

Power-to-Gas Utilisation of Wind and Solar Energy

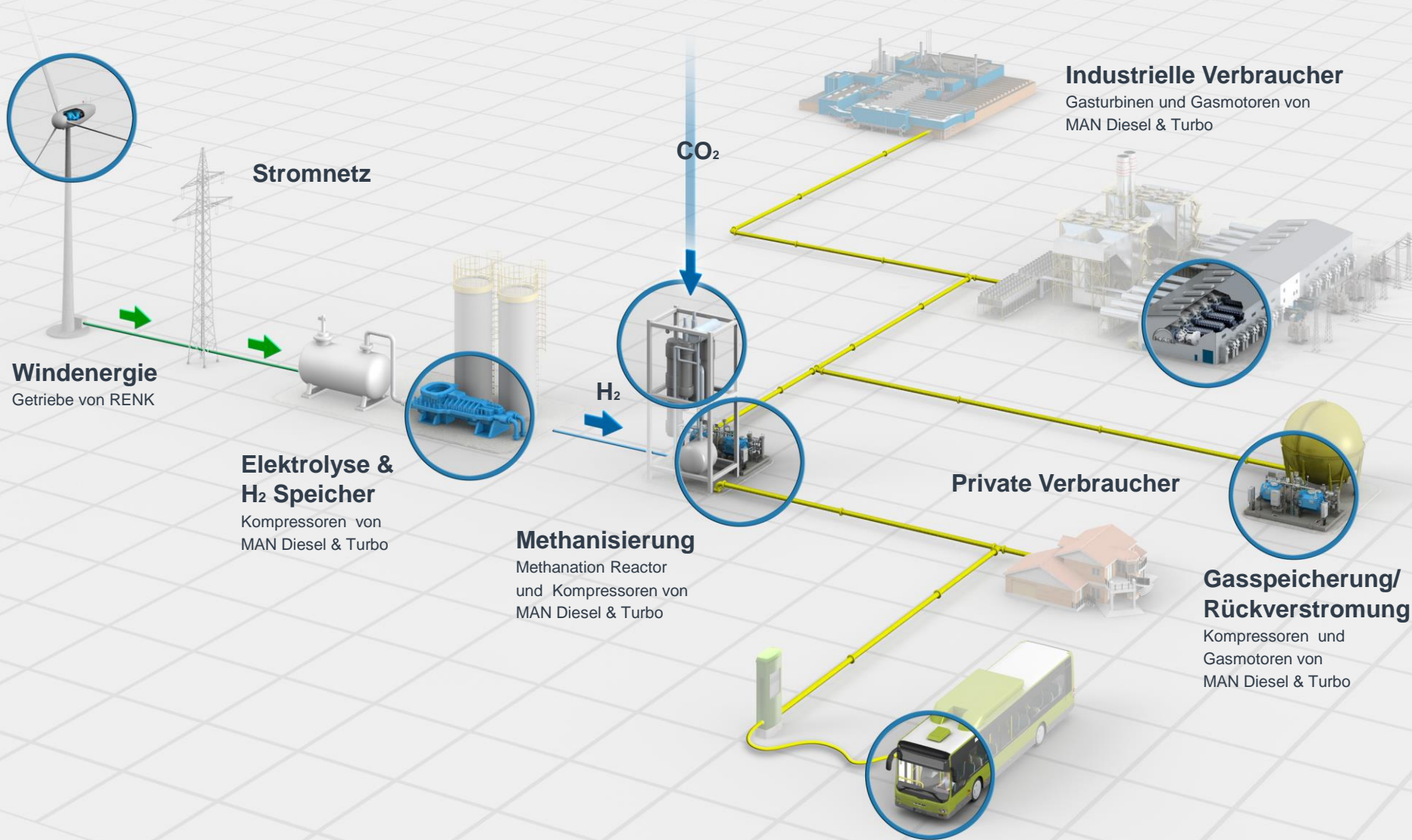


MAN Diesel & Turbo SE, Site Deggendorf



Power-to-Gas: CO₂-Methanation

A new Energy Supply Concept



MDT-Site Deggendorf



- Founded in 1924, shipbuilding
- Reactor and pressure vessel manufacturing since 1955
- 1955 – 2017 more than 60 YEARS TUBULAR REACTOR EXPERIENCE
- Technical Segments
Apparatus: ETRA
Reactors: ETRR
- Employees:
about 450
- Engineers:
about 60



Feedgas: Synthesis Gas (Erdgas, Biomass, Coal, Waste, ...)



Focus today:

Feedgas: Carbon dioxide + renewable Energy (Wind, Solar, ...)



Process Development in the Pilot Plant of MDT-Deggendorf:

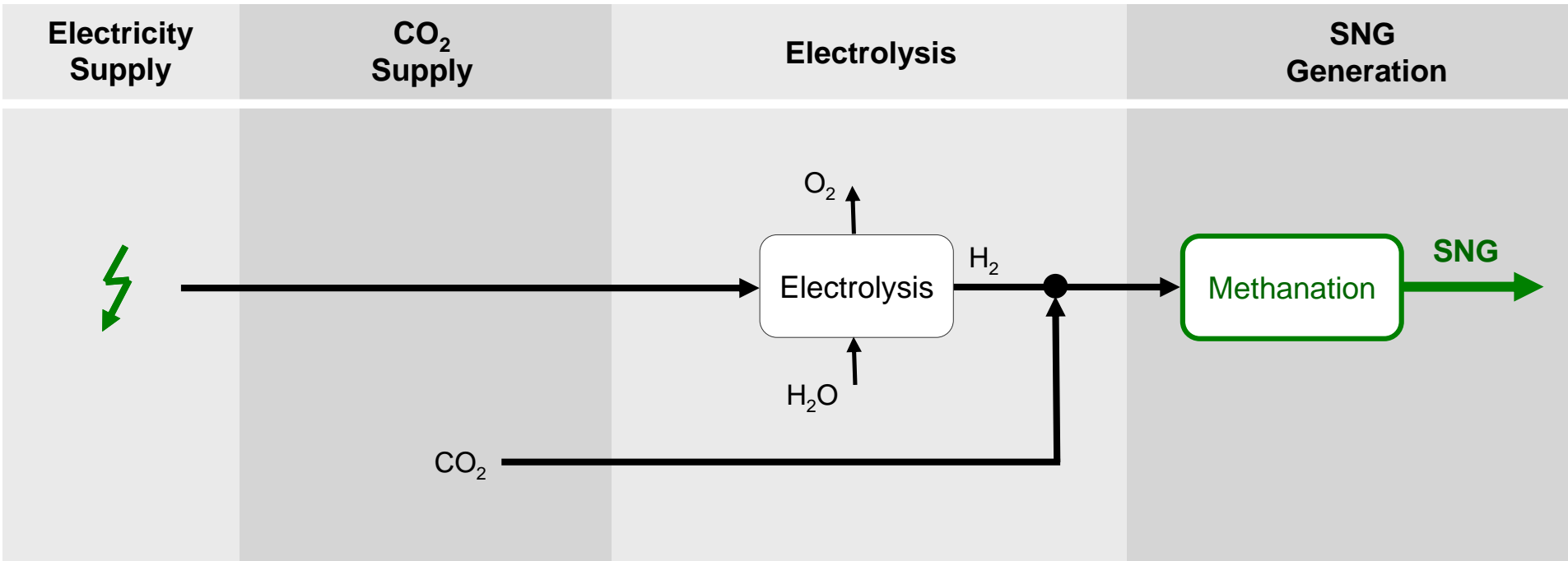
SNG Production from

- $H_2/CO/CO_2$ or
- H_2/CO_2 Synthesis Gas

DWE®-Reactor



SNG from Electricity

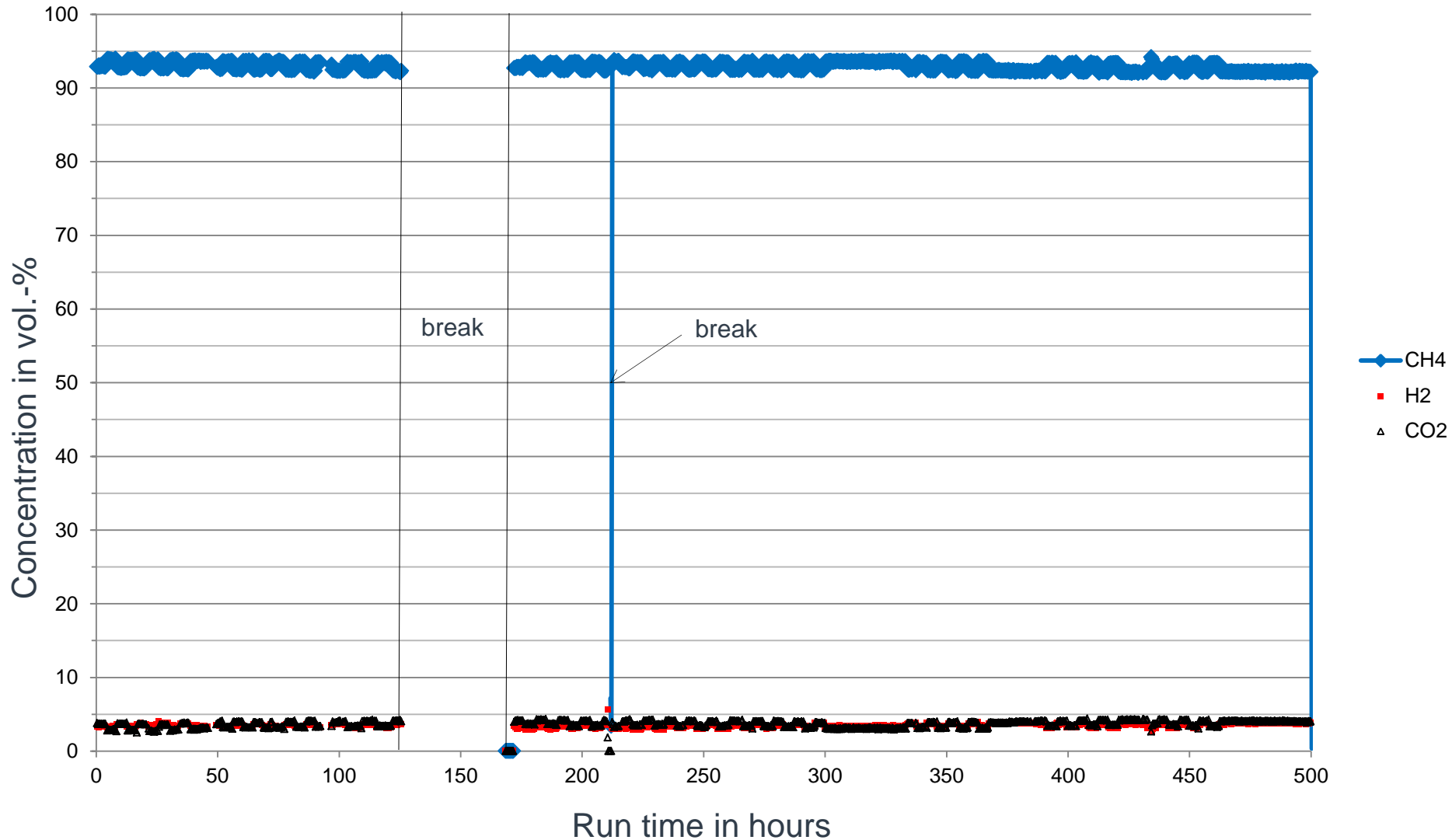


H₂/CO₂: Educt for SNG

- H₂ via water electrolysis
- CO₂ from various sources e.g.
- Flexible range for balancing power
- Power station with CO₂ capture
- Biogas (digestion)

Methanation

Dynamic Tests 500 hours



Power-to-Gas: Summary

Site „Werlte“



Audi e-gas-Plant in Werlte

Audi e-gas-Anlage
12/12



Elektrolyse
Drei mit regenerativem Strom betriebene Elektrolyseure spalten Wasser in Sauerstoff und Wasserstoff

Methanisierungsanlage
In der Methanisierungsanlage reagiert der Wasserstoff mit Kohlendioxid. Ergebnis ist synthetisches Methan – das Audi e-gas

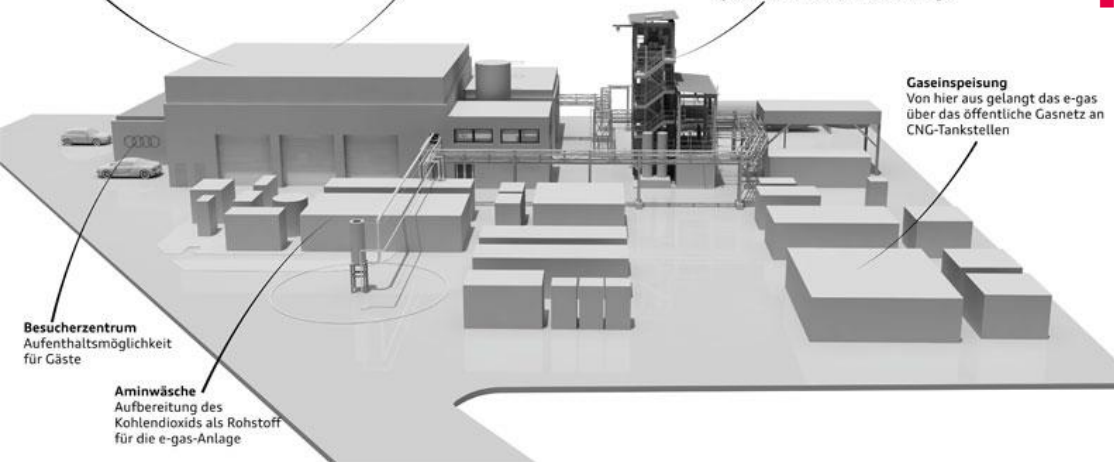
Stromversorgung
Ausgangsprodukt für das Audi e-gas ist regenerativ erzeugter Strom

Gaseinspeisung
Von hier aus gelangt das e-gas über das öffentliche Gasnetz an CNG-Tankstellen

Besucherzentrum
Aufenthaltsmöglichkeit für Gäste

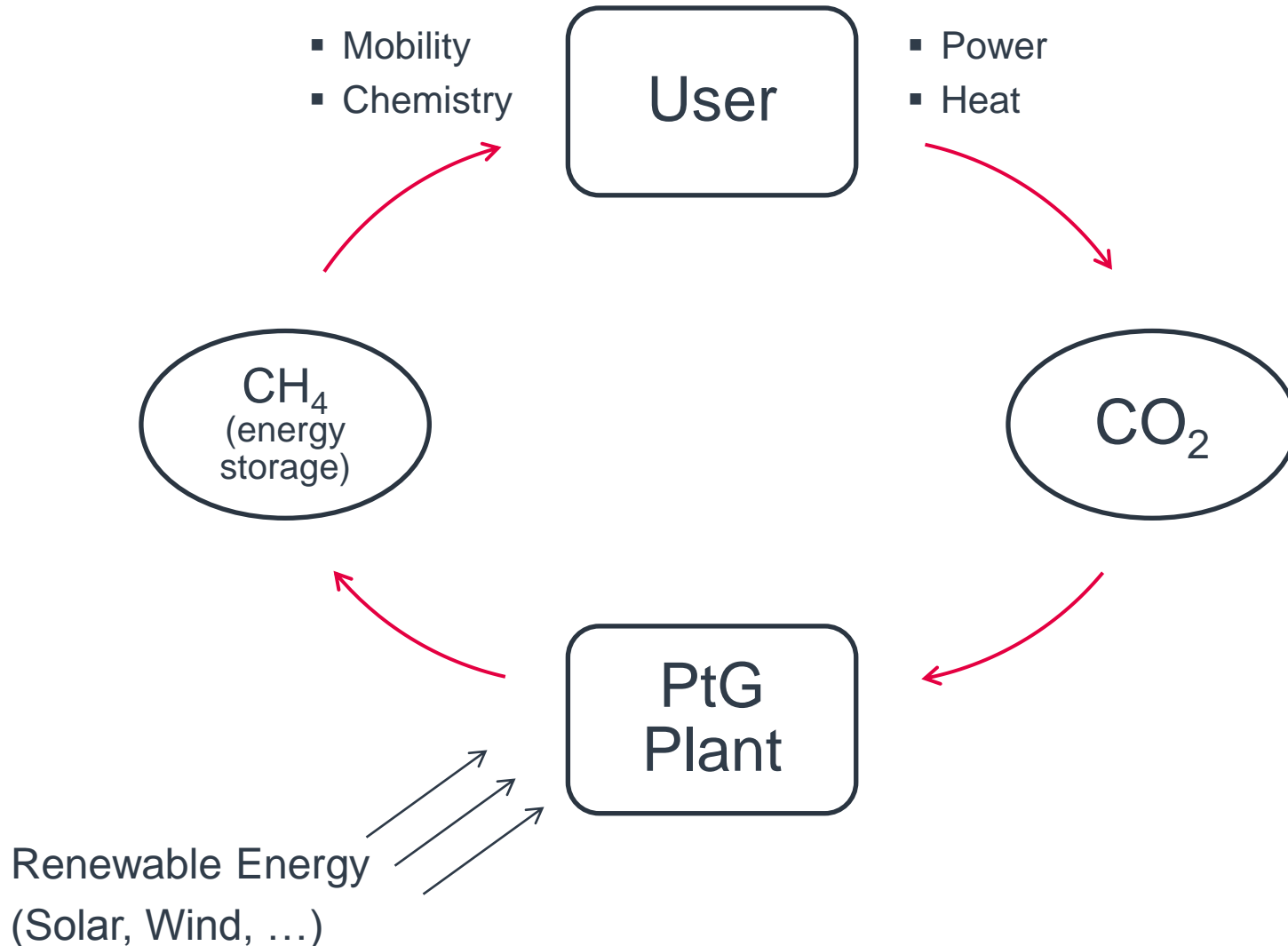
Aminwäsche
Aufbereitung des Kohlendioxids als Rohstoff für die e-gas-Anlage

- Power to Gas Plant in Werlte using Reactors from MDT-Deggendorf.
- Additional products of MDT could be used in PtG Plants: Compressors, Gas-Engines and Gas- & Steamturbines



The Feasibility of Technology is proven (on Stream since Dec. 2013)

Power-to-Gas: A Sustainable Energy Concept without Waste



Thank You for Your Attention



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