Energy
Transitions
Commission

ETC Asia Australia Chapter Engagement meeting

April 8, 2025

Agenda

State of the global climate debate in early 2025 (including mis/disinformation), including specifics re. Asia and Australia

Transforming power systems: highlights

Cooling Buildings in Asia: key insights

ETC 2025 workplan: feedback on topics and engagement areas

Past ETC engagement on these topics

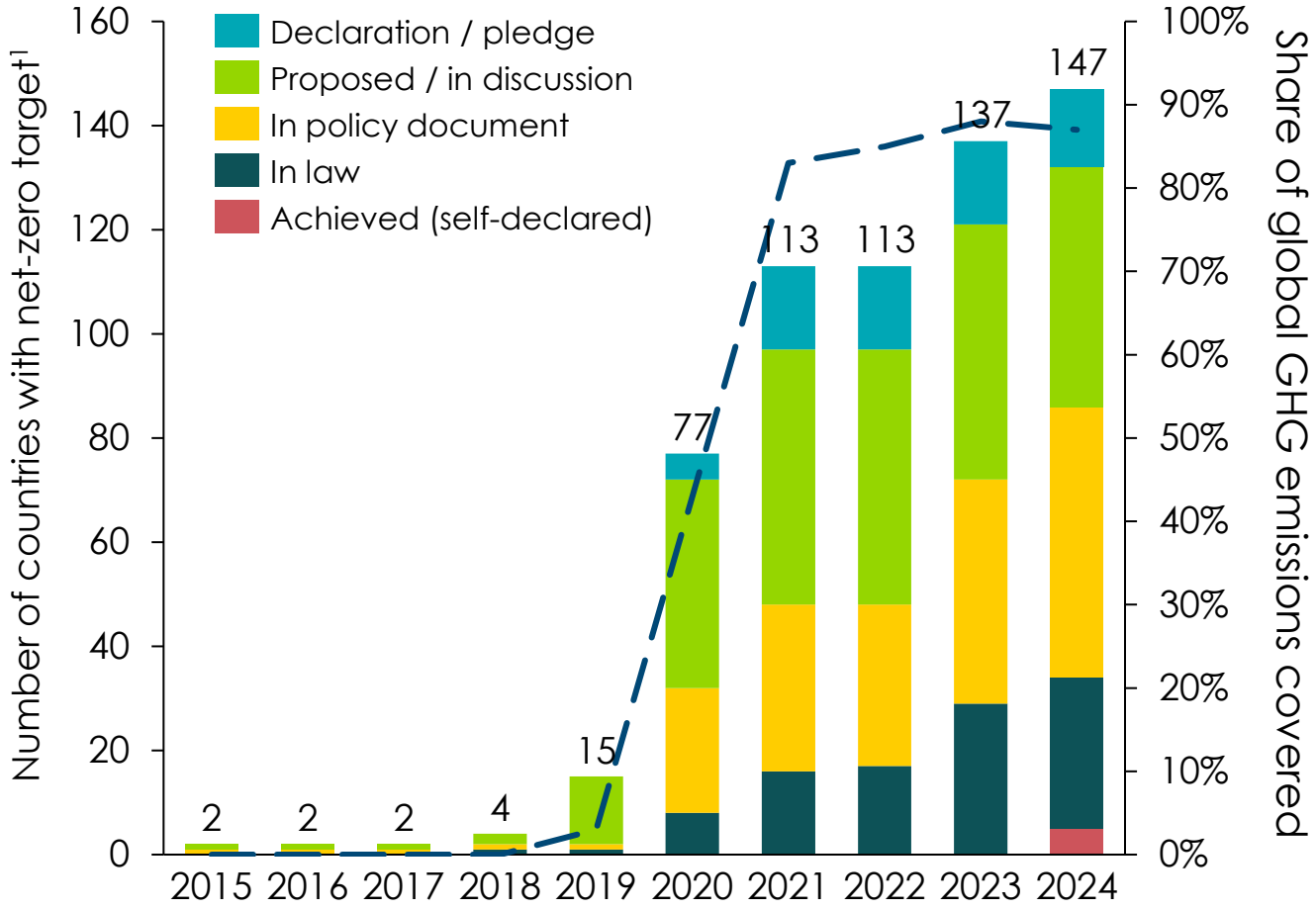
Topic	ETC engagement
State of the climate debate in early 2025	ETC Representatives and Commissioners meetings in Feb and March 2025 respectively
Transforming power systems: highlights	2024 workshops: Cross-border transmission, Sizing the system balancing challenge, DSF, Interconnections 2025: Unlocking Enablers for Power Systems Transformation (Feb)
Cooling Buildings in Asia: key insights	6 workshops on Buildings decarbonisation in 2024, with one focused on Cooling.
ETC 2025 workplan: feedback on topics and engagement areas	ETC Representatives and Commissioners meetings in Autumn 2024

State of the global climate debate in early 2025, including specifics re. Asia and Australia

Until 2024 significant progress was being made in net zero commitments

A growing number of countries are committed to net-zero

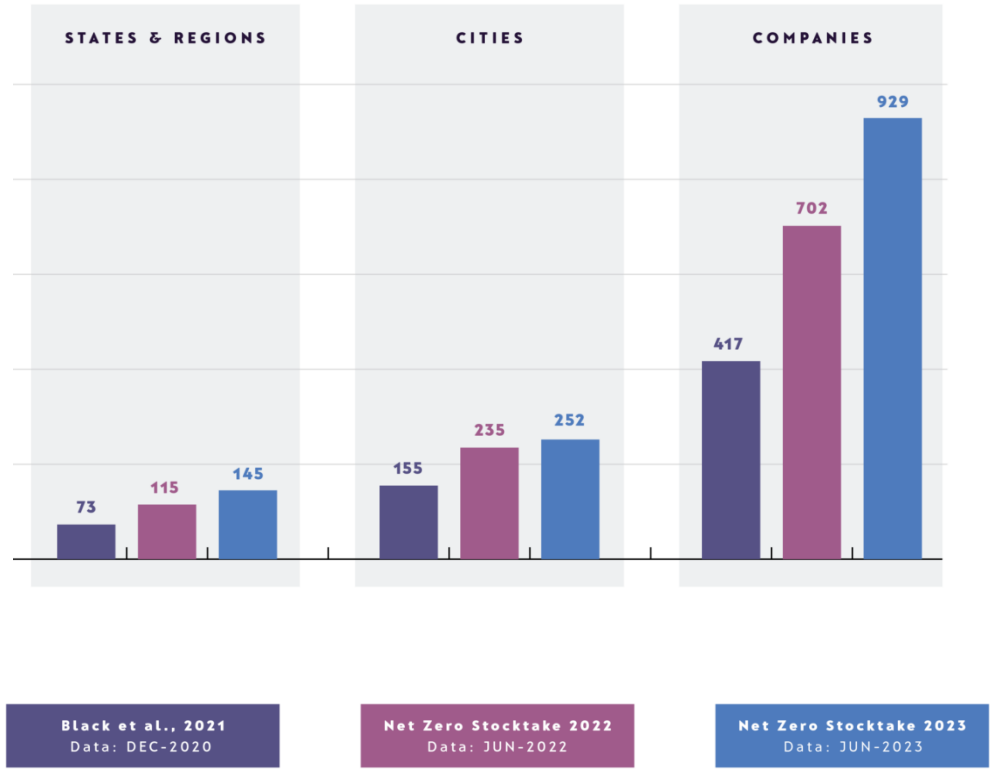
2015-2024



Note: Figures for 2023 estimated.
Source: Data from Net Zero Tracker (zerotracker.net) accessed on 13/02/2025

A growing number of entities set net-zero targets

2021-2023

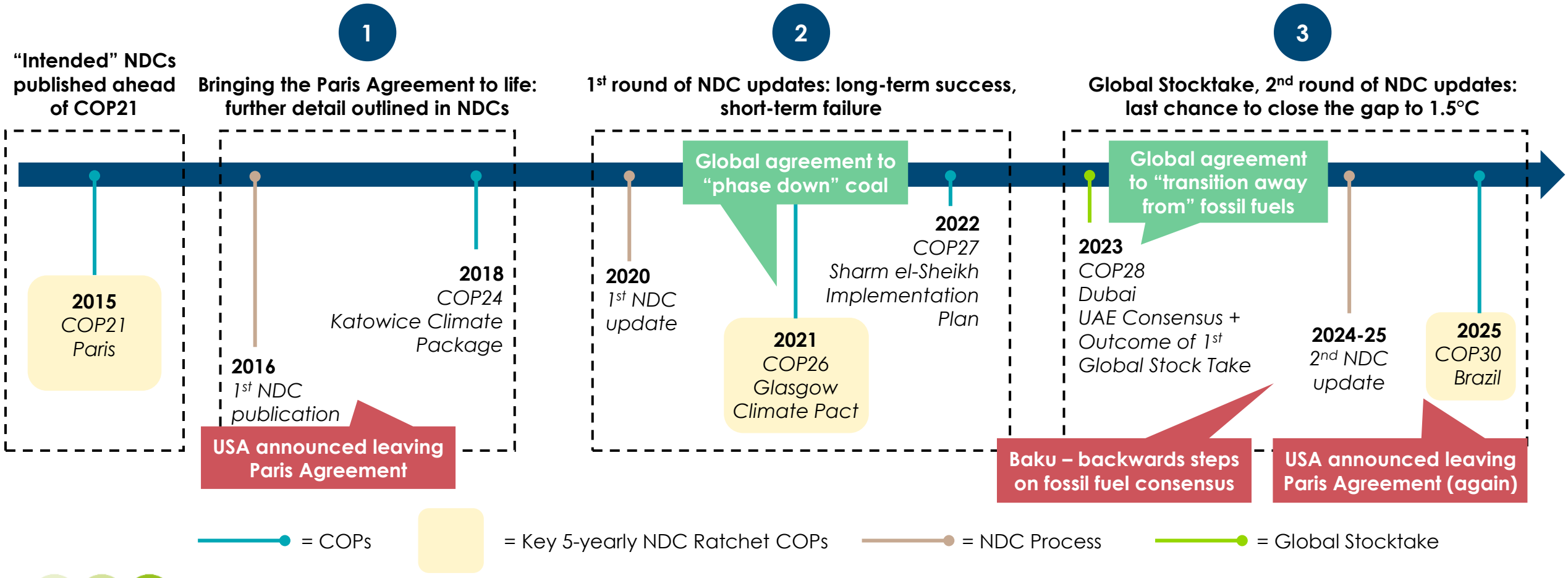


Source: Net Zero Climate (Accessed 2025); *Global Net Zero Progress*

Recent COPs, up to COP28 have been a driver of positive change

Timeline of UNFCCC Conferences of the Parties (COPs)

2015-2025



Trump elected in November 2024 – wider climate consensus challenged

US rolling back climate initiatives

- **Pulled out of Paris Agreement** (again)
- **Paused renewables permitting; Green New Deal investments/subsidies**
- **"National Energy Emergency" > Lifted freeze on LNG permitting**
- **Pullback from aid, including climate aid and JET-Ps**
- **Republican senators criticise 'woke capital' & challenge IEA**

Climate coalitions/ambition unravelling

- **GFANZ** (Glasgow Financial Alliance for Net Zero)
  - Restructure: dropped requirement to be Paris aligned & publish targets and progress; new CEO-led focus on mobilising capital in EMDCs
  - Over 700 members in 2024, members leaving sub-alliances (i.e. NZBA)
- **NZBA** (Net Zero Banking Alliance – over 140 members in 2025)
  - 11 banks have left: 6 largest U.S. banks, 4 Canadian & 1 Australian
  - Upcoming vote on commitment to 1.5°C
- **NZAMI** (Net Zero Asset Managers Initiative – 325 signatories as of Jan '24)
  - Major companies have left e.g., Blackrock in 2025, Vanguard in 2022
  - Suspended activities to track signatory implementation and reporting in January 25

Additional factors

Some oil and gas companies revising transition targets

Tariffs disrupting global trade, including clean energy

Selected implications for Asia region

Climate change

FINANCIAL TIMES

China, Europe and UK should form climate coalition apart from US, energy expert says

Lord Adair Turner advocates for 'pull together' of rest of the world to accelerate shift to green energy

- **China noting its climate finance provision at COP 29** – the US withdrawal may compound this effect.

- **The CBAM effect? China's carbon price reached a high** of almost $15/tonne in 2024. **India also introducing carbon pricing.**

- **India** added ~30 GW of renewable capacity in 2024 (total now 210 GW)
- **However, India dismayed by "COP29 outcome on climate finance in Baku"**; a **lowball NDC may be put forward**

A role for India in South-South climate cooperation Premium

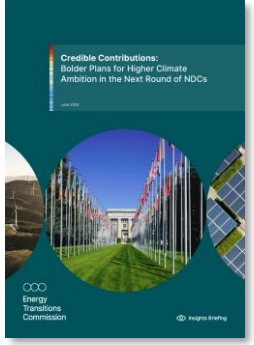
India can position itself as a leader in the global transition to a low carbon pathway, through transparent processes and equitable partnerships

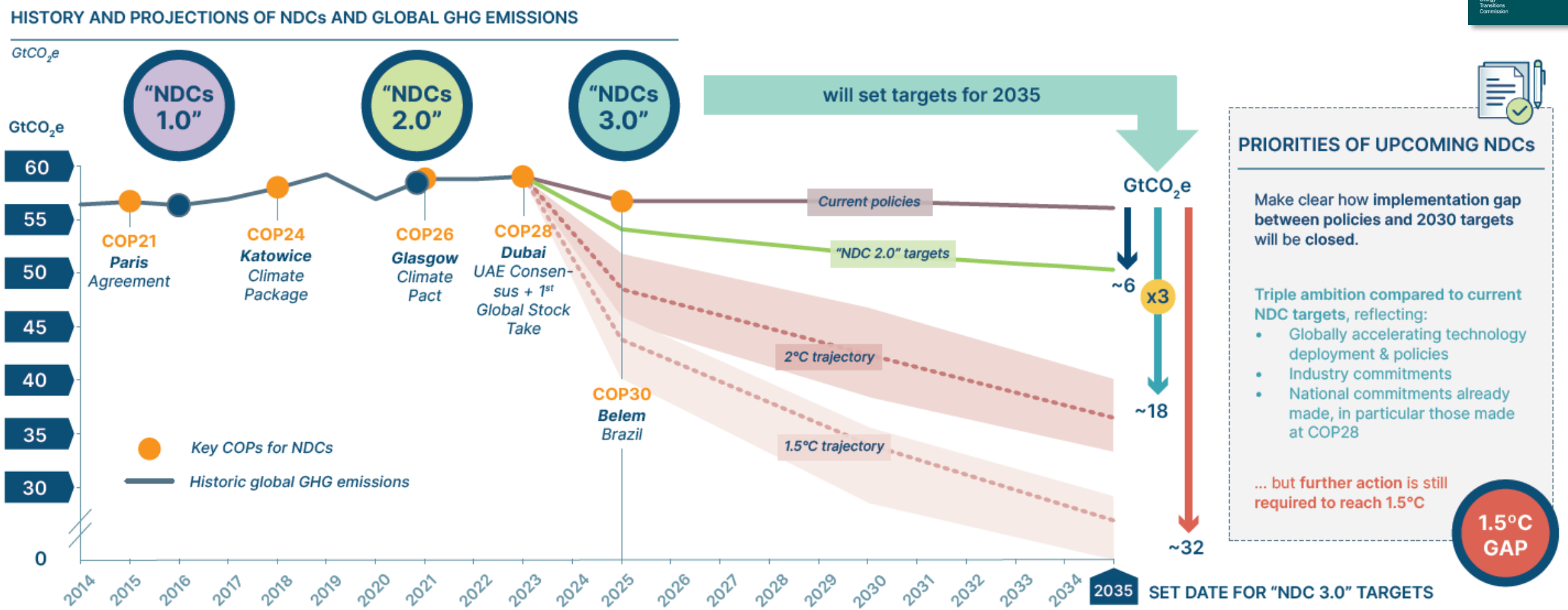
- **Indonesia govt. committed to coal exit – but** US withdrawing from **Just Energy Transition Partnerships** (JET-Ps)
- **JET-P** also affects **Vietnam, Senegal, South Africa.**
- **US-Aid withdrawals** and other aid cuts likely **to affect wider transition.**

US Tariffs likely to affect Asian clean energy manufacturing, in particular:

- **Solar:** China >300%, Vietnam ~250%, Cambodia/Thailand 100%+; Indonesia just 10-20%
- **Battery storage:** 30-50%+ across China, Cambodia, Vietnam, Thailand, Indonesia and India

NDCs must be much more ambitious to put the world on track for 2°C





Source: ETC (2024), *Credible Contributions: Bolder Plans for Higher Climate Ambition in the Next Round of NDCs*

Growth of disinformation in the climate space & how ETC plans to counter these challenges

Where should ETC place our focus?

		Current focus:
Denialism	**1) Combatting denialism – demonstrate climate change is real and a threat** + Denialism is rising, if people don't believe there will be strong resistance to change - Less than 15% of people don't believe, many entrenched, limited gains, high pushback	**Very Limited**
Salience	**2) Ensuring salience – move energy transition up voter's agenda** + Energy transition often not top priority, costs discounted, benefits seem unattainable - Hard to make people more focused without being overly 'Doomer'	**Limited**
Education	**3) Providing education – climate conscious voters to recognise effective policy** + Many "green" parties don't have effective policies (nuke closure, onerous P&P) - Highly localised issue, may require many resources and partners on the ground	**Medium**
Economic Impacts	**4) Explaining economic impacts – illustrate aggregate costs and distributional effects** + Many unaware of wider picture (cost curves, scaling benefits, access to tech) - Competing citizen priorities (increased cost of living and low income growth)	**High**
Progress	**5) Outlining progress – explaining where positive progress is being made** + ETC's traditional expertise, can counter adverse narratives by sharing good stories wider - Positive progress often discounted, not as popular with media as negative stories	**High**

Transforming power systems

The ETC has focused this year on key challenges of running expanded and decarbonised power systems

Managing System Balancing

Meeting balancing needs as the penetration of wind and solar grows

Building and optimising grids

Ensuring grids can increase 2-3 times in size and modernise to support demand growth and new generation

Ensuring low costs

Ensuring future clean power system costs are no higher than today's

5 key technologies are critical to building and managing grids of the future

Flexible dispatchable generation

Long-distance transmission

Energy storage

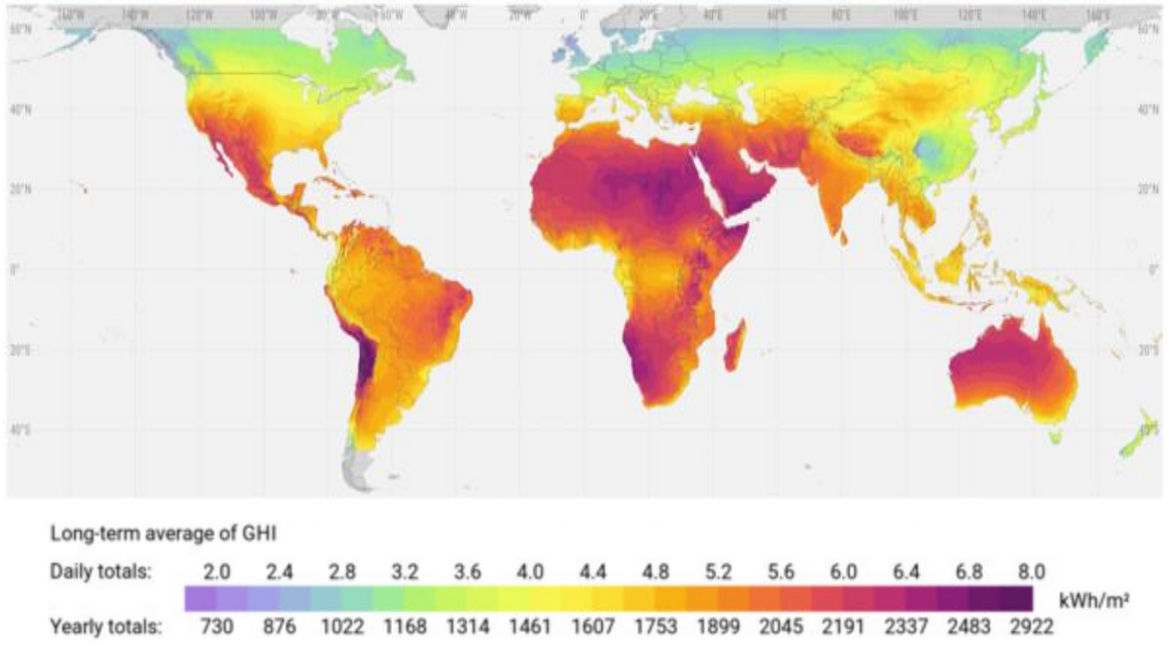
Demand-side flexibility

Innovative grid technologies

Asia offers both world-class solar and wind potential — but regional patterns vary

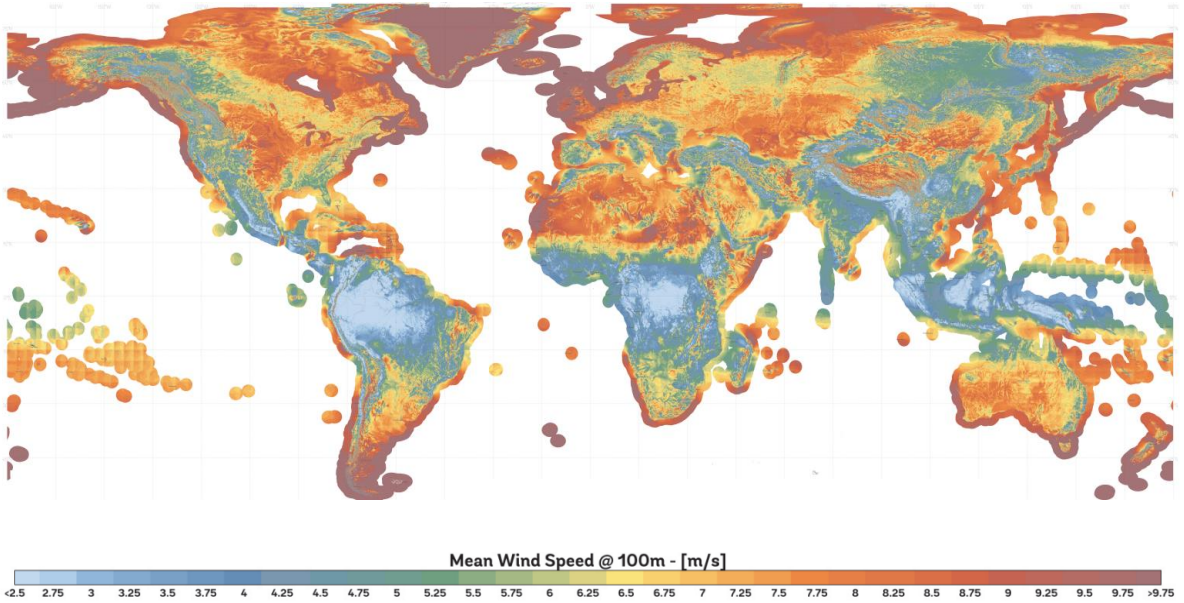
Irradiation varies across the globe

Long-term yearly average of daily and yearly GHI totals



Wind power density also varies substantially

Mean wind power density at 100 m above surface level

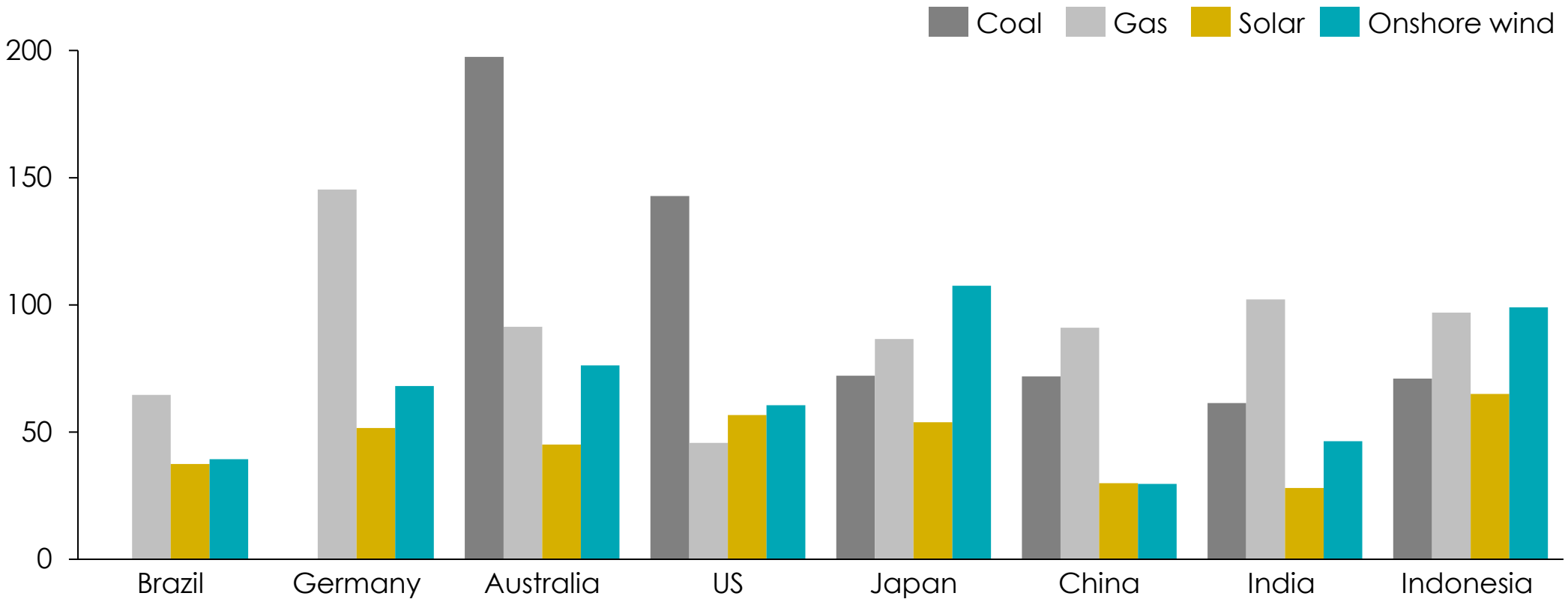


Source: LHS, World Bank (2023), Global Solar Atlas; RHS, World Bank (2023), Global Wind Atlas

Rapid decline in technology costs, particularly solar, support wind and solar development including in Asian countries

New bulk generation LCOE costs in selected markets

$ per megawatt-hour (real 2024)

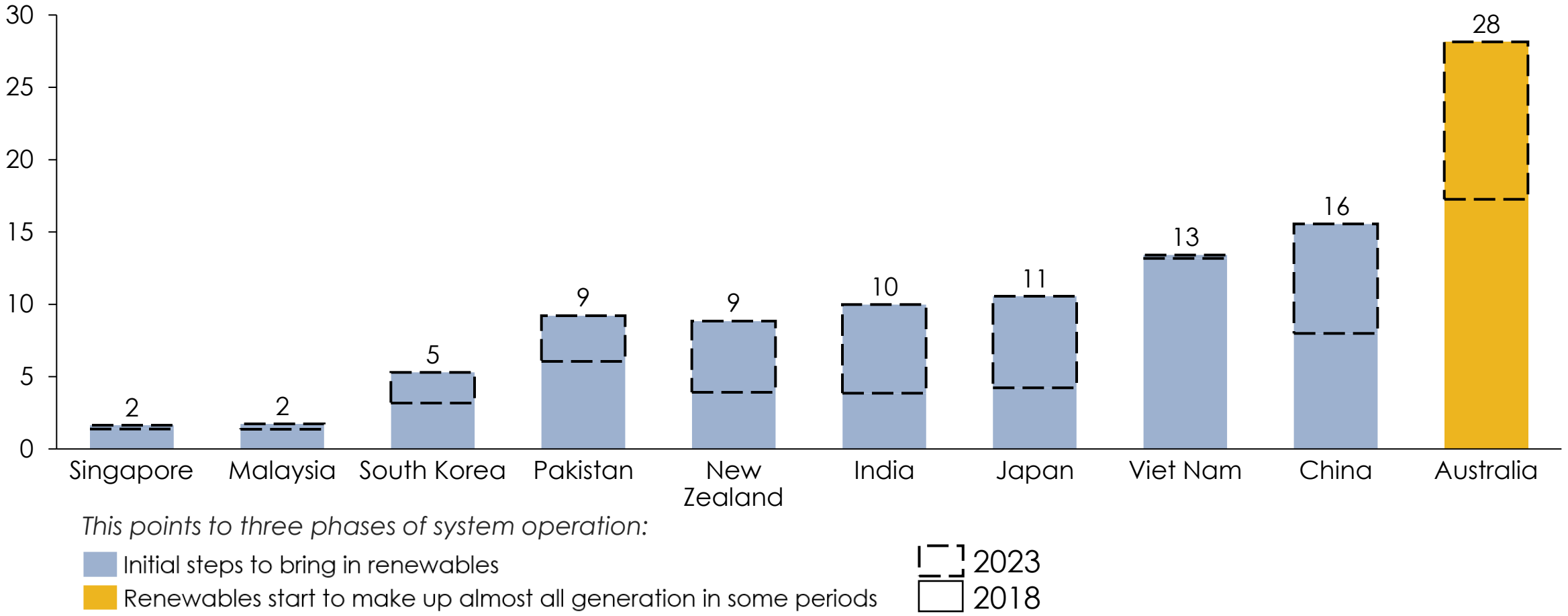


Note: All LCOE calculations are unsubsidized. Project size is at utility scale. Capacity factors for wind are P50. PV capex is in $/MW(DC). In countries where carbon schemes exist, the LCOEs and marginal cost of generation estimates of fossil fuel power plants include a carbon price. The LCOE range represents a range of capacity factors and project costs. For each market, we apply the standard corporate tax rate and an inflation rate from International Monetary Fund's (IMF)forecast consumer price index (CPI) annual rate for that market. Currency exchange-rate assumptions are based on a three-month average preceding the start of the analysis Source: BNEF (2025) Levelised Cost of Electricity Update 2025.

Wind and solar increasing quickly as a total share of generation in Asia

Annual wind and solar share and corresponding system integration phase in selected countries

% Wind and solar annual electricity generation, 2018, 2024



[1]France's wind and solar share dropped from 14% in 2023 to 12% in 2024 due to increased nuclear and hydro contributions to the electricity generation mix in 2024.
Source: Ember (2024), *Electricity Data Explorer, featuring latest available data (2024 for European countries, 2023 for others); BloombergNEF: New Energy Outlook (2024), 1H 2024 South Korea Energy Transition Market Outlook (2025),*

Systems can meet balancing challenge, which varies in sunbelt vs. windbelt regions. Asia will benefit from low costs with many 'Sunbelt' countries

- **Technical system operation in clean power systems can be managed**, provided via new technologies, already real-world examples where wind and solar provide most of the electricity generation at certain times of the year
- **Balancing needs differ by region and resource type:**
  - **Sunbelt regions (e.g. India, Australia, Vietnam)**
    - Balancing is primarily diurnal, driven by daily solar cycles
    - Short-duration storage and demand-side flexibility are increasingly sufficient and cost-effective, while medium- or ultra-long-duration storage is rarely required, resulting in low total system costs
  - **Windbelt regions (e.g. Central, Western China)**
    - As solar plays a smaller role, balancing needs extend beyond daily cycles to include week-to-seasonal timescales, and meeting rare wind droughts
    - Medium and long-storage therefore play greater role, increasing total system costs due to these technologies being more costly
- **Sunbelt countries in Asia** will therefore have particularly competitive, low cost, clean power systems

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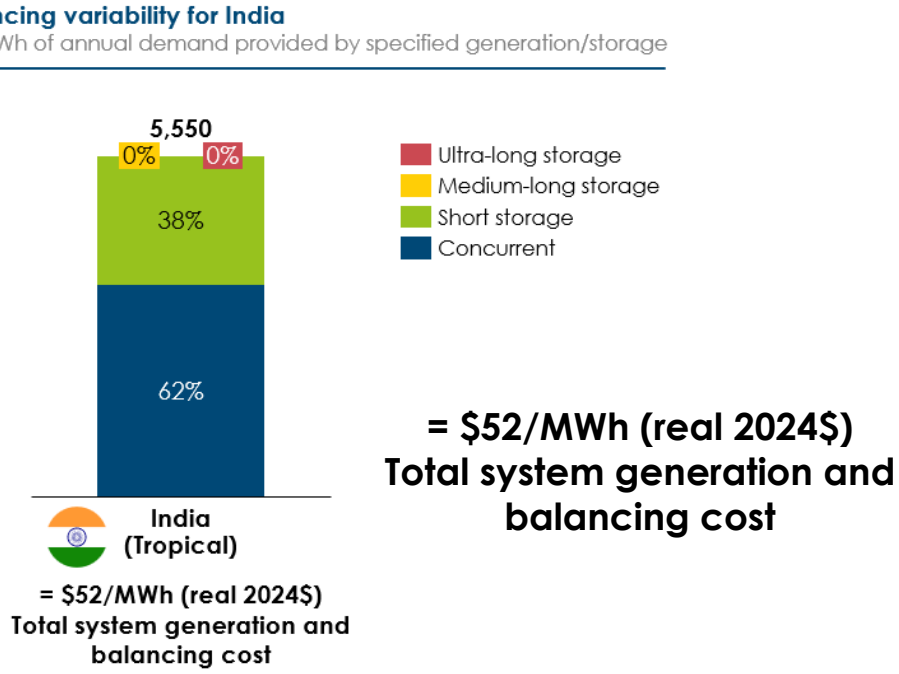

= $52/MWh (real 2024$)
Total system generation and balancing cost

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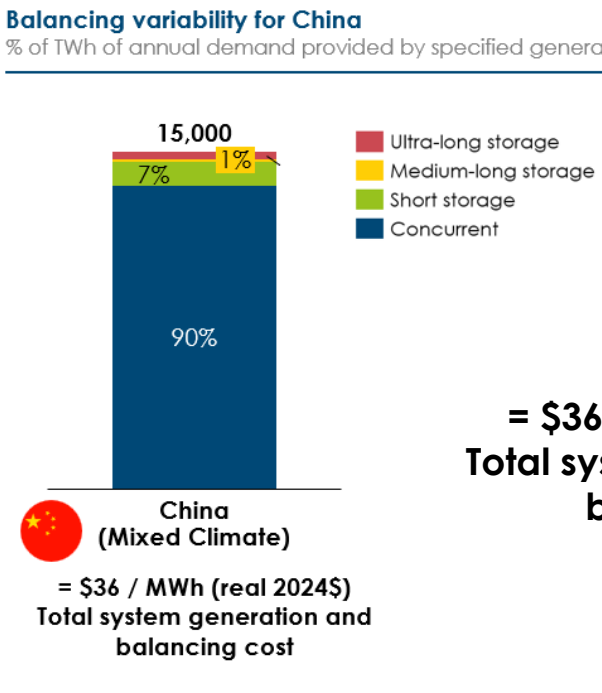


= $36/MWh (real 2024$)
Total system generation and balancing cost

= $36 / MWh (real 2024$)
Total system generation and balancing cost

ETC analysis on long-distance transmission links highlights high potential of interconnection across the Asia region

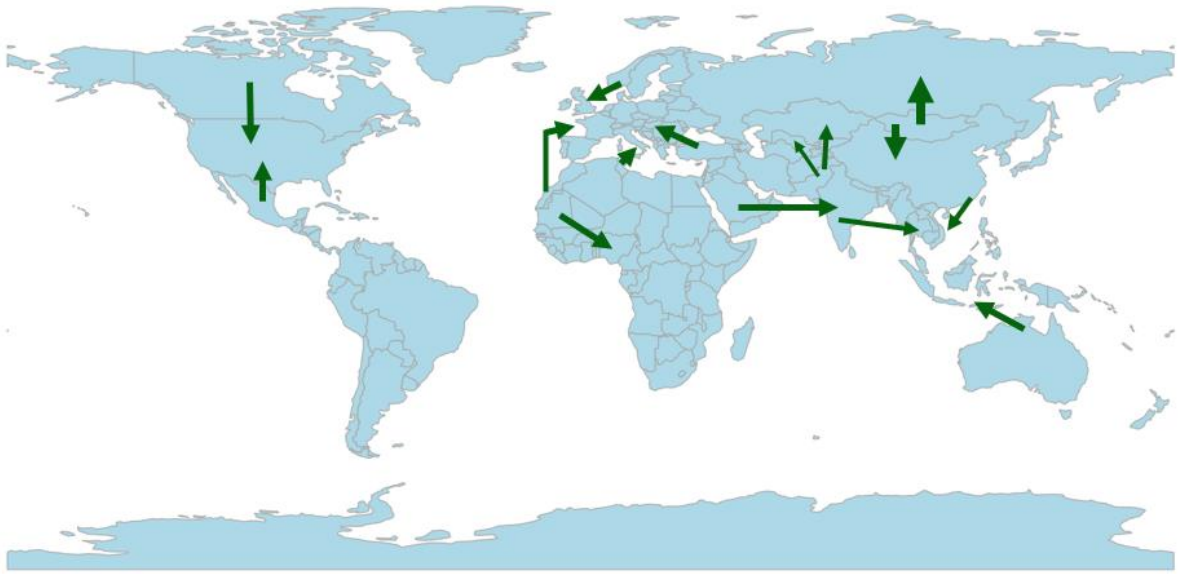
Long distance transmission can help to deliver:

- Low-cost clean generation, from a low cost/high availability geography
- Balancing, Using non-correlated weather and demand including with storage at the export site

Overall the modelling results suggest very large global technical potential for cross border interconnection, with a small number of high potential links having potential to deliver by 2050:

- **15%** of global power demand
- **1.8 Gt** per annum carbon reductions (equal to 13% of global power sector emissions)
- **$100bn** dollars of savings per year

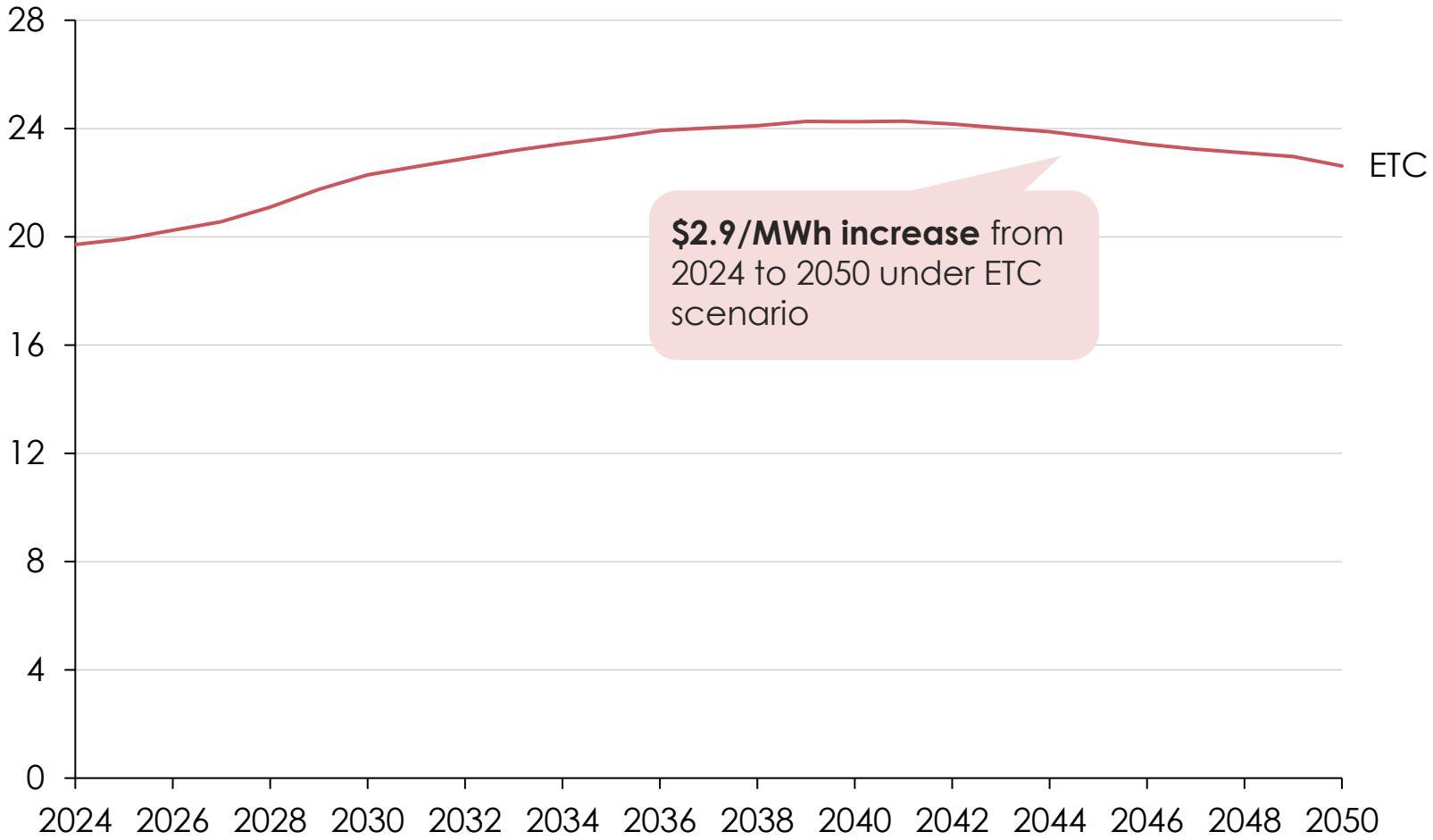
<u>Overall modelling results</u>: top 15 lines show potential for network 'megaprojects' such as Morocco and Australia as export hubs



Grids will need to expand, optimisation is key: costs per MWh will only increase slightly to 2050, but can be reduced if we maximise flexibility

Grid Capex costs (transmission & distribution) per demand unit, global, 2024–2050

$/MWh (real 2024$) for payments per electricity demand; interest rate = 5%; 30-year repayment timeline



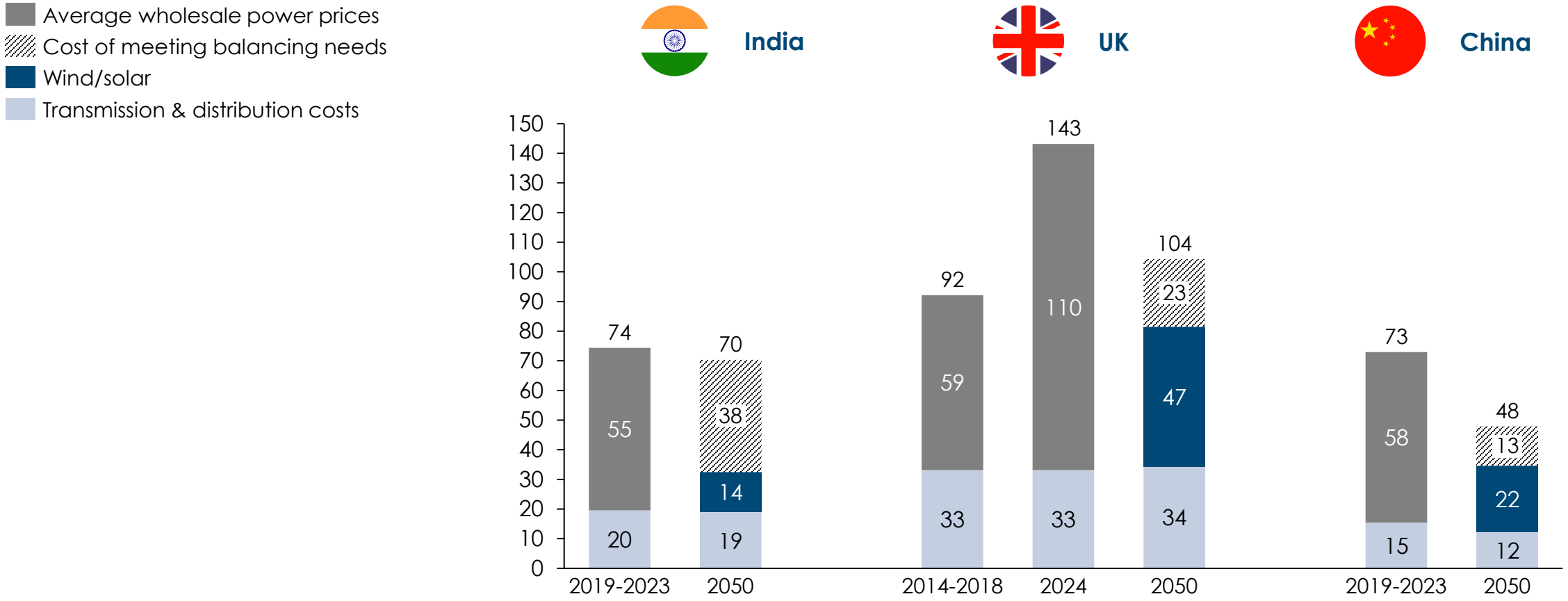
Source: Systemiq analysis for the ETC (2025), BNEF (2024) *New Energy Outlook 2024*

- **Grid capacity must grow by at least 50% by 2050** to meet electrification needs, even with all efficiency and optimisation measures in place
- The **initial increase in cost per unit of demand** is due to the upfront investments needed to build and reinforce the grid infrastructure in line with rising electricity demand.
- **The grid cost per unit of demand then decreases** because the fixed costs are spread over a larger volume of electricity consumption.
- **Grid optimization measures could further reduce** the need for additional grid build, lowering overall costs.

Total system generation, balancing and grid costs could be lower than current wholesale prices

Total system costs (generation and grids), recent vs 2050

$/MWh (real 2024$)



Sources: Systemiq analysis for the ETC (2025); BNEF (2023), 2H 2023 LCOE: Data Viewer v.1.0; Ofgem (2025), *Wholesale market indicators – Electricity Prices: Forward Delivery Contracts – Weekly Average (GB)*; *IEA (2023), Electricity Market Report – Update 2023*; Statista (2024), *Average electricity prices for enterprises in China from September 2019 to September 2024*

Key considerations for Asia – for discussion

- **Sunbelt countries benefit from lower-cost future power systems,** presenting a major opportunity to Asian countries as many benefit from high solar radiance
- **Hydrogen and ammonia co-firing** are not cost-effective generation or balancing options. Their high cost and low efficiency make them unsuitable as core generation or flexibility solutions compared to storage and grid optimization; furthermore, emissions reduction are limited from co-firing.
- **JET-P funding is shifting**. Coal phase-out finance in Indonesia and Vietnam is at risk, prompting debate on alternative investment models for transition
- **India's PPA market, featuring corporate contracts for generation and storage backed by the government, shows progress**. De-risked procurement is attracting private capital, even without full market reform
- **LDES deployment is lagging**. Outside of India, government support for long-duration storage remains limited, with assistance required from de-risked mechanisms to ensure deploymentt
- **Regional interconnection is a major opportunity**. Tropical countries with solar surpluses could support neighbours, but coordination and infrastructure gaps remain
- **Avoiding LNG lock-in is critical**. While gas could offer short-term reliability, new investment in gas infrastructure risks delaying renewables and locking in emissions

Cooling Buildings in Asia: key insights

Verbal summary from Hannah Audino

ETC 2025 workplan: feedback on topics and engagement areas

ETC 2025 work programme

Energy Transitions Commission

Building the clean energy system faster

Power systems transformation

Balancing renewable grids | *Building & optimizing grids* | *Long distance interconnect -tion* | *DSF & power demand* | *Low-carbon baseload: nuclear & geothermal*

Energy Productivity

Sector by sector opportunities | *Road transport* | *Harder-to-abate sectors*

Role of carbon molecules in a zero-emissions economy

Economics of the transition

Investment, costs & affordability | *Trade in low-carbon technologies*

Extending our influence in the global climate debate

- Disseminating ETC insights & recommendations
- Leveraging existing knowledge
- Informing the influencers

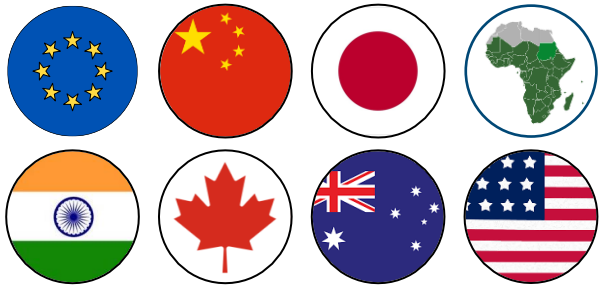
Delivering action through future COPs

- Triple up, double down, phase down
- COP 30, 31

Building the ETC regional network

Expand into new

Enhance networks and local priorities



Share insights & best practice

Supporting the ETC members

Meetings | Analysis | Resources | Events

Supporting the MPP and the ITA

MISSION POSSIBLE PARTNERSHIP

ITA INDUSTRIAL TRANSITION ACCELERATOR

2025 Analytical Work programme

Energy Transitions Commission

2025 | **Into 2026…**

Energy productivity

- Role of EP overall
- Road Transport & HTA deepdives

Power systems transformation

Integrated view on Power Systems Transformation
- Balancing renewable systems
- Role of grids

+ Interconnection opportunities

- Power demand growth
- Demand side flexibility
- The role of low-carbon baseload in net-zero power systems: nuclear and geothermal

Regional Programmes
- Indonesia – solar + grids
- India - AgriPV

Power Market design 2.0 – consumer pricing

Beyond power and H_2 – the role of emission-free molecules and 'defossilising' carbon

- The role of low-carbon molecules across sectors
- Sourcing fossil-free carbon (recycling carbon, DACC, bioresources)

Economic impacts of the energy transition

- Trade of low carbon technologies
- Investment, costs & affordability

Repackaging existing insights

- Carbon credits: Role of scope 3 emissions
- Bio-resources in net-zero economy
- Regional Programmes
  - Brazil
- Others - tbc

'Beating the drum' – *ongoing*

- Short form & tailored content
- Taking the messages out – media, events
- Partnership building

ETC regional programme: primary focus on Brazil, Canada, India, and Indonesia

Brazil

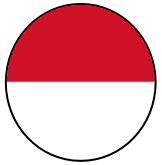
- Systemiq Brazil, ETC, iCS
- Re-examination of Brazil's latest NDCs
  - Interrogation of bio-centric decarbonization pathways
  - Framing of Brazil within the global context, rather than as a standalone country
- Run up to COP30

Canada

- Transition Accelerator + ETC
- Canada specific look at grids + bio
  - Focus on types of forests for bio-supply, comparing higher latitude countries like Canada with Brazil
  - Integration of high shares of renewables into Canadian grid

India

- TERI and ETC
- Examination of agriPV pilots in India
  - Land availability for solar generation
  - Interaction with distrubtion networks
  - Best practices around agriculture
- 8-10 months, starting end Q2



Indonesia

- IESR and ETC done under Indonesia Climate and Growth Dialogue (ICGD) platform of IISD
- Systems-wide approach to Net Zero
  - Update of IESR power system analysis in light of latest solar and battery costs
  - Implications for energy security and economic growth

Additional considerations in Asia/Australia – for discussion

- **Nuclear:** China, Japan, Korea all building it – greater long-term role than in other systems?
- **Renewables vs. coal:** focus on system integration in power work to dispel myths around grid operational issues
- **Economics of the transition:** ETC will work with country archetypes – likely increased cooling, lower heating, and greater income disparity that other regions. Mobility patterns also different.