# Towards the development of a hydrogen valley demonstrating applications in an integrated ecosystem in Greece

Cyprus Hydrogen Association – OEB Conference
*Hydrogen for a Clean Future: Pathways for Cyprus & Beyond*

14 November 2025

TRIĒRĒS

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The project is supported by the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research under Grant Agreement No. 101112056

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# Motor Oil Group at a Glance
# A Diversified Multi-Energy Group

## Refining, Supply & Trading

Local Energy Champion with a Global Reach

**~12,700 kt**
Refining Processed Volume[1]

**12.61**
NCI[2]

## Retail

One of the Largest Mobility Networks in Greece

**c.1,500**
Fuel Stations in 5 Countries

**>250,000**
Electricity and Gas Customers

## Regional RES Champion

#2 RES Operator in Greece

**839 MW**
Installed Capacity

**2.7 GW**
Pipeline

## Circular Economy and Alternative Fuels

Integrated Circular Economy Platform

**~300,000 tpa**
Solid Waste Management

**43,000 tpa**
Lubricants Processing and Regeneration

| Financials (2024) | €12.2bn | €0.967bn | €433ml | €1.4 |
|---|---|---|---|---|
| | Revenues | EBITDA | Investments | Dividends per Share |

Notes: 1.2023. 2. The Nelson Complexity Index (NCI) is a measure of the sophistication of an oil refinery.

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# The project
in a nutshell

**5**
Countries

**26**
Partners

**2,410**
Tons of renewable $H_2$ supplied per year

**9,880**
Tons/year $CO_2$ removed from industry & mobility via fuel substitution with renewable $H_2$

**58 Months**
**5 years**
July 2023 – April 2028

**8 mil €**
Total EU grant

Clean Hydrogen Partnership
VALLEY OF THE YEAR AWARD 2024

HYDROGEN VALLEY H2V CERTIFIED BY MISSION INNOVATION

MOTOR OIL · AVIN · New Energy Coalition · HYDRUS · ΟΛΠ · university of groningen · GROWTHFUND · OEB · ΔΕΥ · DEMOKRITOS · ITE · fen research · ΔΕΗ · REGION OF PELOPONNESE · FULGOR S.A. · NEEST · LPC · DIORIGAGAS · ΟΔΟΣ ΟΛΥΜΠΙΑ · NOVA · ECOFERRY · Coral GAS

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# **Versatility** in end-use applications

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VALLEY OF THE YEAR AWARD 2024

HYDROGEN VALLEY H2V CERTIFIED BY MISSION INNOVATION

## Industry

MOTOR OIL · FULGOR S.A. · LPC

## Public Authorities

REGION OF PELOPONNESE · GROWTHFUND

## Road Mobility

ΟΛΥΜΠΙΑ ΟΔΟΣ · ΟΣΥ · AVIN

## Other Valleys

fen research · OEB · New Energy Coalition · Hydrogen Egypt

## Energy

ΔΕΗ · DIORIGAGAS

## Research

DEMOKRITOS · university of groningen · FORTH

## Maritime Mobility

ΟΛΠ · HYDRUS · ECOFERRY

## DT & Business Models

NOVA · NEEST

### Industry

Consumption of renewable hydrogen by Motor Oil Hellas refinery in Ag. Theodoroi and the lubricant refinery of LPC in Aspropyrgos during TRIĒRĒS project, aiming to reduce carbon dioxide emissions from their production processes.

### Road Mobility

Up to three (3) urban buses operated within the metropolitan area of Athens.

One (1) light hydrogen-powered vehicle used for day-to-day operations along the TEN-T network.

One (1) passenger car operated by the Municipality of Loutraki–Perachora–Ag. Theodoroi.

### Energy

One (1) small-scale clean energy production unit (100 kWe FC-APU) to produce electricity via green hydrogen at the Port of Piraeus.

### Maritime Mobility

One (1) short sea ferry vessel retrofitted with a 200kW FC system.

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# Overview of H2 value-chain operations


Disclaimers for EC funding:

- EPHYRA project is supported the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research under Grant Agreement No. 101112220
- TRIERES project is supported the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research under Grant Agreement No. 101112056
- IRIS project receives funding from the European Innovation Fund programme under Grant Agreement No. 101133015
- REA project has received funding from the Connecting Europe Facilit – Transport programme under Grant Agreement No. 101079451
- REAH3 project has received funding from the Connecting Europe Facility – Transport programme under Granta Agreement No 101165972


AKRATA

Safe reliable transport to end users by Coral Gas

MOTOR OIL
MOH Refinery

Ephyra
Green Hydrogen Production Unit

TRIĒRĒS
Small Scale Hydrogen Valley

IRIS
Sustainable hydrogen and e-methanol production through deep refinery decarbonization

LPC
Supply $H_2$ to Lubricants' Refinery

AVIN
REAH3
1 Hydrogen Refueling Station (HRS) for public transport means – buses in Attika

1 FC EV passenger car

Safe reliable transport to end users by Coral Gas

3 FC EV Buses

1 FC EV passenger car

Municipality of Loutraki

Olympia Odos

ATHENS

PORT OF PIRAEUS

CORINTHOS

AG. THEODOROI

SALAMINA

1 short-sea ferry vessel, 200kW FC

AVIN
REA
1 Hydrogen Refueling Station (HRS) for passenger cars, light-duty and heavy-duty vehicles

1 FC APU 100kWe to produce clean electricity via green hydrogen

## Circular Economy & industrial symbiosis

Ephyra
Renewable $H_2$ Production

+ Green Hydrogen Project (expansion to 50 MW)

- Renewable electricity
- Waste heat usage via ORC
- Non-fresh water use
- Digital Twin & dedicated energy management system
- 30 MW AEL Electrolyser
- Direct $H_2$ & $O_2$ use within MOH Refinery

TRIĒRĒS
Renewable $H_2$ Logistics

- Track loading compression terminal
- Pipe system compression terminal
- 3 Tube trailers
- DIORIGA GAS Injection to Natural Gas Grid
- FULGOR Physical pipeline MOH-FULGOR


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# Current Status (1/2)

## Project progress


**Infrastructure Development**:

- **Electrolyser**: 30 MW funded via CH JU (EPHYRA)
  → **upscaled** to 50 MW via RRF (Green Hydrogen)
  → **FID:** Positive for 50 MW AEL electrolyser; engineering & construction underway
  → **Environmental permit**: approved by Greek Ministry
- **HRS**: 1 operational at Ag. Theodoroi (REA/CEF-T); 1 under tender for OSY bus depot
- **Feasibility Studies**: Hydrogen ferry, hydrogen pipeline to FULGOR, hydrogen in lubricant production

**Logistics & Distribution**:

- **4 $H_2$ tube trailers** purchased (3 co-funded by CH JU, 1 by MOH own funds)
- **1 report** prepared for virtual pipeline on scheduling and H2 distribution optimization

**Mobility Pilots**:

- **1 light-duty vehicle** in procurement (Municipality of Loutraki)
- **3 FC buses** under tender preparation (OSY)
- **1 heavy-duty vehicle** in market research (OLYMPIA ODOS)
- **Maritime vessel** retrofit under study (SHIPPING COMPANY)

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# Current Status (2/2)

**Energy & Industry Pilots:**

- **100 kWe FC APU** at Port of Piraeus **for building heating/cooling**: tender preparation underway
- **LPC**: Lubricants factory conversion in progress; the environmental permit is on-going and the procurement of equipment under preparation

**Regulation:** Engaged on Law 5151/2024 (Art. 63 – hydrogen supply regime) and recently adopted law for licensing of renewable hydrogen plants

**R&D: Digital twin** and **scientific publications** ongoing

**Safety and Supply:**

- **Preliminary Safety framework** for the Corinth Hydrogen Valley completed
- **HAZOP studies** for electrolyser, tube trailers, 1st HRS completed

**Collaboration and Knowledge Sharing:**

- Participation in **internation forums**
- **Study visits** in pioneering valleys (Austria, Netherlands)
- **Workshop on hydrogen innovation for regional growth** under the auspices of ROP & MOL (June 2025)
- **Co-organisation of the 3rd JIVE Roadshow across Greece and the Balkans**: new skills gained on hydrogen mobility and safety

**Outreach & Communication:**

- Project **website**: https://trieres-h2.eu/
- Various **social media** for different target groups: (Linkedin, Youtube, Facebook)

**Clean Hydrogen Partnership Awards:** TRIERES was honored with the prestigious EU H2 Valley of Year 2024 Award!

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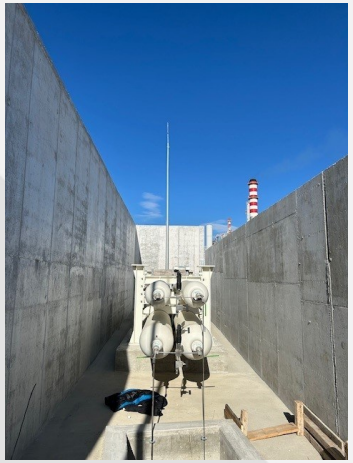
# Hydrogen Refueling Stations – REA / REAH3

## REA – The 1st HRS commissioned in Greece & 1st AFIF HRS in Europe


### REA 1st HRS in Ag. Theodoroi - Operational since Q2 2025

- The **1st Hydrogen Refueling Station (HRS) – REA** was installed inside a new service station of AVIN OIL (AVIN) located near the central TEN-T road network in the area of Ag. Theodoroi, Corinth, Greece
- It serves as a **gateway and local hub** to the south part of **Orient/East Med corridor**
- Supply-chain by compressed Hydrogen loading terminal to be operational in 2026 and transport by **4 tube trailers** readily available with ability to reach up to 500km



**Source:** EPHYRA Electrolyzer by Refinery

**Mass flow (compressor):** 65 kg/hour minimum

**Service Capacity:** Trucks, Buses, Cars

**Pressure Levels:** 350 bar and 700 bar


* REA project is funded from the Connecting Europe Facility programme under Grant Agreement No. 101079451.

* REAH3 project is funded from the Connecting Europe Facility programme under Grant Agreement No. 101165972.

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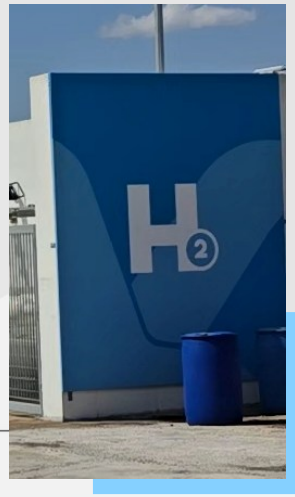
# Hydrogen Refueling Station Agioi Theodoroi (REA)


Dispenser


Compressor Area

Storage Area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# Work progress for Electrolyser installation

Electrolyser stacks

Earthworks for Electrolysis Unit

Compressor

New Hydrogen Network Pipeline

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# Next Steps

## 🚀 Hydrogen Deployment Timeline (2026–2028)

### 2026

🚙 Hydrogen powered vehicles (MOL, OLOD)

🚌 3 FC buses (OSY)

### 2027

⚡ Electrolyser in full operation

⚓ FC APU in Piraeus Port

🚢 Vessel with FC for short sea distances

🏛️ Greek Ministry budget secured (additional 50 FC buses, OSY)

### 2028 & beyond

⛽ More HRS under planning

Other valley expansion activities

Continuous dissemination and communication activities to enhance awareness and knowledge sharing with pioneering players, as well as all actors of the hydrogen value chain and the general public

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# Why TRIERES Matters for Cyprus

## A blueprint for future hydrogen valleys in the East Med

TRIERES is **explicitly designed to be replicable** – Cyprus is named as a **"follower region"**

Offers:

- Technical roadmap for infrastructure deployment, digital twin innovations, safety plans
- Business models for scaling and investment attraction
- Regulatory insights (Greek Law 5151/2024 on $H_2$ supply, framework for H2 producers)
- Cross-border knowledge sharing with similar geography, energy profile

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# Enabling Conditions: What Cyprus Can Take Forward

## Insights from TRIERES implementation:

- Early investments in infrastructure (HRS, tube trailers)
- Multi-source funding (CH JU, CEF, RRF, Innovation Fund, EIB)
- Real-life challenges (permitting, end-user incentives, public awareness)
- Close engagement with national authorities and EU bodies

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# *Thank you!*

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TRIĒRĒS

https://www.trieres-h2.eu/

https://www.linkedin.com/company/trieres-h2-valley/

https://www.youtube.com/@TRIERES-H2

Trieres Greek Hydrogen valley

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