

The changing role of markets in Australia's transition to renewable electricity: back to where we started?

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Outline

1. Introduction
2. Before deregulation/liberalisation
3. The liberalisation era
4. Australia's (the NEM's) electricity liberalisation journey
5. How has it worked out in Australia and Victoria in particular ?
 - a. Distribution
 - b. Transmission
 - c. Retail
 - d. Wholesale
 - e. Distributed Energy Resources
6. The road ahead

Before liberalisation/deregulation (before 1980s)

- ▶ From Maxwell/Faraday to widespread practical application took 60 years
- ▶ Economies of scale; natural monopoly in transmission; joint-product nature of Generation & Transmission (G&T) and absence of storage, led to ever greater integration of G&T and dominance of big companies
- ▶ Nascent competition (U.S. pools; Nordel), but big industry structure questions (G&T integrated) seemed to be settled. Much debate on integration or not of G&T and distribution&retail

The deregulation era

- ▶ From early 1980s; privatisation (Chile then Britain) & wholesale markets (Britain, Norway, NZ, the NEM, Alberta, Texas, other parts of U.S. & Canada, Europe)
- ▶ In Britain, privatization spurred demand for market and competition.
- ▶ But competition without privatisation in many others (either because industry already private or because privatisation not possible).
- ▶ Essential features:
 - ▶ separation of generation from transmission;
 - ▶ competition for supply to large customers;
 - ▶ an organized market developed by industry on governments' instruction.

A dizzying array of choices became available in time

- ▶ Transmission:
 - ▶ separate power system operation and market operation?
 - ▶ separate power system operation and network operation?
 - ▶ separate planning from network ownership?
 - ▶ “merchant” transmission?
 - ▶ contestable development of regulated assets?
- ▶ Generation
 - ▶ Mandatory or voluntary pool?
 - ▶ Structure of offers?
 - ▶ Financial instruments?
 - ▶ Gate closure time?
 - ▶ Compensation for availability other than through energy?
 - ▶ Markets for ancillary services?
 - ▶ Locational or regional?
 - ▶ Single price or separate buy and sell prices?

What precipitated the deregulation/liberalisation ?

- ▶ The 1980s: fall of Berlin Wall, disintegration of USSR, democracy in Poland and Baltic States, Glasnost, Perestroika, Popper, Hayek and Thatcher *“rolling back the frontiers of the state”* and Reagan *“the most frightening thing you can hear is I am from the government and I am here to help”*
- ▶ In Britain, priority was to privatise and minimise scope of regulation. Theories of “optimal spot prices” – (Caramanis, Bohn, Schweppe) not influential. Existence of U.S. pools provided encouragement on the prospects for markets.
- ▶ Generation Operation and Load (GOAL) in Central Electricity Generating Board allowed for cost-based constrained dispatch. Operationally, the creation of a mandatory centrally settled pool was not such a big change.
- ▶ The fervour for privatisation and desire to minimise scope of regulation made the huge decision to separate transmission from generation possible.

Deregulation / liberalisation in Australia

- ▶ Privatisation in Victoria was a driving force.
- ▶ But reformist federal governments (Hawke and Keating) sought to encourage “national” thinking and “national” market.
- ▶ In spirit of “co-operative federalism”, south and eastern states came together to develop “national electricity market”.
- ▶ But many states would not agree to privatise. So compromise was “competitive neutrality”: imagine that your government-owned corporations are privately owned. A massive complication.

Australia critique: Distribution

- ▶ Network regulation has been a disaster: regulatory asset values per connection tripled – much worse for government-owned distributors than privately owned.
- ▶ Ownership *per se* can not explain
- ▶ Problem was “competitive neutrality”: private investor post-tax cost of capital to government-owned distributor provided incentive to gold plate (the very opposite of what was intended!) and so fund transfers from consumers to government.

Australian critique: transmission

- ▶ Relatively better (cost) outcomes than distribution (building transmission lines is much harder)
- ▶ Co-ordination of transmission and generation investment is now the big issue. Price-based mechanisms for transmission access have proved impossible to implement.
- ▶ Snowy 2.0 (2000 MW pumped hydro) a stunning failure:
 - ▶ Snowy Hydro said no need to count the cost because generators do not pay for transmission;
 - ▶ Transmission monopoly (and regulators!) said no need to count cost of Snowy 2.0 because decision already made to build it.
- ▶ Similar issues now in Victoria: wind and solar farm entry without regard to transmission capacity. And same problem arising in Tasmania.

Australian critique: retail markets

- ▶ Full deregulation has been short-lived.
- ▶ Concerns over search costs led to re-regulation to provide easy access to “fair” (regulated) offer.
- ▶ Continues to be highly concentrated market.
- ▶ Survey’s suggest customers value ability to choose but don’t want the bother of choosing.
- ▶ The rise of behind-the-meter supply (PV) and storage (batteries) and of electric vehicles now a major source of retail market innovation.

Australian critique: distributed energy resources

- ▶ A remarkable (and completely unanticipated) success.
- ▶ 1/3 homes now with rooftop solar, 20 GW on homes and 4 GW on business roofs. Biggest source of renewable electricity in the market. Much cheaper (at point of use) than transmission-connected large scale solar.
- ▶ Has had huge impact on wholesale prices
- ▶ Popular with politicians and customers, but resented by distribution monopolies, regulators and large scale solar developers.
- ▶ Big focus now on impact of batteries (about 1/12 solar homes now have batteries).

Australian critique: wholesale markets

- ▶ It has “privatised” operating risks, but not investment risk. Governments and investors do not trust the market. Investors look to government to absorb price risk and/or provide income outside the electricity market.
- ▶ Regulators’ response to concerns has been “more market”. Enormous focus on “missing money” and “missing markets”. But governments (and investors) have ultimately turned (repeatedly) to “direct action” to spur investment – competition *for* the market rather than competition *in* the market.
- ▶ Market power an enduring concern, but feeling that market power problem will go when the coal generators go.

Summary of Australian critique

1. “Competitive neutrality” has been a damaging delusion in network regulation.
2. Retail markets have been problematic; but choice is valued and technology (PV, batteries and EV) is stimulating innovation.
3. Wholesale markets have failed to privatise investment risk.
4. DER not in the least anticipated when the market was created. Now, by far, the cheapest source of delivered electricity.
5. Big co-ordination problems in expansion of transmission, generation and storage. Locational prices have proved impossible to implement.

Road ahead: The Government of Victoria has said it will re-create the electricity commission: what should it do?

Context :

- Very rapid decarbonisation: 30 TWh of coal (70% of grid demand) to be replaced by renewables in 11 years, government says.
- G&T&storage co-ordination failures need to be addressed
- Customer choice is treasured
- G,T + storage technology-providers and developers serve global markets
- Well developed private developers supported by mature equity and debt markets
- State government corporation's profits are not taxed, but govt lacks industry expertise and not likely to be competitive on costs.

My answer: an effective state government energy corporation might usefully have:

- a monopoly on transmission planning,
- the right to control transmission system access (through the implementation of independently established rules),
- the right (although not a monopoly) to procure, develop and operate variable renewable generation, transmission and storage, and
- the right (but not a monopoly) to sell electricity directly to customers.