

THE  
**WIND**  
SHOW MENA 2020

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# Market Report for Wind Energy

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# MENA outlook

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In this market report we will look at the most notable current and future initiatives for the Middle East and North African region's wind sector.

The region has considerable renewable energy potential and in the past number of years has really exploited its natural assets to become a global contender in the move away from fossil fuels. Whilst much of this attention has been given to solar energy, excitement is growing for wind energy to serve as a primary power source in countries such as Egypt, Morocco and Saudi Arabia, with other nearby countries following suit.

The contribution of renewables to the power generation mix is steadily growing in the region. Technologies that were once considered to be economically and technically challenging are now becoming viable. A combination of a drop in technology costs, increasing private sector competition and a change in regulatory policies all pave the way for MENA's wind energy capacity to grow substantially to 23GW by 2027.

Market activity is set to mature over the next ten years in two expected phases. From now until 2023 Egypt, Morocco and Saudi Arabia will spearhead strong growth and raise installed wind power capacity in MENA to over 11 GW, each country expected to add over 2 GW each. During the second phase running from 2024-2027, approximately 12 GW of wind capacity will be installed in MENA and will include contribution from the likes of Oman and Jordan.

Government authorities, investors and regulators are increasingly recognising the transformative effect of the adoption of renewable energy in helping to diversify the energy mix, contribute to sustainable development and improve socio-economic conditions across the region. Considering how ripe the market is for investment, favourable regulation and ever evolving innovation, the MENA region has established itself as a key region for establishing renewable energy. Many years of exciting opportunities lie ahead.

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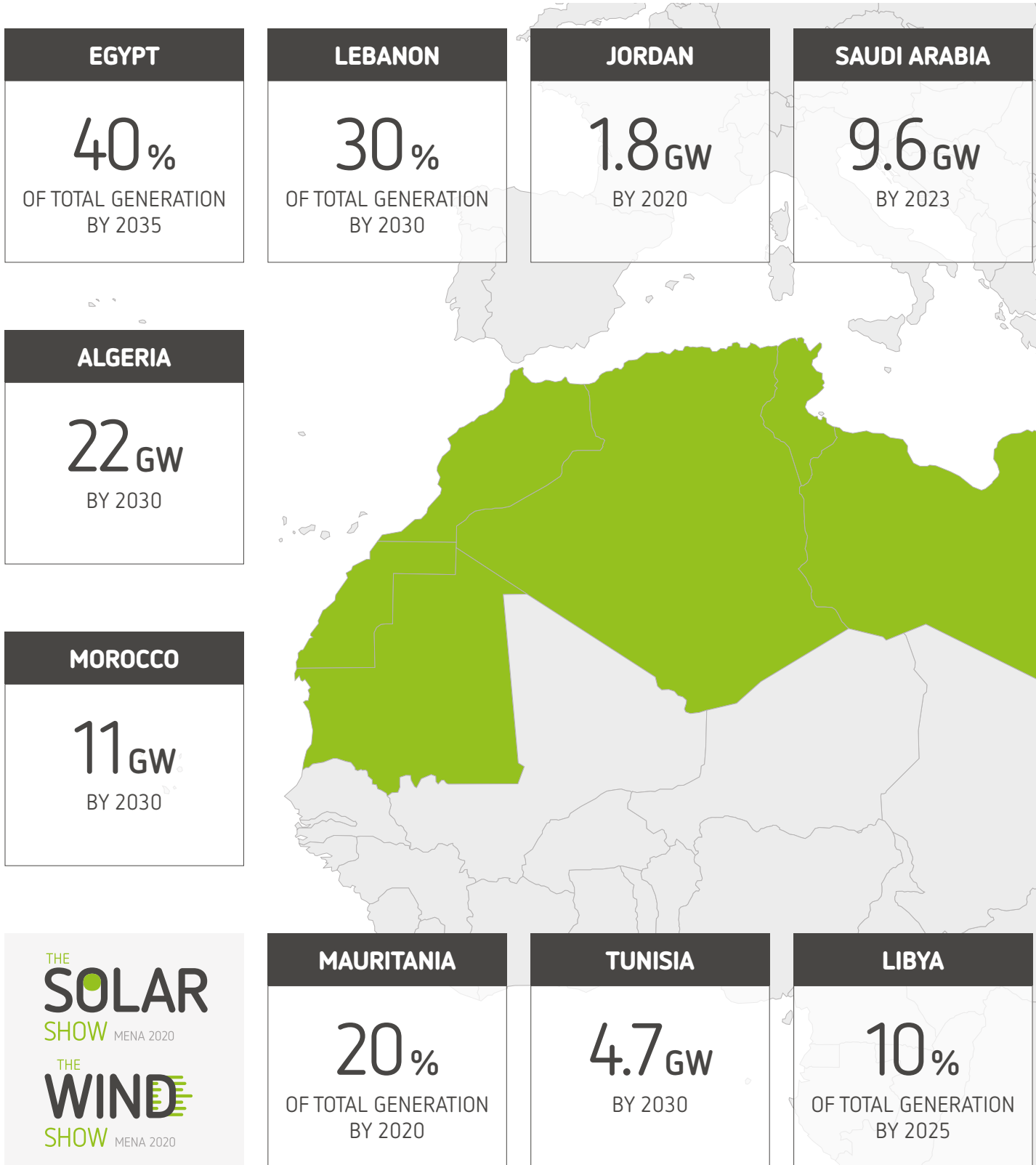
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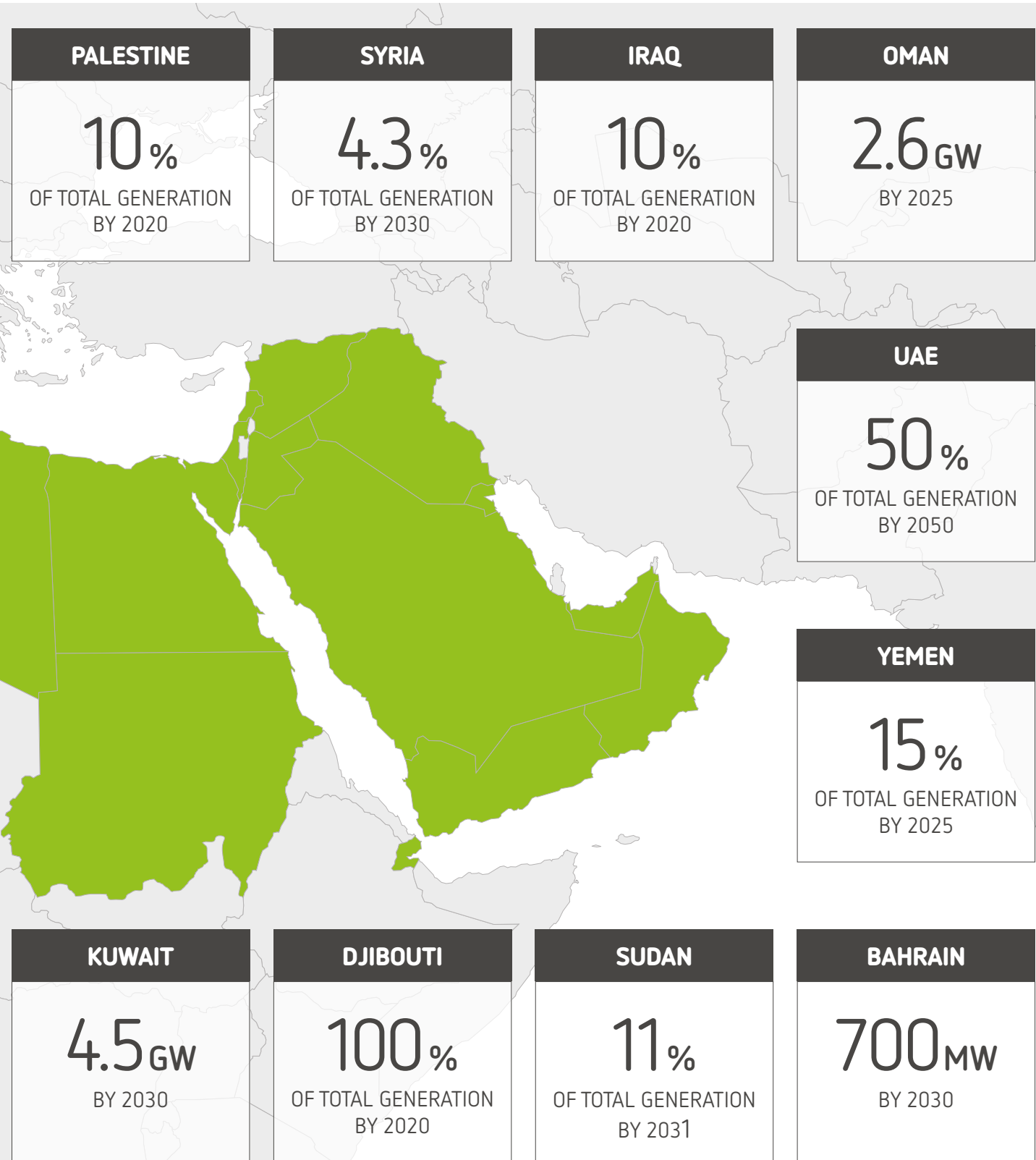
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# Renewable mar



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# Market opportunity





# Egypt

Renewable energy is increasingly viewed as having a positive impact on communities and enterprise across Northern Africa. Egypt is leading the way due to its favourable conditions and an eager government keen to bring more clean energy onto the grid. As one of only 38 countries worldwide with a published National Wind Atlas, Egypt enjoys strong wind at an average speed on 10.5 miles per second.

The country is aiming to boost its renewables' share from 1% to 20% of energy produced by 2022, 12% of this energy is to be created by wind.

The state is keen to attract investors to inject capital into various projects happening all over the country. A milestone was achieved in 2007 by promulgating the feed-in tariff law which aims to secure 2000 MW of wind as well as the Egypt Renewable Energy Financing Framework which is expected to be completed by 2022. The programme assists in planning, policy setting and enhancing energy integration mechanisms and pumping investments worth \$1 billion into the development and construction of renewable energy projects. The aim is to generate 1,400 GW of electricity annually.

The mechanism in the first phase is debt financing by both organisations of up to \$500 million, including up to \$150 million in loans from The Green Climate Fund (GCF). In the second phase, debt financing would be leveraged from commercial banks and private sector investments.

These efforts have resulted in Egypt being ranked second among countries making progress throughout the year in the transition to renewable energy in a report by Bloomberg Climatescope. According to the report, Egypt climbed 23 places to rank 19 out of the 71 evaluated countries in emerging clean energy markets.

The Egyptian Electricity Transmission Company (EETC) has been inviting tenders for constructing projects with a capacity of 250 MW for wind energy in the BOO (Build-Own-operate) system. In addition, the New and Renewable Energy Authority (NREA) is launching bids to design, supply, and execute projects with a capacity of 750 MW for producing 1980 MW of wind energy.

Overall the Ministry of Electricity and Renewable Energy aims to generate 51.3 GW of renewable energy in the next five years.

Projects of interest at the moment include a 250 MW wind farm project in the Gulf of Suez, near Ras Ghareb which will increase Egypt's wind energy capacity by 14% once constructed, the Zafarana complex for wind power with a capacity of 545 MW and the Gabal al-Zeit complex for wind power with a capacity of 580 MW.

## KEY PLAYERS

Ministry of Electricity and Renewable Energy, Egypt

New & Renewable Energy Authority (NREA)

Egyptian Electricity Holding Company (EEHC)

Egyptian Electricity Transmission Company (EETC)

European Bank for Reconstruction and Development (EBRD)

International Finance Corporation (IFC)

The Green Climate Fund (GCF)



## COMPANIES OPERATING IN EGYPTIAN WIND PROJECTS

Orascom | Senvion | Siemens Gamesa | ACWA Power | Sterling & Wilson | Voltalia | Masdar | Lekela  
El Sewedy | ENGIE | Nordex | Acciona | Aalfa Wind Energy Co. | Ras Ghareb Wind Energy S.A.E. | Italgen S.p.A.

## PROJECTS

### The Ras Ghareb wind farm

- 262.5 MW near-shore wind project being developed near the Gulf of Suez
- The first independent power producer project in the country
- Being developed by Ras Ghareb Wind Energy, a special-purpose joint venture company established by Engie (40%), Toyota-Tsusho / Eurus Energy (40%) and Orascom Construction (20%) on a build-own-operate (BOO) basis
- The estimated investment in the project is \$400m
- It is expected to be completed in 2019 and supply power to approximately 500,000 households when fully operational
- The wind turbines are provided by Siemens Gamesa Renewable Energy
- There will be 125 turbines type G97, rated 2.1 MW with a hub height of 71m
- Financed by Japan Bank for International Cooperation, Nippon Export and Investment Insurance, Sumitomo Mitsui Banking Corporation, Société Générale and Commercial International Bank

### 250 MW wind farm project in the Gulf of Suez

- Created under a power purchase agreement (PPA) with the Egyptian Electricity Transmission Company (EETC) and Lekela Power
- Located 30 kilometres north-west of Ras Ghareb, the project is part of the Government's Build, Own, Operate (BOO) scheme.
- Once constructed, it will increase Egypt's wind energy capacity by 14%
- The project will produce more than 1000GWh a year, powering the equivalent of over 350,000 homes in Egypt.
- The total investment for the project is estimated at \$325 million
- The project will be constructed on a turnkey EPC basis and set to be operational in 2021

### Gulf of El Zayt Wind Farm

- The world's largest wind farm in the Gabal El Zayt area in the Red Sea
- The farm has a capacity of 580 MW, with a total investment of \$670.64 million
- The first completed project contains 120 turbines with a capacity of 240 MW; meanwhile, the second and third projects will have 110 turbines with a capacity of 220 MW and 60 turbines with a capacity of 120 MW, accordingly
- The Gabal El Zayt substation is the main connection point between the Gabal El Zayt wind farm, one of the largest in the region, and the grid

# Saudi Arabia

The Ministry of Energy, Industry and Mineral Resources (MEIM) announced this year that Saudi plan to tender seven renewable energy projects by mid-2019. The projects are hoping to attract a total investment of \$1.51 billion and will create over 4,500 jobs during construction, operations and maintenance. With a combined generation capacity of 1.51 GW, the seven projects will supply enough energy to power 226,500 households.

The announcement is in line with the nation's ambitious renewable energy plans. Saudi seek to achieve over 25 GW of wind and solar power generation over the next five years, and close to 60 GW over the next decade, 16 GW of this is to be generated by onshore wind. The targets are part of Saudi's National Renewable Energy Programme, a strategic initiative under the countries Vision 2030 and the King Salman Renewable Energy Initiative aiming to maximise the renewable energy potential in Saudi Arabia.

The nation has the potential to lead the Middle East's wind power market in the next decade as the kingdom accounts for almost half of the region's wind capacity additions by 2028. Due to its natural resources it has the potential to produce more than 200 GW of on shore wind energy with an average capacity factor of 35.2%, higher than most countries paving the way in wind energy generation including the US (33.9%), UK (27.8%), Denmark (28.4%) and Germany (19%).

## Projects

### Dumat Al Jandal Wind Project

- The Dumat Al Jandal Wind Project was awarded to a consortium led by EDF Energies Nouvelles and Abu Dhabi Future Energy Company (Masdar) by The Renewable Energy Project Development Office (REPDO)
- The \$500 million project will be Saudi Arabia's first utility-scale wind farm and expected to generate 400 GW
- It is the second tender to be issued by MEIM as part of the National Renewable Energy Program under the auspices of the King Salman Renewable Energy Initiative which aims to diversify the country's energy sector
- The project was awarded based on the levelised energy cost of \$2.13 cents/kWh, which is a new record-low price for a project of this type across Europe, Middle East and Africa
- When completed, the wind farm will generate sustainable power for up to 70,000 Saudi households and is expected to create almost 1,000 jobs during construction and operation

### Midyan Wind Farm Project

- The project forms part of the Round 1 of the National Renewable Energy Programme and expected to have a total capacity of 400 MW installed capacity
- Set to be operational by 2019

## KEY PLAYERS

Ministry for Energy, Industry and Mineral Resources Saudi Arabia, (MEIM)  
Renewable Energy Project Development Office, Saudi Arabia, (REPDO)  
Public Investment Fund Saudi Arabia (PIF)  
Electricity and Cogeneration Authority Saudi Arabia, (ECRA)  
King Abdullah Petroleum Studies and Research Center Saudi Arabia, (KAPSARC)  
Saudi Electricity Company  
EDF Energies Nouvelles, France  
Masdar, UAE



# Morocco

Morocco has one of the most ambitious clean energy targets in the world and aims to generate 42% of its total power from renewables by 2020, and 52% by 2030.

The Moroccan Integrated Wind Energy Project, spanning over a period of 10 years with a total investment estimated at \$3.2 billion, will enable the country to bring the installed capacity, from wind energy, from 280 MW in 2010 to 2000 MW in 2020.

Objectives of the wind energy program include increasing the share of wind power in the national energy balance to 14% by 2020 and achieving a production capacity from wind power of 2 GW and annual production capacity of 6600 GWh, corresponding to 26% of current electricity generation.

In November 2018, the Midelt project (180 MW) reached financial close, allowing the start of construction work for an investment of over \$258 million. This fleet is part of the 850 MW Integrated Wind Project, which includes four other farms, for a total cost of nearly \$3 billion. It is developed by Midelt Wind Farm SA, jointly owned by ONEE and the Nareva-Enel Green Power Consortium (EGP).

## Projects

### The Midelt wind farm

- Midelt is the first of the wind farms included in the Moroccan 850 MW Integrated Energy Project
- Expected capacity is set to reach 180 MW

## KEY PLAYERS

Moroccan Agency for Sustainable Energy (MASEN)

Office National de l'Électricité et de l'Eau potable (ONEE)

Nareva

Enel Green Power

Siemens Gamesa

The Moroccan Agency for Energy Efficiency - AMEE

German Development Bank (KfW)

European Investment Bank (EIB)

European Commission

ACWA

Engie

# Oman

In a bid to diversify its energy sources, Oman has set an ambitious goal of covering 30% of its electricity demand with renewable energy projects by 2030.

With the launch of several major renewable energy projects in the sultanate, Oman Power and Water Procurement Co (OPWP) expects solar energy, wind farms and waste energy projects to account for as much as 30% of the country's energy mix by 2030. According to OPWP wind power is projected to account for 6.5% of the total energy mix by 2030, respectively.

OPWP has also set a target that by 2025 renewable energy sources will produce around 16% of total power needed in the sultanate. Wind power will account for 2% each in Oman's energy mix. In 2019, the OPWP announced the launch of several renewable energy projects, including a mega wind energy project with an anticipated capacity of 300 MW.

## Projects

### Dhofar Wind Power Project

- 50 MW Dhofar Wind Farm comprised of 13 turbines
- Located in the southern Omani governorate of Dhofar
- Fully financed by Abu Dhabi Fund for Development (ADFD)
- Will generate enough electricity to power an estimated 16,000 homes
- Expected to be completed in Q3 of 2019

### Wind 2023 Project

- The first mega wind project in Oman
- The independent power project (IPP) has an anticipated capacity of 300 MW
- The estimated cost of the project is \$1 billion

## KEY PLAYERS

Abu Dhabi Fund for Development (ADFD)

Rural Areas Electricity Company of Oman (TANWEER)

Oman Electricity Transmission Company


Authority for Electricity Regulation (AER)

The Oman Power and Water Procurement Company (OPWP)

Masdar

GE

TSK

A row of green wind turbines stands on a grassy hill, receding into the distance under a cloudy sky. The turbines are the central focus, with their blades extending outwards. The overall scene is bright and green, suggesting a clean, renewable energy source.

“This is the renewable energy event Egypt and the MENA region has been waiting for”

Eng. Eman Rashad Saeed | General Manager for Renewable Private Power Projects | Egyptian Electricity Transmission Company (EETC)

“An excellent platform for connecting, brainstorming, and moving forward”

Pierre El Khoury | President | The Lebanese Center for Energy Conservation

# Rest of the Middle East

## Lebanon

Lebanon's goal is to produce 12% of its electricity from renewable sources by 2020 in order to resolve the country's electricity deficiency and provide residents with 24 hour electricity. Three companies were granted licenses to build Lebanon's first wind farms in 2018, potentially opening up the possibility for large scale private investment in the country. The deals involve three companies, Lebanon Wind Power, Hawa Akkar and Sustainable Akkar who aim to build wind farms in the northern Akkar region with a combined capacity of 200 MW by 2020.

### KEY PLAYERS

Ministry of Energy and Water, Lebanon  
Lebanese Center for Energy Conservation (LCEC)  
Hawa Akkar  
Lebanon Wind Power  
Sustainable Akkar

## Jordan

Jordan does not have the natural resources of its neighbours and imports 90% of its energy and fuel requirements, comprising nearly 20% of the country's GDP. However, the Jordanian government plans to boost electricity generation capacity from renewable sources up from the current 18 MW to 1.8GW by 2020. Jordan initially set a target of 10% of primary energy demand from renewable energy by 2020. However, the kingdom is reviewing its 2007-2025 strategy with plans to establish even more ambitious targets toward 2030 and 2050. The strategy is built on four main pillars: energy security, increasing energy independence, reducing cost, and diversifying energy resources. Renewable energy investments in Jordan are set to reach \$4 billion in 2020.

### Projects

#### 52 MW wind farm in Daehan

- \$103 million Daehan project is being developed by two Korean sponsors, KOSPO and Daelim Energy
- IFC is providing a \$10 million loan

#### 100 MW wind farm

- Due to be operational by the end of 2019
- Power over 150,000 homes

### KEY PLAYERS

Ministry of Energy and Mineral Resources, Jordan  
Energy and Minerals Regulatory Authority, Jordan  
National Energy Research Center, Jordan  
Jordan Renewable Energy and Energy Efficiency Fund (JREEF)  
The European Bank for Reconstruction and Development (EBRD)  
The International Finance Corporation (IFC)  
Alcazar Energy  
KOSPO  
Daelim Energy  
GE  
Vestas  
Siemens Gamesa

## Bahrain

Bahrain intends to create 10% of its energy needs from renewable sources by 2035. The Sustainable Energy Unit (SEU) was established in 2014 as a joint initiative between the Office of the Minister of Electricity and Water Affairs and the United Nations Development Program (UNDP) and created the country's first National Energy Efficiency Action Plan (NEEAP) and the National Renewable Energy Action Plan (NREAP) in 2016. The latter aims for renewable energy to account for 5% of the country's electricity mix by 2025 and calls for renewable sources to make up 10% of the national feedstock by 2035.

The NREAP represents the Kingdom's efforts to deliver the sustainable energy transition envisioned in the Economic Vision 2030. It calls for initiatives to place solar panels on rooftops, develop wind-power projects both on land and at sea, as well as requirements to install solar infrastructure on new residential units and renewable-energy requirements for new infrastructure projects such as bridges and railways. Bahrain also established a Sustainable Energy Centre in 2019 which will be supervised by the Minister of Electricity and Water and provide support for the preservation, enhancement, security and investment of sustainable energy sources.

### Projects

#### 5 MW wind and solar plant

- Located at Al Dur in the Southern Region of Bahrain
- The plant will produce 3 MW of solar energy and 2 MW of wind energy
- Due to cost approximately \$17 million

### KEY PLAYERS

Energy and Water Authority (EWA)  
Sustainable Energy Unit (SEU)  
Ministry of Electricity and Water Affairs, Bahrain  
The National Oil and Gas Authority

## Kuwait

Kuwait is working hard to ensure that 15% of the country's local power demand is met through renewable energy sources by 2030. The plans, which have been set in motion since 2017, are part of the New Vision 2035, a set of goals aimed at sustainability and diversification away from oil dependence.



# Rest of North Africa

## Tunisia

Tunisia is currently seeking to attract \$2 billion in foreign investment to develop a series of wind and solar power projects over the next three years. These investments would create 1900 MW of generation capacity by 2022, which, by that time, would account for about 22% of installed capacity.

This target will also help meet Tunisia's longer-term goal, as set out in the 2016 Renewable Energy Action Plan, of having 30% of power needs met by renewable resources by 2030.

In 2018, the Tunisian Ministry of Energy, Mines and Renewable Energies launched two tenders, for 500 MW solar photovoltaic (PV) power plants and for 500 MW wind farms.

The wind tender covers three projects — 200 MW at Jbel Abderrahmane in Nabeul Governorate, 100 MW at Jbel Tbagha in the governorate of Kebili, and 200 MW of capacity at sites in the governorates of Ben Arous and Bizerte.

The expansion of renewables in the energy mix is expected to lead to an increase in private investment in the sector, with independent power producers (IPPs) playing a much bigger part.

### Projects

#### 120 MW Wind Project

- Four onshore wind projects totalling 120 MW
- Projects represent a combined investment of \$134.5m

### KEY PLAYERS

Société Tunisienne de l'Electricité et du Gaz (STEG)  
Ministry of Industry and Small and Medium Enterprises, Tunisia  
ABO Wind AG  
UPC Tunisia Renewables  
Lucia Holding  
VSB Energies

## Algeria

Algeria is heavily dependent on its fossil fuel sector, with revenues accounting for approximately 30% of the country's gross domestic product. The government is aiming to diversify the energy mix and aims to re-launch the Algerian Renewable Energy Development and Energy Efficiency Program (PENREE) which aims to produce clean energy by 2030.

### KEY PLAYERS

Ministry of Energy and Mines (MEM)  
National Society for Electricity and Gas  
The Government of Algeria

## Libya

Libya is an important natural gas and crude oil exporter to the world. Its economy relies heavily on fossil fuels. However the Libyan government is making efforts to diversify its energy mix and to harness the country's solar and wind potential. By 2020, Libya aims for 7% of electricity generation to come from renewable energy, followed with 10% by 2025. Libya is also in the process of implementing its NEEAP.

# THE WIND

## SHOW MENA 2020

13<sup>th</sup> - 14<sup>th</sup> April 2020

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Amidst all the opportunities present in the MENA energy sector, The Wind Show MENA, co-located with The Solar Show MENA and the Electric Vehicles Show MENA stands out as the must-attend event. The event brings together the governments, leading utilities, power producers, project developers, investors and solution providers to allow new business opportunities and valuable connections to be made.

Driven by generating genuine business connections, The Wind Show MENA is committed to showcasing your products, ideas and innovations, and ensuring you meet with the right customers.

Call **Rebecca Tyson** today on **+97144402521** or email **rebecca.tyson@terrapinn.com** to learn more about exhibiting, sponsoring or speaking.

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