



**DHC+**  
TECHNOLOGY PLATFORM

under the umbrella of



**EUROHEAT  
& POWER**

# Ongoing EU projects

CITIES



PLANNING & MAPPING



EXCESS HEAT



DIGITALISATION



LOW TEMPERATURE



4<sup>th</sup> GENERATION



ENERGY INTEGRATION



RENEWABLES



RETROFITTING



## Digital heat roadmap



- To offer insights on how digitalization impacts the industry
- State-of-art
- Objectives, targets and recommendations
- Topics:
  - Production level
  - Distribution level
  - Buildings level
  - Consumption level
  - Design & planning
  - Sector Coupling & integration of multiple sources

# Strategic Research Priorities for Thermal Energy Storage

Wim van Helden

AEE INTEC, Gleisdorf, Austria

ISEC, 4 October 2018, Graz, Austria



# Strategic Research Priorities

TES experts from the European Technology and Innovation Platform on Renewable Heating and Cooling formulated a series of R&D priorities:

- In the areas Sensible, latent and thermochemical heat storage
- For the short, middle and long term
- For basic research, applied research and development and for demonstration
- These priorities were condensed in the “Cross-cutting Technology Roadmap” and presented to the EC for their H2020 programming

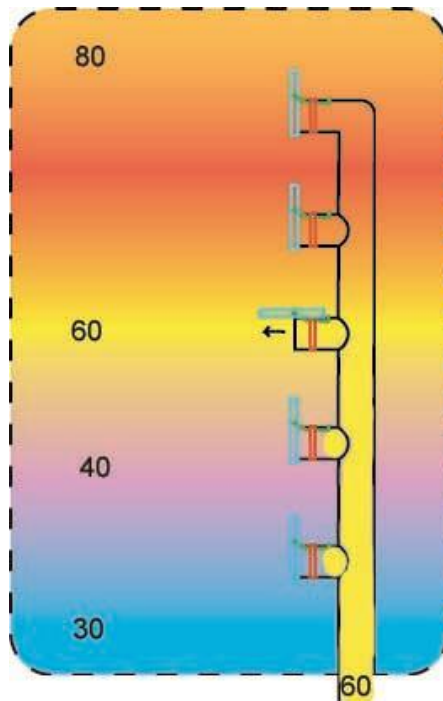
Available at: <http://www.rhc-platform.org/publications/>

Some examples of R&D work are presented in short

# Sensible heat storage

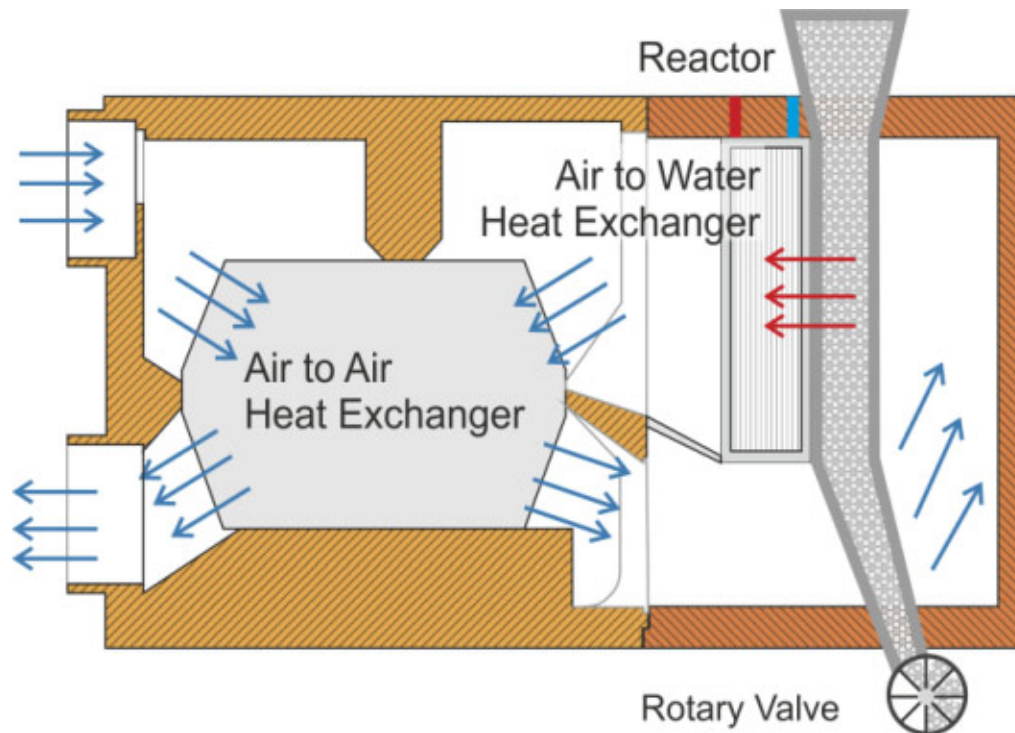
## Swisstank, Jenni

- Temperature stratification:
- Higher quality
- Cf. counterflow heat exchanger



# Open solid sorption for seasonal heat storage – ITW, Stuttgart University

- External reactor, transport of zeolite or composite grains
- Capacity and power uncoupled

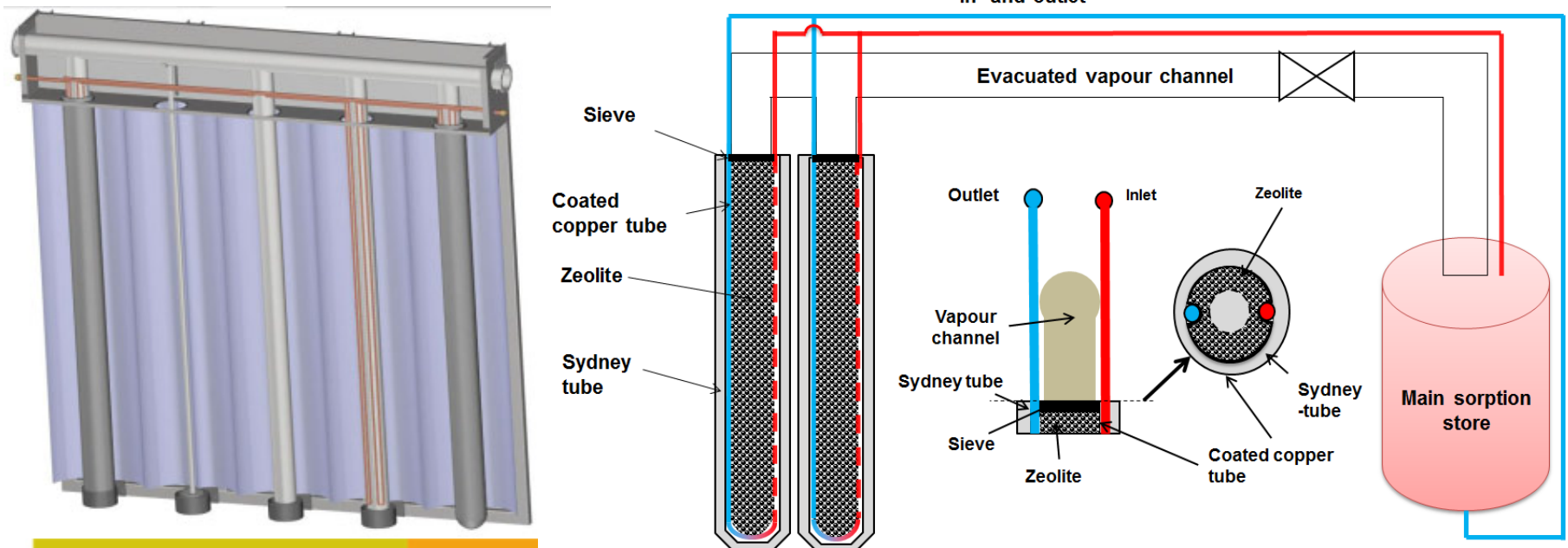


FlowTCS system  
ITW, University of  
Stuttgart, DE

# Sorption Collector development

## AEE INTEC together with GreenOneTEC

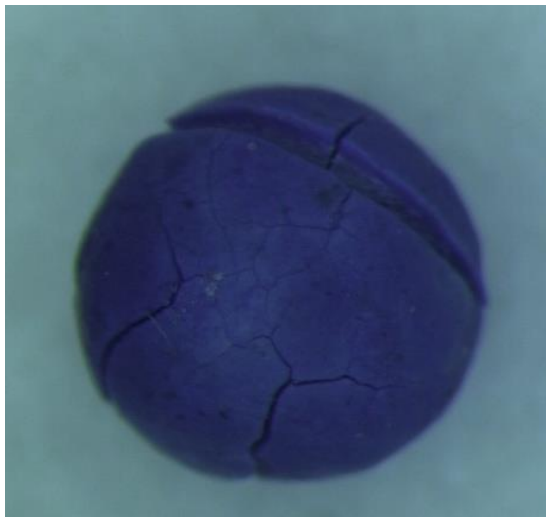
- Stainless steel pipes filled with sorption material Zeolite 13XBF and under vacuum
- High temperatures available for desorption of collector material
- Better conditions for charge boost (cooling during night)



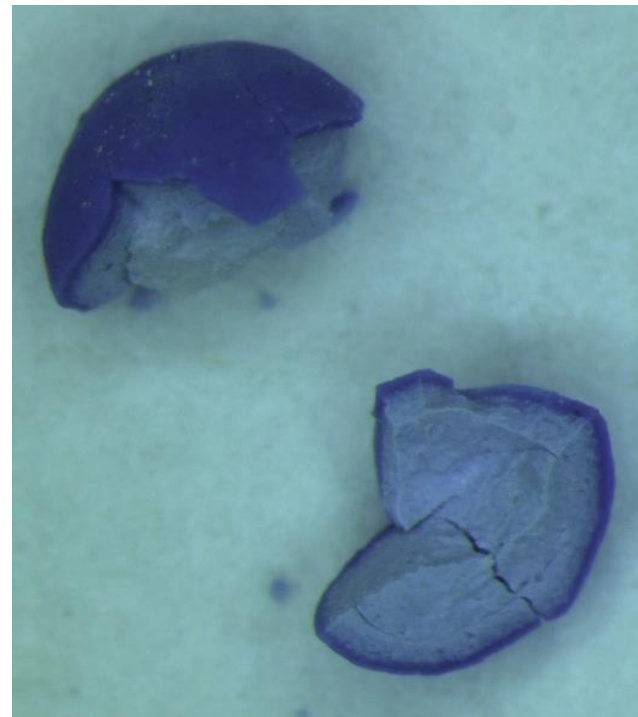


## New materials research; TU Vienna

Copper sulfate with ammonia: 1770 kJ/kg storage density; volume expansion controlled by integration into zeolite (215 kJ/kg) (TU Vienna, AT)



$[\text{Cu}(\text{NH}_3)_4](\text{SO}_4)$  on zeolithe



$[\text{Cu}(\text{NH}_3)_4](\text{SO}_4)$  on zeolithe

# Outlook

- R&D activities on TES have increased slowly over the last 5 years
- Progress made in materials, components and systems integration research and development
- Progress is still much too slow for achieving breakthroughs in time for necessary energy transition
- Message should be brought clearer to policy makers