



New level of natural circular economy

Creating value out of all kind of organic waste

ABOUT US ...

Holzner Druckbehälter GmbH and PROEMTEC Behnke Präzisionstechnik GmbH developed the blueFLUX process from 2013 to 2020 and founded blueFLUX Energy AG in 2020 as a spin-off to create the right platform for this forward-looking technology.

Our technology is unique. It is currently the world's most efficient solution to produce green hydrogen from organic residues.

Whether sewage sludge, liquid manure, wood and green cuttings, fermentation residues or food waste with plastic packaging residues: Any type of organic residue, with a plastic content up to 30%, can be converted into synthetic coal, biochar, synthesis gas, green hydrogen, biomethanol and biomethane using our patented plant technology.

Our focus here is on the processing of organic residues into synthetic coal, synthesis gas and green hydrogen.



GREEN HYDROGEN OUT OF ORGANIC WASTE



blueFLUX H2 is a highly innovative new type of plant type developed and manufactured by blueFLUX Energy AG. The plants convert organic wastes from agriculture, municipalities and industry (with a plastic content of up to 30%) into the high-quality energy carriers synthetic coal, biochar, synthesis gas, green hydrogen, biomethanol and biomethane within a few hours and at competitive cost.

economical -
sustainable -
CO₂-neutral

COMPANY PURPOSE



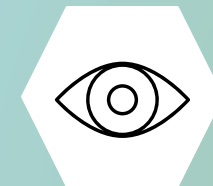
MISSION

bring waste-to-value on a new level

produce green H₂ for less than 3 € / kg

reduce the CO₂ pollution

VISION



green H₂ energy affordable for EVERYONE

100 % replacement of fossil fuels

global market leader with a disruptive technology for production of green H₂

OUR VALUES – OUR MOTIVATION

flexibility and
customer orientation



sustainability

team spirit

blueFLUX^{H₂}

innovation



WE TRANSFORM

blueFLUX H_2

Synthetik
char

Bio-
char

Green
Hydrogen

Green
Syngas

Bio-
methanol

Bio-
methan

OPPORTUNITIES

German high-tech company

Decentralized approach

innovative H₂ production technology

2-4 € / kg green H₂

fast ROI

cost efficient

game changing technology

patented

disposing of wet & dry materials

conversion-rate of 65 % with hydrolysis

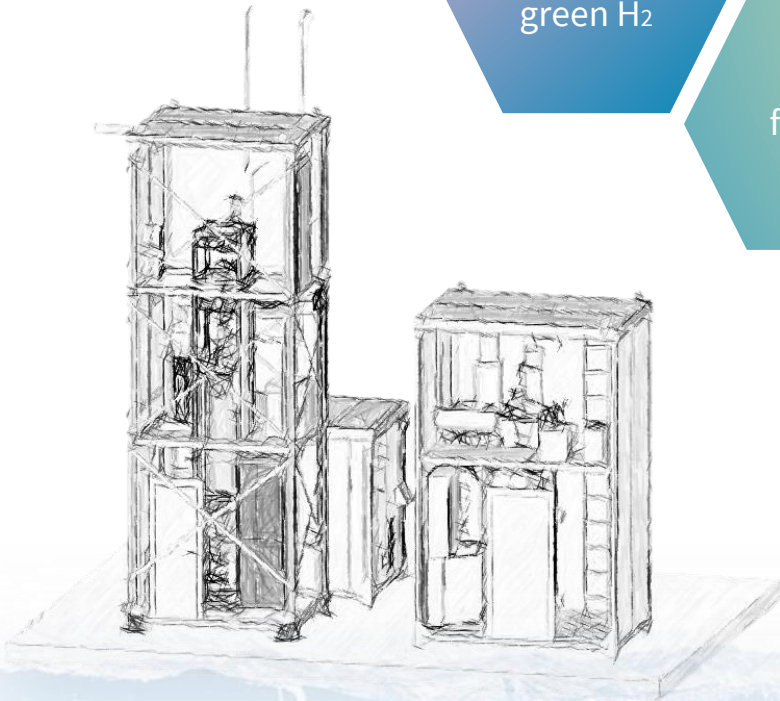
no presorting

Waste-to-Value

solution for disposal problem

Alternative to electrolysis

Our focus- we transform biological waste to H₂



WITH blueFLUX INTO THE FUTURE

PREHISTORY

PRESENT TIME

FUTURE

	PREHISTORY	PRESENT TIME	FUTURE
Agriculture/ Nutrition	 <p>Hunting and farming on small farms. Regional and natural circular economy.</p>	 <p>The intensive agriculture on large areas relies on maximum yield. The soil is leached out and harmful fertilizers are used.</p>	 <p>Cyclical agriculture: soil improvement through the application of coal and phosphorus.</p>
Mobility	 <p>Getting around by horse, ox cart and on foot.</p>	 <p>The fossil raw materials of our earth are massively mined and consumed by cars, trains and airplanes.</p>	 <p>Mobility with green H₂ is environmentally neutral. Decentralized solutions for waste disposal – less transport traffic.</p>
Climate	 <p>CO₂ is bound again. Climate improvement through decarbonization.</p>	 <p>Life-threatening increase in CO₂ in the air ozone layer and oceans. Climate change is in full swing.</p>	 <p>No CO₂ excess problem. Natural cycle through the utilization of organic material and plant growth.</p>
Disposal	 <p>Organic waste from cities and agriculture is converted into energy in an environmentally friendly and emission-free manner, making it a new resource.</p>	 <p>With industrialization, cities are getting bigger. Disposal of generated waste is becoming an increasing problem.</p>	 <p>Organic waste is recycled and fed back into the natural cycle.</p>
Energy	 <p>Energy sources are sun, wind, wood, fire and water.</p>	 <p>The affluent society is rapidly consuming our planet's resources.</p>	 <p>Sustainable energy sources are obtained from organic residues. Waste-to-Value</p>



WHAT MAKES US SPEZIAL



Anton Oswald
Farmer

“Of course, it would be ideal if I had such a recycling plant where I could turn the waste into electricity and gas. Simply get energy out of the company and give it back to nature. Combining tradition and innovation that doesn't stand still.”

Rene Kircher
Head of hydrogen – Total Deutschland GmbH

“We have been building and operating hydrogen filling stations since 2002 and, of course, we are interested in the fact that hydrogen can be produced from renewable energy if possible, for example in the concept of the blueFLUX hydrogen system. It's an immense added value. In this way we are contributing to reducing CO2 and creating a WIN-WIN situation.”



Josef Steigenberger
Mayor Bernried am Starnberger See (a.D.)

“If you look at other countries today, for example, a filling station network from Munich to Verona for hydrogen vehicles is already planned. So far there have only been large fossil fuel refineries. But green hydrogen can now be produced cheaply and in an environmentally friendly manner - that would have to be learned first.”

Andrea Jochner-Weiß
Chief District Administrator – Landkreis Weilheim Schongau

“There must be more incentives in big politics to support these modern new innovative technologies. I am proud that we have such companies with us that give so much thought to it and develop such projects.”



Dr.-Ing. Nina Thiel
Project Engineer - bifa Umweltinstitut GmbH

“Especially about the European waste hierarchy, the blueFlux process is to be classified as material recycling as a priority over energetic recycling and disposal, because green hydrogen is generated and can thus substitute other fossil fuels. Processes like blueFLUX save resources elsewhere, from which the fabrics would otherwise have to be made.”

CHALLENGES OF THE APPLICATION AREAS

Political and economic framework conditions massively restrict **agriculture**, e.g., the European fertilizer ordinance, falling prices for their products or the ongoing discussion of EEG funding for biogas plants. Excess energy from photovoltaic systems can no longer be used profitably and soils are depleted through extensive cultivation over many years.



The **disposal** of organic waste is becoming more and more difficult due legal requirements. However, according to a report by the World Bank, this waste will increase by 70% by 2050 (from 884 million tons to 1,496 million tons per year).

The **pharmaceutical and chemical industry** needs hydrogen directly or indirectly as a raw material. The gray hydrogen is obtained from fossil fuels, which is not sustainable. Long-distance transport is costly and lossy. Contaminated sludge from the production processes must be disposed of in a laborious and expensive manner.





Municipalities must dispose of ever larger amounts of sewage sludge including microplastics and other biogenic waste. This requires a complex, costly and energy-intensive drying of the waste. In the medium term, mono-incineration will no longer receive any new approval.

In **tourist centers** such as large hotel complexes or campsites, large amounts of biological waste are generated every day. Most of these raw materials are currently being burned around the world. In order to improve the calorific value, plastic waste is often added, which increases the environmental impact.



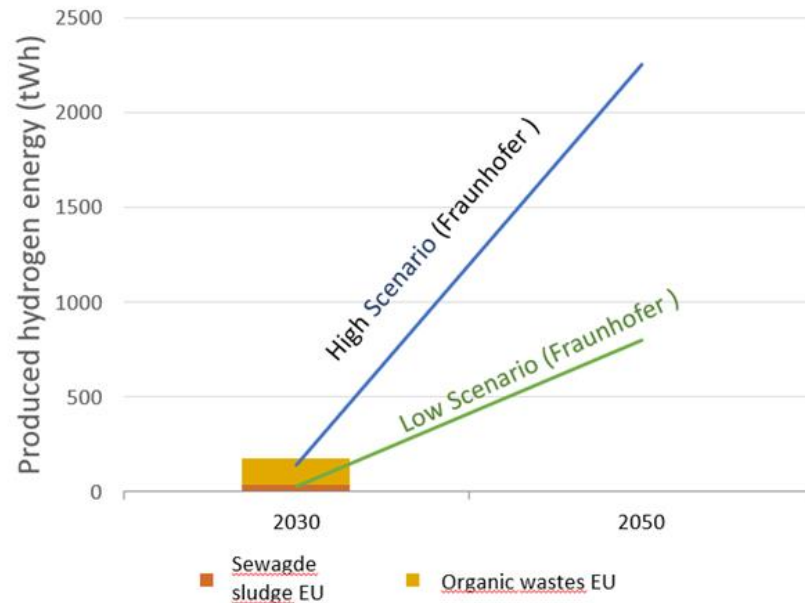
Transport: Individual, rail, shipping requires inexpensive and environmentally friendly energy sources. The mobility of the future must be achieved by switching to electric-based drives become CO₂-free in order to avoid further high greenhouse emissions and to save our environment.



New legal requirements in Europe only permit the recycling of biogenic residues from **food production** to a limited extent. In future, it will have to be disposed at high costs and the amount of organic waste from private households is increasing steadily.

TASKS WE WANT TO FACE

Hydrogen demand and production potential in the EU until 2050 according to Scenario



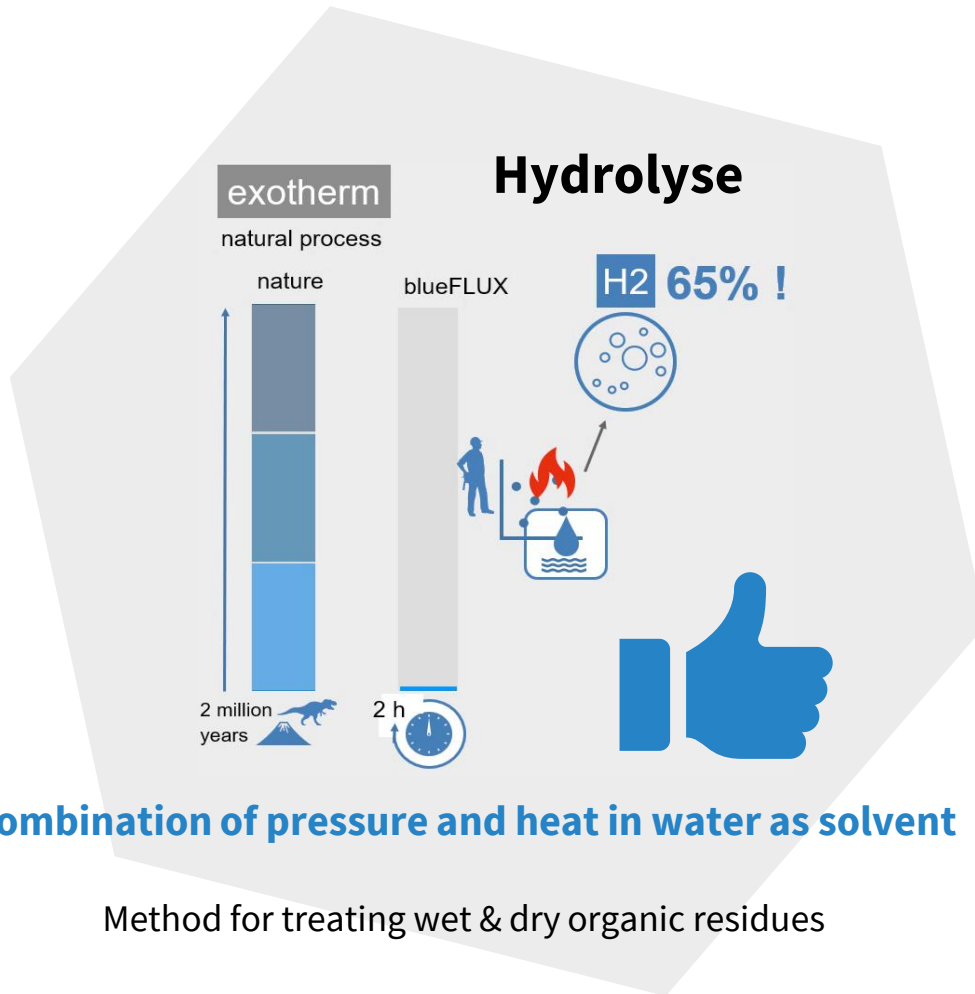
Categorie	Potential hydrogen energy production (tWh)
Sewage sludge EU	39,80
Organic wastes EU	138,89
Total EU	5540,32

Quelle(n): [9261_dena-Leitstudie_Integrierte_Energiewende_lang.pdf](#) (Seite 230 TeilB) (2018)
[Eine Wasserstoff-Roadmap für Deutschland \(fraunhofer.de\)](#) (2019)
[Klärschlammaufkommen nach Ländern in Europa 2019 | Statista](#)
[Bioabfälle | Umweltbundesamt](#) (2019)
[Bioabfallkomposte und -gärreste in der Landwirtschaft \(umweltbundesamt.de\)](#) (2017)



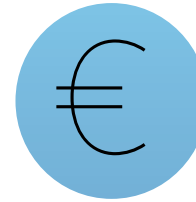
Continuously increasing amount of biological/organic residues

SOLUTION & VALUE PROPOSITION



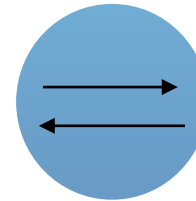
Combination of pressure and heat in water as solvent

Method for treating wet & dry organic residues



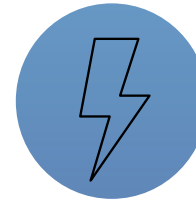
game changing technology

2-4 €/kg for green H₂ - standard size



conversion rate hydrolysis: 65 %

(vs. conversion rate pyrolysis: approx. 23 %)



less energy consumption than electrolysis by factor 3-4

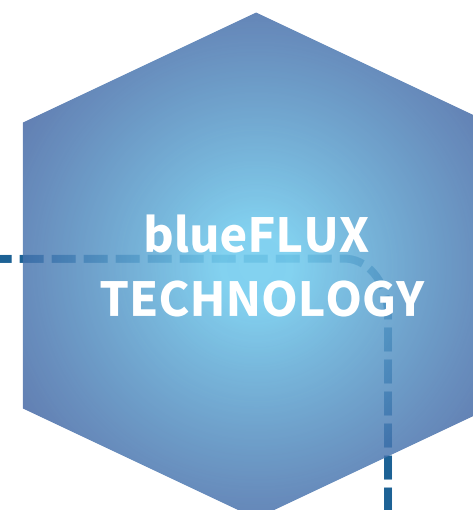


disposal of wet & dry materials - no drying or pre-sorting necessary

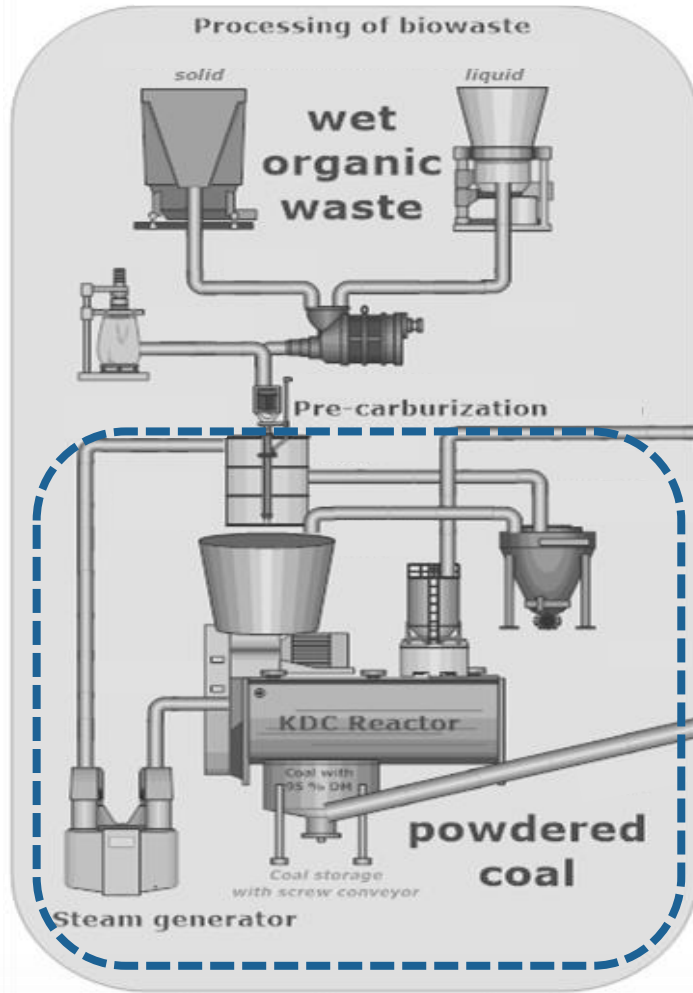


reduction of the environmental pollution by nitrate

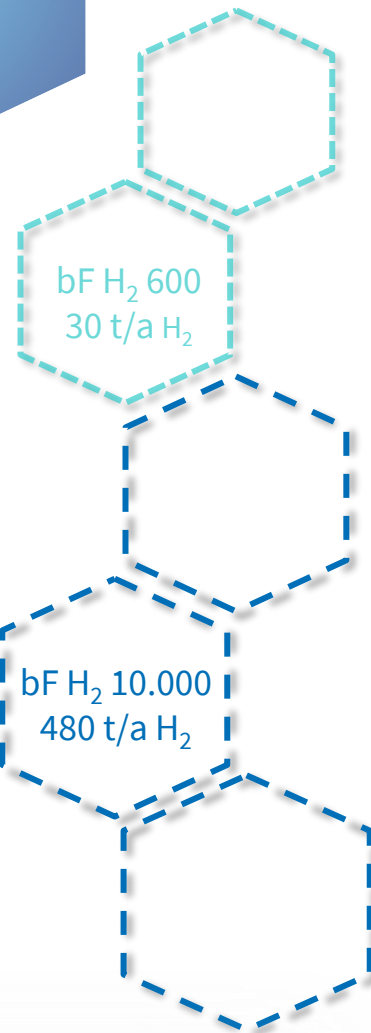
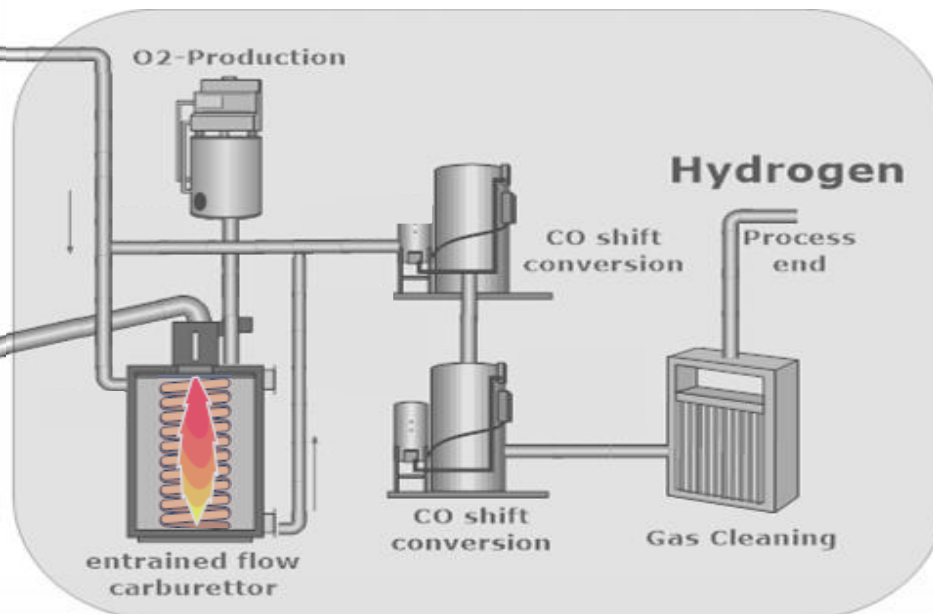
waste-to-value without CO₂ -pollution



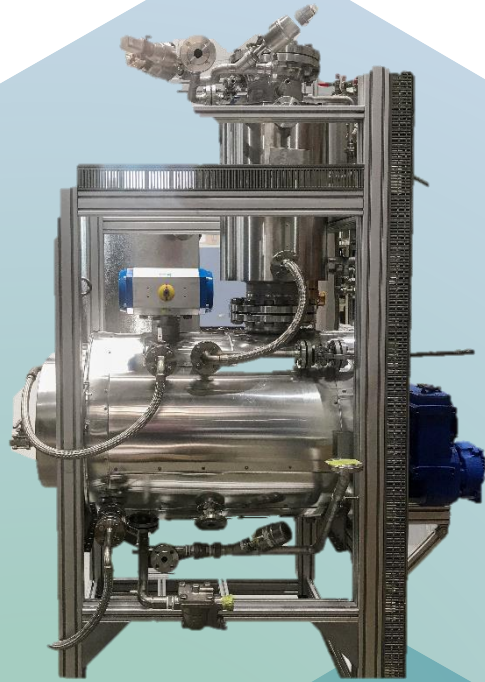
CARBONIZATION BY HYDROLYSIS



GASIFICATION AND STEAM REFORMING



OUR SOLUTION FOR ALL APPLICATION AREAS



blueFLUX^{H₂}

- Disposal of organic waste, sewage sludge and sterilization of waste with a plastic content of up to 30%.
- Production of green hydrogen by converting organic waste (without prior separation or drying) into synthetic coal, biochar, synthesis gas, green hydrogen, biomethanol, biomethane and heat.
- Decentralized production of green hydrogen at competitive prices for CO₂-free mobility.
- Agriculture as a circular economy. Liquid manure is processed into green hydrogen and biochar. Economically successful and ecologically valuable.
- The by-products nitrogen and phosphorus can be obtained and used as concentrated, high-quality fertilizers.

7 USE PATHS FOR ORGANIC RESIDUES

1

Production of green hydrogen by carbonization with subsequent gasification for direct use in fuel cells, combustion engines and raw gas. Alternatively, the use of synthesis gas.

2

Production of biomethane by microbiological methanation for energy supply, for fuels or as a preliminary product for the chemical industry. CO₂ and H₂ become CH₄.

3

Inexpensive production of methanol from biological materials and sewage sludge.

4

Material use for soil improvement by introducing biochar into agriculture areas for decarbonization of the environment.

5

Useable thermal energy through superheated steam for heating and process heat.

6

Recycling of difficult waste materials by gasifying them at the highest temperatures and breaking them down into useable components.

7

Storage of valuable materials through storable slag in which phosphorus and heavy metals are bound. In the future, the separation of phosphorus, sulfur and nitrogen is planned in a separate pre-treatment step.

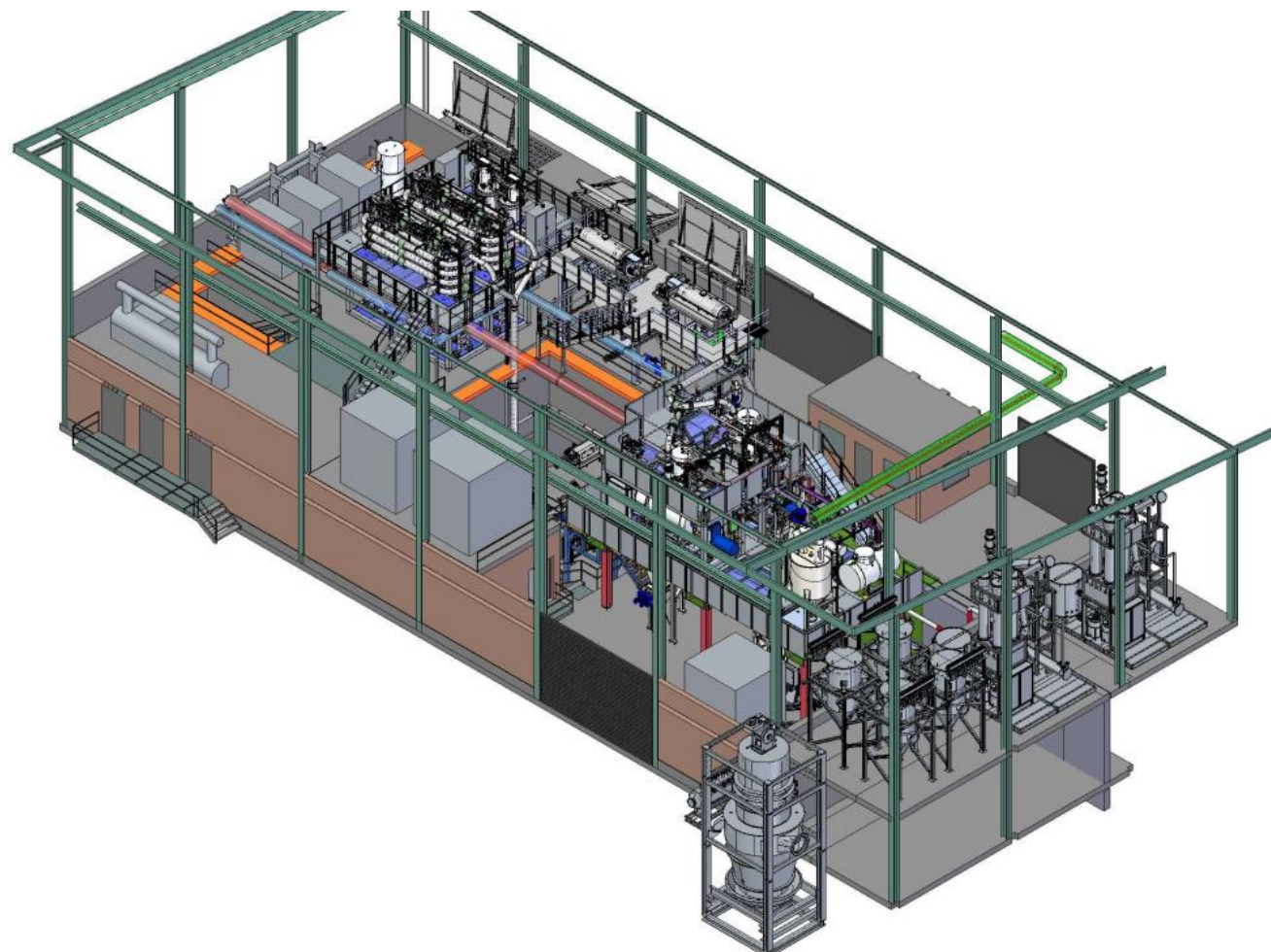
INPUT & OUTPUT

System size	bFK00600	bFH00600	bFK10000	bFS10000	bFH10000
Organic residue with 30% dry matter [t/a]	1,200	1,200	18,500	18,500	18,500
Electrical energy [GWh/a]	3	2.5	15,3	14.7	13.1
HTC coal* [t/a]	300	-	5,300	-	-
Synthesis gas* [GWh/a]	-	-	-	16.4	-
Hydrogen* [GWh/a]	-	1.1	-	-	18.7
Residual process heat* [GWh/a]	0.25	0.23	12	11	11.5

*Output depending on system configuration (guide values)

Implementation project: blueFLUX integrated into brick production bFS10000

- Commissioning in September 2021
- Construction in progress
- Construction of the plant from Q4/2023
- Commissioning in stages Q3/2024
- 16,500 tonnes of municipal sewage sludge + 2,000 tonnes of wood chips
- Substitution of 16.4 million kWh of natural gas per year
- Utilisation of residual process heat
- Utilisation of water from organics

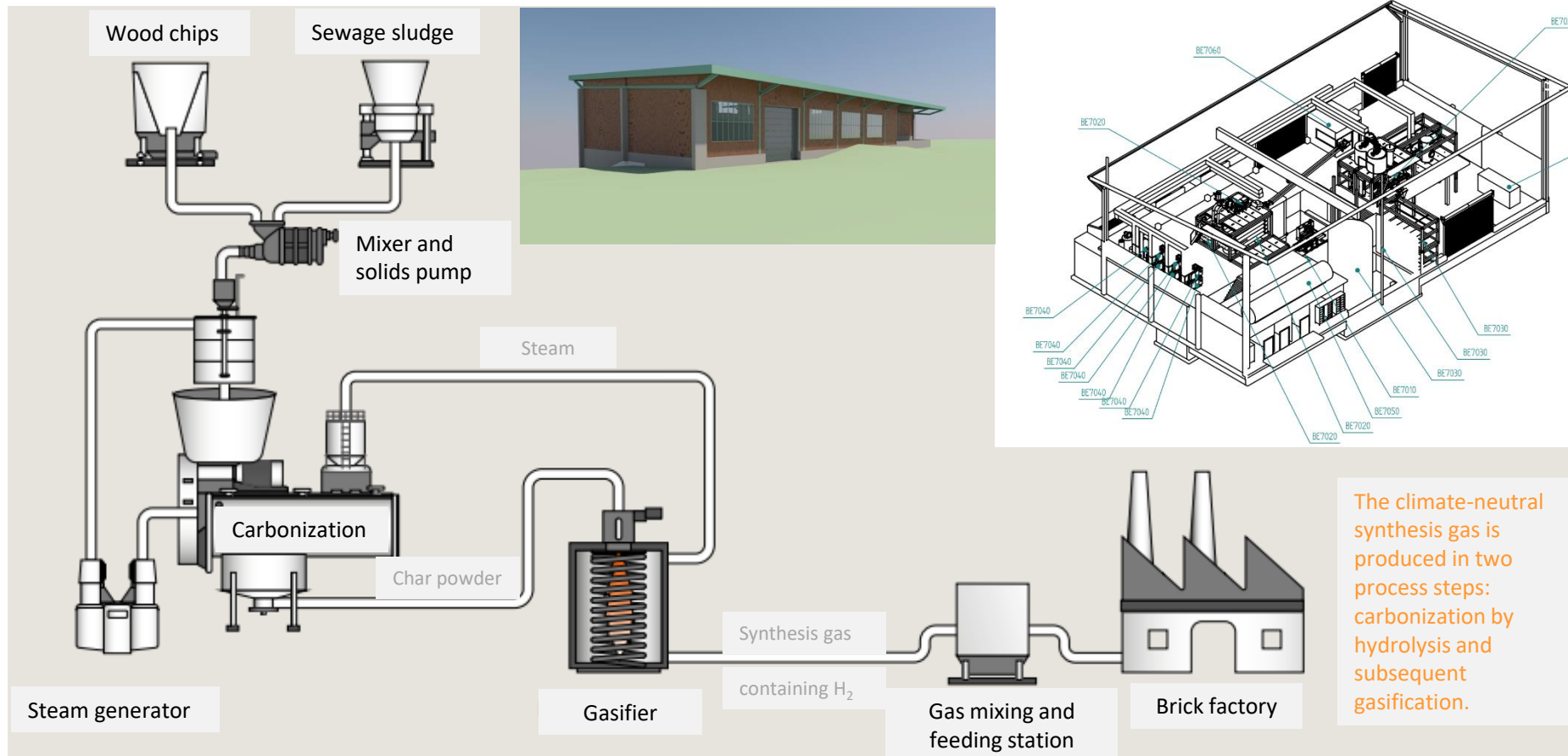


Bayerisches Staatsministerium für
Wirtschaft, Landesentwicklung und Energie



* Funding project Hörl & Hartmann Ziegeltechnik GmbH & Co. KG

Implementation project: blueFLUX integrated into brick production bFS10000



Implementation project: blueFLUX integrated in agriculture bFH00900

Integration of blueFLUX into agriculture*.

Construction commissioned in October 2021
Mechanical construction in progress
Production of bio-hydrogen, biochar and utilization of process heat
Goal: "From the cow to the hydrogen car"

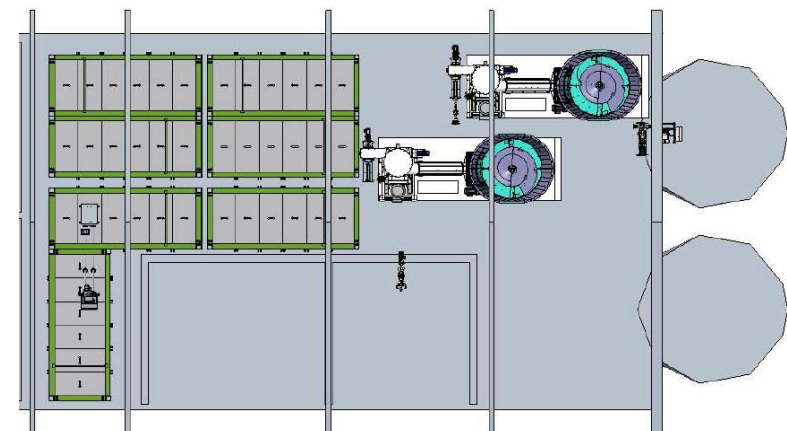
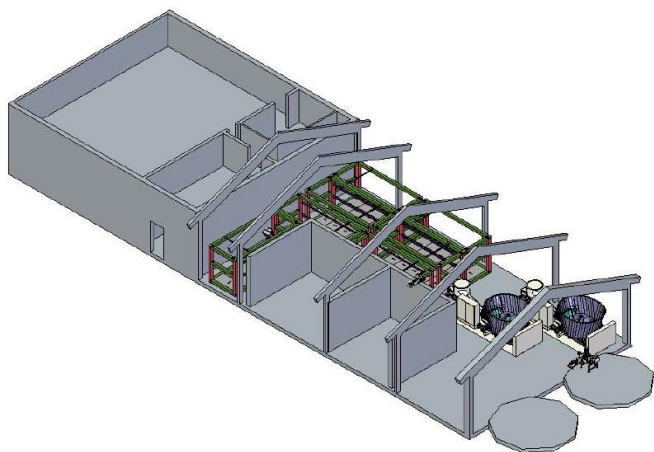
Bayerisches Staatsministerium für
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* Funding project Holzner Druckbehälter GmbH



Implementation project: blueFLUX integrated in agriculture bFH00900



WE DELIVER WITH OUR PARTNERS...



- Site qualification and approval support
- Plants to produce synthetic coal, biochar, synthesis gas, green hydrogen, biomethanol, biomethane including planning, construction, operation and maintenance
- Compact and modular blueFLUX systems with small component sizes
- Filling stations for hydrogen

Awards



Picture from Lukas Barth



Our YouTube Video:

[blueFLUX H2 2021 – Auf dem Weg zur H2-Modellregion blueFLUX H2 /// 2021 - YouTube](#)



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"The water is the coal of the future. Tomorrow's energy is water that has been decomposed. The elements of water that have been decomposed in this way, hydrogen and oxygen, will provide the earth's energy supply for the unforeseeable future."

Jules Verne (1870)

Hubert Kohler

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