Aerleum®

https://aerleum.com/

Aerleum®

We make e-methanol out of thin air.

Aerleum®

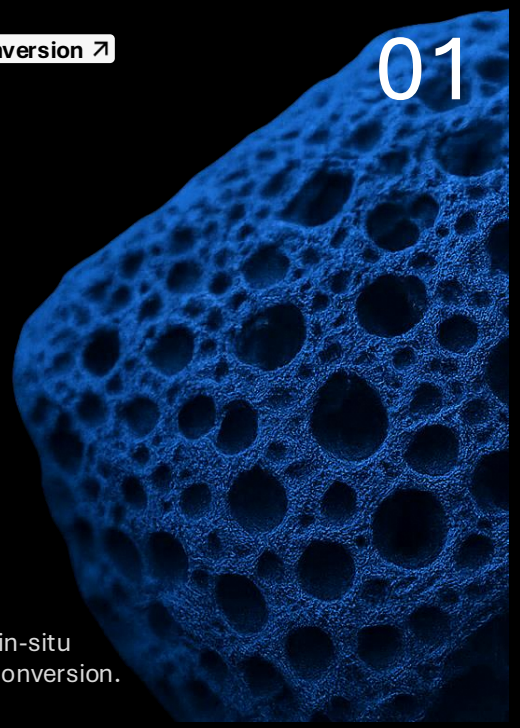
Introducing Direct Carbon Utilization®.

Aerleum invented a novel process (DCU®) to enable direct CO_2-to-methanol conversion through a proprietary combination of reactor architecture, dual-functional materials, and high-efficiency heat management. A new paradigm for e-methanol: fewer steps, lower costs, scalable.

Reactive Sorbent

Adsorption ↗ Conversion ↗

01



A material enabling in-situ capture and direct conversion.

Single Reactor

CAPEX ↘

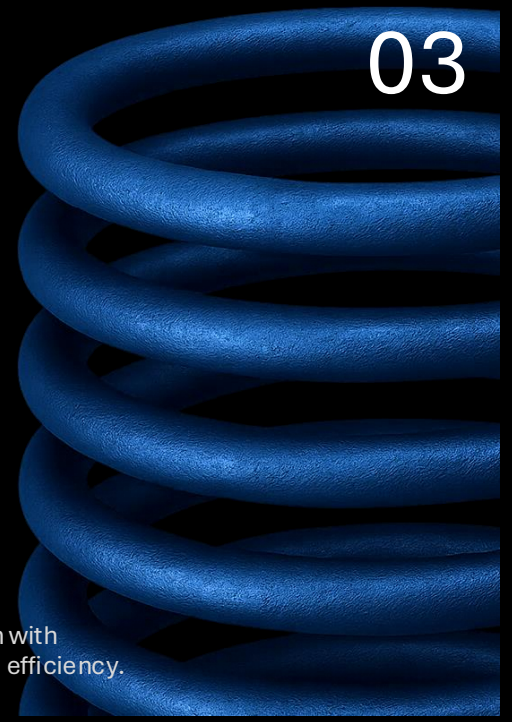
02

An integrated process, one system, two steps.

Precision Heating

Speed ↗

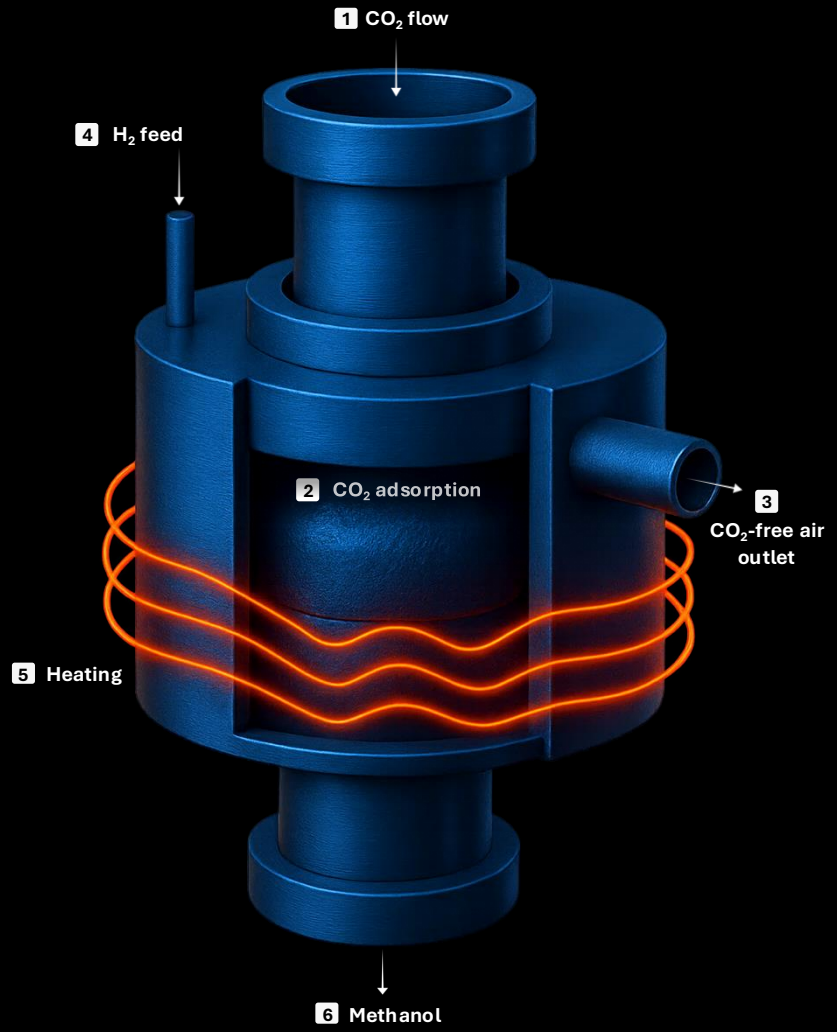
03



An electrified system with fast heating and high efficiency.

Integrated within a single system.

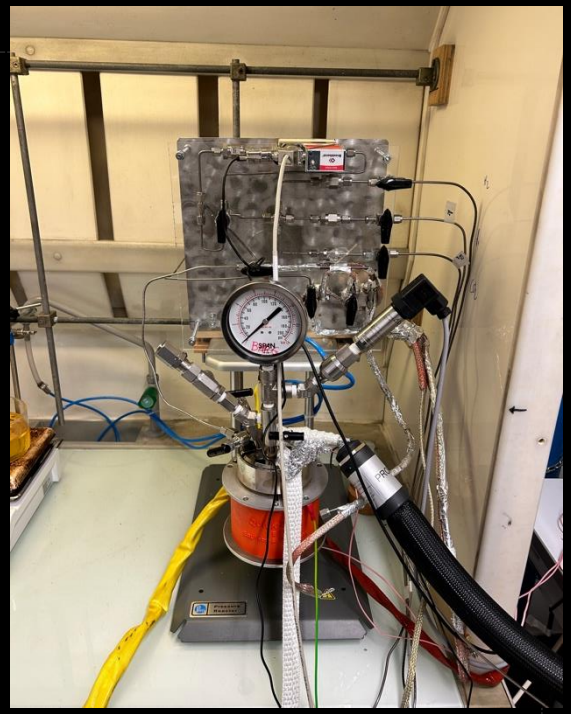
The technology has been engineered to be standardized in compact modular systems, with minimal footprint.



Inside DCU®. A six-step journey from CO_2 to e-methanol:

1. CO_2 – either from ambient air or point sources – is introduced into the system.
2. CO_2 is selectively captured by reactive sorbent until saturation.
3. CO_2 free air is safely returned to the environment.
4. H_2 is injected into the system.
5. Controlled thermal activation drives the $CO_2 + 3H_2 \rightarrow CH_3OH + H_2O$ reaction.
6. Methanol is collected after purification.

We are on track to deliver over 100,000 tons of e-methanol per year by 2031.



Proof-of-Concept. 06.24

First grams of MeOH produced.

TRL 4 achieved.

Pilot. 12.26

> 50 kilos of MeOH per month.

TRL 6 achieved.

Demo. 12.29

> 500 tons of MeOH per month.

TRL 8 achieved.

First-of-a-Kind. 12.31

> 8,000 tons of MeOH per month.

TRL 9 achieved.

Aerleum®

Driving unprecedented industrial transformation.

Aerleum delivers on three fronts: lower costs, higher output, and minimal emissions. It’s happening now, by 2030.

Operational.

(First-of-a-kind plant capacity)

> 100 KT

Economical.

(E-methanol price)

< 800 $/T

Environmental.

(CO_2 emissions reduction)

- 90 %

Aerleum®

Made possible by radical energy savings (> 55%).

ADSORPTION

CO_2 fixation onto a capture material.

DESORPTION

CO_2 is released from its capture material.

TRANSPORTATION

Compression, transport, storage.

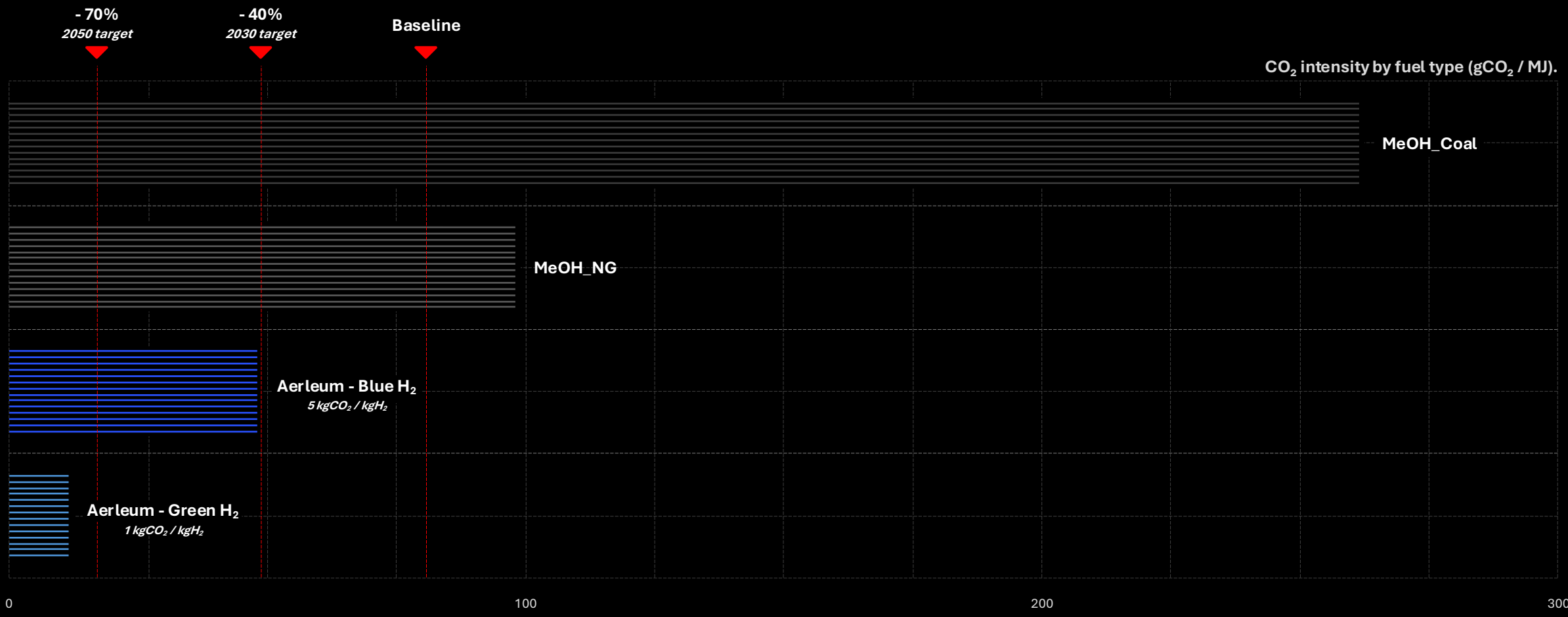
CONVERSION

CO_2 hydrogenation to produce e-methanol.

Cumulative energy requirement across steps.

Empowering industries to meet climate goals.

Meeting ambitious decarbonization targets requires a complete fuel shift. By avoiding 2 to 6 tonnes of CO_2 for every tonne of fossil fuel replaced, Aerleum's e-methanol makes it possible.



Aerleum®

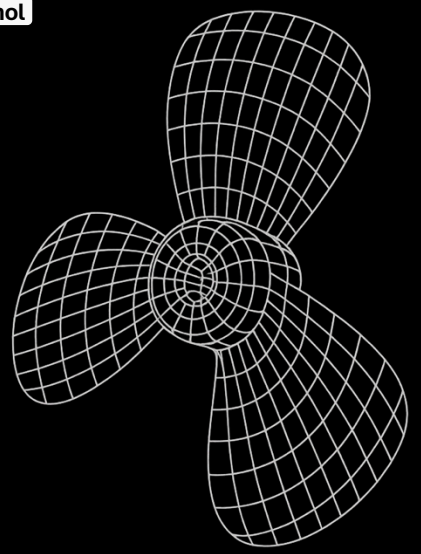
To drive energy transition across industries.

Supporting hard-to-abate sectors decarbonization efforts.

Maritime

E-methanol

01

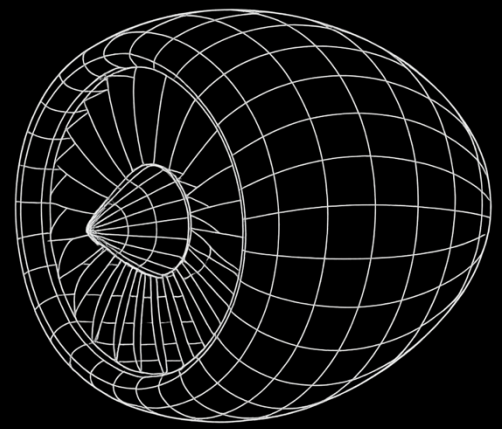


Fossil fuel replacement
for new build and retrofit.

Aviation

E-methanol-to-Jet

02

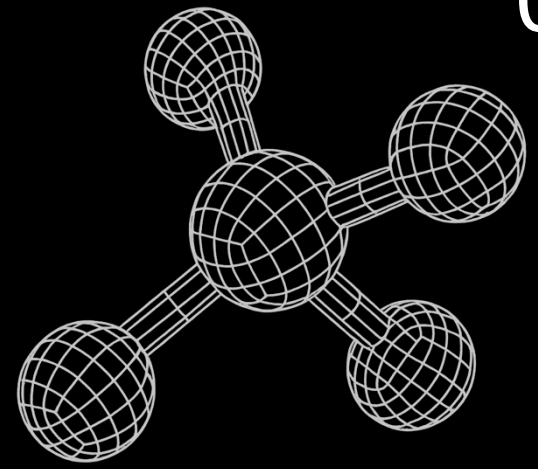


Sustainable Aviation Fuel
derived from e-methanol.

Chemicals

E-methanol-to-X

03



Clean chemicals for
fossil-free end products.

Led by builders. Advised by experts.

Aerleum brings together founders, scientists, and industry leaders with deep expertise in carbon technologies, scale-up, commercialization and innovation.

Sébastien Fiedorow

CEO

Ex-VC investor at Bpifrance backing climate tech founders (H2, CCU, etc.), Sébastien now leads Aerleum's vision, operations, and growth.

Steven Bardey, PhD

CTO

With a PhD in CO_2 conversion from the French Institute of Petroleum, Steven leads R&D at Aerleum to turn thin air into clean fuels.

Team members at Aerleum

12

Christophe Coperet

CO_2 Catalysis Advisor

Professor and Head of the Department of Chemistry and Applied Biosciences at ETH Zürich, with expertise in CO2 catalysis.

Burçin T. Mckenna

Scale-up Strategy Advisor

Global Head of Carbon Capture at Ramboll, with prior key roles at Topsoe and FLSmidth, focusing on scale-up and business strategy.

Cuong Pham Huu

Thermal Processes Advisor

Research Director at CNRS and co-founder of BlackLeaf, bringing experience in Precision Heating.

Mijndert V. der Spek

DAC Systems Advisor

Associate Professor in Chemical Engineering at Heriot-Watt Univ., with prior experience at Shell, specializing in reactor design and DAC.

Years in CO_2 science & industry

70+

Fueled for what's next.

Backed by public institutions and climate-focused investors, Aerleum has raised $6m to accelerate the deployment of its technology and drive long-term decarbonation efforts.

Région Grand Est

360 Capital

Raise Sherpas

HTGF

Bpifrance

Marble

Norrsken

Non-dilutive funding

$2.5m

Seed round closed in Oct.-24

$3.5m

Elevated by strategic partnerships.

To address the industrial decarbonation challenge, Aerleum works hand-in-hand with leading technology providers and belongs to key innovation communities in climate and deeptech.

Industry partners

CMA CGM	Working with CMA CGM to accelerate the decarbonization of global logistics. As one of the world's largest shipping companies, with over 10 MT of annual fuel demand, CMA CGM selected us through their ZEBOX accelerator to support their transition to low-carbon fuels.
Air Liquide	Partnering with Air Liquide to scale e-methanol applications. As a global leader in gases and technologies, Air Liquide selected Aerleum through its Accelair program to help bring breakthrough carbon utilization from lab validation to industrial scale.
Jifmar	Working with Jifmar to support the transition of maritime operations toward low-carbon fuels. With a diversified fleet and strong expertise in offshore marine services, Jifmar represents a strategic offtake partner for Aerleum's e-methanol.
Allia	Partnering with Allia to industrialize Aerleum's core systems. As Aerleum's boiler-making and metal fabrication partner, Allia supports the design and manufacturing of key equipment, helping translate our technology into robust, scalable industrial units.

Technology partners

Hynamics	Collaborating with Hynamics to integrate low-carbon hydrogen in France. As EDF's dedicated hydrogen subsidiary, Hynamics is developing large-scale electrolysis capacity, enabling local CO_2-to-fuel production powered by low-carbon hydrogen.
Technip Energies	Working with Technip Energies and Processium to scale our technology. After winning their Maritime Decarbonization Award, we've initiated collaboration on core engineering and industrialization challenges, supporting our transition from lab-scale innovation to deployable systems.
Vema Hydrogen	Partnering with Vema to harness natural hydrogen worldwide. Together, we explore low-cost natural H_2 sources across high-potential regions, leveraging Vema's natural hydrogen expertise to unlock a new pathway for producing highly competitive e-methanol at industrial scale.
Vertimass	Partnering with Vertimass to convert methanol into sustainable aviation fuel. As a specialist in alcohol-to-jet fuel technology, Vertimass provides a key downstream pathway to transform Aerleum's e-methanol into low-carbon fuels for aviation and other hard-to-abate transport sectors.

Aerleum®

Highlighted for impact.

Distinction	Organizer	Year	Location	Status
Maritime Decarbonization Awards	CMA CGM	2024	Marseille, France	Winner
Start-up Awards	CMA CGM	2024	Marseille, France	Winner
Pépites France Awards	Bpifrance, French government	2024	Paris, France	Winner
i-Lab Innovation Awards	Bpifrance, French government	2024	Paris, France	Winner
Maritime Decarbonization Awards	Technip Energies	2024	Paris, France	Winner
EDF Pulse Awards	EDF	2024	Paris, France	Winner
Gitex Global Awards	DWTC	2024	Dubai, UAE	Finalist
DTM100 Awards	Deep Tech Momentum	2025	Berlin, Germany	Finalist
Energy & Decarbonization Awards	Tech Tour	2025	Essen, Germany	Finalist
Better Production Awards	Cleantech Open France	2025	Paris, France	Winner
Carbon X Program	Tencent	2026	Shenzhen, China	Finalist
Spotlight on Innovation Award	Smart Freight Center	2026	Amsterdam, Netherlands	Finalist
Best CO_2 Utilization Award	Nova Institute	2026	Cologne, Germany	Winner

Aerleum®

From today's emissions to tomorrow's fuels.

aerleum.com