

Evaluating the ancillary services market for large-scale renewable energy integration in China's northeastern power grid

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Abstract

The installed renewable energy capacity in China is the largest in the world. However, the curtailment of renewable energy remains problematic. To alleviate this problem, a pilot for integrating the ancillary service market for renewable energy in China's northeastern power grid began in 2017. Before this time, a compensatory ancillary service cost mechanism was implemented, in which thermal plants not providing ancillary service paid the costs of the thermal plants providing ancillary service under government supervision. The pilot ancillary service market allowed thermal plants providing ancillary service to make independent quotes. Renewable energy plants were included in those paying the ancillary service costs. We examine the effects of the ancillary service market in the context of large-scale renewable energy integration. The results show that this market has given rise to competing interests between renewable energy and thermal plants. Therefore, measures must be taken to improve the ancillary service market, including eliminating the ancillary service bidding limits, establishing a renewable auction mechanism, and transforming the spot market.

Biography:

Dr. Junfeng Hu is an Associate Professor in the School of Economics and Management, at North China Electric Power University(NCEPU). He was also a Visiting Faculty Affiliate for the China Energy Group, Energy Technologies Area, at Lawrence Berkeley National Laboratory in 2018-2019. His work focuses on energy economics, electricity markets, and electricity system modeling. He presently studies the development of power sector, renewable energy integration and interconnection between power market and carbon market in China mainly. He holds a PhD in Technical Economics and Management from NCEPU, and an MS in Management Science and BS from the School of Economics and Management at Harbin Engineer University, China.

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