

GFSE Newsletter

Dear Friends of GFSE,

We are pleased to send you our July 2022 edition of the GFSE newsletter, containing updates, important events, and news from stakeholders working towards a sustainable energy future for all.

Enjoy reading!

The Global Forum on Sustainable Energy

GFSE Policy Brief Natural gas and renewable hydrogen in Africa and cooperation opportunities with the EU

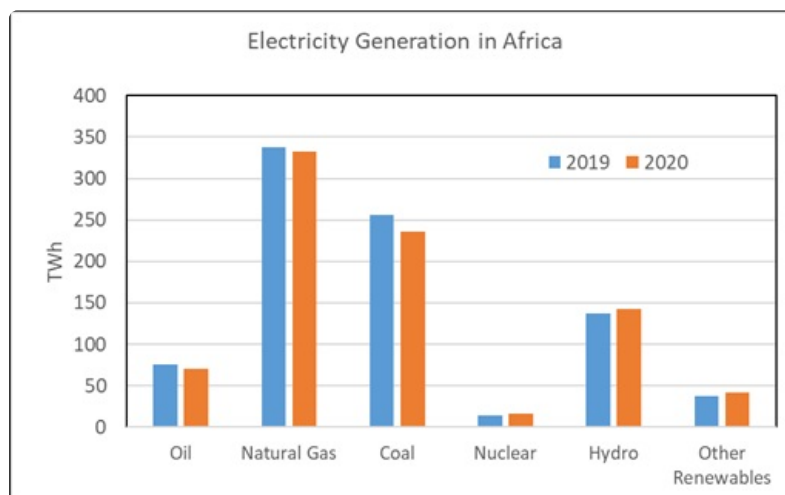
Europe needs to reduce consumption of Russian natural gas by diversifying its suppliers, reducing gas consumption and switching to other energy carriers, including renewable energy. This policy brief presents an overview of current developments in the natural gas and the renewable hydrogen sectors in Africa. It provides some suggestions for possible cooperation between the European Union and the African continent on LNG and green hydrogen markets.

Cooperation between Africa and Europe on renewable energy can become a building block for a broader cooperation on trade, security, technology, climate and environmental policy, thus strengthening the EU's external relations towards Africa as strategic partner. A sound cooperation requires development of trade relationships, substantial investments, opening of markets and recognition of African countries as equal partners.

Renewable hydrogen production in Africa for local and export markets could help reduce the costs of production through scaling up and learning-by-doing effects. Intercontinental renewable hydrogen trade can help the EU diversify its sources of energy and reduce geopolitical dependence on Russia and other fossil fuel exporters.

However, at the same time, Africa need to develop its renewable energy resources for domestic consumption to support its economic development and will require support from Europe for this purpose.

Renewable hydrogen can also be used as a feedstock and fuel by African industry to produce green products with higher value-added than raw materials such as green steel, green fertilizers and cement for domestic consumption or exports to the European Union.



Egypt green ammonia project in the Suez Canal Economic Zone

Egypt has a significant potential for renewable energy. The Integrated Sustainable Energy Strategy has set the target to generate 42% of its electricity from renewable sources by 2035. Egypt has also plans to develop electricity interconnectors with several African countries. In 2021, the renewable electricity installed capacity was about 6,226 MW, which amounted to about 10.55% of the total installed capacity (approx. 59 GW). Egypt is the sixth largest urea producer in the world and is among the top 10 suppliers of fertilizers worldwide. The country has increased its food exports since 2020, reaching \$4.1 billion in 2021. Egypt has also increased its liquefied natural gas (LNG) exports to Europe. In April 2022, Egypt signed an agreement with the European Union (EU) to cooperate on LNG and renewable hydrogen trade between Europe and Africa. Egypt will also be the host of the UN Climate Change Conference (COP27) in Sharm El Sheikh in November 2022.

In 1960 one of the first alkaline electrolyzers, Aswan Electrolyser (KIMA), with a capacity of 165MW was installed in the Assuan hydropower dam in Egypt. These electrolyzers are still in operation. The government is currently working on a hydrogen plan and Egypt has signed several initial agreements and MoU with project developers from Norway, Denmark, France, UAE, Australia, Saudi Arabia and the U.S. for the development of renewable hydrogen and ammonia projects.

A project for renewable ammonia production is being developed by Scatec, a Norwegian renewable energy project developer, together with the General Authority for Suez Canal Economic Zone (SCZONE), The Sovereign Fund of Egypt (TSFE), the Egyptian Electricity Transmission Company (EETC), and the New and Renewable Energy Authority (NREA). The facility is expected to have a production capacity of one million tonnes of Ammonia annually and to be located in the Ain Sokhna Industrial Zone in the Suez Canal Economic Zone near the Egypt Basic Industries Corporation (EBIC), which produces ammonia. The consortium selected US-based Plug Power to provide 100 MW of electrolyzers for installation.

Scatec (NO) is a large solar PV project developer in Egypt. In 2017, Scatec signed 25-year Power Purchase Agreements with the Egypt Electricity Transmission Company for delivery of electricity from solar PV plants with a total capacity of 380 MW using bifacial modules that can produce electricity from both sides of the solar cell.

Water scarcity is a significant problem in Egypt. The country has a significant water deficit that is straining its economy and can lead to social conflicts in Egypt and conflicts with its neighbours as well as food price shocks. Seawater desalination would be required for hydrogen production via electrolysis since the country cannot deviate fresh water resources for this purpose.

[Read more about Scatec and partners developing a large-scale green ammonia facility in Egypt](#)

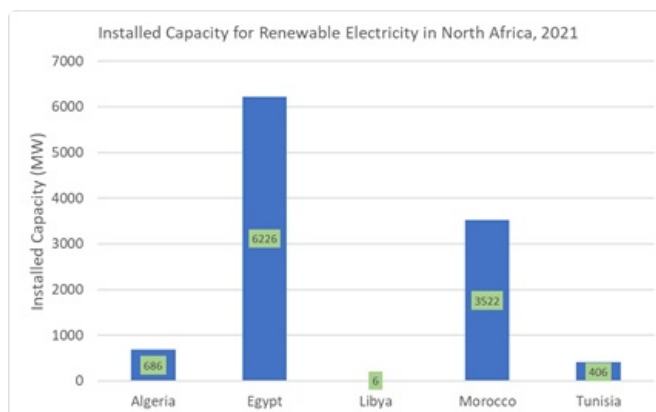
[Read more about Egypt's Synergy Between Natural Gas and Green Energy Transition from the Middle East Institut](#)

Short comparison between countries in North Africa

Regarding energy in North Africa, all countries have two things in common: growing demand for power and a high potential for renewables, especially wind and solar. While having seemingly similar prospects and needs, their paths and motivations for investing in renewables vary.

Morocco is one of the leading countries in renewable energy expansion. The 2016 host country of the COP22 set itself a highly ambitious target of 52% renewables by 2030 and is already working towards the target, reaching 19% in 2020 with several large-scale solar projects starting operation in the past years and more being planned. A significant motivating factor for Morocco is the prospect of mitigating its dependency on imports, which is currently still high. 71% of Morocco's electricity is still produced from coal. While the country wants to extend its electrical connections to Spain and Portugal, it will still take time for potential exports to become ripe for discussion. Egypt is similarly ambitious, wanting to reach 42% renewables in their electricity production by 2035. Reforms in the energy sector have also significantly increased investments, and the country is reaching out to European countries for partnerships. Just like Morocco, Tunisia relies heavily on imports. 95% of its electricity is still produced through natural gas. The country used to live off

its resources and even exported oil and gas, but around 2000 the reserves started running out, and its import dependency increased. Its goal is to reach 35% of renewables in electricity production by 2030.



Source: IRENA, 2022: Renewable Capacity Statistics 2022. April 2022

Not all North African countries rely on imports. On the contrary: Algeria and Libya export natural gas and crude oil. Their motivations toward renewables, however, differ. Algeria, as a key player in the global oil and gas market, sees a strategy to minimize its fossil-based resource consumption and maximize export. It has set a target of 27% by 2030 and has been investing in large-scale solar & onshore wind since 2015. Libya struggles with power outages and may profit from renewables as a more decentralized energy system. Currently, almost all of Libya’s electricity is produced centrally through its oil and gas resources. The ministry for oil and gas did set up a plan to expand renewable energy to reach 10% in 2025, but it currently seems unlikely it will reach its target.

It is to be noted that all percentages in this article refer to the electricity production and not the total energy consumption, where the share of renewables is progressing much slower.

[Read more about Morocco by the IEA](#)

[Read more about Algeria by the IEA](#)

[Read more about Tunisia by the IEA](#)

[Read more about Libya by the IEA](#)

[Read more about Egypt by the IEA](#)

Renewable Hydrogen Potentials in North Africa

Country	TWh
Algeria	649
Egypt	4720
Libya	3776
Morocco	586
Tunisia	385

Source: Fraunhofer, 2022: IEE PtX Atlas. <https://maps.iee.fraunhofer.de/ptx-atlas/>

The HEVO Ammonia Morocco Project

Morocco has a large potential for renewable energy and has made some progress with the development of renewable electricity. In 2021, Morocco had installed 3,522 MW of renewable electricity capacity. This accounted for about 32% of the total installed capacity in the country.

Morocco is also a large producer of fertilizer. The OCP group corporation, owned by the Moroccan Government and the Banque Populaire du Maroc, has about 31% global market share in fertilizers. Morocco relies on imports of fossil gas-based ammonia for its fertiliser production. Morocco holds limited fossil gas reserves and is looking for alternatives. Morocco and Nigeria initiated a cooperation for building capacity in Nigeria to produce ammonia and other fertilizers using Nigerian gas.

Morocco is also looking for renewable-based alternatives such as renewable hydrogen and ammonia. Morocco has issued a green hydrogen strategy and a national roadmap. Among others, the strategy includes the following measures:

- The development of a national hydrogen market, inviting operators and

- investors to use clean energy based on green hydrogen;
- Ensuring the necessary financing for the development of hydrogen and associated production activities by strengthening international cooperation;
- The creation of a Moroccan and regional research and development (R&D) pole and to propose a set of pilot projects;
- The implementation of necessary measures for the local industrial integration of the hydrogen sector through the training of human resources and the transfer of expertise to Moroccan skills;
- The creation of favourable conditions for the export of hydrogen and its derivatives, with priority given to its export to Europe.

In July 2021 Morocco's Ministry of Energy, Mines and Environment launched the HEVO Ammonia Morocco project, with an estimated investment value of over \$850 million. The facility is expected to produce 183,000 tons of green ammonia by 2026. Project developers include Fusion Fuel Green and Consolidated Contractors Group, while trading firm Vitol has signed a MoU to manage the offtake of green ammonia from the site. Fusion Fuel expects to supply the technology to produce the 31,000 tons of green hydrogen needed annually for the project. The ammonia produced in this plant is expected to be exported to Europe.

The facility will use HEVO, Fusion Fuel's proprietary miniaturized PEM electrolyser, which can be mass produced. HEVO electrolysers are combined with a concentrated photovoltaic (CPV) solar panel. When developing hydrogen production based on electrolysis in Morocco, it has to be taken into account that water scarcity is a significant problem in Morocco and has led to local conflicts. Water is an essential resource for the production of renewable hydrogen via electrolysis and for every litre of water one cubic metre of hydrogen can be produced. Water scarcity requires the use of desalination plants for hydrogen production. The water from these desalination plants needs to be also used to supply municipalities close to the hydrogen production facility, to relieve water scarcity. Oversizing desalination plants for electrolysers to be able to cover the water needs of nearby communities could help obtain a "social license to operate". The environmental impacts of desalination plants on maritime ecosystems and coastal use, however, have to be taken into account.

[Read more about how Morocco invests in desalination plants on AI Monitor](#)
[Read more about the HEVO Ammonia Morocco project](#)

GIZ/BMZ project "Green hydrogen for sustainable growth and a low-carbon economy in Tunisia" (H2Vert.TUN)

The GIZ in cooperation with the Tunisian Ministry of Industry, Mines and Energy (MIME) has launched the project "Green hydrogen for sustainable growth and a low-carbon economy in Tunisia" (H2Vert.TUN) in June 2022. The project aims at supporting the Tunisian Ministry of Industry, Mines and Energy (MIME), which coordinates the development of renewable hydrogen and PtX in Tunisia, with the development of a hydrogen market.

The project is based on three pillars:

- Development of a national hydrogen strategy 2050, including the identification of key stakeholders, including synergies with international partners that may support specific activities and participatory preparation of three sectoral strategies for green hydrogen and PtX, action plans and roadmaps.
- Supporting cooperation between local and international companies and advising the national observatory for green hydrogen/PtX value chains
- Expanding the professional capacities of those with political and scientific responsibility.

[Read more about promoting a green hydrogen economy in Tunisia on the GIZ Webpage](#)

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Renewable energy in Tunisia

Tunisia has significant potential for renewable energy, particularly wind and solar power. However, the country is still heavily dependent on fossil gas for electricity generation and is currently facing an energy crisis. The Tunisian Solar Plan foresees a share of renewable electricity of 35% and an installed capacity of 4GW by 2030.

In 2021, Tunisia had achieved only 400 MW, with the majority stemming from wind power and smaller amounts in solar and Hydropower.

Up to 2000, Tunisia was mostly self-sufficient when it came to energy. It was only after the fossil reserves of fossil fuels started to run dry that the country had to up its import. The amounts and the money spent on imports have

been rising, posing a significant motivating factor in Tunisia's path of regaining energy independence. Tunisia plans to invest US\$294m per year in renewable development to expand its renewable production by 500 MW annually.

Luckily the country has enormous potential. A study found a possibility of 840GW of PV potential and 1000GW of CSP (concentrated solar power). The country is now working on using this potential and has five solar parks at an advanced stage of development, which after their completion in 2023, will amount to 500MW.

But there is also a promising prospect for wind energy. The Tunisian Company for Electricity and Gas is currently building four new wind parks that are set to start operations in 2024 and will produce 500MW. Also, companies from Germany, the Netherlands, and France have received licenses to build On-shore wind parks. International tenders like the one for the wind parks are a major strategy in Tunisia's deployment of renewable sources. This means that licenses for renewable capacities were issued to foreign companies. In March 2022, 500MW went to 3 companies from around the world. A new tender for 2GW was launched in June 2022.

Tunisia's final goal is to reach 21GW by 2050, covering 80% of its demand from renewable sources.

Tunisia has potential for renewable hydrogen production but the country does not yet have the legal, regulatory, technical and human resources to do it. There is no hydrogen strategy yet and the country has to address its current energy crisis. Still some pilot projects have been launched. For example, TunUr, a former Desertec partner, has a pilot project in the south of Tunisia to produce renewable ammonia for local industrial consumers.

[Read more about Tunisia by the GIZ](#)

[Read more about the renewable readiness assessment done by IRENA](#)

Global Forum on Sustainable Energy
Mariahilfer Strasse 136
1150 Vienna
gfse@energyagency.at



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