

# Digital O&M opportunities in a water-scarce India

**Operations and maintenance** | India's solar industry has been focused on reaching a hugely ambitious target of 100GW of PV by 2022. But as Tom Kenning reports, the need to get smart on managing and maintaining solar assets is now becoming an overriding priority



Credit: IBC Solar

**T**he current rush in India to deploy huge amounts of PV as quickly as possible has often diverted attention away from the question of how to manage a solar plant five or 10 years after construction. As a result the operations and maintenance (O&M) side of the industry has barely made the news, even though the quirks of Indian climate and regulation represent a handsome business opportunity for both domestic and foreign O&M service providers. The cheapness of labour in India could be seen as a barrier to entry for more tech-focused firms, but in a price-sensitive society, any kind of money saving technique is welcome.

India appears to have been slow at embracing big data solutions, but the South Asian giant may also be at an inflection

point in adopting state-of-the-art monitoring software. It is also beginning to take notice of the lessons offered by more established markets where O&M has become a key focus – as is the case for many early movers in Europe. New forecasting rules are set to be taken up slowly but surely, state by state, which could start to drive this data element. Meanwhile, traditional water-based solar plant cleaning methods could also become a crunch point in a country where water shortages are high on the political agenda.

Attitudes to O&M vary in the industry, says Jasmeet Khurana, associate director of consulting, at analyst firm Bridge to India. Inexperienced developers are most likely to overlook the maintenance aspect of a PV plant. For them it can appear to be a minor

**Cleaning modules in areas facing water shortages is just one the O&M challenges facing India's solar industry**

issue when confronted by the wider process of developing a plant. Operators who see their generation dropping will take action quickly and it would be false to make a broad statement about O&M practices in India, Khurana adds. Nevertheless, there is a sense among industry observers that there needs to be more education in the Indian market to avoid the mistakes originally made in Europe and elsewhere.

## Opportunities

Plenty of companies have in-house O&M teams in India, as was the case in the early days of European solar, but that should not limit the opportunity for third-party O&M firms.

"A big percentage (by volume) of the project developers are looking for

third-party O&M contractors,” says Kelly Mermuys, a business development executive at Belgian renewables analytics service provider, 3E India.

Mermuys says that India has strong technology and big data capabilities for many applications, but not so much for wind and solar at present. Thus the smart monitoring side of O&M represents an opportunity for those with prior experience to bring to India new and improved strategies. “But this gap could disappear very quickly where knowledge exchange between Europe and India can play a key role,” adds Mermuys.

France-based O&M analytics software provider, QOS Energy, recently opened a new office in Delhi to meet growing demand from the booming local market. QOS monitors more than 300 plants in India, including some utility-scale projects in Rajasthan.

“It is a very open market with strong Indian players, but many European and North American players want to invest there, which means that there’s mix of technology,” says Franck Le Breton, CEO of QOS Energy.

Le Breton feels there are very few strong players on the monitoring side in India. He also feels that the level of monitoring required by some of the largest PV players in India will mean technology needs to be imported from abroad. While competition does exist in this area, and will certainly increase over time, there are multiple gigawatts of opportunities available all the way under the government’s 2022 target of 100GW of PV and beyond, he says.

Solar EPC in India is much more about the capex model rather than the opex model, claims Eric Daniel, sales director, QOS Energy. However, as the market matures, it is turning towards optimising plant performance. Many independent power producers and asset managers have plants with different SCADA systems, hardware and pricing. Thus, if a problem occurs, it may require unique solutions on each plant. This is another area in which data firms with innovative solutions can offer help. One solution is to render the old Excel spreadsheet defunct, and replace it with automatically uploaded aggregation of data across an asset manager’s portfolio.

### Big data

“Today India is going by what’s available on standard legacy SCADA systems and inputting that into spreadsheets,” says Sandeep Nath, CMO of Shri Shakti Alternative Energy,

### Indian utility NTPC is experimenting with automated cleaning solutions on its solar installations



Credit: NTPC

an India-based company that offers specialised solar O&M Solutions and diagnostic services. “They don’t have much to do with real-time monitoring and they do not realise the importance of big data. That’s the reality on the ground. It’s not that they are ignoring it. It’s that they haven’t prioritised it.”

Nath even compares some developers to “headless chickens” under the pressure of building capacity, noting that while they have started to read and learn about the various nuances of O&M, senior managements are still struggling to think ahead about operations from the very start of installing a PV plant.

“In six months to two years all that will change,” he adds. “They will get a hang of the right approaches, which work to the right standards.”

Plant developers or owners who are contracting O&M providers are now able to demand more than they used to when carrying out due diligence and other checks.

Thus, solar O&M firms need to better communicate to investors the value they are adding to projects through data management and digitalisation, says Uwe Schmidt, director of O&M, at Germany-based integrated solar firm IBC Solar. In a way they need to “step into the shoes of investors” to prove how their new data tools have impacted plant performance and energy yields. Whereas in previous eras O&M performance could be communicated via emails, now tools can gather information and send reports far more effectively and instantaneously, but it’s not always easy to explain to investors how a company’s O&M actions have translated into higher energy yields for the plant.

“Investors are looking more at the quality side and quality is pretty hard to prove sometimes,” adds Schmidt. “You have to communicate; you have to prove what

you really did.”

Firms that have the right tools for the job and can demonstrate the value they add potentially have a lot to offer in India, particularly in helping the countries so-called discoms (distribution companies). This is particularly the case in the context of new forecasting rules, which will require both the plant operator and the regional load dispatch centre (RLDC) to provide forecasting of power generation and mean more collaboration between the two sides of energy production and distribution.

“The issue discoms have today is they have no clue now much renewable energy will be produced in the next few days,” says Daniel. As a result QOS Energy is already in discussion with some discoms to help them understand forecasting from renewable energy projects as well as how to aggregate information on energy produced across each discom’s area.

### Cleaning

The more traditional O&M subject is how to clean modules, and on this question India presents some specific challenges. In the hot season, parts of the country can face water shortages, while solar plants tend to collect even more dust than usual in that season. Sand storms are also possible in the deserts of Rajasthan and heavy rains in the monsoon season all over India. The period immediately after heavy rain when the sun comes out can also have some of the highest irradiation, so managing the spikes in energy production can be a challenge for both plant operator and the grid.

“In any state where the site of the solar PV installation is dusty and has a shortage of water availability, the smarter developer will go for waterless cleaning systems,” says Mermuys. “The waterless cleaning system is

a good mitigation measure.”

What was for a time the world's largest solar project, the 648MW Kamuthi plant in Tamil Nadu developed by Adani Green Energy, a subsidiary of Indian conglomerate Adani Group, made the press recently over water issues. Local media reported locals complaining of their ground water sources being tapped by Adani for cleaning its mammoth solar installation. However, Adani said that it had been using automated solutions for cleaning parts of the plant and only required monthly cleans of the project rather than daily – as had been suggested. Whatever the truth, it's clear that water is a sensitive issue here.

Developers should also be considering different PV module technologies than can cope in the various climates including solutions such as anti-soiling coatings, Mermuys adds.

One of the reasons that the focus on digitalisation has been less pronounced in India is due to the low staff costs. So while waterless cleaning solutions are often automated, there is a balance to be found in terms of economics where using multiple staff from the local surrounding area can be both cheaper and rewarding for the local

community. However, India's largest utility NTPC, which plans to have a multi-gigawatt solar portfolio over the coming years, has already been experimenting with robotic cleaning solutions.

### Security

Security is a big issue in India and project developers will always want the project site fenced, including CCTV cameras and 24-hour basis security personnel on-site, says Mermuys. Theft of PV components, a frequent occurrence in remote areas, typically involves PV modules, inverters and cables, which can impact a project's energy production.

“These criminal acts can force the plant to stop for several weeks and are extremely difficult to prevent,” Mermuys adds. “Beside the technical replacement of the stolen electrical components, there is work updating the plant documentation with new inverter datasheet or serial number.”

Ultimately O&M goes hand in hand with any solar installation and the quicker India takes it seriously the more optimised its projects will be, but for the foreseeable future the focus is likely to remain firmly on those enormous capacity targets. ■

### Solar operators face new forecasting requirements

Indian states are slowly adopting new forecasting rules that will force solar energy plant operators and regional load dispatch centres to provide more frequent and accurate projections of energy production or face penalties.

The Central Electricity Authority (CEA) has been insisting on such forecasting requirements and invariably all state discoms will have to implement them.

3E India's Kelly Mermuys says that project developers may need to attain more accurate tools and software for forecasting generation as a result.

Only Karnataka and a few other Indian states have taken on new forecasting rules so far, according to Bridge to India's Jasmeet Khurana.

Speaking broadly, forecasts will now have to be provided in more frequent windows of time in affected states. Meanwhile, the margins for error have also been tightened, combined with the threat of penalties.

“The only concern is that the older projects have not accounted for these costs, because at that time these regulations didn't exist, so they may have to do whatever retrofitting is required to make sure that they are able to forecast as well,” adds Khurana.

The rules are expected to be gradually rolled out in other states as India continues to steamroller its way ahead in renewables deployment, having recently reached a cumulative 15.6GW of solar installations, of which 14GW is utility-scale, according to Khurana.

Industry members are not yet clear what level the penalties relating to forecasting will be set at, particularly as they are going to be introduced state-by-state rather than in one umbrella ruling.



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