

German Aerospace Center (DLR) Institute of Combustion Technology

Stuttgart, Germany

Dr. Peter Kutne (Head of Department Gas Turbines)



United Nations
Educational, Scientific and
Cultural Organization



• UNESCO Chair on Innovative
• Sustainable Clean Energy
• Research and Education at
• the University of Genoa, Italy
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Knowledge for Tomorrow



DLR German Aerospace Center



- Research Institution
- Space Agency
- Project Management Agency

- Approx. 9000 employees across 54 institutes and facilities at 30 sites

Research Areas of DLR (Institute)

- **Aeronautics**
- Space Research and Technology
- Transport
- **Energy**
- Digitalisation
- Defence and Security



Institute of Combustion Technology



Institute of Combustion Technology

Focus and goals

- **Combustion & Gas Turbines**

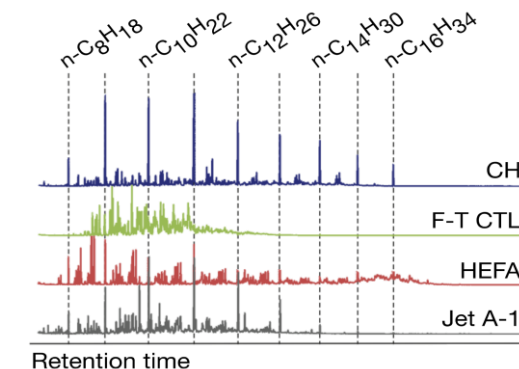
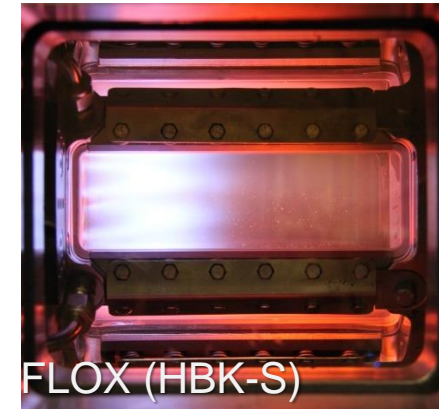
- For the energy transition and the world market
- Emission-free (NO_x , soot), fuel and load flexible

- **Micro Gas Turbine (MGT) Systems**

- Decentralized combined heat and power generation
- Mobility (range extender, aero engines)

- **Chemical Energy Carriers (Fuels)**

- For energy, traffic, aeronautics and astronautics
- Applications, technical performance
- Chemical analysis, assessment and optimization, „Designer Fuels“



Department Gas Turbines

Development of efficient, fuel flexible, low emission combustion systems for conventional and alternative fuels, e.g.

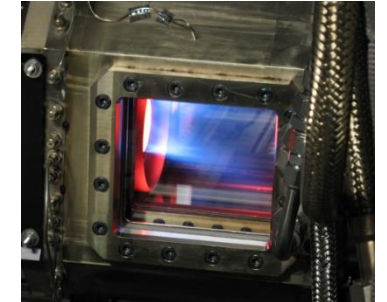
- Natural gas, diesel, kerosene, ethanol , pyrolysis oil
- Low calorific gaseous fuels (bio gas, wood gas, sewage gas, hydrogen)

Optimization of conventional MGT CHP systems

- Development and application of ceramic components
- Optimization of recuperator

Development of innovative MGT CHP concepts

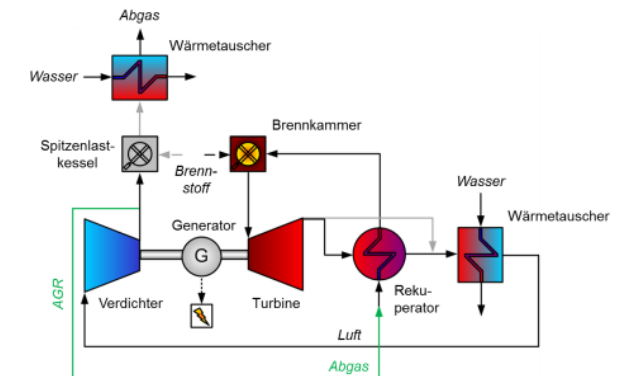
- MGT CHPs for single household applications
- Process integration (Hybrid MGT systems with heat pump, thermal storage)
- WET cycles
- Hybrid electric power trains



C30 recuperator



optimized SLM recuperator

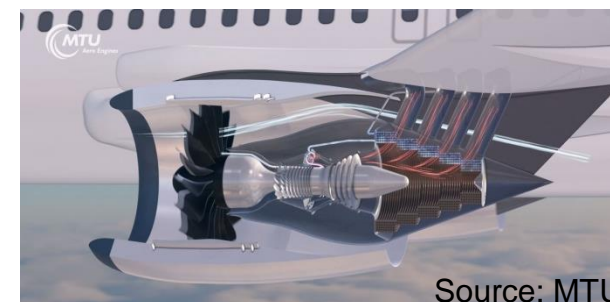


Actual research projects

Development of a mobile micro gas turbine lab for component testing



Demonstration of innovative power train concepts for 2030+



Development and demonstration of a fuel flexible combustion system for decentralized CHP applications



Modification of an aeronautic gas turbine for hydrogen application

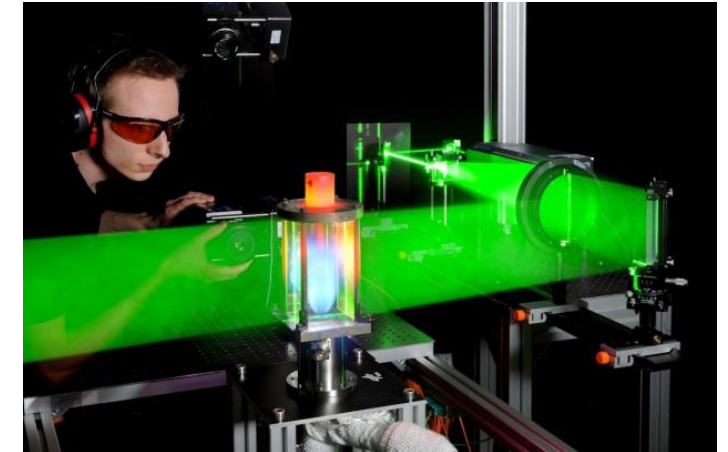
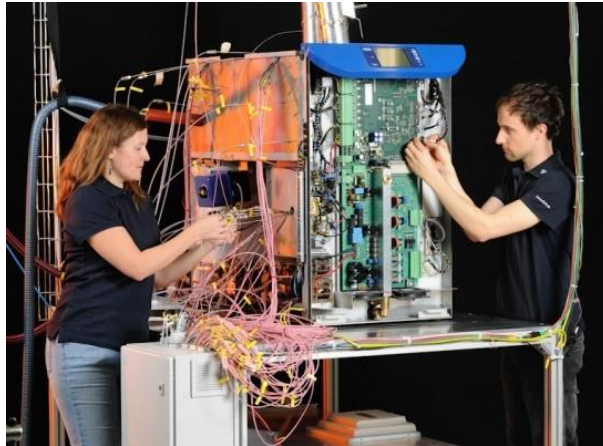


Partner of the UNESCO UNITWIN Network Innovative, Sustainable and Clean Energy Research and Education

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Quelle: DLR

