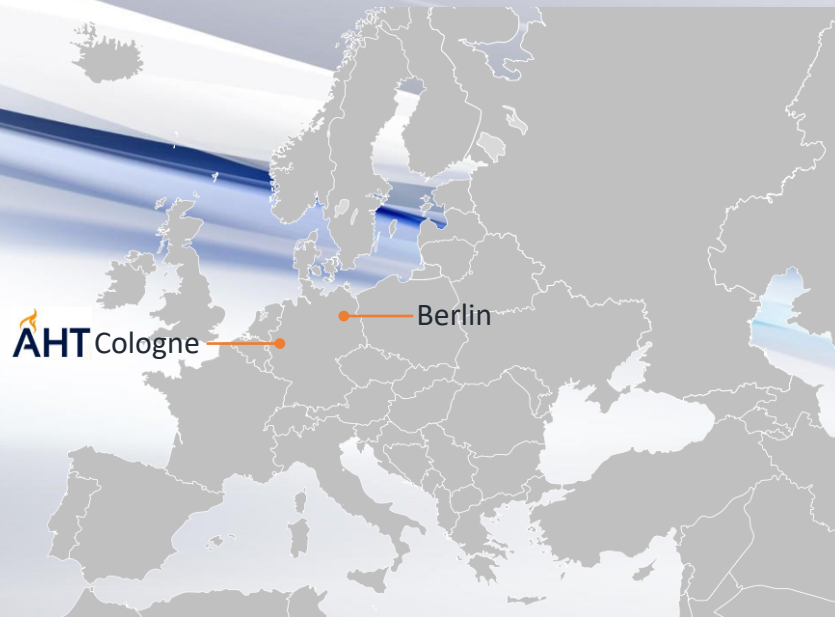




## Biomass CHP solutions to decarbonise agriculture

Strategies  
Concepts  
Technical solutions



**Who we are – what we do**

**Biogenic Agricultural Residues for Energetic and Material Recovery**

**Feedstock Conditioning**

Hydrothermal Carbonisation

**Syngas Generation – The Twin-fire Gasification Principle**

**Heat and Power Generation**

**Process Chains & Products**

**Decarbonisation Taken Further**

Hydrogen Separation

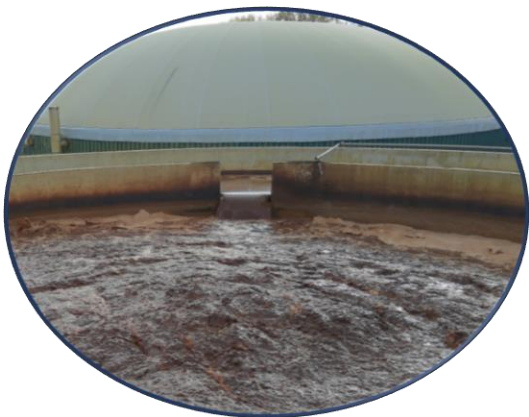
**Reference Switzerland**

## Who we are – what we do

RAW & CLEAN GAS for Industrial Applications	CLEAN GAS for Decentralised Power Plants	SERVICES
600 kW <sub>th</sub> - 50 MW <sub>th</sub>	200/500 kW <sub>el</sub> - 12 MW <sub>el</sub>	<ul style="list-style-type: none"><li>• Feasibility, Engineering</li><li>• Delivery, Erection, Supervision</li><li>• Support, spare-parts &amp; maintenance</li></ul>

Consulting & Empowering	Design & Customisation	Sales, Shipment & Implementation	Maintenance & Services	R&D / Engineering
				

# Biogenic Agricultural Residues



*Digestates*



*Manure*



Credit: John F. Hays Univ. Nebraska

*Bare corn cobs*



*Waste wood*



*Crop residues*



# Feedstock Conditioning



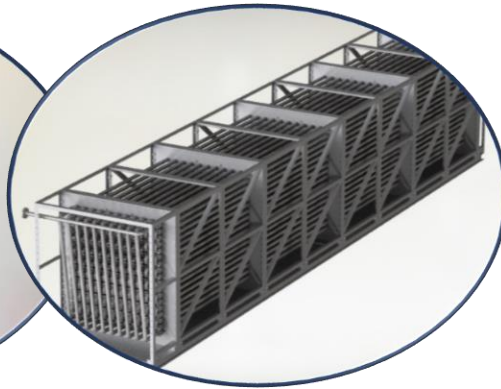
*Mixing, Homogenisation*



*Chipping, Drying*



*Briquetting*



*Hydrothermal Carbonisation*



*Hydrochar*

## Feedstock Conditioning – Hydrothermal Carbonisation in a Nutshell

### Hydrothermal Carbonisation (HTC)

- Biomass conversion to a lignite-like hydrocarbon
- Continuous process for pumpable biomass and sewage sludge
- Application of temperature (approx. 220 °C), pressure (approx. 22 bar) and time (2-12 h)

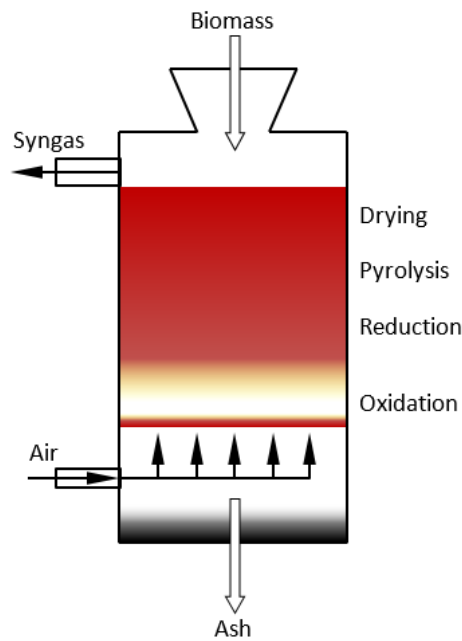


- Usable as energy source or soil conditioner
- Liquid and solid fertiliser extraction



# Syngas Generation - The Twin-fire Gasification Principle

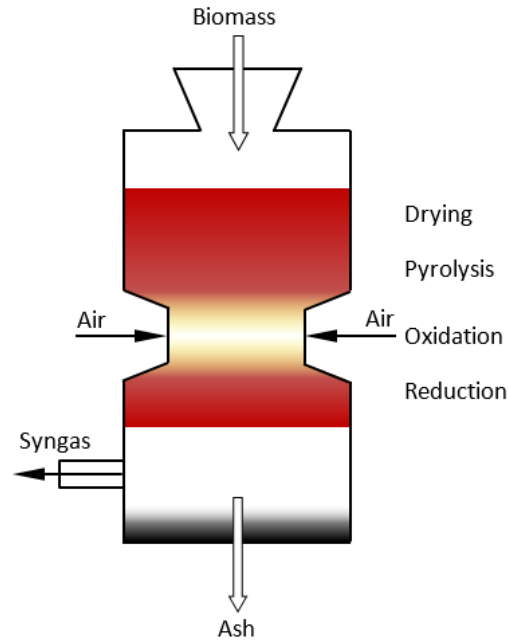
Updraft (counter-current)



High tar content, low ash content

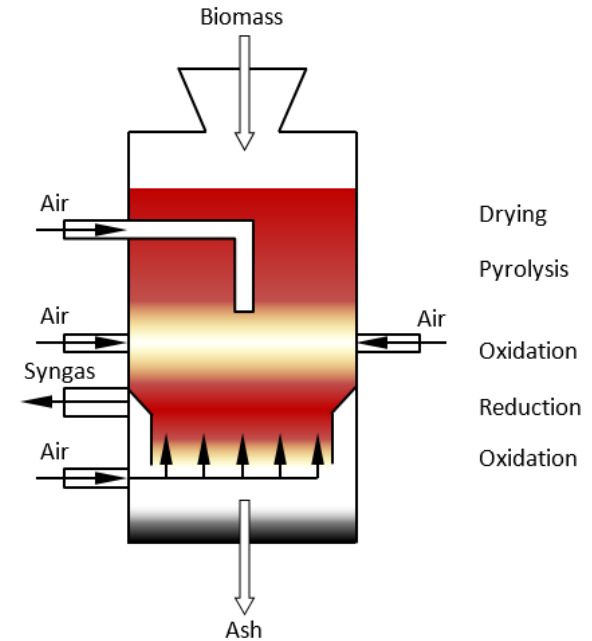
Usually incomplete gasification (char coal remaining in ash)

Downdraft (co-current)



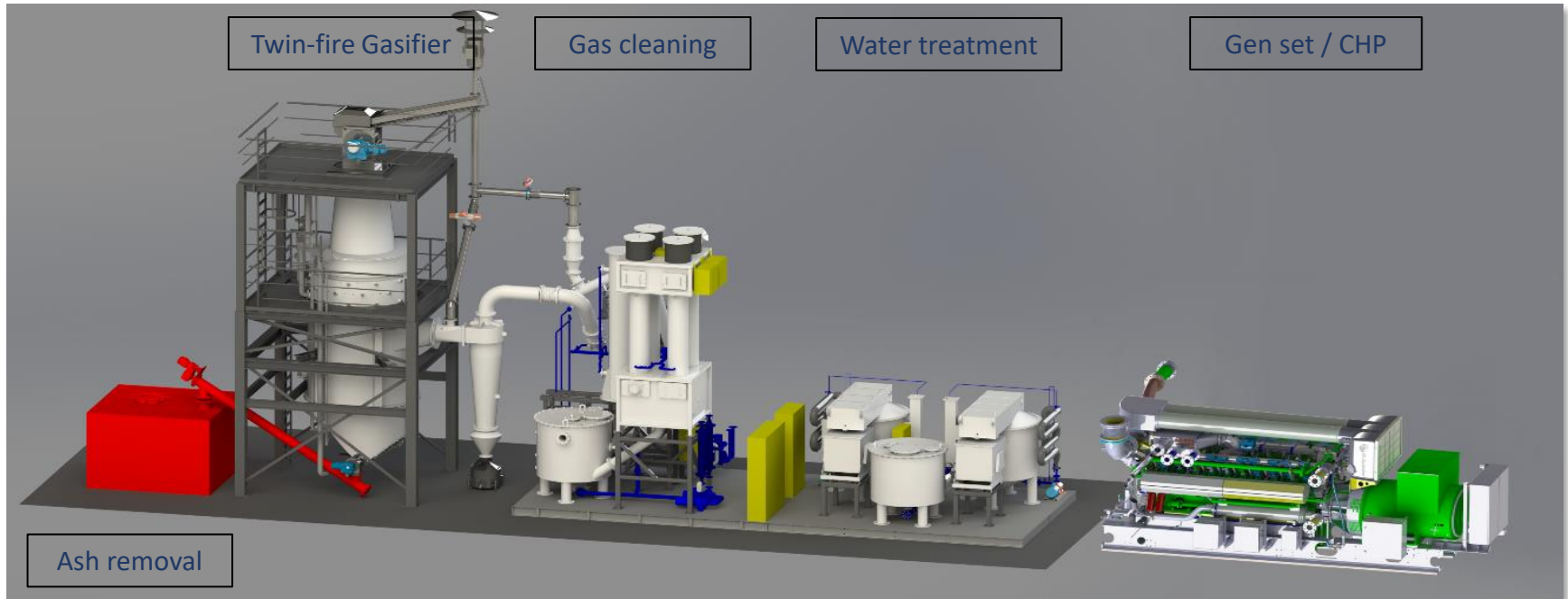
Low tar content, high ash content

AHT Twin-fire (co- & counter-current)



Low tar content, low ash content

Almost complete gasification



**Feedstock**



**Preparation**



**Gas Generation**



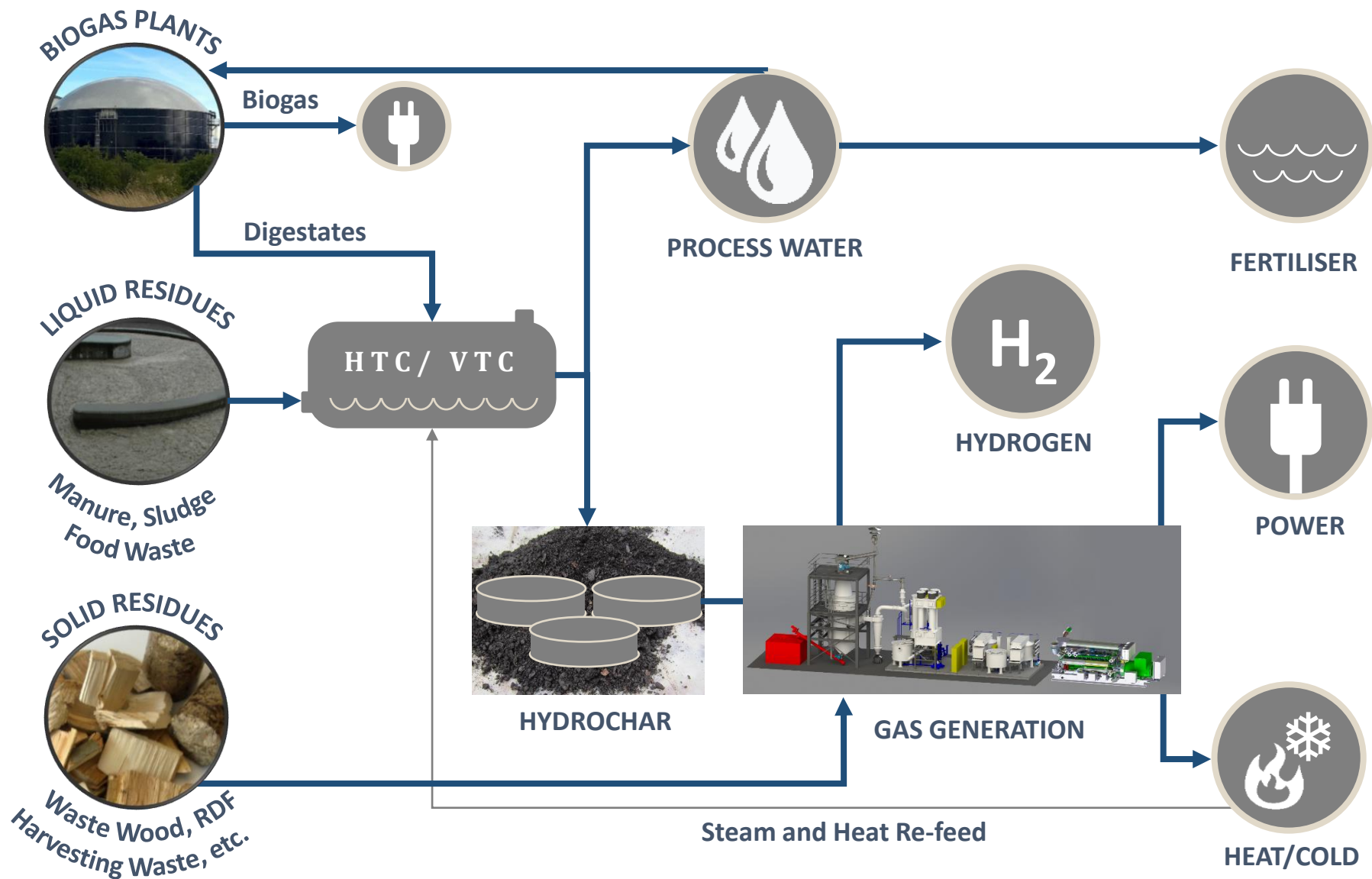
**Gas Conditioning**



**Syngas, Heat & Power Generation**



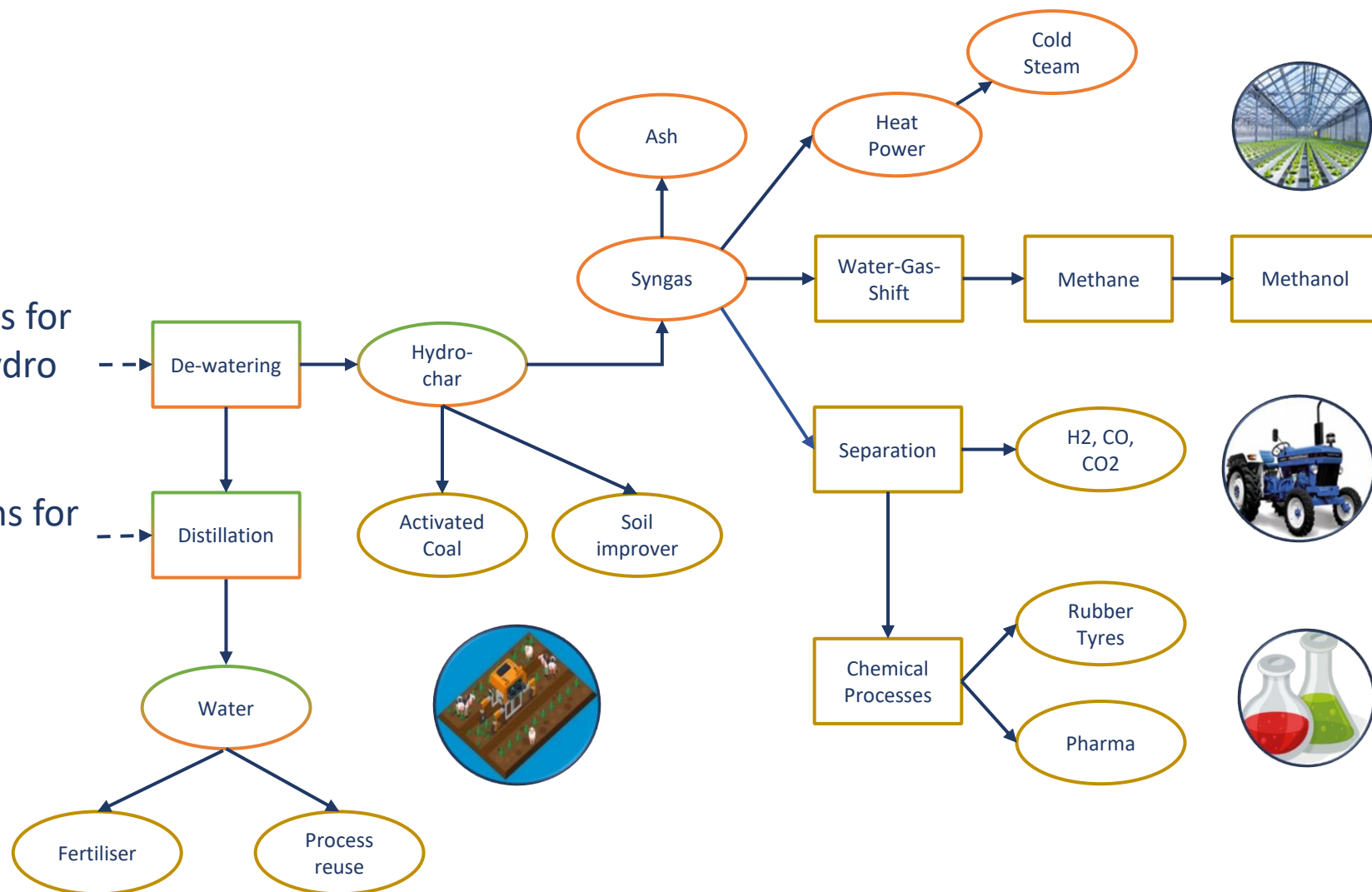
## Process Chains & Products



# Decarbonisation Taken Further

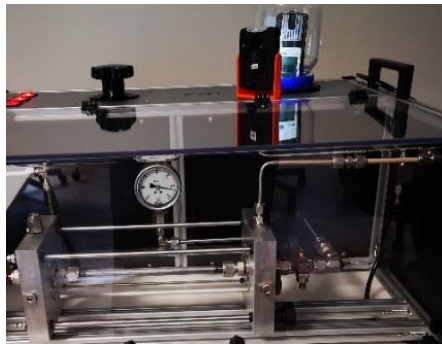
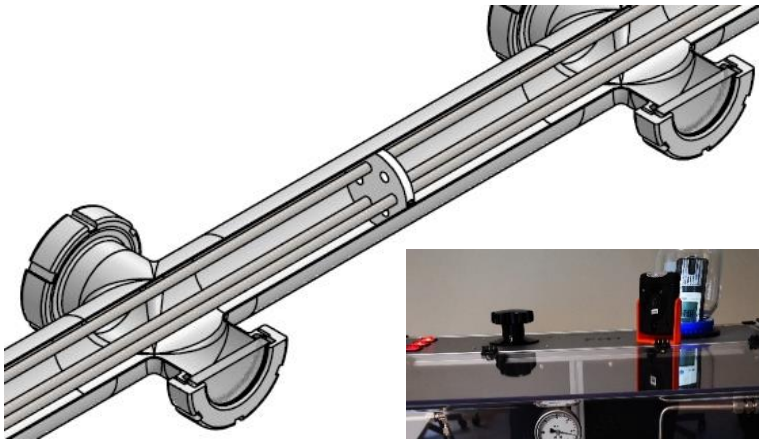
Options for  
wet Hydro  
Char

Options for  
Water



## Hydrogen Separation (FHT)

- Patented low-energy, low-pressure technology to separate hydrogen from syngas
- Absolutely pure hydrogen for industrial applications, fuel cells and mobility
- Hydrogen from biogenic residues can be produced directly where it is needed



(Mitteilung aus dem Institut für Allgemeine Elektrotechnik der Technischen Hochschule Dresden.)

### **Die Diffusion von Wasserstoff und Deuterium durch Eisen.**

#### **I. Das Eisen als Kathode einer Glimmentladung.**

Von A. Güntherschulze, Hans Betz und Hans Kleinwächter.

Mit 13 Abbildungen. (Eingegangen am 24. Dezember 1938.)

## Technologic Principle

- specially prepared pure iron tubes are exposed to a gas mixture at slight overpressure.
- Inside the iron tube, the pure hydrogen is extracted at a slight negative pressure. All other substances and elements cannot pass or "tunnel" through this metal grid due to their size.

## Reference

Location:  
***Chur / SWITZERLAND***

Application:  
***Clean gas, heat & power***

Feedstock:  
***Hydrochar from sludge***

Output:  
***200 kW<sub>el</sub> / 185 kW<sub>th</sub>***

- Commissioning
- Can be used for trials





# Contact



## **A.H.T. Syngas Technology N.V. Domicile**

Hurksestraat 43  
5652AH Eindhoven  
The Netherlands

## **A.H.T. Syngas Technology N.V. Administration**

Diepenbroich 15  
51491 Overath  
Germany

[info@aht-syngas.com](mailto:info@aht-syngas.com)

[www.aht-energy.com](http://www.aht-energy.com)



[Link](#)

Tel.: +49 2206 95190-00

