TRIĒRĒS
Towards the development of a hydRogen valley demonstrating applications in an integrated EcoSystem in Greece

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Project Overview

Project dates: 01/07/2023 - 01/05/2028

Total project budget: 10,492,431.25€

% stage of implementation 01/11/2023: ~6,5%

Maximum grant amount (decision award): 7,995,825.63€

Call year: 2022
Call topic: HORIZON-JTI-CLEANH2-2022-06-02 | Hydrogen Valleys (small-scale)
Partners and location of the Hydrogen Valley

TRIERES small-scale valley (Greece)

- 26 partners from 5 countries
- Partner categories:
  - Private & public sector companies
  - Local & Regional Authorities
  - Academic & Research Institutions

Egypt
TRIERES Small Scale Valley Value Chain

TRIERES valley geographical coverage

* The 30 MW Electrolyser will be developed and demonstrated in the framework of the EU project EPHYRA co-funded by the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research under Grant Agreement No. 101112220
## Calendar for project implementation and progress

<table>
<thead>
<tr>
<th>TRIÈRES valley component</th>
<th>Responsible partner/Owner</th>
<th>Funding source</th>
<th>1st Phase Development</th>
<th>2nd Phase Deployment</th>
<th>3rd Phase Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Studies - tenders</td>
<td>EPC</td>
<td>Operation</td>
</tr>
<tr>
<td>30 MW Electrolyser</td>
<td>MOH</td>
<td>External to TRIÈRES</td>
<td>2022-23</td>
<td>2023-2024</td>
<td>2025</td>
</tr>
<tr>
<td>Compression &amp; Trailer Filling Terminal</td>
<td>MOH</td>
<td>External to TRIÈRES</td>
<td>2022</td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>NG grid injection compressor</td>
<td>DG</td>
<td>External to TRIÈRES</td>
<td>2023-2024</td>
<td>2024-2025</td>
<td>2026</td>
</tr>
<tr>
<td>3 Tube Trailers</td>
<td>MOH</td>
<td>In TRIÈRES</td>
<td>2022</td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>5 HRS</td>
<td>AVIN</td>
<td>External to TRIÈRES</td>
<td>2022-2024</td>
<td>2023-26</td>
<td>2024-2027</td>
</tr>
<tr>
<td>Port Bunkering facilities</td>
<td>PPA</td>
<td>Studies in TRIÈRES</td>
<td>2023-2026</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hydrogen purification</td>
<td>MOH</td>
<td>External to TRIÈRES</td>
<td>2022</td>
<td>2023</td>
<td>2024</td>
</tr>
<tr>
<td>Pipeline to FULGOR</td>
<td>MOH - FUL</td>
<td>Studies in TRIÈRES</td>
<td>2023-2024</td>
<td>2025</td>
<td>2026</td>
</tr>
<tr>
<td>FC short sea ferry</td>
<td>ECO</td>
<td>In TRIÈRES</td>
<td>2023-2024</td>
<td>2024-2025</td>
<td>2027</td>
</tr>
<tr>
<td>3 Buses</td>
<td>OSY</td>
<td>In TRIÈRES</td>
<td>2023-2024</td>
<td>2024-2025</td>
<td>2026</td>
</tr>
<tr>
<td>Passenger Car(s)</td>
<td>OLOD</td>
<td>In TRIÈRES</td>
<td>2023-2024</td>
<td>2024-2025</td>
<td>2026</td>
</tr>
<tr>
<td>Passenger Car(s)</td>
<td>MOL</td>
<td>In TRIÈRES</td>
<td>2023-2024</td>
<td>2024-2025</td>
<td>2026</td>
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</table>
TRIÈRÈS uses multiple financing sources

• TRIÈRÈS partners have a clear and structured plan to finance the investment within the Valley in line with state-aid rules.
• TRIÈRÈS grant will provide approximate 1% of the valley investment cost to set up the market and disseminate the results to attract more stakeholders.
• TRIÈRÈS entails an investment of 115 mil EUR (initially by project partners) up to 408 million EUR (potential direct/indirect leverage of investments).
• Partners will exploit additional synergies with other tools and funding mechanisms e.g.:
  - Recovery and Resilience Facility (RRF)
  - Connecting Europe Facility (CEF) programme
  - Horizon Europe
  - Loans and equity
Training and Skills

TRIERES Valley development and operation will run in parallel with:

- Focused training activities
  - Over 4 online trainings tutorials
  - 4 webinars and
  - 2 PhD summer schools

- 10 training programs focused on reskilling of personnel

- TRIERES Young Researcher Network (YRN)
  - Provide counsel and training to young researchers and engineers with support from the External Advisory Board to help them excel and develop their careers.

Replication activities

Country based replication - Bridge Hydrogen Valleys’ experience (dedicated WP)
- Collaboration with existing HEAVENN, WIVA P&G HyWest Valleys
- Transfer knowledge and knowhow to developing valleys in EU (Cyprus) and third countries (Egypt)
- Connect with international valleys from Mission Innovation countries

Sector based replication - Build upon and multiply activities
- Maritime applications - More ports and vessels
- Road transport applications - More HRSs and vehicles to other regions
- Industrial applications - Additional industries benefit from the supply plan of TRIERES, as well as the retrofit knowhow for the factories
Lessons Learnt

TRIERES is in first steps! «scio me nihil scire», Socrates

- Capable partners from industry, research and academia to co-develop innovative applications and de-risk investment
- Must have → Engagement of public authorities to receive feedback for legal and regulatory issues that enable the hydrogen economy
- Strategic plan is a pre-requisite, but goes hand in hand with flexible adaptation of the supply chain
- Utilise all financing sources for optimal mix! Identify best funding tools for each project component
TRIÉRĒS is communicated/disseminated using various channels:

- https://www.linkedin.com/company/trieres-h2-valley/
- https://www.youtube.com/@TRIERES-H2
- https://www.trieres-h2.eu/

TRIERES KoM, 28-29 September 2023, Athens, Greece
## Synergies With Other Projects And Programmes

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Source of funding/co-funding</th>
<th>Synergies/Interactions/Joint Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPHYRA - Establishing European production of hydrogen from renewable energy and integration into an industrial environment</td>
<td>HORIZON EUROPE</td>
<td>Clean Hydrogen Partnership</td>
</tr>
<tr>
<td>REA - Construction of an HRS for passenger, light-duty and especially long-haul heavy-duty vehicles in Agioi Theodoroi (Corinth, Peloponnese, Greece)</td>
<td>CEF Transport</td>
<td>Alternative Fuels Infrastructure Facility</td>
</tr>
<tr>
<td>REAH2 - Construction of a HRS for passenger cars, light-duty and heavy-duty vehicles in Akrata (Achaia, Western Greece)</td>
<td>CEF Transport</td>
<td>Alternative Fuels Infrastructure Facility</td>
</tr>
<tr>
<td>IRIS - Innovative low carbon hydrogen and methanol production by large scale carbon capture</td>
<td>Innovation Fund / Large scale Projects</td>
<td>IRIS project comprises a novel, heavily integrated point-source CCUS technology solution, applied on its current hydrogen production process and its coupling to a small-scale methanol production unit, which will utilize part of the captured CO2 as feedstock.</td>
</tr>
</tbody>
</table>
What is the future for Hydrogen Valleys?

- **Expansion** - Provide support in line with GBER to replicate and multiply end-use case applications
- **Inclusion** - Provide incentives for supply chain vendors to participate and increase readiness, resilience and transparency for the procurement of components critical to the hydrogen economy
- **Synergies** - Work with CINEA to explicitly promote synergies between hydrogen valleys and CINEA programmes
- **Connection** - Promote formal hydrogen corridors connecting hydrogen valleys to delimit the geographical deployment of future hydrogen projects
Thank you for your attention!

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The organizational structures of TRIERES are the following:

- **On behalf of EC and CH JU appointed:**
  - PO, FO and 2 external experts to monitor the project
  - A Communication Officer to leverage visibility at EU/global level
- **General Assembly** (ultimate decision-making body)
  - 1 representative per project partner
- **Executive Board** (supervisory consortium body for the project implementation and daily management)
  - All Work Package Leaders led by Project Coordinator
- **External Advisory Board** (high-esteemed experts to provide guidance & advice to the project; enhance visibility of results; connect with networks)
- **Young Research Network (YRN)** (mentor and train young researchers and engineers, through the guidance of the External Advisory Board)
<table>
<thead>
<tr>
<th>Description of risk (likelihood/severity)</th>
<th>Proposed mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow responsiveness of public bodies/ limited resources in managing allocated tasks</td>
<td>• Public governance awareness - Dedicated communication and dissemination strategy/ early engagement and identification of competent divisions, close collaboration and guidance by national and international partners on technical and best practices aspects</td>
</tr>
<tr>
<td>Delays on safety planning and regulatory issues caused by external factors i.e., public authorities (low/low)</td>
<td>• The consortium is in close contact with the ministries of “Transport and Infrastructure” and “Energy and Environment” which are responsible of the relevant legal framework development. Members of consortium support ministries for updating the legal framework.</td>
</tr>
<tr>
<td>Digital twins and artificial intelligence misuse (low/high)</td>
<td>• GDPR compliance, in lined with AI Act, ethical AI systems</td>
</tr>
<tr>
<td>Insufficient staff competences (low/high)</td>
<td>• High skilled employees selected for core project teams, additional external expertise if needed • Good complementarity of consortium competencies</td>
</tr>
<tr>
<td>Delays in the purchasing of the equipment critical to hydrogen supply (low/medium) FCEV Vehicles not available for purchase or leasing (low/medium)</td>
<td>• Early receipt of RFQs for the equipment so as to be are ready to order the equipment from early stages of the project to ensure timely delivery/ To mitigate the impact of potential delays, the missing vehicles will be leased • Early communications in place with multiple manufacturers to ensure the availability of FCEV vehicles according to the detailed calendar of the project</td>
</tr>
</tbody>
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