Utilities

IEA insights on renewables

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The IEA recently released a report on the global renewal energy market. The key takeaways from it include: The world over, capacity build-up in the renewable (RE) technology manufacturing value chain is still strong; this bodes well for cost advantages and generation capacity additions; The dominance of China in the supply chain is likely to continue, particularly in polysilicon manufacturing; and Investments in wind power and transmission grid are poised for a major traction, to address variability and increasing curtailment of RE generation.

- RE capacity additions to gather momentum: Global renewable capacity additions are set to soar by 107GW, the largest absolute increase ever, to more than 440GW in 2023 driven by expanding policy support, growing energy security concerns and improving competitiveness against fossil fuel alternatives. Within renewables, onshore wind capacity additions are on course to rebound by 70% in 2023 to 107GW, a record after 2 years of stress.

- China continues to dominate the RE supply chain: The manufacturing capacity in China increased by 40-50% for wafers, cells and modules; in polysilicon, it almost doubled in 2022 and is expected to further double by 2024. Given the large mismatches in the solar PV manufacturing value chain coming up across US, Europe and India, the new plants will need to import cells and other components from China.

- India to experience a real deployment boom beyond 2025: India's renewable capacity additions are expected to incrementally increase again in 2023 and 2024 owing to faster onshore wind, hydropower and distributed solar PV deployment. The Indian market should experience a real deployment boom beyond 2025, with higher auction volume, domestic manufacturing capacities and lower prices.

- RE industry's financial health is improving: The demand for solar PV cells/modules is not expected to grow as quickly as supply in the short term, leaving capacity utilisation of all manufacturing segments relatively low. Given protectionist trade policies, growing demand, falling commodity prices and proven resilience of the industry, the outlook for the financial health of the renewable energy industry is bright.

- RE cost trend remains uncertain: The average LCOE for utility-scale PV and wind could be 10-15% higher in 2024 than it was in 2020 due to the higher cost of capital, which can annul gains from softening commodity prices. Nevertheless, continued innovation is expected to reduce cost further, improving competitiveness even with existing fossil fuel-fired plants.

- Global RE manufacturing capacity adequate to meet Net Zero demand in 2030: Global solar PV manufacturing capacity is expected to reach almost 1,000GW in 2024 from 450GW in 2022, adequate to meet the annual IEA Net Zero target of ~650GW in 2030 (w.r.t the IEA's Net Zero by 2050 objective). However, wind equipment manufacturing continues to expand more slowly, such that it may not be able to keep pace with demand growth under the Net Zero scenario through 2030.

- Increasing shares of wind and solar PV generation calls for investment in the grid: As the penetration of variable renewable energy (VRE) increases, the share of curtailed RE generation is also on the rise in many markets, largely due to inadequate grid infrastructure. China's large-scale investment in grid infrastructure (USD 75bn on average per year since 2010) has significantly reduced VRE curtailment, decreasing it from 16% in 2012 to less than 3% last year.

Led by solar PV, renewable power growth is surging – driven by the global energy crisis and policy momentum

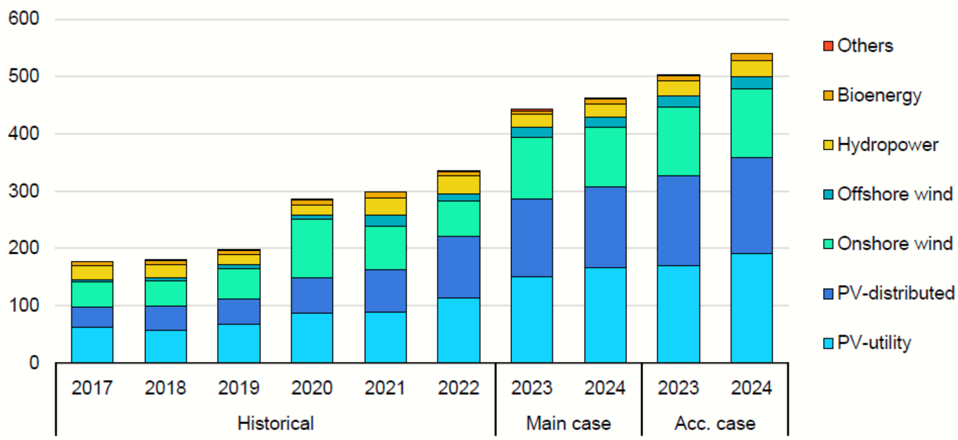
The International Energy Agency (IEA) recently came out with an update on the renewable energy market that looks at market and policy developments in 2022 and updates its outlook for 2023 and 2024. We have captured some findings of the report that have a broader impact on global energy transition, particularly India's renewables story.

Is the momentum of renewable capacity addition tapering?

Global renewable capacity additions are set to soar by 107GW, the largest absolute increase ever, to more than 440GW in 2023. This unprecedented growth is being driven by expanding policy support, growing energy security concerns and improving competitiveness against fossil fuel alternatives.

Within renewables, onshore wind capacity additions are on course to rebound by 70% in 2023 to 107GW, a record after 2 years of stress. IEA expects onshore wind to rebound strongly in 2023 compared with last year. In wind, China is expected to expand onshore and offshore manufacturing facilities by almost 20% by 2025, especially offshore wind.

Exhibit 1. Net renewable capacity additions by historical, main & accelerated cases (GW)



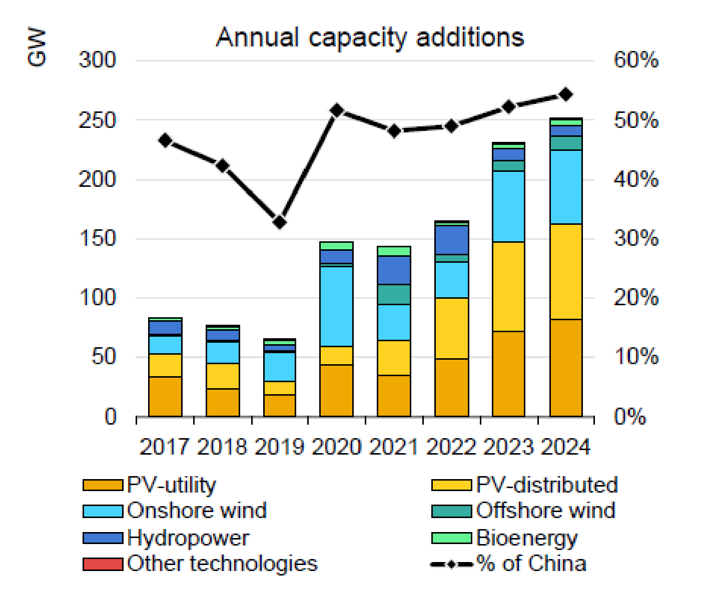
Source: IEA, JM Financial

How long will China dominate the renewable supply chain?

In 2022, global solar PV manufacturing capacity increased by over 70% to ~450GW, with China accounting for over 95% of new facilities throughout the supply chain.

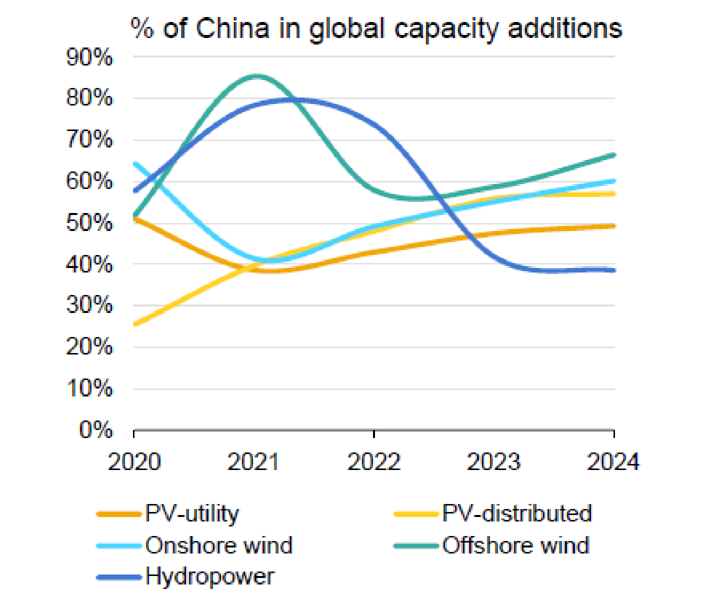
The manufacturing capacity in China increased by 40-50% for wafers, cells and modules and almost doubled for polysilicon. Further, China is expected to double its PV manufacturing capacity again by the end of 2024, significantly swelling the supply glut.

Exhibit 2. China net renewable capacity additions (2017-2024)



Source: IEA, JM Financial

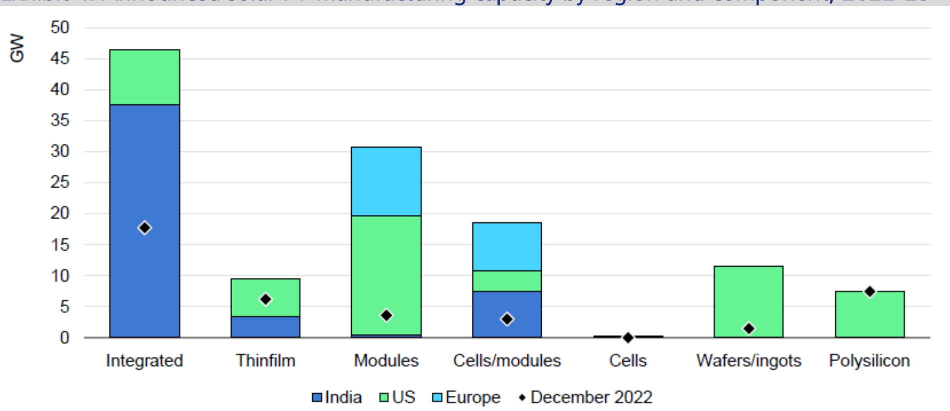
Exhibit 3. China's share in global deployment (2017-2024)



Source: IEA, JM Financial

Governments in the United States, Europe and India are promoting domestic solar PV supply chain diversification through various policy measures that have the potential to create national PV supply chains with over 20GW of capacity in each region.

Exhibit 4. Announced solar PV manufacturing capacity by region and component, 2022-23



Source: IEA, JM Financial

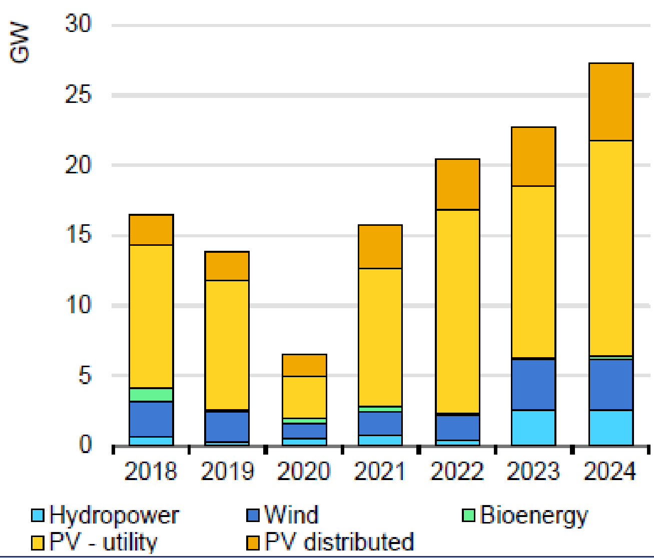
However, there are many large mismatches in the whole solar PV value chain - polysilicon, ingots, cells, and modules. Nearly 80% of the proposed integrated manufacturing plants (which produce three or more components) do not include dedicated polysilicon production facilities. These new plants will, therefore, still need to import cells and other components from China.

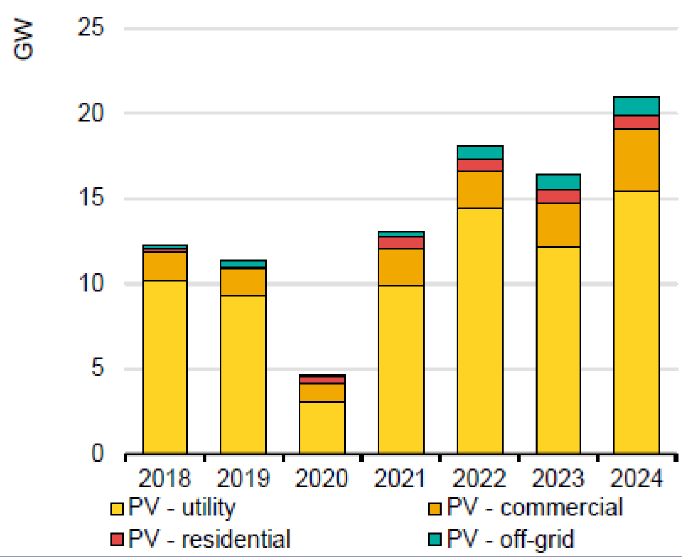
China is expected to continue its dominant position in the renewable supply chain.

Will India's renewable energy deployment boom in 2023 and 2024?

India's renewable capacity additions are expected to increase again in 2023 and 2024 owing to faster onshore wind, hydropower and distributed solar PV deployment. However, annual additions for utility-scale projects, India's largest renewable electricity growth segment, are expected to slow briefly this year due to supply chain challenges, preventing renewable energy growth from truly booming in the short term. In 2022, India's utility-scale solar PV capacity additions (made up mainly of capacity awarded in auctions) reached a record-breaking 14GW, accounting for over two-thirds of renewable energy growth in the country. The Indian market should experience a real deployment boom beyond 2025, with higher auction volume and lower prices.

Exhibit 5. India net renewable capacity additions by technology, 2018-2024





Source: IEA, JM Financial

Is the renewable energy industry's financial health improving?

The renewable energy industry has demonstrated remarkable financial resilience amidst the challenges posed by energy security concerns, volatile commodity prices, supply chain constraints and trade measures.

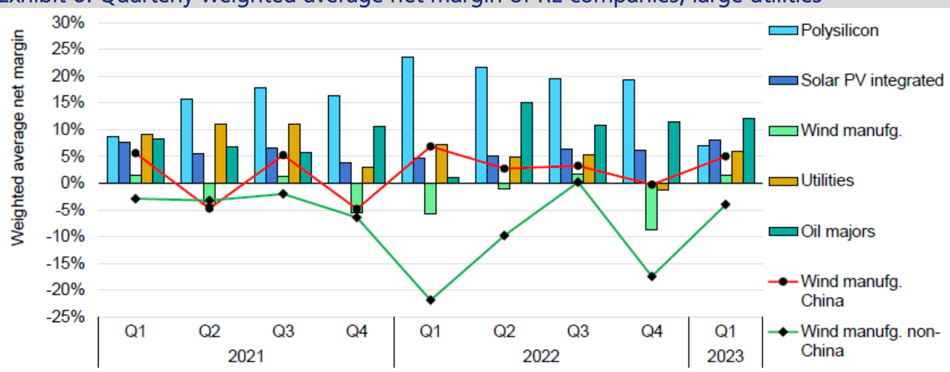
The demand for solar PV cells/modules is not expected to grow as quickly as supply in the short term, keeping capacity utilisation in all manufacturing segments relatively low. In the past, this situation has led to negative margins for the industry but did not result in major bankruptcies for Chinese manufacturers.

Going forward, the new manufacturing investments in India, the United States and Europe are expected to create excess supply, making it challenging to sustain profitability in the long term.

Wind equipment manufacturers are expected to benefit from lower commodity, electricity and freight prices, which could improve their margins as demand expands in the short term.

Given protectionist trade policies, growing demand, falling commodity prices and proven resilience of the industry, the outlook for the financial health of the renewable energy industry is bright.

Exhibit 6. Quarterly weighted average net margin of RE companies, large utilities

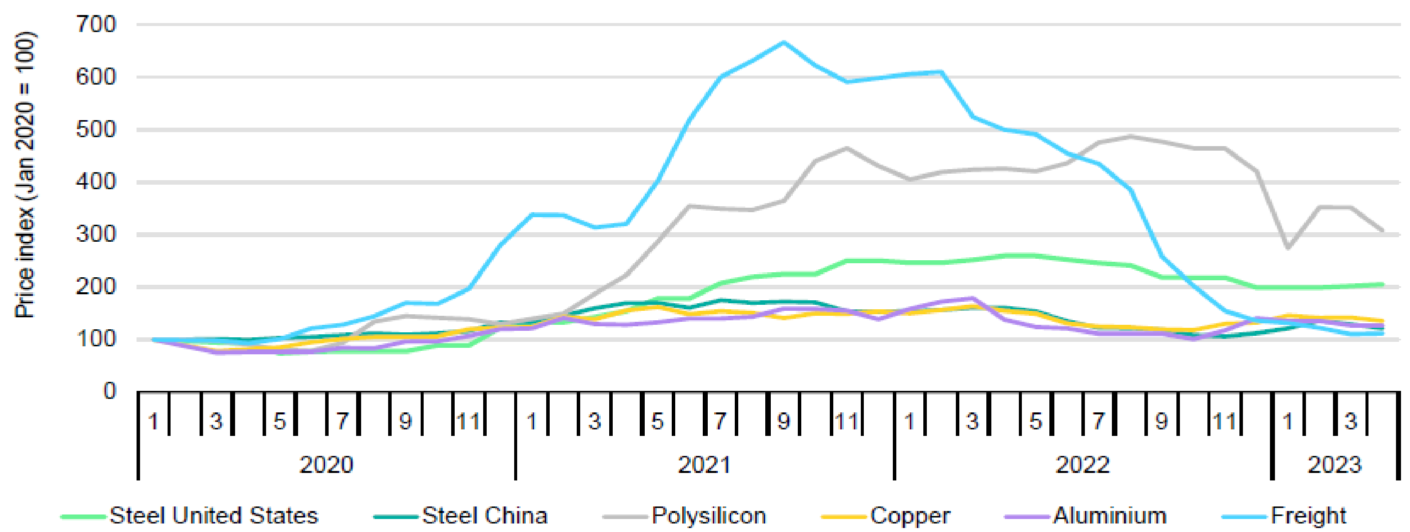


Source: IEA, JM Financial

Will solar PV and wind costs finally begin to fall again in 2023 and 2024?

In 2023, commodity prices have fallen significantly below their peaks, but they remain elevated compared with 2020.

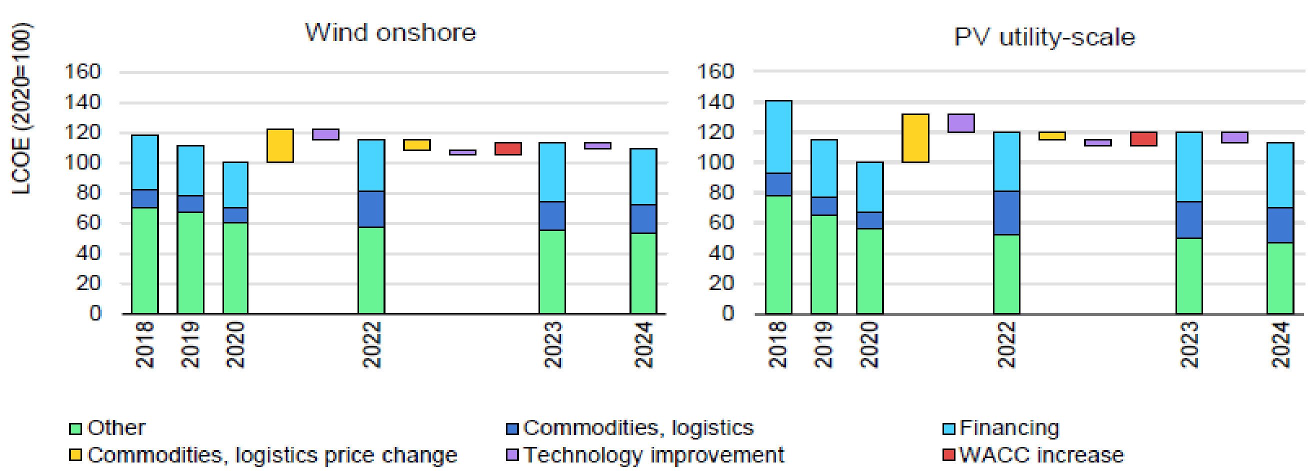
Exhibit 7. Monthly commodity and freight price indexes, 2020-2023



Source: IEA, JM Financial

Electricity generation cost from new utility-scale onshore wind and solar PV plants is expected to decline by 2024, but not rapidly enough to fall below pre-Covid-19 values in most markets outside China.

Exhibit 8. Solar PV and wind LCOE index based on average annual input costs, 2018-2024



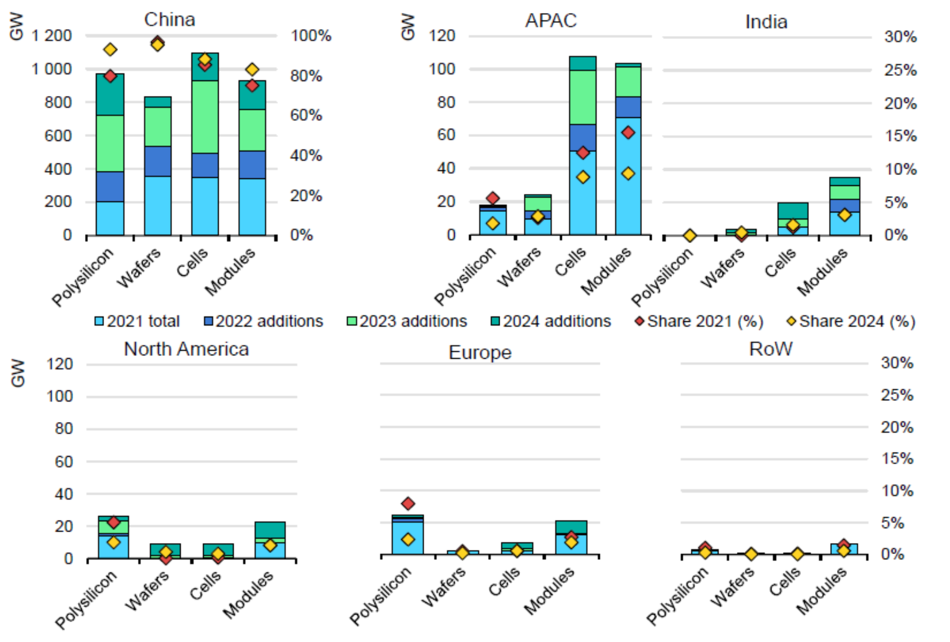
Source: IEA, JM Financial

The higher cost of capital could offset most of the cost decreases resulting from lower commodity prices and further technological innovation in the next 2 years. Consequently, the average LCOE for utility-scale PV and wind could be 10-15% higher in 2024 than it was in 2020. Nevertheless, continued innovation is expected to reduce cost further, improving competitiveness even with existing fossil fuel-fired plants.

Will global solar PV and wind technology manufacturing capacity be adequate to meet Net Zero demand in 2030?

Global solar PV manufacturing capacity is expected to reach almost 1,000GW in 2024 from 450GW in 2022, adequate to meet the the annual IEA Net Zero target of ~650GW in 2030 (w.r.t the IEA's Net Zero by 2050 objective). However, wind equipment manufacturing continues to expand more slowly, such that it may not be able to keep pace with demand growth under the Net Zero scenario through 2030. While China will dominate global wind and solar PV manufacturing capacity in the short term, PV project announcements indicate supply chain diversification.

Exhibit 9. Solar PV manufacturing capacity by region and component, 2021-2024



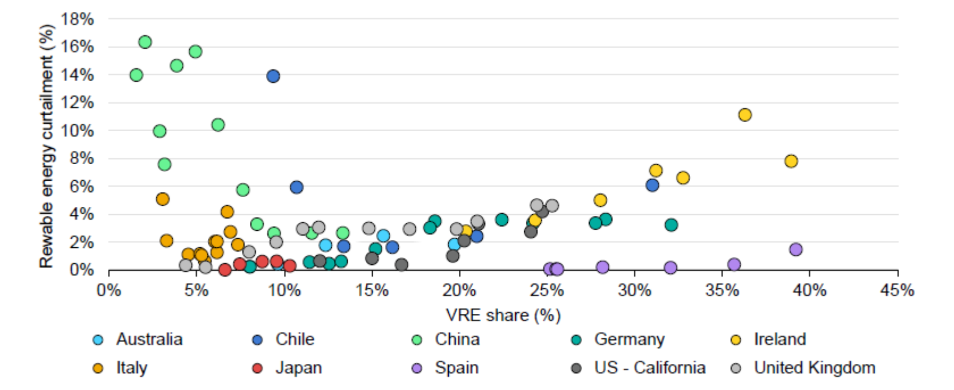
Source: IEA, JM Financial

Do higher shares of wind and solar PV generation always imply more curtailment?

How important is the investment in grid infrastructure?

Inadequate investment in grid infrastructure remains a challenge worldwide not only for faster growth in new wind and solar PV capacity but also for maximising generation potential from existing power plants. As the penetration of VRE increases, the share of curtailed wind and solar PV generation is also on the rise in many markets. This trend is particularly evident in areas where major grid infrastructure investments and/or advanced market design and regulation are not keeping pace with VRE deployment.

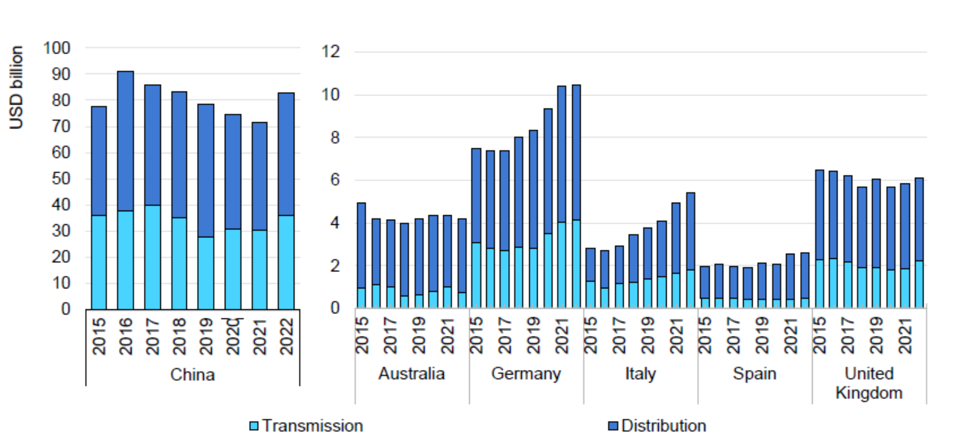
Exhibit 10. VRE shares in generation and technical curtailment for selected countries



Source: IEA, JM Financial

China's large-scale investment in grid infrastructure (USD 75bn on average per year since 2010) has significantly reduced VRE curtailment, decreasing it from 16% in 2012 to less than 3% last year. During this period, China increased the interconnection capacity between wind and solar resource-rich northern and north-western provinces to load centres in the southern and eastern regions.

Exhibit 11. Investment in transmission and distribution grids for selected countries

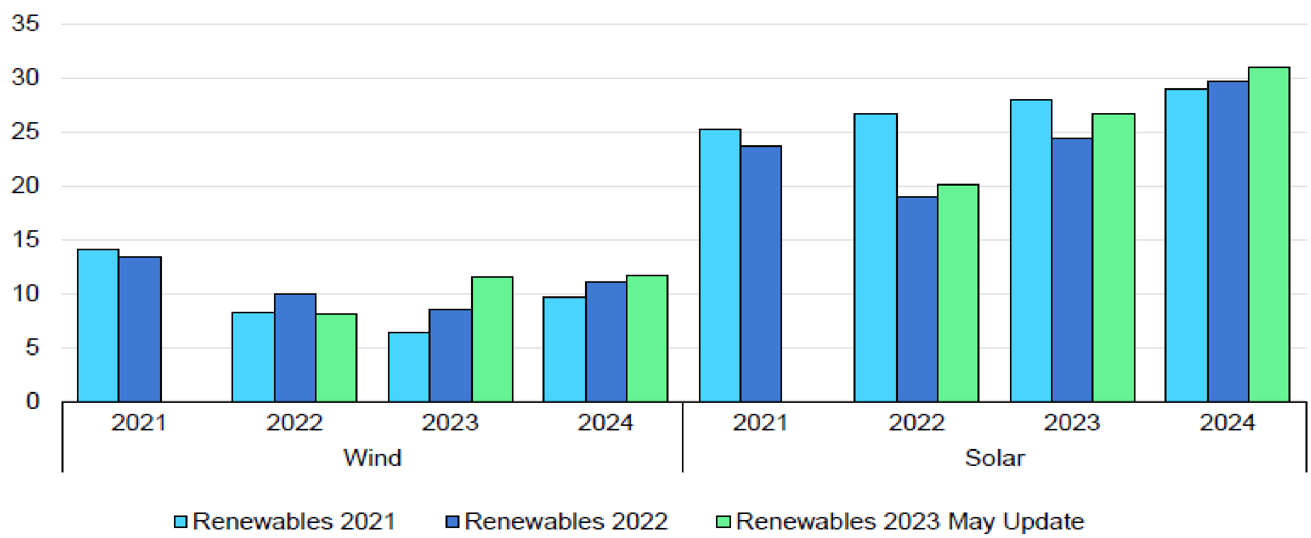


Source: IEA, JM Financial

Will the US Inflation Reduction Act impact wind and PV deployment in the short term?

For both solar PV and wind projects, long-term tax incentives under the IRA are a game-changer. Under the Act, solar PV projects are eligible for production credit if construction begins before 2025. Hence, the IRA's impact will become visible mainly beginning in 2025. The resultant increase in demand for renewable energy is likely to place greater pressure on permitting, transmission and distribution grids, and supply chains.

Exhibit 12. Net solar PV and wind capacity addition in the US by year, 2021-24 (GW)



Source: IEA, JM Financial

APPENDIX I

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* REIT refers to Real Estate Investment Trusts.

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