Egypt Energy

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North Africa Energy Overview Report 2023

By

informa markets

Summary

- Energy landscape in North Africa
- Country overview:
  - Egypt
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  - Morocco
  - Tunisia
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- Investing in North Africa's secure energy future
- Sub-sectors overview:
  - Renewable energy
  - Transmission and distribution
  - Energy consumption and management
  - Critical backup power
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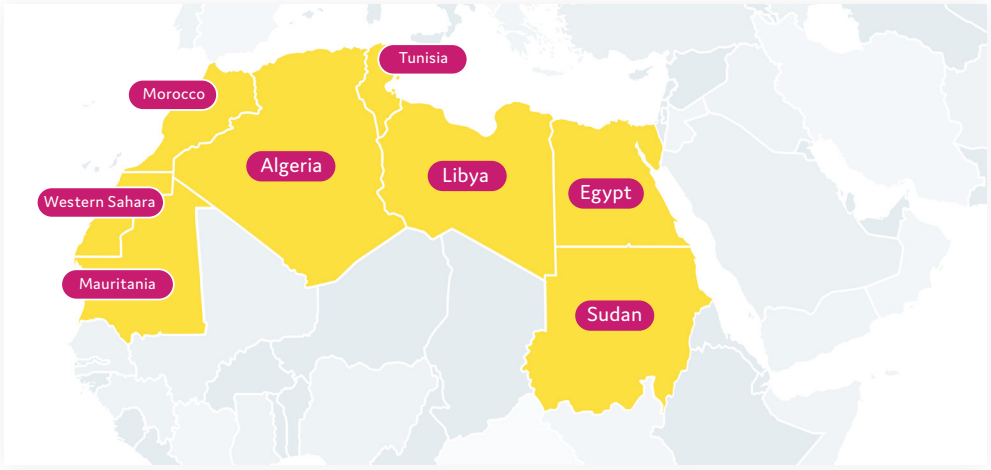
Energy Landscape in North Africa



> According to a recent article from Fitch Solutions, there will be an increased focus on grid-scale investment in North Africa in 2023 and beyond

After a challenging year for the electric power sector, with spiking costs and extreme climate events continuing to test grid resilience, industry and policymakers across the global North and South have responded by working to bolster reserves, deploy energy storage and microgrids, harden infrastructure, and strengthen flexible load options.

However, research from Deloitte reported that providing secure, reliable, affordable, and clean electricity could become even more challenging in 2023 and beyond. Inflation, high fuel costs, and supply chain snarls may increase electricity prices. At the same time, extreme weather, cybersecurity threats, and the growth of variable renewables and distributed energy resources may continue to require innovative management to ensure grid reliability. Despite these challenges, new technologies and supportive policies could ripen opportunities in 2023 and help the industry achieve its goals.

Although over 600 million people are without access to electricity in Africa, several North African countries are emerging as frontrunners, with Morocco, Egypt, and Tunisia the only African countries with an electrification rate of 100% region. In addition, according to a recent article from Fitch Solutions, there will be an increased focus on grid-scale investment in North Africa in 2023 and beyond. As a result, the development of the region's energy security and initiatives to improve grid and electricity access have significantly increased. These financing and investment initiatives will be essential drivers to achieving increased electricity and grid access in the remaining countries in North Africa.

The region is also a promising place for the future production of green hydrogen and is also home to critical raw materials (CRMs) necessary for the energy transition. The International Renewable Energy Agency (IRENA) outlined North Africa to have some of the highest technical potential for green hydrogen production based on renewable potential and the cost of electricity. It lists Morocco as one of the countries best placed to become a green hydrogen producer by 2050, along with Australia, Chile, Saudi Arabia, and the United States.

The energy agency has also pegged North Africa as an essential player in clean energy value chains. Clean energy industries and their value chains have much to offer North African countries, especially if the region's governments progress on integrating their regional electricity markets and regional harmonisation of technology standards.

Meanwhile, Fitch Solutions highlights an expected divergence in investments of hydrogen projects by type in North Africa as the different types of hydrogen become regionally concentrated. The new green hydrogen rules will impact the number of projects reaching construction stages over 2023. As markets look for other regions to buy their green hydrogen due to the regulations, Asia may emerge as a larger green hydrogen buyer than the EU.

> The International Renewable Energy Agency (IRENA) outlined North Africa to have some of the highest technical potential for green hydrogen production based on renewable potential and the cost of electricity

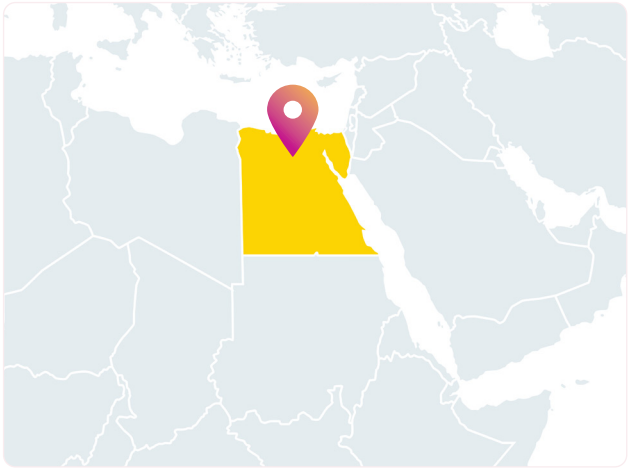
According to the International Energy Agency (IEA), global installed battery capacity is projected to grow between tenfold and sixteenfold by 2030. With batteries essential to enhance grid flexibility, as they can store renewable electricity and serve at peak demand hours, the demand for batteries will grow strongly in 2023. The North African battery market is expected to rise at a CAGR of more than 9% between 2019 and 2027, driven by the increasing adoption of renewable energy in the region and rapidly growing telecom and database sectors. Similarly, the expanding involvement of the countries in the region towards its renewable and Electric Vehicle (EV) sector is likely to create several future opportunities for the North African battery market.

Country Overview

Egypt

Key stats

- Committed to reducing emissions by 65% in the oil and gas sector, and 7% in the transportation sector by 2030.
- Plans to install additional renewable energy capacities that will generate 42% of electricity by 2035.
- In a memorandum of understanding signed with the government of Egypt, BP has said it would explore the potential for establishing a green hydrogen production facility in the country.
- UAE's Amea Power completes $1.1bn renewable energy deal in Egypt. The company will build, own and operate the 500MW solar PV plant and 500MW wind farm in the country.
- In 2022, Siemens announced two orders for 300,000 and 175,000 smart meters and two advanced distribution management systems for the Alexandria Electricity Distribution Company and North Delta Electricity Distribution Company (NDEDC) in Egypt.



0.71%

Share of global GHG emissions

by 2030

Committed to reducing emissions by 33%

by 2060

The impact of climate change will represent 2-6% of Egypt's GDP

1.26 Billion US

Revenue of electricity transmission and distribution in 2022

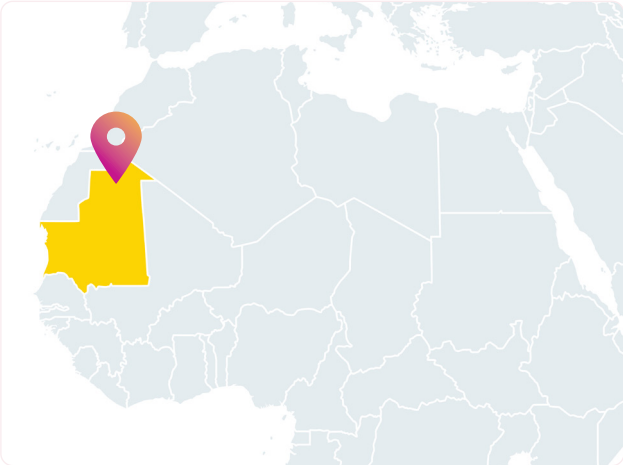
Egypt has initiated many energy sector reforms, gradually reducing electricity subsidies and introducing feed-in tariffs to promote renewable energy production. The energy sector reforms recently undertaken by the country have resulted in a significant increase in investments which have boosted electricity production over the last five years and ensured a stable supply across the country. Submitted in 2017, Egypt's NDC is conditional on receiving international funding of $73 billion for 2020–30 and is supported by the National Climate Strategy 2050, launched in November 2021. Renewable energy is central to Egypt's Vision 2030, which aims to achieve a diversified, competitive, and balanced economy within a sustainable development framework.

Country Overview

Mauritania

Key stats

- Economic growth is headed towards a 5.1% increase in 2023 on the back of the country's expanding oil, gas and renewable energy sectors.
- BP signed an agreement with Mauritania to explore ways to develop low-carbon hydrogen on a large scale. Under the plan, BP will initially study the feasibility of building onshore wind and solar farms that are required to produce green hydrogen.
- The African Development Bank (AfDB) announced that it would commit $379.6 million over the next seven years to provide funding for 500 MW of solar energy and storage for the Desert to Power G5 Sahel Facility in Mauritania, Mali, Burkina Faso, Niger and Chad.



$379.6 M

Funding over the next 7 years for providing 500 MW of solar energy

$34.3 Billion

The cost of cutting greenhouse emissions by 11% in 2023

4%

Increase in economic growth in 2022

by 2030

Mauritania aims to increase the share of renewables to 60%

in 2022

4% increase in economic growth

457.9 GW

457.9GW of solar & 47GW of wind power as an estimated potential

Mauritania is working on expanding its electricity supply and encouraging investment in the renewable energy sector to stimulate the economy to reach universal access by 2030. The country plans to produce and export green hydrogen and gas from the offshore Grand Tortue Ahmeyim (GTA) project, which is expected to commence production in 2023.

Mauritania is set to become a world-class liquefied natural gas (LNG) hub and intends to increase domestic gas consumption to achieve its net zero emissions goal. It has strong potential to develop solar, wind, and hydraulic energy and is also a leading producer of critical minerals such as zinc, titanium, iron ore, copper, and phosphates.

Country Overview

Sudan

Key stats

- Committed to reducing greenhouse gas emissions by 38% in the energy sector by 2030 compared to business-as-usual.
- The financial support needed for mitigation and adaptation measures is $8.24 billion over the next ten years.
- The Egyptian Electricity Transmission Company and the Sudanese Electricity Transmission Company have awarded Siemens Energy with a contract to build grid stabilization stations in Sudan which will stabilize the grid and ensure a reliable flow of power from Egypt to Sudan.

60%

of the population has access to electricity

0.26%

Share of global GHG emissions

by 2031

Sudan aims for universal electrification

in 2022

56% was generated by hydropower

Sudan predominantly depends on oil- and hydro-based power generation, with hydropower accounting for more than half of installed capacity. The country has yet to add any generating capacity since 2018. Power demand in Sudan has increased by an average of 9% a year since 2015, but 46% of the population still lacks access to electricity.

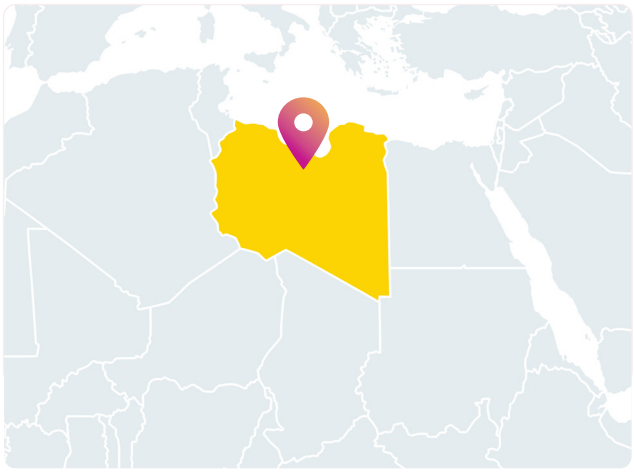
In May 2021, Sudan passed a Public-Private Partnership Act to increase private participation in developing the country's infrastructure, including the electricity sector.

Country Overview

Libya

Key stats

- International Renewable Energy Agency estimates that Libya had just 6 MW of solar at the end of 2021.
- UAE-based Alpha Dhabi signed a preliminary agreement with the General Electricity Company of Libya (Gecol) to invest in Libyas renewable energy sector. The companies aim to build a solar photovoltaic power station and sell the energy produced to the Libyan government.
- French multi-energy group TotalEnergies SE signed a preliminary agreement with power producer General Electricity Company of Libya (GECOL) to implement a 500-MW solar project in the country's north.



by 2030

Libya aims to generate 22% of electricity from renewables

6 MW

Libya had just 6MW of solar at the end of 2021

in 2020

69.71 % of the population has access to electricity

0.004 US Dollar/ kWh

The price of electricity for households

The outlook for economic growth in Libya remains positive. The economy is projected to grow by 3.5% in 2022 and 4.4% in 2023, depending on political stabilisation, security improvements, and the persistence of oil production. In 2021, Libya ratified the Paris Agreement; the country is preparing to develop its NDC.

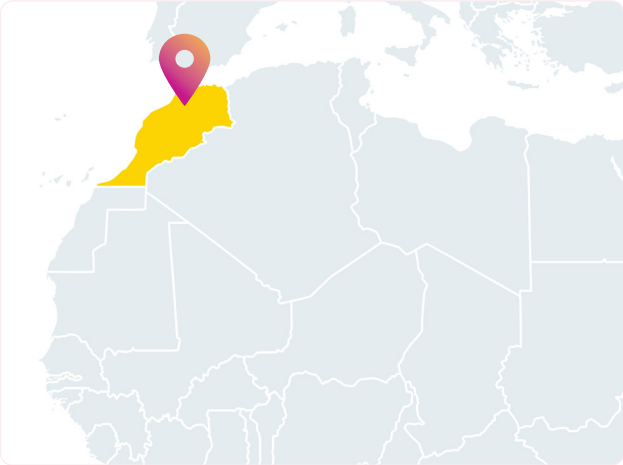
The energy-related plans and commitments are governed under the Strategic Plan for Renewable Energies,2018–30, which targets 22% of electricity generated from renewables by 2030. Libya has the necessary financial resources for climate adoption but needs to strengthen the capacity of its institutions to respond to climate change challenges.

Country Overview

Morocco

Key stats

- Morocco set to reach its 42% electricity target capacity from renewable energies by 2023
- The US Trade and Development Agency awarded a grant to Régie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA), Marrakech's electricity and water utility, for a feasibility study to transform the power distribution infrastructure in Marrakech into a smart grid.
- The European Investment Bank (EIB) and Masen (Moroccan Agency for Sustainable Energy) signed a cooperation agreement concerning a €2 million grant to finance a feasibility study that could pave the way for an initial small-scale offshore wind energy pilot project in Morocco.



#8

on the Climate Change Performance Index

by 2030

Conditional emissions reduction target of 45.5%

by 2050

Able to generate 85% of its electricity needs from green energy

$53 Billion

Needed to decarbonise Morrocco's national economy by 2050

Morocco has launched energy reforms to foster the development of the country's industry in renewable energy and energy efficiency sectors, penetrate regional and international markets, and encourage the development of indigenous resources. The development of renewables is helping to improve energy security and deliver on Morocco's clean energy and climate change commitments.

Heavily dependent on fossil-fuel imports for its energy needs, Morocco set ambitious targets for 42% of its generating capacity to be renewable by 2020 and 52% by 2030. Seen as key to securing energy independence and reducing expensive fuel imports, the renewables sector has received strong state support.

Country Overview

Tunisia

Key stats

- According to reports, Tunisia has two significant shale formations located in the southern part of the country in the Ghadames (or Berkine) basin.
- Construction of 100-MW solar power plant in Tunisia's Kairouan to start soon. The Kairouan PV plant is part of the first series of solar projects totalling 500 MW registered under a concession programme launched by the Tunisian government
- Tunisian utility STEG is planning to build a 400-600MW pumped hydro energy storage plant, for a 2029 commissioning date, and is currently undertaking studies for the project.

by 2030

Conditional emissions reduction target of 45% below 2010 levels

472 MW

is the total capacity of installed renewable energies through March 2022

100%

of the national electricity access is boasted by Tunisia

2

Shale formations located in the southern part of the country

Tunisia is a relatively small hydrocarbon producer, with the production of petroleum and other liquids steadily declining since the mid-1980s. Tunisia aims to move toward a cleaner power matrix and jump from 3% of renewables generation in 2021 and 30% by 2030. Two separate auction regimes – the authorisation for smaller projects and concession for larger projects – are the main instruments to achieve these objectives.

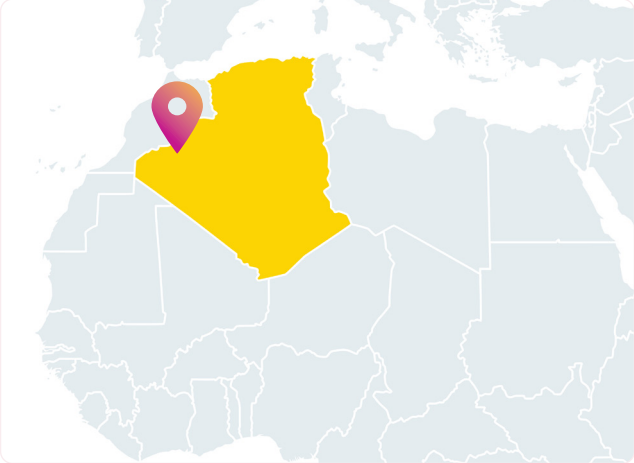
Over 85% of Tunisia's 6.7 gigawatts of installed power capacity and more than 95% of the electricity produced in 2021 came from gas-fired plants. As of the end of 2020, only 309MW of wind, 446MW of PV, and around 144MW of small-scale PV were commissioned. However, the power mix will become more diversified over the next few years as auctions are set to increase the country's clean energy capacity.

Country Overview

Algeria

Key stats

- Algeria has a 99.8% national electricity access rate – 99.6% in rural areas and 99.9% in urban areas
- Plans to install around 22 GW of renewable energy capacity by 2030



99.8%

National electricity access rate

13.9 TWh/year

One of the highest solar potentials in the world

by 2030

Plans to install around 22 GW of renewable energy capacity

30-40%

of the electricity for domestic consumption will be from solar energy by 2030

Algeria is a large oil and gas producer and exporter, with Algeria's boasting a production rate of 130 bcm of gas annually, of which over 50 billion is exported. In 2015, the country updated its Renewable Energy and Energy Efficiency Development Plan to 2030. It focused on deploying large-scale renewables, including solar PV and onshore wind installations, through various incentive measures.

Algeria's efforts to ensure and strengthen its energy security will take an essential step in the coming decades by commissioning new energy infrastructure based on the intensive use of water, coal, nuclear, non-renewable, and renewable sources. The implementation of new power infrastructure is expected to be operational in 2030.

Investing In North Africa's Secure Energy Future

> **Development finance institutions have a critical role to play in improving access to energy in North Africa, especially by enabling more electrification of household energy and finance for rooftop energy solutions.**
>
> European Council on Foreign Relations

Sustainable energy financing towards net zero

According to the European Council on Foreign Relations, different industries, technologies, and value chains will require varied and specific support to attract corporate investment. Countries such as Algeria, Egypt, Morocco, and Tunisia have made many of their emissions cuts and their renewable energy plans as part of their nationally determined contributions, conditional on the availability of sufficient funding.

Development finance institutions have a critical role to play in improving access to energy in North Africa, especially by enabling more electrification of household energy and finance for rooftop energy solutions. In addition, using explicit financing tools could make finance available at more affordable rates.

To spur investment in clean energy in North Africa, third-party access to energy transport infrastructure, such as pipelines, will be essential, including access to transmission lines and pipelines. It will likely require a change in regulation as well to facilitate third-party access. Nevertheless, tackling this is essential to maximise investment flows.

The World Bank highlights that climate change poses significant financial risks in North Africa, compounding elevated levels of macro, banking sector, and debt risk. A green and resilient financial industry can be critical in mobilising climate finance and managing risk.

This includes:

Greening the financial institutions, systems, and instruments will be the cornerstone of climate-smart transitions

Supporting national budgets and expenditures to align with green financing needs, unlocking private capital flows for green investments

Identifying climate-related physical and transition risks to the economy will be essential to formulate policies for resilient financial institutions and governance in North Africa

Accelerating private sector participation in the financing of the energy sector

The role of the private sector is critical to bridge the financing gap, providing the latest technologies, and bringing innovative approaches for a low-carbon and resilient future in North Africa.

1. Reducing barriers to private sector engagement

Simplifying environmental regulations	Providing conducive regulatory frameworks	Enhancing competition and removing barriers to entry	Strengthening building regulation and enforcement to mitigate climate change/disaster risks

2. Leveraging good practices to increase private sector participation

Greening bonds	**Greening healthcare facilities**	**Climate finance for MSMEs**

Source: The World Bank

Table 1. Examples of Private Sector Climate Finance Tools

Commercial bank lending with climate considerations	Conventional commercial bank lending with climate considerations is growing, driven by both commercial banks' voluntary climate strategy and financial regulations.
Green bonds and green loans	Green bonds and loans are used to exclusively finance projects that have positive climate and environmental impacts. Some may qualify for a "green" label. Green Sukuk are also being explored in Islamic finance.
Sustainability-linked bonds and sustainability-linked loans	Sustainability-linked bonds and loans are used by corporates and sovereigns to raise capital often at lower costs, by committing to achieve predefined key performance indicators (KPIs) on sustainability.
Sustainability bonds and social bonds	Sustainability and social bonds are financing tools where the proceeds are used to finance projects that achieve positive climate and social impacts.
Green asset-backed securities (ABSs)	Green securitization can transform illiquid climate-friendly assets into tradable financial securities.
Other financial instruments	Other financial instruments are used in private climate finance, including through certain environmental, social, and governance funds (with climate considerations), as well as private equity and venture capital investments in climate-related firms. Shareholder engagement is also used to encourage companies' green investment decisions.

Sources: World Bank, OECD, Climate Bonds Initiative & IMF.

The European Green Deal

North African countries are considered natural partner candidates for the EU's Green Deal, given their geographical proximity and strong ties with the EU. North Africa has enormous renewable energy potential, particularly in solar and wind power, whose surplus could be easily exported to Europe. Clean electricity from North Africa would be an important medium-term option to help diversify Europe's energy mix and reduce reliance on imported fossil fuels in the long term. North Africa could become an important partner in Europe's energy transition. North Africa is also a good place for the future production of green hydrogen, an energy source that is likely to be essential for the EU to fulfil its climate goals in hard-to-decarbonise sectors.

The most notable achievements in renewable energies in North Africa benefitting from European funding include an Egyptian 240 MW wind farm on the western coast of the Gulf of Suez, the first photovoltaic plant connected to the national electricity grid at Kom Ombo in Aswan, Morocco's solar projects with the completed 580 MW Noor Ouarzazate complex and the ongoing 1,600 MW Noor Midelt initiative.

Countries primed for energy investments

Funds needed in climate-smart investments:

Egypt

The International Finance Corporation (IFC) believes Egypt needs $ 174 billion in climate-smart investments by 2030. A critical area of focus of energy investments in Egypt is the development and encouragement of investment in green hydrogen and green ammonia. Subject to the issuance of the needed regulatory framework, Egypt has the potential to be a regional leader in the production and exportation of green hydrogen.

Morocco

According to the World Bank, Morocco needs an enormous investment of $53 billion by 2050 to decarbonise its national economy. While there is already a substantial volume of investments to decarbonise the economy, the report adds that Morocco needs an even bigger investment volume to develop climate resilience by 2050.

Algeria

Meanwhile, Algeria has great potential for energy investment, given the rapid growth in peak oil demand in the past two years. In 2020, Algeria started to shift its stance to welcome foreign investment by revising several regulations, for example, by allowing foreign entities to own a majority stake in projects in non-strategic sectors with some restrictions. These measures may provide the required balance between allowing greater flexibility for international investors to operate in Algeria while ensuring some knowledge transfer and local participation in projects.

Tunisia

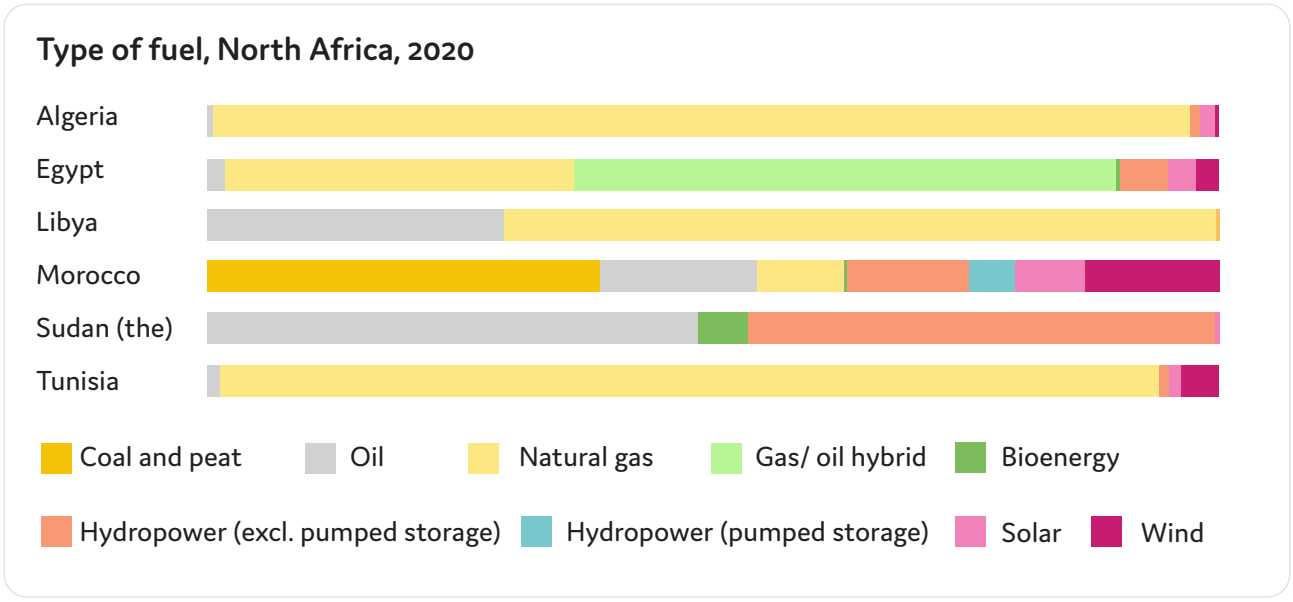
Similarly, with Tunisia aiming to increase the share of renewable energy in its energy mix to 35% by 2030, the government is committed to supporting investment in the renewable energy sector by removing barriers, facilitating administrative procedures, and abandoning permits for projects of less than one megawatt.

Renewable Energy

> **Countries in North Africa must accelerate system-wide transformations and develop long-term pathways to build low-carbon, resilient societies, promote inclusive development, peace and stability in the region.**
>
> **World Bank (WB)**

Supportive renewables policies, rising energy demand, and efforts to boost electrification rates are driving the development of renewable energy markets across North Africa. With favourable climatic conditions and renewable-friendly investment policies in tow, several North African countries have successfully implemented diversified energy mix models, which are set to drive the growth of renewables markets across the region.

Figure 2.25 North Africa's electricity generation capacity by country and source, 2020



Source: IRENA 2021a

According to IRENA, the North African market is set to dominate the continent's renewables penetration in 2023 and beyond, driven by massive solar, wind and green hydrogen projects deployment.

Egypt, Tunisia, Sudan, Algeria and Morocco have each set ambitious national renewable energy policies and targets, with large-scale clean energy projects underway and in the works.

National regulations, plans and commitments:

Egypt The Integrated Sustainable Energy Strategy 2035 calls for renewables to make up 42% of the electricity mix by 2035

Algeria The Renewable Energy and Energy Efficiency Development Plan 2016-2030 and the NDC set a conditional target of 27% of electricity generation from renewables by 2030

Morocco The National Energy Efficiency Strategy aims to reduce energy consumption by 20% by 2030 compared with a business-as-usual scenario

Tunisia The National Renewable Energy Action Plan 2018 targets a 3.8 GW capacity for renewables by 2030

Libya The Plan aims to achieve 7% renewable energy contribution to the electric energy mix by 2020 and 10% by 2025. This will come from Wind, Concentrated Solar Power, photovoltaic and solar water heating

Sudan The Energy Efficiency Strategy for Sudan (EES) summarises the key elements of Sudan's approach to making the transition to highly efficient technologies, reducing the overall increase in energy demand

Mauritania The country has an ambitious three-step strategic plan for the future development of its petroleum, mines, and energy resources from 2022 to 2030. Priorities include reduction of energy costs through diversified energy sources, addition of generation capacities to meet a growing demand, regional energy integration, a shift from heavy fuel oil to hybrid power plans, forthcoming domestic natural gas, and increased electricity access in rural areas.

Today, most of **Egypt**'s electricity supply is generated from thermal and hydropower stations, but now the nation's first nuclear power plant is under construction at El Dabaa. There is around $35.9 billion worth of energy projects underway in Egypt – the most significant is the $28.9 billion nuclear energy programme.

Meanwhile, **Morocco** is set to become a significant green hydrogen exporter, with the 2021 Green Hydrogen Roadmap envisioning a local hydrogen market of 4 terawatt hours (TWh) and an export market of 10 TWh by 2030. This would require the construction of 6 GW of new renewable capacity and support the creation of more than 15,000 direct and indirect jobs.

Tunisia's abundant solar and wind resources and proximity to Europe make it a very attractive location for green hydrogen production. In June 2022, Tunisia's government announced an action programme to promote green hydrogen production for the domestic and export markets and create a legal framework to encourage foreign investment in this sector.

Similarly, according to the World Bank, **Egypt** could account for 5% of the global green hydrogen market by 2040. In addition, BP recently signed an MOU pledging to evaluate the technical and commercial feasibility of developing a multiphase, large-scale green hydrogen production and export hub in Egypt. The deal came just one day after Cairo had signed another agreement with local energy and utility provider Taqa Arabia and its French partner, renewable energy producer Voltalia, to establish, finance, and operate a 150 kilotons/year capacity green hydrogen production plant. Egypt also recently announced plans for a $5 billion project for producing green ammonia.

With North African countries seeking to maximise the massive renewable energy potential across the Maghreb region, giant wind and solar energy projects, including Morocco's 7.5 GW Amun solar PV facility and Egypt's 560 MW Abydos solar PV and 505 MW Amunet wind projects, are underway.

Algeria's renewable energy potential is enormous, primarily focused on solar. Some 60 solar photovoltaic plants, concentrated solar power plants, wind farms, and hybrid power plants are planned. Sonatrach's 2030 Vision calls for installing 1.3 GW of solar generation capacity at the company's oil and gas sites, mainly to cover electricity needs on production sites. Some 30-40 % of the electricity produced for domestic consumption in Algeria will be from solar energy by 2030. In addition, Algeria has tremendous wind energy and geothermal potential, with wind potential forecast to be about 35 TWh/year.

Among the major green energy projects in the country is a 50MW renewable energy plant in Bali Walid, a solar plant in Tajoura with a peak capacity of 62 kilowatts and a 100MW solar PV plant in Soura, in addition to other public-private partnership projects designed to produce 2,000MW of renewable power in the coming years, according to investment platform Energy Capital & Power.

In **Sudan**, the government has sought to diversify its power portfolio mix and has prioritised thermal power investments in recent years. The government is reportedly planning to build additional thermal power generation units at Garri (El–Jaili) and Port Sudan that could collectively provide almost 1 GW of generation capacity, but how much progress they have made in constructing these power plants is unclear.

Sudan also has significant wind and solar energy resources that are largely untapped. According to a recent World Bank study, Sudan has substantial wind power potential along its Red Sea and Northern State coast. Sudan also has solar power potential, but renewable energy power tends to be small in scale and used for off-grid solutions.

Regional mechanisms such as the Regional Center for Renewable Energy and Energy Efficiency and the Pan-Arab Sustainable Energy Strategy 2030 have the potential to drive private sector investments, encourage technical skills development and knowledge sharing, and enable North Africa to achieve its goal of deriving 12.4% of its energy from renewables by 2030, according to IRENA.

IRENA also highlights that the region stands to benefit from falling renewable energy costs and its ample endowments of wind and solar energy, as well as from increased interconnections, more battery storage deployment and, potentially, even green hydrogen production. All these can help the region decrease the cost of electricity generation by increasing the share of renewables in the electricity mix. Interconnections also bring flexibility that will complement the more diverse power systems in North Africa with a higher percentage of renewable energy.

Transmission and Distribution

Globally, we are witnessing a paradigm shift as transmission and distribution (T&D) systems undergo fundamental transformation – utilising new technologies and shifting to a more decentralised energy infrastructure. This new era is characterised by renewable energy sources such as wind and solar and more flexible new technologies such as fuel cells and battery storage. Inverter-based resources (IBRs) such as solar photovoltaics and battery storage have different characteristics to more traditional resources, affecting how they are interconnected and operated on the power system. As a result, there's a year-on-year rise in IBRs delivering the power fed into the electrical grid.

From a sustainability perspective, the T&D sector will see an increase in renewable energy systems and other new technologies being introduced into the grid. Secure communication to and within systems promotes safer operations and more effective communication between technologies at different points in the power system. Of course, better communications enable better preventative maintenance operations and easier adoption of new technologies.

Market changes needed to attract investment in T&D in North Africa

According to commentary from Frost & Sullivan published in the ESI Magazine, Africa has been caught up in underinvestment in the T&D sector resulting in system losses and poor service quality. Energy providers should consider breaking up the vertical integration of utilities into three separate entities: generation, transmission, and distribution. This will reduce cross-subsidisation and create distinct market segments in which market competition is made possible. This unbundling needs to be synonymous with increased private-sector participation by opening the African T&D sector to private-sector investment. PSP in the gird sector can take many forms, from service and management contracts, over leases and concessions to partial or complete divestiture of parts of the T&D value chain.

Egypt: Leading the way

Egypt's transmission sector is undergoing rapid development, expansion and modernisation, driven by the national Integrated and Sustainable Energy Strategy 2035. Therefore, we can expect plenty of sector opportunities to upgrade the network, naturally using cutting-edge transmission technologies to enable more efficiency and access to cheaper resources.

The EU-funded Integrated and Sustainable Energy Strategy (ISES) 2035 anticipates that renewable energy should comprise 42% of the total electricity generated by 2035 – and integral to achieving this is a significant upgrade of the existing transmission network. The strategy also demands enhanced international interconnections, bringing access to less expensive resources with a higher investment return.

As a signatory to the Eight Countries Electric Interconnection Project, the nation's electricity grid connects to neighbouring transmission grids in Libya, Jordan, and Syria. While the project is still under development, on completion, it will connect the remaining partners - Iraq, Lebanon, Palestine, and Turkey. But, of course, such a vast project needs a great deal of support, and now Egypt plans to extend its electricity connectivity to the EU. As a result, opportunities are rife for cutting-edge technology supply.

Energy Consumption and Management

Energy Management Systems (EMS), which allow close monitoring, controlling and optimising of the performance of a power generation or transmission system, are becoming more prevalent in the energy management and consumption sector. EMS is intrinsically linked with the growing need to save and manage energy usage, especially in rapidly growing nations across North Africa.

Recent research suggests the global energy management systems market is expected to grow at a CAGR of 18% from 2022 to 2032. Increasing interest in the sector is driven by the need to gain cost savings in a global arena marked by rising energy prices and to ensure adequate environmental management of energy – from smart lighting to more sustainable production methods.

As Egypt and North Africa continue developing rapidly, there is a great need to manage energy and ensure careful sustainable energy supply and consumption. Egypt's 2035 Integrated Sustainable Energy Strategy emphasises the importance of renewable energy. As part of government efforts to regulate energy consumption, the Ministry of Electricity is replacing 38 million old electricity meters with smart pre-paid ones over the next five years.

Mega housing projects, continued industrial growth and a burgeoning IT sector require careful energy management technologies. As a result, the need to balance power consumption with sustainable energy delivery has never been greater.

Today, smart technologies drive innovation and cost savings and meet environmental concerns. For example, technology companies worldwide produce smart grids using digital technologies and IoT to make grid operation more reliable, cost-efficient, flexible, safer and sustainable.

Innovations in automation, data and energy efficiency include driving energy cost reductions and helping businesses, sectors, and nations achieve carbon emission goals.

A clear sign of the growing interest in and need for energy management in Egypt is Misr Italia Properties (MIP) $9 million investment in implementing state-of-the-art smart technology systems from Honeywell in its Il Bosco City housing development. The technology includes smart, sustainable energy optimisation solutions.

Critical and Backup Power

The critical backup power sector is growing exponentially as more companies rely on large data storage and seek out reliable, secure, continuous power supplies. The industry needs hardware, software and international standards – and on top of all this, there is an increasing requirement for power to come from renewable sources.

North Africa is witnessing a rising number of refinery green- and brownfield projects, which will warrant an increase in backup power requirements. But, as with every sector, the critical power sector must be mindful of environmental reforms and stringent emission regulations.

Populous North African countries such as Egypt, Algeria, Sudan and Morocco are experiencing rapid urban growth, and their IT sector is expanding exponentially. As a result, both require extensive access to continuous power, which can only be achieved with reliable sources of critical backup power.

Backup diesel generators have been a permanent feature in many African countries. However, recent advances in battery storage and the rise of the more affordable and safer cobalt-free LFP battery solutions could finally present a viable opportunity for large-scale stationary storage to displace some of these diesel generators in the energy sector.

Smart Solutions

There is a global shift to smart metering solutions as infrastructure moves towards future-proofing demand and supply. Smart solutions offer efficient energy management and straightforward (remote and local) energy usage monitoring. But integrating smart solutions requires an intensive capital outlay, complex technologies, hardware, software and personnel with the right expertise.

System integration is also key. For a smart solution to operate smoothly, there needs to be integration across work management systems, mobile workforce management, SCADA/DMS and distribution automation systems.

Despite the complexities, the public and private sectors are behind smart solutions, given the overarching drive for sustainable energy supply and the need to adopt smart energy solutions such as smart meters.

Addressing the multi-faceted challenges of energy supply security, diversification of energy sources and the smooth transition towards a resource-efficient, socially just, resilient, and climate-neutral economy means adopting smart solutions rapidly. For example, between 2018 and 2020, Egypt's Giza Systems - partnering with Oracle, Schneider and Cisco - supported the national infrastructure by installing some 250,000 smart meters. And in 2022, Siemens announced two orders for 300,000 and 175,000 smart meters each and two advanced distribution management systems for the Alexandria Electricity Distribution Company and North Delta Electricity Distribution Company (NDEDC) in Egypt. Today, after several successful installation schemes and public-private partnerships, there are 10 million smart meters installed, with work continuing to replace the remaining eight million old electricity meters by 2027.

With an electrification rate of more than 99%, Algeria is the most electrified country in Africa. Over the last six decades, power generation grew at an annual growth rate of 7% and is expected to grow 8.5% annually through 2025. Algeria plans to invest in grid expansion and upgrades to accommodate growing demand, notably by deploying a smart metering and grid system with more than 30,000 kilometres of transmission lines.

In Morocco, state utility ONEE has partnered with technology firms Atos and Siemens to deploy a smart energy metering system that will enable smart meter data acquisition, processing, management and use. The metering platform will enable ONEE to deploy data-driven, innovative services by leveraging over 100,000 smart meters that will be deployed for consumers. The project is part of Morocco's Energy Efficiency programme and will include Atos providing the IT infrastructure and security systems whilst Siemens will provide its EnergyIP meter data management solution.

Meanwhile, in July 2022, it was announced that Sagemcom, Itron, Siemens and Efluid would work on Tunisia's €78 million smart grid deploying smart meters across the country.

Egypt Energy

Explore. Empower. Energise

About Egypt Energy Exhibition and Congress

Egypt Energy has been an essential annual event for the past 32 years helping introduce new energy and electricity products into the market, connect parties and expand the energy market in Egypt and North Africa. The event brings together energy manufacturers and suppliers from all over the world to showcase new technologies and innovative solutions to contractors, utilities, policy makers, end-users, consultants and distributors from Egypt and Africa. The event covers the entire energy value chain from power generators, energy storage and energy management systems, high and low voltage cables, energy transmission and distribution, solar panels, solar power and green energy.

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