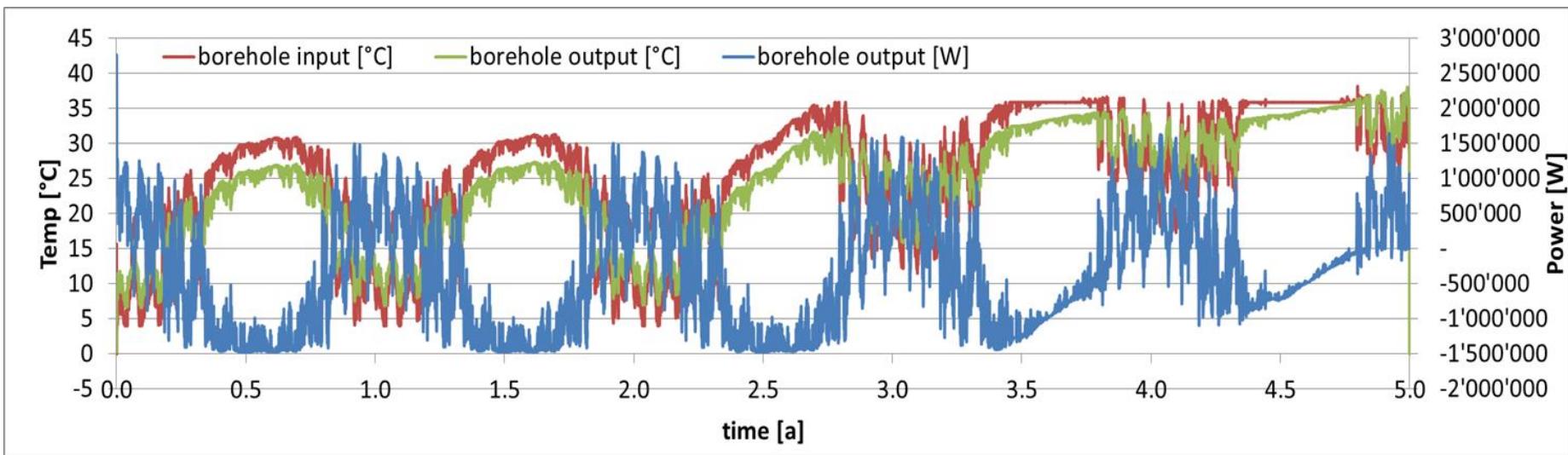
Future Installations



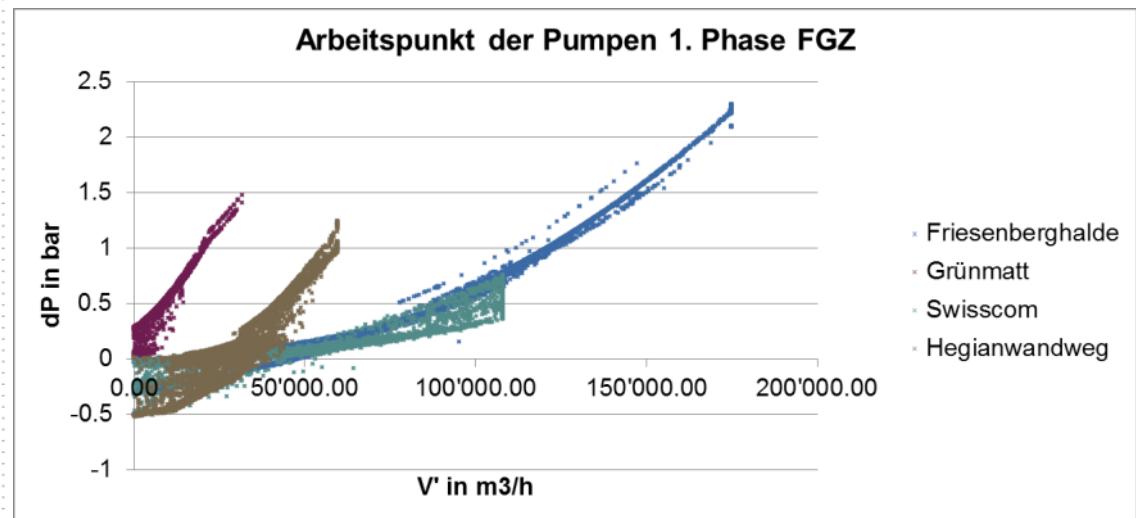
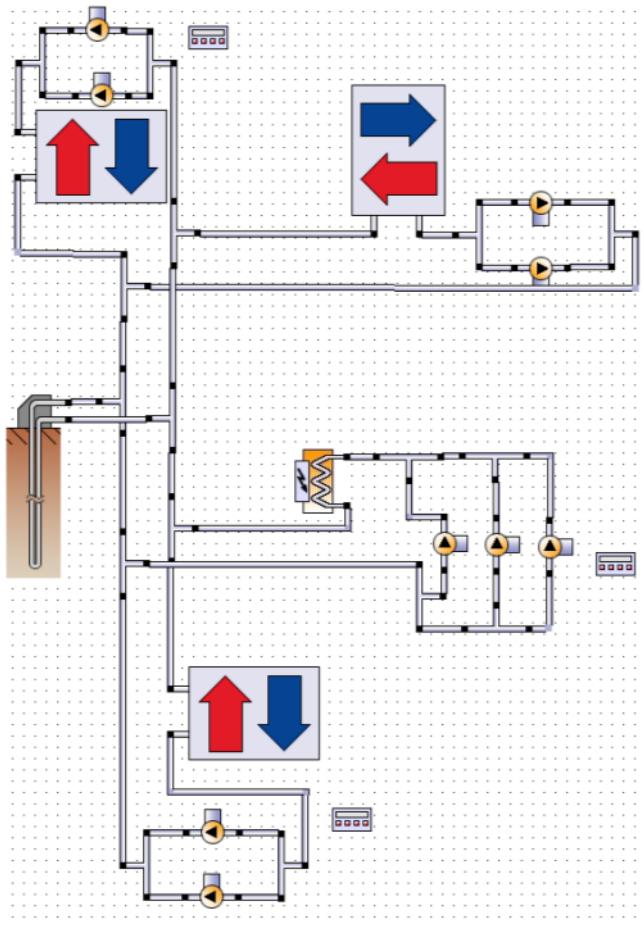
Future Installations



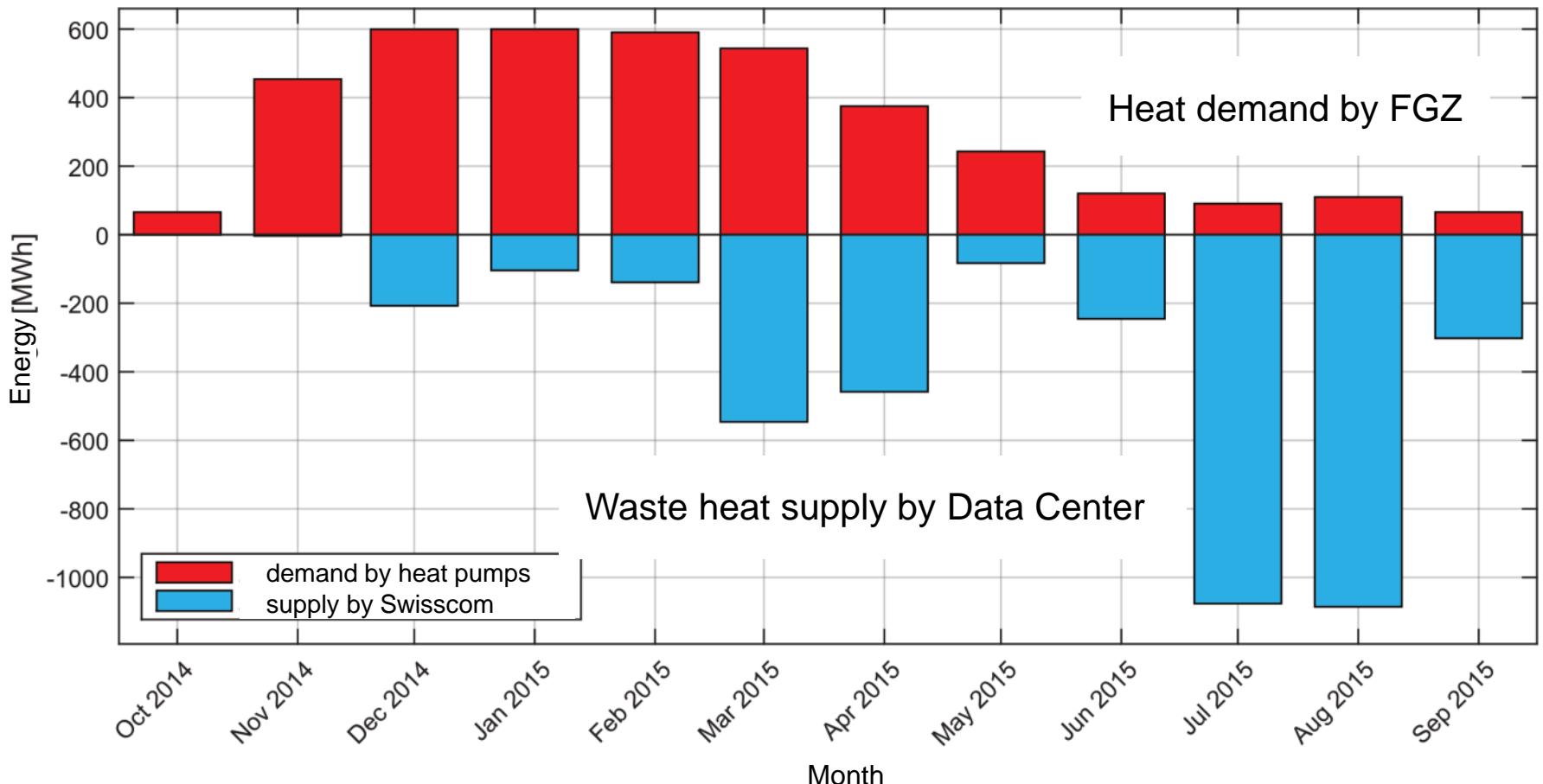
Simulation – Network Temperature Development



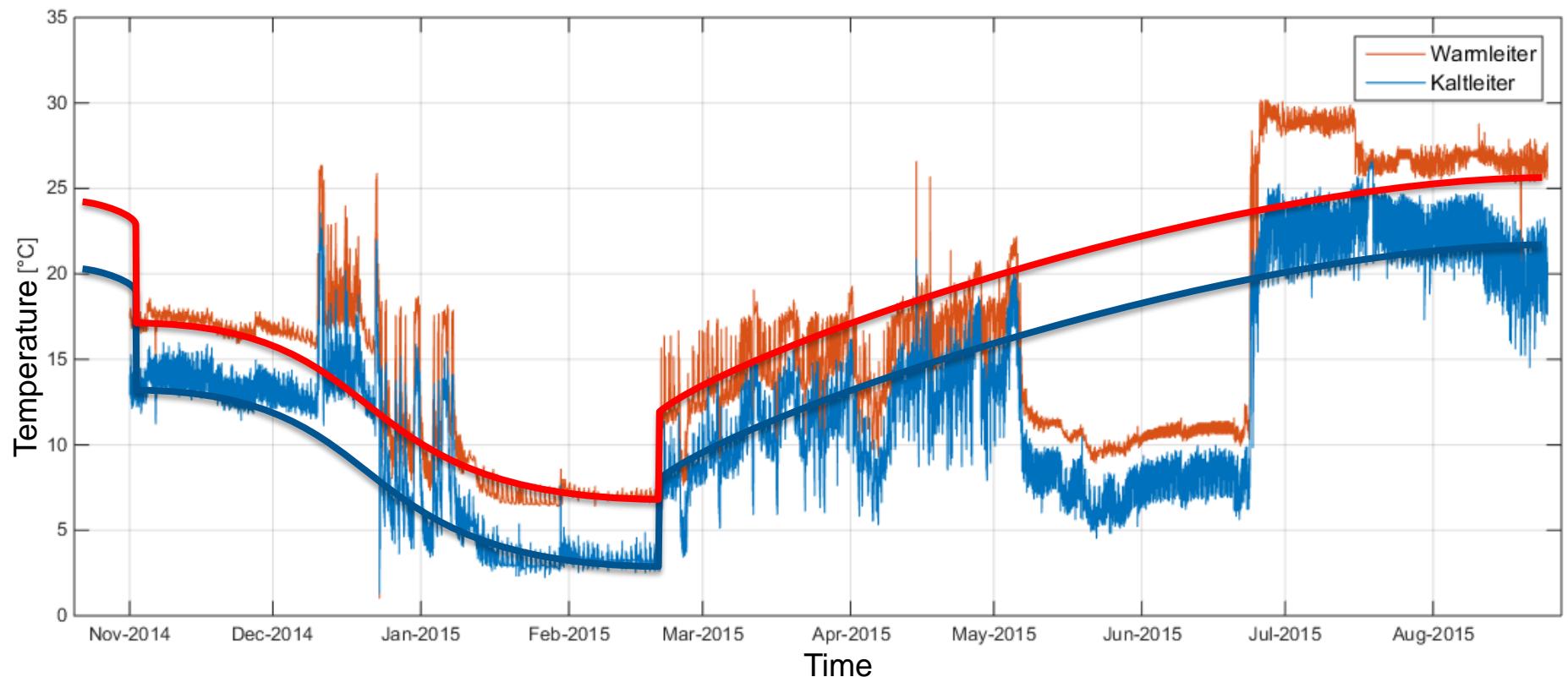
Simulation – Hydraulics for Pump Dimensioning



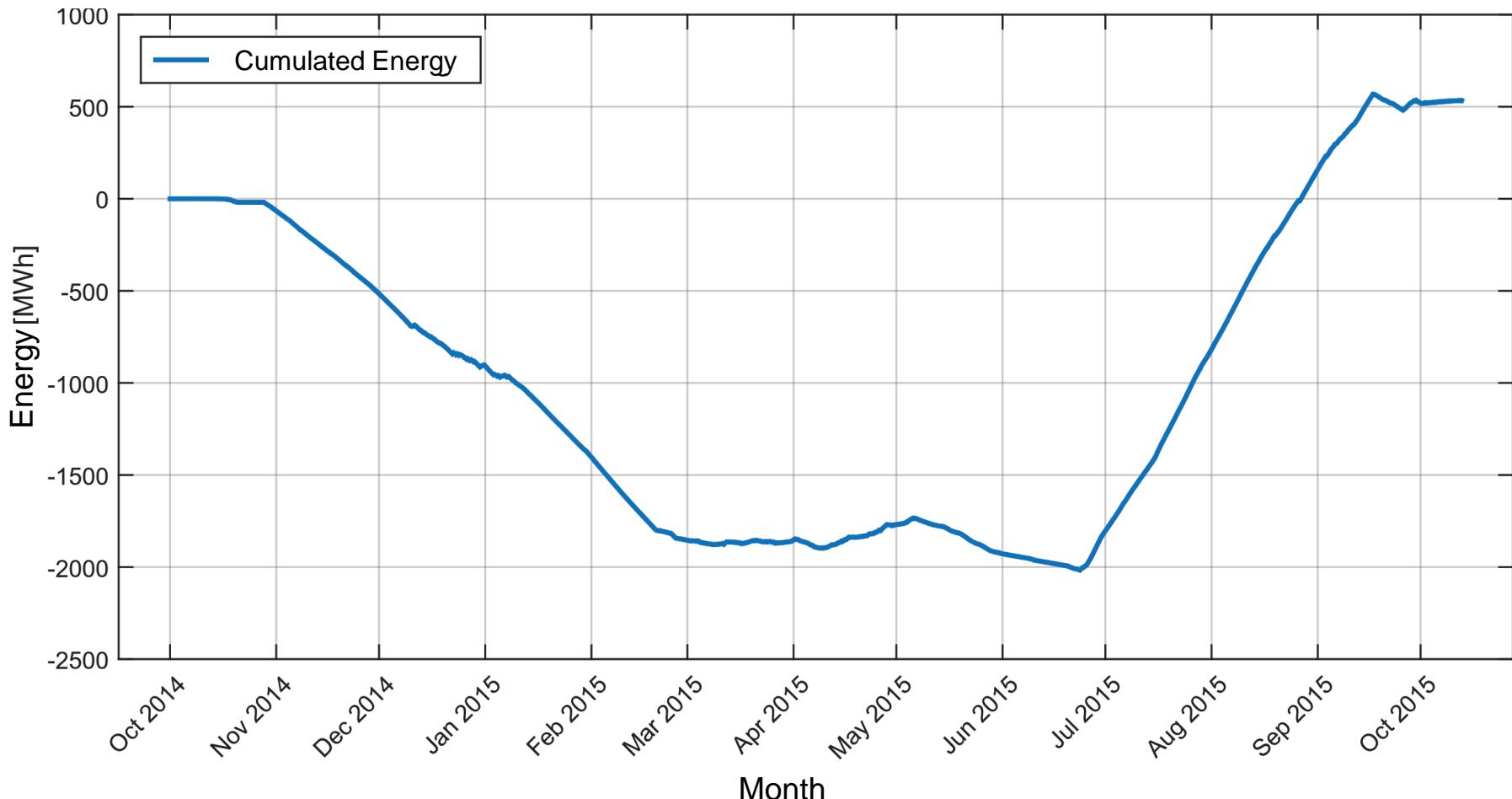
Operating Figures – Waste heat demand and delivery



Operating Figures– Temperature Profile of Network



Operating Figures – Load of Bore Hole Field

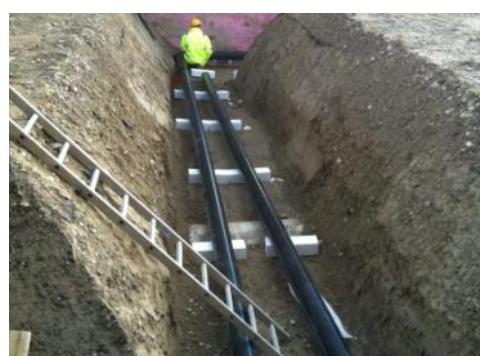
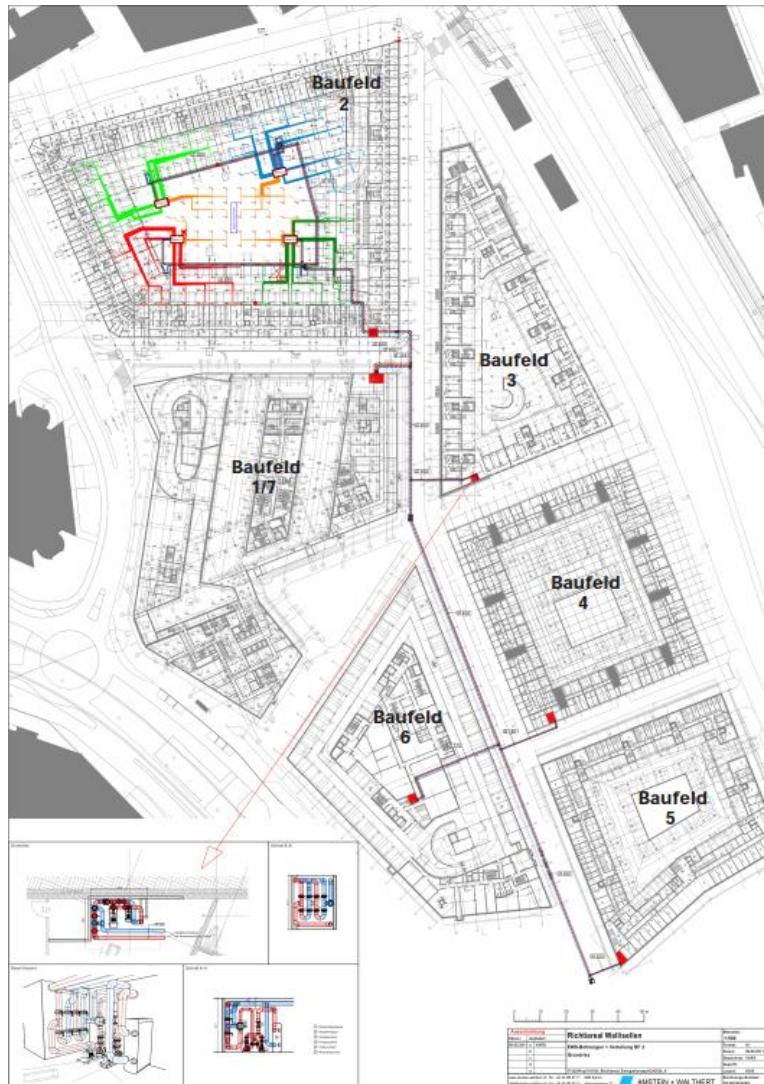


Network 'Richti Areal' in Wallisellen (Zurich)

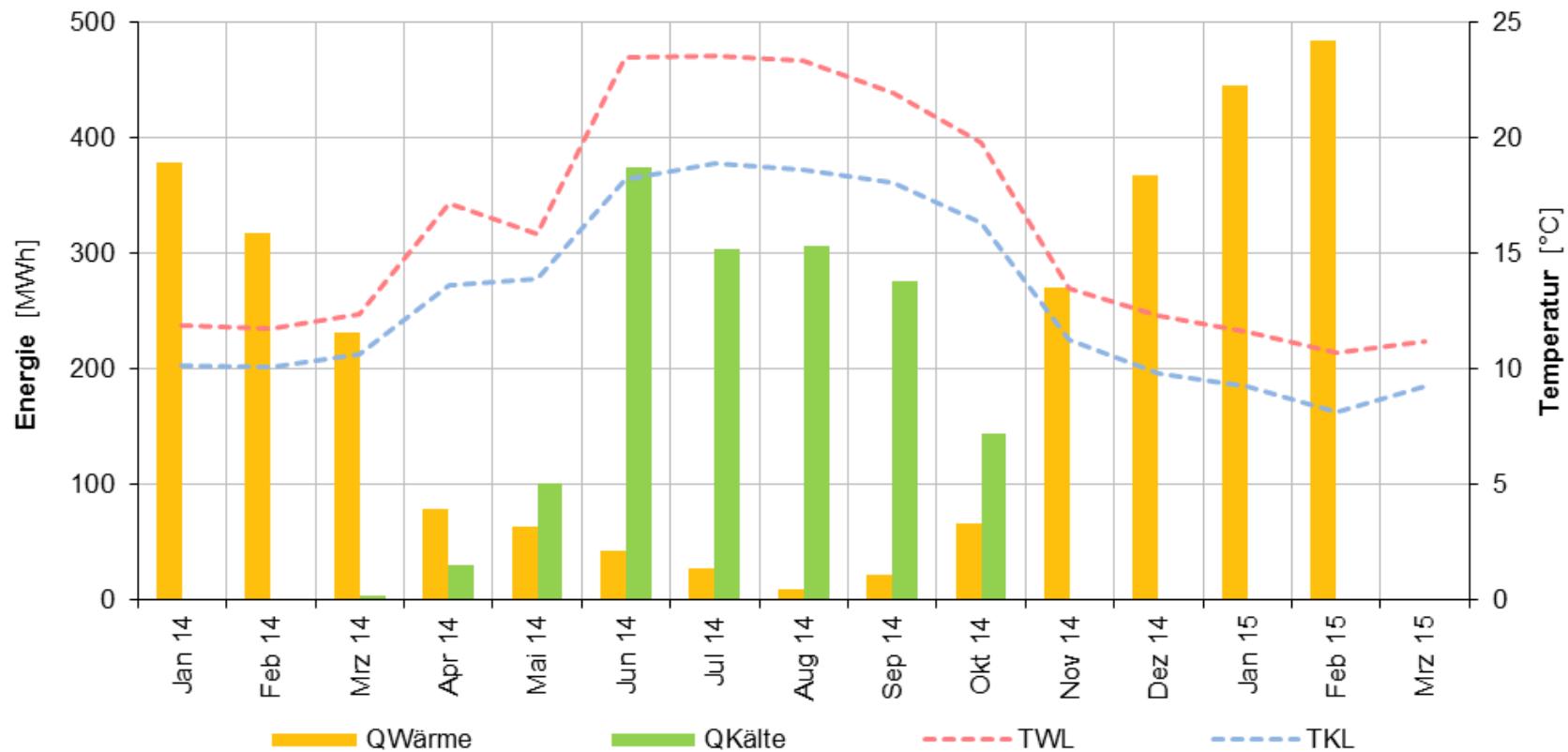


**145'000 m² energy reference surface
5'700 MWh heat demand
6'000 MWh cooling demand**

Overview Anergy Network 'Richti' Area



Operating Figures – Energy Balance, Temperatures



Outlook – Potential Areas for Anergy Networks





AMSTEIN+WALTHERT

Thank you very much
for your attention

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