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17 February 2021

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Mark Hutchins
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Risk vs. reward: Optimizing energy yield with 182mm wafers

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Embracing Ultra-high Power Large Module

February 2021

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Despite the ongoing COVID-19 pandemic, the end market is still seeking to achieve a lower BOS costs and LCOE. This has contributed to a growing trend to adopt high power modules, as well as to the corresponding improvements in module technologies.

This presentation will cover size trend, and current large module status.

PV InfoLink

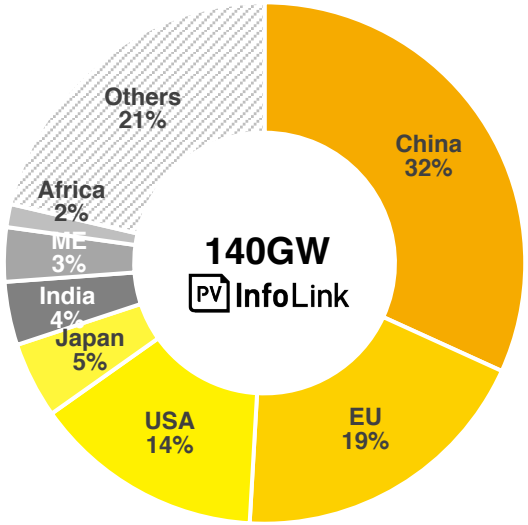
ONE

Size Trend

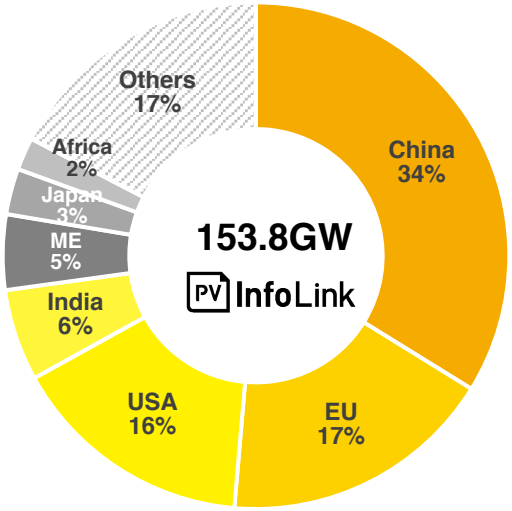
Global market demand 2020-2021

- 2020 PV market beat forecast due to Vietnam's installation rush and China's utility-scale and residential project installation boom. Against this backdrop, PV InfoLink raises global module demand in 2020 to 140 GW.
- **Global demand outlook is expected to be brighter this year. PV InfoLink predicts that module demand will reach 153.8 GW, up 10% compared with 2020.**
- Major drivers behind the PV growth are projects that have been postponed until this year due to the pandemic or price increases in the supply chain.
- Another driver is the growing demand in traditional markets including China, India, Europe, and the U.S., which will take up more than 70% of the share.
- Emerging markets including the Middle East and Latin America will both be driven by unsubsidized and utility-scale projects.

Module demand forecast (2020)



Module demand forecast (2021)



Source: PV InfoLink Database, Jan. 2021

2021 Highlight

Growing 12% YoY in 2021.

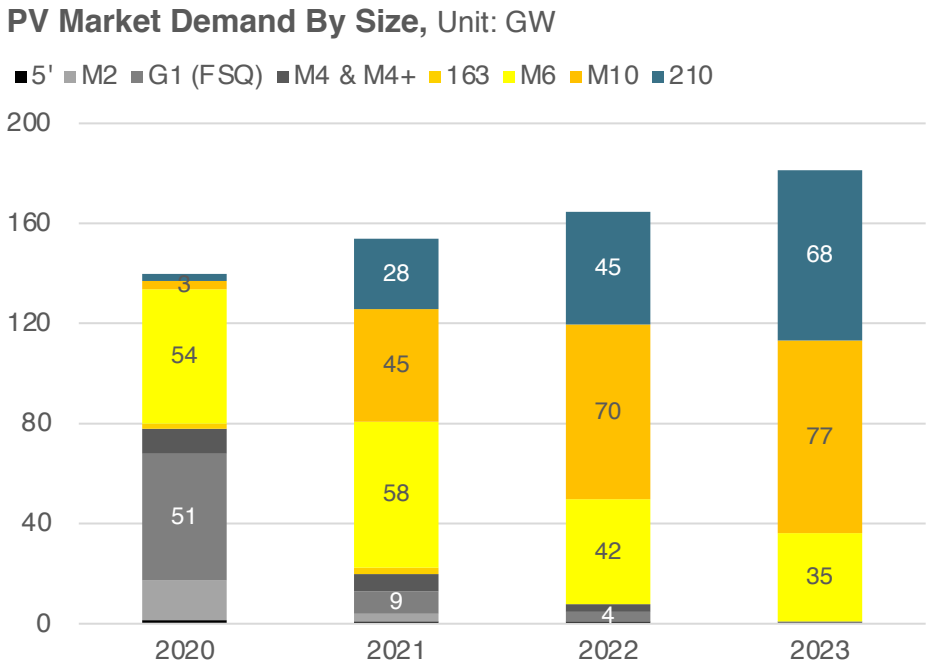
China, Europe, the U.S., and India will occupy more than 70% of market share in 2021.

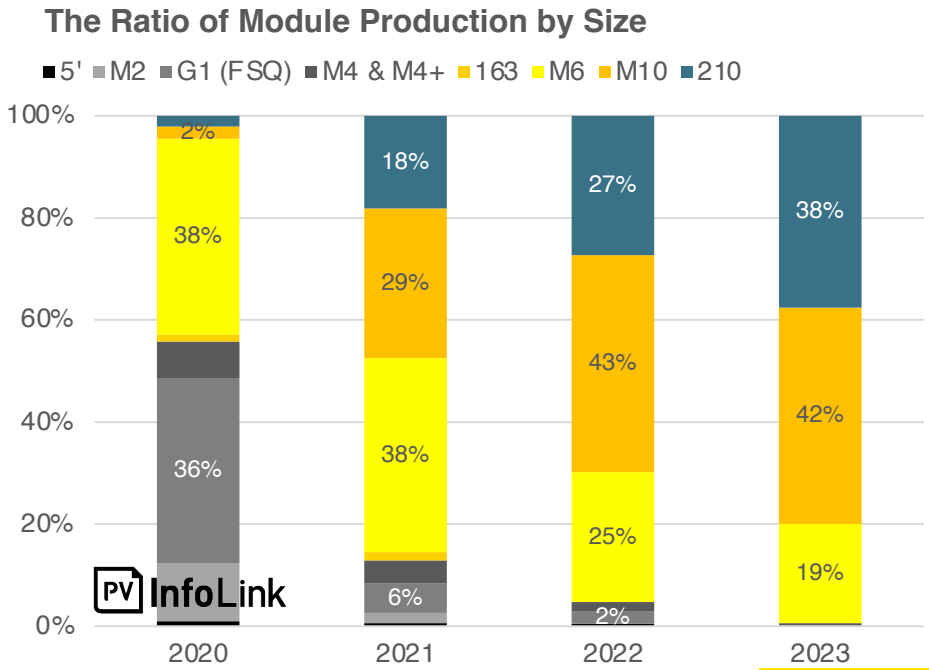
China will remain dominance in the global PV market, taking up more than 30% of share.

The Middle East and Latin America are rising stars this year.

Size Trend

- The rapid shift in wafer sizes last year pushes the market to shift to the next-generation size faster than expected. The market started shifting to M6 products in the middle of 2020. However, most manufacturers accommodate new production lines due to be installed with sizes up to 182 / 210mm, and so M6's market share will plunge from 38% to 25% in 2022.
- In H2 2020, Tier-1 vertically integrated companies started promoting modules rated beyond 500W to optimize costs and LCOE, with some advocating 182mm-modules (M10) and some advocating 210mm-modules (G12). With the large size development still at its early stage, G12 products are facing challenges of market acceptance, logistics, applications of BOM materials and yield rates. Factoring in these reasons, **M10 format will dominate the market from 2022 to 2023, pushing the mainstream module power output to 500-550W.**





Source: PV InfoLink Database, Jan. 2021

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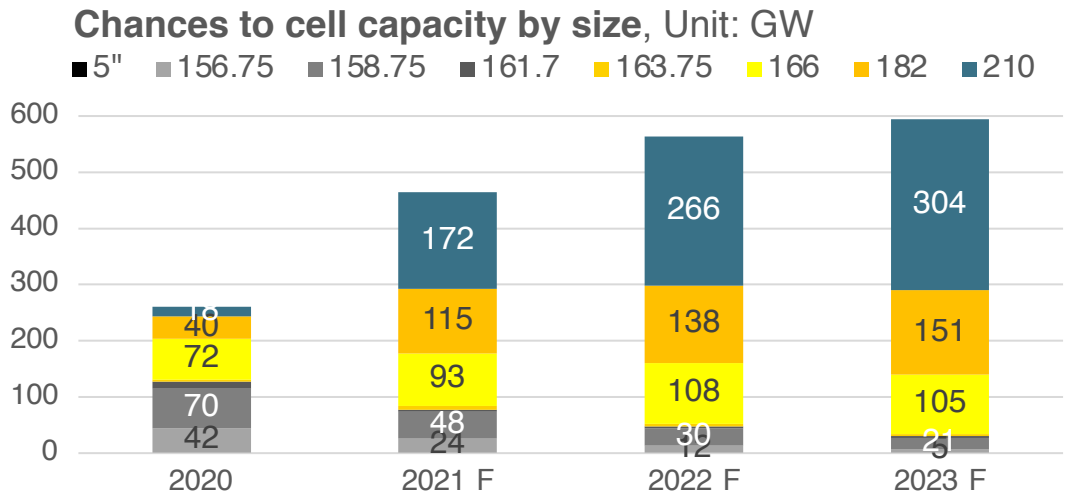
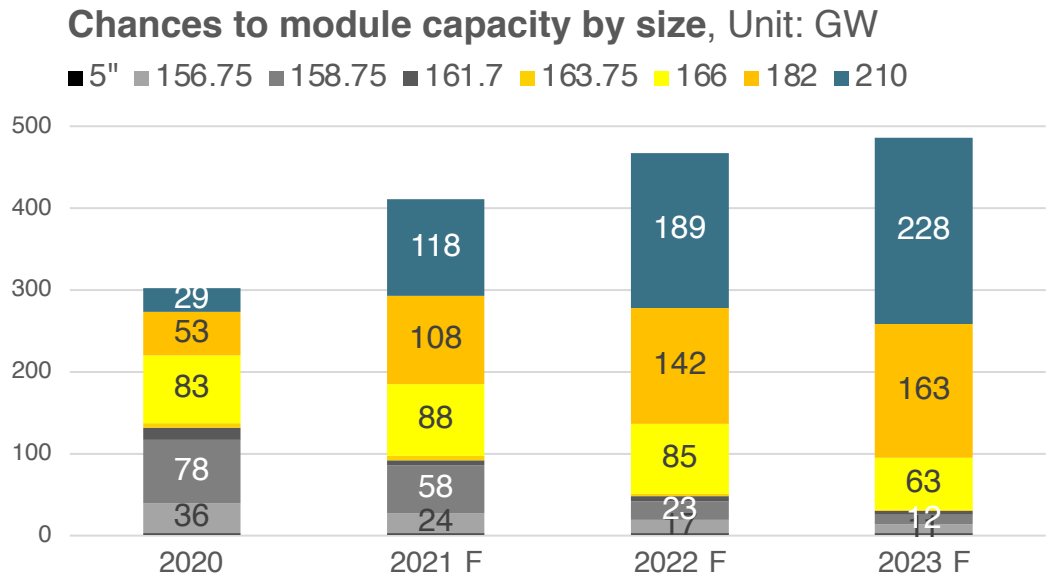
TWO

Analysis of PV Supply Chain

Capacity upgrade for different size variants

- It is relatively easy to upgrade the size of the ingot growth furnace, so the development of large size is not a problem in the production capacity of silicon wafers.
- Older cell and module production lines for M2 and G1 in China will gradually be eliminated after executing the existing orders.
- Factoring in the equipment capex, Tier-1 manufacturers mostly opt to install new lines that are compatible with M10/ G12, whereas Tier-2 manufacturers chose to modify lines.
- Given new production lines offer advantages in cost and capacity, capacity for large format cell and modules mostly come from new production lines.
- In response to rapid shift in sizes, most manufacturers opt to install new cell and module lines that are compatible with sizes up to 210mm, but most of them will producing M10 size this year due to production stability and market demand.
- As of the end of 2020, there are already more than 50 / 80GW of large-size cell and module production lines on the market, and there may be a substantial expansion to more than 200GW this year, so there is no capacity bottleneck for the development of large-size cells and modules.

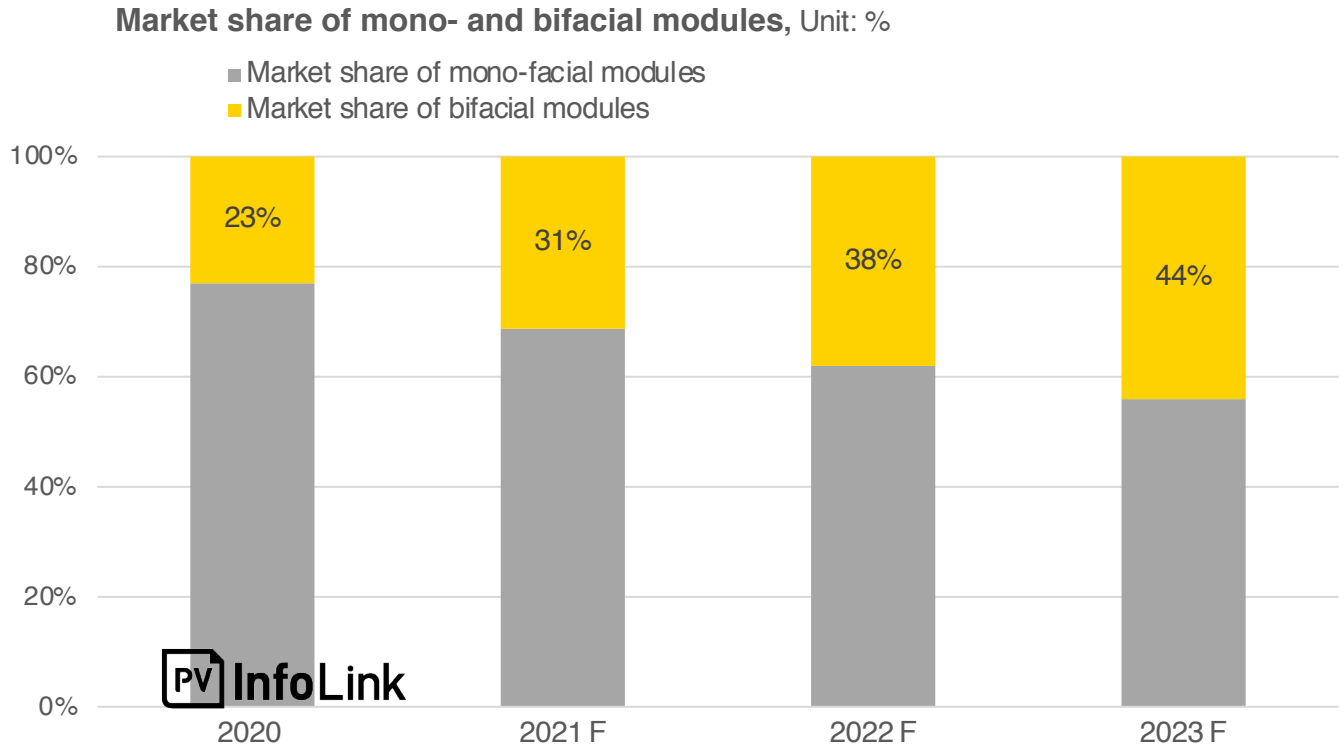




Source: PV InfoLink Database, Jan. 2021

Bifacial modules

- The market share of bifacial modules increased rapidly in 2020, but the shortage of PV glass in the second half of 2020 sent bifacial module costs and prices up. Therefore, buyers and sellers also paid special attention to PV glass production capacity this year.
- This year capacity will face bottleneck in the polysilicon and large format glass segment, but this won't hit bifacial modules development. Lots of the tier-1 module producers are speeding up the assessment and certification of bifacials with transparent backsheet. PV InfoLink reckons that production of bifacial modules with transparent backsheet are increasing from Q1 2021 onward.

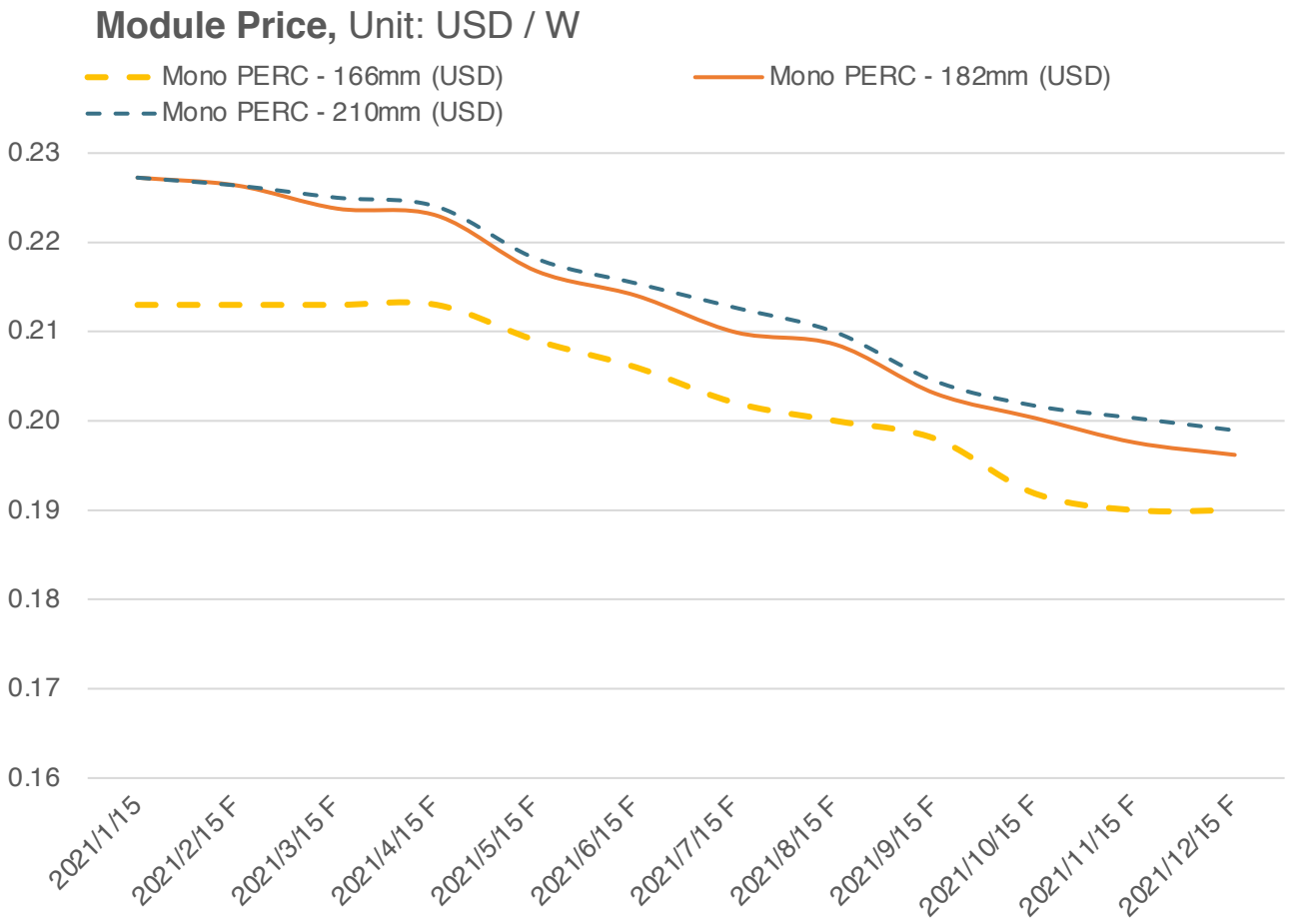


THREE

Conclusion

Module Prices Trends

- As BOM costs remain persistently high and Tier-1 cell makers prevent cell prices from declining too fast before the Chinese New Year, module production costs can hardly be improved during Q1. So, at this point mainstream M6 module price remain consistent with their high levels: RMB 1.6–1.66/W or USD 0.215–0.225/W.
- Production of M10- and G12-based modules keeps growing. And because such modules are mainly intended for use in ground-mounted systems, and their price gaps with M6 modules are therefore narrowing. Prices for M10- and G12-based modules are forecast to come in at RMB 1.63–1.68/W in 1Q21 or USD 0.223–0.23/W, depending on the project size and delivery deadline. In addition, since the recent quotation of G12 is slightly higher than that of M10 modules, the price difference between M10 and G12 module is gradually appearing.



Conclusion

- The market continues to shift toward large sizes. Start from H2 2020, M6 module dominate the PV market. M10 will then take its position in end of 2021 to 2023. Whether the market pursues larger size modules after 2023 depends on the development of technology and the cost-effectiveness of materials and costs.
- Not only tier-1 Chinese manufacturers ramp up capacity aggressively but tier-2 manufacturers also follow suit catch up the transition to large sized products during the 2021-2022 period. As a result, capacity for 182mm and beyond will grow robustly from 50-80 GW at the end of 2020 to 200GW+ by the end of this year. Rapid capacity expansion has also accelerated the progress in the market share of large-size modules.
- Production of M10- and G12-based modules keeps growing. And because such modules are mainly intended for use in ground-mounted systems, and their price gaps with M6 modules are therefore narrowing.
- From a cost perspective, most manufacturers opt to install new lines that are compatible with sizes up to 210mm, but most of them will producing M10 size due to production stability and market demand. M10 module will gradually become the mainstream of the market in the second half of the year and **will dominate the market from 2022 to 2023.**

ABOUT US

PV InfoLink is a provider of solar PV market intelligence focusing on the PV supply chain. We provide accurate quotes, reliable PV market insights, and global PV market supply & demand database, as well as market analysis and forecast. We also offer professional advice to firms to help them stay ahead of competition in the market.

Our team comprises well qualified analysts with over 5 years of experience in the solar industry and have kept on improving through our in-house training program. The analysts also actively attend solar energy events, conferences, and trade fairs for delivering the most reliable market information and trend analysis.

Since our establishment, we have built a client base encompassing top-tier companies across the supply chain, who use our accurate price quotes updated on our website, WeChat, and Twitter account every Wednesday as their index for price negotiation. We also partner with regional research firms, exhibit service companies, and consulting firms to strengthen our offering.

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