



ATHENA

RECHERCHE & INNOVATION

Environmental protection or the opportunity to innovate!

Our project: the production of bioHydrogen

At Athena Research and Innovation, **we produce biohydrogen** thanks to wastes and wastewaters coming from the food industry. Indeed, this wastewater, which is not valued, is actually a wonderful source of energy for the living world.

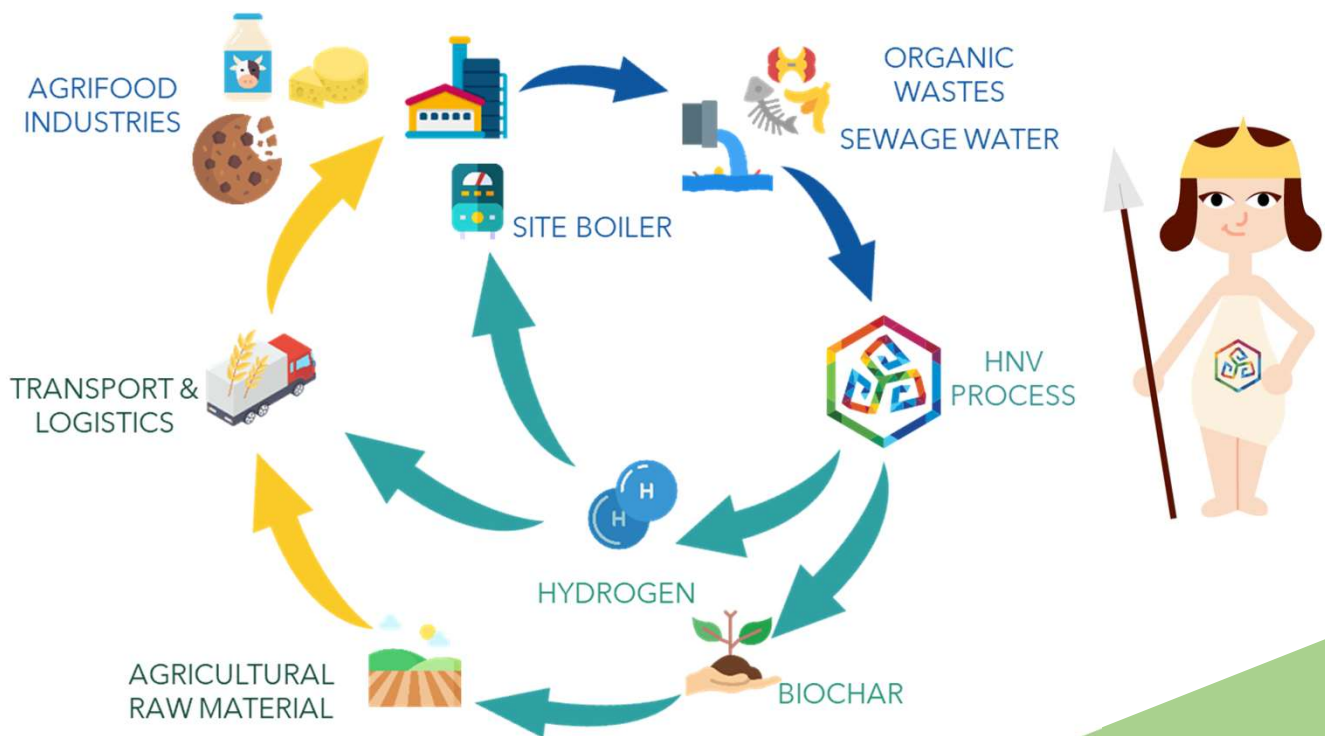
They are **composed of organic matter and minerals**, which allows our bacteria to grow while releasing hydrogen.

This hydrogen is then intended to be used in heavy mobility or in the production of heat in substitution of diesel and natural gas.

The co-products (biochar, compost) return to feed the agricultural soils that supply the raw material to the factories. **We develop circular ecosystems.**

Since January 2024, in France, we are allowed to reuse the treated sewage water in the processes.

Our vision: the circular economy



Innovation :

We produce hydrogen by dark fermentation



zero waste :

All co-products from the HNV process are valued



Various sources of waste:

Dairies, pastries, ready meals, ... It works! Do not hesitate to ask us for a try!



Energy Decarbonization:

Our biohydrogen is a step towards carbon neutrality!



Wastewater treatment:

Let's reuse treated wastewater!

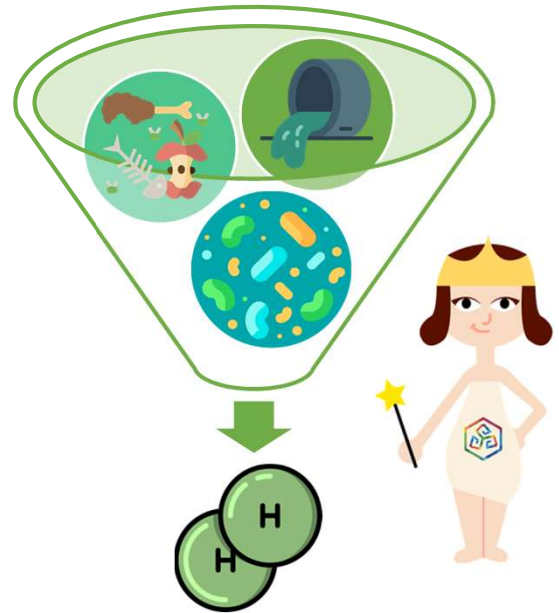
Our HNV Process – How does it work?

Our original biohydrogen production process uses an 8,000-year-old technology, the **fermentation**.

Thus, to develop our HNV process, Hydrogen New Version, we selected a bacterium producing hydrogen capable to grow in wastewater from the food industry (dairies, industrial caterers, slaughterhouses...).

These wastewaters are loaded with organic matter (proteins, sugars, fats...) and minerals that are the fuel of our bacteria; hydrogen is its waste.

Thus, we purify these wastewaters while producing an energy vector destined to be developed massively. By using biomass, we ensure zero carbon emissions.



Who are we?

Founded in October 2016 by Romain IRAGUE, Doctor of Microbiology, and Ludovic BRIAND, Energy Engineer, Athena Research and Innovation represents the association of academic research and industry **servicing the decarbonization of energy** with processes, turnkey, said Waste-to-Power.

Now, Athena Research and Innovation **speeds up its scale-up** by launching a 1 m³ pre-industrial demonstrator (bioreactor). By the end of 2024, a 30 m³ bioreactor will be started with the objective to launch **the industrialization of the solution in 2026**.

Supported by the French government, through the **France 2030 program**, and motivated by the needs of the energy transition, we are committed to bringing technically and economically viable solutions to the market.

Our partners: our project would be less rich without their support and advices



CE PROJET EST COFINANCÉ PAR LE FONDS EUROPÉEN DE DÉVELOPPEMENT RÉGIONAL



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