

Tech Consulting Services





IEA Bioenergy Task 34 – National Stakeholder-Workshop

Dr. Johann Halbartschlager

Profile

Professional and sector experience

- ⇒ PhD programme in Chemical Engineering at the Vienna University of Technology
- ⇒ 35 Years' professional experience in plant engineering for process and environmental engineering systems (Exhaust air, Waste water, Waste, Chemical Weapons- and munitions disposal)
- ⇒ Experience in global Sales
- ⇒ Employed as a Managing Director within various organisational structures of a family-run business
- ⇒ Experience in establishing full-service and operator models(BOT) for the Logistic- and Automotive sectors as well as for environmental technology
- ⇒ 2 Years as an Expat in China to set up the „Environmental Technology Business Unit“ in Shanghai
- ⇒ **2021 Founder of Tech Consulting Service**



Consultancy Portfolio

Strategy and Implementation consultancy, including management Coaching, in the following areas:

- ⇒ Wet chemical and process engineering optimisation of Greenfield and Brownfield plants
- ⇒ Requirements for production-integrated environmental protection (PIEP) with regard to exhaust air, waste water and waste
- ⇒ Measures for energy and resource efficiency, emission reduction and waste prevention in painting and process engineering plants
- ⇒ Waste heat recovery in the chemical and food industries
- ⇒ Consultancy on regulatory approvals (BImSchG, TA-Luft, etc.)
- ⇒ Consultancy and training in mechanical and plant engineering
- ⇒ www.tech-consulting.services

TCS – Experience with Pyrolysis 1/2

Industrial Applications:

01

Recovery of Gold from industrial scrap & swept-up rubbish



Two-stage process in rotating drums: 1. Pyrolysis, 2. Controlled oxidation (combustion)

02

Pyrobuster (Eisenmann)



Dual-chamber-rotary-kiln: Industrial pyrolysis plant for sewage sludge and other waste materials: Unlike many simple pyrolysis plants: a) the process heat is recycled internally, b) the pyrolysis gas is utilised for energy, c) and the system can operate partially autothermally.

03

Counter flow-gasifier for wood biomass



An industrial plant was to be built based on a pilot plant.

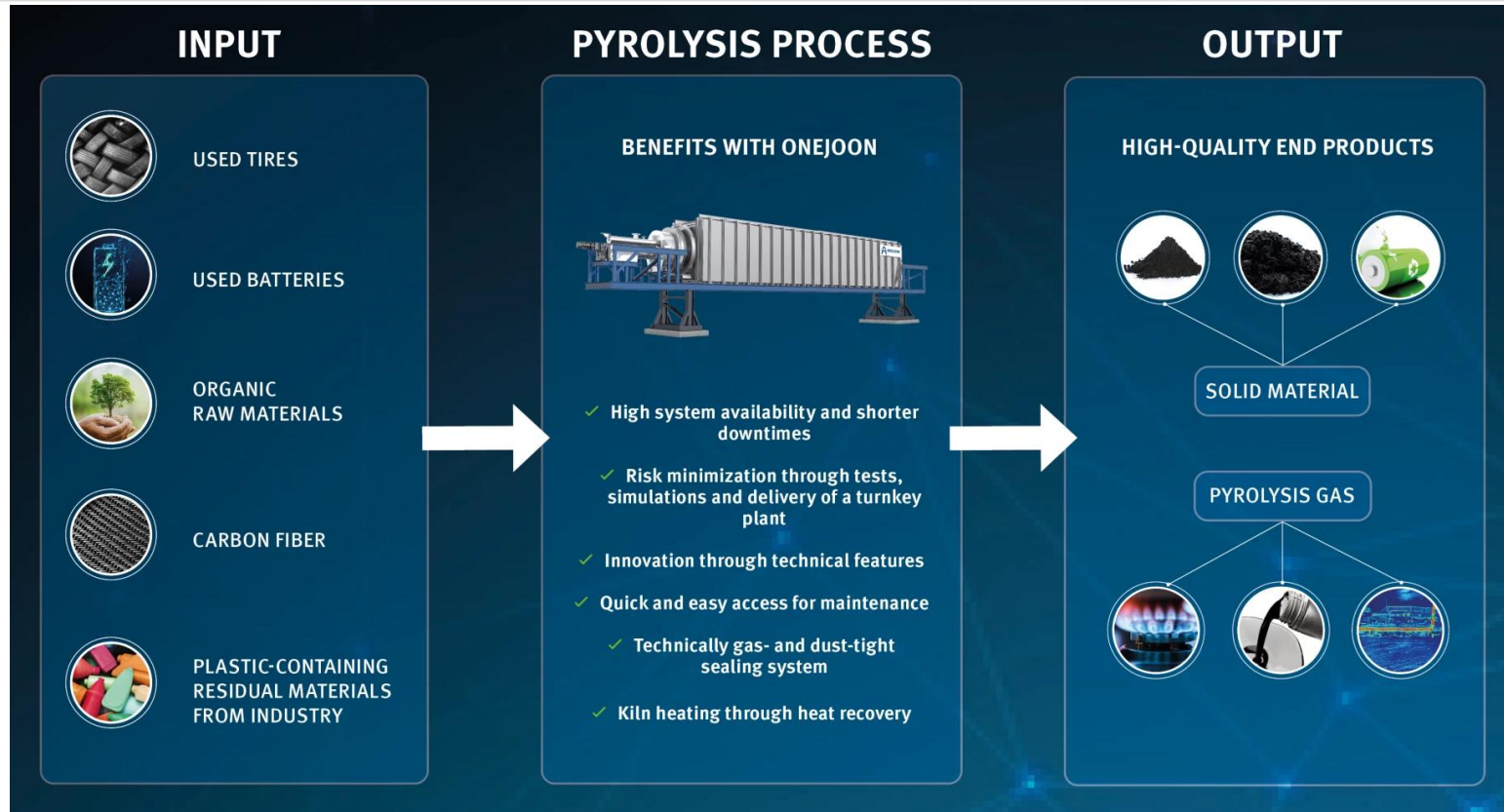
- the search for investors went on for years (Discussion on guarantees)
- visits to reference plants in Japan (Problems with tar, frequent shutdowns)

04

Smouldering gas pyrolysis process



Chamber oven or Fluidized bed reactor: used for stripping of paint from paint racks, grating and skids in paintshops



Source: ONEJOON

Consultancy Project: Advanced Bioenergy Lab Austria

Objective:

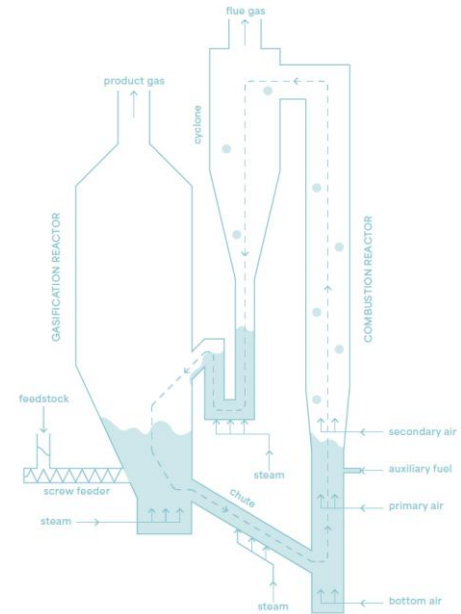
To establish a research infrastructure for the production of SNG and FT-diesel from biomass using DFB gasification (Dual Fluidized Bed steam gasification)

Scale: ≥ 5 MW input to the DFB gasifier

Task of Tech Consulting Services (TCS):

TCS was commissioned by ABL eGen to carry out an assessment of the project's status, to draw up work packages, a timetable and staffing requirements, to define milestones, and to provide feedback on optimisation and improvement – including through plausibility checks and the evaluation of tenders – as well as to make proposals for project optimisation and cost reduction.

➔ The final investment decision to build the research and demonstration plant was taken in June 2026.



Comparison of Research Sites (Quelle: Advanced Bioenergy Lab eGen)

Site	Simmering(Austria)	Zeltweg(Austria)
Purpose	Further development of the DFB gasification process for municipal waste and various residual materials.	Demonstration and optimisation of the production of 'drop-in' fuels from biogenic residues from agriculture and forestry; first-ever implementation of the entire process chain in a real-world environment.
Plant	DFB gas generation and primary gas purification 1MW, fine gas purification, FT-synthesis 0.2 MW (Syncrude), no processing into finished products on site	DFB gas production and coarse gas purification 5 MW, fine gas purification, FT synthesis (1.4 MW), processing of synthesis products into 'drop-in' fuels, practical use of the fuels (e. g. tractors), Production of grid-ready SNG (approx. 3 MW)
Fuel	1 MW fuel thermal output (200 to 300 kg of residues / waste per hour.	5 MW fuel thermal output (approx. 1,300 kg of wood chips / biogenic waste per hour)
Products	Syncrude (crude-FT-product, FT-wax)	Syncrude (crude-FT-product), FT-wax and 'drop-in' biofuels, total approx. 120 kg/h, approx. 3 MW of grid-ready SNG
Operating Mode	Campaign operation, 100 to 250 hours per campaign	Campaign operation, 750–1,000 hours per campaign resp. continuous operation once fully commissioned
Operating Hours	max. 1.000 h per year	max. 4.500 hours per year for the entire process chain
Operator	BEST GmbH	ABL- Genossenschaft

Synthesegas-Erzeugung *)

Biomasse-Input *)	t/h	1.32
	MW	5.00
Syngas-Output	MW	3.26

*) Getrocknete Biomasse am Eintritt in den Gaserzeuger (bei 20 m.-% Wassergehalt).

Measures to increase the yield of FT products:

- Syngas composition
- Synthesis parameters for FT-synthesis
- Reaction parameters for tail-gas reforming
- Adjustment of the FT-loop:
 - Tail-gas recirculation ratio
 - Tail-gas reforming
 - CO₂- capture and recirculation

SNG-Synthese



SNG **)	Nm ³ /h	296
	MW	2.82

**) Einspeisefähig laut ÖVGW G B210:2021

Fischer-Tropsch Synthese



Fischer-Tropsch Produkte	kg/h	116	≈ 170-180 ***)
	MW	1.40	≈ 2-2.2 ***)

***) Zusätzlich: Erreichbare Werte nach **Optimierungsmaßnahmen** und **Vergrößerung des FT-Loop**.

Your Contact:

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