Interview with Attaqa: World's first' liquid hydrogen corridor to link Oman, the Netherlands and Germany

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Experts: Exporting Liquid Hydrogen Marks a Strategic Shift for the Sultanate of Oman

Exporting liquid hydrogen is one of the most significant features of Oman's strategic transformation, particularly after it signed a historic agreement in April 2025 to develop the world's first global commercial corridor for liquid hydrogen.

This corridor links Duqm Port in Oman with the Port of Amsterdam in the Netherlands, extending to key logistical hubs in Germany, such as Duisburg Port.

Experts, speaking exclusively to *Energy Platform* (based in Washington), affirmed that this agreement—participated in by Hydrom, OQ, and Duqm Port—represents a pivotal step in establishing Oman as a global center for the production and export of green hydrogen.

The Sultanate aims to capture a substantial share of the global clean energy market, targeting an annual production of 1.25 million tons by 2030 and attracting an estimated $49 billion in investments.

A Strategic Leap

Salah Mahdy, Global Director of Hydrogen at **Chart Industries** (a global leader in hydrogen liquefaction and transportation technologies), stated that Oman's move to establish the world's first commercial corridor for exporting liquid hydrogen to the Netherlands and Germany marks a qualitative leap and a forward-looking vision that balances ambition with pragmatism.
He pointed out that this historic agreement sends a clear message to the world: Oman is not merely exploring hydrogen opportunities but is actively implementing them on a broad, tangible scale.

Mahdy noted that this project reflects Oman's direction to become a key player in the global hydrogen economy, leveraging its excellent natural resources (solar and wind energy), strategic geographic location, and strong partnerships with European countries.

He emphasized that the success of this corridor hinges on three main factors:

1. The ability to scale up green hydrogen production and liquefy it cost-effectively.
2. Developing reliable infrastructure—including liquefaction, shipping, and regasification.
3. Aligning these efforts with European energy and demand policies.

If well-executed—as early indicators suggest—this corridor could become a global benchmark for intercontinental hydrogen trade.

A Global Model for Hydrogen Trade

In exclusive comments to *Energy Platform*, Eng. Salah Mahdy said that Oman's choice of **liquid hydrogen (LH_2)** is a strategic one.
He explained that LH_2 allows for the transportation of large volumes over long distances and could follow in the footsteps of the **liquefied natural gas (LNG)** model, making it scalable, tradable, and increasingly economically viable thanks to rapid advances in deep-cooling technologies.
With an integrated system including large-scale green hydrogen production, advanced liquefaction technology, refrigerated container shipping, and regasification

facilities in Europe, this project could become a **global model** for hydrogen trade and a clean energy artery connecting the Middle East to Europe.
Regarding transportation methods, Mahdy explained that the ideal method for exporting hydrogen depends on geography and distance. For short distances or intra-continental distribution, **pipelines** are the most cost-efficient due to lower energy losses and simpler operation.
However, for **intercontinental trade**, like from Oman to Europe, pipelines are not practical. Here, **liquid hydrogen** transported via ocean-going tankers—similar to LNG—becomes the best solution.
He added that **liquefaction and maritime shipping** currently represent the most feasible method for long-distance, cross-border hydrogen transport.

Promising Projects

Mahdy confirmed that several countries in the Middle East and North Africa (MENA) region are exploring similar projects for **liquid hydrogen exports**. Chart Industries is currently working with multiple developers in these countries to locally produce and liquefy hydrogen for efficient export to Europe.
He noted that the region has strong fundamentals, including abundant **renewable energy resources**, long coastlines, and geographical proximity to major demand centers in Europe and Asia. These can be paired with advanced liquefaction and cryogenic transport technologies to meet strategic energy goals.
Oman, as an early mover, is expected to set the **standards and infrastructure models** in this sector. Other Arab countries with industrial bases and investment ambition can follow suit and engage in this vital market.

Strategic Partnerships

Matt Moran, Managing Director of **Moran Innovation LLC**, a leading liquid hydrogen company, said this step gives Oman a strong **first-mover advantage** as other countries begin to pursue the same direction.
In statements to *Energy Platform*, Moran expected Oman to benefit from lessons learned in **Australia's previous hydrogen export experience to Japan**.
Moran highlighted Oman's strengths:

- High solar irradiation levels.
- Low-cost, scalable land for solar plant development.
- Existing gas infrastructure and trained workforce.

He added that the Sultanate also has abundant seawater and methane—both critical for hydrogen production.

Success in this project will require **strategic commercial partnerships** with major importers. Moran identified **the Netherlands and Germany** as ideal partners due to:

- Existing LNG shipping trade relations.
- High energy demand and low seasonal solar irradiance.
- Existing infrastructure to accommodate hydrogen across growing sectors.

He also mentioned that **long-term investments** from sovereign wealth funds could help build the necessary infrastructure.

Achieving Economic Viability

Moran compared export methods—**liquefaction** versus **pipeline transport**—in terms of economic viability. He said the optimal choice depends on the specific use case.
Natural gas infrastructure is more suitable for regional or local distribution (including hydrogen blending in current pipelines), while **liquid hydrogen** is better suited for **long-distance exports** and customers needing it in liquid form for specific applications.
He emphasized a key **integrative advantage**: the ability to generate high-pressure gas from LH_2 without compressors, or using smaller ones—an approach used for decades in **refrigeration industries** through "pressure build-up" systems that also recover part of the energy used in liquefaction.
Moran also pointed to various ways to improve system efficiency using **heat exchangers** that capture the cooling energy in LH_2—elements common in well-designed systems.

The Liquid Hydrogen Export Market

Moran stressed that many Arab countries could enter the LH_2 export market with the same strength as Oman, given their similar capabilities.

Green hydrogen represents a **strategic pathway** for most Middle Eastern countries to transition away from oil and gas, especially as the world seeks to reduce pollution and carbon emissions from fossil fuels.
He noted that **hydrogen systems already exist** in chemical plants and refineries, and there is already a skilled workforce and suitable infrastructure in place.

These assets give Arab nations a **strong competitive edge** to seize this emerging opportunity. Over time, traditional **oil and gas customers** will likely become the new hydrogen consumers, as part of the global energy transition.

Additional Insights

Frank Wouters, Chair of the MENA Hydrogen Alliance and former Deputy Director-General of IRENA, emphasized that **green hydrogen liquefaction** is one viable shipping method, alongside conversion to **ammonia** or use of **liquid organic hydrogen carriers**.
Given the growing momentum in LH_2, the MENA Hydrogen Alliance launched a **Liquid Hydrogen Task Force** last year.
Wouters concluded that **pipeline transport** remains the **most cost-effective** way to move large quantities of green molecules, although shipping offers greater flexibility and avoids complex cross-border pipeline networks.