

# Power-to-Gas Utilisation of Wind and Solar Energy

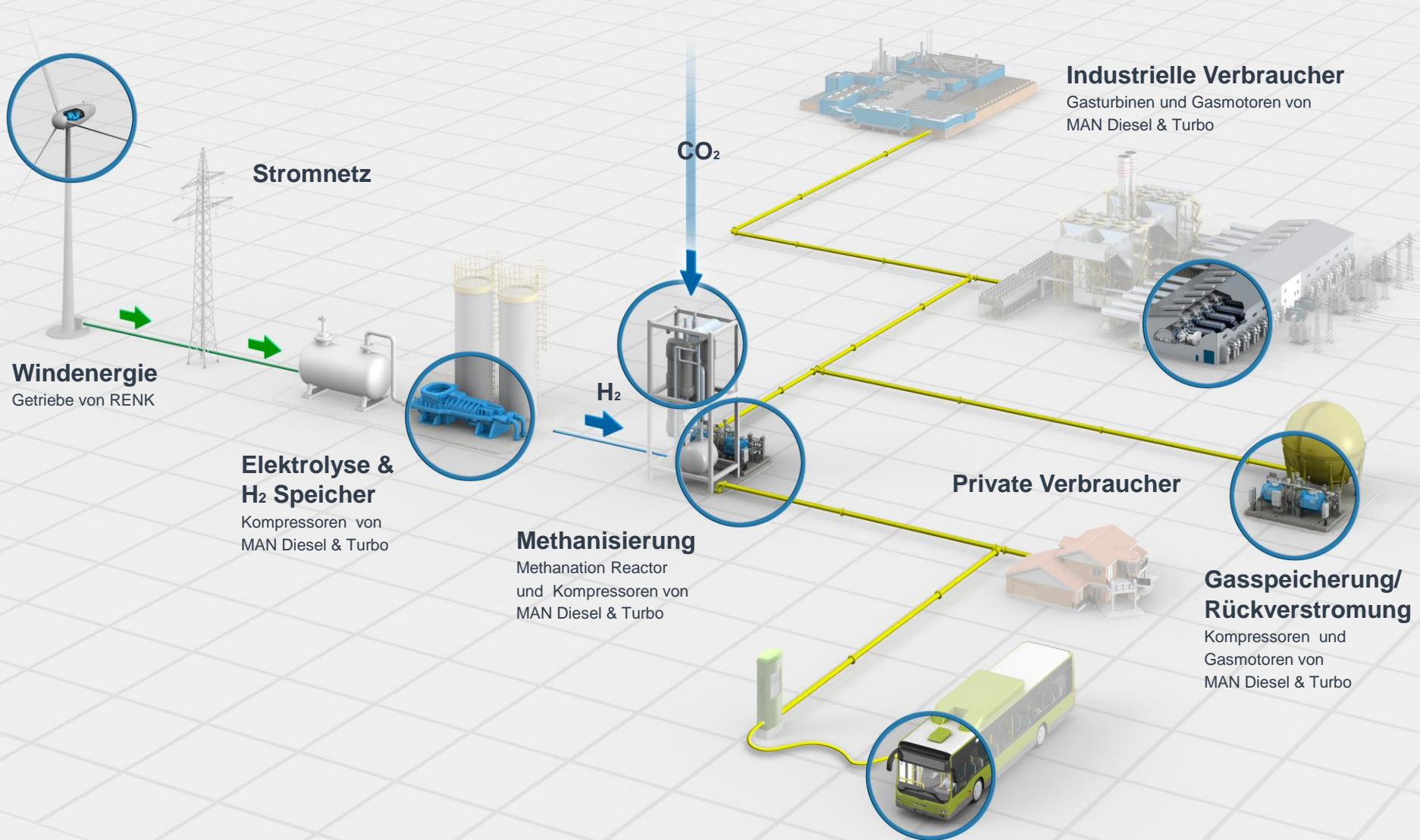


## MAN Diesel & Turbo SE, Site Deggendorf



# Power-to-Gas: CO<sub>2</sub>-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:

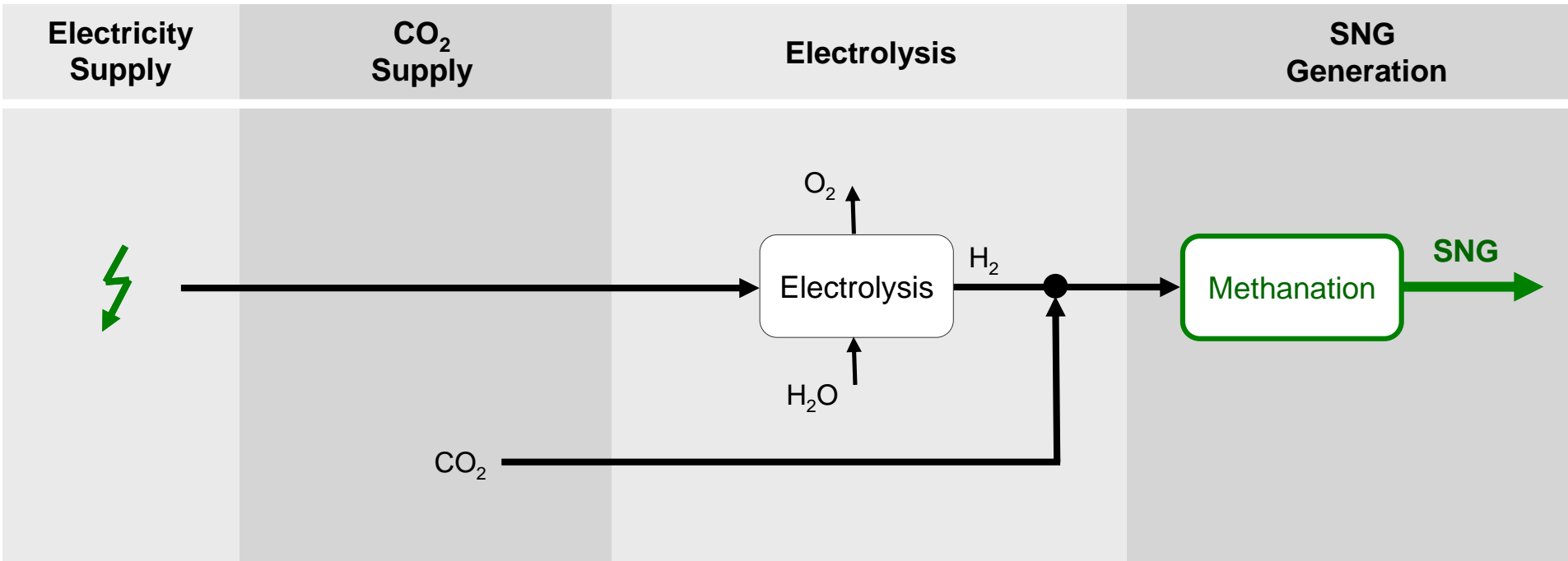
### SNG Production from

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

DWE®-Reactor



## SNG from Electricity

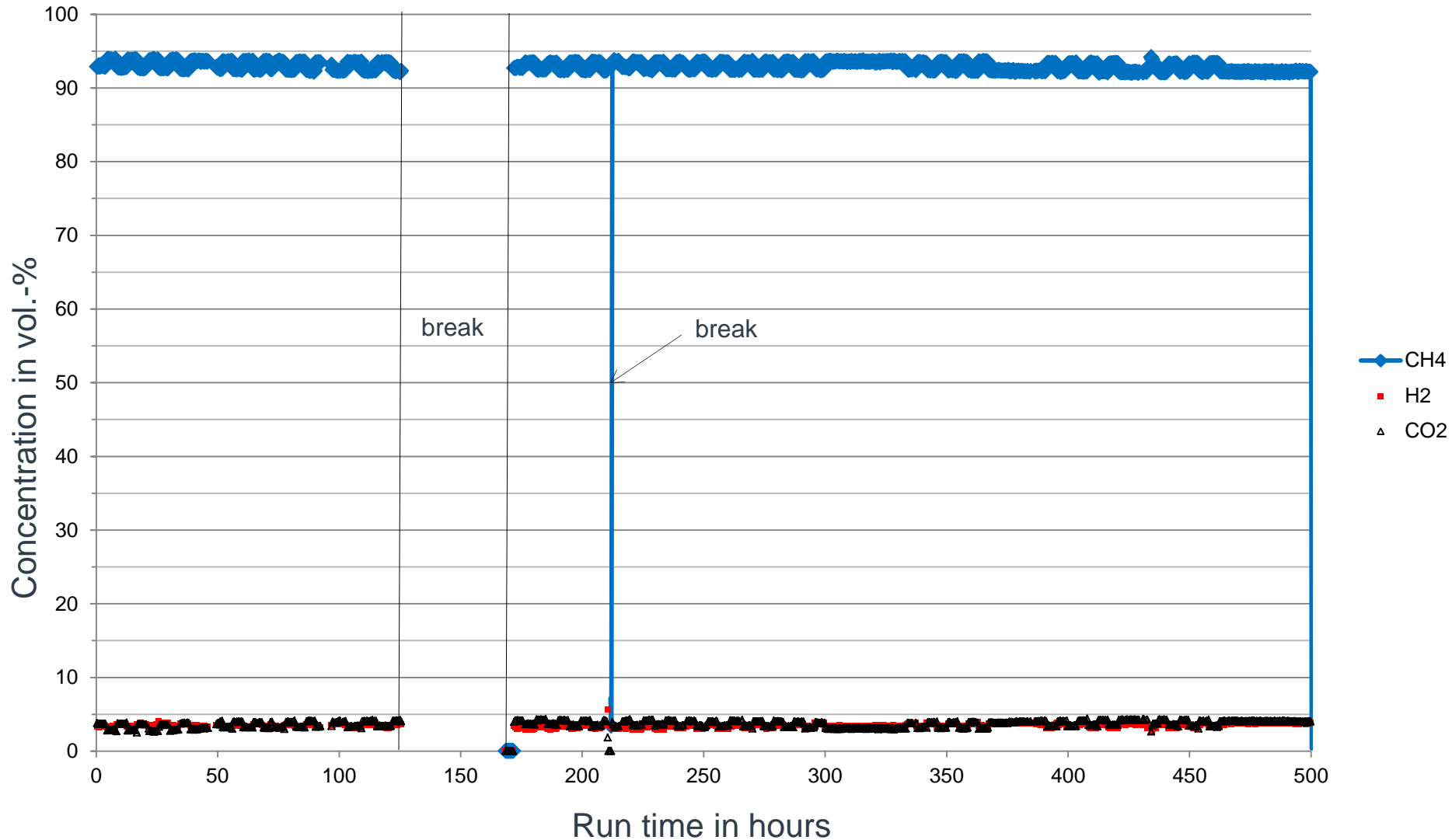


### H<sub>2</sub>/CO<sub>2</sub>: Educt for SNG

- H<sub>2</sub> via water electrolysis
- CO<sub>2</sub> from various sources e.g.
- Flexible range for balancing power
- Power station with CO<sub>2</sub> 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

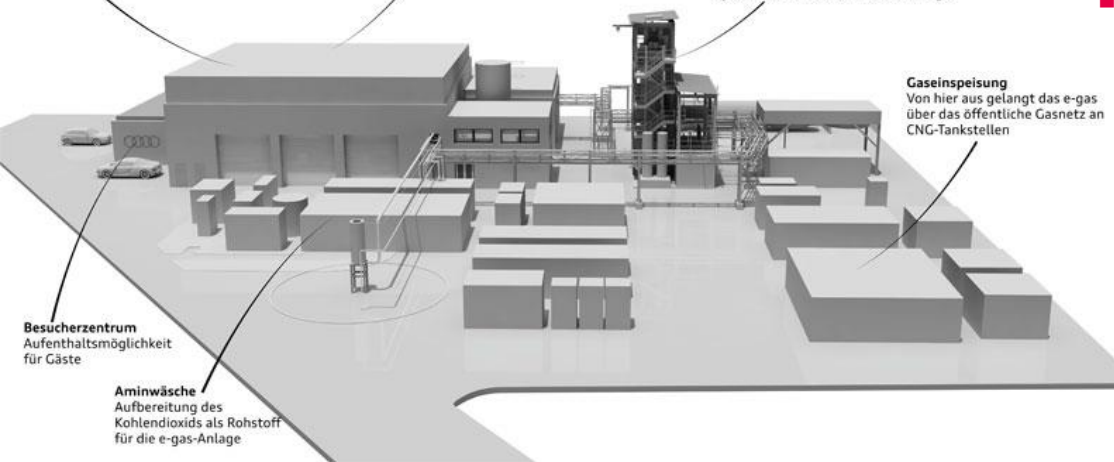
**Gaseinspeisung**  
Von hier aus gelangt das e-gas über das öffentliche Gasnetz an CNG-Tankstellen

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

**Besucherzentrum**  
Aufenthaltsmöglichkeit für Gäste

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

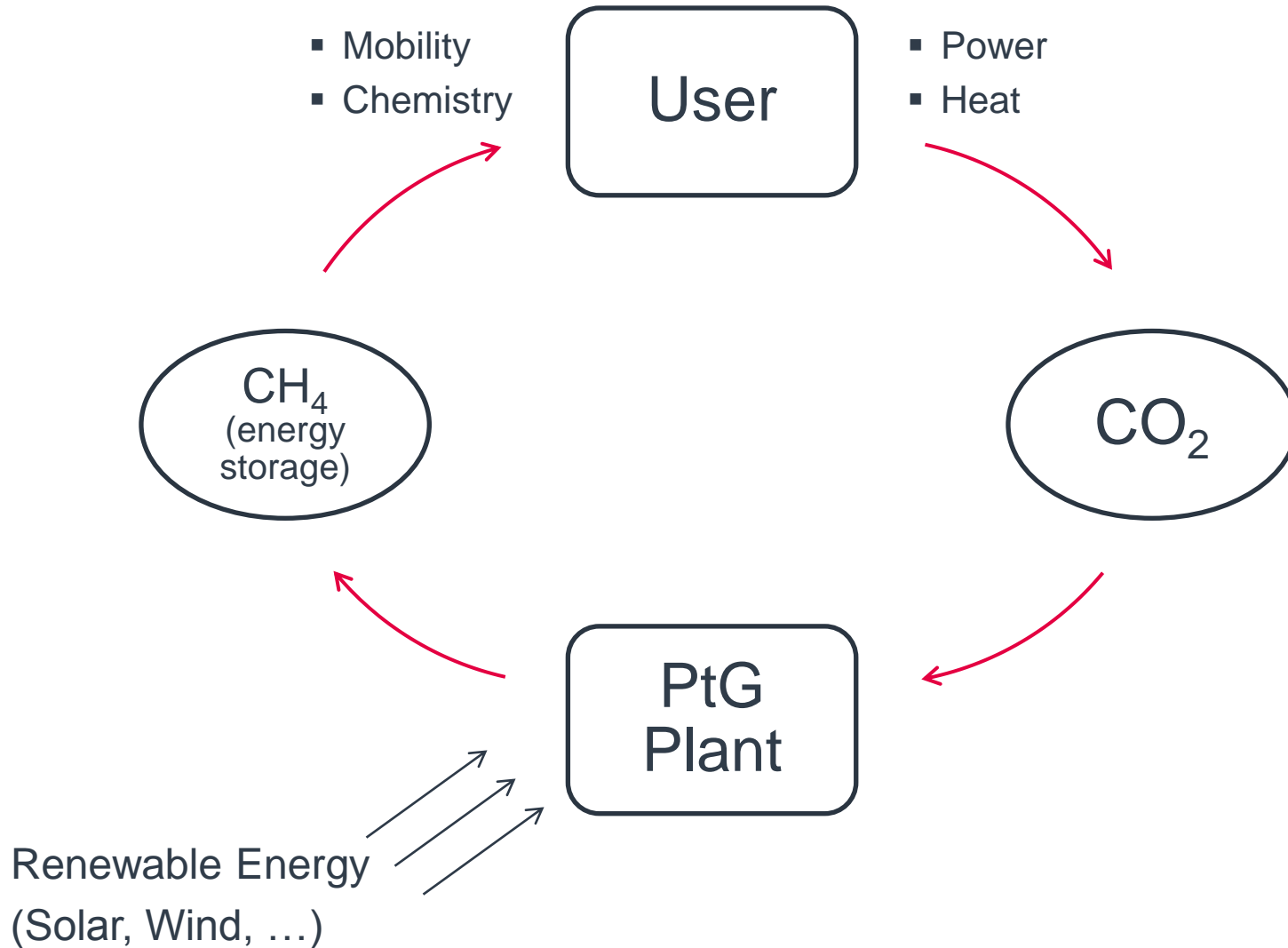
- Power to Gas Plant in Werlte using Reactors from MDT-Deggendorf.
- Additional products of MDT could be used in PtG Plants: Compressors, Gas-Engines and Gas- & Steamturbines



**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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