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Tackling key challenges of Austrian district heating networks within the STRATEGO project

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4th Generation District Heating
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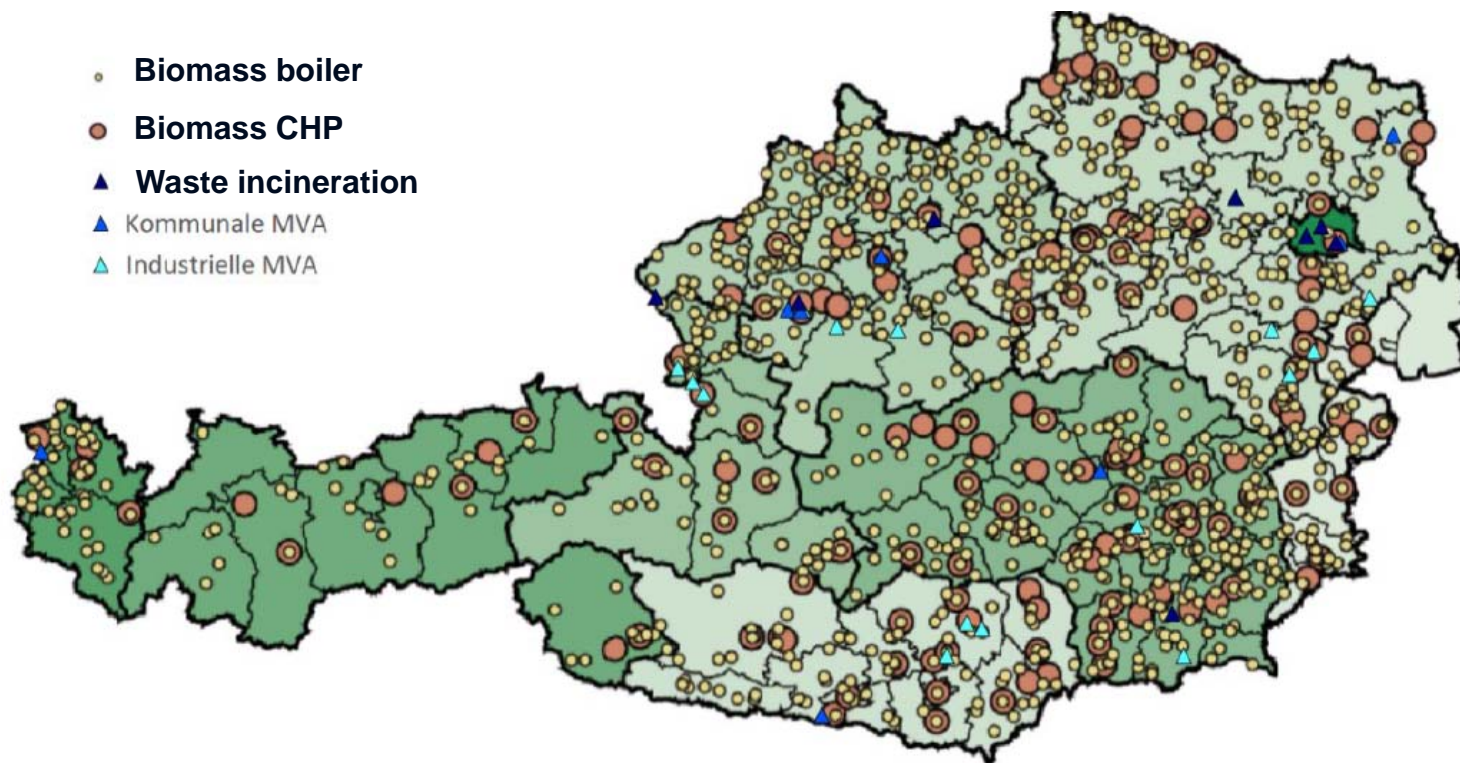
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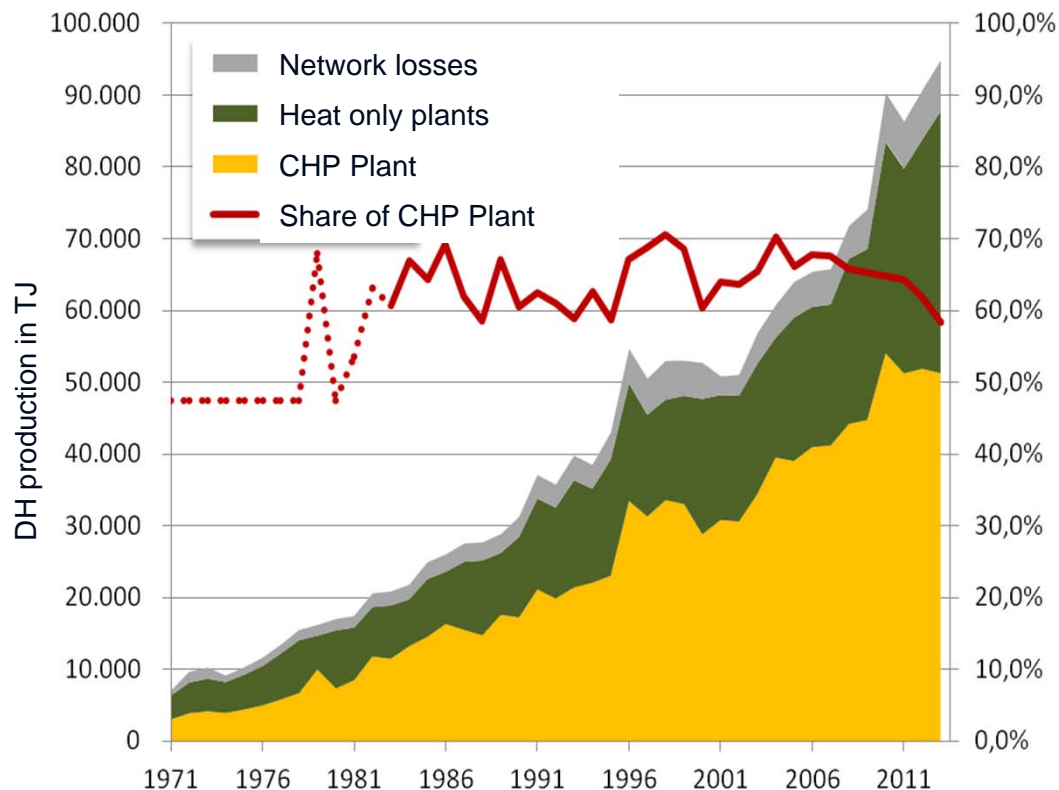
DHC in Austria – Status-Quo

<http://www.bmwf.gv.at/EnergieUndBergbau/Energieeffizienz/Seiten/Hocheffiziente-KWK-und-Fernwaerme-Potenziale.aspx>

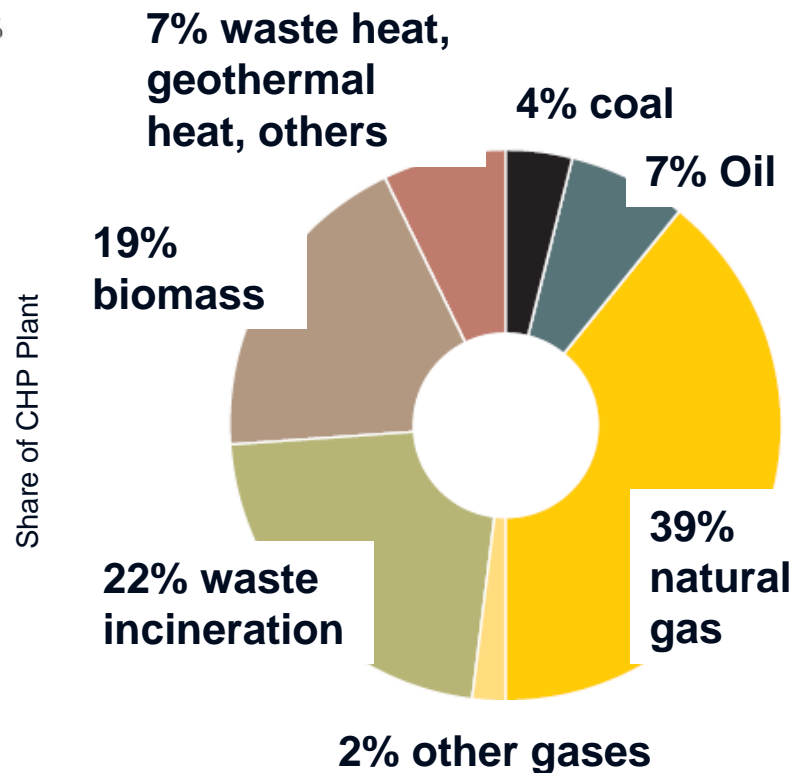


In Austria, more than 2.400 heat networks are existing (among them a large number of small biomass networks). DH market share is about 24%. District cooling has only a minor role limited to some cities.

DHC in Austria – Status-Quo



Source: Statistik Austria



Source: Zahlenspiegel Fernwärme 2015

DHC in Austria – Potentials and challenges

Potential of additional DH networks in Austria

- The (little) additional DH potential in Austria is competitive only for high connection rates (>90%)

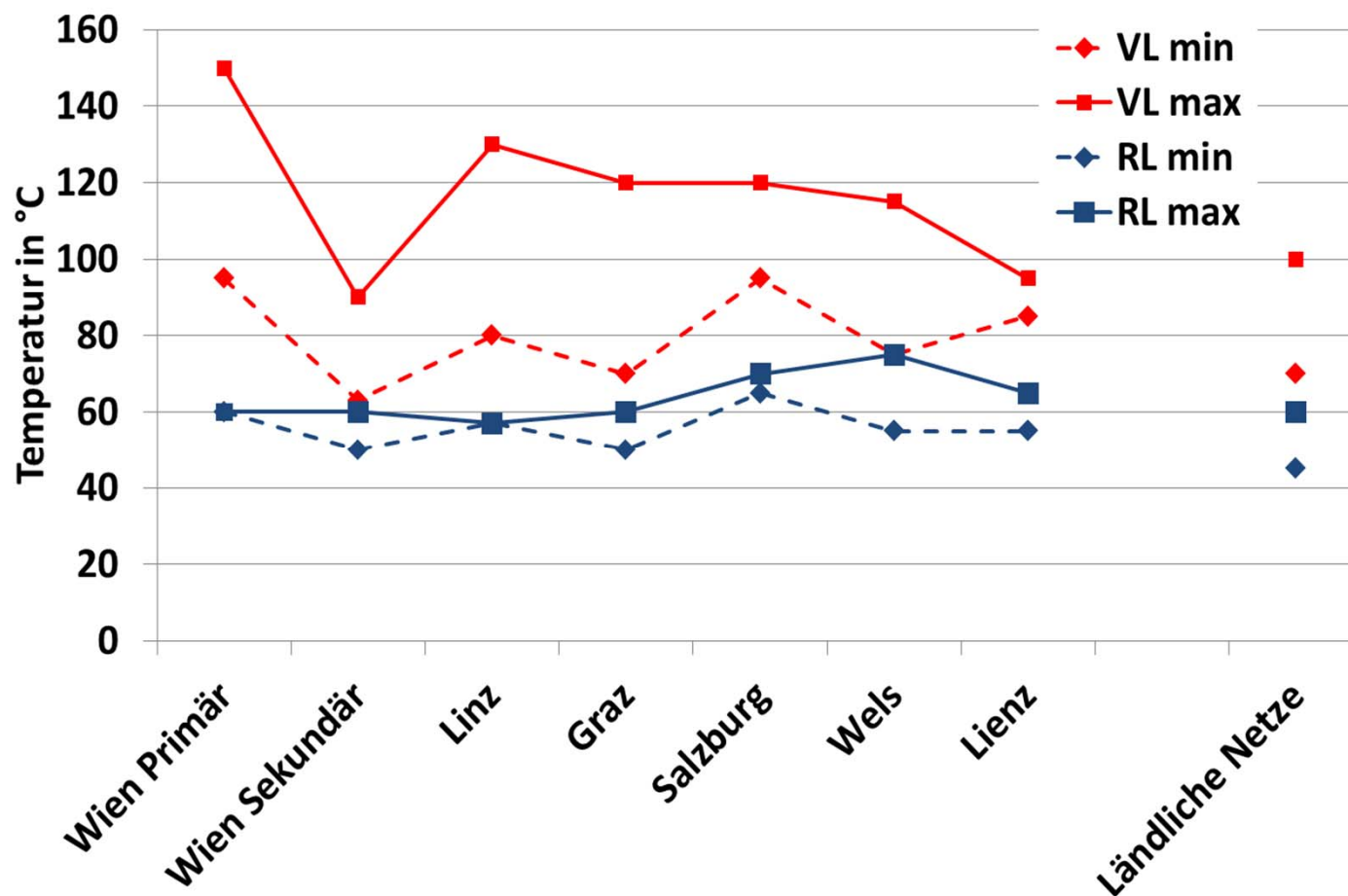
Challenges to the existing systems in general

- Dominant role of fossil based CHP + unpredictable fuel prices
- Increasing prices for biomass
- Decreasing specific heat demand

Challenges to the integration of alternative heat sources

- High system temperatures
- Incentives and regulatory conditions are not sufficient

DHC in Austria: temperature level in the networks



Quelle: OPTIMIERUNG UND AUSBAUMÖGLICHKEITEN VON FERNWÄRMESYSTEMEN; Siegmund Böhmer, Michael Gössl, REPORT REP-0074, Umweltbundesamt GmbH, Wien, 2009 and other sources

STRATEGO: Multi-level actions for enhanced Heating & Cooling plans

- European **IEE** Project (no research)
- **runtime:** 4/2014 – 11/2016
- **partner:** Associations, universities, research centres and consultants from 16 different countries
- **coordination:** Euroheat & Power
 - 8 targeted countries
(BE, AT, CZ, HR, RO, DE, IT, UK)
 - 2 « supporting » countries
(DK and SE)
 - 2 « roll-out » countries
(PL and SP)



STRATEGO: 2 focus areas

1. Mapping:

- detailed assessment of the energy efficiency potentials for 5 target regions (CZ, HR, IT, RO, UK) → **Austria is not involved**

2. Coaching:

- 23 cities/ regions are coached for the assessment of their energy efficiency potential and identification of priority areas
- AIT has a double role:
 - **Coaching of 4 target regions in Austria** (in cooperation with Swedish project partners)
 - Coaching of target regions in Croatia (not part of this presentation)

4 representative target regions in Austria

- **The 2 largest cities** (about 25% of the Austrian population)
 - Vienna: largest population growth in Austria, aiming to increase the share of renewables
 - Graz: is looking for alternatives to the main CHP plant
- **2 small biomass based rural DH networks** (representative for about 2000 similar networks in Austria)
 - Großschönau and Maria Laach am Jauerling: Inefficient operation due to part load operation in summer times and high return temperatures



<http://www.austrian-heatmap.gv.at>

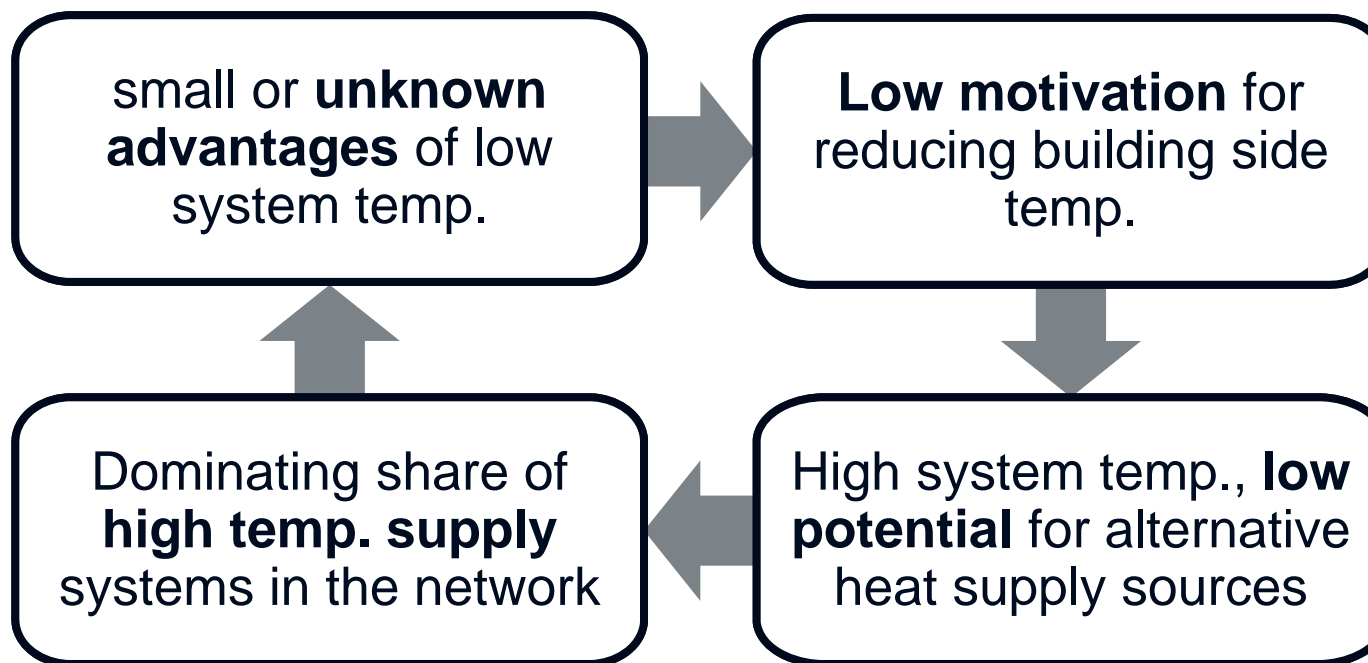
Method within the STRATEGO project

- **Stakeholder processes** with the national target regions
 - Workshops and meetings, Know-How transfer
 - TelCos and interviews
 - Discussions with national authorities and a national advisory group

- Support from **Swedish partners**
 - Partner within the STRATEGO consortium (Profu and SDHA)
 - Additional national coaching parties (Gävle, Gävle Energi, Gävle Kraftvärme, Fortum)
 - Workshops and side visits in Sweden

→ **Customized solutions** has been developed within the STRATEGO project

Identification of one **common key challenge**: the „high temperature vicious circle“



Source: URBANcascade final report

Approaches for „**breaking**“ the vicious circle developed within STRATEGO*

**also solution for other challenges has been developed (e.g. technical options for decentralised supply, utilization of the waste heat from data centres)*

Vienna

- **Identification of two main barriers:**
 - existing customer contracts signed for an indefinite period request high supply Temp. (approx. 90° C), independent of the real requirements.
 - several costumers do not follow the stipulated maximum return temperatures and the network operator cannot directly influence them

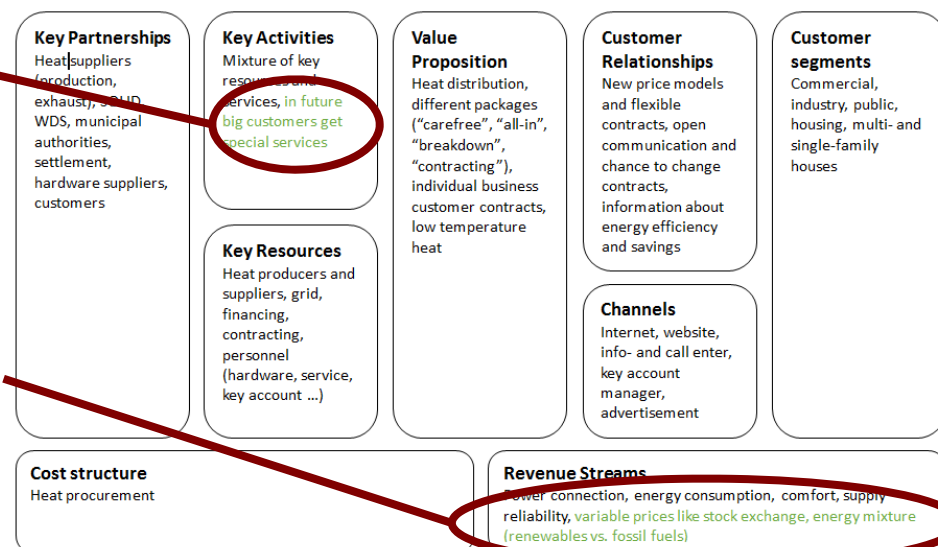
- **Solutions developed:**
 - approach customer directly to change customer contracts (if possible) from 90/60° C → 63/40 ° C and reduce the installed capacity
 - Encourage the cooperation between building developers, DH operators and national authorities → use the opportunity of refurbishment projects

Graz

- **Identification of the main barrier:**
 - Missing financial benefits and incentives for reducing the return temp.

- **Solution developed:**
 - a new business model incl.:

- special service for the biggest customers, e.g. heat load analysis, measures for reducing return temp. and peak loads, etc.
- flexible tariff system (hourly based) and/or higher heat price for the supply from renewables - similar to "ökostrom" (green electricity) tariff



Rural DH networks

- **Identification of the main barrier:**
 - planners and installers are not aware of the secondary side requirements of DH networks
- **Solution developed:**
 - A workshop for planners and installers which addresses following topics:
 - awareness, theoretical background, substations, low temperature heating systems, practical trainings ...
- Within the framework of STRATEGO, a first “test” workshop has been done with more than 20 participants



Conclusions

- Austria already has a high maturity of their DH networks, the economic potential for new networks is very limited
 - Many existing networks are running into economic difficulties due to unstable energy prices
 - The current high system temperatures are one of the main challenges for the integration of alternative heat sources
- Within the STRATEGO project, different approaches for „breaking“ the high temperature vicious circle were developed for representative regions:
 - Including customer relations and contractual conditions, business models and quality assurance measures for planners and operators
- **Outlook:**
 - proposal for a follow up project in a national research call:
„transformation of conventional heat networks towards low temperature systems via secondary side measures“, including a cost-benefit assessment. Funding decision expected End 2016



Thanks for your attention!

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