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**The global energy transformation and China's growing dominance of solar and storage manufacturing, technology and deployments**

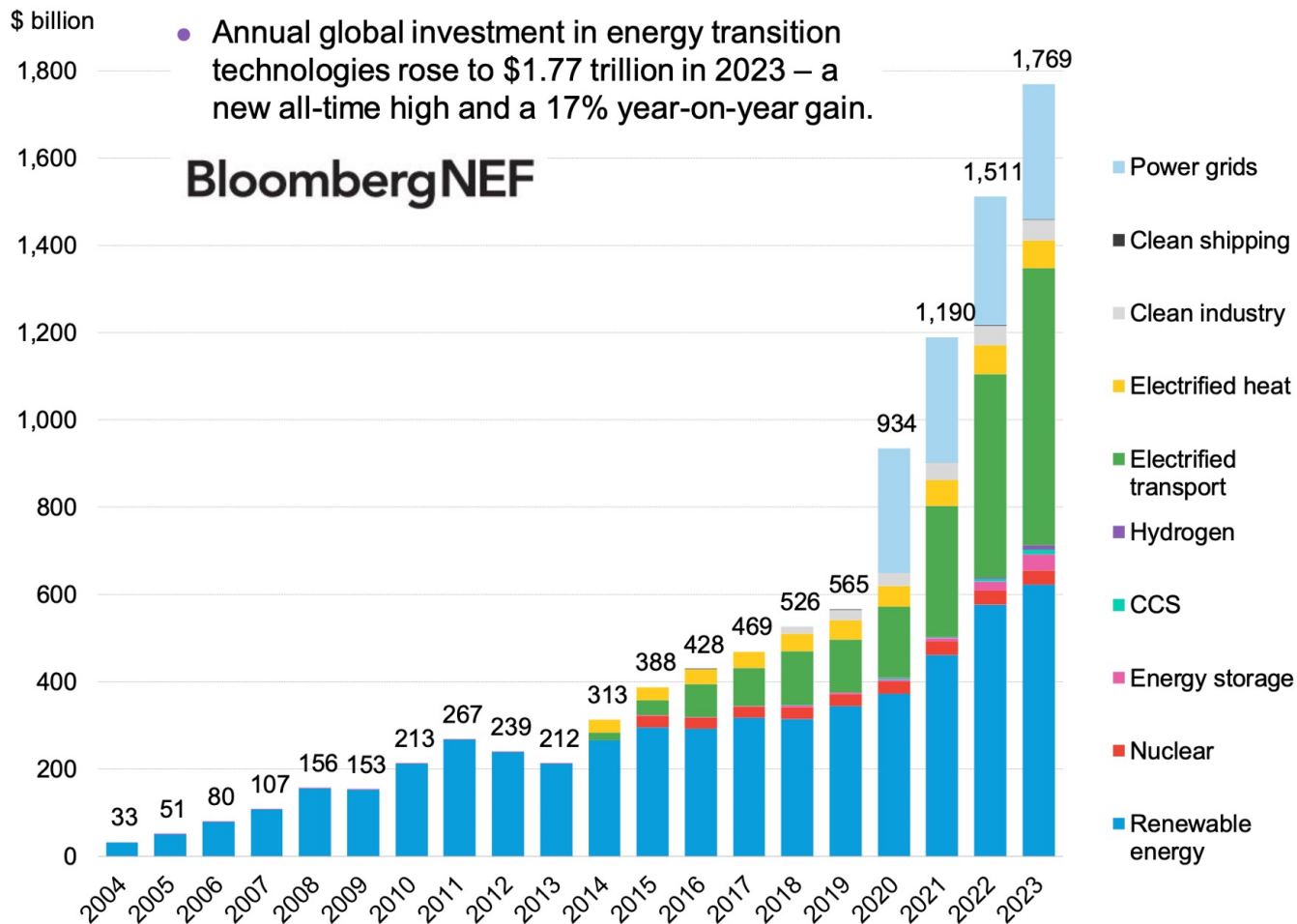
**Solar & Storage**

**9.20am 2 May 2024**

# The Global Energy Transition

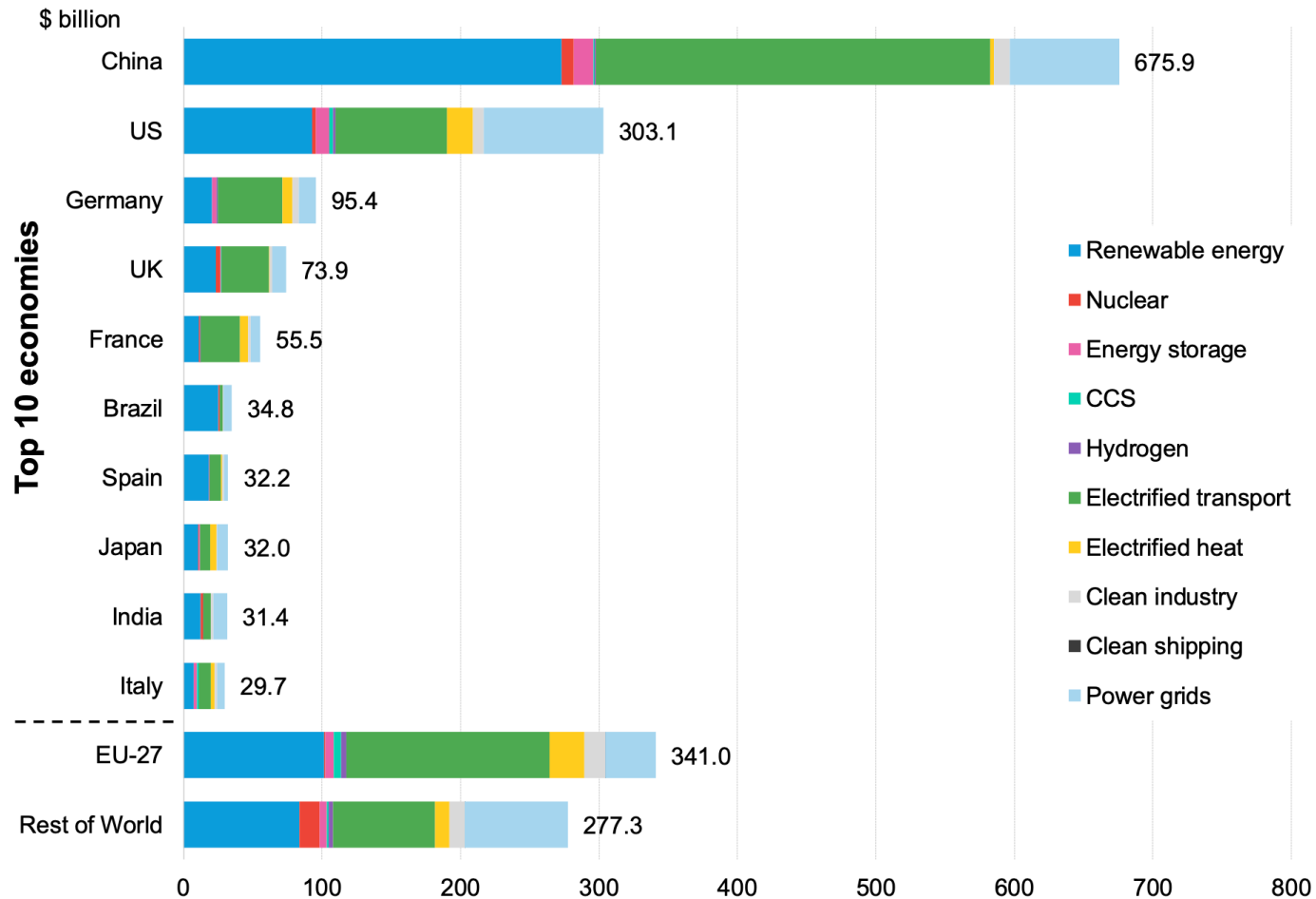
Increases across almost all categories push anticipated spending in 2023 up to a record US\$1.77 trillion, +17% yoy

## Global investment in energy transition, by sector



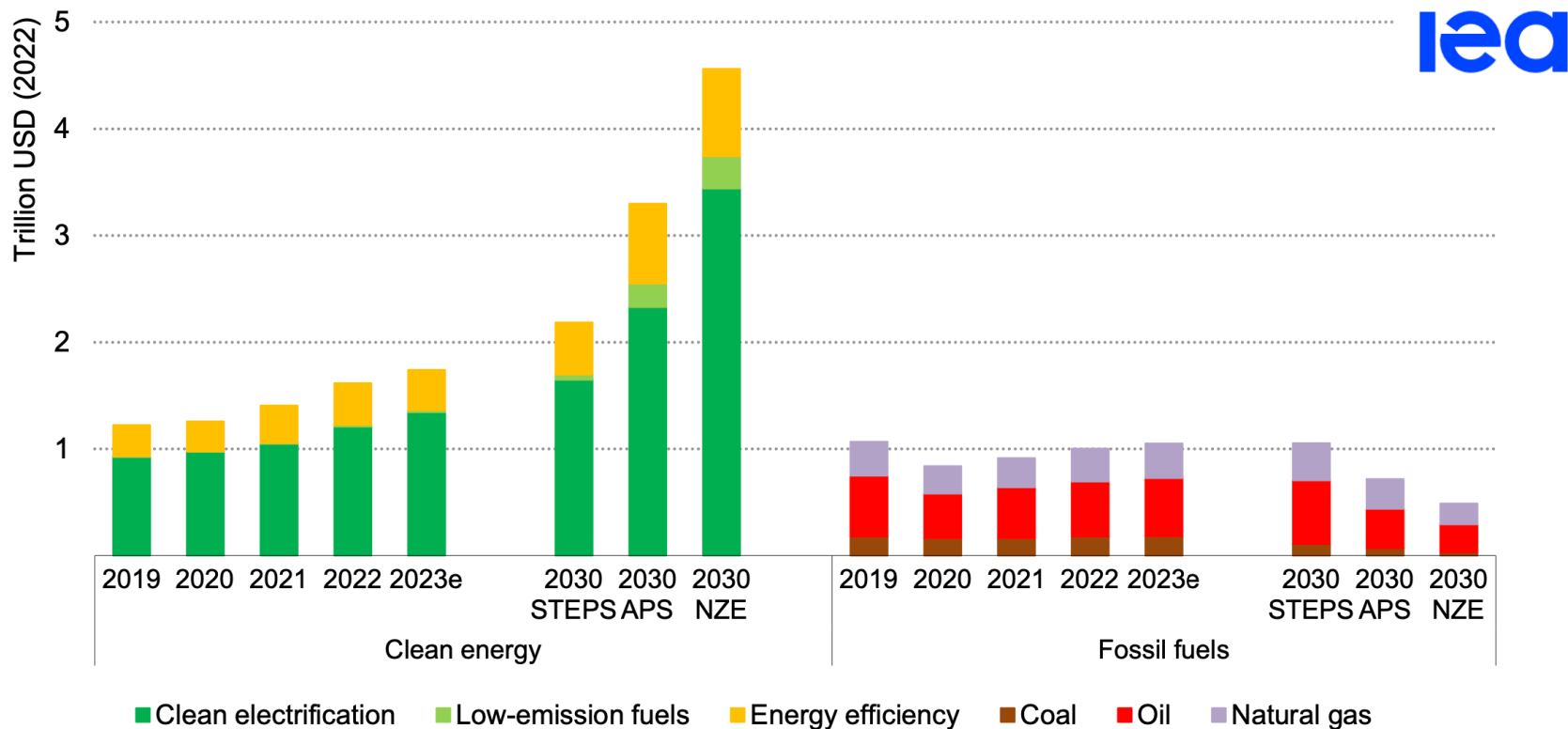
# 1. China Leads the World in Cleantech Investing

Top 10 economies for 2023 energy transition investment, plus the EU-27 and rest of the world



# 1. The Global Energy Transition

## Global Investment Needed by 2030

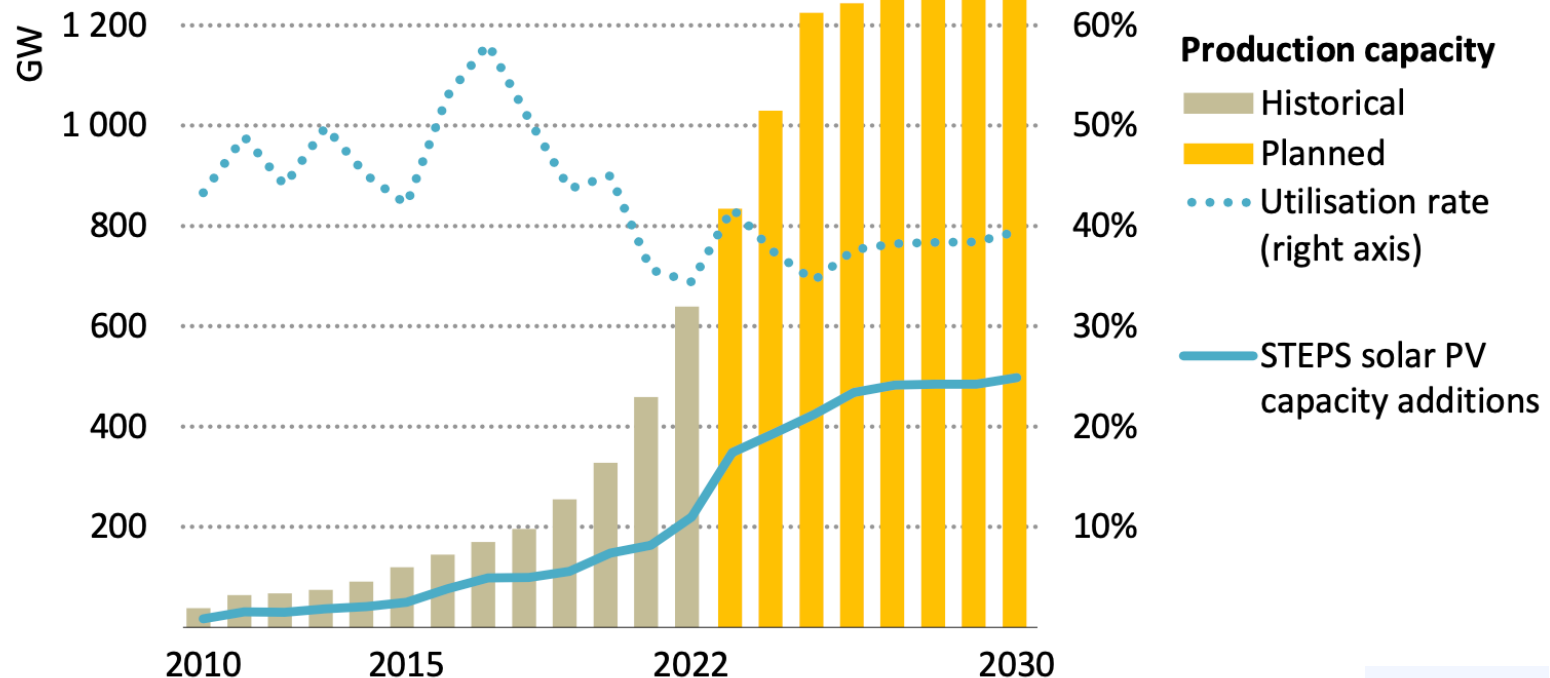


Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario.

## 2. China Dominates Solar

Solar Growth is Accelerating, Globally. BNEF forecasts 392GW in 2023, +56% yoy, and module prices of US\$0.145c/w by end 2023.

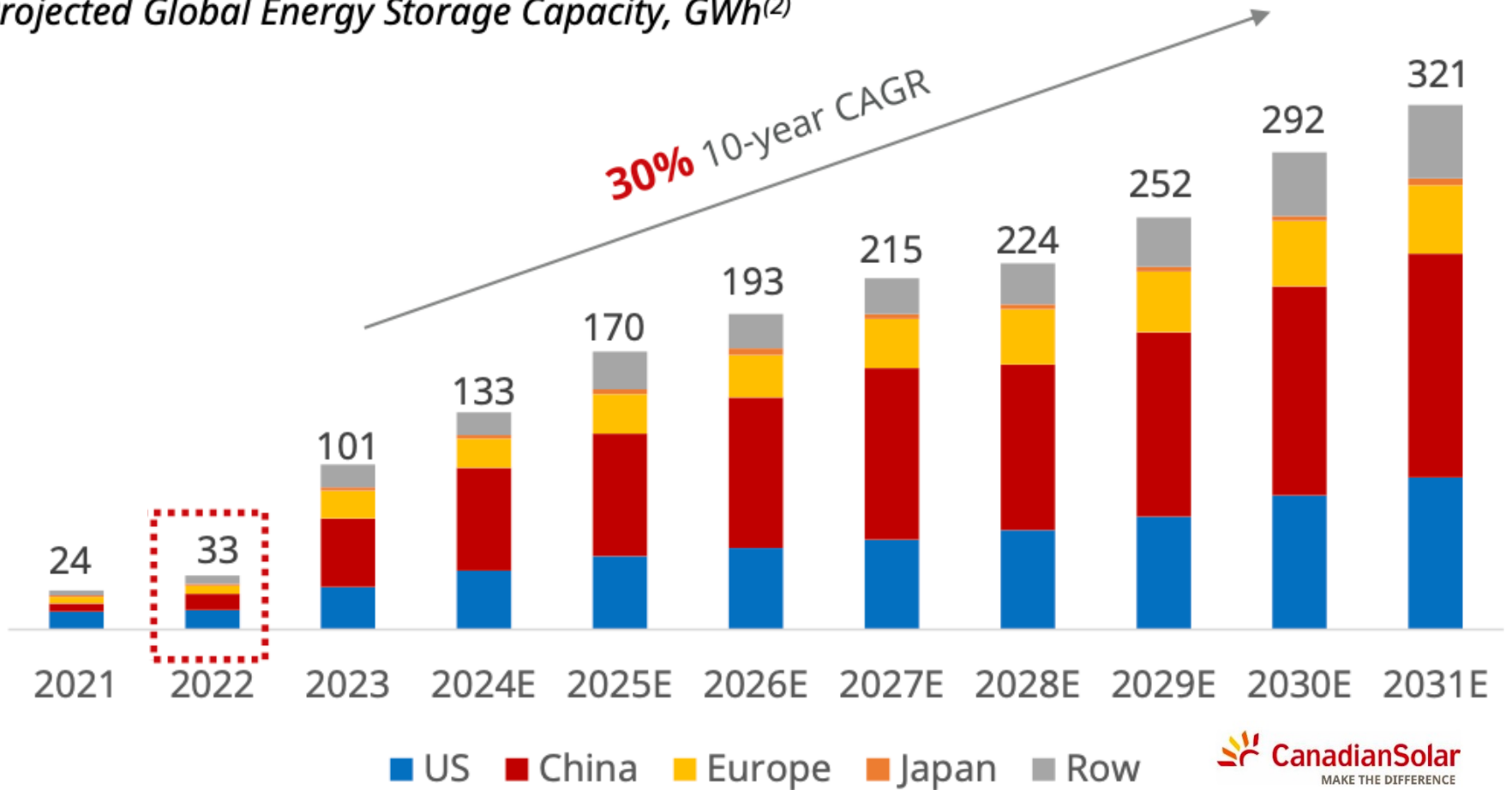
**Figure 1.10** ▶ Global solar module manufacturing and solar PV capacity additions in the STEPS, 2010-2030



*Planned expansion of solar manufacturing outpaces solar PV capacity additions to 2030; its low utilisation rate presents a huge opportunity to accelerate clean energy transitions*

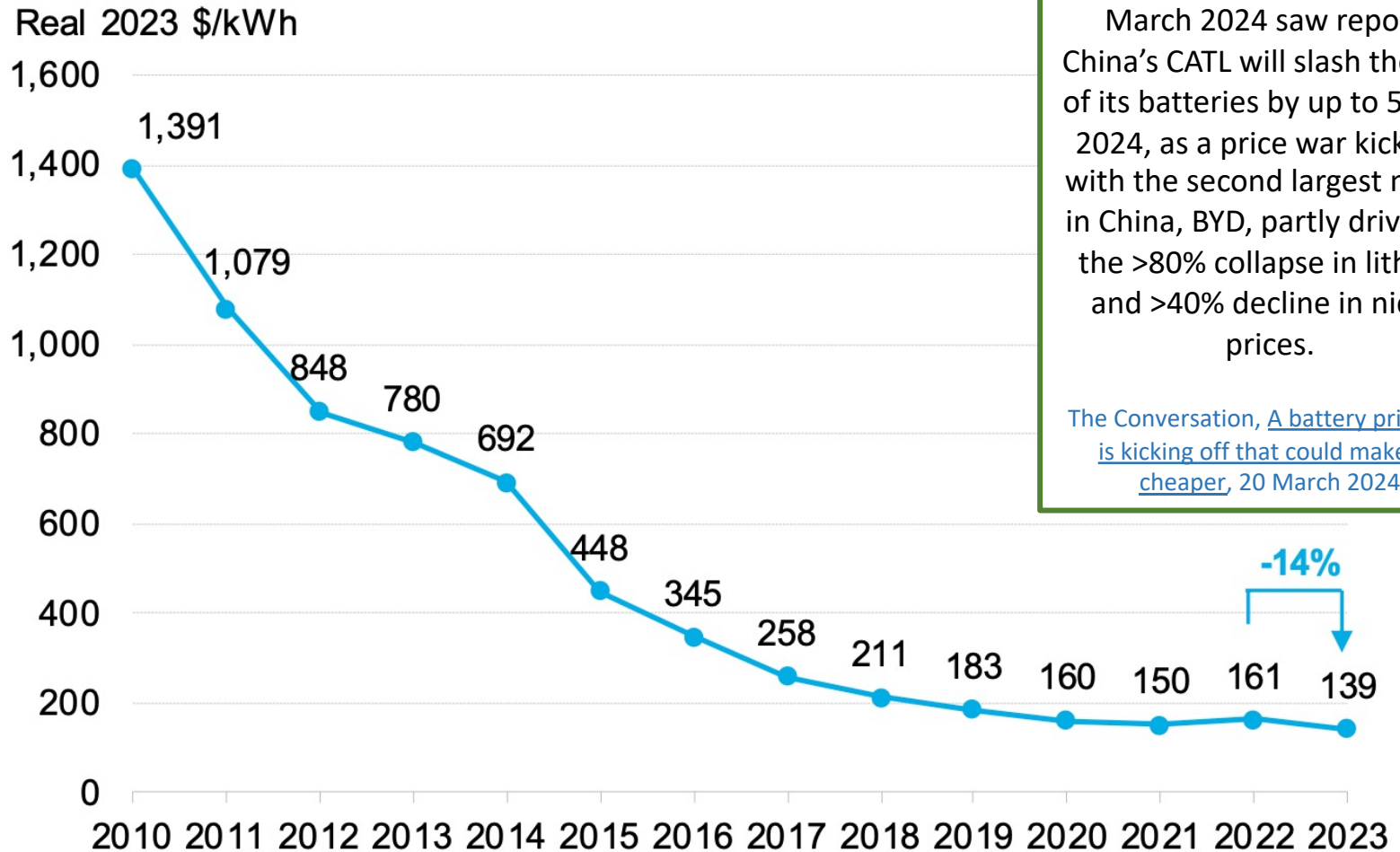
# Global BESS installations are set to boom

Projected Global Energy Storage Capacity, GWh<sup>(2)</sup>



# 1. Deflation

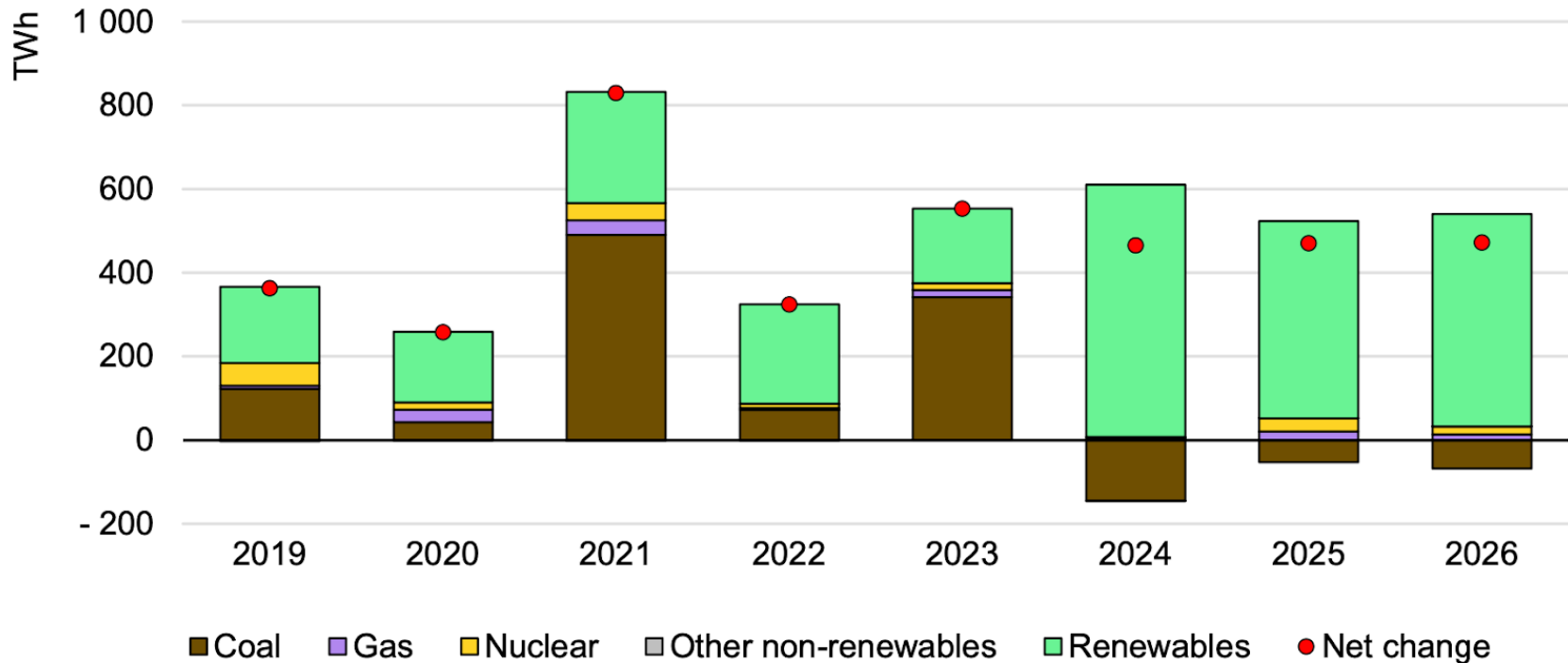
## Volume-weighted average lithium-ion battery pack price



Source: BloombergNEF. Note: Historical figures have been adjusted to real 2023 dollars.

# China's Electricity Generation Mix

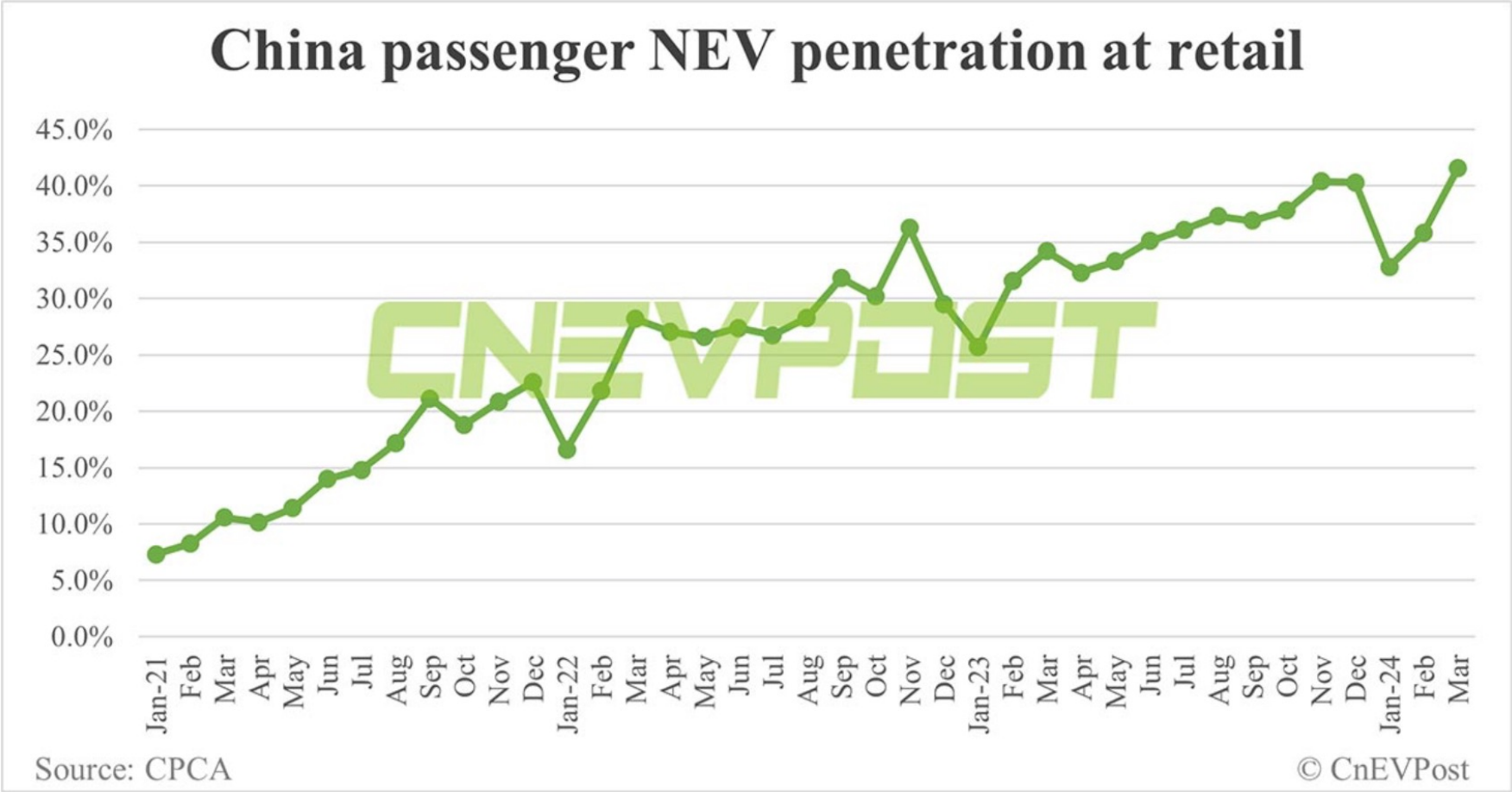
Year on year change, TWh, 2019-2026





# China's Rising New Energy Vehicle Penetration

Passenger NEVs in China totalled 709,000 units in March 2024, +29.5% yoy, penetration reaches record 41.6%



Source: <https://cnevpost.com/2024/04/09/china-nev-retail-in-mar-2024/>

# China is installing 21GW per month of RE

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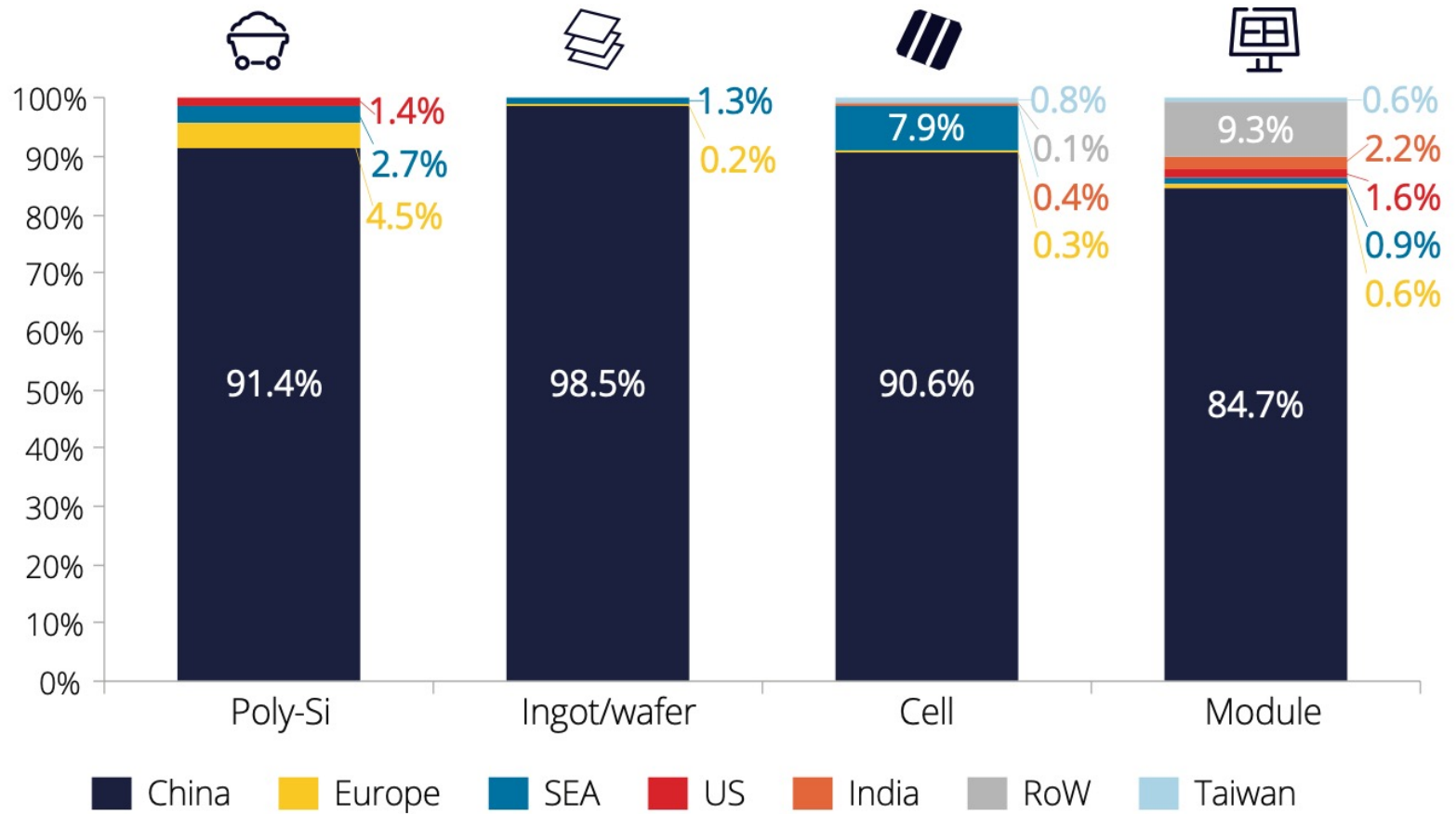
## New Capacity Installed in China in Jan-March 2024

		Jan-March 2024	Share of new adds (%)	Change (yoy %)	Mar-24	Share of new adds (%)
Thermal Power	GW	6.4	9%	-21%	1.3	8%
Hydropower	GW	1.8	3%	-33%	0.8	5%
Nuclear Power	GW	-	0%	-100%	0.0	0%
Wind Power	GW	15.5	22%	49%	5.6	34%
Solar Power	GW	45.7	66%	36%	9.0	54%
<b>Total capacity added</b>	<b>GW</b>	<b>69.4</b>	<b>100%</b>	<b>24%</b>	<b>16.7</b>	<b>100%</b>
Renewable Energy adds	GW	63.0	91%	35%	15.4	92%
Zero Emissions Capacity Adds	GW	63.0	91%	31%	15.4	92%

Source: NBS, CEF Estimates

# China's Solar Manufacturing Dominance

Market share in 2023 global PV manufacturing production<sup>4</sup>



Source: Australian PV Institute, S2S Roadmap, Feb 2024

# Australia's Silicon 2 Solar Roadmap

Projected annual solar PV demand in Australia<sup>1</sup>

June 2023 installed capacity:  
(residential and utility)

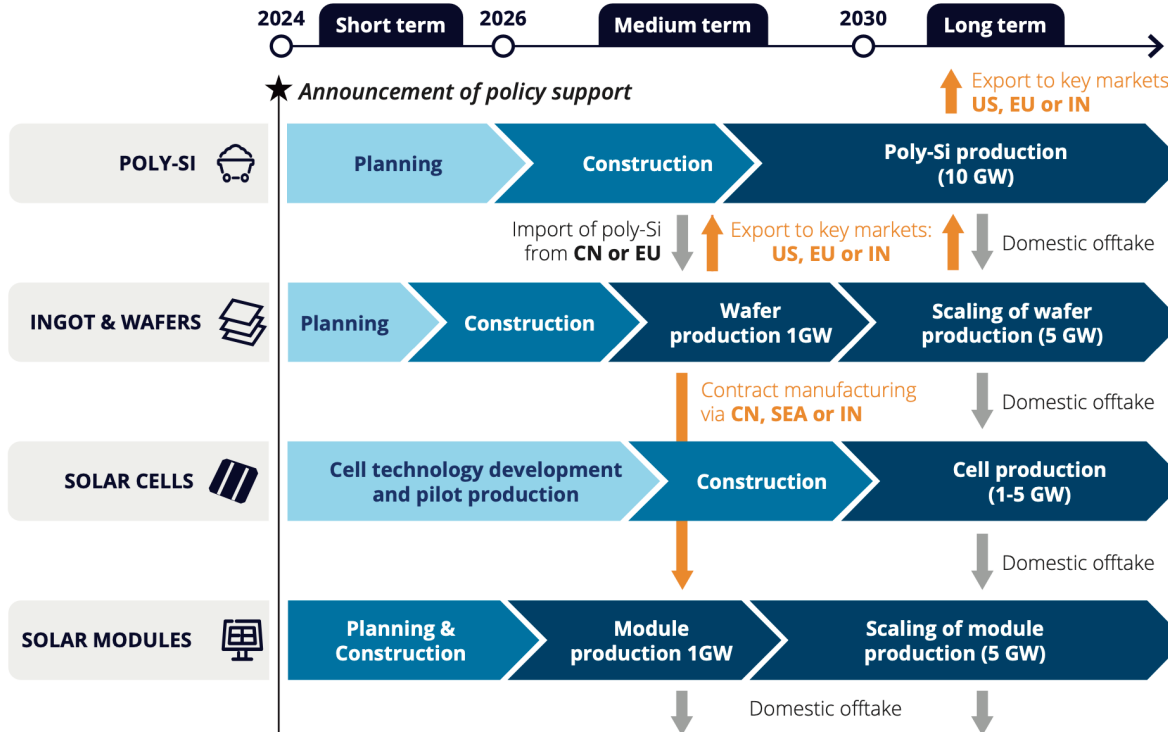
**32 GW**

**AEMO ISP baseline forecasts:**  
(Range: Step Change – Hydrogen Superpower)

**5 – 15 GW**  
*per annum*

**Alternative ambitious forecasts:**  
(Range: ARENA Ultra low-cost solar whitepaper – Net Zero Australia)

**37 – 70 GW**  
*per annum*



## Priority considerations

**At the poly-Si step,** Australia can be part of a globally diversified supply chain exporting particularly to the rapidly growing US and EU markets. Australia would export energy-intensive value-added products and have direct control over poly-Si for the needs of the domestic solar market.

**Ingot & wafer manufacturing** addresses the most concentrated step in the solar value chain. Australian wafers can be exported to the US, EU and other regions. Contract manufacturing overseas could enable domestically produced wafers to be used in local solar systems in the medium term.

Rapid development of **cell technology** and large capacity scale up present a challenge to setting up viable cell production domestically. Australia's strong track record in cell research could lead to cutting-edge production, however, R&D, prototyping and pilot lines require additional time.

**Module production** represents a "low-hanging fruit" option due to the relatively small upfront investment and government support needed. However, building globally competitive module production is challenging and Australian modules would be for the domestic market only.