ECONOMIC ROUNDTABLE SUBMISSION

TOPIC 2: INVESTING IN THE NET ZERO TRANSFORMATION

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Net zero may be achieved by reducing emissions or offsetting emissions, or a combination of both. This submission focuses on delivering emission reductions, and thus specifically in the electricity industry, which is the largest emitter in the economy.

The Productivity Commission (PC) lists three key threads in its review:

1. **Reduce the cost of meeting carbon targets**

   In the electricity sector, reducing carbon emissions follows from burning less fossil fuel. This may be achieved by (a) energy efficiency in production processes and the in home; (b) a carbon tax or a cap-and-trade scheme; (c) substituting renewable energy for fossil fuel plants supported by storage and used correctly; (d) a more competitive wholesale and retail market and (e) some simple market design reforms.

   Points (a) and (b) require little explanation. (c) Is partially but very imperfectly underway. To be effective, renewable energy requires a vast storage capacity; the current pace of investment is too slow to effect a meaningful transition, even with the federal government's Capacity Investment Scheme. Two problems emerge: (i) how to integrate storage in the National Market (economics) and (ii) what is a cost-effective storage technology, considering the vast amount of storage that is necessary. (To be clear, pumped hydro is of limited relevance in Australia given the scarcity of rivers.) Furthermore, large players like Origin or EnergyAustralia are able to transfer their market dominance in generation and retail to the storage market – see Roger (2024) in the References. They are currently the largest investors in, or operators of, storage assets; there is very little new entry. Finally, the combination of renewable energy (like solar) and fossil fuel (like gas) can lead to increases in emissions because of insufficient competition – (c) and (d) connect here. With little competition, colluding gas-peaking plants take turns in producing, and each of them ramps up too fast and produces inefficiently to meet inelastic demand. With a concave production function, they also emit more than if operating at a lower level of output.

   Market design reforms are essential to reduce the cost of meeting carbon targets – (e). First, the National Energy Market (NEM) is currently restricted to zonal pricing rather than nodal pricing. On the transmission network alone, there are hundreds of nodes, each of which is subject to transient congestion that should be reflected in the price of energy. But the NEM allows for only five pricing nodes. Five prices cannot correctly allocate energy at hundreds of nodes: this is like saying we can use five prices to allocate hundreds of different products. More mature markets like California and Texas use nodal pricing – a price at each node, which gives investors the correct price signal to locate their generation and storage assets. Second, competition in the NEM can be enhanced by the introduction of a day-ahead market (DAM), which is also used in California, Texas, PJM, New-England or New York, and others. A DAM operates like a forward market, which is pro-competitive. It is also better for price discovery: the (more) predictable part of the market is priced ahead, and the less predictable one at delivery. Additionally, the combination of nodal pricing and a DAM is likely to assist in the uptake of storage, precisely when storage investment must be accelerated. The reason is that storage feeds on price differences, which nodal pricing provides. Storage also dislikes uncertainty, and a DAM removes much of this uncertainty ahead of the physical delivery of energy. Finally, it is urgent to restore price elasticity (aka demand response) in the wholesale market. At present, retailers each offer a quantity to buy rather than a whole demand schedule. They should be required to bid a full, price-dependent schedule (as is the case with suppliers). With the advent of smart meters, there is no excuse for retailers not to do so. The benefits of a price elastic demand side are (i) lower clearing prices in the wholesale market, and (ii) smaller quantities traded – that is, a more efficient use of energy.

2. **Speed up approvals for new energy infrastructure**

   Connecting new assets to the grid induces externalities to incumbents and, more importantly, on the market operator – for example, stability concerns. We suggest first that developers seeking a connection should be required to offer a remedy to any externality they impose on the system. This remedy may be a technical solution like a storage unit, accurate forecasting of production or other such as contracts for delivery of services by a third party. We also point out that understanding the economic implications of new connections is a lot easier under nodal pricing than under zonal pricing, which imposes proportional curtailment. (With nodal pricing, the curtailment is marginal.) Second, we propose investigating a new queuing system for new projects that ranks them according to their benefit to the grid. Such an approach induces proponents of a new project to disclose all information that is pertinent to the market operator, and so forces them to internalise the problems of the market operator in the first place. The details of this system are still under development by the research team at Monash University.

3. **Encourage adaptation by addressing barriers to private investment**

   We identify the main barriers to private investment in new, environmentally-friendly technologies as being (a) completion risk; (b) operational uncertainty and (c) incumbency.

   Completion risk can be very costly, and can be reduced by providing speedy and transparent approvals, as discussed above. To reduce it, the federal government or even the market operator (AEMO) can underwrite projects (in return for a fee and against some collateral or access to future operating revenue) so that developers can seek financing from project financiers. At present, project financiers are reluctant to carry both the competition risk and the operating risk. To reduce the operating risk, developers contract with large operators that are creditworthy. There are only three of them: Origin, AGL and EnergyAustralia. The additional problem is that it consolidates their market dominance. Unfortunately, the CIS does not address completion risk, nor does it provide the correct incentives to potential entrants.

   Operational uncertainty has become problematic in the NEM. State governments and the federal government enter into extremely opaque contracts with asset owners such as Neoen (the Big Battery in Victoria), or AGL (Loyang A), or Origin (Eraring, NSW) that distort what can be reasonably anticipated by market participants.

   Incumbents can use their mere presence and sheer size to pre-empt entry by new firms: they invest just enough so that the next firm finds entry unprofitable. They can also exploit the advantage inherent to their portfolio of assets. This issue is especially acute when it comes to storage: large, diversified firms like Origin can combine their generation assets and storage assets to enhance their market power.

In summary, we wish to emphasise the need for storage investment as well as market reforms. Market reforms are inexpensive alterations of the trading environment – they are much cheaper than capital investment – that can deliver real benefits to all Australians.

References:

Jha, Akshaya and Gordon Leslie (2025) “Start-up costs and market power: lessons from the renewable energy transition”, American Economic Review, vol. 115, no. 2, February 2025 (pp. 690-726)

Roger, Guillaume (2024) “The storage imperative”, working paper, Monash University