Zeotropic Mixtures in 4/5thG District Heating Application

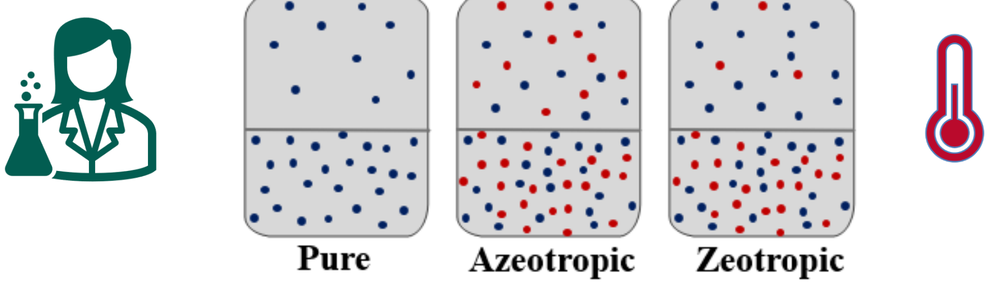
Heat transfer and Thermodynamic (HTT,UTwente)
Presenter: Dr. Tingting Zhu

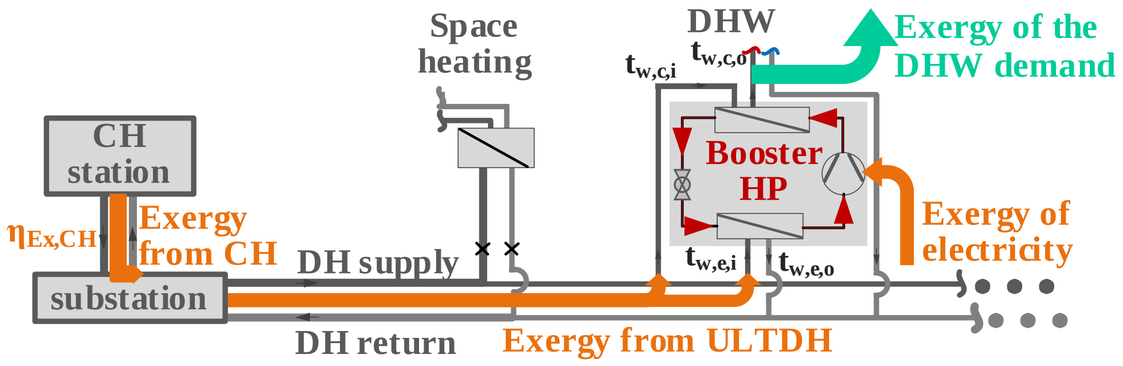
Advanced Heating and Cooling

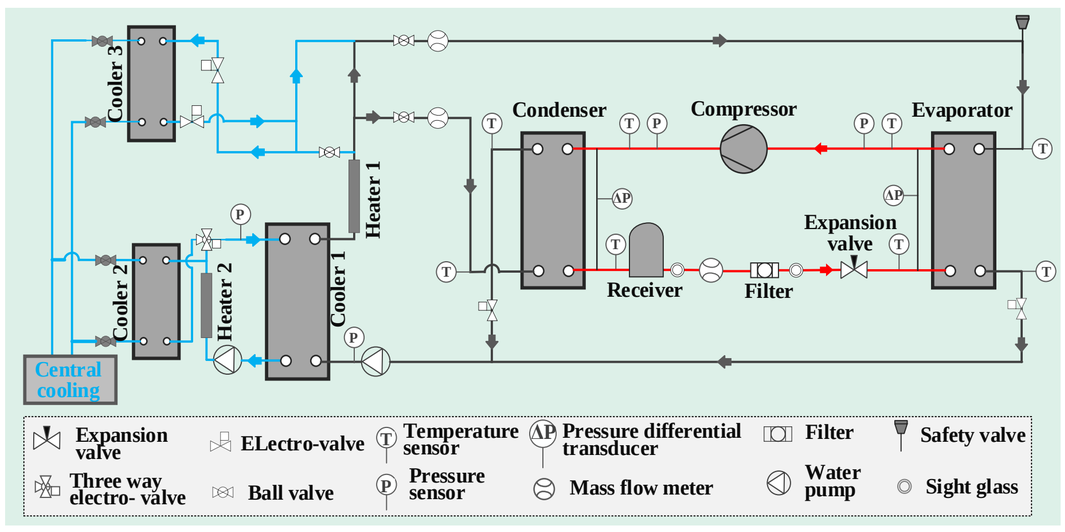
Highlights

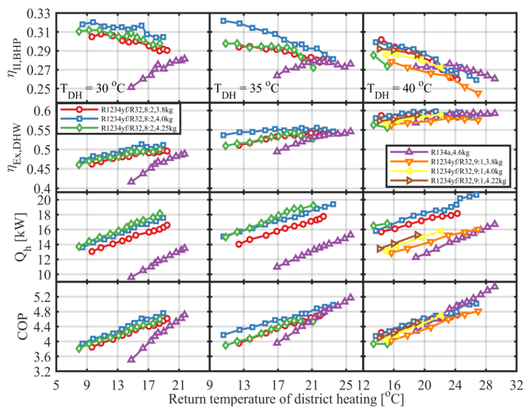
Zeotropic mixtures tested in booster heat pumps.
Coupling effects of district heating and heat pump.
Temperature profiles reveal efficiency challenges.
Heating capacity & COP improved with mixture refrigerants.

Methodology & Results

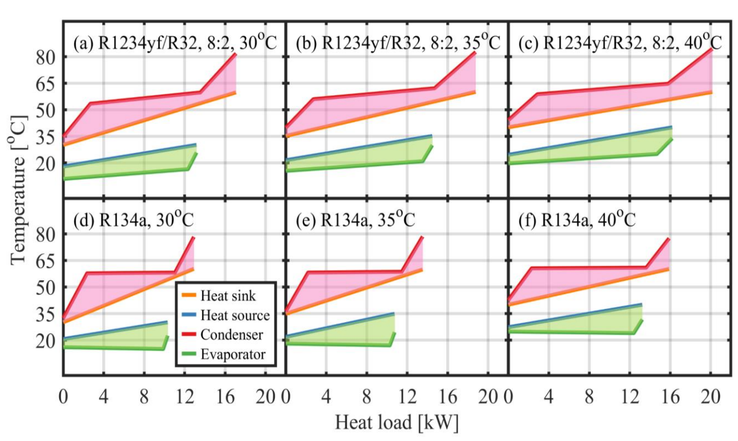








Efficiencies

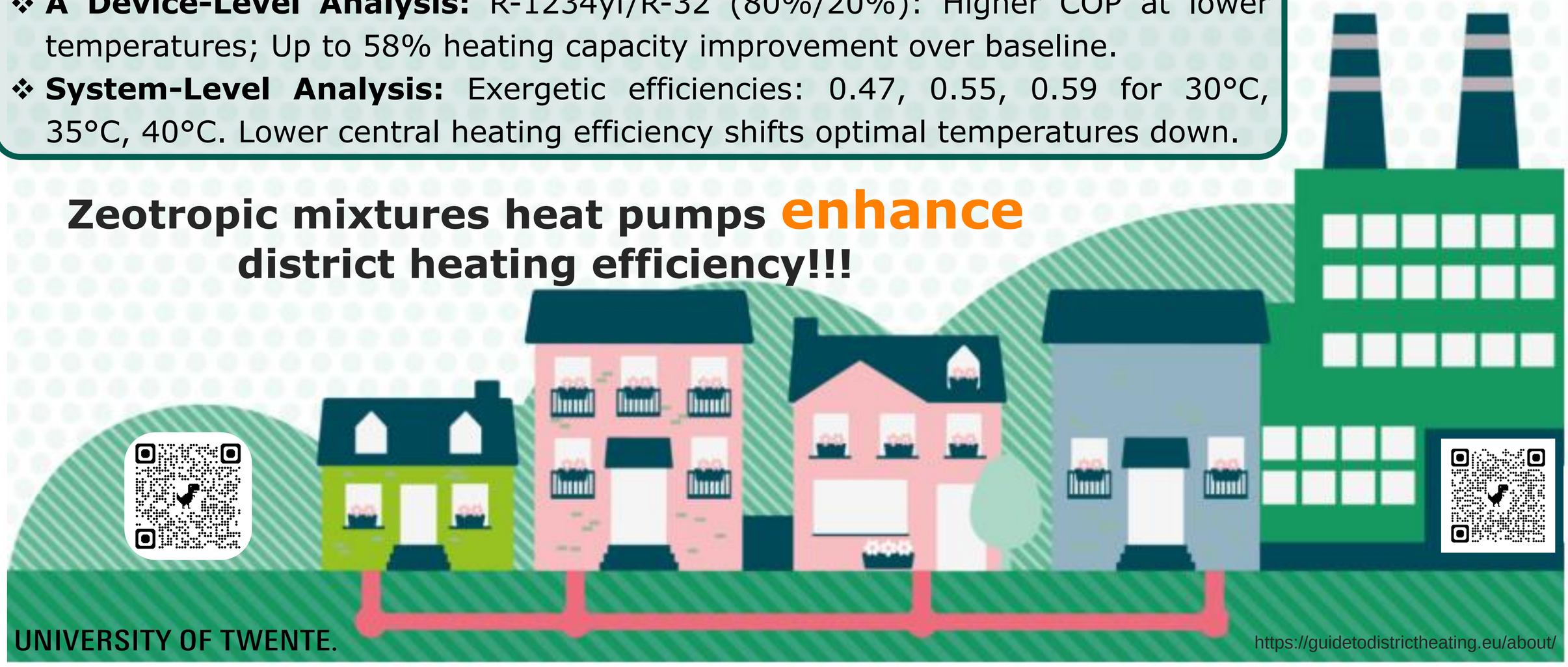


Temperature profiles

Conclusion

- **A Device-Level Analysis:** R-1234yf/R-32 (80%/20%): Higher COP at lower temperatures; Up to 58% heating capacity improvement over baseline.
- **System-Level Analysis:** Exergetic efficiencies: 0.47, 0.55, 0.59 for 30°C, 35°C, 40°C. Lower central heating efficiency shifts optimal temperatures down.

Zeotropic mixtures heat pumps enhance district heating efficiency!!!



TU Delft Delft University of Technology
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