

## Solar - China

## Solar Flow: Dec 2023 Chinese export growth moderated slightly

## Industry Overview

## Better December solar export volume +54% YoY

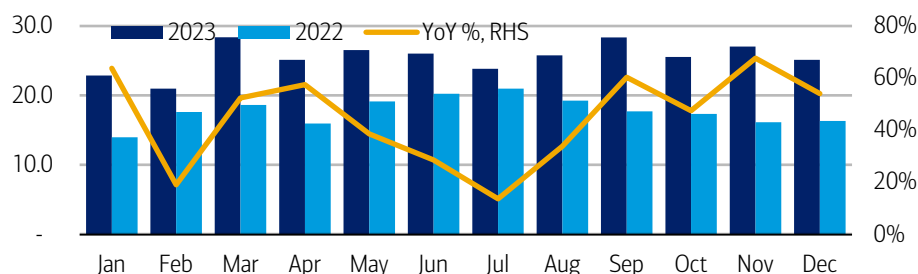
"Solar Flow" is our monthly report tracking solar trade data in China and other key countries. Chinese solar (wafer, cell, module) exports fell -26% YoY on value but +54% on volume in December, slightly weaker than -23% YoY and +68% in November. Strong Asia (in particular India) & Oceania demand has offset weaker Europe and Africa.

A lot of focus is on the overseas inventory situation. Our recent expert calls suggest Europe solar module inventory is still very high at 60-80GW by 2023. While some market speculation that inverter's situation has improved, our experts see no strong evidence while December Chinese inverter exports improved MoM for the second consecutive months.

- **Module:** China module exports rose +50% YoY on volume (16.2GW) and -20% YoY on value (US\$2.1bn) in Dec. By value, Asia demand increased by +65% YoY in Dec led by India and Saudi Arabia (accounting for already a quarter of shipments), offsetting the decline in Europe (-54% YoY) and Africa (-45%). Module export value fell -7% YoY in 2023.
- **Cell:** Cell exports were more robust than module growing 37% YoY (3.7GW) on volume and down -56% on value (US\$204mn) in Dec. Export value to India rose by 39%YoY and to Cambodia declined to -47% vs -23% in Nov.
- **Wafer:** Wafer exports grew +88% YoY on volume (5.3GW) in Dec vs 66% in Nov and fell 29% YoY on value (US\$321mn). By value, exports to Thailand remain relatively flat at -1% YoY, and India is rising very rapidly from <1% share at the beginning of 2023 to 11% in Dec vs 4% of wafer exports in Nov.
- **Inverter:** Export value fell -40% YoY in Dec from -47% in Nov on lower demand in Europe (Netherlands -82% and Germany -56%) while US stayed weak at -3% in Dec. But absolute export value improved for two consecutive months now.

## Exhibit 1: Chinese solar (wafer, cell &amp; module) export volume (GW), 2022-23

Total volume at 25.1GW +54% YoY in Dec— module +50%, cell +37% and wafer +88%



Source: BofA Global Research; China Customs, InfoLink

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Equity  
China  
Renewable Energy

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

**Julien Dumoulin-Smith**  
Research Analyst  
BofAS  
+1 646 855 5855  
[julien.dumoulin-smith@bofa.com](mailto:julien.dumoulin-smith@bofa.com)

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

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

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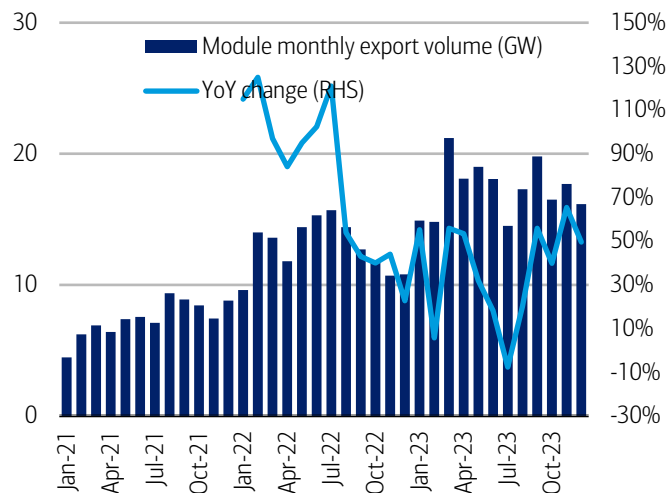
Timestamp: 23 January 2024 10:43AM EST

# Chinese solar export trends

## Module

**Exhibit 2: China solar module export volume and YoY change**

December module export volume (16.2GW) rose by 50% YoY

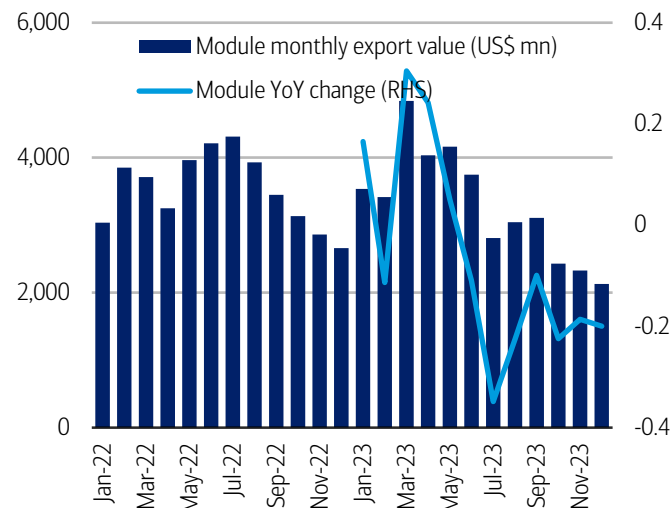


Source: BofA Global Research; InfoLink

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**Exhibit 3: China solar module export value (US\$ mn) and YoY change**

December module export total value (US\$2.1bn) dropped by 20% YoY

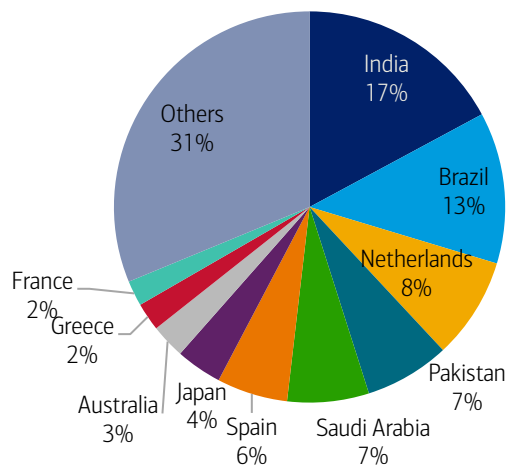


Source: BofA Global Research; China Customs

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**Exhibit 4: China Dec solar module export value by country**

Top 5 of China's exporting countries accounted for 52% in Dec '23

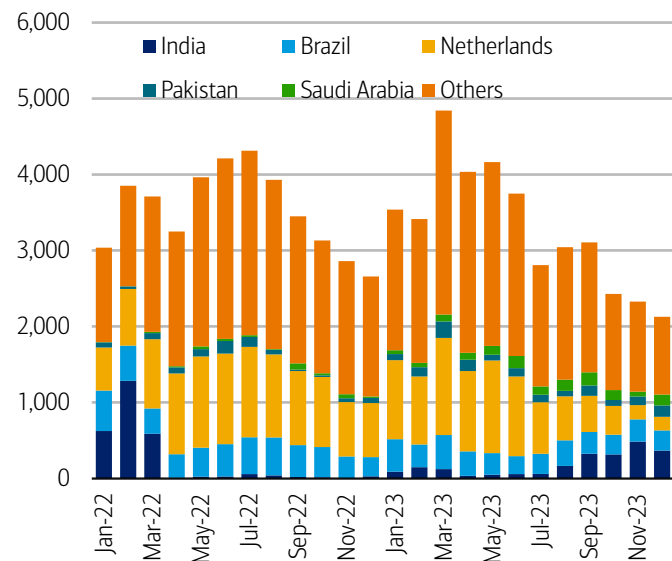


Source: BofA Global Research; China Customs

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**Exhibit 5: China solar module export value (US\$ mn) by destination**

YoY decline was led by Netherlands



Source: BofA Global Research; China Customs

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**Exhibit 6: China module exports by top destinations YoY growth %**

Bright spot in India and Saudi Arabia

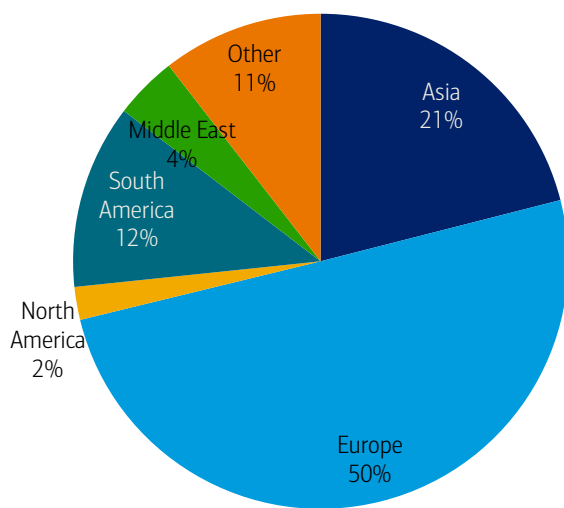
YoY % change	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	2023
India	-86%	-89%	-79%	353%	112%	130%	1%	312%	1653%	2068%	51310%	1320%	-19%
Brazil	-20%	-36%	35%	4%	-25%	-45%	-45%	-33%	-31%	-35%	2%	5%	-22%
Netherlands	83%	20%	40%	-1%	2%	-12%	-43%	-47%	-51%	-59%	-74%	-75%	-20%
Pakistan	17%	282%	167%	87%	-21%	-34%	-24%	18%	694%	273%	121%	122%	60%
Saudi Arabia	1363%	1764%	507%	535%	213%	503%	345%	1689%	108%	383%	19%	696%	324%
Spain	31%	8%	13%	-5%	-41%	-27%	-61%	-35%	-40%	-61%	-7%	3%	-23%
Japan	-4%	5%	-15%	-15%	-40%	-35%	-47%	-49%	-27%	-44%	-35%	-31%	-30%
Australia	-44%	-7%	51%	32%	-24%	-16%	-25%	-10%	11%	50%	37%	40%	-1%
Greece	47%	103%	59%	-44%	NA	-62%	-43%	-50%	-36%	-36%	-46%	4%	-26%
France	81%	101%	79%	104%	63%	9%	25%	-14%	-12%	-26%	-49%	-14%	24%
Korea	9%	92%	140%	61%	-48%	46%	38%	164%	129%	-1%	2%	2%	24%
Portugal	18%	-1%	39%	-4%	18%	-27%	-70%	-50%	-35%	-5%	-54%	-35%	-25%
Belgium	536%	195%	357%	162%	178%	14%	-30%	107%	200%	98%	-52%	19%	112%
Poland	-29%	-54%	-31%	-48%	-39%	-27%	-29%	-46%	-43%	-32%	-49%	-32%	-39%
United Kingdom	357%	260%	149%	145%	173%	121%	39%	4%	-4%	-8%	-74%	-36%	51%
Others	90%	81%	66%	65%	38%	2%	-30%	-20%	-9%	-28%	-36%	-50%	6%
<b>Total</b>	<b>17%</b>	<b>-11%</b>	<b>30%</b>	<b>24%</b>	<b>5%</b>	<b>-11%</b>	<b>-35%</b>	<b>-23%</b>	<b>-10%</b>	<b>-22%</b>	<b>-19%</b>	<b>-20%</b>	<b>-7%</b>

Source: BofA Global Research; China Customs

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**Exhibit 7: Chinese solar module exports by region, 2023**

Half of Chinese exports went to Europe

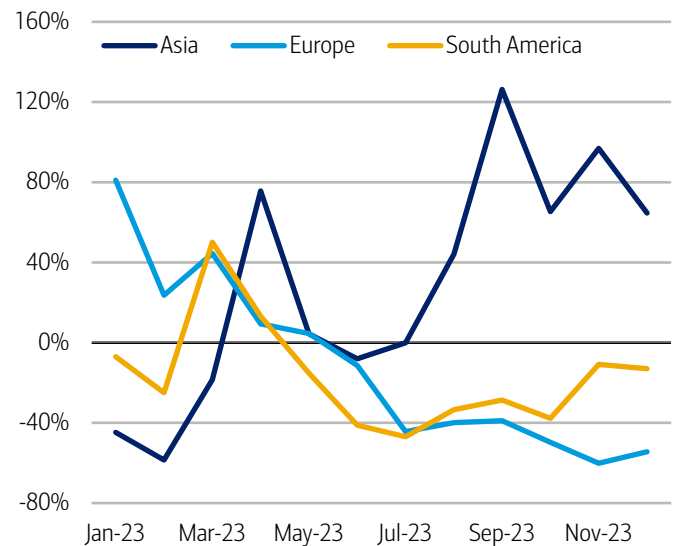


Source: BofA Global Research; China Customs

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**Exhibit 8: Chinese solar module export value by region YoY % change**

Asia rose by 65% but Europe and America fell by 54%/23% YoY in Dec

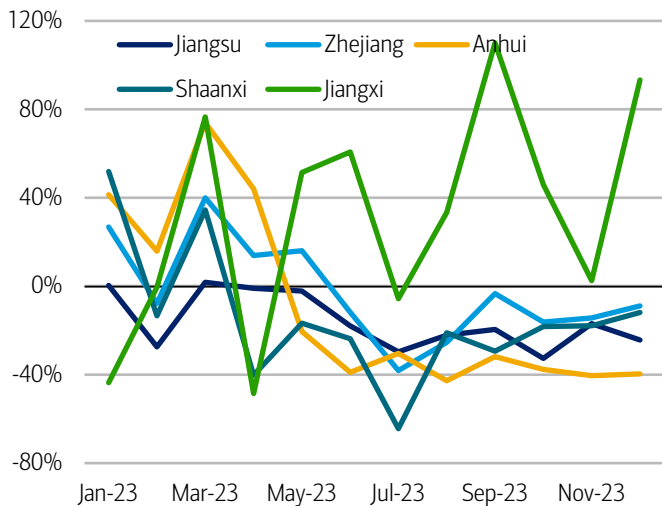


Source: BofA Global Research; China Customs

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**Exhibit 9: China module exports by province YoY growth %**

Jiangxi outperformed in Dec 2023 while Anhui lagged

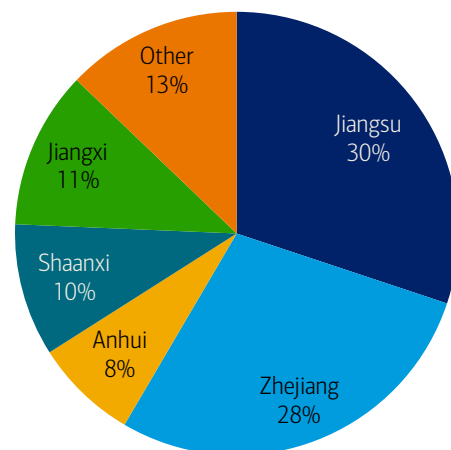


Source: BofA Global Research; China Customs

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**Exhibit 10: China module exports share by province in 2023**

Most module exports from Jiangsu followed by Zhejiang

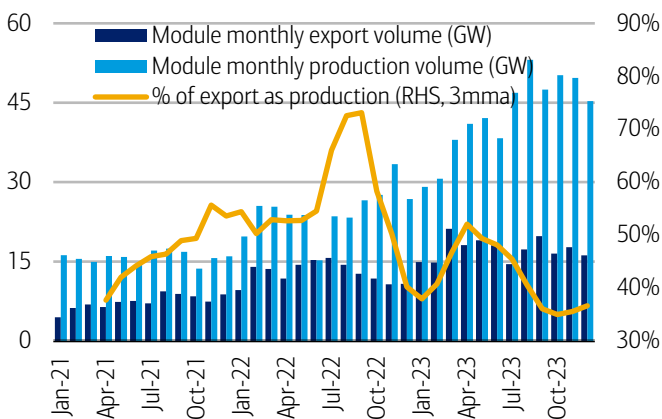


Source: BofA Global Research; China Customs

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**Exhibit 11: Chinese monthly module production and exports (GW)**

Exports on average account for about one-third of Chinese module production in Aug-Dec '23

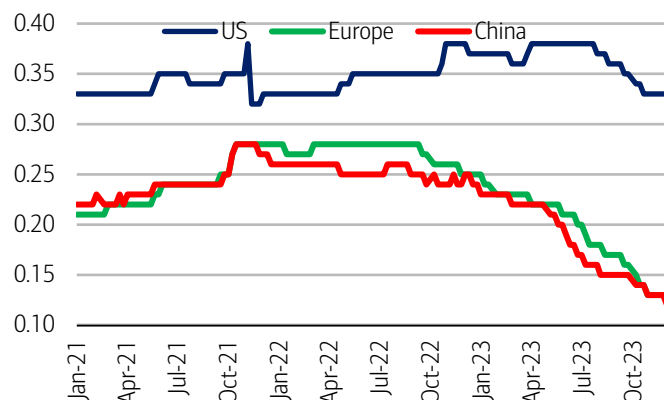


Source: BofA Global Research; China Customs

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**Exhibit 12: Solar module shipment prices (USD/W) to the US, Europe and China**

US module shipment prices more resilient



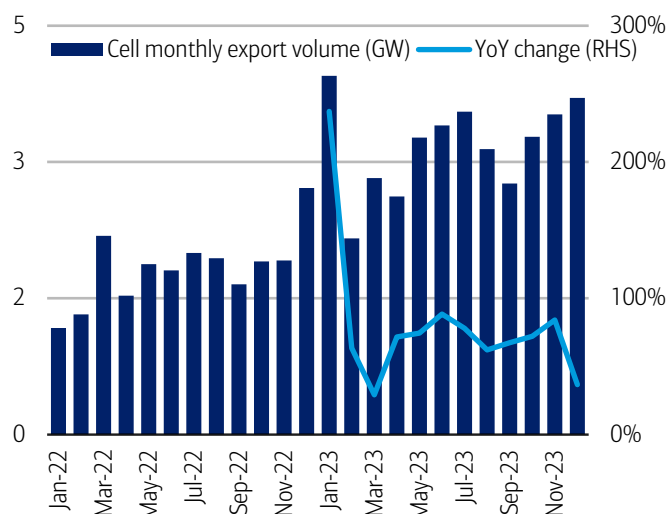
Source: BofA Global Research; Bloomberg

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## Cell

### Exhibit 13: China solar cell monthly export volume (GW) and YoY change

Dec export volume (3.7GW) rose by 37% YoY

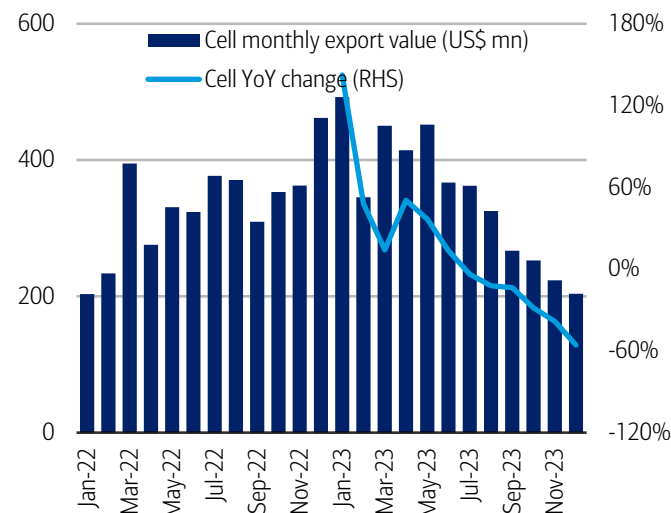


Source: BofA Global Research; China Customs

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### Exhibit 14: China solar cell export value (US\$ mn) and YoY change

Dec cell export total value (US\$204mn) dropped by 56% YoY

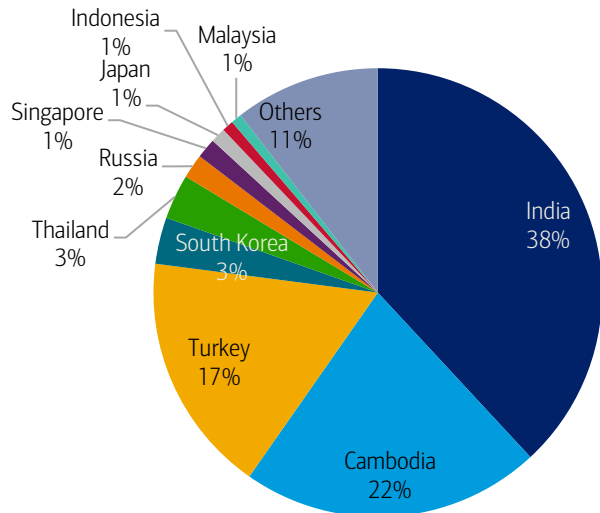


Source: BofA Global Research; China Customs

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### Exhibit 15: China Dec solar cell export value by countries

Top 5 of China's exporting countries accounted for 84% in Dec '23

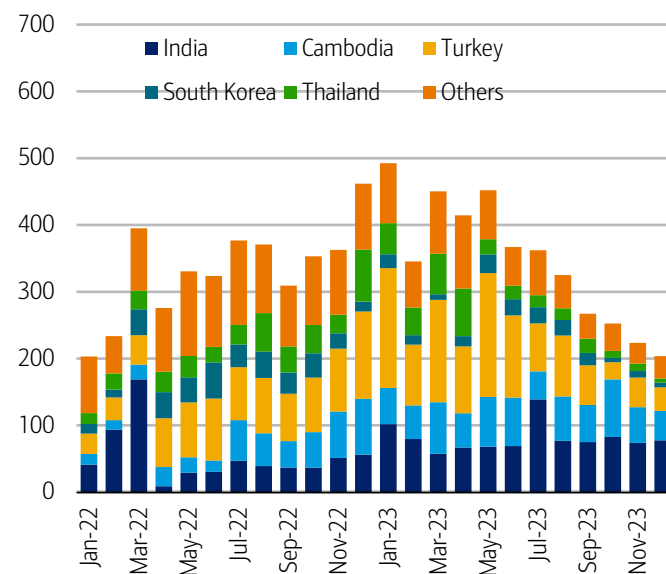


Source: BofA Global Research; China Customs

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### Exhibit 16: China solar cell export value (US\$ mn) by destination

India +39% YoY in Dec as the bright spot supporting cell exports



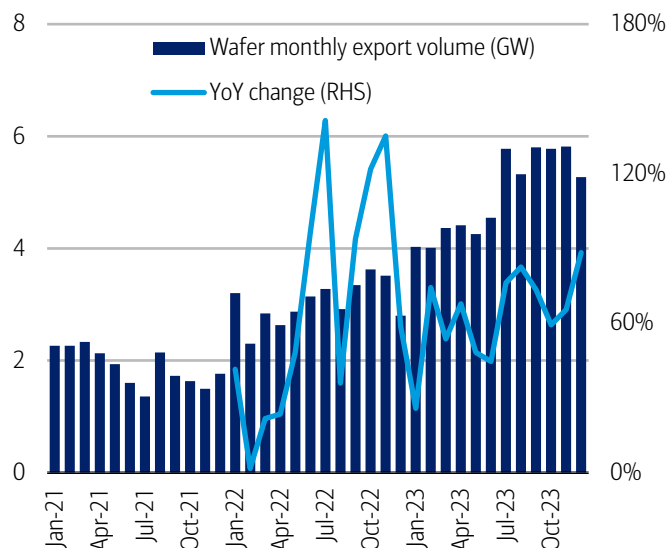
Source: BofA Global Research; China Customs

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## Wafer

**Exhibit 17: China solar wafer monthly export volume (GW) and YoY change**

Dec wafer export volume (5.3GW) rose by 88% YoY

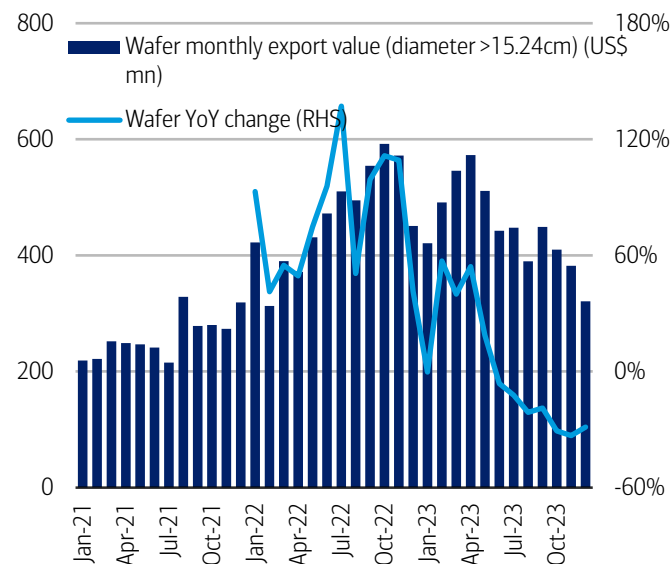


Source: BofA Global Research; China Customs

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**Exhibit 18: China solar wafer export value (US\$ mn) and YoY change**

Dec wafer export total value (US\$321mn) dropped by 29% YoY

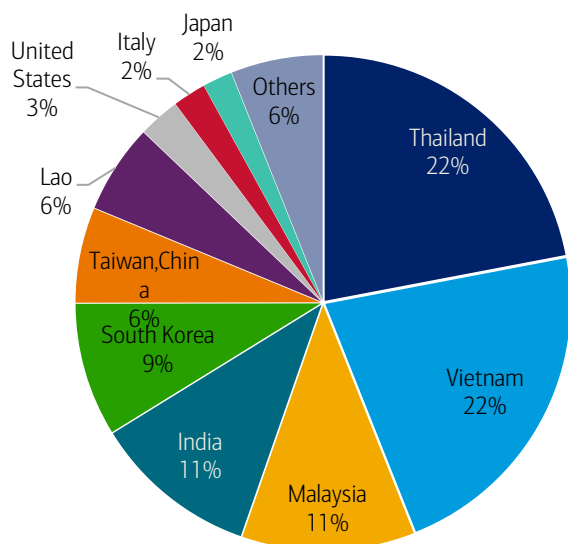


Source: BofA Global Research; China Customs

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**Exhibit 19: China Dec solar wafer exports by countries by values**

Top 5 of China's exporting countries accounted for 75% in Dec '23

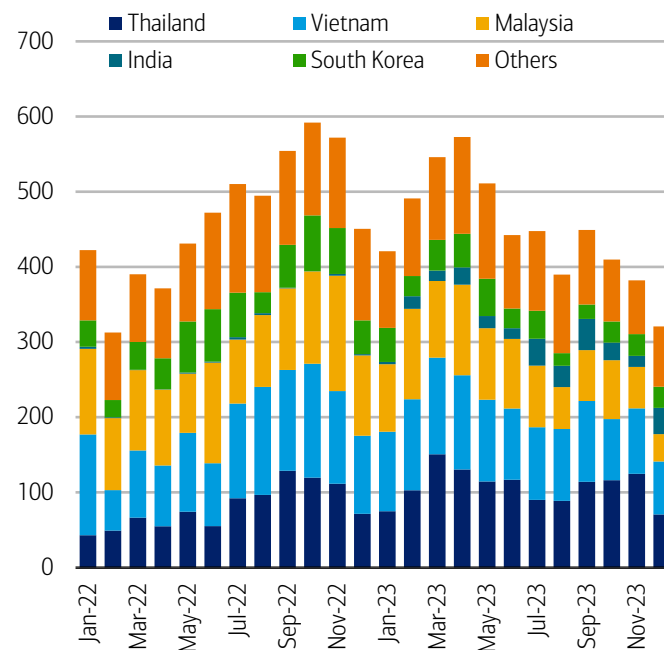


Source: BofA Global Research; China Customs

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**Exhibit 20: China solar wafer export value (US\$ mn) by destination**

Vietnam -32% YoY in Dec; South Korea -37%, Malaysia -66%



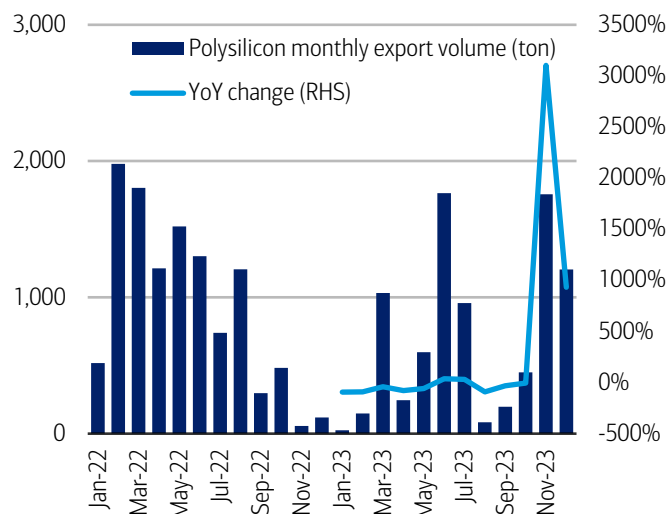
Source: BofA Global Research; China Customs

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## Polysilicon

**Exhibit 21: Polysilicon monthly export volume (ton) and YoY change**

Dec polysilicon export volume (1,204tons) rose by 931% YoY

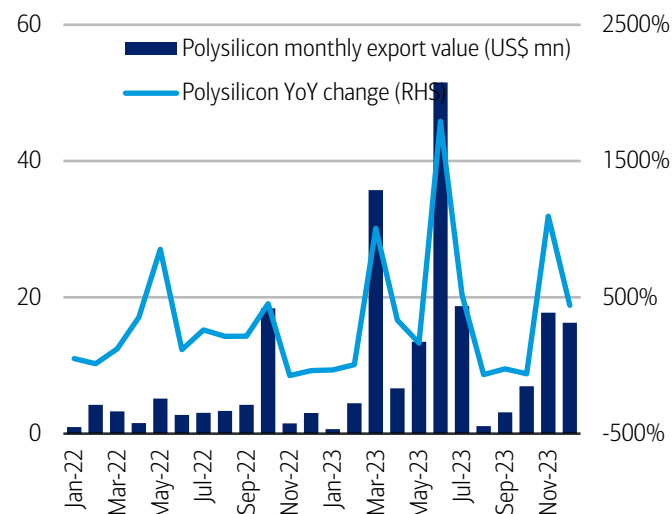


Source: BofA Global Research; China Customs

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**Exhibit 22: China polysilicon export value (US\$ mn) and YoY change**

Dec polysilicon export total value (US\$16mn) rose by 441% YoY

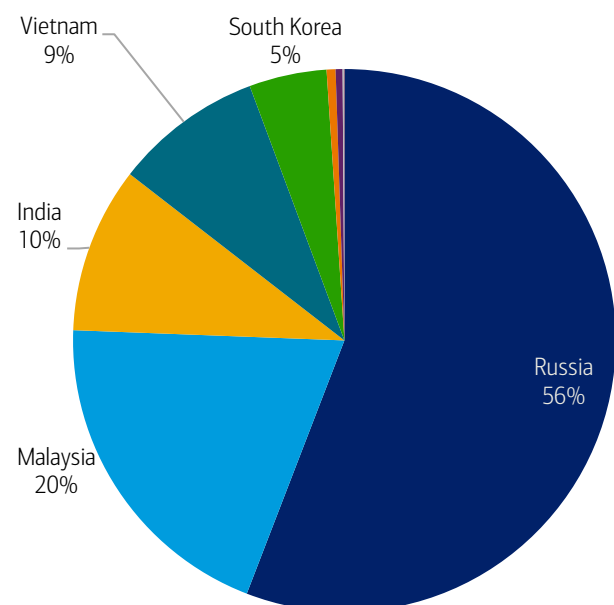


Source: BofA Global Research; China Customs

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**Exhibit 23: China Dec polysilicon exports by countries by values**

Top 3 of China's exporting countries accounted for 85% in Dec '23

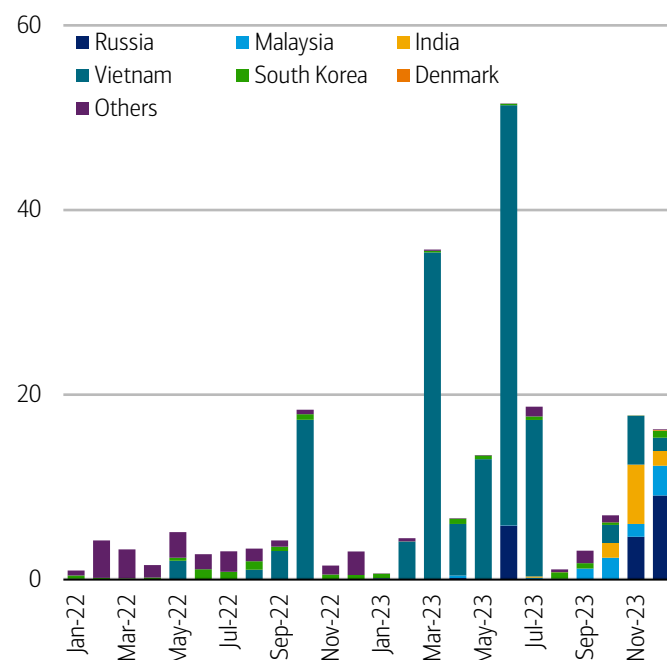


Source: BofA Global Research; China Customs

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**Exhibit 24: China's major polysilicon exporting countries historical share (US\$ mn)**

Vietnam led the exporting countries of China's polysilicon until Aug '23



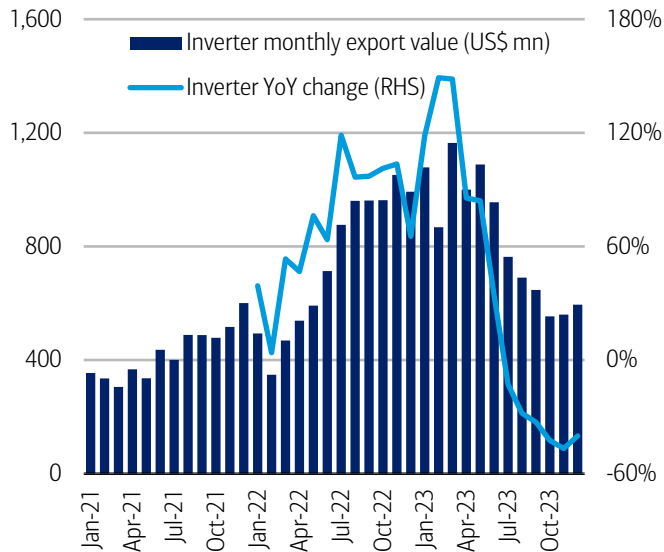
Source: BofA Global Research; China Customs

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## Inverter

### Exhibit 25: China inverter export value (US\$ mn) and YoY change

Dec inverter export total value (US\$595mn) declined by 40% YoY

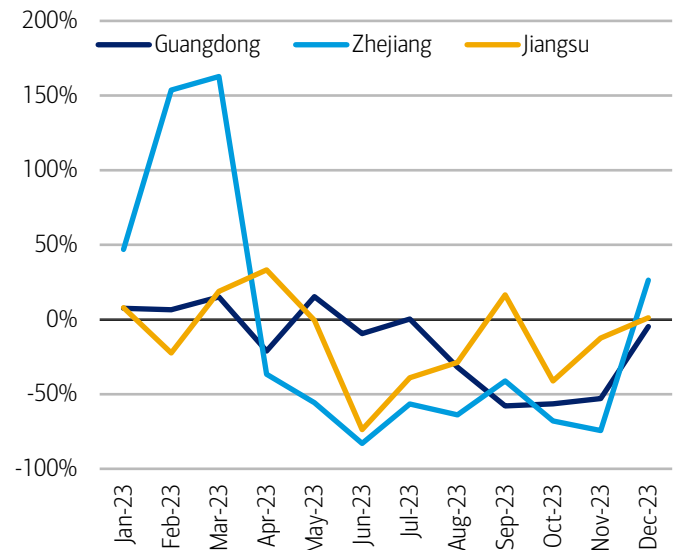


Source: BofA Global Research; China Customs

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### Exhibit 26: China inverter exports to US by origin province YoY change

Guangdong, Zhejiang, and Jiangsu account for 87% of Chinese Dec exports to the US

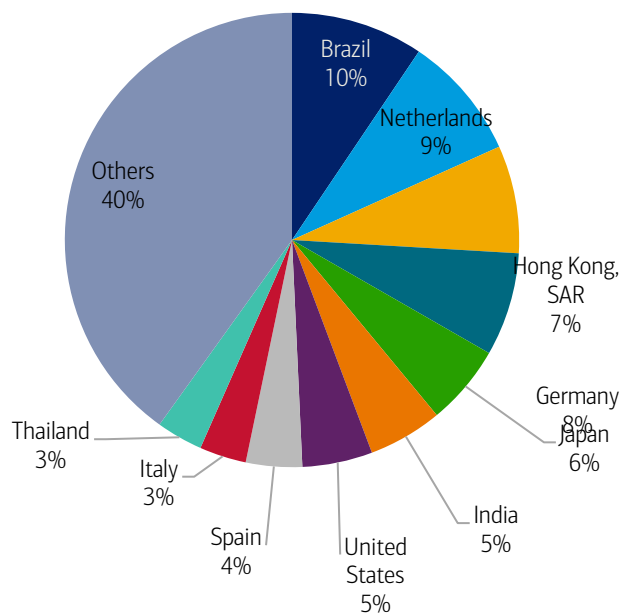


Source: BofA Global Research; China Customs

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### Exhibit 27: China Dec inverter exports by country

Top 5 of China's exporting countries accounted for 39% in Dec '23

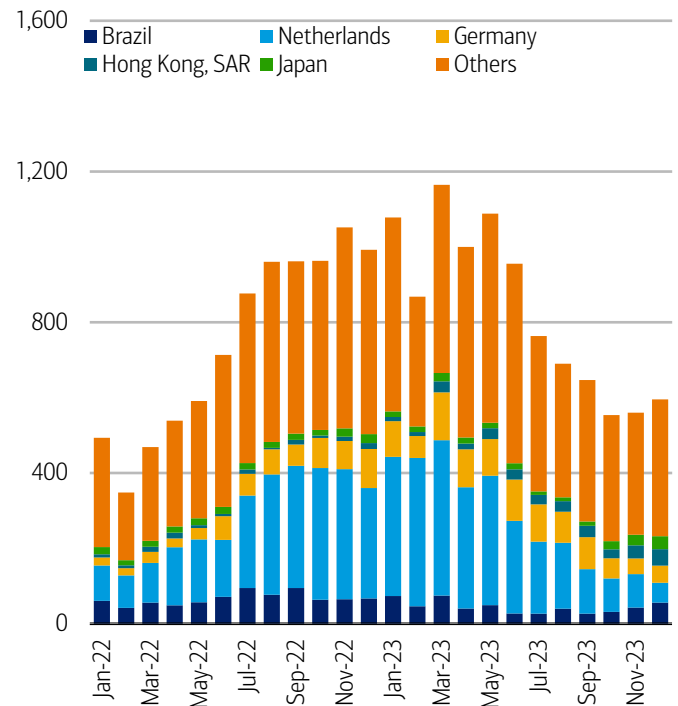


Source: BofA Global Research; China Customs

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### Exhibit 28: China's major inverter export value (US\$ mn) by destination

Netherlands -82% YoY in Dec, Germany -56%, Brazil -16%



Source: BofA Global Research; China Customs

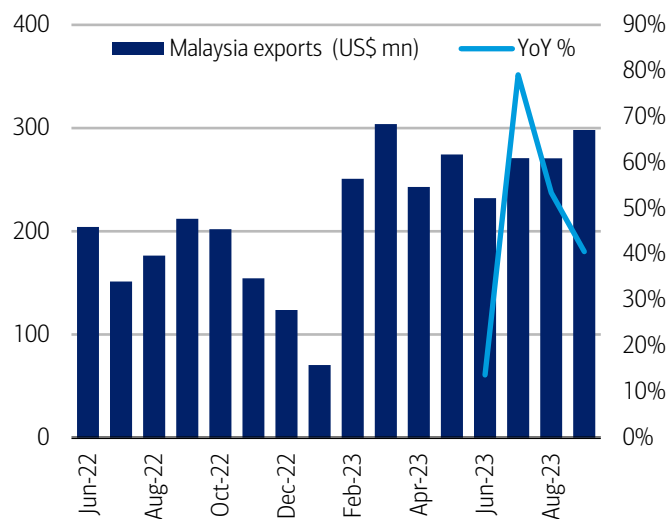
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# Southeast Asian solar export trends

## Exhibit 29: Malaysia monthly solar module exports (US\$ mn)

Malaysia solar module exports value (US\$298mn) rose by 41% YoY in Sept '23

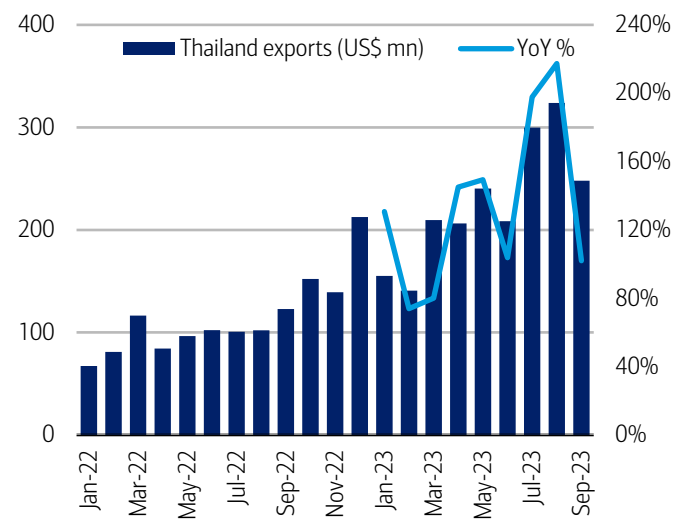


Source: BofA Global Research; ITC Trade Map

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## Exhibit 30: Thailand monthly solar module exports (US\$ mn)

Thailand solar module exports value (US\$248mn) increased by 102% YoY in Sept '23

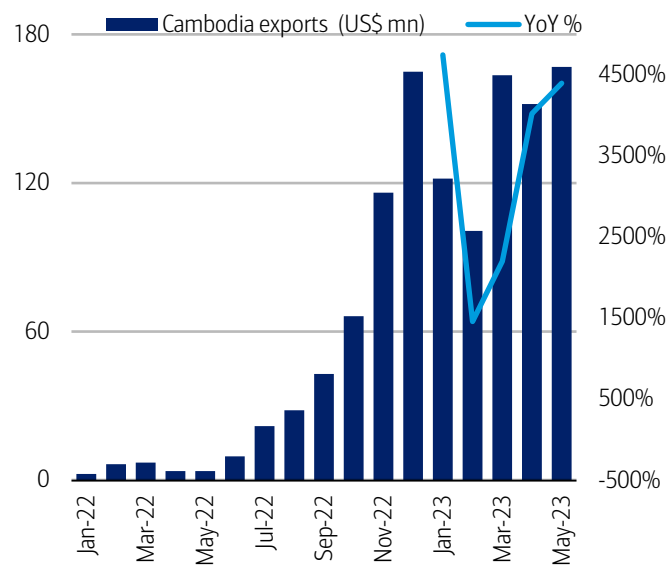


Source: BofA Global Research; ITC Trade Map

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## Exhibit 31: Cambodia monthly solar module exports (US\$ mn)

Cambodia solar module exports value (US\$167mn) surged more than 4000% YoY in May '23

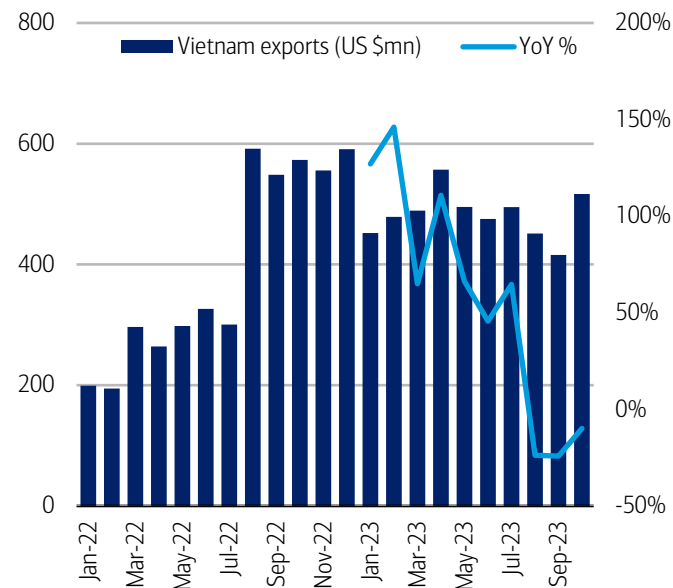


Source: BofA Global Research; ITC Trade Map

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## Exhibit 32: Vietnam monthly solar module exports (US\$ mn)

Vietnam solar module exports value (US\$517mn) fell 10% YoY in Oct '23



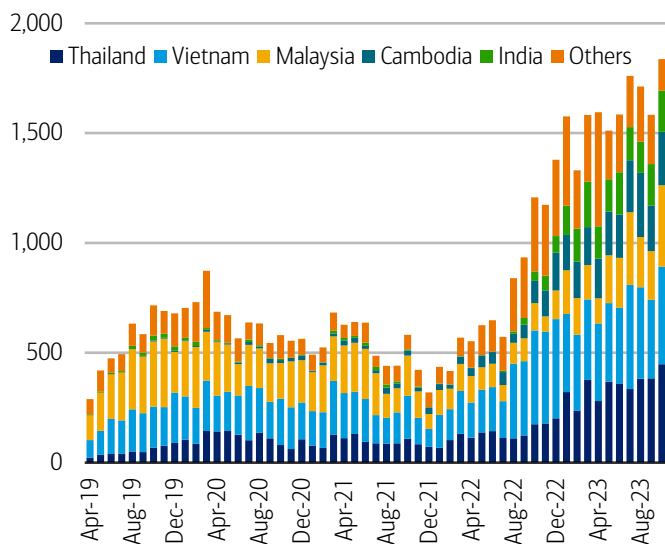
Source: BofA Global Research; ITC Trade Map

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## Other solar import trends

### Exhibit 33: US major solar module importing countries by values

US module imports rose 52% YoY in Oct; strong increase from Malaysia, Cambodia and India

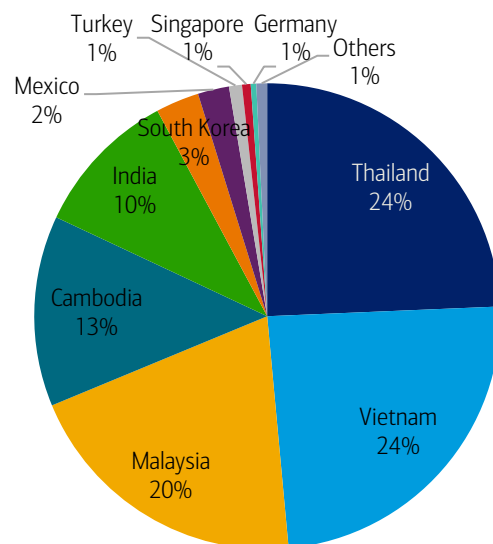


Source: BofA Global Research, ITC Trade Map

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### Exhibit 34: US Sept solar module imports by countries by values

Top 5 of US's importing countries accounted for 92% in Oct '23

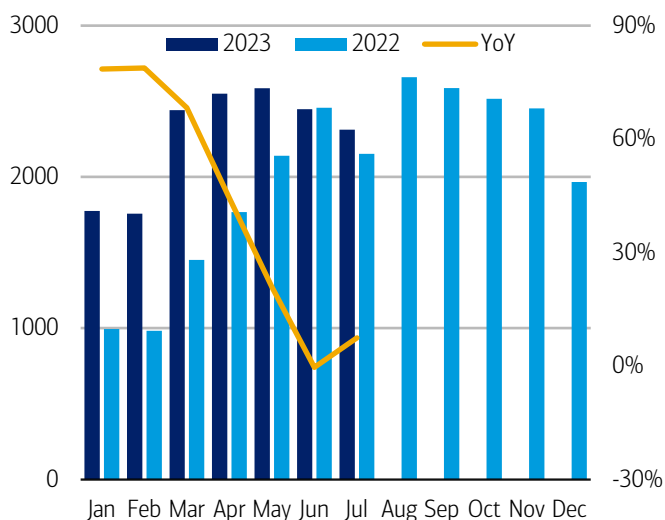


Source: BofA Global Research, ITC Trade Map

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### Exhibit 35: EU monthly solar cell and module imports (US\$ mn) and YoY change

EU solar cell and module imports value (US\$2.3bn) rose by 7% in Jul '23

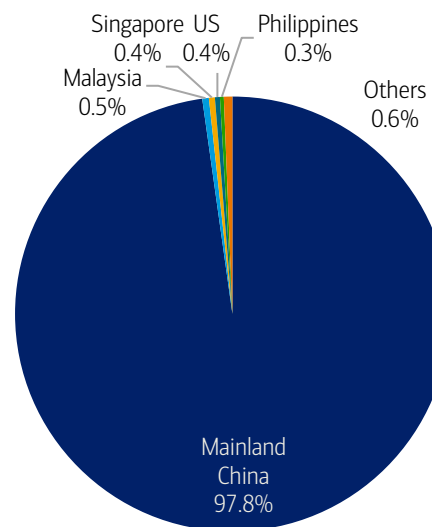


Source: BofA Global Research; BNEF

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### Exhibit 36: EU solar cell and module imports by exporter in 7M23

China accounted for c.98% of EU solar cell and module imports

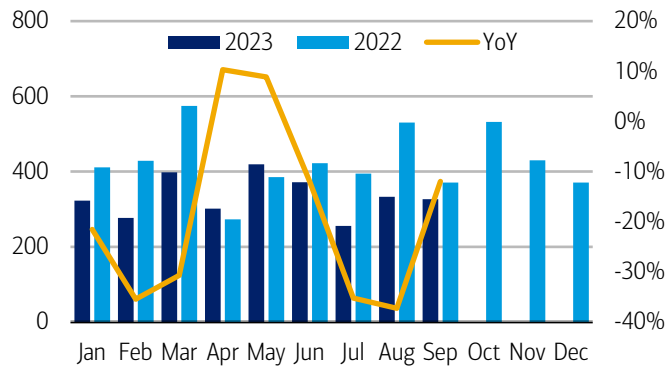


Source: BofA Global Research; BNEF

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**Exhibit 37: Brazil solar module imports (US\$ mn) and YoY change**

Brazil solar module imports value (US\$327mn) decreased by 12% YoY in Sept

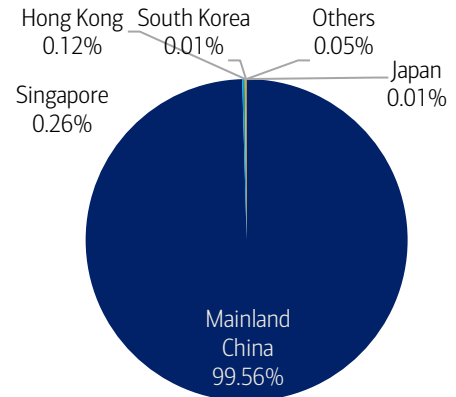


Source: BofA Global Research; BNEF

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**Exhibit 38: Brazil solar module imports by exporter in 9M23**

China accounted for c.99% of Brazil solar module imports

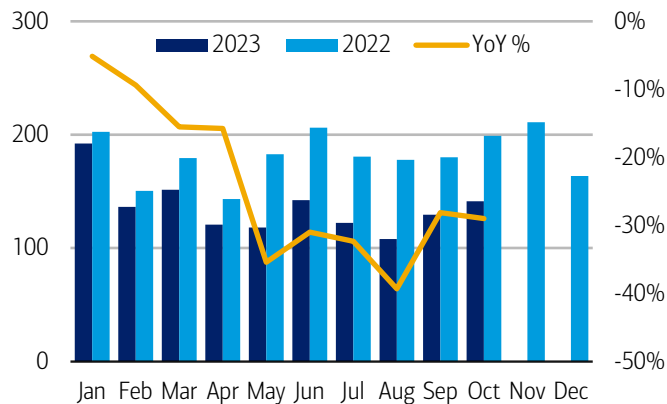


Source: BofA Global Research; BNEF

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**Exhibit 39: Japan solar module imports (US\$ mn) and YoY change**

Japan solar module imports value (US\$141mn) fell -29% YoY in Oct

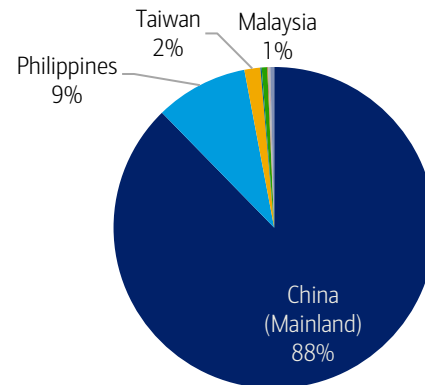


Source: BofA Global Research; ITC Trade Map

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**Exhibit 40: Japan solar imports by exporter in 10M23**

China accounted for c.90% of Japan solar imports

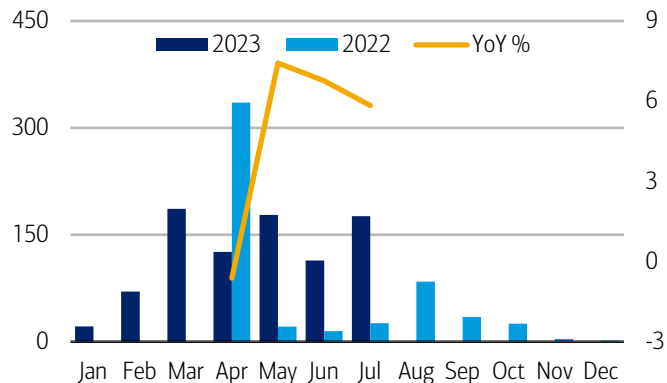


Source: BofA Global Research; ITC Trade Map

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**Exhibit 41: India solar module imports (US\$ mn) and YoY change**

India solar module imports value (US\$176mn) +584% YoY in Jul

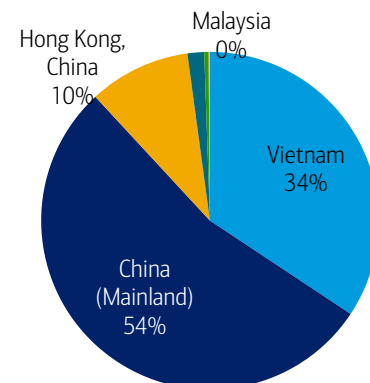


Source: BofA Global Research; ITC Trade Map

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**Exhibit 42: India solar imports by exporter in 7M23**

China accounted for 54% of India solar imports



Source: BofA Global Research; ITC Trade Map

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