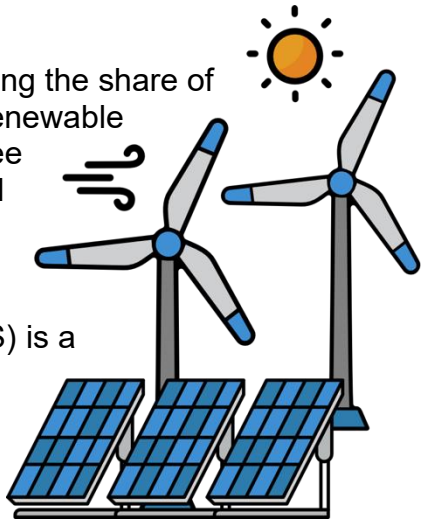
Asia-Pacific Economic Cooperation

POLICY BRIEF

Regulatory/Market Settings to Support Greater Electrical Energy Storage Development for Sustainable and Socially Responsible Electricity Sector CO2 Emissions Reductions in APEC Economies

Benefits of Electrical Energy Storage



In 2014, APEC member economies set an ambitious target: doubling the share of renewables in the energy mix between 2010 and 2030. Variable renewable energy (VRE) sources, such as solar and wind, are expected to see the largest growth in terms of capacity in APEC between 2020 and 2050. However, as solar and wind generators are inherently variable compared to traditional energy sources, achieving significant VRE integration will require substantial investments to modernize electricity infrastructure. Electrical energy storage (EES) is a critical part of the solution, capable of storing surplus VRE energy that might otherwise be wasted and supplying it when needed. This makes EES a pivotal technology to enhance grid flexibility and reliability and support the renewable energy transition in APEC.

The role of market settings

Market settings create the right conditions to help a market grow and function effectively. For EES, this means establishing rules, policies, and support systems that attract businesses and investors, enabling them to thrive. In many APEC economies, the EES market is currently still in its early stages of development, largely because most projects are government-driven, reducing the immediate demand for a broader market. To scale EES adoption to levels that support renewable energy goals, substantial growth in capacity is essential, requiring active private sector involvement. Achieving this will depend on creating a supportive market environment to strengthen EES markets and build investor confidence, especially as EES remains a costly and high-risk investment across many APEC economies.

Criteria of good market settings

Advancing EES requires a comprehensive and strategic approach. Insights from APEC member economies that have achieved notable progress in EES investments highlight three essential elements as criteria for good market settings to support greater EES development.

Regulatory frameworks Well-designed regulations provide the predictability and incentives needed to promote EES adoption and attract investment.

Financial support Financial support from the government can mitigate the high upfront capital costs of EES projects and incentivise private investment.

Market mechanisms Robust market mechanisms enhance the profitability of EES projects, bolstering investor confidence and ensuring project viability.

These three criteria serve as foundational pillars for guiding actionable recommendations and fostering an enabling environment for EES development.

Recommendations for APEC member economies

Building on the three criteria of good market settings, this section provides key recommendations to establish effective market conditions for EES technologies in APEC member economies. These recommendations aim to support a successful renewable energy transition across the region.

Regulatory frameworks

Targets and mandates: Implement specific domestic and/or sub-domestic targets for EES deployment. Consider utilizing mandates/incentives for EES integration with RE projects.

Policies for behind-the-meter applications: This could include mandates or incentives related to the use of EES, such as BESS, with PV for commercial and industrial buildings.

Establish clear timelines for policy development: Publicize clear timelines for policy rollout to signal demand and guide investment.

Enhance supportive policies for VRE projects: Gradually increase the allowable percentage of VRE on the grid, creating a market need for supporting EES infrastructure, offering subsidies, grants and/or concessional finance for residential and utility scale VRE projects, or identifying RE zones.

Create mechanisms for stakeholder engagement: Develop forums for stakeholder feedback on draft regulations and project planning

Support for R&D: Provide grants or tax credits for EES R&D projects, tailored to regional needs.

Financial support

Government investments: Fully fund or co-invest in EES projects with private/international partners.

Standalone system support: Offers tax credits, low-interest loans, or grants for standalone EES systems.

Behind-the-meter system incentives: Subsidize installation costs and offer battery maintenance/replacement rebates.

Support for PSH: Subsidize infrastructure development costs for PSH projects, such as tunnel construction or power station upgrades.

Financial incentives for RE projects: Provide financial incentives for RE projects to indirectly promote EES investments.

Market mechanisms

Investment signals: Use long-term contracts like PPAs with fixed rate escalation clauses for revenue stability.

Energy arbitrage: Enable energy arbitrage through time-of-use pricing models to boost profits.

Competitive procurement: Develop a transparent, competitive bidding process for EES projects.

Ancillary service markets: Compensate EES for providing ancillary services like frequency regulation and voltage control.

Capacity payments: Pay EES providers for maintaining available storage capacity to enhance grid reliability.

Additional recommendations

Knowledge sharing: Promote workshops, trainings, or centralized digital platforms that share best practices and standards.

Leveraging existing reservoirs for PSH development: Encourage the use of existing water reservoirs for PSH projects to reduce capital, social, and environmental costs.

Cost-benefit and feasibility studies: Conduct cost-benefit and feasibility studies for proposed EES projects.

Data collection and market monitoring: Regularly collect and share market data to improve market transparency and inform stakeholders.