Multi-Objective Auctions for Utility-Scale Solar Battery Systems: Lessons for ASEAN and East Asia

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Abstract

Auctions are an increasingly popular means of competitively promoting and procuring renewable energy to meet energy, social, and climate change objectives. To succeed, the technology designs need to accommodate technological progress, declining costs, and increasing Environmental, Social and Governance (ESG) demand. This analysis examines international experiences with large-scale solar photovoltaic (PV) and battery energy storage systems (BESS) auctions, which may be useful for East and Southeast Asia. It revisits auctions' theoretical and conceptual frameworks while concentrating on the ESG aspect from the perspective of such key stakeholders as investors, government, bidders, and communities, regarding efficient allocations of risks, costs, and benefits. It then relates this framework to real-world practices and international evidence on solar PV with and without BESS. The analysis shows that integrating ESG in auction designs and business models is possible and can benefit business and sustainable development. This analysis' focus on the ESG and solar PV plus BESS in auctions contribute are nearly non-existent in the existing academic literature according to the review by del Río and Kiefer (2023).

Key words: Renewable energy, solar power, battery storage, auction design
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