

# Waste-to-Energy

## Raising efficiency with Energy Storage Technologies – Potential and Best Practice

9th CEWEP Waste-to-Energy Congress 2018  
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# The German Energy Storage Association (BVES)

- The BVES is the industrial association of German energy storage companies that is open to all technologies in the areas of electricity, heat and mobility.
- We are a dialogue partner for politics, administration, science and publicity. With targeted lobbying at the interfaces of political decision making we are trying to improve the German regulation and policy framework.
- In addition, the BVES monitors research and development activities and informs members of new results and developments.



# Members (extract)

3



# Storage is an ideal tool...

- Peak load smoothing
- Black-Start capability
- Voltage control
- Raising efficiency
- Inertia reserve
- Optimization of self-consumption
- Back up energy
- Positive/negative control energy
- Reactive power compensation
- Off-grid supply
- Shifting excess energy to other sectors





# Industrial Storage Market

- Since last 3 years growing market.
- Subsidies in various federal states (e.g. North Rhine-Westphalia, Thuringia).
- ~ 700 projects in Germany: agriculture, multi-family houses, trade business and industry
- **Waste-to-Energy → “Too good to waste”**



# Waste to Heat and Electricity – „Hungerkamp“ project in Braunschweig, GER replacing 34 coal, gas and oil burners

The complex consists of four parts: a cogeneration plant, a wood boiler, a natural gas boiler and heat storage.

- 9,200 MWh/a of electricity for ~ 1.000 households
- 15,600 MWh/a of heat to ~ 2,000 households
- Saving emission of 8,000 tons of CO<sub>2</sub> per year

"Global District Energy Climate Award" for the innovative and environmentally friendly concept

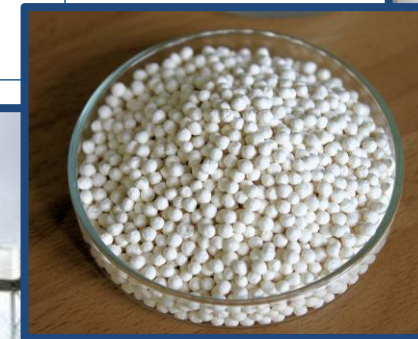


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# Raising efficiency: Mobile Sorption Heat Storage in Industrial Waste Heat Recovery

- CHARGING with 130°C hot air at the waste heat incineration plant
- DISCHARGING 7 km far away at an industrial drying process with humid exhaust air from the dryer
- 14 tons of zeolite realize a storage capacity of 2.3 MWh and save 616 kg carbon dioxide per cycle

Zeolites store heat very compactly and almost without losses due to their microporous framework structure



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# Veolia - Lithium Ion Battery at a Waste to Energy Plant in Ellesmere Port, UK

- Lithium Ion 500kW/385kWh – grid friendly
  - Lowering electricity demand on the local network
  - Maintaining the essential load in the event of a power outage
  - Feeding power to the grid to the grid when needed
- Improving the energy and environmental performance of the WtE Plant

Decentralising, decarbonizing and digitalising the grid whilst supporting overloaded grid networks.”



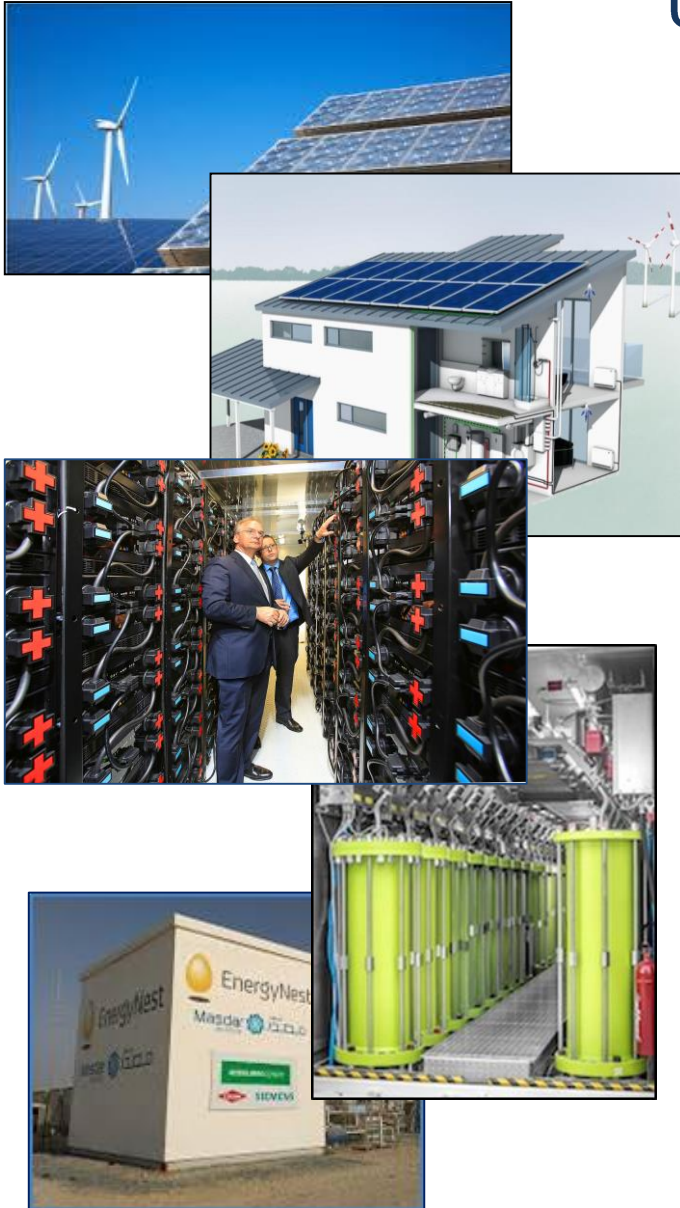
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# Conclusions



- Energy storage = Swiss army knife
- Residential, industrial and large scale applications are in service and economically viable

Numerous “Waste-to-Energy” applications have been realized so far by means of energy storage

- Cross sectoral integration offers a huge potential of useful applications



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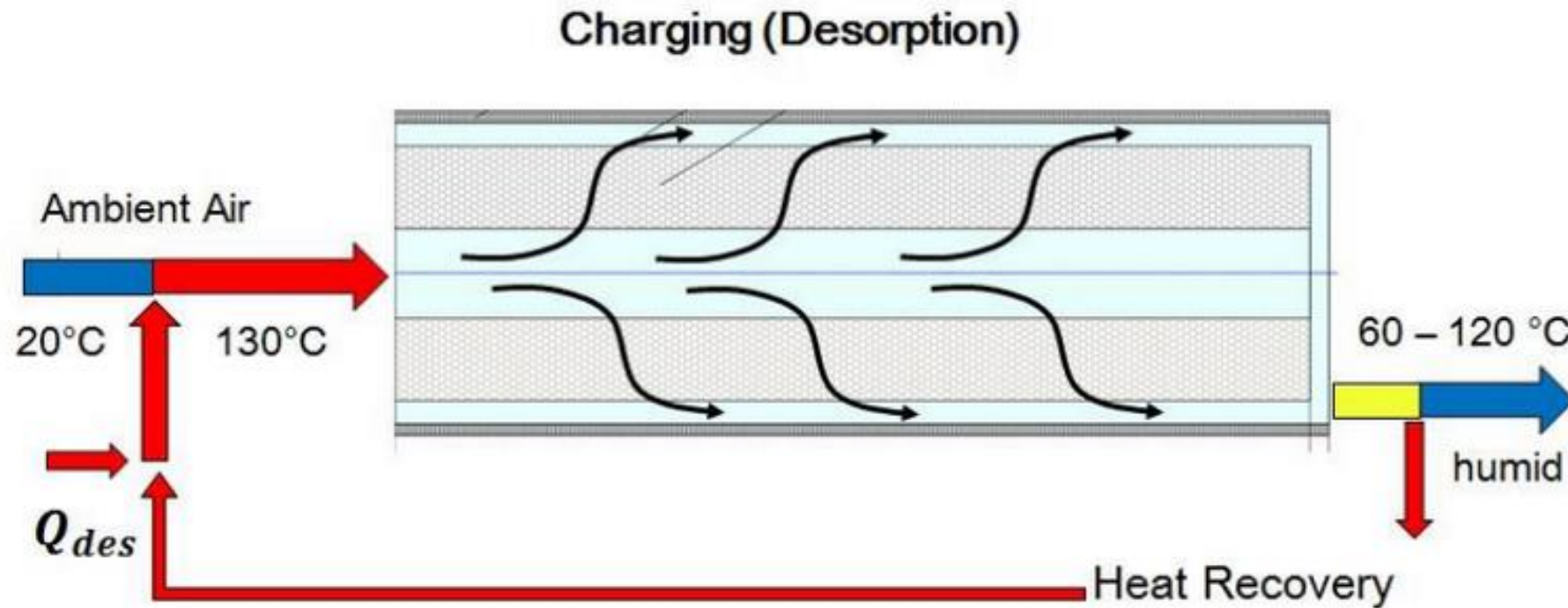
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# BACKUP - Technology Chart of Mobile Sorption Heat Storage



- Schematics of the charging process with heat recovery