

BTG Bioliquids presentation for TC Biomass

Fast Pyrolysis technology enables commercial scale
production of SAF, Marine fuels and chemicals.

August 25th, 2026





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Our company history & milestones



1987

Biomass Technology Group (BTG) starts as a spin-off from the University of Twente



2008

BTG Bioliquids is established by BTG



2015

Start-up of first commercial fast pyrolysis plant (Empyro) in The Netherlands



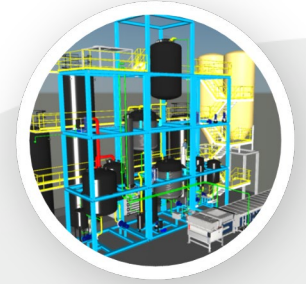
2021

GFN plant in Finland and Pyrocell plant in Sweden in operation



2023

Standardisation of modular design pyrolysis plant
—
ready for commercial roll-out



2024

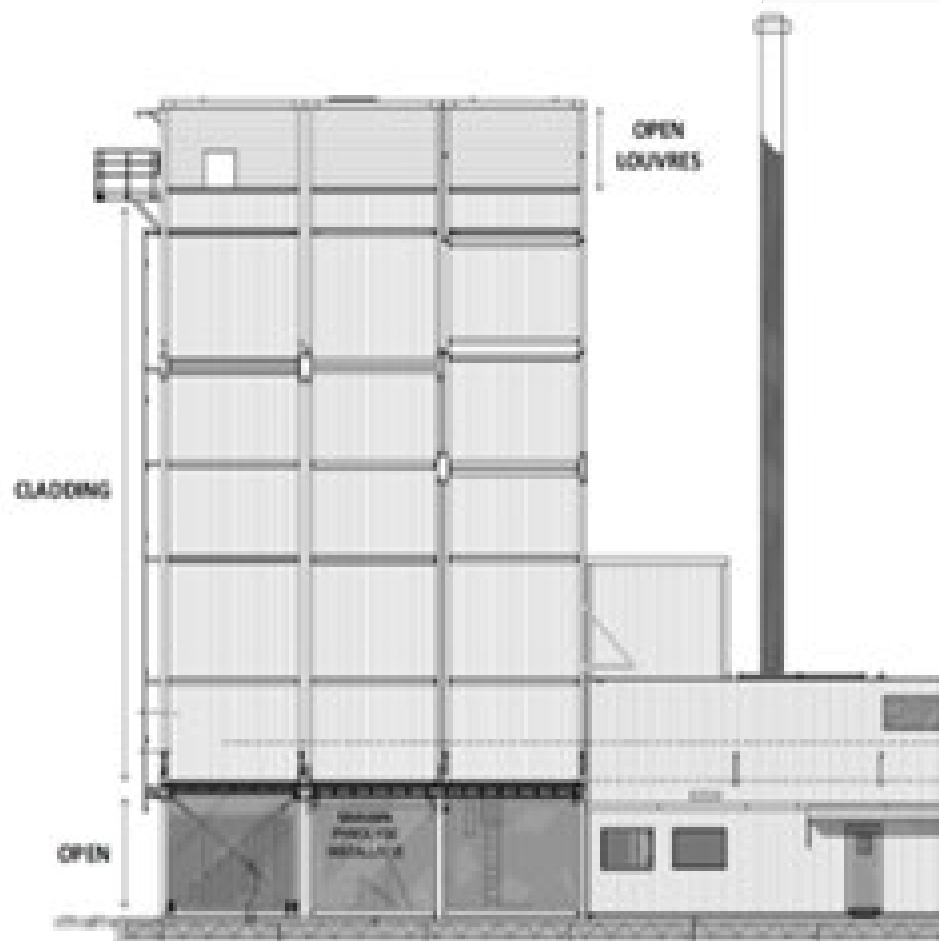
Start development fractionation unit
—
modular design



Value and logistic chain

- Coupling the biomass world (small) with the (petro) chemical world (large)
- Disconnect between the biomass availability and the need for energy / materials / chemicals.
- Liquids can easily be **stored and transported** and used anytime you like.
- First step (pyrolysis) should be done (relatively) simple and second step (upgrading) can be more complicated .

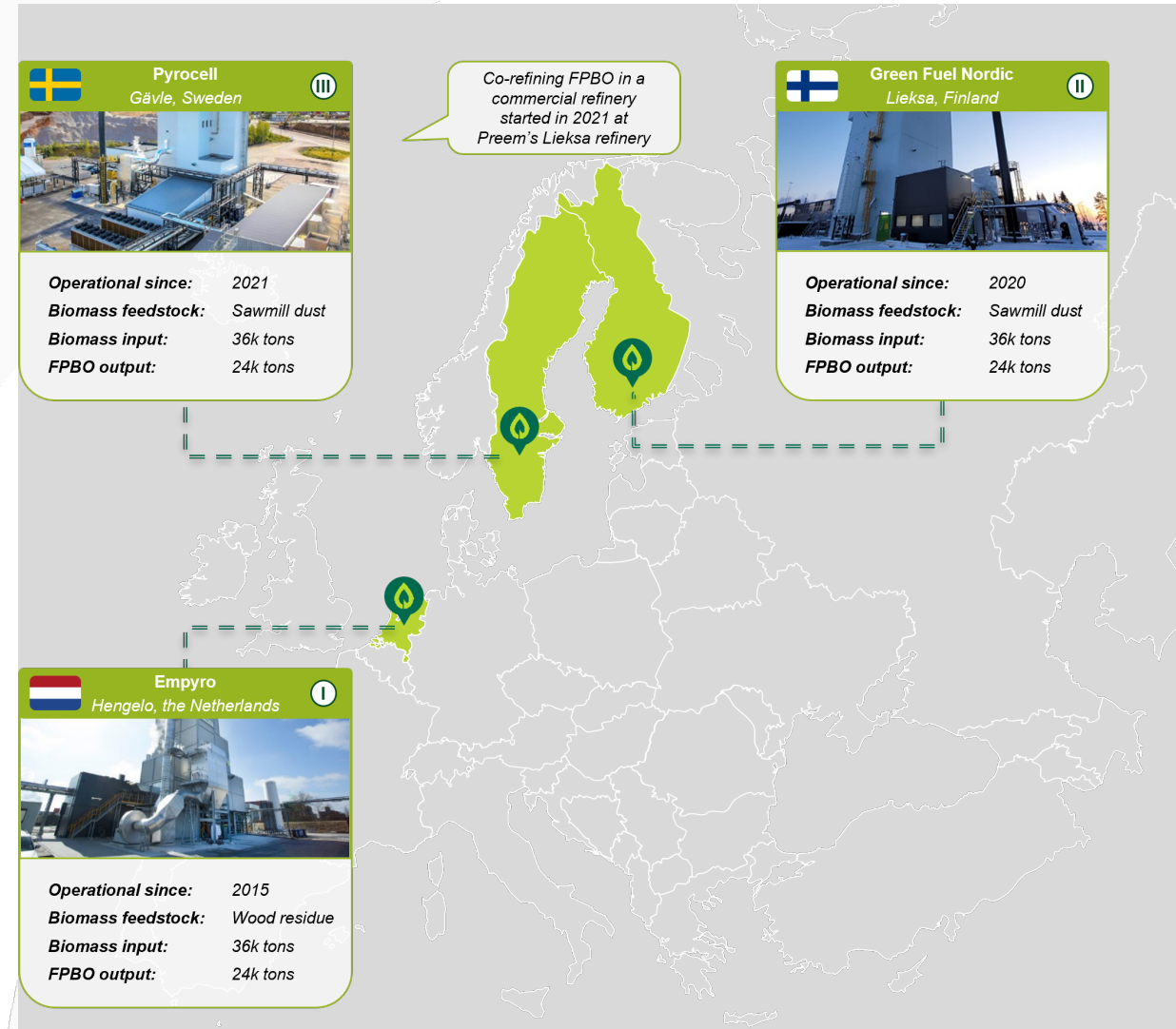
Modularization. Why?



- Lump sum turnkey projects **stick built** result in high risks, long time on site, weather risks, lots of site engineering and construction leading to high CAPEX due to risk reservation in price.
- Modularization leads to:
 - Lower risks due to building of modules in factory environment.
 - Shorter delivery times. Building of modules and site preparation can go in parallel.
 - Short time on site. BTG Bioliquids modules erection time is two weeks.
 - Lower costs due to high degree of standardization.
 - High quality. All equipment and most connections can be tested in the factory in a Factory Acceptance Test. Time of commissioning is shortened.

Proven technology means less risk

- Lessons learnt from the first Empyro plant in 'own backyard' has helped optimizing the technology and operational processes to increase overall plant performance
- Performance of GFN and Pyrocell plants confirm technology is now ready for full-scale commercial roll-out
- No scale up risk. We have done it before!
- Bank loans possible with export credit guarantee from Atradius, backed by Dutch Government



Standardization

The BTG Bioliquids pyrolysis plants are highly standardized. We have the strategy to scale by numbers. Bring the pyrolysis plants to the biomass and convert the crude biomass to crude pyrolysis oil.

Advantages of standardization:

- **Hardly any engineering is needed.** Within several weeks after contract award, we can order equipment.
- **Very short delivery times** . Within 18 months after ordering of the plant the first pyrolysis oil is produced.
- Ready for **full-scale commercial roll-out**
- Our pyrolysis plant with EU design is complete standardized. The US design (ASME, ASTM) is ready and will be standardized in the future.



The background of the slide is a photograph of a rural landscape. In the foreground, a field of golden-brown hay is filled with numerous rectangular hay bales. In the middle ground, there is a line of green trees. In the background, two white wind turbines are visible against a clear blue sky with some light clouds.

Overview FPBO Applications

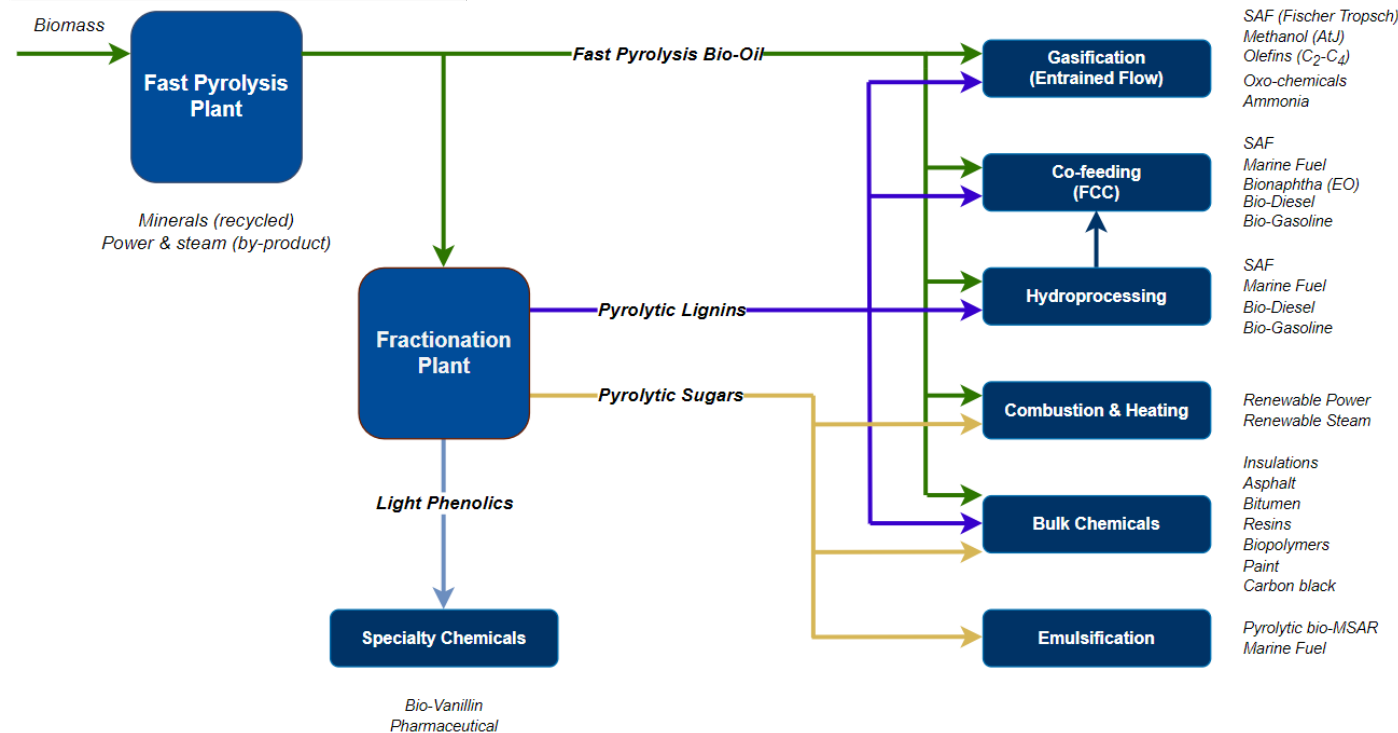
More and more applications are
reaching commercial readiness levels

Fast Pyrolysis Bio-Oil Applications

- Pyrolysis oil is densifying biomass and is connecting the biomass world with the chemical, petro-chemical and energy world.

- Following applications can be served via the pyrolysis oil platform:

- Gasification** of pyrolysis oil on an existing gasifier (ammonia, methanol, syngas, hydrogen, SAF, marine fuel, bio diesel)
- Co-feeding** in refinery via FCC to go to SAF, Marine Fuel, Bio-diesel, Bio Gasoline (demonstrated with VaroPreem).
- Hydro-processing** (BTG-NeXt technology and Nanostech) to make SAF, Marine fuel and Bio Diesel.
- Combustion** to make renewable heat and steam (demonstrated by FrieslandCampina in Netherlands and Fortum in Finland).
- Fractionation with Aurora Renewable Chemicals** into Pyrolytic sugars and lignin to go to insulation material, asphalt, bitumen, resins, paint, impregnation of wood (bulk chemicals)
- Fractionation using **Alder technology** to go to SAF.
- Emulsification** of pyrolytic sugars into HFO with **Quadrise**.



Projects under development



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[Houston American Energy chooses BTG Bioliq](#) [uids' SAF tech](#)

October 21, 2025 | Meghan Sapp

In Texas, Houston American Energy Corp. and Abundia Global Impact Group, LLC announced the execution of a binding Term Sheet with BTG Bioliq

uids B.V. pursuant to which HUSA intends to develop biomass-to-liquid fuels and Sustainable Aviation Fuel projects that will integrate BTG Bioliq

uids' proprietary fast pyrolysis technology for the production of Fast Pyrolysis Bio-Oil from woody biomass waste streams. HUSA plans to further upgrade the FPBO into high-value biofuels and SAF. The next phase of development, to optimize the upgrading process at scale, is intended to be advanced at HUSA's Cedar Port site in Baytown, Texas, which will serve as the foundation for commercial demonstration and future deployment.

Tags: Houston American Energy, SAF, Texas

Category: Fuels



ENSCHEDÉ, Netherlands & CALGARY, Alberta--(BUSINESS WIRE)--BTG Bioliq

uids BV (BTL), a Netherlands-based leader in fast pyrolysis technology, and NanosTech Technology & Innovations Ltd. (NanosTech), a Canada-based catalyst development and manufacturing company, have signed a Memorandum of Understanding (MOU) to deliver a fully integrated solution to produce advanced, drop-in biofuels.

PUBLIÉ LE 30 SEPTEMBRE 2025

Seneca et Minheekw choisissent la Ville de Lebel-sur-Quévillon pour bâtir la première usine de pyrolyse afin de traiter le bois brûlé des feux de forêt de 2023.

Par Service du greffe

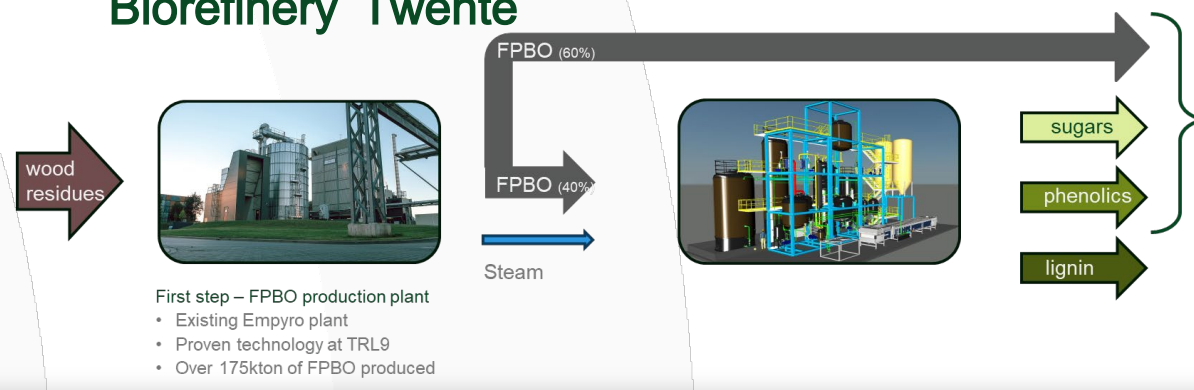
Le projet Minheekw passe à l'évaluation finale avant le début de la construction.

Lebel-sur-Quévillon, Québec, 30 septembre, 2025 – La ville de Lebel-sur-Quévillon est heureuse d'annoncer qu'elle a été choisie par Minheekw et Seneca pour bâtir son usine de transformation par pyrolyse de bois brûlé pour produire un bio-fuel de grade ASTM D 7544. Minheekw a mené plusieurs évaluations de site et a maintenant officiellement lancé le processus pour développer ce site pour la production de bio-fuel.

À la suite des feux de 2023, les Cris de Waswanipi, grâce au programme d'initiative de foresterie autochtone de Ressources naturelles Canada, ont rapidement mis en place Minheekw, un projet novateur d'économie circulaire basé à Waswanipi. Minheekw



Biorefinery Twente



A photograph of a male worker in a white hard hat and safety glasses, wearing a dark blue jacket with a yellow stripe and a bioliquids logo. He is working on a large industrial pipe with a blue valve. The background shows a complex network of pipes and structural elements of a facility.

Bio Refinery Twente

Fractionation Technology
Cost efficient way to bring green carbon to
chemicals and advanced fuels

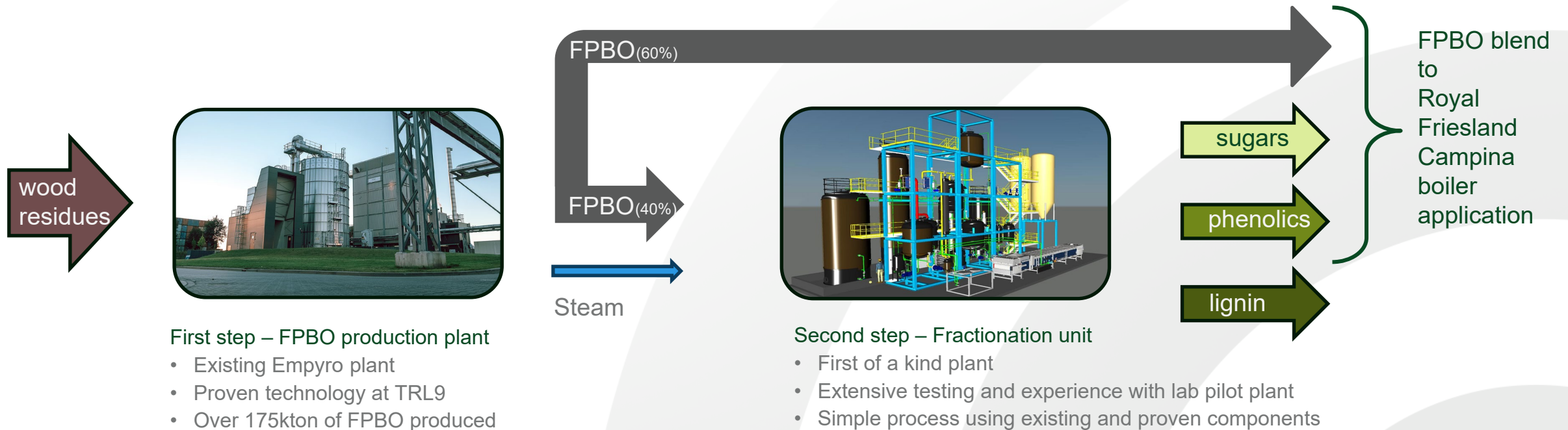
First of Its Kind Fractionation Plant

- Thermo-chemical **fractionation** is a two-step conversion process to transform different bio-resources into raw-materials for bio chemicals.
- In this approach, a **first step** short thermal treatment at elevated temperatures (fast pyrolysis) is followed by a **second step** of low temperature fractionation of the bio-oil into its functional groups being; pyrolytic lignin and pyrolytic sugars.
- The first fast pyrolysis step has already been **commercially proven** (TRL9) with over 175,000 tonnes of fast pyrolysis bio-oil produced at 3 commercial production sites. The second liquid-to-liquid fractionation step has been proven at pilot scale (3 tonnes input per day) by BTG Biomass Technology Group.
- Basic design** has been finalized for a 1.2 tonnes input per hour (ten-fold scale up) fractionation plant situated next to the existing 3 tonnes per hour FPBO production plant in The Netherlands (Empyro).
- The fractionation plant can **easily be upgraded** in the future to 3 tonnes input per hour, matching the current production FPBO output.



Biorefinery Twente

De-risking and low investment using existing pyrolysis plant



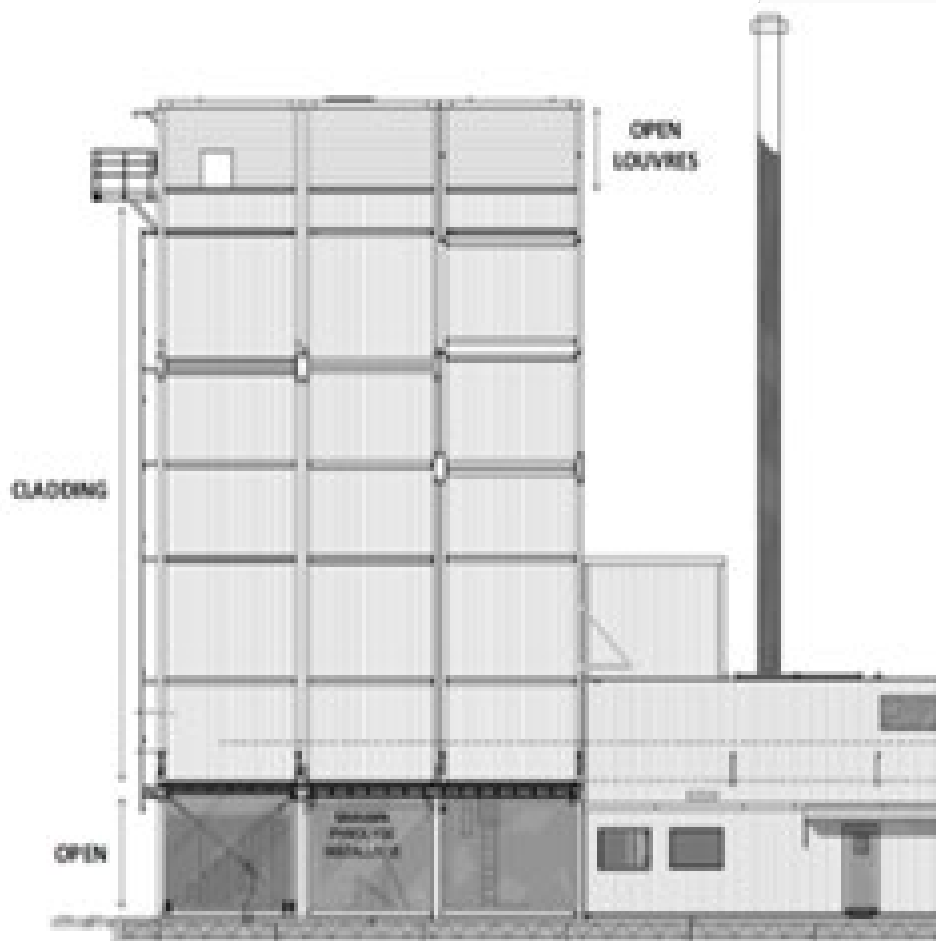
Project Status

- Aurora Renewable Chemicals (sister company of BTG Bioliquids) has bought back Empyro from Twence.
- Financial close for the restart of Empyro has taken place. Oil delivery to FrieslandCampina and delivery of steam to Nobian Salt factory will be restarted in September 2026.
- Fractionation will be done at a scale of 1.2 t/h (7,200 t/a) next to Empyro in Hengelo, The Netherlands.
- 15M euro total project costs including development of fractionation plant and modification of Empyro plant. Around 7 million EUR grants have been secured from Dutch and provincial Government.
- Long term offtake contracts being negotiated for pyrolytic lignin with Kingspan insulation,
- FID fractionation project is expected 4th quarter 2026.



Summary

- The lessons learned in Empyro are implemented in Green Fuel Nordic and Pyrocell and this resulted in a standard design.
- Modularization and standardization leads to:
Lower risks, shorter delivery times, short time on site, lower costs and high quality due to high degree of standardization. Engineering efforts are very limited
- Do not build the plants too large. Scaling by number is a good way to address the biomass availability and lower the costs.
- Pyrolysis oil is a very interesting way to connect the biomass world to the industrial world, leading to energy, fuels and chemicals.
- The Biorefinery Twente project is currently under development and FID is expected 4th quarter of 2026.





BTG Bioliquids

we replace fossil
fuels