



# EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition

# Imprint

EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition

## PUBLISHED BY

**EPICO KlimalInnovation**

(Energy and Climate Policy and Innovation Council e.V.)

Friedrichstraße 79

10117 Berlin (DE)

## College of Europe

Dijver 11

8000 Bruges (BE)

## AUTHORS

Ms Stefanie Schäfer ([stefanie.schaefer@coleurope.eu](mailto:stefanie.schaefer@coleurope.eu)) and Mr Jonas Meuleman ([jonas.meuleman@coleurope.eu](mailto:jonas.meuleman@coleurope.eu)), Ms Anna-Loreen Mondorf ([anna-loreen.mondorf@coleurope.eu](mailto:anna-loreen.mondorf@coleurope.eu)), Ms Ana Valverde ([ana.valverde@coleurope.eu](mailto:ana.valverde@coleurope.eu)), Mr Marco Valenziano ([marco.valenziano@coleurope.eu](mailto:marco.valenziano@coleurope.eu))

## REVIEW BOARD

Mr Carlos Alvarez Aguilera, Policy Officer at DG ENER, TF.1. Global Demand and International Negotiations, European Commission, Dr Klaus-Dieter Borchardt, Visiting Senior Fellow at the Oxford Institute for Energy Studies (OIES) and former Deputy Director General (DG ENER), European Commission, Professor Dirk Buschle, Energy Chair at the College of Europe, and Deputy Director & Head of Legal, Energy Community Secretariat, MEP Nicolás González Casares (Spain, S&D), Dr Tudor Constantinescu, Special Advisor on Hydrogen to the Director General, DG ENER, European Commission, European Commission, MEP Ignazio Corrao (Italy, Greens/EFA), Dr David Dutton, Deputy Ambassador, Australian Mission to the EU and NATO, Mr Emilien Gasc, EU Climate Diplomat at the Delegation of the European Union to the United Kingdom, Dr Andreas Goldthau, Visiting Professor in the EU International Relations and Diplomacy Studies at the College of Europe, Ms Flavie Guerin, Trade Officer at the Canadian Mission to the EU, Mr Cédric Lombaerts, Energy Attaché at the European Affairs Directorate-General, Belgian Ministry of Foreign Affairs, Ms Camille Maury, Senior Policy Officer, WWF Europe, Dr Yolanda Garcia Mezquita, Head of Unit at DG ENER, TF.2. Relations with the Member States and the Neighbourhood, Dr Simon Schunz, Professor in the EU International Relations and Diplomacy Studies at the College of Europe, Ms Maria Assumpció Rojo Torrent, Director, Trade and Industrial Policy at Hydrogen Europe, Ms Tatiana Marquez Uriarte, Member of Cabinet of Energy Commissioner Simson, European Commission, and Dr Bernd Weber, Visiting Professor in EU Energy Policy at the College of Europe and CEO EPICO KlimalInnovation.

## **STEERING GROUP**

Saga Henriksdotter, Junior EU Energy Policy Specialist at EPICO KlimalInnovation, Thijs Vandebussche, Assistant to the Chair for European Energy and Climate Policy, College of Europe, and Sam Williams, EU Policy Manager EPICO KlimalInnovation.

## **CITE AS**

Jonas Meuleman and Stefanie Schäfer (2023). “Powering a Global Just Transition: Fostering Socio-Ecological Justice in the EU’s Green Hydrogen Partnership with Morocco”, *EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition*, EPICO and College of Europe, Brussels (pp. 1-13).

Anna-Loreen Mondorf (2023). “EU Hydrogen Diplomacy vis-à-vis the Eastern Mediterranean”, *EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition*, EPICO and College of Europe, Brussels (pp. 14-24).

Ana Valverde (2023). “Unlocking Cooperation with the Southern Neighborhood on Renewable Hydrogen”, *EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition*, EPICO and College of Europe, Brussels (pp. 25-32).

Marco Valenziano (2023). “An EU Strategy: Unlocking the Potential of Green Hydrogen Production in Southern and Eastern Africa”, *EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition*, EPICO and College of Europe, Brussels (pp. 33-41).

## Description

“EU Hydrogen Diplomacy in Africa and the Middle East: A Just Regional Energy Transition” is a collection of policy briefs jointly published by EPICO KlimaInnovation and the Iberdrola Energy and Climate Chair at the College of Europe.

For the purpose of this pilot project, a call for papers was launched on 22 December 2022 for College of Europe students and alumni, and diplomats from the Diplomatic Academy, to develop policy briefs focusing on EU Hydrogen Diplomacy strategies vis-à-vis third countries. An official launching event took place at the College of Europe (Bruges) on 30 January 2023, on the occasion of a panel discussion with Ambassador Badr Abdellatty, Mission of Egypt to the EU, Dr Bernd Weber, CEO at EPICO KlimaInnovation, Jacob Werksman, Principal Adviser for International Aspects of EU Climate Action (DG CLIMA), European Commission, Professor Dirk Buschle, Iberdrola Energy and Climate Chair at the College of Europe, and Dr Simon Schunz, Professor in the EU International Relations and Diplomacy Studies at the College of Europe.

Students and alumni submitted 25 entries on 1 March 2023, and the high-level review board submitted their feedback on the policy briefs by mid-April 2023. On 6 June, Ambassador Caroline Millar, Australian Mission to the EU and NATO, hosted the closing ceremony at the Residence of the Australian Ambassador, with keynote speeches by Mr Jorgo Chatzimarkakis, CEO at Hydrogen Europe, Dr Bernd Weber, Amb. Caroline Millar, and Michele Chang, Director of the Transatlantic Affairs Programme at the College of Europe.

On this occasion, Ms Stefanie Schäfer and Mr Jonas Meuleman, authors of “Powering a Global Just Transition: Fostering Socio-Ecological Justice in the EU’s Green Hydrogen Partnership with Morocco”, received an honorarium of €300 as prize for writing the policy brief with the highest grade provided by members of the review board.



Brugge

College of Europe  
Collège d'Europe



Natolin



Dear readers,

I welcome you to EPICO KlimalInnovation's and the Energy and Climate Chair at the College of Europe's joint publication collecting four policy briefs on EU Hydrogen Diplomacy, with a focus on Africa and the Middle East.

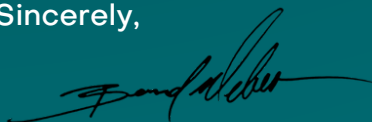
The energy crisis, the unlawful and unprovoked Russian war on Ukraine, and the fierce fight we must carry against climate change, position Green Hydrogen as an essential part to shift to a decarbonised economy, in the European Union and globally. In 2022, 58% of EU energy supply was imported from third countries, Russia being Europe's main energy provider. 43% of gas imports, 29% of oil imports, and 54% of coal import came from Russia. While fossil fuels need to be phased out gradually, the EU needs to rebalance its relations with third countries to avoid relying on single countries, which may lead to energy crises such as the one experienced in summer 2022. The aim should be to strengthen cooperation with diversified partners, and to jointly develop technologies and innovation that can help us to reach Net-0 GHG emissions. The global energy map is changing.

In this context, our joint project on supporting young voices in EU-decision-making is of great significance and importance. I invite you to note the policy briefs' emphasis on sustainability, and the need to ensure that the EU's hydrogen diplomacy strategy adds value to third countries' local communities. In this context, Africa, and specifically the Southern Neighbourhood, appear as natural partners for the EU.

Stefanie Schäfer and Jonas Meuleman zoom into Morocco, proposing a comprehensive strategy that addressees the issue of potential negative socio-ecological injustices as consequence of the country's renewable hydrogen transition. Anna-Loreen Mondorf turns the spotlight on the Middle Eastern and North African countries, suggesting feasible solutions to extend the European Hydrogen Bank through reforms to ENP action plans. Maintaining the focus on the Southern Neighbourhood, Ana Valverde targets sustainability criteria, the need to strengthen trust, and boost financial support as main milestones to boost green hydrogen production in the region. Marco Valenziano investigates the potential of EU hydrogen partnerships with Eastern and Southern African regions, focusing on reforming existing EU regional funding schemes and boosting diplomatic efforts.

I thank everyone who participated to this insightful project.

Sincerely,



Dr Bernd Weber  
CEO, EPICO KlimalInnovation



Dear reader,

It is a pleasure to present you with this collection of policy briefs on EU Hydrogen Diplomacy. The publication before you is the fruit of the contributions of students of the 'Sassoli promotion' (2022-2023) and Diplomats of the European Diplomatic Academy of the College of Europe. They submitted papers in response to the Call for Papers, which the Energy and Climate Policy Chair held with EPICO KlimaInnovation in December 2022.

The objective given to the students was to write an innovative policy brief on the topic of 'EU hydrogen diplomacy'. The strongest papers, selected by a jury composed of policy-makers and stakeholders, all converged on the importance for the EU to guarantee a just transition in its climate policy vis-à-vis third countries. The students' message is an inspirational one, encouraging policy-makers and stakeholders to ensure that hydrogen trade shall also tackle socio-environmental challenges from the get-go. Their message and recommendations will be of interest to both policy-makers and stakeholders working on or interested in the EU's climate diplomacy.

I kindly thank EPICO KlimaInnovation for this fruitful cooperation, and the Student Energy Group of the David Sassoli Promotion for their involvement in this project.

Sincerely,  
Dirk Buschle

Chairholder of the IBERDROLA Manuel Marin Chair  
for European Energy and Climate Policy



# Table of Contents

- 01 **Powering a Global Just Transition: Fostering Socio-Ecological Justice in the EU's Green Hydrogen Partnership with Morocco**  
Stefanie Schäfer and Jonas Meuleman  
PAGE 1
- 02 **EU Hydrogen Diplomacy vis-à-vis the Eastern Mediterranean**  
Anna-Loreen Mondorf  
PAGE 14
- 03 **Unlocking Cooperation with the Southern Neighborhood on Renewable Hydrogen**  
Ana Valverde  
PAGE 26
- 04 **An EU Strategy: Unlocking the Potential of Green Hydrogen Production in Southern and Eastern Africa**  
Marco Valenziano  
PAGE 34

# Powering a Global Just Transition:

Fostering Socio-Ecological  
Justice in the EU's Green  
Hydrogen Partnership with  
Morocco

By Stefanie Schäfer and  
Jonas Meuleman



## EXECUTIVE SUMMARY

The Kingdom of Morocco (hereafter Morocco) is a forerunner concerning renewable energy (RE) and seeks to become a significant producer of renewable hydrogen in Africa. It signed a Green Partnership with the EU in 2022. Still, Morocco's potential does not vanish possible negative socio-ecological justice consequences of a renewable hydrogen transition. Those include human rights violations, unequal access to natural resources, livelihood issues, and a lack of local ownership in energy projects. It should be vital for the European Commission to tackle these justice issues to comply with its normative ambition to support a global just energy transition and support the stability of its renewable hydrogen partner(s).

We recommend three strains of EU policy action: policy dialogue, mutual engagement, and extended due diligence policies for EU companies.

### Policy recommendations

1

#### Policy dialogue and cooperation

Propose freshwater limits and the inclusion of local communities as shareholders via bilateral and regional dialogues in the EU-Morocco Green Partnership.

2

#### Mutually beneficial energy relationship

Realising a reciprocal energy network focused on hydrogen.

3

#### EU companies

Extension of the EU Corporate Sustainability Due Diligence Directive to support the local green transition and job creation.



## CONTEXT

In 2021, Morocco published its roadmap towards becoming the region's major renewable hydrogen producer, aiming to source 52% of its energy from renewables by 2030 (Kingdom of Morocco, 2021). Morocco is an important future hydrogen partner of the EU because of its lower electricity production costs, higher electrolyser efficiencies and cheaper capital expenditures (Bennis, 2021). Hence, imports of renewable hydrogen from Morocco will be more economically beneficial for the EU than domestic production.

Morocco is a country of focus given its geographical proximity to Europe and the already existing oil and gas infrastructure which could be retrofitted for renewable hydrogen exports (Biogradlija, 2023; Mohseni-Cheraghlou, 2022).

The EU intensified its cooperation with Morocco in the field of hydrogen through the signature of the EU-Morocco Green Partnership in October 2022 (European Commission, 2022a). Still, this newly established partnership on renewable energy (RE) and power-to-X technologies requires considering the possible socio-environmental implications of a renewable hydrogen transition in Morocco. Reaching a just and, as stated in the REPowerEU plan (EU, COM(2022) 230), a “mutually beneficial” partnership is fundamental.

Renewable hydrogen can have a negative impact on socio-environmental justice both from the construction of RE plants and from the increased demand of freshwater it brings.



## Land ownership issues

The generation of renewable hydrogen impacts socio-environmental justice through the accelerated need for RE as an energy input, including a demand for more land to install RE plants. **The need for additional land increases the risk of human rights violations**, in particular the right to land, food, water, health, and work. On an international level, the *International Covenant on Economic, Social and Cultural Rights* (G.A. UN, R. 2200A (XXI) 1976), which Morocco ratified in 1979, recognises these rights.

### Case study concerning land ownership issues:

The case of the Noor Ouarzazate Concentrated Solar Power (CSP) project (2009), close to the city of Ouarzazate, illustrates the socio-ecological justice risks with RE production. The CSP was created by acquiring more than 3000 hectares, which formerly belonged to the Barbers community Amazigh Aït Ougrou (Rignall, 2016: 546–547). The local residents were not priorly informed about the sale of land and were denied direct access to revenues created through the sale (Rignall, 2016: 549–550; Ryser, 2019: 2–3). Moreover, they were excluded from all decision-making procedures surrounding the project and did not benefit from its rents (Rignall, 2016: 552–553; Ryser, 2019: 17–18). The CSP had been created as a private-public partnership (PPP), while leaving generated revenues and energy prices to price-setting choices of multinational companies, here notably the Saudi Arabian company ACWA Power International (Carmen, 2021).

## Freshwater Issues

The production of one kilogram of hydrogen requires nine litres of freshwater (Beswick et al., 2021: 3167). Therefore, the development of hydrogen in Morocco might **accelerate freshwater scarcity issues**, notably in economically poorer areas of the country with a high level of desertification and a greater need for water through farming activities, employing around 40% of the Moroccan population (2017) (Hammouzaki, 2013: 91-111; International Energy Agency, 2019: 16). To lower the direct use of freshwater resources, hydrogen projects often include creating **desalination plants**. However, desalination plants negatively affect marine ecosystems and local fisheries (Kalt and Tunn, 2022: 74).

**“The increasing need for solar plants as an initial energy carrier for renewable hydrogen might exacerbate governance and energy justice issues”**

The increasing need for solar plants as an initial energy carrier for renewable hydrogen might exacerbate governance and energy justice issues, for example in the Ouarzazate CSP project. Civil society actively protested in various forms against social injustices related to the CSP project and demanded greater inclusion in its benefits, without success (Rignall, 2016: 550). The use of RE to produce hydrogen to export to the EU might reduce the possibility of using RE capacities for a local green energy transition. The development of hydrogen increases the local communities' risks for health and the loss of economic revenues

through intensified freshwater scarcities and environmental damage. Thus, cooperation on renewable hydrogen should consider mechanisms to lower the societal and health impacts on local communities.

## Lacking benefits for local communities from energy infrastructure

The current discussions surrounding an EU-Morocco Green Hydrogen Partnership mostly focus on the potential of Morocco as an exporter of renewable hydrogen. However, as seen in the Ouarzazate CSP project, local communities do not necessarily benefit from the revenues or energy produced through RE and hydrogen by multinational companies on formerly pastoral land. Currently, Spain and Morocco share two electricity interconnections with a total technical capacity of 1400 MW<sup>1</sup>, which is limited in its commercial exchange capacity to 900 MW (Red Eléctrica, 2019). The capacity of 700 MW per cable is similar to those between EU member states. An example would be the COBRACable between Denmark and the Netherlands with a technical capacity of 700 MW (Tennet, 2022).

Despite the existing interconnections, Morocco still lacks a regional integration in the EU electricity grid, while at the same time being highly dependent on energy imports of fossil fuels (The North Africa Post, 2022; International Energy Agency [IEA], 2019a: 11). According to the International Energy Agency (2019a: 127, 136), Algeria plays a major role as one of the three main suppliers of Morocco with oil and natural gas<sup>2</sup>.

The factor that the Western Sahara conflict plays in this logic cannot be

<sup>1</sup> Morocco and Spain signed a Memorandum of Understanding (MoU) for a third electricity interconnection with a technical capacity of 700 MW in 2019, which should become operational in 2026.

<sup>2</sup> Algeria supplied 8% of Morocco's oil imports next to Spain (23%) and the United States (19%) in 2016 and 94% of its gas imports in 2017.

underestimated. The prolonging nature of these tensions spills over in the energy domain. Algeria has already retaliated by playing on its energy dominance towards Spain due to the latter's pivot on the Western Sahara conflict towards Morocco (Al-Fawiris, 2022), so it is not unthinkable that Algeria may do the same with Morocco in the near future. Moreover, Algeria and Morocco are both trying to get better energy partnership deals with their European partners (Shawamreh, 2023), making competition rather than cooperation more likely.

This policy brief stresses the need to tackle both aspects of local benefits and to expand bilateral energy infrastructure to ensure a mutually beneficial partnership, supporting a just and green transition in the EU and Morocco.

**“Tackling socio-environmental challenges in its new green partnership will be vital for the Commission to comply with its normative ambition to support a global just energy transition and the reliability and stability of its international renewable hydrogen partner(s)”**

## POLICY ALTERNATIVES

The EU-Morocco Green Partnership is not legally binding. Socio-environmental justice issues might be considered national policy issues on which the EU has limited influence. However, failing to address challenges arising from the development of renewable hydrogen in Morocco would risk severe consequences. Inaction would most likely increase inequalities in areas with new RE plants. Unequal access

and distribution of natural resources, livelihood issues, and a lack of local public involvement and ownership in renewable energy projects are among the main drivers of societal (violent) conflicts (Löhr et al., 8-13). The lack of a local green transition and benefits might give ground to accusations of neo-colonial extractivism and ‘green grabbing’ by the EU.

Tackling socio-environmental challenges in its new green partnership will be vital for the Commission to comply with its normative ambition to support a global just energy transition and the reliability and stability of its international renewable hydrogen partner(s).

The EU's Green Hydrogen Strategy is based on several partnerships and initiatives, including financing through the Global Gateway. However, the “Just Energy Transition Partnerships” in the Africa-EU Green Energy Initiative mainly address access to clean, affordable, secure energy, energy efficiency, and infrastructure (European Commission, 2022b).

They do not address socio-ecological justice issues emerging with developing renewable hydrogen, such as local ownership, livelihood issues, privatisation, or water scarcity. The EU-Morocco Green Partnership, including the “Energie Verte” programme, likewise refers to the need to promote a ‘just’ green transition without specifying how to address the socio-environmental issues in the Morocco-EU renewable hydrogen trade (European Commission, 2023).

## POLICY RECOMMENDATIONS

**1** **Policy dialogue and co-operation:** propose freshwater limits and the inclusion of local communities as shareholders via bilateral and regional dialogues in the EU-Morocco Green Partnership.

The Moroccan government has supported the development of **participatory governance approaches** in the last few years (Haddad et al., 2022: 394). However, **public participation has been absent** in large-scale RE projects (Haddad et al., 2022: 394). The Commission should indicate the dichotomy of both developments to the Moroccan authorities and suggest more local ownership in the projects to continue on the path of participatory governance and reduce the risks for social unrest during ministerial meetings and other policy dialogues. The Moroccan interest in a stable and trustful relationship should open the ground for discussions on participatory governance in energy projects.

### Local ownership via local energy communities (LECs)

LECs exist in various governance forms in Europe (Local Energy Communities, 2019). Their main objective is to ensure community ownership and energy self-sufficiency, notably in remote communes. **The model of LECs should be proposed for Moroccan communities in the immediate neighbourhood of RE and hydrogen projects** in order to strengthen local ownership and acceptance as well as to ensure local renewable energy supply and social benefits. The proposition might be launched during the regular meetings in the framework of the new Green Partnership between the EU and Morocco.

Possible governance forms for the LECs might include the **co-operative model**, which leaves decision-making powers with members/users of the

cooperative, and joint ventures in the form of **PPPs, which include local citizens and communities as shareholders** (Local Energy Communities, 2019: 4–5). Their inclusion might be ensured via the creation of a **project board**, which offers a framework for discussing local issues related to the instalment of renewable energy projects.

The project board would include representatives of the local population (users) and other project shareholders, while respecting a sufficient representation of minorities. The idea of a project board has already been used in UK PPPs (Tahir M Nisar, 2013: 648). Furthermore, the concept of the local population as a shareholder is currently applied in several countries, e.g., Denmark, with a minimum share of 20%, and is considered a model for other developing countries, such as India (Sapan Thapar et al., 2017).

### Safeguard local freshwater supply via a freshwater scarcity level

The Moroccan Ministry for Equipment and Water is responsible for quantitative and qualitative water management to safeguard the water supply for the Moroccan society (Ministère de l'équipement et de l'eau, 2023).

The Green Partnership between Morocco and the EU should **include a (technical) dialogue on the issue of freshwater** needed to produce renewable hydrogen. It might involve the **mutual definition of a freshwater scarcity level** based on data from the Moroccan Ministry. **When the limit is reached, the production and export of renewable hydrogen for the EU market should be limited to protect local communities' health, food, and work.** This freshwater level could be based on existing international indicators such as the water stress index (WSI) or water resource sustainability (WRS) metrics (Damkjaer and Taylor, 2017).

The Commission might consider creating new technical development projects together with the Moroccan counterpart for an integrated water resource management system that measures renewable hydrogen's freshwater impacts. In the past, the EU has already been active in funding projects on governance and integrated management of water resources with Morocco (EU Neighbours South, 2017).

Indeed, the greatest challenge related to the freshwater limit will be an **adequate quantitative definition of the minimum water** needed per person, its **technical measurement**, and the **effective implementation** of the management and dialogue.

However, the burdens should be manageable with the help of already existing data on water resources, the extensive literature on water scarcity indicators and geographical specificities, technical know-how transfer, and a clear communication on the social and ecological essentiality of such a freshwater limit as well as their monitoring through governance bodies, such as a monitoring group established in the framework of the Green Partnership.

## 2 **Mutually beneficial energy relationship:** realising a reciprocal energy network focused on hydrogen.

A mutually beneficial energy relationship based on reciprocity is what underscores our recommendations. This means establishing a fairer system wherein Morocco would get backed up in case of energy disruptions by an integrated connection to the European internal electricity market, while increasing renewable hydrogen flows from South to North.

### **Connecting Morocco to the European electricity grid**

The reciprocity of this recommendation means first that

there should be an integrated European approach that **ensures Morocco's full integration to the European electricity grid**. Such an effort would not come out of the blue; indeed, there are already well-established electricity interconnections between Spain and Morocco.

Moreover, under the recently agreed Sustainability Electricity Trade Roadmap, sustainable electricity trade is set to increase significantly between Morocco and the EU (The North Africa Post, 2022). This further regional market integration with the EU will bring in necessary interest from renewable energy companies to further invest in Morocco to scale up its domestic solar production, while ensuring the **flexibility** needed to meet changing demand and supply for RE both in the EU and Morocco (Pariente-David, 2020).

This naturally means that there should be a **reciprocal element** in the guarantee that Morocco gets backed up by European energy in case of disruptions in its domestic production such as fall-outs or repairing infrastructure in case of damages. The logic here would be the same as for the internal EU energy market, where countries act in solidarity with one another in case of energy disruptions (Kurmayer, 2022). This would greatly **enhance energy security and justice** on both continents and set a precedent for a fully integrated Euro-Mediterranean RE market (Bennis, 2021: 14-15). It would also establish more trust among Morocco's population that the EU is a reliable, committed partner to Morocco's long-term prosperity.

Connection to the European electricity grid would give Morocco the opportunity to **receive RE from Europe in times of unbalances**. In doing so, its domestic dependence on electricity generated from coal, currently still 70% for its domestic energy production (Baumann, 2021), will be lowered while its population

benefits from a green and secure supply of energy. It would also contribute to the social stabilisation and economic development of the Southern neighbourhood (Mohseni-Cheraghloou, 2022). In the first place however, a deepened integration with the European electricity grid will increase RE flows from South to North due to added incentives for RE companies to invest in Morocco and neighbouring North African nations.

### Exporting renewable hydrogen through existing pipelines

Morocco should transport hydrogen via **existing gas pipelines in the Iberian peninsula** (Bennis, 2021: 16), which is cheaper than transporting renewable hydrogen by shipping it (Biogradlija, 2023). The benefit of this is that there are almost no new investments in the infrastructure needed, except for the retrofitting of gas pipelines between Morocco and the EU. Maintaining the infrastructure already in place ensures current gas flows which are still necessary for a foreseeable time, while adapting for the future scale-up of renewable hydrogen flows.

Initiatives such as the GreenH2Pipes project and H2Med are already underway (Fuente Cobo, 2023: 20–21), yet need sufficient funding to work (Mohseni-Cheraghloou, 2022). By incorporating these new projects under the European Hydrogen Alliance umbrella, and by raising awareness of the Hydrogen Public Funding Compass among Moroccan authorities and civil society on the ground, more foreign direct investment and private investments may be attracted in the future that are necessary to **liberalise the renewables market in Morocco**, which is still a huge challenge (Baumann, 2021).

This would also alleviate the issue of mega-projects being built on contested soil, as more private investments and incentivisation of civil society would steer smaller

projects beneficial to the local communities (Baumann, 2021).

The EU should also try to make more **linkages and interoperability** between the European Clean Hydrogen Alliance and the **African Green Hydrogen Alliance** in order to present a strong, joint investment front in African hydrogen development (Helmeci, 2023). This shows the EU's commitment to the North African region as the future regional hub for renewable hydrogen, and is needed to scale up RE projects and facilities more quickly (Bennis, 2021: 5). Finally, by leveraging existing tools like EU Projects of Common Interest (PCI) to co-finance retrofitting of existing pipeline infrastructure or the European Hydrogen Bank, the hydrogen value chain would be scaled up entirely.

**EU companies:** extension of the EU Corporate Sustainability Due Diligence Directive to support the local green transition and job creation.

3

In February 2022, the Commission proposed a **Corporate Sustainability Due Diligence Directive**, recognising that businesses “play a key role in creating a sustainable and fair economy and society” globally (European Commission, 23 February 2022). This policy brief suggests enlarging the human rights and environmental obligations of EU companies to strengthen a local fair economy and society, as well as for contributing to a just green transition outside of the EU. This new corporate responsibility might be implemented via several obligations.

### Support the local green transition by ensuring RE security

To foster the local green transition, EU companies shall be obliged to feed a **minimum percentage of the produced RE into the local grids** to an **energy price appropriate to the**

### **local economic and social circumstances.**

The price and local sale might be captured in new or redefined Power Purchase Agreements (PPAs) with the Moroccan National Office for Electricity and Potable Water (ONEE) as major energy transmitter and distributor or other energy purchasers, such as municipalities, following the renewable energy market liberation via Moroccan Law 13-09 (Bentaibi and Pape, 2011). PPAs are already existing with some companies in Morocco and are used for several small to large-scale projects in Africa and Asia (The World Bank, 2021).

### **Create local job opportunities**

Companies should **prioritise local low- and high-skilled workers** needed to install and maintain RE and hydrogen plants before international workers. To reach the necessary educational level, EU development programmes shall support the education of local high-skilled workers for the green transition. Before finalising the corporate obligations in the employment of local workers, the Commission may undertake a general **assessment** about possible hurdles in the employment process (lacking skills, local labour specificities) to define regional needs and a realistic timeframe for overcoming these issues.

Moreover, a **cost-benefit analysis** might be needed to assess the impact of these obligations on the willingness of EU companies to invest in renewable hydrogen projects in Morocco.

We believe that all recommendations would foster a **fair and sustainable local economy and society**, notably given the presence of EU energy companies in Morocco, e.g. ENEL and Vitol. They will probably extend their business activities in light of the EU-Morocco Green Partnership and bilateral partnerships with EU member states. Moreover, non-

European multinational companies are often active in the EU market, including them henceforth in these possible new corporate obligations.

**“If the EU wants to succeed in its green transition supported by renewable hydrogen, it needs the supply by international partners, such as Morocco”**

### **CONCLUSION**

Renewable hydrogen is essential for a successful green transition, notably in sectors which cannot be electrified (cf. aviation) or are energy-intensive such as the chemical industry. According to a report by the International Energy Agency (2019b: 32), less than 1% of the production of hydrogen has been fuelled by RE in 2019 while the potential for renewable hydrogen is high in several regions in the world, including Northern Africa.

If the EU wants to succeed in its green transition supported by renewable hydrogen, it needs the supply by international partners, such as Morocco. However, this need should not be fulfilled at the expense of socio-ecological justice in third countries but instead contribute to a mutually beneficial sustainable just development and green transition.





## BIBLIOGRAPHY

Al-Fawiris, Mohamed (24 August 2022). Morocco and Algeria square off over Western Sahara. *Qantara.de*. <https://en.qantara.de/content/the-eus-diplomatic-dilemma-morocco-and-algeria-square-off-over-western-sahara> [accessed on 8 July 2023].

Andarcia, Maria Victoria (2023). Morocco seeks to lead the energy transition on Europe's southern flank. *Universidad de Navarra: Global Affairs and Strategic Studies*. <https://en.unav.edu/web/global-affairs/marruecos-busca-liderar-la-transicion-energetica-en-el-flanco-sur-de-europa> [accessed on 27 March 2023].

Baumann, Bauke (2021). Green hydrogen from Morocco – no magic bullet for Europe's climate neutrality. *Heinrich Böll Stiftung*. <https://eu.boell.org/en/2021/02/09/green-hydrogen-morocco-no-magic-bullet-europes-climate-neutrality> [accessed on 27 March 2023].

Bennis, Amine (2021). Power Surge: How the European Green Deal can succeed in Morocco and Tunisia. *European Council on Foreign Relations (ECFR)*. <https://ecfr.eu/publication/power-surge-how-the-european-green-deal-can-succeed-in-morocco-and-tunisia/#challenges-and-opportunities-in-moroccos-and-tunisias-green-transitions> [accessed on 25 March 2023].

Bentaibi, Wacef and Pape, Benoit (2021). Thomson Reuters Practical Law: Electricity regulation in Morocco: overview. [https://uk.practicallaw.thomsonreuters.com/w-019-3058?contextData=\(sc.Default\)&transitionType=Default&firstPage=true](https://uk.practicallaw.thomsonreuters.com/w-019-3058?contextData=(sc.Default)&transitionType=Default&firstPage=true) [accessed on 5 July 2023].

Beswick, Rebecca, Oliveira, Alexandra, and Yan, Yushan (2021). Does the Green Hydrogen Economy have a Water Problem?. *ACS Energy Letters*, 6(9), 3167–3169. <https://doi.org/10.1021/acsenergylett.1c01375>.

Biogradlija, Arnes (6 February 2023). It's Cheaper to Import Green Hydrogen from Morocco than Produce It in the EU. *H2 Energy News*. <https://energynews.biz/its-cheaper-to-import-green-hydrogen-from-morocco-than-produce-it-in-the-eu/> [accessed on 26 March 2023].

Carmen (2021). NOOR I (Ouarzazate) CSP – Molten Salt Energy Storage System, Morocco. *Power Technology*. <https://www.power-technology.com/marketdata/noor-i-ouarzazate-csp-molten-salt-energy-storage-system-morocco/> [accessed on 25 March 2023].

Damkjaer, Simon and Taylor, Richard (2017). The measurement of water scarcity: Defining a meaningful indicator. *Ambio*, 46, 513–531. <https://doi.org/10.1007/s13280-017-0912-z>.

European Commission (2023). EU launches new cooperation programmes with Morocco worth €624 million green transition, migration and reforms. [https://neighbourhood-enlargement.ec.europa.eu/news/eu-launches-new-cooperation-programmes-morocco-worth-eu624-million-green-transition-migration-and-2023-03-02\\_en](https://neighbourhood-enlargement.ec.europa.eu/news/eu-launches-new-cooperation-programmes-morocco-worth-eu624-million-green-transition-migration-and-2023-03-02_en) [accessed on 22 March 2023].

European Commission (2022a). The EU and Morocco Launch the First Green Partnership on Energy, Climate and the Environment Ahead of COP 27. [https://climate.ec.europa.eu/news-your-voice/news/eu-and-morocco-launch-first-green-partnership-energy-climate-and-environment-ahead-cop-27-2022-10-18\\_en](https://climate.ec.europa.eu/news-your-voice/news/eu-and-morocco-launch-first-green-partnership-energy-climate-and-environment-ahead-cop-27-2022-10-18_en) [accessed on 22 March 2023].

European Commission (2022b). EU-Africa: Global Gateway – Africa-EU Green Energy Initiative. [https://ec.europa.eu/commission/presscorner/detail/en/fs\\_22\\_1120](https://ec.europa.eu/commission/presscorner/detail/en/fs_22_1120) [accessed on 22 March 2023].

European Commission (23 February 2022). *Proposal from the Commission: Directive on Corporate Sustainability Due Diligence*. EurLex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A0071%3AFIN> [accessed on 22 March 2023].

EU Neighbours South (28 September 2017). *Twinning project supports integrated management of water resources in Morocco*. <https://south.euneighbours.eu/news/twinning-project-supports-integrated-management-water-resources-morocco/> [accessed on 4 July 2023].

Fuente Cobo, Ignacio (2023). *Analysis paper: Could Morocco become an energy provider for Europe?*. Instituto Español de Estudios Estratégicos (IEEE). 18. [https://www.ieee.es/Galerias/fichero/docs\\_analisis/2023/DIEEEA18\\_2023\\_IGNFUE\\_Marruecos\\_ENG.pdf](https://www.ieee.es/Galerias/fichero/docs_analisis/2023/DIEEEA18_2023_IGNFUE_Marruecos_ENG.pdf) [accessed on 26 March 2023].

Haddad, Christian, Günay, Cengiz, Gharib, Sherin and Komendantova, Nadejda (2022). *Imagined Inclusions into a 'green Modernisation': Local Politics and Global Visions of Morocco's RE Transition*. *Third World Quarterly*, 43(2), 393-413. <https://doi.org/10.1080/01436597.2021.2014315>.

Hammouzaki, Youssef (2013). *Desertification and its Control in Morocco*. In Heshmati, Gholamali, Squires, Victor (eds.), *Combating Desertification in Asia, Africa and the Middle East: Proven Practices* (91-111). Springer, Dordrecht. [https://doi.org/10.1007/978-94-007-6652-5\\_5](https://doi.org/10.1007/978-94-007-6652-5_5).

Hamouchene, Hamza (31 March 2016). *The Ouarzazate Solar Plant in Morocco: Triumphant 'Green' Capitalism and the Privatisation of Nature*. Portside. <https://portside.org/node/11225/printable/print> [accessed on 22 March 2023].

Helmecci, Daniel (2 February 2023). *Realizing North Africa's green hydrogen potential*. Atlantic Council.

<https://www.atlanticcouncil.org/blogs/energysource/realizing-north-africas-green-hydrogen-potential/> [accessed on 27 March 2023].

International Covenant on Economic, Social and Cultural Rights, Resolution 2200A (XXI) (UN General Assembly), 1976. <https://www.ohchr.org/sites/default/files/cescr.pdf> [accessed on 27 March 2023].

International Energy Agency (IEA) (2019a). *Energy Policies Beyond IEA countries: Morocco 2019*. <https://www.iea.org/reports/energy-policies-beyond-iea-countries-morocco-2019> [accessed on 27 March 2023].

International Energy Agency (IEA) (2019b). *The Future of Hydrogen: seizing today's opportunities*. <https://www.iea.org/reports/the-future-of-hydrogen> [accessed on 06 July 2023].

Kalt, Tobias and Johanna Tunn (2022). *Shipping the Sunshine?: A Critical Research Agenda on the Global Hydrogen Transition*. *GAIA-Ecological Perspectives for Science and Society*, 31(2), 72-76. <https://doi.org/10.14512/gaia.31.2.2>.

Kingdom of Morocco (8 October 2021). *Feuille De Route De Hydrogène Vert. Vecteur De Transition Énergétique Et De Croissance Durable*. Mem. [https://www.mem.gov.ma/Lists/Lst\\_rapports/Attachments/36/Feuille%20de%20route%20de%20hydrog%C3%A8ne%20vert.pdf](https://www.mem.gov.ma/Lists/Lst_rapports/Attachments/36/Feuille%20de%20route%20de%20hydrog%C3%A8ne%20vert.pdf) [accessed on 27 March 2023].

Kurmayer, Nikolaus J (27 June 2022). *Germany and five other EU countries commit to solidarity as blackouts loom*. Euractiv.

<https://www.euractiv.com/section/energy/news/germany-and-five-other-eu-countries-commit-to-solidarity-as-blackouts-loom/> [accessed on 27 March 2023].

Local Energy Communities (LECo) (2019). *Report on Best Practice Legal Framework / Ownership models for Community Energy Projects*. [https://leco.interreg-npa.eu/subsites/leco/Ownership\\_report\\_LECo\\_01\\_2019.pdf](https://leco.interreg-npa.eu/subsites/leco/Ownership_report_LECo_01_2019.pdf) [accessed on 2 July 2023].

Löhr, Katharina, Matavel, CustódioEfraim, Tadesse, Sophia, Yazdanpanah, Masoud, Sieber, Stefan and Komendantova, Nadejda (2022). Just Energy Transition: Learning from the Past for a More Just and Sustainable Hydrogen Transition in West Africa. *Land*, 11(12), 1-23. <https://doi.org/10.3390/land1122193>.

Ministère de l'Équipement et de l'Eau (2023). Eau. <http://www.equipement.gov.ma/eau/organisation/Pages/Missions-de-la-DGH.aspx> [accessed on 4 July 2023].

Mohseni-Cheraghloou, Amin (29 March 2022). Europe needs a new energy option that isn't Russia. It should turn to North Africa. *Atlantic Council*. <https://www.atlanticcouncil.org/blogs/menasource/europe-needs-a-new-energy-option-that-isnt-russia-it-should-turn-to-north-africa/> [accessed on 26 March 2023].

Nisar, Tahir M (2013). Implementation Constraints in Social Enterprise and Community Public Private Partnerships. *International Journal of Project Management*, 31(4), 638-651. <https://doi.org/10.1016/j.ijproman.2012.08.004>.

Pariante-David, Silvia (9 June 2020). COVID-19: a Catalyst for Decarbonization and Integration of the Mediterranean Energy Market. *Policy Center for the New South*. <https://www.policycenter.ma/opinion/covid-19-catalyst-decarbonization-and-integration-mediterranean-energy-market> [accessed on 27 March 2023].

Red Eléctrica (14 February 2019). Spain and Morocco agree on the development of a third interconnection between both countries. <https://www.ree.es/en/press-office/news/press-releases/2019/02/spain-and-morocco-agree-development-third-interconnection-between-both-countries> [accessed on 07 July 2023].

REPowerEU Plan, COM(2022) 230 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN> [accessed on 26 March 2023].

Reuters (2 November 2015). Thousands Protest Utility Prices in Morocco's Tangier. *CGTN Africa*. <https://africa.cgtn.com/2015/11/02/thousands-protest-utility-prices-in-morocco-tangier/> [accessed on 22 March 2023].

Rignall, Karen Eugenie (2016). Solar Power, State Power, and the Politics of Energy Transition in Pre-Saharan Morocco. *Environment and Planning A: Economy and Space*, 48(3), 540-557. <https://doi.org/10.1177/0308518X15619176>.

Ryser, Sarah (2019). The Anti-Politics Machine of Green Energy Development: The Moroccan Solar Project in Ouarzazate and its Impact on Gendered Local Communities. *Land*, 8(6), 1-21. <https://doi.org/10.3390/land8060100>.

Soeiro, Susana and Marta Ferreira Dias (2020). Community RE: Benefits and Drivers. *Energy Reports*, 6, 134-140. <https://doi.org/10.1016/j.egyr.2020.11.087>.

Shawamreh, Nashat (9 February 2023). The Energy Geopolitics of North Africa. *Fikra Forum*. <https://www.washingtoninstitute.org/policy-analysis/energy-geopolitics-north-africa> [accessed on 8 July 2023].

Tennet (2022). COBRACable. <https://www.tennet.eu/projects/cobracable> [accessed on 07 July 2023].

Thapar, Sapan, Seema Sharma, and Ashu Verma (2017). Local Community as Shareholders in Clean Energy Projects: Innovative Strategy for Accelerating RE Deployment in India. *Renewable Energy*, 101, 873–885. <https://doi.org/10.1016/j.renene.2016.09.048>.

The North Africa Post (9 November 2022). COP27: Morocco & European partners agree on sustainable electricity trade roadmap. *The North Africa Post*. <https://northafricapost.com/62504-cop27-morocco-european-partners-agree-on-sustainable-electricity-trade-roadmap.html> [accessed on 27 March 2023].

The World Bank (2021). *Power Purchase Agreements (PPAs) and Energy Purchase Agreements (EPAs)*. <https://ppp.worldbank.org/public-private-partnership/sector/energy/energy-power-agreements/power-purchase-agreements> [accessed on 5 July 2023].

Timmermans, Frans, Executive Vice-President European Commission, (18 October 2023) "Discours Du VPE Timmermans Lors La Signature Du Partenariat Vert Avec Le Maroc." [Speech], Rabat, Morocco. [https://ec.europa.eu/commission/presscorner/detail/fr/SPEECH\\_22\\_6246](https://ec.europa.eu/commission/presscorner/detail/fr/SPEECH_22_6246) [accessed on 27 March 2023].

Wuppertal Institute for Climate, Environment and Energy and Germanwatch (2015). *Social CSP – Energy and Development: Exploring the Local Livelihood Dimension of the Nooro I CSP Project in Southern Morocco. Final Report*. [https://epub.wupperinst.org/frontdoor/deliver/index/docId/6444/file/6444\\_Social\\_CSP.pdf](https://epub.wupperinst.org/frontdoor/deliver/index/docId/6444/file/6444_Social_CSP.pdf) [accessed on 21 March 2023].



# EU Hydrogen Diplomacy vis-à-vis the Eastern Mediterranean Countries

By Anna-Loreen Mandorf

## EXECUTIVE SUMMARY

Hydrogen will be an important pillar of the EU's energy transition towards climate-neutrality by 2050. As both climate change and Europe's energy crisis call for the energy system's decarbonisation, diversification, and interconnection, Eastern Mediterranean partners stand out as potential hydrogen producers. Given the region's geographic proximity and untapped renewables potential, hydrogen cooperation offers opportunities for domestic emission reductions and both green and blue hydrogen exports to Europe. As a region of geostrategic importance to EU foreign policy, hydrogen diplomacy may also give new impetus to the European Neighbourhood and enlargement policies' current deadlock, for interregional cooperation and sustainable development. While the depoliticization and diversification of regional energy relations must remain a key priority of EU hydrogen diplomacy, this policy brief proposes best practice dialogues to promote more inclusive energy cooperation and the joint development of a neighbourhood hydrogen master plan for fast-track implementation of renewable energy sources and hydrogen infrastructure. The political will and pragmatic regulatory incentives at neighbourhood level can be enhanced, together with increased cross-border investments, capacity development, and low-carbon solutions. This policy brief shows that hydrogen diplomacy offers medium to long term opportunities for both relativising the salient role of natural gas in the region and reconciling Europe's supply crisis and climate action, thereby opening doors for spillover effects beyond technical cooperation in the energy sector.

## Policy recommendations

1

### Reducing gas explorations in the Aegean

Gradual decrease of EU funding for fossil fuel infrastructure to depoliticize and decarbonize regional (energy) relations.

2

### Hosting energy dialogues

at neighbourhood and en-largement levels to promote de-escalation and more inclusive energy cooperation.

3

### Fostering RES and green hydrogen deployment

to increase domestic and export capabilities with financial incentives and technical assistance.

4

Developing a neighbourhood hydrogen master plan and reforming ENP Action Plans.



## INTRODUCTION

Putin's invasion of Ukraine and ban of natural gas exports to the EU triggered an energy crisis that put both the EU's energy security and underlying market liberal approach in question. Calling for diversification, interconnection, and decarbonisation, green energy partnerships became even more crucial for Europe's socio-ecological transformation away from fossil fuels towards climate-neutrality.

For an increasingly decentralised, renewables-based energy system to operate securely and efficiently, flexibility options are of key importance, in which context hydrogen plays an essential role as energy carrier.

**“The Eastern Mediterranean stands out as a potential hydrogen producer, offering opportunities for both the region's decarbonisation and exports to Europe”**

As a region naturally rich in hydrocarbons and important opportunities to produce renewable energy, the Eastern Mediterranean stands out as a potential hydrogen producer, offering opportunities for both the region's decarbonisation and exports to Europe.

By offering spillover perspectives beyond technical cooperation in the energy sector, hydrogen diplomacy may also give the European Neighbourhood Policy's (ENP) deadlock and enlargement new impetus for interregional cooperation and sustainable development. Hence, this paper sheds light on the region's potential in hydrogen cooperation by asking how to effectively structure the EU's hydrogen diplomacy vis-à-vis

the Eastern Mediterranean and unlock its decarbonisation potential.

## Hydrogen Diplomacy

Committed to mid-century climate-neutrality, the EU is moving away from fossil fuels towards a circular, resource-efficient economy. Particularly the energy sector undergoes systemic modifications due to climate change and Europe's energy crisis, offset by its import dependence on Russian natural gas with a share of 39.3% in 2021 dropping to 15.0% in 2022 (Eurostat, 2022). Challenged by the renewable energy sources' (RES) feed-in volatility, flexibility options are key for an increasingly decentralized, RES-based energy system.

Due to its potential to carry and store energy, hydrogen plays a crucial role in balancing periods of low wind and solar power generation. Also grid interconnection and cross-border cooperation, both within and beyond EU borders, will be essential for balancing geographic supply and demand divergences (Agora Energiewende, 2023).

Although Europe has the greatest planned electrolyser and renewable capacity (IEA, 2021), renewable hydrogen imports remain crucial for guaranteeing EU energy security prospectively. REPowerEU hence sets out for 10 million tons of renewable hydrogen imports by 2030 (European Commission, 2022a), while 40 Gigawatts of electrolyser capacity are to be installed in its neighbourhoods (European Commission, 2021).

Given its global dimension (Figure 1), the International Renewable Energy Agency (IRENA), concludes that the hydrogen diplomacy is “[...] becoming a standard fixture of economic diplomacy” (2022: 12).

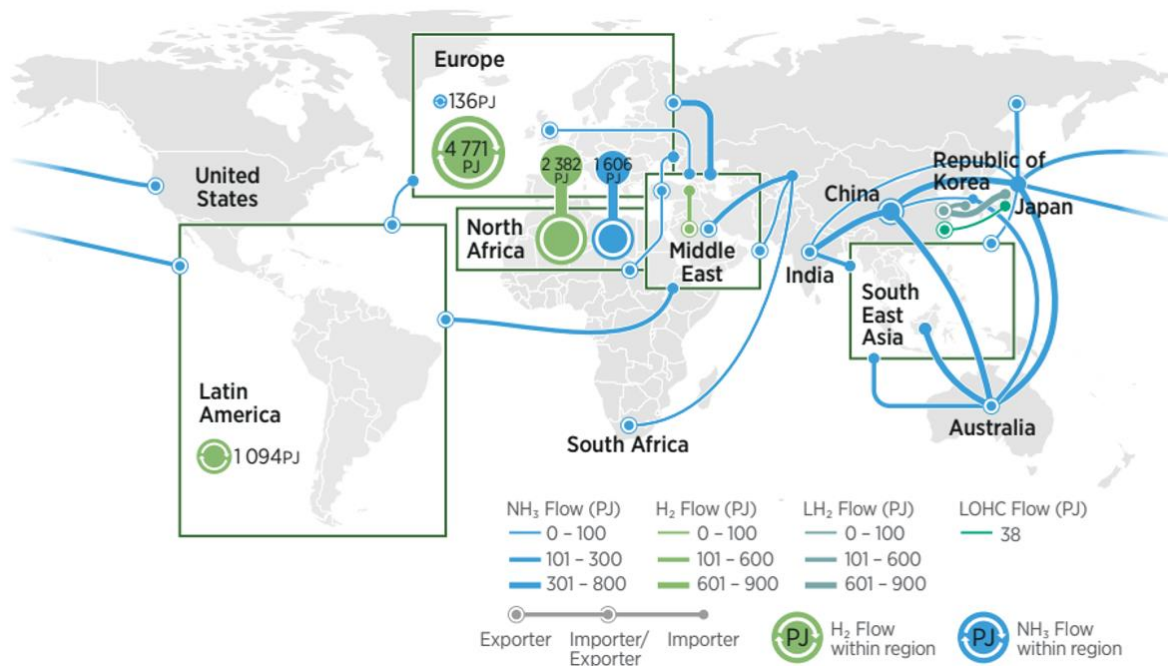


Figure 1: Global hydrogen trade map under optimistic technology assumptions in 2050. Source: IRENA (2021: 56).

Due to its geographic proximity and untapped renewables potential, the Eastern Mediterranean offers opportunities for transcontinental hydrogen cooperation. Its economic and political relevance for the EU's neighbourhood and enlargement policy sets the region's importance for the EU's hydrogen strategy apart from other major future exporters, such as Australia, Latin America, and India (Figure 1). Accordingly, the Eastern Mediterranean is an area of strategic importance to energy geopolitics and EU foreign policy, which geographically includes Member States, Candidate Countries, and countries in the ENP (Cyprus, Egypt, Greece, Israel, Jordan, Lebanon, Palestine, Syria, Türkiye).

While acknowledging the hydrogen potential of Jordan and Lebanon once governance reforms take effect, this paper focus on the EU member states Cyprus and Greece, and Türkiye as candidate for EU accession on the one hand, and Egypt and Israel as comparatively stable ENP partners, gas producers, and members of the EastMed Gas Forum (EMGF) on the other, with both sides sharing

conflicting relations and geopolitical ambitions in the region.

## EASTERN MEDITERRANEAN: QUO VADIS?

As a region rich in hydrocarbons, as well as in solar and wind power potential, the Eastern Mediterranean is of geostrategic importance for global energy politics, connecting the shores of Europe to the Middle East (Figure 2). Offshore natural gas discoveries in its basin received much international attention in recent years, fuelling regional competition over natural resources and maritime boundary disputes between Cyprus, Greece, and Türkiye – especially since regional economies are marked by high dependences on fossil fuels, albeit at varying degree (Dalay, 2021; Bianchi, 2020).

With the aim of replacing Russian gas supplies, the EU, Egypt, and Israel signed a memorandum of understanding (MoU) in 2022 to increase liquefied natural gas (LNG) exports from Israel via Egypt to





Figure 2: Eastern Mediterranean map. Source: United Nations Geospatial (2020)

Europe despite the EU's net-zero ambitions.

Considering that the Mediterranean area may experience climate change induced warming at a rate 20% faster rate than the global average (Observatoire Méditerranéen de l'Énergie [OME], 2022), the region's decarbonisation should be considered crucial for combating environmental degradation.

While low levels of interconnection, cross-border investments, fossil fuel subsidies, and structural instabilities have hindered the region from living up to its RES potential, both RES and hydrogen are gaining increasing momentum in the region (IEA, 2021; Raimondi, 2022).

Many Eastern Mediterranean countries are well-located to produce and export both natural gas- and renewables-based hydrogen (Habib and Ouki, 2021), which contributed to the 2022 MoU leading to an EU-Egyptian green hydrogen partnership at COP27.

The region's hydrogen momentum is furthermore driven by the EU's intention to ramp up hydrogen imports from its neighbouring countries, suggesting increasing funding and policy support, and the CBAM's signal effect to decarbonise production processes (Ruseckas, 2022), as well as dwindling natural resources and a growing domestic energy demand (Raimondi, 2022).

Egypt, one of the largest and most hydrogen-proactive economies in the Middle East and North Africa region (MENA), aims at replacing domestic fossil fuels-based with low-carbon hydrogen solutions and a 42% RES share of electricity production by 2035 (Habib and Ouki 2021). As the host of COP27, Egypt signed eight framework agreements on green hydrogen and ammonia projects, aiming at becoming the hydrogen hub of the Eastern Mediterranean with a 5% global market share by 2040 (Lewis, 2022; State Information Service Egypt [SIS], 2022).



Figure 3: Gas infrastructure map. Source: Global Energy Monitor (2023). Note: Yellow= operating; Red= under construction; Brown= proposed.

With the potential of becoming a transit hub for electricity and hydrogen imports from Gulf states, Egypt will be of great relevance, which is signalled by the Egypt–Saudi electricity interconnection project (Ministry of Energy, 2021). The EuroAfrica Interconnector further connects the electricity grids of Egypt, Cyprus, and Greece as of 2027, which already applies to the EuroAsia Interconnector between Israel, Cyprus, and Greece, therewith ending Cyprus’ energy island status.

Although at an early stage of hydrogen development, Israel’s RES capacity is expected to more than double by 2026 thanks to an increasingly supportive policy framework and solar power potential (IEA, 2021).

As candidate country, Türkiye’s power grid is increasingly synchronized with continental Europe’s, which could be integrated into a larger RES-based power network (European Commission, 2022b; Rau et al., 2022). The energy relations, however, remain challenged by domestic developments, postponed unbundling,

and Türkiye’s primary geopolitical interest in energy independence, shown through its increasing domestic coal and natural gas production (European Commission, 2022b; Rzayeva and Lambert, 2021).

At an early stage of hydrogen development, but located at the interface of Europe, the Balkans, Caucasus, and Middle East, Türkiye stands out as potential hydrogen transit country (Rzayeva and Lambert, 2021), as foreseen in the European Hydrogen Backbone initiative to repurpose the Transadriatic pipeline (TAP) from the South Caucasus to Greece by 2040.

Positioned between the “energy-rich [Middle East] and energy-consuming [EU]” (Badarin and Schumacher, 2022: 426), Greece cannot draw on significant natural energy resources, but is equally committed to transforming its vast natural gas infrastructure (Figure 4) into an extensive hydrogen pipeline system (Badarin and Schumacher, 2022; Ruseckas, 2022). Hence, both Greece and Türkiye aspire to enhance their geopolitical influence as energy hubs

in the region, which further fuels their antagonistic relations (Badarin and Schumacher, 2022).

Nonetheless, Türkiye's pipeline network (Figure 3), geostrategic location, and military weight remain crucial in regional issues, as with regards to the Eastern Mediterranean Gas Forum (EMGF) (Rau et al., 2022). Initiated by Egypt in 2019, in view of Türkiye's increasingly hegemony-seeking foreign policy, EMGF comprises Egypt, Israel, Jordan, the Palestinian Administration, and EU members Cyprus, France, Greece, and Italy – but not Türkiye.

The forum nonetheless aims at creating a regional natural gas market, which fuels the on-going Turkish–Egyptian and Turkish–Greece competition to become an energy hub in the region (Elgendy, 2022). Having granted the European Commission observer status in 2021, EMGF states are well aware of the key role they can play for diversifying the EU's energy supply and focus on renewables increasingly (Nicolaou, 2022).

**"The depoliticization of energy relations remain key objectives to be pursued in the EU's energy diplomacy"**

## POLICY RECOMMENDATIONS

Despite the potential of creating path dependencies via grid interconnection, renewable energy sources, and hydrogen deployment, regional tensions remain deeply rooted and manifold, as the maritime and natural gas dispute between Cyprus, Greece, and Türkiye in the Aegean has shown in 2022 (Rau et al., 2022).

Accountability and diversification, as well as the depoliticization of energy relations remain key objectives to be

pursued in the EU's energy diplomacy.

**"Diplomatic endeavours can contribute to depoliticizing intraregional and transcontinental (energy) relations"**

### Reducing natural gas explorations in the Aegean.

1

The EU and member states should thus continue to encourage regional actors to reduce natural gas explorations in the Aegean (Rau et al., 2022). While respecting the states' right to economic development and sovereign decision-making under international law, **diplomatic endeavours can contribute to depoliticizing** intraregional and transcontinental (energy) relations, which is of particular importance for the Cyprus conflict and maritime boundary disputes.

To both **mitigate climate change and relativize the salient role of natural gas** in the region, the EU should **refrain from investments in new fossil fuel infrastructure, but offer more sustainable alternatives by incentivising hydrogen investments and diversifying import routes instead.**

### Hosting energy dialogues at neighbourhood and enlargement levels to promote de-escalation and more inclusive energy cooperation.

2

Existing dialogue formats, including the Union for the Mediterranean and ENP energy platforms, should implement **best practice dialogues among high level and private sector actors on the role of hydrogen innovations in the energy transition**, which the European Commission could also promote at EMGF level. Since the latter remains a dividing issue of limited political and

environmental sustainability due to Türkiye non-membership and its natural gas focus, the **EU could lobby for Türkiye's EMGF accession** (cf. Dalay, 2021) or **propose a hydrogen framework initiative among EU, EMGF members, and Türkiye.**

Contributing to de-escalation, technical cooperation, and decarbonisation, **hydrogen diplomacy has the potential to offer a functional way out of the geopolitical deadlock and EU sanction regime against Türkiye** over unauthorized drilling activities. Only with Türkiye's inclusion can the EU's external action in the region succeed – political will to de-escalate on both sides provided.

### 3 **Fostering RES and green hydrogen deployment** to increase domestic and export capabilities with financial incentives and technical assistance.

Energy dialogues should continue to focus on expanding sustainable energy infrastructure at intra and interregional level. **EU funding and investment incentives** should be accordingly adapted with a particular **focus on hydrogen, solar, offshore wind energy, and grid interconnection.** This includes projects facilitated by the Connecting Europe Facility (CEF), but also a potential hydrogen investment fund in cooperation with the European Investment Bank (EIB) and connected to the EU's currently evolving hydrogen bank can help setting financial means free.

As a second-best solution, fossil fuel-based hydrogen could play an interim role in EU hydrogen diplomacy, as it may reduce emissions, and help transitioning from purely fossil fuel-based economies to more sustainable solutions prospectively (Ansari, 2022). Considering the ecological and lock-in risks, **fossil fuel-based hydrogen imports should come with a transition timeline to renewables-**

**based hydrogen solutions.** As an EU-imposed transition may turn out costly especially at the political level, EU hydrogen diplomacy is confronted with a tightrope walk between satisfying its internal (low-carbon) demand and looking out for both its diplomatic relations and global GHG emissions.

**Germany's H<sub>2</sub>diplo initiative,** designed to foster bilateral hydrogen cooperation diplomatically and help tackling the macroeconomic challenges related to phasing out fossil fuels, **could thus function as an example to also foster interregional cooperation and best practice dialogues at the EU level.** EU H<sub>2</sub>offices (or Green Deal experts in EU Delegations) should promote hydrogen-specific technical and legislative assistance and institutional support on how to access funding for RES and hydrogen projects.

As ENP Action Plans remain vague and Progress Reports outdated, with Egypt's most recent review taking place in 2014 for instance, **ENP Action Plans should be updated more frequently and progress on hydrogen cooperation and legislative approximation live tracked digitally,** contributing to transparency and investment decision-making.

### 4 **Developing a neighbourhood hydrogen master plan and reforming ENP Action Plans.**

Currently marked by incoherence and bilateralism, especially in the southern neighbourhood, the EU's external energy governance at ENP and enlargement level requires a large-scale hydrogen strategy as well.

While a holistic review of the ENP's energy governance exceeds the scope of this paper, **a neighbourhood hydrogen master plan** would already promote targeted cross-border cooperation by **complementing the European Hydrogen Bank with its neighbourhood dimension.** In the example of the Med-TSO's

*Mediterranean Master Plan 2020 of Electricity Interconnections*, EU and Eastern Mediterranean actors should thus jointly identify RES and hydrogen priorities, which's most cost-effective and climate-friendly projects should be promoted regulatorily (i.e. TEN-E/PCI).

**Simplified and streamlined permit granting procedures for fast-track implementation of RES and hydrogen projects** should thus be backed up by environmental impact assessments and carried out with the help of a priority status for neighbourhood hydrogen corridors to foster an environmentally sound market integration of ENP countries. Türkiye remains a relevant transit country also for hydrogen imports from the South Caucasus via TAP and TANAP to Greece and Italy (Rzayeva and Lambert, 2021).

Hydrogen could furthermore be exported gaseous via pipelines from Egypt and Israel or liquified via ships to the EU, while ammonia shipping appears cheaper than pure hydrogen (ACER, 2021). Van Wijk and Wouters (2021) calculated “a hydrogen ‘South-Nordstream’ from Egypt, via Greece to Italy, 2,500 km, to have a similar capacity as the actual Nordstream” for “total investments of €16.5 billion” (van Wijk and Wouters, 2021: 101).

**Repurposing existing natural gas infrastructure for hydrogen transportation** by almost tripling the pipelines' compression power, however, should remain a priority due to its cost and resource efficiency as compared to building new networks. Repurposing the Eastern Mediterranean (EastMed) pipeline from Israel to Cyprus and Greece for hydrogen transportation in the long run will be key.

## CONCLUSION

As a region of untapped renewables potential and geostrategic importance to EU foreign policy, the Eastern Mediterranean is of particular importance to the EU's emerging hydrogen diplomacy. In view of the region's deeply rooted conflicts, the EU should neither turn a blind eye to the risk of weaponization of energy relations, nor miss the energy crisis' momentum for RES and hydrogen deployment. At times of geopolitical fragmentation and energy insecurity, the diversification and depoliticization of energy relations must become a key priority of the EU hydrogen diplomacy vis-à-vis the Eastern Mediterranean.

With political will and regulatory incentives provided, hydrogen cooperation has the potential to decarbonise both the EU and its neighbouring countries. While keeping its integration limitations in mind, path dependencies and spillovers may also give the ENP's deadlock and enlargement new impetus for interregional integration and sustainable development. Pushing its ENP and Green Deal agenda together ahead, hydrogen diplomacy offers medium to long term opportunities for reconciling Europe's supply crisis and international climate action towards mid-century climate-neutrality.



## BIBLIOGRAPHY

Agency for the Cooperation of Energy Regulators (ACER) (July 2021). *Transporting Pure Hydrogen by Repurposing Existing Gas Infrastructure: Overview of existing studies and reflections on the conditions for repurposing.* [https://acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Publication/Transporting%20Pure%20Hydrogen%20by%20Repurposing%20Existing%20Gas%20Infrastructure\\_Overview%20of%20studies.pdf](https://acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/Transporting%20Pure%20Hydrogen%20by%20Repurposing%20Existing%20Gas%20Infrastructure_Overview%20of%20studies.pdf) [accessed on 28 March 2023].

Agora Energiewende (March 2023). *How Europe can make its power market more resilient. Recommendations for a short-term reform.* <https://www.agora-energiewende.de/en/publications/how-europe-can-make-its-power-market-more-resilient/> [accessed on 14 July 2021].

Ansari, Dawud (July 2022). *The Hydrogen Ambitions of the Gulf States.* Stiftung Wissenschaft und Politik, SWP Comment 44. [https://www.swp-berlin.org/publications/products/comments/2022C44\\_HydrogenAmbitiones\\_GulfStates\\_WEB.pdf](https://www.swp-berlin.org/publications/products/comments/2022C44_HydrogenAmbitiones_GulfStates_WEB.pdf) [accessed on 27 March 2023].

Badarin, Emile and Schumacher, Tobias (2022). *The Eastern Mediterranean Energy Bonanza: A Piece in the Regional and Global Geopolitical Puzzle, and the Role of the European Union.* *Comparative Southeast European Studies* 70(3), 414–438. <https://doi.org/10.1515/soeu-2022-0036>.

Bianchi, Margherita (21 July 2020). *Prospects for Energy Transition in the Mediterranean after COVID-19.* Istituto Affari Internazionali, IAI Papers 20(18). <https://www.iai.it/en/pubblicazioni/prospects-energy-transition-mediterranean-after-covid-19> [accessed on 14 July 2023]

Dalay, Galip (January 2021). *Turkey, Europe, and the Eastern Mediterranean: Charting a Way Out of the Current Deadlock.* Brookings Institute. <https://www.brookings.edu/wp-content/uploads/2021/01/Turkey-Europe-and-the-Eastern-Mediterranean.pdf> [accessed on 14 July 2023].

Elgendy, Karim (18 July 2022). *Egypt as an Eastern Mediterranean power in the age of energy transition.* Middle East Institute. <https://www.mei.edu/publications/egypt-eastern-mediterranean-power-age-energy-transition> [accessed on 28 March 2023].

European Commission (9 February 2021). *Renewed partnership with the Southern Neighbourhood. A new Agenda for the Mediterranean.* JOIN (2021) 2 final. EUR-Lex. <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A52021JC0002> [accessed on 14 July 2023].

European Commission (18 May 2022a). *REPowerEU Plan.* COM(2022) 230 final. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN> [accessed on 14 July 2023].

European Commission (12 October 2022b). *Türkiye 2022 Report. Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. 2022 Communication on EU Enlargement policy.* SWD(2022) 333 final. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022SC0333> [accessed on 14 July 2023].

Eurostat (December 2022). *EU imports of energy products.* Eurostat Statistics Explained. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU\\_imports\\_of\\_energy\\_products\\_-\\_recent\\_developments#Main\\_suppliers\\_of\\_natural\\_gas\\_and\\_petroleum\\_oils\\_to\\_the\\_EU](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_imports_of_energy_products_-_recent_developments#Main_suppliers_of_natural_gas_and_petroleum_oils_to_the_EU) [accessed on 16 March 2023].

Global Energy Monitor (2023). *Global Gas Infrastructure Tracker*. <https://globalenergymonitor.org/projects/global-gas-infrastructure-tracker/tracker/> [accessed on 30 March 2023].

Habib, Ali and Ouki, Mostefa (November 2021). *Egypt's Low Carbon Hydrogen Development Prospects*. Oxford Institute for Energy Studies, OIES Paper ET04. <https://www.oxfordenergy.org/publications/egypts-low-carbon-hydrogen-development-prospects/> [accessed on 14 July 2023].

International Energy Agency (IEA) (2021). *Renewables 2021. Analysis and forecast to 2026*. <https://iea.blob.core.windows.net/assets/5ae32253-7409-4f9a-a91d-1493ffb9777a/Renewables2021-Analysisandforecastto2026.pdf> [accessed on 24 March 2023].

International Renewable Energy Agency (IRENA) (2021). *Global Hydrogen Trade to Meet the 1.5°C Climate Goal. Trade Outlook for 2050 and Way Forward*. [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA\\_Global\\_hydrogen\\_trade\\_part\\_1\\_2022\\_.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA_Global_hydrogen_trade_part_1_2022_.pdf) [accessed on 30 March 2023].

International Renewable Energy Agency IRENA (2022). *Geopolitics of the Energy Transformation. The Hydrogen Factor*. [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA\\_Geopolitics\\_Hydrogen\\_2022.pdf?rev=1cfe49eee979409686f101ce24ffd71a](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA_Geopolitics_Hydrogen_2022.pdf?rev=1cfe49eee979409686f101ce24ffd71a) [accessed 30 March 2023].

Lewis, Aidan (15 November 2022). *Egypt signs framework deals in bid to launch hydrogen industry*. Reuters. <https://www.reuters.com/world/middle-east/egypt-signs-framework-deals-bid-launch-hydrogen-industry-2022-11-15/> [accessed on 21 March 2023].

Ministry of Energy (5 October 2021). *In the presence of HRH Minister of Energy and H.E. Egyptian Minister of Electricity and Renewable Energy, the Kingdom and Egypt Sign Electricity Interconnection Contracts*. Kingdom of Saudi Arabia. <https://www.moenergy.gov.sa/en/MediaCenter/News/Pages/saudi-egyptian-electricity-interconnection-project.aspx> [accessed on 23 March 2023].

Nicolaou, Kyriacos (14 October 2022). *President Anastasiades: 'East Med can play key role in EU energy diversification'*. CyprusMail. <https://cyprus-mail.com/2022/10/14/president-anastasiades-east-med-can-play-key-role-in-eu-energy-diversification/> [accessed on 23 March 2023].

Observatoire Méditerranéen de l'Energie (OME) (2022). *Mediterranean Energy Perspectives 2022. Special COP27 Edition*. <https://www.ome.org/mep-2022-special-cop27-edition-released-in-december-2022/> [accessed on 14 July 2023].

Raimondi, Pier P. (May 2022). *Eastern Mediterranean Energy Resources between Energy Security and Energy Transition: A Regional Perspective*. Istituto Affari Internazionali, IAI Papers 22(11). <https://www.iai.it/sites/default/files/iaip2211.pdf> [accessed on 23 March 2023].

Rau, Moritz, Seufert, Günter and Westphal, Kirsten (February 2022). *The Eastern Mediterranean as a Focus for the EU's Energy Transition*. Stiftung Wissenschaft und Politik, SWP Comment 8. <https://doi.org/10.18449/2022C08> [accessed on 14 July 2023].

Ruseckas, Laurent (August 2022). *Europe and the Eastern Mediterranean: the Potential for Hydrogen Partnership*. Stiftung Wissenschaft und Politik, SWP Comment 50. <https://doi.org/10.18449/2022C50v02> [accessed on 14 July 2023].

---

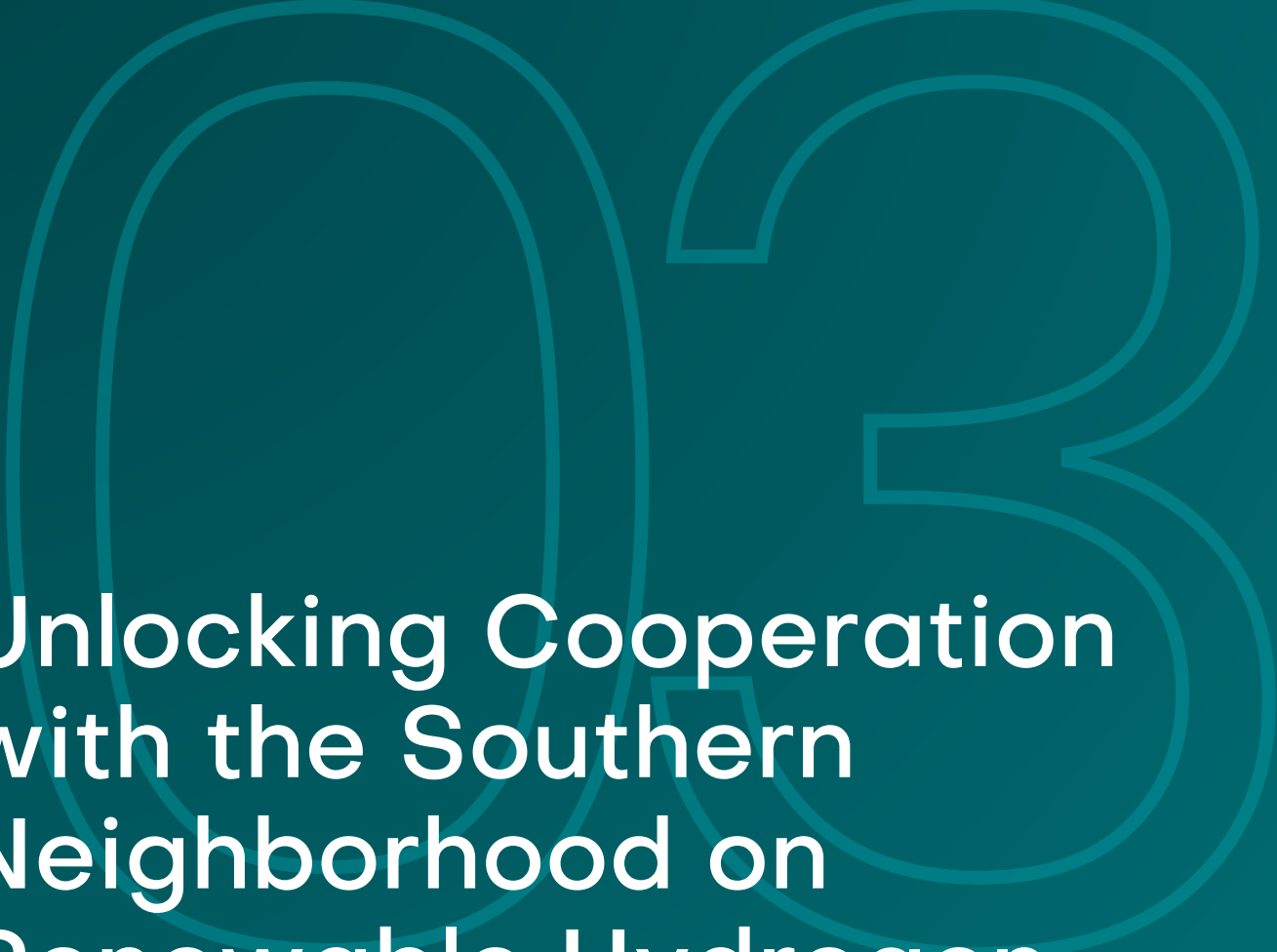
Rzayeva, Gulmira and Lambert, Martin (November 2021). *What role for hydrogen in Turkey's energy future*. Oxford Institute for Energy Studies, Energy Insight 102. <https://a9w7k6q9.stackpathcdn.com/wpcms/wp-content/uploads/2021/11/Insight-102-What-role-for-Hydrogen-in-Turkeys-energy-future.pdf> [accessed on 21 March 2023].

State Information Service Egypt (SIS) (15 November 2022). *Petroleum minister announces framework of Egypt's low-carbon hydrogen strategy*. <https://www.sis.gov.eg/Story/172771/Petroleum-minister-announces-framework-of-Egypt%27s-low-carbon-hydrogen-strategy/?lang=en-us> [accessed on 21 March 2023].

United Nations Geospatial (1 July 2020). *Eastern Mediterranean*. <https://www.un.org/geospatial/content/eastern-mediterranean> [accessed on 30 March 2023].

Van Wijk, Ad and Wouters, Frank (2021). *Hydrogen – The Bridge Between Africa and Europe*. In Weijnen, Margot P., Lukszo, Zofia and Farahani, Samari (eds.), *Shaping an Inclusive Energy Transition* (91-119). Springer. [https://doi.org/10.1007/978-3-030-74586-8\\_5](https://doi.org/10.1007/978-3-030-74586-8_5) [accessed on 21 March 2023]





# Unlocking Cooperation with the Southern Neighborhood on Renewable Hydrogen

By Ana Valverde

## EXECUTIVE SUMMARY

Renewable hydrogen will be crucial to achieve the EU's aim to become climate neutral by 2050 and move away from its reliance on Russian fossil fuels. By 2030, the EU aims to consume 20Mt of renewable hydrogen, out of which 10 Mt are expected to be imported from third countries. Among these partners, the Southern Mediterranean countries are regarded as key actors.

To contribute to creating a level playing between domestic and external producers, the Commission has recently published two Delegated Acts that define the conditions under which hydrogen can be considered renewable. These non-legislative acts have been complemented by the proposal on a European Hydrogen Bank, to finance the production of renewable hydrogen. Despite these legislative developments, it is uncertain how third countries will be able to comply with the same sustainability requirements.

This policy brief attempts to be an inspiration for policymakers in the design of the renewable hydrogen market with the Southern Neighbourhood, by shedding light on the existing policy loopholes and suggesting possible policy measures. More specifically, it will be crucial to consider approximating sustainability criteria, strengthening trust and boosting financial support.

## Policy recommendations

1

### Develop clear and aligned sustainability guidelines

- Develop clear guidelines
- Develop a robust tracing system
- Strengthen the role of the EU in energy diplomacy

2

### Build trust

- Encourage discussion platforms that involve all stakeholders
- Understand the needs of different markets and address challenges
- Allow for flexibility

3

### Scale up targeted financial support

- Ensure coherence of funding resources to priority regions
- Increase budget of the international pillar of the Hydrogen Bank
- Create a separate financial instrument



## CONTEXT

The EU committed to move away from fossil fuels and to increase the consumption of renewable hydrogen to 20 Mt by 2030, of which 10 Mt are expected to be imported from third countries (REPowerEU Plan, COM/2022/230). To achieve this objective, energy imports from the Mediterranean will be crucial. Together with the REPowerEU communication, the report *EU external energy engagement in a changing world* reopens the idea of developing a common Mediterranean energy policy. Furthermore, the report positions this region as one of the main potential hydrogen suppliers, together with the North Sea and Ukraine.

With Morocco leading the race of renewable hydrogen, other countries such as Algeria or Egypt have also set ambitious targets by 2030. Yet, the production of renewable hydrogen in most countries of the southern shore of the Mediterranean is still in its infancy. For political pledges to be able to consolidate into concrete actions, financial regulatory and social challenges will have to be addressed. It is in the best interest of the EU to work closely and support its neighbours into the energy transition.

According to Article 1 of the Delegated Act on Union methodology for Renewable fuels of non-biological origin (RFNBOs) (hereinafter “first Delegated Act”), and complemented by the Delegated regulation for a minimum threshold for greenhouse gas (GHG) emission savings of recycled carbon fuels (hereinafter “second Delegated Act”), producers from the Southern Neighbourhood will have to comply with the sustainability criteria for producing renewable hydrogen in the same way as the EU’s domestic

producers. The first Delegated Act requires to demonstrate a temporal and geographical correlation between the electricity production and the fuel production, as well as compliance with an additionality element to the existing renewable capacity to ensure that hydrogen exports are not replacing more efficient use of electricity. Furthermore, the second Delegated Act establishes the methodology for calculating GHG emission savings from RFNBOs and recycled carbon fuels.

While contributing to create a level playing field, and avoiding carbon leakage<sup>1</sup>, the equal application of rules for certifying hydrogen sustainability in third countries has yet to be clarified. Current certification standards – such as Egypt’s and Morocco’s Green Certificate Company, Tunisia’s National Institute of Standardisation and Industrial Property, and the EU’s CertifyH2 – are not compatible. Each of these schemes has its own sustainability standards, and cover different parts of the supply chain, therefore making it imperative to improve alignment between the standards if the EU wants to develop a coherent hydrogen market that will rely to a large extent on its closer neighbours.

More recently, the European Commission (Commission) has released the details of the European Hydrogen Bank that will serve to finance the development of the hydrogen market. According to the Communication on the European Hydrogen Bank (2023), the Commission is now “further exploring how to design the international leg of the European Hydrogen Bank to promote a coordinated EU strategy for renewable hydrogen imports”.

This policy brief attempts to be an inspiration for policymakers in the

<sup>1</sup> According to the European Commission, carbon leakage may occur if, “for reasons of costs related to climate policies, businesses

were to transfer production to other countries with laxer emission constraints”.

design of the renewable hydrogen market with the Southern Neighbourhood, by shedding light on the existing policy loopholes and suggesting possible policy measures.

## POLICY RECOMMENDATIONS

### 1 Develop clear and aligned sustainability guidelines.

Certification of renewable hydrogen relies to a large extent on private voluntary schemes, and these diverge across countries and regions. The Commission is working to develop a single EU-wide database to certify the carbon footprint of hydrogen: CertifyHy. Furthermore, some work is being done through the working group MENA Hydrogen Alliance to approximate a GO scheme for the MENA region. However, this is only in its infancy and no international certification scheme exists yet, which poses compatibility challenges that need to be addressed if the EU wants to develop a robust and coherent framework that meets its objectives.

Sustainability criteria of renewable hydrogen varies across regions and countries depending on the certification entity used as a reference. If the EU wants to ensure consistent implementation of its criteria across the market from the start, **the Commission should further develop operational guidelines that include definitions, emissions, factors used or boundaries.** Furthermore, the Commission should work towards an integrated certification system where double counting is avoided. In this regard, the operational guidelines should help ensure that multiple certificates are not issued for the same unit of renewable hydrogen.

In the same vein, to facilitate hydrogen imports, **more coordination among internal EU policy standards would be**

**desirable.** The EU currently applies different purity standards depending on the end use of renewable hydrogen. This is scattered across numerous pieces of legislation: Effort Sharing Regulation (ESR), Emissions Trading System (ETS), Renewable Energy Directive (RED III), CO<sub>2</sub> emission performance standards for cars and vans, ReFuelEU Aviation, FuelEU Maritime, Energy Taxation Directive (ETD), Alternative Fuels Infrastructure Directive (AFID) and the Directive on common rules for the internal markets in renewable and natural gases and in hydrogen (Figure 1).

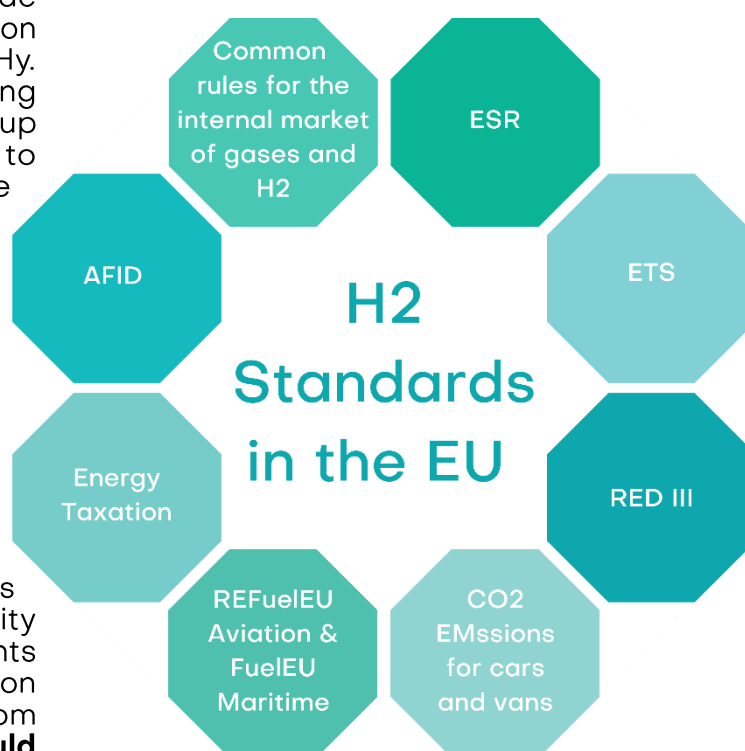


Figure 1: H2 standards in the EU. Author's own elaboration.

### Develop a robust tracing system

Tracing of renewable hydrogen is key to ensure the sustainability criteria is met and that double counting is avoided. Learning from the experience of tracing mechanisms used for biofuels, the Commission should accelerate the development of a single Union database to trade liquid and gaseous renewable and recycled carbon fuels and extend it to renewable hydrogen that is produced both domestically and

externally. Similarly, developing digital tools such as smart contracts would facilitate the exchange of information between the EU and partner countries and increase transparency.

### Strengthen EU energy diplomacy

Complying with a different certification scheme can have many associated costs for partner countries. In the absence of a harmonized standards, exporting countries must either comply with all of them or choose the most convenient system for them. It is therefore crucial that the Commission continues developing a strong energy diplomacy, together with the EU Member States, to become the first choice of the Union's partners. This should be complemented by a strong leadership that supports the upgrade of international governance arrangements to ensure that the market delivers on its purpose. The International Partnership for Hydrogen and Fuel Cells in the Economy's (IPHE) Hydrogen Production Analysis Task Force can be taken as a reference to develop common international standards.

**“It is crucial that the Commission continues developing a strong energy diplomacy, together with Member States”**

2

### Build trust between importers and exporters on the certification system

This is key to ensure a smooth renewable hydrogen trading system, until common international standards are developed.

**Encourage discussion platforms that involve all stakeholders.** To ensure compatibility of certification

schemes, the EU should first understand regional market requirements and technical skills needed along the chain. Anticipation of expected requirements, and outcomes is key for third countries to be able to design projects that can meet the demands. To understand the needs and challenges, the Commission should engage with all stakeholders involved in the production, transport, and use of renewable hydrogen. This could take the form of regular exchanges, the creation of a dedicated platform, capacity building and knowledge sharing.

### Understand needs of different markets and address challenges.

Alleging a “technical nature”, the two Delegated Acts were not accompanied by an impact assessment. This puts into question the feasibility of applying the EU's proposed methodology in countries with different certification systems (book & claim v. mass balancing), regulatory challenges, and economic distribution.

To start with, approximately 60% of the people in the MENA region live in areas under severe water stress, and climate change is accentuating this trend (Amro 2023). Since the production of renewable hydrogen requires large quantities of water, policymakers should try to avoid social and environmental costs of the EU's measures by developing sustainable solutions.

Similarly, Southern Neighbourhood countries are heavily reliant on fossil fuels. To avoid having a knock-on impact effect of its measures, the Commission should ensure that its partners do not increase the green hydrogen export capacity at the expense of burning more fossil fuels to power domestic generation.

**Allow for flexibility.** Developing a strong and reliable certification and tracing system of renewable hydrogen is essential for informing about the origin of hydrogen and avoiding carbon leakage. It is also necessary to ensure a fair level

playing field and to attract investments.

Nevertheless, policymakers should also take into consideration the incipient component of the renewable hydrogen market, and the need to boost innovative solutions. For instance, applying additionality and carbon allowance clauses may pose restrictions for early-stage projects that draw on grid power to be economically viable.

Certification schemes should be flexible enough to ensure that the nascent renewable hydrogen market can develop, and innovative solutions are encouraged, especially in the transition period.

### 3 Scale up targeted financial support

To meet the EU's renewable hydrogen consumption needs, the EU will need domestic production as much as third countries' one. However, EU funding for third countries is limited and not targeted according to strategic needs. The European Commission should:

#### **Ensure coherence of funding resources to priority regions.**

Financial instruments, such as NDICI-GE, IPA III, the Global Gateway, Recovery and Resilience Plans, or EFSD+, remain very important to complement the efforts of the Hydrogen Bank. In order to ensure policy coherence and consistency, it is crucial that policymakers keep in mind the Southern Neighbourhood as a strategic region when designing new projects.

Furthermore, redistribution of funds of the above-mentioned financial instruments to this

region should be done whenever possible, to ensure consistency with REPowerEU and the EU External Energy Engagement Strategy.

Additionally, the Commission should give energy infrastructure projects connecting the Southern

Neighbourhood and the EU duly consideration under the first Union list of PCI/PMIs expected to be adopted in November this year.

#### **Increase budget of the international pillar of the Hydrogen Bank.**

The total investment needs for importing 10 million tonnes of renewable hydrogen by 2030 have been quantified by the Commission at EUR 335 – 471 billion. With only EUR 3 billion allocated to support both domestic and international production through the Hydrogen Bank, cooperation with international partners remains very limited. The European Commission should consider increasing this budget.

#### **Create a separate financial instrument.**

Current financial programs such as the MFF 2021–2027, NDICI-GE, IPA III, EFSD+ have already allocated its funds to priority areas and leave very small leeway for alternative budget distributions to renewable hydrogen. This is why it is especially important to boost investments in this early stage by raising the budget of the Hydrogen Bank.

Furthermore, as suggested by market analysis and stakeholder feedback to the Commission, “there is a need for a dedicated instrument that can support hydrogen flows from third countries” (Communication on the European Hydrogen Bank, 2023). In this way, policymakers could envision the division of the Hydrogen Bank's budget into two different ones for each of the pillars.



**BIBLIOGRAPHY**

Amro, Selim (20 July 2020). *The MENA Region's Water Crisis: Avoiding Potential Water Wars*. The Washington Institute. <https://www.washingtoninstitute.org/policy-analysis/mena-regions-water-crisis-avoiding-potential-water-wars> [accessed 27 March 2023].

Braslawsky, Jared (31 January 2023). Certification for facilitating international trade of green hydrogen, 31 January 2023, OECD, Paris [video]. YouTube. [https://www.youtube.com/watch?v=\\_HKfjsZSH4](https://www.youtube.com/watch?v=_HKfjsZSH4) [accessed 20 March 2023].

CERTIFHY. Home. <https://www.certifyhy.eu/> [accessed 20 March 2023].

Commission Delegated Regulation (EU) 2023/1184 of 10 February 2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin C/2023/1087 OJ L 157, 20.6.2023. [https://eur-lex.europa.eu/eli/reg\\_del/2023/1184/oj](https://eur-lex.europa.eu/eli/reg_del/2023/1184/oj) [accessed 20 March 2022].

Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions EU External Energy Engagement in a Changing World Join/2022/23 Final <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022JC0023> [accessed 20 March 2022].

European Commission (2023a). Commission Sets out Rules for Renewable Hydrogen. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_23\\_594](https://ec.europa.eu/commission/presscorner/detail/en/ip_23_594) [accessed 30 March 2023].

European Commission (2023b). Commission outlines European Hydrogen Bank to boost renewable hydrogen. [https://energy.ec.europa.eu/system/files/202303/COM\\_2023\\_156\\_1\\_EN\\_ACT\\_part\\_1\\_v6.pdf](https://energy.ec.europa.eu/system/files/202303/COM_2023_156_1_EN_ACT_part_1_v6.pdf) [accessed 26 March 2023].

Hritsyshyna, Maryna (15 June 2022). Possible Impact of the Delegated Acts on Import of Hydrogen in the EU. Energy Post. <https://energypost.eu/possible-impact-of-the-delegated-acts-on-import-of-hydrogen-in-the-eu/> [accessed 20 March 2023].

Hydrogen Europe (March 2023). The European Hydrogen Bank Kickstarting the European hydrogen market. [https://hydrogeneurope.eu/wp-content/uploads/2023/03/2023.03\\_Hydrogen-Bank\\_H2Europe\\_paper.pdf](https://hydrogeneurope.eu/wp-content/uploads/2023/03/2023.03_Hydrogen-Bank_H2Europe_paper.pdf) [accessed 27 March 2023].

International Energy Agency (IEA) (2023). Morocco. <https://www.iea.org/countries/morocco> [accessed 27 March 2023].

International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) (2022). International Trade Rules for Hydrogen and its Carriers: Information and Issues for Consideration. [https://www.iphe.net/\\_files/ugd/45185a\\_29c90ec0ea15463eadf5d585cfd7b20a.pdf](https://www.iphe.net/_files/ugd/45185a_29c90ec0ea15463eadf5d585cfd7b20a.pdf) [accessed 27 March 2023].

International Renewable Energy Agency (IRENA) (2020). The World Power-to-X Summit 2020 SESSION 4 IRENA - Collaborative Framework for Green Hydrogen. [https://www.irena.org/-/media/Files/IRENA/Agency/Articles/2020/Oct/Morocco\\_PtX\\_IRENA\\_session-summary.pdf?la=en&hash=2BF20AE0F8272EF0E813A3E0D78A7A742D904075](https://www.irena.org/-/media/Files/IRENA/Agency/Articles/2020/Oct/Morocco_PtX_IRENA_session-summary.pdf?la=en&hash=2BF20AE0F8272EF0E813A3E0D78A7A742D904075) [accessed 27 March 2023].

Klessmann, Corinna, Toop, Gemma, and Alberici, Sacha (3 May 2022). The Road to Green Hydrogen Certification - and the Potholes to Be Avoided. Euractiv.

---

<https://www.euractiv.com/section/energy/opinion/the-road-to-green-hydrogen-certification-and-the-potholes-to-be-avoided/> [accessed 20 March 2023].

Sundar, Sowmya (7 April 2022). MENA Well-Positioned to Meet European Union's Hydrogen Demand. ZAWYA. <https://www.zawya.com/en/projects/industry/mena-well-positioned-to-meet-european-unions-hydrogen-demand-kpfbvow5> [accessed 27 March 2023]

Varvelli, Alberto and Rizzi, Arturo (14 March 2023). Opening the Global Gateway: Why the EU Should Invest More in the Southern Neighbourhood – European Council on Foreign Relations. The European Council on Foreign Relations (ECFR). <https://ecfr.eu/publication/opening-the-global-gateway-why-the-eu-should-invest-more-in-the-southern-neighbourhood/> [accessed 27 March 2023].

Zahw, Tareq, Peterse, Jaap, Schimmel, Matthias and Cihlar, Jan (October 2022). Facilitating hydrogen imports from non-EU countries. Guidehouse Netherlands B.V. [https://gasforclimate2050.eu/wp-content/uploads/2022/10/2022\\_Facilitating\\_hydrogen\\_imports\\_from\\_non-EU\\_countries.pdf](https://gasforclimate2050.eu/wp-content/uploads/2022/10/2022_Facilitating_hydrogen_imports_from_non-EU_countries.pdf) [accessed 19 March 2023].





# An EU Strategy: Unlocking the Potential of Green Hydrogen Production in Southern and Eastern Africa

By Marco Valenziano

## EXECUTIVE SUMMARY

The plans of the EU to establish a hydrogen economy strongly rely on external partners. Indeed, the plans to import 10 million tonnes of renewable hydrogen by 2030, will not solve the Union's problems on energy interdependencies. Learning from the lessons of Russia's war of aggression against Ukraine and the energy relations with Russia, the EU risks to repeat the same mistakes of the past. Nevertheless, other reliable suppliers may arise in areas not renowned for producing energy commodities, especially in the Eastern and Southern African regions. This will require restructuring the funding schemes, such as the NDICI-GE, the IPCEI and the LEAP-RE, and diplomatic efforts to create common standards to attract Foreign Direct Investments (FDI). The EU has already developed some partnerships in North Africa, but there is more potential to expand its external activities to Southern and Eastern African countries.

### Policy recommendations

1

A smoother rollout of funds into targeted projects on green hydrogen.

2

The European Commission should take the lead in negotiating more Memorandum of Understanding and agreements with Southern and Eastern African countries.

3

The Important Projects of Common European Interest on hydrogen (Hy2tech and Hy2use) should cooperate with the LEAP-RE to test technologies in Southern and Eastern Africa.

4

The European Commission should establish Energy Dialogues to ensure the alignment on standards that could bring FDI.

5

The European Commission should also prepare the field for when these funds will arrive.



## CONTEXT

The EU Strategy on Hydrogen kickstarted long-awaited European investments in this field which have been followed by several policy proposals (European Commission, 2022, 2023). If the current setup appears to incentivise the production of hydrogen from all sources, the long-term strategy aims at a sustainable economy which uses hydrogen from renewable sources only (Valenziano, 2023).

This is anticipated in a delegated act defining what green sustainable hydrogen is (European Commission, 2023b). Yet, the Commission admitted that the EU could not be self-sufficient in its production of sustainable hydrogen and plans to import 10 million tonnes of green hydrogen into the EU by 2030 (Collins, 2022). This puts the EU again at risk of tense relationships with its energy suppliers (Talus, 2013). Those who have expressed interest in investing in hydrogen production in order to export it to the EU are some of the current most prominent exporters of oil and natural gas to Europe. Therefore, diversification is a challenge that the EU must address, especially when it comes to the Union's vulnerabilities and to unfriendly suppliers.

Despite the promises to produce and export only green hydrogen, many of the EU's current energy providers highlight the risk of supplying electrolysers with non-renewable energy sources such as natural gas.

Several partners have already signed hydrogen agreements with EU Member States. For instance, Germany opened a Hydrogen Diplomacy Office in Saudi Arabia (German Federal Foreign Office, 2022). The Saudi Kingdom also signed a Memorandum of Understanding with Greece, intending to export to the Balkans and Central Europe, and

is not focusing only on renewables (Saudi Press Agency, 2022). The Algerian national gas company Sonatrach signed strategic agreements with the Italian energy company Eni (Eni, 2023). Turkey is pondering the introduction of green hydrogen among its exported products by channelling it through the Trans Adriatic Pipeline (TAP) in a mix with natural gas (Rzayeva and Lambert, 2021). Finally, Morocco and Portugal reached an agreement on Green Hydrogen Cooperation (Kasraoui, 2021).

However, in dealing with these partners, the EU should be mindful of other potential concerns beyond not receiving hydrogen from renewable sources. To a certain extent, none of them fully adhere to fundamental human rights and democratic principles (Freedom House, 2023). Furthermore, some have complex relationships with one or more Member States and use their market power to influence European decisions.<sup>1</sup>

Undoubtedly, the number of sources will allow diversifying the supply from like-minded or friendly countries. At the same time, an uncoordinated action could become an obstacle to the creation of a single market for hydrogen (both renewable and from fossil sources). Many inefficiencies may stem from the lack of coordination – if not the competition – between Member States to invest in the same country and secure supplies. Therefore, diversifying to other regions and speaking with one voice could reduce the impact of such risks.

**“The EU should be mindful of other potential concerns beyond not receiving hydrogen from renewable sources.”**

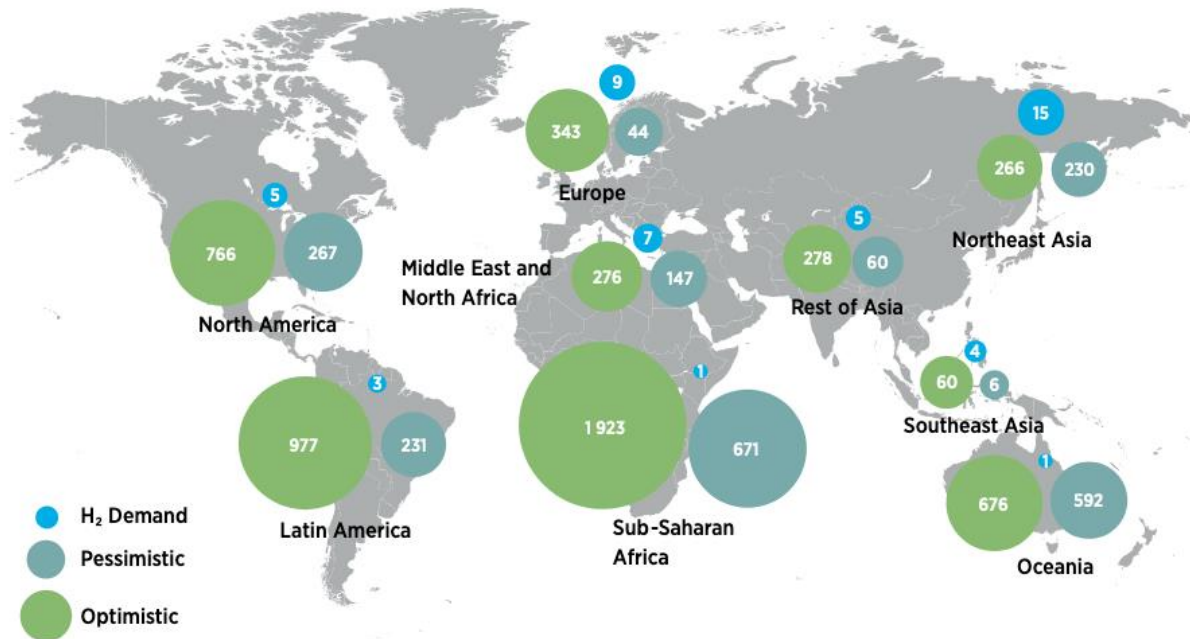


Figure 1: Comparison between economic potential of green hydrogen supply below USD 2/kgH<sub>2</sub> and forecasted hydrogen demand, in EJ/year, in 2050. Source: IRENA (2022)

## FOCUS ON AFRICA

### A favourable environment for green hydrogen

In 2050, Africa's population is predicted to reach 2.5 billion, and its economy is expected to grow by 2.2% to 3.1% per year. This rapid population and economic growth will result in an increase in energy consumption and GHG emissions in Africa.

It is estimated that by 2050, Africa's emissions may shift from the current 3% to an amount that ranges between 5% and 20% of global emissions (Mukelabai et al., 2022). Much of this volatility depends on whether African countries opt for new investments in fossil fuels or in renewables. Hydrogen has the potential to be very attractive for Africa due to its ability to be an energy vessel (Yohannes and Diedou, 2022).

It is also estimated that the African continent will have enough resources to produce more green hydrogen than it will need for its economy (Figure 1). The International Energy Agency (IEA) forecasted that Africa will be able to produce green hydrogen at a competitive price by 2030 thanks to

its water, wind, land, and solar resources (Figure 1).

With the right investments and economy of scale, it could produce 5,000 Megatons yearly, which is equivalent to the current global total supply, for less than USD 2 per kilogramme (International Energy Agency [IEA], 2022).

However, this will require scaling up the deployment of renewable power generation (European Commission, 2020). Until now, Sub-Saharan countries are not willing to invest at full speed in the funding required for these infrastructures.

The EU could play a role in helping promising countries from the Eastern and Southern African regions through its diverse aid plans and investment schemes and by favouring a dialogue to increase the number of FDI. In turn, the EU would receive green hydrogen supplies in due time. This would reduce the risk of compromise with unfriendly partners, which is the current situation with Russia and other problematic interdependencies in the energy field.

Southern and Eastern African countries have not been considered relevant energy suppliers for the EU, a view that may have changed due to Russia's war of aggression against Ukraine. In turn, most of the Southern and Eastern African countries already respect democratic values or are improving (Freedom House, 2023). They can become reliable partners for new energy supplies such as hydrogen. Several electrolyser hubs have been announced in Namibia and are under study or construction. Their defined purposes are transport, electricity production and export (IEA, 2022). Common projects with Botswana are also being envisaged, according to the Africa Solar Industry Association (AFSIA) (REGlobal, 2022).

Namibia even launched the African Green Hydrogen Alliance with Mauritania, South Africa, Egypt, Morocco, and Kenya to develop investments in this technology further (IEA, 2022). In Eastern Africa, Kenya will likely be another good partner for the EU, which marked its interest with the involvement of the European Investment Bank (EIB). Due to its abundant water resources, Zambia's production of green hydrogen could be even more profitable (Mukelabai, 2022).

Despite the high hopes for projects in these areas, the investment requirements are not matched by resources African nations have at their disposal. For instance, the Hyphen Hydrogen Energy project in Namibia is estimated to cost USD 9.4 billion, compared with the national GDP of around USD 11 billion (IEA, 2022). Thus, the EU could be a customer of African green hydrogen and a stable partner for technical development and other investment.

### The Role of the EU in Southern and Eastern Africa

Given these premises, the EU should play its leading role in climate and democratic rights for four reasons:

- to design an integrated single market for green hydrogen from scratch, which considers dimensions internal and external to the EU,
- to avoid the skirmishes among Member States mentioned above and reduce their concerns towards foreign partners,
- to reduce the bargaining power of energy suppliers which seek to divide the Union to keep their dominant position in negotiations,
- to keep the GHG emissions of Africa low and promote through its investments the development of a local green economy and virtuous democratic institutions.

Unlike other fields of external action where Member States have kept competencies at national level, the EU can independently address the foreign policy branch of its energy policy.

Firstly, the Commission must be informed of any new bilateral deal between a Member State and a foreign energy supplier. This way, it is possible to check the compliance with EU Law *ex ante* as well as guide the inclusion of provisions for "good governance" (Talus, 2013). Secondly, according to Article 216(1) TFEU, the EU could conclude an international agreement in areas where this is necessary to realise one of the European objectives, or if it is tasked by a binding act of the EU (Talus, 2013). This has been hardly the case in the past, with measures often limited to liberalisation and unbundling. Still, renewable energies are a primary EU Action (Talus, 2013). Combining the aims of the European Green Deal with the disposition under Article 194 TFEU could theoretically allow the EU to autonomously

negotiate and stipulate energy contracts in the field of hydrogen.

These capabilities are operationalised by a set of tools the EU already uses in emerging economies. However, that must improve if the institutions, specifically the Commission, intend to take the lead in negotiating the import of hydrogen. The EU is a significant player in the field of development aid. In the 1970s, the European Community implemented some renewable projects in African, Caribbean, and Pacific (ACP) countries, but the lack of enforcement resulted in the failure of the missions.

The Lomé III and IV Conventions included energy among the priorities, but renewables were not considered, perhaps due to the previous unsuccessful experiments (Grubb, 1995). Under Horizon 2020, the European Commission co-funded the Long-term Europe Africa Partnership on Renewable Energy (LEAP-RE), a five-year program to foster long-term Research and Innovation (R&I) capabilities in renewable energy between the EU and Africa. Each consortium must involve at least four countries from the two continents, with at least two consortia members from the EU and at least two from African countries. Nonetheless, currently, there is only one project focusing on white hydrogen – a by-product of the mining industry – thus not from renewable sources (CONVERGE, 2023).

Concerning investments, the EU's Global Gateway framework supports projects in renewable hydrogen in partner countries as part of their green transition, with the European Fund for Sustainable Development Plus providing grants and guarantees under the Neighbourhood, Development, and International Cooperation Instrument – Global Europe (NDICI-GE). This support is essential in facilitating investments, particularly in projects that are co-financed by the EIB and EU Member

States' development financing institutions as "Team Europe." The EIB created a Green Hydrogen Fund in 2022. Still, the project is funded only by Germany and has not backed any project so far (European Investment Bank [EIB], 2023a). Moreover, the EIB is forming a sustainable hydrogen partnership with Kenya and plans to increase investments in green hydrogen based on research confirming Africa's significant potential for green hydrogen (EIB, 2022, 2023b).

Nevertheless, these projects need to be more cohesive, and donors are still investing only in specific projects of their choice. For instance, the Team Europe Initiative on Green Hydrogen (GH2) development in Chile gathered the EU, the EIB and 8 EU Member States, while a similar project for Namibia under the Global Gateway is still in the design phase (European Commission, 2023c). In addition, it is not possible to use NDICI-GE funds to pay for commodities used within the EU, such as green premiums for producers of renewable hydrogen in third countries, hindering part of the potential investments in Africa (European Commission, 2023c).

Finally, the EU could establish relations through the Energy Dialogues. In the case of the EU-Norway Energy Dialogue, the two sides exchange their views on the coordination of energy policy, relations with other energy-supplying countries, and research and technological development in the field (Talus, 2013). Such mechanisms could allow the flow of FDI by establishing common standards in a developing economy, such as hydrogen.

## POLICY RECOMMENDATIONS

The Commission's Communication on The European Hydrogen Bank shows that the EU is considering investments in Southern and Eastern Africa. Nonetheless, the abovementioned shortcomings must be overcome to ensure steady relations with these potential energy suppliers.

The Neighbourhood, Development and International Cooperation Instrument – Global Europe must be amended to allow **a smoother rollout of funds into targeted projects on green hydrogen**. The Commission should also promote the EIB's Green Hydrogen Fund to find more donors among the Member States.

**1** **The Commission should take the lead in negotiating more Memorandum of Understanding** and agreements with Southern and Eastern African countries and establish an EU-wide fund to develop hydrogen produced from renewables in those regions in the next Multiannual Financial Framework (MFF) at the latest.

**2** **The Important Projects of Common European Interest on hydrogen (Hy2tech and Hy2use) should cooperate with the LEAP-RE** to test technologies in Southern and Eastern Africa. They could bring technical knowledge and more profitable results due to the more favourable environment for solar and wind energy.

Whenever African partners are more reluctant to adopt binding policies, **the Commission should establish Energy Dialogues** to ensure the alignment on standards that could bring FDI. The Union should also provide additional measures, such as insurances, to reduce the high costs

associated with political, economic, and geopolitical risks.

In conclusion, some solutions require the allocation of new funding, which is a matter that will hardly be modified before the next MFF. Therefore, **the Commission should also prepare the field for when these funds will arrive**. This will facilitate the implementation of R&D cooperation with Southern and Western African countries. If these regions receive proper funding to unleash their potential, they can be more stable and democratic partners in comparison to some of the EU's current energy suppliers.

**5**



## BIBLIOGRAPHY

Collins, L. (4 May 2022). 'Europe is never going to be capable of producing its own hydrogen in sufficient quantities': EU climate chief. Recharge. <https://www.rechargenews.com/energy-transition/europe-is-never-going-to-be-capable-of-producing-its-own-hydrogen-in-sufficient-quantities-eu-climate-chief/2-1-1212963> [accessed on 8 August 2023].

Commission Delegated Regulation (EU) 2023/1184 of 10 February 2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin. [http://data.europa.eu/eli/reg\\_del/2023/1184/oj/eng](http://data.europa.eu/eli/reg_del/2023/1184/oj/eng) [accessed on 7 July 2023].

CONVERGE (2023). HyAfrica. LEAP-RE. <https://www.leap-re.eu/hyafrica/> [accessed 4 April 2023].

Eni (23 January 2023). Eni and Sonatrach sign strategic agreements to accelerate emissions reduction and strengthen energy security. <https://www.eni.com/en-IT/media/press-release/2023/01/eni-sonatrach-sign-strategic-agreements-accelerate-emissions-reduction.html> [accessed 4 April 2023].

European Commission (2023). Hydrogen. [https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen\\_en](https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen_en) [accessed 4 April 2023].

European Commission (8 July 2020). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Hydrogen Strategy For A Climate-Neutral Europe [COM(2020) 301 final]. European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0301> [accessed on 3 April 2023].

European Commission (18 May 2022). Commission Staff Working Document Implementing the REPowerEU Action Plan: Investment Needs, Hydrogen Accelerator and Achieving The Bio-Methane Targets Accompanying the Document Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions REPowerEU Plan [SWD(2022) 230 final]. European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD%3A2022%3A230%3AFIN&qid=1653033922121> [accessed on 3 April 2023].

European Commission (16 March 2023). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on The European Hydrogen Bank [COM(2023) 156 final]. European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0156&qid=1680594714959> [accessed on 3 April 2023].

European Investment Bank (2023). Green Hydrogen Trust fund. <https://www.eib.org/en/products/blending/donor-partnerships/trust-funds/green-hydrogen-fund> [accessed 4 April 2023].

European Investment Bank (21 December 2022). New study confirms €1 trillion Africa's extraordinary green hydrogen potential. European Investment Bank.



<https://www.eib.org/en/press/all/2022-574-new-study-confirms-eur-1-trillion-africa-s-extraordinary-green-hydrogen-potential> [accessed 4 April 2023].

European Investment Bank (1 March 2023). Kenya: EIB and Kenya strengthen green hydrogen cooperation. <https://www.eib.org/en/press/all/2023-083-european-investment-bank-and-kenya-strengthen-green-hydrogen-cooperation> [accessed 4 April 2023].

Freedom House (2023). Global Freedom Status Map. <https://freedomhouse.org/explore-the-map> [accessed 4 April 2023].

German Federal Foreign Office (27 February 2022). Hydrogen diplomacy office opening in Saudi Arabia. <https://www.auswaertiges-amt.de/en/aussenpolitik/themen/hydrogen-diplomacy-office/2513802> [accessed 4 April 2023].

Grubb, Michael (1995). *Renewable Energy Strategies for Europe*. Royal Institute of International Affairs. [https://doi.org/10.1016/0960-1481\(94\)90358-1](https://doi.org/10.1016/0960-1481(94)90358-1).

International Energy Agency (June 2022). *Africa Energy Outlook 2022*. <https://www.iea.org/reports/africa-energy-outlook-2022>.

IRENA (May 2022). *Global hydrogen trade to meet the 1.5°C climate goal: Part III – Green hydrogen cost and potential*. <https://www.irena.org/Publications/2022/May/Global-hydrogen-trade-Cost>.

Kasraoui, Safaa. (2 February 2021). Morocco, Portugal Sign Agreement on Green Hydrogen Cooperation. *Morocco World News*. <https://www.moroccoworldnews.com/2021/02/333919/morocco-portugal-sign-agreement-on-green-hydrogen-cooperation> [accessed on 3 April 2023].

Mukelabai, Mulako Dean, Wijayantha, Upul K. G., & Blanchard, Richard E. (2022). Renewable hydrogen economy outlook in Africa. *Renewable and Sustainable Energy Reviews*, 167. <https://doi.org/10.1016/j.rser.2022.112705>

REGlobal (1 February 2022). Massive green hydrogen project planned in Botswana and Namibia. *REGlobal News*. <https://reglobal.co/green-hydrogen-project-expands-to-5-gw-in-botswana-and-namibia/> [accessed on 3 April 2023].

Rzayeva, Gulmira, and Lambert, Martin (2021). What role for hydrogen in Turkey's energy future?. *Oxford Institute for Energy Studies, Energy Insight* 102.

Saudi Press Agency (27 July 2022). Saudi Arabia and Greece Sign Memorandum of Understanding on Cooperation in Energy. <https://www.spa.gov.sa/viewfullstory.php?lang=en&newsid=2372599> [accessed on 3 April 2023].

Talus, Kim (2013). *EU energy law and policy: A critical account*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199686391.001.0001>.

Valenziano, Marco (2023). *The EU Hydrogen Policy and the Challenges of New Interdependencies*. College of Europe.

Yohannes, Bitsat, and Diedou, Arona (2022). Green hydrogen: A viable option for transforming Africa's energy sector. *Africa Renewal*.



 epico



Brugge

College of Europe  
Collège d'Europe



Natolin