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Electricity and Privatisation

by

Stewart Smith

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Executive Summary

In the late 1800's electricity became the preferred method for street lighting, and it was not long before local councils across the State became responsible for coordinating electricity supply infrastructure. The first power station in Sydney was completed in 1904 at Pyrmont. By 1949, there were 157 electricity suppliers, either generating or distributing electricity to people across the State (page 2).

Post World War II, the burgeoning economy and lack of new investment during the War led the State government to form the Electricity Commission under *the Electricity Commission Act 1950*. The Commission acquired power stations and distribution networks, and gained centralised control over new investment in generation and the interconnection of distribution networks (page 4).

The centralised, monopolistic electricity supply industry performed its function with little scrutiny until the early 1990's. In 1991 the Industry Commission estimated that the reform of the electricity supply industry could result in national output expanding by \$2.2 billion annually (page 5).

Individual State governments and the Council of Australian Governments began the process of reform of the industry. State grids were connected to form a national grid, which allowed the commencement of a national electricity market. The reforms were given a boost with the release of the Hilmer Report on National Competition in 1993 (page 8).

In 1995 the ALP State Government enacted the *Electricity Supply Act*, the *Energy Services Corporatisations Act* and the *Sustainable Energy Development Act* (page 11). These Acts enabled the introduction of a competitive wholesale and retail electricity market, corporatised the power stations and distributors, and provided assistance in the market place to reduce greenhouse gas emissions. Generators were broken into three competing firms, whilst the distributors were amalgamated into six State owned companies.

In May 1997, the NSW Government introduced legislation to create the national electricity market, which is expected to commence fully in March 1998. Proposals to corporatise the Snowy Mountains Hydro-electric Authority did not proceed in Parliament (page 14). In May 1997 the Treasurer released proposals to privatise the electricity supply industry (page 14). In response to criticism about the privatisation plan, the government commissioned an inquiry chaired by Mr Bob Hogg. The majority view of the inquiry was to privatise the industry, with conditions (page 51). A dissenting minority view was also presented, arguing that the privatisation of the industry was not in the public interest (page 51).

The paper briefly explains some basic economic arguments on the reform of monopolies and utilities (page 20). The international experience of electricity supply industry privatisation is reviewed. It is noted that many countries across the world are in the process of privatising their electricity assets. Many power utilities from the United States and the United Kingdom have expressed special interest in acquiring electricity assets in Australia (page 24). Detailed case studies of the privatisation of the electricity industry in the United

Kingdom (pages 25- 31) and New Zealand (pages 32-37) are presented.

The electricity industry in all States across Australia is undergoing reform, whilst the Victorian government has privatised sections of their electricity industry (page 37). Some potential problems of environmental protection in a national electricity market are explored (from page 44.)

Arguments for and against privatising the electricity supply industry are canvassed. Arguments for privatisation rest on the premise that the private sector can manage a firm more efficiently than can the public sector; the government is exposed to risk if it maintains the industry in public ownership in a competitive market; and that the government can pay off State debt with sale proceeds and use excess for the rejuvenation of public infrastructure (page 46). Opponents to privatisation argue that the public sector is an integral component of the economy, and can compete just as efficiently as the private sector. Public ownership of utilities is important to maintain regulatory control and achieve goals of social equality and economic development (page 48).

A summary of the Hogg Report is presented (page 51).

1.0 Introduction

Electricity has become a fundamental part of our life. Without it, today's society would not have developed as it has and its continued existence without electricity is inconceivable. The electricity supply industry is therefore such a strategic part of the economy and 'well being' of the nation that governments have traditionally taken a major role in the development of electrical infrastructure.

Over time this interest by government has taken different forms, and since the Second World War has been expressed by government ownership and control of the industry. However, there is a world wide movement away from this government ownership of the electricity supply industry back to private ownership. On a global basis, the privatisation of the electricity industry has been spearheaded by the United Kingdom. This has not been without its problems, with one major issue being massive profits made by the newly privatised industries.

Domestically, the reform of the electricity supply industry since the early 1990's has resulted in large scale changes in its structure. The interlinking of State electricity networks and the creation of a national electricity grid has transformed the industry. The electricity market has changed from one of giant monopoly to one of increasing competition, with governments gradually removing themselves from day to day management. Victoria has led the nation in the reform of its electricity industry to the extent that it has also privatised many of its components. In NSW there are now proposals to privatise parts of its electricity supply industry.

This paper presents a brief history of the electricity industry in NSW and analyses some of the economic arguments that lie at the root of industry reform. Reforms of the industry in the UK, New Zealand and Victoria are discussed, whilst Appendix A lists a glossary of terms and Appendix B provides a select reading list.

2.0 The History of Electricity Supply in New South Wales

In 1842 the City of Sydney was incorporated, and one of the responsibilities of the city was to provide street lighting. Whilst initially streets were illuminated by gas lights, it was not long before electrical lighting systems were developed, and the Council inquired about these as early as 1882. Meanwhile, other local government areas took the lead in regards to the electrical lighting of streets, and Tamworth became the first town in the southern hemisphere to light its streets with electricity in 1888. Young, Penrith, Moss Vale, Broken Hill and Redfern soon followed, and by 1891 each of these towns had its own electrical supply system.¹

¹ Anderson, G. *Fifty Years of Electricity Supply. The Story of Sydney's Electricity Undertaking.* The Sydney County Council, 1955, p 10.

Whilst regional NSW councils developed their electricity supply industry, Sydney City was problematic. For instance, the Municipal Council of Sydney Electric Lighting Bill was first introduced into the Legislative Assembly in 1891, but was not passed until 1896. The Bill had three strong groups influencing its development. The first group believed that private enterprise should have a monopoly in the generation and supply of industry, at least to private consumers. The second group accepted that Sydney City Council should have the controlling interest in electricity generation and supply, but should let private enterprise do this on Council's behalf. The third group believed that Council should be granted the powers to generate and supply electricity, and that it should carry out the whole operation itself.²

The most contentious aspects of the Bill were contained in clause 6, which brought the three conflicting ownership arguments to a head. Clause 6 empowered the Council to contract with any company or person to supply electricity for any periods not exceeding 21 years. The prorogation of Parliament and the contentious nature of clause 6 led to the five year delay between introduction of the Bill and its enactment. Ultimately clause 6 was negatived in Committee, and the Municipal Council of Sydney took on the responsibility of providing electricity to the City, both for street lighting and private purposes.³ Hence for the City of Sydney public ownership of the electricity supply industry began. The first power station for Sydney was completed at Pyrmont in 1904, with a total capacity of 1,500 kilowatts.

In NSW local government took the lead in the provision of electricity supply and generation. The *Local Government Act 1919* gave local councils the power to establish, acquire and conduct trading enterprises, including the supply of electricity and the provision and installation of electrical fittings and appliances. Local councils also had the power to delegate this authority to County Councils, or alternatively a council had the right to grant a franchise to a private operator for the provision of electricity supply.⁴

By 30 June 1949 there were 157 suppliers, generating and/or distributing electricity supply to the public within the State. These suppliers are shown in Table 1.⁵

² *Ibid* p 12.

³ *Ibid* p 15.

⁴ Storey, R. & Caldwell, J. *Statement of Views on Proposal of the State Government to Create a Commission for the Control of Generation of Electricity Supply*. Local Government and Shires Association of NSW, 1950, p 3.

⁵ *Ibid*

Table 1: Suppliers of Electricity 1949			
Supplier	Number	Consumers	Units reticulated KWH
State Departments	3	5,040	108,493,714
Municipal and city councils.....64 Shire Councils...40 County Councils..17	Total of 121	669,839	1,921,410,138
Private Companies operating under franchise from the Local Government Authority	33	72, 586	184,086,816

Up to the 1940's, the municipal and city councils were the dominant players in the supply of electricity to the State. On the power generation side alone, there were two major systems of generation and transmission run by the State, one by the Railways with power stations at Sydney, Lithgow and Newcastle, and one by the Public Works Department with its main power stations at Port Kembla, Burrinjuck and Wyangala. As at June 30 1949, 33 local government bodies were generating their own electricity requirements, and the balance of the 188 Councils were taking supply in bulk from the systems of the railways, Public Works Department, or from other local government bodies such as Sydney County Council. Local government bodies were responsible for providing 55% of the total electricity generated.⁶

From the beginning of the century until the outbreak of the Second World War, the demand for electricity steadily increased. Between 1915 and 1929, demand doubled every five years, and after the depression demand doubled every nine years. The interconnection of generating systems began shortly before the Second World War, and continued to cover most of the State.⁷

Post-war, the burgeoning economy and lack of new investment in generating capacity during the war, resulted in a serious power deficiency. By 1949, exacerbated by industrial disputes, the electricity supply position had become acute, and inability to meet demand made it necessary to ration supplies and shed load.

⁶ *ibid* p 4.

⁷ Allbut, G. *A Brief History of some of the features of Public Electricity Supply in Australia and the Formation and Development of the Electricity Supply Association of Australia 1918 - 1957*. Electricity Supply Association of Australia, 1958, p 32.

In 1949 the Premier of NSW announced the intention to form an Electricity Commission, empowered “by legislation to become ultimately the overall generating authority for the State.”⁸ The enactment of the *Electricity Commission Act 1950* firmly entrenched the role of the State in the ownership and control of the electricity supply industry, including compulsory take over of existing private companies. The *Electricity Commission Act* established the Commission which had the following tasks:⁹

- to restrict and regulate the use of available supplies of electricity to the greatest overall advantage of the community
- to acquire the power stations and transmission lines of the four major supply authorities whose interconnected systems already extended over a large part of the State
- to increase power production and develop the State’s resources to cater for its future electricity requirements.

From 1950, the Commission’s transmission system extended to country areas, allowing the power generation equipment of a large number of municipal and shire councils and franchise holders to be retired.¹⁰ Between 1955 and 1982, the Commission added more than 8000MW of generating capacity, and transmission lines and underground cables extended from 3,901 to 16,919 kilometres.¹¹

The generation of electricity followed the world wide trend of large centralised power stations supplying large areas through interconnected transmission networks. In NSW, the coal fired power stations are mainly located on the coal fields that form an arc around the main population and industrial centres of the Sydney basin.

3.0 Reform of the Australian Electricity Supply Industry (ESI)

Over the last twenty years the electricity supply industry has undergone significant reform.¹² In 1979, the Fraser Government encouraged State Governments to develop resources infrastructure, due to the expected ‘resources boom’, through an ‘infrastructure borrowing programme’.¹³ As a result the Electricity Commission engaged in the ‘rapid construction of substantial new generating plant capacity to meet the expected growth during the 1980’s.’ However the expected industrial demand for energy did not eventuate and NSW was left

⁸ Storey,R. & Caldwell,J *op cit* p 1.

⁹ Allbut,G *op cit* p 34.

¹⁰ The Electricity Commission of NSW. *Performance and Future Direction. Statutory Report to the Minister for Energy*, 1983, p 17.

¹¹ *Ibid* p 18.

¹² The following discussion is adapted from: Mullen,V & Smith,S *Commentary on the Electricity Legislation Amendment Bill 1995*. NSW Parliamentary Library Briefing Paper No 20/95.

¹³ ‘Plug power industry into competition’, *The Australian Financial Review*, 16/4/92.

with a level of generating plant over and above that which would normally be required to achieve adequate reliability of supply. In order to counteract resulting inefficiencies, the Electricity Commission 'embarked on a major commercialisation process' resulting in increased profitability, price increases below inflation, improved productivity through workplace reforms and the establishment of a competitive market for the Commission's coal purchases as a result of the privatisation of collieries.¹⁴

In 1991, a report commissioned by employees of the electricity industry examined the need for reform of the industry and stated that:

...a national electricity industry strategy, which would incorporate national integration within an overall national energy policy has become a major economic, political and public administration priority. The urgency comes from the need for structural adjustment, from the impact of the current recession and the realisation of the environmental damage the industry has caused. All levels of government in Australia, the trade union movement, the private sector, and the community are putting the industry under minute scrutiny.¹⁵

From an environmental perspective, calls were also made for reform on the basis that despite electricity supply exceeding demand, electricity commissions around Australia were still constructing coal fired power stations. Because of oversupply, the commissions were stimulating rather than controlling the demand for electricity. As '[n]early half of Australia's emissions of the principal greenhouse gas, carbon dioxide (CO₂), come from this industry'¹⁶, it would appear that demand management would be more prudent rather than increasing generation capacity.

In May 1991, the Industry Commission released its report titled 'Energy Generation and Distribution' which was to examine the electricity and gas supply industries with respect to the 'institutional, regulatory or other arrangements subject to influence by governments in Australia which lead to inefficient resource use' and 'advise on courses of action to reduce or remove such inefficiencies'.¹⁷ The need for administrative and structural changes in the industry to overcome past inefficiencies was identified:

¹⁴ NSWPD, 16/10/91, p 2254.

¹⁵ Pluto Press Australia in association with the Public Sector Research Centre, University of New South Wales, *Powering the Future: The Electricity Industry and Australia's Energy Future*, 1991, p 1.

¹⁶ Diesendorf, Dr M, 'The abuse of power', *Conservation News*, October 1991, Vol 23, No 7, p 5.

¹⁷ Industry Commission, *Energy Generation and Distribution*, 1991.

Analysis undertaken by the Commission suggests that, if the electricity supply industry's performance were as good as international best practice and cross-subsidies between users were eliminated, national output could expand by around \$2.2 billion annually.¹⁸

The recommendations of the Industry Commission to rectify serious impediments to efficient resource use in the electricity supply industry included the following:

- increase competition by, notionally separating (ring fencing) activities within two years and, second, fully separating activities as soon as possible thereafter by, for example, the separation of ownership of generation, transmission and distribution functions; the formation of a number of independent generating bodies; the formation of a public body to acquire and operate all transmission assets in New South Wales, Victoria, Queensland, South Australia and Tasmania; the creation of multiple distribution franchises and the provision of open access by all transmission and distribution bodies;
- corporatise all public bodies engaged in electricity generation and the transmission and distribution of electricity to place them on a commercial basis, at arms length from government;
- modify regulatory and other controls applying to private utilities;
- progressively sell publicly owned electricity generation and distribution assets to the private sector;
- implement other initiatives to increase efficiency with respect to: pricing; the Snowy Mountains Hydro-Electric Scheme; new capacity for public utilities; load management and energy conservation measures and
- initiate a review by an independent body of the progress made in implementing reforms and options for further improving efficiency.¹⁹

In response to the Industry Commission report into the electricity industry, it was decided at the Special Premier's Conference of July 1991 that a national grid should be established. Subsequently, the National Grid Management Council was established for the purpose of encouraging and initiating the further restructuring of the electricity industry in Australia so that the country can move ahead to more efficient generation, transmission, distribution, and use of electricity, thereby improving international competitiveness, particularly of manufacturing and energy-intensive industries.²⁰

¹⁸ *Ibid*, Vol 1, p 2.

¹⁹ *Ibid*, Vol 1, p 23.

²⁰ Landels, J, 'Electricity reform: the National Grid Management Council', in Galligan et al (eds), *Managing microeconomic reform*, Federalism Research Centre, 1993, p 105.

On 16 October 1991, the *Electricity Commission (Corporatisation) Bill 1991* (NSW) was introduced into the Legislative Assembly for the purpose of establishing The Pacific Power Corporation of New South Wales Limited ('Pacific Power Corporation') as a State owned corporation within the scheme of the *State Owned Corporation Act 1989*. Certain assets, rights and liabilities of the Electricity Commission were to be transferred to Pacific Power and the Commission was to be dissolved. It was stated in the Second Reading Speech to the Bill that '[t]ogether with the Special Premiers Conference initiative to move towards an eastern States power grid, corporatisation of the Electricity Commission will create a new competitive market environment.'²¹

On 12th November 1991, the then ALP Opposition raised a number of concerns surrounding the proposed corporatisation of the Electricity Commission. These included:²²

- the possible privatisation of the Commission
- the possibility of increased production of greenhouse gases
- accountability issues
- the real nature of the potential competition and efficiency gains
- the future of employees of the Commission
- executive salaries
- lack of consultation with the community.

In light of opposition from the environmental movement, concerns about the accountability of the proposed Corporation and the possible referral of the Bill to a parliamentary committee, the Government withdrew the Bill from Parliament in December. However, the (then) Minister for Energy stated that the programme of commercialisation of the Electricity Commission would continue with the separation of the power stations into separate business units, and the change of the Commission's name to Pacific Power from 1 January 1992.²³

In June 1993, the Council of Australian Governments

endorsed the creation of an interstate electricity transmission network through the adoption of separate network corporations in participating States. What is proposed is that the monopoly wires, that is transmission, be separated from generation to form the national grid.²⁴

²¹ NSWPD, 16/10/91, p 2254.

²² NSWPD, 12/11/91, pp 4285-4298. Pat Rogan MP, leading for the Opposition.

²³ 'Elcom plan shelved, not abandoned: minister', *The Sydney Morning Herald*, 14/12/91.

²⁴ NSWPD, 21/4/94, p 1647.

The economic benefits of electricity grid interconnections have been identified as follows:²⁵

- the efficiency of resource allocation can be improved as 'interconnections between state grids can allow states with low cost power resources to export power to those states with high cost power sources.';
- interconnection between systems based on different technologies such as hydroelectric generation (which can respond quickly to changes in demand) and thermal coal stations (which are slower in response but provide cheaper power) can increase flexibility and reduce costs;
- lower reserve plant margins are needed to maintain supply which means that investment in new plant for this purpose may be deferred; and
- greater competition is possible in a larger interconnected network leading to efficiency gains.

At the June 1993 meeting of the Council of Australian Governments, the progress made since the establishment of the National Grid Management Council was reviewed and 1 July 1995 was set as the new deadline for the structural changes to be put in place for the development of a national grid.

The interconnected States - Victoria, NSW and South Australia - and Queensland will pursue a transmission link structure in which they continue to control their individual networks. Under this proposal transmission operations will be separated from generation and run by separate corporations, although South Australia is 'considering the use of a subsidiary structure pending resolution of cost issues associated with separating transmission from its vertically integrated authority.'²⁶

In August 1993, the Hilmer Report into National Competition Policy was released. The Report identified the issue of the ownership of essential facilities as crucial to competition reform. Examples of essential facilities noted by the Report included electricity transmission grids and local telephone exchange networks. The Report supported the establishment of a general legislative right of access to an essential facility where a clear public interest exists.²⁷

²⁵ Dalziel, I et al, *The economics of interconnection: electricity grids and gas pipelines in Australia*, ABARE, 1993, p. 15-16.

²⁶ Orchison, K, 'Milestones on the path to electricity reform', *Electricity Supply Magazine*, No 11, July 1993, p 4.

²⁷ Commonwealth of Australia, *National Competition Policy. Report by the Independent Committee of Inquiry*, Chaired by Prof F Hilmer, 1993, at 248.

On 15 October 1993, the (then) Minister for Energy, Garry West announced that NSW would take part in trials for a national electricity grid, with just one generator (Pacific Power) after the Federal Government had 'backed away from its insistence that Pacific Power be broken up and that there be multiple generators in NSW'. The Minister also stated that:

If we move to multiple generating organisations in this state it will be done after a proper study has been made and after the government is convinced that such a move would be to the benefit of the state and all electricity consumers.²⁸

On November 26, 1993, the Premiers of NSW and Victoria, signed a Memorandum of Understanding on the reform of the electricity industry:

Today's agreement provides for NSW and Victoria, which are the two major participants in the Snowy Mountains Hydro Electricity Scheme to develop mutually acceptable proposals for the commercialisation/corporatisation of the electricity generation and transmission operations of the SMHE Scheme.

It also provides the basis for ensuring that as the electricity industry is transformed, neither of the States will use their transmission networks to impede the flow of power.²⁹

On 16 December 1993, a joint statement on the National Grid was released by the Commonwealth Minister for Resources, Michael Lee, the NSW Minister for Energy, Garry West and the Queensland Minister for Minerals and Energy, Tony McGrady. It was announced that:

The Commonwealth, New South Wales and Queensland Governments have reached agreement to commence work on a preparatory study for an electricity grid interconnection between New South Wales and Queensland entitled 'Northlink'. This agreement has been formalised in a Memorandum of Understanding.

However, a note of warning about the fragmentation of the electricity industry in Australia to increase competition was sounded by Ross Bunyon, then the General Manager and Chief Executive of Pacific Power, in June 1993.³⁰ Bunyon noted that Australia's electricity industry had made considerable efficiency gains without compromising consumer interests. As a result of the increased performance, he believed that the philosophy of 'divide and

²⁸ The Minister for Energy, *Media Release*, 15/10/93.

²⁹ Premier of New South Wales, 'Historic Agreement on Interstate Electricity Industry Reform', *News Release*, 26/11/93.

³⁰ Bunyon, R, 'Australia's electricity supply industry: doing well, but under threat', *The Mining Review*, October 1993, Vol 17, No 4, p 10.

compete' would expose top performing sections of the industry to potential foreign takeovers:

The economic rationalists fail to acknowledge the realities of capital intensive, high-volume, low-margin industries such as ours. Their catch-cry is 'divide and compete'. They fail to see that our competitors overseas are vertically integrated utilities that dwarf any in Australia. Some are as large as the entire Australian electricity industry. These cashed-up international players have targeted Australia, seeing it as ripe for picking off the spoils of any major industry break-up.³¹

Bunyon believed that Australia needs to retain ownership of its top performing utilities in order to realise the potential for international opportunities, particularly in Asia. He noted that Pacific Power had already marketed electricity related services to over 15 countries. These services have included large infrastructure project management, power station and transmission engineering, advanced power technologies, management, training, development and technical services.³² Ironically, it is exactly these types of services and overseas projects, and the associated risk with government capital, that have led to calls for the privatisation of the industry. More recently, in September 1997 a leading commentator on the electricity industry claimed that the break-up of Pacific Power into three organisations had resulted in a loss of efficiency.³³

On 13 October 1994, the (then) Minister for Energy, the Hon EP Pickering MLC (in the Second Reading Speech to the Electricity Transmission Authority Bill 1994) stated

The Government is firmly committed to this national grid process, as long as these reforms lead to the introduction of a truly efficient, effective and competitive market in electricity. The formation of a separate transmission authority in New South Wales will complement both the national grid reform process or, if this does not eventuate, the further development of a competitive electricity market within New South Wales.³⁴

It was agreed by the participating governments (Vic, S.A., NSW and ACT) that a national electricity market would need to be regulated by a some form of framework, known as the national electricity code. In 1993/94 the National Grid Management Council drafted the National Electricity Code, and it soon became apparent that this code would need to be supported by legislation. The governments agreed that uniform legislation in each of the

³¹ Ibid, p 12.

³² Ibid, p 13.

³³ "Expert warns on electricity 'fire sale'" in *The Sydney Morning Herald*, 9 September 1997. The expert referred to is Mr John Petty, Vice President of the Australian Society of Certified Practising Accountants, after a five year study of Pacific Power.

³⁴ NSWPD, 13/10/94, p 32.

jurisdictions would be the most suitable method to support the code, and in May 1996 the energy Ministers signed the national electricity market legislation agreement to formalise these arrangements. South Australia passed the lead legislation in June 1996.³⁵

With the election of the NSW ALP government in early 1995 it was up to the new government to maintain the momentum for reform, which it did. In May 1995 the Electricity Legislation Amendment Bill was introduced and assented to on 19 June 1995. The Act amended the *Electricity Commission Act 1950* to the *Electricity (Pacific Power) Act 1950*. The Act was a precursor to the implementation of an industry reform program to empower the Government to direct bodies, principally Pacific Power and the electricity distributors to restructure. The Electricity Commission was reconstituted and corporatised as Pacific Power, and the Act facilitated the amalgamation of the electricity distributors. The Minister concluded his Second Reading Speech to the Parliament about the Bill with: "In contrast to the action taken by the Opposition's colleagues in Victoria, these reforms are not driven by an ideological belief in perfect competition; nor are they driven by a privatisation agenda or attempts at creative accounting in order to deal with a debt problem."³⁶

In late November 1995 the government introduced the Electricity Supply Bill and two cognate bills - Energy Services Corporatisations Bill and the Sustainable Energy Development Bill. These three bills continued the essential reforms leading to a competitive electricity market. The *Electricity Supply Act* has the following objects:

- to establish a competitive wholesale and retail market in electricity so as to promote efficient and environmentally responsible production and use of electricity and to deliver a safe and reliable supply of electricity.
- to regulate network operations and wholesale trading in the wholesale market for electricity in anticipation of the introduction of a national electricity market.
- to regulate network operations and electricity supply in the retail market in a manner that ensures open access to electricity distribution systems, promotes customer choice and creates customer rights in relation to electricity connections and electricity supply.

The Act provided the mechanics for the administration and development of the electricity markets. The *Energy Services Corporations Act 1995* corporatised the generating and distribution state owned enterprises. Pacific Power was broken up into three corporations: Pacific Power; Macquarie Generation and Delta Generation (for more information on the generators see below). The new corporations became operational on 1 March 1996. The corporations were provided with a set of objectives which included: to be a successful business; to protect the environment by conducting its operations in compliance with the

³⁵ NSWPD, 14 May 1997, p. 8495.

³⁶ NSWPD, Legislative Assembly, 31 May 1995, Mr Carl Scully MP.

principles of ecologically sustainable development; to exhibit a sense of responsibility towards regional development and decentralisation; to operate efficiently, safely and reliably and more. The Act provides for shares in the corporations to be only held by eligible government Ministers, which excludes those Ministers in a regulatory role - such as the Minister for the Environment.

The objects of the *Sustainable Energy Development Act 1995* are to reduce greenhouse gas emissions and to encourage the development of sustainable use technology. The Sustainable Energy Development Authority, Advisory Council and Energy Fund were established to help achieve the objects of the Act. The main role of the Energy Fund is to intervene where market failure is raising barriers to the economically efficient utilisation and application of sustainable energy technologies.³⁷ The Act remains a cornerstone in the Government's agenda to reduce greenhouse gas emissions, whilst still promoting a national electricity market.

The interim State Electricity Market commenced on 1 March 1996, and on 10 May 1996 the *Electricity Supply Act* was proclaimed. From May the price of electricity has been determined at half hourly intervals depending upon supply and demand. The initial focus of the reforms was to introduce competition between generating units. In October 1996 competition in the retail sector also began according to the timetable shown in Table 2 below.

Start Date	Energy Use Threshold	Typical Premises	Annual Bill (approx)	No of Customer sites
1 October 1996	> 40 GWh pa	Large metro. Hospital, heavy manufacturing plant	\$2,000,000 +	47
1 April 1997	> 4 GWh pa	Multi storey office block	\$250,000 +	660
29 June 1997	>750MWh pa	Supermarket, engineering workshop	\$75,000+	3,500
1 July 1998	>160 MWh pa	Fast food restaurant, service station	\$16,000+	10,800
1 July 1999	none	All premises		2.7 million

37

NSWPD, Legislative Assembly, 23 November 1995, p 3972.

Prior to the reforms electricity customers had to purchase electricity from their appropriate franchised retail supplier. With the implementation of competition, customers will be able to choose the supplier of their choice, and already the larger firms are able to purchase electricity direct from the wholesale market. Once a customer is eligible to become a non-franchised customer according to the above timetable, they have one year to choose their new supplier. This is referred to as the 'grace period', in which they have the opportunity to shop around for their best deal. The Independent Pricing and Regulatory Tribunal of NSW will continue to regulate electricity prices for NSW franchise customers until 1 July 2000, which is the end of the 'grace period' for retail customers as indicated in the timetable above. Once premises have become non-franchised, the electricity bill will be determined by competitive market forces alone (ie, no longer capped by IPART). The price component of the monopoly functions of transmission and distribution will continue to be regulated for both franchised and non-franchised customers.

An electricity bill is comprised of the following components: generation; transmission; distribution and retail supply. Analysis of bills indicates that the major cost component of the bill is generation, and therefore the trend in retail prices should reflect the trend in the wholesale price of electricity. This in turn will depend upon, in the long term, the generators' costs and efficiencies gained.³⁸ An analysis of NSW residential electricity prices shows a 10% reduction in real terms over the period 1992/93 to 1995/96. Residential prices are projected to fall by a further three percent in real terms in 1996/97. Since 1992/93, electricity bills for residential customers have fallen by \$155 million in real terms, whilst average weekly earnings over the same period increased by four percent in real terms.³⁹

Over the same period from 1992/93 to 1995/96, there was an average real reduction of 23 percent in business prices. A further fall of nine percent is expected in 1996/97, which since 1992/93 represents annual savings of \$400 million in real terms to business customers.⁴⁰

In May 1996 the energy Ministers also agreed to the establishment of two corporations, the National Electricity Market Management Company, NEMCO, and the National Electricity Code Administrator, NECA. It became apparent that the operation of the full national electricity market would not start as early as anticipated, and in November 1996 the relevant Ministers from NSW, Victoria and the ACT signed an agreement for the staged introduction of the national electricity market, known as NEM1. Trading through this system began in early May 1997. In NEM1 the Victorian and NSW markets have been linked. However they will continue to be administered separately. Electricity flow between the State Markets is based on competitive bid offers received in both markets. In NSW, TransGrid is responsible for market and system operation, developing rules and codes in consultation

³⁸ Department of Energy, *Retail Competition in Electricity Supply. Information Sheet 10, Future Direction of Retail Prices.*
See Internet site: [http://www.doe.nsw.gov.au/Electricity/infosheet/info sheet.htm#sheet9](http://www.doe.nsw.gov.au/Electricity/infosheet/info%20sheet.htm#sheet9).

³⁹ Independent Pricing and Regulatory Tribunal, *Electricity Prices 1996/97. An information paper.* January 1997, at 1.

⁴⁰ *Ibid*, at 1.

with participants. The Independent Pricing and Regulatory Tribunal (IPART) is responsible for regulating the transmission and access regimes, while the Australian Competition and Consumer Commission (ACCC) authorises the NSW market code. The ACCC is also responsible for administering the *Trade Practices Act*, which all NSW participants are obliged to comply with.

Once the full national market becomes operational, the ACCC will be required to authorise the National Electricity Market Code and be responsible for the regulation of the transmission and distribution network access regimes. Individual States will still be responsible for tariff control for franchise customers and environmental and occupational health and safety regulation.

The National Electricity (NSW) Bill was introduced into the Legislative Council on 14 May 1997, and went through its remaining stages in the Legislative Assembly on 18 June 1997. The Act provides for the establishment of the national electricity code by Ministers of the participating jurisdictions, requires generators, network operators and wholesale customers to register with NEMCO, confers powers upon NECA to enforce the provisions of the code, sets out the proceedings and civil penalties that are permitted in relation to the code; sets out the functions, composition and procedures of the National Electricity Tribunal, which has powers to review decisions of NEMCO and NECA; provides powers to NEMCO to act to ensure the safety and security of the electricity system, and exempts code participants from liability for failure to supply electricity except when that failure is due to bad faith or negligence by the participant.⁴¹

The Minister intends to proclaim the Bill when the national electricity market starts, which is expected to be March 1998. The Electricity Legislation Amendment (Wholesale Electricity Market) Bill was also introduced into Parliament on 14 May 1997, and assented to on 23 June 1997. The Act empowers TransGrid to enter into wholesale market arrangements which provide for joint management of system security. Additionally, some amendments were made to assist in the flexibility of the system to help test the national market during the transition period.⁴²

On 29 May 1997 the government introduced the Snowy Hydro Corporatisation Bill to corporatise and reform the Snowy Mountains Hydro-electric Authority. Complementary legislation is due before the Victorian and Commonwealth Parliaments. However the Bill did not proceed, with debate centering on the need for a public water inquiry to determine environmental and other flows before passage of the Bill rather than after, as the government preferred.

⁴¹ NSWPD, 14 May 1997, p. 8496.

⁴² NSWPD, 14 May 1997, p. 8498.

In May 1997 the Treasurer Michael Egan MLC released the discussion paper "A Plan for a Secure NSW".⁴³ The plan proposed the privatisation of the electricity supply industry to retire State debt and invest in infrastructure development. The government subsequently appointed an Inquiry chaired by Mr Bob Hogg to inquire into the sale of electricity assets. The 'Hogg Report' was publicly released on 28 August 1997, and a summary of the report is presented in section 12 of this paper.

4.0 How the Electricity Market Works - A Summary

Currently the NSW, Victorian and the proposed National Electricity Markets have a similar overall design. The market provides a wholesale energy trading mechanism between generators and retail authorities, or major end use customers. Both spot and contract trading are available with the spot market operating on a half hourly pool price. All electrical energy is traded through the spot market or pool, with contracts only being of a financial instrument form.⁴⁴

The generators determine which of their generating units are to be in service, the quantities of electricity available and their price. Retailers also submit their requirements, all of which must be registered with the market operator⁴⁵ by 10.00am of the working day immediately prior to the day of operation. The market operator takes data on bids, load forecasts and network capabilities and determines the expected load dispatch of generation and controllable loads. The determination of 'presdispatch' by the market operator provides indicative prices, in which the generators are dispatched starting with the cheapest generating units.

For real time dispatch of electricity, the process analyses system capabilities, together with standing data and bids and determines the production levels for generators and controllable loads in real time. At the beginning of each five minute period, an automated estimate of the instantaneous demand is made for the end of the period (ie, five minutes). The resultant plant loadings are checked for system security, and once cleared are loaded electronically into an automatic generation control system. This system controls generators to the scheduled output. The pool price is set in each five minute period by the highest price bid that is dispatched to meet the target load. The highest price generator to be used to meet the load sets the pool price for the period. The half hourly pool price is then determined from the average of the six five minute periods in that half hour.

⁴³ Egan, M. *A Plan for a Secure NSW*. A discussion paper prepared by the Treasurer and Minister for Energy, Michael Egan, MLC for distribution to Pacific Power and Electricity Unions at the Consultative Meeting on May 22 1997.

⁴⁴ Spalding, B. *The Australian Market: Competitive Pool Operations*. See TransGrid Internet site: <http://www.tg.nsw.gov.au/sem/doc/reports/807m/>

⁴⁵ In NSW the market is managed by TransGrid, in Victoria it is managed by the Victorian Power Exchange (VPX) and the national market will be managed by the National Electricity Market Management Company (NEMCO).

The Market Manager operates the accounting or settlement process, in which the Settlements Fund receives all money from consumers for payment to wholesale suppliers of electricity.

5.0 Current Electricity Generation and Distribution Arrangements in NSW

Generation

The main demand centre for electricity in NSW is in the Newcastle/Sydney/Wollongong area where about 80% of the State's electricity is consumed. The system maximum demand occurs in winter and is around 10,600 MW. On 1 March 1996, Pacific Power was divided into three State owned generation businesses. These are Pacific Power, Delta Electricity and Macquarie Generation.

Pacific Power is comprised of four separate but inter-related businesses: domestic and international coal business through Powercoal; domestic and international engineering services through Pacific Power International; Eraring Generation (4X 660 MW), a modern power station on the Central Coast; and an important grouping of alternative sources of energy which encompasses gas, hydro, solar and other forms of renewable generation.

Pacific Power achieved an operating profit result of \$521.8 million in 1995-96, and will make a \$127.8 million income tax equivalent payment and a \$315.7 million dividend payment to the government. Return on assets and return on equity during 1995-96 were 11.3 and 18 percent respectively. Pacific Power funded all capital expenditure internally and reduced its nominal debt from \$2.3 billion in 1994-95 to \$0.5 billion in 1995-96 (\$1.8 billion of debt was transferred to the new generating utilities).⁴⁶ As of 30 June 1996 Pacific Power had 1430 staff.

In March 1996 Delta Electricity commenced business. Delta comprises four power stations: Vales Point (2X 660 MW); Munmorah (2X 300 MW); Wallerawang (2X500 MW); and Mount Piper (2X 660 MW) with a total capacity of 4,240 MW. Mount Piper, the newest coal fired power station in the state, and the recently established Wallerawang, are located in the central West region of NSW near Lithgow. Vales Point and Munmorah power stations are located on the Central Coast. The Corporation produced approximately 30 percent of the NSW electricity supply in 1995-96.⁴⁷ As of 30 June 1996 Delta Electricity had a total staff of 1,248.⁴⁸

Macquarie Generation owns and operates two major coal fired power stations, Bayswater (4X 660 MW) and Liddell (4X 500 MW) located in the Upper Hunter Valley. The two stations have a combined generating capacity of 4640 MW and contribute 32 percent of the State's electricity supply. Macquarie Generation has total assets exceeding \$2 billion and

⁴⁶ NSW Government, *Performance of NSW Government Businesses 1995-96. Microeconomic Reform*, February 1997, p53.

⁴⁷ *Ibid* p54.

⁴⁸ Delta Electricity, *Annual Report 1996*, at 42.

a workforce of 826 employees.⁴⁹

The Snowy Mountains Scheme is owned and operated on a cooperative basis with the Commonwealth and Victorian governments. The scheme has three power stations with an installed capacity of 3370 MW.

Distribution

There are now six electricity distributors across the State. These are: Energy Australia; Integral Energy; North Power; Great Southern Energy; Advance Energy; and Australian Inland Energy. Details of the employment figures of each of the distributors are listed in Table 3.

Distributor	Number of Customers ⁵⁰	Number of Employees ⁵¹
Energy Australia	1.33 million	3,817
Integral Energy	715, 379	2,294
North Power	330,000	1,565
Great Southern Energy	219,512	901
Advance Energy	115,000	539 ⁵²
Australian Inland Energy	18,500	115 ⁵³

Energy Australia was formed by the merger of Sydney Electricity and Orion Energy. It is the largest electricity retailer in Australia supplying nearly half of all NSW customers. Covering an area over 22,000 square kilometres, Energy Australia serves a community of 3 million people, has annual revenue of \$2 billion and assets valued at \$3.5 billion. Energy Australia was constituted as a state owned corporation on 1 March 1996 under *the Energy Services Corporation Act 1995* and the *Electricity Supply Act 1995*.⁵⁴

⁴⁹ NSW Government, *Performance of NSW Government Businesses 1995-96. Microeconomic Reform*, February 1997, p55.

⁵⁰ As of end 30/6/96

⁵¹ As of end 30/6/96

⁵² As of September 1997

⁵³ As of September 1997

⁵⁴ NSW Government, *Performance of NSW Government Businesses 1995-96. Microeconomic Reform*, February 1997, p59.

Integral Energy was established by the merger of Prospect Electricity and Illawarra Electricity on 1 October 1995. Integral Energy serves 1.7 million people, covering 691,000 households and businesses. The Corporation has consolidated assets of \$2.1 billion and expects to generate a revenue of \$1.0 billion in its first full year of operations.⁵⁵

In 1995-96 rural electricity distribution underwent substantial structural change. The number of rural distributors was reduced from 21 to four, achieved through amalgamations. The four corporations were formed in October 1995, and corporatised in March 1996. NorthPower, the largest of the new distributors, covers the north of the State and had 1995-96 electricity sales of \$353 million. NorthPower was formed by the merger of Tenterfield Shire Council (electricity department) and six distribution authorities: Northern Rivers; Oxley; Namoi Valley; New England; Peel Cunningham; and North West.⁵⁶

The second largest of the rural distributors, Great Southern Energy, covers the south of the State. It was formed from the amalgamation of eight distribution authorities; Monaro; Murray River; Murrumbidgee; Northern Riverina; Southern Riverina; Southern Tablelands; South-west Slopes and Tumut River.

Advance Energy was established from the amalgamation of the former Central West Electricity, Ophir Electricity, Southern Mitchell Electricity and Western Power. It distributes and supplies electricity to 115,000 customers over an area of 167,272 square kilometres covering most of the western areas of the State.

Australian Inland Energy was formed from Broken Hill Electricity and parts of Great Southern Energy's franchise areas to deliver energy to the Far West of the State. It has 18,500 customers and a franchise area of 155,100 square kilometres.⁵⁷

TransGrid

TransGrid is the authority responsible for managing the State's high voltage electricity transmission network as well as the State's electricity market. TransGrid is responsible for: operating, controlling and maintaining the State's high voltage transmission network - including the balancing of supply and demand of electricity, coordinating the dispatch of electricity generating units and ensuring reliability and security of supply; coordinating the transmission of electricity between transmission networks; and developing, implementing and administering the State's wholesale electricity market.

TransGrid manages assets of \$2.1 billion. It has a debt of around \$900 million, about 1,265 staff and an annual turnover of nearly \$400 million. TransGrid achieved a pre tax operating profit of \$95.7 million for the year 1995-96, representing a rate of return on assets of 9.2

⁵⁵ *Ibid* p77.

⁵⁶ *Ibid* p109.

⁵⁷ *Ibid* p 109.

percent.⁵⁸

6.0 How Much is the NSW Electricity Supply Industry Worth - A Summary

There is considerable debate and speculation in the community and government on the sale value of the NSW electricity assets. As will be noted later in the paper, Victoria has raised \$19.1 billion so far on the sale of five distribution companies and four electricity generators. The NSW electricity market is about 50% larger than Victoria's, and has a faster growth rate. On this basis, some commentators suggest that the NSW power industry should be worth anything from 30 - 60% more than the Victorian sales have realised.⁵⁹ Some commentators suggest that the generating assets could be sold for \$8 billion, the distribution companies for \$13 billion, and TransGrid for \$3 billion, a total of \$25 billion.⁶⁰

Treasurer Egan suggests that the sale of the industry could realise at least \$22 billion. However, since these figures have been put forward, in early August 1997 the Commonwealth government changed depreciation arrangements, which threaten to reduce the value of State infrastructure sales by billions of dollars. Under present tax law, assets can be isolated from tax-exempt entities being sold and the buyers allowed to use depreciation on the basis of the cost of acquisition, rather than the lower written down book value of the asset, on the day of acquisition. This high depreciation allowance, together with interest costs, has the effect of sharply reducing or eliminating company tax for many years, even though the cash flow of the asset is strong. The result is that the asset is more attractive to buy and can command a higher sale price. The changes as put forward by Federal Treasurer Costello closes this loophole by reducing depreciation charges. The result could reduce the value of electricity assets by around \$1 billion, or possibly more.⁶¹ Advisors to the Hogg Committee, Deutsche Morgan Grenfell, conservatively estimate the value of the six distributors, three generators and the transmission businesses to be \$22 billion, but consider \$25 billion to be a more realistic estimate.⁶²

⁵⁸ *Ibid* p 149.

⁵⁹ "Sitting on power bonanza" in *The Australian Financial Review*, 30 May 1997.

⁶⁰ "Up for sale" in *The Sydney Morning Herald*, 31 May 1997.

⁶¹ "Billions at risk in State tax switch." in *The Australian Financial Review*, 5 August 1997.

⁶² NSW Government, *Report of the Committee of Inquiry into Sale of the NSW Electricity Assets*. Chaired by Mr Bob Hogg, August 1997 at 67.

7.0 An Economic Review of Utilities, Regulation and Privatisation

This section provides a very brief review of the economic aspects of utilities and their relationship with the wider community. Many text books have been written on this subject alone and the footnotes attached and the reading list in Appendix 2 provide reading for those who wish to delve into this area in more detail.⁶³

The preceding section on the history of the electricity supply industry in Australia noted that the State took over responsibility for electricity generation and transmission in the 1950's. The underlying concept of nationalised development of utilities like electricity generation and distribution lie in the theory of natural monopoly. A natural monopoly occurs when in the supply of a good, the operating costs and prices to a consumer would be greater if competition were permitted. It is also said that utility firms cannot compete because they are monopolistic by nature. That is, even if firms were allowed to compete, only one firm would survive because operating conditions would permit one firm to drive the other(s) out of business.⁶⁴ However, the issue of what part of the electricity supply industry conforms to a natural monopoly is in dispute.

A major challenge facing society is determining the most efficient method of controlling a natural monopoly. This may include government ownership and direct control, indirect government control through regulation, and competition. One of the major economic forces of the 1980's and 1990's is the reform of public utilities through competition, as spearheaded by the Hilmer Report. Where competition is not feasible, or competitive enough, then government regulation is required. The next section discusses the regulation of monopolies.

7.1 Monopoly Regulation and Price Setting⁶⁵

The study of economics suggests that every product sold has an optimum price. Optimum in terms of the greatest economic advantage to the seller and buyer, and hence the economy as a whole. To achieve the optimum price for a good, in the absence of any offsetting effects, the optimal price is set equal to the short run marginal cost (SRMC) of production of the last unit sold. The SRMC of production is the extra cost associated with a one unit increase in output. The determination of the most economically efficient or optimal price (ie, SRMC) of a good can be left to the market where there are a large number of both sellers and buyers. However, in a monopolistic market or in a market with a small number

⁶³ See for example:
King,S. & Maddock,R. *Unlocking the Infrastructure. The reform of public utilities in Australia.* Allen and Unwin, 1996, especially chapter 4 and 5.
Roberts,J *et al. Privatising Electricity. The Politics of Power.* Belhaven Press, London, 1991, especially chapter 1.

⁶⁴ Primeaux,W. "Electricity supply: an end to natural monopoly." in Veljanovski,C (Ed) *Privatisation and Competition. A market prospectus.* Institute of Economic Affairs, 1989, at 129.

⁶⁵ This section is largely drawn from: King,S. & Maddock,R. *Unlocking the Infrastructure. The reform of public utilities in Australia.* Allen and Unwin, 1996.

of sellers, optimum pricing is unlikely to arise. For a government owned monopoly, it is thought that prices are likely to be set to obligations imposed by the government and to reflect the interest of the public sector manager. If the monopoly is privately owned, price will generally be set above SRMC.

Firms may achieve monopoly status through their own efficiency, eliminating any competition, or by government mandate where a natural monopoly occurs. If competition raises total production costs in a natural monopoly situation, then direct government regulation of the monopoly is likely to produce the most feasible social optimum price and level of production.

Regulation of a monopoly is fraught with difficulty. Whilst a government may decree that the price of a good from either a public or private monopoly should be set at SRMC, the regulator will never be able to determine what that level actually is. The regulator will have to rely on cost information from the monopolist, who may not provide or be able to provide this accurately.

The problem of incomplete information may be partially overcome by using alternative sources of information. For example, it may be possible to obtain information about the performance of a similar monopoly in another State or nation. One form of interfirm comparison is known as 'yardstick' competition. The monopoly price is set by direct comparison with those of a similar but separate monopoly. The key criterion to make this work is that the costs of one firm provide some extra information about the achievable costs of the other firms. In essence, firms are compared against each other to identify more efficient production practices.

Because of the difficulties of identifying and quantifying the right information about monopolies, and the associated costs of making the wrong decisions, many policy makers prefer to rely on the markets rather than the regulators to solve such problems. However, there have been two main methods of price regulation that try to minimise the problems caused by lack of information. These are the rate of return (ROR) and the price capping method.

The rate of return method tries to establish a uniform price regime for a monopolist that is both fair to consumers and the producer. Rate of return does not set prices, instead it allows the monopolist to set their own price subject to a regulatory constraint on production costs. ROR is widely used in the United States, where most providers of utilities are private firms seeking profits. ROR sets a maximum on those profits.

Under ROR, the regulator sets an allowable rate of return that the monopolist can earn on its capital stock. If the monopolist earns more than this regulated level then it must respond by lowering profits. The regulator would generally like the monopolist to increase production and lower price, benefitting consumers. However, the monopolist could also increase its capital base, but this is less optimal as it may result in inefficient production.

Price cap regulation was pioneered in the United Kingdom and is now a widely used alternative to ROR. Price cap regulation is applied through two slightly different mechanisms. In the UK it is referred to as RPI-X, and in Australia it is known as CPI-X. Regulation involves limiting any price rises by the monopolist to a fixed level below inflation. This level, indicated by the X, is determined for say a five year period. With the fixed price cap method, the monopolist can retain any profits. As will be explained in the section on the United Kingdom, this has created some difficulties in the face of massive profit increases for the newly privatised electric utilities.

Whilst the implementation of either ROR or the price cap method may result in similar problems, King and Maddock consider that the proper implementation of a price cap represents a major advance compared to cost regulation models.

There may also be other problems in forcing a monopolist to price their goods at SRMC. This is particularly so where doing so will lead to a loss for the monopolist. This situation is most likely to arise in technologies which have a very large upfront cost, while the marginal cost of producing one more extra unit is relatively low. Electricity cable networks are one example. In these types of industries, the monopolist faces decreasing average production costs over all levels of output. In this situation, SRMC always lies below average cost. As a result, setting the price equal to SRMC ensures that average revenue never exceeds average cost and the producer will always operate at a loss. Production in these types of industries requires large infrastructure costs prior to any customers being served, and marginal costs are very low as long as the system is not operating at capacity. In this case, the government can only enforce SRMC pricing if it compensates the monopolist for this loss by making a direct payment to the firm out of other government revenues. If such compensation is impractical (either politically or fiscally) then SRMC pricing is unachievable, and the monopolist will have to price their good above SRMC.

From this very brief review it is apparent that an unregulated monopolist will abuse their market position to the detriment of the economic efficiency of the economy as a whole. As well, it is unlikely that government regulation will be able to make a monopolist 'efficient'. It is with this background that Hilmer and the promotion of competition has arisen. It is thought that one of the best ways to regulate a monopoly is with competition. Where a monopoly exists, the source of the monopoly needs to be identified. This may involve an artificial monopoly by government restrictions, which should be removed to create competition. If a natural monopoly occurs, perhaps at a point in production, then that area of the market should be isolated and regulated. Competition should be allowed to flourish in all other parts of the production process. To achieve this, equal access to the services of the natural monopoly is crucial to the advancement of competition.

In the case of the electricity supply industry, it is apparent that TransGrid and the lines business of the distributors enjoy a natural monopoly. Competition is possible between generators and distributors/retailers, but less suitable for the major power line holder. Components of the electricity supply industry are open to competition. Individual generating units, from a diverse range of fuel or renewable energy sources, can compete with each other in an open market. Likewise, electricity retailers can compete for customers

across the State and nation. It appears to be the power line business itself which has the characteristics of a natural monopoly. For competition to flourish, equal access to the electricity distribution facilities is essential.

8.0 The International Experience of Electricity Supply Industry Privatisation

“A worldwide revolution in the power industry is underway, away from government ownership to investor control...” writes one commentator from the United States.⁶⁶ Many countries are in the process of privatising their ESI, including developed, developing, and post-communist countries. In 1995, electric power led all other industries in terms of asset privatisation valued at US\$12.9 billion. Table 4 shows the value of completed power privatisations from 1988-95 around the world.⁶⁷ Particularly active in the seven year period were South American countries, Europe (notably the UK) and to a lesser extent Australia (ie, Victoria).

Since 1995, there has been considerable merger and acquisition activity worldwide in the energy industry, with most of the big deals involving the electricity sector. In 1995, only three of the 16 transactions valued at over US\$1 billion did not involve an electric utility and 32 of the top 50 mergers and acquisitions were power related. In 1996, 11 of the 13 deals valued at over US\$1 billion involved electricity companies and at least half of the top 50 involved electricity utilities. Electricity assets in the UK, Australia and South America are the most in demand.⁶⁸

Table 4: Completed Power Privatisation 1988-95 (millions of US\$)	
Argentina	4,653
Australia	4,276
Austria	400
Belize	14
Bolivia	212
Brazil	1,196
Canada	654

⁶⁶ Houston, D. “Worldwide power privatisation” in *Electric Perspectives*, July/August 1996, at 34.

⁶⁷ *Ibid* at 34.

⁶⁸ Bamber, D. “Power still hogs the M&A limelight.” in *Petroleum Economist*, December 1996, at 38.

Table 4: Completed Power Privatisation 1988-95 (millions of US\$)	
Chile	217
China	987
Czechoslovakia	173
Germany (East)	6,607
Germany (West)	1,350
Grenada	6
Honduras	11
Hungary	1,248
Malaysia	1,474
Peru	913
Philippines	98
Poland	2
Spain	1,300
Thailand	200
Trinidad/Tobago	112
Turkey	114
United Kingdom	13,516
Total	39,733

Power utilities from the United States have been one of the most active in terms of acquisitions abroad from their home country. This has been due to domestic capital spending by most US utilities declining due to existing adequate capacity, resulting in plenty of cash reserves for foreign acquisitions.⁶⁹ The 'privatisation drive' around the world and need for new generation capacity in developing countries has assisted these expansion ambitions. It has been reported that of special interest to US power utilities are the power distributors of New South Wales:

⁶⁹ Byrne, H. "Power Plays. In search of higher returns, more US electric utilities are venturing abroad." in *Barron's*, January 29, 1996, at 18.

...with US companies hoping to cash in nicely on investments there and elsewhere in Australia including PacificCorp; Entergy; Utilicorp United; General Public Utilities; and Texas Utilities....While competition exists in the Australian retail market, it's not as daunting as the vicious turf wars that may emerge as deregulation advances in the United States. Best of all, there's plenty of room to improve results at the Australian facilities, which apparently were run with little concern for profitability when the government owned them....An analysis by Prudential Securities predicted that all of the American utilities that had bought Australian properties would enjoy 'significant' earnings benefits from their purchases within five years.⁷⁰

Other countries of interest to US power utilities include India, China, Indonesia, Phillipines, Turkey, Italy and Spain. Each country has different reasons for pursuing the privatisation of their ESI, however lessons can be learnt from each. This paper concentrates on two countries, the United Kingdom and New Zealand for a detailed analysis of their ESI restructuring programs. The UK was chosen because it has led the world in electricity privatisation, and New Zealand was chosen because it began the restructuring path towards privatisation, but for various reasons has yet to complete it.

8.1 Privatisation of Electricity in the United Kingdom

The restructure of the ESI in the UK has been one of the most prominent in debates about energy policy over recent years. The privatisation of the ESI in the UK has been described as one of the most complex industrial reorganisation ever undertaken in the western world. The entire restructuring and privatisation took four years and cost close to US \$1 billion.⁷¹ The UK electricity supply industry had been in public ownership since 1948. In England and Wales, the Central Electricity Generating Board (CEGB) was responsible for generation and transmission. It sold electricity to 12 Area Boards under the terms of a bulk supply tariff, based upon marginal costs. The Area Boards were responsible for distribution and selling electricity to customers. The industry believed itself to be relatively efficient in terms of its operating costs, although it acknowledged that its record in building power stations to time and budget was poor, and that past over-investment meant that it had too much capacity.⁷²

A variety of English White Papers set the scene for the ESI privatisation, and in July 1989 the *Electricity Act 1989* divided up the CEGB. Transmission was separated from generation, with the transmission company jointly owned by the Area Boards. Two generating companies were to be formed, National Power which would own 70% of the CEGB's capacity, including all the nuclear power stations, and PowerGen which would own 30%, all fossil fuel based. National Power was designed to be bigger to absorb the

⁷⁰ *Ibid* at 17.

⁷¹ Henney,A. "Challenging the Status Quo: Privatising electricity in England and Wales" in *Fortnightly*, Vol 132, July 15 1994, at 26.

⁷² Green,R. "Reform of the Electricity Supply Industry in the UK" in *The Journal of Energy Literature*, Vol II, No 1, June 1996, at 3.

risks of the nuclear power stations, whilst PowerGen was to help aid competition.⁷³

The White Papers firstly assumed that competition in generation would have to be based upon long-term contracts. However, the attempt to build a system based on this approach failed, and competition was premised around a spot market, known as the Pool, with daily bidding and half hourly prices for electricity. Long term contracts could also be used to hedge these prices, but the Pool was the centrepiece of the system. As the Pool system was being developed, the Government announced that competition would begin in stages. Consumers with a minimum demand of 1 MW (about 5000) could choose their supplier from the start, and from 1 April 1994 those with a minimum demand of over 100 kW (about 50,000) could choose their supplier. These two groups comprised around 50 % of the market. From 1998, smaller consumers can choose their preferred supplier, creating a market of 22 million customers.⁷⁴

Towards the launch of the restructuring on 31 March 1990, revelations on the cost of the nuclear power stations were revealed, and the nuclear power stations were withdrawn from privatisation and placed in Nuclear Electric, a state owned company. There was no longer any justification for National Power's size, but it was too late to do anything about it.

The United Kingdom ESI underwent enormous change in the 15 months following the launch of the restructuring of the industry on 31 March 1990. Twelve Regional Electricity Companies (formerly the Area Boards) which jointly owned the National Grid Company were sold in November 1990, sixty percent of the shares in National Power and PowerGen were sold in March 1991, with the balance sold in February 1995, and the two vertically integrated companies in Scotland were sold in June 1991. The smaller industry in Northern Ireland was restructured in 1992, and its piecemeal privatisation followed.⁷⁵

Competition in the Generation of Electricity in the United Kingdom

Competition in the generation sector is based around the bulk electricity supply market, which was set up as a spot market (although more accurately it is called a 'day ahead' market) for the despatch and pricing of electricity.⁷⁶ Generators submit a set of prices for each of their generating sets, together with technical information on the set's availability for the following day. A computer program draws up the least cost schedule which is capable of meeting the forecast demand, based on the bids rather than the companies' true costs. In each half hour, the bid of the most expensive set in normal operation is used to calculate the System Marginal Price (SMP). It is the System Marginal Price which is paid for every unit a producer is scheduled to generate. In addition, a capacity element is also paid based on each unit of capacity declared available to generate, whether or not it is called upon.

⁷³ *Ibid* at 4.

⁷⁴ Henney, A. *op cit* at 27.

⁷⁵ Green, R. *op cit* at 3.

⁷⁶ Newberry, D.M. "Power Markets and Market Power" in *The Energy Journal*, Vol 16, No 3, 1995, at 43.

Pool prices vary significantly over the course of a day, week and from month to month.

The generation market underwent significant changes with the introduction of new gas fired turbines, which could produce modest amounts of electricity (300 - 600 MW) and relatively short construction times of two to three years. The new turbines were competitive against the older less efficient coal fired power stations, which suffered from high coal prices and tightening environmental restrictions. The new stations, known in the industry as 'Independent Power Producers' (IPP) convinced the Regional Electricity Companies to sign 15 year contracts for the sale of base load electricity. This meant that the IPPs could negotiate 15 year gas supply contracts, and finance construction relatively cheaply due to the low risk as both sales and fuel supply prices were locked in. So attractive was this package that within months contracts for 10 GW of gas turbine plant were signed, displacing about 25 million tonnes of coal.⁷⁷

The rise in gas turbine production was the catalyst that led to the collapse of the British coal market, and the closure of more than half of the remaining mining pits. In the end, British Coal was privatised in December 1994.⁷⁸

The Regulation of the UK Electricity Market

The UK electricity supply industry is regulated by an independent agency called The Office of Electricity Regulation (Offer). It became evident to Offer that the two main generators between them set the Pool price over 90% of the time. Offer negotiated a price-cap on pool prices for the two financial years 1994-95 and 1995-96, and the main generators agreed to divest some of their generating power. It was hoped that the price cap would restrain the exercise of market power by National Power and PowerGen until the divested plant was in the hands of competitors who would increase competition in the pool price market.⁷⁹

Ed Wallis, the CEO of PowerGen, described the changes after privatisation:

Whereas the CEBG has been risk averse, PowerGen needed to be innovative. Whereas the CEBG had been engineering led, PowerGen needed to be commercially driven. Whereas the CEBG had no concept of 'the customer', the customer needed to be PowerGen's main focus. And whereas the CEBG had been slow moving and bureaucratic, PowerGen needed to be flexible and responsive.⁸⁰

From privatisation to 1995, PowerGen more than halved staff numbers to 3700, removed restrictive work practices and added flexibility to working arrangements, made business

⁷⁷ *Ibid* at 52.

⁷⁸ Green, R. *op cit* at 17.

⁷⁹ Newberry, D.M. *op cit* at 59.

⁸⁰ Wallis, E. "Managing Privatisation at PowerGen." in *Long Range Planning*, Vol 28, No. 6, 1995 at 12.

units work on the basis of management by profit and loss account, diversified its fuel sources and improved the technical performance of power plants. In the five years from 1990/91, PowerGen's profit before tax has increased by 100%, earnings per share by 116% and dividends by 80%.⁸¹

The Office of Electricity Regulation is also responsible for regulating the 12 Regional Electric Companies (REC), which distribute and retail electricity. On 1 April 1990, Offer also implemented a price cap mechanism for regulating the country's 12 RECs. A REC was permitted to increase electricity prices at a rate of RPI-X +Y. RPI is a measure of general inflation, X represents a productivity offset and Y represents adjustments for costs deemed to be outside REC control.⁸²

However, there has been strong criticism of the profits the RECs made since privatisation. The REC shares were sold at 240p each, giving a total market capitalisation of £5.18 billion. The share sale was on average 10.7 times oversubscribed, with 54.6% of the offering allocated to UK retail investors and REC employees and pensioners. The RECs were priced on a dividend yield of about 8%, which at that time was about 2 % more than the average market yield. This premium was considered justified given the risk of an unclear regulatory environment.⁸³

However, what neither the government nor market analysts counted on was the fast cost cutting programs the RECs were capable of achieving, and the regulatory regime which allowed them to amass vast profits. During the first full financial year following privatisation, the REC Norweb recorded pre-tax profits growth of 123%, Manweb 78% and Southern Electric 58%. After the first price review in 1994, the regulator announced the first review of price controls. From April 1995, the RECs would have to make price reductions between 11 and 17%. Subsequently, they would have to make real price reductions of 2% per year until the year 2000. In March 1995, the regulator announced a revision to the price review, providing for a further £1.25 billion price cuts between 1996 and 2000. The value of the RECs was still strong. By the end of 1995, five years after privatisation, six of the RECs had new owners, and the value of the RECs was close to £20 billion. The original share issue price of 240p subsequently became an 'embarrassment' to the government.⁸⁴

⁸¹ *Ibid* at 18.

⁸² Einhorn, M. "Regulation of Regional Electric Companies in the British Electricity Experiment." in Einhorn, M. (Ed) *From Regulation to Competition: New Frontiers in Electricity Markets*. Kluwer Academic Publishers, 1994, p. 116.

⁸³ Edwards, B. "How the analysts got their sums wrong." in *Euromoney*, November 1995, at 58.

⁸⁴ *Ibid* at 59.

The UK and Renewable Energy Sources

Under the privatisation reforms the new Regional Electricity Companies are obliged to make power purchase contracts, at levels set by the Secretary of State for Energy, with suppliers of non fossil fuel generated electricity. The additional cost (over and above the nominal cost of fossil fuel price) being made up via a levy on fossil fuel generation.⁸⁵ This scheme is known as the non fossil fuel obligation (NFFO).

Several factors mitigated against the scheme to promote environmentally friendly electricity from renewable sources. Initially, the concept of a NFFO was put forward to support nuclear power. However, in a bid to make this proposal more popular, in 1989 a 600 MW renewable quota (non-nuclear) was set aside within the NFFO to be filled in stages by the year 2000. Nuclear energy sources enjoyed a quota of 8.5 GW. To receive support from the NFFO, companies needed to apply to the Department of Energy which selected which renewable energy proposals were to be funded with the NFFO. The major criteria was that the project could produce electricity at no more than 6p/KWh.⁸⁶

The NFFO ran into trouble from the start. The European Commission, fearing that the NFFO was merely a subsidy for nuclear power, immediately opposed the levy and considered it to be in conflict with the EC's 'fair competition' policies. The compromise was that the NFFO would last for 8 years, ending in 1998. This brings it into immediate conflict with the development of renewable energy technology.

The economics of renewables are very sensitive to the rates of return expected and the period over which the supply contract runs. Given that there are no fuel costs, merely high initial capital expenditure and operations maintenance, the longer the contract runs the better the economic return. Whilst many of the initial applications for NFFO support from renewable energy companies priced themselves over 20 year contracts, the eight year NFFO term and the requirement by many REC's who wanted shorter term contracts with greater flexibility worked against many of the renewable energy applicants.⁸⁷ In 1989, the Department of Energy received applications for NFFO support for 1,236 MW worth of renewable energy. In the end, 75 contracts worth 170 MW were awarded, the bulk of them (128 MW) being biofuel/waste projects, including 25 landfill gas schemes. Five wind farms (25 MW) survived the application process. For the 1991 applications round, the Secretary of State for Energy introduced sub-quotas for each renewable power source. For example, out of total of 200-250 MW quotas of 25-50 MW for wind, 5 - 10 MW for hydro, 30 - 60 for landfill gas, 50-100 MW for municipal and waste incineration and 15-30 MW for sewage gas were established. This at least ensured that each form of renewable energy supplies were given the opportunity to develop.

⁸⁵ Elliot,D., "Renewables and privatisation of the UK ESI" in *Energy Policy*, Vol 20, No 3, March 1992 at 258.

⁸⁶ *Ibid* at 258.

⁸⁷ *Ibid* at 259.

It is apparent that at each stage of the privatisation process, competition in the ESI for renewable (non-nuclear) energy supplies had to be watered down, with protected quotas, ring fences and cross-subsidies, all applied in an ad hoc way. Many commentators have called for an end to this piecemeal interventionist technique to be replaced with a renewable industry strategy.⁸⁸

Much of the literature suggests that privatisation of the ESI in the UK has blocked, as much as stimulated, the strategic development of renewable energy supplies. This has certainly been for those more 'experimental or sunrise' renewable energy sectors such as wind power. Other forms of support apart from the NFFO subsidy have also been called for, including one off development grants for 'research and development', to small scale grant schemes providing appropriate types of financial support for the various phases in the move from 'research' to full scale commercial success.⁸⁹ However, the biggest deterrent to the development of the renewables energy sector was the limitation of the NFFO to last only until 1998. Nuclear energy, kept as a public company, would always benefit from government cross subsidies, especially in relation to decommissioning of power plant costs and waste disposal, whilst non-nuclear renewable sources would not enjoy this level of public sector support.

The long term nature of renewable energy supply development does not fit nicely in the current market, where short term price and market factors influence energy development policy. Above all, it is apparent that an economy must have a broad scale energy generation policy for renewable energy supplies to survive. A commitment to a diversified energy generation industry as part of this policy is essential.

The United Kingdom Experience - Conclusion

The UK ESI privatisation 'experiment' has provided the world with a good case study, and is sometimes referred to as the 'UK model' of privatisation. There are many lessons to be learnt from their experience. One of the biggest criticisms of the process was only dividing the main coal fired power stations into two separate entities - National Power and PowerGen, hence creating significant market power for the two corporations. The massive profit rises of the newly privatised utilities, the widescale shedding of labour and the large pay rises for the new company executives have contributed to much of the 'distrust' of the privatisation process. Indeed, it has been written about the UK: "one country now stands virtually alone as the place where privatisation is ... not popular with politicians or voters."⁹⁰ However, as Burton recognises, the distrust of the privatisation process has not extended to those government enterprises that were privatised in a competitive setting, eg British

⁸⁸ Roberts, J *et al*, *Privatising Electricity. The Politics of Power*. Belhaven Press, London, 1991, p. 155.

⁸⁹ Elliot, D. *op cit* at 264.

⁹⁰ In the *Economist*, 1995, as cited in Burton, J. "The competitive order or ordered competition?: the UK model of utility regulation in theory and practice." in *Public Administration*, Vol 75 No 2, 1997, at 158.

Airways.⁹¹ The key is to first restructure the market into a competitive environment, and then privatise the industry if desired.

Fraser suggests the following lessons are pertinent for Australia following the UK experience:

- Merger and takeover integration in the same industry should be viewed with greater caution than proposals for horizontal integration of regional companies across industries.
- Proposals for vertical integration in the same industry should be viewed with greater caution than proposals for horizontal integration of regional companies across industries.
- Because of negative consumer perception of profit levels among privatised companies, the role of profits should be explicitly acknowledged in the regulatory process.
- The potential for resolving consumer company conflict over profit levels by the inclusion of a profit sharing element in the regulatory constraint should be considered.
- In the absence of any regulatory control over quality of service, cost cutting activities by privatised companies will feature a mixture of genuine cost efficiencies and reduction in the quality of service.
- In situations where competition cannot be used to protect consumer interests, the regulatory constraint on a privatised company with monopoly power should include a quality of service component.⁹²

⁹¹ Burton, J. "The competitive order or ordered competition?: the UK model of utility regulation in theory and practice." in *Public Administration*, Vol 75 No 2, 1997, at 158.

⁹² Fraser, R. "Privatisation in the United Kingdom: Lessons for Australia." in *Economic Papers*, Vol 15, No 4, December 1996, at 18.

8.2 The New Zealand Experience⁹³

The development of the ESI in New Zealand has until recently featured the government developing hydro-electric power sources to aid national development. Culy *et al* have described the characteristics of the New Zealand ESI into the following three distinct phases:⁹⁴

- the Departmental Phase (1945 - 1978). Electricity was supplied by a separate government department initially called the State Hydro-Electric Department and later renamed the New Zealand Electricity Department (NZED).
- the Integrated Ministry Phase (1978 - 1987). In this period the NZED became the Electricity Division (NZE) of the Ministry of Energy, and electricity planning and pricing formed part of an integrated energy plan.
- The Corporatisation Phase (1987 - present). In this period the NZE became the Electricity Corporation of New Zealand (ECNZ), a State Owned Enterprise (SOE) which was expected to act in a normal commercial manner.

During the departmental phase, virtually all investment and pricing decisions in regard to electricity generation and supply were made by Cabinet committees on the basis of advice from relevant government departments. The NZED served a very few large scale users, whilst all other consumers were served by Electricity Supply Authorities (ESAs). Major urban ESAs were often owned by local authorities, who were significant customers in their own right. In 1945 there were 94 ESAs, and by 1991 restructuring attempts had only reduced this number to 55.

The basic thrust of government policy during this period was to develop resources and get power to the people at the lowest possible price. Whilst the ESAs controlled their own expenses and set a wide variety of tariffs, they were controlled by the requirement to make no profits. In general terms, there has been a cross subsidy from business consumers to domestic consumers, and a cross subsidy between the urban consumer and the rural consumer. In 1959, nearly two-thirds of supply authorities charged domestic consumers less than the actual average cost of their consumption.

Toward the end of the Departmental phase, there was widespread public criticism of the over forecasting, overbuilding and overruns that seemed to characterise power planning at that time. Hydro schemes began to be seen as having a negative impact on the environment, and the concept of electricity as a scarce resource became popular within the notion of a

⁹³ Unless otherwise indicated, the information for this section is from: Culy, J *et al* "The evolution of New Zealand's electricity supply structure." in Gilbert, R & Kahn, E. (Eds) *International Comparisons of Electricity Regulation*. Cambridge University Press, 1996.

⁹⁴ *Ibid*, p.317.

need for a national integrated energy plan. Hence the formation of the Ministry of Energy and the beginning of the next period.

The Ministry of Energy Phase (1978-87)

By the 1970's, the New Zealand government had extensive direct interests in the energy sector that were administered through separate departments. The Electricity Department not only produced almost all of the electricity, but also controlled most of its inputs, including water, geothermal sources, coal, gas, oil and power station construction under State control. The government also exercised much influence through direction negotiation with major industries, intervention in crisis situations, manipulation of demand through price controls, subsidies and taxes.

However, coordination of all these actions under separate departments was difficult, and in 1978 the Ministry of Energy (MOE) was formed. The Ministry undertook the development of Energy Plans to provide for the management of at least the state owned elements of the sector. However, the distribution sector was not really affected by the formation of the MOE, and a few industry rationalisations continued to occur.

The main objective of the MOE was to eliminate 'wasteful' competition between State energy sectors. Electricity and gas were heading to meet the same demand, creating surplus capacity in both sectors. However, the total energy market was still in some disarray, with much of the confusion attributed to the diversity of objectives promoted by political interests. For instance, at time of excess electricity capacity the MOE was using construction to boost employment, while promoting conservation to satisfy environmentalists.

The Electricity Corporation Phase (1987-present)

The election of the new Labor Government led to the widescale reform of the New Zealand economy. The efficiency of almost every sphere of the economy was examined, with special attention paid to government owned enterprises. It was believed that traditional bureaucratic structures inhibited the efficient allocation of resources, and that far reaching structural changes, including the commercialisation and possible privatisation of government enterprises was required.

In 1987 the Electricity Division of the Ministry of Energy was restructured as the Electricity Corporation of New Zealand (ECNZ), a limited liability company with no statutory responsibility to supply. In an attempt to create a competitive market, controls on entry into generation and wholesaling of electricity were removed. As a State Owned Enterprise (SOE), the ECNZ was expected to make a commercial return on its assets, and the government distanced itself from the running of the business. The ECNZ conducted several reviews of its operations, one result being the reduction of staff numbers from 6,000 in 1987 to fewer than 3,200 in 1992.

Under the reign of the Ministry of Energy, the Electricity Department developed its own fuel supply for its power stations. With the formation of the ECNZ, this policy was reversed, and the ECNZ had to negotiate new and fully commercial fuel supply contracts.

The result was largely lower fuel prices, especially lower coal prices at reduced quantities.

The ECNZ was separated from the long distance transmission business, known as Trans Power which is also a SOE. This was done to ensure that new generation entrants did not have to deal with ECNZ to ensure access to transmission lines. However, to date there has been no new generators enter the market, mainly due to the present surplus capacity and even though ECNZ is pricing electricity above short run marginal costs, this is still below entry costs.

ECNZ is not subject to any electricity sector specific regulation, apart from supply standards and safety regulations. However, it is subject to the *Commerce Act 1986*, which prohibits anti-competitive behaviour or abuse of a dominant position and provides for the possibility of price control. Since corporatisation, there has been considerable effort towards reducing costs and increasing the efficiency of generation plants. The improvements from 1987 to 1992 include the following:

- wholesale prices have been reduced by 8% in real terms
- unit operating costs (excluding fuel and capital related costs) have been reduced by 13% in real terms
- sales volume has increased by 2.6% per annum
- profits have increased from \$262 million to over \$400 million
- average plant availability increased from 73 to 91% for thermal, and from 87 to 95% for hydro
- the number of employees was reduced by about 47% from 6000 to around 3,150
- productivity as measured by GWh/employee almost doubled from 4.5 to 8.5 GWh/employee.

Whilst it is stated that these figures should be treated with some caution, it does provide some indication of the improvements made since corporatisation.

ECNZ has been heavily criticised on its vastly improved profitability, even though that profit is largely paid back into State revenue. Criticisms include that it is somehow 'wrong' for an organisation to make a profit out of selling an essential service, or that it is wrong for an organisation to make profits out of assets that the people have already paid for. Other criticisms relate to the 'commercially realistic' remuneration packages for senior management, the ECNZ's promotion of consumption, the narrowness of its objectives, and the way in which formerly public data are now treated as commercially sensitive and not released.

In principle, ECNZ is now free from political interference. However, Culy notes that due to increasing public criticism as noted above, it is apparent that the threat of substantial political intervention is growing, and that ECNZ is having to take action to comply with the government's wishes in order to avoid formal intervention.⁹⁵ Culy concludes from this that the SOE model, which has achieved impressive results to date, is not a sustainable model

⁹⁵ *Ibid* at 355.

in the long run. It appears unlikely that senior management will continue to pursue profitability aggressively in such a climate, and it is possible that the prospects of continuing to attract high calibre management from the private sector is poor as long as the job involves intense public criticism and the prospect of political interference.

About two years ago ECNZ was split into two companies, with the separated company, Contact Energy, controlling the gas fired power stations. The aim of this division was to help create a competitive generation market. However, the old and inefficient plant that Contact Energy inherited has resulted in relatively poor returns to the government. Contact Energy has invested in new gas fired generating capacity which is expected to come on line in 1998, replacing some of the smaller inefficient gas fired power stations currently in use.

Distribution Sector Reforms

During the period of reform of the NZEC, the Electricity Supply Authorities still provided electricity to end consumers. The *Empowering Act 1987* enabled the Authorities to adopt corporate structures, with appointed Directors replacing elected members. The aim was to give the ESAs a much greater commercial focus, and it was clear that reforms in the distribution industry would continue.

The *Energy Sector Reform Act* in 1992 corporatised supply authorities and removed franchised areas, starting with small customers in 1993 and extending to all in 1994. The government looked at various ways to sell and privatise the ESAs. Share sales were strongly resisted on the grounds that, if they were sold to consumers, they would be paying again for the assets they have already paid for, and, if not, the government would be selling the people's assets. A proposal to give away shares to consumers (about \$1,400 worth per household) also met with opposition, on the basis that most people were likely to sell them and ownership would be concentrated in the hands of a few. With the government unable to convince members of the public on any selling proposal, community trusts were established for each ESA, and these trusts, in conjunction with the existing commercial directors and the Ministry of Energy decided the future ownership structure of their respective ESA. Many are still owned by local authorities, but privatisation, either through share giveaways or sales has occurred in about 50% of ESA sales. Several energy companies are now listed on the stock exchange, and others allow trading through their own share registries.

The Current Status of the Reform Process

With the initial reforms starting in 1986, it was widely expected that SOEs would ultimately become privatised, the rationale to improve incentives for efficiency and reduce public sector debt. The initial push for full privatisation seems to have waned, and it is generally accepted that those who support continued reform have gradually lost power to those who favour a more traditionalist, pragmatic approach.

There have been three major studies of the ESI since 1989. Culy notes that all have reached broadly similar conclusions in regard to market structures required, but none have proceeded to the point of action. This has been because successive governments have been increasingly reluctant to pursue privatisation, and the various parties within the industry have

found it very difficult to agree on a reform package.

There is considerable debate on the best structure for ECNZ, with some support for it to be broken into a core generating area producing about half the total load, and the balance divided between 2 to 53 smaller groups. However, commentators are unsure if the New Zealand economy is large enough to support an unregulated competitive generation market. If competition does not develop, then regulation may be the only option.

Culy notes that it is apparent that the public has strong preferences that constrain the sale of public electricity supply assets. Public distrust of the possibility of facing an unregulated privatised generator with an effective monopoly is evident. The public is also concerned about loss of access or sovereignty over 'their' lakes and rivers.⁹⁶

Privatisation is not expected to provide further improvements in the operational efficiency or coordination of existing plant, but to improve the environment for competitive investment and to prevent an otherwise inevitable regression of the ECNZ to the inefficiencies of its former self. Fears of difficulties arising with coordinating a multitude of generators, or that they may deliberately 'play games' in ways that raise prices, reduce energy efficiency or cause blackouts have also been raised. Studies suggest that this form of behaviour can be expected, but on the other hand long run prices will ultimately be disciplined by entry of new competitors.

Currently the ECNZ is worth NZ\$4.49 billion, Contact Energy NZ\$1.79 billion and TransPower NZ\$2.97 billion. Whilst the new coalition New Zealand government has indicated that it intends to kick start the privatisation program, the coalition agreement prevents the privatisation of the ECNZ, Contact Energy and TransPower.⁹⁷

Conclusions from the New Zealand Experience

It is apparent that the momentum for privatising the ESI in New Zealand has faltered. Public concern with the reform process and possible adverse consequences has been the main cause for this. Whilst competition between generators for large commercial users has reduced the cost of electricity, domestic consumers have seen few benefits. For instance, since the corporatisation of ECNZ one decade ago, the wholesale price of electricity has dropped by 17% (after inflation has been taken into account), yet domestic energy costs have risen by 20% (inflation adjusted).⁹⁸ Domestic price rises have been blamed on the elimination of cross-subsidies from industry.

The Minister for Energy Max Bradford is reported as saying "...competition among the electricity companies for household customers is disappointingly rare."⁹⁹ The report

⁹⁶ *ibid*, p.362.

⁹⁷ "Birch signals privatisation." in The New Zealand Herald, 2 June 1997.

⁹⁸ "Power Plays to threaten hike prices" in The New Zealand Herald, 7 July 1997.

⁹⁹ "NZ sector rejig fails with users." in The Australian, 12 June 1997.

continues that the Minister has warned the electricity industry that unless domestic power customers saw some benefits soon, the Government would be under increasing pressure to end the market reform process. For instance, at the moment most of the power companies are simultaneously in the business of providing the lines network down which the electricity reaches the consumer, and of the buying and selling of electricity itself. The former is a natural monopoly, the latter is open to competition. The companies dual role carries the risk they will cross subsidise the contestable business at the expense of the network's captive users, and so protect it from competition. Whilst regulations attempt to restrict this practice, there is some scepticism at their ability to be able to do this. Bradford is reported as saying "...we may have to face up to formally requiring through legislation that the line and energy business of every power company be split into separate companies with separate managements."¹⁰⁰

9.0 Electricity Reform in Australia

Section 2 of this paper introduced some of the reforms to the electricity supply industry on a national basis and in NSW. This section describes how other Australian States have responded to the challenge of electricity reform. As Victoria has gone further down the road of reform compared to other States, its reforms are described in greater detail.

9.1 Victoria

Of all Australian States Victoria has led the electricity reform process. The government aims to achieve a competitive electricity supply industry by the year 2001, and to do this has established a three stage process. This is as follows:¹⁰¹

Stage 1

This involved the creation of three new State owned businesses responsible for:

- generation
- transmission and system control
- distribution

These businesses became operational in January 1994.

Stage 2

This involved a world wide study of the electricity industry to determine the best operating framework. This led to the creation of the following State owned entities:

- five competitive, independently operating generation companies (three brown coal, one gas and one hydro)
- a transmission company, Power Net Victoria, which owns and maintains the high voltage grid

¹⁰⁰ "Bradford ready to give power companies a jolt." in The New Zealand Herald, 4 July 1997.

¹⁰¹ See internet site:
<http://www.dpie.gov.au/resources.energy/energy/apec/regulators/australia/australia10.html>

- five regionally based distribution businesses (three urban and two regional) which have a defacto monopoly over the distribution systems within their regions; and an initial monopoly of exclusive franchise (to be phased out in accordance with the timetable as outlined below) in respect of electricity services supplied to the franchise customers within their region, but which are free to contest (along with independent retailers) business within each other's regions for non-franchise customers.
- Victorian Power Exchange (VPX)

The Victorian Power Exchange links all electricity supply industry businesses both physically and financially. Physically, VPX is responsible for the secure operation of the main power system, and its financial responsibilities include managing spot trading in the wholesale electricity market. VPX's role includes the following:¹⁰²

- operating and controlling the market for spot trading of electricity
- controlling generation dispatch, and matching available generation to demand
- controlling the security of the main power system
- operating the electricity transmission system
- planning and directing the augmentation of the extra high voltage transmissions system.

Also created during Stage 2 was the Office of the Regulator General. This Office provides independent regulation of the industry where competitive pressures are not sufficiently developed. Key tasks of the Office are to oversee franchise customer tariffs, service standards, Pool rules and operating procedures, transmission and distribution access and pricing and market conduct generally.

A key outcome of Stage 2 was the development of a transitional tariff structure through to the year 2000. The tariffs (regulated by a Government Tariff Order) include maximum uniform retail tariffs for franchise customers which are subject to a CPI-X (productivity trade-off) and maximum network tariffs for transmission use of system and distribution use of system.¹⁰³

Stage 3

Stage 3 has largely involved the privatisation of elements of the industry. By November 1995, the five distribution/retail businesses were sold, the privatisation of the generation business had began (first one sold in March 1996), and the Office had issued licences to independent retailers.

The distribution businesses were keenly sought after, especially by United States companies. The distribution company United Energy was bought by US based UtilityCorp for \$1.55

¹⁰² See internet site:
<http://www.people.interconnect.com.au/~palberts/vpxwho.htm>

¹⁰³ See page 21 for an explanation of these terms.

billion; Solaris was purchased by a consortium of Australian Gas Light Company and US partner Energy Initiatives for \$950 million; Eastern Energy was sold to a subsidiary of Texas Utilities for \$2.8 billion; Victorian western region distributor Powercorp was purchased for \$2.2 billion by PacificCorp; and Melbourne's CitiPower was bought by US based Ent Energy for approximately \$1.5 billion.

The first generating business was sold in early 1996, with Yallourn Energy sold to the UK led PowerGen consortium for \$2.2 billion. Hazelwood Power Corporation was sold for \$2.35 billion to another UK led group headed by National Power in August 1996. The government has also sold 50% of the power station Loy Yang B for \$1 billion in 1992, and in April 1997 the power station Loy Yang A was sold for \$4.85 billion to a US consortium led by CMS Energy.

The privatisation of electricity assets has earned the Victorian government nearly \$19 billion, which has been used to retire State debt. The Victorian State debt remains at \$16 billion, and the government hopes that this will be reduced to below \$10 billion with the sale of the high voltage grid network company PowerNet for \$2 billion, and the privatisation of the gas industry for \$4 billion.¹⁰⁴

The deregulatory timetable for customers to choose their supplier of electricity is as follows:

December 1994	Customers (about 50) with demand above 50MW were given choice of supplier.
July 1995	Customers (about 350) with demand above 1 MW were given choice of supplier.
July 1996	Customers with electricity consumption in excess of 750 MW
July 1988	Customers with demand in excess of 160 MW
January 2001	All remaining customers

Until customers are able to choose their electricity supplier, they are known as franchise customers. Customers who are eligible to choose are referred to as non-franchise or contestable customers.

The regulation of the electricity supply industry is crucial to safeguarding public rights and interests. Victoria has established the Office of the Regulator General, which has been established to ensure that service standards are met in accordance with the Supply and Sale Code. The Code applies to distribution businesses, retailers and customers, and sets the minimum conditions under which distributors sell electricity to franchise customers.¹⁰⁵

The Code obliges a distributor to provide the basic services to franchise customers, including supplying and maintaining distribution equipment to the point of supply, providing

¹⁰⁴ "Loy Yang fetches \$4.75 billion" in The Sydney Morning Herald, 22 April 1997.

¹⁰⁵ Baragwanath, C. *Privatisation: An audit framework for the future*. Victorian Auditor General's Office, 1996, at 12. See <http://yarra.vicnet.net.au/~vicaud1/sr38/ags38fd.htm>

standard metering and to make reasonable efforts to supply electricity at the prescribed standard voltage. The ORG will ensure that certain minimum standards are maintained. The ORG sets maximum tariffs for each of the distributors, however there is no restriction on charging customers less than the maximum and cross-subsidisation between customer classes is permitted.

The Regulator-General has stated that: "As far as reasonably practicable, the regulatory framework is light handed. That is, it lets the participants in the 'regulated industries' get on with their business and provides for intervention only where it is necessary to correct misuse or abuse of market power in the interests of competition or customers."¹⁰⁶

An Electricity Industry Ombudsman, which reports to the ORG, has also been established. The aim of the Ombudsman's office is to provide a forum for dispute resolution for individual domestic and business customers. The Ombudsman is an independent office and can make legally binding decisions.

The ORG has identified the following consumer concerns:¹⁰⁷

- hot spots (localised areas of poor reliability)
- some instances of long response times to restore supply
- reluctance by some retailers to pay compensation for power surges.

The liability for power surges is of particular interest to Victorians. The Australian Competition and Consumer Commission has ruled that distributors are required to provide households with merchantable quality (ie, no spikes or brownouts), and that they are liable for damage from power surges. Currently, the Victorian Ombudsman is pressing distributors to settle up to 30 outstanding cases relating to surges or brownouts.¹⁰⁸

Many commentators have identified the electricity regulator as the linchpin in the success or otherwise of the Victorian electricity industry reforms. The ORG has responsibility for overseeing environmental and social externalities caused by the electricity industry. One danger of utility markets is that their nature promotes sale of greater throughput at the expense of demand management. Grey has identified it as a serious shortcoming that the ORG is not required to consider demand management in the examination of the Victorian energy industry.¹⁰⁹ Similarly, conservation groups have warned that the privatisation of the

¹⁰⁶ The Regulator-General of Victoria. *Annual Report 1994-95*. As cited in Baragwanath, C.A. *Privatisation: An Audit Framework for the Future*. Victorian Auditor-General's Office, 1996. See Internet site: <http://yarra.vicnet.net.au/~vicaud/sr38/ags38fd.htm>

¹⁰⁷ "Quality and reliability the top concerns of Vic users" in *The Australian Financial Review*, June 26 1997.

¹⁰⁸ *Ibid*

¹⁰⁹ Grey, F. *Trading Power: The New Victorian Power Game. The economic dynamics of Victoria's electricity reforms*. Public Sector Research Centre, The University of NSW, 1996, at 72.

Victorian ESI has created incentives for the new private companies to generate and sell more power, instead of encouraging conservation.¹¹⁰ Without careful regulation, the reduction of greenhouse gas emissions can only be that much more difficult under this operating regime.

Other commentators have highlighted the reduced accountability of the electricity supply industry once it enters the private sector. For instance, the Ombudsman has been criticised for an apparent lack of impartiality which stems from:¹¹¹

- the Ombudsman receives its funding from the industry it monitors;
- the Ombudsman's Office has a Board of Directors composed primarily of representatives of the electricity supply industry. This Board determines the terms of reference under which the Ombudsman operates, which ensures that the industry retains absolute control over the scheme;
- conciliated decisions of the Ombudsman may be made in secrecy, removing the requirement for openness which allows for public accountability and justice.

Judicial review of a decision of the Regulator-General is restricted to cases where there was no power to make the determination, or that procedural requirements in relation to the making of the determination were not complied with. Instead of a right to judicial review, the Office of the Regulator-General Act 1994 provides for an appeal to be heard by an appeal panel. However, there is no requirement in the Act to ensure that all three members of the appeal panel are not service providers from the electricity supply industry. Stuhmcke concludes that there is no requirement for fairness, openness or impartiality, which are the fundamental values of administrative law review.¹¹²

Many commentators compare the UK model of electricity privatisation with the Victorian model. Comments include: "Victoria stands front and centre of world energy deregulation because of the ferocity of the competition that has occurred and the presence of international players in both generation and distribution businesses...Frankly, the UK model is a lot more attractive to participants because there's a bit more margin in electricity retail and a lot more in generation and distribution, while the Australian model looks pretty fearsome."¹¹³

Under the Victorian government reforms, it was thought that the wholesale price of electricity would level out at around \$38-\$40/MWh. In January 1996 the wholesale price

¹¹⁰ "Electricity sell off: Greens warn Carr." in The Sydney Morning Herald, July 15 1997.

¹¹¹ Stuhmcke,A. "Administrative Law and the Privatisation of Government Business Enterprises: A Case Study of the Victorian Electricity Industry." in *Australian Journal of Administrative Law*, Vol 4 No 4, August 1997, at 189.

¹¹² *Ibid* at 192.

¹¹³ Comment by Kook Kalstein, an energy sector specialist at the Boston Consulting Group in San Francisco, as reported in "Private Power: the jury is still out." in *Business Review Weekly*, June 9 1997, at 83.

of electricity was \$40/MWh, and currently the price is \$25 MWh and falling, which means the generators are receiving around 2 cents per KWH. However, the distributor companies are still selling electricity to domestic consumers at early 1996 prices, at around 12 cents per KWH.¹¹⁴ Leading industry observers suggest that the cost price of electricity generation from the La Trobe Valley generators is in the low \$30 per MWh.¹¹⁵

Conclusions from the Victorian Experience

There has been both praise and criticism of the Kennett government privatisation reforms. It is apparent that in the divestment of electricity assets the overriding sale criteria was to maximise the prices gained. The relatively high prices gained as a result of this approach have received applause from many commentators in the financial markets. Elsewhere, the methodology has been criticised for its lack of social welfare objectives, notably in relation to environmental protection and employee job security. It is evident that governments are faced with the choice of maximising the sale price of electricity assets with relatively few conditions attached, or attaching social and environmental objective conditions to the sale and possibly having to accept a lower price.

It is clear that the reforms pioneered in the UK have provided the inspiration for the Victorian reforms, with one important difference. The Victorian government has provided for a much greater level of competition between generation companies. The result of this has led to a dramatic decrease (at least in the short term) in the wholesale cost of electricity. The difficult part now is to be able to make this sustainable in the long run, as well as passing on these savings to the retail customers.

9.2 States Other Than Victoria

In mid 1997 the Queensland government reached agreement with NSW to connect the two electricity grids together with the establishment of 'Westlink', expected to be operational in late 2001. The Queensland government owned generation body Austa Electric owns nine power stations and generates 80% of the State's electricity. The government is in the process of splitting Austa into three generating bodies, competing against each other and new private generating bodies. The Queensland Transmission and Supply Corporation's seven distribution authorities will be retained, with three new regional trading corporations created to buy and sell electricity. An interim competitive market is planned to be in operation by late 1997, and a full competitive market in place by 2001. The Minister for Mines and Energy Tom Gilmore is reported as saying that privatisation is not on the government agenda.¹¹⁶

¹¹⁴ "Privatised power costs halved: but no benefit to consumers." in *News Weekly*, July 12 1997, at 4.

¹¹⁵ "Private Power: the jury is still out." in *Business Review Weekly*, June 9 1997, at 83.

¹¹⁶ "Queensland facing wait for cuts." in *The Australian Financial Review* June 26 1997.

The South Australian government is mid way through a restructure of its electricity supply industry. In January 1997 the Electricity Trust of SA was divided into two separate entities, ETSA Corp and Optima Corp. ETSA controls the States distribution and transmission assets, valued at around \$2 billion, whilst Optima owns and operates the State's two generators, valued at \$300 million. South Australia buys 30-35 % of its electricity from Victoria. Later this year the South Australian government will decide on a \$100 million 250MWh electricity link with , called Riverlink. The link would provide fresh competition with the existing 500MWh link with Victoria and provide better access for generators to the South Australian market.¹¹⁷

The Tasmanian Hydro Electric Corporation generates electricity by 27 hydro power stations and a 200MWh oil fired generator, as well as operating the distribution and retail side of the business. The Tasmanian government has formed a committee to investigate selling the distribution and retail sector and to ready the State for a competitive market, and another committee to study the feasibility of getting private investment to fund Basslink, the \$400 million underwater electricity connection to Victoria. The Tasmania Premier is reported to have said that he would pay for his 'economic plan', announced in April this year, from the sale of the distribution and retail businesses but would keep the Corporation's dams and assets in public ownership.¹¹⁸

In Western Australia the electricity supply industry is based on two separate markets. The first is the integrated market based around the south west of the State, whilst the second is the development of mostly gas fired power stations to serve large mining ventures. The biggest source of electricity generation under State control is at Collie, site of the State's only commercial coal field. Two coal fired power stations are in operation, with a third presently under construction. This new station will be government owned but privately operated. The State also owns a small gas fired station just north of Perth, and commentators have noted that this would be a discrete easy to sell asset that would help create competition for generation in the south west. Reforms of the industry date back to 1983 when the Carnegie Report recommended the dismantling of the old government monopoly State Energy Commission of WA into separate gas and electric entities, and a process devised to achieve a deregulated market and encourage private investment in the gas and electricity distribution sectors. Whilst there has been much discussion on privatising the Collie power generation facilities, this appears to be off the government agenda at this time.¹¹⁹

¹¹⁷ "Crunch time looms for small South Australian market in energy battle." in The Australian Financial Review June 26 1997.

¹¹⁸ "Tasmania faces hard task with sale of HEC assets." in The Australian Financial Review June 26 1997.

¹¹⁹ "Relaxation of rules lightens up the outback." in *Business Review Weekly*, June 9 1997, at 92.

10.0 Environmental Protection in a National Electricity Market

The electricity supply industry has a variety of environmental impacts, both locally and on a more global basis. Whilst the site impact of a power station may be relatively significant on the local environment, it is the greenhouse gas emissions from the industry as a whole that has the largest environmental impact. The importance of reducing greenhouse gas emissions is under debate world wide, with the Global Convention on Climate Change again to be debated at Kyoto in Japan at the end of this year.

Without doubt NSW leads Australia in innovation and support for renewable energy supply technologies. This is contrast to the reforms in Victoria which have included little in the way of special programs to reduce greenhouse gas emissions. For instance, Grey notes that the Victorian reforms have built in incentives to expand power output. The distributor monopolies make their money from each unit of electricity that passes through their wires. The wires in turn make 90% of their revenue, and hence the only way that a distributor can expand output is selling more power. Grey considers that efforts to restrict demand will be limited to reducing peakloading and dealing with distant and expensive components of the network.¹²⁰

In the drive to reduce greenhouse gas emissions, the NSW government has established the Sustainable Energy Development Authority and introduced greenhouse gas reduction requirements in licences for electricity retail suppliers. The Authority has been established to reduce greenhouse gas emissions by investing in the commercialisation and use of sustainable energy technologies such as renewable energy, energy efficiency and cogeneration. SEDA has already launched programs of energy smart buildings, energy star office equipment, a \$500 rebate scheme for consumers who buy new solar or heat pump water heating systems for their home, a 'green power' scheme for electricity consumers and more.¹²¹ With the assistance of their programs the Authority hopes to be able to reduce greenhouse gas emissions by 14 million tonnes per annum through cost effective measures such as energy efficiency, co-generation and fuel substitution. This roughly equates to a one quarter reduction of greenhouse gases from the electricity supply industry.¹²²

The *Electricity Supply Act 1995* requires electricity retail suppliers to be licensed by the Minister for Energy. It is these licences that contain environmental conditions, which require licence holders to develop strategies for greenhouse gas reduction and plans for energy efficiency, demand management and sustainable energy procurement. The objectives

¹²⁰ Grey, F. *op cit* at 57.

¹²¹ Sustainable Energy Development Authority, Corporate Plan.

¹²² Sustainable Energy Development Authority, Media Release, 6 January 1996. See Internet site http://www.seda.nsw.gov.au/html_frames/frame_whatnew.html.

of the licence conditions are to improve environmental outcomes through.¹²³

- (a) reduced levels of emission of the principal greenhouse gases, and;
- (b) increased utilisation of environmentally superior generation technologies and increased energy efficiency in consumption.

The Department of Energy anticipates that the compliance with the environmental guidelines will deliver substantial benefits to electricity customers in NSW by improving the range and quality of energy services provided, by increasing energy efficiency and reducing environmental impacts. The Department also notes that retailers will need to invest significant resources to deliver these benefits, and that it would be inappropriate to allow any retailer to seek to gain an advantage over its competitors by failing to fulfil its obligations in this regard.¹²⁴

In this regard, it is possible that electricity retailers operating in NSW will have a higher cost base than retailers in other States, due to the more onerous licencing conditions. In a national electricity market, consumers could purchase power from an inter-State retailer who does not have the same licences conditions as a NSW based retailer, and hence potentially cheaper electricity. However, the *Electricity Supply Act 1995* prevents any person from selling electricity in NSW without a NSW licence, and hence all retailers wishing to sell electricity in NSW will be subject to the same licensing conditions. This would then have the curious effect of the NSW Department of Energy 'supervising' the greenhouse reduction programs of companies based inter-State.

It is also hoped that even if greenhouse reduction strategies result in higher priced electricity, energy efficiency programs will reduce the demand for electricity so that electricity bills may actually be less.

As the national electricity market takes shape over the next few years, it is likely that industry participants will call for greater coordination between regulatory authorities in regard to environmental concerns. This is where the National Environment Protection Council may be able to play a role, with the implementation of National Environment Protection Measures. It will also depend on the Commonwealth government's attitude to the reduction of greenhouse gas emissions, and any restrictions that may be placed upon Australia by international convention. So far, it is evident that the Commonwealth government intends to apply minimal regulatory pressure on industry and the community to reduce greenhouse gas emissions.

It is apparent that at least in the short term active Government intervention in the market place will be required to support renewable energy technologies. The United Kingdom

¹²³ Department of Energy, *Electricity Supply Act 1995. Further Environmental Guidelines and Requirements. Retail suppliers - greenhouse gas reduction strategies*, July 1997. See Internet site: <http://www.doe.nsw.gov.au/Electricity/guidelines/env-gd13.html>.

¹²⁴ *Ibid*

government implemented this via the Non Fossil Fuel Obligation, with some success, although the program was weighted towards nuclear generation. However, what also came out of the UK reforms was the over-riding need for a national renewable energy policy. The 'piecemeal' approach of support for some renewable projects and not for others undermines the whole industry. A rational and coherent renewable energy policy was considered essential to assist the advancement of alternative energy supply industries.¹²⁵

11.0 The Privatisation of the Electricity Industry - Reasons for and Against

11.1 Reasons Supporting Privatisation

Originally, many of the arguments for privatising government enterprises came from conservative governments. Ideologically, conservative parties tend to believe in small government, with minimal government intervention and regulation of the marketplace. However, governments of all persuasions have been down the privatisation route, with the sale of the Commonwealth Bank and QANTAS being notable examples in recent times.

The motivation for the privatisation of government trading enterprises can be found in several areas, but mostly relies on arguments to increase the economic efficiency of the enterprise, which then has benefits for the economy as a whole. The arguments for deregulation and privatisation of government enterprises are made on the assumption that the market is the best regulator of economic activity and governments should not interfere with it. Enterprises will be most productive if exposed to the full range of market forces. The classical argument is that the public sector is inherently inefficient and unproductive and that big spending by government, funded by public sector borrowing and taxation, reduces private initiative and crowds out private sector activity. The assumption that the public sector is inefficient rests on the grounds that it does not have to face the tests of the market which induce efficiency in the private sector. Public enterprises do not go bankrupt, public servants are rarely sacked and the organisations never get taken over.¹²⁶

The ownership of a utility is important because it is this that determines the utility's objectives. In one case the managers report back to a Minister and the voting public, and the firm's objective may be set by Ministerial direction. In the other case the shareholders ultimately form the utility's objectives. There is also a difference in the monitoring of utilities with a change in ownership. The managers of a privately owned firm will be concerned with meeting the requirements of the capital market and be faced with threats of take-over or bankruptcy. In contrast, the public firm will concentrate on the satisfaction of Ministerial objectives and will not typically be threatened by take-over or bankruptcy.¹²⁷

¹²⁵ Roberts, J *et al*, *Privatising Electricity. The Politics of Power*. Belhaven Press, London, 1991, p. 155.

¹²⁶ Page, B. *Privatisation*. Parliamentary Library, Background Paper 1986/2.

¹²⁷ Yarrow, G. "Does ownership matter" in Beljanovski, C. (Ed) *Privatisation and Competition. A market prospectus*. Institute of Economic Affairs, 1989, at 53.

The United Nations lists the following reasons why a government may choose to privatise a public enterprise.¹²⁸

- improving the government's position - one main aim is to relieve burdens on State treasury. These burdens may include subsidies, as well as the provision of working capital and equity financing. Proceeds from the sale of State assets can be used to reduce budget deficits.
- strengthening market forces and competition - whilst the mere transfer of a company to private ownership may not increase market forces and competition, certain privatisation techniques such as contracting and franchising may be helpful in the stimulation of competitive conditions, especially where there is a natural monopoly. Special incentive programs of investment opportunities and tax advantages may also help promote competitive conditions.
- improving enterprise performance - privatisation often results in less government interference in company affairs, requiring managers to develop entrepreneurial skills, including attention to the long run growth of the firm. Relief from the financial constraints of the public sector will be replaced by competitive pressure in the financial markets and the need to provide investors with satisfactory returns on their capital.
- strengthening financial markets - in the UK for example, which had a strong financial market before privatisation started, the potential for expanding private investment was achieved by attracting the goodwill and financial support of the general public to the privatisation program. The widespread adoption of employee share ownership also worked towards the then governments aim of encouraging 'popular capitalism'.
- building wider business ownership - the objective of spreading business ownership more widely throughout the economy has been linked to the development of capital markets. The underlying issues here may be quite varied, including opening the markets to foreign capital, limitations on foreign investment, or simply that economic activities should be left to the private sector.

The NSW Treasurer Hon Michael Egan MLC has outlined his arguments for the sale of electricity assets. Mirroring some of the objectives as identified by the United Nations, one main objective is to eliminate State debt, and any excess proceeds to be spent on revitalising State infrastructure. Eliminating State debt would also save \$500 million each year (which is the difference between interest paid and dividends received each year). The Treasurer argues that governments must focus resources and capital on those areas that will be of most direct benefit to society. In this regard, all the operations of the electricity supply industry can be just as easily, or even more efficiently, performed by the private sector. This frees

¹²⁸ United Nations, *Accounting, Valuation and Privatisation*. United Nations, New York, 1993, at 5.

up capital and resources to be focussed elsewhere, whilst achieving social equality objectives at the same time. The Treasurer summarises the argument as the following:¹²⁹

The choice for government is whether it regulates and oversees this industry to secure good social and economic outcomes, or whether it owns this industry, thereby risking billions of dollars of taxpayers' money in commercial enterprises, rather than investing those funds in social and economic services and facilities that are the core areas of government responsibility.

The risk to government of continuing to own electricity assets in a competitive market is seen as potentially a major problem. This risk was considered by the Hogg Committee which said that: "Numerous respondents noted that the advent of the competitive market and the entry of private firms has significantly increased the risk profile of the sector. It was commonly argued that the level of risk was now inappropriate for publicly-owned assets."¹³⁰ Supporters of privatisation also note that job losses in the industry are inevitable regardless of ownership.

The electricity supply industry has undergone major reform, with competition between generators and distributors now occurring. However, the problem is that all the NSW based competitors are owned by the same entity, that being the government. The Auditor-General Mr Tony Harris has highlighted this problem, and is reported as saying: "In particular, in a competing market, you expect firms to fail, and it is very difficult under the current structure for the Government to manage its shareholder interests properly." Mr Harris noted that there was no model whereby a single shareholder could foster unfettered competition between the companies it owned. The problem, of course, would be solved by the privatisation of the industry.¹³¹

11.2 Arguments Against Privatising Government Enterprises

"The philosophy of privatisation ignores the positive role and methods of the public sector in combatting social inequality and creating otherwise lost economic and social opportunities. Due to this oversight, action taken to privatise the public sector has not secured freedom, liberty and enterprise for the majority. In reality the rhetoric of privatisation often functions as a blunt ideological instrument wielded by those not fully versed in the subtleties and complexities of government."¹³²

¹²⁹ Egan.M. *A Plan for a Secure New South Wales*. A discussion paper prepared by the Treasurer and Minister for Energy, Michael Egan, MLC for distribution to Pacific Power and Electricity Unions at the Consultative Meeting on May 22 1997.

¹³⁰ NSW Government, *Report of the Committee of Inquiry into Sale of the NSW Electricity Assets*. Chaired by Mr Bob Hogg, August 1997 at 64.

¹³¹ "Left attacks auditor's support for power sale" in *The Sydney Morning Herald*, 4 August 1997.

¹³² Evatt Research Centre, *State of Siege. Renewal or Privatisation for Australian State Public Services?* Pluto Press, 1989, p.79.

The above quote from the Evatt Foundation summarises the ideological stance of those opposing privatisation. The public sector is considered a vital component of the economy, essential for achieving goals of social equality and economic development.

The public control over sections of the community which were operated by democratically elected governments will be lost with privatisation. If you don't like what the government is doing with service provision you can vote against them at the next election. However no such opportunity is provided for private operators who provide bad delivery of an essential service. People living outside major cities are especially in danger of having services cut back or cut out with the removal of cross-subsidies which enable the public sector to provide services to all Australians at reasonable cost.¹³³

In regard to the privatisation of elements of the electricity supply industry, some of the arguments against this as put forward by the Labor Council are as follows:¹³⁴

The Labor Council does not believe that the sale of electricity assets can be justified on economic, social or environmental grounds. The Council believes that State debt is already being reduced at a steady rate, and it is unnecessary to privatise the electricity industry to eliminate it. In contrast, the real pressure on the public sector is that of revenue, an area to which the electricity industry contributes \$1 billion per annum. It is believed that there are other methods available for financing infrastructure.

The Council notes that international experience suggests that large multinational companies will attempt to reintegrate elements of the industry which are separated in the privatisation process (ie, distributors are separated from generators). However, the Council notes that the regulatory policies of the government still rely on the separation of elements of the industry, and may be of little use if the industry is allowed to merge its separate elements. The regulatory structures in place at the moment are industry specific, and have little ability to deal with the convergence of other utilities such as telecommunications and gas with electricity.

If privatisation goes ahead, the government may remain involved with providing assistance to disadvantaged users. These costs will no longer be offset by revenue and the ability of government agencies to determine need will be undermined. It is possible that privatisation will restrict avenues of redress available for consumers, and will prevent the involvement of the Ombudsman.

The problem of reduction in workforce numbers and restricted union involvement in the privatised industry also concerns the Labor Council.

¹³³ Campbell, G *et al Privatisation and Deregulation*. Researched and written for the ALP Steering Committee, 1986, at 3.

¹³⁴ This section is taken from: Lennon, M & Robertson, J "The Labor Council: 'consumers, workers, the environment will suffer.'" in *NCOSS News*, Vol 24, No 6, July 1997, at 10.

The Labor Council notes that the electricity supply industry has started to confront environmental problems. Whilst some solutions are cost effective and likely to be continued in the private domain, others are not so. The scope for the considerable investment in research and development needed for the development of alternative environmentally friendly sources of electricity are beyond the scope of what could be achieved under privatisation.

The ALP Taskforce Submission to the Hogg Inquiry presented 17 findings in support of retaining electricity assets in public ownership. These included the following arguments:¹³⁵

- with the information on the industry currently available, it is impossible to show that there will be a net financial gain to the State from the sale of NSW's electric utilities.
- the government and community derives greater value from maintaining public enterprise in public ownership rather than through privatisation
- a privatised electricity industry runs the danger of affecting the structure of the industry through mergers, creating a privately owned oligopoly.
- studies world wide have shown that the public sector electricity industry is at least as efficient as the private sector.
- privatisation will lead to massive job reductions, with direct ramifications for rural NSW.
- the government can fund infrastructure programs by setting aside \$250 million from recurrent expenditure, over time raising \$3 billion for infrastructure projects.

Meanwhile, environment groups fear that privatisation of the industry will harm the development of renewable energy technologies. Some of the threats identified include:¹³⁶

- the removal of the ability of government to exert policy direction on the industry through ownership, control and Board appointments;
- pressure from within government to weaken environmental standards to maximise the sale price;
- pressure from private investors and bankers to have environmental standards weakened to maximise future profitability of asset purchases;
- privatisation of natural monopoly assets (transmission and distribution) risks the re-emergence of discrimination against energy efficiency, cogeneration and renewable energy.

¹³⁵ Lennon, M *et al*, *ALP Taskforce Submission to the Committee of Inquiry into the Sale of Electricity Assets*, 1997.

¹³⁶ Tarlo, K. "Greenpeace: biggest threat to sustainable energy." in *NCOSS News*, Vol 24, No 6, July 1997, at 11.

As an indication of some of the environmental problems resulting from privatisation, environment groups use Victoria as an example. Environmental problems in Victoria resulting from privatisation of the electricity industry are claimed to include:¹³⁷

- the loss of most energy efficiency, demand management and renewable energy programs
- distribution/retail businesses maximising their unit sales of electricity in both the contestable and franchise markets
- price capping of monopoly elements of the industry, which discriminates against energy efficiency
- heavy emphasis on supply charges (as against charges for the number of units used) act as a strong disincentive to energy efficiency.
- no environmental performance standards in legislation or bid selection criteria, as part of the government's focus on maximising the sale price of the businesses.

As an example, the Victorian Office of the Regulator General has informally advised one power distribution utility that a green power tariff scheme similar to that in NSW would contravene the Tariff Order which caps Victorian power prices until 2001. One representative of a Victorian electricity distributor, CitiPower, is reported to have said "I'm envious of the [NSW] government getting behind renewables, which is not the case in Victoria."¹³⁸

12.0 The Hogg Report - A Summary

The Committee of Inquiry was chaired by Mr Bob Hogg and included Dr Tom Parry, Chairman of the Independent Pricing and Regulatory Tribunal; Mr Steve Heffernan, Consultant; Mr Steve Turner of the Public Service Association and Ms Cathy Zoi of the Sustainable Energy Development Authority. The majority view of the Committee was that the generation, distribution and retailing of electricity in NSW should be privatised. One member of the Committee, Mr Turner of the PSA, delivered a minority report that the industry should not be privatised.

The majority view was that the financial gain to the State with privatisation is very significant. It was noted that if the industry is not privatised, competitiveness will decline and the income stream it provides to the State budget over time will decline. The majority agree that there will be further job losses in the industry, and note that these may be

¹³⁷ *Ibid* at 11.

¹³⁸ "Illegal: Vic power regulator on green tariffs." in *Environment Manager*, Issue 160, July 1 1997 at 3.

accelerated by privatisation. The Report divides the debate into five different areas, as follows:¹³⁹

1/ Sale versus retention value

The majority concluded that under all scenarios tested the sale value of the industry exceeds any retention value. This is largely due to the increased efficiency which a private owner is likely to achieve, the increased ability of a number of separate private owners to manage the risk involved in running a competitive commercial operation, and access to depreciation tax benefits which are not available to the government.

The minority report noted the conflicting advice given on the sale value of the electricity industry. The minority reached the conclusion that after costs and other sale conditions were taken into account, there is less than \$1 billion remaining after privatisation. The difficulty in reaching agreement on the value of the industry, both privatised and if kept in public ownership were noted.

2/ Appropriateness of further government investment in electricity infrastructure.

The majority of the committee took the view that it was not realistic to expect the government to make further significant capital investment in the industry. It was accepted that no government, faced with competing priorities, is going to choose to invest large amounts of capital in risky electricity ventures. The majority concluded that this was a significant disadvantage of continued government ownership.

The minority report noted that a government position of not investing in electrical infrastructure is a political decision arising from a philosophical base. It is the minority view that allowing further borrowing to invest in electrical infrastructure is not wrong.

3/ Risk

The majority of the committee noted that whilst some parts of the electricity supply industry (primarily the wires business) are good investments, there are risks associated with their ownership which the government is not in the best place to manage. Risks include: having to respond rapidly to developments in the competitive market and having to deal with conflict of interest in owning a number of competing assets. The majority report noted: "There are also a range of constraints on the Government's ability to manage risk, not the least of which is the difficulty of fully controlling or measuring risk. The Government is not able to manage market risks which can ordinarily be hedged by acquiring a diversified portfolio of investments."¹⁴⁰

The minority report noted that the risk of government ownership must also be balanced with the risk of the government not owning the assets. This was described as the public risk

¹³⁹ NSW Government, *Report of the Committee of Inquiry into Sale of the NSW Electricity Assets*. Chaired by Mr Bob Hogg, August 1997 at 8.

¹⁴⁰ *Ibid* at 65.

under private ownership including: blackouts; price rises; environmental degradation; loss of jobs in regional areas; and loss of income to the State budget. The minority report did not accept that 'risk' was a compelling factor to support privatisation. The government ownership of all assets allows balancing of any market risk.

4/ Declining potential sale value

The majority considered that the time is now right for a sale, with evidence for a number of 'cashed up and ready' buyers. To delay privatisation, the forthcoming introduction of a competitive market means that if the NSW businesses fail to compete effectively the sale value of the industry will decline. The introduction of the national market will increase the risks of continued government ownership.

5/ Other issues

These issues included price, customer service, environment and debt management. The majority of the committee note that price rises for electricity are not expected under privatisation, and that in a competitive market prices should continue to decline. An appropriate regulatory framework can ensure guarantee of customer service, as well as protecting the environment. The majority also note that the State budget will benefit from reduced public debt for many years to come, equalling hundreds of millions of dollars per year.

The minority report argues that the price of electricity will rise after privatisation, especially as remaining cross-subsidies are removed. It is argued that privatisation experience overseas and interstate has resulted in supply interruptions and other undesirable side effects such as power surges. The continued government ownership of the industry allows control and the ability to ensure efficient operation to meet industry protection policy. The minority report notes that the private sector is unlikely to automatically pursue environmental programs that cost money, and believes that an appropriate mix of incentives and penalties are required. Finally, the minority view is that ownership is the best form of regulation for an essential community service. The difficulty of regulating private owners on a State basis in a national market is noted.

13.0 Conclusion

What constitutes government in the 1990's is vastly different to the attitudes of even 20 years ago. The language of public administration now predominantly features expressions such as: 'core responsibility'; 'managerialism'; 'accountability'; 'most efficient allocation of capital'; and 'social obligations can be provided regardless of ownership'. The public sector is under continuous pressure to prove itself to be at least as efficient as the private sector. If it is not key business units are likely to be isolated and contracted out. No segment of the public sector is immune to these forces, and since the early 1990's the public utilities have especially been the focus of microeconomic reform.

The electricity supply industry in Australia has already undergone widespread reform. These national reforms cannot be stopped. The question arising for NSW in the light of this is 'does ownership matter'?

APPENDIX A
Glossary of Terms

AVAILABILITY

The ratio (expressed as a percentage) of equivalent hours during which generating plant is available for full load service, to the total hours in the period.

AVAILABILITY CAPACITY FACTOR

Measure of the energy production of a generating plant during a period compared to the total energy production if the plant had operated continuously at full output during the period.

BASE LOAD

That part of power demand which is effectively constant throughout the year. A unit providing this load should run on a continuous basis at or near rated capacity when not out of service for routine or annual maintenance. Such plant would normally operate with an AVAILABLE CAPACITY FACTOR (see above) in excess of 60%.

COGENERATION

The generation of electricity as part of some other process such as the supply of low pressure steam to a chemical plant or the recovery of waste heat and gases from a blast furnace.

COMBINED CYCLE

A two stage electrical generation process. In the first stage, electricity is generated through a gas turbine. The waste heat from this process then passes through a heat recovery boiler which produces steam for additional power generation in a conventional steam turbine. This results in an increase in overall power generation efficiency.

CONSERVATION

The efficient use of energy, either by forsaking energy needs or by using more efficient systems and appliances. Note that conservation options are not necessarily least-cost options, and may involve important trade-offs to capture environmental benefits.

CONSUMER PRICE INDEX (CPI)

Measures the movement in the price of a basket of goods and services and accounts for the major proportion of expenditure by wage and salary earners.

CORPORATISATION

Reform of government sector agencies which aims to improve efficiency and competitiveness. Corporatisation can involve both administrative changes and market reorganisation.

DEMAND

The instantaneous requirement for electricity that the system has to meet, the usual units being megawatts (MW) or gigawatts (GW). See POWER.

DEMAND SITE MANAGEMENT

Commonly defined as the systematic planning and implementation of energy utility services designed to influence customer use of energy in ways that will produce desired changes in the utility's load. It is also known as **demand management** and encompasses both load management and energy conservation.

DISTRIBUTION EFFICIENCY

Low voltage power lines and transformers which supply low voltage end-use customers.
Can refer to:

Productive Efficiency, which is achieved when a product or service is produced by the least-cost mix of inputs such as labour, capital and fuel;

Allocative Efficiency, which is achieved when the price for a product or service equals its marginal cost of production (that is, the cost of producing one extra unit of that good or service);

Dynamic Efficiency, which is achieved when demand and supply are matched over time.

END-USE

The final use of energy to provide an energy service (e.g. electricity for refrigeration, gas for space heating).

ENERGY

A measure of the amount of electricity used over a period of time. Units used are gigawatt-hours (GWh), megawatt-hours (Mwh) or kilowatt-hours (kWh), depending on the power and time scale involved. The kWh is the familiar unit used to measure customer electricity consumption. See ENERGY AND POWER UNITS.

ENERGY AND POWER UNITS

Electricity: Power (or Capacity)

watt	(W)	
kilowatt	(kW)	=1000 W
megawatt	(MW)	=1000 kW
gigawatt	(GW)	=1000 MW

Electricity: Energy

kilowatt-hour	(kWh)	
megawatt-hour	(MWh)	=1000 kWh
gigawatt-hour	(Gwh)	=1000 Mwh

Energy (Heat)

Joule	(J)	
kilojoule	(KJ)	=1000 J
megajoule	(MJ)	=1000 kJ
gigajoule	(GJ)	=1000 MJ
terajoule	(TJ)	=1000 GJ
petajoule	(PJ)	=1000 TJ

ENERGY AUDIT

An examination of an energy system to assess the most appropriate sources of energy to use and opportunities for efficiency improvements.

ENERGY EFFICIENCY

The ratio of energy used to provide a service (e.g. lighting) compared to the level of service (e.g. lumens of light).

ENERGY SERVICE

The warmth, cooling, lighting, motor power, or output of electronic devices which energy customers obtain in the use of energy.

FORCED OUTAGE

The unscheduled outage of a generating unit due to the occurrence of a component failure or other condition which requires the unit to be taken out of service for repairs or inspection.

FRANCHISING

The sale of rights to distribute power in a region.

GAS TURBINE

A generating unit in which an air/fuel mixture is burnt and the resulting hot gas mixture used to drive a turbine. This turbine drives a generator to produce electrical energy. A steam boiler is not required.

GREENHOUSE EFFECT

The absorption of solar energy radiated back from the earth by carbon dioxide and certain other gases. Increases in greenhouse gases are thought to cause rises in air and surface temperatures and possibly in sea level.

INFRASTRUCTURE

A collective term for physical and social services such as roads, power and water supplies, housing, health services, schools, technical and industrial support services, etc.

INTERMEDIATE LOAD

That part of power demand falling between the highly fluctuating peak loads and the steady base load component. Plant supplying intermediate loads typically operated during weekdays and is shut down or off-loaded overnight and on weekends.

LEAD TIME

The period required between deciding to build plant and the plant entering commercial service. It is the sum of planning and approvals, design, construction and commissioning periods.

LEAST-COST ELECTRICITY PLANNING

A process of identifying the cheapest options for meeting the energy service needs satisfied by electricity. These can include generation options (supply-side options) and conservation and other demand management options (demand-side options).

LOAD

Instantaneous demand for electrical power. See DEMAND.

LOAD FACTOR

The ratio of average load supplied over a period, to the peak or maximum load during that period. Usually expressed as a percentage.

LOSS OF LOAD PROBABILITY

A statistical parameter that which measures the average duration of any time during a year in which a power supply system will be unable to fully meet the demand.

LUMEN

A measurement of light energy.

NATURAL GAS

Fuel gas, principally methane with some ethane and traces of other hydrocarbons, obtained from natural underground reservoirs. Often associated with petroleum reservoirs.

OFF-PEAK PERIOD

A time span of lower electricity usage currently defined as public holidays, all weekend plus 11.00 pm to 7.00 am on weekdays.

PEAK LOAD

That part of the power demand occurring for relatively short periods, mainly during weekday mornings and evenings. Plant specifically installed to meet this part of the load might operate with an annual capacity factor of up to 30%. However, this would depend on the mix of generating plant available in the system.

POWER NETWORK

Refers to the entire electricity supply system - from generator network to end-use customers.

POWER GRID

The part of the electricity supply system consisting of the transmission and sub-transmission systems.

POWER

A measure of instantaneous demand for electricity. Units used are gigawatts (GW), megawatts (MW) or kilowatts (kW) depending on the scale involved. See ENERGY AND POWER UNITS above.

PRICE-CAPPING

Government regulation of prices which involves the setting of a ceiling. Long-term price-capping involves setting goals in relation to the CPI. Some monopolies are set a price-cap below the inflation rate, called a CPI-X pricing formula.

PRIVATISATION

Full or partial transfer of government sector assets or operations to the private sector.

RELIABILITY

The ability of the system to meet the demand imposed by users.

RENEWABLE ENERGY

Energy obtained from sources that are naturally regenerated. This encompasses hydro, solar, wind, wave, tidal and geothermal sources.

RESERVE PLANT MARGIN

The total plant capacity available less the actual maximum demand for electricity in a particular year, expressed as a percentage of the maximum demand.

RING FENCING

The division of an enterprise into separate accounting entities.

SCHEDULED OUTAGE

The planned removal of a generating unit from service for routine or preventative maintenance.

SPECIFIC ENERGY

The energy released upon combustion of a unit quantity of fuels. Units are kJg^{-1} .

SPINNING RESERVE

The reserve on the system to provide for an unexpected loss of generation.

STANDBY/EMERGENCY DUTY

The use of generating plant to cover unexpected outages of other plant or sudden increases in load.

SUB-TRANSMISSION

Medium voltage power lines and transformers which carry electricity from terminal stations to sub-stations and medium voltage customers.

SUSTAINABLE DEVELOPMENT

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

THERMAL GENERATION

The use of heat to generate electricity. Fuel is burnt, producing steam from water which drives a turbine. The spinning of the turbine produces electricity from a generator.

TOTAL FACTOR PRODUCTIVITY

A measure of the use made of all inputs to production by a firm. Main inputs to production include labour, capital, material, technology and energy.

TRANSMISSION

High voltage power lines and transformers which transmit electricity from power stations to terminal stations and high voltage customers.

UNIT

One generating unit in a power plant, such as Loy Yang A1. The decision to bring a unit into service is based on the calculation of incremental cost and generation and expectation of demand.

WHEELING

Transfer of energy from a seller to a buyer through a third participant's system.

YARDSTICK COMPETITION

'Competition' created by comparing performance between similar organisations where no market competition exists.

APPENDIX B
Select Reading List

Allbut,G. *A Brief History of some of the features of Public Electricity Supply in Australia and the Formation and Development of the Electricity Supply Association of Australia 1918 - 1957*. Electricity Supply Association of Australia, 1958

Anderson,G. *Fifty Years of Electricity Supply. The Story of Sydney's Electricity Undertaking*. The Sydney County Council, 1955

Beljanovski,C. (Ed) *Privatisation and Competition. A market prospectus*. Institute of Economic Affairs, 1989

Bishop,M *et al Privatisation and Economic Performance*. Oxford University Press, 1994.

Clinton,A.(Ed) *Regulating Regional Power Systems*, Quorum Books, 1995.

Commonwealth of Australia, *National Competition Policy. Report by the Independent Committee of Inquiry*, Chaired by Prof F Hilmer, 1993

Egan,M. *Electricity Reform Statement*, Presented by the Honourable Michael Egan Treasurer of New South Wales and Minister for Energy, May 1995.

Egan.M. *A Plan for a Secure New South Wales*. A discussion paper prepared by the Treasurer and Minister for Energy, Michael Egan, MLC for distribution to Pacific Power and Electricity Unions at the Consultative Meeting on May 22 1997.

Einhorn,M. (Ed) *From Regulation to Competition: New Frontiers in Electricity Markets*. Kluwer Academic Publishers, 1994

Elliot,D., "Renewables and privatisation of the UK ESI" in *Energy Policy*, Vol 20, No 3, March 1992

Ernst,J. *Whose Utility? The Social Impact of Public Utility Privatisation and Regulation in Britain*. Open University Press, 1994.

Evatt Research Centre, *State of Siege. Renewal or Privatisation for Australian State Public Services?* Pluto Press, 1989

Galligan et al (eds), *Managing microeconomic reform*, Federalism Research Centre, 1993

Gilbert,R & Kahn,E. (Eds) *International Comparisons of Electricity Regulation*. Cambridge University Press, 1996.

Green,R. "Reform of the Electricity Supply Industry in the UK" in *The Journal of Energy Literature*, Vol II, No 1, June 1996

Grey.F. *Trading Power: The New Victorian Power Game. The economic dynamics of Victoria's electricity reforms*. Public Sector Research Centre, The University of NSW, 1996

Independent Pricing and Regulatory Tribunal, *Electricity Prices 1996/97. An information paper*. January 1997

Industry Commission, *Energy Generation and Distribution*, 1991

Kellow,A. *Transforming Power. The Politics of Electricity Planning*. Cambridge University Press,1996.

King,S. & Maddock,R. *Unlocking the Infrastructure. The reform of public utilities in Australia*. Allen and Unwin, 1996

Lennon,M *et al*, *ALP Taskforce Submission to the Committee of Inquiry into the Sale of Electricity Assets*, 1997.

Newberry,D.M. "Power Markets and Market Power" in *The Energy Journal*, Vol 16, No 3, 1995

NSW Government, *Performance of NSW Government Businesses 1995-96. Microeconomic Reform*, February 1997

NSW Government, *Report of the Committee of Inquiry into Sale of the NSW Electricity Assets*. Chaired by Mr Bob Hogg, August 1997

Parliament of Victoria, Public Bodies Review Committee, *Report to the Parliament on the "appropriate model for the corporatisation of the State Electricity Commission"*, June 1992.

Pluto Press Australia in association with the Public Sector Research Centre, University of New South Wales, *Powering the Future: The Electricity Industry and Australia's Energy Future*, 1991

Ramanadham,V. *Privatization and After. Monitoring and Regulation*. Routledge, 1994.

Roberts,J *et al*. *Privatising Electricity. The Politics of Power*. Belhaven Press, London, 1991.

Rosenthal,S & Russ,P. *The Politics of Power. Inside Australia's Electric Utilities*. Melbourne University Press, 1988.

Storey,R. & Caldwell,J. *Statement of Views on Proposal of the State Government to Create a Commission for the Control of Generation of Electricity Supply*. Local Government and Shires Association of NSW, 1950

Stuhmcke,A. "Administrative Law and the Privatisation of Government Business Enterprises: A Case Study of the Victorian Electricity Industry." in *Australian Journal of Administrative Law*, Vol 4 No 4, August 1997

The Electricity Commission of NSW. *Performance and Future Direction. Statutory Report to the Minister for Energy*, 1983

Trengrove,C (Ed) *Australian Energy Policy in the 80's*. Allen and Unwin, 1986.

United Nations, *Accounting, Valuation and Privatisation*. United Nations, New York, 1993

Veljanovski,C (Ed) *Privatisation and Competition. A market prospectus*. Institute of Economic Affairs, 1989

Waterson,M. *Regulation of the Firm and Natural Monopoly*. Basil Blackwell Ltd, 1988.

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