



REWARDHeat



Cost and Benefits of Shifting Towards Low Temperature District Heating Networks – Energy Planning Approach

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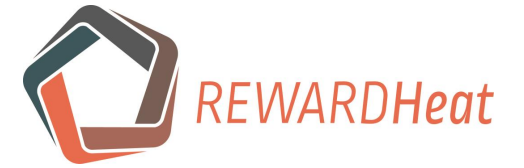
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Content



- REWARDHeat project
- Ultra-low temperature district heating
- Overview of existing cases
- DH modelling
- Supply temperature and Cost reduction
- Future work
- Conclusion



REWARHeat project overview



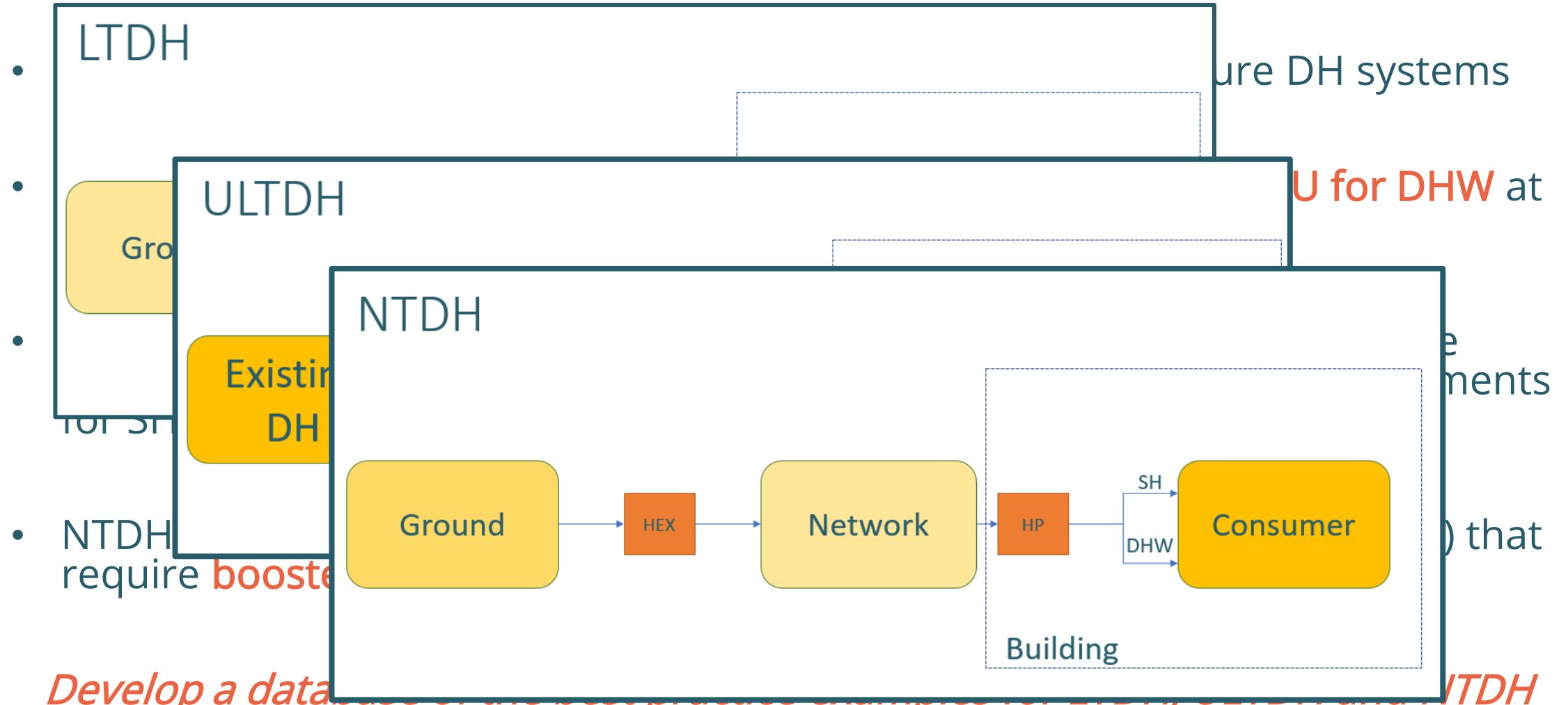
- H2020 financing, 2019-2023
- 27 project partners, coordinator EURAC
- 7 DH networks case studies

Specific objectives

1. Demonstrate a new generation of low-temperature district heating and cooling networks
2. Integration of renewable and waste heat, available at low temperature
3. Develop innovative technologies for flexible use of heat
4. Develop business models and financial schemes to enable large public and private investments
5. Develop predesign tool for low-T DH networks



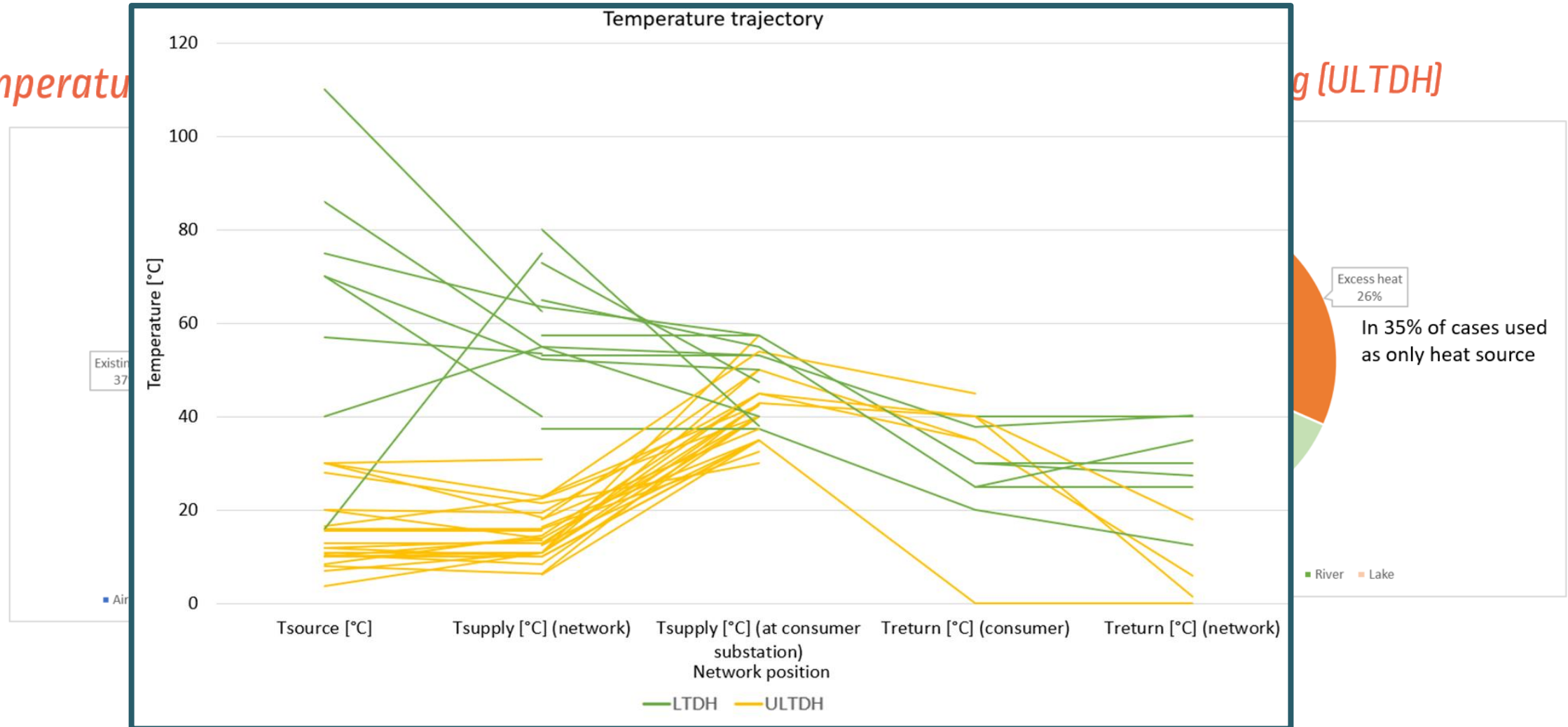
Low temperature DH categorization



DH best practice examples overview

Low Temperature

g (ULTDH)



District heating modelling



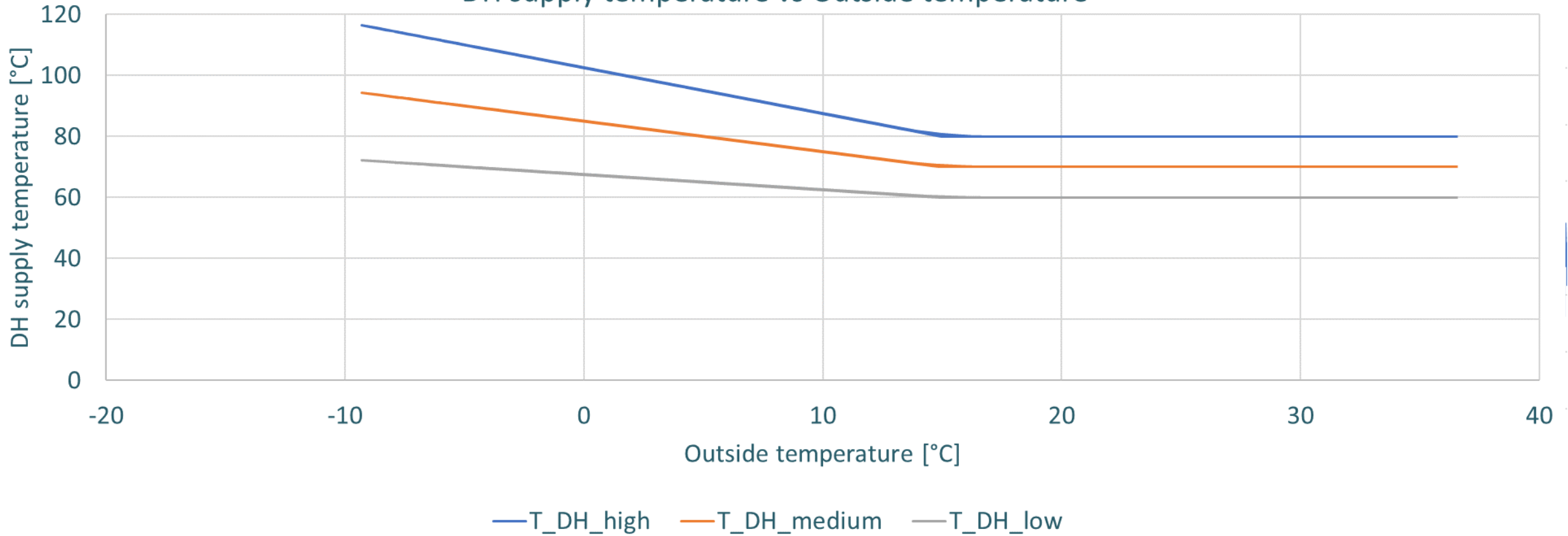
- LP optimization
- Minimization of total running cost
- Numerous technologies: heat pump, heat-only boiler, CHP, solar thermal collectors, thermal storage
- Optimal operation for a whole year → 1h time step



Input data



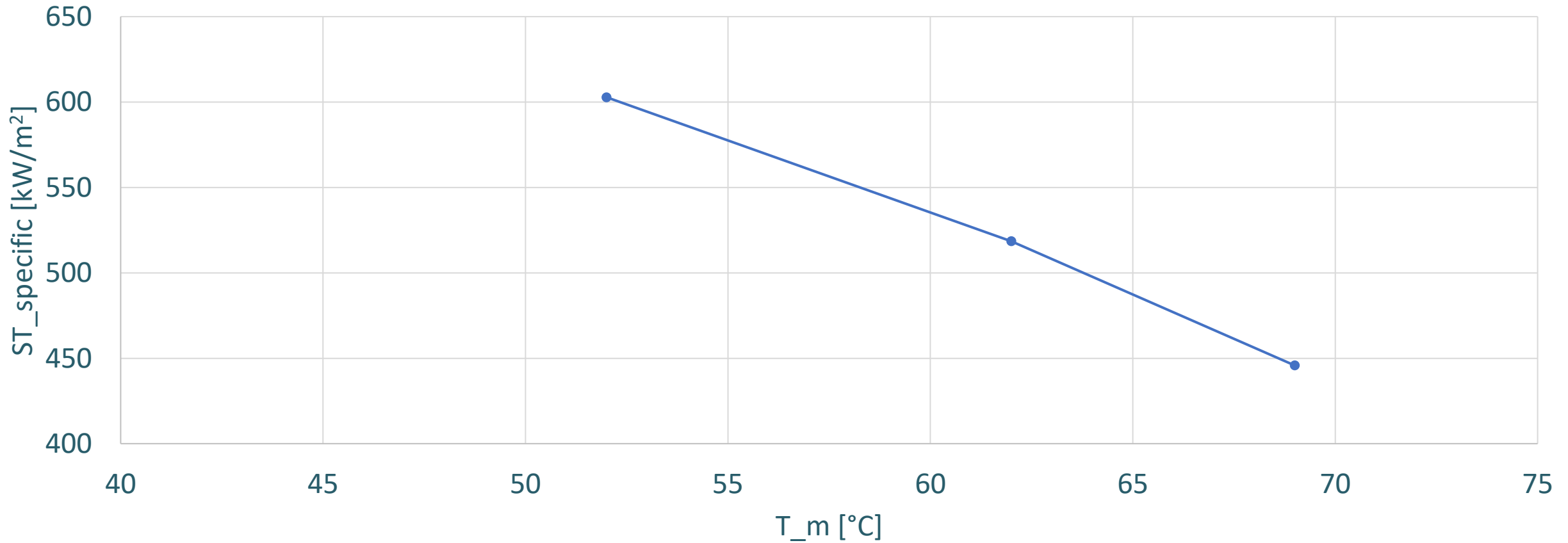
DH supply temperature vs Outside temperature



Temperature of supply and technology efficiency



Specific solar thermal production



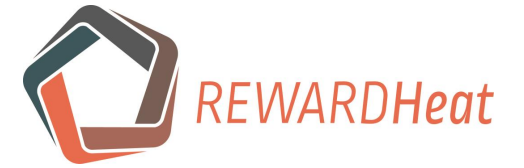
Scenario



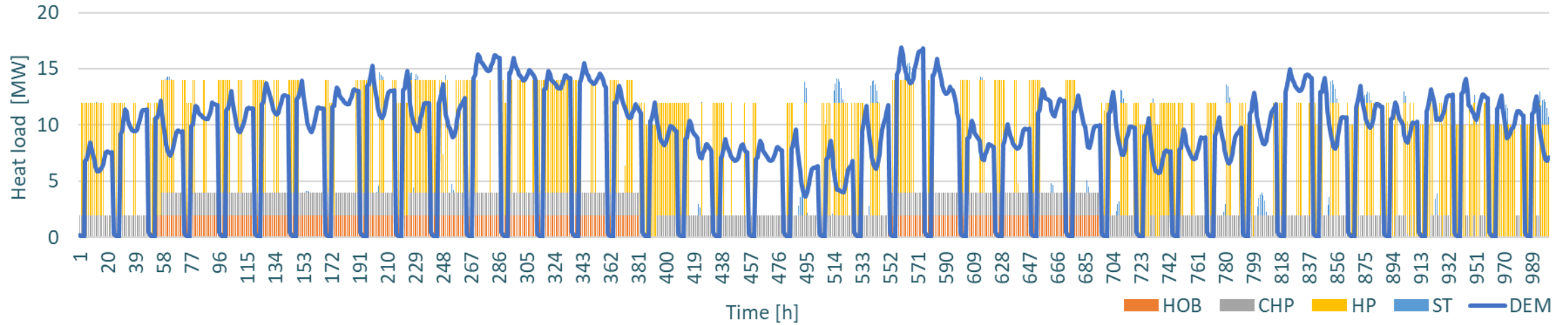
- DH system which consists of:
 - Back-pressure cogeneration
 - Heat-only boiler
 - Heat pump
 - Solar thermal collector field
 - Thermal energy storage
- Reduction of supply temperatur (high → medium → low)
- Analysis of the running cost reduction



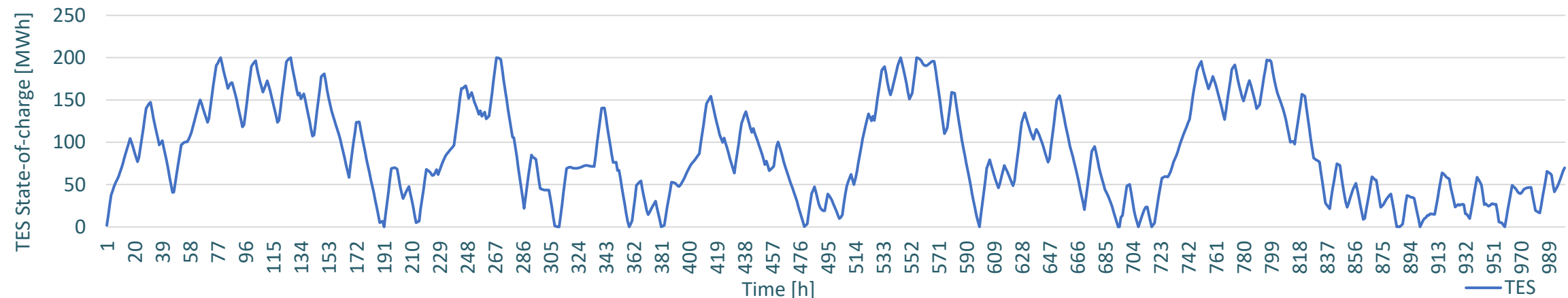
First results – DH operation



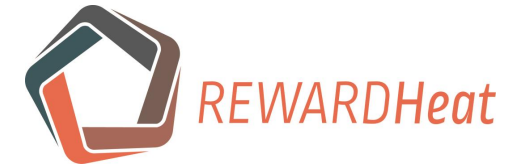
Distirct heating system operation



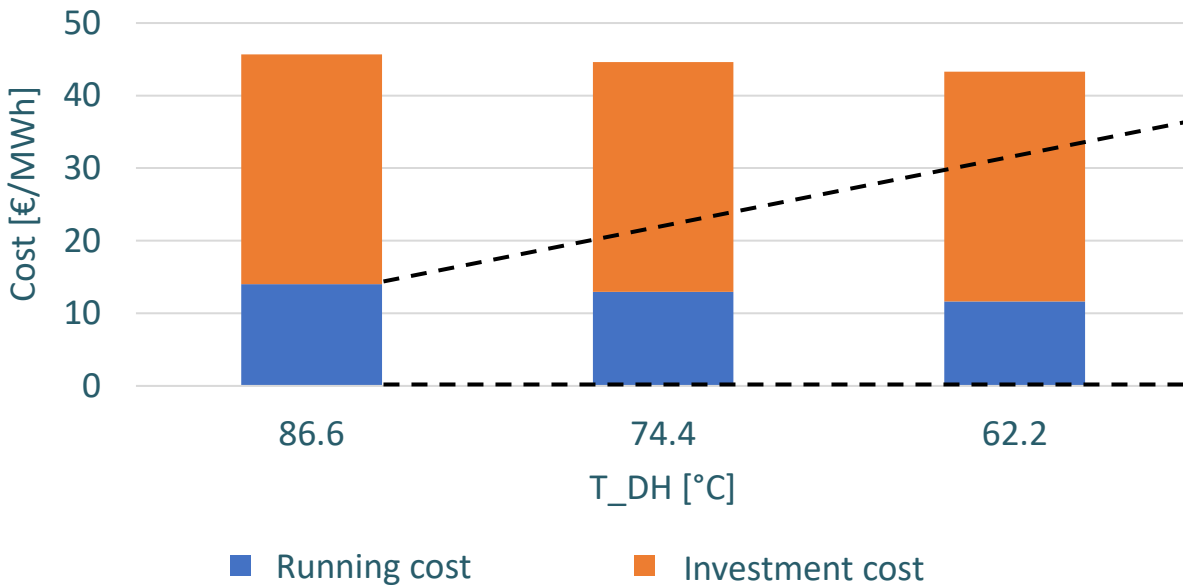
Thermal storage operation



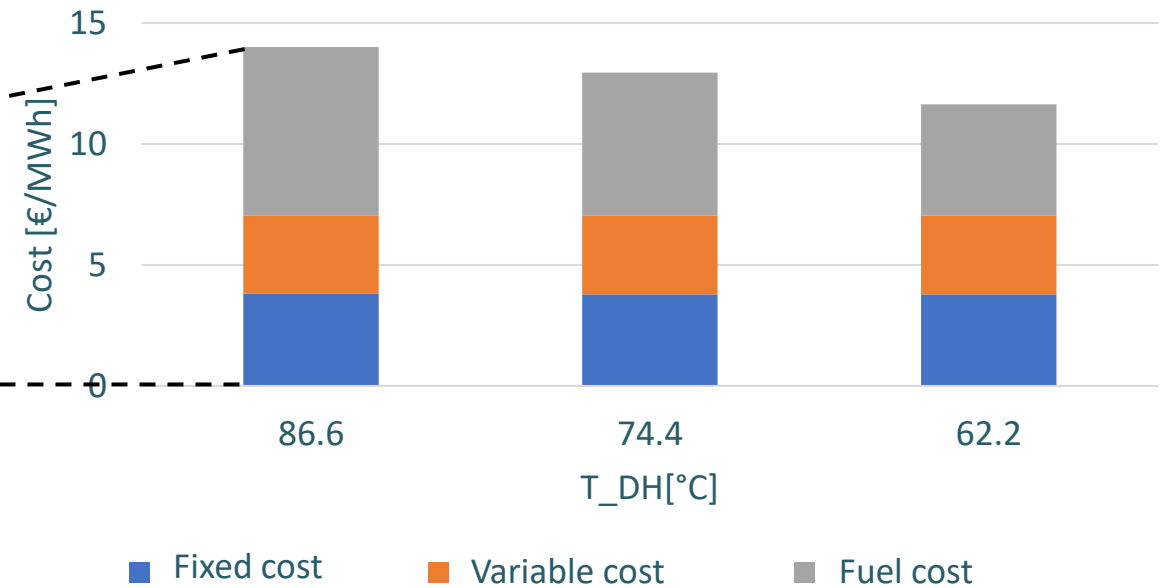
First results - The impact of temperature reduction



Investment and running cost reduction



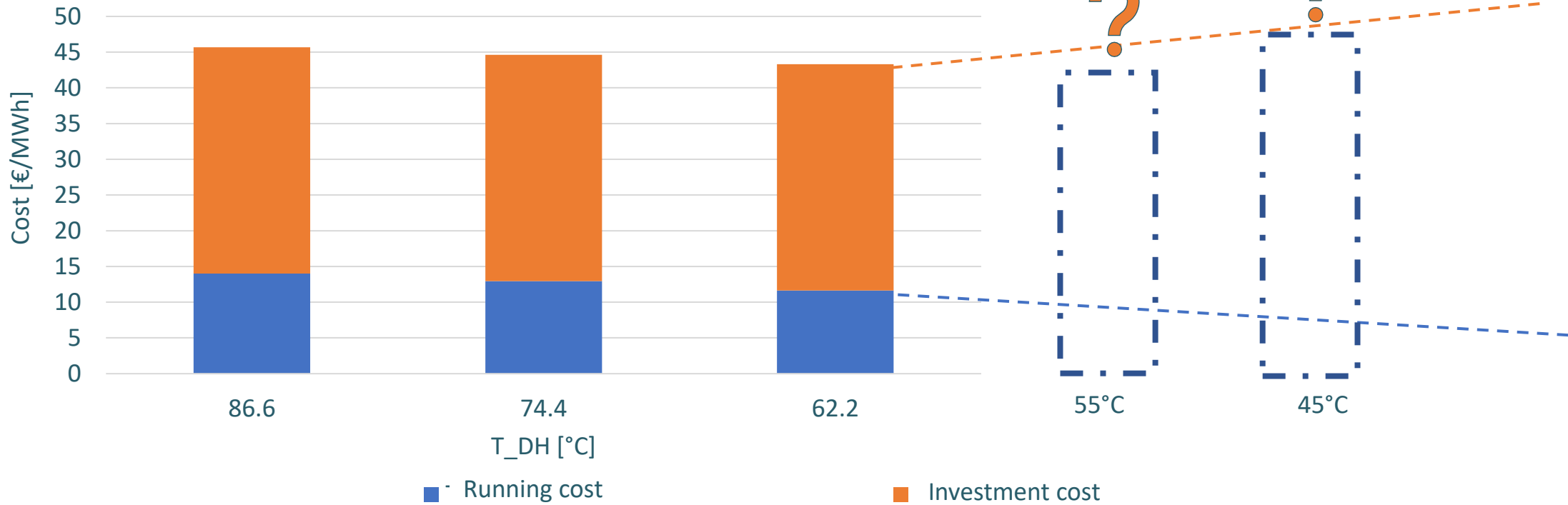
Running cost overview



Future work



Investment and running cost reduction



Conclusion



- Presentation of H2020 REWARDHeat project
- Development of database low-temperature DH systems
- Analysis of the temperature reduction of system running costs
- Basis for future research has been defined





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Thank you

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