Haffner Energy

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Haffner Energy successfully commissioned its hydrogen-from-biomass production unit in Marolles, France – a breakthrough for the hydrogen industry

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- **Commissioning of the world's first plant producing hydrogen from solid biomass** at the Marolles site (Champagne region, France).
- **Unique thermochemical process that significantly reduces** green hydrogen costs.
- **"Super green"[1] hydrogen available** for commercial use beginning the second half of 2025.

Haffner Energy (ISIN: FR0014007ND6 – Ticker: ALHAF) announces the commencement of hydrogen[2] production utilizing its proprietary solid biomass thermolysis technology at its Marolles hydrogen production, testing, and training center, as was announced in the 12/17/2024 press release. This unique technology enables the production of renewable hydrogen at a substantially lower cost compared to conventional methods, while offering an unparalleled carbon footprint.

"*Achieving the continuous production of competitive green hydrogen is a decisive step. Currently, the industry faces significant delays due to the excessive cost of decarbonized hydrogen. We are confident that our solution will accelerate the adoption of renewable hydrogen and enhance the sector's competitiveness. I want to congratulate the Haffner Energy team and our partners for this remarkable achievement, ushering the company into a new era*," stated Philippe Haffner, Co-founder and CEO of Haffner Energy.

A Flexible and Economically Advantageous Production Model

The site's production capacity will be **15 kg of hydrogen per hour** (kg/h), with an initial phase temporarily limited to 11 kg/h due to the existing PSA (Pressure Swing Adsorption) purification equipment. This equipment will be replaced in the coming months by a PSA designed to reach a 15 kg/h capacity. The unit already produces hydrogen at 8 bar pressure, ready for commercial distribution starting in the second half of 2025 to serve transportation and industrial markets.

Anticipated since late 2024, this commissioning required the site to be connected to the medium-voltage electrical grid, which was completed earlier this year, followed by the on-site presence of commissioning engineers focused on the main equipment suppliers for hydrogen purification.

The biomass thermolysis unit, operational since June 2024, **exceeds the capacity required to produce 15 kg/h of hydrogen**. The new PSA, already received by Haffner Energy, will be complemented by a compressor reaching 35 bar pressure, supplying an H14 distribution station provided by HRS.

Marolles is designed to operate 8,000 hours per year. As part of this site's operations, 120 metric tons of mobility-grade hydrogen per year (15 kg/hour) will be produced, contributing to the

[1] In accordance with the order of July 1, 2024 specifying the greenhouse gas emission threshold and the methodology for qualifying hydrogen as renewable or low-carbon.

[2] Samples were taken today by an independent laboratory to validate the mobility quality of this hydrogen.

decarbonization of mobility and industry. This is equivalent to 12 million kilometers traveled with hydrogen vehicles. Approximately 2,400 metric tons of CO_2 per year will be avoided or captured through hydrogen and biocarbon (char or biochar) combined.

A **memorandum of understanding for the offtake** has been signed for the supply of 90 tonnes of hydrogen per year, mainly for mobility applications, which is designed to ensure a commercial outlet within the next few months.

Hydrogen Production from Residual Solid Biomass: A Game Changer

The scaling up of Haffner Energy's proprietary biomass thermolysis technology **is poised to disrupt the global and French renewable hydrogen markets**, facilitating accelerated commercial and industrial development. This technology offers several key advantages:

- **Economically Competitive Solution: Already capable of competing with gray hydrogen** for installations of 20 MW and above – a feat far from achievable by alternative technologies.
- **Economic Model Based on Low-Cost Biomass Energy:** Hydrogen from biomass thermolysis is significantly cheaper to produce than hydrogen from the electrolysis of water thanks to low primary energy costs (<30€/MWh and often even <20€/MWh, compared with >70€/MWh for decarbonized electricity) and optimal energy efficiency (generally >70%).
- **Independence from the Electrical Grid:** Unlike electrolysis, thermolysis is minimally dependent on electricity availability and cost, ensuring stable and predictable production.
- **Negative Carbon Footprint**: This technology sequesters biogenic carbon through **biochar** co-production, achieving a negative carbon footprint when considering the full LCA.[3]
- **Flexible Sourcing:** This biomass-agnostic technology is able to utilize various residual biomasses, in particular from agriculture, ensuring **greater autonomy and resilience** against feedstock market fluctuations while significantly expanding available resources.

Towards Commercial and Industrial Expansion

The commissioning of the Marolles unit marks a strategic milestone for Haffner Energy. This success accelerates commercial discussions with several partners interested in this disruptive technology and, as announced in previous communications, will **enable the Company's project pipeline to be converted into firm orders**, thereby **generating revenue**. In particular, the effective commissioning of the site is a catalyst for finalizing the signing of **two major contracts.**

The continuous operation of hydrogen and renewable gas production equipment on site will also enable Haffner Energy's team to conduct tests using specific biomasses for each potential client, including non-conventional biomasses such as organic sludge, manure, and algae, thereby confirming the compatibility of Haffner Energy's technology.

[3] In accordance with the life cycle assessment study carried out by the LCA consultancy EVEA at the end of 2021.

Furthermore, Haffner Energy is now positioned **to leverage a previously untapped technological solution that converts hydrogen into electricity at an extremely competitive cost**, highly valuable during peak consumption periods.

Despite a global context that remains unfavorable to the development of the hydrogen market, particularly in Europe and in France—where the national hydrogen strategy has yet to be announced—Haffner Energy's position in this high-potential market is now strengthened.

Additional resources

- About Marolles : press release and November 2024 media kit
- About renewable gas production commissioning in Marolles : 06/20/2024 press release
- About biomass procurement partnerships : with Bambbco - 09/24/2024 press release; with Hexas- 03/13/2024 press release

Next events

Annual results 2024-2025	June 18, 2025
Annual Shareholders Meeting	September 10, 2025

About Haffner Energy

Haffner Energy is a French company providing solutions for competitive clean fuels production. With a 32-year experience converting biomass into renewable energies, it has developed innovative proprietary biomass thermolysis and gasification technologies to produce renewable gas, hydrogen and methanol, as well as Sustainable Aviation Fuel (SAF). The company also contributes to regenerating the planet through the co-production of biogenic CO_2 and biocarbon (or char/biochar). Haffner Energy is listed on Euronext Growth (ISIN code : FR0014007ND6 – Ticker : ALHAF).

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Glossary:

* Biocarbon is a carbon-rich solid material. Biocarbon contains biogenic carbon absorbed from the atmosphere by plants via photosynthesis. This characteristic makes it a major carbon sink when used as a soil

amendment, either applied directly or incorporated into fertilizers (known as biochar), or incorporated into building materials (known as char). Biocarbon is also a very dense source of renewable energy (31 MJ/kg) that can be gasified on site to increase the production of biofuels such as bio-SAF or the production of renewable hydrogen, but can also be shipped and gasified at another site, notably for the production of e-fuels.