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Credit: Qcells

How US solar manufacturers can compete with China as decentralisation of PV production grows

5 April 2022: US solar manufacturers can compete with Chinese companies for US PV projects given additional import costs and modules making up less than half a project's costs, while also ensuring a secure supply to the US market, lowering the carbon intensity of products and exploiting strong market demand, says Michael Parr, executive director of the Ultra-Low Carbon Solar Alliance (ULCSA).

Module price rises, ongoing supply chain disruption and geopolitical tensions have all made the case for decentralising PV manufacturing even stronger over the past couple of years and Parr believes the world "needs to signal some changes" about how and where solar products are being produced.

The solar manufacturers of today are far more sophisticated than they were five years ago, are highly automated and are taking on expansion projects with much larger capacities, says Parr, allowing US companies to compete with China on price while also lowering the carbon intensity of the final product. Parr notes how modules made in China contain twice as much carbon as elsewhere given much of China's electricity in solar producing regions is derived from coal and other fossil fuels.

And despite cheap energy and substantial government subsidies, Chinese modules have been steadily rising in price for US consumers and now cost around US\$0.33c/W for bifacial mono-PERC 440-450W modules, excluding any tax or shipping costs, according to data from PVInfoLink.

Hanwha Solutions' Q CELLS is ramping up module production in the US and will benefit from the restarting of the Moses Lake polysilicon facility.

"On a straight manufacturing cost comparison US labour and other costs make it more expensive to produce things here versus China by some increment," says Parr. "But when you roll shipping costs, tariffs and related factors into the mix, and the fact that modules are only about 40% of project costs, projects with US produced modules are not significantly more expensive than projects with Chinese modules."

"You're competing against imports that have tariffs costs, shipping costs and other costs added on to those. You're not competing with manufacturing costs in China, you're competing with landed price," says Parr.

"And as shipping costs have gone up, the cost differentials have come down. So manufacturing in the US can be more expensive from a human resources



Credit: Solar Media

Speakers at the Large Scale Solar Event in March 2022.

perspective but the fact that we're about to double module manufacturing capacity in the US in the next 18 months shows that people believe they can compete."

"And competitiveness is more than just cost equivalence: there are other factors that are considered including quality, longevity, strength of warranty, sustainability and supply reliability that factor into a buying decision," says Parr.

Indeed, there has been much noise lately from the solar industry about trying to establish manufacturing bases for cells, wafers and modules outside of China, with several countries announcing policy support.

The US Biden Administration is under increasing pressure to support the country's PV manufacturing sector through legislation, including the Solar Energy Manufacturing for America (SEMA) Act, which Parr said would "turbocharge" manufacturing growth in the US and act as an effective scaling up incentive.

"Our take [on SEMA] is that the investment logic is there," says Parr. "We're seeing rapid growth today, although from a small-scale, but rapid growth in the US nonetheless. We think policy elements like SEMA would turbocharge that."

Meanwhile, Chinese companies with western customers are thinking seriously about how they could continue to serve those markets, says Parr. He notes how the likes of JinkoSolar, LONGi and Trina Solar are all talking about developing supply chains outside of China. Inside China, companies are increasingly invest-

ing in production centres to the East of the country – rather than the mainstays of Inner Mongolia and Xinjiang – that uses roughly 35% cleaner power due to its strong hydropower resources.

The carbon intensity of solar products has been in the spotlight lately and Parr says manufacturers should consider three areas when looking to reduce carbon in their products: the carbon intensity of the grid system in question; energy efficiency in the manufacturing process; and energy efficiency in the power procurement process.

On this last point, Parr says he knows of several US solar manufacturers who are now actively shifting their production schedules to off-peak times and on weekends when more, cheaper renewable power is available.

"You can tailor manufacturing capacity to the power curve," he explains, noting how this reduces costs and the carbon intensity of the final product.

"So, many of the factors that made manufacturing outside of China riskier five or 10 years ago, the industry has now grappled and dealt with," says Parr, adding that the "primary risk" to solar manufacturing in the US is an "inconsistency of policy".

That said, solar is becoming less dependent on government policy support as it continues to rise in prominence as a vital source of power and a means of emissions reduction, says Parr.

The US already has 20GW of polysilicon capacity – set to be increased following

the announcement that Hanwha Solution is to restart production at Moses Lake – about 8GW of module capacity as well as growing cell capacity, with Parr expecting a wafer announcement soon to complete the supply chain.

"US manufacturers have learnt how to be competitive with China," he says. "And, when you factor in the supply risks associated with the Chinese supply chain, we're in a different world than we were five years ago."

'Fit for 55 can be thrown in the bin': PV players discuss Europe's push to scale up deployment

31 March 2022: Solar players in Europe have called for efforts to accelerate renewables deployment and unlock more corporate power purchase agreement (PPA) volumes in light of the European Union's (EU) push for more energy independence following Russia's invasion of Ukraine.

The European Commission announced earlier this month it would simplify renewables permitting as it unveiled its REPowerEU strategy, which will see the EU reduce demand for Russian gas by two-thirds before the end of the year. That plan follows EU proposals to increase the percentage of renewables in the bloc's energy mix from a previous target of 32% to 40% by 2030 as part of its 'Fit for 55' package.

Russia's invasion of Ukraine means that Fit for 55 is now "something that you can throw in the bin", said Stefan-Jörg Göbel, senior vice president of wind and solar for

Spain and Germany at Statkraft, adding: "I think we have to radically rethink energy policy from A to Z."

Speaking at the Large Scale Solar event, hosted by PV Tech publisher Solar Media, Göbel said that while energy policy has previously been focused on balancing security of supply with environmental concerns and the economy, now it has shifted to "security of supply first, second and third".

"So it's about doing everything possible to bring in more supply into the market via solar, wind, any other technology, including hydrogen, as fast as we can."

Göbel pointed to an announcement by Portugal's secretary of state for energy, João Galamba, who said at the event that the country will no longer require environmental impact assessments for new solar projects with a capacity of under 50MW as the government looks to accelerate PV deployment.

"I think this is the type of radical approach we need to see," Göbel said of the policy.

While the war in Ukraine has prompted a rethink of European energy policy, it was also revealed during the panel discussion that it has also disrupted the solar supply chain.

Gulnara Abdullina, vice-president of Europe at LONGi Solar, said the module manufacturer previously transported connectors from Europe by land, but with some train services stopping because of the war, they now need to be airfreighted. "As a result, they're getting more expensive," she said.

In terms of solar financing, Fit for 55 and accelerated deployment targets in markets across Europe means "a huge pool of capital is needed", according to Anthony Doherty, chief investment officer at Irish renewables investor and asset manager NTR.

While corporate PPAs are becoming more popular across Europe, Doherty warned that there will be a shortage of them as there aren't enough credit-worthy counterparties of sufficient size to meet the demand that's needed for the number of projects.

As a result, he called for more support to encourage aggregation. "It would be fantastic if there was some EU backstop in terms of mid-tier corporates that could align together and aggregate. I think that's probably where we are missing a big part is medium-size corporates aggregating and then going out to market."

PV Tech Premium reported earlier this year that there could be an emergence of credit structures that enable smaller and mid-sized corporates in Europe to access renewable PPAs via aggregation.

A recurring theme brought up by speakers at the Large Scale Solar event is the need for the industry to communicate the benefits of solar to local communities.

Manuel Silva, director of project development at investment firm Aquila Capital, said developing solar in Portugal has changed within the last two years, with there now being more scrutiny on new projects. This means developers should engage with local stakeholders and carry out public consultations to understand community concerns and expectations.

"Then comes the important part: which is you need to walk the talk, meaning you need actually to implement some changes in the project, you need to live up to the standards that you are preaching," Silva said. This could mean, for example, reducing the use of concrete foundations, avoiding cutting down trees and creating landscape integration plans that mitigate a project's impact.

"On top of that, you should create a strategy of shared value," Silva added. "You basically need to find initiatives – be it with agriculture, be it with tourism, be it with biodiversity – and create some initiatives locally that present you as an agent of local development and as a long-term partner."

Panic at the Discom: Andhra Pradesh high court ruling sets worrying precedent for Indian utilities

18 March 2022: A high court in the Indian state of Andhra Pradesh has ruled that state distribution companies (Discoms) must honour the power purchase agreements (PPA) they signed with electricity producers and settle any debts within six weeks in a move with potentially huge significance for the country's solar sector.

India's cash-strapped Discoms have long sought to renegotiate signed contracts and are "perennially in financial trouble", so this week's (16 March) ruling is potentially huge for both them and independent power producers (IPPs) in India.

PV Tech Premium spoke with analysts in India and abroad about the ruling and what it means for the country's solar sector.

The ruling

A high court bench of one judge ruled that Discoms must pay power generators the full amount they are owed "in accordance with the PPAs", along with "a late payment surcharge levied as per the terms of the PPAs", according to a court filing on the proceedings.

While the high court had previously ruled that Discoms in the state could make the payments at an interim tariff rate of INR2.43 (US\$0.032)-2.44 per unit – instead of the agreed PPA tariff rate of INR5.99/kWh (US\$0.079) for the first year – the judge told Discoms to "abide by the terms of the PPAs executed with the [power generators] and make timely payments therein."

Andhra Pradesh's Discoms now must pay back the full PPA tariff rate within six weeks, with an estimated cost of around US\$1.4 billion, inclusive of dues arising from the difference between the PPA rate and the interim rate over the last three years.

Girishkumar Kadam, senior vice president of the ICRA rating agency, said the ruling was a "significant positive development for the renewable energy sector and will thus provide major liquidity relief for the affected IPPs in the state."

"The pending resolution of PPA tariff renegotiation has been a key concern for the renewable energy sector and in turn affected the credit profile of wind and solar IPPs in Andhra Pradesh," said Kadam.

A ROTH Capital note said both Azure Power and ReNew Power stood to benefit financially from the ruling. ReNew had previously indicated that it was looking to recover almost US\$200 million from Andhra Pradesh, while Azure was chasing around US\$24 million of receivables and long-term payments.

"The high court order is a relief for the industry, particularly as it reinforces the basic tenet of contract enforcement," said Vinay Rustagi, managing director of research firm Bridge to India (BOI).

Rustagi added the ruling lays down a "definitive marker" for other states trying to renegotiate PPA contracts.

What it means going forward

While the order will be welcomed by India's solar sector, and ReNew and Azure in particular, it "doesn't deal with the bigger problem of terrible Discom finances, the root cause for states seeking to renegotiate PPAs and delaying payments," said Rustagi.

Problems with Discoms' finances are no secret and even the court filing referenced the "financial crisis" of the state's utilities.

"Having run up dues over three years, it is not clear how the Andhra Pradesh Discoms will suddenly find money to pay in six weeks," said Rustagi. "For the long-term health of the power sector, it is imperative that the central government works together with states to find a permanent cure to Discom payment issue."

Raj Prabhu, co-founder and CEO of Mercom Capital, agreed that Discoms were "perennially in financial trouble" but said their search for the cheapest power available may present some significant issues for the solar industry moving forward.

India will introduce a basic customs duty (BCD) on solar modules and cells from 1 April this year. This is expected to push up both cell and modules prices in the short-term, with trade bodies calling on the MNRE to grandfather certain projects or risk up to 10GW of solar deployment.

"If the PPA prices go up after BCD comes into effect, the fear is [Discoms] will not pay more for the same solar power," said Prabhu. "Instead, the fear is that they may delay solar procurement until the prices come back to the lower levels they are used to, which will not be a good thing for the industry."

On top of this, the ruling sets a precedent for other states. Rustagi said the issue of poor Discom finances and the renegotiating of contracts was not endemic to Andhra Pradesh. "There are at least four or five other states which have been delaying payments to power producers for more than a year," he said.

These states – Telangana, Tamil Nadu, Maharashtra, Rajasthan and Karnataka – will be watching proceedings in Andhra Pradesh carefully.

Although the dispute in Andhra Pradesh has been dragging on for the best part of three years, the ruling could have significant repercussions for other Indian states seeking to renegotiate contracts with power producers if other their judicial systems accept it as a precedent.

Inflation, power price volatility and seeking an equilibrium between PV projects and capital

8 March 2022: There's an adage in politics that has grown in popularity of late. It's said there are years when weeks of notable

events happen, and weeks when years happen. Sunny Aurora, partner at consultancy firm EY, perhaps best placed into context, moderating the keynote panel at PV Tech publisher Solar Media's Solar Finance & Investment Europe 2022 conference, when he reminded the room that COP26 took place in Glasgow less than six months ago, and a landmark IPCC report was published in early March.

Such have recent events, especially Russia's invasion of Ukraine and its ricocheting effect on energy economics in Europe and beyond, impacted the renewables landscape that it is perhaps difficult to isolate a key theme from the opening day.

But if there is one threat posed to the industry's deployment prospects in the near-term that speakers and delegates were most concerned by, it is that of inflation. The solar industry has contended with incredible price pressures already over the last 12 months in particular and, with sky-high energy prices sending inflation soaring – and that lifting interest rates and other costs of capital – the levelised cost of electricity for renewables projects is being significantly impacted.

Giovanni Terranova of Bluefield suggested that with double-digit inflation a distinct possibility in certain markets, such price pressure would require a significant rethink in the way projects are approached. The increasing cost bases of PV projects would quickly eat up remaining margins and, as Everwood Capital partner Jose Antonio Urquiza stressed, interest rates are already of concern. And that's not considering where interest rates may climb to if inflation worsens.

Inflation and the cost of capital was an ever-present topic on the event's opening day, with much debate over to what extent Europe's soaring wholesale power prices could offset cost increases. One potential consequence could be for asset owners and operators to consider more merchant exposure and adjust the percentage of revenues from power purchase agreements (PPAs) accordingly, a dilemma which Gregor McDonald, head of trading and PPAs at European Energy, described as a "luxury problem" for developers given the spiralling prices on Europe's power markets today.

But even concluding on PPAs in today's market is riskier, despite the inherent benefit for corporate or utility customers looking to hedge their costs. As McDonald said, given the time it takes to conclude

on a PPA, especially for corporate customers, coupled with power market volatility, the pricing bandwidth offered at the start of negotiations – and indeed the entire economic basis for the project, given capex costs – could be wildly different by the time counterparties are in a position to sign.

Higher power prices are, however, sending corporate customers into action. Whereas previously corporate customers may have been "buying a PR story" by entering into a PPA with a solar project, triggered by ESG initiatives, McDonald said they are now hedging against power price volatility. And what's more, higher capture prices for PPAs are "allowing creativity" in terms of pricing structures.

This is too creating hope that financing will be plentiful, even if the plethora of headwinds persist. The same may not be said for the number of projects, especially against a backdrop of heightened targets throughout Europe.

As the European Union's RePowerEU strategy reinforced today, total PV generation capacity is expected to reach upwards of 420GW by 2030. Success in Germany will be pivotal for the continent reaching this target, the country having not too long ago increased its deployment target to 200GW by 2030. That will require as much as 9GW of solar PV to be installed each year and while supply chain concerns obviously continue to persist, a greater number of projects will also need to come forward. Tim Kallas, CIO at developer Blue Elephant Energy, said while projects are still economically feasible in spite of inflation, the industry needs to "reach an equilibrium" between project developers and providers of capital.

Terranova echoed Kallas' sentiments by stressing that investors are moving into decarbonisation and clean energy in general and that capital will be available, just not as cheaply as it might have been. The biggest hurdle, Terranova stressed, will be in the availability of projects in which to invest that financing. ■

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