

Quality in India: battling the stereotypes

Quality | The speed of solar deployment in India has raised concerns that quality may be sacrificed for expediency. As Tom Kenning reports, although there are warning signs of a potential quality problem, efforts are underway to nip it in the bud



The breakneck pace of PV deployment in India over the last two years has come hand in hand with warnings from some quarters that poor implementation of projects will come back to bite the industry. Certain commentators regularly express fears over low quality standards in modules, construction and even some of the most basic components. They tend either to pigeonhole Indian business attitudes as being too price sensitive or blame Chinese equipment imports. With the relentless plummeting of Indian solar tariffs, critics are also concerned that EPCs are cutting corners.

To be sure, some of India's earliest solar plants have demonstrated a worrying lack of resilience to extreme weather conditions, particularly high winds. And the problem has proved sufficiently worrisome to attract the attention of the Indian government, which has introduced

new quality standards and inspection protocols, while threatening to bar poorly performing companies from the sector altogether.

Yet to say that India is becoming a haven for poor quality PV equipment and shoddy workmanship would be premature and an unfair generalisation. The warning signs are undoubtedly there that quality could become a problem for India's fast-growing but still comparatively young PV sector. A closer look, however, reveals plenty of efforts going on to curb the processes and practices that could cause a potential problem to become an actual one with potentially damaging consequences for the sector.

To open this inquiry, it's best to look at the past history of Indian plant mishaps. Manish Singhal, head of business development at top Indian EPC firm Mahindra Susten, categorises two kinds of key failures in the early years. The first was PV

Some of India's early PV plants suffered problems from heavy wind, but quality is improving

structures flying away under heavy gusts of wind, due to poorly designed foundations. The second, less visible problem was the frequency of micro-cracks in the offerings of some of the first thin-film module suppliers to India.

"Obviously quality is a concern and we've had issues with modules for example in early stages of the market," says Jasmeet Khurana, associate director of consulting at Bridge to India. "There was a US-based company called Abound Solar. It sold modules into India and some whole projects [and modules] stopped, and they were not around to replace them. There are some stories like that, but overall I think it is a concern and people now do a lot of things to make sure they are getting the right product."

Singhal says that all other examples of faults have been very small in size and number, although he adds that eight or nine major failures in the last five years

Module import quality, analyst and EPC perspectives

Some Indian news outlets have reported a stabilising of module prices, which puts pressure on developers who have won projects with extremely low tariffs on the assumption that module prices – one of the largest expenses in a solar project – would continue to fall. Industry members share their views on this supply and the delicate interplay between price and quality:



Finlay Colville, head of solar intelligence at Solar Media

"The price outlook for solar panels in India will depend on a host of factors, most notably the levels to which Chinese suppliers need to ship lower quality multi c-Si panels overseas, directly from Chinese factories.

"Over the past couple of years, the Indian market has been the lowest price globally for solar panels, with this coming from a blend of Chinese oversupply of multi, coupled with the emphasis on site capex taking precedence over any higher quality or power variant that would have added several pennies to the costs at the panel level.

"While the Chinese market is certainly running at levels which make pricing and quality of module supply a priority, there are potentially multiple gigawatts of lower power multi produce that may simply not be able to get sold in China.

"India would be the default route for this, and this may simply ensure that India keeps importing this type of offering from China."



Lavleen Singal, director at Acira Solar

"When developers go to buy, they want the cheapest stuff. I wouldn't be surprised if some [Chinese] material comes to India at lower than international prices.

"Europeans are being sold these modules at 50 cents (for example) and we are buying them at 45 cents... tell me; are we smarter than the Europeans? I'm trying to imply that they are giving us rubbish quality."

Singal claims that certain Chinese manufacturers are outsourcing services at various stages of the production of modules and as a result, quality is suffering, even if testing is being done at the main factories in China.



Jasmeet Khurana, associate director, consulting, Bridge to India:

"Modules prices in India are lower than module prices in China even though modules are coming from China. There are export incentives within China and the feed-in tariffs from China are higher so they are able to sell at higher cost within China.

"I'm not sure it's true and to what extent, but there is concern that there is still some differential in quality between what's being sold from a tier-one company when they sell to the US versus what they are selling to India. There might be some difference in the bill of materials so that concern is there."

is actually a rather large number. But he also agrees the industry is wising up – switching into a kind of "stabilisation mode" and starting to understand the importance of getting the EPC service right.

For example, more evidence can be found in Indian firms now negotiating the complete bill of materials (BOM), including everything from cells to backsheets, when discussing module prices.

"That trend came into being because there was something called the 'Indian BOM', which basically means that manufacturers were giving a slightly below-standard bill of materials to projects in India," adds Khurana. Now module purchasers are testing materials at every level to make sure they get what they were promised.

The move from a shaky, windswept start to a more robust practice in India is also confirmed by Jonathan Selwyn, director at international advisory firm, Solar Consulting, which has overseen a number of projects in the country. "It's fair to say there was very variable quality in the early solar farms and rooftop projects, but I'm very pleased to say that in two years, there's been a very rapid development in the quality of projects and know-how on the ground from local partners and international operators," he says.

Indeed, for Selwyn, there's now no distinction between Indian PV projects and those seen springing up across the rest of the globe in mature markets, but he highlights the perennial need to have a local partner in India to get a solid project completed to a high standard. "They are the ones who really know how it all works," he says.

If quality is indeed improving within India, then one of the major flashpoints of the future will be the supply of

"The entire value chain is going to have very strict standards because I don't want my Indian people to ever suffer from bad quality equipment. Those companies that do not live up to good quality standards will not be allowed to participate"

modules from China, the country responsible for the majority of imports to India. Suspicions are high due to the low prices of goods sold to India when compared to other markets (see box, above). However, some commentators have brushed off

these worries by claiming that Indian firms are just talented at negotiating a tough deal.

Quality standards

The Indian government appears to have heard the concerned voices and recently decided to implement stricter quality standards for solar tenders, including inspections for modules, cells and wafers, as energy and mines minister Piyush Goyal announced at Intersolar Europe in Munich back in May. Issuing a warning to both developers and manufacturers at the Indo-German Energy Forum, Goyal said: "Bear in mind we are watching, we are watching your performance."

The Ministry of New and Renewable Energy (MNRE) had already released a draft technical regulation for testing and standardisation of solar equipment last August. Since then, manufacturers from Taiwan, China and India have all told PV Tech Power that tier-one manufacturers tend to have to give their lowest priced bill of materials to the Indian market, given the Indian focus on cost reductions. This has led to fears about whether other less reliable equipment is entering the country.

"Quality standards are going to be tightened for all future bidding going forward," said Goyal. "There will be inspection of facilities before we approve people for their ability to participate in tenders, so even developers will have to procure from approved companies [only]."

However, these new quality standards will not be imposed on contracts that have already been bid out. Instead, all future tenders will have "strict standards" on modules, with any manufacturer at home or abroad requiring approval. Comparable rules for the entire value chain, including for cells and wafers, will follow.

Goyal said: "The entire value chain is going to have very strict standards because I don't want my Indian people to ever suffer from bad quality equipment. Those companies that do not live up to good quality standards will certainly not be allowed to participate..."

While such rhetoric may have cheered the most pessimistic observers of India's steamrolling utility-scale market, Khurana says that the draft regulation standards for solar equipment are effectively only a copy of IEC standards. Therefore the only real change is that solar manufacturers will also have to

obtain certification within India. Indian authorities will have the right to go and inspect any batch of solar modules, at an Indian fab or in warehouse storage, to make sure that they are still complying with the standard.

Khurana also believes that Goyal's comments were more targeted towards off-grid and distributed generation projects, because in that segment it is very difficult to negotiate your bill of materials.

Ultimately, developers in India will need to engage in third-party testing beyond just the IEC standard – a marker which many feel is too easy to pass. Such independent verification would help stamp out the chances of significant potential-induced degradation (PID).

Another source, a manufacturer from India, tells *PV Tech Power* that he is more positive about the stringency of the proposed new standards claiming that imports will have to be certified by an agency within the country for example the National Institute of Solar Energy (NISE) or the Bureau of Indian Standards. The banking sector will then not be able to finance products that are not certified, which the manufacturer claims is crucial for India given its trajectory of becoming a plus-10GW annual market in the coming years.

EPCs

The blame for poor quality can't just be flung abroad. Thus, the revelation that India has the cheapest EPC services in the world is worth investigating. Mahindra's Manish Singhal says that the Indian EPC space is divided into three segments: one for projects of 50MW+ capacity, where only a handful of organisations have the bandwidth and the financial capacities to compete; the second is concentrated around 5-10MW projects where there is

huge competition; and the third, 1-2MW segment is even more crowded.

"At the kind of tariffs that we have in India, it's really getting challenging to have a balance between quality and cost," Singhal adds. "We have a bottom line already set in sight – below this we will not go. There are many who pick the deals at very low numbers. How they are managing I cannot comment, but [...] they may see some kind of failures. Already there are examples in India. People cut corners on the structures, they reduce the structure tonnage and they play on the factor of safety a lot. These examples have been there since last three, four years."

Lavleen Singal, director at Indian EPC firm Acira Solar, also says that the Indian industry struggles by trying to do too much on its own and then cutting corners.

"They overlook key aspects and they end up [using] a makeshift solution," he says. "That's what happened in CSP and I see that happening in PV as well."

Indeed, when asked to predict what aspect of the Indian industry was most likely to surface as an issue in five years' time, Khurana predicts that if anything it will be the overall quality of construction, in terms of practices followed for cabling, engineering and implementation. Such problems will be driven by having to complete projects in short time periods and the use of unskilled labour.

Other components

Bridge to India has already highlighted the need to educate the sector and ensure high performance standards in a rapidly evolving market. The consultancy started with a report on how poor implementation of DC cables has caused underperformance in India, with other prevalent component blunders soon to be analysed.

Again, Manish Singhal claims that issues with DC cables would not be prevalent in the higher capacity projects where the top five or six EPC players and consultants all use TÜV-certified cables, whereas less robust practice is "very prevalent" in the 5-10MW segment. Here customers are also less well informed and often lack the bandwidth to appoint consultants

"That's an area where something can go wrong. Where people use locally manufactured cables which are not

TÜV-certified, there are no quality standards available."

Lavleen Singal also lists a range of other potential problems such as shaking from high winds causing micro-cracks and a lack of long-term guarantees on transformer and inverter combinations. There are also risks of blowouts caused by poor connections and the ensuing risk of having to start production from a plant months later than wanted and with the added cost of replacing cables.

The newbies

While, it has been easy to list a number of potential calamities, there has been plenty of positivity about the progress and improvements in Indian solar. Thus for Khurana, the worries should not be directed at the large projects sprouting up from major players, but rather at those projects being developed by one-timers and newbies. For example, while many big names stayed away from the recent 1.5GW tender in Tamil Nadu, a huge number of first time players have won capacity. The emphasis on spreading smaller-sized projects across different taluks (small regions) of Telangana has also attracted new names.

"These are the kinds of vulnerable developers who are a) inexperienced and b) also under pressure to beat the price and tariff benchmarks, which are already very low," Khurana says. "I think they should hire a technical consultant who is able to make sure that everything is done properly and implemented properly."

"If you are an inexperienced player and you are trying to meet tariff expectations which have been set by more experienced players, who have learned how to optimise and still maintain some quality, then it gets really difficult for you to have a profitable project, or at least a profitable project on books, and still have all the quality ensured within your projects."

Price pressure has been a key factor in many of the problems mentioned above, so the recent enforcement of the Goods and Services Tax (GST), which will tax modules at 5% and other components most likely at 18% will be a cause for more concern, let alone the now official launch of an anti-dumping investigation on cell and module imports from China, Taiwan and Malaysia, the outcome of which – albeit unlikely – could raise project prices further.



India's energy minister Piyush Goyal has warned solar companies that they face closer scrutiny on quality

Credit: Solar Promotion GmbH