Regulated electricity networks, investment mistakes in retrospect and stranded assets under uncertainty

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From 2004 to 2018 the Regulatory Asset Base (RAB) of electricity networks across Australia's National Electricity Market tripled in value, from $32 billion to $93 billion. The run-up in the capital stock was driven by forecast demand growth and a tightening of reliability standards. But demand contracted from 2010-2015. With a rising RAB, demand contraction and a regulated revenue constraint, an adverse cycle of sharply rising tariffs and falling demand appeared to be emerging.

Certain networks are now characterised by significant investment mistakes in retrospect. Significant investment mistakes in retrospect combined with an electricity network in decline presents policymakers and regulators with a serious problem because the outcomes for consumers are in stark contrast to competitive markets. In the competitive generation market, investment mistakes in retrospect result in (1) excess capacity, (2) falling prices, (3) asset write-downs and plant closures, (4) shareholder losses and (5) consumer surplus through lower prices. Conversely, investment mistakes in retrospect and declining demand for a regulated network monopoly results in (1) a higher RAB, (2) a higher annual revenue requirement, (3) a correspondingly higher regulated tariff, (4) stable returns to shareholders, and (5) welfare losses borne entirely by consumers through higher tariffs. Various consumer groups in Australia have argued that some level of the RAB should be stranded, or written-off completely and network tariffs reduced.

Ignoring such a problem is difficult. Historically, significant investment mistakes in retrospect could be "sweated out" with comparatively little damage done to overall economic efficiency. Constant population growth and an expanding economy could be relied upon to produce ever higher power system demand and thus planning

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errors would self-correct over time. But various jurisdictions are now experiencing *networks in decline* (or as one reviewer noted, *networks in flux*) in the traditional utility services of electricity, gas, fixed line telecoms and postal services (see also Decker, 2016).

In this article, we review the arguments for and against the recovery of stranded assets. There is no basis for full recovery, but nor is there any serious argument for zero recovery. A policy decision to write-off a material level of a network RAB without some form of financial and economic reorganisation is likely to produce a distressed utility business. The reason for this is axiomatic; our analysis confirms any meaningful asset stranding program would result in severe financial distress and technical insolvency, at least for our modelled template regulated network utility business. Besides which, how can we be sure that energy demand is entering a state of terminal decline?

In this article we present a method for dealing with stranded assets under uncertainty. Rather than permanently stranding assets that fail a *used and useful test*, we reorganise the financial and economic affairs of a template network utility and "Park" excess capacity and issue credit-enhanced bonds (i.e. that have been wrapped by government) to temporarily finance the stranded capital stock. The use of wrapped bonds produces a cost of capital arbitrage and stabilises the finances of the utility.

Using a 20-Year Model, we re-examine the level of Parked Assets at the end of each five-year regulatory determination and use customer numbers as the testing variable, with Assets "Un-Parked" and returned-to-service in line with connections growth.

The policy produces an immediate reduction in network tariffs through (i) the lower RAB and (ii) the cost of capital arbitrage via the use of wrapped bonds. Tariffs follow a more stable trajectory albeit with marked increases when Parked Assets are Un-parked and returned-to-service.

Our analysis has certain limitations. We touch seldom and lightly on the valuation of stranded assets. Additionally, we do not contemplate the macroeconomic significance of the policy and its potential impact on the future cost of money for participating governments. Furthermore, our analysis largely ignores the treatment of Parked equity capital, and how to treat a Parked RAB that proves to be permanently stranded. These remain areas for further research.