

Emerging market briefing

Ben Willis looks at the latest trends from some of the world's most promising emerging PV markets. This issue features Oman, Saudi Arabia, Kazakhstan and South Korea

South Korea prepares to take the next step up

With 6GW of PV installed by the end of 2017, South Korea is not strictly speaking an emerging solar market. Nevertheless, recent government plans for what would represent a step-change in the country's renewable energy ambitions make it worthy of a close look.

At the end of 2017, the South Korean government announced a target of meeting 20% of its power needs from renewables by 2030, rather than build a new generation of nuclear reactors. Within this, solar looks set to play a significant role, with a huge 30.8GW of new capacity planned – a fivefold increase on current levels.

"Considering South Korea's current level of renewable penetration (7% of total generation including waste biomass, which is not considered renewable in other countries), this is indeed a very significant and ambitious target," says Bloomberg New Energy Finance analyst David Kang.

The government's main policy instrument for driving such a high level of deployment would be its Renewable Portfolio Standard, which requires large-scale power companies to procure a set percentage of electricity generation from renewable sources, says Kang. "The annual RPS upward ratchet is currently set to rise from 4% in 2017 to 10% in 2023. RE3020 plans to increase this mandate to 28% (not decided) by 2030. The government also plans to temporarily (possibly only available during current President Moon's term) introduce a feed-in tariff for small-scale PV projects (sub-100kw)," he adds.

But Kang says Korea will be "challenged" to meet this goal as its new policies fail to provide solutions to two "key barriers" against large-scale solar and wind deployment in the country – namely the availability of suitable sites and permit challenges. Another impediment may be the relatively low penetration of foreign players in South Korea's solar market, a consequence of language barriers, among other things.

For South Korea to reach its target, "continuity in energy policy will be key", says Kang. "RE3020 defers over 70% (36.3GW) of its planned solar/wind capacities to post-2022, i.e. the next administration," he explains. "This leaves the roadmap vulnerable to future revisions which can be all-the-more critical since key impediments of solar deployment in Korea (site limitation, permit challenge) can only be resolved through strong policy support"



Credit: Conergy

Solar is taking precedence over new nuclear capacity in South Korea's future energy plans

Headway at last for the Middle East's sleeping giant?

An analogy sometimes used for Saudi Arabia's as-yet untapped solar market is that of a 'sleeping giant', which, when it stirs, will become a force to be reckoned with.

Certainly there seems to be no limit to the international interest in the potentially huge opportunities for developing solar in the oil-rich gulf state. Yet so far the kingdom's solar sector has remained just that – potential rather than actual, much hyped but beset by a number of delays and false starts.

But that could be about to change. Shortly before this edition of *PV Tech Power* went to press, local developer ACWA Power won a tender to build the 300MW Sakaka project, the first time any large-scale PV project in Saudi had reached this stage of the development process. The project was set to reach financial close by the end of February 2018 and begin commercial operation in 2019.

The question now on the international PV community's lips is of course whether the progression of the Sakaka project is just a one-off or signifies the start of the Saudi giant's full awakening. Saudi Arabian authorities have certainly signalled their intent to diversify the country's energy mix away from oil, starting with a target of building 9.5GW of renewables by 2023. After Sakaka the next stage towards that target looks likely to be another solar tender round

later in 2018, confirmed at the start of the year by the Saudi Renewable Energy Project Development Office (REDPO), this time for 3.3GW across seven projects. So the signs for a steady increase in deployment look positive.

But one note of caution sounded over the future development of the kingdom's solar industry concerns the very low bid price Sakaka attracted. Although the ACWA winning price of around US\$2.342/kWh was not the lowest tendered, it was nonetheless extremely competitive. At the time the bid prices became public, industry observers questioned what sort of precedent this would set for future tenders, given that the involvement of international players perhaps unable to access similarly favourable sources of finance available as ACWA Power seems almost inevitable if the Saudi government's ambitions are to be realised.

To some extent that question remains and will need to be considered by REDPO and other authorities in future tenders, says Gurmeet Kaur, communications director at the Middle East Solar Industry Association (MESIA).

"If bidders form a view that only very low pricing is going to be accepted then it would discourage a lot of people from bidding in the next rounds," Kaur says. "It's not going to be the case that the winning bidder for this tender would necessarily have the capacity to build 9GW, so it's necessary to diversify and

Kazakhstan looks to break the oil habit

Kazakhstan may be a dyed-in-the-wool oil state, but its authoritarian government has nonetheless signalled its commitment to renewable energy, with an eye both on international climate change obligations and a need to diversify the local energy mix.

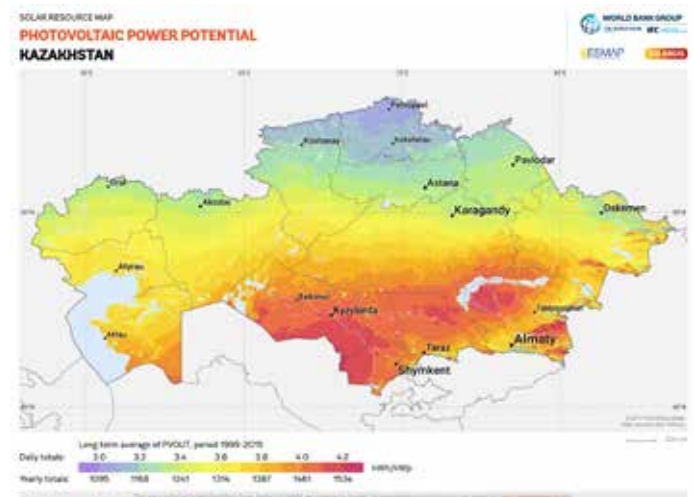
Under a plan published in 2013, a series of renewable energy targets were outlined, starting at 3% in 2020 before rising to 30% and 50% by 2030 and 2050 respectively. In 2014 tariffs for key technologies such as solar, and wind were enshrined in law, offering, for example, KZT34.41 (US\$0.106) per kWh for PV.

Despite the relatively attractive tariffs, however, actual projects taking advantage of them have been slow to come forward. According to Luc Garé, managing director of QWAY energy, a newly launched renewables development company active in Kazakhstan, this has been a consequence of a lack of professional experience within the country to exploit the opportunities on offer.

“What we saw in the beginning, in 2014, 15, 16, was that many local Kazakhstan people just jumped on this opportunity to start developing solar projects,” Garé says. “They said ok, we have a piece of land, it’s not far from a substation I’m going to develop this project. But the problem was that those people, the majority of them, hardly speak any words of English; they have no exposure to an international community of investors. So they finally received their [power purchase agreement] from the government but then their projects were stuck, nothing happened, because they didn’t have the capital and debt financing possibilities to build these projects. Their idea was to sell it to somebody then, but if you have no exposure to the international solar community you are stuck. And that’s what’s been happening.”

Garé, a former senior executive with module manufacturer REC Solar, claims the combination of his international experience in the global PV business and strong local connections puts Qway in a strong position to break the deadlock in Kazakhstan. Already the company has developed a number of projects across various different technologies. Among these it has four PV projects – three of 125MWp and a fourth of 62MWp – ready to go, with the necessary grid licences, environmental impact assessments and other permits.

These projects will be entered into an auction planned for later this year. This will be Kazakhstan’s first and signifies a change of tack by the government, away from the discredited system of simply offering PPAs to projects with the necessary licences, to a proper competitive bidding process aimed at attracting new players to the market. “By making this more international, they hope to get more interna-



Kazakhstan’s solar resources are similar to those found in southern Italy or Spain

tional players into Kazakhstan and therefore get out of the status quo they’re in now,” Garé says, adding that he hopes all four of Qway’s projects will be successful given the headstart the company has had on other international actors.

Overall, the Kazakh government’s 10% renewable energy target by 2020 represents around 3GW of new capacity across all technologies, so this debut auction, which Garé understands has been set at about 1GW, will be just the first step for the country. And given that the 2030 target is 50%, Garé believes that this is just the beginning of a steady scaling up renewables activity in Kazakhstan.

One advantage the country has is its location on the route of the old Silk Road, which is currently a target for Chinese overseas investment under its ‘One Belt One Road’ initiative. This is trying to enhance Chinese trade links with countries such as Kazakhstan through extensive infrastructure investment. According to Gare, renewable energy is one of the sectors that looks set to benefit from China’s largesse, a factor that greatly increases its attractiveness for foreign investors.

“Those four projects we cannot build them all by ourselves; we started the company only 1.5 years ago,” he says. “We see many potential Chinese investors very interested in jumping in this market; also because they are of course being pushed by their own government to start developing these [projects].”

therefore I think [the Saudi authorities] have to be realistic on the pricing you can get in future rounds. They need to be aware that the pricing achieved in this round is not necessarily going to be the same for the next ones.”

Indeed, the fact that in the case of Sakaka the winning bid was not the lowest will have sent out an “important message” to the international solar community, Kaur adds. “I think that’s what they need to continue to do – to send those messages that it is a transparent process, it’s a fair process and that is important.”

Another question mark concerns the local content rules that are being imposed on renewable energy project in the kingdom. These have started at 30% for solar, rising to 40-60% this year and ultimately to over 60% from 2019 onwards.

“That seems quite high; so I guess it needs to be monitored how international bidders are able to comply with the local content requirements,” Kaur says.

These are undoubtedly questions that must be addressed as Saudi Arabia begins the long-awaited process of rolling out its renewable energy programme. But one certainty is that they are unlikely to deter the opportunity-hungry international developers who have waited patiently for this moment to come.



Saudi Arabia’s tentative steps into the world of renewable energy look set to accelerate

Oman looks to the sun

While record-busting tender prices have become something of a hallmark of PV projects in the Middle East, one country that has yet to get caught up in the hype is Oman. This in spite of having some of the best solar resources in the world and a rapidly growing appetite for power to feed its developing economy.

In fact Oman's lateness to the table where solar is concerned is not so surprising when you consider its status as a leading exporter of natural gas and its heavily subsidised utility prices, which make it difficult for solar and other renewables to gain a foothold.

Nevertheless, the government has set a target of meeting 10% of Oman's power demands from renewables by 2025, equating to around 3GW of new capacity. That target is technology neutral, but recent indications suggest solar looks set to take a substantial slice of the pie, most likely sharing it with onshore wind.

For starters, at the end of last year the Oman Power and Water Procurement Company (OPWP), the government agency responsible for the sultanate's electricity infrastructure, announced a 500MW large-scale PV tender. The development will be run on a build-own-operate basis following the independent power producer (IPP) model that has delivered the record-low prices seen in neighbouring markets in the region. The tender, still being finalised, is seeking investment of US\$500 million, with contracting slated for completion by the end of 2018 and completion of the final project by 2021.

Another significant project announcement followed swiftly on the heels of this one when, in early 2018, the government-owned oil and gas company Petroleum Development Oman (PDO) issued a call for expressions of interest to develop a 100MW PV power plant in the south of Oman near the city of Salalah. The full tender process for this project is due to be launched in February 2018, a contract awarded in June and construction to take approximately 18 months thereafter. As with the OPWP tender, the PDO project is being run on an IPP basis.

According to Haider Al-Zaabi of the Oman Solar Association, PDO is a "pioneer" of renewable energy in Oman, having already embraced technologies such as solar thermal to generate steam used in oil recovery as an alternative to burning natural gas. Notable among these is the Mirrah project built by the California-headquartered GlassPoint, which when fully complete will hit the 1GW mark (see image).

"That was [PDO's] first [renewable energy project], now it's undertaking the 100MW PV project," says Al-Zaabi. "They're moving towards being powered 100% by renewables, so they're one of the driving forces for renewable energy in Oman."

Despite some false starts on embracing the potential offered by solar PV, Al-Zaabi believes these recent tender announcements will come to fruition, marking Oman's first steps towards its 2025 goal.

And aside from large-scale projects, the Oman government last year launched a rooftop solar programme aimed at residential properties. The initiative, dubbed Sahim, will operate much like some of the early European feed-in tariff programmes, where rooftop solar system owners will be able to sell power to the grid at a predetermined tariff.

These are early days for this initiative, and one impediment is the heavily subsidised price of power in Oman, which makes solar less competitive for householders. But Al-Zaabi believes reform in this area could be around the corner, leading to a more level playing field for solar as an alternative to conventional sources of power.

An added impetus for Oman's solar ambitions, whether large or small scale, is the fact that in the coming decades, the prices of oil and natural gas are expected to become increasingly volatile, meaning Oman will by necessity need to diversify its economy. Alongside this, ongoing improvements in solar technology are pushing prices ever further downwards. "That's why interest in solar is increasing in Oman," Al-Zaabi says.

Already a significant adopter of solar thermal generation, Oman is now turning to solar PV to meet future power needs



Credit Glasspoint