

**bnc**<sup>®</sup>



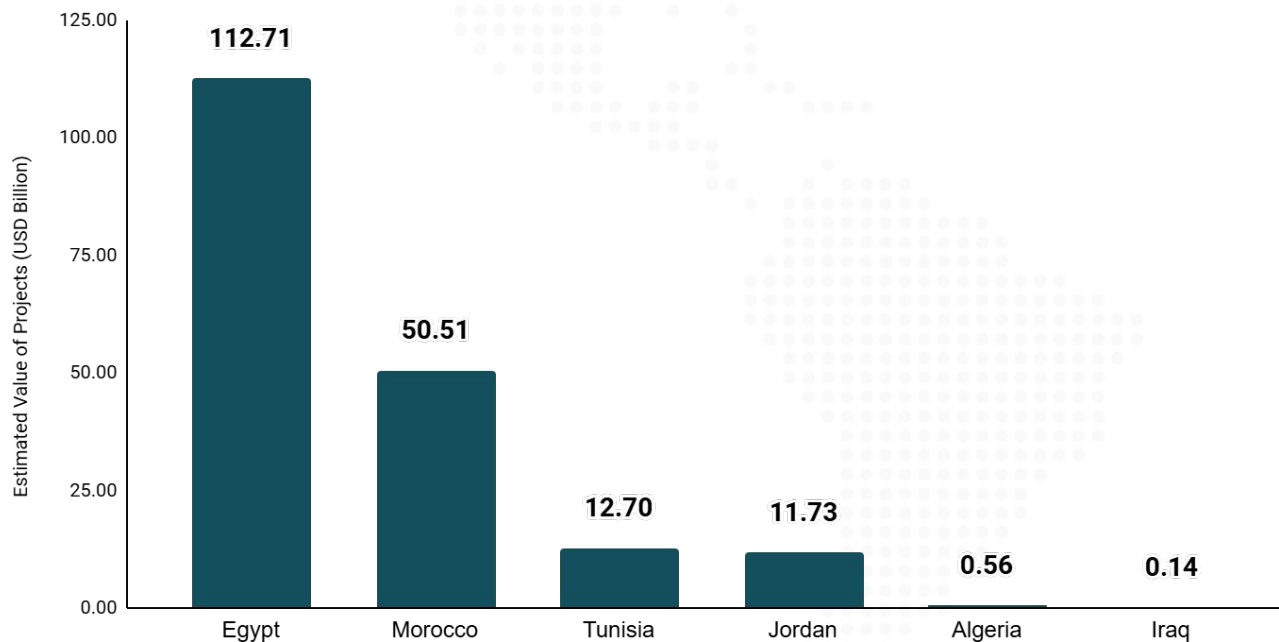
**EGYPES**  
EGYPT ENERGY SHOW

# The Hydrogen Economy: North Africa & East Mediterranean

Report Published by BNC Network  
for EGPES 2025

HYDROGEN H<sub>2</sub>

# Hydrogen Projects Overview

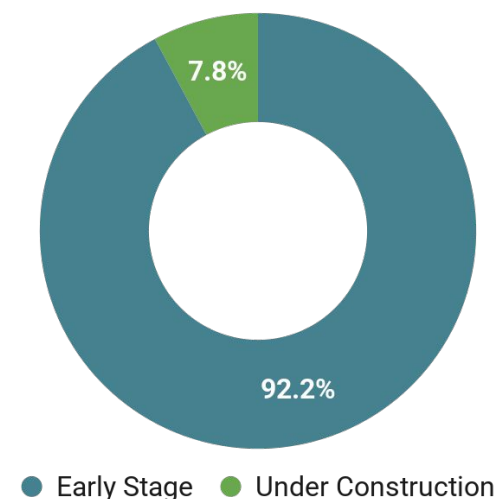


In North Africa and the East Mediterranean, hydrogen presents a unique opportunity to harness abundant renewable energy resources, thus positioning the region as a key player in the global hydrogen market. **Countries such as Egypt, Morocco and Tunisia are spearheading projects that leverage their geographical advantages to produce hydrogen at scale.** These initiatives not only aim to meet domestic energy demands but also to export hydrogen to Europe and other markets, thereby contributing to energy security and diversification.

**Hydrogen projects in the North Africa and the East Mediterranean region are worth nearly USD 190 billion with a large portion still in early stages.**



Stage-wise Distribution of Hydrogen Projects in North Africa and East Mediterranean



# Current Market Landscape

The current state of hydrogen initiatives in North Africa and the East Mediterranean reflects a dynamic landscape characterized by strategic investments, policy frameworks, and collaborative projects aimed at leveraging the region's abundant renewable resources. Countries such as Egypt, Morocco, and Tunisia are positioning themselves as potential leaders in the hydrogen economy through ambitious national strategies that align with global decarbonization efforts.

## Investment in Hydrogen Economy

Investment flows into hydrogen projects are gaining traction, with both public and private stakeholders channeling funds into large-scale initiatives. Governments are rolling out policy incentives, while private investors are increasingly committing capital through partnerships and green financing instruments. Financial institutions are ramping up support through green bonds and sustainability-linked loans, reflecting a growing confidence in hydrogen's commercial viability.

**In September 2020, Egypt became the first country in the Middle East and North Africa to issue sovereign green bonds, raising USD 750 million. Similarly, in 2024, Arab African International Bank (AAIB) issued a USD 500 million sustainability bond, with investments from IFC, the European Bank for Reconstruction and Development (EBRD), and British International Investment (BII), to advance Egypt's green transition and micro, small, and medium-sized enterprises (MSMEs). The sustainability bond is the largest issued by a private bank in Africa - and will support green and sustainable projects in Egypt.**



# Current Market Landscape

## Stakeholders and Policy Frameworks

Regulatory frameworks are evolving rapidly to accommodate the expanding hydrogen sector. Governments are enacting policies that facilitate private-sector participation, streamline project approvals, and ensure compliance with sustainability standards. Stakeholder engagement is becoming a crucial aspect of project development, with an emphasis on minimizing environmental impact and fostering community acceptance. **The Mediterranean Green Hydrogen Partnership (MGHP) is an initiative backed by Hydrogen Europe, aiming to establish a governing body for hydrogen trade between the European Union and North African nations, including Algeria, Egypt, Morocco, Tunisia, and Libya. The partnership focuses on creating a structured framework to facilitate green hydrogen production and export, enhancing collaboration between Europe and North Africa.**

**The Africa Green Hydrogen Alliance was formed by Egypt, Kenya, Mauritania, Morocco, Namibia, and South Africa to intensify collaboration and accelerate the development of green hydrogen projects across the continent.** The alliance focuses on public and regulatory policy, capacity building, financing, and certification needs to mobilize green hydrogen production for domestic use and export. As regulatory clarity improves, hydrogen projects are moving from feasibility assessments to implementation, accelerating the region's progress in clean energy adoption.



# Current Market Landscape

## Export to Europe

European nations are intensifying their engagement with the Middle East to secure long-term energy supplies, with a particular focus on green hydrogen. This collaboration is especially pronounced in North Africa, where abundant renewable resources and strategic proximity to Europe position the region as a key player in the emerging hydrogen economy. As Europe accelerates its transition to clean energy, partnerships with North African countries are expanding to scale up green hydrogen production, establish reliable supply chains, and facilitate seamless export routes to European markets.

**A preliminary agreement between Morocco's OCP Group and France's Engie focuses on projects in desalination, renewable energy, and green hydrogen, potentially leading to investments worth up to €17 billion (~USD 17.6 billion).** The collaboration aims to explore renewable energy production with power storage, green ammonia production, and infrastructure development.

**Tunisia is developing the H2 Notos plant aimed at producing 200,000 metric tons of hydrogen per year, which would be transported to Europe through the 3,300 km SouthH2 pipeline connecting Tunisia to Italy and continuing onto Austria and Germany.** By 2030, Tunisia aims to supply 300,000 tonnes of green hydrogen annually to Europe through the SouthH2 pipeline. This initiative reflects the country's commitment to developing hydrogen infrastructure and strengthening energy ties with Europe.



# Current Market Landscape

## Hydrogen Storage

Advancements in hydrogen storage technologies are playing a key role in scaling up the hydrogen economy. High-pressure storage solutions, metal hydrides, and chemical storage methods are being developed to enhance the efficiency and safety of hydrogen transport. The deployment of these technologies is already underway, supporting industrial applications and enabling the integration of hydrogen into power generation, transportation, and maritime sectors. With ongoing research and pilot programs, storage innovations are steadily addressing the logistical challenges of hydrogen adoption.

Emerging projects in the region are illustrating the practical applications of hydrogen technologies and their integration into existing energy systems. **Notable initiatives include pilot plants for hydrogen production, development of hydrogen storage solutions, and the establishment of demonstration projects focused on the use of hydrogen in the maritime and transport sectors. Examples include two pilot plants by Siemens and a pilot plant by TAQA in Egypt and one in Algeria by Sonatrach in partnership with Eni.**

These projects not only serve as proof of concept but also provide valuable insights into the operational challenges and economic feasibility of hydrogen deployment at scale.



# Technological Innovations - Green Hydrogen Production

Emerging techniques for hydrogen production are gaining traction, particularly as technological advancements lead to more efficient and cost-effective methods. Beyond traditional electrolysis, innovations such as photoelectrochemical water splitting and thermochemical cycles are being explored.

The integration of such technologies could facilitate the establishment of a robust hydrogen production infrastructure, leveraging local resources and minimizing carbon footprints, thereby aligning with global decarbonization efforts.

## **Solar Hydrogen Production Methods**

Solar hydrogen production methods are emerging as a pivotal technology in the transition towards a sustainable hydrogen economy, particularly in regions with abundant solar resources like North Africa and the East Mediterranean.

**One of the most prominent solar hydrogen production techniques is solar water electrolysis, which utilizes electricity generated from photovoltaic (PV) panels to split water molecules into hydrogen and oxygen.** This method benefits from the decreasing costs of solar photovoltaic systems, making it an economically viable option for large-scale implementation. Furthermore, advancements in electrolyzer technology are improving efficiency and reducing operational costs, which will be crucial for the scalability of this approach.

**Another innovative method is solar thermochemical hydrogen production, which employs concentrated solar power (CSP) to drive endothermic chemical reactions that produce hydrogen.** This process typically involves high-temperature reactions in a two-step cycle that can yield hydrogen from water and other feedstocks. The potential for CSP systems to operate at high temperatures opens new avenues for hydrogen production, particularly when coupled with suitable catalysts.

# Technological Innovations - Green Hydrogen Production

Additionally, **photoelectrochemical (PEC) water splitting** represents a cutting-edge approach for solar hydrogen production. This technology combines photovoltaic materials with electrolysis to directly convert sunlight into chemical energy stored in hydrogen. PEC systems can potentially achieve higher efficiencies than traditional electrolysis, as they eliminate the need for separate photovoltaic and electrolysis components. Research and development in this area are advancing rapidly, and successful deployment could position the region as a leader in innovative hydrogen production techniques, further enhancing its role in the global hydrogen market.

## Wind Energy and Hydrogen Generation

The North Africa and the East Mediterranean region is endowed with vast wind resources, making it a prime candidate for harnessing wind power to produce renewable hydrogen.

The integration of wind energy into hydrogen production relies on electrolysis, where electricity generated from wind turbines is used to split water into hydrogen and oxygen. This process is particularly advantageous in areas with high wind potential, as it allows for the production of hydrogen on a large scale while minimizing greenhouse gas emissions. Furthermore, advancements in electrolyzer efficiency and cost reductions make this method increasingly viable for large-scale deployment. Investments in infrastructure to support the integration of wind and hydrogen technologies are crucial for realizing this potential.

## Biomass and Other Emerging Techniques

Utilizing organic materials for energy production not only aligns with regional renewable energy goals but also offers a sustainable pathway for hydrogen generation. **Biomass can be converted into hydrogen through various processes, including gasification and anaerobic digestion.** These methods enable the extraction of hydrogen while simultaneously addressing waste management challenges, making biomass a dual-purpose resource.

# Technological Innovations - Hydrogen Storage

An effective hydrogen economy necessitates a comprehensive understanding of storage technologies, which play a pivotal role in the production, transportation, and utilization of hydrogen. Consequently, several innovative storage technologies have emerged, tailored specifically to meet the demands of hydrogen as a clean energy carrier.

## **Compressed Hydrogen Storage**

Compressed hydrogen storage is one of the most widely adopted methods. It involves compressing hydrogen gas to high pressures, typically between 350 and 700 bar, and storing it in high-strength cylinders or tanks. This technology is particularly advantageous for transport applications, allowing hydrogen to be easily distributed and utilized in fuel cell vehicles. However, the energy costs associated with compression and the structural integrity of storage vessels are critical considerations in hydrogen infrastructure development.

## **Liquid Hydrogen Storage**

Liquid hydrogen storage represents another prominent technology, where hydrogen is cooled to cryogenic temperatures, approximately -253 degrees Celsius, to achieve a liquid state. This method significantly reduces the volume required for storage and transport, making it suitable for large-scale applications. However, the energy-intensive liquefaction process and the need for specialized cryogenic tanks present economic challenges.

## **Metal Hydrides and Chemical Hydrogen Storage**

Metal hydrides and chemical hydrogen storage are emerging as alternative technologies that offer potential advantages in terms of safety and energy density. Metal hydrides involve the formation of solid compounds with metals, allowing hydrogen to be stored in a stable solid form. This technology can mitigate some risks associated with gaseous storage, making it an attractive option for stationary applications. Chemical hydrogen storage, on the other hand, involves reversible reactions that release hydrogen when needed. These technologies could play a crucial role in decarbonizing sectors such as maritime transport, where high energy densities and safety are paramount.

# Key Players

Government entities play a pivotal role, with energy ministries in the Middle East leading the charge in establishing regulatory frameworks and supportive policies that facilitate the growth of hydrogen projects.

In addition to government bodies, a robust network of private sector stakeholders is crucial for the advancement of hydrogen technologies. Global energy companies, ranging from established oil and gas firms to innovative startups, are investing in renewable hydrogen production techniques that harness the region's abundant solar and wind resources.

## Key International Energy Companies



## Key Government Entities



Ministry of Energy and Mineral Resources

The Hashemite Kingdom Of Jordan



Ministry of Electricity and Renewable Energy  
New and Renewable Energy Authority

# Drivers of Hydrogen Projects in North Africa & East Mediterranean

- **Abundant Renewable Resources:** The region benefits from high solar irradiation and strong wind resources, making it ideal for large-scale green hydrogen production.
- **Strategic Geographic Location:** Proximity to Europe provides a significant advantage for exporting hydrogen to meet the EU's decarbonization targets.
- **Growing Government Support & Policy Frameworks:** Countries like Egypt, Morocco, and Tunisia have introduced national hydrogen strategies, facilitating investment and regulatory clarity.
- **Increasing Investment & Financial Innovation:** Green bonds, public-private partnerships, and international funding opportunities are accelerating project development.
- **Integration with Existing Infrastructure:** Hydrogen can be blended into existing natural gas pipelines, reducing the need for entirely new transport networks.
- **Decarbonization of Hard-to-Abate Sectors:** Hydrogen can be used in industries like steel, cement, and transportation (maritime, aviation), reducing carbon emissions.
- **Technology & Innovation Advancement:** Pilot projects, research collaborations, and regulatory sandboxes can accelerate hydrogen technology development and commercialization.
- **Ammonia Production & Export:** Green hydrogen can be used for ammonia production, creating an additional export avenue for North African countries looking to serve global fertilizer and energy markets.
- **Hydrogen-Powered Transportation:** Beyond maritime and heavy industry, the development of hydrogen-based transport solutions (e.g., fuel cell buses, trucks, and trains) could be an emerging market for the region.
- **International Collaborations & Joint Ventures:** Increased partnerships with the EU, China, and Gulf nations could bring technical expertise, funding, and market access.

# Challenges in Developing a Hydrogen Economy in North Africa & East Mediterranean

- **High Initial Investment Costs:** Electrolyzers, hydrogen storage, and transportation infrastructure require significant capital, often posing financial risks.
- **Regulatory & Policy Uncertainty:** A lack of standardized hydrogen policies and safety regulations can deter investors and slow project implementation.
- **Infrastructure Gaps:** Existing pipelines, ports, and distribution networks need adaptation or expansion to accommodate hydrogen transport and storage.
- **Energy & Water Demand for Electrolysis:** Hydrogen production via electrolysis requires substantial electricity and fresh water, which may strain resources in water-scarce regions.
- **Market Uncertainty & Demand Volatility:** The global hydrogen market is still developing, and price competitiveness against fossil fuels remains a challenge.
- **Technical Challenges in Storage & Transport:** Hydrogen has a low energy density, making storage and transport (as compressed gas or liquid) costly and technologically demanding.
- **Competition from Other Energy Sources:** Natural gas and alternative clean energy solutions, such as battery storage, may compete with hydrogen for investment and market adoption.
- **Security & Geopolitical Risks:** Political instability, trade restrictions, and conflicts in parts of North Africa and the East Mediterranean could impact cross-border hydrogen supply chains.
- **Grid Integration Challenges:** Scaling up hydrogen production alongside renewable energy projects requires significant grid enhancements, which may be costly and technically challenging.
- **Long-Term Economic Viability:** Hydrogen production costs remain high compared to fossil fuels, and achieving cost competitiveness requires sustained policy support, technological breakthroughs, and economies of scale.

# Top 10 Hydrogen Projects in North Africa and East Mediterranean

## ACME - Green Hydrogen Plant - Ain Sokhna Industrial

### Zone

**Value:** USD 12 billion

**Country:** Egypt

**Stage:** Concept

**Developers:** Suez Canal Economic Zone (SCZone), New and Renewable Energy Authority (NREA), Acme Solar Holdings Ltd., Egyptian Electricity Transmission Co. (EETC), The Sovereign Fund of Egypt

**Hydrogen Production Capacity:** 2.2 mtpa

**Completion:** Q4 2028

## TAQA - 6GW Green Hydrogen Station - Lagouira

**Value:** USD 10.2 billion

**Country:** Morocco

**Stage:** Concept / Pre-FEED

**Developers:** Taqa Morocco

Production Capacity

**Power Generation Capacity:** 6GW

**Completion:** Q4 2030

# Top 10 Hydrogen Projects in North Africa and East Mediterranean

## K&K - Green Hydrogen Plant - Suez Canal Economic Zone

**Value:** USD 8 billion

**Country:** Egypt

**Stage:** Concept

**Developers:** Egyptian Electricity Transmission Co. (EETC), Suez Canal Economic Zone (SCZone), Kk Power International LLC, Renew Power Private Limited, New and Renewable Energy Authority (NREA), The Sovereign Fund of Egypt

**Hydrogen Production Capacity:** 0.23 mtpa

**Completion:** Q4 2028

## MEMR/Amarenco/H2 Global Energy - Green Hydrogen/Ammonia Production Facility

**Value:** USD 8 billion

**Country:** Jordan

**Stage:** Concept

**Developers:** Ministry Of Energy & Mineral Resources (MEMR), H2 Global Energy, Spectrum International For Renewable Energy Investments (Amarenco)

**Hydrogen Production Capacity:** 1 mtpa

**Completion:** Q4 2030

# Top 10 Hydrogen Projects in North Africa and East Mediterranean

## White Dunes Green Hydrogen Plant

**Value:** USD 8 billion

**Country:** Morocco

**Stage:** Concept/Pre-FEED

**Developers:** Falcon Capital, Hydrogène de France (HDF Energy)

**Power Generation Capacity:** 17GW

**Completion:** Q3 2028

## ACWA Power - 12GW Green Hydrogen & Renewable Energy Plant

**Value:** USD 7.7 billion

**Country:** Tunisia

**Stage:** Concept

**Developers:** Ministry of Industry and Small and Medium Enterprises (Tunisia), Acwa Power

**Power Generation Capacity:** 12GW

**Hydrogen Production Capacity:** 0.6 mtpa

**Completion:** Q4 2030

# Top 10 Hydrogen Projects in North Africa and East Mediterranean

## China Energy Green Hydrogen Plant - Suez Canal

### Economic Zone

**Value:** USD 6.8 billion

**Country:** Egypt

**Stage:** Under Construction

**Developers:** Egyptian Electricity Transmission Co. (EETC), Suez Canal Economic Zone (SCZone), New and Renewable Energy Authority (NREA), The Sovereign Fund of Egypt

**Hydrogen Production Capacity:** 0.21 mtpa

**Completion:** Q4 2028

## Green Hydrogen Pipeline Between Morocco & Italy

**Value:** USD 5 billion

**Country:** Morocco

**Stage:** Concept/Pre-FEED

**Developers:** Government of Morocco

**Completion:** Q4 2029

# Top 10 Hydrogen Projects in North Africa and East Mediterranean

## 1GW Waste to Hydrogen Plant - East Port Said

### Industrial Zone

**Value:** USD 4 billion

**Country:** Egypt

**Stage:** Concept

**Developers:** Suez Canal Economic Zone (SCZone), H2 Industries

**Power Generation Capacity:** 1GW

**Hydrogen Production Capacity:** 0.3 mtpa

**Completion:** Q4 2026

## Green Hydrogen Plant - Southern Region

**Value:** USD 3 billion

**Country:** Morocco

**Stage:** Under Construction

**Developers:** Gaia Energy

**Power Generation Capacity:** 8GW

**Hydrogen Production Capacity:** 0.32 mtpa

**Completion:** Q4 2027

# Conclusion

The vision for a sustainable hydrogen future in North Africa and the East Mediterranean hinges on the strategic integration of renewable energy resources with innovative hydrogen production techniques. The deployment of electrolyzers powered by renewable energy will enable the large-scale production of hydrogen, addressing both local energy needs and export potential.

Cross-border hydrogen trade presents significant opportunities for collaboration among countries in the East Mediterranean. As nations recognize the potential of hydrogen as a clean energy carrier, establishing trade agreements and infrastructure to facilitate cross-border exports becomes imperative. By investing in pipelines and transport solutions, nations can ensure the efficient movement of hydrogen to meet both domestic and international demands, thereby enhancing energy security and economic resilience.

Investments in hydrogen fuel cell technologies for shipping and heavy-duty transport will contribute to cleaner air and lower emissions in urban areas. Moreover, the development of hydrogen refueling infrastructure will be crucial to support the adoption of hydrogen-powered vehicles, creating a seamless transition towards a sustainable transport system.

**Collaborative efforts among regional stakeholders will enhance knowledge sharing and accelerate the deployment of these technologies, ensuring that North Africa can position itself as a leader in the global hydrogen market.**



**EGYPES**  
EGYPT ENERGY SHOW

**COPYRIGHT**

© 2025, Industry Networks (FZC). The content, organization, graphics, design, compilation, magnetic translation, digital conversion and other matters related to BNC are protected under applicable copyrights, trademarks and other proprietary (including but not limited to intellectual property) rights. The copying, redistribution, use or publication of any such matters or any part of BNC, is strictly prohibited.



[www.bncnetwork.net](http://www.bncnetwork.net)