



M[⚡]REFORMER

Methanol Reformer

Off-Grid & Sustainable & Mobile energy solutions

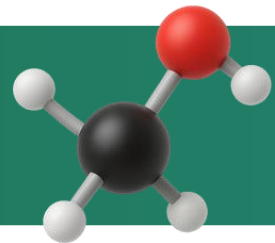
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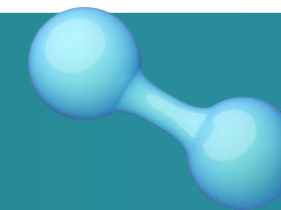


Hydrogen & Electric production on-site & on-board

Off-grid - Sustainable - Mobile



Methanol
Methanol & DI water



Hydrogen
Gas

Hydrogen logistics challenges

“H₂ is easy to produce but expensive to transport”



Ideal situation:

- Electrolyzer close to the final destination (within 50 meters).



Non-ideal situation:

- Electrolyzer far from the destination (>100 km), leading to **high transportation costs and inefficiencies**.
- Long distances example:



Hydrogen pipe
Not yet ready



Compressed H₂ transport
Non- efficient

Why methanol?

It is the most efficient solution for hydrogen logistics

1 TRUCK OF METHANOL

=

12 TRUCKS OF COMPRESSED H₂



3.6 Tons
H₂



Methanol x 1 truck

+600 km + 1.37 Tn CO₂

Compressed H₂ x 12 trucks

+ 7.200 km + 16.4 CO₂

*Source for the calculation CO₂ from trucks: Transport & Environment (2021). Easy Ride: why the EU truck CO₂ targets are unfit for the 2020s

**3.6 Tn H₂ requires 18 Tn D.I. water for the reformation process

- One 30 ton gas truck can only carry 300 kgs of H₂ (**<M30 daily production**)
- One 30 ton methanol truck can carry **12 times** more.
- H₂ Compressed: **1% to 5% Boil Off/day** during the whole production/transport/stock cycle)
- For long distance transportation methanol beats compressed H₂

* 250 bars pressure

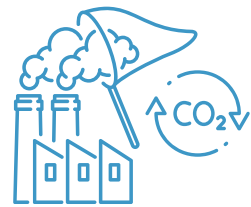
Methanol Sources

Green vs conventional productions systems



NATURAL GAS

From conventional Fuel (Methane) - Extraction from well and reformed



CO₂ CAPTURED

Captured from conventional fuel combustion or industrial emissions.
E.g., cement, steel production...

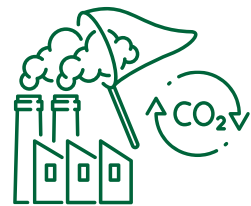


BIO-METHANOL produced from biomass

- From agricultural waste (Biodigestors)
- From dumping site & sewage (Direct)

Methane Gas (biogas)

$\text{CH}_4 + \text{H}_2\text{O steam} \rightarrow (\text{CO} + 2\text{H}_2) + \text{Catalyzer} \rightarrow \text{CH}_3\text{OH}$



E-METHANOL

- Green hydrogen + CO₂ captured
- Renewable electricity

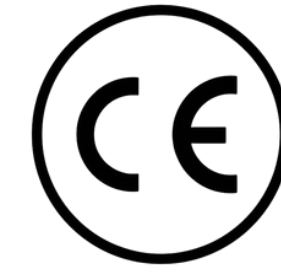
- From biomass burning
- From industrial process

CO₂ captured

$\text{CO}_2 + 3\text{H}_2 \rightarrow \text{CH}_3\text{OH} + \text{H}_2\text{O}$
H₂ from renewable source

Core Product: Methanol-reforming

Medium power (L/M18) / High power (L/M30)



Strong points:

- **High purity (99,997%)** H₂ for Fuel Cells (ISO 14687 for H₂ mobility)
- **No emissions of NO_x & SO_x & PMs**
- Low CO₂ emissions (or **carbon neutral if green**)
- **Lower OPEX & CAPEX**
- **24/7 Run Times & Long lasting**
- **Independent from Grid**
- **No Operator Needed & Remote Monitoring**



CLICK HERE

Integrating Our H₂ Generator into the
Containerized Solutions Portfolio

Scalability (MW)



Modularity



Plug&Play



Dimensions 879 x 2,080 x 1,380 mm
(LxWxH): 1,500 kg
Weight:

Containerized Solutions



We offer mobile & stationary solutions for hydrogen or power generation, depending on your environment and energy needs.



ELECTRIC SOLUTIONS

Designed to generate electricity directly from methanol — flexible, reliable, and scalable.

- **e-Nomad – 150 kW:**

Mobile electric power generation (20 ft container).

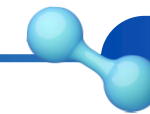
Includes: LM18/ LM30 reformer, fuel cell, battery pack, power electronics & control system.



- **CPG – 250 kW**

Stationary electric power generation (LM30 unit)

Includes: LM30 reformer, *fuel cell*, *power electronics & control*.



HYDROGEN SOLUTIONS

Designed for hydrogen production — on-demand, flexible, and scalable for a range of applications.

- **H-Nomad – up to 16.2 kg H₂/h**

Mobile hydrogen production (20 ft container).

Includes: LM18/ LM30 reformer, buffer tank, compression system, power electronics & control system.



- **CHG3/CHG6 – up to 50 kg H₂/h**

Stationary hydrogen production (20ft or 40ft).

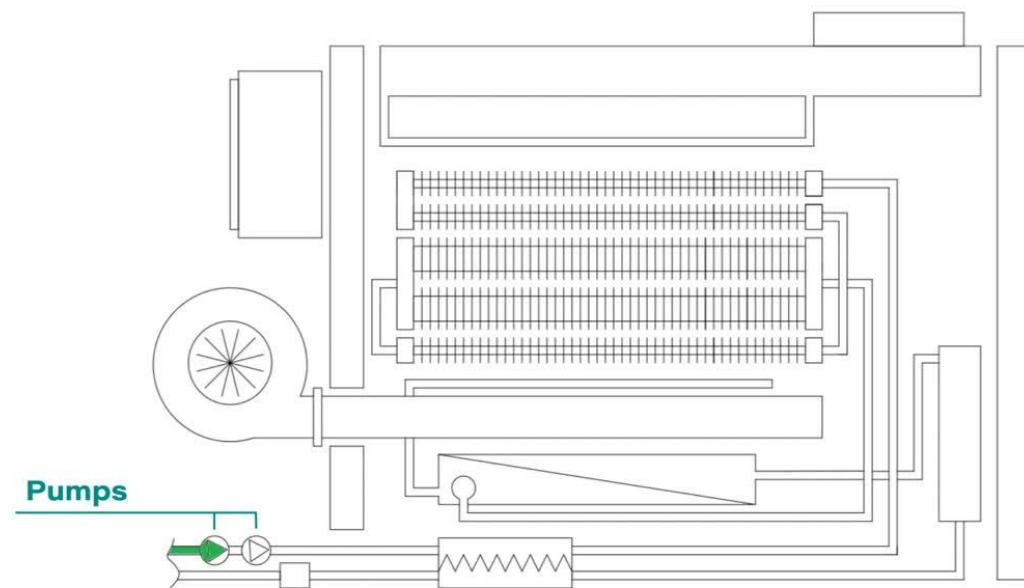
Includes: LM30 reformer, buffer, compression, power controls.



[🔗 You'll find full technical datasheets in the annex.](#)

Outlook of methanol-reforming process

L/M18 & e-Nomad

[Flow diagram](#)

Outlook of methanol-reforming process

REFORMER



$$\eta = \frac{172.45 \left[\frac{g}{min} \right] * \frac{1 kg}{1000 g} * \left[\frac{120.21 MJ}{kg} \right]}{1253.1 \left[\frac{g}{min} \right] * \frac{1 kg}{1000 g} * \left[\frac{20.094 MJ}{kg MeOH} \right]} = 0.823 = 82.3\%$$



82,3 %

REFORMER ENERGY POWER



- Methanol Reformer: 82 %
- Fuel Cell Generator: 50 % - 60 %



42 % - 49 %

Cost comparison (€) per kg H₂ / kWh

	Grey methanol	Green methanol
Methanol price (€/Ton)	500,00	1200,00
Feedstock composition ±0.5 wt% methanol, balance DI water (≥14 MΩ-cm)	62,50	62,50
feedstock density	0,87	0,87
Feedstock flow (l/min)	2,10	2,10
Methanol flow (kg/h)	68,51	68,51
Hydrogen production per hour	9,75	9,75
1kg H ₂ in a FC produce (kWh)	15,00	15,00
kWh price (€)	0,23	0,56
kg H ₂ price (€)	3,51	8,43

Key Milestones 2025

Strategic partnerships & product deliveries



Mining machine company

Delivery of first e-Nomad



HELION

Strategic partnership



STATION AI

Collaboration with Nagoya Industrial Area



USA

Delivery of first reformer to USA



Northern Europe

Delivery of first reformer to Northern Europe.



Mitsubishi Gas Chemical

3 party agreement (MGC & MReformer & Element1) for expansion in Japan.



Aeroport Lleida-Alguaire

Agreement between Aeroports de Catalunya and Methanol Reformer SL for testing at Lleida-Alguaire Airport, promoting decarbonization.

Cross-sectorial applications



Civil works/ Mining

Off-grid & support to availability areas providing fast charging of battery packs or H2 to mining/civil works areas.



Services Stations

Fast Charging Stations - H2 Station Easy using the same infrastructure and producing on-demand.



Airports

Off-grid & support to availability areas in renewable energy.



Industry

Main supply of Hydrogen to furnace with the right quality at low OPEX to different industries: energy, metallurgical, ceramic...



Backup System

Backup system to provide Hydrogen or electricity off-grid: data centers, electrolyzers, hospitals, ports, stadiums...



Main expansion target 2025 -2030

Electric or Hydrogen supply on-site



ELECTRIC CHARGING – EU DIRECTIVE (2026)

- **Fast charging on major roads:** availability of 400 kW every 60 km on key corridors.
- **Infrastructure challenge:** in some locations, it will be impossible to obtain such high power from the grid, requiring alternative solutions like energy storage or on-site generation.



HYDROGEN REFUELING – EU DIRECTIVE (2030)

- **Hydrogen refueling on high-traffic roads (TEN-T):** deployment of a Hydrogen Refueling Station (HRS) every 200 km by 2030.

Global Methanol Industry Overview

Innovations in Environmental Sustainability

METHANOL DUAL FUEL IN THE GLOBAL FLEET



EU shipping emissions regulation steps up in 2025 and **low-carbon energy** ship orders are ramping up.

By today there are **22 methanol** dual-fuel box ships **sailing** and another **216 on the order** books.

OPS



Flexibility of H₂ to supply **emission-free energy** in port operations.

In addition, it offers a **scalable alternative** to comply with upcoming European regulations that will require the supply of shore-side power (OPS) by 2030 under **AFIR's** regulation.

CERTIFICATIONS



EU ETS

Since 2024 regulated companies must **measure, report and verify** (MRV) their emissions to determine how many allowances they need.

"Who pollutes pays" Phased implementation EU ETS
2024: 40%, 2025: 70%, 2026: 100%.

Methanol Reformer's role Maritime Applications

Enhancing Ports/Fleets Sustainability and Functionality with Alternative Power Sources

- Onboard use in **fuel cells** or as a **combustion enhancer** for engines.
- Port-side energy supply for **heavy equipment** (cranes, trucks, forklifts).
- **Multi MW** applications
- Free Carbon Emission reduction **if feedstock complies:**
 1. With **RFNBO** methanol
 2. With **Bio-methanol**
- Alignment with **green fuel diversification** strategy
- Efficient & reliable system as principal or back up

Partnerships:



MARITIME
PARTNERS



e-Nomad system

Designed to operate reliably and continuously 365 days a year



ON-SITE POWER SOLUTIONS AT AIRPORTS

- **Power supply to control towers:** Guarantees uninterrupted power and eliminates reliance on external electrical grids.
- **Electric charging for ground vehicles:** Efficient charging for all airport transport, including passenger shuttles, baggage vehicles, electric aircraft, and GPU (Ground Power Units).
- **Emergency power support:** Reliable backup power for critical infrastructure in remote or hard-to-access locations.

Other projects



XTREME-E

A radical off-road racing series highlighting climate change impacts. One of the competitors is using a reformer with a Fuel Cell to charge the vehicles using our technology and a carrier as Methanol.



PROJECT ACCIONA FLEX FUEL

This innovative trial demonstrates on-site clean power production from green methanol using our H-Power Tower fuel cells.



BLUE BOX PROJECT

Operative using methanol to provide energy to charge Electrical vehicles. **Tested during mid April 2023 **Testing on Demand*



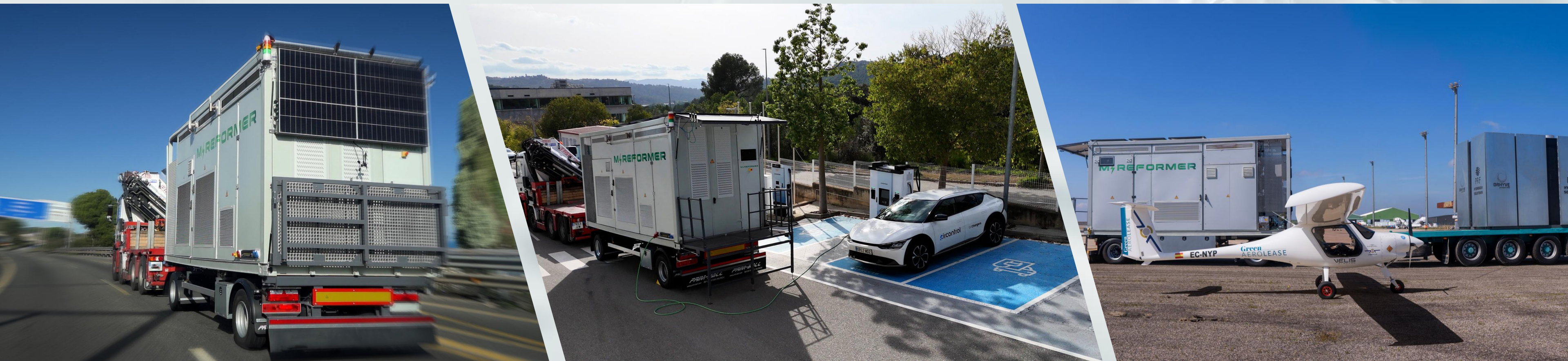
PROJECT HYDROGEN ONE

"We chose methanol as our fuel of choice due to its widespread availability in river systems and global ports, compatibility with existing distribution infrastructure, and safety."





Hydrogen generation from methanol-reforming for on-site and/or on-board applications



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Annex

Graphic material



[L/M 18](#)



[L/M 30](#)



[e-Nomad - Datasheet](#)



[e-Nomad - Onepage](#)



[H-Nomad - Datasheet](#)



[H-Nomad - Onepage](#)



[Brochure](#)



[Cast brochure](#)

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Annex

Multimedia material



[Product video](#)



[H2 & Electricity Anywhere](#)



[Product video with
drone recordings](#)



[Demoday 27.03.25 -
Lleida-Alguaire Airport](#)

[Inside the
e-Nomad](#)

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