

# Country Activities GERMANY

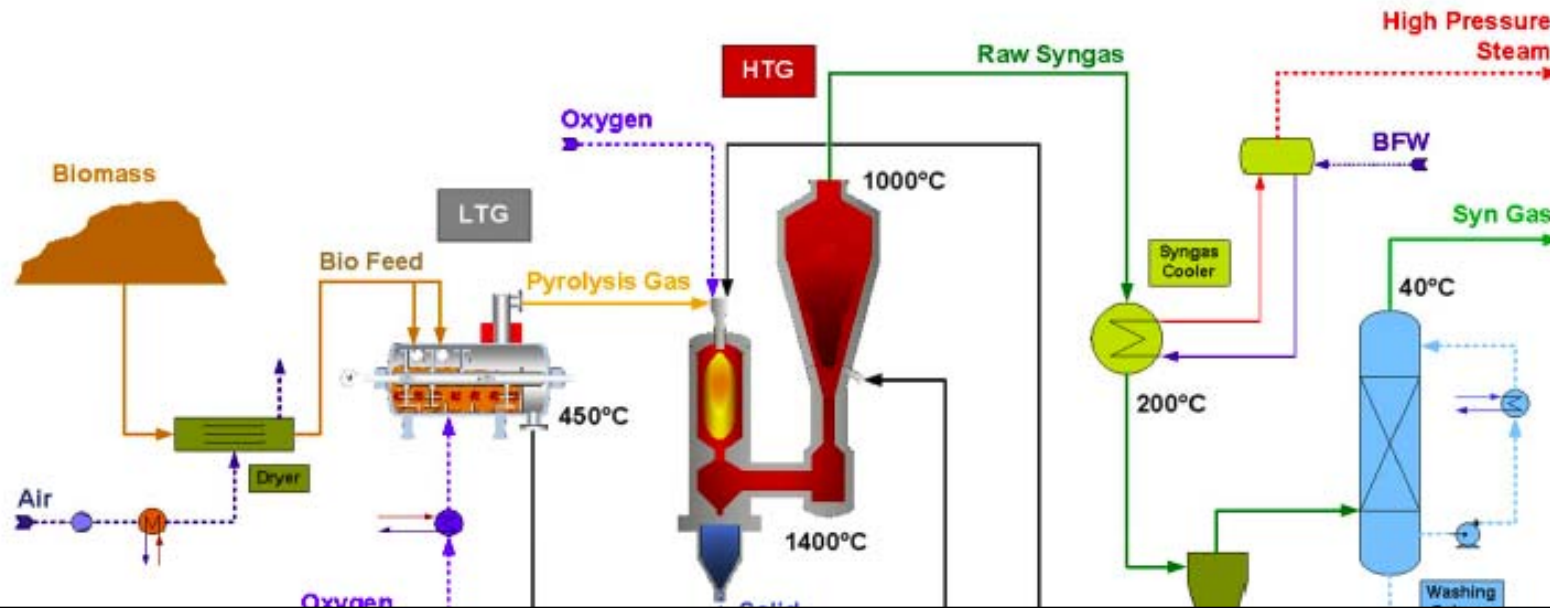
Engler-Bunte-Institute, Fuel Technology  
Institute for Technical Chemistry, Gasification Technology

Thomas Kolb / Mark Eberhard

**IEA Bioenergy: Task 33 Thermal Gasification of Biomass**

**Task meeting, May 11<sup>th</sup> 2015, Ponferrada, Spain**

# Carbo-V® - Process Flow Sheet



February 2012	Linde Engineering Dresden GmbH acquires Carbo-V® IP
January 2013	Linde has elaborated numerous technical corrections of Carbo-V process design Linde and Forest BtL (Finland) sign agreement to apply Carbo-V process to provide Syngas for downstream Biodiesel and Naphta   Kemi, Finland
February 2014	ForestBtL / VAPO / NER300 canceled the project
<b>Update May 2015   Sven Petersen</b>	no news in project pipeline

# The B-XTL BioTfuel-Projekt



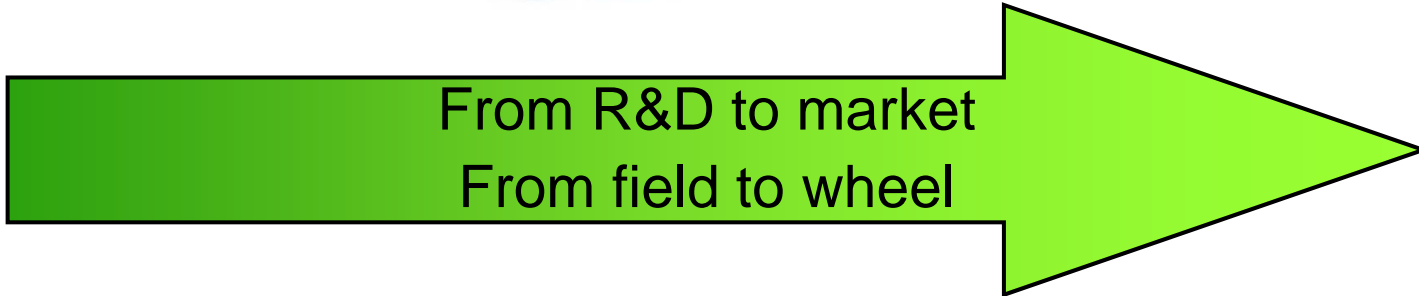
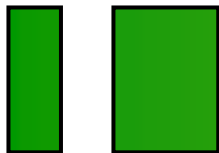
**R&D**

**Technologies licensors**

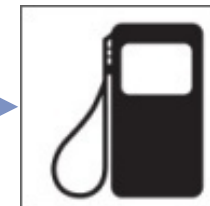
**Fuels producers**



energie atomique • énergies alternatives



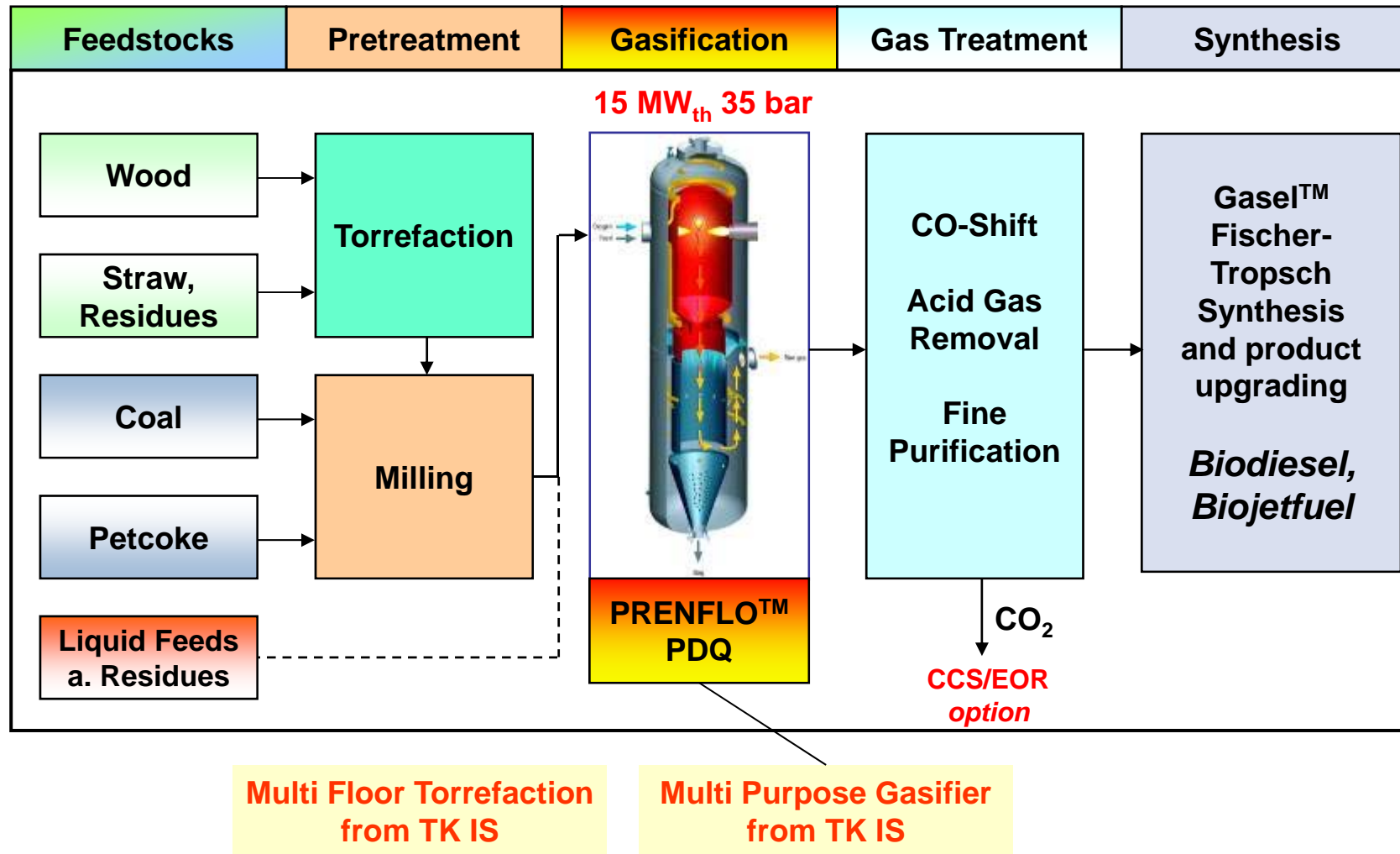
**Bio-diesel  
Bio-jetfuel**



**8 years partnership to realize a RD&D programme  
to develop a complete B-XTL process chain  
Total Project Budget 180 M€ / Comissioning January 2017**

# BioTfuel-B-XTL Project

Process chain 2nd. Generation Biodiesel und Biojetfuel

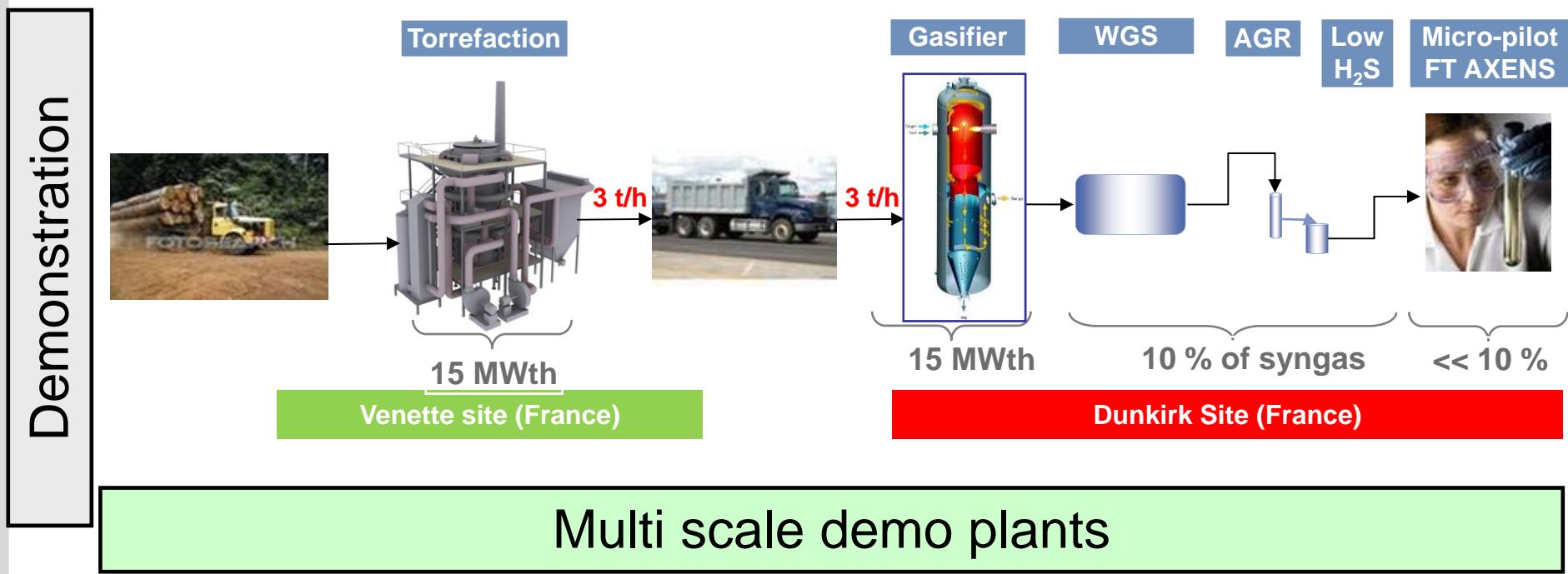


# BioTfuel-Projekt

## BioTfuel main figures & objectives

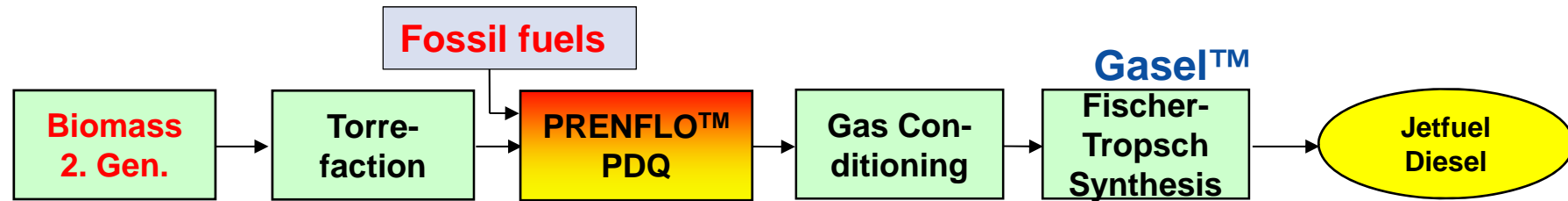


- BioTfuel demo plants:
  - Two multiple scale demo plants will be located in France
    - to get scale-up data
    - to validate various scheme/configurations



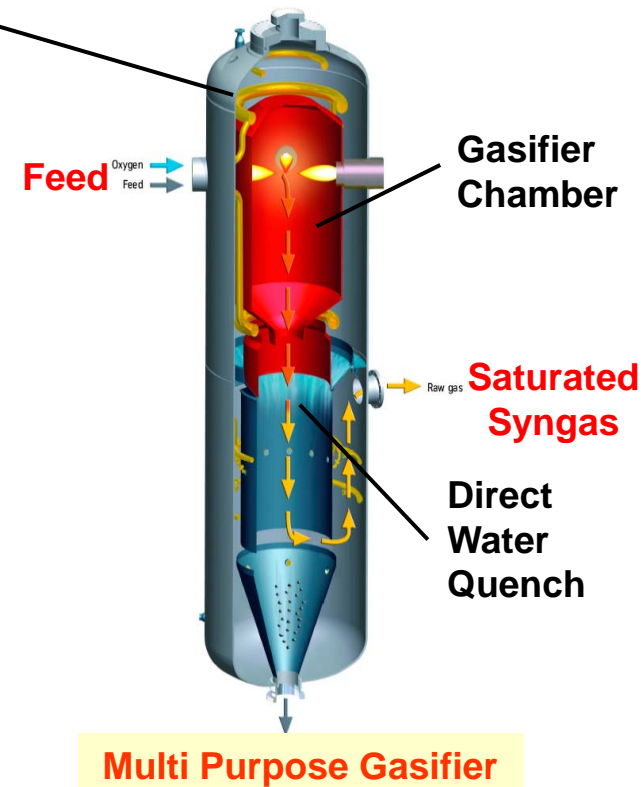
# BioTfuel-Project

## PRENFLO PDQ Integration in the BioTfuel process chain



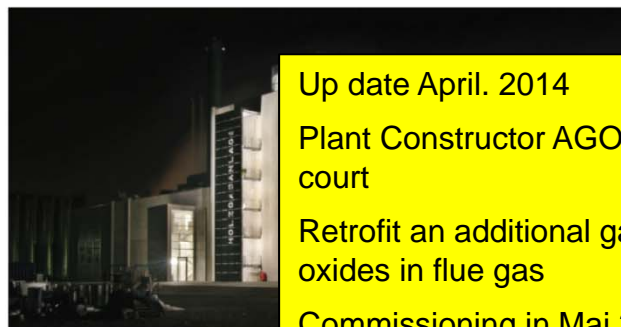
### PRENFLO PDQ Features

- Single-line capacity up to 1,200 MW<sub>th</sub>
- Dry powder feed (coal/biomass)
- Horizontal co-annular burners
- Long-life steam cooled reactor screen
- Direct water quench
- Compact gasification system



# SWU Stadtwerke Ulm CHP Demo Plant

## Biomass gasification plant Senden/Ulm, DE



Up date April. 2014

Plant Constructor AGO and SWU settlement out-of-court

Retrofit an additional gas cleaning to reduce nitrogen oxides in flue gas

Commissioning in Mai 2014



Start of the construction	12/2009	
Actual status	commissioning	
Fuel	Wood chips	
Input	14,3	M
Output	5,0	M
	6,2	M
Total efficiency	78	%
Overall investment	33	M

Up date May 2015

Plant is in operation still not full electrical power generation

In 2014 average 300 h/month in operation

In 2015 average 500 h/month in operation

Plant design is 600 h/month

Source: R. Rauch, SGG Gasification Seminar 2012

# State of the bioliq®-Project

- Successfull integration of „hot gas cleaning“ and verification of specified clean gas values in ppb
- Hot commissioning of the process chain gasifier / hot gas cleaning /synthesis
- 9 h stable process chain operation with model fuel (Monoethylenglycol + 20% Straw coke from bioliq I)
- 9 h & 12 h stable process chain operation with Wood oil
- ca. 124 h gasifier operation with slurry
- ca. 85 t slurry converted into syngas
- Production of > 200 l raw petrol
  
- 100h champaigne for the process chain in autumn 2015





# State of the bioliq®-Project



## 18.11.2014 bioliq®: Complete Process Chain Is Running

High-quality Fuels from  
Residual Biomass – Plant  
Commissioning Ceremony  
with Representatives of the  
Federation and State – KIT  
President: Another Module  
for the Energiewende

# Mass, Species and Energy balances

