



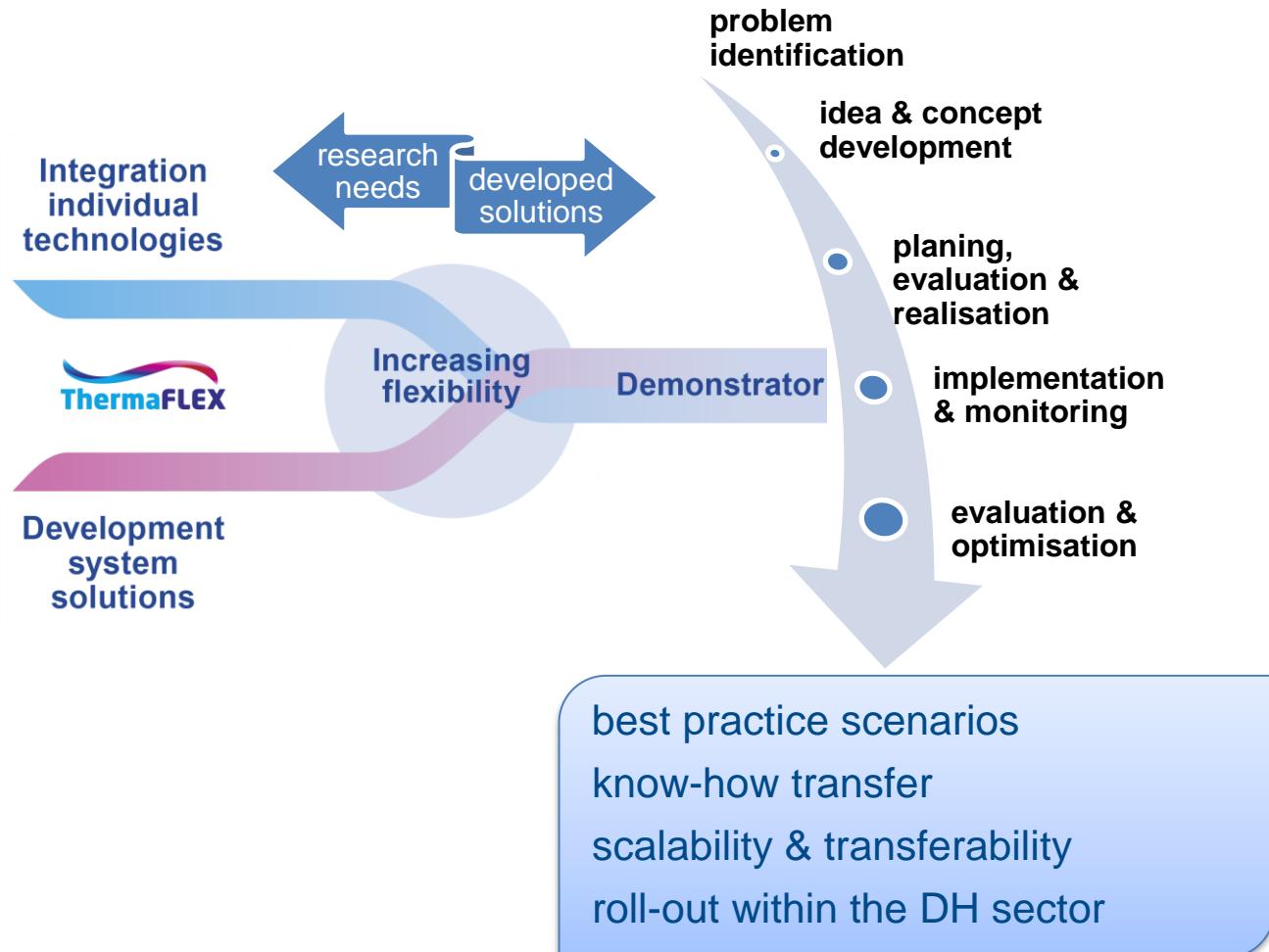
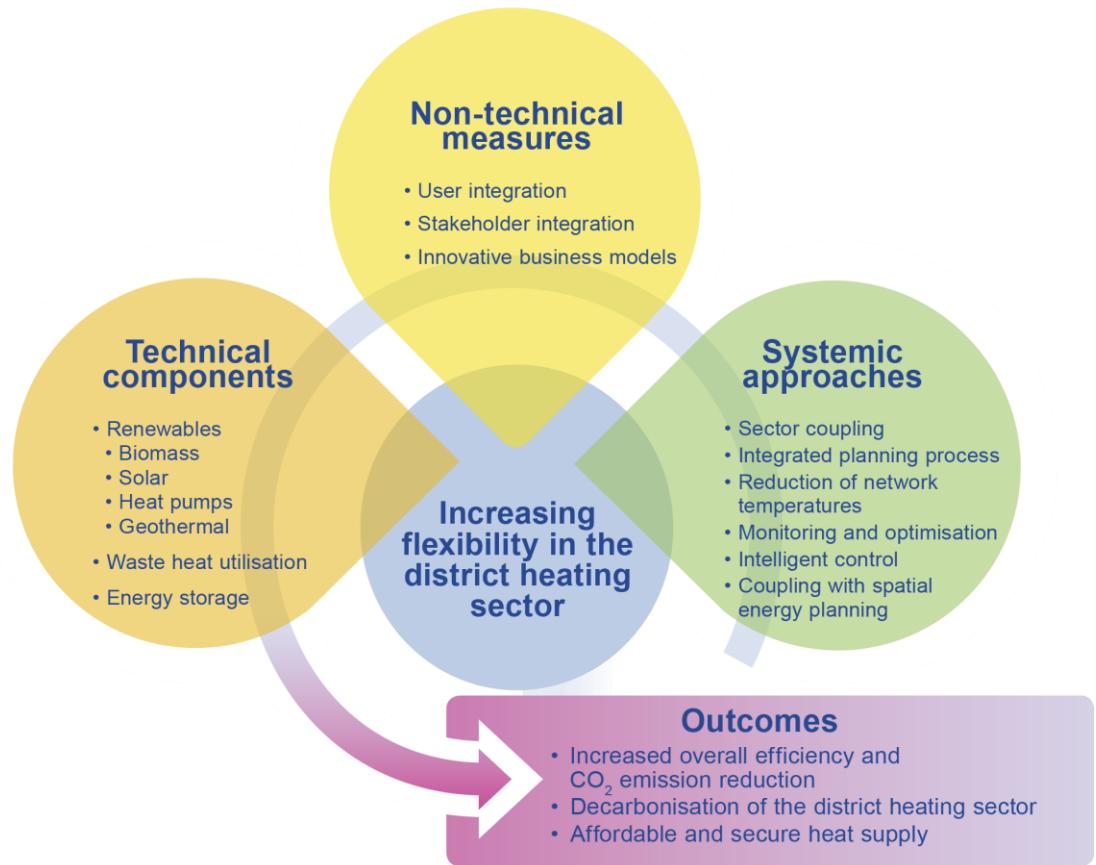
Interconnection & smart control of district heating networks for increased flexibility

7th International Conference on Smart Energy Systems
21-22 September 2021, Copenhagen, Denmark

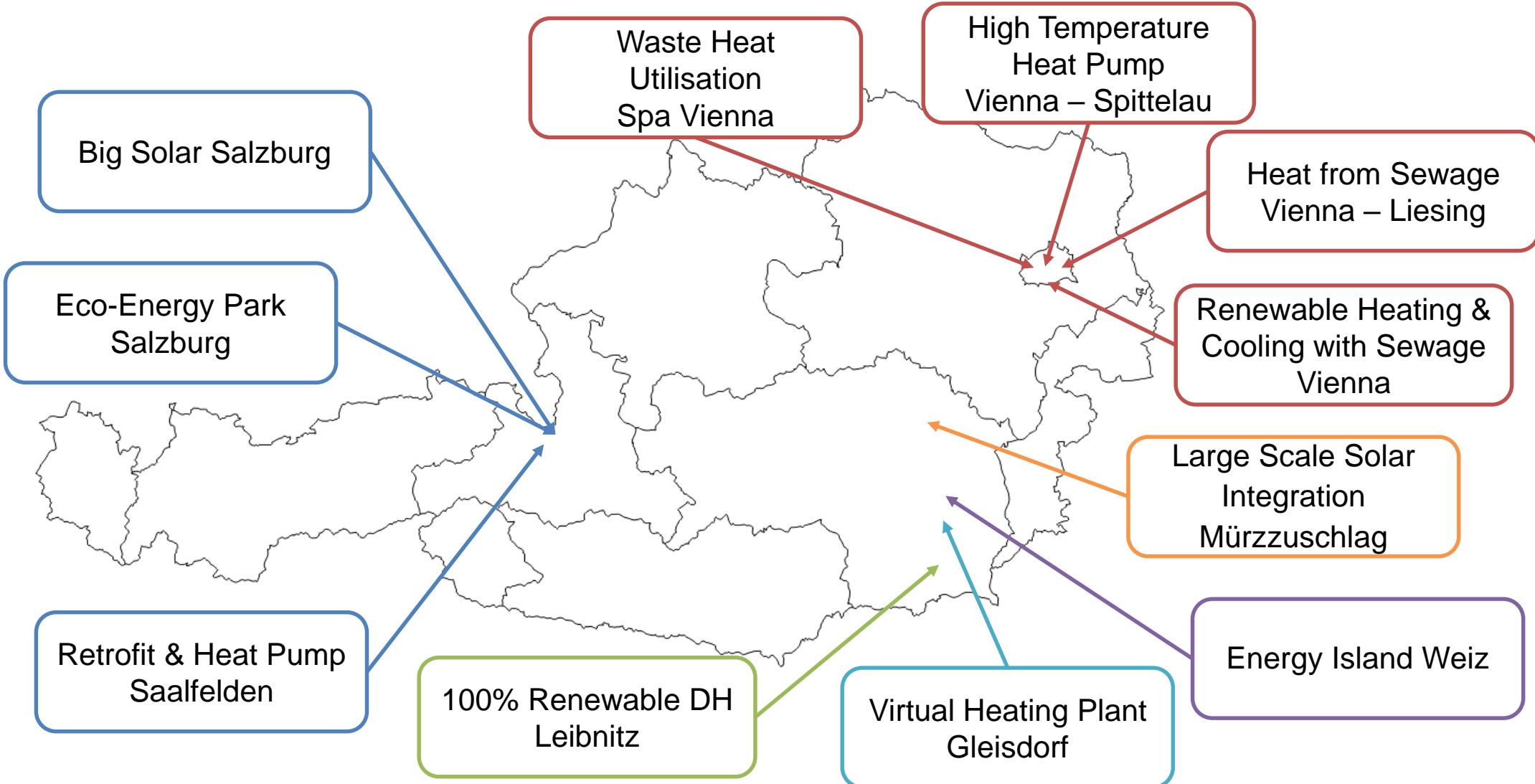
Jakob Binder, Valentin Kaisermayer, Daniel Muschick, Wolfgang Rosegger
Günter Beck, Joachim Kelz, Markus Gölles



ThermaFLEX: Aim & approach

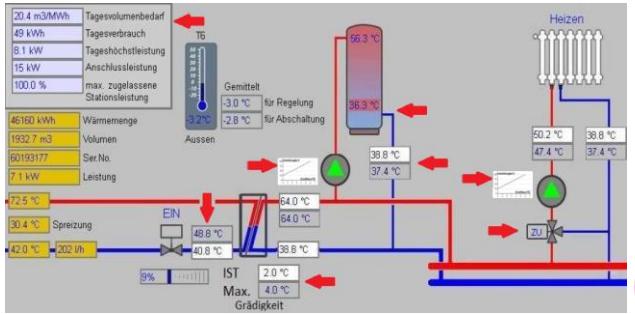


Demonstration case studies of various DH networks



100% renewable district heating Leibnitz

modernisation & optimisation of heating plants



Interconnection & massive expansion of DH networks



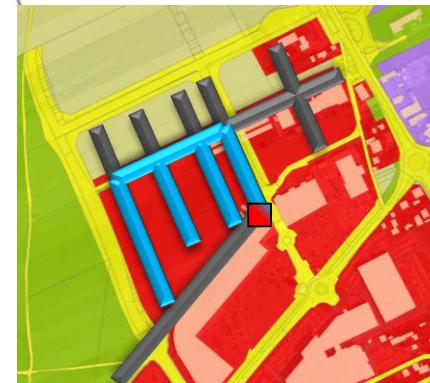
waste heat utilisation



smart control (EMS & DSM)



stakeholder & user integration



low-temperature DH solutions



storage integration & management

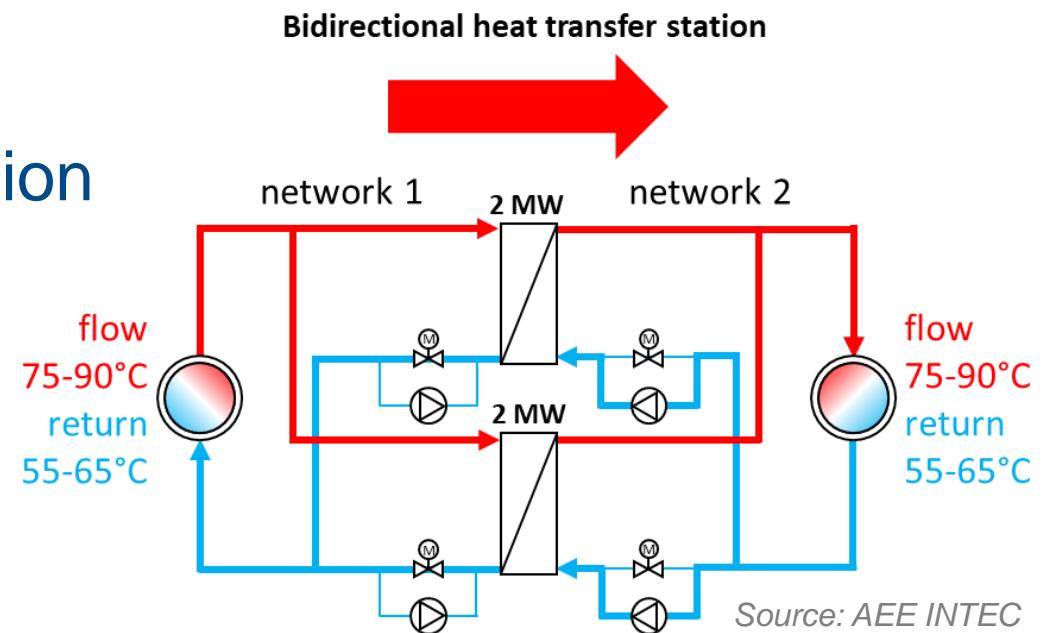
Interconnection of DH networks

■ Why?

- save costs of peak load or backup boilers
- free up production capacity for network expansion
- increase flexibility and security of supply of the network

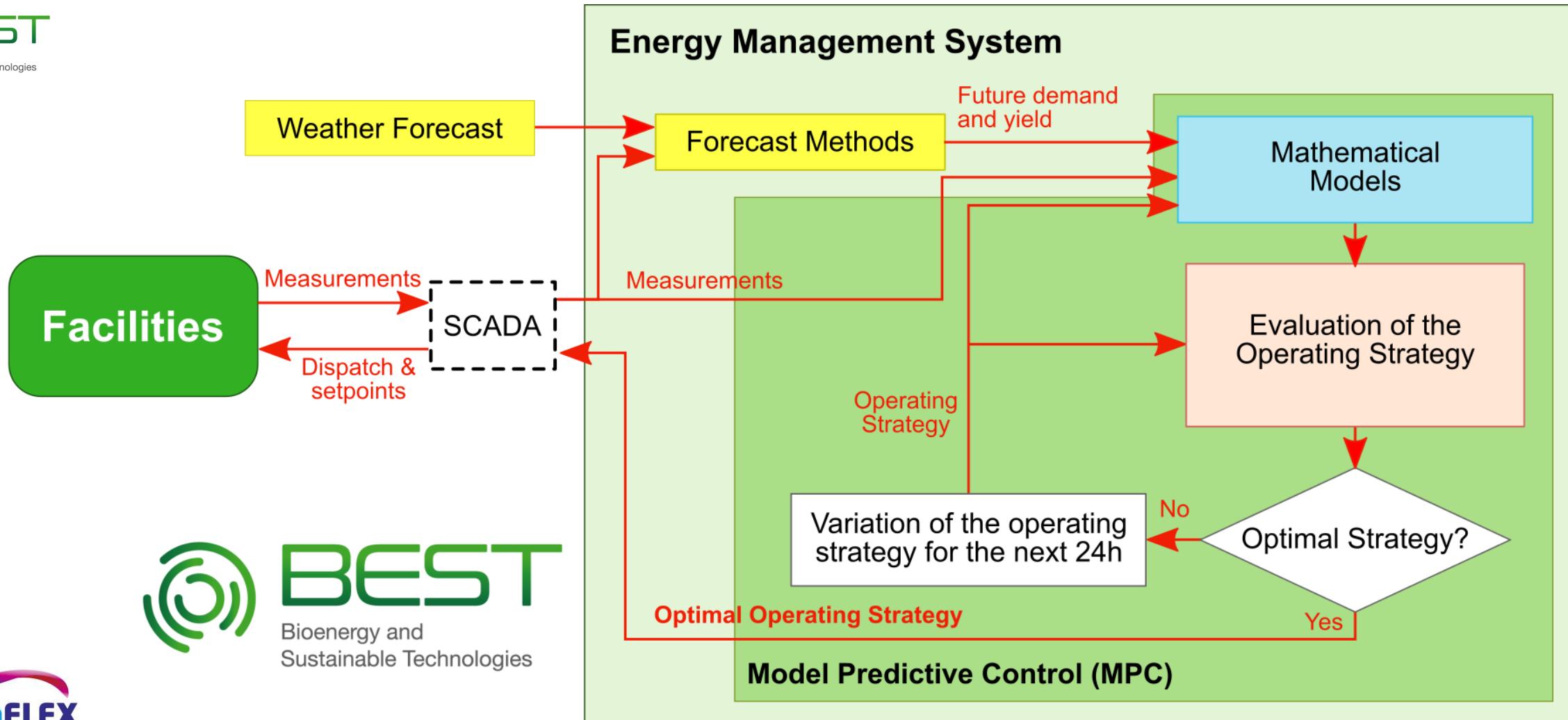
■ Challenges for change of direction

- water hammers
- temperature cool down



Source: AEE INTEC

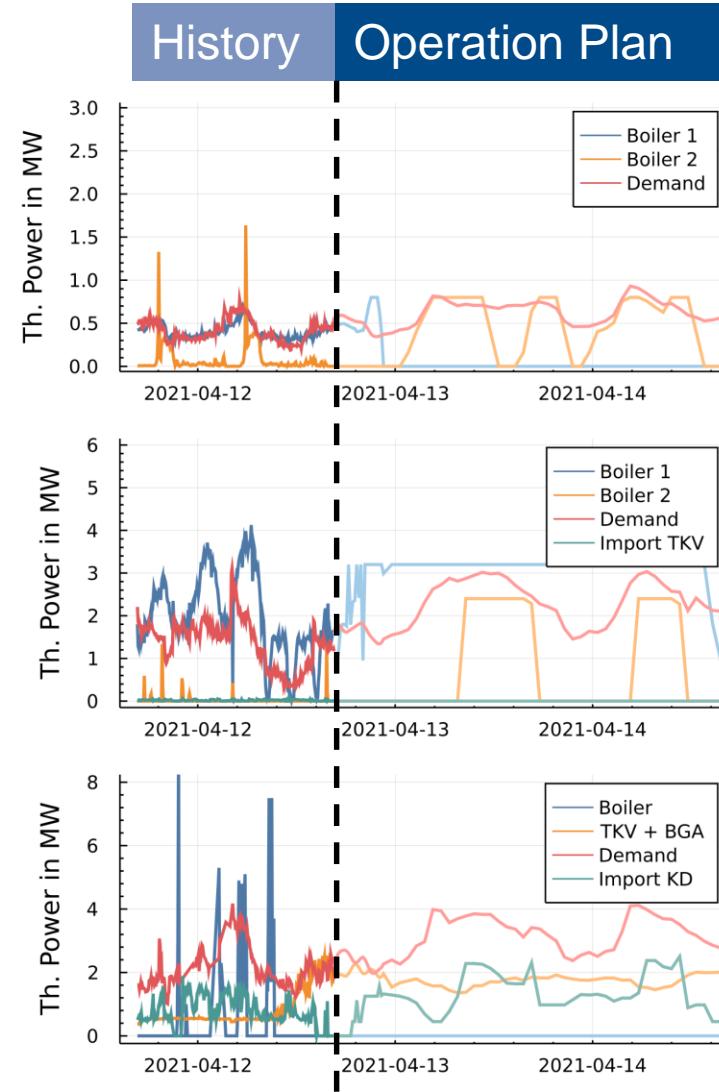
Smart Control EMS – Energy Management System (1)



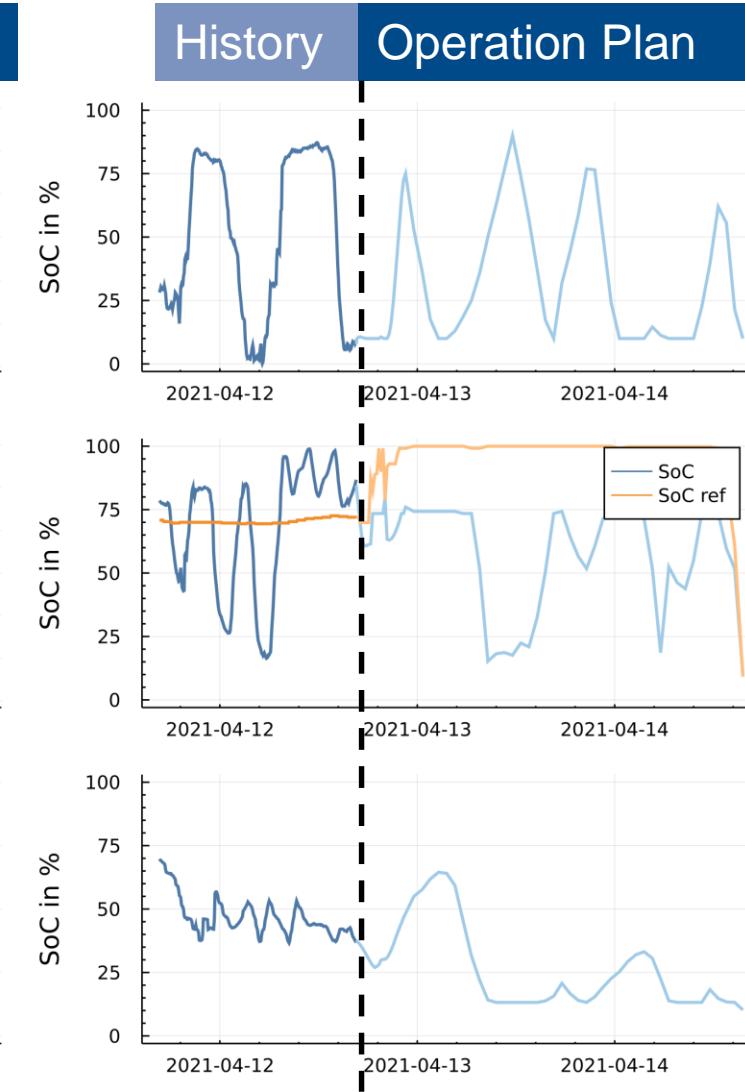
Source: BEST

Smart Control EMS – Energy Management System (2)

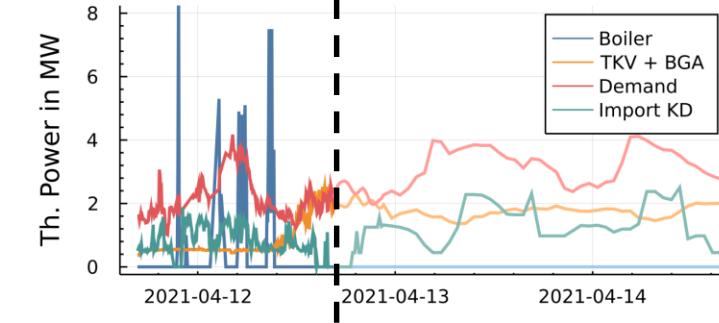
Tillmitsch



Kaindorf

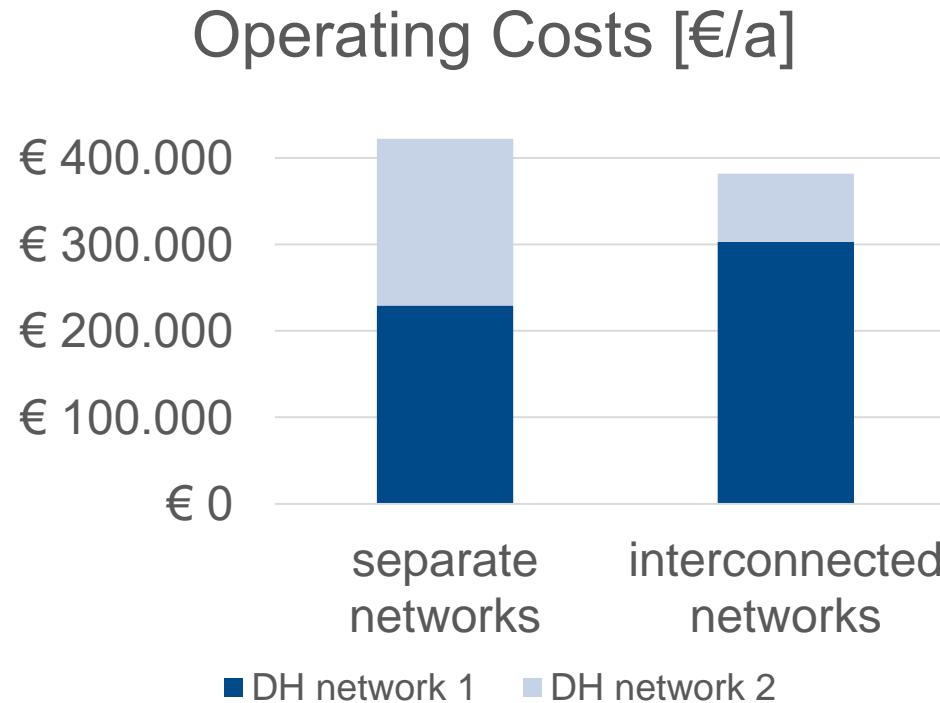


Gabersdorf

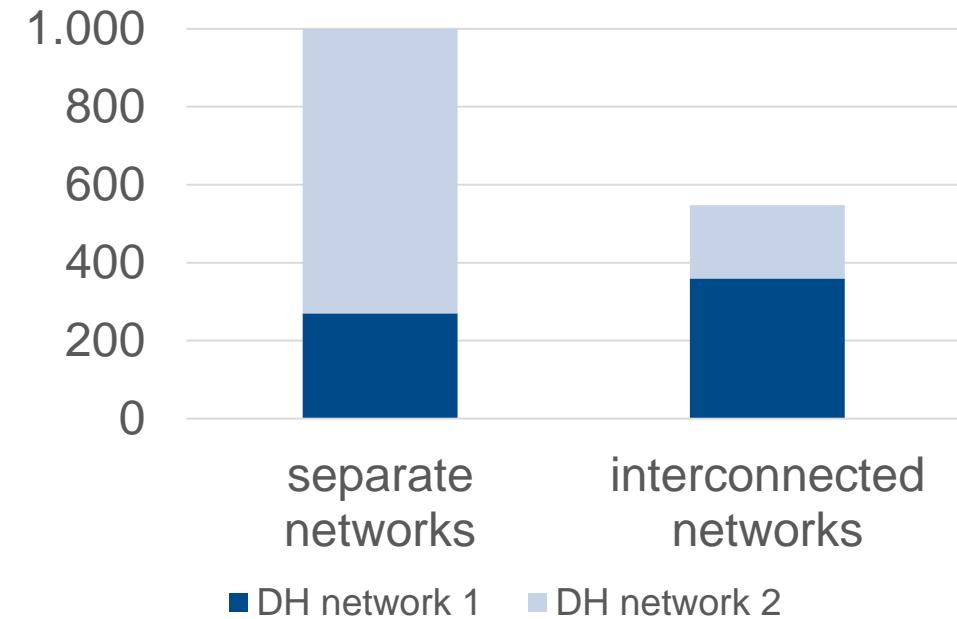


Source: BEST

EMS: First estimation of results



CO₂ emissions [t/a]



9% reduction of operating costs of the overall system

45% reduction of CO₂ emissions

Smart Control DSM – Demand Side Management (1)



- 100 of 200 consumers „active“ (30 to 50 % of the load)
 - load limit OR forced consumption
- DSM stops automatically for a particular station, if undersupply is detected

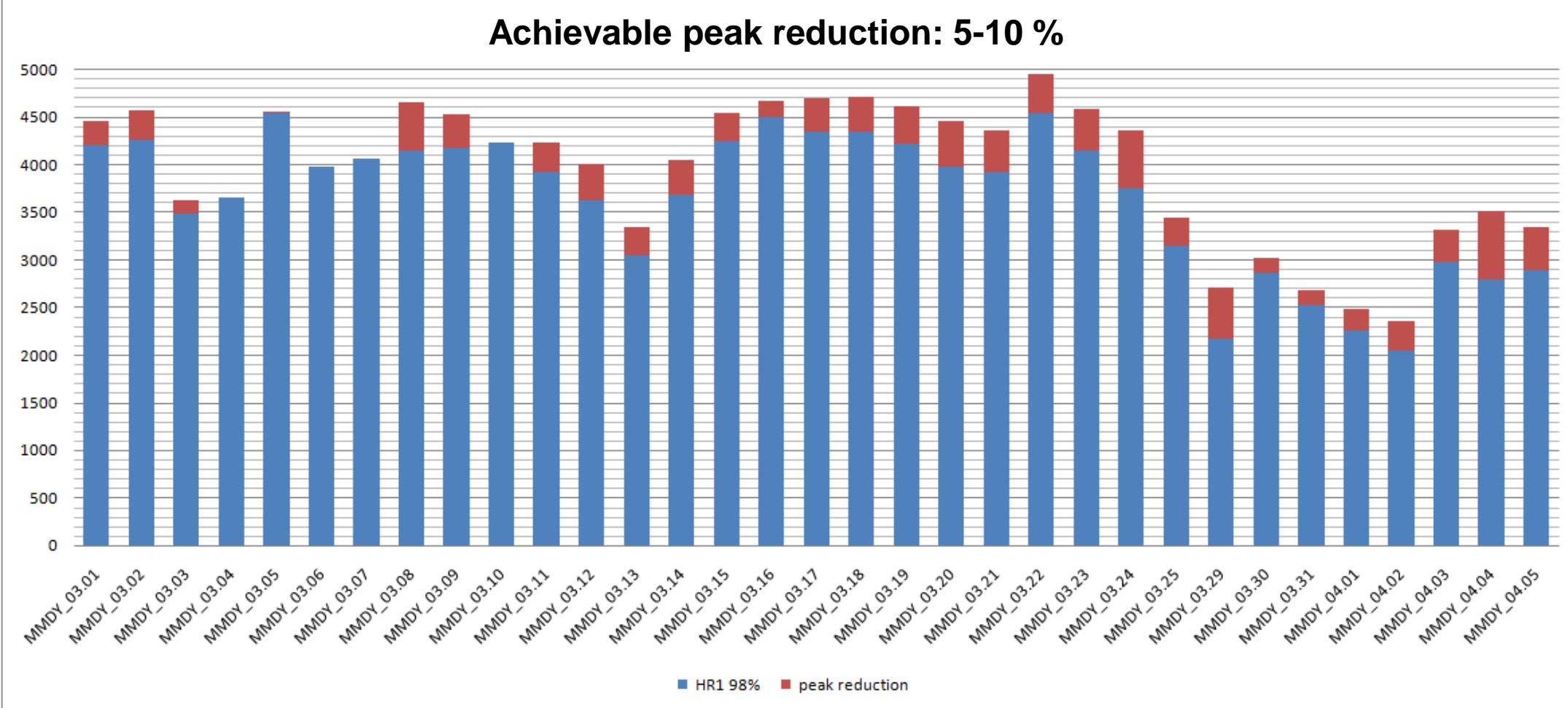


Source: Beck & Partner

Smart Control DSM – Demand Side Management (2)



Achievable peak reduction: 5-10 %



Source: Beck & Partner

Conclusion & Outlook

- Reduction of ...
 - peak loads
 - operating costs
 - CO₂ emissions
- Challenges with ...
 - interfaces between standard control & EMS
 - different interests of operators
- Test operation, optimisation & evaluation until 02/2022
 - Potential for interconnections of DH networks in Austria?
 - Best practice & roll-out strategies

Conference for Renewable Heating and Cooling in Integrated Urban and Industrial Energy Systems

ISEC 2022 - a forum for research, business and energy policy

- **Date:** 05th – 07th April
- **Venue:** Congress Graz, Graz, Austria
- **Call for abstracts:** September 2021
- **More information:** www.aee-intec-events.at



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Thank you for your attention!

ThermaFLEX:
Thermal demand & supply as flexible elements
of future sustainable energy systems



VORZEIGEREGION
ENERGIE



<https://thermafex.greenenergylab.at/>

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