DEVELOPMENT, TESTING, INFRASTRUCTURE.

SUPPORTING THE ECONOMICALLY FEASIBLE UTILISATION OF HYDROGEN BY TRANSFERRING RESEARCH RESULTS TO INDUSTRY.

For the hydrogen ramp-up, new energy carriers will play a major role due to their high energy density and the use of existing infrastructure. ZBT focuses on researching methane, methanol and, in particular, ammonia as carbon-free and CO_2-neutral energy carriers for hydrogen storage and use and is thus bringing green molecules to application.

- Ammonia cracking, reforming, methanation, gas purification
- Developing new concepts of components and processes
- Testing of catalysts and components in industry-relevant scale
- Enhancing efficiency
- Prolonging lifetime
- Cutting down capital expenses

ZBT IS YOUR PARTNER IN TECHNICAL SOLUTIONS FOR OUR FUTURE HYDROGEN BASED ENERGY SYSTEM.

ZBT partners with various other research institutions in basic research projects on energy science. More applied research and experimental development are carried out in cooperation with industry partners, for which we offer various testing and qualification services.

YOUR KEY CONTACTS

FUELS AND PROCESSES

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JRF MEMBER OF Johannes-Rau-Forschungsgemeinschaft

H_2 DERIVATIVES – NH_3 AND CH_4 –

ZBT

DEVELOPMENT

PROCESSES, PLANTS AND COMPONENTS FOR AMMONIA CRACKING, REFORMING, METHANATION, PURIFICATION.

- Conception and engineering
- Flow-sheet development, plant layout
- Component development of reactors, heat exchangers, burners, evaporators, pressure vessels
- Modelling and simulation
  - 0D process modelling (Aspen Plus®, AVL CRUISE™ M, Model CONNECT™)
  - 2D-continuum modelling (Python)
  - 3D-FEM analysis
  - 3D-CFD (Comsol)
- Design and construction using CAD
- System integration
- Safety conception (for toxic and flammable media)
- Control development in TwinCat, LabVIEW, Python using Beckhoff and NI components

Cracking reactor fabricated by additive manufacturing

TESTING

SHORT AND LONG-TERM INVESTIGATIONS TO QUALIFY CATALYSTS, COMPONENTS AND SYSTEMS.

Multifunctional test bench for cracking applications

- Flexible test benches available
- Catalyst testing & qualification
  - Activity
  - Kinetics
  - Long-term stability
- Component, plant and system testing
- Prototype testing
  - Ammonia cracker
  - CHP-systems
  - Reformer-FC-systems
  - SNG-research-plant
- Analysis of fuels, gas mixtures and trace substances

INFRASTRUCTURE

LABORATORY, TESTFIELD, TEST BENCHES, SAFETY IN TESTING.

- Ammonia, methane, hydrogen and special gases
- 4 t ammonia for gaseous and liquid supply up to 20 bar and 80 kg/h
- Space for up to 10 test benches
- Integrated safety technology
- Product and exhaust gas purification system according to BImSchG and others
- Containerized research facilities on hydrogen testfield
  - Methanation
  - PEM-Electrolyser
- Gas analytics
  - NH_3: 0 - 3000 ppm, 0 - 100 %
  - H_2, CH_4: 0 - 100 %
  - Exhaust (FTIR)

Ammonia storage and supply container