



Is the NEM broken? Policy discontinuity and the 2017-2020 investment megacycle

EPRG Working Paper 2014

Cambridge Working Paper in Economics 2048

Paul Simshauser and Joel Gilmore

The recent history of Australia's National Electricity Market (NEM) from 2012-2017 has been problematic with unforecasted coal plant closures, a tight domestic gas market and sharply rising electricity prices. The supply-side response that followed from 2017-2020 was significant – 12,000MW of plant commitments comprising \$21.5+ billion across 105 projects – most of them Variable Renewables. For a market the size of the NEM, this was an investment megacycle.

The volume of activity comprising the investment megacycle has itself led to problems including entry lags, connection delays, system Frequency careering outside normal bands, reduced grid stability, rising Frequency Control Ancillary Service costs and increasing Operator interventions in the security-constrained dispatch process. All market institutions were caught out by the rate of change.

Yet instead of identifying and addressing urgent problems, a suite of fundamental market redesign reform proposals were proposed to fundamentally alter the National Electricity Market's real-time gross pool, zonal market design. Despite the abundance of exotic market redesign reform proposals, there is surprisingly little evidence, and certainly no united agreement, on what problem actually exists.

In this article, we analyse recent National Electricity Market performance and find all pressing issues relate to real-time power system security rather than Resource Adequacy, reflecting a 'Rate of Change' problem stemming from record levels of simultaneous (asynchronous) new entry. As it stands, no reform proposal comes even close to resolving these existing, and pressing, problems. To be sure, our analysis reveals the existing NEM design *must* be altered to restore power system resilience – 'missing markets' for Operative Reserves, system strength, and Fast



Frequency Response must be established. But fundamental market redesign aimed at resolving perceptions of future Resource Adequacy are a distraction. It may well become necessary, but there is no united agreement as to why this is the case, nor when it is required.

In our view, missing markets required to restore power system resilience need to be procured on a proactive basis, and where relevant in locations where grid stability may be at risk under conditions of rapid plant closure (or entry). The power system is experiencing new and emerging modes of failure, some visible and other yet to be revealed.

None of the results from our analysis point to an alternate market design that might have improved outcomes. Conversely, changing a market design in the middle of a major transitional phase risks adversely impacting recent generation commitments, freezing ongoing merchant generation plant investment, frustrating each and every retail and wholesale contract spanning the event, and, will almost certainly induce liquidity events – noting that a surprising large and complex debt refinancing task now faces the industry following the 2017-2020 investment megacycle.

For international Market Operators seeking to learn from Australia's recent experience, we would suggest i). avoiding policy discontinuity and the conditions that trigger uncontrolled *gold rush* conditions and an awkward investment megacycle, and (ii). assume plant stock transition will eventually involve an abrupt phase – therefore, ensuring a well-prepared, airline cockpit-style emergency handbook exists is quite essential in order to deal with scenarios not anticipated, i.e. rapid aged thermal plant closures followed by a very large fleet of asynchronous generators.