Energy Transition in Mena Region

The Case of Egypt: A Transition in Progress

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The Middle East and North Africa (MENA) region, traditionally associated with abundant fossil fuel resources, is undergoing a transformative shift towards a more sustainable energy future centered on renewable sources. Governments in the region are increasingly recognizing the importance of diversifying their energy mix and reducing dependence on traditional fossil fuels.

The MENA region will become one of the world's foremost renewable energy producing regions and a hub for international renewable energy supply chains within the next 25 years. Egypt, United Arab Emirates and Saudi Arabia have taken some initial steps toward their own green energy ecosystems. While there have also been some positive trends in several other MENA nations like Morocco, and Jordan that expand their capacity and participate in international supply chains.

The MENA region faces significant challenges in its energy transition, including an over-reliance on fossil fuels, inadequate grid infrastructure, high regulatory and financial barriers, and growing electricity demand. However, it also identifies opportunities for transformation, such as the region's abundant solar and wind resources, declining costs of renewable energy technologies, and increasing international support for green investments.

Challenges Facing Energy Transition in MENA Region

A range of structural, financial, and policy-related barriers confronts the transition toward renewable energy in the Middle East and North Africa MENA region. Despite growing recognition of the need to diversify energy systems, progress remains uneven due to the following key challenges:

1. Financing Renewable Energy Projects

The shift toward renewable energy requires substantial and sustained investment. While total energy sector investments in the Middle East have reached approximately **175** billion dollar, only **15 percent** of this has been allocated to clean energy. The situation is even more pronounced in Africa, where clean energy accounts for merely 2 percent of global energy investment. These figures highlight a pressing need to mobilize greater financial resources, both public and private to scale up renewable energy deployment across the region.

2. Energy Infrastructure Constraints

The integration of renewable energy into national grids requires major upgrades to existing infrastructure. Many of the region's electricity grids are outdated and weren't designed to accommodate the variability and decentralized nature of renewable energy sources such as solar and wind energies. To ensure stability, reliability and efficiency, significant investment in smart grid systems, modern technologies, and interconnection capabilities is essential.

3. Political and Regulatory Barriers

Fossil fuel subsidies remain a central obstacle to advancing clean energy. These subsidies not only distort energy markets but also discourage investment in low-carbon alternatives. Between 2020 and 2022, fossil fuel subsidies in the MENA region doubled, reaching an estimated **340** billion dollar, according to the International Monetary Fund (IMF). Redirecting such subsidies toward renewable energy development requires strong political will, comprehensive regulatory reform, and coordinated policy action at the national and regional levels.

Energy Transition in Egypt

Egypt's energy transition has gained significant momentum over the past decade, driven by a strategic vision to diversify its energy mix and reduce reliance on fossil fuels. Egypt has lunched the **Integrated Sustainable Energy Strategy 2035** and its updates, aiming to generate **30 percent** of its electricity from renewable sources by 2030, with a mega projects like, "**Benban Solar Park"** with **1465** MW capacity, and major wind farms in the Gulf of Suez with more than **2000** MW capacity. Egypt has also begun integrating battery storage technologies and exploring green

hydrogen economy, with announcement of the **Low- Carbon National Hydrogen Strategy** and several international partnerships underway.

Until now, renewables contribute approximately **12.6** percent of total electricity generation, and almost **8.6** GW of the total installed capacity in Egypt. Egypt has attracted billions of international climate finance, particularly through the **NWFE** program, which aims to decommission old thermal power plants and add up to 10 GW of new renewable capacity. These developments mark a shift toward a more sustainable model in the region, with the potential to improve energy security, reduce carbon emissions, and stimulate green economic growth.

Challenges facing Egypt's Energy Transition

Egypt's energy transition faces key challenges, which affect the energy transition including:

- **Grid modernization**: Egypt's electricity grid needs upgrades to handle variable renewables (solar & wind) and keep supply stable.
- **Financing and fiscal constraints:** Large projects and grid upgrades will need stable long-term financing, public budgets alone won't be enough. Mobilizing private capital and international finance is essential.
- **Fossil fuel subsidies**: Subsidies make oil and gas cheaper, reducing the competitiveness of clean energy.
- **Regulatory barriers**: Egypt has made regulatory reforms and encourage for private IPPs in utility-scale renewables, but barriers remain for decentralized generation, net-metering, and small commercial/residential PV. Regulatory reviews highlight gaps in incentives and market access.
- **Energy export ambitions**: Egypt aims to export power to Europe and Africa, but this requires stronger transmission networks and consistent policies.

Egypt's energy solution: green hydrogen

There is growing global progress in green hydrogen and its role in driving the energy transition. In this context, Egypt has taken major steps to attract investment in green hydrogen and its derivatives, positioning it as a cornerstone of the country's energy transition while creating new industrial and economic opportunities. By expanding

wind and solar capacity, Egypt is well-placed to become a regional hub for green hydrogen, particularly through the Suez Canal Economic Zone. The country has already announced plans for over 100 GW of renewable energy projects dedicated to green hydrogen and green ammonia production in partnership with leading international consortia. These developments are expected to generate wide-ranging economic benefits, supporting growth across multiple sectors in Egypt.

Firstly, green hydrogen can help phase out fossil fuels in hard-to-electrify sectors—such as steel , fertilizers and cement—reducing dependence on fossil fuels, particularly natural gas..

Secondly, global demand for hydrogen is expected to rise significantly, particularly in Europe and Asia. Egypt can leverage its strategic location to position itself as a key exporter, aiming to capture around 5–8% of the global green hydrogen market by 2030–2040.

Conclusion

Egypt's energy transition is both a national necessity and a regional opportunity. Positioned at the crossroads of Africa, the Middle East, and Europe, Egypt can become a clean energy hub that strengthens energy security and shapes regional dynamics. Success will depend on expanding renewables, modernizing the grid, reforming subsidies, and ensuring stable policies, while leveraging green hydrogen and cross-border projects to diversify the economy and boost regional cooperation. Egypt's path is not just about decarbonization—it is a strategic move toward economic resilience and long-term economic development.

Resources:

1. https://www.iea.org/reports/world-energy-investment-2024
2. http://www.moee.gov.eg
3. https://www.nrea.gov.eg/Media/Reports
4. https://www.amcham.org.eg