

## Utilities - HK/China (H)

# Watt's Up #2: Grid capacity concerns, '23 solar shipment ranking, solar/wind tenders

Industry Overview

"Watt's Up" is our new series highlighting key developments in the China power utilities and renewable energy sector. We also include our latest event calendar at the end.

**Solar: Limited grid capacity constraints distributed solar**

Bloomberg reported around 150 locations in China cannot take the extra solar generation from distributed solar due to local limited grid capacity. The amount of distributed solar projects in China has exceeded all solar project in the US. Provinces like Hubei, Fujian, and Shandong are facing problem of connecting new distributed solar projects. Though some said rooftop installations that initiated by local grid companies won't be impacted by the connection limits, others still suggest enhancing regional grid capacity and build out more storage to sustain China's smooth green transition.

**Solar: Qinghai facing low project returns on curtailment**

Caixin reported low solar base investment returns in Qinghai, due to severe curtailment and mandatory additional investment. Central SOEs are still heavily investing in such solar bases as national duty. Some are concerned such irrational investment may come to a sudden halt in the future. In Hainanzhou, average PV utilization hour is 1400-1500, vs. local sunshine hour > 2000. The only UHV line, Qinghai to Henan 800kV, is operating at <25% utilization, as the baseload generators to balance the grid is yet to commission. Henan is also suffering from distributed PV overload. Since 2022, Qinghai requires all new solar farm to be matched with new power demand load, and solar farms need to buy such quota. By Nov 2023, 10GW completed PV projects in Hainanzhou and Haixizhou are queuing for grid connection.

**Solar: 2023 module shipment ranking; top 4 at 52% share**

Solarbe announced the 2023 solar module shipment ranking. The top 4 companies, Jinko Solar (75+GW, 60% N-type), Trina Solar (70GW), LONGi (65-67GW), and JA Solar (60-65GW) have a combined shipment volume of over 270GW, with a market share of 52%. Over 400GW (>75% market share) were from the top 9 companies. The market expects the share of N-type module to rise to 65% in 2024. More than 15 companies have declared their target that N-type product will account for 60% of shipment in 2024. We think shipment volume is the key metric to watch as oversupply worsens in 2024.

**Solar: Record low module tender prices**

On Jan 9, 2024, 56 module producers participated in the solar module tendering of PowerChina (42GW) and China Resources Power (1.56GW). Among the 42GW tender, the lowest quotation of P-type (25% of volume) and N-type (75%) module are Rmb0.806/W (average Rmb0.9/W and Rmb0.87/W (average Rmb0.969/W), respectively. The ASP gap of N/P-type module enlarged to Rmb0.06-0.07/W compared to Rmb0.05/W at the YE23. (More on the next page...)

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**Gary Tsang >>**  
Research Analyst  
Merrill Lynch (Hong Kong)  
+852 3508 6825  
gary.tsang@bofa.com

**Charlotte Xia >>**  
Research Analyst  
Merrill Lynch (Hong Kong)  
+852 3508 5029  
charlotte.xia@bofa.com

**Cissy Guan >>**  
Research Analyst  
Merrill Lynch (Hong Kong)  
+852 3508 6483  
cissy.guan@bofa.com

RE: renewable energy

UHV: Ultra High Voltage

MoM: month over month

SOE: state-owned enterprises

WTG: wind turbine generator

LCOE: Levelized Cost of Electricity

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Among the 1.56GW all N-type module tender of China Resources Power, the lowest quotation hit Rmb0.883/W (average Rmb0.9675/W).

### **Wind: Offshore WTG bid price hit record low**

On Jan 9, 2024, PowerChina's 2024 WTG tender includes 3 packages: 1) 5GW onshore wind, 2) 12GW onshore wind, and 3) 3GW offshore wind. The lowest quotation for packages 1 & 2 is Rmb1,295/kW. The lowest quotation for package 3 is Rmb2,450/kW, hitting new record low. With the pure onshore WTG price reaching Rmb1000/kW at YE23, market participants believe that the bidding prices of onshore WTG have reached the bottom, except for bidding for some large-scale RE bases or projects.

### **Solar: EGing PV pauses 10GW TOPCon cell project**

On Jan 6, 2024, Changzhou EGing PV announced that due to the growing demand of large-sized cells in the market, the company decided to pause the 10GW TOPCon cell project and upgrade the equipment to match the changing demand in wafer size.

### **Solar: New rival of China panels - Japan perovskite cell**

WSJ reported China's dominance in solar controlling >80% of the global supply chain for silicon solar panels face new rival from perovskite solar cells that don't use any silicon. A key element in manufacturing perovskite is Iodine, where Japan is the world's second-largest producer after Chile, accounting for around a third of global production. Perovskite cells' conversion rates can reach as high as 25%+ per US Department of Energy data. Versatility sets the perovskite cells apart because they are light and flexible, and hence can be installed on walls or curved surfaces. The key hurdles are costs and humidity. Most industry participants believe this new technology will only see wider adoptions toward the end of this decade.

### **RE: Challenges of entering the power market trading**

As of end Nov '23, accumulated solar power installation reached 560GW, given the goal of "all RE power enters power market trading", concerns regarding solar power entering market have been raised, including: 1) accelerated solar power tariff discount despite 270GW out of 560GW are subsidized. The installation cost of subsidized solar projects reduces from Rmb10/W to Rmb4/W, but old projects may have lower or no profit than new project due to higher cost and low efficiency; 2) delay payment of subsidies have hurt profitability of solar operators. In some regions the income from power sales could not cover taxes; 3) old wind power projects have better locations than new ones with higher wind speed and lower LCOE. Some have suggested solar power generators should sign a 20-year long-term fixed power tariff contract with agency companies to ensure profitability when entering market power sales.

### **Power: Inner Mongolia promotes RE consumption**

As of Dec 17, 2023, Inner Mongolia ranks #1 in grid-connected wind & solar power capacity in China with over 85GW. The provincial government proposes to vigorously promote the construction of incremental distribution networks, encourage power grid enterprises establish long-term strategic partnership with regional energy investment SOEs, and explore the relevant mechanism of incremental distribution network to increase RE consumption ratio.

### **Solar: 12GW module supply contract sign with Microsoft**

On Jan 8, 2024, South Korea solar module manufacturer Hanwha Q Cells announced they will supply 12GW of solar panels to Microsoft by 2032, which is the largest module supply contract in the US so far. Hanwha expressed that the order will be manufactured and supplied by its new integrated plant in Georgia state. This cooperation will help Hanwha to compete with China by building an integrated supply chain in the US.

## Upcoming BofA Utilities events

We highlight our upcoming events and takeaways notes below. Please contact BofA China Utilities team or your BofA salesperson for more details or registration.

[Wind - China: Longyuan conference call takeaways](#)

[Solar - China: Key takeaways from solar expert call with Rystad Energy](#)

[Wind - China: Key takeaways from expert call with China Wind Energy Association](#)

[Beijing Enterprises Water: Call takeaways: saw better cash collection rate and water supply tariff](#)

### Exhibit 1: Upcoming BofA Utilities events

In-person lunch events in Hong Kong on Jan 16<sup>th</sup> and Jan 19<sup>th</sup>

| Date      | Time (HKT) | Type      | Topic         | Speaker                  | Company/Title  | Language         |
|-----------|------------|-----------|---------------|--------------------------|--|------------------|
| 1/12/2024 | 9:00       | Expert    | Solar         | Yana Hryshko/Huaiyan     | Wood Mackenzie - Global Solar Supply Chain Research              | English          |
| 1/12/2024 | 11:00      | Corporate | Utilities     | Johnson Tsang            | Guangdong Investment (270 HK) Deputy General Manager             | Mandarin         |
| 1/12/2024 | 15:00      | Corporate | Gas           | Dongzhi Wang             | ENN Energy (2688 HK) CFO   | Mandarin         |
| 1/15/2024 | 9:00       | Expert    | Power         | Peng Peng                | Chinese power market reforms & outlook                           | Mandarin         |
| 1/15/2024 | 16:00      | Corporate | Solar         | Zhang Hongguang          | Suzhou Maxwell (300751 CH) IR                                    | Mandarin         |
| 1/15/2024 | 21:00      | Corporate | Solar         | Christian Comes          | Huasun Energy - Director of EU Business Development              | English          |
| 1/16/2024 | Lunch      | Expert    | Power         | Danny Qi                 | Eyes from Chinese power investment from private investor         | Mandarin/English |
| 1/16/2024 | 16:00      | Expert    | Power         | Anders Hove              | Oxford Institute for Energy Studies on Chinese power market      | English          |
| 1/17/2024 | 10:00      | Expert    | Solar (Poly)  | Jinbiao Lv               | Silicon Industry of China Nonferrous Metals Industry Association | Mandarin         |
| 1/17/2024 | 11:00      | BofA      | Solar         | Julien Dumoulin Smith    | BofA - US solar demand and policy read                           | English          |
| 1/17/2024 | 16:00      | Corporate | Power         | Hu Shufeng               | Huadian Power (1071 HK)  | Mandarin         |
| 1/18/2024 | 9:00       | Expert    | Power         | Xue Jing                 | Ex China Electricity Council on China power market               | Mandarin         |
| 1/19/2024 | Lunch      | BofA      | Power         | BofA China Utilities     | China Utilities & Renewables Year Ahead lunch                    | Mandarin/English |
| 1/23/2024 | 9:00       | Expert    | Solar         | Shujuan Wang             | Chinese solar supply chain with Zhihui Solar PV                  | Mandarin         |
| 1/23/2024 | 10:00      | BofA      | Solar         | BofA Asia solar research | China solar supply chain team call                               | English          |
| 1/23/2024 | 16:00      | Corporate | Renewables    | Zou Min                  | Datang Renewable (1798 HK) Director of Securities Department     | Mandarin         |
| 1/24/2024 | 9:00       | Corporate | Solar         | Anais Wu                 | LONGi Green Energy (601012 CH) IR                                | English          |
| 1/24/2024 | 10:00      | Expert    | Gas           | Miao Lv                  | China Gas Association  | Mandarin         |
| 1/24/2024 | 11:00      | Corporate | Gas           | Kelvin Shan              | CR Gas (1193 HK)   | Mandarin         |
| 1/25/2024 | 9:00       | Expert    | Carbon/power  | Boyang Jin               | Refinitiv LSE - Team Lead China Carbon & Energy Transition       | English          |
| 1/30/2024 | 9:00       | Expert    | Solar         | Frank Haugwitz           | Asia Europe Clean Energy (Solar) Association                     | English          |
| 2/1/2024  | 10:00      | Expert    | Solar (Glass) | Yuping Cui               | SCI99 - Senior Analyst of Float Glass Market                     | Mandarin         |

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