

KEY TAKEAWAYS: FIRST COHORT OF ACTION PLANS FOR RAPID POWER SECTOR DECARBONIZATION



India



Australia



Chile



European Union



United Kingdom

Background

A collaborative report from the Clean Energy Ministerial (CEM) on [Lessons Learned for Rapid Decarbonization of Power Sectors](#) was delivered to energy ministers and presented at the 13th CEM (CEM13) in the United States in September 2022. In light of these lessons learned and discussed at CEM13, several jurisdictions signaled intent to develop Action Plans for power sector decarbonization, to be released at CEM14 in India in July 2023. These Action Plans, supported by the [21st Century Power Partnership](#) and other CEM workstreams via direct technical assistance and capacity building, are intended to focus on select implementation actions given each country's existing power sector goals and activities, and are an opportunity for countries to display leadership in power sector decarbonization. The first set of Action Plans has been developed by India, Australia, Chile, the European Union, and the United Kingdom.

These Action Plans are voluntary, developed by each country individually, not comprehensive of all activities within the jurisdiction, and are living documents that are subject to change.

Common Themes

These Action Plans differ in their approach to power sector decarbonization based on the domestic resources available, governance structure, and regional context, among other factors. However, they also share common themes that were emphasized in the collaborative report released at CEM13. Below is a select analysis of the implementation of best practices.

Planning: Cross-Sectoral Coordination

India: There are various initiatives that connect the power sector to other sectors, such as the Green Hydrogen Mission.

Australia: The Integrated System Plan accounts for transport and industry electrification, and the Powering Australia Plan is a coordinated economy-wide approach to achieving climate targets.

Chile: A path to carbon neutrality contains mitigation actions in the power sector (e.g., coal phaseout), as well as mitigation actions linking the power sector to industry and transport.

European Union: The REPowerEU plan links renewables (increasing the target to 42.5% of the energy mix by 2030) to energy security (ending dependence on Russian oil and gas).

United Kingdom: The decarbonization targets include components for hydrogen and carbon capture, utilization, and storage, both of which require coordination with heavy industry.

Planning: Long-Term Scenario Development

India: The Transmission Plan for Integration of 500 GW of Renewable Energy and the National Electricity Plan, developed every 5 years, were recently published.

Australia: The Integrated System Plan envisions an expansion of utility-scale wind and solar (ninefold increase), distributed solar (fivefold increase), and storage (30-fold increase) by 2050.

Chile: Chile is targeting a coal phaseout by 2040, and their projected power generation mix by 2050 includes a significant amount of solar photovoltaics, concentrating solar power, and wind.

European Union: The Joint Research Centre provides long-term energy and emissions projections; in the 1.5°C scenario, Europe's generation mix is primarily wind, solar, and nuclear.

United Kingdom: To assist with long-term scenario development, the United Kingdom sets 5-year carbon budgets 12 years

in advance, along with a corresponding plan to meet those budgets.

Building: Grid Modernization Actions

India: India is supporting transmission development to interconnect 500 GW of non-fossil capacity by 2030, and developing resource adequacy guidelines for high levels of renewables.

Australia: Actions include investing in grid expansion and modernization, including renewable energy zones and an undersea high-voltage direct-current cable to Tasmania.

Chile: A law to promote transmission development is paired with a plan to build utility-scale battery storage and distributed energy resources to ease congestion on transmission lines.

European Union: The European Network of Transmission System Operators for Electricity publishes a nonbinding 10-year network development plan every 2 years.

United Kingdom: Along with its existing transnational transmission lines, the United Kingdom is constructing lines to France and Denmark and considering lines to France and Germany.

Building: Clear Procurement Approaches

India: The carbon credit trading scheme seeks to increase private sector emissions reductions, and the Green Energy Open Access Program increases access to renewables for small customers.

Australia: The National Reconstruction Fund supports supply chains and manufacturing and industrial capabilities for wind turbines, battery cells, solar panels, and critical minerals.

Chile: The National Green Hydrogen Strategy aims to build Chile's green hydrogen export industry, and the National Lithium Strategy promotes sustainable domestic lithium mining.

European Union: The Renewable Energy Directive has been revised to increase the renewable generation targets, supported by policies for wind, offshore energy, and solar power.

United Kingdom: The Action Plan includes a focus on carbon capture, utilization, and storage (e.g., funding for initial pilot projects) and nuclear (e.g., investments in small modular reactors).

Operating: Innovative Market Designs

India: India has regulations to increase coal plant ramp rates and reduce minimum operational levels, pilot projects for faster

scheduling and dispatch of resources, and green electricity markets.

Australia: The Australian Energy Market Operator has developed an Operations Technology Roadmap that identifies system and market operations capabilities needed in the coming years.

Chile: Chile introduced updated market competition conditions, where generators can bid for specific time blocks in 1- or 6-hour increments, supporting wind and solar generators.

European Union: One proposed revision to the electricity market is to allow cross-border intraday trading of electricity closer to real time, creating more opportunities to share renewables.

United Kingdom: The United Kingdom identifies the capacity market and contracts for difference (providing stable revenue for renewables) as key enablers for its climate goals.

Operating: Prioritize All-Asset Flexibility

India: Pilot projects have provided important insights about beneficial ancillary services that can be provided by distributed battery storage, electric vehicles, and demand response.

Australia: The Distributed Energy Resources Program seeks to incorporate high levels of distributed energy into the grid through demonstrations, modeling, and standards development.

Chile: Chile anticipates hydrogen production electricity demand to peak midday, coinciding with solar production, and electro-mobility demand to peak at night, due to charging flexibility.

European Union: The European Union called on member states to define national objectives for demand response, distributed storage, and other sources of end-use flexibility.

United Kingdom: The percentage of coal in the electricity mix reduced from 40% in 2012 to 1.8% in 2020, enabled by flexibility from natural gas, imports, renewables, and load.



The full Action Plans and synthesis report can be found at: 21stcenturypower.org/our-work/action-plans

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The 21st Century Power Partnership is a multilateral effort of the Clean Energy Ministerial and serves as a platform for public-private collaboration to advance integrated policy, regulatory, financial, and technical solutions for the large-scale deployment of clean energy in combination with deep energy efficiency and smart grid solutions.

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