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MED•GEM
MEDITERRANEAN GREEN ELECTRONS AND MOLECULES
NETWORK

Powering the New Pact

# MED GEM MAG

Green Electrons & Molecules
for a Mediterranean Future

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# Edito

## Hercule and the MED-GEM Network

Heracles (also known as Hercules), the mythical Greek hero famously strangled two large snakes as a baby, and later went on to perform 12 heroic tasks across the Mediterranean. Perhaps slightly less heroic, the MED-GEM Network was established to create a Mediterranean community to advance four clean energy topics: policy, infrastructure, industrial development and finance. And the MED-GEM team communicates meaningful results to increase awareness. We bring together actors from both the public as well as the private sector and it is worth looking at each of these topics separately.

A major piece of relevant policy is the EU's Carbon Border Adjustment Mechanism or CBAM, which aims to prevent so-called carbon leakage. CBAM applies a similar emission reduction logic on goods imported into the EU as if they would have been produced inside the EU. It applies among other things to hydrogen, fertiliser and steel, and both can be made cost-effectively using renewable energy in Southern Mediterranean Countries. The MED-GEM Network has organised several information sessions on the mechanics of CBAM, which have proven to be extremely insightful and very popular. We currently organize an online CBAM Monthly Help Desk, allowing people to ask questions to experts.

A major infrastructure project is the South H2 Corridor. In January this year, a Joint Declaration of Intent (JDoI) has been signed by representatives of Germany, Algeria, Italy, Austria and Tunisia in Rome to strengthen European-North African collaboration on the project. The initiative will establish a hydrogen pipeline between North Africa, Italy, Austria and Germany, spanning 3,500-4,000km. The next step for the consortium is to finalise plans for the hydrogen pipeline across the Mediterranean, which is supported by the German government.

The MED-GEM Network was instructed by the Industry Advisory Board to study the creation of local value in the upcoming green energy economy. After an initial baseline gap analysis, we continue the work with a regional integration analysis assessing the potential for regional integration, cross-border collaboration opportunities, and the strategic alignment of manufacturing capabilities across countries. The work will pinpoint national barriers and opportunities to better inform policy and investment decisions, leverage regional strengths and complementarities, and develop a harmonized industrial ecosystem that supports innovation, supply chain integration, and sustainable growth.

In the field of finance, European development banks EIB and EBRD support lending to green initiatives, and Germany's H2Global developed a financial mechanism to support the import of green molecules into the European Union through competitive auctions. The first project supported by H2Global was a green ammonia project in Egypt. After successfully concluding a scoping study on financing green energies, the MED-GEM network organized a successful and well-attended finance workshop early April.

The MED-GEM Network has successfully built a cooperative framework between the involved countries and builds on this framework to advance a common agenda. The scale and urgency to build a green energy economy around the Mediterranean is herculean, but the momentum and positive-cooperative atmosphere brings the common objectives within reach. We don't need to kill snakes to make it happen.

Frank Wouters

# Expert voice

## Unlocking a Green Hydrogen Future in the Southern Mediterranean: Infrastructure, Industry, and Regional Cooperation

Green hydrogen has emerged as a cornerstone of the global energy transition - particularly for decarbonizing sectors that are difficult to electrify, such as heavy industry, chemical manufacturing, and long-distance transport. The Southern Mediterranean Countries (SMCs) are uniquely positioned to become a global hub for green hydrogen production and export, thanks to their exceptional renewable energy potential, existing energy infrastructure, and geographic proximity to Europe.

**The SMCs stand at a pivotal moment**. By taking collective action, the region can emerge as a globally competitive green hydrogen hub - driving industrial growth, enhancing energy security, and contributing to global climate goals. Cooperation across borders is not just beneficial - it is essential. Through joint planning, strategic investment, and strong partnerships, the Southern Mediterranean can turn potential into power and opportunity into impact.

Realizing this vision requires more than natural advantages. It demands a focused, collaborative effort to strengthen regional infrastructure, develop domestic industrial capacity, and foster cross-border integration. Recent analyses conducted under the MED-GEM Network provide a clear roadmap for how the SMCs can move from ambition to implementation - through investments, policy reforms, and coordinated partnerships.

A regional gap analysis reveals that while foundational infrastructure exists - including ports, power grids, and natural gas pipelines - key upgrades are urgently needed. Desalination capacity must increase, pipelines repurposed or built for hydrogen, and port infrastructure adapted to enable export.

Equally critical is the development of local manufacturing capabilities for electrolyzers, storage systems, and renewable energy components. Consultations show that many existing industries could be adapted, but face technology gaps, financing challenges, and limited supply chains. Policy tools such as R&D support, public-private partnerships, and local content requirements can catalyze industrial growth.

Mustapha Taoumi

To accelerate progress, five strategic actions are recommended:

- Develop a coordinated regional infrastructure strategy
- Strengthen domestic manufacturing capacity
- Harmonize standards and regulatory frameworks
- Invest in human capital and skills development
- Leverage joint financing mechanisms

With decisive, cooperative action, the SMCs can lead in green hydrogen - not only as exporters, but as drivers of innovation, value creation, and regional integration. The opportunity is clear. The time to act is now



## "Creating a network means planting connections. Growing it means listening, translating, bringing people together."

Over the past two years, I've had the privilege of helping the MED-GEM Network become not just a project, but a living, breathing community - built through stories, shared challenges, and common ambition. My role has been to give it narrative coherence, identity, and visibility.

From the very first article to the first podcast, from the DCV plan to the $GH_2$ Camps and the launch of the EDU-HUB, this network has grown word by word, event by event. With my team, we've coordinated more than 100 editorial pieces, created new formats, and opened up technical discussions to wider audiences - through articles, videos, social media, and conversations.

This work happened in constant dialogue with our partners in 10 countries - navigating institutional validations, national sensitivities, and most of all, a desire to co-build. Behind every campaign, every translation, and every approval, there was one clear mission: to make a shared vision visible.

From Brussels to Beirut, Cairo to Sidi Bou Saïd, we've connected ministries and industrials, students and donors, experts and communicators. And if launching MED-GEM was the challenge, growing it into a trusted voice for green hydrogen in the Mediterranean has truly been the honour.

**"And the most exciting part is what comes next."**

Raya Ben Guiza Verniers

# Voices from DG MENA & Gulf

## A new pact for the Mediterranean: Green hydrogen and a shared horizon

***This pact will outline how the EU can support regional aspirations in renewable energy, clean tech manufacturing, and connectivity. Green hydrogen is central to this vision.*** - Giulio Gentile

At the Fourth Steering Committee of the MED-GEM Network, held in Istanbul in December 2025, policymakers and energy leaders gathered to chart the next chapter of cooperation in the Mediterranean. In a podcast episode recorded on-site, Frank Wouters sat down with two key figures from the European Commission: Giulio Gentile, Team Leader at DG NEAR, and Milou Beerepoot, Programme Manager for Regional Energy Programmes.

Their dialogue revealed the contours of the forthcoming Mediterranean Pact - an ambitious EU initiative that places the region at the heart of Europe's green transition strategy.

### A Commissioner for the Mediterranean

For the first time, the European Commission has appointed a **Commissioner specifically dedicated to the Mediterranean region**, reflecting a renewed institutional focus. ***This is not just about diplomacy - it's about delivering tangible results***, explained Gentile. The Pact, to be unveiled in 2025, will articulate clear actions to scale renewable energy, expand clean tech manufacturing, and build cross-border infrastructure.

### Green hydrogen and cross-border cooperation

At the core of the Pact lies **green hydrogen**, described by Gentile as ***a key enabler of regional cooperation***. With funding from the **Global Gateway** strategy and mechanisms like the EU **Hydrogen Bank** and **H2Global**, the EU aims to create a Mediterranean hydrogen corridor that links North and South in a mutually beneficial partnership.

Pilot initiatives are already moving forward. ***We're not just talking vision - we're testing certification, cross-border trade, and industrial partnerships***, said Gentile. Wouters noted the strong interest from private sector actors, eager to see how such partnerships will translate into investment opportunities.



### Morocco as a testing ground

Beerepoot highlighted the Morocco hydrogen certification pilot as a turning point. ***This is the first time we're applying EU-recognised certification schemes outside Europe***, she said. The pilot aims to ensure that renewable hydrogen produced abroad meets the same standards required within the EU.

***This is not about erecting trade barriers***, Beerepoot clarified. ***It's about a common framework that builds trust and enables trade***. The impact extends beyond the Mediterranean: countries in Latin America and Asia have expressed interest in replicating the model.

### From vision to practice

The MED-GEM Network continues to act as a laboratory for EU climate diplomacy. With an open, competitive selection process for its pilot project, the Network is demonstrating a transparent and scalable model. ***It's not just a policy forum - it's where the future of hydrogen is being built***, Wouters concluded.

As 2025 approaches, the MED-GEM community stands poised to transform ideas into action - and to ensure that the Mediterranean becomes a hub of clean energy cooperation.

# Voices from the network

On the eve of his death, Pope Francis I gave a long and inspiring speech on what it means to "be happy". I invite everyone to read it, because whatever our beliefs or convictions, the content is universal. I'd like to extract one tiny sentence to illustrate what MED-GEM has represented to me, as project manager, since its start in January 2023:

« Use obstacles to open windows of intelligence. »

I ardently believe that if MED-GEM has been so successful, despite the many challenges it has faced, it is thanks to the intelligence brought to the fore by all its stakeholders. Our collective intelligence that led to creativity, collaboration and perseverance. It took wisdom for all to understand the importance and urge to develop renewable energy in a collaborative way, amidst all other societal needs and economical competition. It took common sense to organize regional activities in the complicated and unfortunate climate that we all know. It took brainpower to ensure that all network members, whatever their level of development in the renewable energy sector, could reap the rewards. I'm proud to have been able to contribute to the positive results generated by this project, and even prouder that it has been granted additional time and funding to do more. The MED-GEM team is committed to working with its partners to continue along the path of intelligence. Whatever obstacles raise in front of us, we will open windows of intelligence to overcome them. Togethet, as a network of actors. See you soon

Tiziana de Harlez

As the Hydrogen economy is still emerging in the region, Lebanon, in partnership with the MED-GEM Network, embarked on studying the potential of Green Hydrogen ($GH_2$) in the country at the level of production, local use, and export, aiming to have a national strategy in this rapidly developing sector. This study came as a request from the General Director of the Lebanese Center for Energy Conservation during the national consultation workshop for $H_2$ development in Lebanon, which was held on the 20th of September 2023 in Beirut during the Beirut Energy Week. The study has been completed where a preliminary national roadmap for $GH_2$ has been developed and is yet to be validated and endorsed by the Ministry of Energy and Water, putting Lebanon on the right track to contribute to a sustainable $GH_2$ transition across the Southern Mediterranean region. Furthermore, the MED-GEM Network organized a $GH_2$ summer camp and hackathon during the months of September and October of 2024, where students from all universities across Lebanon actively took part in, coming up with brilliant ideas and business cases. The winning team participated in one week study trip at the Friedrich-Alexander-Universität Erlangen-Nürnberg in Germany where their idea is being transformed into a full-blown concept note to be presented to potential donors and project developers.

Toufic Rizkallah

Developing a green hydrogen market goes far beyond simply exporting to the EU; it's also about creating local value and tapping into domestic demand. In Jordan, for instance, $GH_2$ holds great potential in the country's flourishing fertilizers sector, where it could replace imported grey ammonia with a cleaner, locally produced alternative. $GH_2$ can also serve as a sustainable source of industrial heat in the country, as highlighted in a recent MED-GEM Network study. And these are just a few examples. The transition to $GH_2$ is expected to become more cost-competitive in the future, especially with government support. The beauty of the MED-GEM Network lies in how it could bring such possibilities in member countries to light, proving that building a $GH_2$ economy can benefit everyone.

Bandaly El-Issa

## The MED-GEM Core Team:

Milou Beerepoot | Project Manager, Energy Neighbourhood South (DG MENA)

Frank Wouters | Director

Dr. Mustapha Taoumi | Renewable & Green Technologies Expert

Raya Ben Guiza | Communication & Information Expert

Toufic Rizkallah | Technical Manager (GIZ)

Bandaly El-Issa | Junior Energy Advisor (GIZ)

Yasmina Tarhbalouti | Project manager (GIZ)

Tiziana de Harlez | Project manager (GIZ)

Najoua Nafti | Project manager (GIZ)

# Timeline

## 2022-2025 KEY MILESTONES & REGIONAL ENGAGEMENT

### 2022 - Foundations laid

**Q4 2022** – MED-GEM is launched by the European Commission (DG NEAR), and GIZ Ins is selected as implementing partner.. Initial scoping confirms priority pillars: *Policy*, *Finance*, *Industry*, and *Awareness*.

### 2023 - Setting the groundwork

**January 2023 - Brussels** - Kick-off meeting with DG NEAR, DG ENER, DG CLIMA; establishment of the Steering Committee and formalization of national focal points.

**April-July 2023 - Field Missions to Jordan, Morocco, Lebanon** - Meetings with ministries, energy agencies, and GIZ offices. Development of detailed country profiles and initial CHRA data collection.

**May 2023 - UfM Energy Platforms, Barcelona** - MED-GEM officially presented to the regional energy community; partnerships initiated with MEDREG, MED-TSO, RCREEE, and MEDENER.

**September 13, 2023 - Brussels** - 1st *Steering Committee* and EU Stakeholders Consultation Workshop.

**September 20, Beirut** - 1st *National Consultation Workshop* (NCW) in Lebanon during Energy Week. A draft hydrogen roadmap is launched.

**October 10, online** - *MedTSO x MED-GEM first webinar* on Mediterranean Transmission System Operators.

**October 23** - First Newsletter

**November 22, Amman** - *EU-Jordan Hydrogen Dialogue* confirms Jordan's ambition to align its hydrogen vision with EU frameworks.

**December 19, Brussels** - 2nd *Steering Committee* Meeting.

**December 20, Brussels** - 1st *Industry Advisory Board* (IAB): Working groups on skills, infrastructure, and local value creation officially launched.

### 2024 - Building technical muscle

**January 31, Online** - *MED-GEM x RCREEE Podcast*: A special post-Clean Energy Day dialogue with Frank Wouters and Jawad El Kharraz.

**February 8**, *Podcast* - MED-GEM & RCREEE Celebrating International Clean Energy Day

**February 23, Beirut** - Workshop on legal frameworks for hydrogen hosted with WEC-Lebanon and LCEC.

**March 27, Beirut** - MED-GEM moderates the *Lebanon Committee of the World Energy Council* panel on green hydrogen's future in Bekaa Valley.

**April 3, Online** - *MEDREG x MED-GEM Webinar* on transport and storage infrastructure.

**April 29, Online** - *IRENA x MED-GEM Webinar*: Leveraging industry to accelerate $GH_2$ deployment.

**May 15, Istanbul** - MED-GEM showcases its tools and youth outreach at *UfM Mediterranean Green Week*.

**June 10, Brussels/Online** - *Hybrid CBAM Training* with DG CLIMA and DG TAXUD; launch of Help Desk and regional compliance resources.

**June 10-11, Brussels** - 3rd *Steering Committee* and 2nd *IAB*: presentation of country fiches and pilot certification updates.

**July 1-6, Benguerir** - *$GH_2$ Morocco Camp*: 8 teams tackle challenges, 3 winners pitch at World PtX Summit.

**July 23, Online** - *Awareness Webinar* for $GH_2$ Lebanon Camp with EU Neighbours South and LCEC.

**September 3, Online** - *Joint Webinar with UNIDO & RCREEE* on Green Hydrogen Valleys.

**September 4, Online** - *Israel NCW #2* includes EU grant writing and skills gap roundtable.



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**September 17, Beirut** - *Hackathon finale*: 4 Lebanese teams present the concept of a "$GH_2$ Valley" for the Bekaa region.

**October 1-3, Cairo** – RCREEE CSEW: Egypt CC presents green hydrogen corridor scenarios.

**October 8-9, Marrakech** - *World PtX Summit*: MED-GEM youth teams and pilot results featured; hackathon winners awarded study trip.

**October 21, Online** - *Just-Green AFRH2ICA Webinar #1*: African green hydrogen imports and EU energy system impacts.

**October 15-16, Vienna** - *14th Dii Desert Energy Summit*: MED-GEM joins the investment and storage agenda.

**November 14, Online** - *Just-GreenAFRH2ICA Webinar #2*: Benchmarking hydrogen, e-fuels, and derivative imports.

**November 19, Brussels** - *EU Hydrogen Week*: Country fiches and EU regulation navigator presented.

**November 28, Online** - *IRENA x MED-GEM Webinar* on standardization and metrology for $GH_2$ in SMCs.

**December 9, Online** - *LDES Webinar*: Long-duration energy storage for balancing renewables.

**December 17-18, Istanbul** - *4th Steering Committee* and *3rd IAB*: Gap analysis results, launch of EDU-HUB and financing action plans.

### 2025 - Turning plans into action

**January 28, Online** - *International Clean Energy Day Webinar* with Women in $GH_2$, MED-GEM, UNIDO and EU Neighbours South.

**March 19, Online** - *Pitstop #3*: Focus on strategic hydrogen reserves with OMEC and EC stakeholders.

**March 25, Online** - *CBAM Help Desk Info session*: Regulation updates and PtX e-learning preview with PtX Hub.

**May 14, Online** - *PtX Hub x MED-GEM Webinar*: "Sustainable Aviation Fuel - A Business Opportunity for MENA?"

**June 2025, Rotterdam** (TBC) - *Final Steering Committee & IAB*: Legacy review and Phase II launch planning.

**July 7-11, Sidi Bou Saïd** - *$GH_2$ Tunisia Camp*: First Euro-Med regional edition, with mixed EU–SMC teams and policy labs.

**October 15-16, Vienna** - *14th Dii Desert Energy Leadership Summit 2025*: MED-GEM delivers Phase I lessons to global audience.

### MED-GEM Phase I in numbers:

- 10 Country Fiches
- 17 Gap Analysis
- 5 National Consultation Workshops (Lebanon, Jordan, Israel, Egypt, Morocco)
- 3 GH2 Camps (Summer Schools & Hackathons - Morocco, Lebanon, Tunisia)
- 18 Webinars
- 4 Steering Committee Meetings
- 3 Industrial Advisory Board (IAB) Meetings
- 3 IAB PitStop Meetings
- 500+ stakeholders directly engaged
- More than 80 articles published
- 20 Newsletters
- 20 Podcasts
- 62 Videos

# Country snapshots

## Achievements | Priorities | 2025-2030 recommandations

### EGYPT

#### Achievement

- 30+ MoUs signed on GH2
- National GH2 Strategy (2024)
- Suez Canal Economic Zone (SCZone) emerging as GH2 hub

#### Priorities

- Ramp-up RE (target: +19 GW)
- Export via ammonia from Ain Sokhna
- CBAM certification roadmap

#### 2025-2030 recommandations

- SCZone H2 Valley deployment
- First large-scale export pilot
- Convert MoUs to Final Investment Decision (FID)

### JORDAN

#### Achievement

- 29% RE in electricity mix (2023)
- 12+ H2 MoUs signed
- National GH2 Strategy (29 GW electrolysis target)

#### Priorities

- Develop Aqaba hydrogen valley
- Align incentives and infra planning
- Structure Technical and Vocational Education and Training (TVET) on PtX skills

#### 2025-2030 recommandations

- Establish modular training centres
- Build Aqaba infrastructure zone
- Launch certification roadmap

### ISRAEL

#### Achievement

- National H2 strategy (2023)
- 7 desalination plants in operation
- High-tech GH2 R&D ecosystem

#### Priorities

- Retrofit Israel Natural Gas Lines (INGL) pipelines for H2
- Create decentralized H2 production hubs
- Certify exports via EU-aligned schemes

#### 2025-2030 recommandations

- Launch pilot hubs (Eilat, Negev)
- Certify H2/ammonia for EU
- Scale innovation-to-market pipeline

### LEBANON

#### Achievement

- Draft GH2 roadmap under development
- RE 30% target by 2030
- Strong modular TVET ecosystem

#### Priorities

- Adopt legal framework for GH2
- Link Tripoli port to RE clusters
- Test water–energy–nexus pilots

#### 2025-2030 recommandations

- Finalise GH2 roadmap
- Launch RE+H2 incentive schemes
- Establish dialogue with EU



### MOROCCO

#### Achievement

- 37% RE share in electricity
- National GH2 Roadmap + “Morocco Offer”
- Active pilot projects (MASEN, GIZ, KfW)

#### Priorities

- Position Jorf Lasfar as H2 export hub
- Enhance CBAM readiness
- Stimulate local manufacturing

#### 2025-2030 recommandations

- Structure large-scale H2 pipeline
- Retrofit Dakhla/Jorf ports
- Deploy GreenH2 clusters

### TUNISIA

#### Achievement

- GH2 Strategy adopted
- STEG turbines H2-ready
- Elmed cable (Tunisia–Italy) greenlit

#### Priorities

- Build Gabès–Zarzis GH2 Valley
- Incentivise domestic use (steel, SAF)
- Anchor RE training in TVET system

#### 2025-2030 recommandations

- Launch southern GH2 backbone
- Pilot green Sustainable Aviation Fuel (SAF)
- Structure national PtX curriculum

### PALESTINE

#### Achievement

- 800+ green jobs created
- Pilot PV manufacturing line
- Palestinian Energy and Natural Resources Authority (PENRA) and MoE engaged in MED-GEM

#### Priorities

- Unlock Gaza/Area C infrastructure
- Develop national RE+GH2 framework
- Promote cross-border skills sharing

#### 2025-2030 recommandations

- Launch Gaza TVET & desalination pilot
- Establish RE incubators
- Integrate into MED-GEM certification pilot

### Morocco, Tunisia, Egypt cross-cutting opportunity:

Shared technical training modules and regulatory alignment with EU certification bodies.

### Jordan, Lebanon, Palestine cross-cutting opportunity:

MED-GEM to support MoUs-to-project translation and joint EU-aligned TVET certification paths.

# Regional gap analysis

## Shared regional **challenges**: Challenges across MENA partner countries

| Thematic area | Common bottlenecks |
|---|---|
| **Water access** | Chronic water scarcity across all countries.<br>Desalination needed but costly and energy-intensive. |
| **Renewable integration** | Huge RE potential but limited grid integration.<br>variability and lack of large-scale storage solutions. |
| **H2 infrastructure** | No dedicated hydrogen pipelines.<br>Missing salt caverns for storage.<br>Ports not yet H2-export ready. |
| **Local manufacturing** | High dependence on imported PtX equipment<br>(electrolysers, tanks, compressors, PEM). |
| **Skills and workforce** | Lack of qualified workers for design, O&M, safety, certification,<br>digital tools across the PtX value chain. |
| **Regulatory gaps** | No harmonized H2 standards.<br>Lack of CBAM readiness, Guarantee of Origin schemes<br>or cross-border PPA models. |

Countries share similar structural weaknesses, but also complementary strengths that can be activated together.



## Regional **opportunities** at a glance: Cooperation can build resilience

### Infrastructure & logistics

| Opportunity | Countries | Description |
|---|---|---|
| **MENA–EU H2 backbone pipelines** | EG, MA, TN | Interconnected corridors<br>(Elmed, Medgaz, Xlinks, SouthH2 Corridor). |
| **Industrial H2 ports & valleys** | EG, JO, MA, TN | SCZone, Jorf Lasfar, Gabès, Haifa,<br>Aqaba under development. |
| **Shared desalination units** | EG, JO, PS | Regional pilot projects to secure water access<br>for H2 production. |
| **Cross-border storage & conversion** | EG, IL, MA | Specialised hubs for ammonia, methanol<br>or synthetic fuels. |

### Skills & certification

| Opportunity | Countries | Description |
|---|---|---|
| **MED-GEM H2 training hubs** | JO, MA, TN | Centres of Excellence (IFMEREE, GJU, ENIT)<br>with regional outreach. |
| **Hydrogen MOOCs & hackathons** | PS, LB, TN | Online courses + innovation challenges for youth +<br>TVET. |
| **Certification standards via Regional Working Group on Sustainable Mobility** | All | Align with EU CBAM & voluntary Guarantee of Origin<br>schemes. |

## Local value creation

| Opportunity | Countries | Description |
|---|---|---|
| **Shared industrial supply chains** | EG, MA, TN | Joint clusters for metals, PV, PEM, storage and Power-to-X components. |
| **Hydrogen Special Economic Zones** | EG, MA, TN | Fiscal incentives for EU and MENA investors in GH2. |
| **Shared testing & R&D platforms** | IL, JO, MA | Regional labs for prototyping and techno-validation. |

## Governance and Market access

| Opportunity | Mechanism | Description |
|---|---|---|
| **H2 standardisation via Regional Working Group on Sustainable Mobility** | MED-GEM | One platform for norms, safety and certification alignment. |
| **Multi-level energy diplomacy** | MED-GEM & UfM | Dialogue and joint roadmaps to structure cross-border cooperation. |
| **Cross-border PPA modelling** | EBRD & MED-GEM | Legal and financial models for PtX trade with EU partners. |

**"Let's build the MENA Green Hydrogen Corridor together. From shared training and regulation to ports and pipelines, MED-GEM can turn fragmentation into a connected, scalable, and investable value chain."**



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# Experts insights

## From sun to certification: How the Mediterranean can power Europe's green future

In the shifting landscape of global energy transition, one certainty emerges: renewable hydrogen is not a trend - it's a cornerstone. In Brussels, regulation leads. Across the Southern Mediterranean, ambitions rise. Flavien Lescanne and Marie Pensalfini, two key figures at the strategy consulting firm Hinicio, offer us a rare window into the world where rules, molecules, and sovereignty converge.


*Understanding the rules of the game is already stepping into it*, says Flavien Lescanne. Based in Brussels, he ensures that hydrogen producers in countries like Morocco, Egypt, and Tunisia are not sidelined as mere suppliers. As manager at Hinicio, he knows that EU certification for renewable fuels of non-biological origin (RFNBOs) is not just a stamp - it's the gateway to a high-value market and a cross-Mediterranean value chain.

At his side, Marie Pensalfini, senior consultant and regulatory expert at CertifHy, reminds us: ***Certification isn't an end in itself. It's a tool - a lever to structure lasting, local industrial ecosystems in producing countries***.

### European regulation, Mediterranean opportunity

***The RFNBO framework wasn't initially designed for non-EU countries***, admits Pensalfini. But faced with the limited renewable capacity within the EU, Europe's vision has widened. The goal is for 50% of renewable hydrogen to be imported by 2030 - an unprecedented opportunity for sun-rich Mediterranean countries.

To seize it, producers must master the regulatory landscape: additionality rules for renewable electricity, certified supply chains, traceability systems like mass balancing and book and claim - essential for verifying the green origin of hydrogen or electricity across borders.

### Infrastructure and strategy: a regional vision needed

Yet regulation alone isn't enough. ***If each project builds its own infrastructure, we'll lose time and money. We need shared export hubs, desalination plants, hydrogen storage and transport networks***, says Lescanne.

This is not just a technical ambition - it's a political one. A vision of a Mediterranean that exports not just energy, but expertise, jobs, and innovation.

### Morocco leads by asking the right questions

At the recent MED-GEM workshop in Rabat, one remark stood out to Pensalfini: ***Participants are not only asking how to certify. They want to train local auditors, build local value chains, and own their energy future***.

This is where certification takes on a human dimension. A value chain is only as strong as the people building it.

### The final link: connect production to demand

As Lescanne points out: ***You can produce fully certified hydrogen - but someone must buy it. Certification is necessary, but not sufficient. We also need off-takers, use cases, and business models***."

The MED-GEM Network understands this well. By bringing together experts, regulators and developers from both shores of the Mediterranean, it turns EU regulation into a regional opportunity. Standards become bridges. And energy transition becomes a shared endeavor.

## Green Hydrogen Certification & CBAM
## CertifHy's role in facilitating market access for exporting countries

As the EU advances its climate transition, RFNBOs (Renewable Fuels of Non-Biological Origin - the regulatory term for green hydrogen and its derivatives - are central to decarbonisation. For exporting countries, meeting EU certification and verification requirements is essential for market access.

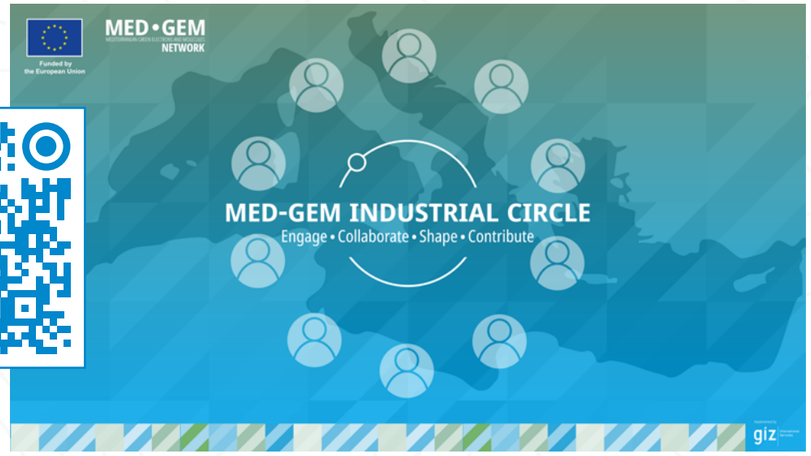
Under the Renewable Energy Directive (RED II/III), RFNBOs must comply with strict sustainability and greenhouse gas criteria. Certification must be conducted by EU-recognised voluntary schemes and include third-party verification of lifecycle emissions and electricity sourcing. CertifHy offers RED-compliant certification to support producers and developers in demonstrating eligibility.

The EU's Carbon Border Adjustment Mechanism (CBAM) will apply a carbon price on imported hydrogen based on embedded emissions. Unlike RED certification, CBAM requires verified installation-level emissions data from accredited verifiers. However, RFNBOs from RED-certified facilities will be treated as having zero process emissions under CBAM - substantially reducing the carbon cost for compliant exporters.

CertifHy enables international producers to meet RFNBO requirements efficiently, contributing to a transparent, credible hydrogen economy

Marie Pensalfini

Join the circle!



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# Inside the Help Desk

## Decoding EU rules, one question at a time

The MED.GEM Help Desk was initiated to provide expert consultation to partner countries, in close collaboration between the MED.GEM Network and International Power-to-X (PtX) Hub, helping stakeholders to navigate a dynamic policy and regulatory environment. By virtue of the monthly Help Desk, stakeholders in partner countries can clarify questions related to the concrete impact and understanding of EU policy and regulation. Moreover, the Help Desk provides info sessions on relevant policy and regulatory developments such as the proposed changes to the CBAM Regulation as part of the Omnibus package. Below, a couple of examples of questions and answers addressed by the help desk.


**Morocco**: *We want to verify if mixing RFNBO and non-RFNBO ammonia in the same tank is allowed, and whether this would affect the carbon footprint of the RFNBOs?*

Mixing RFNBO and non-RFNBO ammonia is possible without having an impact on the carbon footprint. The condition for this would be that the green input is substituting the grey input.

**Palestine**: *There are concerns that CBAM certification may indirectly favor EU businesses by creating competitive disadvantages for similar businesses in developing countries.*

CBAM monitoring and reporting obligations do not indirectly favor EU businesses. EU businesses shall comply with equivalent monitoring and reporting obligations under the EU-ETS. Besides, CBAM financial obligations derived from the purchase of CBAM certificates are not on the installation in third country but on the reporting declarant. This can be the importer if based in the EU, or indirect custom representative if the importer is not based in the EU.

**Lebanon**: *Does the CBAM regulation establish any thresholds below which emissions reporting requirements are waived? And does this threshold vary according to the type of activity?*

As part of a simplification effort, a new "de minimis threshold" based on an annual cumulative mass threshold of imports in the four industrial CBAM sectors (Iron and Steel, Aluminum, Fertilizers and Cement) per importer has been proposed by the European Commission. A mass-based threshold of 50 tons is proposed to ensure that more than 99% of emissions are maintained in the scope while exempting a considerable share of importers from the CBAM scope.

# EDU-HUB & GH2 Camp

## From Knowledge to Action: MED-GEM's GH2 Camps and EDU-HUB Empower, Train and Inspire

SUMMER SCHOOL & HACKATHON

In the Southern Neighbourhood region, the green hydrogen revolution is not just a technological shift - it is a skills transformation. The EU-funded MED-GEM Network is leading the charge by empowering young professionals, engineers, and institutions with the knowledge and tools needed to drive the green hydrogen ($GH_2$) transition.

At the forefront of this dynamic approach are the **Green Hydrogen Camps**, an initiative that mobilises youth, researchers, and innovators through summer schools and hackathons. With two successful editions already held in Morocco and Lebanon - **featuring over 80% female participation** - the $GH_2$ Camps provide a space for students to co-create solutions adapted to their local contexts. Finalist teams benefit from mentoring and access to regional networks, and winners have earned study visits to Germany.

In July 2025, the third regional $GH_2$ Camp will take place in Tunisia, in collaboration with ENIT, GIZ Tunisia, the Ministry of Industry, and EU Neighbours South. Participants will engage in expert-led workshops followed by a 48-hour hackathon, fostering regional collaboration and real-world innovation.

EDU•HUB

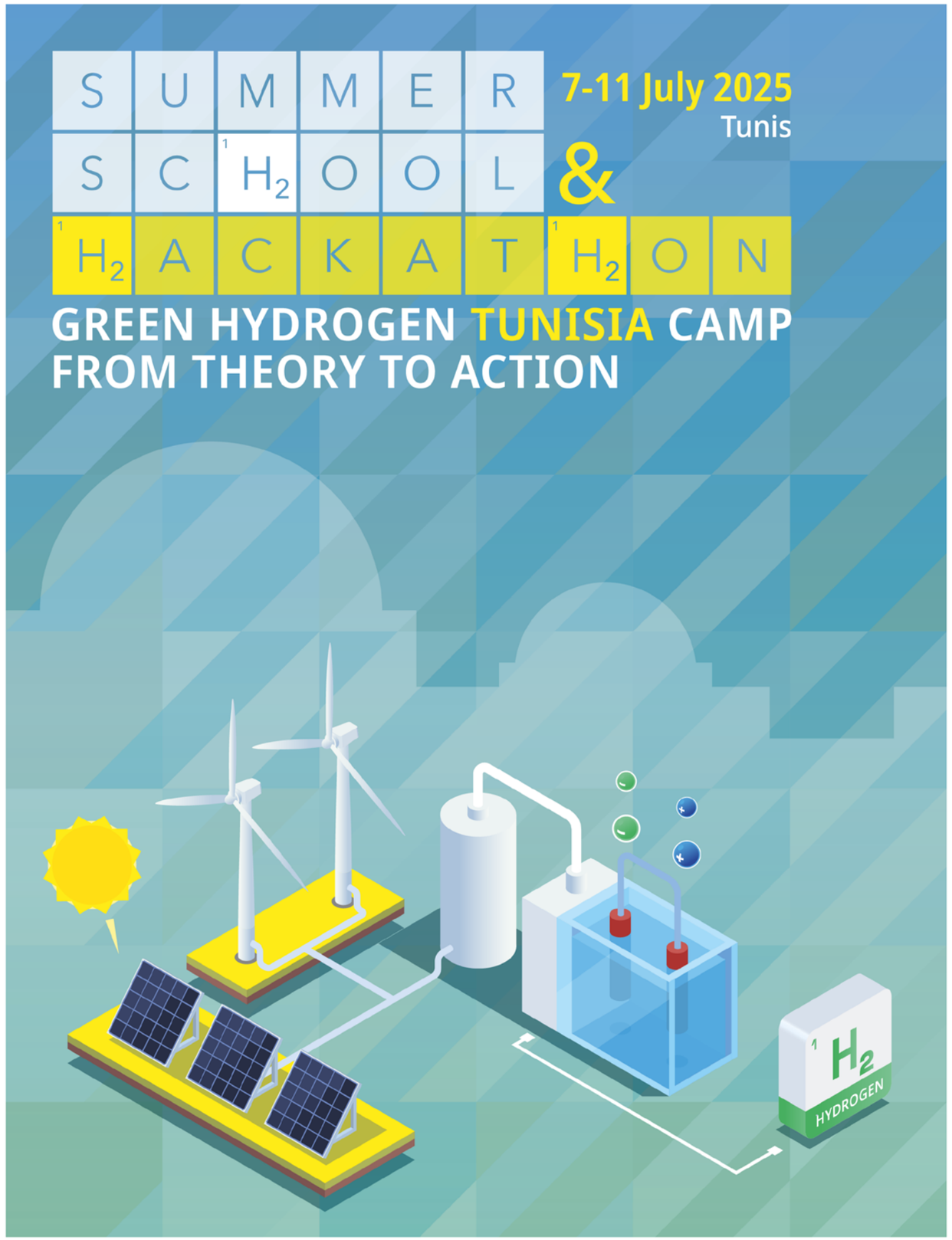
Complementing this initiative, MED-GEM's EDU-HUB is a centralised e-learning platform set to officially launch this June. Drawing on expertise from European academic institutions and EU-funded private sector initiatives, EDU-HUB offers a curated, modular, and open-access learning environment. It features tutorials, certification guidance, and EU-aligned content tailored to the needs of national partners and members of the Industrial Advisory Board across the Power-to-X (PtX) value chain.




Both the camps and the platform are grounded in MED-GEM's comprehensive skills gap analysis, which mapped 138 job profiles across five categories and identified concrete training priorities. Through targeted upskilling, national partnerships, and alignment with EU frameworks such as CBAM, MED-GEM is laying the foundation for a skilled, GH2-ready workforce.

The MED-GEM Network showcases how EU cooperation can raise awareness and build capacity - creating inclusive, future-proof training ecosystems and preparing Mediterranean talents for global green hydrogen careers.





# The Missing Pieces in Europe's Energy Transition: Strategic Hydrogen Reserves


As Europe accelerates its clean energy transition, one critical challenge remains unresolved: the lack of sufficient energy storage infrastructure to support the integration of renewables. The third Pitstop Meeting of the MED-GEM Network, held online on March 19, 2024, brought together experts to discuss the urgent need for strategic energy reserves. Frank Wouters, Director of the MED-GEM Network and Chairman at the MENA Hydrogen Alliance, delivered a key presentation on the pivotal role of storage solutions in ensuring energy security and grid stability.

## Bridging the storage gap

Despite ambitious decarbonization goals, global energy systems remain heavily dependent on fossil fuels. Currently, electricity accounts for only 17% of total primary energy consumption, with the rest covered by fossil energy molecules. For this reason, molecular energy storage - consisting of oil, coal, and natural gas - still dominates, representing over 20% of all stored energy. While renewables such as wind and solar are being deployed at an unprecedented pace, the infrastructure required to store and distribute this energy efficiently remains vastly inadequate. Grid-scale electricity storage accounts for a mere 0.03% of total storage capacity, raising serious concerns about energy reliability and the ability to phase out fossil fuel reliance.

Strategic energy reserves have long played a fundamental role in reducing price shocks and geopolitical risks. The European Union mandates oil reserves equivalent to 90 days of consumption and maintains significant gas reserves exceeding 1,000 TWh, with a required fill rate of 90% before winter. However, as Europe pivots away from fossil fuels, hydrogen is poised to play a key role in the energy transition - yet no strategic hydrogen reserve currently exists.

## The case for a european hydrogen reserve

Frank Wouters outlined a compelling case for the establishment of a European strategic hydrogen reserve. With the EU targeting a significant ramp-up of hydrogen production and consumption, a dedicated reserve would be instrumental in stabilizing the market and ensuring supply security. His proposal advocates for a reserve amounting to 25% of projected hydrogen needs, equivalent to approximately 1.7 million tonnes by 2030 (or 2.7 million tonnes including market-balancing storage).



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## Unlocking the hydrogen economy

A well-structured hydrogen reserve system would yield multiple benefits:

- Investment Confidence: Developers of hydrogen projects currently struggle find sufficient demand. A strategic reserve would act as a guaranteed off-take mechanism, de-risking investments and accelerating project implementation.
- Infrastructure Development: Hydrogen transport and storage require significant infrastructure, including salt caverns and a hydrogen network. A dedicated reserve would create a clear demand signal, spurring infrastructure investments.
- Geopolitical Resilience: With growing concerns over energy security, particularly in light of recent geopolitical disruptions, hydrogen reserves would provide a buffer against supply chain vulnerabilities and market shocks.

## Implementation: Regulatory and financial considerations

For such a reserve to become a reality, a structured regulatory and financial framework is essential. Hydrogen storage should be integrated into the business model of Transmission System Operators (TSOs), akin to the management of gas infrastructure. A joint financing model - combining EU Member State contributions with European Commission support - could be structured through aggregated hydrogen purchasing programs. Strategic storage sites should be selected based on existing underground gas storage infrastructure, leveraging salt caverns and other geological formations suitable for long-term hydrogen containment.

## Conclusion: A critical next step for the EU

As Europe charts its course toward carbon neutrality, strategic hydrogen reserves must become a cornerstone of energy policy. Without a robust storage strategy, the continent risks falling short of its climate ambitions, facing continued reliance on fossil fuels to balance intermittent renewables. The establishment of a hydrogen reserve would not only provide a safety net against energy crises but also accelerate the development of a fully-fledged hydrogen economy, reinforcing Europe's leadership in the global energy transition.

# Charting the Course of the Mediterranean Energy Transition

## Highlights from the 3rd MED-GEM Pitstop - 19 March 2024

The 3rd Pitstop Meeting of the MED-GEM Network offered a strategic space for institutional stakeholders and technical experts to align visions on the region's energy future. A key moment came with the presentation of the **OMEC study** by Director General **Houda Allal**, offering in-depth modeling of renewable and green hydrogen potential across the Southern Mediterranean.

The study confirms Egypt and Turkey as leaders in renewable capacity, with up to **7% of electricity generation potentially exportable to Europe by 2030**. Morocco and Egypt emerge as early hydrogen suppliers, with Tunisia, Mauritania, and Jordan to follow. But realising this potential requires **$220–300 billion** in infrastructure, regulatory alignment, and reliable off-take agreements.

At the EU level, **Milou Beerepoot** (DG MENA) introduced the Trans-Mediterranean Energy & Clean Tech Initiative (Team ET) and underlined the strategic value of a renewed **New Pact for the Mediterranean**, now extended to include Gulf countries.

To complement these efforts, **Frank Wouters**, MED-GEM Director, stressed the need for **strategic hydrogen reserves** to ensure market resilience. He proposed a **1.7 Mt hydrogen stock by 2030**, representing 25% of projected demand, to be managed by **regulated TSOs**, building on the natural gas model.

This session marked a turning point - OMEC's data-driven approach now provides a shared reference for Mediterranean partners to move from ambition to implementation.

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# Acknowledgements

## NFPs, Country Correspondents

### MED-GEM National Focal Points

*Our pillars in the region*

The MED-GEM Network is guided by a dedicated group of national focal points (NFPs) and technical leads, appointed by their governments and institutions. They act as strategic anchors - facilitating coordination, aligning national priorities, and connecting policy with action across the Mediterranean.

#### Algeria
**Sara Boukari**, Office Manager, Energy Division
(Ministry of Energy and Mines)

#### Egypt
**Ahmad Elbakly**, General Manager, Energy Researc
**Samar Al-Ahdal**, EU Cooperation Advisor
(Ministry of International Cooperation)

#### Israel
**Janet Shalom**, Head of the International Department
(Ministry of Energy and Infrastructure)

#### Jordan
**Yacoub Marrar**, Director, RE & EE Department
(Ministry of Energy and Mineral Resources)

#### Lebanon
**Pierre Khoury**, General Director
**Hadi Abu Moussa**, Energy Engineer
**Sorina Mortada**, Technical Consultant
(Lebanese Center for Energy Conservation – LCEC)

#### Mauritania
**Mamadou Amadou Kane**, Head of Mission, Policies and Strategies
(Ministry of Petroleum, Mines and Energy)

#### Morocco
**Ahmed Ghzaoui**, Head of Renewable Energy Division
**Hind Abdaoui**, Hydropower Engineer
(Ministry of Energy Transition and Sustainable Development)

#### Palestine
**Basel Yaseen**, General Director
(Palestinian Energy and Environment Research Center)

#### Tunisia
**Belhassan Chiboub**, Director General, Electricity and Energy Production
(Ministry of Industry, Energy and Mines)

### MED-GEM Country Correspondents

*Our eyes and voices on the ground*

Beyond national focal points, MED-GEM's country correspondents form a vital operational layer of the network. They ensure continuous coordination with stakeholders, feed national insights into the regional process, and support the visibility of MED-GEM activities across borders

Egypt: **Ali Habib**
Israel: **Ofer Keren**
Jordan: **Bandaly El-Issa**
Lebanon: **Reem Irany**
Morocco: **Mehdi Hssein**
Palestine: **Imad Khatib**
Tunisia: **Ali Kanzari**



## Institutional Anchors & EU Partners

### MED-GEM Institutional Anchors & EU Partners

*Shaping a common vision for green hydrogen across the Mediterranean*

The MED-GEM Network is anchored in the EU ecosystem through key experts who provide strategic, regulatory, and regional - true co-architects of the Green Deal's southern dimension.

#### European Commission – Core DGs

**DG MENA & Gulf**
**Milou Beerepoot** – Project Manager, Energy Neighbourhood South
**Matthieu Craye**, **Francesco di Massa**, **Luca Tonelli** – Regional Cooperation

**DG ENER**
**Agnese Dagile** - Team Leader, International Relations
**Marco Berti Palazzi**, **Matteo Fumerio**, **Ruta Baltause** - Policy Officers

**DG TAXUD**
**Maxime Monleon**, **Xavier Vanden-Bosch** – CBAM & certification regulations

**DG TRADE**
**Antonio Caruso**, **Mariusz Hubski**, **Dr. Fabian M. Kreuzer** – Trade policy coordination

**DG GROW**
**Siobhan McGarry** – Policy Officer, Industrial policy

**DG RTD**
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**Eirik Velle Wegner Lønning** – Policy Officer

**EEAS – European External Action Service**
**Leoni Theodoridou** – Energy & Climate Diplomacy

#### EU-Funded Partners & Technical Platforms

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**WindEurope**
**Laura Casuscelli**

**Hydrogen Europe**
**Jorgo Chatzimarkakis**, **Pau Ruiz Guix**

**Engie**
**Loïc Jaegert**

**Eurogas**
**James Watson**

# Industry Advisory Board Members

## MED-GEM Industry Advisory Board

*Where national ecosystems meet the regional market*

The Industry Advisory Board (IAB) brings together NFPs, business leaders, technical experts and innovators from across the Southern Neighbourhood. Its role is to ensure that national industry voices inform MED-GEM's priorities on infrastructure, certification, investment and skills development.

### Egypt
**Ihab Ismai**l, CEO - NREA
**Waleid Gamal El Dien**, Chairman – SCZONE
**Dr. Amr El-Baradie**, $GH_2$ Project Manager – EETC

### Israel
**Atar Hayek** & **Nir Kantor** – Manufacturers Association of Israel

### Jordan
**Imad Zureikat**, CEO – Edama Association
**Salameh Al-Boun**, Sector Engineer – Jordan Chamber of Industry
**Mohammad Al-Dardasawi**, Special Projects Advisor – Aqaba Development Corporation

### Lebanon
**Ibrahim Mallah**, Head of Energy Committee – ALI
**Ghinwa Fayad**, Process Engineer - SIBLINE sal

### Libya
**Dr. Khalifa Tamer**, Libyan General Union of Chambers of Commerce

### Morocco
**Yahya Zniber**, President – $GH_2$ Cluster
**Mourad Hajjaji**, Director general - $GH_2$ Cluster
**Amine Houssaim**, CEO – OCP Green Energy
**Tarik Hamane**, Acting CEO – MASEN
**Mahdi Frikel** - MASEN
**Fatima Zahra El Khalifa**, Director – Cluster EnR
**Younes Farouk**, COO - HydroJeel - Innovx
**Safae Lyazidi**, Head of Security, Safety & Sustainable Development (Ministry of Equipment, Transport, Logistics and Water)

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**Dr. Abdelrahman Al Tamimi**, Director – Palestinian Hydrology Group
**Mansour Mansour**, CEO – PalSolar
**Nashaat Abu Baker**, GM – PETL

### Tunisia
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**Ali Kanzari**, CSPV President – UTICA



## Powering Change through Partnership

We warmly thank all our partners and contributors for their trust, commitment, and collaboration throughout this journey.

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