The challenge of benchmarking PV module suppliers in 2021

Bankability | Finlay Colville, head of research at PV Tech and Solar Media, offers exclusive insight into the PV ModuleTech Bankability Ratings and explores how the industry's major module manufacturers can be grouped entering 2021.

Selling photovoltaic (PV) modules remains an activity that many companies wish to excel in. The more modules shipped each year, the better; add in special kudos for having a global footprint and being a leading player in overseas markets.

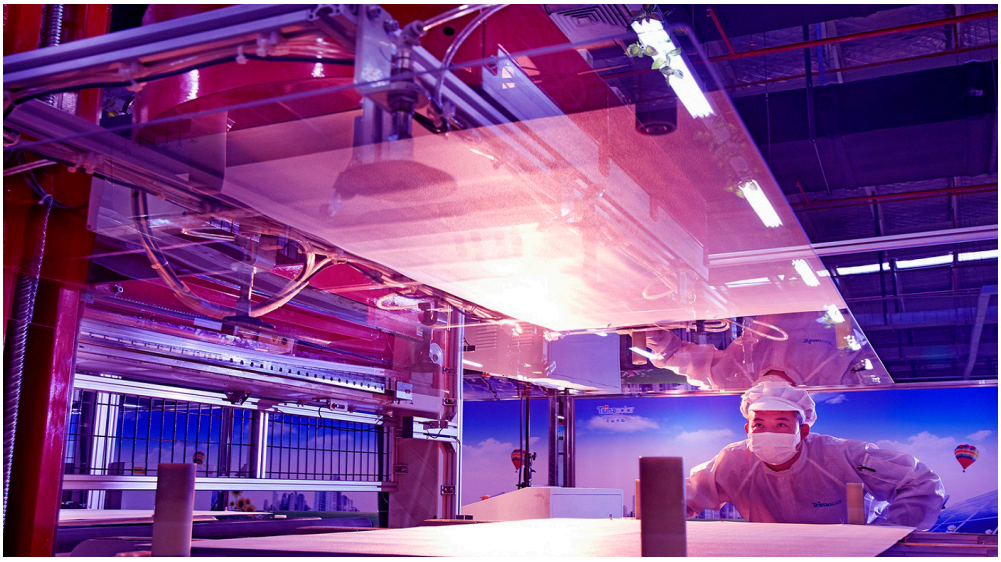
Each year, many companies exit the sector, often simply to be replaced by new entrants, seemingly trying to do what others had done before with little change to the recipe. Indeed, each time a domestic downstream end-market is thriving, the lure for new manufacturers only increases.

Yet, it is possible to count on one hand the number of companies that have sustained a profitable module business over several years. The PV industry has seen literally hundreds of casualties in the past couple of decades, in particular across Europe, the US and the whole of Asia, and this is something that is unlikely to change going forward.

This article examines what is behind the leading PV module suppliers to the industry today, and during the next 12 months. It explains why segmenting the business models of module suppliers into specific groupings can go a long way to help module users/investors make more informed decisions on preferred suppliers.

The basis for the analysis used in the article is PV Tech's latest *PV ModuleTech Bankability Ratings* report, with the Q4 2020 findings used as the backdrop for 2021 module supply activity.

After an overview of the methodology used to assess PV module suppliers' bankability ratings, the results of the Q4 2020 analysis are presented. This reveals the leading global module suppliers for large-commercial and utility-scale projects in 2021. Using the module suppliers occupying the highest bankability ratings, new groups are created that capture the underlying motives and business models pursued by these companies. The results of this are then discussed, and how they can be of use to companies required to differentiate between module suppliers in the near to mid-term.



Credit: Trina Solar

A small group of companies occupy the A and B ratings within the PV ModuleTech Bankability Ratings

The PV ModuleTech Bankability Ratings method

After more than a decade tracking and analysing almost every PV module manufacturer's operating features and characteristics, the PV Tech market research team undertook an intensive six-month research project to develop a fully-validated model that could allow any PV module supplier to be benchmarked across a range of manufacturing, technical and financial performance metrics.

The full methodology, with supporting data, was outlined across a range of featured articles on the *PV-Tech.org* web portal between July and August 2019 . Further enhancements to improve the accuracy of the analysis were then undertaken during 2020, in particular how to compare the financial health of private and public-listed module-owner entities, and the need to optimise best fit scaling and power coefficients on a quarterly basis.

While the full analysis uses extensive and time-consuming data-gathering for all the module suppliers each quarter - across many manufacturing, technical and financial metrics - the underlying principle of the ratings method is remarkably simple.

To achieve high bankability 'scores' (zero-to-ten), any given PV module supplier needs to have above peer-average manufacturing and financial health. A deficiency in either yields a low rating. Furthermore, quarterly ratings use trailing blended values, essential to eliminate one-off events that are frequent occurrences in the PV industry. At any time in the past, the analysis effectively mirrors the PV module suppliers that were winning the major deals in the industry (large-commercial and utility-scale, typically institutional investor bankrolled).

Each quarter, a refreshed rankings hierarchy is obtained with the most bankable PV module suppliers in the highest AAA-Rating band, and the lowest (least-bankable or highest risk) in the C-Rating band. Typically a small group of companies (10-15) occupy the A and B grade bands; every other PV module supplier then falls into the risk-heavy C grade bands. This is exactly what is seen in the PV industry; for large volume deals globally, only a select group of companies are ever in the running at any given time as viable candidates.

The Q4 2020 bankability ratings hierarchy pyramid

Every quarter, PV module suppliers are ranked by their bankability rating score, with the highest graded (AAA, AA and A ratings) shown at the top of a pyramid graphic, and lower-ranked suppliers allocated to bands in the B and C grades. The hierarchy pyramid for Q4 2020 is shown in Figure 1.

This shows a total of 13 module suppliers in the 'premium' A and B grades, with LONGi Solar the only highest-ranked AAA-Rated company. Most of the module suppliers in the sector today actually fall into the 'unlisted' lowest C-Rated band, with many of these being low-capacity operations or contract/OEM suppliers only. The CCC and CC-Ratings tend to be highly populated each quarter, characteristic of suppliers shipping sub-GW-level volumes and often single-country dominant.

The main grouping for global large-scale site selection are those in the A and B grade bands, the validation here being in our regular checks with downstream investors and global developers/EPCs that are undertaking supplier due-diligence at any given time. With utility sites today being in the hundreds of megawatts often, it is also not surprising that suppliers with limited volumes or focused on covering a range of small rooftops segments are absent from these supplier selection processes.

Therefore, the focus should be on working out how to group together the 13 top ranked module suppliers here, and seeing if there are common business models and groupings that can be established to better explain the different strategies at large. This is undertaken in the remaining sections of this article.

New categorization of the leading rated PV module suppliers

There are many obvious ways in which the 13 companies can quickly be segmented. Before looking at the new categorisation framework, a few of these are discussed first.

The easiest segmentation is by country of company headquarter operations. Most of the companies are Chinese-run entities: LONGi Solar, Canadian Solar, JA Solar, JinkoSolar, Trina Solar, Risen Energy, Astronergy, Suntech, GCL-SI, Seraphim and Talesun. Of the remaining two, First Solar is a US-run company and Hanwha Q CELLS is Korean.

Another route would be to assign by module capacity location. Many of the companies have high volumes of cell/module capacity in China, and various owned/joint-venture activities in South-east Asia: LONGi Solar, Canadian Solar, JA Solar, JinkoSolar, Trina Solar, Astronergy and Talesun. Others are China capacity-centric today, but have plans to add Southeast Asia capacity in 2021: Risen Energy, Suntech and Seraphim. First Solar has capacity in the US and Southeast Asia. Hanwha Q CELLS has capacity in Korea, China, Malaysia and the US. GCL-SI falls into an 'other' category here, as the only supplier with China-only owned capacity today.

However, the most valuable means of segmenting the leading ranked module suppliers is by combining some of the above aspects with parent/reporting-entity revenue streams. This is potentially one of the most critical ways at looking any PV module supplier today.

To explain this better, consider a couple of examples. If PV module revenues form a very small part of reporting/listed company turnover, there is a risk that the module business can be eliminated at any time as it is often deprioritised in any company strategic changes. This becomes a big deal for example if parent company finances are challenged, or the module business unit is consistently loss-making. The flipside to this are the companies that are almost 100% reliant on selling modules. Here, the entire company is dependent on module sales being profitable in the long-term, although short-term losses can be sustained.

Many of the high-profile 'bankruptcies' or periods of market-share losses from module suppliers to the industry can often be tracked back to the module supply business unit falling into one of the two scenarios above.

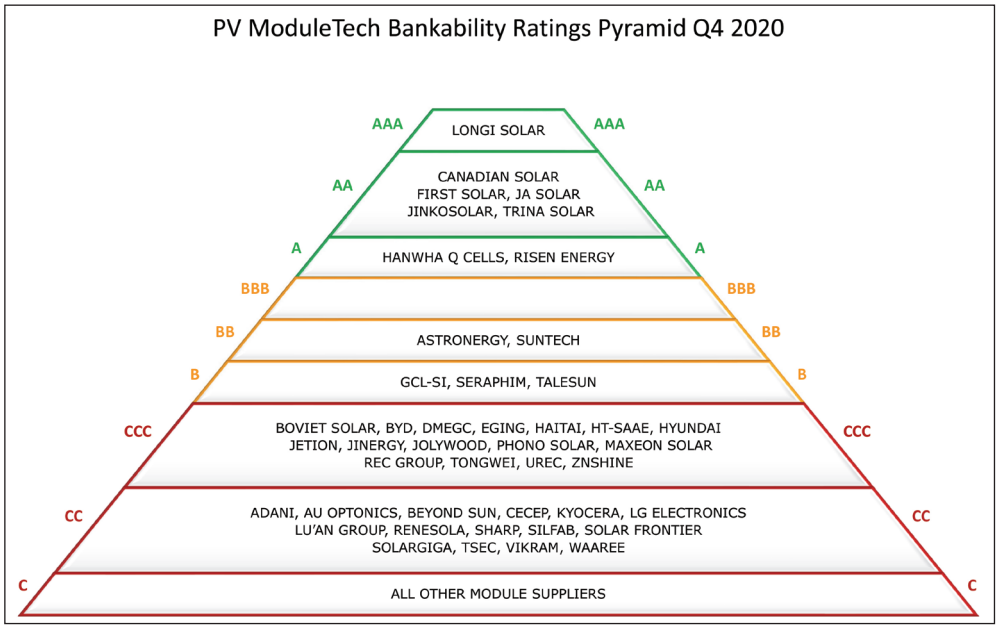
The 'middle-ground' - where module revenues form a 'significant' part of parent/reporting entity turnover – can often be seen as a prudent operating model. Here, module revenues may account for about 40-70% of turnover, implying that module activities are the key business focus, but still allowing for secondary revenue streams often phased to compensate for any downturn in module profitability.

Before looking at the new categories for the A and B graded module suppliers, it should be noted that some of the listings in Figure 1 are for 'brands' in the market, not necessarily the company selling the product (warranty guarantor). This is true for Hanwha Q CELLS, which is the module supply brand offered today by Hanwha Solutions. Astronergy is the module offering from Chint Group. Talesun is the brand offering of Zhongli Group. Until recently, Suntech was the module offering within Shunfeng International, although the company has now been carved out in China under private ownership.

The new categories are shown in Figure 2. Here, companies are grouped according to perceived strengths in two different areas.

The first area relates to 'Own-brand Module Business Priority', shown on the x-axis. Essentially, companies furthest to the right on the graph are those that have prioritised module business in-house the

Fig. 1



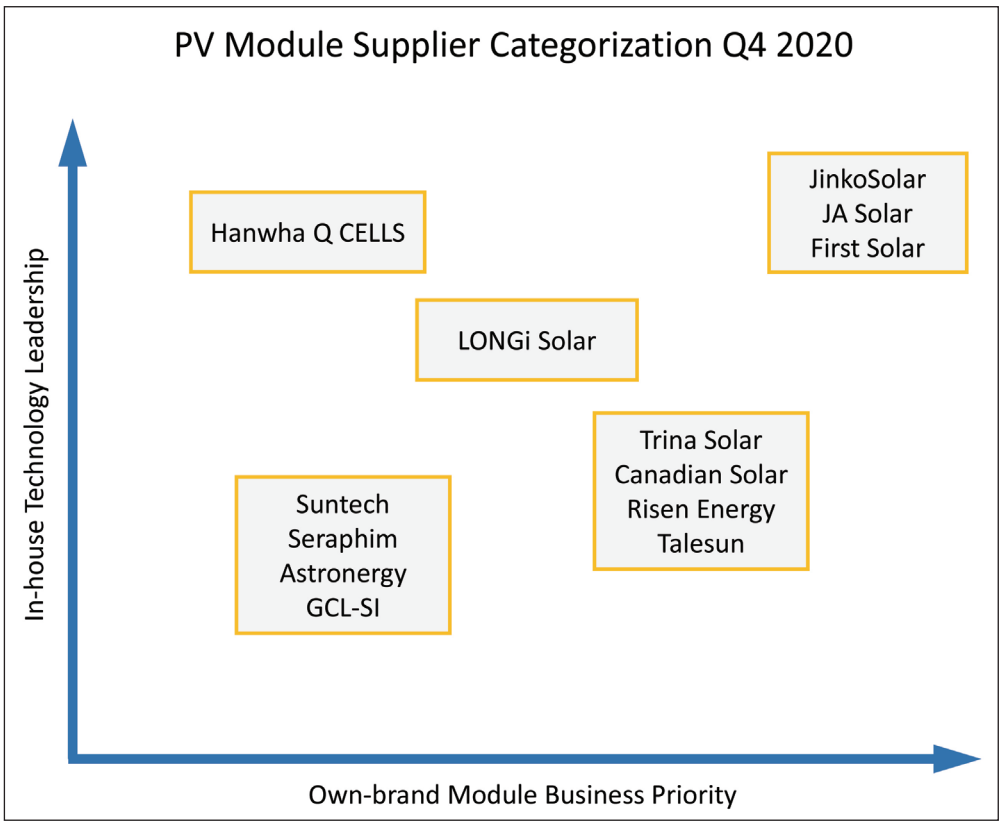


Fig. 2

most over the past few years, compared to all other business avenues. Companies more to the left on the x-axis either tend to prioritise other business activities (PV or non-PV) or have been chopping and changing business models frequently.

The second area is what is called 'In-house Technology Leadership'. This is based on the degree to which the company has concentrated on in-house investments/supply from wafer-to-module (or thin-film in the case of First Solar), where this in-house activity is entirely for the benefit of own-brand module supply. The contrast is when companies are cell/module or module-only focused, supply to competitors when the need fits including wafers, cells and modules, or operate lines under contract or OEM deals.

Therefore, the module suppliers that have the most focused in-house technology emphasis on using own products through the value-chain for own-brand module supply (and this being the major focus of the parent/reporting entity) will appear in the upper-right of the graph.

The three companies shown together in what is a best-of-class grouping near the top-right are JinkoSolar, JA Solar and First Solar. These three companies can easily be grouped together, despite the fact that First Solar is thin-film specific. The three companies are somewhat unique in the PV industry today because their focus on in-house capacity and production goes back to raw-materials (glass, polysilicon), and the entire focus of this including all technology-investments is to drive own-brand module supply. They are the only PV module suppliers that can claim this in the industry today. Every other module supplier tends to rely on being part of a network of supply-deals or offering its services and products to other PV manufacturers on a regular basis.

Trina Solar, Canadian Solar, Risen Energy and Talesun have also been grouped together. These companies are still module-heavy, despite having made considerable investments into cells and wafers over the years. They have tended not to drive technology-change (compared to JA Solar and JinkoSolar for example), and have a far more relaxed stance when it comes to full in-house audit trail or production through the value-chain.

The other grouping of companies is the box containing Suntech, Seraphim, Astronergy and GCL-SI. These module suppliers have each been subject to quite a bit of change in the past, either being part of financially-risky parent entities (Suntech, GCL-SI), or making changes from legacy strategies to try and play in the same league today as the other module suppliers shown on the graphic.

Hanwha Q CELLS and LONGi Solar are somewhat outliers today, as they cannot really be grouped with any peers. This is just a consequence of how the group/parent operations are structured now. Hanwha currently has Q CELLS reporting within the Hanwha Solutions entity, and the company's PV operations have seen wafering terminated in recent years. LONGi Solar also has no direct comparison, and has managed to be both a leading wafer supplier and module supplier at the same time – something that is somewhat at odds, given that most of the wafer customers are in theory module competitors if they make both cells and modules.

Concluding remarks

The PV industry does remain a very challenging sector to operate within, in particular having a module-focused business model and staying profitable each year while adapting to a constant flow of unexpected changes.

Certainly, there is no magic formula to succeed, and the fact there are different business models and drivers across the leading most-bankable suppliers backs this up. However, over time, the suppliers that regularly feature in the A Grade bands are clearly the ones that have been managing to adapt appropriately to end-market conditions, while staying sufficiently profitable for share-holders or private owners.

In this regard, tracking the suppliers that make the move from CCC-Rating and B Grade bands, up to the A Grades, over the next couple of years may be of more interest. In particular, how will these companies have to change their strategy and focus on module supply in order to compete with the top half-dozen players in the segment today? If this fails to happen, then module supply for mega-sized solar sites may simply be an area where only a few suppliers truly compete. This type of supplier re-organization would represent a significant change in the industry and may perhaps be the final piece of the jigsaw needed as PV moves truly to the mainstream energy supply stage. ■

https://marketresearch.solarmedia.co.uk/collections/pv-tech-research/products/pv-moduletech-bankability-ratings-quarterly-report