

A History of Electricity Reform in Australia

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Note:

This is an early draft of an introductory chapter of a collection of papers on electricity market reform.
This version has benefitted from comments from John Quiggin, Simon Ville and Guillaume Roger.

Abstract

The dominant narrative to describe the Electricity Supply Industry (ESI) in Australia is one of vertically-integrated state run enterprises that are replaced by a market structure in response to national competition policy reforms in the 1990s. A corollary is that the transition to a net-zero carbon future represents a period of unprecedented change.

Policy changes have been driven by twin policy objectives, an ever-present concern with 'resource adequacy' and the goal of using cheap energy as a spur to economic and social development.

This history from the origins of the ESI offers a different, more revealing, story of constant change and that the reforms of the 1990s contain more policy failure than policy success. Through a better understanding of how previous reforms were developed and how they performed it is hoped that current reformers can achieve better outcomes.

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1. Introduction

Being mindful of George Santayana's dictum "Those who cannot remember the past are condemned to repeat it," any volume about reform of electricity markets should begin with a history (Santayana 1905-06). Therefore, the analysis of electricity market reform needs to place the reforms themselves in their historical economic context. History isn't just a 'corpus of ascertained facts', the historian chooses the facts that are significant to them and the analysis they wish to provide (Carr 1961). Carr advises us 'that when we take up a work of history, our first concerns should be not with the facts which it contains but with the historian who wrote it.'

Many articles on the Australian market include some short reference to history. Rai and Nelson (2019) are not atypical in their opening to a review of twenty years of Australia's National Electricity Market (NEM) when they write:

Prior to the 1990s' Hilmer microeconomic reforms, the east-coast Australian electricity industry's functions—generation, transmission and distribution, and retail supply —were vertically integrated within government owned state electricity commissions. Following the reforms, the competitive components (electricity generation and retailing) were separated from those with monopoly characteristics (transmission and distribution).

This shorthand division into two periods, first of vertically integrated state-owned enterprises and then of a structurally separated competitive market, suits the writer who wants to focus on that latter period. The issue becomes more extreme when writers talk about a period of 'unprecedented change.'¹ This history offers an alternative view, that change has been a constant in the Electricity Supply Industry (ESI) and that the static view has led to some of the challenges now faced.

As Newbery and Green (1996, p. 26) note:

The modern approach to the design of regulatory systems often overlooks the historical constraints placed on the options available for reform and implicitly assumes the state of the industry is one of neutral equilibrium, in which any displacement will not set in train a sequence of subsequent changes that have long-term implications for structure and performance of the industry.

When economists are endeared to models of equilibrium rather than change their market design will fail to consider how institutions will transition to a competitive market. A consequence of this approach being followed in the design of the NEM has been the ongoing failure of any significant demand side participation to emerge over the twenty years post reform.

Engineers have also failed to incorporate the reality of change, their mode of thinking is determined by the technology or the 'regime' to use the term from multi-layer perspective of socio-technical transitions (Geels 2002). As an example, the market operator (AEMO) is responding to issues of low minimum demand from high levels of solar PV connected to the distribution network now it has become a problem, rather than beforehand.²

The story told here is similar to the global experience as detailed by Hausman et al. (2008). They emphasise the capital-intensive nature of the ESI and the role foreign capital often played in early developments. This was followed with increased government activity and ownership, before coming full circle to the post 1980s and 1990s reforms with growing ownership again often by large multinational firms. The Australian narrative

¹ See for example Karmel (2018), Moran and Sood (2013), ENA and CSIRO (2016)

² See AEMO's Renewables Integration Study Stage 1 Appendix A: High Penetrations of Distributed Solar PV <https://aemo.com.au/-/media/files/major-publications/ris/2020/ris-stage-1-appendix-a.pdf?la=en>

is slightly different, as we will see, with governments taking a more active early role; but overall the arc of the story is consistent with their themes.

This history is divided over four sections. The first deals with the primarily municipal origins of the ESI. The second deals with the development of the State Electricity Commission model, which occurred at different times in each state over the period 1919 to 1950.

The third section covers the national market reforms that followed from the Industries Assistance Commission's *Inquiry into government (non-tax) charges : the electricity supply industry in Australia (IAC 1989)* and the Industries Commission's *Energy generation and distribution (IC 1991)*. The full analysis of what has occurred over the thirty years since the Industry Commission reports of 1989 and 1991 should be situated in economic history. McLean and Shanahan (2007) report that three themes have emerged as important new directions for Australian Economic History – a focus on post-1945 economic issues, a consideration of the history of economic policies and a move from macro-economic growth focus to 'micro dimensions of that story.' Economics and economists have been increasingly relied upon since WWII in determining government policy and it identifiably falls in two periods – post war Keynesianism and then neoliberal 'microeconomic reform.' The 'micro-economic reform' of the ESI fits well within that research focus, this, however, is but a small contribution to that study.

The final section will discuss briefly how this history should inform reformers, observing the gap between outcomes and objectives of reform.

2. Municipal Origins

While electricity had been used for lighting in various individual uses, such as illuminations in Sydney to celebrate the wedding of the Prince of Wales in 1863 and a night football game at the MCG in August 1879, (Edwards 1969) the Electricity Supply Industry in Australia dates from street lighting in Tamworth in 1888 (Tait 1925). The ESI is defined as being the generation of electricity in one place for consumption by one or more customers in multiple other locations.

In a history that predates the reforms of the 1990s Butlin et al. (1982, pp. 251-8) provide a very useful description of the development of the ESI including its use for both traction and lighting. This also provides a brief insight into the development of demand, and the means used by utilities to both realise economies of scale and levelise demand. Tramways and railways sold bulk power to municipal undertakings and industry, while public lighting utilities marketed early household appliances, while they also commenced selling electric motors to factories. Darroch (2015) records that this was initially by renting motors that replaced engines to drive the extensive series of belts that linked multiple machines in factories before the real benefit of electricity individual motors developed.

There are useful histories of the development individual systems or localities. Queensland is well covered by a two-volume history of electricity in Queensland (Thomis 1987, 1990) and two studies of parts of regional Queensland (Doran 1990; Williams 1983). South Australia is also covered by two studies, one focused on the state utility after government took ownership (Linn 1996) and an unpublished doctoral thesis (Spoehr 2008). For Victoria there is a history published by the State Electricity Commission to commemorate its first fifty years (Edwards 1969) and in New South Wales two histories (in part) of Sydney commissioned originally by what became of the Sydney County Council (Darroch 2015; Wilkenfeld 2004) and an unpublished thesis detailing the history of the Electricity Commission (Thornton 2015).³

While municipal supply was a common model across all countries, an important distinction applies to Australia where the involvement of municipal authorities almost always began through the provision of the public good of street lighting. In the US municipal authority involvement was more commonly simply as authorizing the construction of poles and wires through streets. That is not to say that there weren't also municipality owned companies, they just weren't as prevalent.

The role of government in Australia is different to that in the UK and USA and has been shaped by our history and geography. As Quiggin (1996) notes there are three factors motivating this difference. The first is Australia's origins as a penal colony where almost by definition the whole society's needs were delivered by government. The second is Australia's (almost paradoxical) development of democratic government without revolution or force, and so government is not primarily seen as a power to be feared. The third has been the geographic consequence of a vast thinly populated land in which only government could raise the requisite finance for many projects.

Notwithstanding these factors, the extent of early private ownership, of both electricity utilities and electric powered transportation is often overlooked. In the case of Sydney many municipalities were served by the Balmain Power Company. The Adelaide Electric Supply Company, Ltd; Kalgoorlie Electric Power and Lighting Corporation; Melbourne Electric Supply Company, Ltd; Electric Supply Company of Victoria Ltd; Brisbane Electric Tramways Investment Company; Kalgoorlie Electric Tramways Ltd; The North Melbourne

³ Other histories not included in this literature review are for various NSW municipalities (Armstrong 2002; Inchbold-Busby 2011; Low 1992, 2004; Wilkenfeld 2004), for Qld (Board 1977; Morwood 1968; Pearson 2000, 2001, 2007, 2010; Prentice 1982; Smith 1988), for SA (Kerr & Kerr 1979; McLaren 1994), for Vic (Andersen 1992; Dike & Lamb 2012; Harvey & Peckman 1993; Lincolne 1955; Napier & Easdown 1993; Penrose 1995; Ruddock 1981; Rusden 1968; Society 2003; Vines 2000; White 1986), for Tasmania (Garvie 1962; Read 1985) and the ACT (Jones 1980).

Electric Tramway and Lighting Company Limited. Consistent with Quiggin's observation capital formation was locally challenging and the listed private companies were listed on the London stock exchange.

Quiggin's three items are not the only factors that distinguish the Australian experience. Australian 'exceptionalism', that Australia has prospered by being a resource rich nation while avoiding the typical problems of corruption, low growth or stagnation, has been attributed to the development of an adaptive framework of national institutions. (McLean 2013). A similar position, though from a very different perspective on economics, has been advanced as an explanation of why Australia was alone in the Anglophone neoliberal economies in avoiding recession following the Global Financial Crisis (Chester 2012).⁴

Rather than attempt to detail a complete genealogy of all the enterprises that make up the ESI through history, two simple case studies of municipal enterprises leading up to the formation of State authorities are provided. The first is a review of the development of the ESI in Sydney, while the second is a short history of electricity in the Queensland country town of Longreach.

2.1. The ESI in Sydney⁵

The NSW country town of Tamworth installed street lighting in 1888, and Young, Penrith, Moss Vale and Broken Hill had also done so by 1892. Newcastle soon followed. The small municipality of Redfern adjacent to the Sydney Municipal Council built a small power station to illuminate its main shopping area in 1891.

The New South Wales railways first generated electricity in 1893 for a trial tram-run to Randwick. By 1902 the railways completed the construction of a power-station at Harris Street, Ultimo (now the Powerhouse Museum) to supply power for the tramways, and the famous Bondi tram ('shooting through like a Bondi tram') was travelling at speeds of 30km per hour.

In Sydney, the Council's 'Electricity Undertaking' commenced operation in 1904. It initially faced five pre-existing electricity undertakings – Palace Electric Lighting, Strand Electric Lighting, Oxford Street Electric Lighting, Imperial Arcade Electric Lighting and Empire Electric Light. As their names suggest these each primarily lit shops and their surrounding precincts. After a period of price competition, the Undertaking acquired four of these in 1907 and the last, together with the Redfern Municipal Council power station, in 1913.

The Undertaking extended its service into other Sydney municipalities at their request (and cost) and by 1910 included Paddington, Annandale, Mascot, Randwick and Woollahra in its service area. The Sydney Council Undertaking faced competition from the Electric Light and Power Supply Corporation which had been granted a franchise by the Balmain Borough Council.⁶ The Balmain Power Company (as it was popularly known) secured the right to also supply Newtown, Leichhardt, Ashfield and Petersham. Progressively each added further council areas. The railways built a second power station at White Bay in 1911 though full electrification was not completed till 1926.

Growth in demand combined with delays in capacity expansion due to the World War disrupting supply and the impact of the Great Strike in 1916 resulted in challenges for the Undertaking in providing capacity to meet demand. This resulted in talks between the Railway Commissioners and the Undertaking about ways of "linking up" their mutual systems and exchanging power from their respective power stations and an interchange agreement was reached in 1919. Electricity supply in Sutherland, Bankstown, Sutherland and Campbelltown began in the early 1920s using bulk power supply from the railways.

⁴ It is noted that the term Global Financial Crisis is a term mostly restricted to use in Australia, however it is more descriptive than the terms such as 'the crisis' or 'the great recession' used elsewhere.

⁵ This summary is mostly drawn from (Darroch 2015; Wilkenfeld 2004)

⁶ In 1903 Balmain Council had been directed by the Public Health Department to cease the open tip dumping of local rubbish. The Council called for tenders for a combined waste destruction and power generating facility. The power station burnt waste and coal.

In 1936 the Undertaking was removed from the control of the City Council to a new entity – the Sydney County Council – was governed by five councillors from local government areas served by it.

The Second World War also caused difficulties as equipment ordered from Europe (the UK) was delayed. As a wartime security measure the four existing generating authorities in NSW were linked-up into a “primitive electricity grid” – this being the SCC (Pyrmont and Bunnerong), the Railways (White Bay), the Balmain system (the power station stood on the south side of Iron Cove beside the Iron Cove Bridge) and the Port Kembla plant run by the Department of Public Works. The SCC and Railways had, as noted, been connected since 1919.

Following the war, supply problems caused by failed equipment deliveries and coal strikes resulted in frequent blackouts. In response, and recognising the changed economics of generation and transmission the Electricity Commission of NSW was formed in 1950. It acquired the power stations and main transmission lines of the four major supply authorities (Southern Electricity Supply, Sydney County Council, the Department of Railways and the Electric Light and Power Supply Corporation Ltd, known as the Balmain Company). The Commission was responsible for the centralised co-ordination of the state's electricity generation and supply, with local supply by separate distribution businesses. There had been 188 separate electricity generation and distribution bodies in NSW in 1948. After the creation of the Electricity Commission consolidations resulted in there being only 69 distribution businesses by 1959 and by 1980 this reduced to 26, all government owned⁷.

The availability of hydro-generation from the Snowy Mountains Scheme for peak and emergency power enabled New South Wales to use large generating plant as base-load units. According to McDonnell it became “a world leader in the technologies of large black-coal generation.”

2.2. Longreach Powerhouse⁸

Sitting in the Central West of Queensland, 700km from the Eastern Coast, Longreach is named after the “long reach” of the Thompson River on which it sits. The town was gazetted in 1887 as part of the development of the railway which reached the town in 1892. This is the real outback of Australia.

In 1921 Longreach became the base for Queensland and Northern Territory Aerial Services Ltd (Qantas) which is now the third oldest airline in the world. Also in 1921 electricity was first generated in the Longreach Powerhouse. The powerhouse was owned and operated from 1921 to 1966 by the Longreach Shire Council which undertook to install an electric light scheme for the town. Initial supply was limited to the main portion of the town bounded by Crane, Duck, Ibis and Bustard Streets (most streets in the town are named after birds – those running east-west are named after water birds, those heading north-south after land birds). In 1924 the scheme was extended to residents in the Eastern and Northern portions of the town. In later years the powerhouse supplied power to Longreach, Ilfracombe and Isisford as well as a large rural grid.

The first engines were Ruston & Hornsby charcoal gas units powering direct current (DC) generators by a belt drive. Timber was initially used as a fuel source because it was cheap to obtain and in plentiful supply. The timber was burnt and the resulting charcoal was provided to the power station for use in the gas producers.

After almost 25 years timber of suitable quality was becoming hard to come by and was no longer cheap, so in 1948 a National RA7 engine was installed, this being the first oil engine used to generate electricity in the

⁷ The most common structure was a County Council which was a cooperative of city, municipal or shire councils. Wilkenfeld (2004) provides a table at Appendix 3 showing the history of the consolidation of the supplies in the areas served by EnergyAustralia in 2004 (this is now the area served by Ausgrid as a Distribution Network Service Provider).

⁸ This history is entirely constructed from the information on display at the Longreach Powerhouse.

powerhouse. It was installed as an interim measure as the conversion to gas produced from coal would take some time to complete. It was also the first unit capable of generating AC power.

The conversion to coal as the source of gas began in 1951. Coal was sourced from the Blair Athol coal mine and railed to Longreach; a spur line being constructed in 1951 to bring coal directly to storage bunkers inside the powerhouse.

From 1921 to 1943 the power station provided a DC supply (32 V) only. To transmit power over longer distances using AC the power station generated a dual supply of DC and AC from 1943 to 1953. As residents became aware of the advantages of 240V AC (mostly for more appliances) the Council received steady applications for conversion to AC. Work began to convert the whole supply to AC in 1953 and was completed in 1954.

In 1966 the Central West Regional Electricity Board took over operation of the power station. This new Board had responsibility for the supply of electricity in the Shires of Longreach, Barcaldine, Blackall, Tambo, Jericho, Aramac, Ilfracombe and Isisford. Power generation was centralised in Longreach and Barcaldine and in 1973 a 66kV transmission line was constructed between Longreach and Barcaldine to equalize generation supply between the two towns.

In 1971 a three year program to convert the Longreach power station to oil was completed. All the diesel generators installed in Longreach (apart from the National RA7 above) were machines that had previously operated in other powerhouses having become available because their previous location had connected to the State grid.

The powerhouse ownership was transferred to the Capricornia Electricity Board (CAPELEC) in 1977 following a re-organisation of the electricity industry. Generation continued in Longreach supplying electric power to Longreach, Ilfracombe, Isisford and Morella until 1985 when electric power was delivered to the region from the state grid via a transmission line which originated at the Gladstone Power Station.

In 1998 the 66kV line connecting Longreach to Barcaldine was replaced; the new line used concrete poles instead of the original wooden poles and took a route close to the Landsborough Highway. This significantly reduced faults on the line which had an average of over 25 power outages per year.

3. State Commissions

Two national histories from the middle of the last century provide detail on the developments up to the period where State statutory authorities had been created in the five States that later formed the National Electricity Market (NEM) (Allbut 1958; Boehm 1956). The latter tells us that State Government action through statutory corporations became effective in each State in the following years: Tasmania, 1914; Victoria, 1918 ; New South Wales, 1935 ; Queensland, 1938 ; South Australia, 1943 ; and Western Australia, 1946. The 1935 reform in NSW was only partial, and the State Electricity Commission really only formed in 1950.

This move to statutory corporations occurred under governments across the spectrum of Australian political parties. The respective Governments at these dates were : Tasmania-Earle (*Labor*) ; Victoria-Lawson, (*Nationalist or Liberal*) ; New South Wales-Stevens and Bruxner (*Liberal and Country*); Queensland-Forgan Smith (*Labor*); South Australia-Playford (*Liberal and Country*) ; and Western Australia-Wise (*Labor*). Soon after electricity was introduced commercially State Governments had legislated to empower various authorities (often municipalities) to generate and supply electricity, but otherwise had not played an active role.

3.1. Progress within the states

Tasmania was the first State Government to act, setting up the Hydro-Electric Department in 1914, to develop the State's water power resources and to supply electricity in bulk to several municipalities and industries, thereby assisting especially the establishment of the metallurgical industry. In 1930, the Hydro-Electric Commission was constituted to take over the development of power resources and it gradually acquired each local authority's distribution system. It did develop a single fully integrated utility for the entire state.

In Victoria a statutory corporation, called the State Electricity Commissioners, was constituted in 1918 to initiate the co-ordinated development of the State's power resources. Victoria had suffered from highly unreliable black coal supplies from NSW and the Victorian Government sought to exploit its own brown coal resources using techniques developed in Germany. Sir John Monash, who became chairman of the renamed State Electricity Commission of Victoria in 1920, while still in England demobilising Australian WWI forces, sent a mission to Germany to get first-hand information on how they had addressed the problem of using coal that contained 60 per cent moisture. Eventually after the Treaty of Versailles the Victorians obtained the willing assistance of the Germans (Edwards 1969).

The Victorian development involved building new coal fired power stations at the site of the coal fields and the investment in high voltage transmission lines as the only practical solution. The need for the coordinated investment in new mines, new power stations and new transmission effectively determined the need for government control.

In his Presidential Address to the 1924 meeting of the Australasian Association for the Advancement of Science Monash demonstrated the need for a significant expansion in generating capacity, noting:

The conclusion is obvious that the immediate attention of Scientists, Engineers and Statesmen is required to satisfying the demand for electrical services which is confronting Australia; that we must evolve far-reaching plans for meeting the situation; and that we must take exhaustive stock of our various resources for power production and estimate their respective extent and capacity and distribution. (Monash 1924)

He went on to note that the linking up of power stations had already proceeded in considerable scale in the US, and that something on a modest scale had been achieved in the same direction in Victoria.

The next developments according to both Boehm (1956) and Thomis (1987) were influenced by the report *Power Development in Australia* (Gibson 1929). Though this was a Commonwealth Parliamentary Paper

tabled in the Senate on 14 August and the House of Representatives on 22 August in 1929 no reference has been found to it in Hansard in the remainder of 1929 or 1930.⁹

The report noted that 'modern economic development is becoming increasingly dependent upon the supply of power to operate countless machines which mankind has developed for every conceivable purpose' and that all nations 'are straining their efforts to increase the availability and reduce the cost of power supply.' It also observed Australia had a few great cities near the sea-board, country towns and rural centres that were comparatively stagnant, and thus an unbalanced distribution of the population more noticeable than most other countries. Rural power development was thus seen as an economic necessity, citing the earlier development of ports and railways as influences in unleashing the potential of primary production.

In reaching these conclusions Gibson referred to two works by his business partner, and subsequent first chair of the CSIR (later CSIRO), George Julius. In these papers, titled *Australian Made* and *Production Efficiency* (Julius 1926, 1927), Julius made the case that to develop Australian manufacturing greater utilization of electricity was necessary but that the import tariffs on electrical equipment, an industry that was unlikely to be developed in Australia, was holding the development of electricity supply and use back.

Gibson's strongest conclusion was that, with the exception of Victoria and Tasmania, the 'organization for investigating, coordinating, and controlling the supply and distribution of power, is either lacking or insufficient' in the States. It recommended the establishment by each State constitute an authoritative Power Commission or Power Board. It also recommended that the Commonwealth Government should set up a 'suitable organization' to control national waterways, to control electrical energy where it is transferred from one state to another, to ensure the standardization and co-ordination of frequency, voltage, and methods throughout Australia and that the Commonwealth should assist states 'in every way possible' to develop their power resources. Gibson suggested that the Chairmen of the State Electricity authorities should meet together under a chairman appointed by the Commonwealth. (The value of 'linking up' electricity systems had also been extolled by Monash in 1924 in his capacity of President of the Australasian Association for the Advancement of Science (Monash 1924).)

While nothing seemed to happen nationally, the report triggered debate in Queensland and a new Act and Electricity Board in 1933 and then a Royal Commission in 1936. The Royal Commission drew a distinction between State ownership and control, while recognizing the state ownership of electricity and other public utilities as 'a contemporary trend or tendency' they recommended the creation of a State Electricity Commission that would only exercise control. Its first focus was to be south-east Queensland while in the longer term it would plan for the whole of the state approving future extensions. The Commission commenced in 1938.

The next development was in South Australia which had had no fuel resources of its own and had one major electricity undertaking, the Adelaide Electric Supply Company Limited. Writing of the company's assistance in wartime Linn (1996) notes that 'though the company's efforts were laudable, public and parliamentary disquiet about its attitudes bubbled beneath the surface.' Two fundamental reasons are given; a strong difference of opinion about regulation of the company between Premier Thomas Playford and the company, and the question of mining and development of brown coal from Leigh Creek.

Playford established an Electricity Supply Committee in March 1943 which favoured Leigh Creek development and recommended the formation of a central supply and generation authority. The South Australian Electricity Commission was established later in 1943. The Commission provided Playford with experts who could assist his cause but only further antagonized the company. In 1944 Playford introduced a Bill to further regulate the company's operations and to limit electricity prices.

⁹ When the report was tabled, the parliament was already consumed in debating the industrial relations reforms that brought down the Bruce government as the great depression began to take hold. It is unsurprising therefore that the report did not feature in debate.

The company sought the inclusion in the Bill for a Royal Commission to assess the company's affairs. The Bill then had three parts, the first was to allow trading in the company's shares, the second set an upper limit of seven per cent on dividends, and the third provided the company with 'the right to a Royal Commission into its affairs' if it felt it had been dealt with unfairly. Having passed the lower house, the bill was amended in the upper house to remove everything but the calling of a Royal Commission.

The Royal Commission recommended that the Adelaide Electric Supply Company Limited be acquired by the government and vested in a public utility trust to be set up for the purpose. At the second attempt Playford had legislation passed in 1946. The company unsuccessfully tried to have the Act challenged in the Privy Council, and the Electricity Trust of South Australia came into existence on 1 September 1946.

In New South Wales Gibson's criticism of inconsistent standards and inadequate state control led to the passage of the *Gas and Electricity Act 1935*. This Act provided for an Electricity Advisory Committee to which electricity supply authorities were required to submit their development plans (as well as the constitution of the Sydney County Council). The Committee could veto but not amend proposals.

The Second World War was instrumental in increasing electricity demand and a desire for greater security of power supplies which (as noted above) prompted interconnection of the major power stations. This weakened the opposition of the Local Government Association to the reorganisation of the industry.

Boehm refers to three reports that the NSW Government received by the end of 1945.¹⁰ Relying on these reports the NSW Government strengthened its control by constituting the Electricity Authority of New South Wales in 1945. This was rapidly followed by the establishment of the Electricity Commission of New South Wales in 1950. Its function was to generate and transmit the electricity requirements of the interconnected system to provide bulk power supply to various distribution authorities. The process of acquiring existing generators, building new generators and transmission and the reorganization of distribution authorities was ongoing.

Western Australia followed a similar trajectory to other states, though its interconnected system was restricted to the south-west corner. As it and the Northern Territory are not formally part of the NEM their history will not be dealt with in detail. Similarly, the Australian Capital Territory supply is not taken up in this essay.

3.2. Motivations for reform

The municipal system of supply had an interesting mixture of business models across Australia, ranging from municipal owned undertakings, to franchises for private sector supply to municipal undertakings purchasing bulk power supply. The move to State Commissions mostly had the consequence of eliminating the private ownership model, though it never appears to have been the dominant motivation.

¹⁰ The first was that of London consulting engineers: Rendel, Palmer and Tritton, *Report on Electrical Development in New South Wales* (Rendel et al. 1937) which recommended the reorganisation of the state into four interconnected systems and the development of a hydro-electric scheme on the Snowy River to add to supply for Sydney. The second report, *Report on the Re-organisation of Electricity Supply in New South Wales*, presented to the State Government in 1944 was by Cochran who was the Chair of the State Electricity Commission of Queensland. His report recommended the creation of a Central Electric Authority to be responsible for all electricity development in the State. The third was the *Recommendations of the Electricity Advisory Committee on the Question of the Co-ordination and Control of Electricity Generation and Distribution* (Committee 1945) which was printed as a Parliamentary Paper of New South Wales for 1945-46 along with a report by Premier McKell (1945) *Electricity Co-ordination in Great Britain and Rural Electrification in the United States of America, Great Britain and Canada*. The Committee's recommendations, which Boehm reports as being 'largely endorsed' in the *Electricity Development Act 1945*, is prefaced with the observation 'The Committee re-affirmed its previous recommendations' that a State Electricity Committee should be formed.

Boehm (1956) proposes five economic and technical forces that promoted the evolution of 'large scale central planning' of the ESI:

1. Savings in capital expenditure on large generating plant, and the savings have been higher than the additional transmission costs involved;
2. The pooling of generating capacity provides a significant saving with respect to total capacity;
3. The diversity of loads served by a central authority to a wide area results in a higher load factor of 50-55% compared to 30% for the small local supplier;¹¹
4. A central authority is able to view the power requirements of a whole state; and
5. A major authority, through economies of scale, the financial backing, and the use of 'modern techniques' is able to exploit resources more quickly and efficiently than small local independent enterprises.

To this should be added government policy for economic development, be that of the metallurgical industries, manufacturing or primary production (and hence rural electrification). Boehm outlines the 'public interest' in electricity supply quoting from a 1943 South Australian Committee of Inquiry a concept that sound much like the current National Electricity Objective:

The ambit of the term...public interest, in its relation to the supply of electricity, requires:-
(A) *Security,— In the form of reliability, continuity, and sufficiency of supply; and sufficiency of supply; and*
(B) *Economy.—In the form of the cheapest supply to consumers.*

He argues that it would be hard for a private undertaking to justify investment that was in the public interest that would not provide an adequate return in a short time. Finally, he notes two institutional factors; the exemption of public authorities from income tax and the lower rate of interest at which public authorities can raise capital.

As we saw from the complexion of governments that undertook centralization in each state, the development of the State Electricity Model had little to do with ideology and was instead motivated by practical issues, notably security of supply and scale efficiency.¹²

In his conclusion Boehm speculates on the role of the Commonwealth Government and possible future developments. Noting that the advent of the Snowy hydro-electric resources in July 1949 brought the Commonwealth into the field, he suggests that interconnections between the eastern mainland States could trigger commonwealth interest. He adds that another important factor could be the development of atomic energy. He, prophetically, concludes:

It appears that the Commonwealth has no constitutional authority to participate directly in the development of any State's power resources, apart of course from the Commonwealth's unquestioned authority for defence purposes. It is understandable that in its Constitution no specific reference is made to the development of Australia's electric power resources, although one could infer that, had this matter been considered at the time of Federation, no general authority to undertake electric power except for defence purposes, would have been granted to the Commonwealth. Nevertheless, it is possible that should events occur as envisioned above [i.e. interconnections], a central authority could be constituted, of representatives of the Commonwealth and the participant States, to co-ordinate and to control their development of electric and nuclear

¹¹ Load factor is defined as the average load divided by the peak load in a specified time period.

¹² This is not the only possible reading of the historic events. For example, Fathollahzadeh (2005) breaks the development of the ESI into five stages and gives it a political economy framework.

*power generation and transmission to individual State distribution authorities, in order to satisfy adequately and on the soundest economic basis their various electricity requirements.*¹³

¹³ The constitutional question is indeed interesting. The other major use of electricity – the telegraph and telephone – is a Commonwealth power, though its inclusion is because these services and the post had an international dimension to them. The *Post and Telegraph Bill 1901* as introduced included a clause 136 “An electric authority shall not construct any electric line or do any other work for the generation use or supply of electricity whereby any telegraph line of the Postmaster-General is or may be injuriously affected.” Debate in the House of Representatives on 28 August 1901 saw contributions from many speakers. WM Hughes observed “ The purport of this clause apparently is to place the whole control of the use of electricity in the hands of the Postmaster-General.” Alfred Deakin observed “Our power in regard to electricity is very limited.” William Know and Dugald Thomson between them suggested that the question of electricity regulation might be the subject of “one of the many conferences which will have to be brought about before the machinery of the States and the Commonwealth will work well together.”

4. National Reform

4.1. The road to micro-economic reform

The circumstances considered by Boehm were realised in 1980 when the Commonwealth and the governments of New South Wales, Victoria, South Australia and Tasmania appointed Sir David Zeidler to chair a committee of representatives from each State electricity body and Snowy Hydro to inquire into electricity generation and the sharing of power resources in South-East Australia.

The committee's report (Zeidler 1981) first dealt with the prospect of nuclear power based on a study by the State Electricity Commission of Victoria which found nuclear power not cost competitive with a coal fired station in New South Wales or Victoria. It found that high capacity interconnections could be accomplished using existing technology, but overall, having examined the cost and technical feasibility of further interconnections of the South-East Australian electricity systems, the committee reported that there was no justification for the establishment of an integrated grid within the decade. The committee recommended that the matter continue to be reviewed as circumstances changed.

The committee recommended a limited extension of the NSW/Victoria interconnection to South Australia and that no action be taken on an interconnector to Tasmania.¹⁴

Earlier, in 1977, the Doug Anthony as Minister for Natural Resources established the National Energy Advisory Committee (NEAC) to 'advise the government on energy matters and assist in the formulation and development of a national energy policy in Australia' (Anthony 1977). The NEAC produced 21 reports before it ceased to exist in 1983. These covered a diverse range of energy topics, including on an energy conservation program, electric vehicles and renewable energy resources. Its nineteenth report was *Electricity in the Australian Energy Market (Committee 1983)*.

The report found that the share of electricity in final energy demand (consumption) had grown from 11% in 1970-71 to 14% in 1980-81, though the share of natural gas had grown faster from 3% to 13%. It observed that the displacement of oil by electricity and gas was consistent with energy policy to reduce dependence on oil. It also found that the level of electricity prices began to rise in real terms at the end of the seventies, having been in decline for over twenty years before that. Its major conclusion, however, was that 'the efficient and economic development of the electricity supply industry in the future will, as in the past, depend to a significant degree on the extent to which appropriate pricing policies are followed.'

So not for the last time a major recommendation was to accelerate the reform of tariffs. This included both the use of time of use or demand tariffs and the possibility of 'concessional tariffs for a lower reliability supply' to reduce the need of plant reserve margins. It also recommended the consideration of broad targets for improvements in operating efficiency. No evidence has been found of any action on these recommendations.

Indeed, the next major development was the disaster that befell the State Electricity Commission of Victoria. Evans (2004) asserts that 'the typical electricity organisation up to the 1970s was bureaucratic and mechanistic in form and structure...electricity planning was positivistic.' Because the preference for large plants had worked well, these organisations were caught out by the levelling of demand in the 1970s. As a consequence of 'the embedded engineering pro-development culture' of such organisations and the levelling of demand, Evans reports that 'by the mid 1980s, planned expansions to existing excess generating capacity in New South Wales, Queensland and Victoria were cause for serious concern.' He concludes his piece with a rollicking tale of progressive improvement in management and culture at SECV from a managerialism

¹⁴ Booth (2000), who is generally critical of the market reform program, argues that the Zeidler committee was intentionally misled by state power companies.

introduced under the incoming ALP Government in 1982, through commercialization, corporatisation and privatisation.

Booth (2000) tells a totally different tale, summarised his description of Australia as 'not so much a nation, but more a series of warring tribes.' . He recounts first the many problems that SECV had with the development of the Yallourn and Hazelwood power stations before settling in on the 'Newport saga.' Because of the continuing poor performance of the Latrobe Valley power stations and because oil was plentiful and cheap, in the late 1960s SECV planned a 200MW peaking plant to the West of Melbourne, at either Werribee or at Geelong near the oil refinery. However, the engineers took over the project and 'became preoccupied with continuing to utilise the Newport power station site.' The project morphed away from a small peaking plant well away from the city to become two large 500MW units in the city that offended its neighbours, the unions and environmentalists. It was converted to gas after the discoveries in the Bass Strait that was made available to Melbourne in 1969. Thankfully, Victorians were saved from having to use oil at Newport when the oil price shock came in the middle of the 1970s.¹⁵

Newport's problems were dwarfed by the disasters of the Loy Yang project. When given parliamentary approval in 1976 it was promised the project would match world's best practice in brown coal plants. It was largely on the basis of the cost estimates for Loy Yang and that the full cost of energy from brown coal would match that from black that SECV convinced Zeidler against the need for further interconnections.

With the election of the ALP in Victoria SECV had to confess to a large blow-out in costs by 65-70% and the doubling of operating costs. With some management changes and in response to targets set by the ALP Loy Yang was brought online in 1986 in line with earlier budgets and operating with an availability of 81%, well above the other La Trobe plants.¹⁶ The really big disaster was the development of Loy Yang B 1&2 projected to cost \$1700 million, but ultimately delivered at a cost of \$2800 million that led to the near bankruptcy of SECV.

It was later revealed that NSW had offered to complete the Mt Piper project, construction of which had ceased due to lack of demand, at a cost of \$320 million and to augment the necessary transmission. In late 1986 the Victorian Government initiated an inquiry by the National Resources and Environment Committee (NREC) of the Victorian Parliament. It concluded that, unlike the Zeidler conclusions in 1980, the cost of power from Victorian brown coal plants had risen to 50% more than buying power from black coal plants in the northern states.

4.2. Micro-economic reform

Borland (2015) claims that the idea that microeconomic reform "constituted a broad and coherent episode of policy making has only gradually become apparent." He notes that "The story of government intervention in the Australian economy in the 30 years after World War 2 has been described as 'All the restrictive practices known to man.'"

To describe economic policy post 1945 as consisting of two periods, Keynesian and neoliberal, is without doubt a great simplification. Cornish (1993) is critical of the thesis proposed by Crisp (1961) and Whitwell (1986) of a "Keynesian revolution in economic policy commencing in the 1940s and to which the Treasury was an early and powerful convert." Cornish asserts that "it is doubtless true that the economic profession in Australia and some of the nation's principal economic policy advisers had accepted the Keynesian

¹⁵ Butlin et al. (1982) citing work by McColl provide evidence that SECV had a long history of poor investment decisions.

¹⁶ It is instructive that the initial Loy Yang problems occurred before the ALP won office, and it was the Labor Government's intervention that got it on track. Subsequent SECV disasters were on Labor's watch, but the issue seems to have been the organisation not the government. Booth is also highly critical of the Victorian choice of 500kV transmission lines.

dispensation by the outset of the Second World War.” However, he notes that “a similar conversion did not eventuate among the nation’s policy makers, the politicians, notably those of Cabinet rank.”

However, there was a very decided change in approach starting in the mid 1980s. The reforms to the Electricity Supply Industry (ESI) were labelled as part of a ‘micro-economic reform agenda’ by Prime Minister Hawke in a February 1990 campaign speech (Hawke 1990b).

McLean (2013) notes that the microeconomic reforms of the 1980s and 90s had their origins in reforms in the 1970s, while the Industry Commission noted that “interest in the gains from microeconomic reform dates back at least to the report of the Vernon Committee in the mid-1960s.” (Commission 1995).

The Industries Assistance Commission, a replacement of the Tariff Board, was moved to the Treasury portfolio in 1988 ((PC) 2003) ¹⁷. The Treasurer announced a substantial forward work program for the IAC; saying:

The sharp deterioration of Australia’s terms of trade over the past two years, and the more recent troubles in world share markets, have highlighted the need for our industries to become and remain internationally competitive, for efficiency to be improved across-the-board and for impediments to change to be removed.

... While the Commission will continue to conduct inquiries of a traditional kind into particular industries, the Government now intends that it also conduct broader ranging inquiries directed towards removing impediments to improved efficiency across the whole spectrum of industry. (Treasurer, Press release, no. 7, 26 January 1988, quoted in (Commission 1995, p. 53))

An inquiry into government (non-tax) charges was one of four included in a forward work program on this agenda, and a report on the Electricity Supply Industry in Australia was released on 17 March 1989 ((IAC) 1989). The report found excessive generation capacity, tariffs discriminating in favour of rural users and domestic customers and revenue not recovering true costs. The ‘true costs’ not being recovered included an allowance for a market-based cost of capital rather than the simple recovery of historic costs plus any loan terms from Governments. The report also found that the ‘authorities’ internal operating environment compared unfavourably to the private sector as management was faced with conflicting objectives, government interference, and pricing policies established to promote social and regional development outcomes.

The Commission noted reforms already underway, but further noted that ‘the benefits from such reforms could be increased if interconnections between the States were strengthened. This would enhance the potential for trade in electricity across State borders. In itself this is estimated to have potential benefits of about \$180 million annually.’

It is easy to overestimate the significance of the IAC’s report. As McDonnell (1989) notes:

When the National Resources and Environment Committee of the Victorian Parliament reported in April last on its enquiry into electricity supply beyond the mid 1990s, its themes were similar to some of those of the NSW Inquiry into Electricity Generation Planning whose report was tabled 12 months previously — uncertainty in demand growth, planning flexibility, better plant performance, greater inter-State co-ordination, alternative energy sources, demand management, conservation. ¹⁸

McDonnell goes on to note that the overhang of supply built in the accelerated power station development programs in the 70s and 80s together with the fall-off in demand both created significant problems and opportunities for reform. He goes on to state ‘For social, economic and operational reasons the role of inter-

¹⁷ The Industries Assistance Commission was the second incarnation of a function called the Tariff Board, and was replaced by the Industries Commission and ultimately the Productivity Commission (Commission 2003)

¹⁸ The cited reports have not been read for this review.

State planning and co-ordination is very important and should be greatly strengthened. Much of the overhang is the result of the past lack of development co-ordination between the two major States and joint planning would reduce future capital and resource requirement.' He states:

*This paper canvasses some of the implications of the interconnection of the four systems, the introduction of gas as a fuel for power generation, the development of national energy markets and their operating and regulatory structures, and opportunities for national co-ordination in providing better conditions for pricing and investment.*¹⁹

Following through on the election commitment on microeconomic reform a Special Premiers Conference was convened in October 1990. In his opening statement the Prime Minister said 'our agreed goal can be simply stated...to make the Federation work better.' (Hawke 1990a) He continued:

An important objective for this first special Conference is to reach broad agreement on a set of principles, as a clear guide for future action in the key areas under review. Those areas which we are looking at today cover the full range of inter-governmental relationships: the general financial relationships; tied grants; micro-economic reform; duplication of services; the environment; and industrial relations.

The Communique from the conference records for electricity generation, transmission and distribution, under the heading of microeconomic reform:

Leaders agreed that there may be additional benefits from an extension of, and/or organisational changes to, the interstate electricity network covering NSW, Victoria, Queensland, South Australia, Tasmania and the ACT. Consequently, they further agreed that a working group be set up to:

- (a) assess whether extensions to the interstate network are economically justified;*
- (b) if so, assess the organisational options for achieving this, including a jointly owned interstate transmission system, a pool arrangement, and other ways of improving the management of current interstate arrangements; and*
- (c) report to the next Special Premiers' Conference.*

The working group will include representation from relevant electricity authorities and policy agencies from the respective governments including the Commonwealth, and seek contributions from interested parties, including major users in the private sector.

Interestingly, under the heading of the environment the same communique records: '

The commonwealth and the States agreed that both levels of government would co-operate on a national greenhouse strategy. This strategy would include measures for limiting emissions of all greenhouse gases and adapting to climate change, for conducting further research and ensuring that the community understood the need for early action and the measures individuals could take. Leaders recognised that the structure of Australia's cities contributes to relatively high levels of energy consumption and consequent greenhouse emissions. They agreed that they would encourage the immediate adoption of cost effective emission reduction options, and that more complex options would be considered in consultation with the ecologically sustainable development working groups referred to above....

They also recognised, however, that new economic and trade opportunities could open up for Australia through the development of more environmentally sound processes and products, and all governments agreed to encourage industry to take up this challenge vigorously.

¹⁹ This paragraph makes for powerful reading thirty years later as we grapple with proposals to significantly augment the interconnections and as the Commonwealth government has backed greater utilisation of gas as a transition fuel.

In May, two months after the 1990 election and just fourteen months after receiving the IAC's report, the Treasurer tasked the now renamed Industries Commission with another inquiry on gas and electricity. The terms of reference called for a report on 'institutional, regulatory or other arrangements subject to influence by government in Australia which lead to inefficient resource use, and advise on courses of action to reduce or remove such inefficiencies.' Among the list of items to which the Commission should give priority were the scope for rationalization by interconnection, the appropriateness of various load management and energy conservation initiatives to enhance efficiency and the relative efficiency and cost effectiveness of options to reduce the environmental impact of burning fossil fuels. The last of these was removed from the terms of reference in December 1990 when the Treasurer gave the Commission a separate reference on greenhouse gases emissions. (That report appeared in 1991 (Commission 1991)).

The Industry Commission Report was delivered in May 1991. It advanced the following proposals in relation to the ESI:

- All public electricity and gas utilities be corporatized as soon as possible, preferably within twelve months.
- The separation of generation and transmission, to be introduced in two stages – the first through ring-fencing for up to two years prior to full separation.
- The creation of power pooling arrangements through 'various markets' (the IAC report had previously noted that the State Commissions were already using merit order administrative arrangements).
- The various generating activities of the State Commissions be broken up to give a spur to competition.
- The distribution function (where not already so) be separated from transmission (distribution was separate in NSW and Queensland and in the case of 11 municipal undertakings handling 20% of the electricity in Victoria). This should also be introduced in two stages.
- That distribution be operated through a number of separate authorities, each large enough to provide economies of scale, but providing enough entities to use 'yardstick' regulation.
- The integration of a national grid entity that would be accountable to a Council of Ministers, with independent regulatory oversight. The development of the new arrangements to be the responsibility of a Steering Committee comprising representatives of participating governments rather than utilities. (Note the state commissions favoured a model of the existing arrangements coordinated by a National Grid Management Council).
- The activities of the national grid, distribution authorities and other entities to be subject only to the general monitoring provisions of the Trade Practices Commission and the Prices Surveillance Authority.
- With the possible exception of the transmission segment, nothing about the ESI justifies continuing public ownership. The Commission recommended governments sell their generating assets and progressively sell their distribution assets.
- Governments address the institutional impediments (e.g. government policies which prevent energy prices from reflecting supply costs) and market failures (e.g. environmental concerns and information gaps) which impede the efficient use of energy, provided it can be demonstrated that net benefits would result.

All the elements of the reform program including separation are included here – two years before the Competition Policy Review by Hilmer.²⁰

The Special Premiers Conference that followed however did not fully execute the Industry Commission Plan. The Communique notes that leaders agreed to establish a National Grid Management Council (NGMC) 'to encourage and co-ordinate the most efficient, economic and environmentally sound development of the

electricity industry in eastern and southern Australia having regard for key National and State policy objectives.' It noted 'This represents an important step forward in advancing co-operation in the electricity industry, the absence of which has cost the nation dearly in terms of excessive generation capacity, inappropriate plant mix and inflexibility of fuel use.'

Each participating Government was to nominate a representative to the Council which was to have an independent chairperson. The Council's task was to oversee the preparation of a draft protocol to be presented to Heads of Government for consideration in November 'covering the planning, operation, development, monitoring and extension of the eastern and southern Australia grid.'

The communique notes that leaders agreed that extensions to the current interstate grid were technically feasible and economically justified. With an expectation of further details being prepared for the November meeting, it was noted a link to Tasmania could be operational by the mid to late 1990s and the extension to Queensland possibly from 1997.

4.3. From NGMC to AEMO

The Commonwealth Government was to learn quickly that the commitment of the Premiers to these reforms was not shared by their supply authorities. The single biggest difference between the IAC and IC reports and the work being undertaken by the States was the emphasis in the Commonwealth reports on interconnection.

The agreement between the States for establishing the NGMC appeared to be quite clear in its definition of the National Grid:

The Council will define the South and East Australian National Grid ("the Grid") in terms of the elements of the transmission networks of the State and Territory-owned electricity utilities of the participating States and Territories, and any privately owned or other elements, that comprise the Grid. (National Archives of Australia: Department of Prime Minister and Cabinet; A1209 1991)

However, the Commonwealth Government soon realised that the process would not run smoothly. Less than a year later, in a briefing note to Prime Minister Paul Keating from Rod Sims, then a Deputy Secretary in the Department of Prime Minister and Cabinet prior to the next leaders meeting (National Archives of Australia: Department of Prime Minister and Cabinet; A1209 1992a). He noted that the generally agreed approach to reform is via internal restructuring and the introduction of competition, but raised doubt about whether the National Grid Management Council could achieve its aims noting 'it is a co-operative venture in an industry accustomed to barriers to entry and the monopoly rents associated with them.'

Before providing talking points for discussion with Premiers Greiner and Kirner, Sims suggests that if these discussions do not contain a commitment before the Conference to enter into agreements to establish an NGC' the PM should 'urge them on Monday to agree to "work towards and NGC"' subject to settling some issues. The memo also notes that initial pool arrangements had been operating in NSW since 1 January 1992 and that Pacific Power (the renamed Electricity Commission) would be introducing its electricity exchange market (ELEX) from 1 July 1992. He noted that Victorian reform was pursuing a substantially different approach with long term contracting and retention of distribution withing SECV.

Commenting on the meeting in a press conference (Keating 1992), PM Keating observed:

Moving now to electricity generation, which was another 'One Nation' topic we had on the agenda, we did secure agreement in principle to the separation of power generation from transmission. This is the key point in this issue – that the providers of power are not the transmitters of power with a view to establishing an East-Coast electricity grid, a network which would be represented by a structure yet to be agreed...In other words, that the transmission assets of the East-Coast State would be part of an East-Coast grid, a body, a corporation...but the principle of separation is agreed.

The Communique from the meeting (Government 1992) was equally clear on the principle of separation, but less so on the topic of the structure of the grid:

It was agreed to develop an interstate transmission network across the eastern States and that the National Grid Management Council would report on the precise nature and operating guidelines of the structure by the end of 1992. To achieve this, Heads of Government agreed to the principle of separate generation and transmission elements in the electricity sector.

In preparation for the next leaders meeting (the first meeting as the Council of Australian Governments) in Perth, Peter Harris drafted a memo on what might need to be achieved at the meeting (National Archives of Australia: Department of Prime Minister and Cabinet; A1209 1992b). He first noted that State Governments had told the NGMC that they did not need the \$100 million earmarked in 'One Nation' for transmission augmentation. He further observed that the BCA and MAIC were keen to join the NGMC which at the time was dominated by electricity generators (although Victoria and NSW claimed to be preparing to replace these with State officials). In considering how to address the membership question, Harris noted:

We are at a point where if we do not cut the utilities down to size, we will have achieved the equivalent of putting Telecom in charge of the telecommunications reform process (remember that Telecom supported competition in 1990, just that it wanted competition on its own terms.)

On the topic of a National Grid Corporation Harris surmised that the Commonwealth did not have much prospect of getting up a National Grid Corporation, noting the NGMC appeared to be committed to only ring-fencing transmission from generation. He noted that a proposal had been put together to claim that separate multiple network corporations will be set up. However, Harris expresses his view that this isn't what the Prime Minister got the previous meeting to accept. He further noted that the Chair of the NGMC had warned NSW and SA that their attitude risks destroying the NGMC, adding:

We believe the NGMC will be publicly criticized (as it is, now, privately by people such as Kerry Schott) as nothing more than a generators club.

He concludes the note by suggesting that 'pressing Premiers to pay some attention to the NGMC' is also not a bad idea. While we cannot always expect that State officials will do a better job on pro-competitive issues, they can do no worse than their utilities.'

In a further note to Rod Sims (and others including Don Russell and Ric Simes) following the meeting Harris noted that the Prime Minister's intervention had proven pivotal in getting the NGMC to move beyond ring-fencing. All utilities had 'rolled over' for multiple network corporations that would place State transmission companies under some form of co-ordinated control. He noted it is a short step from there to the point where the controller (described as the National Electricity Board) takes on responsibility for merit order dispatch and settlement.

He notes that ring-fencing would be used as a interim step and that inevitably a neutral, independently managed grid arrangement would not have been created by July 1993, the date at which the NGMC timetable suggested there was supposed to be a customer market in electricity in operation. Consequently, he suggested that the commitment to timing of a customer market should be revisited.

This dive into the archives is used to demonstrate the ways incumbents and the states disrupted the plans for reform. While ELEX was operating in July 1992 the expansion to a fully functioning NEM only occurred in 1998 and full retail contestability was slowly rolled out from 2002 to 2013.

The new arrangements were formally introduced by the *National Electricity (South Australia) Act 1996*. The market was operated by the National Electricity Market Management Company (NEMMCO) under a code authorised by the ACCC and obligations of market participants were enforced by the National Electricity Code Administrator (NECA). Each of NEMMCO and NECA were joint ventures of the Governments of Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania. Full

retail contestability was introduced in all States other than Queensland and Tasmania between 1 January 2002 and 1 July 2003 with regulated prices, with Queensland progressing to FRC in 2006 and Tasmania in 2013. Price deregulation occurred in a period over the period from 2008 to 2015, but still does not apply in regional Queensland and Tasmania (AEMC 2017).

In 2001 the Council of Australian Governments (COAG) issued a statement on energy policy *Towards a National Energy Policy* (COAG 2007). After noting the progress of reform since the 1991 Industry Commission report, the statement noted “there remain immediate and long-term issues that need to be addressed. They include National Electricity Market (NEM) issues of capacity, interconnection, pricing (including transmission pricing), NEM governance, and regulatory overlap, the facilitation of increased market penetration of natural gas and improved demand management.”

It noted agreed objectives of:

- Encouraging efficient provision of reliable, competitively-priced energy services to Australians, underpinning wealth and job creation and improved quality of life, taking into account the needs of regional, rural and remote areas;
- Encouraging responsible development of Australia's energy resources, technology and expertise, their efficient use by industries and households and their exploitation in export markets; and
- Mitigating local and global environmental impacts, notably greenhouse impacts, of energy production, transformation, supply and use.

These objectives were supported by three areas of priority action:

- National energy policy leadership – the establishment of the Ministerial Council on Energy (MCE) requested to report back after its first meeting on ‘key approaches and handling timetables’ for issues that included likely energy use scenarios over the next decade, potential for harmonizing regulatory arrangements, opportunities to increase interconnection and system security, and ways of accelerating improved consumer choice. The latter was suggested to involve ‘providing better information and enhancing cooperative energy efficiency activities and decision making for demand side participation.’
- Immediate action on high priority national electricity market issues – this included tasking the recently formed NEM Ministers; Forum to give urgent attention to NEM issues of impediments to investment in interconnection, transmission pricing, regulatory overlap, market behaviour (eg rebidding), and the effectiveness of regulatory arrangements in promoting efficient market outcomes. The Forum was also asked to address regional boundaries and demand side participation.
- High level independent strategic review of medium to longer term energy market directions – the terms of reference for the review included identifying impediments to the realisation of the benefits of energy market reform and strategic directions for further reform. It specifically sought advice on ‘regulatory approaches that effectively balance incentives for new supply investment, demand responses and benefits to consumers’ and ‘assessing the relative efficiency and cost effectiveness of options within the energy market to reduce greenhouse gas emissions from the electricity and gas sectors.’

The review report (Parer 2002), *Towards a Truly National and Efficient Energy Market* detailed what it called ‘serious energy market deficiencies’ listing:

- The energy sector governance arrangements are confused, there is excessive regulation, and perceptions of conflict of interest.
- There is insufficient generator competition to allow Australia's gross pool system to work as intended.
- Electricity transmission investment and operation is flawed, and the current regions do not reflect the needs of the market.
- The financial contracts market is extremely illiquid, in part reflecting large regulatory uncertainty.

- There are many impediments to the demand side playing its true role in the market.
- There is insufficient competition in the east coast gas market, and too much uncertainty surrounding new pipeline development.
- Greenhouse responses so far are ad hoc, and poorly targeted.
- The NEM is currently disadvantaging some regional areas.

Its recommendations were for the governance arrangements to be simplified by creating a National Energy Regulator to encompass the energy specific roles of the ACCC, all the state and territory regulatory bodies, and some of the roles of NECA, and for an enhanced role for NEMMCO in terms of proactive market development.

In relation to transmission it proposed giving NEMMCO responsibility for all transmission planning and that NEMMCO should auction firm transmission rights (FTRs). It proposed that investment in further inter-regional transmission should be triggered by the traded prices for FTRs. It also proposed an increase in the number of regions with 'full nodal pricing as the longer term goal.'

In relation to demand side participation issues the report proposed the mandated roll-out of interval meters and the removal of retail price caps. To enable the demand side to gain full value from what it can bring the report proposed a 'pay-as-bid' mechanism into NEMMCO dispatch and settlement.

On greenhouse emissions the report proposed abolishing most existing schemes including the Commonwealth's Mandatory Renewable Energy Target be replaced by an economy wide emissions trading system.

The MCE response to COAG embraced the recommendations but stopped short of anything that impinged upon State regulation. In responding to the governance recommendations the MCE proposed the creation of both the Australian Energy Regulator as proposed by Parer but also created the AEMC as a rule maker and body responsible for market development. While agreeing that 'further reform should be undertaken to address **greenhouse emissions** from the energy sector, in the light of concerns about climate change and the need for a stable long-term framework for investment in energy supplies' the MCE only proposed to 'work closely with the CoAG High Level Group on Greenhouse to address greenhouse gas emissions from the energy sector on a national basis.'

The question of economic regulation was handed to another review (Beale et al. 2006) and later the Energy Reform Implementation Group (ERIG) provided its report *Energy Reform: The way forward for Australia* (Scales 2007). The terms of reference for the latter was led by a requirement for ERIG to provide reform recommendations for 'achieving a fully national transmission grid including the most suitable governance and transitional arrangements having regard for COAG's objective of achieving a truly national approach to the future development of the electricity grid.'

The report itself was scathing of the governance arrangements governing the sector and that improvement was a 'critical pre-condition' for continued improvement, noting that it 'strongly believed' that 'single Australia-wide, energy market-wide, independent (and preferably separate) institutions covering planning, market operation, market regulation and rule-making are urgently required and would be the logical evolution of current market governance arrangements.' It proposed that sharpening the separation between the role of the MCE as the peak policy-making body, and the bodies responsible for planning, operating, rule-making and regulation of Australia's energy markets, would improve governance, including by ensuring the independence of market operators from governments. Increasing the influence of the Commonwealth or COAG in the oversight and development and monitoring of Australia's energy policy and clarifying and strengthening the role of the Commonwealth Government within the MCE would help as well.'

It found that the AEMC was in need of reforms, noting it needed 'to be adequately and transparently funded, preferably by the Commonwealth Government, and to have more control over its own work programme, subject to being required to develop rules that enhance market efficiency.' It also proposed reforms to

NEMMCO including that a 'national energy market operator should replace the separate operators for gas and electricity.' On the issue of transmission the report proposed the creation of a new National Transmission Planner function that would be placed within NEMMCO if the appropriate reforms to NEMMCO were made.²¹

The response to both these reports resulted in the creation of AEMO to replace NEMMCO and the adoption of consistent definitions of the objective of the national gas and electricity laws.

4.4. Current Status

Three further significant reviews have reported on the market; the *Review of Governance Arrangements for Australian Energy Markets* (Vertigan et al. 2015), the *Blueprint for the future : independent review into the future security of the National Electricity Market* (Finkel 2017) and the *Retail Electricity Pricing Inquiry* (ACCC 2018). Action on recommendations has been inconsistent – except for the inability of the jurisdictions to agree on any proposals that strengthen the national character of regulation and institutions, and a reluctance to empower the market bodies.

The creation of the Energy Security Board (ESB) as a coordination mechanism between the market bodies and an entity designed to steer significant reform was a recommendation of Finkel's report that was enacted, but its first foray into reform – the National Energy Guarantee, an attempt at replacing disparate climate policies with an effective emissions trading scheme within the electricity market — failed and ultimately cost Prime Minister Turnbull his position. The ESB is now involved in trying to turn a half-thought idea from a meeting of energy ministers in October 2018 into a new market design under the banner of the Post 2025 project.

At the creation of the ESB it was announced that it would be reviewed after three years and the review report was completed in June 2020 (Edwards & Consulting 2020). In their response to the review (Ministers 2020) energy ministers agreed to extend the term of the ESB to December 2021 'pending completion of the post 2025 market design project' and that they will consider options for future energy governance arrangements in mid-2021. The response noted 'transition planning for the cessation of the ESB should include a proposal for a Market Bodies Forum (MBF).' Interestingly the market bodies had launched just such a forum as an attempt to forestall the Finkel recommendation for the ESB (AER 2017).

In the face of the COVID19 crisis the Prime Minister and the Premiers and Chief Ministers took to meeting as a 'National Cabinet' and have since decided to replace COAG with these arrangements. Despite suggesting this was the start of a new era of cooperative federalism the impact on energy policy has so far simply been to give the meeting of energy ministers its fourth name²² while tasking it with simply with immediate measures to ensure reliability and security of the electricity grid ahead of the 2020-21 summer, completing the Post 2025 design by mid 2021, and a package of reforms by July 2021 to unlock new gas supply (Morrison 2020).

²¹ It is somewhat amusing to note that the ERIG report discusses a submission from the Energy Users Association of Australia that 'one option for delivering national co-ordination and the identification of optimal projects to transmission in the NEM would be the establishment of a national grid company.' This is noted without any reference to it being the Commonwealth's initial preferred approach.

²² In sequence the Ministerial Council on Energy, the Standing Council on Energy and Resources, the Energy Council of COAG and now the Energy National Cabinet Reform Committee.

5. Conclusions

Opinions on the progress of energy sector reform covers a broad spectrum. There are those who support the theme expressed by the title of an AEMC publication *The National Electricity Market: A case study in successful microeconomic reform* (AEMC & KPMG 2013). There are those who may be critical of the outcome but less so of the process such as:

Australia's microeconomic policy agenda in the 1990s led to the structural reform of the electricity and gas industries [they then cite (Hilmer 1993) for the original competition policy recommendations related to structural separation of public monopolies]. State Electricity Commissions had historically been responsible for operating electricity systems within jurisdictional boundaries...The reform of electricity generation and creation of the NEM could be argued to have been the centrepiece of microeconomic reform of the East-coast electricity market.(Nelson & Orton 2016)

There are others who take a more radical view, largely focussed on the question of whether markets can deliver an efficient ESI, such as:

The conclusion must be that the disaggregated, disconnected market is not working sufficiently well to provide reliable electricity at affordable prices and that some further radical reshaping of the market is now needed.(Aulich & Wettenhall 2017)

What is incontrovertible is that the real price of electricity, having been largely stable for two decades, suddenly and dramatically increased from about 2007 ((ACCC) 2018). The divergence happens to coincide with the point at which years of steady consumption growth reversed (and the failure of AEMO to accurately forecast for the next ten years), the move to national economic regulation of networks under highly deficient rules, and the impact of drought that drove up wholesale prices in 2007-08 through shortage of hydro-electric supply and some generators not having water for cooling (Moran & Sood 2013).

Writing in 2008 Moran and Skinner note that 'a key debate surrounding electricity markets remains the general question of resource adequacy — i.e., can we leave investment in long-lead time and long-lived assets, producing a product essential to every other part of the economy to the chaos of a free market?' (Moran & Skinner 2008). They conclude that the NEM had been successful, in particular because the bias of electricity commissions to 'base load' stations had been replaced by more investment in peaking generators. Further, the peaking generators responded to the opportunities in the market improved their operations to be able to generate within two hours rather than the five that had previously been their performance.

This review has listed only some of the many Royal Commissions, inquiries, expert reviews and legislative reforms over the 132 years since electricity was used to light Tamworth's streets. As policy makers and market bodies confront the challenges that accompany the transition of energy systems to a zero-carbon future, there are two conclusions from this review of history that needs to be kept in mind.

The first is that the dominant narrative of a relatively stable ESI that was operated through vertically integrated state owned entities until reformed in response to Hilmer's competition policy is false. The reality is different:

- The ESI began as a complex mix of public and private municipal-scale enterprises;
- The move to create State Electricity Commissions (or equivalent) happened at very different times and under different motivations in each State;
- At the start of the 1990s only in the ACT, South Australia and Tasmania supply was provided entirely through the vertical operation of the State Commission — in Victoria 20% of distribution continued through municipal enterprises, while in NSW and Queensland all distribution was beyond the control of the Commission;

- The reform process was triggered more by the interest in interstate trade in energy as a competition boost than by general competition policy, and it was triggered before the Hilmer committee was even created;
- There has been a continual process of change, but the pace has always been much slower than those who instigate change envision.

The second conclusion is that the same issues have been recycling for thirty years, including:

- Despite the motivation for the NEM being an oversupply of generation, policy makers greatest concern has always been resource (both generation and transmission) adequacy;
- The desire for demand management and demand side participation has been a constant unrealised goal;
- The need to reduce greenhouse gas emissions has been an ever-present goal without effective action, and;
- The self-interest of energy companies and jurisdictional officials has dominated policy outcomes.

Hugh Outhred (2007), credited in the acknowledgements of the seminal *Spot Pricing of Electricity* (Schweppe et al. 1988), observed in the introduction and conclusion of a conference paper extolling the success of the Australian reforms of the 1990s:

Electricity restructuring is a complex, never-ending process that has engineering, economic, commercial, legal and policy dimensions and takes place within a broad societal context that itself influences and is influenced by the outcome... Success depends on establishing and maintaining a consensus on the key objectives and principles... The dynamic and evolving nature of the broader social context means that there can be no guarantee of future stability and continuity in approach to electricity industry restructuring. For example [The AEMC's Comprehensive Reliability Review] opens up the possibility of a complete re-think of the current approach to addressing the perennial and irresolvable (in a deterministic sense) question of "resource adequacy."

History bears Outhred right, electricity restructuring is complex and never-ending; it is not a picture of stability punctuated by insightful reforms based on single studies. Success in reform requires recognition of the multiple facets of the ESI and its societal context and must be underpinned by an enduring consensus on the policy goals.

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