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Facilitating efficient augmentation of transmission networks to connect renewable energy generation: the Australian experience

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Abstract

Australia is heavily dependent on coal for electricity generation. The Renewable Energy Target has spurred growth in the utilization of renewable energy sources, with further growth expected into the future. Australia's strongest renewable energy sources are generally distant from the transmission network in resource *basins*TM. Investment is needed to augment the transmission network to enable delivery of electricity from these sources to consumers. Considerable economies of scale flow from anticipating the connection of numerous generators in an area over time and sizing augmentations accordingly.

Following a lengthy rulemaking process, the National Electricity Rules were recently amended by a new rule, designed to facilitate the construction of such efficiently sized

augmentations. However, the new rule is more conservative than initially envisaged, making little substantive change to the current frameworks for augmentation and connection.

This paper outlines these frameworks and the rulemaking process and identifies the key debates surrounding the rule change are identified. This paper then provides a detailed analysis of the new rule, concluding that it is defective in a number of respects and is unlikely to result in the efficient and timely augmentation of the network needed to unlock the potential of Australia's strongest renewable energy resources.

Highlights

- Remoteness of renewable energy sources is a barrier to greater renewable energy utilization.
- Significant economies of scale flow from efficiently-sized transmission network augmentation.
- Current frameworks in Australia do not incentivise efficiently-sized network augmentations.
- The lack of property rights in an augmentation is particularly problematic.
- The new Scale Efficient Network Extensions rule is not apt to facilitate efficiently-sized network augmentations.



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Abbreviations

ABARE, Australian Bureau of Agricultural and Resource Economics; AEMC, Australian Energy Market Commission; AEMO, Australian Energy Market Operator; AER, Australian Energy Regulator; AGL, AGL Energy Ltd (previously Australian Gas Light Company); CEC, Clean Energy Council; COAG, Council of Australian Governments; CREZ, Competitive Renewable Energy Zones (Texas); DCCEE, Department of Climate Change and Energy Efficiency; DECC, Department of Energy and Climate Change (UK); DSP, Demand Side Participation; ERCOT, Electricity Reliability Council of Texas; ESAA, Energy Supply Association of Australia; ESOO, Electricity Statement of Opportunities; FERC, Federal Energy Regulatory Commission (US); MCE, Ministerial Council on Energy (now called the Standing Council on Energy and Resources); MEU, Major Energy Users; MPCCC, Multi-Party Climate Change Committee; NEB, National Electricity Board (Canada); NECA, National Electricity Code Administrator (roles and functions now transferred to the AEMC and AER); NERA, National Economic Research Associates; NEB, National Energy Board (Canada); NEL, National Electricity Law; NEMMCO, National Electricity Market Management Company; NEM, National Electricity Market:

NEO, National Electricity Objective; NER, National Electricity Rules; NGF, National Generators Forum; NGMC, National Grid Management Council; NSP, Network Service Provider; NTNDP, National Transmission Network Development Plan; OECD, Organisation for Economic Cooperation and Development; OFGEM, Office of the Gas and Electricity Markets; PUC, Public Utilities Commission (Texas); RET, Renewable Energy Target; REMF, Review of Energy Market Frameworks in light of Climate Change Policies; RIIO, Revenue=Incentives+Innovation+Outputs; RIT-T, Regulatory Investment Test for Transmission; RPI-X, Retail Price Index-X; SENEs, Scale Efficient Network Extensions; TNSP, Transmission Network Service Provider; TEC, Total Environment Centre

Keywords

Transmission policy; Transmission network augmentation; Scale efficient network extension

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