



Concepts for reliable and affordable energy systems employing advanced energy storage technology

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- 1 Background / Current Activities**
- 2 Business fields / Applications**
- 3 Technology / Main Components**
- 4 Partners**

1 Background / Current Activities

Electrical Engineering (Technical University of Braunschweig, Germany)

Initiating / establishing a fuel cell division within a mid-sized company

Development of high pressure (up to 100 bar) / high efficiency water electrolysis systems

Concepts for reliable and affordable energy systems based on renewable energies employing advanced energy storage technology

Development of concepts and technology for making use of waste carbon dioxide

Energy storage systems (scalable up to grid scale)

2 Business fields / Applications

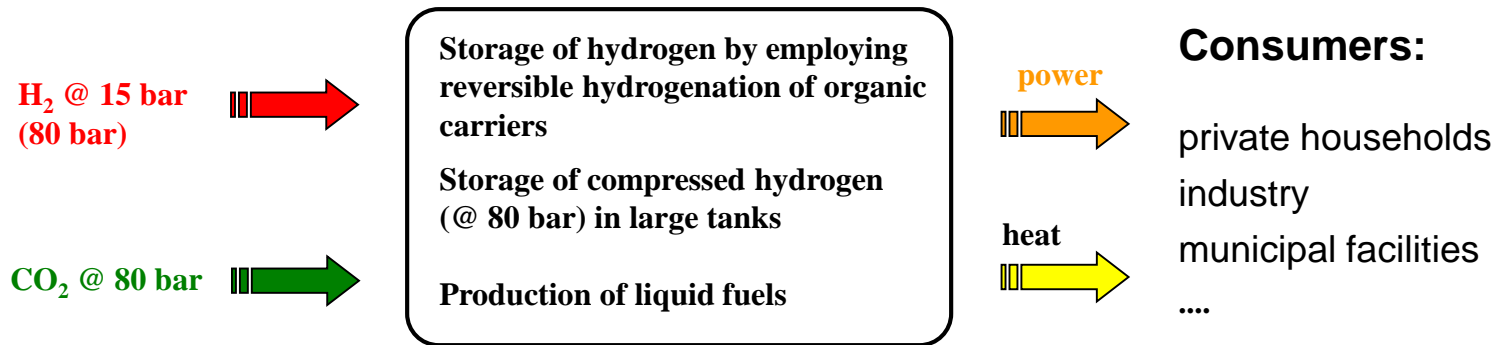
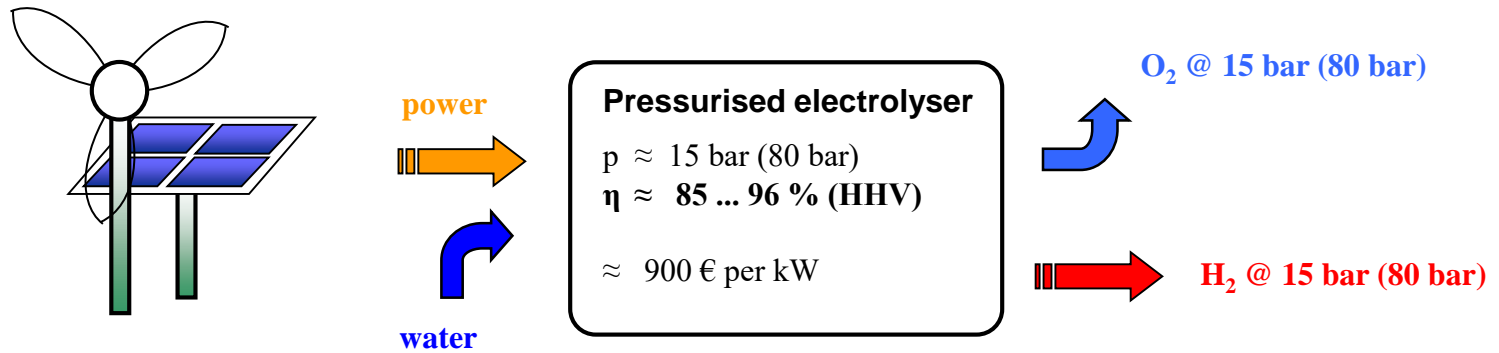
100 % renewable energy systems without any Diesel or other fossil fuel generators

Low-cost energy storage systems including seasonal energy storage (very compact: ca. 1 MWh_{el} per cubic meter of storage medium, CAPEX per MWh storage capacity below 20.000,- Euros)

Production of useful chemicals, i.e. methanol, synthetic fuels from (preferibly biogenic) waste carbon dioxide sources like bioethanol or biomethane injection plants

Optimization of plant operation by making use of different electricity markets / sources (direct usage from wind turbines / solar energy, spinning reserve market, intraday trade)

3 Technology / Main Components



3 Technology / Example

„Green“ Methanol from Waste Carbon Dioxide and Hydrogen

4 Partners

**SMEs, active in the design of equipment for chemical engineering plants
(high pressure vessels, certain ceramic parts, plant control)**

EPC

Owners / operators of solar (PV) plants

SMEs, interested in reducing their energy costs

Off-grid locations, replacing today's Diesel

Municipal facilities

Villages, regions aiming to achieve „self-sufficiency“ with respect to power supply

Mobility: alternative approach for establishing e-mobility

Thank you for your attention ! Let´ s start !

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Back-up slide

Industry, Municipal Facilities

avoidance of peak load bigger than according to contracts (impact on tariff)
by employing our storage technology
feed-in into own storage means („Eigenverbrauch“ / tax advantage)
(surplus) power / energy into seasonal storage

Private Households

feed-in into own storage means („Eigenverbrauch“ / tax advantage)
(surplus) power / energy into seasonal storage (independency from future price increase)

Villages, Cities, even Regions (decentralised power supply)

security of energy supplies solely on the basis of wind and solar plants
very compact, safe / easy to handle and low-cost storage of (surplus) energy in
seasonal storage units

Mobility

this technology could also be employed in traffic / mobile applications due to the very
high specific energy density which is outstanding amongst all hydrogen storage technologies
(even 25 % more energy per liter compared to pressurised hydrogen at 700 bar)