

# **NZ ELECTRICITY SECTOR 1995**

A Report Prepared

by

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For

**INTERNATIONAL RESOURCES GROUP**

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## **POWER RESTRUCTURING IN NEW ZEALAND**

### ***HISTORICAL PERSPECTIVE***

1. New Zealand (NZ) is a Democratic Constitutional Monarchy, of 3.4 million people, in the South West Pacific, comprising mostly descendants of immigrants from the United Kingdom, but including over 600,000 Maori, descendants of the indigenous Polynesian inhabitants. This population is spread over two main islands and a number of smaller islands.

2. The North Island has about 2.6 million people, and of these close to one million are in the vicinity of the main population centre, Auckland. Electricity is reticulated over some 266,000 square kilometres (virtually the whole of the land area), and about 99.7% of the population can obtain supply with no difficulty. Nearly 74% of electricity generation is hydro-electric. Of this nearly 70 percent is generated in the South Island. With most demand occurring in the North Island there is a regular net transfer of power from the South Island to the North Island through the 500 kV DC link. In 107 years the NZ Electricity Industry has gone the full circle, from a pioneering, customer driven, private and municipally operated, dispersed and independent supply systems, through centrally planned integration, national coverage, state ownership and regulation, to the current phase of deregulation, privatization and market driven investment.

3. The Treaty of Waitangi, signed in 1840, between representatives of the British Government and the Maori tribes of NZ gave legal authority to the British Crown in NZ and authorised European settlement. Immigration was given a boost in the 1860's with the discovery of gold in the South Island. While flour mills in the Canterbury Province were powered by privately generated electricity, in the 1860s, and a private house in Auckland received electric lights in 1882, it was in 1888 that the first public electricity supply in NZ was connected in the South Island mining town of Reefton. The power was supplied by a hydro-electric generating unit located on the nearby Inangahua River.

4. With the attraction of gold, the South Island was the major centre of population. The Electric Motive Power Act of 1896 allowed the provision of power to gold fields and in 1903 The Water Power Act vested in the Crown the sole right to use water for generating electricity. Licenses were issued to the private interests generating or interested in generating electricity. In 1918 an Electric Power Boards Act was passed enabling the establishment, of elected local authorities, to reticulate and retail electricity within defined franchise areas, on the local initiative of no less than 25% of local rate payers, by petition to the Governor-General.

5. These bodies were the pioneers of electricity, charged with promotion of its safe use in their areas. Those involved believed quite rightly that by promoting electric power they were advancing the living standards of their fellow citizens. Boards had the power to raise loans and the local tax payers (rate payers) could be levied to meet any operating

deficiencies, thereby carrying the commercial risks. They were obliged to supply electricity on a non-discriminatory basis. On the one occasion a Power Board faced financial difficulties requiring rating property owners, the government nationalised the Board, which in 1936 became Southland Electric Power Supply (SEPS).

6. A State Hydro-electric Department was established in 1946 to co-ordinate government investments in generation assets, produce and on-sell hydro-electricity. In 1958 this became the NZ Electricity Department (NZED). The Department was funded by, (a) Loans raised by the Government and made available to it from the National Development Loans Account (NDLA), and (b) The Department's own internal funds, including, profits, depreciation and other reserves. This department did not incorporate the 60 plus retail electricity undertakings, included Municipal Electricity Departments (MEDs) owned by local authorities and the Power Boards, which mainly served outer suburbs and rural consumers.

7. In the early 1960s the interest rate on loans from the NDLA was 4½% and this rate remained stable until the early 1980s when market rates were close to 20%. Tax was paid on Departmental income, however, in the late 1950's, the country was facing an acute shortage of power supplies and a plan was prepared to augment revenues, to produce an aggregate of revenue over charges and expenses, including depreciation and interest (but not loan repayment), of 25%. This would provide the Department with the revenue it needed to invest in additional plant. These plans were implemented in the early 1960's.

8. In 1945 a Rural Electricity Reticulation Council (RERC), was established, funded by a small levy on all retailers. It was aimed at providing subsidies to electricity supply authorities, towards the cost of building rural supply lines, until they became viable. The role of the RERC was expanded in 1965 to include subsidies for community power schemes, (generation and distribution) separate from the national grid. In 1990, during the major reforms the practice of subsidising rural lines was discontinued, leaving the RERC with the role of monitoring of the impact of electricity reforms on the rural community. In 1995 the RERC reported that it had received few complaints from the rural sector concerning the impacts of the electricity reforms and as a result evaluated whether it should dissolve earlier than its statutory deadline of 1st April 1997.

9. By the mid 1960's the industry had reached a plateau. Most of the country had been reticulated with electric power. Electricity was accepted as an integral part of everyday life rather than a new, potentially dangerous commodity that had to be promoted to the sceptical, as was the case in the early days of the Power Boards. The Boards themselves, which had been the dynamic element promoting electricity lost their pioneering urge and settled back into a complacent and middle age, preoccupied with the problems of securing re-election rather than the economic health of their customers. Bulk Tariffs became increasingly politicised, with the government manipulating the bulk tariff to influence the national inflation figures. Not only was it the tradition to announce the forthcoming tariff at the ESA Conference, but on several occasions tariffs were frozen for years at a time to reduce measured inflation. Cross subsidies between classes of consumers were common place. When faced with a large increase in the bulk supply

tariff the board members invariably resolved to minimise the impact on upon household voters and loaded additional costs on their apparently buoyant commercial customers. In every small town and provincial city the Power Board building was the largest in town and a job with the Board was a by-word for security and good pay. ESSA conferences became jamborees of officers, elected board members and spouses which contributed very little to the development of the industry.

10. At the same time it was becoming clearer that electricity was under priced. Subsidies kept prices down, the pervasiveness of electricity as a fuel source and the decline in the once powerful coal industry were indicators that industry's rapid expansion was encouraging wasteful use. In 1972 the Ministry of Energy Resources was formed as a small, policy and planning body, partly as a broader stream of energy advice than that offered by the heavily electricity focused NZED and Ministry of Works and as a sign of the growing importance of gas and oil in the energy sector.

11. In 1978 the NZ Electricity Department, the Mines Department and the Ministry of Energy Resources were combined to form the Ministry of Energy (MoE)<sup>1</sup>. The OPEC oil crisis forced a rethink of an energy strategy that had been based on burning low cost oil and gas to generate electricity. It led to a period of substantial electricity prices rises, reduced rates of electricity demand growth, with the development of a notional surplus in generating capacity. An over reaction to the crisis led to an intensive oil based fuels replacement program, including extensive gas based development. This included the construction of a production platform in the "Maui" gas field, the construction of a gas-to-methanol, a gas-to- ammonia urea and a gas-to-gasoline plants, the expansion of NZ's only oil refinery and the expansion of its only steelworks. From the middle of 1984 NZ began a major structural adjustment program to correct large fiscal imbalances and major distortions of resource allocation in the economy.

12. In the 1986 Budget the NZED and Power Boards were made subject to company taxation. The effective exemption of the electricity industry from taxation had been a means of stimulating power sector growth without correcting the fundamental problems underlying poor economic performance. The focus had shifted to correcting the underlying misallocation of resources.

## **REFORM STRATEGIES**

13. Following the 1984 Election the new government was faced with a critical fiscal position, including a central government budget deficit of almost 10% of GDP. It undertook several major reviews of government expenditure and trading activities came into the spotlight. In two important policy statements the government adopted a number

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<sup>1</sup> The former Electricity Department and the Electricity Division of the Ministry of Energy were both known as NZED. The principal State Owned Enterprise, was called Electricorp. It was usually known by its abbreviation ECNZ. Following the bad publicity it attracted in the electricity shortages of 1992 its name was changed to ECNZ. The Electricity Department and the Electricity Division will be referred to as NZED and the SOE will be called ECNZ throughout.

of principles to govern the operation of its own trading activities. These were designed to improve their financial performance and to reduce or eliminate the drain on the national budget that they represented. Among the most important principles adopted were some which had a profound impact on the power sector:

14. Responsibility for non commercial functions was separated from major trading state owned enterprises. Regulatory functions and the provision of social services would henceforth be the role of government policy agencies or agencies specially created to handle these roles. As a result decision it was possible to give the managers of state owned enterprises the principal objective of running their enterprises successful business enterprises. Their roles were clarified making it possible for managers to be held accountable for performance. If managers were to be held accountable they needed the power to allocate resources to their best use. Consequently, managers were given responsibility for decisions on the use of inputs and on pricing and marketing of their outputs. Political control would be maintained but in a different form. Instead of focusing on inputs the control mechanisms focused on outputs. Performance objectives were agreed between Ministers and the Enterprises' Boards so that Boards and managers could be held accountable to Ministers and Parliament for the results of their trading.

15. The advantages and disadvantages which state owned enterprises had, including exemption from the need to comply with many laws and regulations governing private sector activity were withdrawn. Also unnecessary barriers to competition, were removed so that normal commercial criteria would provide a fair assessment of managerial performance. Individual SOEs were reconstituted on a case by case basis in an appropriate commercial form, usually as ordinary companies under the normal companies law. Boards were recruited comprising the best possible talent that could be recruited from the senior echelons of the private sector. Remuneration was in line with standards applying in the private sector but in most cases board members were engaged at rates below the levels they would normally command but rejoiced at the chance to straighten out enterprises which had been widely seen as a drag on the economy.

16. These principles were amplified on the 27th March 1986, when it was announced that the government had decided that public enterprises would be required to fund spending from normal private sector loans instead of subsidised Government loans. Enterprises like NZED with cheap loans from the Government outstanding were required to repay these and refinance in the normally commercial money market. State Owned Enterprises (SOEs) were to be required to pay tax and dividends to the government, as with any other company. Some agencies, like power boards, would lose their tax exempt status and new incentives would be set in place to improve departmental asset management policies. These decisions collectively represented a major change in thinking about the role of government trading agencies.

17. Electricity, it was now recognised was one of several industries which had come through the pioneering phase, through the consolidation phase, when it was regarded as primarily a social service and into the commercial era where electricity was seen as a business deploying vast amounts of capital at a huge cost of some citizens of the country and to the enormous benefit of others. While most citizens were in both category, many

suffered disproportionately in one and benefited disproportionately in the other. For example it was traditionally argued that government subsidies kept power prices down benefiting the poor. The government argued that it was inappropriate to use the income tax money paid by modest income people to finance electricity if the principal beneficiaries were Coracle, NZ Steel, the huge forestry companies and people who owned swimming pools.

18. There were predictions that the levying of taxes on the NZED and the Power Boards would lead to a doubling in the price of electricity. In the event, because of the efficiency gains and the threat of competition putting a lid on price rises, this change was absorbed without consumers noticing any difference. This remained true despite a decision to allow the MoE to market electricity at cost based prices, directly to some large consumers, thereby by-passing the retail sector and forcing it to address the large disparity between some domestic, commercial and industrial tariffs. At a stroke this step prevented Boards, where the large direct purchase customers were located, from using them as a cash cow to subsidise other consumers. The threat that other customers would apply for direct supply had a restraining effect on the pricing policies of other Boards as well. In the event only major industrial customers, including BHP-NZ Steel Ltd, NZ Rail Ltd, Pan Pacific Forestry Ltd, Tasman Pulp and Paper and Winstone Pulp International, took up this option. Comalco, an aluminium smelting company was also a direct customer under a separate, deal created in the early 1960s, which became very concessional as the deal had been made without an adequate provision for inflation indexing.

19. Another important step was to remove barriers to new entrants into the industry, with competitive generation being freed from departmental control and investment decisions being placed at the risk of the investor. This effectively removed the prohibition on persons other than the Crown generating electricity for public sale. However, the most noticeable change occurred on the 1st April 1987, when the Electricity Corporation of NZ, (Electricorp), was one of nine State Owned Enterprises (SOE)s formed from the trading activities of former state Departments. The key aspect of this policy was the attempt to put SOEs at arms length from day to day political decision making. Ministers were prohibited from getting involved in the day to day activities of the business. The commercial board structured the new corporation as a holding company with subsidiaries for Generation, Transmission (Trans Power), Maintenance (Powermark), construction (Power Design Build), marketing (Electricorp Marketing).

20. As decided in 1986 the corporations would be accountable to the government and this was achieved through the annual "Statement of Corporate Intent" (SCI) procedure provided for in the State Owned Enterprise Act 1986 (SOE Act). The SOE Act set out a code for the relationship between the government and designated SOEs and the SCI was a key component of this providing the mechanism whereby the Board and the Ministers agree on a corporate strategy. Another important aspect of the Act and associated legislation was the withdrawal of any government guarantees over the corporations' debts. This placed all SOE decisions under the scrutiny of stockbrokers, investment analysts and others who previously, for lack of information, had been forced

to treat these businesses as if their activities had no appreciable economic impact. Also on the 1st April 1987, the Mines Department became another SOE, CoalCorp, and the Ministry of Energy became an independent policy and regulatory ministry. The rump of the once powerful department was amalgamated with the Ministry of Commerce in 1990.

## INSTITUTIONAL STRUCTURE

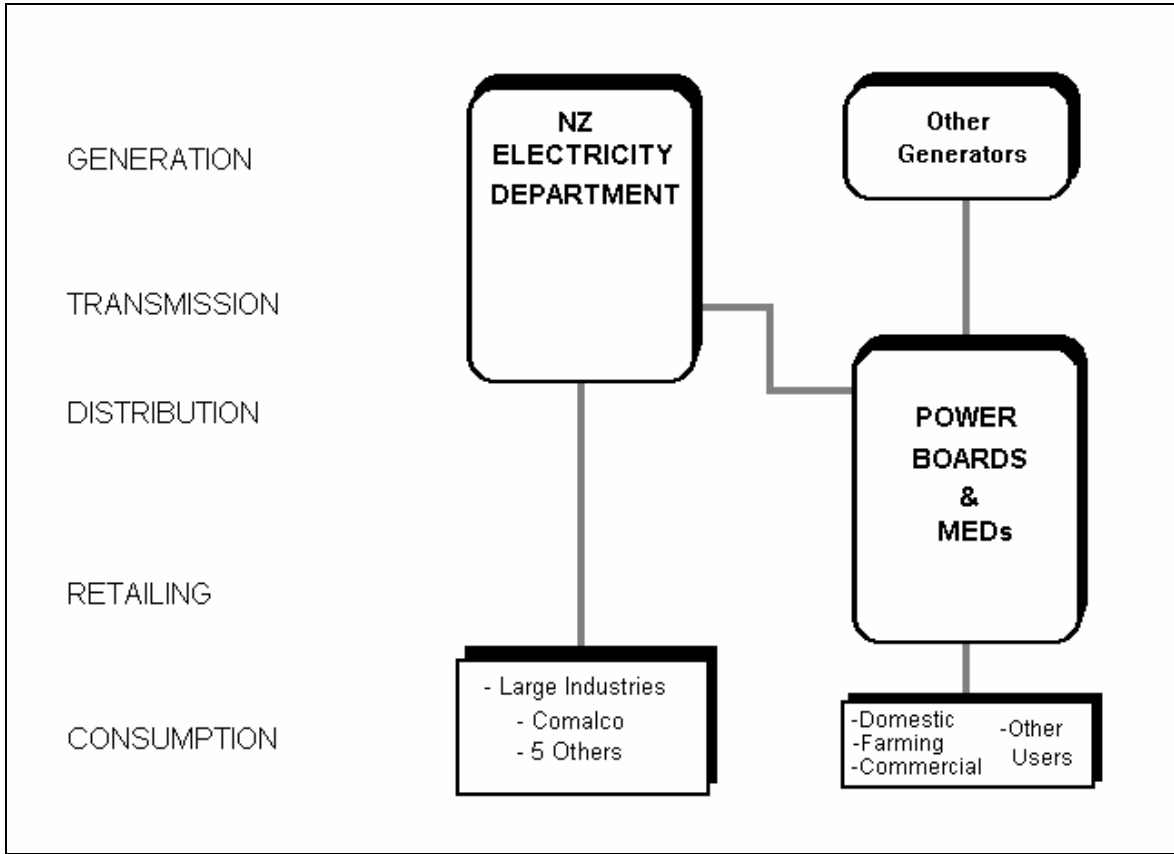
### NATIONAL

21. In 1986 the structure of the electric power industry in NZ was as depicted as in Figure 1. The core of the industry was the generation and transmission arms of the NZED. Some Supply authorities and some private generators were involved in generation but in excess of 96% of all generation was undertaken by NZED. power was sold to the monopoly local networks owned by Power Boards and MEDs. Only the 5 large industrial enterprises, were able to purchase power directly from the NZED, other customers had no choice of supplier or carrier. By 1995 this has changed to the position illustrated in Figure 2. The commercial restructuring of ECNZ is evident through its involvement in direct supply to its major customers and all networks separated from energy marketing. This was not all due to internal decisions in ECNZ. In December 1987, a Taskforce, including ECNZ, the Treasury, the Ministry of Energy and the Department of Trade and industry was established to make recommendations on the future structure of the industry, which would include a consideration of the future of the retail end of the industry. In 1990 the Taskforce reported, and recommended that:

- ESA Franchise areas be abolished as a means of eliminating protection for monopolies.
- Line and energy charges be separated in bills to customers.
- There should be no price control, only be “light-handed” regulation of line charges and retail energy prices.
- ESA should be reorganised into company form, privatized and listed on the sharemarket.
- ECNZ “spur lines” should be owned by Trans Power.
- Trans Power should be separated from ECNZ.
- Trans Power should be owned by a “Club” of generators and distributors, with the government retaining a “Kiwi” share, with voting rights over specified articles.
- Further study of the costs and benefits of further break up of generation.
- Removal of barriers to entry to generation and price discrimination
- Privatization of ECNZ.

22. This ambitious set of proposals has been mostly implemented. The current government have ruled out the privatization of ECNZ, which would in any case be

difficult given the dispute between the government and Maori tribes over ownership of land rivers and water. It was not possible to persuade the generators and distributors to form a club to own Trans Power and this was set up as a separate SOE.



*Figure 1, The Structure of the NZ Electricity Industry 1985*

23. The development of a properly functioning wholesale market was widely recognised as the next step in the development of the electricity sector. In 1993 the Wholesale Electricity Market Development Group (WEMDG), was established by the Government in June. It was to provide the Government with proposals for developing a wholesale market in electricity that, consistent with sustainable development, would ensure that electricity is delivered at the lowest cost to the economy as a whole. Reforms continued, notwithstanding the absence of concrete decisions on many issues and on 1st April, 1994 retail franchise areas were abolished. This step created the potential for competition in retailing as well generation, where it had been allowed since 1985.

24. ECNZ had always recognised the need to isolate its transmission arm from other activities and had set it up as a subsidiary company. The Taskforce had recommended that it be made a separate organisation, a club of generators and distributors. This move had been designed to create more transparency in the relationship between the vertical divisions of the industry, thereby making a “light handed” approach to regulation more feasible. On 1st July, 1994 Trans Power, the subsidiary of ECNZ, was established as an

independent SOE. The government had not proceeded with the club idea when there appeared to be little enthusiasm in the industry for the modest additional advantage it would gain in transparency set alongside the substantial capital cost of buying a one third share of a NZ\$ 2.9 billion enterprise.

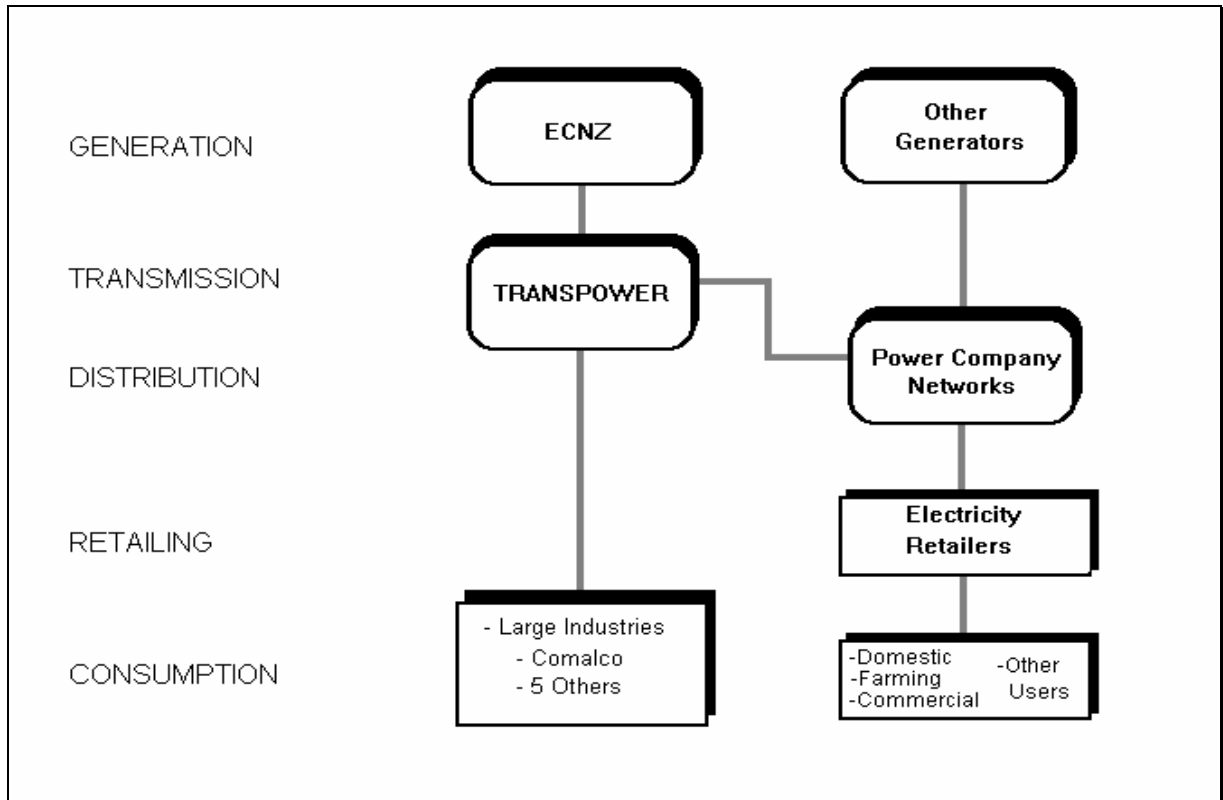


Figure 2, NZ Electricity Sector 1995<sup>2</sup>

25. Transparency was obtainable from another leg of the “light handed” regime. The same day, that Trans Power gained its independence, the Electricity (Information Disclosure) Regulations came into force. With the information provided by these regulations consumers or competitors will be in a better position to exercise their rights under the other leg of the policy, New Zealand’s general monopolies and mergers and competition law, the Commerce Act 1986. This Act prohibits the abuse of a dominant position in an industry to the detriment of competition and contains the, presently inactive, legislative authority to impose price controls. As a pointer to the future the same month, the ESA and ECNZ established a wholesale electricity trading company, Electricity Marketing Company, EMCO. This would be necessary to operate the wholesale electricity market that was then under discussion.

**PROVINCIAL AND LOCAL**

<sup>2</sup> Electricity Enterprise Statistics, Ministry of Commerce, 1995, Page 7

26. In the 1989 Budget Legislation the Government abolished elections for Power Boards and sitting Board members became temporary appointees. As a precursor to implementation of the reform agenda, In 1990 Power Boards were augmented with commercial directors, and most existing Board members became trustees with the task of overseeing the activities of the commercial board and protecting the interests of the local communities. Soon afterwards, several national bodies (including the Electrical Supply Authorities Association, (ESAA), Power Boards Association, (PBA) and Municipal Power Authorities Association, (MPAA)), representing the retail electricity sector, were amalgamated to form a single body, to represent retailers, the Electrical Supply Association (ESA).

27. Under the 1992 Energy Companies Act, all electric power boards and municipal electricity departments were corporatized as electric power companies (EPCs). Shareholdings are a mixture of local authority, trust, direct consumer and investor ownership. A process of mergers and acquisitions began. Following an unusually dry winter a commission of inquiry criticised some aspects of ECNZ's management of the system, in that it placed insufficient attention to the maintenance of power supply. To facilitate the development of competition in the retail sector in early 1992 ECNZ decided generation was its core business and that it would not enter the retail market. Accordingly its Marketing Subsidiary was amalgamated with Electricorp Generation. This was only a precursor to a substantial shake-out of the retail distribution sector which has now commenced.

## **FUNCTIONAL STRUCTURE**

### **GENERATION**

28. NZ's electricity generation is predominantly hydro based utilising run-of-river systems and water stored in natural or man-made lakes. Hydro provides between 70 and 80% of electricity, geothermal 7% and thermal generation, including gas, oil and coal the remainder. Hydro lake storage is only 12% of annual demand when full. Most countries rely on thermal based electricity or systems or have much greater hydro storage capacity. Two lakes in the South Island, Tekapo and Pukaki represent 66% of total storage capacity. ECNZ now has 39 operational power stations, comprising two geothermal stations, seven thermal stations and 30 hydro stations. Other generators primarily produce for their own needs.

29. Three methods have been employed to help optimise the system over time. In the 1950s and 1960s the focus was on "Increased Capacity" because the system was constrained by a shortage of capital. The focus then shifted to "Supply Cost Minimisation" where investment and production costs are minimised within a set minimum security standard that determines the reliability of supply. In more recent times the concentration has been on "Shortage Cost Minimisation (total economic optimisation)", with all factors being expressed in the form of costs. Optimisation is

sought by minimising total cost of the system in terms of investment and production costs, at the same time taking into account the cost of shortages to society as a whole.

30. The dominant generator is ECNZ Generation, with some 96% of generating capacity. In the past few years ECNZ has made significant gains in plant availability with reductions in planned and random outages. The additional potential generation available as a result has been 8800 GWh. Figures 1 and 2 indicate the development of the structure of ECNZ from its predecessor the NZED, and gives a clue to the importance of ECNZ Generation prior to the decisions on the development of a wholesale electricity market.

## TRANSMISSION AND DISPATCH

31. Transmission and dispatch are today the responsibility of Trans Power, an SOE formed in 1994 from the ECNZ subsidiary company. Trans Power is not permitted to buy or sell electricity and its sole function is to carry power between generators and distributors. Pre-dispatch (generation scheduling) and day-to-day dispatch is carried out by the Trans Power control centres under a dispatch agreement with ECNZ. The major item of plant having an influence on management of electrical energy resources is the high voltage direct current (HVDC) inter-island transmission cable. This link was first commissioned in 1965 with a capacity of 600 MW south to North and 300 MW in the opposite direction. The capacity has been upgraded to 1200 MW south to north and 300 MW to 840 MW north to south to increase the flexibility and responsiveness of the system.

- Generation forecast, load demand and transmission losses for up to 48 hours ahead.
- Expected generating plant availability, and any special conditions that apply.
- Transmission equipment status and system security requirements.
- Actual and forecast tributary inflows as estimated value of energy.
- Fuel delivery constraints.
- The generating plant Merit Order.

32. The development of wholesale market will alter the role of Trans Power but to the extent that ECNZ's optimisation planning has been based on evaluations being expressed in the form of costs, it will facilitate rather than hinder the development of a more competitive system.

## RETAIL DISTRIBUTION

33. The major change agents at the retail distribution end of the industry has been the requirement to separate line and energy charges and the abolition of franchise areas. These are now published under the Electricity (Information Disclosure) Regulations 1994, and from 1995 onwards it will be possible to collect information on the variations between companies. This information only makes transparent the large differences in efficiency that existed between the power distributors and retailers in the various regions of the country. These organisations resisted many attempts at rationalisation and amalgamation but the imperatives of the market are forcing them together. There are now only 44 undertakings compared with 61 in 1984. Amalgamations and hostile take-overs are likely to reduce this number still further. Even in the organisations that have not yet been affected by mergers there has been a substantial pruning of the costs of the industry with many functions being abandoned or contracted out and much of the expensive superstructure of the industry being abolished.

34. With the approach of a wholesale market the retail and distribution sector is in a dynamic state. In addition to amalgamations and take-overs, twenty two of the successor companies have banded together into three groups to bargain with ECNZ on more equal terms. Four companies have become “wires only” businesses and have amalgamated their energy marketing activities into one separate company, United Electricity. Of 30 power companies not owned outright by local government units, eight adopted to give-away their shares to their consumers and 22 adopted to remain wholly owned by community trusts. In the case of the Capital City “Capital Power”, owned by the City Council was 49% sold to “TransAlta” a Canadian Power Company. In the Auckland region, the former Waitemata Power Board, which serviced the Auckland North West suburbs, renamed as “Power NZ, it issued shares to its consumers, only to see its neighbour, the former Auckland Power Board, Mercury whose shares are owned by a community trust, engaged in a hostile take over bid. The Rotorua City Charitable Trust sold 100% of the municipal power company to its neighbouring company Trust Power. The Capital Power sale also attracted interest from other parties including Northern Electric of the UK.

35. Several other overseas power companies, have show interest in the NZ power sector include ELF, with a 51% share in a potential partner for one of the joint gas/electricity companies, CoalCorp in a joint venture with Southgas, Amuri Corp with a share in Wairarapa Electricity, Fletcher-Challenge Ltd, with shares in two smaller regional companies and in the Natural Gas Corporation. National Power of the UK were also interested I the new combined cycle Stratford power station, but pulled out at the last stage and were replaced by a consortium including TransAlta and Fletcher-Challenge, NZ’s largest company.

## **ELECTRICITY PRICING STRUCTURE**

### **WHOLESALE / BULK POWER**

36. The main influence on energy prices from 1925 until 1988 was the wholesale bulk tariff. In the 1970s and the 1980s this was announced by the Minister of Energy at the ESAA Conferences. Gradually over the years the bulk tariff was amended to reflect the value of the energy being sold, at first and then the different value of energy in winter and summer months. Appendix 1 records the adjustments announced to bulk tariff over the years. In the periods 1957-60 and 1972-75 it will be noted that adjustments were put on hold due to political considerations. Similarly it can be noted that in post-election years, 1976, 1979, 1982 and 1985, for example the increases tend to be significantly higher, than in the previous year.

37. Since 1988 bulk sales have been negotiated between ECNZ and Power Companies this has been a major factor in encouraging the amalgamation of the distribution and retail sectors of the industry. Published information will be available under the Information Disclosure Regulations concerning: Standard and special contract prices and terms and conditions of supply. The first sets of information supplied under these regulations are with the Ministry of Commerce and will be published shortly. However, information published in the WEMDG report indicates the likely breakdown of wholesale prices, in relation to transmission, distribution and retail, (see Figure 5)

### **TRANSMISSION**

38. The comments that apply to wholesale prices also apply to transmission prices. The information disclosure regulations will impose more stringent requirements on transmission, the natural monopoly than on generation and retailing, the potentially competitive parts of the industry. Transmission and distribution companies will be required to disclose:

- Prices and terms and conditions of supply.
- Costs underlying line tariffs for different classes of customer
- Cost and prices allocation methodologies (i.e. the allocation of joint costs)
- Performance measures
- Audited financial statements

39. In the event that these requirements prove to be inadequate the government has indicated a willingness to employ price controls. At present no price controls remain. The success of these regulations will depend upon tight ring-fencing of the monopoly businesses. The 1990 Taskforce recommended that Generators and Distributors both take a state in the Transmission Company giving both of them the power to ensure that they are not being overcharged in the interests of the other. The fact that neither party

expressed great willingness to become involved financially must be an indicator of their confidence in the approach taken.

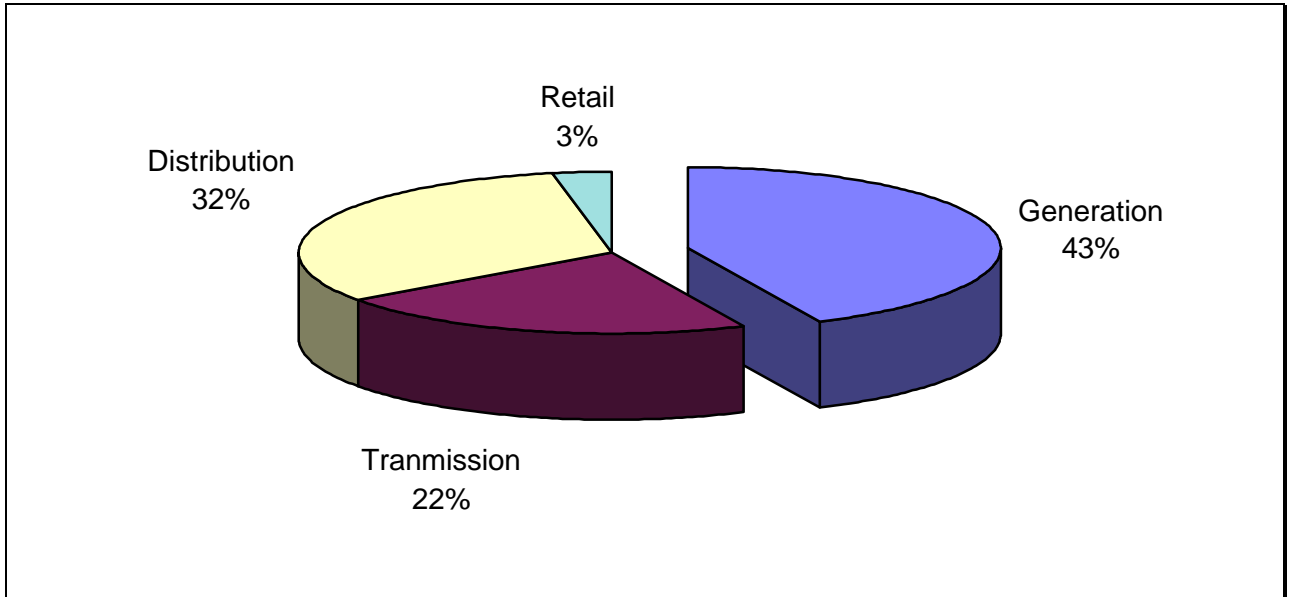


Figure 3, Electricity Industry Revenues<sup>3</sup>

**RETAIL TARIFFS**

40. With endemic cross subsidisation of residential electricity tariffs from industrial and commercial tariffs one would expect a rise in residential tariffs and reductions in industrial and commercial. This has been the pattern as can be illustrated from the data supplied by the Ministry of Commerce, in Figure 4.

41. This has not been a source of complaint as the rebalancing of the tariffs coincided with the policy of ECNZ to meet the challenge of potential competition by substantially cutting prices. These savings have been partially passed on by the retail and distribution sector in the form of reduced tariffs for industrial and commercial customers. With the ability to negotiate tariffs between the retailer and the distribution companies additional efficiency gains have been achieved.

42. One of the potentially most controversial aspects of the reform program was the effect that they would have on rural consumers. The RERC was specially charged to monitor these effects and report on them. They have presented a thorough analysis of the effects of reforms on rural customers and the pattern is similar to that reported above. The results of this study are present in Figure 5.

<sup>3</sup> op cit. Page. 6

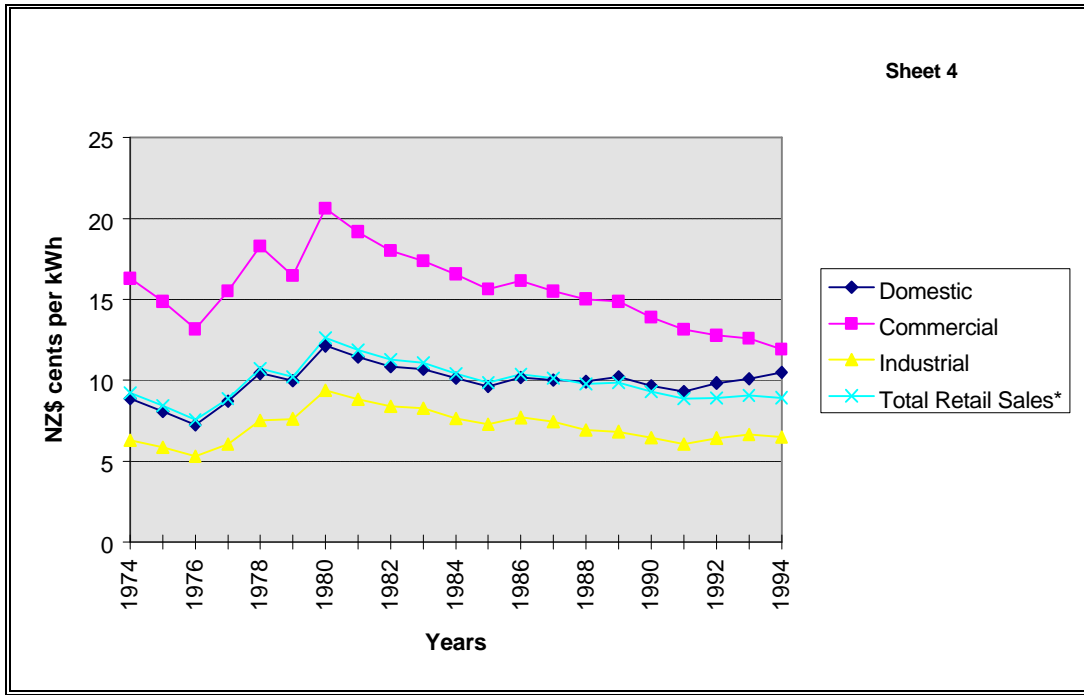


Figure 4, Trend in NZ Retail Electricity Prices 1975-1994<sup>4</sup>

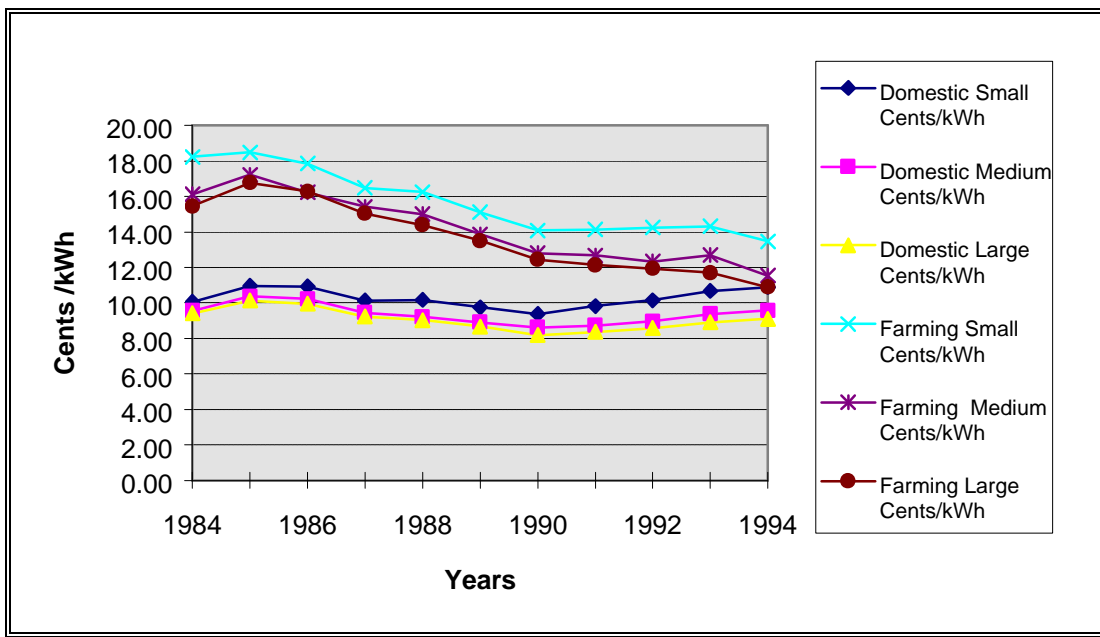


Figure 5, Trend in Rural Retail Electricity Prices, 1975-94

<sup>4</sup> Energy Data File, ministry of Commerce, January 1995, Page 79

## **DEVELOPMENT OF A WHOLESALE MARKET**

43. WEMDG reported in August 1994<sup>5</sup> and concluded that in a non-competitive market it was too easy to over-build electricity generation and pass the costs on to either consumers or taxpayers. They reported that the best way to prevent unnecessary capacity being built was to link building to the future needs of wholesale buyers and their customers. Power stations would not be built unless wholesalers were prepared enter into long-term contracts to purchase the power the new stations would produce. Energy efficiency can delay the need for new power stations and these options must be given an opportunity to compete more effectively against new generation proposals. A properly functioning wholesale market would also guard against new capacity being accompanied by sudden rise in the average wholesale electricity price. The Wholesale market that existed in 1994 did not satisfy these tests.

44. The existing market is dominated by the position of ECNZ as the only generator with which wholesalers can contract, (See Figure 3). ECNZ's power is dispatched by Trans Power operating under a contract with ECNZ. Other generators do not use this market, so wholesalers' choice is limited to one year contracts or to ECNZ's posted weekly prices. The six major users, (Comalco and the 5), do not use the wholesale market at all. The only contract longer than one year is the Comalco contract. In addition to any other limitations, Spot prices are set one week in advance on the basis of ECNZ's forecasts of its own short-run marginal cost of supply. This is the prime signal to the market and permits ECNZ to operate "financial hedge" contracts under which it sells electricity to wholesale buyers.

45. They identified a number of limitations with these arrangements in terms of creating a dynamic, forward looking wholesale market pricing system. The arrangements were created when Trans Power was a wholly owned subsidiary of ECNZ and may suit that company but are likely to discriminate against others, particularly new entrants. The basis for setting short-term prices is "in-house" to ECNZ. The ECNZ Fuel Resources Group, an inter-departmental team, is responsible for managing its fuel resources including, water, gas, coal and oil. It produces an annual integrated Operating Plan including detailed operating and maintenance plans. Generation Control, which is part of the Fuel Resources Group, establishes a Merit Order, weekly, or more frequently to advise the Trans Power Control Centres, at of the estimated value of water resources at any given time. This process is not transparent and is not well understood by customers.

46. Because they are set a week ahead the half-hourly prices are not necessarily consistent with the dispatch of plant on the actual half hour, and therefore do not necessarily ensure that all centrally dispatched competitive generators are adequately rewarded. The spot prices are currently capped at the price of fuel for a peak use station, and include an arbitrary Pool Price Margin, (PPM), which is added to all prices in peak periods. These arrangements fail to reward consumers willing to "sell" or forgo their supplies in peak periods, and fail to provide incentives for continuity of supply by

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<sup>5</sup> *Wholesale Electricity Market Development Group*, Wellington, August 1994, page 40-41.

generators. The PPM can be seen as a surrogate for a security of supply payment, but the total effect is that prices do not reflect marginal costs. Two other drawbacks identified are that customers do not have any choice as to the level of security of supply they purchase and anyone contracting for independent supply has no assurance of continued access to the spot market for back-up and residual demand on a non-discriminatory basis.

47. To resolve these problems the WEMDG recommended:

- The establishment of a wholesale electricity market in NZ at the earliest opportunity, featuring:
  - Sale of most electricity under long-term contracts.
  - A contract trading market to enable the trading of “unders and overs”.
  - A voluntary electricity Pool and Spot Market.
  - An independent Trans Power
  - Operation of the Pool by a neutral entity.
- ECNZ’s domination of the generation market should be constrained
- A domestic energy efficiency levy to fund conservation programs
- A small market co-ordination group should be formed.

48. These recommendations essentially brought together the existing situation with seven enhancements (see Figure 5): The establishment of a Pool would bring together buyers and sellers of electricity. It would also provide a non-exclusive forum for contract trading to enable buyers and sellers of electricity to manage their short, medium and long-term, purchase decisions. The pool would establish an independent spot, or real time price and would provide metering, reconciliation and settlement of transactions, replacing the existing mechanisms run by ECNZ.

49. The introduction of long-term contracts, standardised secondary contracts and a contracts trading market would replace the existing one-year contracts offered by ECNZ. Security hedges would provide a mechanism for wholesale buyers to contract with generators for firm supply, incidentally providing improved investment signals for the generations that will be required to meet security of supply requirements. The clarification and normalisation of the role of Trans Power that has been achieved with its separation would be extended to its role in with the Pool. To be operative the new structure will also require a suitable framework for market governance and management and adequate information services. A set of transitional measures would also be required.

50. Looking at Figure 7 it is clear that WEMDG also contemplated that ECNZ’s generation monopoly would also go and that there would be a significant role for Independent Power Producers (IPPs). While ECNZ had consistently stated that it would welcome competition, the perception of other participants in the market was that management of ECNZ would do everything in their power to maintain their effective monopoly for as long as possible. They were aided in this aspiration by Treasury Officials keen to see ECNZ privatized and anxious to get the best possible price. Other participants in the industry were equally determined to see the ECNZ monolith trimmed

in size and to create the fact of competition as well as the threat. Some saw dangers in the long-drawn out consideration of the wholesale market issues and regarded it as a front to give ECNZ everything it wanted. Until the last minute, for totally opposite reasons, a weird coalition, of state control leaning environmentalist and Comalco, fought both the break up of ECNZ generation and the creation of an effective wholesale market. The environmentalists wanted the opportunity for sympathetic politicians to turn the system on its head and ban new generation in favour of enhanced conservation expenditure and Comalco, for very worthy reasons, essentially opposed any measure that would give the public a better idea of how much they were actually paying for their power.

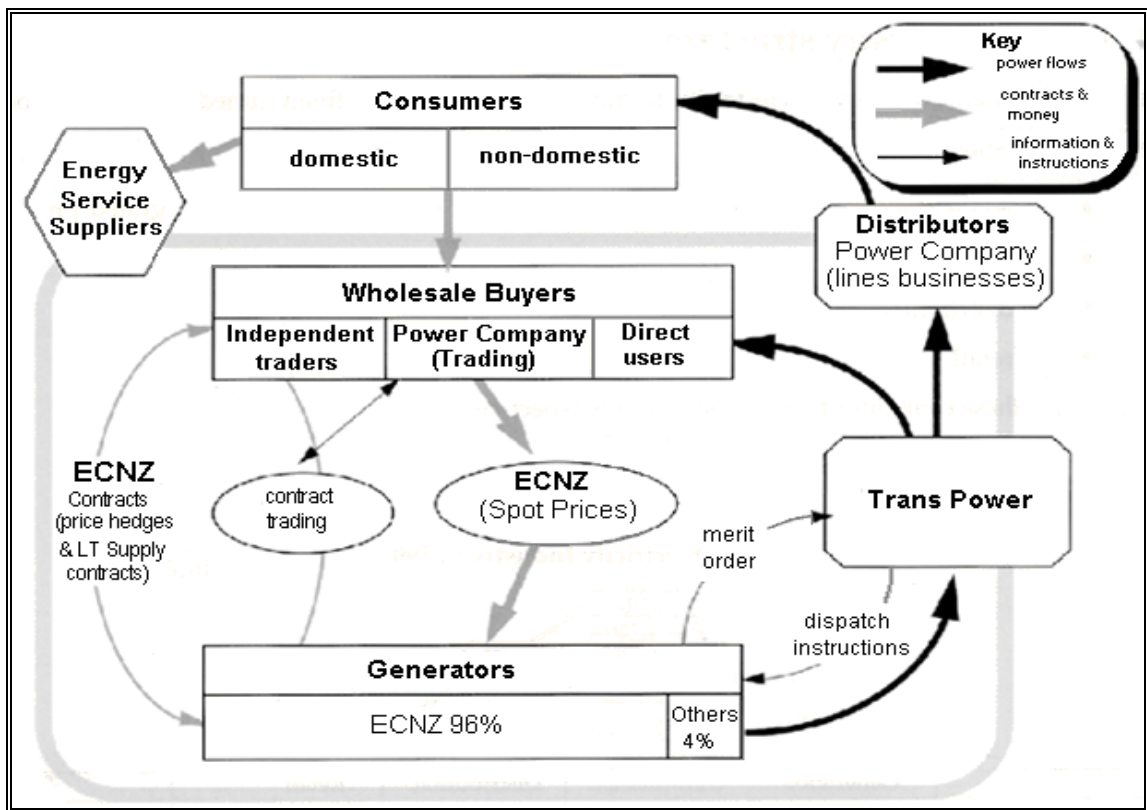


Figure 6, The NZ Wholesale Electricity Market 1995<sup>6</sup>

51. On 8th June 1995, after prolonged consideration of the balance of the recommendations of Taskforce and WEMDG the Government announced a package of decisions on reforms for the wholesale electricity sector:

- A new SOE will be set up, it will own two North Island thermal stations (New Plymouth, Stratford, small “peaking” stations, the geothermal stations and the stations on the Clutha river in the South Island, with about 28% of the country’s generation capacity. It is not for sale.
- ECNZ not for sale.

<sup>6</sup> Wholesale Electricity Market Development Group, op cit., Page 20.

- ECNZ’s gas purchase contract will be transferred to the new SOE.
- Eight small peripheral hydro stations will be sold to regional power companies or Maori interests.
- The Government will establish a five year transitional fund of NZ\$ 18 million to promote energy efficiency in the home, called the Energy Saver Fund.

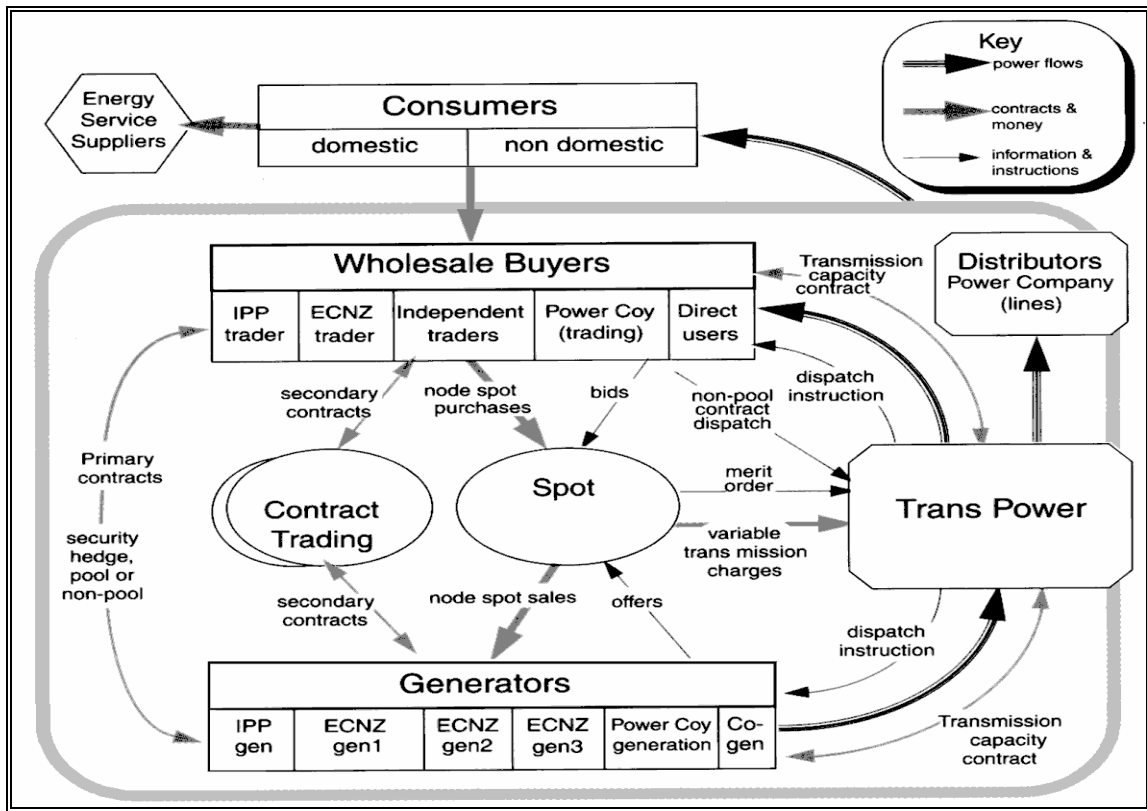


Figure 7, The WEMDG Proposal<sup>7</sup>

52. Even when it is split into two entities, ECNZ will still have a dominant market position in the wholesale electricity market, with a market share of over 60%. Accordingly, to make its pro-competition bias crystal clear, the government have agreed to a further set of special constraints to apply to ECNZ until its market share falls below 45%.

- A cap will prevent ECNZ from building more than 50% of new generating capacity. This will guarantee a share of the market to independent generators and ensure vigorous competition.
- ECNZ will be required to “ring-fence” any additional generating capacity which it provides within the cap. This will prevent ECNZ from cross-subsidising its new generating capacity in any way, forcing it to compete on even terms with alternative suppliers of new capacity and energy efficiency suppliers.

<sup>7</sup> op cit. Page 66

- ECNZ will provide most of its capacity on longer-term contracts, reducing its ability and incentive to manipulate or “game” spot market prices.

53. This set of decisions broadly follow the conclusions of the WEMDG Report and had been anticipated for some time, but while the key decisions have been taken the final shape of the wholesale market is still in a state of flux. What is clear is that dominant role of ECNZ, the successor to the NZED, is coming to an end. The government have clearly rejected advice from some influential analysts who would argue that the threat of competition would be sufficient to keep the dominant ECNZ focused on its customers and that a single dominant generator was no inhibitor of competition.

## **SUBSIDIES**

54. The main subsidy to the New Zealand electricity system was the financing of new construction through the National Development Loans Account System. This ceased with the establishment of ECNZ and progressively the loans account moneys were refunded in the private sector, repaid to the government which used the proceeds to retire debt. There are many uneconomic lines that were constructed at the time of RERC subsidies and these were addressed in the process of valuing the businesses of the new power companies.

55. At the local level there remains a small element of cross subsidy, but as was stated in the 1995 Report of the RERC: “The potential rural problem in most cases are so small in relation to the commercial operations of Energy Companies that it is commercially sensible to have some degree of cross-subsidy.” Innovative ways are being sought to address problems of uneconomic supplies and Also the Trusts that were set up at the time of the formation of the energy companies have both the power and the resources to address any problem areas.

## **PRELIMINARY RESULTS AND LESSONS LEARNED**

### ***Approach to Reform***<sup>8</sup>

#### **LESSON 1**

*The main lesson from the whole decade of economic reform in NZ is that reform was delayed until problems could be ignored any longer and a crisis existed.*

56. Deferral of important decisions and difficult problems makes the approaching crisis more acute and the difficulties greater. When all other soft options have been tried

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<sup>8</sup> These comments owe a great deal to a speech given by Hon Sir Roger Douglas at the Mont Perlerin Society, Christchurch New Zealand, 1989.

the reformer will finally get an opportunity always in the worst possible circumstances. In the case of NZ major reform of the state sector occurred at a time when the rest of the economy was in recession because of record low prices in its crucial agricultural products. The whole economy had to undergo restructuring at the same time compounding the feelings of uncertainty and deepening the problems in the labour market.

## LESSON 2

*Reform is best approached in bold leaps, if you ask for 150% you will be likely to achieve 100%. If you ask for 20% you are likely to get nothing.*

57. Once reform begins, momentum and credibility are essential. Momentum comes from unity of purpose and integrity of approach. Credibility comes from getting top quality advice on what should be done, implementing it and doing what you say you are going to do. Experience would suggest that reform will get the support of people, even those badly affected if the longer-term benefits are understood. Even those not greatly affected by change will feel happier if they can be reassured that compensation will be available for those people, worst affected. Transition, in New Zealand could possibly have been smoother and easier if some entities were compensated for the costs they incurred too, but the crisis fiscal position ruled that out. Institutional compensation is also a slippery slope. The owners of the NZ oil refinery sought compensation for the withdrawal of protection. They claimed that they needed NZ\$ 400 million. They accepted NZ\$ 80. It is arguable they were treated too generously. Once any government indicates a willingness to contemplate compensation, there is no end to compensation that institutions will demand.

58. Provided the principles of the reform program are sound details such as compensation can be negotiated. If the government stands by clear consistent principles, and direction, people will be happy to negotiate the detail. Putting the best available capable people in the right jobs, is a secret of successful reform. Even a strong political opponent with the clear mandate and good incentives will perform well and enhance the prestige of himself and the person who appointed him. Reform in "Packages" with winners and losers identified helps enormously in presentation of the direction and unity of purpose of the government. It has to be appreciated throughout that if the pain of reform is postponed, so are the benefits. Voters need to see the direction and the potential benefits, but voters with adequate information show good sense. Some high profile victories early on are very helpful. As soon as the public realised that ECNZ's formation did not mean a 50% increase in power charges, people relaxed. Once they can identify the incentives for good performance, the new opportunities and choices that reform is opening up voters will generally support what is taking place. Politicians themselves are an important part of the process and should have incentives to work hard and then retire.

59. The New Zealand electricity industry has undergone a major process of reform over a ten year period and that process remains incomplete. Some aspects of the reforms have been accomplished in a very short space of time. ECNZ was established from the

old NZED is the space of barely six months. Very few months elapsed before it had made its presence felt in the sector as a whole. By contrast the task for took more than 18 months to complete its work and the implementation of its conclusions will not be complete until the work of the WEMDG is complete. No decision has yet been made to privatize important aspects of the industry and indeed there have been political decisions that no privatization will take place.

60. This track record would seem to indicate a strong case for proceeding slowly with reforms. However, closer examination would indicate that the first radical steps proceeded at a very fast pace and that all of the subsequent work flowed from getting the initial steps right. The New Zealand preference for a regime of “light handed regulation” enable the process of reform to proceed without ossifying into a predetermined pattern at too early a stage. The threat of competition forced market participants to focus their attention on their customers, and on their discussions with their counterparts on getting the market structures right, rather than being diverted to attending the idiosyncrasies of a particular regulator.

### **LESSON 3**

*The relationship between the government and the major electricity SOE, was determined by policy framework enshrined in the State Owned Enterprise Act 1986, and because this document was well conceived it forced the rest of the industry to adjust.*

61. The SOE Act managed, in six months, to overturn 100 years of history, in the electric power, and several other sectors, and set up the forces that were to create the pressures for further change. The act by-passed the debate over the merits of privatization, by setting it to one side and creating the conditions in which state workers and managers could show what they were capable of. Many of the enhanced freedoms had been requested, sought and indeed offered over many years but inertia had repeatedly got the better of the reformer. The SOE Act created the mechanisms for ministerial accountability. The SCI procedure basically recognises the reality that ministers do not and cannot know the detail of the businesses they are being asked to run. The SOE Act created an alternative accountability framework based on the normal commercial decision making structure and gave ministers a role in that which they could usefully play and which gave them strategic decisions to take, rather than keeping them busy with masses of detail.

### **COMMERCIAL PERFORMANCE**

#### **LESSON 4**

*Privatization was not necessary to foster performance improvement. The key driving factors were good people, a competitive policy environment and the threat of competition to come.*

62. The SOE Act side-stepped the issue of privatization but actually brought private sector boards and management into the heart of the state trading enterprises. Apart from the internal functional separation of the major business groups, the first commercially orientated Board of ECNZ took a number of strong commercial initiatives.

- There was internal separation of high voltage transmission for common carrier purposes and transparency of the “natural” monopoly part of the business.
- There was a strong thrust to market the what was perceived to be a large “surplus” of generating capacity, to improve asset utilisation through increased sales.
- The threat of potential competition was addressed by cutting costs and lowering real prices, and
- Flexible wholesale pricing options were introduced to reflect production cost signals to customers.

63. These decisions took advantage of the SOE framework which permitted the removal of most day to day political considerations from the sector, permitting the sector to focus on commercial performance. ECNZ’s commercial results are set out below.

	1988	1989	1990	1991	1992	1993	1994
Op Margin NZ\$ million	671	816	830	844	836	750	1120
Net Profit after tax & extraordinary	141	332	359	456	449	330	496
Net Profit after tax as % sales revenue	3.7	11	11	14	13.1	8.6	10.7

**Figure 8, ECNZ Results** <sup>9</sup>

64. In addition during the period in question wholesale electricity prices have fallen by about 11% and NZ\$ 2.457 billion, as of the 1st April 1986<sup>10</sup>, of loans from the government were repaid to the government by 31st March 1991. There has been a similar performance experienced in the reformed ESAs, where staff has fallen from in excess of 8,000 in 1989-90 to just over 6,000 in 1993-94. During the same period customers per employee have increased from 172.48 to 244.52, GWh per employee have increased from 2.3 to 3.37 and km of lines per employee have increased from 15.17 to 20.32. The total assets of the power companies increased from NZ\$ 2.5 billion to NZ\$ 3.1 billion. Electricity demand is currently increasing too, so while the sales potential looks rosy there will soon be a need for investment in generation by the whole sector and that is bound to put upwards pressure on prices.

**LESSON 5**

*It is probable that if the gains achieved so far are to be maintained, one or more of the key SOEs will have to be sold to the private sector, thereby creating competition for management.*

<sup>9</sup> ECNZ Annual Reports, ECNZ, Wellington, 1991-1994

<sup>10</sup> Ministry of Energy, Annual Report, Year Ended 31st March, 1987 Page 84.

65. The SOE policy has been very successful at inducing a rapid improvement in the commercial performance of government owned trading activities. However, there are a number of reasons why privatization may be necessary to cement in the gains that have been made. The financial and institutional health of SOEs is always less important than running the country which must be the prime focus of ministers and the government. Experience in many countries over many years indicates that from time to time the needs of enterprises, suffer to government goals of lower prices, budget balance. There are very good reasons for this : If a business can't go broke, it creates the wrong incentives, SOEs hamper politically motivated shifts of resources, but if these are disallowed, why else does a government want to own an enterprise, what does a government "control" from its ownership? The state budget is always exposed to the risk of financial losses. What the proponents of government ownership fail to appreciate, in New Zealand as elsewhere, if the business is private people and foreign investors and banks carry the risks. Risks are almost always as probable as the profits on which advocates of state ownership focus.

## **ENERGY CONSERVATION**

### **LESSON 6**

*A closer focus on economics, and the removal of short-term political considerations from the industry is generally good for the environment.*

66. The first major NZ environmental battle took place over the proposals to develop the Manapouri lake for hydro electric development to generate electricity for the Comalco aluminium smelter. The value of the electricity to New Zealand is now between 6-9 cents a kWh. It is being sold to the aluminium smelter company for what is thought to be less than 3 cents a kWh. The development did take place, but it was hedged with restrictions which prevented the despoiling of a unique natural feature.

67. This battle was an early sign of the need to bring stricter economic criteria to bear on electricity investment decisions and to contemplate alternatives to hydro-electricity. At that time hydro-developments were strongly promoted by the Ministry of Works and Development and by many enthusiasts for electricity who knew its benefits to families and remembered the days of acute power shortages during the Second World War and in the early 1950s'. The need to keep expert dam engineering teams together was frequently advanced as sufficient reason for particular new hydro-electric development proposals.

68. The new focus on the economics of power development that corporatization and opening up to the private sector has brought, has ended this "build dams at all costs" mentality that characterised the former Ministry of Works and Development. In doing so it has had a an impact on increasing electricity costs, at the margin and over time will have the effect of reflecting the cost of environmental degradation in the cost of power and encourage the use of power saving devices.

69. Another impact on energy conservation and the environment generally, is that ECNZ has lost any privileged access to natural resources that it enjoyed when it was an integral part of government. Much of the electricity generation capacity constructed during the 1950s and 1960s was built under special empowering legislation. This legislation facilitated passage of the specific project through normal regulatory requirements, either by relaxing normal requirements for obtaining resource consents, speeding up passage through the process of obtaining resource consents or by overriding the consent process altogether.

70. The SOE Act and the Resource Management Act which followed shortly afterwards were designed to ensure that government inspired development proposals are subjected to exactly the same scrutiny as all others. ECNZ has to renew all of its 1,000 plus resource consents (including discharge permits) by the year 2001. This will limit the flexibility of the generating system and impose additional costs, including advancing the date of new construction or of making conservation options more attractive.

71. The main criticisms of the power sector reform process in New Zealand have been objections to the concept of promoting the sale of electricity, the criticism of burning gas to generate electricity and the alleged increased energy intensity of the whole economy that this has brought about. These criticisms are based on figures relating to the energy intensity of the New Zealand economy. Energy intensity figures are difficult to collect and the conclusions to be drawn from the output are debatable. The evidence seems to suggest that the combination of the major energy sector developments in the early 1980s, the deregulation of the transport sector and the falling prices of oil based energy products has led to some of the increase in energy intensity. More recent figures seems to suggest that this rise in intensity has levelled off and if anything is beginning to fall.<sup>11</sup>

72. Other criticism have been answered by pointing out that ECNZ was marketing a resource that was there already, namely the notional surplus in generating capacity. There is an subsidiary argument that by marking this surplus to a large number of small customers around the country it managed to switch consumers from greenhouse gas burning fossil fuels to largely hydro-generated electricity. The concern in relation to gas has some validity but on the other hand it is important to note that once the decision is made to develop an offshore platform the depletion rate is largely determined by the life of the platform. Newer technologies are perhaps lessening the force of this criticism but it remains valid as a working assumption nonetheless.

## **INSTITUTIONAL CHANGE AND REGULATION**

### **LESSON 7**

*Because a sector of the economy has within it a network, or natural monopoly element, this is no reason to treat the whole sector as a natural monopoly. By carefully*

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<sup>11</sup> *Energy Data File, Ministry of Commerce, January 1985, Page 87.*

*designing the structure of the industry to overcome the information asymmetries normally associated with natural monopolies regulation can be kept to a bare minimum.*

73. An important feature of the NZ reforms has been the dramatic shift in the pattern of government policy towards the sector and a willingness to reshape sector's institutions. The institutional developments have been described in some detail but it is important to emphasise that much of this work was designed to identify an appropriate structure that would obviate the need for intrusive economic regulation.

74. The NZ governments' approach to economic regulation of utility networks has four aspects:

- The reliance on commercial competition and the threat of competition as the prime regulator of the industry.
- Information disclosure (under the Information Disclosure Regulations)
- The threat of price control, (as in the case of Trans Power), and
- The Commerce Act.

75. It has been noted that the Commerce Act contains the legal authority to impose price controls, but also creates the authority for civil litigation by aggrieved commercial parties. It has recently been tested in court in a case involving the similarly deregulated telecom industry. In that case the decision of the Privy Council, (in London England, NZ's highest court of appeal), has been widely criticised as both misunderstanding the policy and the law and being impractical and undermining the whole policy of "light-handed" regulation. As a result, the government is reviewing an Officials Committee Paper on the subject and will consider further provisions to give effect to the intention of the Act. Notwithstanding the judicial fallibility displayed, neither of the parties to the telecommunications dispute want a fundamental change in the law, and recently settled out of court. The officials are prepared to advocate only very modest reforms and it appears as though the intention of the policy, to encourage parties to negotiate solutions, has been achieved. So far there has been no litigation under the Commerce Act involving power companies.

## **SUPPLY RELIABILITY**

### **LESSON 9**

*An appropriate policy framework and mandate are as effective in securing supplies of power as government ownership.*

76. Security of supply has not been a big issue in New Zealand, although some well informed commentators have pointed out that in the absence of a properly functioning

wholesale market, NZ could be facing major shortages within 10 years.<sup>12</sup> On the one recent occasion when the security of supply was threatened by drought a Committee of Inquiry was set up to investigate the situation and to discover if ECNZ had contributed to the situation. In the course of the consideration of the issues, the Committee received several submissions claiming that the whole process of forming SOEs was responsible. The committee studied the evidence and concluded that: “ The Committee wishes to note that it has found no evidence which would suggest that any lack of precise directives in the SOE Act or the ECNZ Statement of Corporate Intent has resulted in a manner of operation that put the electricity generation system at risk.”<sup>13</sup>

## **PRIVATE SECTOR PARTICIPATION**

### **LESSON 10**

*Although political considerations may prevent the privatization of sensitive national assets this does not prevent the privatization of many ancillary activities and privatising aspects of management.*

77. The private sector has been intimately involve in the reform process from the decision to remove the Electricity Division’s licensing role and veto on private power generation, through the first appointments to the Board of ECNZ, until today when there is substantial private sector involvement in the reconstruction of the retail end of the sector and the beginnings of private investment in generation.

78. In addition to the matters already covered, ECNZ made many of its initial savings by contracting out huge swathes of maintenance, design and engineering work. In addition, to forming Design Power, a design and construction subsidiary, ECNZ also encouraged the formation of private sector competitors, such as an internationally known engineering consultancy, AC Power. More recently “Powermark” the former maintenance division of ECNZ has been sold to GEC-Alsthom and the government have decided to sell several small peripheral power stations to private parties, including Maori interests and power companies. Recently Fletcher-Challenge, TransAlta and Mercury Energy (the Auckland power company) contracted to develop the Stratford combined cycle power station. This process of gradual and progress involvement of the private sector looks set to continue.

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<sup>12</sup> *Power Supply Forecasting, Confusion or Complacency?*, Current, the Magazine of the ESA, August 1994, Alan Jenkins, Page 8.

<sup>13</sup> *The Report of the Electricity Shortage Review Committee - 1992*, Department of Prime Minister and Cabinet, Page 64

**APPENDIX 1, WHOLESALE BULK TARIFF, A HISTORY**

(In this appendix \$ means NZ \$)

**1925 - 1948**

First 200 kva of quarterly maximum demand		£2.10.0/kva
Next 4800 kva“	“	£2. 0.0/Kva
Next 12000 kva“	“ “	£1.15.0/kva
All over 17000 kva“	“	£1. 6.3/Kva

There was also a charge for all points of supply after the first.

**1 July 1948 -31 March 53**

First 200 kva of quarterly maximum demand		£2.10.0/kva
Next 9800 kva	“	£2. 0.0/Kva
“ 15000 kva	“	£1.15.0/kva
“ 45000 kva	“	£1.10.0/kva
All over 70,000 kva	“	£1.12.6/kva

Plus charge for extra points of supply.

**1 April 1953 - 31 March 58**

First 200 kW of combined maximum demand		£3. 0.0/kW/quarter
Next 19800 kW of	“	£2.17.6/kW/quarter
“ 30000 kW of	“	£2.12 6/kW/quarter
All over 50,000 kW	“	£2.14.6/kW/quarter

No charge for extra points of supply.

There was a Maximum demand average of three maximum half-hourly peaks.

- If power factor fell below 0.95 charge on kva basis.
- Provision for price review after 2 years
- Rise and fall clause.

**1 April 1958 -30 September 61**

All supply £4.5.0 kW/quarter. Under 1957 Amendment to State Supply of Electrical Energy Act 1917 this tariff was designed to produce an aggregate revenue of 25% more than the amount required to cover all charges and expenses including depreciation and interest but not load repayment charges. With the change in Government in 1957 this raw tariff was postponed annually. Tariff charged was £4.0.0/kW/quarter.

**1 October 1961 - 31 March 67**

With further change in Government in 1960 a new tariff was arranged to operate from 1.10.61. This was £17.0.0 kW/year plus guarantee from, Supply Authorities to meet any deficiency in revenue. Subsequently the guarantee was abandoned.

**1 April 1967 - 31 March 1976**

£9.18.0 (\$19.80)/kW on average of six highest peak - three before 30 June and three after that date + £0.0.27d (0.255c) with provision for price review.

**1 October 1967 - 31 March 1976 (Decimal Currency Introduced 10 July 1967)**

Capital contribution increased from 25% to 50% of the new tariff.  
 £11.15.0 (\$23.50)/kW as before, plus 0.324d (0.27 cents) per unit.

**1 April 1972 - 31 March 1977**

New tariff \$25.85/kW of maximum demand + 0.297 cents/kWh. Later the Government deferred this increase during its first term of office. A new tariff was to be in forced after November 1975.

**1967 - 1975**

Although 31.3.1972 marked the end of the contract period and a new agreement was printed setting the tariff at

\$23.50 + 0.27 cents for Year commencing 31 March 73

and \$25.85 + 0.297 cents for Y/C 31.3.74

in the heat of election the tariff was held at \$23.50 + 0.27 cents until 31.3.76.

**1976/77**

Following negotiations the new bulk tariff was to have the power energy units changed to 1:1 at 0.55 load factor and to increase by 60%. This brought the bulk tariff to  
\$29.21 + 0.61 cents.

**1977-78**

The government decided to increase the bulk tariff by 40%, it became:

\$40.89 + 0.85 cents	(Winter-May/Sept)
\$24.64 + \$5.84 + 1.12 cents	(Summer Sept/May)

**1978/79**

A further increase of 5% still with the 1:1 ratio was announced bringing the bulk tariff:

\$42.93 + 0.89 cents	Winter
\$25.87 + \$6.11 + 1.18c.	Summer

**1979/80**

An increase of 5% was announced at ESAA Conference. In February 79 this increase was withdrawn and replaced by a 60% increase from 1 May 79 to 31 Mar 1980.

\$68.69 + 1.42c	Winter
\$41.39 + \$9.78 + 1.84c.	Summer

**1980/81**

The tariff increased by 6% to:

\$72.01 + 151c	Winter
\$43.87 + \$10.37 + 2.00c	Summer

**1981/82**

Tariff increased by 9% to

\$79.36 + 1.65c	Winter
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\$47.82 + #11.30 + 2.18c

Summer

**1982/83**

Tariff increased by 12% to

\$88.88 + 1.85c

Winter

\$53.566 + \$13.33 + 2.44c.

Summer

**1984/85**

Tariff increased by 6%

Day energy 1/2 hours ending 0730 to 2300

\$2.443 **North Island (NI)**

\$2.305 **South Island (SI)**

Night energy 1/2 hours ending 2330 to 0700

\$1.955 NI

\$1.844 SI

Winter peak 15 May to 15 Sept include

\$57.88 NI

\$14.60 SI

Anytime

\$16.78 NI

\$15.83 SI

**1985/86 25% increase**

**NI: 26.4%**

**SI: 21.8%**

Day rate energy

3.0.88/c/u

2.807 c/u

Night rate

2.471 c/u

2.246 c/u

Winter zone demand

\$73.16/kW/year

\$66.50/kW/year

Any time

\$21.21/kW/year

\$19.28/kW/year

**1986/87 12% increase**

**NI 15.5**

**SI 4.0**

Day rate energy

3.567/c/u

2.919 c/u

Night rate

2.854 c/u

2.36 c/u

Winter zone demand

\$84.50/kW/year

\$69.16/kW/year

Any time

\$24.50/kW/year

\$20.05/kW/year

Differential

NI/SI 22%,

SI Industrial

Concessions now 5%

**1987/88**

9% increase

**NI 15.5**

**SI 4.0**

Day rate energy

3.888/c/u

3.182 c/u

Night rate

3.111 c/u

2.546 c/u

Winter zone demand

\$92.10/kW/year

\$75.38/kW/year

Any time

\$26.70/kW/year

\$21.85/kW/year

Differential NI/SI 22%

**1988/89**

Change to tariff B from May 1988. No data is available on subsequent changes

October 1988 to April 1989            increase of about 4%  
October 1989 to April 1990            Change to 4th tariff option  
Decreases up to 10% for some regions and users depending on relative costs, increase  
about 7% for others who had previously been enjoying an effective subsidy.

Note: The Goods and Services Tax of 10% from 1985, and 12.5% from 1989 is not  
included in any of the above figures.

**APPENDIX 2, STATE OWNED ENTERPRISE POLICY IN 1985-86**

“Set of Principles for State Owned Enterprises<sup>14</sup>:

- Responsibility for non commercial functions will be separated from major trading state owned enterprises.
- Managers of state owned enterprises will be given a principal objective of running them as successful business enterprises.
- Managers will be given responsibility for decisions on the use of inputs and on pricing and marketing of their output within the performance objectives agreed with Ministers so that managers can be held accountable to Ministers and Parliament for their results.
- The advantages and disadvantages which state owned enterprises have, including unnecessary barriers to competition, will be removed so that commercial criteria will provide a fair assessment of managerial performance.
- Individual state owned enterprises will be reconstituted on a case by case basis in a form appropriate for their commercial purposes under the guidance of Boards comprising, generally, members appointed from the private sector.”

“Principles Guiding the 1986 Expenditure Review,”<sup>15</sup>:

- Public enterprises would be required to fund their additional spending from normal private sector loans instead of subsidised Government loans.
- Enterprises with cheap loans from the Government will be required to repay these and refinance in the market.
- State trading enterprises would be required to pay tax and dividends to the government.
- Where the functions of any department were removed or reduced, the funding of that department would be reduced accordingly.
- Departments would be given strong incentives to raise revenue to fund their own activities.
- Departments would be required to recover the cost of supplying goods and services to from users, including Government departments instead of supplying them free or below cost at the taxpayers expense.
- The Government would review critically a wide range of grants and subsidies to ensure they were achieving worthwhile objectives.
- Departments facing difficult transition problems over commercialisation would be given transition assistance.
- Some agencies would lose their tax exempt status.
- New incentives would be set in place to improve departmental asset management policies.

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<sup>14</sup> Statement to the House of Representatives, Hon R O Douglas, Minister of Finance, 12 December, 1995

<sup>15</sup> Statement to the House of Representatives, Hon R O Douglas, Minister of Finance, 12 December, 1985

- Overall funding reductions would be used where necessary to encourage improved departmental efficiency.
- Quangos would be reduced or abolished where their functions were no longer sufficiently relevant.

### APPENDIX 3, STATE OWNED ENTERPRISE ACT 1986

The ideas for reforming state enterprises were developed and incorporated in a single Act of Parliament, known as the State Owned Enterprises Act of 1986. The reforms took effect on the 1st April 1987, six months before a general election. The trading activities of seven powerful bureaucracies and 60,000 staff, were reorganised into 9 publicly owned corporations and two successor Government departments.

The new state enterprises were registered as ordinary companies, under the Companies Act. Like normal companies, they had boards drawn from private sector personnel and their staff ceased to be public servants coming under the private sector industrial relations regime. They had a clear commercial objective to operate like an ordinary private company and to make a profit. If they failed they would be liquidated, or sold. If the government wanted them to undertake social service activities (e.g. keep uneconomic post offices open), then the government was required by law to compensate them for the full cost of doing so.

Many senior accounting and financial staff were drawn from the private sector and to all intents and purposes they functioned as private businesses with balance sheets reflecting a commercial debt equity ratio. They also had an obligation to refinance in the private sector the a share of government debt apportioned to them. The main difference between SOEs and private businesses was that the shareholders were Ministers who performed that role on behalf of the government. Ministers' influence on the business was primarily through a six monthly input to the SOE's "Statement of Corporate Intent", negotiated between the Ministers and the SOE, under the Act. Day to day involvement by Ministers is prohibited.

In Summary, underlying the SOE legislation, were four key objectives<sup>16</sup>:

- State enterprises managers were to have a clear commercial objective: the maximisation of commercial performance, with this intended to give a clear focus, facilitate monitoring, improve accountability and prevent inconsistent objectives from being pursued.
- SOE boards of directors would have the authority to make the decisions necessary to meet their objectives by assuming responsibility for major investment recruitment and other strategic decisions. *Ministers would retain overall responsibility for the firms performance but would not be responsible for day-to-day decisions.*
- Management performance could be closely monitored against the objectives achieved. This would be the function of Ministers, assisted by the Finance Ministry, and the published opinions of private sector monitors, particularly those associated with raising capital for the SOE's.

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<sup>16</sup> R Deane, *Corporatisation and Privatisation: A Discussion of the Issues*, Electricorp, 1989

- An improved system of managerial rewards and sanctions would provide better incentives for performance, particularly as salaries and employment could be linked to performance.

A *Statement of Corporate Intent* is the key document establishing the accountability of directors to the shareholding Ministers. For each corporation on an annual basis this statement lays down:

- The scope and objectives of the business;
- Performance targets and financial ratios;
- Accounting policies and performance information;
- Dividend policies.

The new arrangement demanded much more of management. They had to:

- Raise funds in capital markets.
- Earn a commercial rate of return on capital.
- Put its staff under a private sector employment regime, and were,
- No longer required to purchase only from government departments.

SOEs also faced competition. They *no longer enjoyed*:

- Statutory monopoly protection (and the markets they operated in were deregulated)
- Preferential access to government business or subsidies.

SOEs could still perform social roles:

- Where the government requires subsidised services, a subsidy is negotiated, so that the enterprise's reported performance is not affected.
- The subsidy transparent, because it is entered into the national budget so that MPs and citizens can judge if they are getting value for money.

## APPENDIX 4, NEW ZEALAND ELECTRICITY INDUSTRY STATISTICS

POWER SECTOR	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
<b>I GENERAL ECONOMIC DATA</b>																					
(a) Area square km.	270,000	square	kilometres																		
GNP NZ\$ million (March Years)	10049	11579	13936	14634	16549	19335	22557	27401	30703	33774	37675	43257	52257	59267	63909	66641	68882	68484	73069	77644	
Mean Population '000s	3057.8	3111.3	3136.2	3143.5	3143.1	3138.0	3146.7	3161.2	3189.5	3230.6	3259.3	3273.3	3281.6	3310.2	3318.3	3336.5	3373.1	3415.8	3452.0	3491.1	3539.3
(b) GNP per capita. (total pop)	3286	3722	4444	4655	5265	6162	7168	8668	9626	10454	11559	13215	15924	17904	19260	19973	20421	20049	21167	22241	0
(c) Retail Sales per capita kWh	5317	5687	5996	6043	6060	6093	6234	6358	6695	7118	7348	7399	7719	7781	8021	8151	8247	8375	8049	8372	(a)
<b>II UTILITY POWER SYSTEM DATA</b>																					
(a) Countries Interconnected	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(b) Voltage																					
Transmission: 11, 33, 60, 110, 220, 250 kV																					
Distribution: 3.3, 6.6, 11, 33, 66 kV																					
Low Voltage: 220 Volt																					
(c) Fuel Use Terajoules (March Yr)																					
Hydro	59388	55239	55805	52459	65729	69020	70141	65232	70398	72628	70234	78708	78030	80526	76918	78915	75920	67979	77281	86068	(b)
Coal	3714	3889	3222	2541	1246	1361	1232	1341	2172	2452	2347	1248	2757	2099	1106	1572	774	3413	1641		(b)
Geothermal	4661	4442	4189	4261	3831	4143	3912	3979	4035	4468	3996	4247	4229	4259	5945	7045	7574	7477	7895	83900	(b)
Petroleum	2833	4607	2628	719	179	-38	-28	16	519	4	167	-2	23	20	-7	-4	72	457	7		(b)
Gas	105	6396	14154	13469	6923	5297	6445	15632	14731	16228	20516	15946	16839	18254	19832	19005	24491	24980	24498		(b)
Total	70701	74573	79998	73449	77908	79783	81702	86200	91855	95780	97260	100147	101878	105158	103794	106533	108831	104306	111322	169968	0
(d) Total System losses %	11.33%	12.06%	10.58%	11.09%	12.58%	11.88%	11.62%	12.45%	12.06%	10.94%	10.35%	10.15%	9.98%	10.05%	9.43%	9.28%	9.46%	8.76%	9.89%	9.93%	(c)
(e) Consumers '000	1,215	1,249	1,280	1,310	1,328	1,345	1,363	1,378	1,397	1,418	1,437	1,463	1,488	1,509	1,529	1,548	1,582	1,599	1,608	1,625	(d)
(f) Employees	13795	14297	14276	14989	15029	14865	15141	15511	15780	15783	15592	15750	16388	14632	13513	12922	12588	10764	9898	8395	(d)
(g) Electrification Ratio	99.75	99.92	99.75	99.80	99.80	99.80	99.70	99.70	99.70	99.70	99.70	99.70	99.80	99.80	99.80	99.70	99.70	99.70	99.70	99.70	
<b>III ELECTRICITY CAPACITY / IMPORT DATA</b>																					
(a) Installed Capacity MW																					
Thermal	990	1210	1546	1654	1654	1654	1754	1683	1683	1920	2394	2631	2581	2581	2581	2265	2178	2178	2198	2159	(e)
Hydro	3591	3625	3617	3777	3766	3904	4062	3994	3992	4295	4427	4648	4649	4658	4643	4646	4619	4619	5059	5277	(e)
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(e)
Geothermal	192	192	192	192	192	192	192	140	135	157	157	146	149	149	261	258	258	259	259		(e)
(b) Net Imports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>IV ELECTRICITY SALES mil kWh</b>																					
(a) Residential	7553	8402	8398	8313	8181	7909	8034	8265	8733	8981	8998	9080	9424	9423	9510	9823	10264	10474	10124	10256	(f)
(b) Commercial	2403	2579	2753	2907	2963	3104	3192	3427	3734	3962	4224	4417	4722	4883	5250	5461	5496	5550	5397	5580	(f)
(c) Industry	3196	3339	3565	7105	7263	7466	7703	7781	8230	9424	9955	10038	10471	10764	11065	11187	11200	11712	11276	12901	(f)
(d) Agriculture	370	395	410	436	405	408	457	476	516	499	613	578	567	566	686	655	687	715	759	735	(f)
(e) Government	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	(f)
(f) Other	102	108	109	147	151	153	154	155	158	161	164	162	165	169	187	183	172	157	230	244	(g)
(g) Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(f)
(h) Total	13624	14823	15235	18908	18963	19040	19540	20104	21371	23027	23994	24275	25349	25805	26698	27309	27819	28609	27785	29228	(f)
<b>V UTILITY TARIFFS US cents / kWh</b>																					
(a) Domestic Rate, 1995 prices, converted into US\$	9.23	7.65	7.38	9.27	10.29	9.61	10.00	8.37	7.10	5.09	5.05	5.02	6.67	6.30	5.92	6.00	5.21	4.77	5.49	6.08	(h)
(b) Residential high (400 kWh / mo)																					
(c) Commercial Rate, 1995 prices, converted into US\$	17.00	14.12	13.42	16.54	18.03	15.85	17.01	14.05	11.80	8.30	8.26	8.16	10.60	9.73	8.96	8.74	7.52	6.75	7.14	7.58	(h)
(d) Small Industry (2000 kWh/ mo)																					
(e) Industrial Rate, 1995 prices, converted into US\$	6.57	5.55	5.39	6.46	7.41	7.33	7.72	6.47	5.49	3.95	3.81	3.80	5.06	4.66	4.14	4.01	3.50	3.11	3.59	4.01	(h)
(f) Bulk Rate (see appendix)																					
<b>VI UTILITY FINANCE</b>																					
(a) Average Revenue US cents / kWh																					
(b) Long Run Marginal Cost US cents / kWh																					
(c) ROR on Revalued Net Fixed Assets in service																					

(a) Retail sales per total population from the Annual

(b) Energy Data File, Ministry of Commerce Jan 1995

(c) Annual Electricity Statistics, Table VII, "% Non-Productive", including own use.

(d) Annual Electricity Statistics, Tables XIII and VII

(e) Annual Electricity Statistics, Government Printer Wellington, 1975-1988,

Ministry of Commerce 1988-95, Table VI and corresponding.

(f) Annual Electricity Statistics, Table XI, Table VI, from 1978 NZED figures included in industrial

(g) The last three entries in this row are approximations due to changed basis of presentation of statistics

(h) Energy Data File, Ministry of Commerce, January 1995, Page 79, June 1995 NZ\$ cents kWh