

## ***KHIMOD revolutionizes e-methanol production with the THOR project, an innovation protected by three new patents***

Paris, January 15, 2026 – KHIMOD announces the filing of three patents and confirms a major breakthrough in e-methanol production, validated by the results of THOR, its industrial pilot co-funded by the Île-de-France Region and developed at its Wissous site near Paris. Test results show up to three times higher CO<sub>2</sub> conversion and units four times more compact than comparable solutions currently available. With these performances now validated and the patents secured, KHIMOD is entering a new industrialization phase in a rapidly accelerating global market.

KHIMOD has filed three patents covering its process for producing **synthetic methanol from hydrogen and CO<sub>2</sub>**, also known as **e-methanol**. The performance of this technology was demonstrated through the **THOR pilot unit**, operated at KHIMOD's industrial site in Wissous, where the technology was tested under real operating conditions.

### **A breakthrough driven by optimized heat-exchange performance**

The project confirmed the relevance of a key principle: operating the reaction at **much higher pressures than conventional practice**, increasing from around **80 bar to nearly 300 bar**. This increase in pressure makes it possible to **shift the chemical equilibrium of the reaction**, leading to **yields up to 25 times higher** than the best technologies currently available on the market.

This highly intensified process releases large amounts of heat and could not be implemented in a conventional reactor. Only **precise control of heat transfer**, made possible by the use of **milli-structured reactor-exchangers** capable of operating at such pressures, allows optimal reaction control. This approach also enables a **significant reduction in the amount of catalyst required**, profoundly improving the overall economics of the process.

### **Unprecedented performance in the sector**

Tests conducted at the Wissous site confirmed:

- **CO<sub>2</sub> conversion up to three times higher** than reference technologies;
- **more than 25-fold yield improvement**, with production reaching **up to 25 kg of e-methanol per kilogram of catalyst**, compared with around 1 kg for conventional processes;

- **units four times more compact** than comparable solutions available elsewhere,
- A unique **modular technology** making **competitive methanol** for **small, medium and large scale** projects.

These results pave the way for **smaller, less catalyst-intensive units** that are **far easier to industrialize**.

E-methanol production relies on a **catalytic synthesis reaction between recycled CO<sub>2</sub> and low-carbon hydrogen**. This reaction converts these two inputs into **synthetic methanol**, or e-methanol, which can be used either as a fuel or as a chemical intermediate. The industrial challenge lies in **mastering this reaction** to maximize efficiency while ensuring **stability, safety, and performance**. It is precisely on this critical point that KHIMOD's technology delivers a decisive breakthrough.

### **A rapidly accelerating global market**

This breakthrough comes at a time when demand for **e-fuels is growing rapidly**, driven by the decarbonization of hard-to-electrify sectors and evolving industrial uses:

- **Maritime transport** is increasingly turning to e-methanol as a credible transition fuel, supported by growing investment from shipowners;
- **Aviation** is accelerating the rollout of **sustainable aviation fuels (SAF)**, some of which rely on methanol-based production pathways;
- **The chemical industry**, the largest consumer of fossil methanol, is seeking reliable low-carbon alternatives to reduce the footprint of its processes;
- **European and international regulations** are supporting the deployment of synthetic fuels by 2030, creating a favorable environment for modular and competitive technologies.

In this rapidly evolving landscape, the results achieved with THOR confirm that KHIMOD's technology is well positioned to meet the needs of a fast-growing market and support the rise of **low-carbon synthetic molecules**.

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*“THOR played a crucial role in demonstrating, under real operating conditions, that our approach works in a stable and reproducible way. This project validates an intuition that has guided our work for the past two years: process intensification and exchanger optimization can allow us to cross a decisive threshold.”*

— **Eric Aubay, VP Flow Chemistry, KHIMOD**

*“With these patents and the results delivered by the THOR project, KHIMOD is reaching a major milestone. These field-proven performances enable us to move forward with industrialization confidently, while maintaining the rigor and high standards that define our development.”*

— **Nicolas Serrie, Président, KHIMOD**

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## Industrialization underway

Building on these results, KHIMOD has entered an **advanced industrialization phase**. Two projects have recently been launched, reflecting the growing interest from industry players in **high-performance, modular, and deployment-ready solutions**.

In June 2025, KHIMOD had already reached a key milestone by raising **€23 million** from the **SPI fund (Bpifrance)**, **Audacia's industrial decarbonization fund**, and its long-standing shareholder **ALCEN**.

This step confirms the confidence of major industrial and energy-transition stakeholders in KHIMOD's ability to **turn innovation into operational solutions** for the **aviation, maritime, energy, and chemical sectors**.

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### About KHIMOD

KHIMOD is a French company developing technologies that enable the production of synthetic fuels and molecules from CO<sub>2</sub>, such as e-methane, e-methanol and e-kerosene, thereby contributing to the decarbonization of heavy transport, the chemical industry and other hard-to-abate sectors.

Its technology is based on high-performance milli-structured reactor-exchangers, designed to deliver strong process intensification and high efficiency. KHIMOD also designs turnkey industrial units and is involved in innovative projects in the fields of power-to-gas and sustainable aviation fuels (SAF).

The company also addresses the needs of the fine chemicals industry, leveraging its expertise in advanced reactor-exchanger technologies.

Learn more: [khimod.com](https://khimod.com)

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