

META Monthly: Renewables Update - September 2018

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This month's META Monthly focuses on Saudi Arabia and the rise of wind power. In next month's edition we will discuss combined solar and desalination projects.

Wind in Saudi Arabia

As an oil-producing region, the Middle East and North Africa (MENA) is considered a high emitter of carbon. Saudi Arabia, in particular, is ranked by the European Commission database EDGAR as the 10th highest carbon emitter in the world, despite being the 41st most populated country in the world, with a population of 33.5 million. In an attempt to reduce their carbon footprint the countries of the MENA region are taking active steps towards embracing renewable energy. Countries such as Oman, Kuwait, and the United Arab Emirates have set themselves targets of producing 5-7 percent of their respective energy from renewable sources by 2030. Saudi Arabia has set an even higher and more ambitious target of producing at least 10 percent of its energy, or 9.5 GW, from sustainable sources by 2023 as part of Saudi's 2030 Vision.

Saudi Arabia has been increasingly active in implementing its renewable energy plans. In 2010, the King Abdullah City for Atomic and Renewable Energy (KACARE) was set up to foster renewable energy in the country. KACARE partnered with the National Renewable Energy Laboratory and Battelle Memorial Institute in the United States to calculate Saudi Arabia's capacity to produce energy through solar, wind, geothermal, and waste-derived sources. A full evaluation of the energy sources showed that by 2030, 60 GW of hydrocarbons, 16 GW of solar, and 9 GW of wind power could be produced.

As sunlight is not a scarce resource in the MENA region, solar power has been the prominent focus of renewable energy efforts. The United Arab Emirates and Saudi Arabia each have a large pipeline of solar projects under construction. In February this year, ACWA Power was awarded the contract, having submitted a world record-breaking tariff of US2.34¢ per kilowatt-hour, to develop the 300 MW Sakaka IPP PV solar project (Saudi Arabia's first utility-scale renewable energy plant).

Despite its success in solar power, Saudi Arabia is also looking to diversify its renewable energy mix with the introduction of wind power. Saudi Aramco has confirmed through extensive research that Saudi Arabia's wind supply

is one of the best in the MENA region. Average wind speeds in the northeast, central, and western mountainous regions of Saudi Arabia are 33 percent above the levels required to ensure a wind project is commercially viable.

In January 2017 the first wind turbine was installed in Saudi Arabia by Saudi Aramco and General Electric. The turbine provides electricity directly to Saudi Aramco's facility in Turaif, and can generate 2.75 MW of power at peak, sufficient to sustain 250 homes. This allows Saudi Aramco the opportunity to reduce burning of diesel for power generation by the equivalent of 18,600 barrels of oil per year.

Wind energy offers the potential to provide a new source of energy and enhance power generation efficiency, thus meeting the core objectives of Saudi's Vision 2030. A brief overview of the current wind projects in Saudi Arabia is set forth below.

Dumat al-Jandal (DAJ) 400 MW Wind Power Project:

The DAJ project will be the first utility-scale wind project in Saudi Arabia. It involves the development of a 400 MW wind power plant near the city of Dumat al-Jandal, Sakaka. The Renewable Energy Project Development Office (REPDO) and the Ministry of Energy, Industry and Mineral Resources received bids for the project in July 2018 from ACWA Power, EDF Energies Nouvelles, Enel Green Power SpA, and Engie. What is most striking about these bids is how unusually low two of them are. France's EDF Energies Nouvelles placed the lowest bid at only US\$21.30 MWh, and French electric utility Engie placed a bid of only \$23.62/MWh. The preferred bidder is yet to be confirmed.

The DAJ wind farm is to be developed on a build, own and operate basis, under a single special purpose vehicle to be 100 percent owned by the winning bidder. REPDO estimated the plant will cost \$500 million and will be project financed—the Saudi Arabian government will not be investing in the project. The financing will be through a 20-year power purchase agreement with Saudi Power Procurement Company and is scheduled to begin operation in mid-2020.

Midyan 400 MW Wind Farm Project:

In April 2017 REPDO pre-qualified 25 companies to bid for the Midyan 400 MW wind project. The companies include: Abu Dhabi Future Energy Company Masdar, GE, Marubeni Corporation, Mitsui & Co., JGC Corp, SNC Lavalin Arabia, and Iberdrola Renovables Energia. The project is moving slowly, however, REPDO has chosen to continue working on the project despite it being replaced by the DAJ project in the first round of Saudi Arabia's New Renewable Energy Procurement (NREP) program.

The Midyan wind farm will be located on the eastern coast of the Gulf of Aqaba, in northwestern Tabuk, Saudi Arabia. The project involves the construction of a 400 MW wind farm and includes the construction of a substation; access roads and related infrastructure; the installation of wind turbines, generators, and transformers; and the laying of transmission lines. The project will be developed under a build, own, and operate structure to be 100 percent owned by the successful bidder.

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