

Support to the Solar Industry Outside of Europe

When the Sun Influences Industrial
Policies

Thibaud Voïta, OFATE, June 6th, 2023

Outline

The global solar market: where do we stand?

How did we get there? China's industrial policies

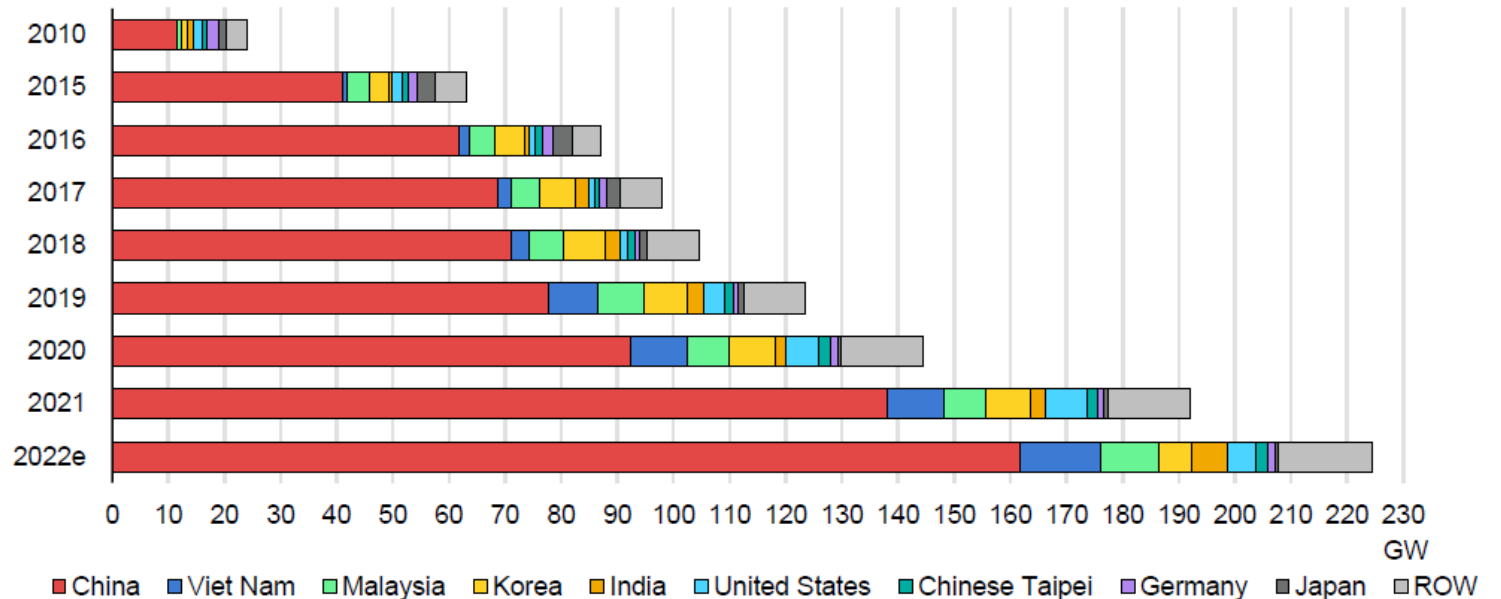
Where do we go there: policies in India and in the USA

Some of the Implications for Europe

China wrote the history of the solar industry

- China opened its first PV cell production line in 2002, with a 10 MW capacity
- It began exporting PV cells to Europe in 2004
- Now, its share in all the manufacturing stages of solar panels exceeds 80%.
- It is home to the world's 10 top suppliers of solar PV manufacturing equipment

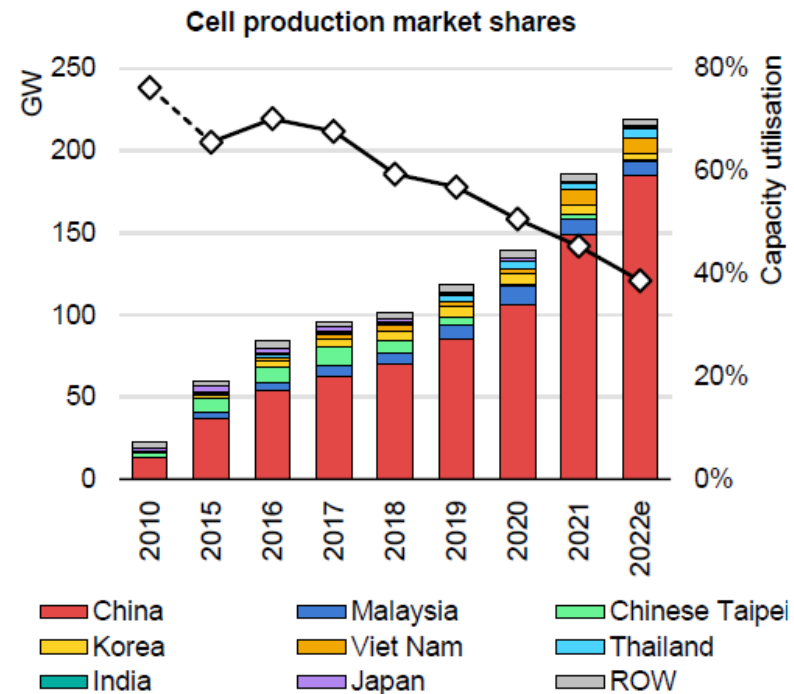
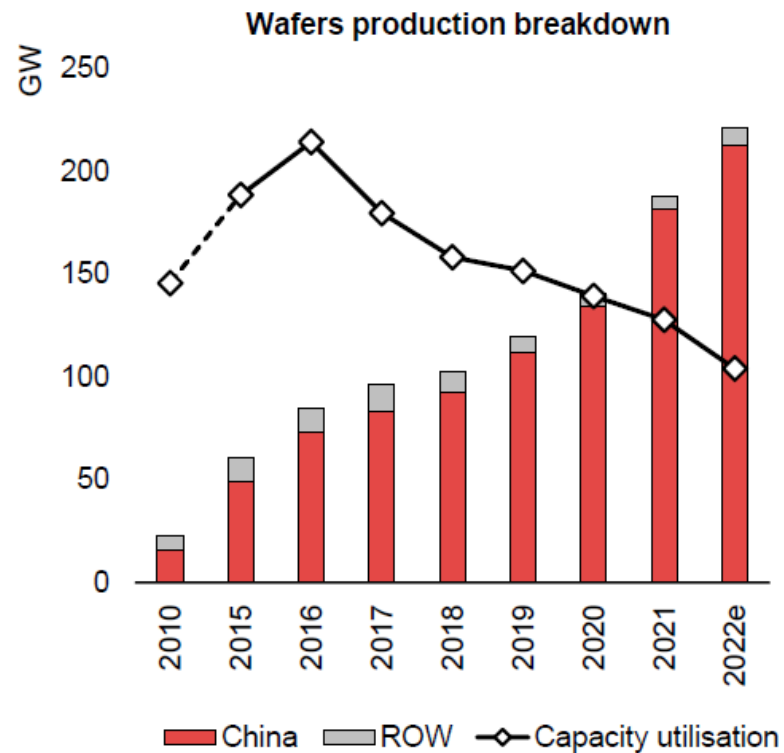
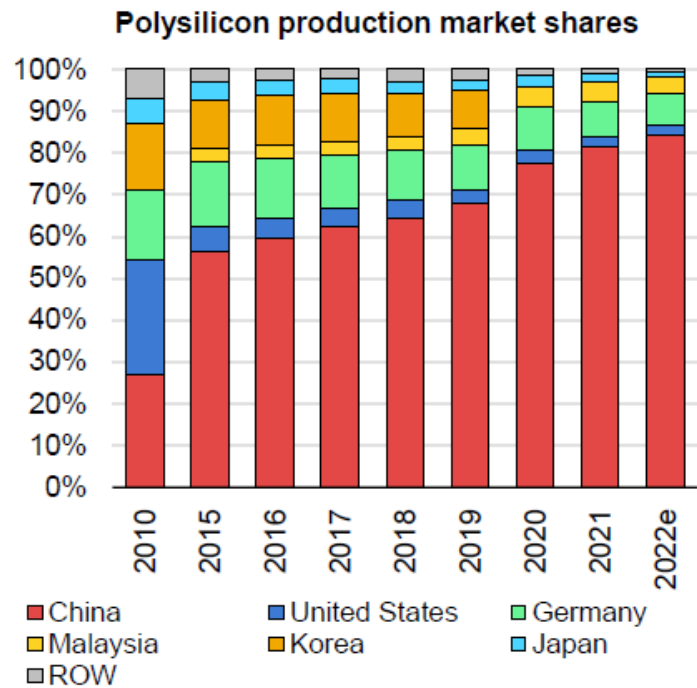
Global solar PV module production, 2010-2022



Notes: ROW = rest of world. Values for 2022 are estimates.

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Source: IEA analysis based on BNEF (2022a), IEA PVPS, SPV Market Research, RTS Corporation and PV InfoLink.



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Conclusion: Some of the Implications for Europe

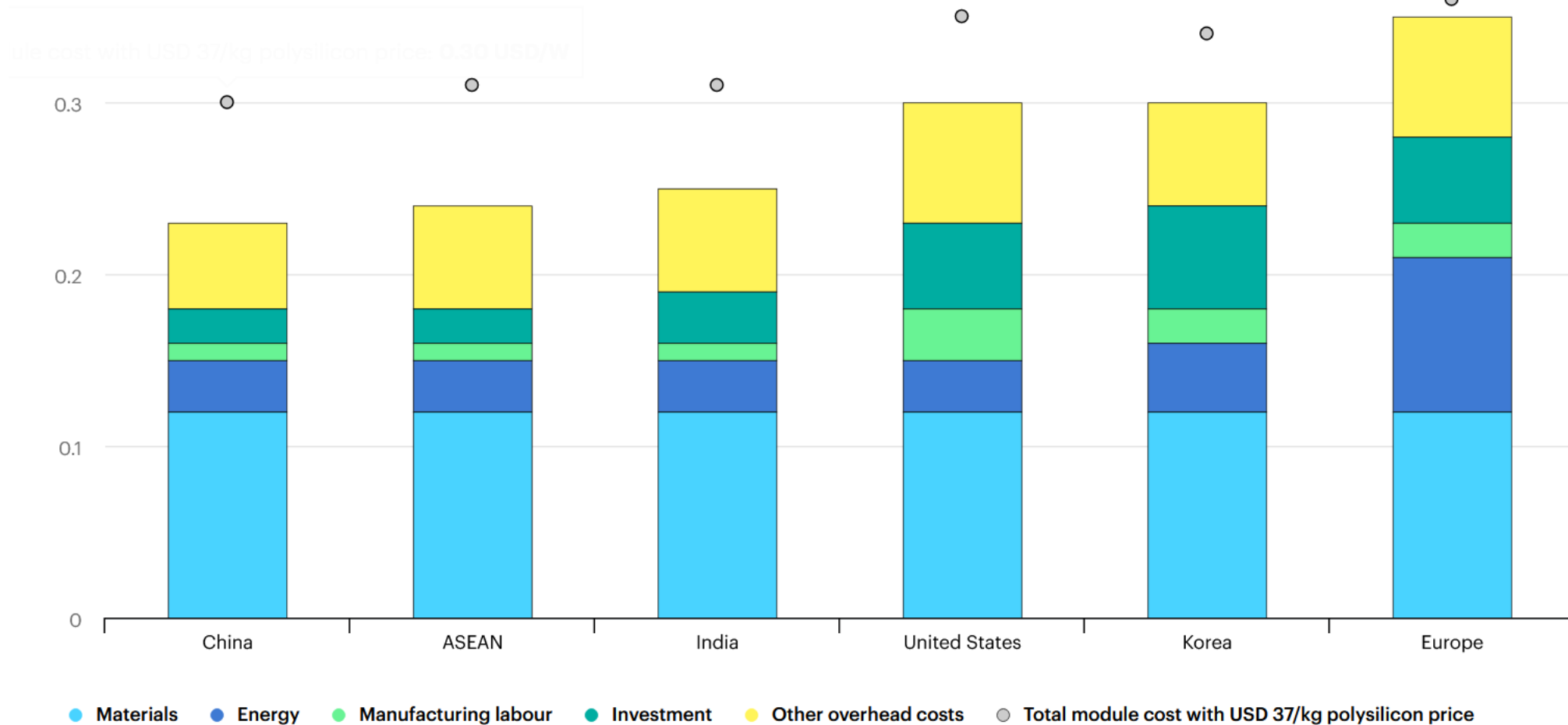
A tale of irrational exuberance?

- PV cell production steadily increased in the 2000s
- However, demand dropped in 2008 (crisis) leading the government to subsidize solar companies through its 2008 stimulus package
- National support later also included:
 - The USD 3 billion Golden Sun Project leading to massive wasted investments & scams
 - Feed-in-tariff
- The removal of subsidies really started in 2018

During most of its history, China's solar PV industry was not profitable

As a result, production costs in China are the lowest in the world...

Total manufacturing costs for mono PERC c-Si solar components by input, 2022 (IEA)



China has shaped the global supply, demand and price of solar PV

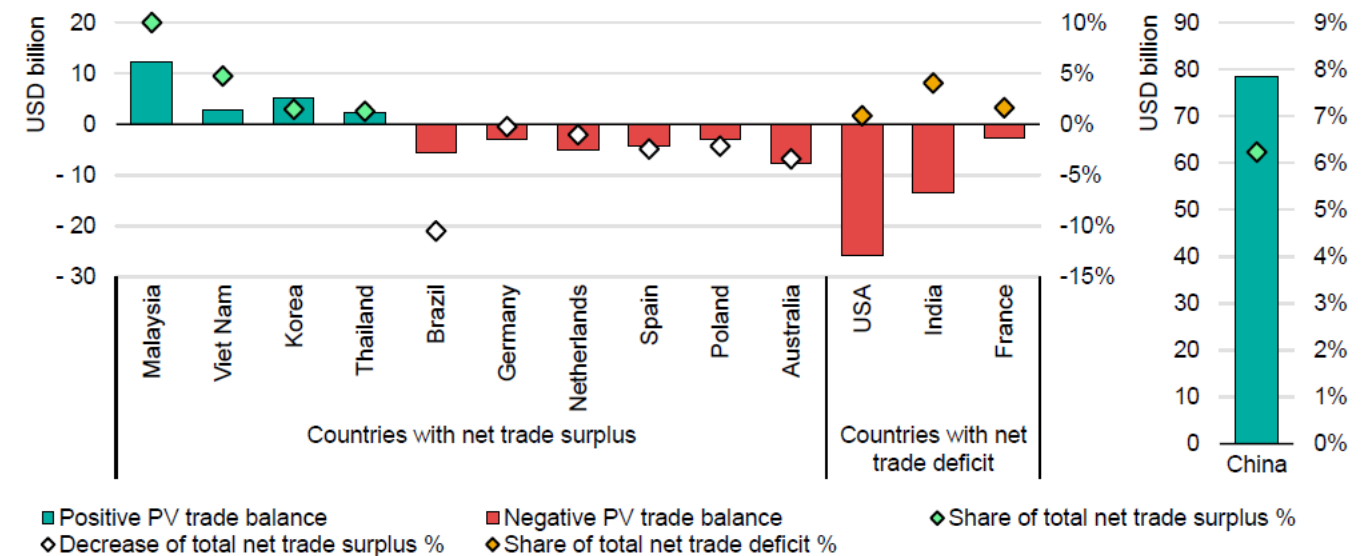
- ... through economies of scale, and continuous innovation throughout the supply chain.
- Cost declined by >80%, PV became the most affordable electricity generation tech in many parts of the world.
- Investments in Malaysia and Viet Nam also made them, major exporters of PV products, accounting for around 10% and 5% respectively of their trade surpluses since 2017.
- Emission intensity of solar PV manufacturing has been halved since 2011.

(source: IEA)

... and Solar PV has become a major trade issue

- In 2021, the value of China's solar PV exports was USD 30+ billion, almost 7% of China's trade surplus over the last five years.
- The total value of global PV-related trade – including polysilicon, wafers, cells, and modules – exceeded USD 40 billion in 2021, an increase of over 70% from 2020.

Cumulative PV-grade polysilicon, wafer, cell and module trade balances, and national net trade balances in goods and services for major PV exporters and importers, 2017-2021



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Notes: CAB = current account balance

Source: IEA analysis based on BNEF (2022a), IEA PVPS, SPV Market Research, RTS Corporation, PV InfoLink, UN Comtrade, OECD and World Bank.

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India: a missed opportunity?

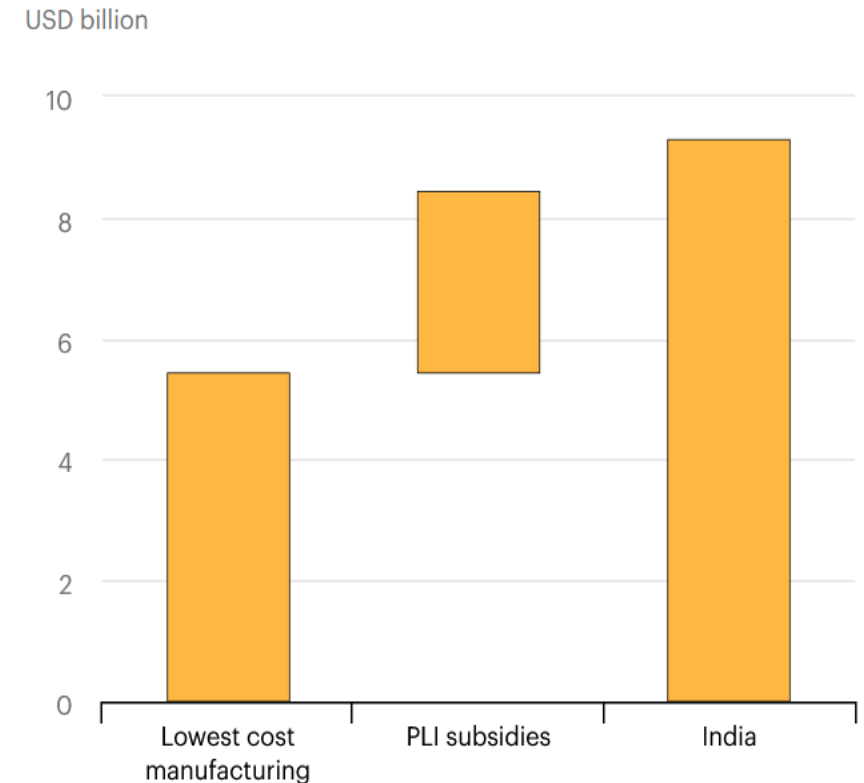


- The Indian national and state governments set up a series of incentives to develop solar energy:
 - National Solar Mission,
 - Competitive bidding
 - Concessional loans by local states
 - The International Solar Alliance
 - RE Certificates
 - Subsidies for rooftop solar that could cover up to 30% of the costs
- Most of the subsidies phased out by 2017, until the PLI

Will the Production Linked Incentive relocate the industry?

- The PLI includes high-efficiency solar PV modules with a USD 0.8 billion budget
- It closes 80% of the investment cost gap with China.
- Tranche II was announced in March, with the objective of 48 GW of domestic Solar Module manufacturing capacity to be added in 3 years
- Import duties increased from 15% to 40% for PV modules and to 25% for cells
- So far, only manufacturers received subsidies to produce PV modules

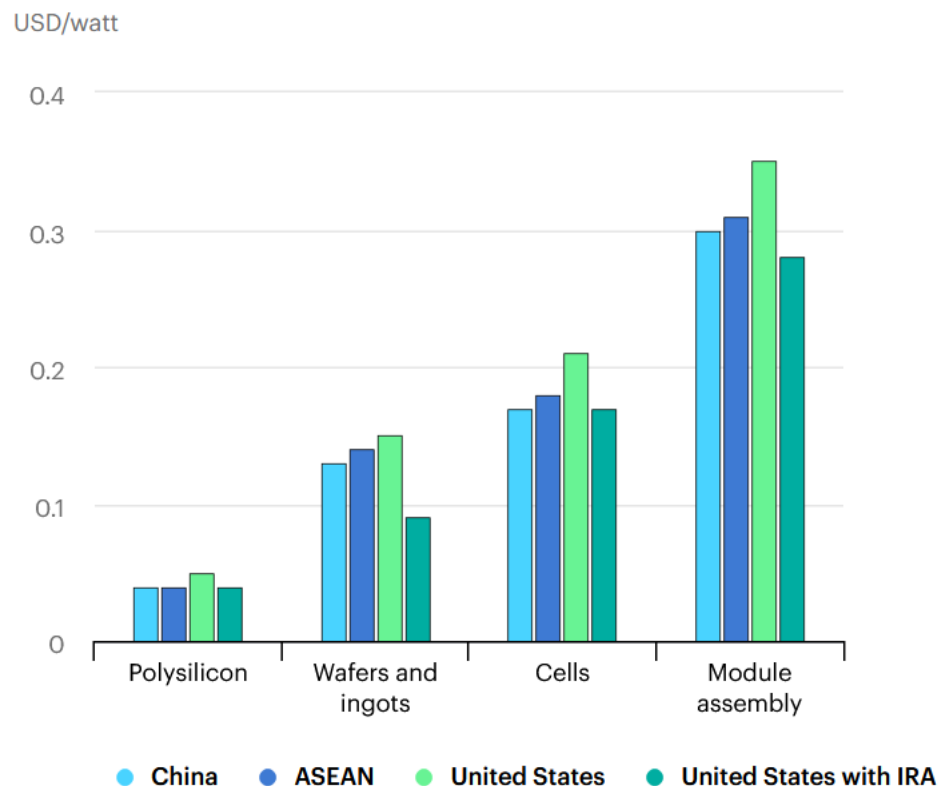
India PLI subsidies and investment cost difference with lowest cost manufacturing (IEA)



Will the IRA be enough for the USA to compete with China?



United States c-Si manuf. costs with & without IRA, compared to China and ASEAN (IEA)



- Under the 2022 Investment Reduction Act, US solar developers can claim new subsidies for facilities built in the US
 - 30% of tax credits for RE facilities
 - Additional 10% off if the project use domestic content
- Other measures aim at:
 - creating a strong solar work force,
 - blocking materials because of Human Right Violation concerns

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Why is the solar industry so important?

- It used to be a new technology frontier, and China took full advantage of it
- Solar energy is crucial to meet the Paris Agreement targets (among other benefits)
- It has important trade implications
- It generates jobs, potentially for lower-income populations, and as such is crucial for just energy transitions
- It strengthens energy security

China's leadership won't be challenged until 2025 at least

- China's share of global polysilicon, ingot and wafer production will soon reach almost 95%.
- Trade restrictions are expanding, risking slower deployment of solar PV.
 - Since 2011, the number of antidumping, countervailing and import duties levied against parts of the solar PV supply chain has increased from just 1 import tax to 16 duties and import taxes, with 8 additional policies under consideration.
 - Altogether, these measures cover 15% of global demand outside of China.
- Currently, the cost competitiveness of existing solar PV manufacturing is a key challenge to diversifying supply chains.

(IEA)

Can trade policies water down the EU's ambitions?

- The CBAM:
 - Can lead to higher costs for glass, aluminum, and silicon
 - May negatively affect the competitiveness of solar power vs. power from fossil fuels, as it leads to lower demand for carbon allowances under the EU-ETS and thus lower prices for fossil-based electricity (Solar Power Europe)
- What if China introduces export controls and bans tech to process silicon wafers?

Thank you for your attention!