

Small Systems, Big Targets: Power Sector Reforms and Renewable Energy Development in Small Electricity Systems

EPRG Working Paper 1709

Cambridge Working Paper in Economics 1720

**Rabindra Nepal, Tooraj Jamasb, Anupama Sen
and Lawrence Cram**

The dominant focus of much policy attention of late has been on the suitability of electricity market reform carried out under the ‘standard’ or prescriptive approach – the end point of which is market liberalization – for the integration of intermittent renewables. There is now a growing consensus around the argument that traditional energy-only electricity markets where prices are based on system marginal cost cannot function efficiently with both fossil fuels and renewables, potentially resulting in market disruptions and price volatility. Consequently, most policy discussion has focused on finding ways to successfully integrate the two through adopting advanced competitive solutions (such as the use of capacity markets in addition to energy-only markets) in larger electricity systems. This paper however argues that the effectiveness of competition is limited by the size of an electricity system – in other words, there is a minimum threshold size (and other associated characteristics such as tropical locations, lack of access, and the prevalence of remote communities of consumers) under which competition will not produce expected outcomes, and for which distinctive policy solutions are required.

Hence, the focus of the paper is on small electricity systems. There is also a limited scope for learning from previous literature for small systems, which account for a small but important number of island economies in the Asia Pacific, South East Asia and the Caribbean which are particularly vulnerable to climate change, and where reform objectives have consequently included market restructuring alongside improving access and scaling up renewables. We review the policy experiences in three small electricity systems: two of these – Nicaragua and El Salvador - have successfully integrated renewables to over 50% of generation within the space of a few years – and based on these countries’ experience we identify a number of practical policy solutions. We propose that a third, Australia’s Northern Territory, closely fits the generic case for the adoption of a similar approach, as the Territory has adopted an ambitious renewable energy target in the midst of ongoing power sector reforms.

We propose that national policies with renewable energy targets and renewable-technology specific law; fiscal incentives through tax exemptions and support for the export and import of renewable energy/equipment; network arrangements such as non-discriminatory grid access and preferential grid dispatch; regulatory instruments such as capacity payments and net metering, and financing arrangements to attract private investments (both domestic and foreign) can help foster renewable energy development across small electricity systems. The role of private sector participation in electricity generation and retail markets; interconnection with larger markets in the longer-run and the opportunity to align renewable energy development with expanding energy access in remote and island communities are equally important in expanding renewable energy use in small systems and territories.

Contact
Publication
Financial Support

rabindra.nepal@cdu.edu.au
May, 2017