PV Module Supply in 2017

Leading global suppliers, performance benchmarks & maximizing investor returns

Finlay Colville, Head of Market Research

PV-Tech : Solar Media Ltd

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Introduction

Solar Media Ltd

• Solar Media Ltd. is a diversified publishing, events and market intelligence business, servicing the global solar energy supply chain, including the renowned PV-Tech website.

Webinar presenter

• Dr Finlay Colville is Head of Market Research at Solar Media Ltd.
• Previously he was Head of Solar at NPD Solarbuzz between 2010 & 2014.
• His blogs have appeared regularly on PV-Tech.org for more than 10 years.

Data sourcing

• All data & graphics taken from the August 2017 release of Solar Media Ltd.’s PV Manufacturing & Technology Quarterly report.
• Extra inputs from PV-Tech market research & PV ModuleTech 2017 agenda.
Contents

• Solar PV supply of modules in 2017: how much?
• What is expected for growth through 2018?
• Where are all the modules coming from?
• How is module technology changing in 2017?
• The impact on utility-scale site design
• The risks in deploying new module technologies
• How to be part of PV ModuleTech 2017
New! Audience participation

• We will be asking two questions during the webinar that you will be able to select answers to.
• We will reveal the results of the polls at the end of the webinar!
2017 module shipments to exceed 90 GW

- The most accurate way of tracking the size of the solar industry is currently based on module supply volumes.
- This is the best metric for ‘end-market demand’ figures.
- Note: government connection data does NOT equal end-market demand. Nor does it equate to module supply or shipments.
- Module supply is the key leading indicator to understand the supply/demand balance.

Source: PV-Tech Research PV Manufacturing & Technology Quarterly report, August 2017 release.
Where are the modules going in 2017?

• China dominates!
• Leading global module suppliers are also prioritizing the US, Japan & India.
• China is supply-driven, making the global solar industry effectively supply driven, aside from markets with capacity-based auctions/tenders.

Source: PV-Tech Research PV Manufacturing & Technology Quarterly report, August 2017 release.
Question 1: What will module supply be in 2018?

1) **Less than 90 GW.** The market will contract because China has over-delivered on its original 5-year plan.

2) **Between 90-100 GW.** China will cool, Section 201 will impact the US supply, & emerging regions will continue to go slow.

3) **Between 100-110 GW.** China will grow, Section 201 will be dismissed, & module ASPs will drive new demand.

4) **Between 110-120 GW.** China will keep exceeding expectations, & emerging regions will see strong uptick.

5) **Greater than 120 GW.** Again, market analysts will again be shown to be too cautious, and solar will be closer to subsidy-free.
Q1: How the webinar attendees voted

- About two-thirds of the webinar attendees through the industry would grow in 2018, compared to 2017.
- Only a small percentage thought that the market would decline.
- Most went for about 10% Y/Y growth.
Q1: How we answered at PV-Tech

- The in-house market research team at PV-Tech is forecasting 108 GW of module supply in 2018.
- Remember: this is only a forecast. There are many variables yet to unfold in the next 15 months.
- However, we are not predicting any poly/wafer/cell or module supply deficit.

Source: PV-Tech Research *PV Manufacturing & Technology Quarterly* report, August 2017 release.
How is module technology changing?

- The biggest impact on module supply in 2017/2018 is coming from the increase in mono-based variants.
- 2018 will be the year that mono-PERC modules start to see strong adoption at the utility scale.
- China is keeping multi share levels strong.

Source: PV-Tech Research PV Manufacturing & Technology Quarterly report, August 2017 release.
Question 2: Which module supplier leads technology innovation?

1) SunPower. Leading module efficiencies by some margin.
2) JA Solar. Diversified mono-PERC & black-silicon options.
4) LONGi Solar. Mono wafer supply dominance & GW+ mono-PERC.
5) Hanwha Q-CELLS. Largest PERC module supplier to date globally.
Q2: How the webinar attendees voted

- In each of the two webinars, SunPower came out top of the polls.
Q2: How we answered at PV-Tech

Options:

1) **SunPower**. Leading module efficiencies by some margin.

2) **JA Solar**. Diversified mono-PERC & black-silicon options.

3) **First Solar**. Strongest Y/Y efficiency gains & new panel size release.

4) **LONGi Solar**. Mono wafer supply dominance & GW+ mono-PERC.

5) **Hanwha Q-CELLS**. Largest PERC supplier to date.

**PV-Tech answer:**

- All-of-the-above!
- The companies above were chosen specifically because they have differentiated technology roadmaps, each focusing on different combinations of c-Si/thin-film, n-type/p-type, mono/multi.
- While we can add up all the production numbers of 100+ module suppliers and conclude that mono-PERC is going to dominate from 2018, in a 100 GW plus market, there remains scope for many module suppliers to co-exist, so long as they have module supply that is competitive, profitable, and field-reliable/proven.
What this means for utility site design

Source: PV-Tech Research *PV Manufacturing & Technology Quarterly* report, August 2017 release.

- For mainstream solar sites using c-Si panels, 2013 to 2018 can be considered phase-1 of a potential 2-phase technology shift for large-scale solar farm design; from 60 cell p-multi with 3BB to 72-cell p-mono PERC with 5BB.

- Phase-2 (2019-2020 ramp) could see transition to glass/glass bifacial with 5BB move to multi-grid front connects.

- Remember elevated temperature coefficients!
Risks in deploying new technologies

Please refer to the article/blog on PV-Tech this week:


Project developers, EPCs and asset owners set to benefit from PV ModuleTech 2017
Register to attend PV ModuleTech

- PV ModuleTech 2017 is a new 2-day event from PV-Tech, with the 2017 launch in Kuala Lumpur, Malaysia, 7-8 November 2017.
- The event will feature the leading module suppliers, material & equipment suppliers, test & certification bodies, global project developers, EPCs, O&Ms, & asset managers and site owners.

Finlay Colville, Head of Market Research
fcolville@pv-tech.org