

RES4Africa Foundation

Towards a Green Hydrogen Ecosystem
EU-AU implementation strategies and Policies
priorities

RES4Africa
Rabat - May 24 th 2024



Green Hydrogen in Europe: strategies and regulations

- The EU strategy on hydrogen was adopted in 2020 and suggested policy action points in 5 areas: investment support; support production and demand; creating a hydrogen market and infrastructure; research and cooperation and international cooperation. Hydrogen is also an important part of the EU strategy for energy system integration.
- The priority for the EU is to develop renewable hydrogen and it aims to produce 10 million tonnes and import 10 million tonnes by 2030



The Fit-for-55 package, presented in July 2021 put forward a number of legislative proposals that translate the European hydrogen strategy into concrete European hydrogen policy framework. This includes proposals to set targets for the uptake of renewable hydrogen in industry and transport by 2030



In September 2022, **the Commission approved "IPCEI Hy2Use"**, which complements IPCEI Hy2Tech and which will support the construction of hydrogen-related infrastructure and the development of innovative and more sustainable technologies for the integration of hydrogen into the industrial sector.



The policy framework was completed with 2 delegated acts, formally adopted on 20 June 2023, applicable to renewable hydrogen under the Renewable Energy Directive. The first one covers renewable fuels of non-biological origin (RFNBOs) and sets the criteria for products that fall under the 'renewable hydrogen' category. The other one puts forward a detailed scheme to calculate the life-cycle emissions of renewable hydrogen and recycled carbon fuels to meet the greenhouse gas emission reduction threshold set in the directive.

A certification challenge...

- **Principle of Additionality:** the power generated by the current RES plants must be supplemented by the renewable electricity utilized to make hydrogen. By following this rule, the creation of hydrogen will always help to increase and develop the capacity for renewable energy. This principle shall not be applied until 1st January 2038 for hydrogen plants in operations before 1st January 2028
- **Temporal correlation:**
 - the production of hydrogen must occur in the same calendar month as the renewable power produced by the RES plant until December 31, 2029
 - as of January 1, 2030, the hydrogen must be produced in the same hour of RES plant's generation
- **Geographic Correlation:**
 - The electrolyzer and the RES plant must be in the same bidding zone, or in interconnected bidding zones if the renewable asset is located in a bidding zone where the power price is equal or higher than in electrolyzer's bidding zone, or if the RES plant is in an offshore bidding zone interconnected to the electrolyzer's bidding zone

Green Hydrogen in Egypt and Morocco: a lot of positive commitments



Project	Date online	Status	Technology	Normalized Capacity (kt H2/y)
Egypt Ministry of Electricity and Renewable Energy	-	Feasibility study	Other Electrolysis	-
KIMA - Aswan electrolyser	2000	Decomm.	ALK	28
Cairo Green Hydrogen	-	Concept	Other Electrolysis	-
EBIC - Ammonia plant	2024	Feasibility study	PEM	15.0
EEHC - Siemens MoU	-	Concept	Other Electrolysis	26.0
Ain Sokhna plant, Suez Canal Economic Zone (SCZone), phase 1	2026	Feasibility study	Other Electrolysis	25
Ain Sokhna plant, Suez Canal Economic Zone (SCZone), phase 2	-	Concept	Other Electrolysis	38
Ain Sokhna ammonia project	2025	Feasibility study	Other Electrolysis	70
Masdar Hassan Allam green hydrogen, phase 1	2026	Feasibility study	Other Electrolysis	19
Masdar Hassan Allam green hydrogen, phase 2	2030	Concept	Other Electrolysis	673.9
Total Eren, Enara green ammonia, phase 1	-	Concept	Other Electrolysis	54
Total Eren, Enara green ammonia, phase 2	2030	Concept	Other Electrolysis	216
Scatec Green Ammonia	2025	Concept	Other Electrolysis	180
ReNew Power - Egypt MoU, Hydrogen, phase 1	2025	Concept	Other Electrolysis	20
ReNew Power - Egypt MoU, Hydrogen, phase 2	2029	Concept	Other Electrolysis	180
ReNew Power - Egypt MoU, Ammonia phase 1	2025	Concept	Other Electrolysis	18
ReNew Power - Egypt MoU, Ammonia phase 2	2029	Concept	Other Electrolysis	180



Project	Date online	Status	Technology	Normalized Capacity (kt H2/y)
Saipem and Alboran Hydrogen (1 plant)		Concept	Other Electrolysis	-
OCP Group demo project	2022	Under construction	Other Electrolysis	0.3
HEVO-Morocco	2026	Feasibility study	PEM	31
Masen - KfW	2025	Feasibility study	Other Electrolysis	17.3
Amun		Concept	Other Electrolysis	-

RES4Africa's position paper (in publication)



Key measures to unlock Green Hydrogen potential in Morocco and Egypt

1. Complete the **country's national hydrogen roadmap by setting quantified feasible targets** for the whole green hydrogen value chain. **Integrate it into the national energy strategy and mix.**
2. Carefully evaluate possible targets and priorities in terms of **local consumption and exports**, also with a view to curbing local greenhouse gas emissions.
3. **Deploy and empower R&D platforms** involving all relevant stakeholders to test the technology and find the most cost-effective solution. Build a feasible roadmap to develop successful technologies for the production and transport of green hydrogen.
4. **Design and implement long-term, stable, and transparent policies, governance schemes, and regulatory frameworks.** This would enable the creation of bankable contracts for off-takers and reduce investment risks.
5. **Design clear and transparent financial support mechanisms and public funding** for market uptake to close the current price gap between green hydrogen and substitutes.
6. **Carefully assess the need to transport hydrogen, considering efficient alternatives upstream and downstream, such as electricity or derivatives.** Set up technical standards and safety norms in line with international practices, with a view of refurbishing existing transport infrastructures where needed, avoiding potential stranded assets.
7. **Set up internationally recognized certifications or Guarantees of Origin.** Hydrogen labeling as “Green” is essential to provide transparency to consumers and create market pull for Green H₂.

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Green Hydrogen: Opportunities and Challenges



Opportunities

- Decarbonise hard-to-abate sectors and match local industrial demand to achieve carbon neutrality targets
- Improve energy security and diversify energy transition strategies
- Use the infrastructure for the production of hydrogen for other local needs (e.g. desalination)
- Grow and develop a hydrogen economy to unlock local value and long-term jobs
- Fast-track industrialization through hydrogen-related technologies and derivatives
- Foster capacity building and create Africa's competitive and technical skills of tomorrow



Challenges

- Local contexts and existing and supporting infrastructure
- Proximity between consumption and production pools in geographies, connect supply & demand
- Prioritise and size RE investments for access to electricity and then avail accompanying supply chain to support the green H2 ecosystem development
- Need for clear policy signals as a key driver for transparency and good governance following clear strategies and plans
- Environmental, resource (in particular water) and safety issues