



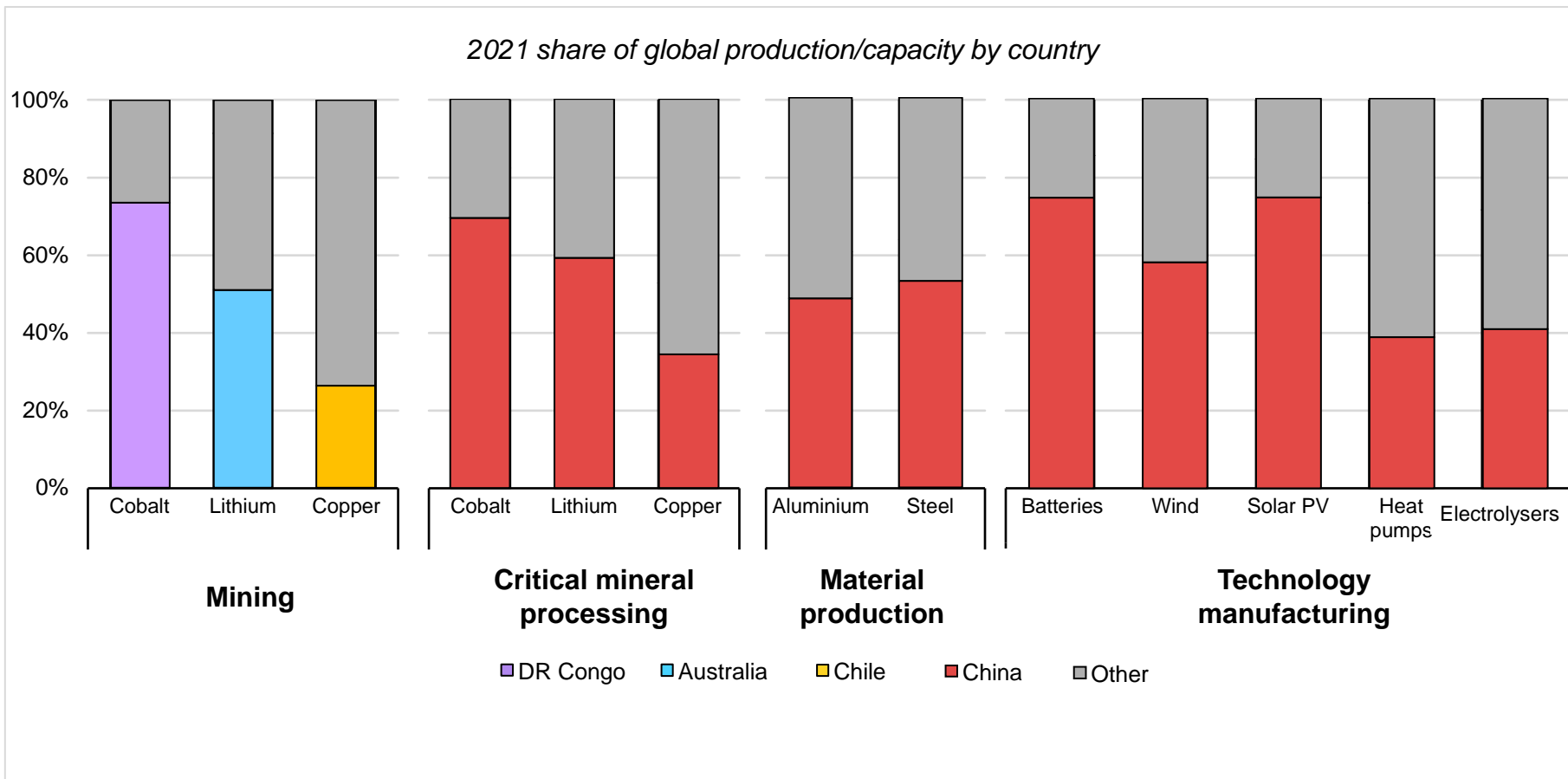
Opportunities and challenges in clean energy supply chains

Araceli Fernández, Head of Technology Innovation Unit, IEA

Symposium: Technologiesouveränität in der Energiewende – Welche Innovationen brauchen wir?

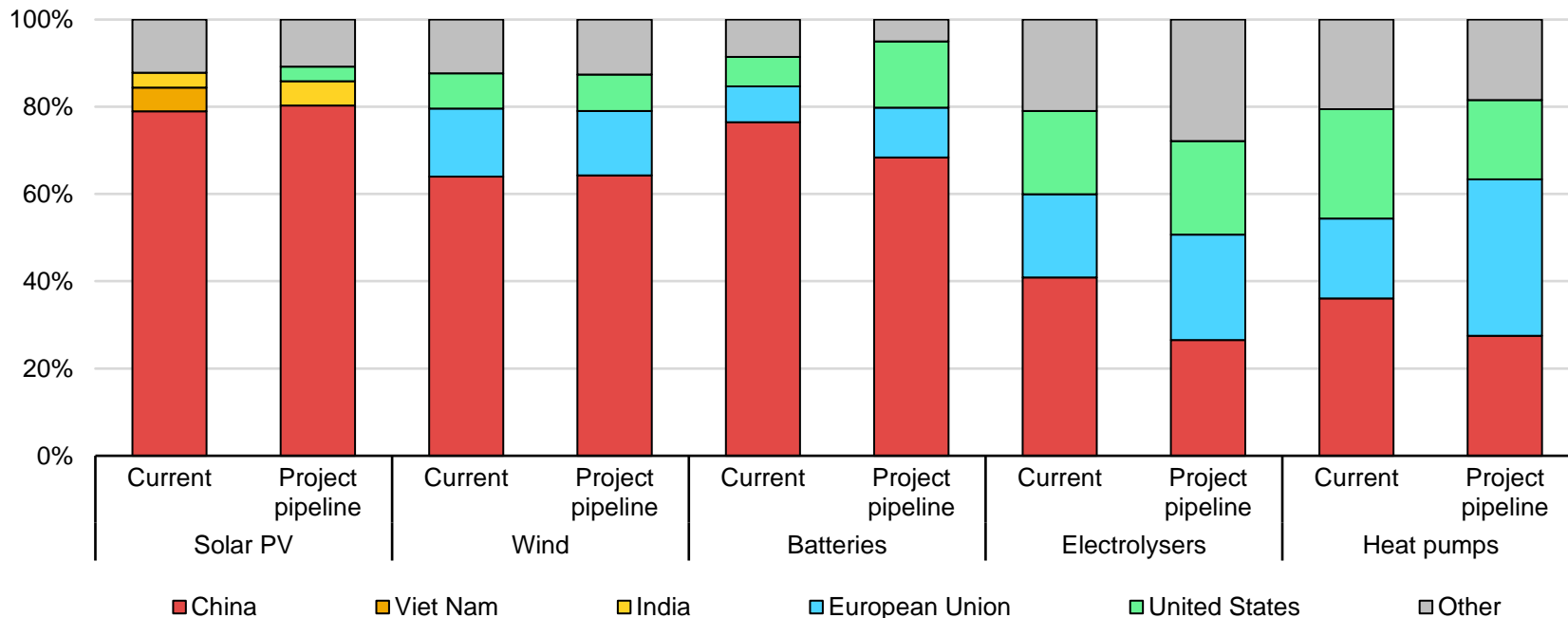
Vienna, 26 June 2023

Clean technology supply chain concentration risks extend beyond mining



Clean technology manufacturing is geographically concentrated

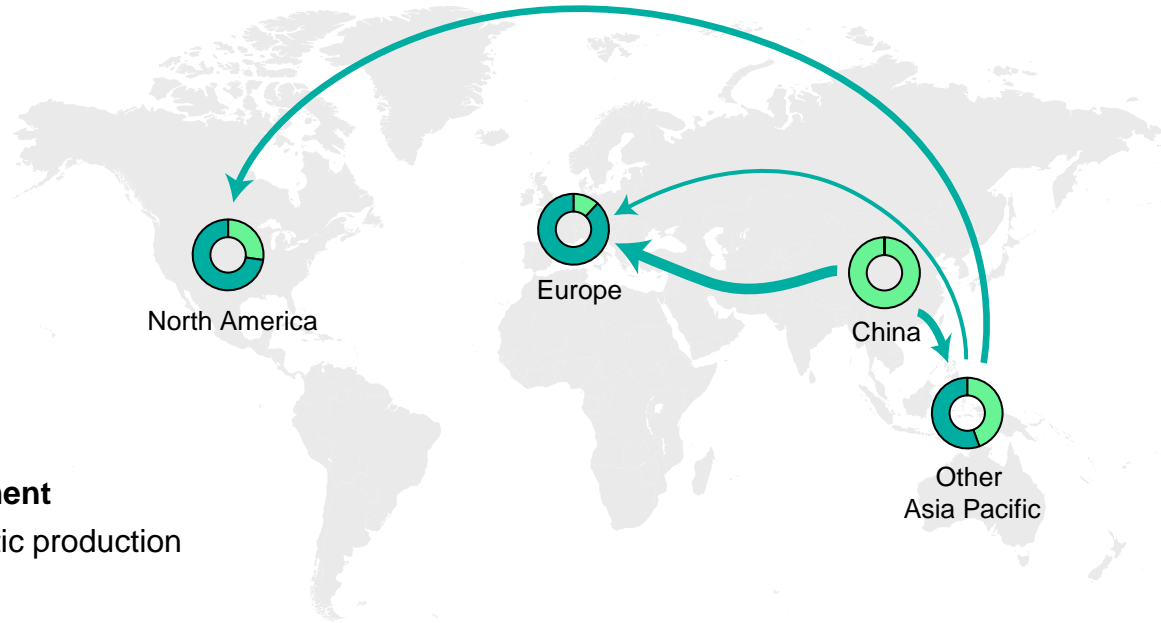
Current and projected geographic concentration for manufacturing operations for key clean technologies



Announced projects – if all realised – will alter the global distribution of manufacturing capacity for batteries, electrolyzers and heat pumps.

Clean technology supply chains benefit from international trade

Main net trade flows for selected clean technologies, 2021



Solar PV modules

Share of trade in global deployment:

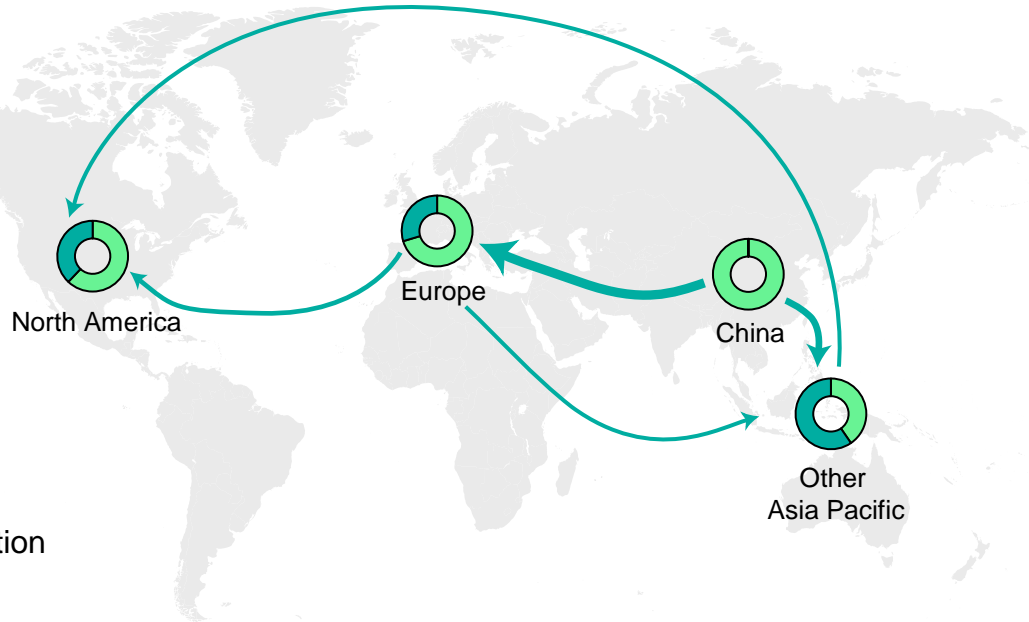
~60%

Deployment

- Domestic production
- Imports

Clean technology supply chains benefit from international trade

Main net trade flows for selected clean technologies, 2021



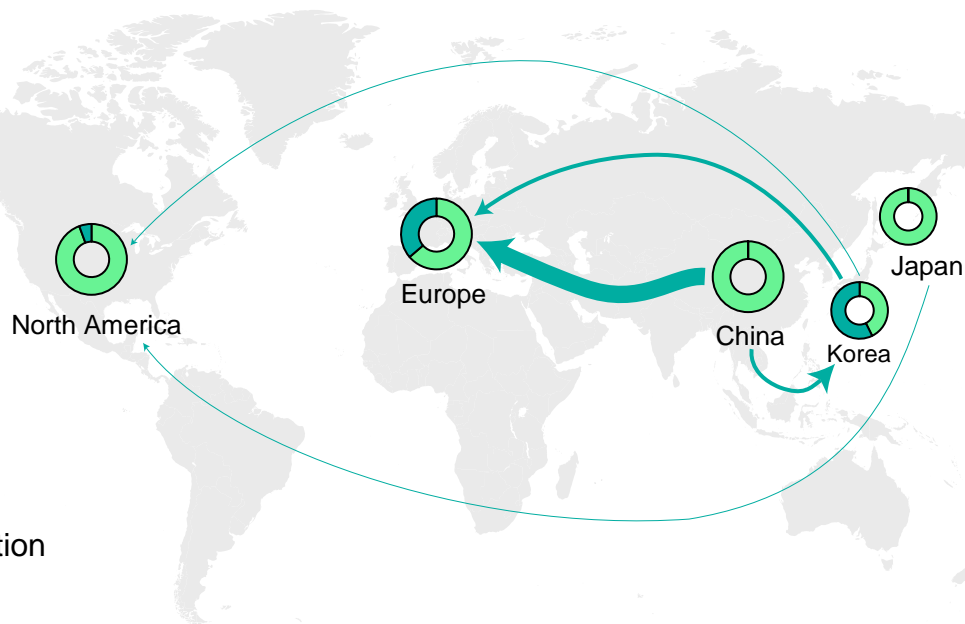
Deployment

- Domestic production
- Imports

Wind
Share of trade in global deployment:
~20%

Clean technology supply chains benefit from international trade

Main net trade flows for selected clean technologies, 2021



EV batteries

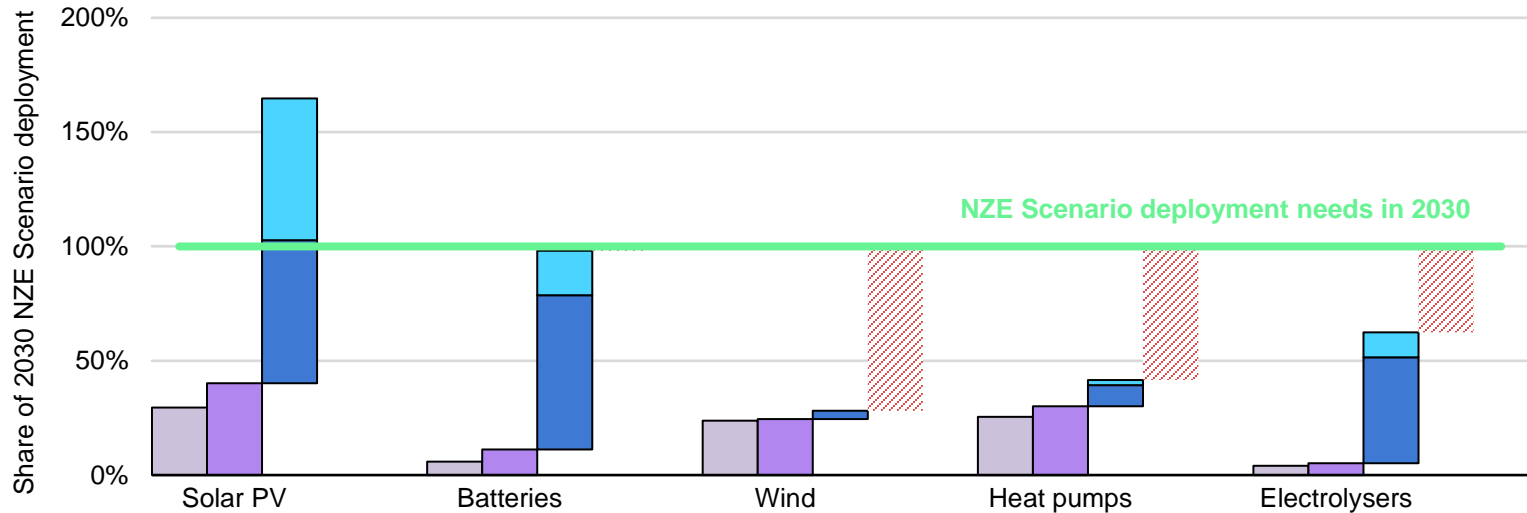
Share of trade in global deployment:

~10%

A large domestic market created by rapid clean technology deployment, combined with concerted industrial policy, have made China the dominant player in global clean technology manufacturing and trade.

The deployment gaps to net zero are closing for some technologies

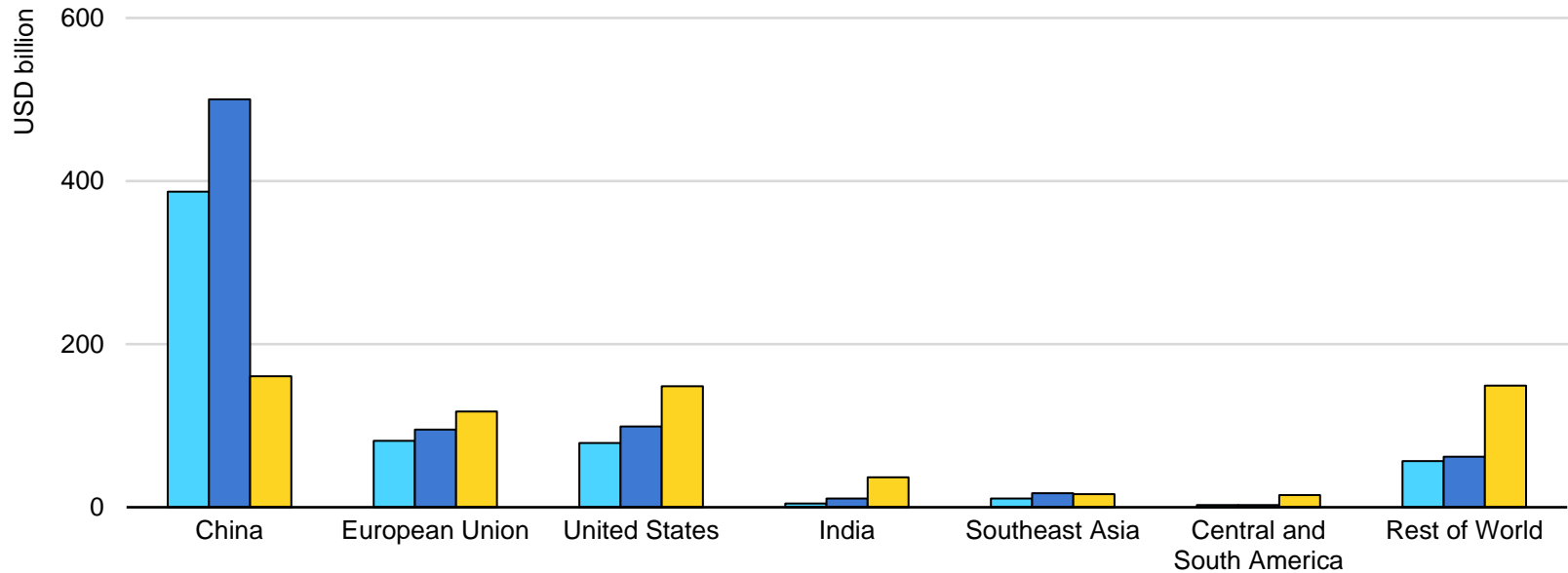
Announced project throughput and deployment for key clean energy technologies in 2030 in the NZE Scenario



For solar PV and batteries, announced projects today already meet and even exceed the deployment levels required in the NZE Scenario in 2030. The gaps remaining for wind, heat pumps and electrolysers are not insurmountable.

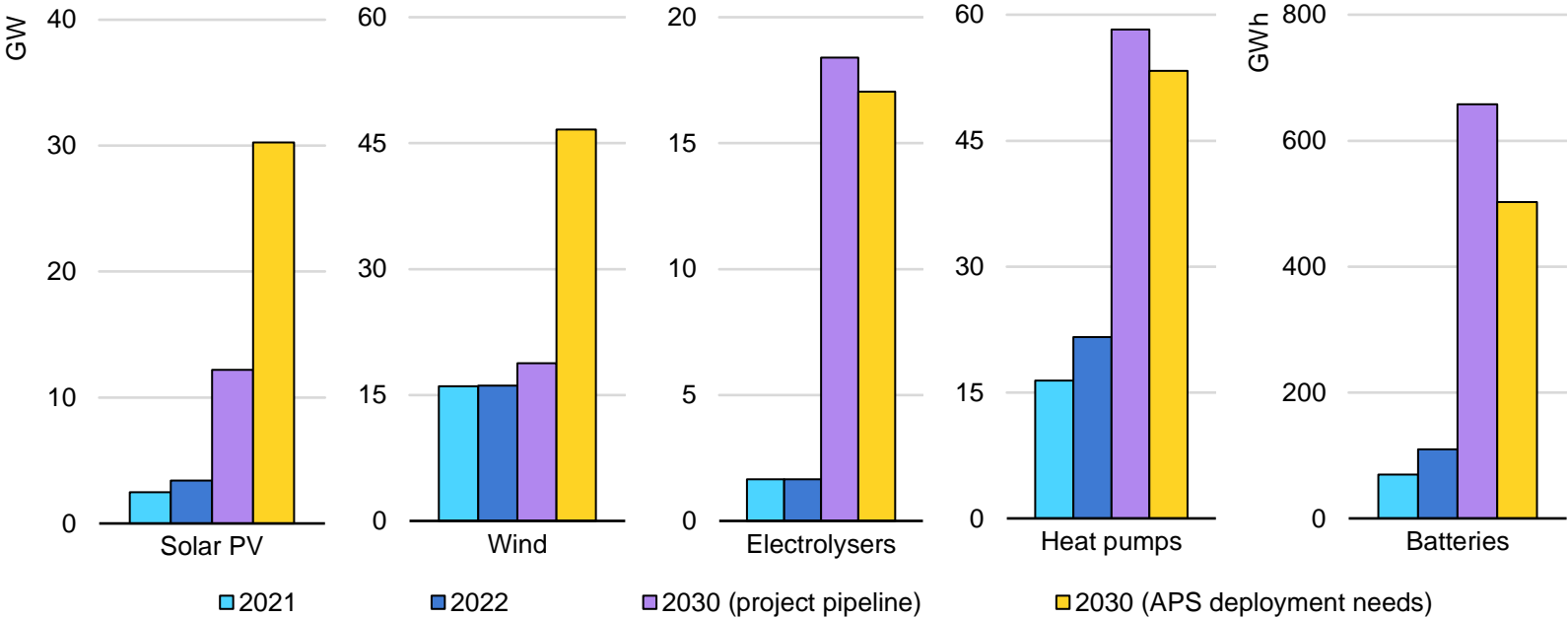
Markets for clean technologies constitute a major opportunity

Market sizes for key clean energy technologies in 2030



The combined market value of the outputs from existing and announced projects looks set to reach USD 790 billion per year by 2030, relative to a combined market size in the APS of USD 630 billion for the same clean technologies.

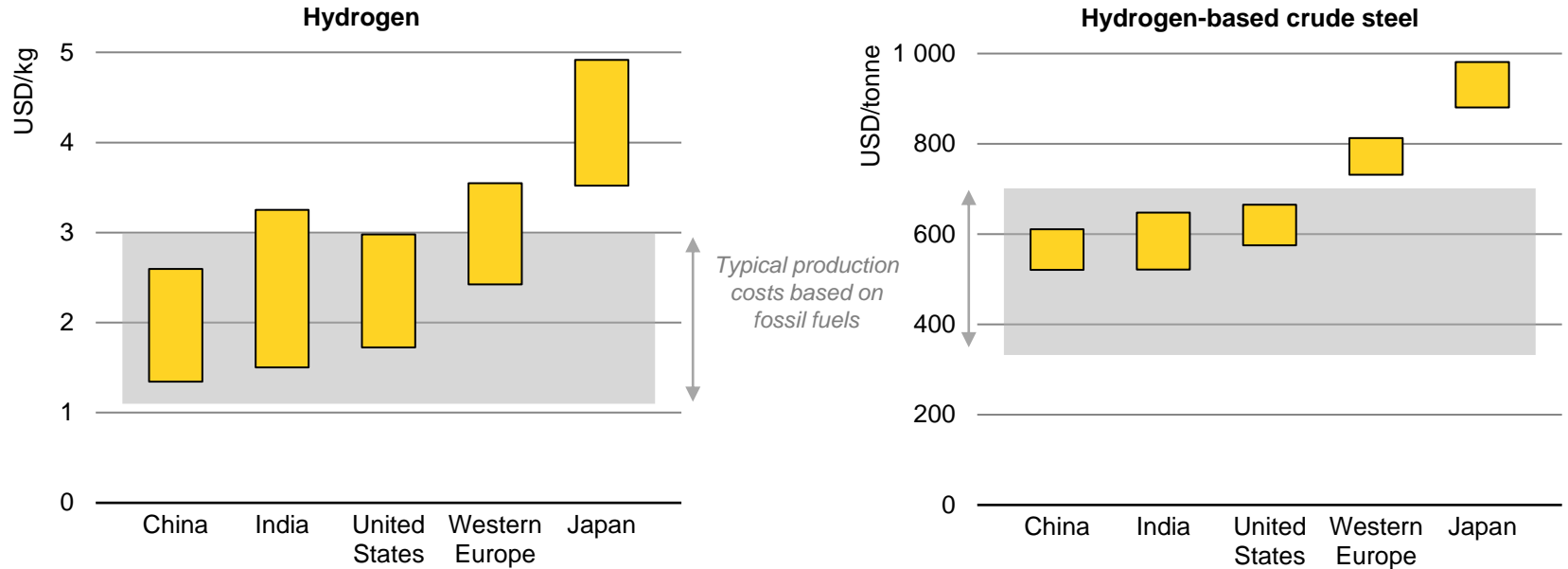
Current and projected manufacturing output for key clean technologies and domestic deployment in the APS in the EU



Output from existing and announced manufacturing capacity in the European Union looks set to satisfy domestic demand in the APS for batteries, electrolysers and heat pumps.

Competitiveness is a key consideration for industrial strategies

Production costs using electrolysis and variable renewables under announced climate pledges, 2030



- The energy world is in the early phase of a new industrial age – the age of clean energy technology manufacturing; reaping the benefits requires an **all-of-government approach**.
- High geographical and market concentrations threaten **supply security**; the policies to deal with such threats differ by supply chain, and must build on competitive advantages and strengths.
- Boosting **supply chain resilience** and **sustainability** is crucial; market disruptions and input price fluctuations can have profound cost implications.
- Participating in the emerging new energy economy requires **industrial strategies** that build on a **mapping of domestic opportunities** and **identify strategic partnerships**.
- **Time is of the essence** for clean energy technology supply chains; governments hold the key to accelerating deployment and tapping into economic opportunities.

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