



BIHCON

Biogas | Hydrogen | Construction

WARRIORS TO SAVE THE PLANET



THE BIOREFINERY OF THE BIOMETHANE PLANT

Methanation • Pellets • Hydrogen

Presented by Michael Niederbacher

CEO BiHcon Srl & TerraX Srl

Vice President, European Biogas Association (EBA) | Board Member, CIB

Company Overview:

 **Cambium** Srl/GmbH - Holding



Srl/GmbH is dedicated to project development and plant operation (**Operation**)



Srl/GmbH focuses on technical design, construction, EPC, and technical maintenance of the plants (**Maintenance**).



Srl/GmbH a newly established company, will focus on innovative projects in the **Power2X** sector, specifically in **biological methanation**.

AS OF TODAY, THE GROUP HOLDS:



REGISTERED TRADEMARKS ACROSS
EUROPE, JAPAN, AND THE USA



PATENT FILINGS WITH
EUROPEAN, U.S., AND ASIAN
PATENT OFFICES

 **31** TOTAL PATENTS
7 GRANTED AND 24
PENDING APPROVAL

 **Cambium** Holding company with strategic stakes in renewable energy businesses.

VALUE CHAIN (Full Integration)

Development → Construction → Maintenance & Operation

KEY COMPANIES



→ Project Development



→ Implementation & Plant Management

BUSINESS MODEL

Projects → Sold to investors *or* Managed directly → Long-term value creation

THE GROUP IS SEEKING AN INVESTMENT OF OVER €1 BILLION TO ACCELERATE ITS INDUSTRIAL PLAN, STRENGTHEN INTERNAL CAPABILITIES, AND CO-FINANCE STRATEGIC ASSETS IN EUROPE AND GLOBALLY.

About the Founder



Experience & Innovation

- ✓ 25+ years in bioenergy, 30+ patents
- ✓ Creator of the first **biogas consortium plant** in South Tyrol (2001)
- ✓ Founder of a company with **225 plants in 14 countries**

Technological Leadership

- ✓ Biomethane from agricultural biomass & OFMSW
- ✓ Biohydrogen from anaerobic digestion
- ✓ Biofertilizers (pellets) from digestate
- ✓ Carbon neutrality systems by **2050**

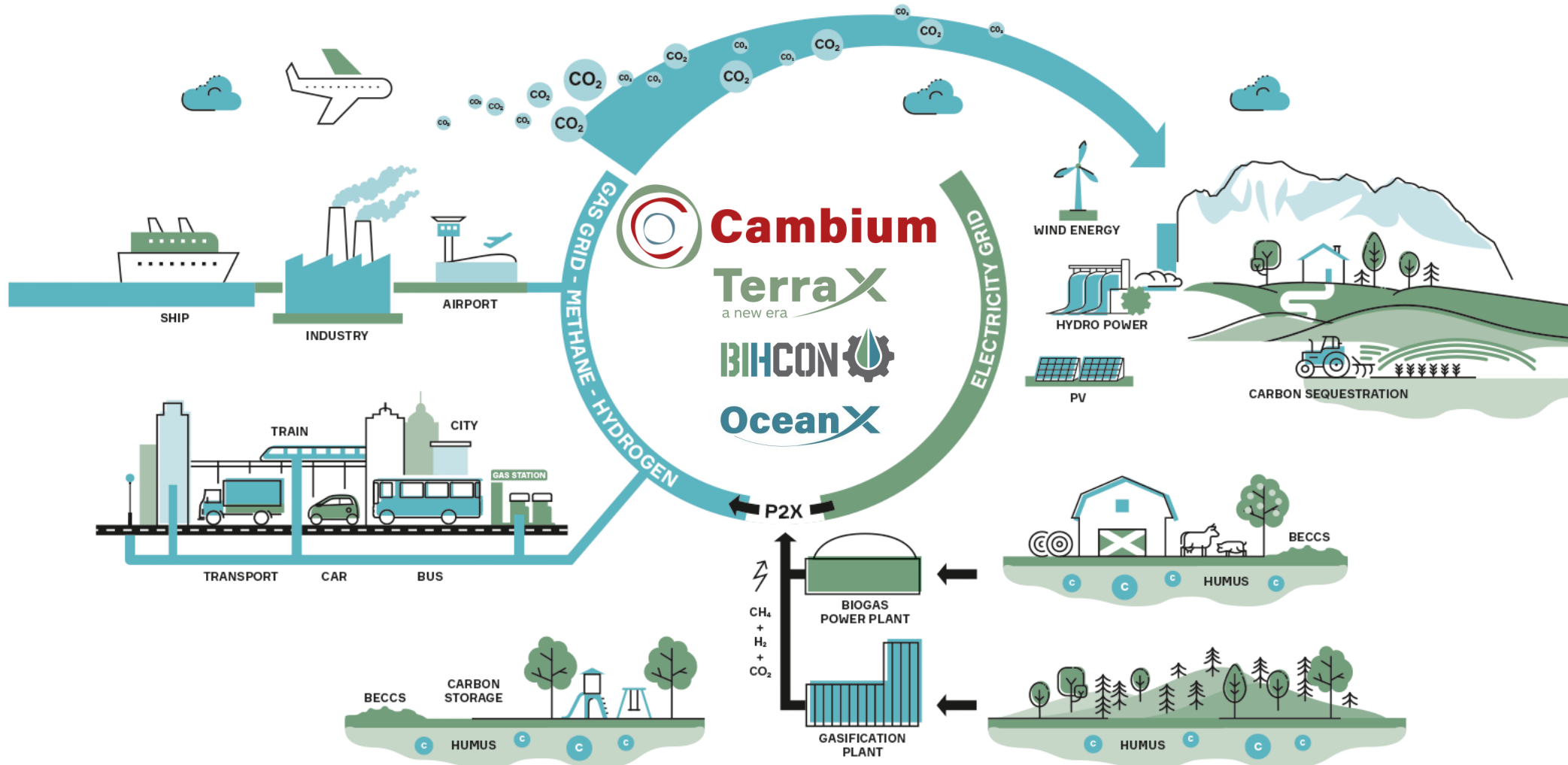
Current Role & Vision

- ✓ Leads (biomethane, biohydrogen) & **Bihcon** (engineering)
- ✓ With **Cambium**, builds an integrated **renewable gas supply chain**
- ✓ Driven by **innovation** and **sustainability**

*"I saw my first anaerobic digestion plant at the age of 13.
Since then, I've nurtured the idea of turning manure into energy."*



Vision and Mission



Vision and Mission

By 2050, half of Europe's energy will come from electricity, and half from renewable molecules — **biomethane and biohydrogen**. Natural gas will be replaced by **renewable gases**, turning **biomass, waste and CO₂** into clean energy and promoting a **fully circular economy**.

Develop **360° technologies and projects** for **anaerobic digestion, biomass gasification, and Power-to-X**, producing **renewable gases and fertilizers** that replace fossil-based products and support **carbon neutrality by 2050**.



Services we provide



Design Solutions

We are experts in the elaboration of **design solutions**, related to biomethane and biohydrogen production plants, high rated and certified by an international advisor.



Projects Development

We are in charge of **developing** highly customized biomethane and biohydrogen production projects, investing in new technologies and pursuing the so-called circular economy.



Financing

With our team of experts, we are able to develop specific projects that meet the **requirements of investors**.



Construction

We are in charge of **building** highly customized biomethane projects, investing in pre-treatment, flexibility and redundancy and pursuing the **circular economy** by considering each project as a **bionergy hub**



Operation & Maintenance (O&M)

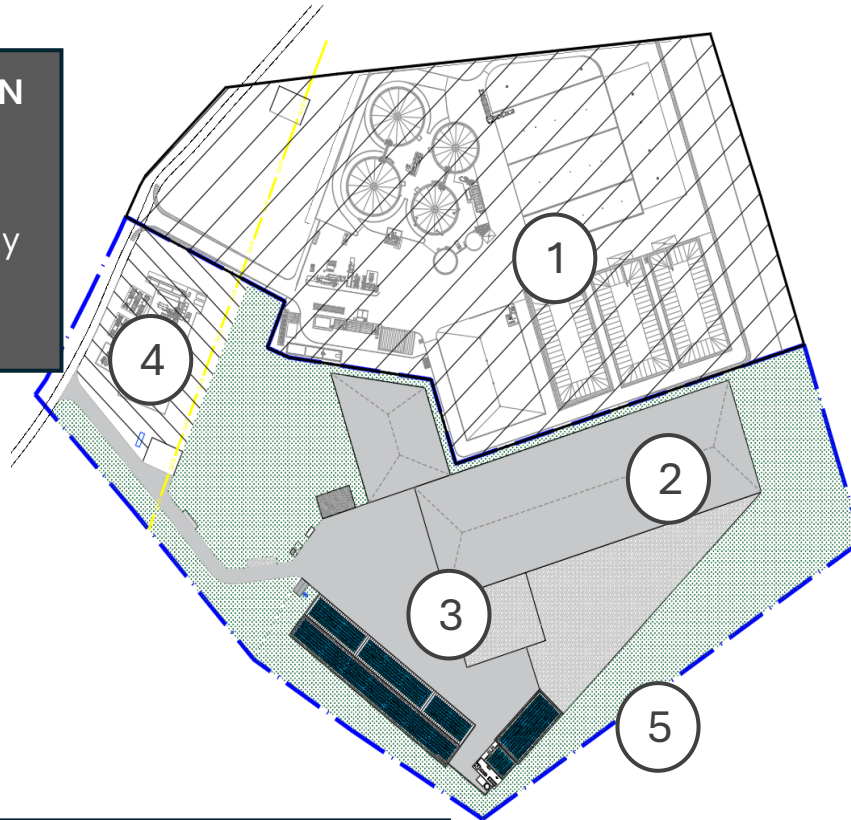
We provide full Operation & Maintenance (O&M) **services for biogas, biomethane and biohydrogen plants**. With extensive technical expertise and field experience, the company ensures optimal plant performance, efficiency, and reliability through preventive maintenance, **real-time monitoring**, and tailored **technical support** throughout the entire lifecycle of the facility.

The Biorefinery of the Biomethane Plant

BIOREFINERY SICILY - UNLOCKING SYNERGIES FOR INTEGRATED, SUSTAINABLE PRODUCTION:

4. BIOLOGICAL METHANATION

of 7.000 t/a biogenic CO₂
incl. 10 MW_{el} electrolyzer and daily
H₂-storage



1. STRAW BIOMETHANE PLANT

with 500 Sm³/h biomethane production

2. UMIFICATION FACILITY

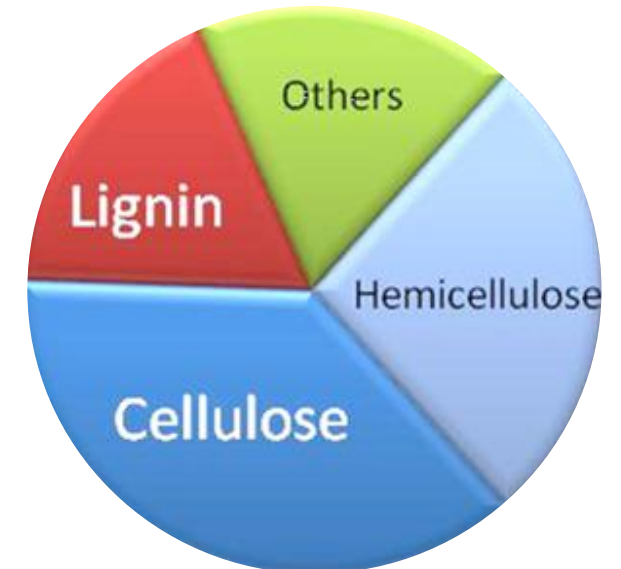
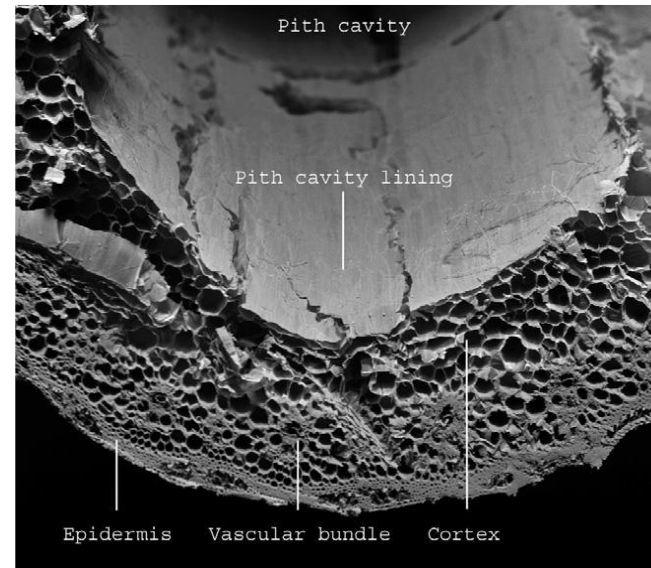
for on-site production of 20.000 t/a humus from
digestate

3. BIOFERTILIZER PRODUCTION FACILITY with capacity of
38.000 t/a biopellets via drying and pelletization of humus
and/or solid digestate

5. WOOD GASIFIER with cogeneration unit and two burners for
heat/electricity self-consumption and biochar production as
additive/stabilizer

THE CHALLENGE

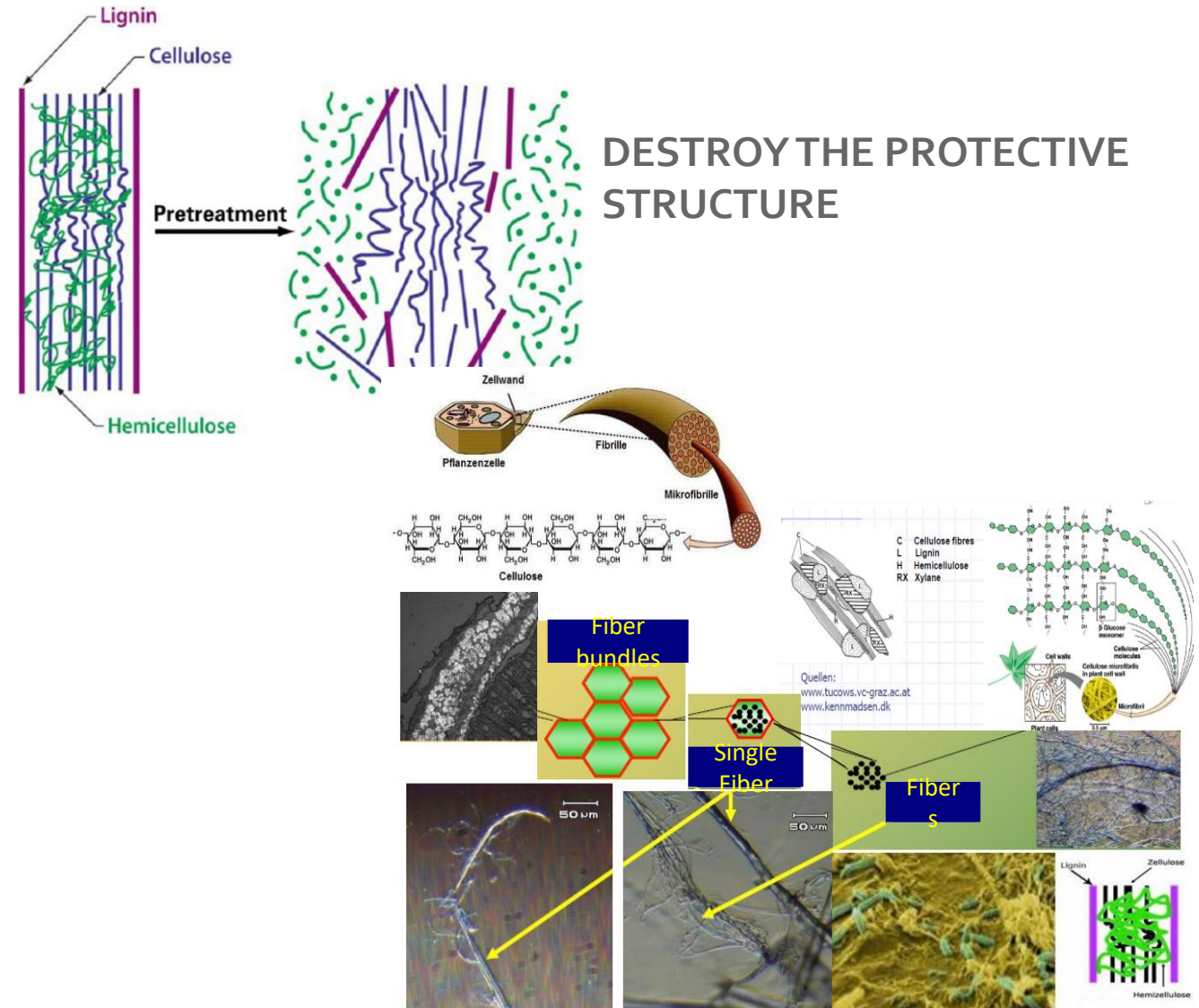
- High lignin concentration
- High dry matter content
- Non-standard supply systems
- High energy demand for pre-treatment
- Straw is swimming and creating floating layer
- Poor degradation in the digester



1. Straw Biomethane Plant

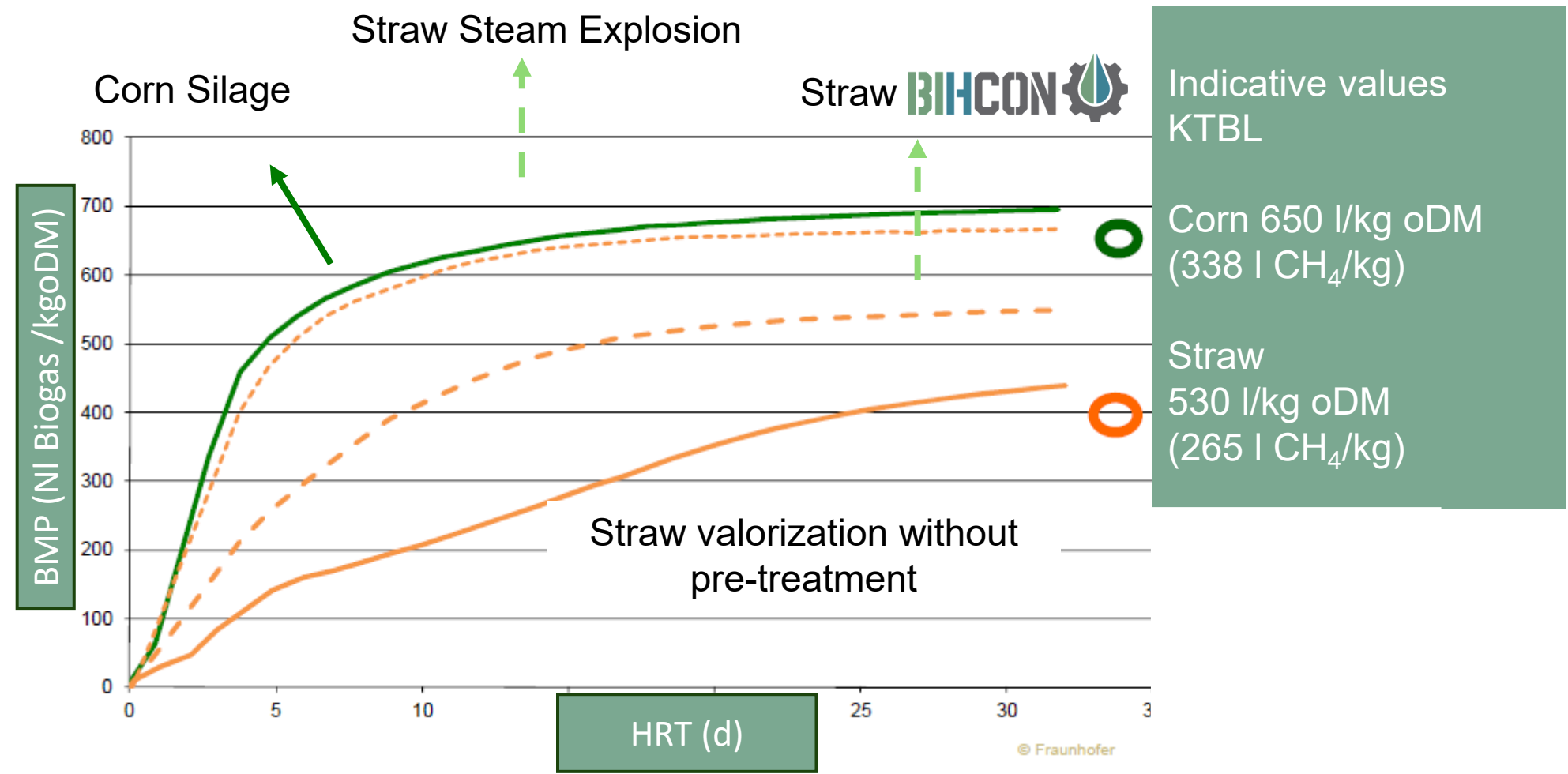
THE SOLUTION

- High Dry Matter => Need to add water, micro-nutrients and enzymes, digestate recirculation after separation and decanter,..
- Low azote => Add N-rich substrates
 - = Chicken manure / Cow manure
 - = Slaughterhouse Waste
 - = OFMSW (organic fraction of municipal solid waste)
 - = Protein-rich plants (e.g. lucerne)
- High lignocellulosic parts => pre-treatment
- Formation of supernatant and crust => Installation of an improved mixing system;



1. Straw Biomethane Plant

BIHCON MECHANICAL PRE-TREATMENT IS COMPARABLE
TO THE STRAW EXTRUSION ONE



1. Straw Biomethane Plant

THE RIGHT PRE-TREATMENT FOR HIGHER QUANTITIES OF STRAW IN THE AD PLANT



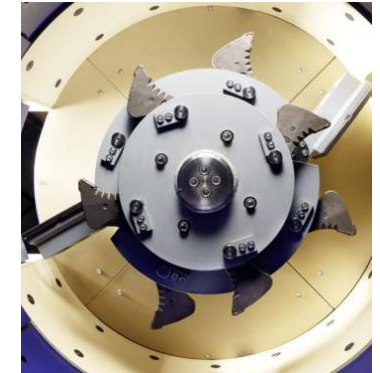
Selected to use the same line for the pre-treatment of the straw for the compost unit and the first pre-treatment of the anaerobic digestion before the Reactor one.

This mechanical system allows the transformation of the straw from hydrophobic to hydrophilic. It is a perfect pre-treatment before insert the biomass in the anaerobic digestion process with a solid-liquid feeding system.

External view



Internal view of the defibration elements



Discharge opening



1. Straw Biomethane Plant



NON treated
straw

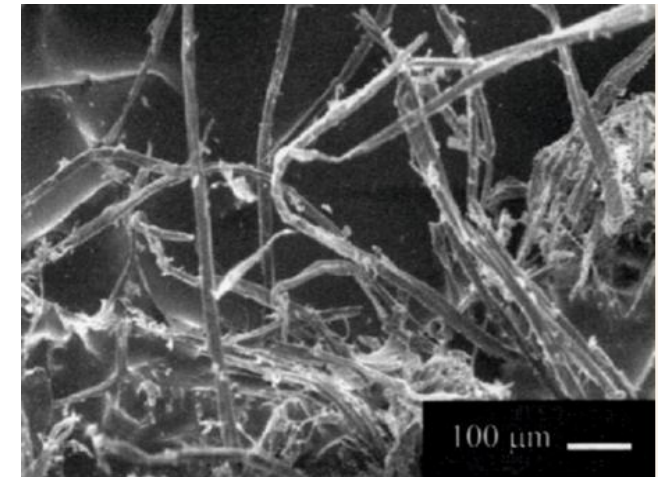
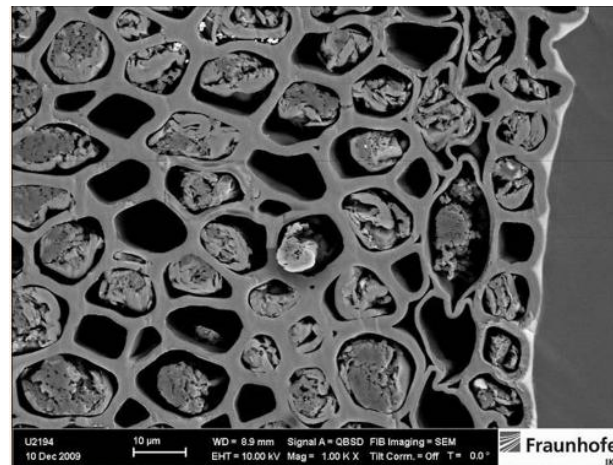
UNTREATED



AFTER MILL+REACTOR PRE-TREATMENT



Treated straw



1. NON TREATED STRAW

2. MILLED + MOISTENED

3. MILLED + MOISTENED + REACTOR

1. Tool box



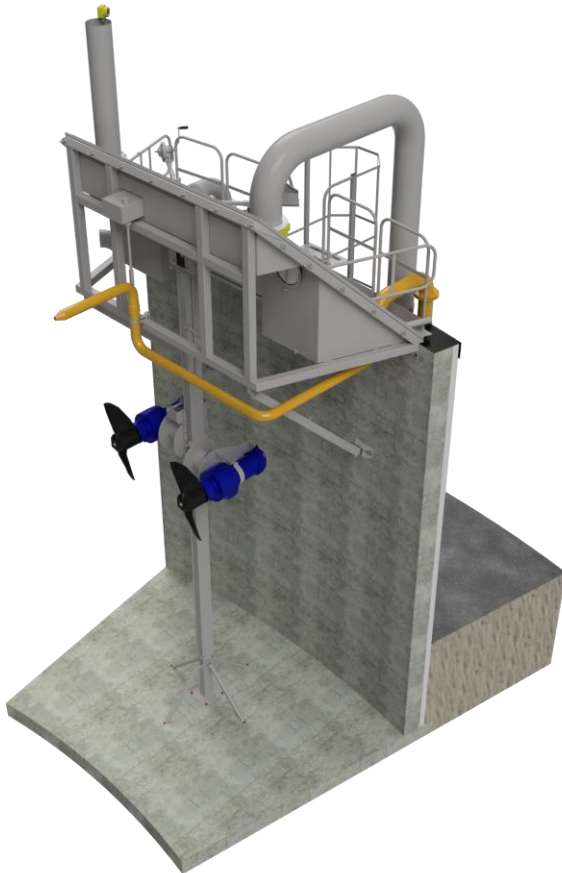
TOOL *box*

THE SOLUTION DEVELOPED BY BIHCON TO
CENTRALIZE ALL CONTROL OPERATIONS
OF EACH TANK IN A SINGLE LOCATION.

1. The Spritz mix

SPRITZmix

BIHCON TECHNOLOGY FOR THE FORMATION OF
SUPERNATANT AND CRUST



COMBINED SPRAYING AND AGITATION SYSTEM
COMPOSED OF:

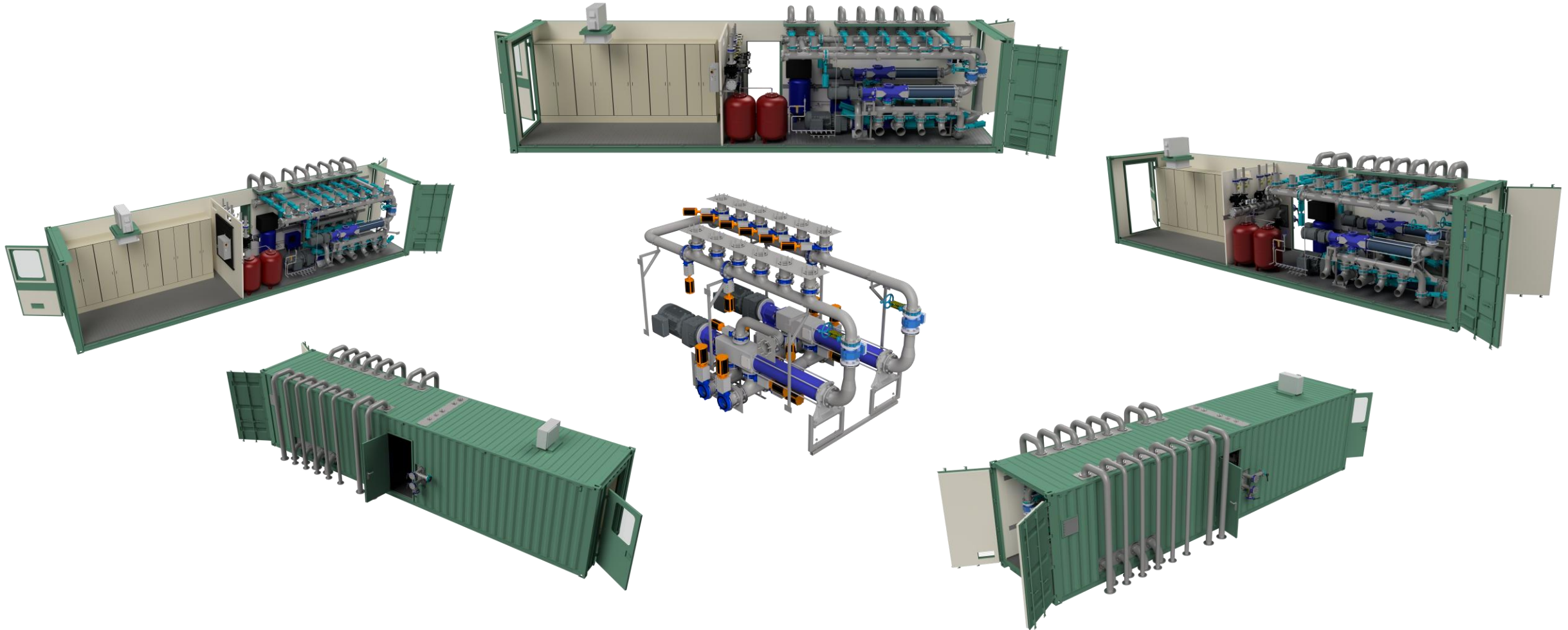
- DIGESTATE PUMPING SYSTEM FROM THE PUMPING STATION
- MIXING AND NOZZLE



ADVANTAGES:

- PREVENTION AND REMOVAL OF CRUSTS AND FLOATING LAYERS
- LOWER ENERGY CONSUMPTION
- REDUCED INVESTMENT IN MIXING SYSTEMS
- HOMOGENEOUS SUBSTRATE

1. Pumping Station



THE TECHNOLOGICAL CONTAINER IS THE HEART OF THE PLANT AND HOUSES THE PUMP ROOM AND THE CONTROL PANEL ROOM.

2. Umification Facility

Stercus Dell'Etna in Paternò – Sicily

- Innovative umification facility with 20.000 t/a humus production
- Optimized for cow slurry with low dry matter content
- Transform liquid digestate in a stable odor free solid biofertilizer
- Total reduction of output quantity of AD plants of app. 70%
- Increased nutrient concentration in the fertilizer (reducing water)
- Additional income of AD plants with the production of a premium biofertilizer enriched with NPKS as needed



Stercus Dell'Etna in Paternò – Sicily

- Recovery of micro/macronutrients via zeolite/biochar addition
- Overall process improvement with reduced nutrient losses and reduction in nitrogen emissions
- Addition of magnesium salts during the stabilization process to enable struvite formation: MgNH_4PO_4
 - Increasing the N-content in the fertilizer
 - Reducing N-emissions
 - Estimated N-recovery up to 80%
 - Production of slow-release premium fertilizer

Struvite (MAP) crystals produced in a manure treatment plant:



3. Biopellet Production

Stercus Dell'Etna in Paternò – Sicily

Experience: Greenergy in Molinella – Emilia-Romagna (built in 2012)

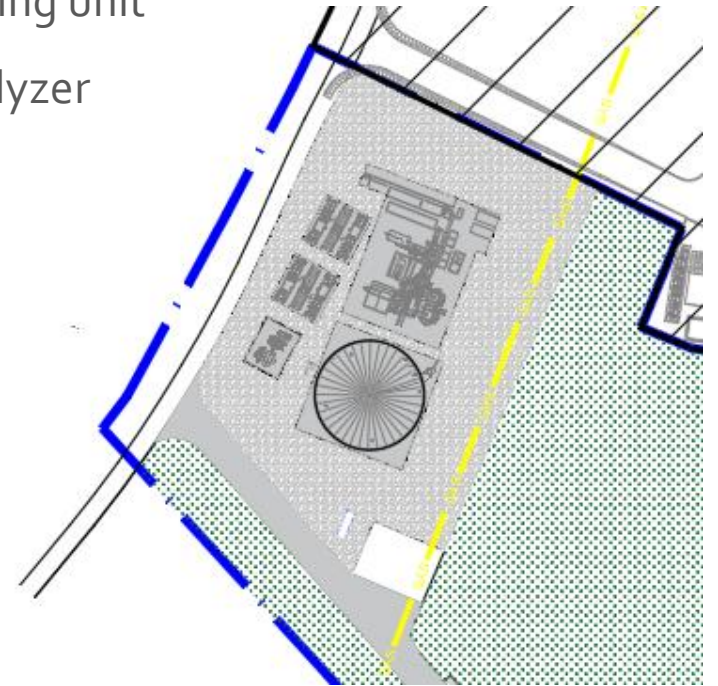
- Treatment of 60.000 t/a humus and/or solid digestate derived from the anaerobic digestion of zootechnical waste and agricultural biomass based on the drying and pelletization of the input material
- 38.000 t/a biofertilizer production as biopellets with $\geq 85\%$ DM for sale in big-bags or 50 kg sacks
- Biochar from wood gasifier, utilized as additive in biofertilizer production, for AD process stabilization of the adjacent biomethane plant and/or its sale



4. Biogenic CO₂ methanation

Stercus Dell'Etna in Paternò – Sicily

- Biomethanation Plant with a total installed capacity of 500 Sm³/h biomethane
- Adjacent to the biomethane and biopellet production facilities
- Utilizing electricity and heat from the wood gasifier
- Plant based on the biological methanation of 7.000 t/a bio-CO₂ from the upgrading unit of the adjacent biomethane plant using green H₂ produced by a 10 MW_e electrolyzer
- Daily hydrogen storage for optimized energy management

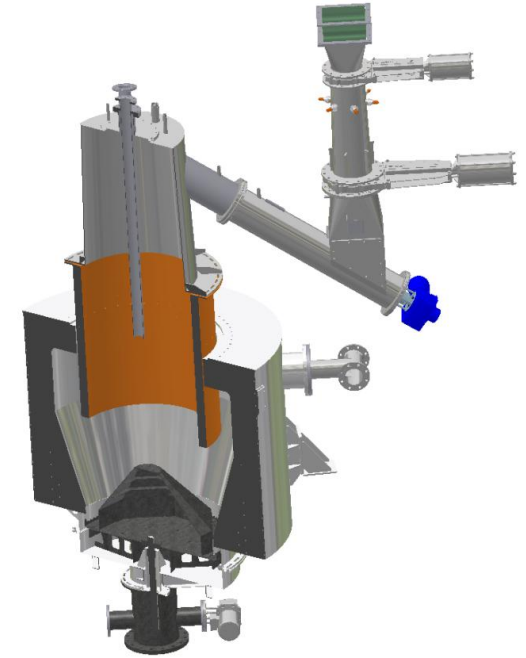


5. Wood Gasification

Stercus Dell'Etna in Paternò – Sicily

Experience: Energiegen. Stans – CH (built in 2007/2011)

- Wood gasifier with cogeneration unit and two burners for heat/electricity self-consumption and biochar production as additive/stabilizer
- Adjacent to the biomethane and biopellet production facilities
- 1.000 t/a biochar production utilized as additive in biofertilizer production, for AD process stabilization of the adjacent biomethane plant and/or its sale
 - 3.600 kW fuel thermal input
 - 500 kW_{el} from cogeneration unit
 - 700 kW_{th} from cogeneration unit
 - 550 kW_{th} from gasification
 - 1.000 kW_{th} from syngas burner



Biomethanation Lentini



- DEVELOPMENT OF **INNOVATIVE POWER-TO-X PRODUCTION PROJECTS**
- FOCUS ON DIRECT METHANATION OF BIOGAS WITH GREEN H₂ FOR BIOMETHANE PRODUCTION
- **PROPRIETARY PROCESS DEVELOPED**
- PLANT ENGINEERED
- PATENT FILING IN PROGRESS
- NEXT STEPS: PROJECT DEVELOPMENT AND PERMITTING FOR INDUSTRIAL-SCALE IMPLEMENTATION

OceanX

KEY PARAMETERS:

500 Sm³/h Biomethane
275 Sm³/h from Biogas
225 Sm³/h from DiBiMeth
10 MW_{el} Electrolyzer
for 3.500 h/a
BESS for parasitic load

“Bio-H₂ Terenten” in Terenten – South Tyrol

- Biogas AD plant revamping
- incl. 300 bar bio-H₂ Trailer Filling Station
- incl. CHP for autoconsumption
 - 200 kW_{el.eq.}
 - 200 kg/d bio-H₂ system
 - 80 t/a bio-H₂
 - 10 buses
 - 1.400 GLU

Feed-in tariff expired

No possibility to gas grid connection





www.bihcon.com

Headquarters

Piazza Gilm/Gilmplatz, 2
I-39031 Brunico/Bruneck (BZ)
South Tyrol- Alto Adige

Office of Operations:

Zona Artigianale/Handwerkerzone, 14
I-39040 Varna/Vahrn (BZ)
South Tyrol- Alto Adige