Coping with COVID

COVID-19 | From manufacturing and logistics constraints to power price collapses, the effects of the coronavirus pandemic are being felt throughout the entire solar supply chain. Liam Stoker details the impacts on the industry and how they have been mitigated

Credit: Solarcentury

COVID-19's potential impact on the solar industry, right the way through from manufacturing to distribution to deployment, has meant the sector has had to learn to live with the virus, and do so quickly.

While the virus was first recorded in November, it wasn't until 23 January that the Chinese province of Hubei was placed under lockdown. This coincided with Chinese New Year celebrations which commenced on 25 January, with China taking the unprecedented step of extending the spring festival until early February in a bid to counter the virus' spread. That decision had a predictable knock-on effect on manufacturing, and official export data released in late February showed that exports of solar products in January fell by around 35% year-on-year, indicating the impact on the upstream industry. Around 4.45GW of solar products were exported in January 2020 compared to just over 6GW in January 2019.

Provinces affected by the virus at the time are home to various manufacturing hubs belonging to the likes of LONGi Group, Trina Solar, Q CELLS and JA Solar, providing a succinct indication as to the possible impact of the virus on solar across the globe. Investment bankers Roth Capital warned in late January of those impacts, stating that while most manufacturing facilities had been operational throughout the holiday period, they likely had "not been running at 100%".

On-site engineers have seen medical face masks added to their list of required PPE.

This would be present not just in module assembly or manufacturing, but throughout the much wider materials and component sector. Roth also noted at the time of an emerging shortage of solar wafers and module-grade glass, driving component pricing upwards in the near term.

Actual reports of infection within factories were, however, minimal. In late March GCL System Integration confirmed that an outbreak at its facility in Jiangsu, China, meant a temporary partial shutdown was necessary. While the company did not provide specific details of the outbreak, nor the partial shutdown, it did state that "anti-epidemic measures" were put into place and production resumed thereafter.

Impacts earlier in the year have already

started to tell. Of those manufacturers to disclose financial results by late April, almost all have confirmed the presence of COVID-19-related headwinds. JA Solar, which has four manufacturing operations in Hubei, reported that its production and logistics cycles had been "extended" as a result. Backsheet and high-efficiency module manufacturer Jolywood too reported a small loss in Q1 2020, down from a small profit recorded in Q1 2019, which it attributed to a number of issues created by the pandemic, including the delayed restart of production as a result of employees facing difficulties in returning to work on top of logistics and transportation restrictions.

Stymied logistics and transportation within China were felt further afield. Microinverter manufacturer Enphase Energy warned in February that while its contract manufacturing facility in China was steadily ramping back up to full capacity, it had seen "some indications" that outbound logistics from China had been constrained by the outbreak. This led to the firm exploring alternative freight options – air instead of sea freight – an option taken previously. Then, in early May, Enphase confirmed that while its manufacturing facility in Mexico had been deemed "essential" and thus could continue operating at full capacity, a slide in demand caused by collapsing installation figures and shelter-in-place rules in its key markets meant that the company would need to work alongside its supply chain partners to "optimise" its inventory in the future. Mass-producing components only for them to sit in warehouses is evidently not considered a wise use of resource at this moment in time.

SolarEdge meanwhile is extending that vigilance further, stressing at its last results disclosure that it was now keeping tabs on its customers' financial health to ensure that it would be paid for each order. CFO Ronen Faier told analysts in May that the firm was cautious of providing credit to customers that it was "a little bit afraid that we will we not be able to collect".

The lessons to learn here, according to Clean Energy Associates chief executive Andy Klump, are that when it comes to supply chains, reducing risk through diversification is critical. Relying on just the one supplier for a key component bears significant risk, with CEA actively encouraging people to consider working with not just two, but three suppliers across diverse projects to protect against any short-term collapse or delay.

John Zahurancik, COO at energy storage developer Fluence, concurs, adding that the company has experienced delays in shipping of parts that have accumulated. This has been "in the order of days and weeks rather than longer", Zahurancik says, and any changes are worked through to reduce the emergence of any critical gaps in supply. "In this environment one of the biggest things has been remaining agile, remaining flexible to be able to adapt to the conditions that emerge," Zahurancik says, lessons that have been taken by many within solar and storage development.

On-site safety

As the virus spread throughout the world, it quickly hit economies where not upstream manufacturing, but downstream development was at risk. A rapid escalation of infections and lockdown measures in response raised the prospect of widespread delays, and Wood Mackenzie lowered its global solar demand forecast for 2020 from 129.5GW to 106.4GW as a result.

Continuing development has been stymied by not just delays in the distribution and delivery of components, but also national lockdown measures and the classification of the solar workforce as essential personnel. This has differed by nation, with most European countries deeming O&M engineers as key workers – and thus allowed to continue being on site – with differing attitudes to ongoing construction. Spain enforced a 10-day shutdown in April before reopening construction works, which was quickly followed by the return to action of most developers. Delays such as these have proven costly, with French developer Neoen noting that the suspension of pre-operational testing at its 375MWp El Llano solar farm in Mexico was costing the firm as much as US$2 million per month in lost generation.

Most solar companies and utilities have been active throughout the pandemic. Iberdrola switched 95% of its staff to remote working as a protective measure, a feat enabled by a sweeping digitalisation of internal processes, the utility said. Worley, which is providing engineering, technology and technical review services for the under-construction Noor solar farm in Dubai, said it adapted its offering by conducting those remotely, holding regular project meetings via videoconferencing facilities after global travel restrictions limited staff movement. Meanwhile asset managers have been able to remotely monitor site performance largely unaffected by the pandemic, with staff able to do so from home. Project pipelines are continuing to gain traction, too. Solarcentury said that while permitting of new sites had slowed since the onset of the virus, it was still continuing, with most planning authorities now having completed their own migration to remote working. Public consultations are even managing to be held, albeit online.

It is the actual nuts and bolts construction of solar farms that has changed the most, however. Oil and gas major Repsol confirmed in April that it was amongst those developers back on site in Spain with a revamped development strategy. Construction teams had been capped at a maximum of four people, with each instructing to observe a safe distance of two metres. In addition, entry to construction sites is conducted in a phased manner to reduce any congestion, while protective clothing and even vehicles are disinfected before they can be shared.

Solarcentury has followed similar practices, allowing construction tasks in open spaces to continue while delaying those that require multiple people working in close proximity. Communal areas such as canteens and break rooms have been closed and, in the interest of preventing the virus' spread, recruitment procedures adapted to minimise new personnel appearing on site.

Of Fluence's development pipeline, Zahurancik says only two or three have

Safe solar development under COVID-19

Adapted recruitment
Prevent the spread of the virus by recruiting locally as much as possible, favouring local experts over those usually asked to travel in.

Phased entrance and exits
Reduce traffic and congestion, especially around choke points, by offering strict windows for entering or leaving the site. This includes deliveries as well as construction engineers.

"Toolbox Talks"
Designated leaders can reiterate new site safety rules as teams arrive on site, stressing their importance and ensuring they are strictly followed at all times.

Construction squads
Limit the size of teams working together at all times, taking into account the manner of the job and the area they'll be occupying. If jobs require personnel to work in close proximity to one another, delay if at all possible

Credit: H/Flicker

An electronic billboard in Washington D.C. instructing citizens to stay at home

experienced delays. The firm acted early to institute social distancing and health screening for those accessing construction sites. Anyone who exhibits symptoms is isolated. No protective equipment is shared and site safety meetings have become more regular. These additions haven't cost a considerable amount, but Zahurancik does suggest there is some cost associated with a loss of productivity. In essence, it's a ramp-up of safety practices already in place. "They're just additions to the safety practices at each site and I think we have to continue to be vigilant of those precautions. They do have some impact to the site in that you're adding some steps and procedures to follow, so there's some productivity impact but using those steps we've been able to move projects forwards," Zahurancik says.

A tumbling power price

The virus has had such a wide-ranging effect on global economies that built solar assets, or at least those that own them, have been just as impacted by its spread. As lockdown measures have been enacted, economies have considerably slowed, with numerous industries all but shuttered. This has led to power demand tumbling, with established economies with strong manufacturing bases the hardest hit.

With demand low and supply steady, the wholesale power price in most European nations has fallen considerably. Countries such as Italy, Spain and the UK have witnessed power prices fall by anywhere from 20–40% since lockdown measures have been enforced. Spanish utility Iberdrola noted in May that its Q1 performance had been affected by a 37% fall in the power price in its home market, while The Renewables Investment Group (TRIG), which owns solar, wind and other renewables assets throughout Europe, said in April that its power price forecasts show a 25% reduction over the next two years. As a result, TRIG's net asset value (NAV) has fallen by around 5 pence per share. Likewise, other European asset holders such as Foresight Group and Bluefield Solar Income Fund have also seen the value of their assets drop, reporting drops of 5 pence and 6.7 pence per share respectively.

While most asset holders in Europe derive a large portion of their revenues from subsidies – TRIG revealed that just 25% of its revenue base comes from the actual sale of power – and are somewhat insulated from falling demand, that NAVs are falling consistently is a concern for investors. Matters are further complicated with a piece of European Union legislation that means in some markets, when wholesale power prices fall into the negative for six hours or longer, subsidy payments for power generated during that time are withheld. In addition, the UK system operator National Grid, triggered by significant low forecasts for power demand, was granted special powers by the country's regulator Ofgem allowing it to instruct distribution network operators to switch off embedded generation, including solar PV of all scales, without compensation.

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Asset owners could also face such contractions for some time yet. Oxford, UK-based consultancy Aurora Energy Research has warned that some of its modelling shows that while a mild recession caused by COVID-19 could see power prices recover by 2022, a deeper recession would see the compression on power prices last until 2025 at least.

The International Energy Agency's 2020 Global Energy Review report compounds Aurora's analysis too. Power demand has already fallen by 5%, according to the IEA, constituting the largest fall in demand for electricity since the Great Depression of the 1930s. Describing the pandemic as representing an "historic shock to the entire energy world", Fatih Birol, executive director at the IEA, said: "Amid today's unparalleled health and economic crises, the plunge in demand for nearly all major fuels is staggering, especially for coal, oil and gas. Only renewables are holding up during the previously unheard-of slump in electricity use

"It is still too early to determine the longer-term impacts, but the energy industry that emerges from this crisis will be significantly different from the one that came before."

Indeed, the IEA's report suggests that renewables – benefitting from priority dispatch and lower operational costs – could deliver as much as 40% of the world's power demand this year, cementing the lead over coal it secured in 2019. But that lead will come at a cost, with the aforementioned collapse in power prices ripping the business models for new projects, especially those coming forward without subsidy support, from beneath their feet,. Felix Chow-Kambitsch, head of commissioned projects for Western Europe at Aurora, stresses that merchant-exposed renewables schemes will be "significantly affected" by the price contraction. Revenues of such projects could fall by as much as 50%, depending on the severity and duration of the pandemic and its impacts, implicating as much as 34GW of renewables developments within the seven countries profiled in its research.

In the face of an unprecedented situation, solar has been able to pivot adeptly and resume activity wherever possible in the short term. This, evidently, has only been possible through manufacturers', distributors' and developers' abilities to react to a constantly changing situation with all the necessary flexibility and agility. Against the context of a significantly different global energy market, it's this flexibility that looks set to become pivotal in the mid- to long-term, when, as you'll read on, solar and storage could become a central pillar to economies the world over.