

25 years OWI Science for Fuels

Overview capabilities

Wilfried Plum, 25th september 2024

25 years of research for the energy transition



1998 - Foundation of the Oel-Waerme-Institut

2000



2007 – OWI affiliated to RWTH Aachen

2010



2020 – Science for Fuels gGmbH

2020



2001 - Introduction of low-sulphur fuels

- Deep desulphurised fuels enable the development of new technologies

2014 – Research on 2nd generation biogenic fuels and combustibles

- Hydrogenated bio-oils, pyrolysis oils etc.
- motor fuel injection

2018 – Launch of major projects in the field of mobility

- MultiSchiBZFuel cells for shipping
- C3Mobility, Redifuel, NaMoSyn: Fuel investigation for road traffic



2004 – Introduction of 1st generation biogenic fuels and combustibles

- Research projects on the feasibility of introducing FAME to the space heating market

2017 – Cluster Future Fuels

- Strategic bundling of Mobility expertise
- Studies in the field of space heating, refinery technology and industrial furnace construction

2022- Focus on methanol and ammonia

- First synthesis plant in operation

NH₃

Our Expertise: 1. Energy carriers

For 25 years:

1. Gen.
biofuels

Low-sulphur
fuel oil

For 10 years:

2. Gen.
biofuels
(HVO, FPBO)

MeOH

H₂

Now and Future:

EtOH

Ethers

NH₃

Other
Oxygenates

From
improved oils
towards
climate
friendly/
neutral fuels
& additives

Our Expertise: 2. High Temperatur Technology

For 25 years:

Conventional
fuel
combustion

Furnace
Construction
Materials

For 10 years:

Alternativ
fuel
combustion

Flame
Senors for
new fuels

Now and Future:

Ultra-low
emission
for biofuel

Industrial Furnace
electric/hybrid
heating

NH₃ & H₂
combustion
materials
durability

From
conventional
fuels burners
and material
endurance
toward the
new fuels and
heating
concepts

Our Expertise: 3. Energy Systems

For 25 years:

Catalytic burner

Reformers

Fuel-Cell systems

For 10 years:

Heat Storage

Reform-gasmotor

Now and Future:

NH₃ Cracker



From efficiency improvement towards new fuels enablers by new innovative concepts

Research and Development Areas

1. Energy Carriers



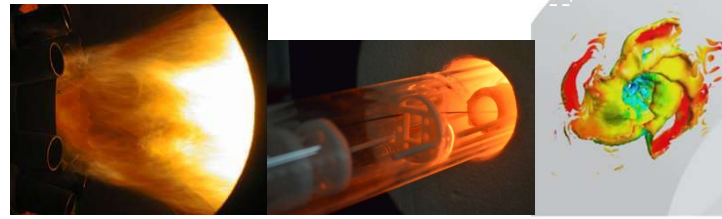
Topics:

- Future fuels und Additives
- Fuel ageing
- Materials compatibility
- Application-related behavior
- Burning Characteristics

Competences:

- Chemical-physical Characterization
- Application-related Characterization
- Accelerated Endurance tests
- Studies and testing
- Development new test Methods
- Performance Tests for Additives

2. High Temperature Technology



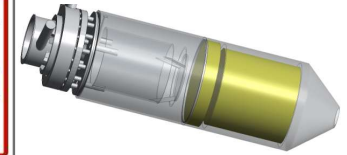
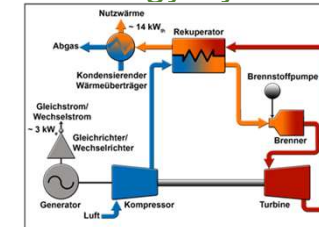
Topics:

- High Temperature material behavior
- High Temperature combability
- Solid Oxide cells
- Combustion technology
- High Temperature Process Engineering

Competences:

- Material analysis
- Furnace testing in varying atmospheric composition
- Sensorics
- Combustion testing
- Combustor development
- Computer aided engineering (CAE)

3. Energy Systems



Topics:

- Fuel Cells Systems
- Fuel Mixture formation
- Reforming
- Combined Heat and Power
- Combustor Systems

Competences:

- System Development
- Component Development
- Automation
- Testing
- System Simulation
- System Analysis
- Concept studies
- Thermo Chemical Calculations

25 years experience for the Energy Transition Research



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