

Professor R. H. Paul Commemoration Lecture 1996

ELECTRICITY INDUSTRY REFORMS

- A WEALTH OF EXPERIENCE

by

W A L W A Perera

Chairman, fellow Engineers, Ladies and Gentlemen.

It gives me great pleasure to deliver this lecture in memory of a teacher whom all his students in unison will remember as a great teacher and an adorable person. We used to approach Prof. Paul with some trepidation but he would soon make us feel welcome.

He encouraged and challenged his students not to back out from facing new problems or new challenges. An example was when he wanted us to sit the IEE Part III qualifying exam while he was negotiating for the exemption of the local degree from the IEE. When we requested him, as the Overseas Representative of the IEE in 1968, to obtain the exemption he asked us whether we thought that his students could not get through the Part III exam and wanted us to sit the exam, in any case. We sat the exam and qualified, while he obtained the exemption.

I was privileged to have been under his tutelage from 1966. To those of us who selected careers in Electrical Power Engineering the pleasant memory of Prof. Paul will spring to our minds when we analyse technical problems in this field. We remember him with great respect and immense gratitude.

Professor R H Paul

Prof. Robert Hoisington Paul is known as the Father of Electrical Engineering education in Sri Lanka, a title which he aptly deserves.

R H Paul having excelled in studies at the University College, predecessor to University of Ceylon, won a Government Scholarship in 1924 to study in the United Kingdom. He obtained a First Class Mechanical Sciences Tripos degree from the University of Cambridge. On graduation he served Metropolitan Vickers as a graduate apprentice. In 1930 he returned to Ceylon and joined the Ceylon Technical College as a Lecturer.

In the nineteen forties, courses for the external degrees in Engineering of the University of London commenced at the Technical College Colombo, and Professor Paul was appointed the

first Professor of Electrical Engineering. He had to set up teaching and laboratory facilities to meet high standards of the University of London. It was due to his efforts that the University of London granted recognition for the Ceylon Technical College to prepare students for its Bachelor of Science in Engineering degree. He served with great distinction the post of Professor of Electrical Engineering until his retirement.

He served the Institution of Engineers Sri Lanka as its President in 1968 and the local centre of the Institution of Electrical Engineers, London as its Overseas Representative. He took an active interest in the activities of these professional bodies. Professor Paul passed away on 03 July, 1978.

An important part of Professor Paul's lectures was the introduction to the Electricity Industry in the country then under Department of Government Electrical Undertakings (DGEU). On his advice we toured the Laxapana Hydro Complex to familiarize ourselves with the systems. Little did we imagine then how much the electricity industry in the country and, indeed, in rest of the world will change to what it is today. As I said before Professor Paul would have expected us to face these changes with some sense of purpose and accept the new situation as yet another challenge to serve the community. Fulfilling this expectation would be a great tribute to Professor Paul, and indeed to all our teachers.

With the above objective in mind I have selected the topic "Electricity Industry Reforms - A Wealth of Experience" for my talk today. I believe future reforms in the electricity industry in Sri Lanka will be a great challenge to the Engineers and Engineers turned Managers in the industry - an opportunity for them to demonstrate what true professionals they are.

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Chairman, Lanka Electricity Company Limited.

In my presentation I propose to analyse the past, present and future of the electricity industry in Sri Lanka, examine problems it is faced with, and suggest solutions through an analysis of wealth of experience in utilities in other parts of the world.

Electricity Industry In Sri Lanka

Past

In the early stages private power companies generated and distributed electricity in Colombo and some large towns. Some Local Authorities also had their own generation and distribution systems. In order to develop the industry at a faster rate in a coordinated manner, the DGEU was formed and the operation of these power companies were taken over by the DGEU. It established its own transmission and distribution systems. With hydro power being made available through this interconnected system Local Authorities which had their own generators opted to purchase electricity from DGEU and distribute.

Due to the inability of the DGEU to keep pace with the rate of development and meet funding agency requirements, the next major reform in the industry was instituted by the establishment of Ceylon Electricity Board (CEB) in 1969. Primary intention of the reform was to establish a commercially oriented autonomous utility responsible for generation, transmission and distribution of electricity. Government retained the control in setting prices and, being the sole investor, directed investment decisions of CEB.

The CEB was solely responsible for generation and transmission. A major part of Distribution was handled by CEB while the balance was managed by some 218 Local Authorities.

Due to falling electricity distribution service standards in Local Authority controlled areas the Government in 1983 introduced the next reform in the industry by setting up Lanka Electricity Co. (LECO) to takeover and develop electricity distribution in these areas. While LECO took over some of the areas CEB took over the remaining areas.

Present

The present position is that the entire Generation and Transmission, and over 80% of distribution in the country is handled by CEB. The balance distribution is handled by LECO. Action has been initiated to take over the distribution systems in Ratnapura M C area, the only remaining Local Authority to hand over the systems to CEB.

Thus the Electricity industry in Sri Lanka at present is managed by two utilities, CEB and LECO. Competition between the two utilities is limited due to CEB being the major share holder of LECO. State sector influence also is seen as a contributing factor for lack of competition in the industry. Ours is a typical vertically integrated monopolistic infrastructure that controls the industry where customer has very little say in the operations.

Legal enactments governing the industry operations are the Electricity Act of 1951 and the CEB Act of 1969. Chief Electrical Inspector is the administrator of the Electricity Act. The Electricity Act is out of date in many aspects of technological advancements seen recently. Several attempts to amend the Electricity Act have been to no avail. In other words we tend to continue in the "Business as usual" mode.

Future

Hard pressed by the diminishing sources for concessionary funds for development and the State's inability to borrow, private sector parties have been invited to set up generating facilities. A majority share of LECO stock holding by the Government and CEB has been offered for sale. A Power Purchase Agreement with a private mini hydro developer will be signed in the near future. A Letter of intent has been issued to another developer to set up few more mini hydro stations. Judging from generation shortfall forecast a large scale Independent Power Producer (IPP) will soon enter the scene. Seen here is an "unbundling" of the existing vertically integrated system.

All this is driven by the need to serve the ever increasing demand for supply, estimated currently at 10% per annum, doubling the demand every 8 years.

Generation plans of CEB indicate the need for an additional 1840 MW generating capacity for next 15 years. Generation investment needs for the next 10 years is estimated at US\$ 1.9 billion or SL Rupees 95 billion, an equivalent of a staggering US\$200 million (Rs 10 billion) per annum for generation alone.

For the efficient transmission and distribution of this power similar large scale investments in transmission and distribution are essential.

In the Asian region, and also world wide, there is very high competition for funds. To attract any form of funds we should operate our systems at peak efficiency and be credit worthy. A simple statement of an enormous task.

For an industry to be credit worthy it must be in sound financial position. To be in a sound financial position it must be run on best commercial practices which will produce a set of satisfied stakeholders.

Industry Stakeholders And Their Needs

The stakeholders in our industry are basically the same as in many other utilities. They are:

- Customers
- Investors
- Regulators
- Employees

There should be no argument that customers take the top position among the stakeholders. Without the customer the industry cannot exist. Thus we have to endeavor to keep existing customers satisfied and attract new customers to ensure business expansion.

In the electricity industry in Sri Lanka the customer does not enjoy his rightful place. This has been due to the State assuming the role of the customer. The State also functions as the investor and regulator. Employees are directly or indirectly influenced by the State. Thus it would appear that if the government is satisfied then all other stakeholders would also be satisfied.

Reforms carried out in the industry world over has been to change this unhealthy situation and empower the customer. In that exercise of instituting reforms stakeholder needs have to be analyzed clearly to decide best course of action.

It must be appreciated that different stakeholders have different needs. However, there must be a balancing of these interests to ensure success of the utility. The stakeholder interests are:

- Electricity Customers need safe reliable supply at competitive prices. Prospective new customers need the services to be provided at least possible cost and delay. Customers expect the utility employees to be courteous and honest in their dealings.
- Investors expect the investment to be secure and earn good dividends.
- Regulator expects to see satisfied stakeholders and the industry meeting national goals.
- Employees expect continuity of a rewarding career.

It will be seen from the above, if the customer needs are satisfied with a proper balancing of the needs of the other stakeholders the business will continue to grow and be successful.

Meeting the Customer Needs

To provide safe and reliable supply an electricity utility must build and operate a system conforming to best technical standards. Electricity demand is growing at a rate between 8% to 12% per annum. This means doubling the demand every 10 years or 6 years as the case may be.

It was noted in the earlier sections that the investment requirements for Generation alone for next 10 years is US\$ 200 million (Rs 10 billion) per annum. To provide adequate system capacities to efficiently transmit this power, similar large scale investments in the Transmission and Distribution are also necessary. Thus large investments are required to meet the growing demand if planned economic growth rates are to be met. If state sponsored funds are not available, private sector funds will be required. To attract private sector funds, utilities have to be commercially oriented and profitable.

The next need of the customer is of competitive price. For the prices to be competitive the systems must be operated at peak efficiency. Losses must be minimized. This requires additional investments in Transmission and Distribution systems. The present high level of losses and low reliability is due to inadequate investments in the expansion of these systems while priority has been given for investments to extend electricity supply to new consumer groups further burdening the systems increasing the losses and lowering reliability. Competitive prices will be related to costs. Subsidies, if any, must be declared and accepted by the stakeholders or funded separately. This calls for transparency in pricing and tariff setting.

To improve cost efficiencies and offer competitive prices to customers Generation, Transmission and Distribution units, having different interests, just as much as any other business unit in a utility, must operate at optimum efficiency and be accountable. This calls for setting up of these as business units with full authority and charged with meeting desired business goals.

Internal competition created through this process will help achieve common utility goals. Through the empowerment and wide exposure of employees to assume wider responsibilities beneficial Human Resource Development will also be achieved. An added important benefit derived through improved efficiencies is minimizing the impact on the environment by the judicious use of natural resources.

To provide the courteous service desired by the customer, employees have to be given a customer orientation. Each employee should appreciate who are the receivers of their output, what is needed and how it is achieved. This is not seen in the state institutions and it is not easy to instill this discipline. In contrast, to be competitive, private sector attaches high importance to this success factor.

Meeting Investor Needs

Investors naturally expect their investments to be secure and earn them good returns. When investments are made by the state this need is rarely insisted upon and profits are only limited to meet minimum requirements of soft loan lending agencies. If it is intended to be efficient to satisfy customer needs and survive in business, Managements must be given competitive financial targets to meet.

Meeting Employee Needs

Employees expect rewarding career continuity. If the business is successful and employees play their role diligently to safeguard the utility interests this aspiration will be fulfilled. If employees are inefficient and if they do not effectively contribute to achieve the utility goals, but yet expect the investor (usually the State) to protect their jobs, their expectations will not be met for long, as already seen on many occasions.

Meeting Regulator Needs

Regulator aims to protect the interests of all stakeholders. If a utility meets the national goals and commands a set of satisfied customers then the regulator's needs will be satisfied. Fair and equitable role play by all stakeholders will ensure realization of this goal.

Are Reforms Necessary ?

I believe the answer is an emphatic "Yes". Special position of the electricity industry and the successes achieved to date may give some justification to the belief "If it is not broken do not fix it". However the industry is now faced with enormous development challenges with an unprecedented financing crunch. The State also has openly declared its intentions in this regard. It wants these commercial enterprises to manage them without recourse to funding by or through the state.

Under this scenario, from the foregoing, need for reforms could be summarized as follows:

- To be commercially oriented and financially viable.
- To reduce prices through improved efficiencies in management and operations.
- To reduce government stakes to release its resources to meet other pressing social needs.
- To attract investor (private sector) funds.
- To reorient the business focus, identify the stakeholders and their needs.
- To empower the customers and meet other stakeholder needs.
- To create internal and external competition.
- To ensure transparency in pricing and tariff setting.
- To improve operation efficiency to conserve energy resources.
- To ensure rewarding career continuity to employees through partnership in business.
- To minimize the impact on environment.

Let us compare these with what is stated in the UK Government's Proposals for the Privatization of the Electricity Industry. The Secretary of State for Energy in his report to Parliament in February 1988 states as follows.

Quote:

"In framing my proposals for privatization, I have adopted six principles:

- Decisions about the supply of electricity should be driven by the needs of customers.
- Competition is the best guarantee of the customers' interests.
- Regulation should be designed to promote competition, oversee prices and protect the customers' interests in areas where natural monopoly will remain.
- Security and safety of supply must be maintained.
- Customers should be given new rights, not just safeguards.
- All who work in the industry should be offered a direct stake in their future, new career opportunities and the freedom to manage their commercial affairs without interference from the Government"

Unquote.

What From Of Reform ?

The electricity industry in countries all over the world has undergone interesting structural changes driven by similar needs as experienced in Sri Lanka. It is emphasized that a structure adopted in one country may not be applicable in another country due to local conditions. However change, as seen recently, is inevitable. Challenge before professionals is to bring out the best suited proposal for adoption in Sri Lanka if our country is to achieve the declared economic development targets.

All desired changes in the industry will take time and need planning. Important structural changes are necessary to improve the business performance of state run utilities. Given this scenario let us examine possible structural reforms under following situations:

- State Run Regulated Monopoly
- Competitive Market Environment

State Run Regulated Monopoly

There has been opposition to the proposed privatization or private sector participation in the electricity industry. If one were to accept the status quo and still hope to deliver the goods as needed in a fast developing country then reforms are necessary to give a real commercial focus to the business while operating as a State Run Regulated Monopoly. An acceptable alternative to the privatization must be offered to the Government since it has to meet the aspirations of the people.

Operating as a State Run Regulated Monopoly to improve business performance internal competition must be created by setting up internal Strategic Business Units responsible for presenting their own profit and loss accounts and balance sheets. External competition must be created by the Government by setting overall commercial performance targets.

Natural internal strategic business units in electricity industry are Generation, Transmission and Distribution. Private sector participation in Generation has already been accepted and is being implemented. Time will come when each power station or groups of power stations will function as independent business units. In many countries the Transmission system is operated as a single business unit and considered a natural monopoly. Distribution is divided among several business units which are allocated operating areas considering geographical or political boundaries.

In order to create internal competition each of these business units must be run as separate profit centres. Generating units must own the assets operate them and sell power to Transmitter to earn income. Transmitter must buy from Generator and sell to Distributors. With the emergence of private Generators Transmitter will be required to operate a price pool system to ensure fair pricing to distributors. This is an immediate need in Sri Lanka.

Distributors will buy power from Transmitter and retail to its customers for income. Due to cross subsidies in the retail tariffs Distributing units which are at disadvantageous positions must be funded by proper analysis to establish level playing fields for competition.

The power system in the UK and many other countries operated in this manner prior to privatization. One may argue ours is a small country with a small demand and this type of approach would be costly. But there appears to be no reason why these units could not be operated as definite profit centres with more autonomy. Empowering the Heads of these units through decentralization and delegation of wider responsibilities will yield better results.

If the industry should continue as a State run monopoly then clear identification of role play by the utility and the State is essential to meet the expected goals. In this exercise we find many commonalities in strategies adopted in many countries. Recent experiences in Australia and New Zealand gives good points for consideration which are discussed below.

Queensland Electricity Supply Industry in Australia had Corporatized its Electricity Commission and seven regional Distribution Boards effective 1st January 1995. Armed with world wide experience available and the State's intent to retain the industry as a Government Owned Enterprise (GOE) the change process is very well documented in a paper presented by Hon. Keith De Lacy, Treasurer of Queensland Government at the 1994 CEPIS conference held in New Zealand.

The main commercial, legal and structural features seen in this change are:

- Utility objectives clearly defined in a Statement of Corporate Intent (SCI) which is agreed annually between the Boards and the Shareholding Ministers.
- Management autonomy and authority. Boards to make commercial decisions on areas agreed in the SCI. Govt. not involved in the day to day management of the GOE.

- Strict accountability for performance. GOE will be accountable to Government, with performance assessed against performance targets set in the SCI. (There has been some resistance from utility staff to this assessment).
- Competitive Neutrality. All advantages and disadvantages related to public ownership removed. For example GOE to pay taxes and dividend and be free from state purchasing procedures.
- Unique corporatization model providing Statutory GOE or Company GOE. (Similar to CEB and LECO respectively).
- Strategy underpinned by long term financial management.
- Before Corporatization, under increasing commercial pressures, QEC established internal business units for Generation, Transmission and Corporate services. (Note that Distribution is already handled by seven separate Boards).
- Electricity Act rewritten to allow private sector participation, market trading arrangements and establish a regulatory regime.
- Clear separation of Generation, Transmission and Distribution.
- Access to Transmission grid is provided on an open and fair basis.
- Subsidiaries of Transmission Corporation (GOTC) has separate Boards reporting to Government through GOTC.
- GOC Act considers Corporate Plan and SCI as crucial documents.
- Ministerial directions, if any, are issued in an open and transparent way.
- A Regulatory unit has been established.
- Electricity Act provides regulations for tariffs and network services.
- Non-commercial activities proposed by the Government will be funded by Treasury as a community service obligation.
- Process has been consultative listening to customer concerns.
- Corporatization brings an end to hidden cross subsidies which have distorted electricity pricing.
- Funded through a Budget provision, Tariff

equalization for domestic consumers across the State will be maintained.

- Structural and Regulatory reform of the industry has been achieved by applying GOC Act and rewriting Electricity Act to a new commercial focus.

The above features give very clear pointers that could be applied in to Sri Lankan electricity industry, considering what has happened in the industry in spite of the existing legal enactments.

Similar restructuring exercises have been undertaken in other countries as well. New Zealand in reforming its Electricity industry from a Government Owned Enterprise to a Govt. Owned Corporation (Corporatization) in 1987 has followed similar objectives. Notable important difference in the New Zealand approach is:

- The Corporation being given the autonomy to set the electricity prices, but subject to information disclosure requirements.

Organization structures as they emerged in Australia, UK and New Zealand are given in Appendices 1 to 4.

Competitive Market Environment

The author of the paper on "Queensland Electricity Supply Industry Reform" foresees following as future developments as markets develop and private participation increases:

- Separation of Transmission and Distribution subsidiaries of QTSC in to stand alone units.
- Market trading arrangements allowing large customers to contract for supply from any Supplier or Generator.
- Further reforms will be considered as the need arises.

This leads us to possible structural reforms under Competitive Market Environment.

Structural and legal changes necessary to cope with emerging competitive electricity markets have to provide for fair competition among Generators, Transmitters, Distributors and Suppliers where each one would be marketing the product, electricity.

The USA has had this environment for some time. The United Kingdom set the pace in 1988 and provoked much discussion in the UK and abroad. Forced by market forces and shortage of funds for development and many other country specific factors many countries in the South East

Asia and Pacific regions have commenced or completed the restructuring processes in a proactive manner to face the emerging challenges. Few examples being: Malaysia, Thailand, Indonesia, India and New Zealand among others.

The New Zealand example is interesting in that it has corporatized its electricity generation and transmission industry in 1987 creating Electricity Corporation of New Zealand Limited (ECNZ). Distribution by that time has been managed by 50 Electricity Supply Authorities (ESA). These were converted to Electricity Supply Companies (ESC) in 1992. In late 1992 Govt. passed additional supply regulations, wiring regulations and safety work rules. A transmission company "Trans Power" has been created in July 1994 separating the transmission function from ECNZ, identifying it as the Generator. A committee has been appointed to report on forming an Electricity Wholesale Market and a draft report has been issued in late 1994.

It will be noted in a time span of just seven years New Zealand has effected a stream of changes where few decades would have been the norm elsewhere. At present, the monopoly of the ECNZ has been broken by creating two large Generating concerns and selling off some plants to private sector. Two large generators are prevented from adding further generating plant until private Generators build plants to hold equal share of generating capacity in the country (See Appendix 5).

These changes and benefits achieved therefrom are discussed in another interesting paper titled "An Overview of the Reform of the New Zealand Electricity Industry" presented at the last CEPsi conference held in New Zealand.

Additional main features seen in this paper than those discussed above under "State Run Regulated Monopoly" scenario are as follows:

- Separation of monopoly functions from contestable functions.
- Develop customer service culture.
- Transmission, national grid, considered a monopoly activity to provide open access in a transparent manner.
- Information disclosure requirements.
- Light handed regulation as against Regulatory Authority.
- Removal of mandatory inspection of electrical installations.

- Removal of exclusive territories granted to ESAs.
- Shares of ESCs listed in stock exchange.
- Emergence of Energy Trading supply chain organizations. A new player - Supplier.
- Establishing a pool into which Generators and Wholesale electricity purchasers bid to or for supply. All electricity will be traded through this pool.

The paper summarizes future developments in NZ electricity as follows:

- Break up Generator (ECNZ) into separate competing generating companies with private sector participation. (Now achieved as stated earlier.)
- Pricing for network user charges.
- Entry of IPPs.
- Sell down Crown ownership in Trans Power.

Some additional features observed in the White Paper on the UK Electricity Restructure are:

- Statutory obligation to supply will be placed on the distribution companies.
- Control and ownership of National Grid will be transferred to Distribution companies.
- Distribution companies formed based on the existing Area Boards.
- Distributing Companies have the right to generate themselves.
- Distributing companies promote competition in generation by having a multiplicity of choices.
- Distribution Companies have to bid for part of their business. (loads over 100kW up to 1988 and no limit thereafter).
- Strong and effective safeguards for customer protection on prices and standards of service.
- Electricity Supply Code to safeguard rights of the consumers to be heard.
- Customers to receive pre-determined financial compensation where suppliers fail to meet the standards set and published.
- Employees given the right to a direct stake in the industry through share ownership.

- Customers are given rights not just safeguards.

In summary, a modern competitive industry widely owned by the public, and more responsive to the needs of customers and employees has been created.

Conclusion

The electricity industry in Sri Lanka after the Corporatization reform in 1969, some 27 years ago, by the creation of the CEB has achieved many a milestone. However, it is now faced with a challenge of meeting future development demands of an unprecedented scale with very limited funding resources. Competition for funds worldwide is enormous. Government has declared that commercially oriented state owned enterprises must arrange their own financing for development programs. This is definitely an unenviable threatening situation for the industry.

As professionals in the industry we have to transform this threatening situation into an opportunity for change. It is the duty of the professionals to put forward proposals on how to overcome this situation and meet the future challenges. It would be self defeating to believe that we can halt this change for long.

As seen in this presentation there is a wealth of experience all around us. Customers demand service. Internal and external changes in the management of the industry are necessary. Let us draw from these experiences and propose reforms in the industry that will best serve the community. This is the challenge before us.

People of the calibre of Professor Paul were equal to the challenges that faced them in their times. Today we pay tribute to them for their achievements. We are now faced with an entirely different form of challenge of our times. Only time will tell how best we met the challenge.

Bibliography

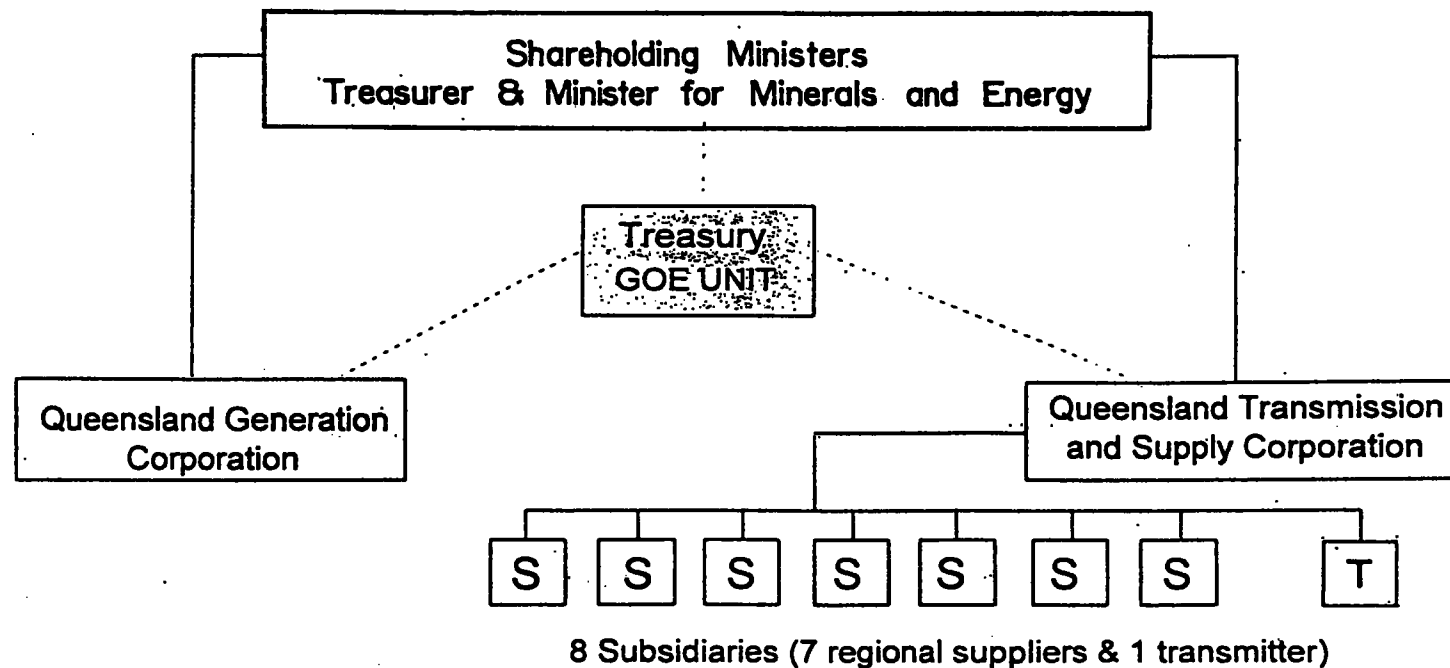
1. "The Effects of De-regulating a Monopoly Energy Supplier" by Hon. Keith de Lacy,

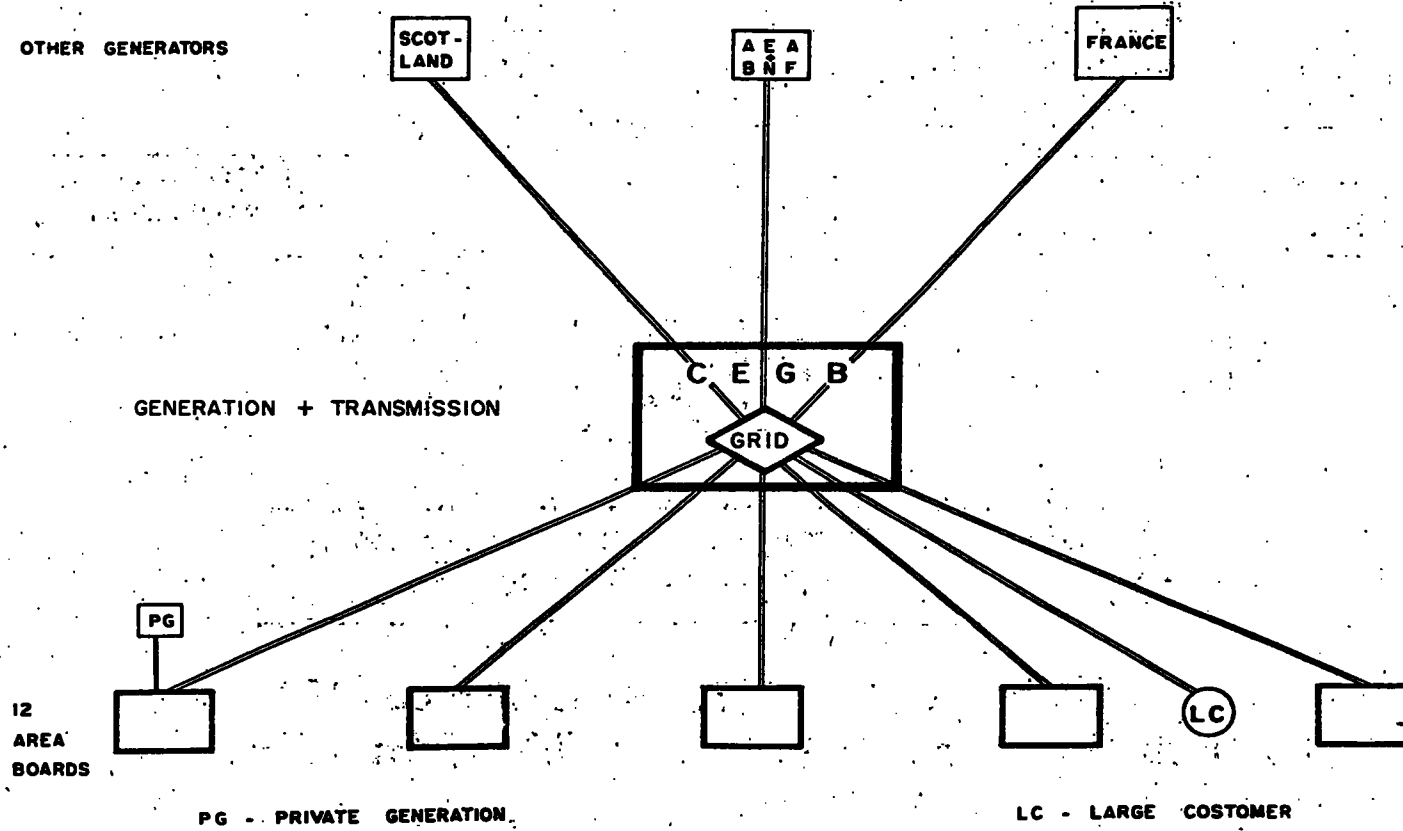
Treasurer of Queensland Government, AUSTRALIA.

2. "An Overview of the Reform of the New Zealand Electricity Industry" by Russel McGeorge, Managing Director, DesignPower New Zealand Ltd.
3. "A Structural Reorganization of the Electric Utility Industry Moving Toward Privatization in Southeast Asia" by James O Travis & Shahid S Qadri of Black & Veatch International, UNITED STATES.
4. "Management at EGAT, a State-Owned Enterprise, in a Regulated Environment and its Preparation for Deregulated Environment" by Sumitra Chirachinda of EGAT, THAILAND.
5. "Deregulation - The TNB Malaysian Experience, Consolidating the Core Business for Competition" by Che Zurina Zainul Abidin and M R Yahya of TNB, MALAYSIA.
6. "Utility Management of a Monopoly in a Deregulated Environment" by Bob Thomson of Trans Power, NEW ZEALAND.
7. "Proven Management Techniques for Utilities Operating in a Regulated, Monopoly Environment" by L C Harper of Global Utilities Institute, UNITED STATES.
8. "A Critique of the UK Privatized Structure" by A K David of Hong Kong Polytechnic, HONG KONG.
9. "New Zealand Electricity - Past, Present and Future" by Dave Frow, CEO, ECNZ, NEW ZEALAND
10. White Paper on Privatization of Electricity Supply Industries in the UK.
11. "Competition in the Electricity Market: the England and Wales Privatization" by Sally Hunt, Director, National Economic Research Associates, UK.
12. "How the Pool Works" by Margaret McKinlay, CEO of the Electricity Pool of England and Wales.

NOTE: #1-#9 Papers presented at the 10th CEPSI Conference (1994).

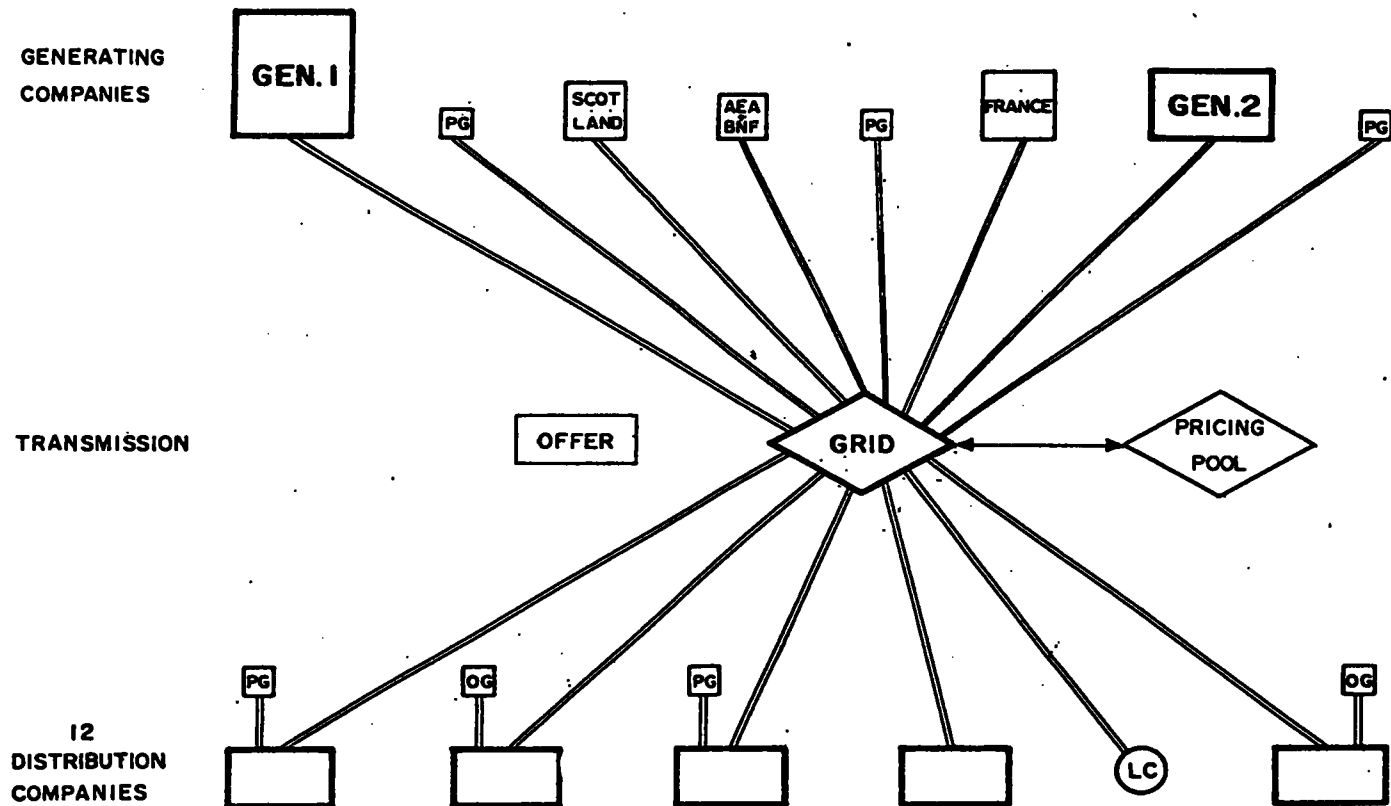
QUEENSLAND ELECTRICITY SUPPLY INDUSTRY NEW STRUCTURE FROM 1 JANUARY 1995





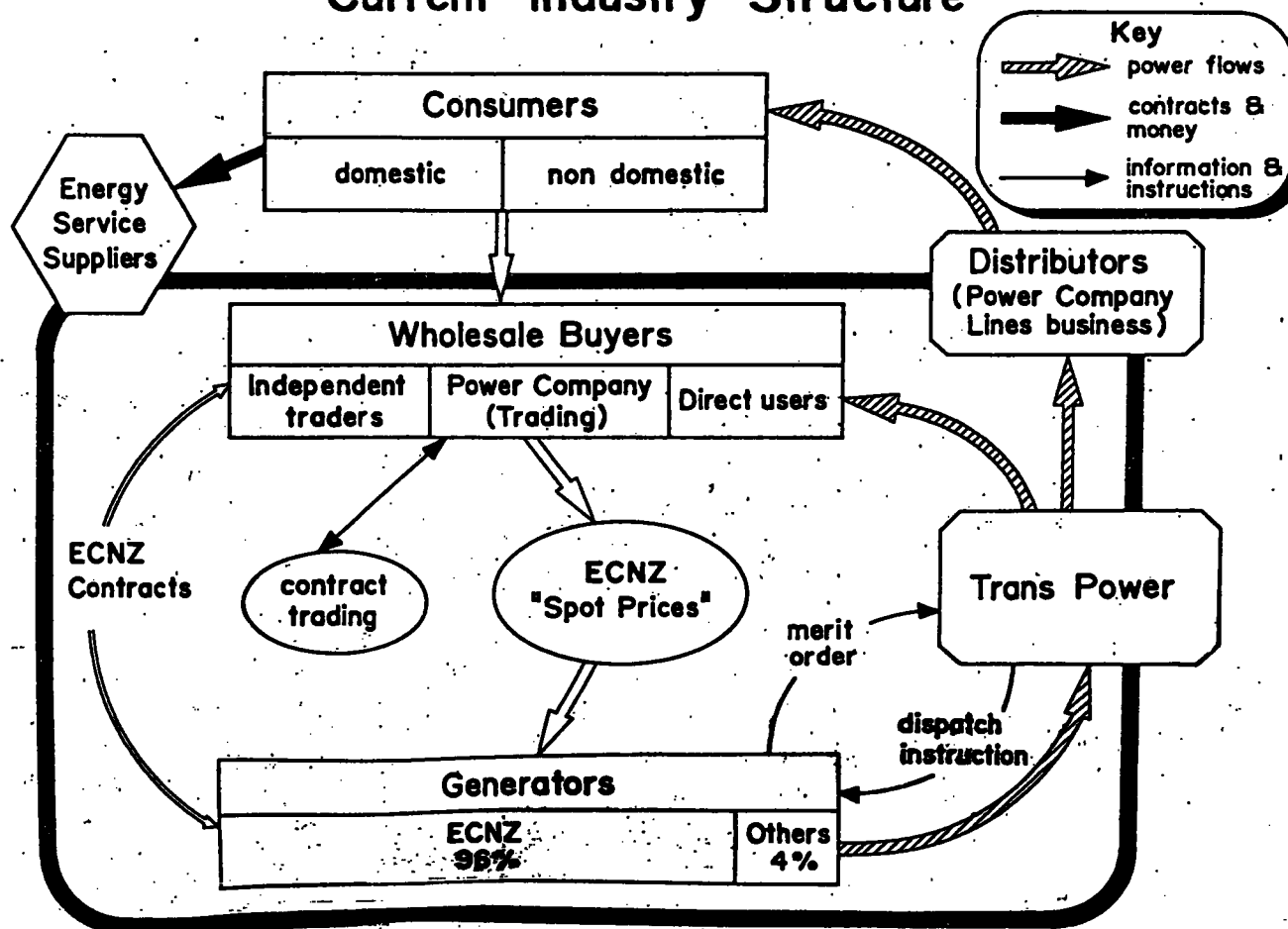
UK POWER SYSTEM BEFORE PRIVATISATION

U K POWER SYSTEM AFTER PRIVATISATION



GEN.1 and GEN.2 - Successor Companies to CEB
 PG - Private Generation LC - Large Customer
 OG - Distribution Company Own Generation

Current Industry Structure



A Vision for Future Industry Structure in Newzealand

