

MENA Solar Market Outlook for 2017

in conjunction with

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MENA NEW ENERGY 2017

A CSP, PV, WIND & ENERGY STORAGE CONFERENCE & EXHIBITION

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Bid, Win and Develop Cash Rich Projects in MENA



Introduction

The Middle East and North Africa’s (MENA) solar energy market is witnessing unprecedented developments as government-driven auctioning and net-metering schemes drive down costs and attract investments.

Some of the world’s lowest solar tariffs can be found in the region today. According to the International Energy Agency (IEA), long-term contract prices for utility-scale PV are as low as \$58/MWh and \$61-\$77/MWh in the UAE and Jordan respectively.

In its medium-term report, released in October 2016, the IEA forecast that by 2021 renewable capacity in the MENA region will grow by 78%, led by the UAE, Egypt and Morocco.

TOP MENA RENEWABLE PROJECTS/PROGRAMS IN 2017

Project title	MW capacity	Technology	Country
MASEN Noor Midelt	400 MW x 2	Hybrid CSP + PV	Morocco
DEWA CSP Phase I	200 MW	CSP	UAE
ADWEA Sweihan	350	PV	UAE
PEA - Renewable Energy Master Plan	300	PV, Small-Scale Wind, Biogas	Palestine
MEMR – Round 3	200	PV	Jordan
MEMR – Round 3	100	Wind	Jordan
MOERE – Round 2	2,000	Solar	Egypt
MOERE – Round 2	2,000	Wind	Egypt

Source: Research by New Energy Update

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PV on an upward trajectory

Solar PV is predicted to account for the lion's share of new capacity in the region, especially in Jordan and the UAE, James Kurz, senior consultant at Apricum.

The Berlin-based cleantech advisory acted as financial advisor to Swedish advanced materials start-up Sol Voltaics in raising \$17 million last May, bringing in the Saudi Arabian fund Riyadh Valley Company as the lead investor.

"We expect a PV market that is much more diversified than CSP and wind. Our forecast is for 1 GW to 1.5 GW of PV to be installed in the MENA region during 2017," Kurz said. "The two largest markets will be Jordan, comprised of IPP tenders, EPC projects and commercial and industrial projects, and the UAE, mainly from DEWA's IPP tender and Shams rooftop programs," he noted.

Jordan's Ministry of Energy and Mineral Resources (MEMR) recently invited expressions of interest for 200 MW of PV capacity as part of Round 3 of the direct proposal submissions process that was. The announcement was made during a trade mission organized by the Middle East Solar Industry Association (MESIA) in Amman in November 2016.

"Jordan's Round 1 of the feed-in-tariff (FIT) program has been successful with all projects achieving financial close. The attractive FIT, strong regulatory framework and appropriate contracts are relevant factors," said Gurmeet Kaur, head of projects in the UAE at global law firm Eversheds.

"Whilst the country removed the FIT and shifted to an open competitive model in Round 2, the projects were successfully awarded and now in process of reaching financial close. Therefore, for new markets, an approach which starts with a good FIT and then moves to a more competitive open tender is sensible and would balance the interest of both the private and public sector," said Kaur.



Scatec Solar's 10 MW Oryx plant reached commercial operation in June 2016 and was one of the first utility-scale PV projects to be awarded in Jordan
Image credit: Scatec Solar.

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Jordan is expected to have about 500 MW of installed wind and solar capacity by the end of 2016, according to the Energy and Minerals Regulatory Commission. Overall, the country is targeting 10%, or 1,800 MW of renewable capacity by 2020, of which 600 MW will come from solar PV.

Price competitiveness

In the UAE, DEWA's 800 MW-third phase of the 5 GW Mohammed bin Rashid al-Maktoum solar park made headlines in June 2016 for its low tariff of 2.99 US cents/kWh. The project was awarded to a Masdar-led consortium comprising Spanish firms Fotowatio Renewable Ventures and Gransolar.

An even lower bid of 2.42 US cents/kWh was submitted for Abu Dhabi's 350 MW Sweihan PV project in September by an Asian consortium, which offered to expand the plant to 1,170 MW at 2.30 US cents/kWh.

RECORD-LOW PV TARIFFS IN THE MENA REGION

Project	MWe Capacity	Awarded tariff	Developer/s	Country
DEWA Phase 3	800	\$29.9/MWh	Masdar-led consortium	UAE (Dubai)
ADWEA Sweihan	350	\$24.2/MWh (not awarded)	Unidentified Asian consortium	UAE (Abu Dhabi)
DEWA Shuaa	260	\$56.1/MWh	ACWA Power	UAE (Dubai)
Mafrqa	60.3	\$61.3/MWh	ACWA Power	Jordan

Source: Research by New Energy Update

"There is a clear downward trajectory in tariffs driven by competitive tendering based on lowest cost of energy as well as the continuing decline in costs of PV system components. The next major PV tender in the region is currently underway in Saudi Arabia where the Saudi Electricity Company is tendering 100 MW," Kurz highlighted.

At the same time, local installed costs for utility-scale PV have fallen from 7 US cents/Watt in 2008 to less than 1.5 US cents in mid-2015, a drop of almost 75%, according to the International Renewable Energy Agency (IRENA). For the price of a 10 MW plant in 2008, the UAE can now build 46 MW, the agency stated in its Renewable Energy Roadmap 2030.

"The biggest tenders have been in the UAE, particularly the Sweihan and DEWA Phase III tenders, which will both result in over 1 GW being installed by 2020," said Kurz.

"Additional smaller tenders already underway such as those in Jordan, Saudi Arabia, Morocco and Egypt will also drive significant market growth through 2020. In Saudi Arabia particularly, we expect the country to ramp up quickly following its inaugural 100 MW IPP tender being run by the Saudi Electricity Company (SEC)."

SEC is currently developing two 50 MW PV IPP plants in Al-Jouf and Rafha in the north of the kingdom and is currently evaluating bids for the projects.

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Secondary markets

Secondary markets for PV in 2017 will be Morocco and Egypt, where larger utility-scale projects are being finally realized, said Kurz. One of the latest projects to be awarded was the 170 MW Noor PV 1 in Ouarzazate, which ACWA Power and Chint consortium won after submitting the lowest tariff at 4.8 US cents/kWh.

Egypt, on the other hand, was on the verge of losing investor confidence after a long delay in signing PPAs under Round 1 of the FIT programme.

However, in mid-October 2016, Egypt's Ministry of Electricity and Renewable Energy (MOERE) finally signed eight PPAs worth for 400 MW of solar capacity, representing a much lower capacity than the original 2.5 GW targeted by 2017. Nearly 80 local and international companies had prequalified at the time.

On October 28, 2016, the Ministry launched Round 2 of the program, limiting it to developers who prequalified in Round 1, until it reaches the target capacity of 2,000 for solar and 2,000 MW for wind. If these capacities were not met by Round 1 qualified companies, then the door will be opened for newcomers.

A number of changes will apply in Phase Two, according to Dr. Fatma Salah, managing partner at law firm Riad & Riad. These include lower FITS and new local content requirements.

For PV projects between 20 MW and 50 MW, tariffs have been reduced from 14.34 US cents/kWh to 8.40 US cents/kWh. Developers will also be required to use a minimum of 30% local content in solar projects.

CSP on the agenda

Since Masdar's Shams project, CSP activity has mostly concentrated in Morocco, where the 500 MW Noor Ouarzazate complex is quickly taking shape. But in the last two years, governments across the region have shown increased confidence in the technology.

"Morocco will continue to be the CSP hub of the MENA region. However, Gulf countries including Kuwait, UAE and Saudi Arabia already have concrete plans to build CSP projects alongside PV to take advantage of CSP's storage capabilities," Kurz noted.

CSP projects at different stages of development are now underway in Kuwait, the UAE, Saudi Arabia, and Morocco. These are a mix of standalone units, hybrid PV-CSP, and integrated combined solar cycle (ISCC) stations.

The majority of these plants are initial phases of megaprojects. For example, Kuwait's 50 MW Shagaya CSP, scheduled to come online in early 2018, falls under the first phase of the Shagaya Master Plan. The three-phased multi-technology park is planned to generate 2,000 MW by 2030, including 1,150 MW of CSP, 700 MW of PV, and 140 MW of wind. The first PV and wind plants, each 10 MW, were connected to the grid in November 2016.

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Dubai's 200 MW solar-tower project also represents the first phase of a larger scheme that aims to deploy 1,000 MW of CSP by 2030. Likewise, Morocco's Noor Midelt, which comprises 800 MW of hybrid solar plants, is part of the government's long-term plan to generate 2,000 MW from solar energy by 2020.

In Saudi Arabia, CSP will be used in three ISCC stations—Duba 1, Waad Al Shamal, and Taiba—all being developed by Saudi Electricity Company (SEC). Notably, SEC managed to secure the cheapest cost per installed kilowatt for each of Duba 1 and Waad Al Shamal: less than \$1,600/kW, compared to the average global price of \$5,550/kW for parabolic trough in 2015, based on IRENA estimates.

Evolving frameworks

According to Aleksi Lumijarvi, programme officer at IRENA, current frameworks in the MENA region are largely focused on large-scale individual projects and favour international consortia, an approach which does not encourage development of local value chains. More advanced frameworks were needed to unlock private-sector activity, he said.

Clint Dempsey, principal associate in Evershed's banking and finance team, recommends the standardisation of documents as an efficient de-risking strategy that can benefit the region's solar industry.

"As we have seen with the IFC's scaling solar program, which proved successful in emerging markets such as Zambia, a standard bankable suite of documents can save an enormous amount of time and cost in achieving financial close."

Dempsey expects that green sukuk will open another avenue of funding in region. "I also expect to see commercial banks coming into play in countries such as Jordan, where we have seen successful Round 1 and 2 programs funded by development finance institutions."

Dubai Government recently launched the region's first clean-tech focused crowdsourcing platform, Green Deal, to make solar systems accessible for residents and businesses.

Moreover, in October, eight commercial banks signed an agreement with the UAE Government and UNEP Finance Initiative to fund renewable energy projects over the next five years. The institutions, which included National Bank of Abu Dhabi and HSBC, pledged to lend, invest in, and facilitate financing to large- and small-scale projects and developers.

According to MESIA, solar project investments in the region soared to \$3.5 billion in 2015 from about \$160 million in 2010.

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Distributed solar



(L) DEWA has achieved significant results in its Shams Dubai initiative. Image credit: DEWA.

(R) DP World operates the region's largest marine terminal, the Jebel Ali Port. Image credit: DP World.

The UAE is one of the few countries in the region taking a comprehensive approach towards solar through initiatives such as Shams Dubai. The rooftop-PV net metering scheme resulted in solar panels being installed on 222 residential and commercial buildings with a capacity of over 6 MW as of October 2016.

The largest of these is being implemented by DP World, the operator of the region's largest marine terminal. The Dubai-based group appointed Green Energy Tomorrow, Phanes Group's rooftop solar subsidiary in the UAE, to install 88,000 panels on its warehouses, offices and car parks in Jebel Ali Free Zone and Mina Rashid port. The first, 22 MW phase is scheduled for completion in 2017.

"The DP World solar project is groundbreaking in that it marks a significant turning point for the rapid scale-up of distributed solar energy in the UAE," Martin Haupts, CEO of Phanes Group, said. "We are likely to see an increase in distributed solar projects, with the private sector stepping up to provide the granular customization needed to achieve the next steps of integrating solar with things like sustainable water solutions and urban greenhouses."

The momentum created by Shams Dubai has inspired Abu Dhabi as the emirate is now gearing to launch its own net metering program.

Only two years ago, Abu Dhabi's Regulation and Supervision Bureau (RSB) said it had no plans for a solar FIT scheme in the city. But in a remarkable change of policy direction, RSB announced it would be issuing regulations in December 2016 for PV energy netting of up to 5 MW per premise, a move which should open up opportunities for solar suppliers and contractors in the UAE capital.

Morocco's government is also undertaking a scheme to install solar PV across 100 of its mosques in 2016, expanding to 15,000 mosques over the next five years. France's Engie has been awarded the first phase of the project, whose costs will initially be covered by the country's Ministry of Islamic Affairs in partnership with Germany.

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Markets to watch

In addition to the region's main solar hotspots, Algeria and Palestine are two emerging markets worth keeping an eye on.

The Palestinian Energy Authority (PEA) is reportedly planning to tender 10 MW of grid-connected solar projects by 2020 for each of its 11 governorates, totalling 110 MW.

A further 35 MW of solar capacity will be added to the grid under a new metering system, split between commercial, public and residential sectors. These projects will be eligible for soft loans from the \$50 million Palestinian Solar Fund, Dr. Omar Kittaneh, minister of the PEA said in a Dubai press conference in March 2016.

In Algeria, Italian oil and gas conglomerate ENI has started construction on a 10 MW PV plant in the Bir Rebaa North oilfield in collaboration with government-backed power company Sonatrach.

It may come as a surprise that Algeria added 268 MW of new solar capacity in 2015, but these are the latest figures from the country's renewable energy research institute (CDER), which indicate that the OPEC-member is actively pursuing solar.



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