Renewables in the Arab world: a new phase

Renewable energy is seeing mixed fortunes in the Arab world. Energy-importing countries and the UAE will continue to accelerate the development of their renewable-energy sectors. They will continue to rely on supporting policies to press ahead, while energy-exporting countries lag behind. The region has received some of the lowest renewable-energy prices awarded globally for both photovoltaic (PV) and wind power; and with some of the best resources in the world, renewables have great potential in the Arab world. But this needs governments to rise to the challenge and improve the regulatory environment to attract investment in one of the fastest-growing energy markets.

Over the past decade, several Arab countries have announced ambitious renewable-energy targets. With power demand across the region expected to grow at 9.9% a year until 2020, governments are keen to increase the share of renewables in the power mix. A shortage of gas and, in some countries, increasing reliance on liquid fuels, a key product for export, have also added to the urgency of energy diversification while environmental concerns increase.

<table>
<thead>
<tr>
<th>Renewable energy targets by country (MW)</th>
<th>Wind</th>
<th>PV</th>
<th>CSP</th>
<th>Total</th>
<th>% Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>5,000</td>
<td>13,500</td>
<td>2,000</td>
<td>20,500</td>
<td>15 2020</td>
</tr>
<tr>
<td>Egypt</td>
<td>2,500</td>
<td>1,700</td>
<td>100</td>
<td>4,300</td>
<td>20 2020</td>
</tr>
<tr>
<td>Jordan</td>
<td>1,200</td>
<td>650</td>
<td>1,800</td>
<td></td>
<td>10 2020</td>
</tr>
<tr>
<td>Morocco</td>
<td>2,000</td>
<td>2,000</td>
<td></td>
<td>4,000</td>
<td>42 2020</td>
</tr>
<tr>
<td>Tunisia</td>
<td>1,500</td>
<td>1,600</td>
<td>300</td>
<td>3,700</td>
<td>25 2030</td>
</tr>
<tr>
<td>UAE AC</td>
<td></td>
<td>1,000</td>
<td>1,000</td>
<td></td>
<td>7 2020</td>
</tr>
<tr>
<td>UAE-Dubai</td>
<td></td>
<td></td>
<td>3,000</td>
<td>3,000</td>
<td>7 2020</td>
</tr>
<tr>
<td>KSA</td>
<td>9,000</td>
<td>16,000</td>
<td>25,000</td>
<td>50,000</td>
<td>40 2040</td>
</tr>
<tr>
<td>Kuwait</td>
<td>4,500</td>
<td></td>
<td></td>
<td>4,500</td>
<td>15 2010</td>
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</tbody>
</table>

(Egypt and Morocco include hydrop) Sources: IFC, GTM, APICORP research

But progress has been mixed, as net energy importers and net energy exporters face different realities. To support their renewable sectors, countries such as Jordan and Egypt introduced feed-in tariffs (FITs), tax exemptions, and power-purchase agreements (PPAs). On the other hand, energy-exporting countries have done little to incorporate renewables, as they continue to rely on cheap-to-extract conventional sources to meet rising electricity demand. Falling technology prices have given some countries an opportunity to move towards increasingly cost-competitive renewable energy, while government support, like in other parts of the world, will be instrumental in driving the growth of renewables in the region.

Morocco, Jordan and the UAE show commitment

Reliance on fuel imports to meet domestic demand and a rising import bill have pushed Morocco and Jordan to diversify their energy sources. In Morocco, the government’s target of 2GW of solar and 2GW of wind power by 2020 is on track. Current wind capacity is over 750MW. The large increase in wind capacity over the past two years is attributed to the startup of the 300MW Tarfaya wind project in 2014. The project is a joint venture between GDF Suez and Nareva Holding and was financed by local banks.

As for solar, the 160MW NOOR-1 concentrated solar power (CSP) is anticipated to be commissioned early this year while NOOR-2 and NOOR-3 are expected to add a combined 350MW in 2017. Upon completion, NOOR will become the largest CSP project in the world. The multi-billion dollar project is financed by international development agencies including the European Investment Bank (EIB) and the African Development Bank.

Jordan’s commissioning of the 117MW Ta’if wind project in the second half of 2015 was a milestone for the kingdom. The project had an estimated cost of $287m and was financed by the International Finance Corporation (IFC), EIB, and other international institutions. As for PV, the country is expected to exceed its target of 600MW by 2020. Capacity of 200MW is expected to come on line by the end of 2016 and an additional 300MW by the end of 2017. These projects were also financed by various international institutions and banks. More recently, Masdar, in the UAE, announced that it will build a 200MW PV plant for the Ministry of Energy and Mineral Resources but no details have been provided.

The UAE has shown a serious commitment to developing solar energy. The 100MW Shams CSP plant has been operational since 2014 in Abu Dhabi. The cost of the project was $600m and was financed by international banks including BNP Paribas, National Bank of Abu Dhabi and Mizuho. On the other hand, Masdar’s ambitious Nour project, which aims to develop 300MW of PV, continues to face delays. In Dubai, the 13MW Phase I of Dubai’s solar park was completed in 2013. The 200MW Phase II has been awarded and will come on line in 2017 while Phase III is in the tendering process, with plans to bring 800MW on line by 2020. The Dubai Electricity and Water Authority is in charge of developing renewables in the emirate and aims to have 7% of Dubai’s generation from renewables by 2020. Additionally, Dubai introduced net-metering in 2014 to promote small-scale solar in the residential sector. By 2030, Dubai will require all rooftops to have solar panels as part of a strategy to generate 75% of electricity from solar by 2050.
Progress in Egypt but finance challenging

Falling gas production and a very rapid increase in domestic gas demand – from both the power sector and industry – have resulted in an increase in gas imports and Egypt turning into an LNG importer. To address rising demand for electricity, the country aims to develop 2.5GW of wind, 1.7GW of PV, and 100MW of CSP capacity by 2020. It recently increased its wind capacity by 35% with the addition of the 200MW Gabal El Zeit, bringing total wind capacity in the country to 800MW.

Renewable-energy plans have also been boosted by the massive contract awarded to Siemens to develop 12 wind farms with a total capacity of 2GW. Additionally, the country signed soft agreements with several companies to develop more than 10GW of solar and wind projects, although no contracts have yet been awarded.

Although there is strong interest in the Egyptian market, some funding challenges remain. International commercial banks fear the devaluation of the currency and want guarantees about the availability of foreign currency – and they are unlikely to receive them. Consequently, the government has little choice but to rely on international lenders like the IFC and the European Bank for Reconstruction and Development (EBRD) for financing. The EBRD alone will provide $500m in funding in 2016 for renewable projects.

Supporting policies paving the way

Regulatory support is improving as several countries accelerate the expansion of renewables. Jordan was the first Arab country to introduce FITs in 2012. The first round of tenders in 2013 led to the procurement of 200MW of PV over 12 projects, of which 11 received a FIT of $0.160/kWh and the 5MW Shama Ma’an project, expected on line by the end of 2016, received $0.149/kWh. Additionally, the FIT for the recently inaugurated 117MW Talha farm was $120/MWh. The second round of tenders – concluded in 2015 through competitive bidding – led to the procurement of an additional 200MW of PV divided in four 50MW projects. The offers for the four 50MW plants were $61.30/MWh, $64.90/MWh, $69.10/MWh and $76.70/MWh, around 50% less than the FITs offered in the previous tender round. The government offered FITs in the first round to attract foreign investment. But there has been a change in strategy and the government recently offered tenders under competitive bidding which attracted very low prices and as a result is unlikely to revert back to FITs for future projects.

Egypt also introduced FITs for 2GW of wind ($0.09-0.11/kWh), 2GW of solar PV ($0.130-0.143/kWh) and 300MW of rooftop solar PV – but it remains unclear when these projects will be connected to the grid. In October 2015, the country received prequalification submissions under competitive bidding for 250MW of wind, 200MW of PV and 50MW of CSP. Developers will design, finance, and build the plants and sign PPAs. The contracts for these projects are expected to be awarded by the end of 2016.

In Morocco, a FIT policy does not exist but a similar scheme called the EnerisPro was launched in 2006. Under this programme, industrial consumers can invest in renewables and the government-owned utility guarantees to buy the surplus electricity at favorable rates. Currently, 850MW of wind was tendered for five projects across the country. These projects are expected to come on line between 2017 and 2020. In January 2016, the Moroccan Energy Minister announced at a summit that the country had received average bids of $30/MWh for the tenders, possibly the lowest wind price globally.

Major renewable-energy projects to come on line by 2020

<table>
<thead>
<tr>
<th>Project</th>
<th>Location</th>
<th>Type</th>
<th>MW</th>
<th>Status</th>
<th>Date</th>
<th>Cost</th>
<th>Owner/developer</th>
<th>Financiers</th>
<th>FIT</th>
<th>Contract type</th>
<th>PPA</th>
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<tr>
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<td>Jordan</td>
<td>PV</td>
<td>53</td>
<td>Development</td>
<td>2016</td>
<td>170</td>
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<td>International Bank</td>
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<td>BOOT</td>
<td>20</td>
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<tr>
<td>Tarra</td>
<td>Morocco</td>
<td>Wind</td>
<td>150</td>
<td>Development</td>
<td>2017</td>
<td>190</td>
<td>Mina/EDF Energies Nouvelles</td>
<td>Local and International Banks</td>
<td>0.066</td>
<td>BOOT</td>
<td>20</td>
</tr>
<tr>
<td>Nour 2 &amp; 3</td>
<td>Morocco</td>
<td>PV</td>
<td>350</td>
<td>Development</td>
<td>2017</td>
<td>190</td>
<td>Aria Power/Tenex</td>
<td>AIG/IBK IWM</td>
<td>0.157-0.163</td>
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</tr>
<tr>
<td>Dubai Solar Park II</td>
<td>UAE</td>
<td>PV</td>
<td>200</td>
<td>Development</td>
<td>2017</td>
<td>190</td>
<td>Aria Power/Tenex</td>
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<td>0.059</td>
<td>BOOT</td>
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<tr>
<td>Triada</td>
<td>Morocco</td>
<td>Wind</td>
<td>300</td>
<td>Contract awarded</td>
<td>2020</td>
<td>490</td>
<td>Nabara Holding/Energy/Siemens</td>
<td>IBK/IBK</td>
<td>0.025-0.030</td>
<td>BOOT</td>
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<tr>
<td>Madati</td>
<td>Morocco</td>
<td>Wind</td>
<td>150</td>
<td>Contract awarded</td>
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<td>240</td>
<td>Nabara Holding/Energy/Siemens</td>
<td>IBK/IBK</td>
<td>0.025-0.030</td>
<td>BOOT</td>
<td>20</td>
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<tr>
<td>Bedu Lahdi</td>
<td>Morocco</td>
<td>Wind</td>
<td>200</td>
<td>Contract awarded</td>
<td>2020</td>
<td>300</td>
<td>Nabara Holding/Energy/Siemens</td>
<td>IBK/IBK</td>
<td>0.025-0.030</td>
<td>BOOT</td>
<td>20</td>
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Costs are falling

Renewable-energy success will rely on its cost competitiveness. According to the International Energy Agency, global investments in renewables totaled $270bn in 2014. The agency estimates that global average onshore wind costs decreased by 30% while those for solar PV dropped by 70% between 2010 and 2015. These cost savings are mainly attributed to technological advancements and the increase of manufacturing activities in Asia. Continuing investments and additional capacities will result in further cost reductions.

Global weighted average levelised cost of electricity for new projects

2015 saw some of the lowest renewable-energy prices in history. The UAE received a solar-PV tender from ACWA of $58.4/MWh for the 200MW phase II Dubai Solar Park while
Egypt was able to achieve $50/MWh for onshore wind (which has been beaten by Morocco in January 2016). The price in the ACWA bid is equivalent to that for a combined cycle gas turbine (CCGT) at around $2.70-5.00/MMBtu or $10-16/barrel. This is promising for the region given that Qatar is the only Arab country with abundant cheap natural gas. Gas supplies in Abu Dhabi and Egypt are estimated to cost in the range of $5-6/MMBtu and can be more expensive in other countries. Based on these estimates, solar PV and onshore wind are capable of undercutting conventional sources in some countries, despite the widespread perception that renewables are not cost competitive.

But slow progress in other countries

Other net-exporting countries are struggling to kick start their programs. Large oil or gas reserves and cheap extraction costs mean that hydrocarbons continue to meet rising demand in countries like Saudi Arabia, Kuwait, and Qatar. Policy uncertainty and the lack of an efficient regulatory framework are mainly responsible for slow progress.

In 2012, the King Abdullah City for Atomic and Renewable Energy announced plans to invest $100bn to produce 41GW of solar by 2032 in the kingdom. But little progress has been made so far. Given the large amount of investment required to reach this ambitious target, it is highly unlikely that the government will meet its renewable targets for now. Other countries, such as Kuwait, have declared a 15% renewable-energy target by 2020 but have only selected preferred bidders for its 50MW Al-Shagaya CSP plant; while Qatar, Oman, and Bahrain have made minor investments with no significant additions expected soon.

Despite many claims that renewable energy will never reach its potential — unless subsidies are phased out — fuel subsidies are not the main constraint for renewable development and other factors play a more important role. One problem lies in the electricity market structure in Arab countries. Almost all rely on a state-owned wholesale buyer to buy and sell electricity. Government wholesale buyers decide the purchase price of electricity from generators as well as the selling price to consumers. If governments want to keep prices low for end-consumers, there is nothing to prevent them from incentivising renewable-energy sources in the same way they subsidise conventional sources.

There are many reasons to be optimistic about the future of renewables in the region. Net-importing countries, driven by their desire to reduce dependency on fuel imports even in a period of low oil prices, will continue to lead in investment and deployment of renewable energy. But financing is becoming more challenging in the current environment and these countries need to continue developing their regulatory framework to attract investment into this sector. For net-exporting countries — with the exception of the UAE — renewables will take a back seat as they continue to rely primarily on conventional sources for additional capacity in the coming years and will use demand-side efficiency and price reform as measures to tackle rising consumption. But the region has received some of the lowest renewable-energy prices awarded globally for both PV and wind and, with some of the best resources in the world, renewable energy has great potential in the Arab world. But this needs governments to rise to the challenge and improve the regulatory and investment environment to attract investment in one of the fastest-growing energy markets.