NATIONAL GRID MANAGEMENT COUNCIL

The Structure of an Interstate Transmission Network for Eastern and Southern Australia

March 1993

Foreword

At their meeting in May 1992, Heads of Government agreed to develop an interstate transmission network across the eastern States and that the National Grid Management Council would report on the precise nature and operating guidelines of the structure by the end of 1992. I now have pleasure in presenting that Report, the public release of which has now been agreed by all jurisdictions.

In making this release as Chairman of the Council, I wish to make it clear that the Governments concerned will wish to give detailed consideration to the Report, particularly its recommendations, before coming to a view. The Report could have far-reaching implications for the future structure of one of Australia's largest and most vital industries and decisions on this structure will not be taken lightly.

The Report recommends that the transmission network be separated from generation; this is intended to facilitate the operation of the competitive market now being developed, as a complement to the fair and transparent pricing system also now being formulated.

More specifically, the Council proposes that the objectives for Governments to work towards is separation through the formation of Multiple Network Corporations. There could be one or more Corporations in each State and the Corporatons should not by definition be limited to State borders. The first step in implementation of these reforms should be the "ring-fencing" of the network businesses of the current owners.

The magnitude of these proposed changes will require an ongoing process of review. It is recommended that if it emerges that there is a better option than Multiple Network Corporations, then Governments should reconsider their objectives. On the important associated question of regulation, the Report recommends a national approach, which should be light-handed where possible.

The release of this Report gives further opportunity for public exposure, complementing the recent release of the first issue of the National Grid Protocol and information papers on Network Service Pricing and Market and Trading Arrangements.

I believe that the release of this Report represents another important step towards the Council's objectives of the most efficient, economical and environmentally sound development of the electricity industry.

JA Landels AO
Chairman, National Grid Management Council

THE STRUCTURE OF AN

INTERSTATE TRANSMISSION NETWORK

FOR

EASTERN & SOUTHERN

AUSTRALIA

A REVIEW OF STRUCTURAL OPTIONS AND MAJOR ISSUES

NATIONAL GRID MANAGEMENT COUNCIL

23 December 1992

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1 INTRODUCTION

Organisational arrangements for the interstate electricity network covering New South Wales, Victoria, Queensland, South Australia, Tasmania and the Australian Capital Territory were placed on a more formal basis in 1991 with the decision by relevant Governments to form the National Grid Management Council (NGMC)[1].

Since its formation the Council has had responsibility for coordinating the development of the interstate electricity industry, with major activities centring on :

- development of a Protocol[2] setting down the rules, responsibilities and technical requirements for trading in electricity through the grid;
- development of a framework for charging for use of the network;
- development of a statement of opportunities to provide market and network capability information to participants; and
- development of arrangements for a customer market.

In February 1992, the Prime Minister proposed in his "One Nation" statement[3] that a National Grid Corporation be formed. Heads of Government at the May 1992 meeting gave consideration to this option, but indicated the structural question should be considered more broadly with the communique[4] recording agreement "to develop an interstate transmission network across the eastern States and that the National Grid Management Council would report on the precise nature and operating guidelines of the structure by the end of 1992." The communique also recorded that "Heads of Government agreed to the principle of separate generation and transmission elements in the electricity sector."

At the National Electricity Strategy Roundtable in September 1992, the Prime Minister stated that the Commonwealth seeks to reach a situation where the network is controlled by a neutral entity, operating in a national electricity market, and that such an entity need not own the assets it manages.

An additional important aspect is the principle of separation. This has had to be considered from the viewpoints of organisational arrangements within entities, and the possibility of separating ownership from management and control. In order to properly consider the question of functional separation, it has also been necessary to give consideration to separation of distribution and energy retailing, as well as generation and transmission.

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1 July 1991 Special Premiers' Conference Communique

2 First Issue of National Grid Protocol, 10 December 1992

3 "One Nation" Statement by Prime Minister, February 1992

4 Heads of Government Meeting Communique, May 1992

The issue of "separation" was further considered at the Council of Australia Governments meeting in Perth on 7 December 1992 and Heads of Governme reaffirmed their commitment to the principle of separate generation and transmissic elements in the electricity sector[5]. Most Heads of Government noted that "separatio went beyond the simple Ring Fencing or accounting separation of generation ar transmission - it envisaged separate management control of the transmission sector[6].

Consideration has had to be given to a wide range of matters to enable conclusions be drawn on the various possible structural options for an interstate transmissic network.

The interstate transmission network is best defined in terms of the function it perforn to support trading, the entities involved in the provision, coordination and regulation network service, and the relationships between those entities. As such it will determir the framework within which the industry develops to meet overall equity, fairness ar efficiency objectives.

Present Structure of the Industry

The electricity supply industry in Australia has developed very largely on a State bas under government ownership, with somewhat different institutional arrangements in tl different States. The industry has demonstrated a determination to pursue a range reforms through restructuring and workplace initiatives aimed at achieving great economic efficiency over recent years. The formation of the National Grid Manageme Council has acted as a further stimulus to reform over the last twelve months.

In considering various structural options for the Interstate Transmission Network it important to consider the current situation in each State and Territory, insofar organisational arrangements, ownership, taxation and regulation is concerned. Industri relations is another important area where there are significant differences between Stat and utilities and in which major reforms are being pursued.

International Experience

The electricity supply industry worldwide is over 100 years old and there has develope great diversity of ownership and structure of the industry through many countries. Tl development of electricity transmission networks owes much to the history of tl industry in particular countries.

In the United States of America, mainly private, vertically integrated utilities domina the industry. In Continental Europe there has evolved a very diverse structure - in son countries utilities that cover the full spectrum of generation, transmission, distributic and retailing, whilst in others the distribution/retailing function is undertaken by separa

5 Council of Australian Governments Meeting Communique, December 1992

6 Letter from Prime Minister to Chairman NGMC, 11 December 1992

entities, and ownership is by both public and private enterprise. The recent initiatives in England and Wales has seen the separation of the main grid from the generation entity and a disaggregation of that entity into a number of generation bodies, whilst different arrangements have been adopted in other parts of the United Kingdom.

There has been an increasing rate of reform in parts of Continental Europe, the United Kingdom, New Zealand and the United States. Although the particular proposals for change have varied, the general direction of transmission structural changes internationally has mainly focused on open access to the grid, particularly where there has been a dominance on vertically integrated utilities, increased competition at the generation level and greater independence of management and control of the grid.

In each of the countries different approaches have developed to improve the benefits accruing from coordination and competition in the planning and operation of the large bulk supply systems.

2 POSSIBLE STRUCTURAL OPTIONS

The following range of structural options have been identified and evaluated :

- Ring Fenced Network Business Units - where existing utilities are structured s that their network business units are Ring Fenced.

- Legally Separate Network Subsidiaries - where the network business units ar established as wholly-owned subsidiary corporations of existing utilities and thu become separate legal entities.

- Multiple Network Corporations - where the network businesses are separate from the existing utilities and formed into a number of new corporations.

- National Network Corporation - where the network businesses are separated fro the existing utilities and combined into a single corporation.

The National Network Corporation option includes the National Grid Corporatic proposed by the Commonwealth Government. The term 'network' rather than 'grid' ha been used however, as being more generic and potentially encompassing all wires use for trading in conformity with the Protocol, not simply those within major utili ownership.

The "Ring Fenced Business Units" and the "Legally Separate Network Subsidiaries whilst not achieving the degree of separation envisaged by many Heads of Governmen represent practical steps that could be taken in moving to Multiple Netwo Corporations or a National Network Corporation and for that reason have bee considered and assessed in this report.

Within the above broad options, there are a number of sub-options which have bee regarded as worthy of careful consideration.

2.1 Ring Fenced Network Business Units

Under this option the monopoly network or wires business within utilities (includi distribution) would be financially and administratively separated from the generation ar retail business (see figure 2.1). If the utility[7] is vertically integrated this would al involve financial separation of the monopoly wires business at the distribution level least to the extent that such wires are used by Participants for trading under tl Protocol. The energy retailing function at the distribution level would also be financially separate business. Ownership of network assets would remain with tl existing utilities.

[7] Utility refers to any entity responsible for the provision of network services and includes distributi authorities as well as vertically integrated electric power utilities.

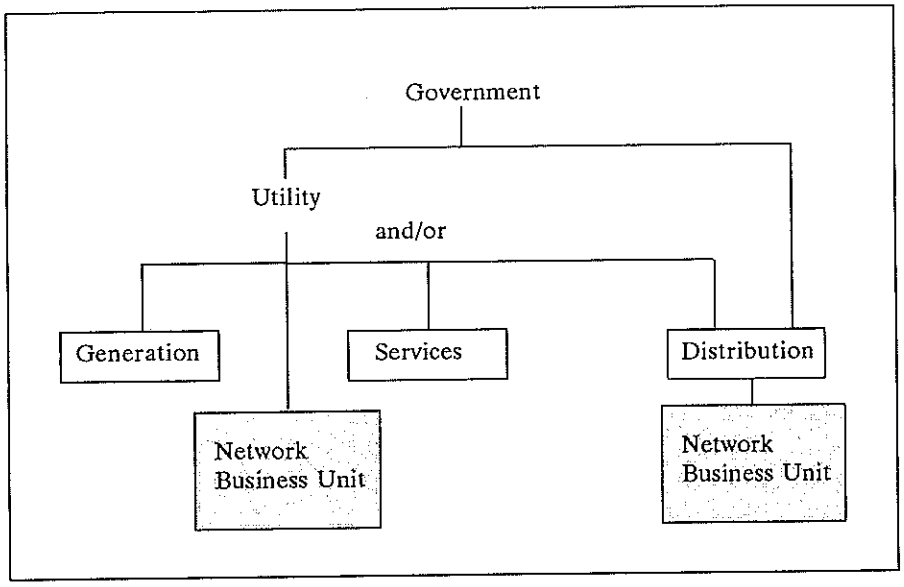

Figure 2.1 : Ring Fenced Network Business Unit Structure

As is currently the case, there would be an ongoing need for coordination across the interconnected network on operational matters, including maintenance coordination, and in respect of planning decisions which impact the overall system. Necessary coordination could be achieved under existing NGMC arrangements, or under a more formal arrangement such as could be provided by a National Electricity Board (NEB - refer 2.5 below).

The Ring Fenced Business Unit would be required to provide access on a non-discriminatory basis for all grid Participants under Protocol arrangements. The Protocol also specifies the arrangements for merit order dispatch. These arrangements are common to all structures.

Ring Fencing of network service businesses involves :

. establishment of separate asset registers & separate accounts,

. allocation of existing debt,

. implementation of some form of transfer pricing,

. apportionment of overhead expenses,

. and separate financial reporting.

No legislation would be required to implement Ring Rencing and Government income would not be affected.

Some of the major utilities are already well advanced in implementing Ring Fencing of network service businesses.

Examples of this type of structure are widespread in the international electricity indust such as Netherlands, Canada, Sweden, Finland and Northern Ireland. Examples Australia are SECV and Pacific Power.

2.2 Legally Separate Network Subsidiaries

Under this option the network service business within existing utilities (includi distribution) would become a wholly owned subsidiary of the relevant utility (see figu 2.2). As such, network services would be provided by entities which are both financia and legally separate from the rest of the utility business.

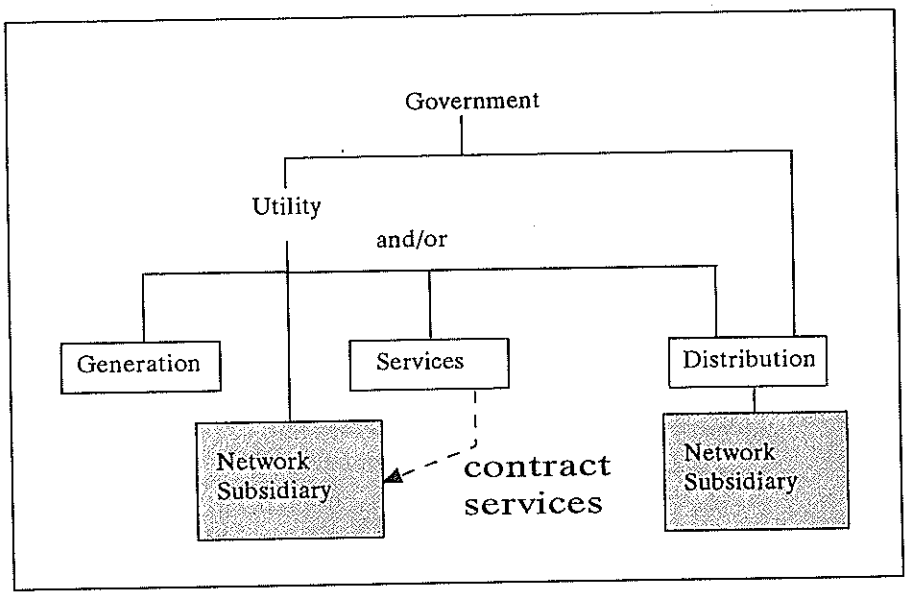

Figure 2.2 : Legally Separate Network Subsidiary Structure

Examples of existing subsidiaries within utilities are ENC (coal mining) and Pac Power International (external consulting) within Pacific Power, and SECV Internatic within SECV. Examples where network service is structured in this manner overs occur in Norway and New Zealand.

Such entities would be established under the relevant regulations and/or legislation a charter or articles of association appropriate to the functions.

Management

The network subsidiary would be constituted under the control of a board of direct some of whom may be external, with a separate General Manager and managen structure.

The business would be responsible for the detailed day to day switching opera maintenance, and augmentation of the network assets. If the business is a major s utility it could also be responsible for directing the non-discriminatory commitment

dispatch of generating capacity, and managing coordinated maintenance of generation and the network, in order to maintain balanced supply and demand.

It is equally viable that the functions of generation commitment and dispatch, and the coordination of generation and network maintenance be performed by a System Operation Group that is entirely separate from the Network Service business.

Depending upon the form of market structure, it may also carry out certain pool functions, including merit order determination and provision of information essential for settlement of customer market trading.

All of the above functions would be carried out in a coordinated and non-discriminatory manner, on behalf of all network users , under the provisions of the Protocol maintained and developed by the NGMC or a newly constituted NEB.

Staff would be transferred to the network subsidiary and employed under existing or new award arrangements. The opportunity could be taken to negotiate new agreements conducive to better work practices and improved productivity.

Finance

Each network subsidiary would maintain separate financial accounting of its operations and report its financial performance by way of a profit and loss statement and balance sheet separate from the rest of the utility business. The balance sheet would be constructed with an appropriate asset valuation and allocation of debt. The opportunity could be taken to refinance debt, however there are issues relating to Government support and allocation which would need to be resolved. Dividends would be paid to State Governments as owners.

Government

Some specific State legislation may be required to establish legally separate network subsidiaries. It is not envisaged that any Commonwealth legislation would be required. Each network subsidiary would be subject to Ministerial control and direction via the utility.

Network subsidiaries would pay income and sales tax equivalents to State Governments where applicable. Regulation could be State based, or alternatively could be carried out by an NEB and/or the TPC/PSA. However a single regulatory body would be preferred.

CSOs would be at Government discretion but would be made explicit and be by formal direction.

Market

Legally separate network subsidiaries would be bound by their charter or articles of association and the Protocol to provide network services to all market participants in a non-discriminatory and transparent manner. This would include pricing on consistent principles for network service, non-discriminatory access, and provision of information

for competitive sourcing. In the case of major utilities, network service would provided by organisations also engaged in generation, and in the case of fully vertica integrated utilities, in energy retailing. Distribution utilities providing network servi would also almost certainly be involved in energy retailing, and may in some cases involved in generation.

2.3 Multiple Network Corporations

Under this option the network service businesses would be separated from existi utilities and formed into a number of network corporations (see figure 2.3). Su corporations may be State or regionally based and would have responsibility for all the network assets used by participants for trading under the Protocol. This wo include such assets within the major utilities and distribution authorities. Aggregati of network assets within various corporations would be undertaken in a manner to b serve the needs of participants consistent with economic objectives.

Examples of this type of structure can be seen in Germany and Switzerland.

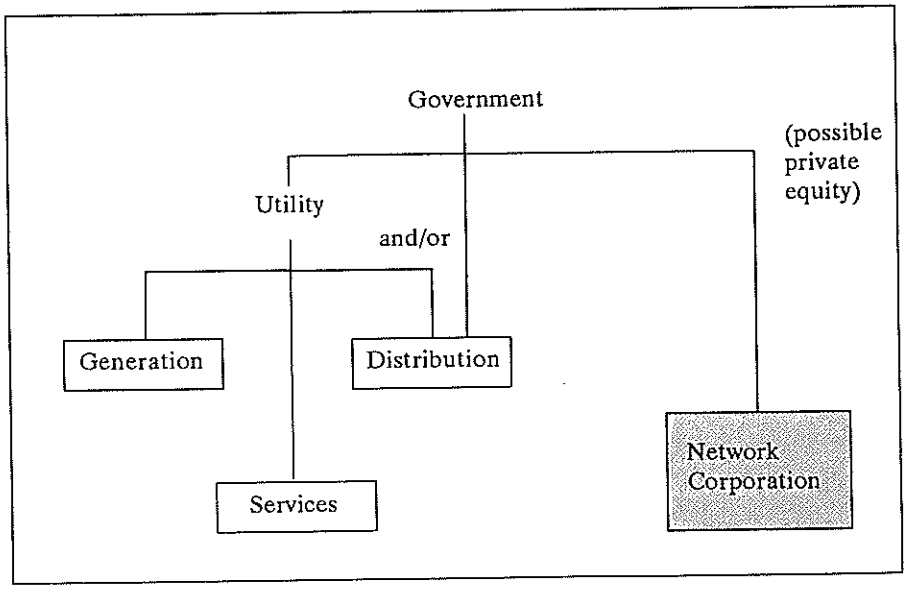

Figure 2.3 : Multiple Network Corporations Structure

Restructuring of the network service businesses in this manner would involve m enabling legislation at the State and Commonwealth (in respect of Snowy) levels.

Network corporations may be directly wholly Government owned, or could be structu based on Government and/or utility and/or private equity. Various sub-options h been evaluated.

Management

Each network service business would be constituted as a corporation with a boar

directors, and a management structure independent of generation and retail supply interests.

The business would be responsible for all the functions outlined for a Legally Separate Network Subsidiary. Staff would be transferred from existing utilities under existing or new award arrangements.

Finance

Corporate overheads involved in establishing an independent business (including relocation costs, establishment of corporate services, etc) would need to be taken into account. Other financial issues would be similar to that required for a Legally Separate Network Subsidiary.

Government

Specific State legislation will be required to establish the corporations and existing legislation will need to be reviewed in the light of the changed responsibilities of utilities and distributors.

The new corporations would pay dividends and income & sales tax equivalents to Governments where applicable.

Requirements for regulation and the treatment of CSOs would be similar to that for a Legally Separate Network Subsidiary.

Market

Network Corporations would be bound by their charter or articles of association and the Protocol to provide network services to all market participants in a non-discriminatory and transparent manner, in a similar way to a Legally Separate Network Subsidiary.

2.4 National Network Corporation

In this option, the network businesses would be separated from existing utilities (including distribution utilities) and combined into a single corporation (see figure 2.4). The ownership of the corporation would be a combination of Governments and/or Utilities and/or Private equity. Staff arrangements, conditions and/or locations would need to be substantially reviewed and enabling legislation would be required at the State and/or Commonwealth level.

The Corporation would coordinate all network planning, operation, augmentation and construction.

Major financial issues would be asset valuation and debt allocation, which would have to be agreed to by all States. The States would retain their equity in the assets but would lose operational and managerial control of them. The Corporation would be

subject to Commonwealth taxation (unless other arrangements are made).

Due to the size of this monopoly, it is potentially less transparent than having multiple network corporations with the comparative competition that they provide. This competition is effective regardless of the regional franchise. Multiple networks compete by comparing how efficiently they provide network service and by providing benchmarks against which other network owners can be judged within Australian conditions. These comparisons will provide incentives for poorer network performers to improve, or risk that new participants will connect elsewhere.

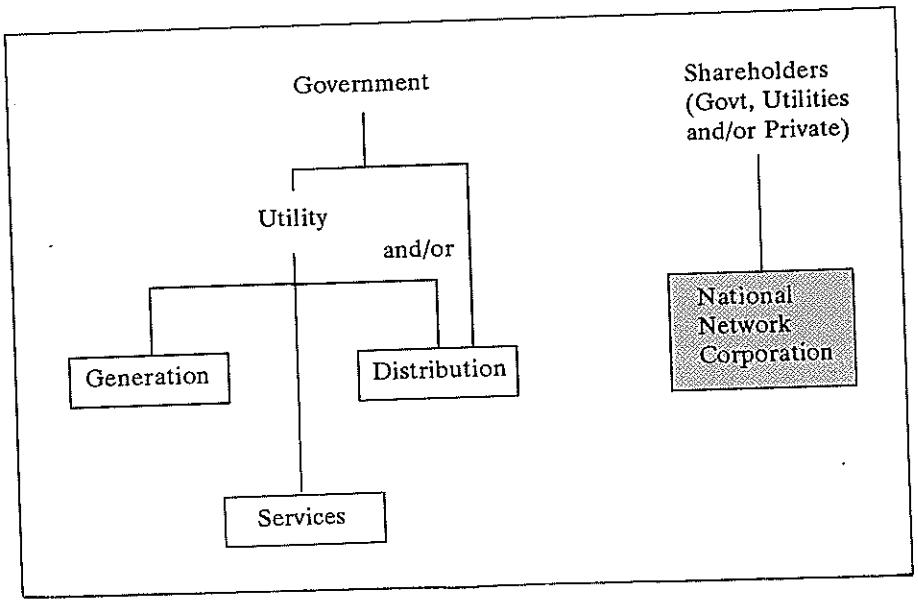

Figure 2.4 : National Network Corporation Structure

In other respects, this option is similar to the Multiple Network Corporations option

Examples of this structure can be seen in England & Wales and Spain (with Norway ar Sweden possibly in the future).

2.5 Role of NGMC or National Electricity Board

In considering various structural options, it has been necessary to consider the role the NGMC, and in particular whether this role needs to be redefined in a manr consistent with each option. There are four broad roles which may be required unc the various structural options :

Coordinating role : In the case of Ring Fenced Network Business Units, Lega Separate Network Subsidiaries and Multiple Network Corporations, there wo be a continuing role for the NGMC or its successor to coordinate operatior maintenance and planning matters on an interconnected basis.

Regulatory role : In each option there is a need for some form of regulatio

some options require more formal regulation than others. This could be a role for the coordinating body (NGMC or its successor) or for a separate entity.

- Advisory role : Under any option, there may be a need for a body to provide a range of professional, business and community advice on the electricity industry. For example, under the National Network Corporation model, it could provide advice on performance of the network. This could be a role for the NGMC or for a separate entity.

- Representative role : Under any option, there could be a need for a body which represents all participants to the Protocol. This could be a role for the NGMC or its successor or an independent body.

In each of the structural options considered, there is a role for a body like the NGMC to continue. Such a body should be neutral and independent of the participants in the industry. Cooperative arrangements like the NGMC have been proved to work overseas - UCPTE, Nordel and STYV are good examples. UCPTE and Nordel do not have any executive powers, as is the case with the NGMC, however they have an advisory role, and identify potential benefits which can be achieved by coordinated planning and operation, despite large diversity of organisational structures between utilities. STYV in Finland is an example of a
cooperative arrangement which has demonstrated its suitability to provide light-handed regulation for a number of diverse utility ownerships.

The possibility of the NGMC evolving into a more formal structure such as a National Electricity Board (NEB) has been canvassed. An NEB is envisaged as an entity with a legal (probably legislated) existence with which Governments and/or their utilities and other Grid Participants would have legislative or contractual arrangements in respect of the matters covered by the National Grid Protocol, ie.

- non-discriminatory network access and pricing;
- competitive sourcing of generation;
- electricity trading arrangements;
- coordination of planning and operation;
- establishment of network standards; and
- performance review.

An NEB could also provide a regulatory function for the interstate transmission network, particularly in respect of complex issues of network service pricing and technical planning and operation standards.

3 CRITERIA FOR EVALUATION OF STRUCTURAL OPTIONS

A complex range of factors need to be assessed to arrive at recommendations o preferred structural options and operational guidelines for the interstate transmissio network. To assess the various options identified, a set of evaluation criteria wa developed.

The purpose of this Chapter is to set out those criteria and explain their meaning, a applied in the present report.

3.1 Consistency with National Grid Protocol

The Draft National Grid Protocol has been developed as a means by which the Nationa Grid Management Council (NGMC) will satisfy the following objectives :

- to encourage the most efficient, economical and environmentally soun development of the electricity industry consistent with key National and Stat policies and objectives;

- to develop a generation market which is initially between grid owners/gr operators and generators. New private capacity will increase competition in th market. The development of arrangements between customers and generato will be in place by July 1993;

- to provide a framework for long-term least cost solutions to meet future pow supply demands including appropriate use of demand management;

- to ensure that the benefits and costs of interconnection extensions are prope identified and accounted for;

- to maintain and develop the technical, economic and environmental performan and/or utilisation of the power system;

- to enable private generation and publicly owned generation to compete on equ terms; and

- to recognise commitments and reasonable expectations implicit in existi contractual arrangements, such as the Interconnection Operating Agreement, a to ensure that parties to those arrangements are treated fairly.

Drawing on the above, it is evident that a major thrust of the Protocol is to facilitat move toward a more competitive market structure for the electricity industry and promote efficiency. For example, the Protocol establishes rules which will determ that there will be open and non-discriminatory access to the grid for sale of electric between generators, distributors and customers.

The Protocol has been endorsed by relevant Governments and this should ens

adherence to its provisions by all Participants. However, the Protocol is a cooperative arrangement, established without a legislative underpinning. This has facilitated the rapid development of the Protocol, at minimum cost. It also has the weaknesses inherent in any cooperative arrangement, although the contracts under the Protocol will have legal force.

It is recognised that the Protocol or some further development of it, will be needed under any of the options considered in this report. This could be under the NGMC or some evolution thereof. It may be that the Protocol will evolve into a legal document, or that the participants will agree to be legally bound by it.

Looking at the market from a customer viewpoint is an essential focus of the present report. In particular, customers will be expecting to share in the benefits which should flow from implementation of provisions under the Protocol.

Transparent and efficient transmission pricing for the trading network is essential and this will be introduced through the introduction of transmission charges aimed for publication in an indicative form by November, 1992.

The Protocol is intended to provide economic and therefore merit order dispatch of generators. It also specifies guidelines for competitive sourcing of new generating capacity, including demand management. The Protocol is intended to provide that this range of objectives is achieved via public reporting and review. Issues of coordinated maintenance (generation and transmission) and standard design criteria are also covered by the Protocol.

Thus the Protocol provides a significant advance, which can be regarded as providing a set of given conditions which all structural options must at least satisfy.

3.2 Support for Competitive Electricity Market

A basic premise of the continuing reform of the electricity industry is that the move to a competitive market will provide the framework for the most efficient usage of Australia's resources. The primary aim of this is to enhance the benefits provided by the industry to electricity customers with the main function of the transmission network being to move electricity between generators and users with access that is non-discriminatory.

Separation of Transmission and Generation

To promote this structure, Heads of Government agreed on 11 May, 1992 to the principle of separate generation and transmission elements. At the Council of Australian Governments meeting on 7 December 1992 this principle was reaffirmed and most Heads of Government noted that this went beyond simple Ring Fencing or accounting separation of the generation and transmission components of the industry. They envisaged separate management control of the transmission sector.

The rationale behind this principle is the potential for conflict of interest where vertically

integrated utilities could compete with new independent (perhaps private sector) generators in a competitive market. Vertically integrated utilities may be in a position to exert anti-competitive action to the detriment of potential entrants.

Adherence by Participants to the Protocol, the development of transparent and non-discriminatory pricing and access rules to be observed by all network service providers and the establishment of an electricity trading market structure separate from the provision of network services should eliminate the scope for vertically integrated utilities to exert anti-competitive behaviour.

There is scope for abuse of monopoly power arising from the natural monopoly characteristics of the grid, so analysis of the options needs to asses the scope for such behaviour and the consequent need for regulation.

The separation of generation and transmission elements, and the separation of distribution elements from retail functions could also encourage the development of arms length trading between generators and customers and therefore the ability to maximise trading potential, both intrastate and interstate.

3.3 Economic Efficiency

The implications of each of the structural options for economic efficiency will depend on a number of variables. For a given industry structure, inefficiencies may be traced to such things as unnecessary production costs, the incentives facing management as a result of regulation, the prevailing pricing rules and the extent of possible anti-competitive practices. While empirical analysis can have a role in supporting the recommended structural options, the nature of the current industry structure and the options being considered is such that the evaluation will depend heavily upon qualitative analysis.

3.3.1 Definitions of Economic Efficiency

The concept of economics efficiency is based on maximising community welfare, for any given quantum of resources. It is usual to distinguish between three different aspects of efficiency.

- Productive Efficiency : Efficiency in production implies that resources such a labour, capital and fuel are combined in such a way as to minimise the level c input required to produce a given level of output. Productive inefficiency may b due to an inappropriate scale of operations or from managerial "slack", either c which can result in more resources being consumed than are absolutely necessar to produce each unit of output. Removal of this type of inefficiency is prerequisite for achievement of the other aspects of economic efficiency.

- Allocative Efficiency is concerned with the alternative allocation of resource Allocative efficiency is achieved when resources are allocated to their highe valued use, ie. when the level of production of goods and services matches th preferences of the consumers. For this efficiency, issues of investment, produ

substitution and consumer demand are critical. In a market economy with demand for individual commodities largely determined by pricing, allocative efficiency will not be achieved unless an appropriate pricing regime is in place.

Dynamic Efficiency : A further aspect of efficiency relates to the maintenance of an appropriate mix of products. In formal terms, efficient conformity between production (supply) and consumption (demand) requires that the rate at which inputs can be transformed in production, be equal to the rate of indifferent substitution of these products by consumers. In the presence of shifts in demand and costs, dynamic efficiency implies the necessary foresight and investment to allow changes in output to match consumers' requirements over time.

3.3.2 Issues which affect Efficiency

Some products and technologies exhibit the traits of a natural monopoly, where provision by more than one supplier leads to inefficiencies. Historically, public utilities were often established in industries where appropriate scale and scope of activity were important factors in achieving efficiency, though the same argument has been made for other protected industries in the past.

A range of regulatory mechanisms has grown to deal with such products, varying from creating barriers to entry, to price controls to impose "public good" objectives. All these have meant that any market place that might exist has been blocked or markedly distorted.

These notions of natural monopoly and consequent regulation are rightly being challenged in the light of market growth, technology change and more rigorous analysis.

The network element of the electricity supply industry typically exhibits the characteristics of a natural monopoly. Network organisations exhibit economies of scale and scope, which lead to reduced efficiency when the same services are provided, within any single region, by more than one supplier.

The fact that, for technical reasons, network services are most efficiently provided by a single supplier raises issues for allocative and dynamic efficiency, even if the network is operated efficiently.

This situation has been acknowledged by the NGMC through the establishment of a pricing working group which has the challenge of creating a pricing regime to overcome the tendency to inappropriate pricing behaviour by network monopolies.

However, the identification of pricing rules designed to maximise community welfare by allocating resources in an efficient manner, does not automatically create the incentive for firms to pursue the cost minimisation such policies assume. It needs to be recognised that industry participants may have incentives to engage in behaviour other than cost minimisation, and that the monopoly structure of the network business can reinforce their ability to do so. This is particularly so where information about costs and customer demand is asymmetrically shared between the utility's management, the owner and the regulator. Under these circumstances, production costs higher than necessary,

that is low productive efficiency, can go undetected by owners and regulators. The inability to enforce and monitor appropriate behaviour is referred to as the "principal-agent" problem, and consideration of the relationships between various principals and their agents (ie. owner-manager, regulator-operator, government-entity, etc) assists in the assessment of structures. Future reviews of structural options in place or proposed should have regard to such analysis.

It is clear that because of the monopoly characteristics of network service it has been accepted that regulation is necessary. It is also accepted that such regulation may have a range of unintended effects or incentives for different behaviours. As a result, it is useful in examining efficiency to overlay the issue of transparency. This issue and consequent effects on efficiency, can be usefully illuminated through the principal-agent concept and the availability of information and attitudes to risk.

The above criteria have been developed as references for the evaluation of structural options. In general, efficiency is consistent with:

- achieving a scale of operations which is consistent with the available technology;
- in the absence of competition, a regulatory regime which provides incentives to reduce costs;
- pricing rules which reflect marginal costs, with correct allocation of joint costs and avoidance of excessive mark-ups; and
- effective control of anti-competitive management behaviour.

3.4 Accountability

The accountability to customers and other grid participants will be to a large extent delivered by adopting a transmission structure which aims to promote the most competitive electricity market. This will require that access to the grid is open and is non-discriminatory between the participants. Transmission charges will also need to be transparent to participants.

Accountability will also be achieved by the transparency and uniformity with which the transmission structures adopted can report financial and other operational details to owners and/or relevant governments and also participants in the grid. To be able to report this way will mean that the lines of reporting will need to be clear and therefore they should aim to minimise duplication in the formal assessment of performance.

3.5 Regulation

Accountability will be affected by the transmission structure and consequent implication for the form of regulation adopted. Such regulation should aim, like reportin arrangements, to minimise duplication. Regulation should also be kept light hande where possible to minimise (direct and indirect) costs and this will be assisted by havin

robust reporting structures in place. Some form of regulation of pricing and competitive behaviour (as well as other aspects of network businesses) is likely to be required for the network. The involvement of the Trade Practices Commission (TPC) and/or the Prices Surveillance Authority (PSA) and/or an industry specific regulator will need to be considered. There may be a number of matters that do not need regulation, and these should be identified.

3.6 Private Sector Involvement

In order to increase transparency and improve benchmarking, the involvement of the private sector in network service provision would be desirable. Structures should be assessed to determine the extent to which they encourage private sector involvement.

3.7 Commercialisation and Corporatisation

Commercialisation is the process whereby a Government Trading Entity adopts a more businesslike approach in its operations with the specific aim of improving efficiency and effectiveness. The establishment and Ring Fencing of business units is a major step in the commercialisation process.

Corporatisation is the process whereby a Government Trading Entity is established as a corporation constituted under and substantially subject to the ordinary law relating to non-government owned trading entities. Corporatised entities do not conform to any particular model.

The generally accepted distinction between commercialisation and corporatisation is that commercialisation represents institutional reform, whereas corporatisation should be viewed as an industry reform aimed at creating optimal economic efficiency.

The benefits and costs of corporatisation and commercialisation need to be assessed with regard to the various structural options.

3.8 Technical Standards

Assessment of the transmission structure models will also need to address technical considerations where there may or may not be constraints on the operation of the system or where
particular models facilitate technical coordination (operation, protection, etc.) better. Maintenance of safety standards for workers and the public and whether the transmission model provides appropriate incentives for maintenance of reliable, high quality supply will also need to be canvassed.

3.9 Operational Responsibilities and Functions

The network structure adopted must permit the physical operation of the entire power system in a safe, reliable and secure manner within the context of the national market or trading arrangements. The operation of the power system includes the direction of generation loading according to the market rules and the coordination of the network.

The criteria to be examined under the different structures being considered are:

- the ability to ensure a balance of generation and demand on a continuous basis;
- the ability to commit generating units into service in a manner which minimises the total cost of production;
- the efficiency of merit order dispatch; and
- the capability for safe, reliable and secure system operation.

As the system operation function involves the integration of both the generation and network segments of the industry, consideration needs to be given as to whether the operational responsibility rests with generation or the network or is independent of both The impact of the different network structures on this issue also needs to be considered.

3.10 Practicality of Implementation

The transmission structure adopted must "work". Essentially every option bein examined is working somewhere in the world, in the sense that the lights have not gon out, but this says nothing about efficiency. There are difficulties and establishment cost associated with any system but these must be seen in the context of benefits arising.

The transmission structure chosen will need to be tailored to facilitate the evolution the competitive electricity market and some assessment of international experience useful in this context. This assessment will need to have regard to Australia's speci load and generation characteristics, the geography of the network and its capacity support trading.

Consideration of the transmission structure will need to assess additional organisati infrastructure requirements, costs of implementation (including effects on existi contractual and other obligations) and the extent of legislative/regulatory chang required. Conversely they will need to highlight potential for simplification arrangements, cost reduction and removal of duplication.

Current Stakeholders

In adopting a transmission structure an appreciation will also need to be gained wheth and to what extent the structure will impact on ownership by the current g stakeholders. Under this consideration the underlying difficulty is that preservation existing arrangements will be easier to implement but may not maximise the over

operational efficiency of the grid. Ownership aspects will draw in financial issues and implications for revenue and taxation receipts (including mechanism for valuation assets and allocation of debt) but these should not become the main consideration for determining the appropriate grid structure. More relevant will be those financial issues which consider bankability and the allocation of risk under particular transmission models.

Industrial and Work Practice Implications

There will also be some models which provide better potential for continuing industrial relations reform (enterprise bargaining, reduction in numbers of unions etc.) but this will need to be balanced against implications for levels of employment and for the relevant conditions/awards.

3.11 Implications for Distribution

Historically distribution systems were established to service local areas, often in association with local generation facilities. However with the economies of large scale generation and transmission, local power generation facilities rapidly became redundant and most distribution systems now receive the bulk of their power requirements via transmission systems. While distribution systems initially may have only had one supply point, with the growth in local areas and the amalgamation of distribution bodies the number of supply points has grown along with the extent and complexity of the networks operated by distribution bodies. In general however distribution systems tend towards radial single path arrangements particularly as they reduce down to individual customers whereas transmission systems tend towards meshed multiple path arrangements.

Distribution bodies in Australia (including both separate organisations and units within vertically integrated utilities) generally perform two main functions, i.e. supply (retail marketing, sales and service) and distribution (transport of power from bulk supply points to the ultimate consumers). One exception to this is in Tasmania where the HECT Retail Business Unit is responsible for marketing sales and service to retail customers whereas the HECT Network Business Unit is responsible for transmission and distribution (transport) of power all the way from generators to customers. This particular arrangement was adopted because of the synergies available between transmission and distribution in the relatively small power system in Tasmania.

Power distribution, while it may effectively be a monopoly function, is also a key factor in the provision of service to customers. Because of the monopoly positions enjoyed by distributors, State Governments have had a major interest and involvement in setting tariffs to ultimate customers. This situation is likely to continue unless other mechanisms can be introduced to increase competition or otherwise overcome the perceived monopoly position of existing distributors with regard to ultimate consumers. Mechanisms which have been proposed and/or utilised for this purpose include use of multiple non-exclusive customer supply arrangements (from 1994 in England).

The definition of the National Grid contained in the Protocol covers basically any transmission and/or distribution systems which may be utilised for trading under the

Protocol. It therefore follows that open access and pricing principles must be applie regardless of whether a particular part of the system is classified, owned or operated transmission or
distribution.

The various structural options for an interstate transmission network intended promote trade in electricity therefore impact on the role, ownership and operation distribution and this needs to be discussed for each option.

4 CONCLUSIONS

Conclusions regarding the structural options for the interstate network are set out below. These conclusions are based on the detailed comparison of the options set out in the Appendix.

4.1 General Matters

- The Electricity Supply Industry has achieved dramatic efficiency gains in recent years. In the area of network services this has been achieved through initiatives involving amalgamation of transmission and distribution functions (in Tasmania and in part, in Queensland), and through Ring Fencing of the network businesses in Pacific Power, SECV, HECT and QEC.

- It is considered that these reform initiatives should continue and extend to other network entities (such as distribution authorities) to enable the full potential of cost savings to be realised.

- The above-mentioned reform initiatives have been associated with increased emphasis on customer focus and a recognition that customers are seeking more options for electricity trading.

- There are significant benefits to be gained by continuing the reform process on a flexible basis so as to gain experience on the initiatives currently being implemented in the areas of network service pricing and the customer market. This would of course need to be done in a manner which did not preclude the implementation of further structural change over time.

4.2 Network Service Pricing

- Network service pricing is intended to ensure that all users are treated fairly and equitably in terms of gaining access to network service and the charges they pay for network service. Implementation of non-discriminatory network service pricing under NGMC arrangements is to be based upon a common set of pricing principles and a pricing schedule which is transparent and capable of independent audit. Network pricing is to apply to all structural options considered.

- The prescriptive nature of network service pricing arrangements being developed by NGMC together with appropriate provisions for regulation should eliminate the scope for network service providers to discriminate against non-utility or other utility generators and customers through price and access arrangements.

4.3 Market, Trading and Operational Arrangements

- An important factor in the development of national trading and market arrangements will be the implementation of non-discriminatory access and network service pricing. There are some views that the structure may influence the delivery of efficient access and pricing arrangements. There are other views that with the NGMC Protocol and pricing arrangements in place, the structure will have no impact.

- The market and trading arrangements now under development are intended to enable market based trading between generators and customers anywhere on the interconnected network, with use of the network separately charged to all users under published arrangements.

- At this stage, system operation should continue under existing arrangements which involve full coordination between regional control centres, with the major utilities responsible for the technical direction of generator commitment and dispatch.

- Market information necessary to enable participants to make an informed assessment of market opportunities is to be provided by the NGMC through the publication of an annual Statement of Opportunities, with the first such document to be available early in 1993.

- Any national market would be dependent on appropriate interconnection capacity. A study for augmenting the capacity of the existing interconnection between New South Wales, Victoria and South Australia is proceeding. Interconnections with Queensland and Tasmania are also under investigation.

4.4 Structural Options

- Work undertaken by a Working Group established by the NGMC identified benefits in terms of transparency, accountability, ease of regulation and allocative and dynamic efficiency for all options which may be greater for the Multiple Network Corporations. The Working Group and independent consultants found that the Multiple Network Corporation has additional costs over the Ring Fenced and Legally Separate Network Subsidiaries. The Working Group and the independent consultants were not able to quantify the benefits attributable to moving to the various structural options.

- Separation of network service businesses within vertically integrated entities (major utilities and distributors) from other business activities (such as generation and retail supply) is considered essential.
- Reform under any option could be further underpinned by commercialisation and corporatisation of entities to ensure business-like arrangements and a clear expression of the functions and role of network service businesses.

- The treatment of Community Service Obligations (CSOs) will depend largely on the degree of corporatisation and private ownership, with complete transparency

essential in a fully corporatised entity, with or without private sector ownership.

4.4.1 Ring Fencing

- Ring Fencing of network service businesses through establishment of separate asset registers, separate accounts, transfer pricing, apportionment of overhead expenses, and separate financial reporting will achieve a high degree of transparency for users at minimum cost and disruption.

- In moving to Ring Fencing, there are significant costs involved in accounting changes (including asset valuation), transfer pricing and reorganisation. However, there are significant benefits to be achieved through better resource allocation & utilisation, greater market focus and improved accountability.

- Under the Ring Fencing option, with public sector ownership, the network businesses would be likely to retain their current tax exempt status under section 23 (d).

- Some of the major utilities are already well advanced in implementing Ring Fencing of network service businesses.

- Ring Fencing should be adopted by all major utilities and distributors who are involved in network service provision (transmission and distribution), including those who are not presently interconnected, in a manner which would not preclude further structural reform.

- The segregation of functions and the valuation of assets and liabilities provided by Ring Fencing is a necessary prerequisite to further reform. Ring Fencing as such could exist for a very short period and in effect not be a discrete structural arrangement.

4.4.2 Legally Separate Network Subsidiaries

- A further degree of separation of network service businesses could be achieved by the establishment of Legally Separate Network Subsidiaries. This would involve the establishment of a separate board responsible for the network service business within each entity.

- This would be a logical step beyond Ring Fencing, in the event that it could be demonstrated that further efficiency gains could be made.

- Tax exemption for the network businesses could be retained under the Legally Separate Network Subsidiaries and Multiple Network Corporations options, with State Government ownership, however expert tax advice would need to be sought to determine if the requirements of Section 23 (d) would be satisfied.

- In moving to Legally Separate Network Subsidiaries from Ring Fenced Business Units, significant additional costs would be incurred in relation to financial,

administrative and ongoing legal costs. However, the principal benefits are the clear obligations and responsibilities of Directors and Management to act in the best interests of the network business rather than the parent organisation, and greater transparency of internal arrangements.

4.4.3 Multiple Network Corporations

- Moving to Multiple Network Corporations under public ownership would achieve the maximum degree of separation possible without proceeding to a full National Network Corporation.

- Multiple Network Corporations would not be limited to the current State and Territory boundaries, where more appropriate regional boundaries are warranted.

- In moving to Multiple Network Corporations from Legally Separate Network Subsidiaries, substantial additional costs would be incurred in relation to financial & legal matters in separating and establishing new corporate infrastructure, and restructuring and refinancing debt; staff transfer; and possible diseconomies of scale and due-diligence costs. However, there are benefits in possible economies through tighter business focus, a more clearly separate decision making process, and possible optimisation of ownership boundaries.

- Multiple Network Corporations owned and guaranteed by State Governments would attract marginally higher borrowing costs than Ring Fenced and Legally Separate Network Subsidiaries (estimated at 0.1% p.a.), which would result in marginally higher (approximately 1%) transmission charges. There would also be higher ongoing financial charges for residual businesses.

- It is recognised that there would be considerable time required to move to Multiple Network Corporations. Whilst the Working Group and the independent consultants could not quantify the benefits of moving to this option, given the time available, it will be possible to more fully assess market perceptions, the deliverability of transmission pricing and access to the network, through experience with other options.

4.4.4 National Network Corporation

- In moving to a National Network Corporation from Multiple Network Corporations, major costs would include :

  - due diligence costs incurred by participating governments;
  - costs associated with refinancing debt;
  - dilution of liquidity of existing (Treasury Corp) funding arrangements leading to higher borrowing costs for some States;
  - developing and implementing network-wide systems for managing the

expanded enterprise;

- dealing with industrial relations and staff conditions, where the likely interest of a National Network Corporation in rationalising the range of Awards and practices would be complex, difficult and could potentially see current productivity arrangements in some States reduced or lost.

. Benefits of a National Network Corporation are that it could have the greatest degree of market neutrality and confidence, and would result in only one entity to be regulated. Prima facie it would seem to provide a greater national focus.

. A publicly owned National Network Corporation would probably operate without the benefit of government guarantees and so would attract borrowing costs estimated to be 0.5% p.a. above the government guaranteed Ring Fenced and Legally Separate Network Subsidiaries options, which would result in higher (approximately 3.5%) transmission charges.

. Taxation would need to be treated in such a manner as to ensure that States were made no worse off than at present. If this can be achieved, as it has in other cases, by negotiation, then it is not a cost as such. If not, it could prove to be a significant barrier to establishing a National Network Corporation. It must be acknowledged that any negotiated solution would be complex.

. The performance benchmarking which currently enables comparison of network service providers would be lost under a National Network Corporation.

. As for Multiple Network Corporations, it is recognised that there would be considerable time required to move to a National Network Corporation. The Working Group and the independent consultants could not quantify the benefits of moving to this option. However, given the time available, it will be possible to more fully assess market perceptions, the deliverability of transmission pricing and access to the network, through experience with other options.

4.5 Role of the Private Sector

. The development of new network capacity based on private equity or a mixture of private and public equity is an option. Opportunities exist for the private sector in the development of the transmission network to interconnect Queensland and Tasmania with the main system.

. Private, or a mixture of private and public ownership of some parts of the network would provide a means of comparison with public sector ownership.

. The establishment of Multiple Network Corporations or a National Network Corporation involving the transfer of publicly owned network assets to wholly or partly privately owned entities would incur substantial costs relating to due diligence, stamp duty (unless exempt), debt refinancing and prospectus, flotation and listing requirements.

. It is unlikely that Multiple Network Corporations or a National Network

Corporation as businesses would prove attractive to private investors in the short term, due to the lack of a proven track record and demonstrated profitable performance.

- Care would be needed in any privatisation process of existing assets to manage risk allocation in such a way that ensured new owner acceptance of environmental and regulatory changes without the provision of government guarantees.

- There is no conclusive evidence at this stage that the benefits of transferring existing public equity to the private sector would outweigh the costs.

4.6 Role of NGMC or National Electricity Board

- Irrespective of which structural arrangements are adopted for the interstate transmission network (up to and including the Multiple Network Corporations model), there will still need to be strong ongoing coordination of the kind currently provided by the NGMC. There will also be the need for some form of regulation. Under any option there will be a need for a body to provide a range of professional, business and community advice on the electrical industry and a body which represents all participants to the Protocol.

- Under each option there is a role for a body like the NGMC to continue. Such a body should be neutral and independent of the participants in the industry.

- A body, with a more formal structure such as a National Electricity Board (NEB) which would be an entity with legal existence, could have legislative or contractual arrangements in respect of the matters covered in the Protocol.

- An NEB could also provide some regulatory functions for the interstate transmission network.

4.7 Network Operation

- The network operation function has a responsibility to operate the system in accordance with market and trading rules in an unbiased and transparent manner Provided the transparency is maintained this function could be carried out by the existing operations centres in each State on a shared coordinated basis or via a national operations centre.

- In a national market arrangement the market operator determines merit orde on a national basis. This can be carried out by regionally coordinated dispatcl centres or a single national dispatch centre.

- None of the transmission structures examined dictates or requires that, fo operational requirements, a coordinated State or National Control structure b adopted.

- The physical operation of the overall National Network is integrally linked to th

operation of the regional systems and to an extent both regional and national centres would be duplicating many activities.

. The benefits of establishing a new, separate national dispatch centre are not considered to outweigh the costs.

. In the event that MNCs are established, it is envisaged that Network operation, including dispatch, would be the responsibility of the separate MNCs.

. To achieve consistency of operation, safety and reliability, procedures and rules for operating the Networks (including distribution networks) are best established under the umbrella of the NGMC or an NEB.

4.8 Regulation

. Regulation can be imposed for a variety of reasons and in a range of forms. The principal reasons for the regulation of the transmission of electricity involves the following functions :

- network pricing;
- access to the grid;
- technical standards (safety, reliability, quality);
- market and anti-competitive behaviour;
- national planning & coordination; and
- reporting requirements.

. Regulation of some of these functions (eg. technical standards, national planning & coordination and access to the grid) could be light-handed and simply codify what has already been specified in the Protocol. Other aspects (such as price regulation) may need to be more prescriptive, with perhaps an industry-specific regulator. The remaining functions are more general (market behaviour and reporting requirements) and may be appropriately regulated by either an industry-specific regulator or by the Trade Practices Commission.

. The arrangements for regulation should be the subject of a separate study in due course, when market arrangements have been more fully developed. However, several points should be noted.

- There should be a national approach to regulation. It is clear from work done to review overseas experience that multi-tiered regulation of the kind that characterises the electricity supply industry in the United States, should be avoided if possible.
- Where there is a need for different regulatory bodies to have

responsibilities for various parts of the industry, these should be drawn in such a way as to avoid overlap.

- Light-handed regulation is a desirable objective. It is noted that major structural reform aimed at improving industry efficiency through separation of functions, and/or introduction of competition in generation and energy retailing, has resulted in large increases in regulatory costs in England & Wales and the United States.

- Due to the ability to benchmark the businesses against one another, the adoption of Ring Fenced Business Units, Legally Separate Network Subsidiaries and Multiple Network Corporations models will have lower regulatory requirements than either the National Network Corporation or the completely vertically integrated structures.

5 RECOMMENDATIONS

The NGMC recommends that:

Structure

1 Multiple Network Corporations be the objective for Governments to work towards in the ongoing reform of the Electricity Supply Industry. Accordingly, Ring Fenced Business Units should be established as the first step towards this objective with the caveat that if, in the course of implementation experience or further cost benefit reviews, it is demonstrated that there is a better option than MNCs, then governments should reconsider their positions.

2 All utilities (including distribution utilities), proceed to:

- separate the network business from other utility business(es) through at least Ring Fencing; and
- adopt uniform accounting standards.

3 All participating governments develop and commit to a timetable for proceeding with recommendation 2 above.

4 A review be undertaken by all participating governments to assess potential for further reform through corporatisation of utilities, with a commitment and a timetable to achieve corporatisation where warranted.

Network Service Pricing

5 Governments ensure that all contracts and charging arrangements with respect to network services be based on the pricing principles developed by the NGMC.

Operation

6 System operation, at this stage, continue under existing arrangements, with the major utilities responsible for the technical direction of network operation and generator commitment and dispatch (in accordance with the Protocol). With any subsequent structural arrangement, system operation could be the responsibility of the Network.

Private Sector

7 The opportunity be provided for the private sector to be involved in major new network projects. This could be through joint venture arrangements with the public sector, or totally private, subject to business evaluation on a case by case basis.

Role of NGMC

8 The NGMC arrangements be reviewed within the three year period envisaged when the NGMC was first formed. This review should consider whether more formal arrangements are required, such as an National Electricity Board, as the industry and the competitive market develops.

Regulation

9 There be a national approach to regulation, to avoid overlap between State and federal jurisdictions.

10 Regulation be as light-handed as possible, to avoid the high regulatory costs experienced in the USA and England/Wales, where major restructuring has also been accompanied by extensive regulatory systems.

11 Regulatory arrangements be separately studied by the NGMC as soon as practicable and given detailed consideration when market arrangements have been more fully developed.

(It is considered impracticable to be specific about the regulatory requirements for the interstate transmission network at this time, given that arrangements for network pricing and the customer market are still being developed.)

APPENDIX

COMPARISON OF STRUCTURAL OPTIONS

The interstate transmission network structural options identified in this report are evaluated on the basis of the criteria developed in Chapter 3. The following sections compare the options under each criterion.

A1 CONSISTENCY WITH NATIONAL GRID PROTOCOL

The Protocol that has been developed by the NGMC sets down the rules, responsibilities and technical requirements for trading in electricity through the grid. The Protocol has been developed to encourage and support a more efficient and competitive electricity supply industry. The effectiveness of the Protocol to a significant degree depends on the level of commitment given by Governments to ensuring that grid owners/operators and grid users within their jurisdictions comply with the provisions of the Protocol.

The provisions of the Protocol are independent of the structure of the interstate transmission network. Each of the structural options is consistent with the provisions of the Protocol.

A1.1 Open and Non-discriminatory Access to the Grid

A central feature of the Protocol is the encouragement of trade in electricity through non-discriminatory access to the National Grid. The Protocol defines the responsibilities, procedures, terms and conditions that must be met by both existing and new Participants (grid owners/operators and grid users).

Non-discriminatory access is seen to be capable of being provided through each of the structural options provided grid owners and operators are required to comply with the provisions of the Protocol. Whilst the Protocol does not have the force of law, it will be necessary, irrespective of the structural option, to ensure that the conditions of open and non-discriminatory access are continuously available to users. These conditions can best be ensured by establishing separate legal agreements between grid owners/operators and users.

In addition to any legal arrangements between grid owners/operators and users, open and non-discriminatory access will be supported by :

- grid charges being set by parties independent of the grid owners/operators (ie. the regulator); and

- the physical characteristics of the network (ie. the laws of physics which determine physical power flows) that would inhibit grid owners/operators from undertaking actions to prejudice the operations of particular customers or generators.

Charges for access to and use of the grid are to be established by the NGMC independently from the grid owners/operators. As such, the charges for entry, exit and use of the network are to be prescribed by the NGMC. Furthermore, the technical aspects (ie. procedures for connections, the physical assets required and their performance characteristics) relating to entry, exit and use of the network are prescribed in the Protocol, providing no latitude for grid owners/operators to place barriers in front of or discriminate against users. Grid charging and grid entry and exit arrangements are easily auditable. However, care would have to be taken that the pricing system itself does not raise barriers.

The physical characteristics of electricity networks also provide a safeguard against inappropriate or discriminatory operational actions on the part of grid owners and operators. With other transport mediums such as road, rail, air and sea there is the potential for transport operators to make life difficult for selected users by say delaying shipments or taking longer

than necessary routes thus causing deterioration in quality of the goods shipped and/or late arrival. With electricity networks there is no scope for such behaviour. Any operational actions on the part of grid owners/operators are instantaneously felt either by a customer or a generator. If circuits or plant on the network are taken out of service or reduced in capacity then a customer will be under supplied and/or a generator's output will be curtailed or reduced.

Therefore, if any grid owner/operator, under any of the structural options, acts in a manner to discriminate against existing and prospective grid users, in relation to grid charges and/or operation, users would be aware of that and be able to seek redress through mechanisms established in the Protocol and compensation for damages arising from such actions on the part of the grid owners/operators.

A1.2 Economic Dispatch of Generators

A significant element in the achievement of an economically efficient electricity industry is the coordination of the operation of generation units available across the total network to achieve optimum operating economy. This is achieved by scheduling and dispatching generation units at all times, based on their incremental production costs and transmission losses associated with transmission of power to load centres. This is universally called economic or merit order dispatch.

The Protocol provides for dispatch of generation units in merit order based on prices which are determined by the true variable costs of each unit. Each of the structural options is equally capable of providing economic dispatch of generators. In most countries or large regions, the coordination of system reliability and economic dispatch are achieved by a single organisation. Even with multiple network arrangements, be they made up of a number of vertically integrated utilities or a number of network corporations, single bodies can undertake the overall coordination role. In the USA such coordination is achieved by many separate regional organisations (power pools) that cover strongly meshed transmission networks, and have bilateral arrangements with neighbouring pools.

Arrangements for the economic dispatch of generation can easily be developed for any of the structural options under consideration.

A1.3 Coordinated Maintenance

Efficient operation of power systems requires coordination of outages of generation and transmission plant to achieve cost-efficient outage patterns consistent with satisfactory levels of reliability. Because the costs associated with generation plant outages (determined by replacement energy values) are usually significantly higher than the costs associated with changing the timing of transmission outages it is important that the transmission outages are coordinated with the generation outages.

Such coordination is required irrespective of transmission network structural options. The Protocol sets out the requirements on grid owners/operators and grid users to participate in coordinated maintenance scheduling in order to achieve overall economic efficiency and maintain appropriate reliability levels.

The Status Quo and Ring Fenced Business Unit structural options involve integrated generation/network utilities which currently and potentially contain most of the generation and grid assets across the network, and can therefore achieve this coordination with little requirement for the provisions of the Protocol. However, as such provisions are contained in the Protocol, then all of the structural options are consistent with the achievement of coordinated maintenance.

A1.4 Standard Design Criteria

Electricity networks, unless designed and operated appropriately, have the potential to spread disturbances over wide geographic areas. Disturbances that develop in one region can spread and impact on customers and generators in other regions. This makes coordination essential for reliability. This coordination can take on several forms :

- establishments of common reliability criteria;
- automatic load-frequency control;
- provision of spinning and installed reserves;
- data exchange in real time for security analysis; and
- data exchange for maintenance scheduling of neighbouring generation and transmission equipment.

In Europe and North America mechanisms to achieve coordination in this area have been established :

- in Europe, UCPTE (Union for the Coordination of Production and Transmission of Electricity); and
- in North America, NERC (North American Electric Reliability Council).

In Australia, this function has been performed for many years by the South East Australian Interconnection Management Committee[1].

The Protocol sets out the rules and guidelines for transmission planning, construction, commissioning and operation. Under each of the structural options there will be a need for some coordinating body such as the NGMC to provide appropriate design guidelines, and as such each of the options is consistent with the Protocol. The National Network Corporation option would be possibly better suited to establish standard design criteria, however overseas experience demonstrates that standard design approaches can also be achieved through cooperative arrangements.

Standard design criteria is an important element in structuring and maintaining fair and equitable grid charges across the network.

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1 Now effectively the National Grid Operating Committee (NGOC)

A1.5 Transparent and Efficient Transmission Pricing

The development of an efficient electricity market requires all users of the network to be able to freely trade through the grid with the price for use of the grid fairly structured, transparent and publicly known. The development of such grid pricing is a key element in providing non-discriminatory access to the grid.

The Protocol sets out the basis for grid pricing, which is being further developed by the NGMC with the objective of publishing grid charges in an indicative form in November 1992. The pricing arrangements are to apply across the network, irrespective of grid ownership or structural arrangements. For all of the structural options, it is envisaged that there will be an independent body such as the NGMC (or other bodies that evolve from or replace the NGMC), that has the responsibility to determine grid pricing. On that basis, the structural options are not expected to differ significantly with regard to pricing.

A2 SUPPORT FOR COMPETITIVE ELECTRICITY MARKET

Structural arrangements for the interstate transmission network must be such as to support the evolving competitive market for electricity in eastern Australia. Before discussing the various structural options from this perspective, it is useful to summarise the main areas of reform which are being pursued for the development of the competitive market, namely:

- non-discriminatory and transparent pricing for the provision of network services, and
- arrangements for competition in the wholesale generation and retail markets through pooling and electricity trading.

An important common factor in these areas is the requirement to support interstate trade both at the wholesale and retail level. The NGMC has provided significant commitment to Heads of Government, particularly in the areas of network service pricing and generator to customer arrangements. Each of these areas is now discussed in turn in relation to identified structural options for the interstate transmission network.

A further important aspect will be the capacity for interstate trade through existing and new interconnections.

A2.1 Network Service Pricing

The NGMC is committed to the development and implementation of non-discriminatory pricing for the provision of network services for all users. The Council has set up a Transmission Pricing Working Group (TPWG) to develop pricing principles, structure and pricing schedules (capable of independent audit) for network service charging. The work of the TPWG is subject to independent consultant review.

The NGMC will publish a report on Transmission Pricing in November 1992. The report will provide a sound basis for consultation with participants on principles, structure and pricing arrangements which will be further refined over the period to 1 July 1993.

Arising out of this work it is important to note that:

- all users will have access to the network on a non-discriminatory basis, under pricing arrangements based on common principles, reflective of the network resources they make use of, no matter where they are located on the network, or at which voltage they take service;
- network pricing principles provide for independence from market pooling and trading arrangements (recognising that these arrangements are at an early stage of development);
- network pricing is being developed to promote economic efficiency in all sectors of the industry by providing users with cost reflective pricing (including allocation of fixed costs based upon benefit derived and in a manner which does not distort variable

cost pricing signals), and by imposing on network service providers incentives for efficient behaviour;

there is a clear business objective for network managers to meet the needs of network users for :

- transport of energy,
- security of the energy transport system, and
- management of the quality of supply,

at lowest overall cost consistent with community and environmental obligations;

- integrated least cost planning processes (including competitive sourcing) are to be used to promote economically efficient network investment decisions;
- network pricing principles will be consistently applied at all transmission, sub-transmission and distribution network levels involved in the transport of electricity under arrangements between generators and customers covered by the Protocol; and
- network pricing is to be based on standard rates for asset replacement values, asset lives and rate of return across the network, with network owners obliged to seek approval for any difference from the standard rate of return required to ensure revenue adequacy, in their particular circumstances.

Given the above situation, and recognising that network service provision will be a regulated business, it is clear that common pricing principles and charging arrangements will apply for all users, irrespective of the structural arrangements adopted for an interstate transmission network. In addition, there is a view that the principle of separation between generation and transmission may be achieved by the separate transparent pricing and non-discriminatory provisions for all users, notwithstanding that various entities may own both generation and network elements and/or be major customers.

Concerns have been expressed that large monopolies, whether they be vertically integrated utilities under Status Quo arrangements or a single National Network Corporation may seek to abuse their monopoly position. In the former case the primary concern is that network service pricing or access arrangements may be applied so as to favour the network owners' generation or direct supply interests. In the latter, the concern is that excessive prices may be charged and/or costs incurred by a monopoly supplier. However, in both cases, these concerns should be reduced by the application of uniform pricing principles. It is worth noting that in all structural options, some form of regulation will be required.

It is also significant that, irrespective of structural arrangements, the owner of transmission will not be indifferent to the choice of generation options. Different options may require major new transmission assets, utilise existing assets more effectively without additional transmission investment, or in some cases, result in reduced use of existing transmission assets. There is therefore scope for a network service provider to be biased in favour (or against) certain future generation options, and hence try to apply discriminatory pricing (if

not prevented from doing so). Transparent and non-discriminatory pricing will be important to offset any tendency for bias arising from the transmission owner's preferences.

Conclusion

It is concluded that under the Protocol and proposed pricing arrangements there are no material differences between any of the structural options identified in relation to generators and/or customers gaining access to network services on a non-discriminatory basis, although greater regulatory costs could be incurred for the National Network Corporation option.

A2.2 Wholesale Market/Pooling and Trading

The NGMC is developing new market and pooling arrangements for introduction on 1 July 1993. The broad objectives to be satisfied are outlined in the Protocol and, in particular, there will be provision for customers (initially larger than 10 MW) to trade directly with generators if they wish.

At this stage, details of the new trading arrangements which could play an increasing role in the evolving competitive market are not yet agreed, but the essential features to provide for the possibilities of direct customer to generator access and competition in retail supply include :

- Non-discriminatory access to the interconnected transmission and distribution network.
- No barriers to interstate trade or entry for new participants in generation or retail supply[2].
- Uniform trading rules across the south and east Australian ESI.
- Interconnection-wide merit order commitment and dispatch to be maintained to achieve least cost operation.
- Trading mechanisms to allow risks to be allocated to the parties in the best position to manage them.
- All participants free to make their own decisions regarding the type of contract structure they are willing to enter into and their risk exposure.

New types of trading under consideration include the spot and capacity contract arrangements being trialled in NSW and Victoria, respectively. Some of the related possible features include :

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[2] Retail supply is the energy trading business. It involves acquiring bulk energy and packaging it to meet the needs of end users. A retail supplier may source its energy from its own generation or purchase energy through the market arrangements. A retail supplier can be a single organisation such as Melbourne City Council or Sydney Electricity, an association of buyers acting as one for mutual benefit of buyers, or the ring fenced retail supply arm of a utility or generation business.

(i) Capacity Contract Trading

Capacity contracts could be entered into between generators and retail suppliers and/or end users[3] on the following basis :

- Capacity contracts could have a fixed component related to capacity and performance, and a variable component for energy production. The variable component of the energy price under the contract and the availability profile of the capacity are submitted for the purposes of unit commitment and dispatch.

- Capacity contracts would separate energy charges from capacity charges.

- Participants could contract or trade freely across the south and east Australian electricity market.

(ii) Spot Trading

- Retail suppliers and end users with loads greater than that provided by their capacity contracts would purchase energy to meet their demands at spot prices.

- Retail suppliers and end users with capacity contracts in excess of their loads can offer their excess capacity under spot arrangements in the market.

- Generators with capacity not covered by capacity contracts can offer that capacity to the spot market.

The above possibilities would require settlement arrangements which recognise the fundamentally different approaches to pricing in spot trading and capacity contracts. Information would be required from power station and customer metering, spot bid and clearing prices, contract quantities and variable cost components for capacity under contract.

Although the market/pooling details are still to be determined, the above discussion of some possibilities indicates that the ownership structure for the network is not a significant factor.

Whilst there may be concern on the part of independent Participants (generators and customers) as to the fairness of the arrangements, it needs to be recognised that these concerns will largely be addressed by the requirement that commitment and dispatch of generators will be on a prescriptive and auditable basis. This means that generators will be able to verify that they have been correctly committed and dispatched on the basis of the variable component of capacity contracts and bid prices submitted to the spot market.

The primary transmission and distribution concerns are access to the network and non-discriminatory pricing which are provided by a common approach and transparency requirements.

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[3] An end user consumes electricity. An end user may wish to deal directly with generators or alternatively purchase from a retail supplier.

It is concluded that the various structural options do not differ in their support for more competitive trading arrangements.

A2.3 Interconnection Capacity Development

To have an effective national market, there needs to be capacity for interstate trade. The market and/or competitive sourcing under the Protocol will dictate the cost-effectiveness of future interconnection enhancement and development. Future increases in the capacity of the interconnectors, including the development of the proposed Basslink (Vic/Tas) and Northlink (Qld/NSW) interconnections, will arise out of the willingness of Participants to pay for this capability, to overcome constraints to effective trading or to reduce capacity requirements. It is considered that the structure of the interstate transmission network does not impact on the development or enhancement of interconnections.

A3 ECONOMIC EFFICIENCY

A major concern in the establishment of a competitive electricity market, is whether the system as a whole generates appropriate types and levels of electricity industry investment in the presence of large sunk costs, long gestation periods for new investment, uncertain future demand and technological innovation. It would be inconsistent with the above principles if under the structural options for the network, access was limited or prices excessive for any single user or group of users. It is imperative that the common carrier role of the transmission network embraces a structure in which independent decisions are based on efficiency criteria, that pricing is transparent, and also that access is seen to be equal for all generators and customers. To address some of these concerns a major objective of the new structure should be to isolate the natural monopoly element of the industry, that is the network services.

Assessment of the efficiency of the various structural options takes into account the possibility of realising maximum economies of scale, the coordination abilities of various options, the difficulties associated with cost allocation in a separated network system and the incentives for cost minimisation and the achievement of appropriate investment levels.

A3.1 Productive Efficiency

Productive efficiency is concerned with cost minimisation, including such factors as scale of operations and incentives to produce efficient behaviour.

In principle, it should be possible to realise economies of scale in a large organisation, compared to a number of smaller ones. This would mainly be associated with the rationalisation of management and head office operations and the possibilities of increased specialisation. It is also acknowledged that large monopolistic organisations have considerable advantages over smaller, competitive firms in effective research and development. However, these theoretical advantages must be weighed against the disadvantage of size resulting from the distancing of central management from day to day operations and the extreme specialisation of work tasks.

In terms of scale of operations, it was considered that a National Network Corporation would have a marginal advantage over Multiple Network Corporations. Economies would also be available to Ring-Fenced Business Units and Legally Separate Network Subsidiaries through their forming part of larger organisations. These conclusions are however, more in the nature of professional estimates and review, rather than based on analysis. Further analysis and review may reveal more solid conclusions but can probably never fully anticipate market solutions.

Significant incentives for cost control exist in all options, other than the National Network Corporation. In the case of regulation by rate of return targets, it is widely recognised that incentives are entailed which lead to over-investment and cost-padding. However, the opportunities for "yardstick" competition are enhanced when the performance of a number of similar, separate organisations is readily compared. Other methods of regulation, such as CPI-X price control, may provide incentives for reducing operating costs over time, but are less conducive to allocative efficiency. It was considered that a greater level of unnecessary costs

would be present in a National Network Corporation than in alternative structural options, in the absence of two other types of regulatory control, namely incentive compatible pricing schemes and holding an auction for the right to operate the network under contractual conditions. These types of regulation are nonetheless just as applicable to all the specified structural options. However, the extent of effective vertical integration is a powerful force for avoiding unnecessary transmission costs in the Ring-Fenced Business Units and Legally Separate Network Subsidiaries.

For a Ring-Fenced Business Unit option there would be low external or market forces for efficiency. Whilst there would be a tendency to seek to maximise whole business profits, the ability to do so would be limited if clear, uniform access rules could be adopted and enforced. Strong reporting requirements, including benchmarking between network businesses where possible, can be a powerful tool to lift performance. However, from that point remedies are either regulatory or persuasive and not market-based. Some arguments related to maintaining a vertically integrated structure actually relate to the benefits obtained by subordinating individual parts (including the network) to the total needs of the business. It must be noted that for some operators, disaggregation would involve diseconomies of scale unless there were broader (ie. across States) amalgamation of assets. It should be remembered that a ring-fenced organisation will have customers who are both competing with each other and with the ring-fenced organisation itself.

In the Legally Separate Network Subsidiaries option, reporting requirements would be more formally legal with attendant responsibilities. These formal responsibilities are critical. However this option is open to criticism similar to the ring-fenced option, in terms of independence. On the other hand, the positive efficiency arguments related to economies of scale also apply here.

Multiple Network Corporations would have greater market pressure applied through the greater ability to compare the performance of different corporations or network service providers. Some market choice for network users could also emerge in the future where there are different locational choices available for generators and customers. However, this option is open to oligopolistic behaviour nationally and monopolistic locally, unless regulated.

The National Network Corporation would be a low risk monopoly operator and its equity holders could be reasonably expected to accept a lower rate of return than the Multiple Network Corporations. The incentives for efficiency come from its charter and openness of its operations (it could be argued that the needs for "commercial-in-confidence" in such an organisation may be restricted to direct contract arrangements it may have with some customers). There is, however, little other efficiency pressure except for regulation. The investment incentive for such an organisation would primarily come from internal efficiency measures to increase returns and from its desire to increase its level of business. This could lead to over-investment. This tendency could be exploited by giving it a "competition facilitator" charter for investment, that is, investment could be made on grounds additional to immediate or even medium term efficiency or return. In this context, efficiency of operation could be difficult to measure, though a National Electricity Board with planning powers would be an important countervailing force.

A3.2 Allocative Efficiency

There are two central aspects to allocative efficiency : whether the industry as a whole delivers an efficient result; and whether there is flexibility to receive and respond to market signals about investment or "dis-investment".

A National Network Corporation should deliver allocative efficiency through strong central planning of the grid. It may not however, depending on information flows and incentives, deliver the efficiency that a market place (including "yardstick" competition) provides. It has the attendant risk that monopolistic behaviour will lead to over-allocation of resources to the grid. This could be ameliorated in part by a National Electricity Board with some coordination and planning responsibilities.

The Multiple Network Corporations would presumably operate in such a way as to deliver a profit on their operations. This could mean taking a regional rather than a national perspective on some occasions. To this extent, a narrower view of allocative efficiency could emerge. A Multiple Network Corporations option may not deliver as strongly planned a national network as the National Network Corporation but this could be dealt with to an extent by the NGMC or a National Electricity Board with coordination responsibilities. The delivery of allocative efficiency in this scenario depends on the level of cooperation, effective pricing of the network use and the level of regulatory power. The very critical difference is that there are alternative sources of information for customers, producers and regulators and the possibility of different creative strategies in different organisations.

Legally Separate Network Subsidiaries and Ring-Fenced Business Units will not have as much incentive to respond to external market-related forces. The dominant incentive for the latter option is likely to be the enhancement of total business. Indeed it could be in the interests of the total concern to restrict the grid as much as to enhance it. A Legally Separate Network Subsidiary would have an internal incentive to maximise the return to business, but this would be muted by their subsidiary nature and may not always be convincing to outside business. The NGMC or a National Electricity Board could provide incentives and compulsion for allocative efficiency through a planning role, but in such a controlled business environment the NGMC or NEB would require specific powers to enhance its role. These options may tend to under-provide grid infrastructure.

One of the most important principles of electricity industry reform is to increase the contestability of the market place through such strategies as removing disincentives to change sources of power, including the disincentive for new players to enter the industry. These are inherent in vertically integrated power supply organisations unless elements which need to be used by all Participants are clearly supplied and priced in a non-discriminatory manner. The Multiple Network Corporations and National Network Corporation are the options that best meet this issue on a market structure basis. No matter how open or well established a transmission pricing policy is, many participants within the industry and customers are likely to seek the assurance through structural change that network financial performance is not being affected by other industry interests.

With regard to the efficiency of operation of the grid, no option provides a high level of competition in the supply of network service. The National Network Corporation is a total transmission monopoly that would rely on openness of operation, international benchmarking

and external regulation/review by bodies such as the Trade Practices Commission to mute its monopolistic behaviour.

A3.3 Dynamic Efficiency

In terms of optimal investment, it was considered that this aspect would also be heavily dependent on the regulatory regime and effectiveness of national coordination. However, a National Network Corporation might be expected to over-invest, all else being equal, because fewer options are available for controlling unnecessary expenditure. Conversely, the option of Ring-Fenced Business Units was considered likely to lead to under-investment, partly due to greater pressure to restrain costs and partly because the incentives to act in a vertically integrated manner with regional generators could result in under-investment. Coordination problems alluded to above were considered likely to lead to less than satisfactory investment levels also in Multiple Network Corporations. Legally Separate Network Subsidiaries could suffer from some of the disadvantages of vertical integration and lack of coordination with respect to investment. The Multiple Network option allows for greater possibilities to adjust organisation or business boundaries to meet financial or investment requirements.

A3.4 Transparency

A critical issue is the nature of decision-making in such organisations. If an organisation is operating in a national competitive market and yet is open to the direction of Government in a national or State context, then there will not be complete confidence that the organisation is free of policy direction incidental to commercial or efficiency objectives. It could be argued that the more corporatised an organisation is, the more transparent it becomes.

Confidence in this transparency would also be related to
ownership arrangements.

An important assumption in considering this criterion is that network pricing will be uniformly set. If this is so, there will be a very restricted range of ways to pursue other objectives. In theory they can only be deliberately funded, though marginal opportunities would inevitably emerge to shift accounting definitions and the like. Such opportunities and the incentives to do so, are probably greater in organisations with common ownership or vertical integration.

A3.5 Summary

An immediate priority to the industry is cost minimisation, because this dimension of efficiency is fundamental to other aspects, not easily achieved under historical industry structures and the results are easily measurable.

It is critical in the industry's current phase to deliver productive efficiency and to therefore facilitate the development of market openness, transparency and opportunities for "yardstick" comparisons. Given the existing infrastructure and the judgemental impact of new options on economic efficiency, it seems advisable to avoid taking large and irreversible steps in the process of reform.

A4 ACCOUNTABILITY

The accountability criterion refers to the extent to which the owners and managers of the transmission system may be held responsible to those affected by their actions (customers and grid participants) and those with nominal authority over them (owners and Governments). Accountability is important to ensure that all participants in the transmission system operate as efficiently and effectively as possible. The degree of accountability depends on the structures of the various entities involved and on the regulatory arrangements adopted. Accountability is enhanced by increasing the transparency of transactions between the business units involved and by a clear definition of the responsibilities of individual units.

Transmission undertakings will be accountable to users and customers through any contractual arrangements for transmission service entered into by the utility. The use of a standard approach throughout the National Grid will also provide some accountability to users in all but the National Network Corporation option as it will permit some comparison of efficiency between States. Similarly, transmission undertakings will be accountable through NGMC overview and their relationships with other systems interconnected with them for the observance of the technical standards set out in the National Grid Protocol.

Requirements for the provision of Community Service Obligations (CSOs) may pose significant problems for accountability. CSOs may, for example, be used as an excuse for poor financial performance which is actually due to lower productivity and lax management. Specifically identifying and funding CSOs increases accountability considerably.

A4.1 Status Quo

In the "Status Quo", the transmission function is treated differently in the different States. Some have transmission identified as a separate business unit as for the "Ring Fenced" option while others have it combined with distribution or generation functions. Accountability to owners and management and to users of the transmission service itself may be lowered under the latter arrangements because there is a lack of transparency in reporting of the combined functions' operations. There is also significant potential for weakened accountability in such structures if community service obligations are involved in the provision of either or both of the services, as the need for cross-subsidies within and between services to fund the CSO may mask actual levels of performance.

Transmission management accountability in this option is usually to a Utility Chief Executive (or possibly one level lower) and thence through the Board (if any) to the responsible Minister. The difficulty with this structure is that utilities are often required to provide a mix of commercial and social services and may be subject to political direction. The resulting mixture of objectives reduces the accountability of management generally.

These weaknesses could in large part be addressed by the corporatisation of utilities and the specification of commercial objectives for them. Any non-commercial activities required by Government could then be treated as Community Service Obligations and transparently funded.

A4.2 Ring Fenced Network Business Units

"Ring Fencing" of business units is an attempt to increase the transparency of the operations of the various units and to increase the accountability of the management of individual units. An accounting separation of the network activity of a utility should increase the accountability of the management of that activity, to utility management for commercial results and to grid users for avoidance of abuses of monopoly power. Transfer pricing between business units would be based on the published network service pricing. However, because the network business unit remains an integral part of the utility, it could still be subject to conflicting objectives at the utility management level. The provision of CSOs could also diminish accountability unless they were specifically identified and funded.

A4.3 Legally Separate Network Subsidiaries

With a structure involving separate network subsidiaries, the separation of the transmission activity is increased and accordingly transparency and accountability are increased. However, the transmission "company" is still wholly owned by a utility holding company and as a result may be required to act in ways which advance the interests of the utility as a whole rather than the transmission entity itself. Nevertheless, the necessary separation and reporting of accounts and proper asset valuation do increase accountability. It remains important, as before, that CSOs are identified and funded in a transparent manner.

A4.4 Multiple Network Corporations

Multiple Network Corporations are probably the most accountable transmission structure. This arises because they can be independent of the remainder of the electricity supply industry (apart from some common ownership) and can be concerned only with their own business. Accountability will be enhanced by the presence of several corporations, as comparisons between corporations will permit judgements by owners, regulators and users as to the performance of individual corporations. If established as corporations under the Corporations Law, they would be fully accountable under its provisions. If they were Government owned corporatised entities, under the Corporations Law or otherwise, management would be clearly accountable to their owners (Governments) for objectives set out in their Statements of Corporate Intent. Accountability to owners would be perhaps increased, in a commercial sense at least, if partial or full private ownership was involved because of the monitoring role of the stock market. In such a case, however, increased regulation costs could be incurred to ensure accountability to Government and to protect grid users and customers.

In the Multiple Network Corporations model (and possibly also in the Legally Separate Network Subsidiaries model) CSOs would be prescribed either by regulation or through Statements of Corporate Intent. It would again be most desirable for the purposes of accountability that the costs of CSOs be specifically identified and preferably funded. Separate funding by Governments would be essential if private sector involvement in the network corporations was to be encouraged.

The establishment of separate entities to carry out the network service function facilitates the regulation of that function separately from the remainder of the electricity supply business.

This ability increases as the transmission entity becomes more clearly identified from the rest of the business, peaking for the Multiple Network Corporations model.

A4.5 National Network Corporation

The accountability of a single National Network Corporation would be less than the Multiple Network Corporations model, because even though it is independent from the remainder of the industry, it would possess a monopoly on information which would make it less accountable (and unable to be compared with any other similar players).

In the National Network Corporation model (as for Multiple Network Corporations) CSOs would be prescribed by regulation and preferably be specifically identified and funded. Separate funding by Governments would be essential if private sector involvement in the network corporations was to be encouraged.

A5 REGULATION

Regulation can be imposed for a variety of reasons and in a range of forms. The principal reasons for the regulation of the transmission of electricity involves the following functions :

. network pricing;

. access to the grid;

. technical standards (safety, reliability, quality);

. market and anti-competitive behaviour;

. national planning & coordination; and

. reporting requirements.

Regulation of some of these functions (eg. technical standards, national planning & coordination and access to the grid) could be light-handed and simply codify what has already been specified in the Protocol. Other aspects (such as price regulation) may need to be more prescriptive, with perhaps an industry-specific regulator. The remaining functions are more general (market behaviour and reporting requirements) and may be appropriately regulated by either an industry-specific regulator or by the Trade Practices Commission.

General Principles

The main feature to be considered in discussing the regulation of network service providers is that transmission systems have natural or geographic monopoly characteristics which have the potential to be abused. It is economically inefficient for all or part of them to be replicated and scale economies dictate that cost effective transmission be undertaken by a single or very small number of operators. Irrespective of whether public or private ownership applies, a lack of direct rivalry may confer the ability to push prices and/or costs to a higher level than would have applied in a more competitive market environment. This type of monopoly is bound to occur in any transmission structure. Structures in which transmission forms part of a vertically integrated utility give network operators an additional incentive to abuse their monopoly position by providing preferential access and pricing to their associated generation and/or distribution interests.

It may be argued that the implementation of proposed uniform network service pricing rules and the principles of the Protocol relating to non-discriminatory access will prevent monopolistic pricing and anti-competitive access restrictions, but network users may not agree with this assessment.

Regulation can also be required for technical and environmental reasons, although these are not addressed in the present discussion. The Protocol maintained by the NGMC (or any successor) outlines the technical and performance standards to which all participants must operate and design their systems to be compatible with the national grid.

As regards the regulation of transmission line corridor planning and environmental approvals, it is noted that mechanisms to promote cooperative action between governments for land use decision making are being pursued with the Australian and New Zealand Environment and Conservation Council (ANZEC) under the 1992 Inter-governmental Agreement on the Environment.

The nature of the regulation which can/should be applied to the transmission elements of the Electricity Supply Industry (ESI) will vary significantly according to the structural option being considered.

A5.1 Fairness and Equity Between Participants

Fairness and equity between participants can be achieved through either :

(i) An agreed Code of Conduct;

(ii) Self Regulation; or

(iii) External Regulation.

In examining each of the options against this criterion, the Transmission Structure Group considered that an agreed Code of Conduct, such as that provided by the National Grid Protocol, was an appropriate mechanism for the Ring Fenced Network Business Units, Legally Separate Network Subsidiaries and Multiple Network Corporations (under Government ownership only) options.

Self regulation is not considered appropriate for the Multiple Network Corporations option with private participation, because of potential conflict between Government and private sector interests in this arrangement. Self regulation would not be appropriate for a National Network Corporation because of the enormous monopolistic powers implicit in such a corporation.

Irrespective of the above, if transmission assets have been transferred into separate legal entities (i.e. Legally Separate Network Subsidiaries through to National Network Corporation options) there is a strong case for self regulation or external regulation under (say) the Trade Practices Commission and/or the Prices Surveillance Authority. It is considered that external regulation would be more appropriate than self regulation for these options. External regulation would be fairest for private Participants on the Grid, by avoiding the problem of Governments being both owners and operators of grid elements in their own right (as well as their generating capacity) on the one hand and regulators of the transmission system on the other.

A5.2 Transparency

The need for and cost of regulation will be reduced if the structure chosen provides transparent commercial relationships between the various parts of the industry.

For ring-fenced business units, the level of transparency will depend to some extent on accounting practices. Transparency would be increased if the ring-fenced unit produced accounts fully separate from those of other units, covering e.g., allocation of assets and debt, and if ring-fencing included corporatisation. The form of corporatisation could also impact on transparency. Both the ring-fenced and separate subsidiary options would report to a parent board, which would make it difficult to regulate them separately from that parent. The parent could also influence the reporting accounts.

Transparency of relationships and ease of regulation will tend to increase as the network activity becomes more removed from the generation and retail supply functions. Legally Separate Network Subsidiaries and Multiple Network Corporations could have accountability and transparency arrangements largely dictated by Corporations Law but there would be additional requirements because of their monopoly markets. Ring-fenced and National Network Corporation models would probably require more detailed regulation to increase accountability and transparency. The more powerful the network monopoly becomes, the greater will be the need for regulation, particularly if there is private sector involvement.

A5.3 Consistency of Regulation

There is considerable potential for any administrative or legislative forms of regulation to be applied in a non-uniform manner, although the Protocol would provide some basis for commonality. Non-uniformity is most likely where a number of different States/Territories are involved, that is, options up to and including separate legal subsidiaries. Provided the multiple network corporations were established according to a similar framework, then there would be a reasonable expectation for the regulation to be consistent between corporations. The greatest degree of consistency with regulation and its application would be achieved with the NNC.

A5.4 Non-discriminatory Access

One of the key aims of the Protocol is for all participants to be able to trade freely in bulk electricity through a national transmission grid, with the charge for the use of the grid publicly known.

Non-discriminatory access to the transmission grid by private and public generators and customers will be achieved by defining and enforcing responsibilities, procedures, terms and conditions that must be met by both existing and new participants.

On the basis that the provisions of the Protocol are to apply to all options it could be argued that non-discriminatory access is not really an issue. However, for those options where there remains a high degree of vertical integration there is likely to be a perception among potential participants that some scope exists to erect barriers to entry in order to protect the interests of those already in the industry. Only experience will prove whether those perceptions are soundly based but there is no prima facie reason to believe that electricity utilities are less likely to act in self interest than any other commercial organisation. However, with pricing and access conditions externally defined, there is very little scope for utilities to discriminate.

Non-discriminatory access is likely to be perceived to be the greatest, with the Multiple Network Corporations and National Network Corporation structures, which conduct transmission independently from the other activities of the ESI.

A5.5 Organisational Requirements for Regulation

In the current State-based, vertically integrated utilities there is no specific regulation of transmission activities.

There are several approaches which could be taken to a regulatory organisation. The requirements could remain based on statutory responsibilities with monitoring by the NGMC even up to and including the Multiple Networks Corporations model. However, if this should be the case, adverse perceptions of the industry essentially regulating itself may become strong. Formation of an NEB to which the utilities had contractual/statutory obligations would reduce this perception, particularly if the NEB were given a specific regulatory role. Prima facie, a single national regulator, eg. for transmission pricing, seems preferable to state-based regulators, under any option.

The options from separate legal subsidiaries and beyond could be made subject to the TPA/PSA. The Trade Practices Commission (TPC) can help to ensure that the benefits of structural reform are maximised by preventing anti-competitive practices and preventing the re-establishment by merger of a less competitive industry structure.

The Commonwealth in October 1992 announced that an independent review of competition law was to be undertaken. The review would consider a range of options, including the application of the TPA to current exemptions enjoyed by State enterprises and non-incorporated businesses. The Act currently does not apply to conduct which is specifically authorised or approved by Commonwealth or State legislation. The Prices Surveillance Authority (PSA) focuses on areas of the economy which lack effective competition and where price or wage decisions have pervasive effects throughout the economy. The PSA has an advisory function only but exerts a powerful moral influence on the industries it investigates.

The TPC and PSA could provide a "light handed" approach to regulation based on the monitoring of actual outcomes rather than detailed investigation and auditing of the network businesses. This could provide a low cost regulatory system.

It is apparent however, that the requirements for non-discriminatory access and pricing under the Protocol, and the approach proposed for network service pricing by the Transmission Pricing Working Group will require a regulator with a specialised knowledge of the industry. In these circumstances, it may be better to establish an industry-specific regulator.

It would be desirable, however, to maintain a low cost "light handed" approach to regulation if that is possible. This could probably be achieved by having the regulator monitor actual outcomes within a uniform integrated framework, perform "reasonableness" checks on a sample, and investigate any specific complaints from network users. A "heavy handed" approach involving detailed monitoring of all network operators could be adopted if light landed regulation was unsuccessful, but it would be necessary to consider the financial and efficiency costs of such an approach before adopting it. If problems arise in applying a heavy

handed approach to transmission it may distort resource allocation in the upstream and downstream areas of the market which is difficult to either predict or quantify.

It is recognised that there is a danger of industry-specific regulators being "captured" by the regulated industry and furthering its interests rather than those of the nation as a whole. To prevent this, there may be benefits in moving from the cooperative NGMC structure to a more formal NEB with statutory responsibilities.

A5.6 Legislative Requirements for Regulation

In each State/Territory the ESI has been established as a legislated monopoly, with restrictions on the private generation, transmission and supply of electricity to other parties. Generally, before electricity generated privately can be sold to other parties, the consent of the relevant State utility/Minister is required. Legislation affecting the transmission elements specifically has not developed.

Existing legislation might accommodate the provisions of the Protocol for the status quo and ring-fenced business units options. Once there is a move to separate legal subsidiaries and beyond, new State legislation which specifically provides for these transmission subsidiaries would be required, and could include regulatory provisions. In the specific case of the Snowy Scheme, changes to Commonwealth legislation might also be needed.

The move to a NNC would also require the amendment to existing State legislation and parallel new State and Commonwealth legislation.

A5.7 Cost of Regulation

It is difficult to quantify the costs associated with regulation of network activities under each of the options.

The cost effectiveness of a detailed regulatory regime compared with more general oversight needs to be considered when determining whether a light handed or heavy handed approach is appropriate.

Under the status quo option costs for regulation are in most cases absorbed into the utility's cost structure and there is no specific regulation of transmission activities. A similar situation exists with ring-fenced business units, although given the separate accounting centres, any transmission-specific costs are likely to be more readily identifiable.

If one is to consider the establishment of some form of industry-specific regulatory body (the heavy handed approach to regulation), then clearly there will be costs associated with the set up of that body and its operation.

The direct and indirect costs of industry specific regulation (eg. OFFER and FERC) can be significant and, in recognition of those costs, there must be a demonstrated need for such regulation.

A light handed approach utilising an oversighting agency to monitor actual market outcomes is likely to prove less costly than maintaining a specific regulatory agency. Employing the general TPC/PSA structures would require only an incremental expansion in their existing structure, with some consequent reduction in any State based regulatory functions.

A6 PRIVATE SECTOR INVOLVEMENT

Involvement of the private sector in network service provision has the advantage of increasing transparency and benchmarking in that it would provide a means of comparison with public sector ownership. Private involvement could take two main forms :

- The development of new network capacity based on private equity or a mixture of private and public equity is an option. For example, opportunities may exist for the private sector in the development of the transmission network to interconnect Queensland and Tasmania with the main system.

- Private, or a mixture of private and public ownership of some parts of the existing network (in a Multiple Network Corporations or National Network Corporation structure).

However, there are also costs involved :

- The establishment of Multiple Network Corporations or a National Network Corporation involving the transfer of publicly-owned network assets to wholly or partly privately owned entities would incur substantial costs relating to due diligence, stamp duty (unless exempt), debt refinancing and prospectus, flotation and listing requirements.

- Care would be needed in any privatisation process of existing assets to manage risk allocation in a way that ensured new owners' acceptance of environmental and regulatory changes without the provision of government guarantees.

Private sector ownership of a National Network Corporation would have similar consequences for costs of debt finance, asset values and transmission charges as outlined for a publicly-owned, non-government guaranteed National Network Corporation. In addition, there would be flotation costs of about 3% of the equity proceeds in the event that public listing was contemplated.

Privately-owned Multiple Network Corporations are considered to be the most expensive of all of the options. Debt financing costs would be at least 0.6% pa above that available to government guaranteed Ring-Fenced or Separate Network Subsidiaries options. Assets would need to be discounted by almost 5% to achieve the same transmission prices, or alternatively transmission prices would need to rise 5.4% to maintain asset values constant. Flotation costs of around 3% of the equity proceeds would again apply in the event of public listing.

It is unlikely that Multiple Network Corporations or a National Network Corporation as businesses would prove attractive to private investors in the short term, due to the lack of a proven track record and demonstrated profitable performance.

There is no conclusive evidence at this stage that the benefits of transferring existing public equity to the private sector would outweigh the costs.

On the other hand, private involvement in new network capacity may be more attractive, provided that the owner is prepared to accept Protocol provisions and to receive a regulated price for the use of his wires.

A7 COMMERCIALISATION AND CORPORATISATION

Some of the benefits that might flow from corporatisation are :

- improved economic efficiency in the allocation of resources (eg. through enhanced pricing and capital expenditure decision making);
- separation of operational and regulatory responsibilities;
- better focus on end-user markets;
- greater incentivisation of staff; and
- separation of political and business decision making.

The achievement of optimal performance under corporatisation, like any industry reform, is heavily dependent on contestable markets. The transition costs of corporatisation can be high and there is almost certain to be a reduction in effectiveness during the transition period, with the possible loss of technical expertise.

In considering the various options, the assumption has been made that Multiple Network Corporations or a National Network Corporation would be unlikely to proceed without full corporatisation. On the other hand, Ring-Fenced Network Business Units and Legally Separate Network Subsidiaries could proceed in either a commercialised or corporatised mode.

Corporatisation would provide greater transparency in any network option, but thorough research would be needed by each utility and its respective Government to consider the costs and benefits on a case by case basis.

A8 TECHNICAL STANDARDS

Reliability, quality and safety of supply are essential features of any electricity supply arrangement. For the purpose of completeness, in this report security has been considered along with reliability. Security relates to operating practice, as systems that are operated beyond secure limits may fail catastrophically if particular disturbances occur.

Based upon overseas experience (particularly the United States and the United Kingdom) it appears that wherever a Grid entity is separated from Government and is given an entirely commercial focus, rather than a service focus (including Power Utilities under investor ownership), there is an increased tendency to apply regulations to achieve minimum technical performance. This is because the optimum arrangements from the Grid's commercial viewpoint will not take explicit account of the full economic benefits to Customers that arise through reliable, secure, adequate quality and safe electricity supply. In effect a community service obligation is imposed upon the Utility on account of its monopoly position.

To some extent the behaviour of the network body with respect to reliability, security, quality and safety will depend upon regulation; the market; planning, operation and maintenance arrangements under the national structure; and the assignment of accountabilities.

Regulation of reliability, security, safety and quality could be light-handed and simply codify what has already been specified in the Protocol. In which case technical standards should be relatively insensitive to the choice of network structure. Nevertheless, a result achieved by network utilities working together in a cooperative rather than competitive environment may well be less costly than a regulated result. A regulator, in effect, must make value-judgements on the needs of customers that might be better developed by direct agreement through consultation to reflect specific needs. Countervailing this, a more competitive environment would test more fully the requirements for the extent of regulation.

A8.1 Reliability and Security

Under past structural arrangements the interconnected States agreed upon minimum planning and operating criteria that were aimed at avoiding major cascading shutdowns following the majority of credible disturbances. Thus each State brought to the interconnection a level of performance that was compatible with overall objectives. This requirement is common in large-scale power pools, since a deficiency in one system has the potential to cause cascading failure throughout the pool. These criteria have now been incorporated in the Protocol.

It is unlikely, in the short term, that all customers could be sufficiently coordinated to reach agreement upon the benefits offered by a major grid augmentation (including for example a new interconnection). Governments or the NGMC act as a surrogate for the general community view to enable such decisions to be taken.

In respect of supply to distributors or customers off the main grid (for which cascading failure is unlikely), levels of reliability have been chosen, usually by the Power Utility, but often in consultation with the distributor, based upon the size and importance of loads and the costs of augmentation. Augmentations are usually timed so as to balance costs against benefits which include an assessed avoided community cost of blackouts. In general, a higher level

of reliability has resulted than would occur if a Grid utility was to have regard only for its own profitability.

This implies there is a community service in which the utility incurs additional expenditure for the "National Good". There is a view that the more commercially independent the network entity becomes, the more it would be expected that regulation of network service would be required to maintain minimum standards. On the other hand, this is not to imply that the profit motive necessarily leads to reduced reliability. Indeed, it may fully test the need for, and the cost of reliability.

It may be difficult to frame regulations in a way that would not result in excessive costs on the one hand, or unacceptable unreliability on the other, and to retain the flexibility to optimise the reliability of the grid and distribution systems to give the most cost-effective supply system to the community.

Regulations remove ambiguity from what is expected of a network entity. However, it is possible that inefficiencies might occur through the inability of regulations to take into account special considerations. This is particularly so in the Multiple Network Corporations and National Network Corporation models where there is increasing reliance on Regulation.

A8.2 Quality

Quality of supply refers to its suitability for its purpose and compatibility with consumers' equipment, rather than its continuity. Quality of supply is determined by actions of both the Power Utility and private generators (in regard to levels of supply voltage and frequency) and customers (in regard to voltage fluctuations and harmonic voltage distortion that may be caused by the Utility or transferred from one customer to another).

In respect of voltage and frequency standards, technical and economic factors usually dictate that the quality will be acceptable to the customer under normal conditions, with acceptable degradation in those emergencies in which alternative supply paths remain.

Voltage fluctuations and distortion are covered by design Standards that are applied to customers' equipment. These Standards were included in the draft Protocol, and are generally regarded within the industry as having the same force as regulations.

Because deficiencies of quality will result in customer problems and complaints, all network entity structures would be expected to achieve equivalent performance.

A8.3 Safety

Safety aspects apply to both the general public and to employees of the network entity.

Safety is determined both by State regulation (which varies in detail between States) and by access to people with the requisite skills. Some aspects of safety are related to preventative maintenance and operating practices. These are areas that would be easy to neglect in pursuit of short-term financial goals.

It would be important that the structural arrangements provide for local surveillance of safety. Regulation of the frequency and quality of maintenance, and the level of expertise to be applied to it would be very difficult to achieve.

Maintenance and monitoring of compliance with standards may be more difficult in the centralised commercial structures in which short term costs associated with plant unavailability (maintenance outages) may encourage excessive deferral of maintenance.

However, under any structure, safety requirements would have to be met by regulation.

A9 OPERATIONAL RESPONSIBILITIES AND FUNCTIONS

A9.1 Power System Operational Requirements

There are four main operational requirements which need to be considered in any transmission network structure.

a) Balance Supply and Demand on a Continuous Basis

Currently the entire interconnected system has its supply and demand balanced through the coordinated arrangements between the three State control centres. At any time one State centre has coordination responsibility; this responsibility being rotated on a six monthly basis.

Although each State Control centre has the responsibility to ensure that its own supply and demand is balanced, this balance can be and is achieved through the utilisation of local generation or from the use of contract or opportunity trading with another State. The continuous interconnection-wide balance is achieved by one or more State's generation (or share of Snowy generation) being varied on a second by second basis to follow the variations in total interconnected demand. This function maintains the total system frequency at a stable value.

b) Merit Order Dispatch and Unit Commitment

Each morning the States exchange data, by electronic means, on the regions' forecast demand, plant capacities and incremental prices. Each of the States then optimises the planning of opportunity interchange to maximise the value of the trading of energy. As the system is operated through the day with changing demand and plant conditions the State control rooms continue to trade in order to reduce total variable costs of production across the interconnection. This results in a system wide minimisation of short run production costs, i.e., merit order dispatch. Transmission losses are also taken into account in the minimisation of total variable costs.

In general, unit commitment decisions, (i.e., generation start-up and shutdown) for the large coal-fired generators are made at an office level and take into account start-up costs, Snowy capability, future demands for the next week to ten days, maintenance programs, average production costs and likely support from interchange. Interchange arrangements that modify unit commitment decisions are routinely examined in trading with South Australia. The large start-up costs associated with the thermal units in NSW and Victoria together with the flexibility of the two States' share of the Snowy scheme result in interchange arrangements not having a great influence on unit commitment decisions.

The States through the Interconnection Operating Committee ensure that maintenance programs that influence capacity are coordinated.

c) System Security and Reliability

Each State is responsible for the security and reliability of supply within its region. Sophisticated on-line power system modelling facilities are utilised in each State control centre to analyse the level of security at all times. The modelling involves the exchange of instantaneous data from the other States to ensure the impact of the interconnection is taken into account.

Maintaining system security involves operating to a standard such that the failure of any major component will not lead to disruption to supply, or overloading or damaging equipment. Transmission and generation equipment maintenance is coordinated and controlled. Contingency plans are formulated. Voltage levels and appropriate reserve plant capability are maintained. The control of the flows of power across various portions of the network is maintained to ensure stable system conditions.

Decisions made on a State basis to ensure reliability (ie. risk averse situations) may involve additional costs through initiation of contingency action. Consideration of responsibility for such costs is important and must not be overlooked in the performance of the system operation function and the development of consistent standards.

d) Safety of Personnel and Equipment

The coordination of high voltage switching and access to high voltage or high power facilities is carried out to ensure safety procedures are maintained. Where this involves equipment between different regions clear coordination arrangements are put in place.

A9.2 Assessment of Structural Options from Operational Viewpoint

As the system operation function involves the integration of both generation and network operation, there is no requirement that the system operation function should be the responsibility of the owner or manager of the grid. That is, the grid owners and maintainers do not have to have the responsibility for system operation. In NSW, currently operations (Grid Control) is a responsibility of the Grid Manager, although this has not always been the case. In Victoria, Operations (System Control) is separate from the Grid at the highest level. In South Australia operations is more closely aligned with generation and in Tasmania it is more closely aligned with the Grid..

The operational function is perceived as being a neutral role and its independence from both generators and customers is desirable. None of the network structures examined impact on this requirement.

The Function of Operations within a Market

The operation function has a responsibility to operate the system in accordance with the market rules in an unbiased and transparent manner while maintaining system security and reliability. As long as transparency is maintained, the operation function could be carried out utilising the existing operating groups, on a shared coordinating basis or via a national operations centre.

Relationship of Operations to Transmission Structures

As outlined above all the necessary functions to ensure the secure, economic and reliable operation of the power system are being effectively performed though the coordination of the three State control centres. Prior to the interconnection with South Australia the two State centres performed the same coordination function. It is considered that the coordination function which has already been extended from two to three centres could be extended to five without major problems.

The operation or coordination function could also be performed by a single National Control centre. It is unlikely however, that such a National centre would eliminate the need for the individual State Control centres which would be required to maintain regional security functions. Separating the responsibility for the activities of dispatch and control from the coordination of high voltage switching is not efficient because a national dispatch centre would duplicate the data requirements of all regional control centres.

None of the proposed transmission structural options dictates or requires that for operational requirements a coordinated State or National Control structure be adopted. Any move away from the existing operational structural arrangements (as shown in Figure A.1) would need to be justified by clear economic and security benefits.

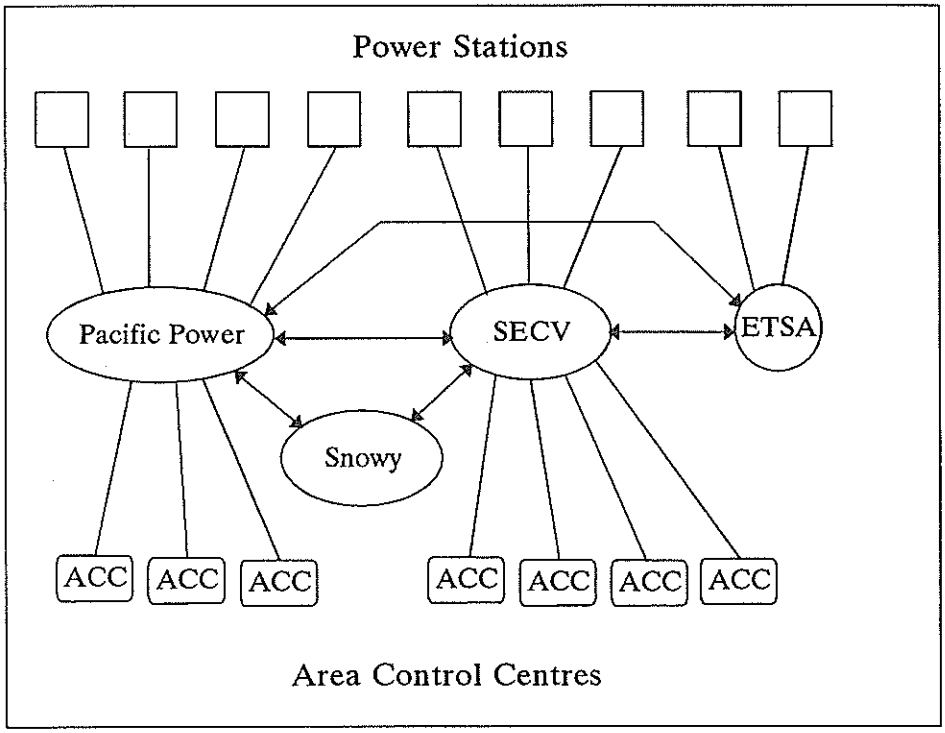

Figure A.1 : Interconnection Control Centre

A9.3 A National Dispatch Centre

In a national market system, the market operator determines merit order on a national basis. This can be carried out by regionally coordinated dispatch centres or a single national dispatch centre.

It is important to realise a national market does not require a national dispatch centre.

If the system operation function is aligned with network ownership, but it is required to have a single group perform national dispatch, then the advantages of establishing a separate national network dispatch centre are:

- Independence from the existing utilities: This is an issue for the first two structural options (Ring Fenced Business Units and Legally Separate Network Subsidiaries) and is relevant when private generation is being dispatched. There could be a perception that a bias could be applied in the favour of the utility generators if an existing state control room was performing the dispatch function. Transparency of operation is necessary no matter who performs the function. When the network is in a separate corporation from generation (as in the Multiple Network Corporations and National Network Corporation options) perceptions regarding independence should be no longer a problem.

- Provide a National focus: The use of a single separate dispatch centre would be seen to provide a clear impression that the National Network was not just a linkage of State networks.

The disadvantages in establishing a national network dispatch centre are:

- The cost: The level of cost would depend on how the National Centre was established. If an existing State Centre was used as a permanent National Centre then depending on how the regional control was managed there would be little additional cost. If the owners of the centre used for national dispatch also owned or were associated with any generation (eg. under the Ring Fenced and Subsidiary models) then the advantages of having a separate National Centre would be eliminated. If it were desired to demonstrate independence by establishing a new centre at a new location, this would include: buildings, extensive communication facilities including totally independent and sustained power supply, power system modelling or energy management computer systems, data acquisition systems, 24 hour operating staff and day support staff. This could easily account for $50 to $100M. This would be a business decision for the group responsible for overall system operation.

- Duplication: The function is already able to be carried out by existing control rooms as part of their regional operating function. The State or regional centres would still be required even with a National Centre. The actual national dispatch operation is only a small percentage of the functions carried out in the State Centre, as is evidenced by the fact that no additional staff are required when a state centre takes its turn at interconnection coordination.

The physical operation of the overall National Network is integrally linked to the operation of the regional systems and to an extent both the regional and national centres would be duplicating some activities.

A10 PRACTICALITY OF IMPLEMENTATION

Material has been prepared by Schroders to summarise their work on financial, legal and taxation matters. This has been included as an appendix to the report, and it will be necessary to distil material from this into the following sections before forwarding the report to the NGMC.

A10.1 Impact on Asset Ownership

Several of the options considered by the Transmission Structure Group have significant ramifications for ownership of what might currently be regarded as "public assets" and would therefore need to be considered carefully by State Governments.

In the case of the first three options (Ring Fenced Business Units to Multiple Network Corporations), the transmission assets remain under the stewardship of the respective State Governments, although the ownership vehicle varies from case to case. For Ring Fenced Business Units, no change to the current ownership arrangements are envisaged, whereas in the Legally Separate Network Subsidiaries case, the transmission assets are moved into a wholly-owned subsidiary corporation of the parent utility, with ultimate ownership still held by the Government. In the case of the Multiple Network Corporations option, transmission assets are again transferred to new corporations, with ultimate ownership retained by the respective State Governments.

The situation is entirely different for the National Network Corporation option and potentially the Multiple Network Corporations option in the event that transmission assets are sold, either in whole or in part, to the private sector in exchange for cash. The implications for Government of this eventuality are two-fold.

(i) the cash received would enable a net reduction in overall State borrowings, with obvious advantages, but there would be corresponding reductions in future cash flows; and

(ii) the "privatisation" of public assets, particularly in relation to an essential monopoly service, such as electricity transmission, may not be well-received by the electorate and may require increased regulatory action.

Full ownership by Governments under the National Network Corporation option would involve the refinancing of transmission assets. Governments would exchange transmission assets for a combination of cash and shares in the National Network Corporation, thereby achieving some of the benefits of debt relief identified above without having to consider the ramifications of privatisation of transmission assets.

However, there would undoubtedly be some real concerns expressed over the loss of control of what has traditionally been regarded as a State-owned and controlled activity, particularly among the smaller States whose transmission assets would individually and collectively represent a very small percentage of ownership of a National Network Corporation.

A10.2 Impact on Revenue and Taxation Receipts

The various options considered by the Transmission Structure Group have the potential to impact on both State and Commonwealth revenues, depending on whether the transmission structure entity is :

(i) Government owned but not corporatised, where the contribution to State revenues can be by way of dividends and tax-equivalent payments.

(ii) Government owned, corporatised under Statutory Corporatisation Legislation and exempted as a public authority from Commonwealth income tax, so that the contribution to State revenues can continue to be by way of dividends and tax-equivalent payments.

(iii) Government owned and corporatised under the Corporations Law, in which event the transmission entity would be liable for Commonwealth Income Tax unless exempted by special legislation as a "public authority" for the purposes of section 23 (d) of the Income Tax Assessment Act. As a result, State revenues under this alternative would be limited to dividend payments. State tax-equivalents could apply if the enterprise were declared exempt from Commonwealth tax as a public authority. If there were no exemption, it would be necessary to consider arrangements for Commonwealth compensation to the States for revenue forgone due to corporatisation, as discussed at the Special Premiers' Conference in October 1990 and at the meeting of Premiers and Chief Ministers in November 1991.

(iv) Partly or fully privately owned. Corporatisation under the Corporations Law would be mandatory in this instance. The transmission entity would be subject to Commonwealth Income Tax and there would be a need to consider arrangements for Commonwealth compensation to the States for tax-equivalent revenue foregone.

Future Returns from Grid Assets

The future treatment of taxation has significant potential effects in corporatisation arrangements for public authorities such as those arising from the transfer of State assets into proposed new corporations (Legally Separate Network Subsidiaries, Multiple Network Corporations or National Network Corporation). Consideration of these issues will raise significant tax compensation issues.

Network assets form a significant proportion of the State power utilities' stock. The value of the transmission assets of the eastern and southern State utilities could be in the vicinity of $6 billion.

These assets are economic, and contribute to the overall financial performance of the State power utilities. Under the Multiple Network and National Network Corporation models (also possibly the Legally Separate Network Subsidiary option), these assets would be transferred to a new commercial entity which would be a tax paying entity unless specifically made exempt.

Even if the assets earn a modest real 5% rate of return, and the effective tax rate (after depreciation, etc.) works out at 20%, the prospective tax stream to the Commonwealth would be around $60 million per annum. These tax costs would be an addition to the cost of electricity as for the most part they are not incurred currently.

Given the monopoly status of such corporations, and bearing in mind the guideline rate of return for Commonwealth public authorities is 10%, much higher taxation revenues could be generated.

The capital value of such tax revenues (even at 10% discount rate) is in the vicinity of $500 million to $1,000 million.

Existing Commonwealth policy on tax compensation is that where corporatisation and/or privatisation results in a transfer of income tax revenue from a State to the Commonwealth, compensation may be paid to the State Government. This has happened on a case by case basis, and only on three occasions (State Bank Victoria, Tasmania Bank and GIO NSW). Current policy is not based on formalised, clearly understood rules or principles, but on consideration and negotiation of the issues in each case.

Recent Commonwealth proposals aim to narrow the issue of compensation to enterprises which have a proven track record of commercial performance and actual quasi-tax payments to the State. This would appear to rule out compensation for the transfer of existing State network assets directly into other corporate structures where a commercial regime would apply, including possible full exposure to corporate tax. It would appear that the only way for States to have a basis for negotiation, would be to establish separate corporatised network corporations first, with liability for State tax-equivalents.

The impact on revenue and tax receipts for each of the options considered is as follows, taking into account the variations identified above.

Ring Fenced Network Business Units

(i) Non-Corporatised/Corporatised under Statute - The contribution of the transmission assets to State revenues by way of dividends and tax equivalent payments (if applicable) is not readily identifiable, as the profitability of transmission activities is either not measured at all or not formally measured in a strict accounting sense.

(ii) Corporatised under Corporations Law - Under this model, contribution to the profits of the utility enterprise from its transmission activity would again be not readily identifiable. State revenues under this alternative would be confined to dividend payments, as the utility would be required to pay Commonwealth income tax at the company rate (unless excepted as noted above). There would therefore be a need to consider Commonwealth compensation to the States for tax equivalent payments foregone in moving to fully-corporatised utilities.

Legally Separate Network Subsidiaries

(i) Non-Corporatised/Corporatised under Statute - In this case State Governments would be entitled to receive dividends passed up through the relevant parent utility. Tax equivalent payments would also continue to be payable where appropriate, based on the consolidated accounts of the parent utility and its subsidiary transmission entity.

(ii) Corporatised under Corporations Law - This model would limit State revenues to dividend entitlements passed up through the parent entity. Commonwealth income tax would be substituted for tax equivalent payment, with compensation to be negotiated between the States and the Commonwealth for tax equivalent revenues foregone.

Multiple Network Corporations

(i) Full Government Ownership - It is considered unlikely that the establishment of Multiple Network Corporations would proceed without full corporatisation under the Corporations Law. In this circumstance, State revenues from transmission assets would be confined to dividend payments. Commonwealth income tax would apply, with compensation from the Commonwealth to the States for the loss of tax equivalent payments to again be considered. In the event that corporatisation of Multiple Network Corporations were to proceed under Statute rather than Corporations Law, then State revenues would be supported by dividends plus tax equivalent payments.

(ii) Part Private Ownership - This alternative would need to be established under the Corporations Law and could easily follow from full Government ownership of Multiple Network Corporations. The impact on State revenues and taxes would be similar to that outlined in the section immediately above (Full Government Ownership), with the exception that dividends would be reduced in proportion to the degree of private ownership involved. However, the loss of dividends would be compensated by a reduction in borrowing costs arising from the sale of State-owned assets represented by shares in the Multiple Network Corporation and a consequent reduction in overall borrowings outstanding.

National Network Corporation

(i) Full Government Ownership - In this instance participating Governments would be entitled to dividend payments in proportion to their equity in the National Network Corporation (NNC). The NNC could be established either under a special Act of the Commonwealth or under the Corporations Law. In either case, the States would be foregoing tax equivalent payments in transferring transmission assets into the NNC and the question of Commonwealth compensation for the loss of these revenues would again apply. The NNC would of course need to refinance transmission assets being acquired by it, resulting in cash inflows to the respective utilities which would in turn be presumably used to reduce their overall borrowings.

(ii) Part Private Ownership - This option could easily follow from full ownership of the NNC by Governments, in which case all of the matters identified in the preceding section would apply, together with some further issues. Firstly, there would be a loss of dividends flowing to the shareholder Governments in proportion to the percentage of private equity in the NNC. Secondly, the reduction in dividends would be offset by the cash received from the sale of equity to the private sector, enabling repayment of some borrowings with a corresponding reduction in borrowing costs.

Summary

It is clear that the impact on revenues and tax receipts is a function of whether or not the transmission-owning equity is exempt from Commonwealth income tax, which in turn hinges on whether the enterprise is non-corporatised, corporatised under Statute or corporatised under the Corporations Law.

All of the options are able to be corporatised under Statute or under the Corporations Law, unless private ownership is
contemplated in which case Corporations Law would be mandatory.

A10.3 Transaction Costs

Use of the interstate transmission network by generators and their customers will give rise to transmission charges which, in turn, will involve transaction costs that need to be recognised. The aggregate amount of such costs will, prima facie, depend on :

- the type of transaction undertaken;
- the transmission structure adopted; and
- the absolute volume of transactions undertaken.

The possible range of transaction types (for both intrastate and interstate flows) can be summarised as follows :

- Utility Generator - Grid Elements - Utility Customer
- Utility Generator - Grid Elements - Private Customer
- Private Generator - Grid Elements - Utility Customer
- Private Generator - Grid Elements - Private Customer

where the Grid Elements may be within or over State boundaries, as required to meet the market transaction.

The intention in some States is to separate the transmission system into a number of regional transmission entities. In these case, intrastate transfers could entail transactions with one or more regional transmission entities. In the other States, transactions would only take place with one party.

Thus, for intrastate transfers, there could be either single or multiple transactions involved, depending on which of the above models was adopted. However, as the proposed changes are independent of the development of the interstate transmission network, there would be no change in the total volume of transactions and in the quantum of transaction costs, irrespective of the transmission network structure adopted.

The situation is different in respect of interstate transfers, which require the use of several Grid Elements (with potentially different owners) to enable power flows to take place from a generator in one State to a Customer in another.

Under this scenario, each Grid Element (or regional transmission entity) under options 1 to 3 (Ring Fenced Business Units to Multiple Network Corporations) would be raising its own transmission charges and incurring its own transactions costs, giving rise to multiple transactions and related multiple transaction costs in respect of interstate transfers.

In contrast, option 4 (National Network Corporation), would in all probability be operated on the basis of a single transaction charge for interstate dealings between generators and customers, with consequent savings in transaction costs. However, the owners of the National Network Corporation in option 4 could decide to operate the Grid Elements in the various States as stand-alone profit centres, or even as subsidiary companies, with internal transfer pricing between the State operating entities. In this event, the reduction in transaction costs would be illusory, as internal transfer would largely take the place of the external transfers identified for the first three options.

Leaving aside the Status Quo, the National Network Corporation is the only option that offers the prospect of lower transaction costs and only then in respect of interstate transfers, which is likely to be a small percentage of the total business.

A10.4 Implementation Costs

The cost of implementing any of the options is substantial, with the overall cost increasing with the degree of separation of network assets from existing utility operations. This is best illustrated by considering the range of options as a development continuum moving progressively from the Status Quo through each option, to arrive ultimately at a National Network Corporation.

The major elements of the costs that would be encountered in moving from each option to the next are briefly summarised below. No analysis has been carried out to assess the extent to which these costs may be cumulative, but there may be some potential for savings in moving from (say) Ring Fenced Network Business Units directly to (say) Multiple Network Corporations.

(i) Status Quo to Ring Fenced Business Units

The major implementation costs are associated with:

- consultancies in relation to commercialisation, finance, accounting and EDP systems matters;
- development and implementation of new systems for asset valuation, allocation and management, debt allocation and management, transfer pricing between business units, accounting and business unit reporting;
- re-allocation of duties and responsibilities;
- resolution of industrial relations issues;
- general disruption and inefficiencies during the change process; and
- communication of the change process to all staff.

(ii) Ring Fenced Business Units to Legally Separate Network Subsidiaries

The major implementation costs associated with this transition would be :

- consultancies in relation to asset valuations, optimising the financial structure, apportionment of debt;
- legal costs;
- establishment costs;
- further refinement of systems for asset management, debt management, accounting, financial control and reporting;
- industrial relations matters;
- re-allocation of duties and responsibilities;
- administration costs;
- some diseconomies of scale;
- there could be costs associated with the transfer of staff from one entity to another, including possible redundancy and staff recruitment costs.

(iii) Legally Separate Network Subsidiaries to Multiple Network Corporations with 100% Government Ownership

This transition could involve costs associated with :

- the transfer of staff from one entity to another (including superannuation issues) and would, in all probability, involve new staff recruitment costs and possibly redundancies;

- corporate infrastructure (including establishing a completely new overhead structure and relocation costs);

- asset transfer;

- due diligence costs (where boundaries of the network to be owned by corporations differ from those of current entities);

- industrial relations issues;

- possible diseconomies of scale, particularly in South Australia and Tasmania.

(iv) Legally Separate Network Subsidiaries to Multiple Network Corporations which are wholly or partly privately owned

The costs associated with (iii) above would be incurred, plus :

- the due diligence costs associated with the sale and purchase of transmission assets or Network Subsidiaries;

- stamp duty on the transfer of ownership (unless exempt);

- costs associated with the refinancing of debt;

- prospectus, flotation and listing requirements if Multiple Network Corporations are listed public companies.

(v) Multiple Network Corporations to a National Network Corporation with 100% Government ownership in both cases

The major costs associated with this transition would be in :

- due diligence costs incurred by the participating Governments;

- costs associated with the refinancing of debt;

- dealing with more complex industrial relations issues;

- establishing a new management and Board structure;

- developing and implementing grid-wide systems for managing the expanded enterprise;

- higher ongoing financing charges for residual businesses;

- dilution of liquidity of existing (Treasury Corp) funding arrangements leading to higher borrowing costs for some States.

(vi) Multiple Network Corporations to a National Network Corporation having an element of private ownership

The major costs associated with this transition would be of the kind identified in (iv) and (v) above, namely :

- the due diligence costs associated with the sale and purchase of transmission assets or Network Corporations;
- stamp duty on the transfer of ownership (unless exempt);
- costs associated with the refinancing of debt;
- prospectus, flotation and listing requirements if National Network Corporations is a listed public company;
- dealing with more complex industrial relations issues;
- establishing a new management and Board structure;
- developing and implementing grid-wide systems for managing the expanded enterprise.

Finally, it should be noted that, all else being equal, increasing implementation costs will be reflected in lower asset values in all options across the continuum. The lower asset values could be offset to the extent that greater efficiencies are realised in progressing across the continuum.

A10.5 Treatment of Community Service Obligations

The treatment of Community Service Obligations (CSOs) under the various options canvassed in this report will depend primarily on the degree of independence of the transmission network from Government.

There is the possibility of private sector involvement in both the Multiple Network Corporations option and the National Network Corporation option, in which case there would be a strong argument for transmission-related CSOs to be delivered directly by Government rather than through the relevant Network Corporation so as to avoid the conflict of interest between private sector and public sector objectives. To the extent that the CSO delivery was considered appropriate for these options, there would be a need for such CSOs to be independently determined in some way and for those CSOs to be delivered by the Network Corporation under a contractual arrangement with the relevant Government.

In a similar vein, because of the potential conflicts of interest between shareholder Government objectives in the delivery of CSOs by a National Network Corporation, it is clear that similar arrangements to those outlined above would also need to apply in this instance.

For the remaining options, the treatment of CSOs will depend on whether the relevant network-owning entity operates more or less under the direction of Government or is fully corporatised, either under Statute or under the Corporations Law, and operates largely at "arms length" from Government. In the first instance the treatment of CSOs would be at the discretion of the relevant Government, perhaps by negotiation with the network-owning entity, with CSOs possibly identified in the network-owning entity's accounts.

Arrangements are already in place in some State jurisdictions to define what constitutes CSOs and to establish the means by which CSOs may be taken into consideration when determining returns to the State.

To the extent that any of the utility or Corporation alternatives outlined in the first three options are fully corporatised, there would be a need for Governments to review the treatment of CSOs along the lines described earlier in this section for private participation in network ownership.

In summary, the treatment of CSOs will depend largely on the degree of corporatisation and private ownership, with complete transparency essential in a fully corporatised entity, with or without private sector ownership.

A10.6 Industrial / Workplace Implications

In general, if the corporate form of the electricity supply industry was changed to include legally separate transmission corporations, it would be necessary for employees to formally change employers. It is considered that this should be effected in most cases by a transfer to the successor employer of obligations for all accrued entitlements and where possible, a guarantee of existing employment conditions. The qualification arises particularly in the case of the National Network Corporation structure because of the potential differences in existing conditions between States.

No significant change in employment levels would be expected for any of the structural options as the system control and regional operations and maintenance functions would be largely unchanged. There could be some very small scope for rationalisation in the areas of administration and transmission system planning and design in the National Network Corporation model.

The following general issues could be of concern if there was a change in structure and/or ownership of the network :

- Employment numbers and redundancies
- Award provisions and/or contract employment
- Superannuation
- Preservation of Long Service Leave, sick leave & other entitlements
- Annual Leave (and Loading)

- Redeployment within electricity industry
- Seniority (length of service)
- Union representation (preference of employment)
- Working conditions, including roster systems/shift work, call-outs
- Training
- Apprenticeships
- Pay systems
- Allowances
- Dispute/grievance procedures

More specifically, the following paragraphs indicate possible impacts of the various structural options on industrial relation matters within each State/Territory.

New South Wales

There would be very little change to industrial relations in the first two structural options (Ring Fenced Business Units and Legally Separate Network Subsidiaries) and these could be readily accommodated in New South Wales.

Under the Multiple Network Corporations option, the main issue would be the similarity or otherwise of conditions between employees of the Network organisation and employees associated with generation within Pacific Power. The movement to a different industrial system/award for Network employees would disturb current arrangements with likely disputation emanating from claims and counter claims between the two industrial regimes, given the similarity of the work. This may be even more difficult if there was a move to a federally-based system for the Multiple Network Corporations.

The National Network Corporation option raises three main issues : levelling of conditions under a federal award; spreading of industrial disputes geographically; and reduced flexibility in negotiation.

Presently there are significant award differences between the various State bodies. Creating close nexus between them especially under a National Network Corporation would inevitably result in a levelling up of conditions.

By Pacific Power remaining under state regulation, independence of Industrial Relations which correlates highly with the competitive regime we have now entered, is encouraged. However, if there was a move to separate the Grid organisation from Pacific Power and place it under the one federal industrial regulative system for the National Grid, any scope for innovation within the State would be seriously impeded as union matters would be dealt with by the same tribunal, with the same bargaining unit and with the same claims. There is therefore an industrial relations risk in forming a National Network Corporation, in that

industrial disputes would be likely to affect the entire network, not just one State as at present.

NSW employees are governed by the Industrial Relations Act 1991 which contains provisions for Enterprise Agreements. These provisions are significantly different from the federal system as it provides considerable flexibility in negotiation. Currently several initiatives have commenced under this Act to implement Enterprise Agreements and include active discussions with Grid personnel.

Victoria

Introduction of Ring Fenced Business Units need bring little, if any, real change in terms of industrial relations, with options being the continuation of coverage under existing award provisions or seeking the establishment of a separate award or agreement, mirroring existing SECV award provisions, to cover Transmission Network employees.

The Legally Separate Network Subsidiaries structure need cause little real change either, but would require that the newly created separate legal entity seek to become a party to the existing SECV award(s) or to a new award or agreement which may mirror the provisions of the existing award(s).

The Multiple Network Corporations proposition would also allow for little change to be made to industrial relations conditions within Victoria. Options would be to seek to become party to the existing SECV award(s) or the establishment of a new award or agreement which may mirror existing award provisions. The existence of different award/agreement conditions between Multiple Network Corporations in each of the states may lead to disputation over claims for levelling up of conditions between States; however, this is less likely and less immediate than in the case of a single National Network Corporation.

The National Network Corporation option would highlight the different rates, conditions and union coverage, etc. across the Corporation's precursors in the various States. There would be pressure for an 'upwards' standardisation of conditions and increased scope for disputes to impact more widely than now, transcending State and (present) award boundaries. This option would likely result in national negotiations on all but very local issues. A Federal award with separate divisions for employees in each State, could provide for the mirroring of some or all respective current award conditions.

A National Network Corporation with a combination of federal and State awards is considered to be an unlikely scenario.

South Australia

If the present Status Quo position was preserved it would not provide ETSA with any immediate employee relations concern; however, in the long term, industrial pressure would exist to level up wages and conditions to the maximum industry standard.

With regard to the establishment of a Ring Fenced transmission group separate from distribution, ETSA has traditionally engaged line personnel to undertake both distribution and transmission work. If transmission employees are separated out, they could be expected to argue for highest industry pay and conditions. However, ETSA distribution employees could

also be expected to seek parity and this would indirectly affect the pay and conditions standards of all other ETSA employees.

In the case of a separate subsidiary company under a holding company or a separate Network Corporation, it is possible that existing Award structures could be maintained (that is, ETSA dissolved and taken over by a new company structure) without any immediate change in current employee relations arrangements. However, in the long term there would be pressure for the maximum industry standards to prevail in both transmission and distribution.

The amalgamation of all State transmission bodies into one National Network Corporation would involve, in all probability, the creation of a new Federal Award structure with standards consistent with the highest standard already existing in the industry. South Australia would expect this to have negative industrial relations implications due to the loss of autonomy and the ability to negotiate on a local basis, enhancement of the power of the industry union and an increase in the likelihood of national disputation.

Queensland

It would seem that Queensland could accommodate the first three structural options without any significant change to its industrial relations arrangements. Under the three structures which have a more obviously separate State transmission entity, it would be possible to enter into a site agreement subordinate to the Award, it that was seen to be advantageous.

The National Network Corporation structure, on the other hand, would probably require a change to Federal Award coverage, of the transmission entity at least. Generation could possibly also come under Federal jurisdiction because of the inter-State trade in electricity. This latter argument could perhaps also apply to the industry structures with State-based transmission entities once significant interstate trade commenced. It is noted, however, that there has been a convergence of the State and Federal industrial relations systems in recent years, so that the change in coverage may be of less significance than previously.

One important concern in Queensland and possibly other States relates to the present arrangements whereby operation and maintenance of the transmission system is undertaken by Electricity Board staff in central and north Queensland. This arrangement provides a lower cost service than maintaining QEC administration, workshops, depots, etc. in these regions. The concern would arise if establishment of a separate transmission award or site agreement resulted in significantly different employment conditions in the transmission and distribution undertakings.

In this regard, it is significant that there is no difference in the skills required for work on high voltage distribution assets and transmission assets, the difference being essentially an arbitrary, ownership-based one. Indeed, the boundary between transmission and distribution is changing in some States as the system evolves and the duty performed by some assets changes.

Tasmania

Increased difficulty could be expected in obtaining, retaining and developing skilled staff as the relatively small network business became more isolated from the remainder of HEC. In the case of the Multiple Network Corporations option the difficulty would most likely be

resolved by relocating many of the skilled, specialised and managerial staff to the mainland or elsewhere. This could in turn lead to difficulties in maintaining the skills base in the remainder of HEC and would undoubtedly mean that liaison with the network business would become more
difficult and cost more as well. .

In terms of industrial implications, it does not appear that the existing industrial situation would be changed significantly for the options up to and including a Legally Separate Network Subsidiary. However, any moves to introduce different terms and conditions for some of the staff working in the industry in Tasmania would be expected to give rise to industrial problems. This situation is only likely to arise for the Multiple Network Corporations and National Network Corporation options.

It is likely that staff employed under the Multiple Network and National Network Corporation options would receive higher remuneration but would probably be employed under more flexible conditions (possibly even on contract).

It is a matter for speculation as to the scope and nature of the possible industrial problems and their consequences. However, in view of the current industrial situation in Tasmania, it is difficult to imagine that the consequences would be favourable for consumers.

Australian Capital Territory

The existing structure in ACTEW is evolving slowly, perhaps to a single award.

In a Ring-Fenced Business Unit structure, there would possibly be an acceleration of industrial reform if a more active commercial approach is adopted - a market driven approach to employment.

In a Legally Separate Network Subsidiary structure, the pressure to perform as a subsidiary would depend on the return demanded by the owners. This could have an effect on numbers of employees as well as the structure of agreements.

A Multiple Network Corporations model is anticipated to have a fully commercial approach in which the survival of the business would depend, in part, on having a light work force with direct workforce negotiation on performance.

A National Network Corporation may not change the industrial situation much if the network businesses are taken over as they exist and run in the same way. However, this is an unlikely outcome. It would be more likely that a single award would be considered desirable with a change in terms and conditions for the member unions.

If the structure is left within Government(s) there are less likely to be industrial consequences. The nearer the model moves to a hard commercial model, the more likely there are to be industrial consequences, ie. staff reductions, changes in terms and conditions, etc.

A10.7 Bankability

An overriding consideration for any of the transmission options is bankability, that is, each option must be capable of raising debt capital on a satisfactory ongoing basis in the domestic and international capital and money markets.

Bankability does not rest on any particular aspect of a financing proposal, but depends on a complex analysis by the providers of debt of a range of factors, including:

(i) Ownership - who are the owners and do they have an established track record?

(ii) Business - what kind of business are they in, who are the main competitors and how will the enterprise perform against them?

(iii) Size - how large is the business and its financing requirement?

(iv) Complexity - how complex are the proposed financing arrangements?

(v) Risk Assessment - what are the risks associated with the venture and how are these to be managed?

(vi) Asset Ownership - who will own the assets used by the borrower in carrying on its business?

(vii) Asset Values - are they realistic in the overall context of the business?

(viii) Balance Sheet - what will the balance sheet look like in terms of debt, equity and overall gearing?

(ix) Profitability - will the enterprise be profitable in both the short and longer term and provide a satisfactory return to its shareholders?

(x) Cash Flows - does the entity have a strong cash flow under a range of conditions?

(xi) Debt Service - is the cash flow capable of servicing debt with a sufficient margin for comfort?

(xii) Security - what security is offered to lenders?

Against this background, there is no analysis that can be undertaken at present that would suggest any particular option is more bankable than any of the others. There is insufficient information available to do this.

However, it is possible to say at this time that, prima facie, all of the options are bankable provided each of the issues identified above are addressed to the satisfaction of both the bankers and the shareholders.

To illustrate the point, some utilities are required at present to borrow from their State central borrowing authority, with the benefit of an explicit Government guarantee on such

borrowings. In these circumstances lending decisions are based on the relevant State credit rating, not on the corporate health of the ultimate user of the funds.

In other cases utilities borrow in the market place in their own name, on the strength of their financial performance and the implicit guarantee that comes with being a State owned business enterprise. To the extent that Governments may wish to further distance themselves from implicit guarantees of this nature there will need to be greater independence of operation (for example, through corporatisation under the Corporations Law) and greater emphasis on strong financial performance. It is in this sense that the bankability issues are so important.

These comments can be applied to the options under review in the following manner:

Ring Fenced Network Business Units & Legally Separate Network Subsidiaries

Under the Status Quo arrangements, utilities are either funded through their respective central borrowing authority or borrow in their own right.

A change to Ring Fenced Business Units or Legally Separate Network Subsidiaries would have no impact on bankability as all structural changes are internal to the Utility. The "parent company" would in all probability continue to be the borrower on behalf of "the group" under the subsidiary option and reallocate debt internally, with security by way of Government guarantee or negative pledge, as at present.

(Note: negative pledge is defined as a covenant whereby a borrower and its guarantor, if any, undertake that neither party will allow the creation or subsistence of secured debt or, if each has the right to issue secured debt in the future, it will not secure such new debt without offering the same security equally and rateably; i.e. parri passu, to the borrowing to which such covenant applies).

There would also be a reallocation of ownership of grid assets under the Legally Separate Network Subsidiary option, to the subsidiary corporation, but this would have little, if any, bearing on the bankability question, because of the nature of the security provided.

Multiple Network Corporations

This option involves the creation of entirely separate legal entities which would own network assets and borrow either from the relevant central borrowing authority or from the market.

In the latter instance the Multiple Network Corporations would not have an established commercial track record and may therefore need to operate in the first instance with the benefit of a Government guarantee, at least for the first (say) 5 years until adequate financial performance has been demonstrated. The Multiple Network Corporations would clearly be assisted in this regard if their cash flows were substantially underwritten by long-term take-or-pay contracts for the transmission of electricity between major generators and their customers.

On the other hand, a Multiple Network Corporation would be expected to have a lower risk profile than its equivalent earlier options, thereby assisting bankability.

The size of the individual Network Corporations could have a bearing on their financing costs. For example, Network Corporations in some States would be small compared with

their network counterparts elsewhere. They could expect to pay more for their funds on account of their modest size, but the degree of cost penalty is not able to be quantified at this time.

As a general comment, the focus of profitability would be on earnings before interest and tax for non-corporatised State entities, because of the dividend and tax equivalent returns usually sought by their owners. Fully corporatised entities, including those partly or fully privatised, would focus on net profit after tax as a measure of profitability, because of the obligation to provide a return to shareholders from after tax earnings.

National Network Corporation (wholly Government owned)

This option is undoubtedly the most complex in terms of bankability.

For a start, the ownership arrangements entail a mix of State and possibly Commonwealth participation and this in itself would represent a major market innovation. The relationship between the various shareholders would need to be clearly understood, as would the degree of commitment from the shareholder Governments, both jointly and severally, to the objectives of the National Network Corporation.

The NNC would in all probability be borrowing in its own name, as a Government owned trading monopoly with no established track record of performance. In these circumstances borrowers may well be looking for guarantees from the shareholder Governments as a prerequisite for providing loan funds, at least in the first five to ten years of operation. The degree to which such guarantees may be required would be influenced, inter-alia, by the balance sheet structure of the NNC, the extent to which its cash flow and hence debt-servicing ability is underpinned by long-term take or pay contracts, and by the nature and complexity of the arrangements that exist between the shareholders.

At the same time, the NNC (like the Multiple Network Corporations) would be regarded as being lower in the risk part of the electricity business because of the essential nature of the services it provides and its monopoly nature, and this would contribute substantially to bankability.

The regulatory regime under which the NNC would operate would also be a factor to be considered by financiers, to ensure that reasonable confidence limits apply to forward projections of operating performance across a range of sensitivities. This comment also applies to any other options, insofar as they may be operating without the benefit of a Government guarantee and within the ambit of an external regulator such as the TPC/PSA.

The NNC is likely to be able to borrow on more favourable terms than (say) any of the Multiple Network Corporations, simply because of its relative size. It is probable that the larger entity would attract stronger competition in the market place to meet its funding needs, to the obvious benefit of the shareholders. However, it is not possible to quantify the likely savings at this stage.

National Network Corporation (part privately owned)

All of the comments in the above section apply equally well to a partially privatised NNC. Attention to strong financial performance would be even more critical however, and there is likely to be a need for Government guarantee of borrowings (or some other form of comfort for lenders) for some time into the future. However, as an investment opportunity, the NNC is untried and unproved and this may be reflected in some marking down of asset values and/or increase in borrowing costs.

A10.8 Legislative Requirements

Changes to the present structure of the industry to give effect to the various options for an interstate transmission network would require increasing legislative changes as options from the Ring-Fenced option to the National Network Corporation were considered.

Depending on the arrangements adopted for regulation of the network businesses, some new State and/or Commonwealth legislation could be required for any of the options. This could involve the amendment of the Trade Practices Act and the State legislation establishing the various network entities, or new legislation to establish and industry-specific regulator.

Legislation to cover corporatisation of network businesses could also be required in association with the changes of structure, particularly to the more separate network corporation models. However, although desirable, it is recognised that corporatisation is not essential for any structure, as the possibility exists for the establishment of network businesses as statutory corporations similar to the existing State utilities.

Ring-Fenced Network Business Units

By its nature, ring-fencing would be unlikely to require any significant legislative changes, because it involves essentially administrative changes within existing organisations.

Legally Separate Network Subsidiaries

For this option, some changes to existing State legislation could be required, eg. to provide for the creation of the new legal entity and specification of its structure and responsibilities or to permit utility ownership of a subsidiary company to carry out some of its responsibilities. These changes are not considered likely to be major. Consequential changes would be required to legislation which made specific references to existing enterprises.

Multiple Network Corporations

Legislative requirements for this option would be similar to those described for the Legally Separate Network Subsidiary option, but it is more certain that they would be required because of the fundamental separation of the functions of the State utilities. It would be necessary to provide for the establishment of the new entities and to define the powers, functions and duties of both the network entities and the generation and possibly retail supply entities created by the separation.

As indicated above, general or specific corporatisation legislation could also be required for this option, although the network corporations could be established as statutory corporations. Again, there would also be a need for consequential changes to legislation referring to existing enterprises.

If any significant amount of private sector involvement was contemplated, it might also be necessary to change legislation provisions with regard to matters such as land access and acquisition.

National Network Corporation

A National Network Corporation would, depending on the manner of its establishment, require the greatest amount of legislative change. In addition to the legislation required under the previous option to separate the generation and retail supply functions from the network business, there would be a need to set up the NNC and provide the framework for its operation. This could involve relatively little change if the NNC was established as a joint venture or similar arrangement, without ownership transfer or, perhaps, if the NNC were formed as a Corporations law company, owned by the Governments involved, and purchased the assets relevant to the network from their present owners. Under some options, however, there could be a need for complementary State and perhaps Commonwealth legislation.

As before, legislation relating to regulation, and possibly corporatisation, would be required, and there would be a greater need for consequential changes to existing legislation.

A11 IMPLICATIONS FOR DISTRIBUTION

All transmission and distribution entities would be subject to the same network regulatory arrangements and the same operating guidelines (under the Protocol). However, there is no requirement for them all to have the same ownership arrangements, although for purposes of transparency there would be a need for separation of the network business from any generation or retail supply functions.

Figure A.2 shows a general structure of the industry and indicates the potential arrangements which would be required for supply of power.

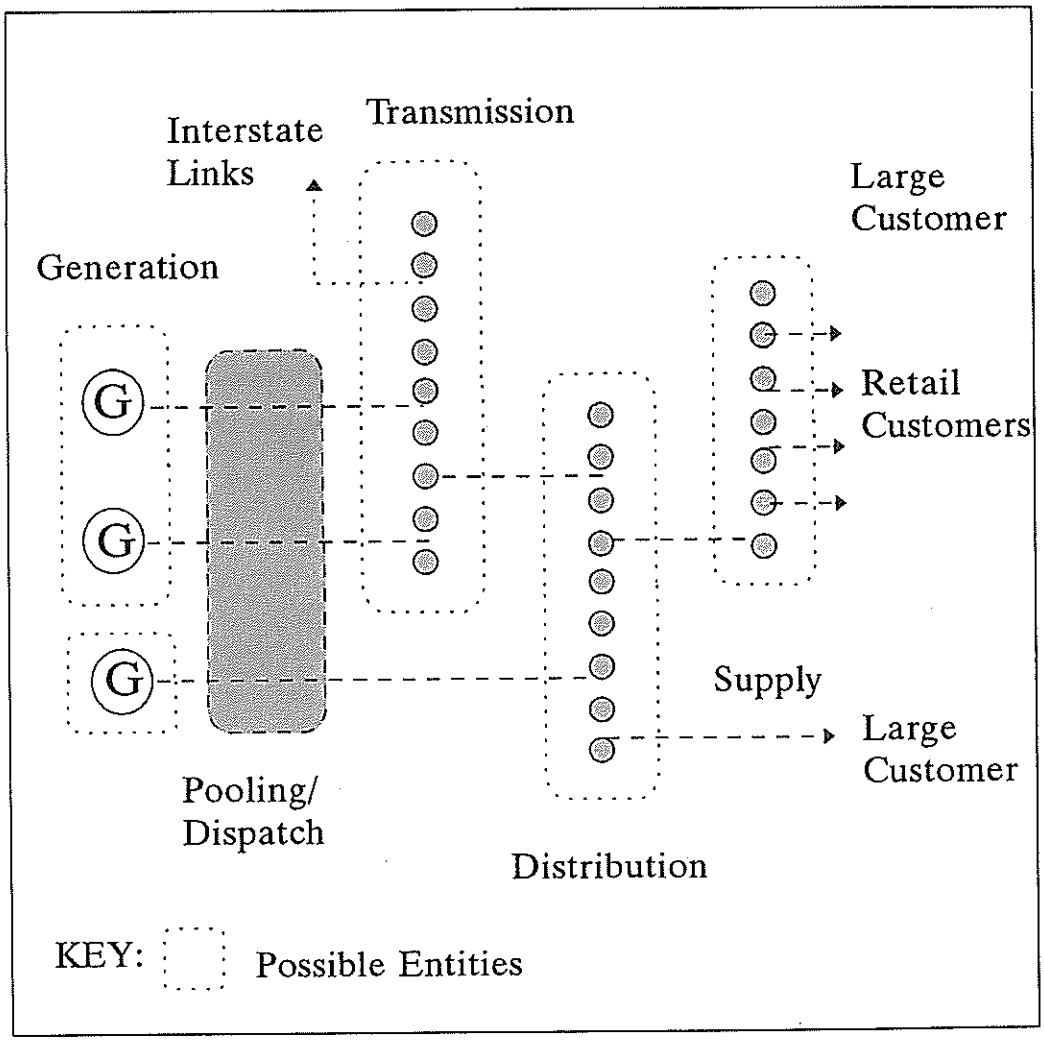

Figure A.2 : Electricity Supply Industry Structure

The implications of the different structural arrangements on distribution will vary from State to State. They will also be influenced by any parallel reforms of the distribution sector on its own.

The following implications are perceived for distribution :

- Clear separation of the marketing, sales and service (supply) business will be required from the distribution (transport) business (as has already been achieved to a large extent in Tasmania for example).

- The supply businesses should be free to source their requirements from any potential generators or suppliers through the network.

- Open access and network pricing principles must be applied to all parts of the network used for trading under the Protocol. The wires involved will change in time (as customers' demands grow and trading increases). Consideration must also be given as to extent to which it is practical to apply network pricing principles to very low voltage radial wires.

Ring-Fenced Network Business Units, Legally Separate Network Subsidiaries and Multiple Network Corporations

- Ring fencing of transmission alone would not necessarily achieve the objective of achieving transparency in transmission pricing for all participants in the National Grid unless the ring fencing included those parts of distribution systems which could be used for trading by participants.

- If ring fencing included all of the transmission and distribution (transport) business some differentiation would be needed between the costs for low voltage retail distribution activities carried out on behalf of the retail supply business and network (transport) activities.

- Multiple Network Corporations, Legally Separate Network Subsidiaries and Ring-Fenced Business Unit structures can coexist across the south and east Australian electricity grid. Therefore, where synergies provide economic incentives, distribution and transmission may be either combined or separate network entities.

National Network Corporation

- It would be unrealistic to expect a National Network Corporation to own and operate all the distribution businesses hence it would be necessary to split off transmission assets into the National Network Corporation at some appropriate level.

- Synergies achieved by combination of transmission and distribution (transport) activities in some regions would be lost or downgraded. Although, there would probably be some synergies for transmission on a National scale.

- Some synergies could possible still be maintained by the remaining network entity contracting for the operation and maintenance of transmission in specific regions to the National Network Corporation.

Conclusions

- Regardless of the structural arrangements adopted for the network (transmission and distribution) function, in order to promote competition at all levels of the industry,

there is a need for the supply function to be clearly separated from the transport function in existing distribution entities.

Those entities fulfilling a transport function should be required to comply with the principles of open access and transparent transmission pricing.