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**Marian Willuhn**  
Editor | pv magazine



# Integrating bifacial - New system design and bespoke products



**Kaushik Roy Choudhury**  
DuPont Photovoltaics and  
Advanced Materials



**Andrea Viaro**  
Jinko Solar EU



**Corrine Lin**  
PV Info Link



**Eric Kuo**  
NEXTtracker

A wide-angle photograph of a solar farm at sunset. The sun is low on the horizon, casting a warm, golden glow over the sky and the rows of solar panels. The panels are dark blue with a grid of silver lines, and they recede into the distance, creating a strong sense of perspective. The sky is filled with soft, white and orange-tinted clouds.

# Insights into the market trend of bifacial modules in 2020

Chief analyst Corrine Lin Apr. 29, 2020

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While the COVID-19 pandemic has created uncertainty over economy and the PV industry, progress in PV technologies is continuing.

Recently, the USTR has issued a notice to put the Section 201 tariffs on bifacial modules back in place in mid-May. PV InfoLink will explore the prospect of bifacial market with industry professionals this time.



ONE

**Market Demand  
Overview**



TWO

**Current Status of  
Bifacial Modules**



THREE

**Prospects and  
Challenges Facing  
Bifacial Modules**



# ONE

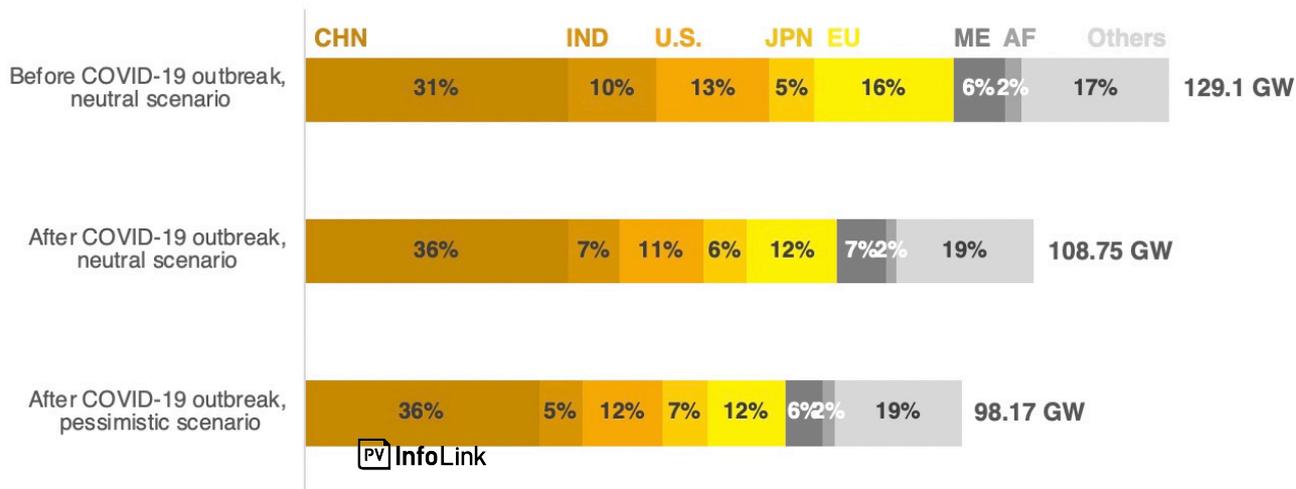
## Market Demand Overview



# Global market demand forecast for 2020

- As it's difficult to tell when the pandemic in Europe and the U.S. will be contained, the market outlook is clouded with pessimism. Impacts of COVID-19 on demand is becoming pronounced, with overseas demand in Q2 being sluggish and it may last until the beginning of Q3. **PV InfoLink has revised down global demand to lower than 110 GW.**
- In the midst of lockdown and severe virus outbreak, demand in India and Europe has turned significantly weaker. In contrast, the Chinese market will help sustain demand in Q2-Q3 as the outbreak has been brought under control. **PV InfoLink projected that China will account for over one third of global module demand this year.**
- If the pandemic could be contained in summer, demand is expected to rise in the U.S. and Europe, where traditional high season falls upon the end of the year. Demand in emerging markets such as the Middle East and Latin America is also worth noting. The Middle East is also a key market of bifacial modules.

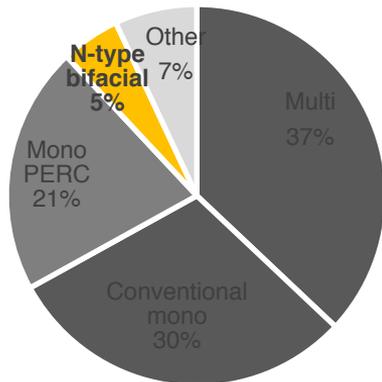
## 2020 Global module demand forecast



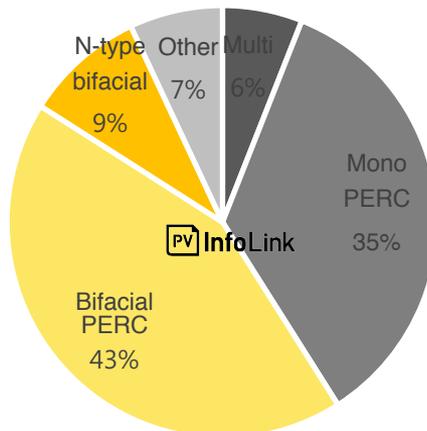
# China dominates bifacial demand from 2019 to 2020

- Reviewing the development of bifacial market in China over the past few years, the Top Runner Program spurred the industry to pursue higher efficiency as well as the development of bifacial modules.
- Of the first batch of Top Runner Program projects, **bifacial modules only accounted for 5% of share because they were n-type modules**. However, **the share rose to 52% in the third batch in 2019**, and 43% of which were bifacial PERC modules. Although China has stopped issuing Top Runner Program projects this year, it continues to launch ultra-high voltage projects, which will drive the development of high-efficiency bifacial modules. **The high standard for module efficiency and the extremely high share of bifacial modules used in ultra-high voltage projects will again drive up cell efficiency and bifacials' adoption of high-efficiency techniques this year**, opening a new chapter for bifacial modules.

Share of Batch 1 Top Runner Program projects by technology



Share of Batch 3 Top Runner Program projects by technology

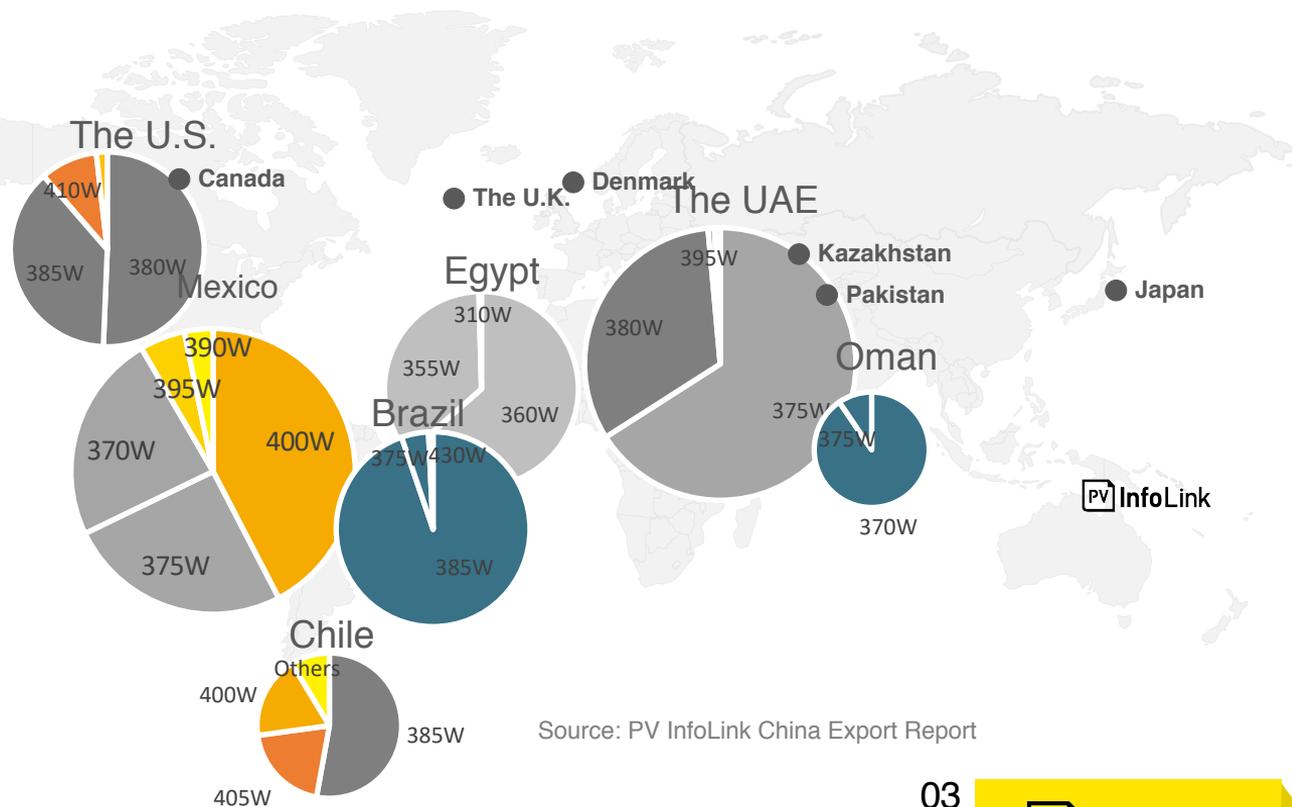


Ultra-high voltage projects will drive up the share of high-efficiency bifacial modules further this year.

# Export markets of Chinese bifacial module in 2019

- Egypt saw utility-scale bifacial projects in the beginning of 2019. This was followed by the UAE and Oman, where bifacial projects were announced. The latter used n-type cells.
- As most projects adopted M2 wafers in 1H 2019, the power output of 72-cell modules was around 370-385W.
- Brazil and Mexico also announced bifacial projects in 2H19. The module power output rose to 385-400W due to the adoption of larger wafers. Most of the bifacial modules used in Brazil were n-type modules.
- The U.S. became a key bifacial market in Q4 2019 after bifacial modules were excluded from Section 201 tariffs.

Distribution of Chinese bifacial module exports in 2019

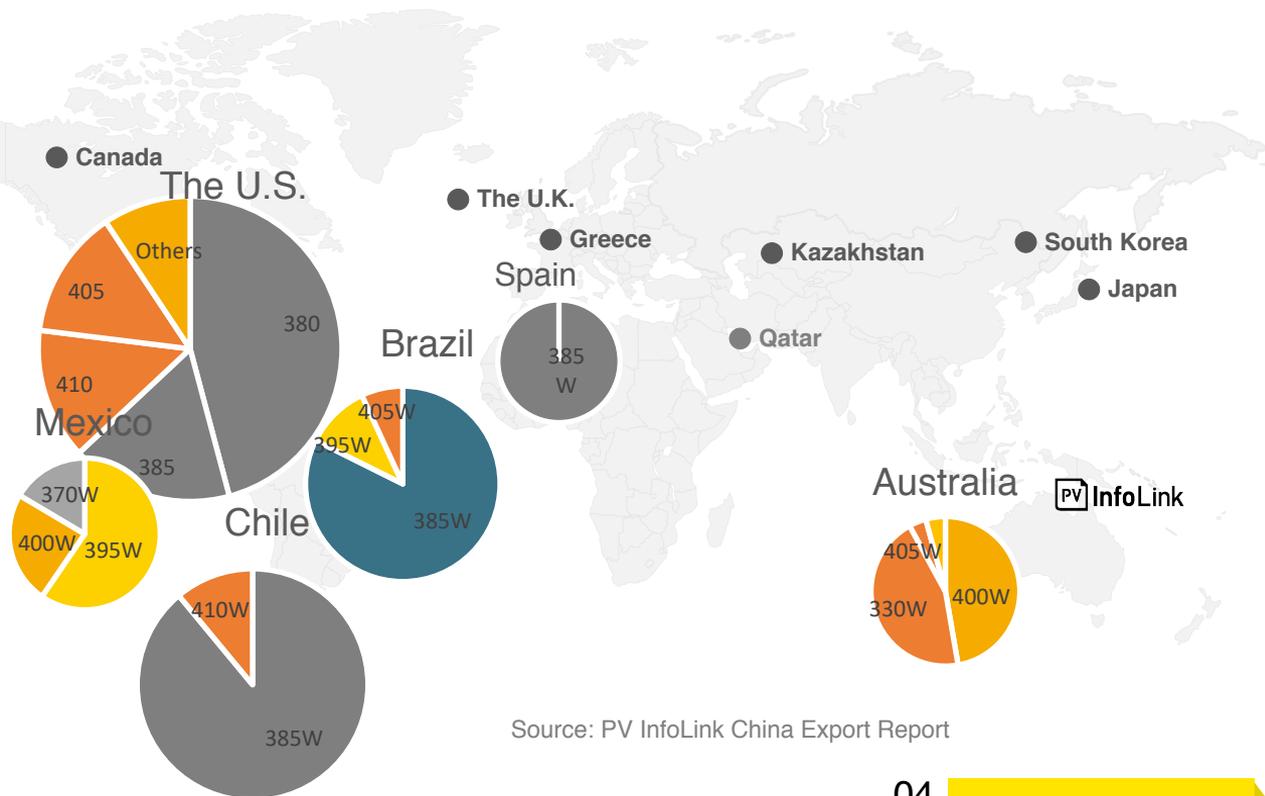


Source: PV InfoLink China Export Report

# Export markets of Chinese bifacial modules in 2020

- As bifacial module power output has reached 400 W this year, and bifacial exemption will remain in place until mid-May, the U.S. market has seen the highest demand for bifacial modules thus far.
- Demand for modules with high power output in the U.S. market has been high. The graph shows that the module power output in the US market has reached 405-410W.
- Apart from Brazil that uses n-type bifacial modules for most utility-scale projects, other markets adopt bifacial PERC modules to pursue better price performance. It seems that only the U.S., Europe, Japan, and South Korea would place some orders for HJT and TOPCon modules at present.

Distribution of Chinese bifacial module exports in 2020



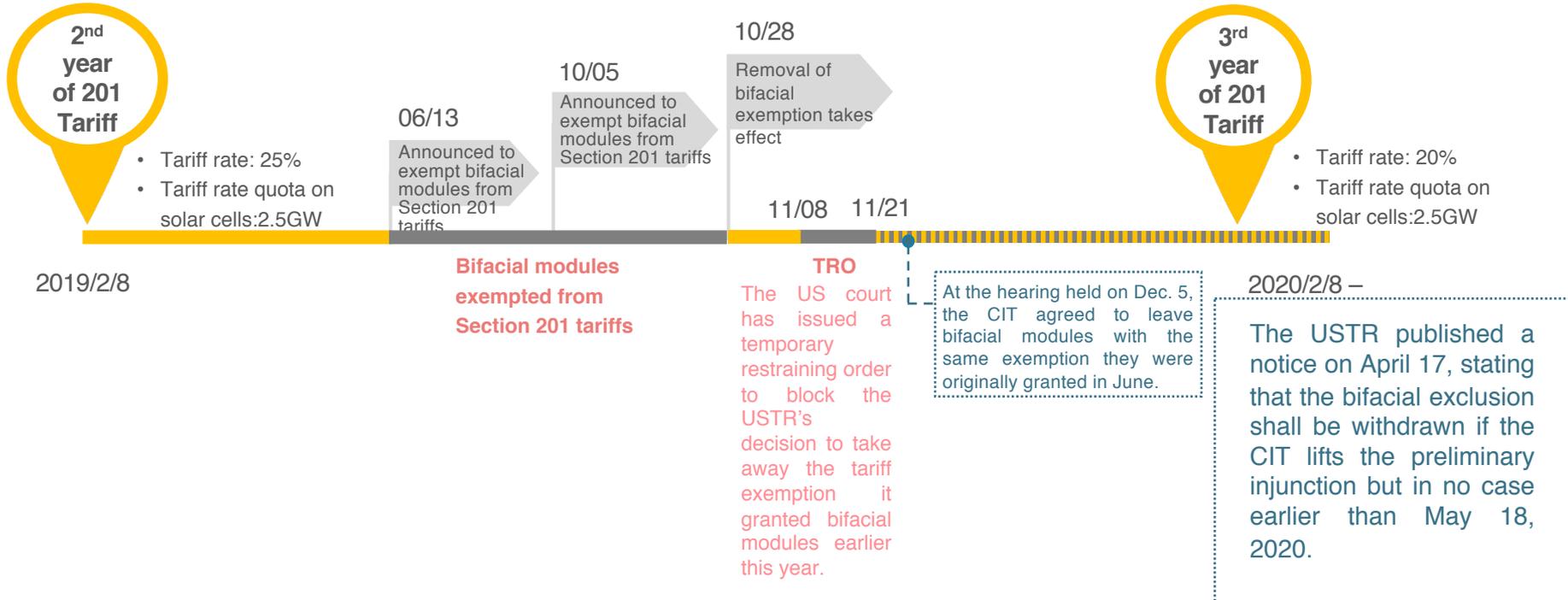
Source: PV InfoLink China Export Report

# TWO

## Market Status of Bifacial Modules

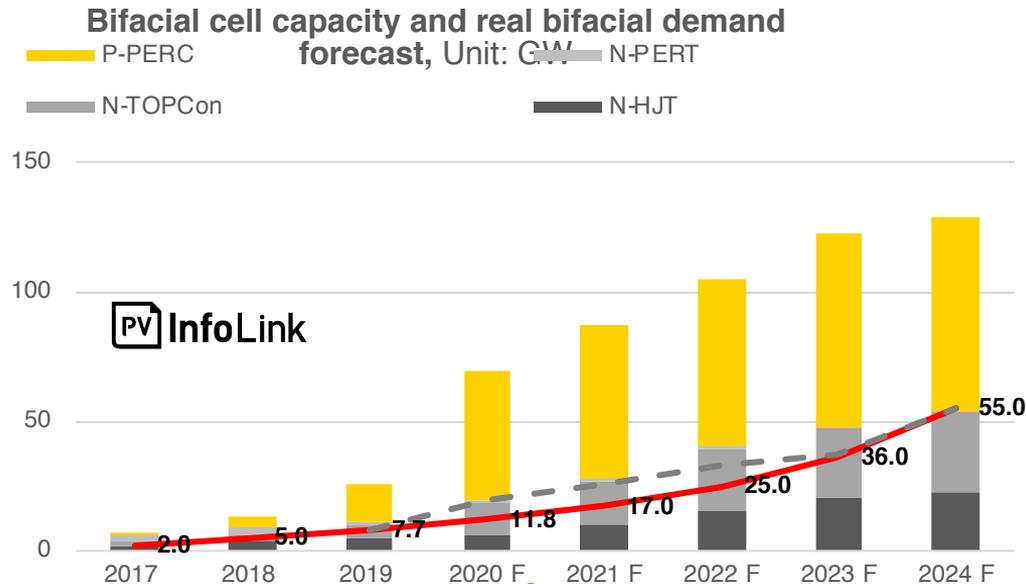


# Timeline of Section 201 tariffs changes to bifacial modules



# Global bifacial demand forecast

- Since 2019, bifacial adoption in overseas markets has been improving, although in a slow pace.
- As there will be around 20-30% loss in capacity if converting mono-facial module lines to bifacial ones, **capacities in Southeast Asia did not convert to bifacial lines in 2H19 because they have been fully booked. Since last October, JA Solar and Risen have exported bifacial modules to the U.S. during the period of temporary restraining order. Later, Jinko, Trina, and Astronergy also followed suit, and the power output of modules they shipped reached 400-410W.**
- After the U.S. removes bifacial modules from the exemption list in mid-May, the acquisition costs of bifacial modules will be higher by US\$ 0.02/W than mono-facial modules in the U.S. Therefore, bifacial demand will continue to grow but in a moderate pace in the US market. Markets outside of the U.S. will also see growing adoption of bifacial modules. The U.S. and Chinese markets aside, bifacial module manufacturers will focus especially on utility-scale projects in the Middle East, such as Dubai.
- PV InfoLink predicts that the market penetration rate of bifacial modules will reach 25% in 2023.**



Driven by China's Top Runner Program, utility-scale projects started widely adopting bifacial modules in 2018, marking the beginning of bifacial market

Demand for bifacial modules started growing in non-China markets.

As the USTR withdraws bifacial exemption, bifacial demand from the U.S. will be lower than expected. With US demand growing slowly, the bifacial market will be sustained by China, the Middle East, and Latin America this year.

# THREE

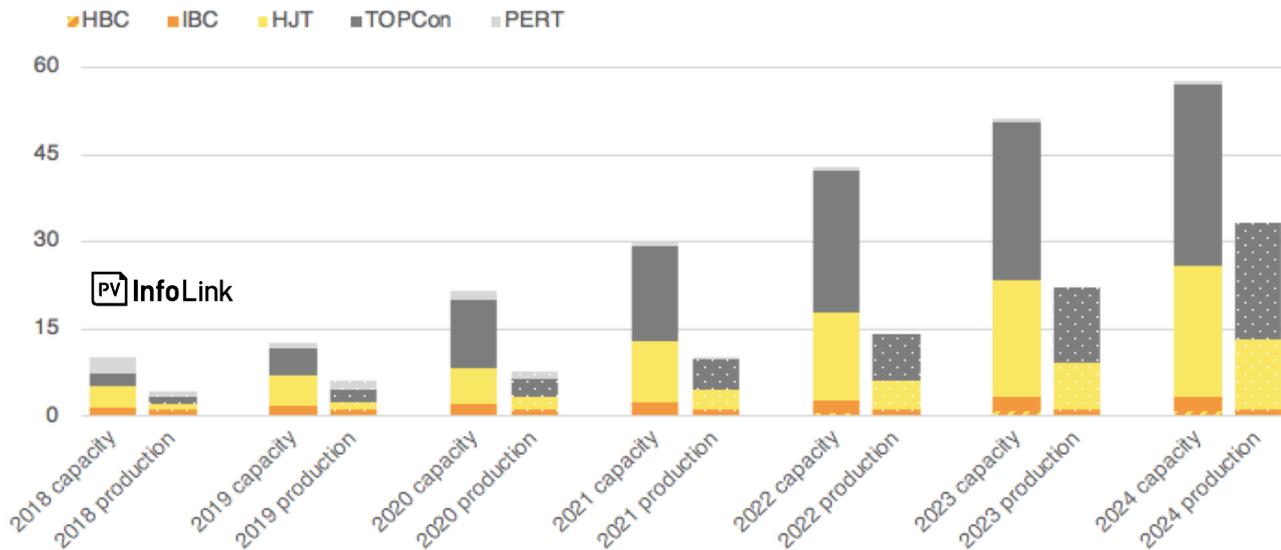
## **Prospects and Challenges Facing Bifacial Modules**



# Current status and estimated capacity of n-type modules

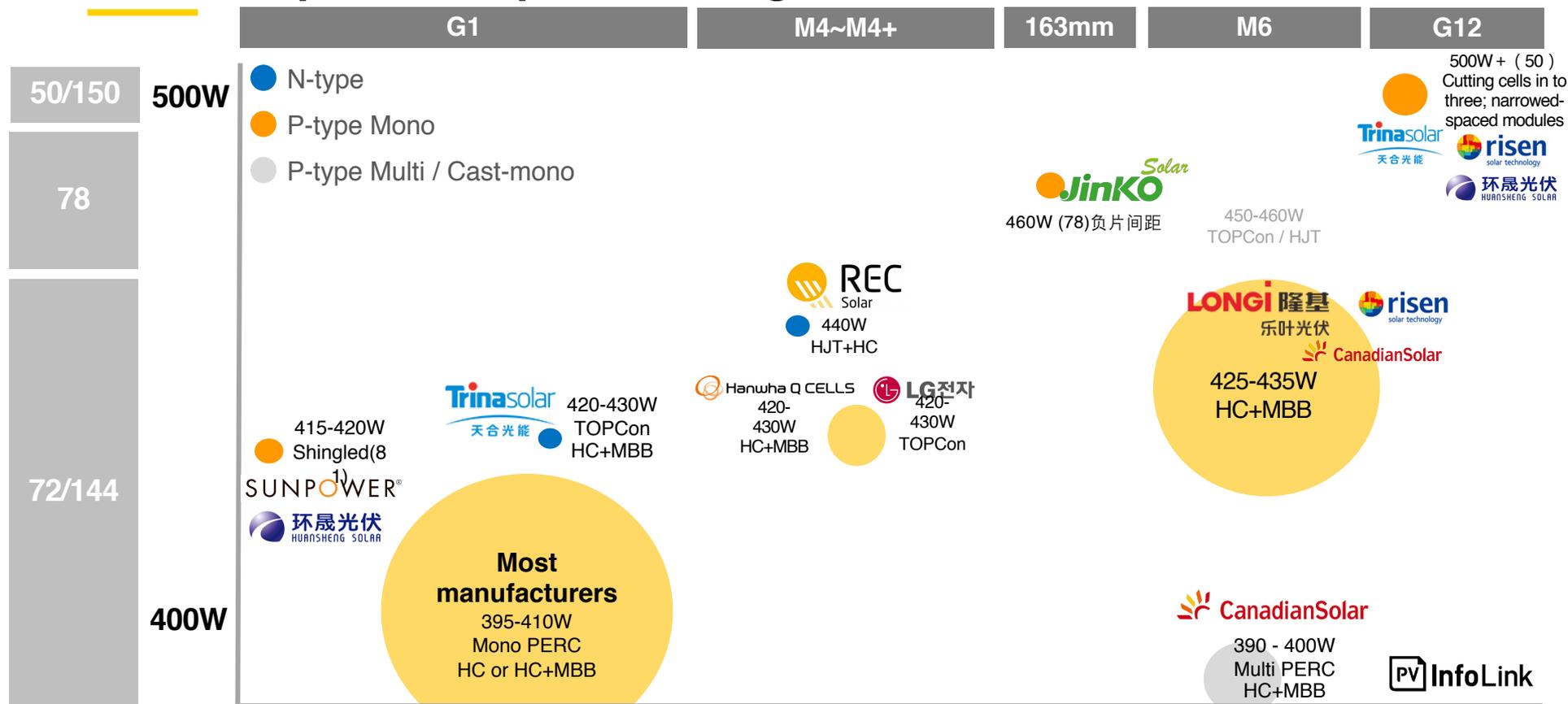
- There has been constant announcements of HJT capacity expansion. Recently, the capex of TOPCon equipment has reduced to a level that is not much higher than PERC, many cell manufacturers have thus reserved some new PERC capacities added this year for **upgrading to TOPCon** in the future. **In fact, TOPCon capacity additions may exceed HJT this year, leading to a significantly increase in n-type cell capacity this year.**
- 2020 will mark a turning point for n-type cells in terms of production and capacity volume, as well as cost reduction and efficiency improvement. If the development goes smoothly, the higher bifaciality brought by n-type cells will help improve bifacial market.

**N-type module capacity and shipment volume (2018-2024), Unit: GW**



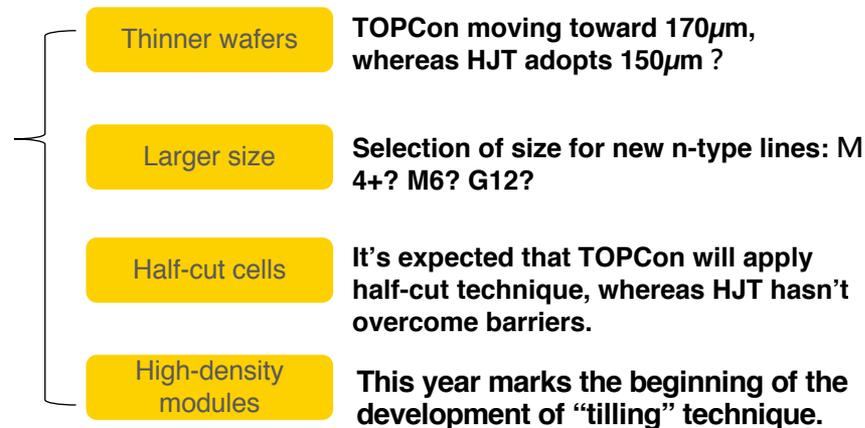
Source: PV InfoLink New Technology Report

# Module power output reaching 400-500W in 2020



# Conclusion

- How to drive costs down and efficiency up is a never-ending topic of solar technology. Bifacial modules can help deliver better LCOE through generating power on both sides of the panels; meanwhile, the costs and prices of bifacial cells have reached the same level as monofacial cells. In fact, the costs of bifacial cells may decrease further to slightly lower than monofacial ones. With costs going down and efficiency going up, the prospect of bifacial market is looking bright.
- With the pandemic continuing to grip countries overseas, total demand will decline instead of rise even if the pandemic could be curbed in summer. Against this backdrop, the anticipated short supply of PV glass will no longer be an issue. Moreover, supply of PV glass won't be the bottleneck in capacity that hinders the development of bifacial market this year. Regardless of glass-glass or transparent backsheet, price performance and long-term reliability will remain the main concerns of end users.
- If n-type capacity expansion plans can be implemented as scheduled and the production volume of n-type products can increase this year, the high bifaciality delivered by n-type will the growth of bifacial market.
- Wafer size enlargement and advancing module technologies will push manufacturers to further increase module power output, which has hit 400-410W in the beginning of the year. Driven by China's ultra-high voltage projects, a large volume of bifacial modules with high power output is expected this year as bifacial is compatible with all techniques.





# ABOUT US

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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.

If you have any question concerning this report, please contact



[service@pvinfoLink.com](mailto:service@pvinfoLink.com)

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[www.pvinfoLink.com](http://www.pvinfoLink.com)