

Parliament of the Commonwealth of Australia

EASTLINK

**The Interconnection of NSW and Queensland
Electricity Grids with a High Voltage Powerlink**

SENATE ECONOMICS

REFERENCES COMMITTEE

DECEMBER 1995

Commonwealth of Australia

ISBN 0642235627

This document was produced from camera-ready copy and was printed by the Senate Printing Unit, Parliament House, Canberra

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TERMS OF REFERENCE

Proposed Eastlink High Voltage Powerline Between Armidale, New South Wales, and Springdale, Queensland

On 30 March the Australian Senate referred to the Senate Economics References Committee the following matters for inquiry and report on or before 28 September 1995:

- (1) (a) the possible impact of the powerline and the accompanying land resumptions on:
 - (i) the health of people and animals in surrounding areas with particular reference to the likely effects of electromagnetic field radiation,
 - (ii) the vegetation and overall environment, and
 - (iii) the social fabric and local economic viability of surrounding communities, including the likely loss of agricultural land;
 - (b) the overall economic impact of the powerline;
 - (c) the likely impact of the powerline on overall levels of electricity consumption, with reference to Australia's obligations and commitment to reduce greenhouse gas emissions;
 - (d) the viability of the use of renewable energy sources including hydro-electricity to provide electricity to Queensland consumers; and
 - (e) the adequacy of the community consultation process undertaken by Government bodies with those people and local authorities in the areas which will be affected by the powerline
- (2) That, in conducting and reporting on the inquiry, the Committee consider whether or not the Eastlink proposal takes sufficiently into account the reservations contained in the 1992 report of the former Standing Committee on Industry Science and Technology on gas and electricity.

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ABBREVIATIONS

ABARE	Australian Bureau of Agricultural & Resource Economics
ACF	Australian Conservation Foundation
CLENRAC	Glen Innes Natural Resources Advisory Committee
COAG	Council of Australian Governments
Co2	carbon dioxide
EIS	Environmental Impact Statement
ELF	extra low frequency
EMFs	electro magnetic fields
ESAA	Electricity Supply Association of Australia
IC	Industry Commission (Commonwealth)
KV	Kilovolts
kV/m	Kilovolts per metre
MG	milligauss - a measurement of magnetic field strength
MW	megawatt
NCRP	National Council on Radiation Protection (USA)
NGMC	National Grid Management Council
QEC	Queensland Electricity Corporation
QETC	Queensland electricity Transmission Corporation
QTSC	Queensland Transmission & Supply corporation
SEQAE	South East Queensland Against Eastlink
TOTA	Totally Against Eastlink
WAKA	Warwick/Allora/Karara Action Group

CONDUCT OF THE INQUIRY

On 30 March 1995, the Senate referred the matter of the Eastlink High Voltage Power Line to the Economics References Committee. The Terms of Reference were then advertised in national newspapers and submissions called for by 2 June 1995. The Committee received 274 submissions from a range of individuals and organisations (Appendix 1). Many of the submissions were from areas most affected by the proposed line. Almost all of the submissions received from private individuals and community groups opposed Eastlink. Those few submissions in favour of Eastlink were from the two power authorities and from several individuals.

The vast majority of submissions came from private individuals (21 of whom 131 identified themselves as rural property owners). The next largest group of submissions came from community organisations and associations (31). Submissions also came from shire councils and members of parliament (9), scientists and medical practitioners (7), schools (6) and government departments or corporations (3). Of the submissions from private individuals, only 2 were in favour of **Eastlink**.

As well as formal submissions, the Committee received 1032 form letters, 91 survey forms, 143 questionnaires and a number of different petitions with a total of 2658 signatures. All form letters, questionnaires and petitions expressed a view opposing Eastlink.

The Committee held public hearings in Toowoomba, Armidale, Melbourne and Canberra. Inspections were carried out in the Toowoomba/Warwick region and in the Armidale/Guyra region (Appendix 11). Oral contributions were taken from 27 witnesses or groups of witnesses (Appendix 111) and 826 pages of evidence were taken. In addition to the formal proceedings at the public hearings in Toowoomba and Armidale, the Committee took the unusual step of allowing any member of the public who wished to put a point of view to the Committee to speak for a period of five minutes. This evidence was also recorded by Hansard.

INSPECTIONS AT ALLORA

On 11 October 1995, during inspections of the Eastlink corridor from Toowoomba to Warwick, the Allora community made special efforts to welcome the Committee and to provide briefing information about their area. **Representatives of** the community groups South East Queensland Against Eastlink and Warwick Allora Karara Action Group travelled with Committee members from Toowoomba to Springdale, then to Ma Ma Creek, Allora and Massie. When the Committee arrived for lunch at Allora, members were greeted by the whole town and rural community, the main street being lined with banners and people. There followed a parade of some 50 trucks and tractors, all bearing posters demonstrating against Eastlink.

However, in addition to making their views against Eastlink known, the Allora community also made a special effort to thank the Committee for visiting their area and listening to their concerns. As well as proclaiming 'No Eastlink', banners stated 'We thank you Senators' and 'Welcome Senators to Allora'. Before lunch, Committee members and staff were each presented with a bouquet of flowers from the local region by schoolchildren, and during lunch the Committee was joined by many people from the Allora community.

EXECUTIVE SUMMARY

Chapter 1 - The Eastlink Proposal

The Eastlink proposal would connect the Queensland electricity grid with that of the south eastern states via a high voltage dual transmission line from Springdale near Gatton in Queensland, to Armidale in northern NSW. The line would be a 330kV double circuit steel tower transmission line having a length of about 380-400km and capable of carrying 500mw in either direction

Chapter 2 - Health and Electromagnetic Fields

Of all aspects of the Committee's inquiry into the Eastlink proposal, the issue of potential health effects of EMFs far outweighed any other subject. Many people hold genuine reservations about the impact that a high voltage powerline may have on their health, and the health of their families.

In attempting to resolve this issue from a scientific point of view, it became clear to the Committee that reputable scientists have taken strong stands both in support of and against the proposition that high voltage power lines may cause health effects in people living near them.

In the light of such conflicting evidence, and because it is not possible scientifically to prove a negative, the Committee is unable to totally dismiss the possibility that there may be adverse effects. Similarly, the Committee is unable to conclude that a definite link between high voltage power lines and adverse effects on human health exists and thus that any new policy recommendations need to be made. (Paragraph 2.66).

However, the Committee is able to conclude that simply the fear of detrimental health effects, whether real or imaginary, is in itself having an impact on the lives of some individuals affected by the Eastlink proposal. In acknowledging these community concerns, the Committee takes a similar stand to that of the Gibbs report. The Committee agrees that, as a minimum policy or until evidence suggests otherwise, the concept of 'prudent avoidance' should continue to be practiced by government and power authorities. (Paragraph 2.67j).

However, in supporting this concept, the Committee also acknowledges that there are some difficulties with it as a policy with practical application. Firstly, people who own land through which high voltage power lines traverse may have difficulty in 'prudently avoiding' those lines while carrying out the normal activities that their farming enterprise requires. Secondly, there are currently no guidelines for what 'prudent avoidance' means. There are safety standards for exposure to EMFs but these do not readily translate to people living or working near high voltage power lines.

The Committee therefore concludes that, in the case of Eastlink, 'prudent avoidance' should mean siting the line as far as possible from houses, outbuildings and other farm facilities. (Paragraph 2.70).

As with human health, the Committee accepts that evidence line impact on the health of stock and crops grown within the vicinity of the line is equivocal. **In the absence of extensive field studies on livestock, the Committee is not able to conclude that high voltage power lines affect the health of livestock and crops, nor is it able to conclude that they do not. The Committee therefore recommends that scientific studies should be carried out in Australia on the possible effects of high voltage powerlines on stock and crops. (Paragraph 2.72).**

Regardless of whether there is an actual effect or not, public perception that there might be an effect can have an impact on the market value of stock and crops produced in areas through which high voltage power lines pass. **The Committee therefore concludes that compensation by power authorities should be extended to those property owners who suffer an economic loss as a result of the construction of Eastlink, regardless of how that loss is brought about. (Paragraph 2.74).**

Chapter 3 - Environmental Impact

The Committee accepts that there will be some direct environmental impact associated with the construction of this high voltage powerline. The primary impact will be loss of trees through clearing of easement and resultant fragmentation of habitat. Other potential environmental impacts include soil erosion, the introduction of noxious weeds during construction and maintenance activities, the use of herbicides to control vegetation regrowth along easements, the unfavourable visual impact of the line, and impact on special heritage areas.

Of greater concern to the Committee is, however, the actions of the power authorities in determining the preferred corridor, then carrying out the Environmental Impact Statement. While the final impact statement is not due to be completed until mid-1996, it is clear that the power authorities have already chosen a specific route.

The Committee questions the practice of carrying out an environmental impact assessment of a proposal when alternatives have not been included in the detailed Environmental Impact Statement and when siting of the line is clearly going ahead before the Environmental Impact Statement is complete. (Paragraph 3.75).

Chapter 4 - Social and Local Economic Impact

The Eastlink proposal, perhaps more than any other high voltage power line in Australia's history, has resulted in high levels of community opposition. The large number of critical submissions received was a strong indication to the Committee that the communities affected do not want Eastlink to proceed.

Impact on Agricultural Land

Property owners were concerned that the position of the line would have a detrimental impact on the efficient operation of their businesses through interference with facilities and with aerial agriculture. **The Committee recommends that any detrimental impact on farm operations should be the subject of compensation. (Paragraph 4.97).**

Local Economic Impact

Eastlink has already had an impact on the real estate market for properties along the Western corridor. In addition, the value of properties along the corridor may well be reduced by the advent of the powerline. It is clear that some people are currently being economically disadvantaged by the proposal.

Regional economics may feel a flow-on effect from the stagnation of the rural real estate market and the unwillingness of property owners in general to make any further capital investment in the properties. The visual impact of the power line may also affect regional tourism.

The power authorities involved have noted that real estate devaluations sometimes occur when a power line is first proposed, but suggested that the market will regain its previous level at some stage after the power line has been completed. The Committee notes, however, that this information does not help property owners who want to sell now, or who are planning to sell in the near future.

The Committee holds the view that, if the power authorities are so sure that the property market will return to normal after Eastlink is completed, they should buy now, at pre-Eastlink valuation, any property that has been on the market and that has not achieved a sale because of speculation about Eastlink. (Paragraph 4.101).

Compensation

It is the usual practice of power authorities to offer compensation for the use of easements and to offset any losses associated with reduced amenity of facilities on individual farms. However, there is a general community belief that in the case of Eastlink, the level of compensation would be inadequate.

The Committee is concerned that the practise of negotiating compensation arrangements on a one-by-one basis, without any requirement for public disclosure of the total amount, or the factors included in the summation, favours the power authorities and enables them to achieve minimum levels of compensation. Were public disclosure compulsory and if landowners had access to a simpler and cheaper avenue of conciliation than the courts, the level of compensation paid may appear more equitable to those seeking compensation for the intrusion of Eastlink.

The Committee recommends wider and more comprehensive compensation provisions, which may include provision for an independent conciliation process for individuals or groups affected. (Paragraph 4.105).

Community Consultation & Social Impact

While the power authorities made every effort to consult the people directly affected by the proposal, both those individuals and the broader community have rejected the consultation process as completely inadequate. People believe that because they were never given the choice of 'no Eastlink' the consultation process was intrinsically flawed.

It appears to the Committee that a significant cause of community disharmony and rancour has been the practice of holding discussions with individual property owners who were disadvantaged by the fact that they were ignorant of what had been said to neighbouring property owners, while the power authority officers had the advantage of knowing what offers had been made to other landholders.

More significantly the fact that the power authorities made changes to the proposed route led to suspicion that improper influence had been brought to bear. This created antagonism between neighbours and in some instances rifts have formed within rural areas that will take a long time to heal.

The Committee concludes that while the power authorities put a large effort into public consultation, the methods used were not accepted by many of those people affected by the proposed power line. The cumulative effect has been considerable social disquiet and stress. (Paragraph 4.108).

State Parliamentary Review Procedures

This Committee and its predecessor, the Standing Committee on Industry, Science and Technology, has over the last few years noted a lack of informed and detailed debate on matters relating to power generation developments. In particular, the

Committee has noted that state governments could play a stronger role in meshing policy with community needs and opinions.

The Committee suggests to all state governments that there would be merit in establishing a process whereby communities and professionals could be more directly involved in debate on energy matters. Through such a process, parliaments could monitor community reaction to energy projects, as well as provide a more accessible and flexible grievance mechanism. (Paragraph 4.111)

Chapter 5 - Economic Considerations

The Senate Standing Committee on Industry Science and Technology recommended in its report on *Gas and Electricity* that any interconnection between NSW and Queensland should not go ahead until it was proven to be economic. While opponents of Eastlink have argued that this has still not been proven, the fact that two State Governments, with the support of the Federal Government, are going ahead indicates that it is considered by them to be economic.

The Committee accepts that the analysis carried out by the Australian Bureau of Agricultural and Resource Economics examined the general economics of interconnection through a high voltage power line, and was not sufficiently detailed to draw conclusions about the specific case of Eastlink. The Committee further accepts that the model demonstrated, in general terms, that electricity interconnection through a high voltage power line would be economic. (Paragraph 5.20).

However, because a specific cost/benefit analysis for Eastlink was not available, the Committee is unable to comment on the specific case of this proposal. (Paragraph 5.21).

The total cost of Eastlink has been stated by the power authorities to be in the region of \$300 million. However, information given by the authorities does not include a breakdown of what expenses have been included. Lack of detailed information has contributed to public confusion and misunderstanding about the relative costs and benefits of Eastlink and therefore to a lack of understanding of the full economic impact.

The Committee believes that, in the interests of good public relations, the power authorities involved should make available to the public a more detailed cost/benefit analysis of Eastlink. (Paragraph 2.23).

Chapter 6 - Electricity Consumption and Greenhouse

The question of impact on greenhouse gas emissions hinges on whether Eastlink will increase the use of coal fired power stations. Because there is almost no data available which relates specifically to Eastlink, the Committee is unable to make a decision as to which is the more likely outcome. However, the Committee notes that the potential does exist for greenhouse gas emissions to increase. **The Committee therefore recommends that the Commonwealth Government investigate in detail the likely impact of Eastlink on coal consumption and the implications of any change in that consumption for greenhouse gas emissions having regard to its international obligations. (Paragraph 6.29).**

Chapter 7 - Renewable Alternatives

Throughout the current inquiry, the Committee was impressed by the knowledge and enthusiasm that community groups and individuals hold for alternative renewable forms of electricity generation.

The Senate Standing Committee on Industry, Science and Technology in its 1992 report, *Gas & Electricity - Combining Efficiency and Greenhouse*, stated that Queensland would be an ideal place to further research on renewables and recommended that the development of a national grid must not preclude the further development of options such as demand management, co-generation and new technologies.

Despite the outcome of the Eastlink interconnection, the Committee reiterates the opinion expressed in the Report on *Gas and Electricity* that Queensland would be an ideal place for increased research and development of renewable energy options. (Paragraph 7.33).

PREFACE

REFORMS IN THE ELECTRICITY INDUSTRY

Electricity generation and transmission is one of Australia's largest industries with assets valued at over \$70 billion, total annual sales of around \$11 billion and a work force in excess of 60,000. Electricity in Australia is not expensive by world standards, the low cost reflecting Australia's abundant natural resources, particularly coal and hydro potential. Competitively priced electricity is a significant factor in the performance of a large number of domestic and export industries.

Until recently the structure of the electricity industry was relatively simple, with each state having its own power authority monopoly, plus the Commonwealth's Snowy Mountains Authority. However, over the last few years, the states have begun to change the structure of their power supply utilities and to move further towards integration of a south eastern grid. This has been primarily motivated by Commonwealth moves to reform the electricity industry to have a competitive multistate, corporatised electricity market with an expanded, integrated grid.

To do this, monopoly elements (such as transmission, and system and market control) are being separated from those that have the potential to be competitive (such as generation and retail supply). Large state power authorities are being dismantled into separate units handling transmission, generation and distribution, and an interstate electricity transmission network with free trade in bulk electricity for private generating companies, public utilities and consumers, is being established.

There is currently a limited capacity for transfers of electricity between three states - NSW, Victoria and South Australia. New South Wales and Victoria are able to interchange power through the Snowy Mountains Scheme, although the capability of this link is limited by stability constraints. There is also a 500mw line between NSW and South Australia, via Victoria. Potential for interconnection includes establishing a high voltage link between NSW and Queensland ('Eastlink') and an undersea cable across Bass Strait ('Basslink') to connect Tasmania with the eastern grid.

The scope for benefits from the interconnection of electricity grids between Queensland and NSW has long been recognised but it has not been until recently that improvements in technology and reduced installation costs have allowed economic consideration of the project to be worthwhile. In February 1992, the electricity commissions of NSW and Queensland signed a memorandum of understanding to initiate feasibility studies, and in December 1993 the two States signed with the Commonwealth a Memorandum to further progress technical studies, community consultation and route selection to the stage of acquiring easements.

In preparation for full interconnection between the south-eastern states, a Special Premiers' Conference agreed in July 1991 to establish a National Grid Management Council (NGMC). This council comprises of representatives of the states of Queensland, NSW, Victoria, Tasmania, South Australia, the ACT, the Commonwealth, and an independent Chairman. The role of the NGMC is to encourage open access to the grid, free trade in bulk electricity, coordinate planning and to arrange competitive sourcing of new generation. In December 1992 the Heads of Government endorsed a NGMC National Grid Protocol which sets out the rules, responsibilities and technical requirements for connection to the National Grid and for participating in trading bulk electricity through Market sharing through the national electricity grid was originally intended to commence in July 1993 but delays have been caused by rivalry among stakeholders and ongoing disputes between the electricity industry and business customers over market arrangements, as well as problems in the development of a code of conduct. The NGMC has still not finalised the software mechanics which will be used in the settlement procedure and there are outstanding problems with the accounting system which will be used when the grid is in operation. A complete transition to a fully competitive market system is not expected until 1 July 1999.

CHAPTER 1

EASTLINK PROPOSAL

Background

1.1 Although the potential benefits of interconnecting New South Wales and Queensland electricity grids had been discussed for several decades, it was not until December 1993 that the State Governments of NSW and Queensland, along with the Commonwealth Government, signed a Memorandum of Understanding to proceed with interconnection. This had been preceded by an agreement in principle, at the Adelaide Premier's Conference of 1991, to work towards the establishment of a national electricity grid, and a 1993 Council of Australian Government (COAG) agreement to the establishment of an interstate transmission network and a competitive national electricity market.

General Concept

1.2 The Eastlink proposal would connect the Queensland electricity grid with that of the south eastern states via a high voltage dual transmission line from Springdale near Gatton in Queensland, to Armidale in northern NSW (Figure 1.1). The line would be a 330kV double circuit steel tower transmission line having a length of about 380-400km, depending on the final route selected, and capable of carrying 5000mw in either direction.

Project Rationale

1.3 Projections indicate that Queensland will require around 280 megawatts (mw) of new capacity in 1998 and between 200 and 300mw each year thereafter to meet projected growth rates. NSW currently has surplus generating capacity and forecasts suggest that it will not require additional capacity until about 2003. Connecting Queensland to the south-eastern grid would allow other states, and in particular NSW, to bid competitively to supply Queensland's future requirements.

1.4 Queensland's energy strategy for the period 1998-2006 is contained in its April 1995 Energy Policy Statement, a document based on the Government's Future Supply Consultative Electricity Task Force report of September 1994. The strategy includes: 'demand-side management, renewable energy, refurbishing and recommissioning power stations which had been closed and inter-State connection with NSW, as well as more conventional options for new generating capacity.

1.5 To allow Queensland to include interconnection among its options for extra supply in 1998, it is necessary to carry out initial feasibility studies for Eastlink now. These preparatory studies include completion of engineering and operational studies, the identification of a transmission line route and acquisition of property easements for the line.

Benefits of Interconnection

1.6 Connection of Queensland to the already connected electricity grids of southern Australia is an important element in the establishment of a competitive national electricity market. The specific benefits expected to be gained from interconnection through Eastlink are that:

- it will offer operational efficiencies as it will allow lower cost power generation in one system to replace higher cost generation in others;
- it will allow the deferral of new power station construction through increased reserve sharing across four states; and
- it will lead to greater efficiencies by increasing competition between power generators through trading in electricity between states (power interchange).

The Authorities

1.7 When the Memorandum of Understanding was signed in December 1993 the two state power authorities involved in Eastlink were Pacific Power (NSW) and the Queensland Electricity Commission (QEC). Since that time, both authorities have undergone major restructuring to separate the functions of electricity generation from transmission.

1.8 On 1 January 1995, the Queensland Electricity Transmission Corporation (QETC) was formed to assume responsibility for the bulk electricity transmission functions of the former QEC. It trades under the business name of *Powerlink* and is a subsidiary corporation of the newly formed Queensland Transmission and Supply Corporation (QTSC) which also has responsibility for all the former regional distribution Boards (now also Corporations). The general functions of the former QEC are now undertaken by *Austa Electric*, the trading name of the Queensland generating corporation. All corporations are Queensland Government owned and *Powerlink* has responsibility for Eastlink.

1.9 On 1 February 1995, the NSW Electricity Transmission Authority was formed as a separate NSW Government Statutory Authority to assume responsibility for the bulk electricity transmission functions of Pacific Power, with the

latter continuing to discharge all the remaining functions associated with electricity generation. The transmission authority operates under the business name *Transgrid* and has responsibility for Eastlink .

Commonwealth Involvement

1.10 The Commonwealth strongly supports the extension of electricity transmission links between the states on the basis of increasing the level of competitiveness among power authorities.

1.11 Under the 1993 Memorandum of Understanding, the Commonwealth agreed to pay one third of the cost of the work undertaken by NSW and Queensland to assess technical feasibility, route selection and environmental impact up to a maximum of \$7 million, with no more than \$3.5 million going to each state. The contributions of the Commonwealth will be limited to \$1 million in 1993/94 and \$3 million in 1994/95 and 1995/96.

Technical Specifications

1.12 The transmission line proposed is to be a 330 000 volt (330kV) single transmission, high voltage alternating current line carrying two circuits with a firm transfer capacity in either direction of 500mw. The line must be capable of carrying 500mw when one of its circuits is temporarily out of service for maintenance, or due to a fault. Connection points must meet several essential technical criteria and site selection has been narrowed down to one site in NSW (an existing high voltage substation near Armidale) and a green-field site in Queensland (a future high voltage substation at Springdale near Gatton). The transmission line would be similar to other 330kV lines around Australia, suspended from towers approximately 40-45 meters high and 400-450 metres apart in flat to undulating country. Other designs are being investigated for visually sensitive areas. The line would be able to transmit up to 500mw of power between the two states.

1.13 The works required for Eastlink are:

- one double circuit 330kV transmission line between Armidale and Springdale;
- substation works at the existing Armidale 330kV substation;
- construction of Springdale 330kV Substation by QETC;
- minor substation works at a number of other sites in Queensland and NSW; and
- the construction of a double circuit 275kV transmission line between Springdale and Blackwall in Queensland. (This line, and some other small substation works would have been constructed at some later time anyway, so only advancement costs are attributed to Eastlink.

Costs

1.14 The present cost estimate for Eastlink is about \$300 million. This includes all survey and engineering costs, installation costs of the line and substations at Armidale and Springdale, casement acquisition and compensation costs, an appropriate level of contingency cost and interest incurred during construction of the project.s

1.15 Operation and maintenance costs associated with Eastlink have been included in the evaluation and are estimated at nil for the first two years after establishment of the interconnection and conservatively at 1% of the c 1 cost per annum from the third year onwards.

Route Selection Process

Three different terms are used in describing the line taken by Eastlink:

Corridor: A general area or broad of land in which a transmission route may be located. The width of the corridor depends on land constraints. It may be as narrow as several hundred metres in critical areas or as wide as 10 kilometres in other areas.

Easement: A strip of land wide enough to construct, operate and maintain the transmission line. Easements required for Eastlink will generally be about 60 metres wide but may increase to 110 metres in some areas.

Route: The specific alignment on which a transmission line is built.

1.17 The process used to determine the ultimate path of the transmission line will have six stages:

- the identification of preliminary corridor concepts;
- the refinement of those concepts, with the aid of the community, into viable corridor options;
- the presentation to the community, for formal comment, of those corridors in a Corridor Selection Report;
- an evaluation of all community comment and environmental and other studies leading to the selection of a preferred corridor;
- the production and presentation of environmental impact assessment documents for the proposed transmission line within the preferred corridor in accordance with state legislation;
- the selection of a final route within the preferred corridor on the basis of the environmental impact assessment and community submissions, technical considerations and following consultations with property owners.

1.18 As shown in Figure 1. 1, two major corridors (Eastern and Western) with a series of link options (Western

Alternative, Central Corridor, Link 1, Link 2 and Link 3) were initially identified. Prior to the selection of a preferred corridor, the power authorities stated: 'At this stage, the Eastlink team has no preferred option and all corridors are being treated equally. The preferred corridor will be selected on an assessment of the relative impact of each of the corridors; the community submissions and the technical requirement for the line.

Figure 1.1 - Corridor an link options for Eastlink (Map available in hard copy report)

Western Corridor Selected

1.19 After extensive consideration of submissions to the selection process and after an assessment of the relative impact of each of the corridor options, notice was given in February 1995 that the Western Corridor (Corridor A in the Selection Process Report) had been chosen for refinement of an exact route. The project team is currently contacting landowners along the preferred corridor to have further discussions aimed at identifying an alignment of the transmission line so as to minimise impact. During the course of the environmental impact statement the corridor will be refined to an easement.

Easement Acquisition

1.20 When a transmission line is constructed across a property, the electricity authority does not normally purchase the affected land but acquires an easement. This allows the authority to maintain and operate the line while most normal farming and grazing activities remain unrestricted. Guidelines are provided which outline activities which are allowed, those which are restricted, and those which are prohibited along easements.

1.21 Ownership of the easement remains with the property owner but, by acquiring the right of easement, the authority is able to use the defined area for a specific purpose. In exchange, the property owner is entitled to compensation based on the impact of the easement, as it effects the market value of the property. However, neighbouring property owners, who may be affected by the visual impact of the line, are not eligible for any compensation.

1.22 The route acquisition process differs in each state: in Queensland the target date for approval of the line route is October 1995 following which line easements will be acquired; in NSW the target date for determination of the Environmental Impact Statement is June 1996, following which line easements will be acquired.

Work Program and Commissioning

1.23 According to the *Powerlink* Submission ' the proposed timetable for Eastlink is:

•Preliminary Environmental Impact Study - for public comment	February 1996
•Environmental Impact Study Complete	August 1996
•Field Construction Commences	April 1997
•Commissioning	December 1998

Role of the Committee

1.24 Although the Commonwealth has actively promoted and supported the concept of an integrated south-eastern electricity grid through interconnection, the Commonwealth's role in the specific matter of the Eastlink transmission line is only one of providing a contribution towards the funding of feasibility studies.

1.25 This Committee is similarly limited in its jurisdiction and thus limited in the recommendations it can make. It is not within the Committee's power to prevent or place a moratorium on the construction of Eastlink. That is a matter that can be decided only by the two states involved, NSW and Queensland.

1.26 However, having received a considerable amount of evidence from the communities affected by the proposal, and having conducted lengthy inspections and discussions with people in those regions, the Committee believes that it has a responsibility to report on the process leading to the selection of the western corridor. A large part of this report details many of the concerns that were raised in evidence about the location of the line, the consultation process, the social impact and local economic impact and the potential health effects. In this regard, the main role of the Committee has been to provide an opportunity for these and other matters to be fully disclosed.

CHAPTER 2

HEALTH AND EMF

Term of Reference 1 (a) (I) ...the possible impact of the power line and the accompanying land resumptions on the health of people and animals in surrounding areas, with particular reference to the likely effects of electromagnetic field radiation!

Introduction

2.1 Electromagnetic fields (EMFs) are found everywhere there is electricity. Concerns about them centre on the potential for very strong fields to cause health effects in people exposed to them long periods or time or at high intensity for shorter periods. Groups of people thought to be at risk include power industry workers and people living close to voltage power lines.

2.2 Over the last 25 years a considerable amount of scientific research has been directed at determining the level of hazard posed by EMFs. This has included both epidemiological studies (patterns of disease in groups of people) and laboratory studies on animals and human volunteers. The results of scientific research on the effects of EMFs on health are equivocal: many studies have been conducted that have found no links between high levels of exposure or proximity to power lines, and health effects, while other studies have reported statistical links. In the meanwhile, power utilities have adopted a policy of 'prudent avoidance' when building new electrical facilities.

2.3 However, regardless of the state of scientific evidence, there is a perception among some sections of the public that there are health risks associated with exposure to strong EMFs. In particular, many people who live along the proposed Eastlink high voltage power line are convinced that there are dangers associated with them and therefore do not want Eastlink to be constructed on or near their properties. People are also concerned about the perceived risk to farm and native animals living near the power line, especially stud breeding stock.

Electromagnetic Fields

2.4 There are two different types of fields produced by electrical equipment and appliances: electric fields and magnetic fields. An electric field is an invisible force that relates to voltage, or the pressure under which electricity is forced along wires. Electric fields are present in any appliance plugged into a power point which is switched on, regardless of whether the appliance is turned on or off. Electric fields are strongest close to their source, but their strength rapidly diminishes as distance away from the source increases. They are blocked by many common materials such as wood or metal. Electric fields are measured in volts per metre or kilovolts (kV) per metre.

2.5 A magnetic field is an invisible force which is produced by the flow of electricity (commonly known as the current). Unlike electric fields, magnetic fields are only present when the electricity is on and the current is flowing. The strength of the magnetic field depends on the size of the current and they also decrease rapidly as distance away from the source increases. Magnetic fields are usually measured in milligauss, but are sometimes measured in gauss, teslas and microteslas (10 milligauss equals 1 micro tesla). Unlike electric fields however, magnetic fields are highly penetrative and difficult to shield.

2.6 Like all other electrical equipment, transmission lines produce both electric and magnetic fields. With power lines, the strength of the electric field varies with the operating voltage of the line and the strength of the magnetic field is related to the amps, or current flowing in the line. Field strengths are also related to the height of the lines, their geometric arrangement and the arrangement of the phases in multi-circuit lines.

Scientific Research

2.7 The question of whether EMFs can detrimentally effect biological systems has been addressed by many scientists over the last twenty years, with studies ranging from in vitro laboratory experiments on single cells to epidemiological studies on large populations. There are many thousands of primary research papers published in peer-reviewed journals, meta-analyses of groups of similar studies, and over 70 comprehensive secondary reviews carried out worldwide by professional committees and panels.

2.8 In undertaking this inquiry, the Committee has used evidence presented to it from the power authorities, from people living in the regions affected by Eastlink and from expert scientists who made representations to the Committee. The Committee has also made reference to some of the major reviews carried out by government sponsored bodies over the last decade in Australia and overseas.

Secondary Reviews of EMF Research

Australian Reviews

2.9 There have been two major reviews conducted in Australia - the Gibbs' Report and the Peach Panel.

2.10 The Gibbs Report, *Inquiry into Community Needs and High Voltage Transmission Line Development*, was commissioned by the NSW Government and was completed in 1991. In this very extensive inquiry, Sir Harry Gibbs sought evidence through submissions, hearings and inspections, reviewed scientific literature, and travelled overseas to meet with academic and government experts. He was assisted in technical matters by a panel of four expert scientists. The report considered both specific power line proposals in NSW and the general subject of EMI's and health.

2.11 In the report, Sir Harry Gibbs concluded:

It has not been established that electric fields or magnetic fields of power frequency are harmful to human health, but since there is some evidence that they may do harm, a policy of prudent avoidance is recommended. ⁴

This statement has frequently been quoted and the expression 'prudent avoidance' is now very widely used.

2.12 At a similar time, January 1991, the Victorian Government established a panel to review public policy approaches in relation to power line fields and to make recommendations (the Peach Panel). In addition to recommending that the Government establish and maintain communication with the community about the subject, the Panel recommended a practical strategy based on prudent avoidance which was described as: 'looking systematically for strategies which can restrict field exposure and adopting those strategies which seem to be prudent investments given their costs and the level of scientific understanding about possible risks'. However, as noted by the Panel, a policy of prudent avoidance was not a 'health based policy' and that the implementation of the policy could not necessarily be seen as being of benefit to public health.⁵

Overseas Reviews

2.13 There have been numerous overseas review of the potential health effects of EMFs. These have been conducted primarily in Britain, America, Canada, and Scandinavian countries. In 1992, an expert group under the leadership of prominent British epidemiologist, Sir Richard Doll, reported to the National Radiological Protection Board on *Electromagnetic Fields and the Risk of Cancer*, with the conclusion that:

... there is no clear evidence of a carcinogenic hazard from the normal levels of power frequency electromagnetic fields, radio frequency or microwave radiation to which people are exposed. ⁶

2.14 In 1993 and again in 1994, the British National Radiological Protection Board reviewed studies in Scandinavia, Canada and France. Despite acknowledging that these studies had shown an association between increased likelihood of cancers and exposure to high levels of EMFs among children and among power industry workers, the Radiological Protection Board concluded that those studies did not establish that 'exposure to EMF is a cause of cancer', though they did acknowledge that 'they provide weak evidence to suggest the **possibility exists**'.⁷

2.15 Similarly, as quoted in submissions from both *Transgrid* and *Powerlink*, the vast majority of secondary studies conducted overseas have concluded that although EMFs have been implicated in primary studies, those studies have not contained sufficient convincing data to establish a causal relationship.

2.16 During the course of the Committee's inquiry, the draft conclusions and recommendations of a report written by the US National Council on Radiation, Protection and Measurements (NCRP) were leaked to the press and subsequently sent to the Committee. This report does not have any official status as it has not been subject to the normal peer review process. However, the report's major finding was that: 'In key areas of bioelectromagnetic research, findings are sufficiently consistent and form a sufficiently coherent picture to suggest plausible connections between ELF EMF exposures and disruption of normal biological processes, in ways meriting detailed examination of potential implications in human health'.⁹

2.17 A member of that Committee, Dr Richard Luben, gave evidence to the Committee. In discussing the report he stated:

I am a member of the council of the National Council on Radiation Protection -NCRP. This is a congressionally established body which advises the United States government on recommendations for safety standards for both ionising and nonionising radiation. As such, we are vested with the responsibility of determining the hazard level of a variety of environmental exposures.

I am also a member of subcommittee 89.3 of the NCRP, which is the committee that produced the document that has at least partially been leaked to the press and has been discussed widely. The committee that prepared the document is, as a whole, dismayed ... that the executive summary of our document has been released in this manner. It is a document that we spent 10 years writing. It consisted of over 800 pages of types material ...

However, I also want to point out that what was leaked is in fact the executive summary that was agreed to by the entire committee, and that there is no doubt in my mind that the report is finished. ... However, as a member of the NCRP Council and not as a member of the committee, I have to say that this document is still undergoing scientific review and ... that this document does not constitute any kind of recommendation or even the opinion of the NCRP council with regard to any non-ionising radiation exposure limits.

Power Authorities' Position

Transgrid

2.18 In its submission, *Transgrid* stated that in considering health concerns about EMFs, it relied on reviews carried out by other bodies, such as those described above. *Transgrid* agreed with the conclusion that adverse health effects have not been established but that the possibility could not be ruled out, and that further research was needed. The Authority therefore monitors worldwide research, participates in the sponsorship of research through the Electricity Supply Association of Australia (ESAA), reviews practices in the light of research findings, measures field strength around its installations, takes 'prudent avoidance' into account in the siting and construction of installations and freely provides information to the public. In the case of Eastlink, two brochures were made available to local communities: *Electric and Magnetic Fields - Sharing Information* and *Your Guide to Understanding EillFs*.

2.19 The *Transgrid* submission accepts the Gibbs recommendation of 'prudent avoidance' but does so in the light of the qualification that 'it may be prudent to do whatever can be done without undue inconvenience and at modest expense

to avert the possible risk'.¹ The submission discussed the two aspects of power line construction which contribute most to EMFs (the physical dimensions of the structure and phasing arrangements) but concluded that because the final

technical and cost aspects of the line had not yet been assessed, it is possible at that stage to say what technical specifications would be used in Eastlink. However, the Authority proposed to acquire a 60 metre wide easement for the line 'which corresponds with to the typical width for) 30,000volt lines on which Sir Harry Gibbs statement was based'. The submission concluded that the: 'actions taken by the Authority are consistent with the notion of prudent avoidance'.

2.20 Modeling has been carried out to estimate the strength and degree of dissipation of electric and magnetic fields along the Eastlink transmission line. With respect to electric fields the *Transgrid* submission states. 'The maximum

electric field strength under average load conditions ... is approximately 3.2 kilovolts per metre (kV/m) under the line, decreasing to about 0.2 kV/m at the edge of the proposed casement, 30 metres from the centre of the line'. 14

2.21 With respect to magnetic fields the submission notes that because they depend on the current flowing in the line, which in turn varies with the load being supplied, there can be no single estimate as there is with electric fields. However, an estimate based on a maximum transmission load of 500mw results in a value of 46 milliguass (mG) directly under the line, decreasing to about 6.5 mG at the edge of the casement, 30 metres away.

2.22 The *Transgrid* submission points out that in many areas of Australia, and particularly in NSW, there are thousands of kilometres of transmission lines. Over NSW, there are about 530kin of 500kV lines, 4480kin of 330kV lines, 690kin of 220kV lines and 8,000kni of 1321cV lines, as well as about 300kin of underground cables predominantly located in the Sydney area; a total of about 14,000km.

2.23 After the Western Corridor was selected as the preferred line in February 1995, estimates were made of the number of dwellings which would be in close proximity to it. The *Transgrid* submission provides the following figures for the NSW sector of Eastlink:

Distance From Transmission Line	Number of Houses
0 - 250 metres	3
250 - 500 metres	23
500 - 1000 metres	58

Table 2.1 - Proximity of Eastlink power line to existing dwellings

2.24 *Transgrid* stated that the closest house is approximately 100 metres from the line and that many lines, particularly in urban areas, would have homes very much closer than this. The submission also noted that when the estimates for electric and magnetic field strengths at various distances away from the source are compared with the proximity of dwelling, there would be negligible effect on even the closest dwelling. 15

Powerlink

2.25 In its submission to the Committee, *Powerlink* stated emphatically that 'Trio causal link has been established' in any of the reviews of EMFs and health and that it had adopted the policy guidelines formulated by ESAA in this matter. The submission described how *Powerlink* had applied the concept of 'prudent avoidance' when selecting the preferred Western Corridor, and in narrowing that corridor to a specific route for Eastlink.

2.26 In the first instance, the concept of 'prudent avoidance' was applied to the process and thus population centres and larger townships were avoided. Then, according to *Powerlink*:

As corridor development proceeded ... prudent avoidance was applied progressively in more detail through each stage. ... Selection of the Preferred Alignment within the chosen corridor has applied prudent avoidance to the greatest level of detail, with proximity to individual houses in particular being considered. The outcome is an alignment which is no closer than 150 metres to any home - a distance at which fields from the transmission line will have reduced to approximately background levels.

2.27 The Electricity Supply Association of Australia (ESAA) takes a very strong view that no causal relationship has been established between EMIs and detrimental health effects. In both its primary submission and a supplementary submission, ESAA argued strenuously that a review of all the literature had shown that there is 'scientific consensus that health effects have not been established'.

2.28 The ESAA noted that public concern about EMFs arises each time a new transmission line is proposed and that this type of reaction is not confined to Australia, being a common experience in other developed countries. This reaction, ESAA suggested, was due to:

- fear due to lack of understanding of the nature of EMFs and their interaction with living things
- fear based on incomplete or inaccurate media stories, pseudo-scientific articles and books, and rumours
- frustration because people see themselves as being involuntarily exposed to an imperceptible agent which may endanger them or their children
- frustration that public health authorities can give no unequivocal guarantees that EMFs are perfectly safe.

2.29 In attempting to overcome this reaction, and in recognition of the fact that some members of the public are genuinely concerned about issues relating to EMFs and health, ESAA conducts employee and public education programs, publishes information brochures and newsletters and presents seminars and lectures on the issue. ¹⁹

Community Concerns

2.30 There is genuine fear among rural communities affected by the Eastlink proposal that electromagnetic fields will have long-term effects on the health of people in those communities, and in particular on children who may live in close proximity to high voltage power lines. A very large number of the submissions put to the Committee by individuals and community groups mentioned potential impact of the power line on health as a concern. This concern extended to the fear that because of the very long time frame of possible EMF effect, compensation would be difficult if not impossible to achieve. Analogies were drawn with other public health problems, such as with tobacco smoking, the herbicide DDT, asbestos and thalidomide, which were originally believed to be safe and were later proved not to have been. ²⁰

2.31 Quite a number of people who put submissions to the committee had themselves examined the overseas epidemiological literature and had quoted scientific surveys which had led to the conclusion that there did appear to be a relationship between EMIs and health risks, particularly childhood leukemia. ²¹

2.32 Several submissions have suggested that there was mounting evidence that occupational exposure to high levels of EMFs may result in health problems. In particular, workers in electrical professions and telephone company employees, have been the subject of some studies and found to have a higher incidence of cancer, particularly lymphoma and leukemia. There is also some evidence that radiographers who are exposed to EMFs through their operation of X-ray units, may be at risk of health effects. While these operators are protected from X-rays, their work may bring them in contact with high and low voltage transformers, cables, circuitry and control panels. Train drivers in Queensland are another group of people who have expressed concern that their jobs are putting them at risk .

Criticism of the Concept of 'Prudent Avoidance'

2.33 While power authorities argued a philosophy of 'prudent avoidance' of high voltage power lines, and thus the avoidance of exposure to ENIFs, people who live along the corridor pointed out that if the power line was to traverse their properties they would not be able to avoid, whether prudently or not, working under the lines, simply because their farm infrastructure or productive land lay beneath it. Individual submissions claimed variously that milking sheds, sheep dips, cattle yards, machinery sheds, cultivated paddocks and watering points, would be directly under the line, or within a short distance of it.²⁵ How, these submissions asked, were they to prudently avoid EMFs coming from the high voltage lines when they had to keep using these facilities?

2.34 One submission noted:

The proposed route traverses many smaller adjoining properties, as well as Ollera, with houses, sheds and stockyards at close proximity to each other. It would therefore be impossible to escape the electromagnetic radiation while going about one's daily business. We are totally opposed to any employee or member of the family being exposed to any radiation for long durations while working in either the cattle or sheep yards. The cattle facilities are used extensively and often cattle are held in a feelot situation. We are also opposed to our stock being exposed continuously to radiation as our cattle are sold onto the domestic market.

2.35 The submission then argued:

It would be almost impossible to relocate the Airstrip, sheep yards, or cattle yards that are within the Eastlink corridor as they are all relatively new facilities that now fit into the whole environment and the overall plan to update and streamline the entire management for the future prosperity for the next generation and managers of Ollera

2.36 In discussing the concept of 'prudent avoidance; Dr Liz Stringer, a medical practitioner from Warwick, noted that while this policy is widely recommended, there are no real guidelines to define this. She explained:

The National health and Medical Research Council has set "safe limits" for EMR exposure below which there should be no immediate or acute effects. These have no relevance to safe levels for long term exposure

Power Authorities and EMF Concerns

2.36 People concerned about the health effects of Eastlink expressed frustration at the apparently *laissez faire* attitudes of the power authorities. Submissions argued that while the power authorities refused to acknowledge that there could be health risks involved with EMFs the whole subject would not be given serious consideration.

2.38 When concerns about the possible health risks of the power line had been put to the power authorities the reply had frequently been given that landholders would encounter more EMFs around the home than they would from the power lines. Yet landholders not that using electrical appliances in the home is a matter of choice. If Eastlink crosses their land they will have no choice. They will have to work beneath the power lines, sometimes frequently, sometimes all day. One submission noted: 'These power lines will emit more than 100 times more EMFs than our electrical appliances around the home.'

2.39 While there is no substantial proof that there are no risks, some people prefer to remain sceptical. They are mindful of the fact there is evidence that suggests that there might be a risk and that, if there is a risk, the consequences are indeed very serious. People with children, potentially the most vulnerable group, share a double concern.

2.40 The St Patrick's Presbytery submission commented: 'Our children are our most precious commodity and we would not wish to expose them to unnecessary risks, particularly to such devastating diseases as leukemia and brain tumours. The effects on young lives are too horrendous to contemplate'.

2.41 This submission also noted that in a recent decision of the Toowoomba Planning and Environment Court, District Court Judge Thomas Quirk ruled that the effect of EM17s on health was 'one of uncertainty but also one of considerable public concern' and the development application under consideration had been rejected because parkland would be located under the power lines. ³¹

2.42 Gibbs himself came to the conclusion that it was possible that children exposed to extremely low frequency electric fields or magnetic fields were at greater risk of developing cancer. ³²

Stress Induced Effects on Health

2.43 The very proposition that a high voltage power line should pass through or near people's properties has already had an effect on the health of those people. Since its announcement, the Eastlink proposal appears to have resulted in a high level of stress in the communities involved. People are genuinely distressed at the thought of the power line being built near them; they do not want Eastlink to be anywhere near their communities. Quite a number of submissions to the Committee were punctuated throughout, or ended with the statement: I SAY NO TO EASTLINK; or more simply: NO EASTLINK.

2.44 When Eastlink was first proposed, there were three main corridor alternatives, with a number of linking options. The corridors varied in width downwards from a maximum of about 11 km. Through the refinement process this zone was reduced to a 2-kilometre corridor. Thus from the outset, quite a large number of people were led to believe that the power line might impinge on their properties. This method, it was argued, placed considerable unnecessary stress on a large number of people and is still placing stress on those people who do not know whether the line will pass through their particular properties.

2.45 In one study of the stress effects of the Eastlink proposal on the health of a sample of people living within the Ma Ma Creek area of south eastern Queensland, the people surveyed attributed to Eastlink an increase in such stress

related symptoms as tension, headaches, palpitations, anxiety, poor sleep, and poor appetite in the adults. Feelings of hopelessness, helplessness, depression, anxiety and, most common of all, anger were also reported. The primary cause of stress was attributed to the fear that EMI7s may prove at some later stage to have been harmful. This study also described how residents in the affected region 'feel that there are social changes in their community over which they had no control and are fearful that they have lost the power necessary to make informed decisions about their environment'.

2.46 Dr Liz Stringer, a general practitioner who has consulted people directly affected by Eastlink, stated: ' Many families and individuals have already been stressed just by the prospect of Eastlink. ... stress and disease are very closely linked. Stress can undermine immunity. Stress can cause disease. Stress can kill. The stress and suffering caused by Eastlink are totally unnecessary.'

Balancing Health Concerns With Environmental Concerns

2.47 The need to ensure 'prudent avoidance' will increasingly conflict with the need to preserve high quality natural environments. Having now adopted a policy of 'prudent avoidance', power authorities will seek to keep the additional cost associated with this policy to a minimum. In order to practice 'prudent avoidance' at lowest possible cost, there will be a tendency for power authorities to put increasing pressure on non-urban areas, prime agricultural land and high quality natural environments.

2.48 The Australian Transmission Line Avoidance Society argued that there is an increasingly urgent need for power authorities to form policies, in the light of the need for 'prudent avoidance', so as to limit damage to high quality environments. Such policies would include the consideration of alternatives to projects such as Eastlink if the conflict between health and the environment could not be adequately resolved. The Society further argued that if any genuine attempt was to be made to resolve the Eastlink conflict, greater cooperation was needed between all groups involved, electricity authorities, state governments, local councils, and all interested members of the community. ³⁶

A Question of Choice

2.49 There are many places around Australia where high voltage power lines have already been constructed. People live near these lines and in new urban developments choose to live near them. Why then has such strong community concern been engendered by Eastlink? One submission suggested that the real source of grievance is the fact that landholders feel that Eastlink is being imposed on them with little or no opportunity to have any real say against it. Their land is 'freehold' but they do not have the option of deciding that the power line will not traverse their land.

2.50 This argument may have some merit, but it tends to overlook the very real concerns of the people affected by Eastlink. Choice is very important to all people and while it may be true that the inability to choose forms the basis of their objection to the imposition of Eastlink, secondary issues such as reductions in land values, destruction of the visual integrity of the landscape, physical impact on the natural environment and perceived health risks become so great as to make the question of choice irrelevant.

Conflicting Scientific Views Presented in Evidence

2.51 In an effort to clarify the issue of health effects of EMFs, the Committee heard evidence from a number of expert witnesses from both Australia and overseas. These witnesses included Dr Michael Repacholi, who was on secondment from the position of Chief Scientist at Royal Adelaide Hospital to the position of Chairman of the International Commission on Non-Ionising Radiation Protection (Institute of Radiation Protection, Germany), Professor Mark Israel, a paediatric oncologist at the School of Medicine of the University of California, and Dr Richard Luben, Associate Professor of Biomedical Studies at the University of California. Although all three witnesses appeared in a personal capacity, Dr Israel's travel to Australia had been sponsored by ESAA and Dr Luben's travel had been sponsored by the community group, Victorian Powerline Action.

2.52 Dr Michael Repacholi provided a comprehensive report to the Committee which gave details of his own and other research on the effect of electric and magnetic field on biological systems. His conclusion was that 'both the laboratory and epidemiological evidence does not support the case that residents would suffer any adverse health

consequences from exposure to 50Hz fields. ... the resident's exposure to 50 Hz fields from the proposed Eastlink power line would be well within current limits accepted internationally and by many countries'.³⁸

2.53 In evidence to the Committee, Dr Repacholi stated:

It has been the work of my commission to assess the literature on a continuing basis because we publish international guidelines on exposure limits that we, on the basis w' the science, consider that people can be exposed to safely, based on the evidence that we have. We meet regularly to assess any new results that are coming out, to see if those results would alter the health risk assessment that has already been made, and, hence, have some implications for standards. To date, right to this day, there is no data that indicates that there should be change to the current international guidelines on exposure limits to the 50-60 hertz fields'.³⁹ He continued 'From a health viewpoint and from my constant assessment of this literature over a period of 20 years, I still have no fear of 50 or 60 hertz magnetic fields causing effects at the levels we are normally exposed to even from power lines.'⁴⁰

2.54 Professor Mark Israel's evidence was consistent with the conclusion made by Dr Repacholi. He strongly opposed any suggestion that EMFs could initiate cancer in humans, stating:

Based on my education, experience, and training as a cancer researcher, medical doctor, and paediatric oncologist, and the available molecular, cellular and whole animal studies, I find no scientific basis for concluding that power frequency electric and/O1 magnetic fields induce or promote cancer or other adverse health effects. Using the accepted scientific criteria that we apply to carcinogenesis, I cannot find support for the notion that power frequency electric and/or magnetic fields can lead to the development of cancer.

2.55 Dr Richard Luben held an opposing view to that of Dr Repacholi and Professor Israel. While carefully clarifying the statement that there was no evidence that EMFs caused cancer, Dr Luben stated that there was strong evidence that there was a correlation between proximity to high voltage power lines and increased incidence of diseases such as leukemia in children. In his submission he stated: 'In my opinion, the epidemiologic literature indicates a low but repeatable correlation between proximity to high energy power lines and the incidence of human neoplasms, in particular childhood leukemia'.⁴¹

2.56 In oral evidence Dr Luben elaborated~

I have had a lot of experience in trying to evaluate the scientific validity of these documents. ... The correlation between power lines and leukaemia is statistically supportable. There are possible mechanisms based on both animal and laboratory results that suggest cancer causing or cancer promoting activities of electromagnetic fields. Combining the statistical association and the laboratory data with which I am most familiar because I work with it every day leads me to feel that there is some reason for caution.

2.57 When questioned by the Chairman, Senator Ferguson, as to how equally eminent scientists could come to such different conclusions, Dr Luben explained that: 'scientists of equal skill and equal dedication can look at the same body of evidence and come away with different points of view. It is similar to any other endeavour. ... two different people can come away with two different points of view based on their background, based on the particular set of information that they have been exposed to and the ways in which that information is translated into action in their own particular lives .

Effect Of EMFs On Stock And Crops

Gibbs Report

2.58 The Gibbs Report concluded that: 'The magnetic fields created by power lines do not affect the health or reproductive capacity of farm animals'⁴⁴ ; that 'from a practical point of view, the electric fields created by transmissions lines have no adverse effect on crops, pasture, grasses or native flora, other than trees, growing under or near to the lines'⁴⁵ and that 'No reason exists for concern as to the effect of the fields on animals or plants'. However, Gibbs did note that bee hives near power lines can be adversely affected and that the growth of trees under the line can be reduced by the effect of corona. However, Gibbs dismisses the later concern with the statement that the height of trees under power lines has to be restricted anyway to avoid interference with the line.

Community Concern

2.59 Farmers are genuinely concerned that the high voltage power line proposed for Eastlink will have detrimental effects on their breeding stock. Many submissions commented to the effect that stud rams could become infertile and ewes abort their lambs. One submission stated: 'the link between infertility in livestock and exposure to high levels of ElvIR is one that many stud owners and farmers know from personal experience.

2.60 Because primary producers are continually seeking to improve efficiencies in farm production, any action that has the potential to reduce productivity (such as an increased rate of spontaneous abortion in livestock) may be considered by them to be unacceptable.

2.61 Concerned farmers suggested that cattle exposed to EkTs might be rejected by local and overseas markets in the same way that the European Community created trade barrier to cattle subject to hormone growth promotants and the American import beef market refused Australian cattle found to have high levels of chlorofluazuron residues. One submissions stated: 'We can well do without another threat to our beef industry ... we must have a written assurance from Eastlink that we will be satisfactorily compensated for losses of income should it subsequently happen that stock that have been subject to Electro-Magnetic Radiation become unsaleable'.

2.62 A submission from the group Lockyer Valley Against Eastlink commented: 'There are at least two stud Cattle farmers who ... cannot obtain insurance on their stock if the stock are grazed in the vicinity of the power lines' . Other specific concerns included apiarists, who believes that their hives were at risk, and organic growers who believed that they would lose certification should power lines be constructed on their property.

2.63 Opponents of Eastlink presented evidence from scientific studies on laboratory animals that indicated a possible health effect and concluded that if an effect on human health was possible, then it was reasonable to infer that reports were also cited of farmers there might be an effect on animal health observing reproductive disorders among dairy cows and 'scrambled eggs' laid by hens living underneath 765 kV power line in New York

Conclusions

2.64 Of all aspects of the Committee's inquiry into the Eastlink proposal, the issue of potential health effects of EMFs far outweighed any other subject. At least one third of all the evidence taken by the Committee related to EMFs and almost all submissions from land owners affected by Eastlink mentioned this subject as one of great concern. The Committee accepts that many people hold genuine reservations about the impact that a high voltage power line may have on their health, and the health of their families. The Committee understands that these people choose to believe those scientific studies which suggest that they should be concerned about their health.

2.65 In attempting to resolve this issue from a scientific point of view, it became clear to the Committee that reputable scientists have taken strong stands both in support of and against the proposition that high voltage power lines may cause health effects in people living near them. The Committee suggests that these contradictory positions can partly be explained by the fact that the scientific literature on the subject is vast and that, because of the very nature of statistical analysis, varying interpretations can be made of both individual experimental results and meta-analysis of collections of experiments. Broad reviews of the literature can be biased, intentionally or unintentionally, by the availability of information, choice of scientific papers used, and inherent opinions of the reviewer.

2.66 In the light of such conflicting evidence, and because it is not possible scientifically to prove a negative, the Committee is unable to totally dismiss the possibility that there may be adverse effects. Similarly, the Committee is unable to conclude that a definite link between high voltage power lines and adverse effects on human health exists and thus that any new policy recommendations need to be made.

2.67 However, the Committee is able to conclude that simply the fear of detrimental health effects, whether real or imaginary, is in itself having an impact on the lives of some individuals affected by the Eastlink proposal. In acknowledging these community concerns, the Committee takes a similar stand to that of the

Gibbs report. The Committee agrees that, as a minimum policy or until evidence suggests otherwise, the concept of 'prudent avoidance' should continue to be practiced by government and power authorities.

2.68 However, in supporting this concept, the Committee also acknowledges that there are some difficulties with it as a policy with practical application, Firstly, people who own land through which high voltage power lines traverse may have difficulty in 'prudently avoiding' those lines while carrying out the normal activities that their farming enterprise requires. Where lines are proximate to facilities and cultivated paddocks, farm workers may have no choice but to work within the electromagnetic fields emanated by those lines, even if only for short periods.

2.69 Secondly, there are currently no guidelines for what 'prudent avoidance' means. There are safety standards for exposure to E1N4Fs but these do not readily translate to people living or working near high voltage power lines.

2.70 The Committee therefore concludes that, in the case of Eastlink, 'prudent avoidance' should mean siting the line as far as possible from houses, outbuildings and other farm facilities.

2.71 As with human health, the Committee accepts that evidence of power line impact on the health of stock and crops grown within the vicinity of the line is equivocal. Opponents of Eastlink presented evidence from scientific studies on laboratory animals that show a possible health effect and concluded that if an effect on human health was possible, then it was reasonable to infer that there might be an effect on animal health.

2.72 However, in the absence of extensive field studies on livestock, the Committee is not able to conclude that high voltage power lines affect the health of livestock and crops nor is it able to conclude that they do not. The Committee therefore recommends that scientific studies should be carried out in Australia on the possible effects of high voltage power lines on stock and crops.

2.73 Regardless of whether there is an actual effect or not, public perception that there might be an effect can have an impact on the market value of stock and crops produced in areas through which high voltage power lines pass. This may particularly be the case with certified organic farmers and with breeders of stud stock.

2.74 The Committee therefore concludes that compensation by power authorities should be extended to those property owners who suffer an economic loss as a result of the construction of Eastlink, regardless of how that loss is brought about.

CHAPTER 3

ENVIRONMENTAL IMPACTS

Term of Reference 1 (a) (ii) '... 1 the possible impact of the power line and the accompanying land resumptions on the vegetation and overall environment.'

Definitions

3.1 In its submission to the Committee, *Powerlink* Queensland states: 'It is acknowledged that a high voltage transmission line may have an impact on the environment of the area through which it passes. The *environment* refers not only to the natural ecological values of the area, but also to the man-made environment, social and cultural attributes and economic issues'.²

3.2 This is a very broad definition of 'environment'. The Committee's terms of reference require it to examine, as separate terms of reference, 'the vegetation and overall environment' and the 'social fabric and local economic viability of surrounding communities'. This report therefore makes a distinction between impact on natural environment, discussed in this Chapter, and social and cultural impact, including local economic impact and impact on agricultural land, discussed in Chapter 4. Broader economic issues are discussed in Chapter 5.

Power Authorities' Position

Environmental Legislation

3.3 In both NSW and Queensland, development of the Eastlink proposal is subject to statutory requirements under environmental impact legislation. In NSW the relevant Act is the *Environmental Planning and Assessment Act 1979* (NSW) and Eastlink cannot proceed until all the legislative requirements of the Act have been fulfilled and the Minister for Urban Affairs and Planning (NSW) has approved the activity.

3.4 In Queensland, the relevant power authority must comply by requirements of both the *Electricity Act 1994*, which specifically covers environmental impact in part 2, and the *Environment Protection Act 1994*.

3.5 The project's Environmental Impact Statement (EIS) must address a comprehensive list of matters and both power authorities must consult the Commonwealth Environmental Protection Agency during preparation of the Environmental Impact Statement. To do this, the two State power authorities have agreed to nominate as joint proponents under the Commonwealth *Environment Protection (Impact of Proposals) Act 1974* and to prepare one Environmental Impact Statement that would satisfy both NSW and Queensland legislative requirements, as well as those of the Commonwealth. It is expected that the EIS will be available for public comment in February/March 1996.

Consideration of Environmental Factors

3.6 According to the two power authorities involved, the Eastlink project takes environmental factors into consideration at two levels. Firstly, in selecting a preferred corridor, the environmental impact of each option was compared so as to select the corridor with the least environmental impact.³ Secondly, after selecting the preferred corridor (the Western Corridor), the exact route will be chosen having regard to the environmental impact study of that corridor.

3.7 In the submission presented by the NSW Transmission Authority, *Transgrid*, it was argued that it was not possible for the Authority to address the Committee's terms of reference, and in particular point 1 (a) (ii), until the EIS process had been completed. However, on the basis of 'extensive past experience' it was possible for *Transgrid* to provide 'some general comments'.

3.8 In an effort to minimise the environmental impact of high voltage power line construction and maintenance procedures, the power authority would seek the involvement of landholders, the NSW National Parks and Wildlife Service and the NSW Department of Lands and Water Conservation.

3.9 With regard to vegetation, *Transgrid* noted that a necessary impact will arise from the statutory requirement that a minimum clearance be maintained between the power line and towers and the ground, and that there was no avoiding some disturbance to the environment through which the line passed. However, all efforts would be taken by the Authority to reduce the damage to vegetation through the use of minimal clearing practises. These would include the lopping of trees instead of their removal, prudent use of topography in open terrain, replacement tree planting with more manageable species, and restricting clearing just to tower sites in rougher terrain, rather than clearing along the full length of the route.

3.10 The impact of the power line on the environment would depend on the type of environment through which the route passed. The line would have minimal physical impact in cleared agricultural land and would have a much higher impact in areas of dense native vegetation such as national parks, nature reserves and undeveloped crown land. The Western Corridor is located primarily within cleared lands and largely avoids forested areas. Those areas that are not agricultural are mainly eucalypt woodland and open forests.

3.11 With regard to the overall environment, *Transgrid* noted that, in its experience: '... once constructed, transmission lines become passive elements in the overall environment surrounding them.' Further, *Transgrid* claimed: 'The process under-taken to identify the preferred location for [the power lines], followed by the detailed environmental impact assessment and the development of comprehensive mitigation measures ensures that the resultant impact is minimal and acceptable.'

3.12 *Powerlink*, in its submission, noted: 'For Eastlink, a consideration of environmental issues started at the beginning of the corridor selection process. The *preliminary corridor concepts* which were developed in-house before public consultation commenced, were based on a consideration of broad environmental issues. Factors such as population density, national parks and wildlife areas, and physical topographical barriers helped define these broad corridor concepts'.

3.13 After delineation of the broad corridors, environmental factors were again taken into account, including present land use, probably flora and fauna impact, location of houses and schools, heritage and conservation areas, access difficulties and scenic quality of areas. In the final corridor selection process 10 primary factors were evaluated: conservation areas, impact on tourism, visual impact, tree cover, severe soil erosion, houses within 500m, cropping land, irrigation land, number of land parcels and technical cost issues.

Broad Environmental Benefits

3.14 As pointed out in the submission by the Commonwealth Department of Primary Industries and Energy, Eastlink may result on a broad scale in some environmental benefits. These could arise from 'the sharing of reserve capacity, the reduced need for additional power generating plant, and the energy saving resulting from the more efficient use of energy resources. The submission further notes that alternatives to Eastlink would not necessarily be environmentally benign and proposals such as the Tully Millstream Hydro Electric Scheme has potentially adverse impacts on a World Heritage Listed area.

Community Concerns

3.15 Considerable concern was expressed to the Committee, both in submissions and in oral evidence, that the construction of Eastlink would result in unacceptable environmental impact. The types of impact sustained, it was argued, would be soil erosion, vegetation loss and disruption to plant and animal communities and consequent fragmentation of habitat. Of broad concern was the apparently contradictory philosophies of governments which, on one hand, promoted programs such as Landcare and One Billion Trees while, on the other hand, allowing the destruction of trees and associated habitat along the full length of the proposed Eastlink route. Other specific concerns included impact on Aboriginal and European heritage.

3.16 Landholders and conservationists argue that the environmental impact would be much wider than just the easement zone; that once the construction damage is done, no amount of rehabilitation will return the affected areas to

their original standard of environmental integrity; and, more importantly, that there is no need for the intrusion in the first place because Eastlink is not necessary and not wanted.

3.17 The construction of the Eastlink power line will necessitate the use of heavy machinery and access to pylon sites about every 400-500 metres along the entire length of the line. As the route proposed would be between 380 and 400 km long, this would mean a total number of pylons of between 760 and 1000. Although the power authorities plan to rehabilitate any areas damaged by construction machinery, submissions argued that in some places it would be impossible to fully rehabilitate the land. Once the soil was disrupted, a scar would be there for ever.

This transmission line would cross farming land that is subject to high erosion from water. With the end result being that considerable soil conservation measures have been carried out ... Maintenance of these control measures is an ongoing procedure and the construction of steel towers anywhere across this land completely contradicts soil conservation practices.

3.18 Another important aspect of construction, of concern to property owners, is the potential for mud-laden machinery to carry weed seeds from one place to another. This can also occur after construction when maintenance inspections are carried out. Several people were particularly concerned about the spread of *Parthenium* weed which is known to cause health problems in central Queensland through allergic reactions to its pollen. Its spread south is of concern to physicians.

3.19 Similarly, the contamination of heavy machinery with soil could allow the spread of fungal diseases such as *Phytophthora cinnamomi*.² In addition, the construction of access roads and the easement itself provides increased access for feral animals into properties and nature reserves, and the creation of windrows of felled trees to create habitat which favours introduced species such as foxes, rabbits and cats.

3.20 However, as described by *Powerlink*, routine procedures are carried out during the construction of power lines to curtail the spread of weeds and fungal spores by cleaning vehicles and equipment prior to their movement from infested to weed-free areas. Should weed infestation be established to have been the result of power line construction, power authorities will take responsibility for their eradication or reimburse farmers for that cost.

Soil Erosion

3.21 Particular concern was expressed about the potential for soil erosion following the excavation of pylon sites and creation of access roads. Once soil is disturbed in some areas, it is very difficult to stabilise again, particularly in steep, heavily wooded country. Although the Darling Downs has deep rich black soil in parts, it is very unstable. Paddocks become inaccessible when wet, and the soil type is classified as having high erosion potential. The hills and ridges in that area are even more prone to erosion. They grow very little grass, being protected by a combination of shrubs and trees. Following mechanical disturbance, the soil moves easily down slope into gullies during rain.

3.22 In Traprock country, south of Warwick, the soil is highly susceptible to erosion. Even on almost flat land (2% slope) a bulldozer can cause erosion that is difficult to repair. Local residents are extremely concerned that construction of Eastlink would cause serious environmental damage. Of particular concern is the possibility that, while local properties have always been managed by property owners who understand the fragility of the land, power line construction crews may not be so sensitive. In evidence to the Committee, a representative of the Traprock Branch of SEQAE/TOTA stated: 'Due to the steep and inaccessible nature of the corridor within the particular reference section, it would be impossible without causing extreme erosion danger to gain access to tower construction sites with heavy vehicles such as cement trucks and semitrailers'.

3.23 Soil erosion affects not only the immediate construction sites but has the potential to affect the water quality of the river systems through siltation and increased flow of nutrients from fallen trees. As stated in evidence to the Committee by a representative of SEQAE: 'since the Eastlink route crosses 350 kilometres of the headwater catchments of the Darling River ... a route more damaging to the Darling River could not be found.' Siltation and increased nutrient deposition can cause toxic algal blooms and destruction of aquatic habitat.

3.24 The power authorities have acknowledged that some environmental damage will occur during construction but they believe that minimal impact construction practices will prevent any serious damage and that, after the construction phase is complete, rehabilitation of disturbed areas will ensure that the impact doesn't continue.

Loss of Trees

3.25 While many farmers in the regions affected by Eastlink have joined in collective conservation practices such as Landcare programs and are making individually efforts on their own properties, they see the destruction of many hundreds of trees along the power line easement to be anathema to the cause of conservation. They see hypocrisy in governments which legislate to ensure tree preservation and which provide funding for tree replanting, yet allow large scale destruction of trees by power authorities.

3.26 One submission estimated that if the easement was 60 metre wide and the power line several hundred kilometres long, then the total area where trees would be removed was about 2000 hectares. The submission argued: 'We should be encouraging, tree plantings not their destruction'. Another submission noted that since the 1970s farmers have been working to link remnant vegetation with road plantings and shelter belts, and in 1991 they were assisted with tree planting through a government grant under the 'One Billion Trees' program. Despite the prolonged drought, farmers have persevered with the program and have worked hard to nurture the trees.

Fragmentation of Habitat and Impact on Fauna & Flora

3.27 One of the likely consequences of tree clearing along the power line route will be fragmentation of habitat. As pointed out by the Armidale Branch of the National Parks and Wildlife Association, the New England environment is already heavily fragmented and any further breakup of woodland habitat should be avoided. The Branch 'is concerned at the prospect of extensive damage to vegetation and wildlife habitat, at a time when every effort is being made to reduce habitat loss, and thereby species loss'.

3.28 Various submissions expressed the view that the creation of a bare corridor through native vegetation, and revegetated farmlands would have a negative impact on wildlife, particularly tree dwelling mammals such as koalas, possums and gliders, and birds such as the Red Goshawk, Squatter Pigeon and Glossy Black Cockatoo. These submissions pointed out that habitat for such wildlife is already fragmented and any further breakup of the integrity of the areas in which they live could threaten their viability. The easement created by Eastlink would result in a continuous north south barrier to the movement of tree dwelling animals, especially in areas where trees are already scarce.

Concern for the Lockyer Malley & Llelidon Hills Areas

3.29 The Helidon Hills area near Warwick has great scenic and botanical value. This rugged area contains a wide diversity of fauna and flora, as it retains much of the natural tree cover and it relatively free of weeds. It also contains several endangered animal species and has been recommended for inclusion as a national park. Being close to Brisbane, its location is convenient for nature-based recreation. The Toowoomba Field Naturalist Club maintained that the Eastlink easement will cause considerable damage to the natural vegetation of the Helidon Hills and the Club opposes Eastlink on these grounds.

3.30 The submission from the Lockyer Valley Against Eastlink group noted that the power line route would pass through areas of high conservation value, including habitat of rare and endangered species, and vegetation types which were poorly conserved in south east Queensland. These areas included the Helidon Hills (a large area of continuous bushland), and remnant bushland in the Paradise Falls, Dry Creek, Silky Oak and Paradise Mountain area. Some of these areas had critical conservation status. ²⁷

3.31 In addition, the Helidon Hills area is an important part of the Lockyer Valley water catchment. Because the Valley has no major rivers or prospect of a major dam it depends totally on underground water. Residents of the Valley expressed concerns that any disturbance to the integrity of the vegetation in the Hills will have an impact on the ability of the area to contribute to groundwater.

Concern for the New England Environment

3.32 Several submissions from the Armidale area expressed concern for the fragility of the New England Environment, noting that the soil structure is such that it is highly susceptible to erosion and that the region has already suffered badly from tree die-back.

3.33 A submission from this region noted:

Some years ago New England suffered what is now known as 'severe tree die-back' where very large tracts of trees died leaving the landscape quite bare ... The de-nuding of trees from the landscape is well known to cause other long-term problems such as lower rainfall, salting of the soil, wind and water erosion to name but a few ... It would now seem that the proposed route could necessitate clearing a large part of what is left of good trees on this property - contemptible.

3.34 The Chairman of the Guyra Landcare group pointed out that the proposed route would disrupt the Guyra Tree Corridor Programme, the region's major Landcare effort, both because the easement would traverse some of the tree corridor and because the Eastlink consultation process had caused acrimony within the community which had hindered the process of negotiating tree corridors between properties.

Concern for the Condamine Catchment Area

3.35 The Condamine Catchment Coordinating Committee was formed to bring about sustainable land management in the Condamine region, an area of some 30,000 square kilometres centred around Warwick and part of the Murray Darling Basin. As outlined in the Coordinating Committee's submission, the Eastlink proposal raises a number of land and water management issues within the catchment. Their major concerns relate to the clearing of trees, which could lead to soil erosion and increased stream siltation, and which will have an impact on biodiversity, animal habitats, weed invasion, and reduction in environmental integrity.

3.36 Local Landcare groups in the Condamine Catchment have worked hard to involve both rural and urban people in a wide range of land rehabilitation projects; planting trees to establish seed woodlots of local native species, planting shelter breaks for stock and crops, integrating tree species to local soil conditions, carrying out remedial work on salinity problems, soil stabilisation work, and establishing wildlife corridors.

3.37 The Allora Landcare Group point out that the proposed Western Corridor traverses an important Landcare project near Allora along Tudor Valley Road. The project involves tree species trials aimed at encouraging graziers to establish timber plots for multiple purposes. The Landcare Group consider the project to be of great importance because of its location, and because a large amount of time and money has been put in to establishing the trials. The Allora Group argued: 'Landcare groups all over the country are demonstrating a genuine commitment to ecologically sustainable development and protection of biodiversity. It is time for a similar commitment from our State Governments and public utilities.'

3.38 They have been dismayed to find that power authority attitudes have been uncaring of their enthusiasm. The Tudor Valley site lies directly along the Western Corridor and when informed of this, representatives of the power authorities reportedly offered to replace the project with 'bushes'. According to a member of the Allora Landcare Group: 'Any effort to point out the potential for serious damage to natural systems has been met with "we'll fix it, little realising (or caring) that detrimental effects can have dramatic and far-reaching consequences that are extremely expensive and sometimes impossible to rectify'.

Use of Chemicals in Easements

3.39 Various methods are used to reduce vegetation height along power line easements. These methods include tree felling and the use of herbicides to prevent their regrowth. Concern was expressed in submissions that because power authorities use subcontractors to carry out vegetation control, the authorities lose control over the operations and the standard of care taken when chemicals are used may not be as high as landholders would like. Examples were cited of chemical mishandling by subcontractors and accidental toxic chemical spray drift onto private properties.

A Philosophy of Care

3.40 Landholders who have worked hard over many years to revegetate their properties in order to improve the landscape and to encourage wildlife are now bewildered and frustrated that their acreages will be divided and despoiled by a cleared easement and rendered unattractive by ugly structures. Similar comments were made by rural landholders along the full length of the line.

3.41 Landholders who have worked to blend their own agricultural land with neighbouring nature reserves pointed out in their submissions that the involvement of rural landholders in wildlife conservation has considerable benefit to all Australians. 'Conservation is being achieved in an economic and sustainable way, instead of locking up large tracts of land which is difficult to keep free from both animal and plant pests and at considerable cost to the public purse'.

3.42 Indeed, for many landholders, the recent drought has highlighted the fragility of the environment in which they live. They have struggled to retain ground cover, to reduce the potential for erosion, to protect their farms from the vagaries of the weather. But while they can accept the impact of the drought, because they have no control over the weather, they are at a loss to understand why anyone would intentionally place stress on the environment in which they live when there appears to be many more benign and globally desirable alternatives.

3.43 Over recent years there has been a change in the way rural Australians think and there is a groundswell for more responsible land management. ³⁶ Through observing the detrimental impact that traditional farming practices have had on their properties, and through the advent of Landcare programs, Coordinated Catchment programs and Whole Farm Planning philosophies, the traditional Australian farmer has changed from user of the land, only reaping the benefits, to concerned custodian, willing to put back into the land as much, or more than has been taken out. There has been a definite change in the philosophy of many rural landholders such that most farmers now both understand the need for environmentally sustainable farm management practices, and are keen to redress the environmental mistakes of the past.

3.44 The Glen Innes Natural Resources Advisory Committee Inc (GLENRAC) submitted that: 'There are in excess of thirty Landcare groups, Catchment Management Committees and Resource Management organisations at work in the North of NSW, all of them cooperating with Government agencies to achieve the objective of reducing soil and water degradation. ... [However] throughout the Landcare Groups there is a strong perception of the denial of the value of the whole Landcare movement by a Government which plans a project which will destroy as many trees as have been planted and cause as much soil erosion as has been rectified by the Landcare Groups, and will in addition cut every wildlife corridor between Armidale and Springdale'. ³⁷

Visual Impact

3.45 Many submissions to the Committee expressed the concern that Eastlink would result in loss of the visual integrity of the bush in those regions through which the line traversed. Submissions pointed out that people generally move to rural areas to enjoy the bush environment, particularly the natural beauty of the landscape and to escape the visual disharmony of cities.

3.46 Many submissions argued that constructing large towers and associated power lines through picturesque farmland would spoil the visual attractiveness of the environments in which they lived. This would reduce the quality of life for those who live within eyesight of the chosen route by despoiling the very beauty of the bush that they had sought by moving to that particular place. ³³

3.47 As an example, during inspections the Committee visited the property of Mr Alexander (Jimmy) Martin; some 100 acres of land bought recently as a place for retirement. The power line would stand between his house, set on the side of a hill, and a scenic valley, obstructing the view. Mr Martin said he had been offered \$22,000 compensation by *Transgrid* for the easement which he believed was insufficient to ameliorate the loss of the view, the main reason why he had bought that particular property.

3.48 In fact, the whole valley in which Mr Martin lives is of high scenic and rural heritage value. The Committee inspected several other properties in the area, all of which had very attractive scenic outlooks, both in the near distance and far away. These views would be considerably spoiled by the imposition of a high voltage power line.

3.49 Other witnesses pointed out that their properties had already been crossed by several other power lines, of lower capacity and height. While they, had tolerated the construction of the smaller lines, the combined impact of those lines and the much larger pylons and lines of Eastlink would be intolerable. One submission stated: 'My small 16.3 ha. property has been grossly devalued by the existing THREE power line constructions through my good improved grazing paddocks. A fourth construction of the even larger Eastlink line is OBJECTIONABLE especially when it is not justifiable'. Another submission noted: 'We already have three power lines going through our 7 hectares hobby farm. They are nothing but an eyesore. To have another set erected will be disastrous for us.

3.50 And, while compensation might be paid to people over whose property the line would cross, those properties which suffered a visual impact only would not be eligible for any compensation, even though the line may go very close to their boundary and completely spoil the view. People in this situation were angry that they had to suffer the visual intrusion of an offensive structure with no prospect of compensation.

Heritage

3.51 A number of properties in the Western Corridor region pointed out that they had special heritage values that would be compromised by the construction of Eastlink. In addition, the general concept of family heritage was mentioned in quite a number of submissions to the Committee.

Aboriginal Heritage

3.52 Mr J W Deacon submitted to the Committee that part of his property through which Eastlink would pass was of significant Aboriginal heritage. The area was used as a camp by Aboriginal people and many of the trees bear marks of Aboriginals removing bark. Mr Deacon has applied to the Heritage Commission for listing, and officers of the Commission have undertaken to express their concerns to the power authorities. Forty-eight trees have been recorded and it is believed that the scars are at least 130 years old. There is also a small valley on the property which has been protected by Mr Deacon's family since 1915 because the valley was a women's area. There is also an Aboriginal camp site and a site of rock quarrying.

3.53 As noted in the submission: 'there are not many sites left close to civilisation where areas are still reasonably intact and have trees which were used by the aborigines still standing. This shows where they lived and hunted. For the towers and cables of Eastlink to be in close proximity to this site would destroy much of its significance and atmosphere'.

Heritage Property 'Olliera'

3.54 Specific concern was expressed that Eastlink was greatly reduce the value of the heritage listed-property 'Ollera'. This property, which is situated some 80 kilometres from Armidale near Guyra, has been listed variously by the National Trust in 1975, the Australian Heritage Commission National Estate of Australia in 1979 and the National Parks and Wildlife Service (NSW) as a wildlife Refuge in 1973. The property has considerable potential for rural tourism.

3.55 The property's assets include:

- a homestead built in 183 8;
- heritage buildings, including slab cottages, shearing shed with surrounding landscaping and trees;
- a small stone church with stained glass windows (St. Bartholomew's Church of England), maintained at the property's expense for 119 years but used by the public;
- a cemetery containing 380 graves (152 years old);
- a cricket field and associated grounds, maintained by the property for 145 years and open for public use; and
- over 130 family journals and documents held by UNE archives.

3.56 The property is already traversed by four other main power lines including a 132kV line.

3.57 The Committee visited 'Ollera' on the morning on 13 October 1995 and agreed that the homestead, the church and the outbuildings had very high value as rural heritage.

Family Heritage

3.58 Both the New England and Toowoomba regions have been settled for many years and some properties have been in the hands of the one family for three or more generations. Owners of these properties felt a strong pride in their family heritage and expressed a strong desire that their property should remain in the ownership of their family for many more generations. However, they felt that the imposition of Eastlink has threatened future heritage: that younger generations would not want to live on a property which had traversing through it a high voltage power line for health reasons, for aesthetic reasons and for reasons of privacy .

Environmental Impact Statement

Power Authority Position

3.59 The formal environmental impact study (EIS) is being carried out for the power authorities by consultants Dames and Moore. The EIS will be supported by a range of specialist studies of the social and biophysical environment, including visual, natural, agricultural and socio-economic environment, with specific studies to cover flora and fauna impacts, visual impacts and impacts on agriculture and land use. The fauna and flora survey was carried out by consultants from New England University.

3.60 According to the terms of reference of the EIS, it must cover:

- a description of the existing environment;
- a description of the effect of Eastlink on the environment.,
- an economic evaluation of Eastlink;
- safeguards and mitigation measures to be employed;
- assessment of feasible alternatives;
- government authorities who must be contacted; and
- issues arising from community consultation.

Community Criticism of the EIS Process

3.61 Two specific criticisms were made to the Committee regarding the Eastlink EIS. The first related to the conduct of the fauna and flora survey and the second related to the extent of the EIS process.

3.62 The fieldwork for the EIS dealing with fauna and flora was carried out for 10 weeks from mid-April until the end of June. Being autumn and winter, and following a severe and prolonged drought, a number of submissions to the Committee noted that this period would not have been the best time to survey flora and fauna. In evidence a representative of the Armidale Branch of the National Parks Association argued that the survey would not have picked up annual plants, nor some perennials which flower in spring and which would have disappeared by autumn.

3.63 The sampling methods used during the flora and fauna survey were also criticised. One submission noted that when a power authority representative had been questioned as to why no survey had been carried out in a certain area, the reply had been that the impact assessment in that area had been done from an aeroplane. Other submissions noted that field surveys had been conducted only on some properties, at a spacing of about every 5 kilometres. In addition a number of local environmental groups, such as the Condamine Catchment Coordinating Committee, requested to be involved in the EIS process for Eastlink but no response to their request was given by the power authorities.

3.64 On one property in the Wandsworth region of New England, a fauna survey was only carried out after a specific request was made by that property owner. Despite spotlighting and live-trapping for small mammals, none of three endangered species known to be present on the property were sighted. It was assumed that this was a result of the time of year that the sampling had been carried out.

3.65 Thus because of the timing of the fauna and flora surveys, and because of the sampling methods used, it was the general view of local environmentalists that the results of the biological survey were not representative of the biota that actually exists along the Western corridor.

3.66 Of equal concern to people living in the Western Corridor was the fact that the Corridor was chosen before the EIS was carried out. Inherent to EIS methodology is the principle that the environmental impact of one option be compared against the environmental impact of another option, or several other options. While the power authorities involved have stated that broad environmental factors were taken into account in choosing the Western Corridor, evidence was presented to the Committee that the legislative requirements of carrying out an EIS are only being fulfilled for one option.

3.67 The Armidale Branch of the National Parks Association, in particular, expressed concern that the EIS related only to the Western Corridor, and that environmental impacts were being assessed without examination of feasible alternatives, both at the broad level of whether the link itself was desirable, and at the level of which Corridor was environmentally preferable.

3.68 In addition, the Branch was concerned that the environmental impact of all the developments associated with Eastlink were not being taken into account and that the EIS was only considering the impact of the Eastlink route itself. The Branch submission noted that the Project Concept document: 'indicates that to achieve maximum trading benefits the interconnection plan will involve many more lines than the single one now being discussed' Other lines associated with Eastlink include:

- a 78km double circuit 275kV line from Blackwall (near Ipswich) to Withcott (near Toowoomba) via Springvale;
- a second 330kV line from Armidale to Lismore (the choice of this route had not been made at the time of the Project Concept report);
- a 340km double circuit 275kV line from the Callide coalfield near Gladstone to Tarong, north of Toowoomba; and
- another line between the Hunter Valley coalfields of NSW and Springdale needed to upgrade interconnection and maximise trading opportunities.

3.69 The Branch submission stated emphatically: 'The discussion of these extra lines ... proceeds without any apparent concern for the two-, three- or four-fold increase in environmental and social impacts to be experienced on the ground. We think that the cumulative effects of the total complex should be considered now, before the first line is allowed to set a precedent for the inevitable sequence'.

3.70 The Gatton Shire Council argued in its submission that it had not been adequately consulted on the future of Springdale. Had the Council been informed that up to nine lines would converge at Springdale it would have more vigorously opposed the location. The Council argued that the EIS should have covered the impact of all lines and not just the one line associated directly with Eastlink, and that it should have been consulted on the terms of reference for the EIS.

3.71 During public hearings and inspections it was made clear to the Committee that the two power authorities were already negotiating with landholders to determine the exact route that Eastlink would take across their land. Yet the EIS has not been completed. This fact, plus the criticisms of the way in which sampling for the EIS was carried out, have led many people in the Eastlink region to conclude that the EIS is considered by the power authorities to be a mere formality and a farce.

3.72 The Committee is aware that on the one hand, the power authorities have taken a pragmatic attitude and that, on the other hand, landholders and conservationists have taken a 'worst case scenario' approach such that the views of the two groups have become very polarised.

3.73 The Committee accepts that there will be some direct environmental impact associated with the construction of this high voltage power line. The primary impact will be loss of trees through clearing of easement and resultant fragmentation of habitat. Other potential environmental impacts include soil erosion, the introduction of noxious weeds during construction and maintenance activities, the use of herbicides to control vegetation regrowth along easements, the unfavourable visual impact of the line, and impact on special heritage areas.

3.74 Of greater concern to the Committee is, however, the actions of the power authorities in determining the preferred corridor, then carrying out the Environmental Impact Statement. While the final impact statement is not due to be completed until mid-1996, it is clear that the power authorities have already chosen a specific route, if not over the whole length of the line, certainly over parts of the line. This is evidenced by the fact that some land holders have already been made offers of compensation. The practice of negotiating an easement before the Environmental Impact Statement is complete goes against recognised Environmental Impact Statement practice.

3.75 The Committee questions the practice of carrying out an environmental impact assessment of a proposal when alternatives have not been included in the detailed Environmental Impact Statement and when siting of the line is clearly going ahead before the Environmental Impact Statement is complete.

CHAPTER 4

SOCIAL & LOCAL ECONOMIC IMPACTS

Term of Reference (1) (a) (iii) the possible impact of the power line and the accompanying land resumptions 1 on the social fabric and local economic viability of surrounding communities, including the likely loss of agricultural land.

and

Term of Reference (e) the adequacy of the community consultation process undertaken by Government bodies with those people and local authorities in the areas which will be affected by the power line.

Introduction

Depth of Community Concern

4.1 The number of submissions sent to the Committee, and the depth of feeling contained within them, made it clear that there is widespread opposition to Eastlink. This opposition comes mainly from the areas directly affected, but is not confined to those areas. Submissions were sent from urban areas not affected directly by the power line, and from wider community groups such as Greenpeace and Australian Conservation Foundation.

4.2 As well as formal submissions, 1032 form letters, 91 survey forms, 143 questionnaires and a number of petitions with a total of 2658 signatures, all opposing Eastlink, were sent to the Committee.

4.3 The submission from the Wandsworth Community, which expressed complete opposition to Eastlink, was signed by 20 people. The Bald Blair Action Group stated in its submission: 'We wish to make it absolutely clear that the people of Bald Blair aim is to prevent the construction of an unsightly and environmentally unfriendly high voltage transmission line through their community'.

4.4 The Guyra Shire Council expressed opposition to the construction of Eastlink throughout the Shire and stated that it supported ratepayers in their opposition to it. In the Lockyer Valley, there was 'widespread opposition to the proposal, with virtual unanimity of all interested parties ... including affected landholders, business people, Shire Councils, and environmental groups. Submissions were received from 6 schools in the south-east of Queensland, all expressing complete opposition to the proposal.

Issues of Greatest Concern

4.5 Of the 274 submissions sent to the Committee, the vast majority were letters from individuals or families directly affected by the Eastlink proposal. The points most commonly raised were:

- that there were perceived dangers to health from exposure to ENTE particularly for children living in close proximity to the power line;
- that the money spent on Eastlink would be better spent on alternative renewable energy generating systems, or on research on such systems;
- that interconnection through Eastlink would continue the use of large generating systems and in particular large coal fired power stations, which would not only not reduce greenhouse gas emissions but may increase them;
- that the visual impact would detract greatly from the natural beauty of the areas through which it passed;
- that the impact on land values would not be properly recognised by the power authorities and that therefore compensation would be inadequate;
- that already the proposal was having a detrimental impact on landholders trying to sell their properties, on the mental and physical health of landholders along the proposed route and on their marital relationship and
- that there would be other, uncompensated impacts such as disturbances to communications systems (2-way radios and mobile phones, essential during emergencies such as bushfires) and to TV reception; increased fire frequency, and damage to the surrounding natural environment.

Impact on Agricultural Land

4.6 The actual loss of agricultural land will be minimal as the land through which the line passes remains in the ownership of the landholder who is, for the most part, able to continue using that land as it has been used in the past. The Transmission Authority makes specific negotiations with each landholder about the alignment of the route to ensure that loss of productivity is kept to a minimum. The owner may be compensated by the power authority for costs and losses incurred through the construction of the line on private land. Costs for which the landholder can be compensated include the relocation of structures such as houses, sheds, fences and airstrips, while losses may include reduced land value through reduced amenity and loss of aesthetic appeal.

4.7 *Transgrid* argued in its submission that, except for the immediate area occupied by a tower, 'a transmission line should cause no loss of productivity of agricultural land. Sufficient clearance is provided under the wires for the safe operation of agricultural machinery and crops can be grown across the easement without problems. Stock will graze quite contentedly under a transmission line.'

4.8 However, some changes to agricultural practices would be necessary as a result of the installation of the line. The most important of these are the aerial spreading of fertilisers, aerial spraying of crops and pastures and the use of large mobile irrigator systems. Power lines interfere with all these activities and alternative practices have to be used.

Loss of Agricultural Facilities

4.9 Many properties and in particular large properties have their own airstrips to facilitate the spreading of fertilisers and agricultural sprays. The close proximity of a power line renders these airstrips inoperable and, on smaller properties, may even mean that there would no longer be any safe site for an airstrip. These airstrips are vital to the good management of grazing and cropping properties and they must be carefully located having regard to the safety of take-off and landing, the proximity of access roads and the geography of the general area. There is often only one good site for an airstrip on a property, or only one in a particular district and they are expensive to construct in all but highly suitable natural areas. Through the generosity of some property owner, they are often freely used by less advantaged neighbours.

4.10 If the power lines do not actually render the airstrip inoperable, they will in many instances prevent aerial agricultural operations over much of the land of some properties. One submission stated: 'The proposed Eastlink High Voltage line, Western Corridor goes beside the two homes on our two properties (4 miles apart) ... The AERIAL SUPER PLANES would not be able to spread super over much of our land'.

4.11 Another submission stated:

Airstrips were one particular area where problems were not recognised [by the power authorities]. We were told they would be relocated if power lines prevented their use, or a neighbour's strip could be used. Both these options are not feasible. Relocating an airstrip would mean massive re-fencing of paddocks, if indeed, a suitable area could be found. Use of a neighbour's airstrip would mean added costs to fertiliser bills, as super planes would have to fly longer distances with each load, and could be very inconvenient for the neighbour, who would have to move stock from the airstrip paddock. It would be a big imposition on a permanent basis. Would Pacific Power [*Transgrid*] pay for the use of a neighbour's strip forever?

4.12 The Bald Blair Action Group stated in its third community response to the Eastlink Corridor Selection Study: 'with respect it would appear that little regard has been shown for the issues raised in two previous submissions ..., particularly those relating to the importance of agricultural airstrips' The submission goes on to point out the importance of aerial agriculture to the region as the most practical way of introducing and replacing essential elements into the soil, of controlling weeds in crops and pasture, and of controlling insect pests. The submission also argues that power lines in the Armidale region are particularly dangerous because of the frequent low cloud and fog.

4.13 Mechanical overhead travelling irrigation systems are also affected by the imposition of power lines. While some property owners have had to put on hold plans to install such systems, others are unsure whether current systems would become inoperable.

4.14 Another problem arises when pylons are placed in cropping areas. One landholder has estimated that it takes about four times as long to mow around impediments such as poles, as it does to mow in uninterrupted lines. In the case of lucerne and other fodder crops, mowing is carried out at about 4-week intervals.

4.15 Some properties through which Eastlink would traverse are quite small and the imposition of towers could not be avoided anywhere on such a small land holding. One 62 hectare property would be cut in half and the line would pass within 250 metres of the farm sheds.

Interference with Electric Fencing

4.16 Electric fencing is now used extensively on both permanent and temporary fences and, with the increasing popularity of 'cell grazing', some properties have an extensive network of electric fences. Electric fencing has a number of advantages over traditional fencing, it is relatively cheaper, it allows greater management flexibility, and it is safer for stock. However, high voltage power lines can interfere with electric fencing operating beneath it. If a high voltage electric fence runs in parallel with high voltage power lines, a current is created in the electric fence of such a magnitude that it could kill even very large animals that come into contact with it. Graziers in the Guyra region expressed concern that 'Induction from high voltage transmission lines in the residence of so much electric fencing will cause considerable problems'.

Increased Fire Risk

4.17 There was concern expressed in submissions, and in particular by the Tenterden Bush Fire Brigade, that the line would result in increased fire risks; that interference with communication equipment near the line could cause unsafe situations; that the line may pose a danger to fire fighters; and that the divisions arising within the community as a result of the divisive consultation exercise was interfering with the smooth running of local brigades.

4.18 The Gatton Shire Council noted that, should Eastlink proceed, then the criteria for easement selection should include consideration of maximising the potential to create fire breaks, while minimising the impact on the environment.

Safety of Operating Machinery

4.19 A number of submissions expressed the concern that, with the system of contoured banks used to stabilise the soil in cultivated areas, there would not be sufficient clearance under power lines for large farm machinery such as grain headers. These farmers considered that their personal safety would be at risk if they were to continue to use such machinery under the Eastlink lines.

Dubious Construction Benefits

4.20 *Transgrid* pointed out that there would be some temporary flow-on benefits to the local community during power line construction through expenditure by work crews and subcontractors. Expenditure would include purchase of fuel, equipment, services, haulage, and construction camp supplies.

4.21 According to locals, however, such benefits would be outweighed by detrimental impact, especially by heavy construction vehicles which would use local roads and farms access tracks. One submission lamented: 'Who's going to repair and maintain our existing minor roads after heavy Eastlink vehicles and trucks loaded with steel materials and machinery, travelling on them have worn them away. I can't see the local shire council doing a great lot as we've contacted them on several occasions, asking for a grader to repair our road, but haven't sighted one in 12 months'.

Local Economic Impact

Devaluation of Affected Land

4.22 Land values can be affected by the impact of the power line on visual appearance and by constraints imposed by the physical presence of the line and associated easement. Land values are also affected by the subjective views of those people who own land in the project region, or who wished to purchase land there, as well as the views held by the wider community.

4.23 The *Transgrid* submission acknowledged that, in its experience, 'land values can drop during the period of uncertainty associated with identifying a route and this can continue, on directly effected properties immediately after construction for a period of a year or two in situations where values have been "talked down" during the route selection process. After this temporary slump prices return to normal with an acceptance of the lines and a realisation that ordinary activities can continue'.

Extent of Impact Of Eastlink On Land Values

4.24 People in the area affected by Eastlink submitted that land values would be lowered by the visual impact of the line, the perceived risks to health, the disturbance caused by construction, the need to relocate farm infrastructure away from the route, and the continuing inconvenience of the casement and towers. The amount by which properties have been devalued was estimated in some submissions to be around 25%, and in others to be between 40 - 60%.

4.25 There is clear evidence that land values have already dropped throughout the whole of the Western Corridor because of speculation about changes to the exact route. In addition, the impact is not just something that will happen in the future, after the line is constructed. For the people who have properties along or near the proposed route, it is happening now. Eastlink has already rendered some properties unsaleable. Landholders who had placed their properties on the market just before the Eastlink proposal was announced have been unable to sell, or have had prospective buyers withdraw and adopt a 'wait and see' policy.

4.26 Actual instances of contracts being lost were cited in submissions. One persons stated that, having lost a potential sale because of public notification of the Western Corridor, the real estate agent was no longer able to get any potential buyers to even view the property. The submission concluded: 'We are being denied the right to conduct our affairs in a businesslike fashion'.

4.27 A number of other submissions commented on the fact that personal circumstances had necessitated a decision to sell the family property, but that the possibility of a sale did not exist because of the Eastlink proposal. In the Allora region it was noted that some 30 houses in town (some distance from the proposed route) were currently listed for sale with real estate agents but that since the announcement of Eastlink, none had been sold.

4.28 Finally, several submissions noted that, should Eastlink go ahead and land values drop, this would have an adverse impact on the level of equity that was held on the property. Consequently, banks may be forced to foreclose, or would not be willing to lend more money should it be required.

Land As An Investment

4.29 A number of people made the point in submissions to the Committee that the properties they had bought as an investment for the future, as a form of superannuation or as an inheritance for their children. Blocks had specifically been bought for their great natural beauty, because of their proximity to new housing subdivisions, or because of some other reason which meant that the market value of the property could be expected to provide a good income in the future.

4.30 One submission stated:

Our property is in seven separate deeds, which we planned to sell off separately as we got closer to retirement ie. our superannuation. In this area between Toowoomba and Warwick, there is a need for small acreage blocks, being purchased mainly by young families. We are in a prime position to take advantage of this trend. The real estate agents have told us that if the Eastlink line goes ahead.. in this area, it will be virtually impossible to sell properties affected by this line at reasonable values. We are concerned that the compensation offered to us will not take this into account and will not be fair in the long term.

4.31 A description of this situation was repeated in several submissions to the Committee from aged landholders who emphasised that the properties were their only form of superannuation and one for which they had planned over many years. They saw Eastlink as representing the loss of their life's savings. These people felt that the value of their properties had been dramatically reduced by Eastlink and that the level of compensation offered would not recognise the potential value of the land, for whatever reason it was seen to be valuable by the owner.

Impact On the Economy Of Individual Farms

4.32 Through concern about exposure to EMFs, both to operators and to farm animals, landholders are reluctant to work under power lines, to put breeding stock in paddocks with lines running across them, and to carry out any improvements along easements. This they believe will result in reduced productivity and will therefore contribute to economic

4.33 Costs will be incurred by individual property owners if they decide to fence out the easement because the power authorities have stated that they will not accept responsibility for such fencing. Economic losses will also be sustained if landholders choose to move farm infrastructure that lies directly under the line or within the easement. The line would interfere with aerial agricultural both by eliminating the possibility of carrying out practices such as top dressing, seeding, pig shooting, weed spraying, and increasing cost because of the need to use airstrips further away.

4.34 According to St Patrick's Presbytery at Allora, the economic impact of the power line will be totally negative. 'It will not contribute to the economic viability of affected properties. Many families will face financial ruin. ... Property devaluation will have an immediate impact on the ability of landholders to borrow finance to fund their enterprises and to maintain the property equity levels required by the financial institutions'

4.35 Some farmers who are already carrying high levels of debt, expressed concern about how their equity would be affected. They were also concerned that Eastlink would result in a reduced ability of landholders to access finance because of the reduced value of their farms. One submission noted: 'The (NSW) regional manager of the ANZ. bank has indicated to us that should our property be devalued by Eastlink they would have to review our financial arrangements . because the family farm is both a source of income and a home, any economic impact would have a double effect and would result in the loss of everything for some.

Concern for Organic & Bio-Dynamic Farming Practices

4.36 Several submissions expressed concern that properties which had Organic or Bio-Dynamic certification status, and which were along the proposed Eastlink route, would lose that status. It takes many years of chemical-free farming practices to achieve certification and once it is achieved the grower must undergo regular testing to retain a chemical-free rating. If power authorities use herbicides along easements the potential exists for chemical drift to come onto a certified property.

4.37 Organic growers, such as Gary and Kathy Harm of the Grantham region in Queensland, believe that if Eastlink goes ahead they would be faced with the risk of losing their chemical-free status and the risk of losing their market, because of possible public perception of the health effects of EM17s on crops. They fear they will be forced to abandon the property they have farmed organically for the last five years and start again somewhere else. However, without sufficient compensation, this would be a financial impossibility.

Private Astronomical Observatory

4.38 Specific concern was also expressed that Eastlink would interfere with a private astronomical observatory built on a property near Mt Lofty, Toowoomba. If a 500kV line passed near the observatory, radio communications essential to the work of the observatory would be affected:

The observatory has considerable photographic capability and complements the USQ/UQ photometric facility at Mt Kent at the other end of the valley. Wide angle photographs of southern navigation stars have been supplied to NASA for the training of space shuttle astronauts, while deep space photographs of southern extended objects have been supplied to the London Planetarium and journals such as 'Sky and Telescope'. The building of a 500kV line near the property would severely limit these activities. 34

4.39 The submission also noted that the property's homestead housed a radio control base which was used to coordinate local bush fire fighting activities and that radio communications from this base would also be affected by a high voltage power line.

Impact On The Local Economy

4.40 The economic impact of Eastlink is already being felt in the communities along the line. Some properties which were for sale have lost buyers, others have dropped considerably in value.

4.41 The fact that land values have dropped, and properties have been impossible to sell, has brought on a wider scenario of regional economic depression. One submission noted: 'Any devaluation of land', because of Eastlink, on top of the effects of the wool market collapse (1990-91), high interest rates and drought will lead to a change in the nature of farm ownership and further evacuation of rural areas. This in turn will lead to further population pressures on the coastal strip'.

4.42 Devalued land will result in reduced shire council rates, which will in turn result in increased rates for other properties to compensate. The Gatton Shire Council expressed concern that if there was a decline in revenue from rates, the Shire's operations, and particularly its status as a major employer, would be reduced. The Guyra Shire Council noted that although it expected that NSW legislation would be enacted to compensate it for rate income foregone resulting from land devaluations associated with Eastlink, it could also make up the loss by requiring other ratepayers to pay increased rates.

4.43 The Gatton Shire Council was concerned that Eastlink would have an adverse impact on the good reputation that the Lockyer Valley has for 'clean' produce and could not afford this. The Council maintained that: 'any reduction in local or export consumption would impact [on] the major economic base of this community'.

Impact on Regional Tourism

4.44 Quite a number of submissions to the Committee expressed the concern that the visual impact of the Eastlink power line would have an adverse impact on tourism and, in particular tourism based on the environment. As one submission argued:

Tourism has become a vital part of regional economies along much of the Eastlink Corridor, providing some insulation from the ravages of drought and declining terms of trade for many producers. As visual amenity is spoilt, fewer tourist dollars will flow into rural communities, once again threatening their viability.

4.45 The importance of tourism to rural economies is increasing. The recent recession and drought has reduced the terms of trade for primary producers and many are seeking to diversify. In the Darling Downs area, for example, tourism grew 8.3% in the year 1993-94 and contributed \$77 million to the regional economy. 'The host farm scheme is an important part of this, and has not only allowed property managers to remain viable whilst putting less grazing and/ or cropping pressure on their land, it has also provided a means of educating the wider community of the importance of natural resource management issues. People living in the Darling Downs area are genuinely concerned that Eastlink will have an adverse affect on tourism.

4.46 The Gatton Shire Council noted that the rural landscape and visual amenity of the Lockyer Valley area was recognised as a major tourist attraction and that rural based tourism, such as Farm-Stays, Rural Day Trips and Country Holidays, was a growth area for the regional economy. Any adverse impact on tourism would affect the diversification of the economic base of the Shire.

4.47 Some submissions stated they had planned to diversify into homestay farm holidays but if Eastlink went ahead they believed that they would have little hope of attracting visitors to a farm which had large power lines across it.

Compensation

The Process of Compensation

4.48 Easements required for the purpose of power line construction and maintenance are usually negotiated on a one-to-one basis between each property owner and the relevant state power authority. When easements are acquired the property owner is usually eligible for some financial recompense for loss of utility of the land. Compensation to landholders detrimentally affected by power lines is determined in the first instance through negotiation but where negotiation fails, easements can be compulsorily acquired. In NSW, compulsory acquisition and compensation provisions come under the *Land Acquisition (Just Terms Compensation) Act 1991* and in Queensland the relevant legislation is the *Acquisition of Lands Act 1967*. If after compulsory acquisition the matter of compensation is not resolved, property owners then have the option of taking their grievance to a state land and environment court.

4.49 Compensation is paid to land owners to recompense them for any effects the power line may have on their properties and it is based on the market value of the property. According to the *Transgrid* submission, 'every effort is made to ensure that an individual owner is not financially disadvantaged by any action by the Authorities in constructing and maintaining the transmission line'

4.50 Compensation is only given if the easement actually crosses a property owner's land. If the route runs close to the property but does not physically intrude on it, there will be no compensation, not even for visual intrusion.

4.51 *Powerlink* in its submission stated: 'Compensation will be paid to property owners for necessary easements on the basis of the "before and after" effect of the value of the property. No property owner will be financially disadvantaged as a result of *Powerlink* Queensland's easement acquisition'.

Community Reaction to Compensation

4.52 There was evidence in submissions that the issue of compensation had not been adequately explained to people who were likely to have the route traverse their land. While it may be argued that that sort of detail was not necessary until a firm route had been chosen and specific negotiations could begin, the lack of accurate information had contributed to stress suffered by landholders who could not help but fear the worst. As an example, one submission stated: 'We have been told we can only expect fifty dollars (\$50) per tower site, and a small amount for the actual easement, approximately two to three hundred dollars (\$200-\$300) per kilometre. Hardly a fair or reasonable amount for the inconvenience of such a project, or the devastating effect Eastlink will cause to de-valuation of our property, the health risks, soil erosion and spread of noxious weeds, and the aesthetic value of our property'.

4.53 People are confused about compensation because the process of refinement, from corridor to easement, has left many people unsure of exactly how they will be affected. Some submissions stated that because different information had been given to neighbours by the power authorities to what they had been told, they had been left both confused about what would eventually happen and in a state of disagreement with their neighbour.

4.54 It was evident from the submissions to the Committee that people were unclear about the process of compensation and about the items for which they might be eligible to claim. Those items mentioned included:

- trees destroyed;
- land degradation through construction of the line and associated
- access roads;
- loss of environmental integrity of properties;
- re-location costs for people who for mental and emotional reasons could not live near the power line;
- neighbouring land suffering reduced visual integrity of the landscape
- loss of revenue associated with particular industries (apiarists, organic producers,);
- devaluation of land under the easement;
- devaluation of neighbouring land;
- loss of re-sale value of property;
- loss of privacy and loss of control over some areas;
- loss of ability to provide quality assurance of stock and crops;
- health effects, including stress related ones,
- restriction of farming activities, now and in the future; and
- loss of opportunities (eco-tourism, subdivisions, etc) '

4.55 People were also concerned that if compensation was based on current land values it would be insufficient because the market for rural land was at that time very depressed .

4.56 Some people affected by Eastlink did not wish to discuss compensation, because to do so was to accept that Eastlink would go ahead. Other people stated that no amount of compensation would be enough to ameliorate the distress caused by the consultation process, the drop in land values, the disruption to community cohesion and, above all, to the blight on the beautiful capes in which they lived.

4.57 As described in one submission:

Compensation is a sour joke. A small property (less than 50 hectares) is all but obliterated by a 70 metre easement. It would be fair to buy the whole place at market value, but the owner ends up with peppercorn compensation and a ruined asset. If the published cost of Eastlink included proper compensation, its cost would skyrocket into the uneconomic realm! How would the taxpayer respond to paying the real cost?

4.58 Some people's lives have been suspended by the long planning phase of Eastlink. Having decided to move into the retirement phase of their lives, they had put their properties up for sale. But since the advent of Eastlink they have not been able to sell and they have been left in a position of total uncertainty: unable to derive income from unrealisable assets, and unable to draw a pension because of those assets'. At this stage, the promise of compensation is of no value to them at all.

4.59 The Guyra Shire Council maintained that the power authorities want landholders to accept the proposal, then discuss compensation. The Council argued that this was an unacceptable business practice and recommended that compensation should be paid both to directly and indirectly affected property owners. It 'should include solarium, lost income, out of pocket expenses and injurious affection'.

4.60 The Gatton Shire Council submitted that the fact that rural landholders affected by Eastlink had not been given adequate information by the power authorities about compensation had caused some stress to those landholders. The Council maintained that past experiences of landholders, in receiving only nominal compensation for power line intrusion, did not give them confidence that fair compensation would be given in the case of Eastlink .

Social Impact

Efforts Made By Power Authorities

4.61 The proponents of Eastlink are legally required to consider social impact as part of the EIS requirements and in its submission to the Committee Transgrid argued that it was unable to respond fully to this term of reference until the EIS was complete. The submission did note, however, that: 'social parameters included at corridor assessment stage included the number of properties potentially affected, the avoidance of communities, the number of homes within a specified distance, and tile land use within the affected corridor'. The submission also stated that the processes used to reduce social impact 'have been successfully applied in past projects to avoid introducing unnecessary social strains within and between communities in the study area'.

4.62 *Transgrid* stated in its submission to the committee that:

... every effort was made by the Authorities during the extensive community consultation the preceded selection of the prefer-red corridor to ensure that the selection process was and was seen to be based on objective principles. ... BY emphasising these principles in the route development there us the best chance to minimise the recriminations of one community against another, or one neighbour against another. Our objective has always been to define a final alignment for the line which is seen by fair minded people as being the best that can be achieved.

Comments in Submissions

4.63 The Northern Rivers Energy Action Network submitted that a comprehensive social impact statement for Eastlink was essential before any decision could be made as to the desirability of the project and that a social impact statement should have preceded the decision to build the Eastlink power line. The submission argued that a comprehensive social impact assessment would:

- assist in improving the social well-being of the community by moving away from the 'lip-service' consultation currently practiced;
- acknowledge the community belief that the need for Eastlink has not been proved;
- enable the true cost of the Eastlink project to the community to be assessed;
- allow an assessment of the relative levels of employment generated by alternative renewable energy sources and demand side management pro-rams as opposed to that generated by Eastlink;
- assist in deciding the best way for Australia to meet its greenhouse gas emission targets;
- allow an energy strategy to be devised which would resolve the issues of equity, sustainability efficiency and environmental quality;
- allow a true assessment of the alternative options for supplying energy needs for both NSW and Queensland;
- look at the social barriers to increased energy efficiency; and
- look at the impact of today's energy decision on future generations.

Community Consultation

Efforts Made By Power Authorities

4.64 The two power authorities involved in the Eastlink project have made considerable efforts to ensure widespread community involvement in the project. In a *Project Information Document* they state: 'Community consultation will lie at the heart of the route selection process for Eastlink. ... Support from the community will be integral to the project's success and community consultation and information will continue throughout the life of the project

4.65 The *Transgrid* submission maintained that: 'The development of the transmission line route for Eastlink has involved the most extensive community consultation program ever undertaken for a major infrastructure project in Australia.' To facilitate community consultation, *Transgrid* and *Powerlink*, together with project consultants Kinhill Engineers, formed a Project Committee and all Queensland. documents produced have been common to both NSW and Queensland.

4.66 The *Project Information Document* outlined three stages for community input into the route selection process for the transmission line:

- at project commencement, community help was sought to help refine the preliminary corridor concepts;
- formal public submissions were sought in response to the corridor selectlon report; and
- formal public submissions will be sought in response to the environmental impact statement.

4.67 To facilitate community consultation the power authorities, inter alia:

- set up free telephone hotlines in NSW and Queensland to facilitate feedback from, and information to, the community;
- produced a regular newsletter distributed during the corridor selection phase of the project
- produced a 12-page, easy to read Project Information Document.
- produced a 10 minute information video;
- produced a large (2m high) display map of the study area;

- established information centres at key locations in the areas of corridor investigations with staff available for to answer questions and record community input;
- staged displays of the corridor options at information centres and other community locations in the study area;
- produced a questionnaire (Community Response Form) to assist people make their comments about the proposal;
- made available for community consultation the corridor selection reports and environmental impact statements at community centres;
- used media outlets to publicise any developments in the project; and
- produced brochures on various aspects of the project, such as easement acquisition and electric and magnetic fields.

4.68 The corridor selection process resulted in over 3,800 written submissions, visits by more than 5,000 people to information centres and over 2,500 people attended public meetings.

Use of Community Input In Decision Making

4.69 The aim of the corridor selection process was to find the 'best balance of the communities' wishes, the environmental impact and the line's own technical requirements'. In the initial phase of community consultation (three months from June to August 1994), the task of the project team was to provide information to a community which knew little about the project, and receive comments. The team then considered those comments along with that from local public bodies and from their own consultant's investigations, and proposed a revision of the preliminary corridor concepts. At that stage the issues raised by the community were, in order of degree of concern:

- environmental/conservation impacts (41% of responses);
- objections or opposition to the project (9%);
- land use concerns (33%); and
- perceived health risks (EMFs) 29%.

4.70 The second round of displays (September 1994) was intended to provide feedback to those who had responded.. and to prompt those who hadn't participated to make a contribution. Part of these displayed included graphical illustrations of the issues already raised by the community. In the following two months more data was gathered, both from public bodies and from the community, and a Corridor Selection Report produced, plus a Viable Corridor display map to go with it. These were displayed in November 1994 and by that stage about 2000 responses had been received, though no new issues had been raised.

4.71 In order to assess each corridor against the information gathered, the project team identified measures that reflected each of the issues raised. 'For example, conservation issues were reflected for each corridor by recording measures such as the amount of tree cover in each corridor as well. as recording specific conservation areas. The issue of perceived health effects and the Authority's response of prudent avoidance was reflected for each corridor by measuring the density of housing in each corridor, and the distance of houses from a nominal centreline'.

4.72 Issues considered important at the time the final decision was made to select the Western Corridor were, not necessarily in order of importance:

- impact on agriculture, horticulture, grazing and airstrips;
- access and erosion;
- EMFs and health issues;
- heritage and conservation;
- land ownership,.
- impact on native flora and fauna, and remnant vegetation;
- property size and values; and
- visual and scenic impacts.

Community Reaction To The Consultation Process

4.73 Many submissions to the Committee stated that they believed the community consultation process to have been inadequate and divisive. They argued that both State Governments had failed to listen to the people regarding their genuine concerns over the corridor options available, and completely different options to Eastlink altogether. Other submissions complained that the whole process was rushed. People felt that both individuals and groups had been treated in an off-hand way by government representatives and power authority officials.

4.74 In August 1994, the Armidale Branch of the National Parks Association had invited a representative of Pacific Power to give the Branch a briefing and Association members were concerned to find that Eastlink was already at 'an advanced stage of planning'. At subsequent public displays presented by Pacific Power, 'the highly organised presentation of the whole project stunned the communities of the Northern Tablelands and Southern Queensland. The strong impression given was that Eastlink was a foregone conclusion, and "public consultation" was not about the desirability or

otherwise of having a link but solely about where it would go. ... There was no discussion of alternative strategies in response to those opposed to the project.

4.75 Repeatedly, submissions to the Committee claimed that the consultation process had been polite but meaningless. While landholders were required to make written submissions detailing requirements, objections, and suggestions at each of the four stages of the corridor selection process, the answers from the power authorities were standardised and non-committal. Information provided by the power authorities at different times was conflicting or renegeed on earlier promises.

4.76 Landholders were frustrated that they have had to spend a large amount of time finding out detailed information, dealing with different people . All the time they were given the impression that unless they 'towed the line' they would be penalised in the route selection process. While the power authorities were in full knowledge of all the discussions that had taken place, individual landholders were often ignorant of what had been said to neighbours and landholders further away. This placed the landholders at a relative disadvantage because it enabled power authority officers to negotiate from a position of omniscience.

4.77 Submissions argued that the consultation process was not about whether the community wanted Eastlink. The project was promoted as a fait accompli and the only consultation which took place was about where it would go. Rural people were given the choice of three corridors, but were never given the choice of 'No Eastlink'. It was obvious that anybody given the choice of having a power line go through their properties or through somebody else's property would choose the latter. This immediately established a basis for community conflict. In addition, rural landholders could see that all corridor options would present a threat to further land and water degradation.

4.78 There was a common belief expressed that despite the community consultation process, the power authorities had chosen the corridor that they had preferred before the consultation process ever began. People criticised the authorities for the enormous amount of money used in community consultation and waste of paper, one submission noting: 'We usually received 6 to 8 copies of each of their information sheets - by mail'. Criticisms were made that the authorities frequently did not reply in writing to requests for information, that in the early stages they were willing to communicate publicly but that when the final decision was made to select the Western Corridor, notice was given over the radio. Representatives from the power authorities were never receptive to the argument that people did not want the power line at all.

4.79 Thus the communities involved felt that the consultation process used to select the exact route was inadequate and those people, plus the wider community, felt that there was no consultation at all as to whether interconnection as a power supply option was desirable. It was claimed that, with the issue at stake being a major power supply for the State's future needs, there was a widespread perception in Queensland that the whole State should have been involved.

4.80 The view was expressed in submissions that the omnipotent power of electricity utilities is no longer appropriate and, in an age when all regional developments must pass through local council approval processes, when landholders have endless constraints imposed on any of their development proposals, that local councils should have the same right of veto, with justifiable reason, over large public utilities in their development proposals.

4.81 The Gatton Shire Council, which had administrative jurisdiction over Springdale, argued that consultation had been inadequate. Initially, the Council was not made aware that up to nine power lines would converge at Springdale. Had the Council known this, it would have more vigorously opposed the whole project.

4.82 The Council further noted that, while the consultation process was representative, in terms of the number of public displays and forums, it was not effective because so many questions about Eastlink remained unanswered. The Council itself is very unsure about the future of Springdale, how it will look in the future, how many power lines would converge there, what the cumulative impact of the lines would be on the Shire, and what would be the impact on other services in the Shire.

4.83 The Condamine Catchment Committee noted that landholders were angry that their property management and environmental concerns had been trivialised and that the general community felt that the consultation process had been neither consultative nor publicly accountable.

4.84 The submission made by the Northern Rivers Energy Action Network noted that according to the *Guidelines for the Development of Electricity Systemis*, power authorities 'should follow an appropriate community consultation process allowing all parties to arrive at a project proposal acceptable to all'. Yet the methods used by the Eastlink project team was no more than a 'rubber-stamped public approval' process. It was a process of superficial cooperation' and 'after-the-fact involvement'. The Network argued that effective collaboration must go beyond cooperation, that it must begin earlier and that it must 'evinced a sincere desire to hear other perspectives and work with the public to create a plan for mutual gain'. In contrast to the processes used by public utilities in Australia, the submission noted that 'Throughout the USA, water and electricity utilities are discovering that collaboration is a powerful new tool for problem-solving and one that can lead to better decisions and less lawsuits.

The Impact of the Consultation Process

Community Conflict

4.85 The community consultation process used by the power authorities has resulted in internal community conflict, brought neighbour up against neighbour and created social disharmony so great that, as described in some submissions, rifts will never be healed. ⁷⁸ Conflict has arisen because people affected by the line believed that more influential neighbours had been able to have the route shifted from their properties onto others.

4.86 One submission commented: 'The manner in which Pacific Power [*Transgrid*] chose to select a path through this closely settled and highly improved land has caused deep jealousy - playing one neighbour's priorities against another. ... The stress and mistrust (in some cases) that has developed between neighbours, families and friends is a tragedy

4.87 As told by one landowner:

Because of the power line neighbours, often relatives in fact, have turned against each other. If one farmer makes a suggestion that the line go to one side of his place than he is inflicting it on his friend and neighbour. The social implications of this proposal have to be weighed against any benefit. ... Resentment and hatred are coming to the fore breaking up long standing relationships and causing great stress. Should the line actually go ahead one wonders at the consequences.

4.88 Yet another submission noted:

The social fabric is being torn apart by the community consultation process as practiced by Pacific Power. Very few people want the line to cross their properties, and neighbours are often not on speaking terms now as each tries to have the line removed from their property and on to their neighbours. Pacific Power will only deal with property owners on an individual basis where local group meetings could perhaps have sorted out the best location for the easement. So where we once had close knit local communities, families who have lived side by side as friends - sometimes for generations, are now not on speaking terms. It has even affected church attendances and caused quarrels between relations. There is a possibility that these quarrels will never be totally patched up.

4.89 Yet another submission stated: 'As newcomers to the Shire of Warwick we witnessed the distress caused by the Eastlink corridor selection process on members of the whole community. This was not an exercise in community consultation at all, it was 'divide and rule', setting up one group against another. The issue involves a major power supply decision for the whole state, so the whole state community should have been involved in deciding how the need is met, not just those of us who were potentially affected'.

4.90 The community conflict that has arisen over Eastlink has had repercussions for other community organisations. For example, the Secretary of the Tenterden Bush Fire Brigade, James Jackson, noted that the division created by the community consultation process had resulted in some members refusing to fight fires on other people's properties and did not assist in the smooth organisation of help in times of crises. And the viability of the Wandsworth Progress Association, which has been a strong focal point of that community for over 30 years, has been threatened because individuals have come into conflict through seeking to preserve their own property, their way of life and their assets.

Cumulative Effect

4.91 While in some areas local community groups have joined forces to oppose the line, the route selection process itself has caused considerable disharmony within rural communities, with previously friendly neighbours coming into conflict with each other as they seek to have the route not go through their own land and therefore, by default, suggest that it go through neighbouring lands.

4.92 Saint Patrick's Presbytery, in the Allora region, noted in its submission:

Those people who constitute the Allora community are already severely stressed because they fear the as yet unknown impact of the power line on their health, the consequences for their children, the likely economic effects on their farms, business and community resources. They know that many people will feel forced to leave their homes as a consequence of the power line and they fear that a blight will descend on their community as the exodus gathers momentum. ... Few issues have caused such widespread community concern as this one.

4.93 The Eastlink proposal has come at a time when the communities through which the line would pass are already considerably stressed. People in these communities have battled through five years of drought but they are willing to continue because they can accept that drought is something that they have no control over. However, the Eastlink proposal has brought both individual and community stress to an extremely high level. This stress has resulted in individual anguish, financial worries, marital conflict and community disharmony.

4.94 Marital conflict has arisen because women are adamant that they will not allow their children to live under a the power line and their husbands cannot leave the family farm as it is their only means of livelihood. Others stated that they were unwilling to start a family until the matter was resolved.

Conclusions

4.95 The Eastlink proposal, perhaps more than any other high voltage power line in Australia's history, has resulted in high levels of community opposition. The proposal came at a time when rural people had been experiencing severe and prolonged drought, accompanied by both a general recession and declining rural commodity prices.

4.96 The large number of critical submissions received was a strong indication to the Committee that the communities involved do not want Eastlink to proceed. They see the proposal as uneconomic in general terms and of specific economic detriment to their communities. They do not want the visual integrity of their landscape to be spoiled and they do not want the physical intrusion of construction and maintenance crews on their land. They assert that the link will perpetuate a national reliance on outdated and polluting electricity generation technologies and will preclude the adoption of modern, non-polluting renewable technologies and the increased use of demand management and energy conservation.

Impact on Agricultural Land

4.97 Property owners were also concerned that the position of the line would have a detrimental impact on the efficient operation of their business through interference with facilities and aerial agriculture. **The Committee recommends that any detrimental impact on farm operations should be subject of compensation.**

Local Economic Impact

4.98 Eastlink has already had an impact on the real estate market properties along the Western corridor. Properties which were for sale at time of announcement of Eastlink lost potential buyers and properties which subsequently came on the market have not sold. Some property owners who had planned to retire have been left in a position where they cannot move elsewhere because their homes are inextricably linked with the rural business of their land, and they cannot sell that land because of Eastlink.

4.99 In addition, the value of properties along the corridor may well be reduced by the advent of the power line. This has been estimated to anywhere from 25% to 100% (people believe that they will be unable to sell at all). Regional economies may feel a flow-on effect from the stagnation of the rural real estate market and the unwillingness of property owners in general to make any further capital investment in the properties. It has also been suggested that the visual impact of the power line may affect regional tourism and farm stay holiday income.

4.100 The power authorities involved have noted that this situation sometimes occurs when a power line is first proposed, but suggested that the real estate market will regain its previous level at some stage after the power line has been completed. However, this information does not reassure proper owners who want to sell now, or who are planning to sell in the near future.

4.101 It is clear that some people are currently being economically disadvantaged by the proposal. **The Committee holds the view that, if the power authorities are so sure that the property market will return to normal after Eastlink is completed, they should buy now, at pre-Eastlink valuation, any property that has been on the market and that has not achieved a sale because of speculation about Eastlink.**

Compensation

4.102 It is the usual practice of power authorities to offer compensation for the use of easements and to offset any losses associated with reduced amenity of facilities on individual farms. However, there is a general community belief that in the case of Eastlink, the level of compensation would be inadequate.

4.103 Compensation is usually only paid to property owners whose land is crossed by a power line and where easements are acquired. However, there may be neighbours whose houses are very close to the power line, or whose view is directly spoiled, but who are ineligible for compensation simply because the line does not cross their property.

4.104 The Committee is concerned that the practice of negotiating compensation arrangements on a one-by-one basis, without any requirement for public disclosure of the total amount, or the factors included in the summation, favours the power authorities and enables them to achieve minimum levels of compensation. Were public disclosure compulsory and if landowners had access to a simpler and cheaper avenue of conciliation than the courts, the level of compensation paid may appear more equitable to those seeking compensation for the intrusion of Eastlink.

4.105 **The Committee recommends wider and more comprehensive compensation provisions, which may include provision for an independent conciliation process for individuals or groups affected.**

Community Consultation & Social Impact

4.106 While the power authorities made every effort to consult the people directly affected by the proposal, both those individuals and the broader community have rejected the consultation process as completely inadequate. People believe that because they were never given the choice of 'no Eastlink' the consultation process was intrinsically flawed. More significantly, as the power authorities sought community opinion as to the location of the line, some people lobbied to have it not put on their properties. The fact that the power authorities made changes to the proposed route led to suspicion that improper influence had been brought to bear. This created antagonism between neighbours, who were often relatives,

and people who had previously been friends for many years. In some instances rifts have formed within rural areas that will take a long time to heal.

4.107 It appears to the Committee that a significant cause of community disharmony and rancour ahas been the practice of holding discussions with individual property owners who were disadvantaged by the fact that they were ignorant what had been said to neighbouring property owners, while the power authority officers had the advantage of knowing what offers had been made to other landholders. The cumulative effect of the proposal itself, the process of consultation used by the power authorities and the community reaction to it has been considerable social disquiet and stress. A very large amount of community energy ahs been expended on opposing Eastlink when this energy might have been spent on projects more directly profitable for the community.

4.108 The Committee concludes that while the power authorities put a large effort into public consultation, the methods were used were not accepted by many of those people affected by the proposed power line.

State Parliamentary Review Procedures

4.109 This Committee and its predecessor the Standing Committee on Industry, Science and Technology, has over the last few years noted a lack of informed and detailed debate on matters relating to power generation developments. In particular, the Committee has noted that state government could play a stronger role in meshing government policy with community needs and opinions.

4.110 In examining the Eastlink proposal and its effect on the communities involved, the Committee has come to the conclusion that a greater role could be played by state parliaments in the review of matters relating to energy developments. The depth of community opposition of Eastlink the high level of public knowledge of energy matters, and the strong desire expressed to be involved in such matters, suggest that unless communities are provided with a more satisfactory avenue for grievances and more informative involvement, conflict will continue to mar energy development proposals

4.111 The Committee suggest to all state governments that there would be merit in establishing a process whereby communities and professionals could be more directly involved in debate on energy matters. Through such a process, parliaments could monitor subjects such as health effects of power lines, environmental and social impacts of development, and degree of community willingness to participate in alternative renewable generating options, as well as provide a more accessible and flexible grievance mechanism.

CHAPTER5

ECONOMIC CONSIDERATIONS

Term of Reference (1) (b) the overall economic impact of the power line.

5.1 The two power authorities involved in Eastlink, *Transgrid* and *Powerlink*, have commenced feasibility studies on the basis that interconnection is economic and will result in net benefits to both NSW and Queensland. The benefits that have already accrued through the interconnection of the southern states are expected to be extended through the connection of Queensland to the grid. However, because Eastlink is part of a broad strategy, it is difficult to separate it from wider economic considerations of the national grid and reforms to the electricity industry.

5.2 The main economic benefit expected of Eastlink is a permanent reduction in the generating capacity held as reserve in NSW and Queensland because, after connection, this reserve capacity can be shared. *Transgrid* estimates that interconnection would allow an estimated 400mw reduction in installed reserves in Queensland and an estimated 350mw reduction in the southern states. Accordingly, a total of about 750mw of new generating plant would not need to be built. *Transgrid* further estimates that the financial benefits of deferring this capital investment in power stations alone outweighs the costs of Eastlink. The net national economic benefit of Eastlink has been quantified by *Transgrid* at \$80 million.

5.3 Economic benefits should also accrue from increased competitive pressures among generating authorities. These pressures should provide an incentive for electricity producers to find ways of reducing costs associated with electricity production and cost reductions should ultimately be passed on to the consumer through reduced electricity prices. Such benefits have not been quantified by the power authorities involved because of the difficulty at this stage of putting them into dollar terms.

Concerns Expressed In Submissions

5.4 In contrast to the views expressed by *Transgrid* and *Powerlink*, many community groups who made representations to the Committee argued that Eastlink was not economic, that the benefits were questionable, that they would not flow to small consumers and that the people of both states, but in particular Queensland, would be better served by a mix of decentralised, renewable power generating systems. Submissions frequently expressed the view that the proponents of Eastlink had not adequately demonstrated any real benefits, especially to the communities that will suffer direct disruption from the proposal.

5.5 A detailed cost benefit analysis of Eastlink has never been published. This has led to suspicion that the 'hidden costs' relating to environmental and social impacts and compensation had not been fully taken into account. ³ Some submissions claimed that it was hard to know what the real cost would be because statements had been made by different people, including state ministers for energy, that the project would cost variously \$280m, and somewhere between \$350m and \$500m .

5.6 While the document *Eastlink Your Questions Answered* (June 1995) concludes that trading in electricity through Eastlink 'will be carried out, like any trading, to the mutual benefit of buyer and seller', some submissions argued that there are more stakeholders than just buyer and seller. Other parties involved include the people affected by the power line, their communities and the environment.

5.7 Among the many detailed criticisms of the economics of Eastlink, the following points were made,

- The projected appeared to have a very high cost, compared to the relatively insignificant supply. (The line is designed to carry 500mw, which represents the output of one older style turbine. Since modern power stations now have four 660mw turbines, this line will carry less than 1/4 of one power station output.)
- If power sharing was to occur from east to west it would be easy to understand the potential for demand sharing, but trading electricity from south to north along the eastern seaboard did not make sense because demand would be synchronised.
- The construction of Eastlink undermined the value of viable, less polluting alternatives such as gas turbines, renewable energy sources and demand side management.
- Current electricity prices do not adequately reflect the environmental, health and social costs that are caused through pollution.
- Electricity used by Queenslanders should be generated within their own state, and not bought from elsewhere because it would result in increased employment in NSW and reduced employment opportunities in Queensland.
- While Eastlink was expected to postpone the need for construction of costly new power generating plant in Queensland, that State has in fact announced a future energy package that includes constructing or upgrading several new power stations thereby increasing its installed capacity to 9840mw by 2006. ⁹

The Small Consumer

5.8 Many people believe that the connection of NSW and Queensland through Eastlink will not in fact result in any decrease in the price of electricity to them, or any other benefits. They believe that small consumers, and particularly those in rural areas will actually be disadvantaged by the creation of a 'national' grid. As put in one submission: 'We simply do not believe that a small number of wholesale entities will enter into free and open competition in order to reduce costs to the consumer; the very nature of free enterprise almost certainly ensure maximisation of profit, not reduction of selling price.'

5.9 The general view presented in submissions was that the overall impact Eastlink would be to promote big business at the expense of small business and individuals. Eastlink is designed to allowing electricity trading between states and big cities, it is not designed to allow delivery of electricity to people who currently lack this service. Electricity will cease to be a service, become instead a commodity which can be purchased more cheaply by the consumers. As pointed out in several submissions, there is no guarantee Eastlink will result in consumer price reductions in electricity as promised the state and federal governments.

The Fear of Privatisation

5.10 There is a strong belief in the Eastlink community that the ultimate , of governments is, once public utilities have been corporatised, to follow m privatisation, an action which was opposed by many people. One submitss concluded:

This power line is not needed, not wanted, a huge cost to taxpayers and consumers, and I suspect, harbouring a hidden agenda to privatise the national grid to the detriment to small consumers.

5.11 The Guyra Shire Council shares the concerns of its ratepayers that privatisation could mean the loss of cross subsidisation of community service obligations and that, in particular, the selling of power generating plants; result in higher charges to rural and remote users. The Council stated emphatically that because of the scattered nature of Australia's population governments must continue to accept responsibility for supplying services rural communities.

As a rural consumer of electricity there is no assurance that competition policy or privatisation will decrease or hold the price of power at its present level. We will not have the same bargaining power as industry, so the opposite is likely to occur. That has been the experience in other countries.

5.12 Extending from this was the concern that once privatisation commenced, the way was open for foreign companies to buy into Australian power authorities and control the basic essential service of electricity supply; a scenario which was rejected in some submissions.

The Need for Decentralisation

5.13 There was the belief expressed in some submissions that the philosophy of increased competition among public utilities was wrong because it placed increasing emphasis on 'big' solutions to economic problems and ignored environmental and social need. More specifically, concern was expressed that competition reforms in the electricity industry would increase Australia's reliance on large power generation plants while what was really needed was diversification in generation capacity with much greater emphasis on renewable and environmentally sound systems.

5.14 The fear was also expressed that once Eastlink was in place it would in itself become a rationale for extending the eastern power grid with more high voltage power lines. Its very presence would limit options for future electricity supply in Queensland. Because it is difficult to predict where demand would be, it would seem prudent instead to develop regional supply options rather than relying transmitting electricity over very long distances.

The Full Cost of Eastlink

5.15 Quite a number of submissions questioned whether the cost of Eastlink as stated by the project's proponents took into account some of the wider, indirect costs which they felt should be attributed to Eastlink. These included:

- fair compensation for all people affected by property devaluation and loss of future options for property use;
- the cost of associated infrastructure needed to distribute the power at either end of Eastlink;
- the full cost of environmental impacts, in both agricultural and natural environments;
- upheaval in affected communities;
- the cost of health problems associated with the project, whether direct or indirect, short-term or long-term;
- the cost of failing to implement or postponing the implementation of energy efficiency programs which would ultimately save money for government, industry and small consumers;
- loss of jobs that could otherwise have been created through developing, producing and installing alternative technologies (such as solar); and
- loss of jobs related to the export of these technologies.

ABARE Analysis

5.16 Submission from both TOTA in Armidale and Lockyer Valley Against Eastlink referred to an ABARE publication which had concluded that there may be significantly greater benefits from gas pipeline interconnection than from electricity, at a ratio exceeding 3:1. They took this conclusion as evidence that Eastlink was uneconomic.

5.17 The Commonwealth Department of Primary Industries and Energy commented on this, saying:

It is important, however, to note that the ABARE and IC studies not designed to be able to account for the benefits flowing from increased competition in the market as a result of grid interconnection and, to that extent, may underestimate the benefits. They are also broad studies with an energy system perspective rather than being specifically designed to examine Eastlink.

5.18 TOTA further argued that an analysis carried out by ABARE, published as Appendix E to the Industry Commission publication, *Australian Gas Industry and Markets Study*, which used the figure of 90mw transfer capacity for Eastlink in modelling exercises, as further evidence that Eastlink was uneconomic.

5.19 When questioned about the models used for this analysis, the Manager of the Energy Economics Branch of ABARE, Mr Roger Stuart, stated.

ABARE conducted a broad national level analysis of the total energy system benefits of electricity and gas interconnections and of the extent of the substitutability between the two types of interconnection under different scenarios. Neither this nor the subsequent report purported to be the detailed feasibility study that would be needed to justify investments in any particular interconnection. Indeed, neither study reports results on individual interconnections, although the interconnection of the Queensland and New South Wales systems is the major new link which the ABARE model constructs. In other words, while the ABARE work can be used to illuminate the relative economics of alternative options, it was not intended and should not be used as a definitive guide to the economics of particular interconnections.

5.20 The Committee accepts that the analysis carried out by ABARE examined the general economics of interconnection through a high voltage power line, and was not sufficiently detailed to draw conclusions about the specific case of Eastlink. The Committee further accepts that the model demonstrated, in general terms, that electricity interconnection through a high voltage power line would be economic.

Conclusions

5.21 The Senate Standing Committee on Industry Science and Technology recommended in its report on *Gas and Electricity* that any interconnection between NSW and Queensland should not go ahead until it was proven to be economic. While opponents of Eastlink have argued that this has still not been proven, the fact that two state governments, with the support of the Federal Government, are going ahead indicates that it is considered by them to be economic. Further, the ABARE analysis has shown that, in general terms, an interconnection would be economic. **However, because a specific cost/benefit analysis for Eastlink was not available, the Committee is unable to comment on the specific case of this proposal.**

5.22 The total cost of Eastlink is stated by the power authorities to be in the region of \$300 million. However, information given by the two power authorities on cost does not include a breakdown of what expenses have been included. Lack of detailed information has contributed to public confusion and misunderstanding about the relative costs and benefits of Eastlink and therefore to a lack of understanding of the full economic impact.

5.23 The Committee believes that, in the interests of good public relations, the power authorities involved should make available to the public a more detailed cost/benefit analysis of Eastlink.

CHAPTER 6

ELECTRICITY CONSUMPTION AND GREENHOUSE

Term of Reference (1) (c) the likely impact of the power line on overall levels of electricity consumption, with reference to Australia's obligations and commitment to reduce greenhouse gas emissions.

Introduction

6.1 The Australian Government is a signatory to the international Climate Change Convention which aims to stabilise greenhouse gas emissions at 1990 levels by the year 2000. Under the terms of the National Greenhouse Response Strategy, all Australian states and territories are to limit greenhouse gas emissions to 1988 levels by the year 2000, with a further reduction of 20% by 2005.

6.2 Although Australia's total contribution to global greenhouse gas emissions is small, emissions per capita are the third highest among advanced industrial countries. With the exceptions of Tasmania and the Northern Territory, more than 80% of electricity is generated in Australia by burning coal and electricity accounts for approximately half of Australia's greenhouse gas emissions.

6.3 Paradoxically, it is possible that Eastlink may, in different ways, result in both a reduction and an increase in power generation. Because of the very high component of coal-fired electricity generation, any change in electricity generation will have a significant impact of the level of greenhouse gas emissions.

6.4 A decrease in electricity generation may occur through more efficient demand management, as Queensland and NSW could share the responsibility for maintaining spinning reserve (reserve sharing). This may delay the need in Queensland for an increase in generation capacity. In addition, NSW may be able to use its excess capacity more efficiently. Any decrease in the requirement for spinning reserve is likely to result in a decrease in greenhouse gas emissions.

6.5 On the other hand, the Eastlink proposal does in no way contribute to increasing efficiency of electricity use at the consumer level (energy conservation). Instead of working towards increased savings in electricity consumption, Eastlink encourages a philosophy that increased demand will be automatically provided for through increased supply.

Power Authority Position

6.6 Although *Transgrid* claimed that it is not in a position to quantify the impact Eastlink will have on greenhouse gas emissions, it maintained that the proposal will offer opportunities for reducing emissions. These reasons were as follows:

- Interconnection and the associated electricity market that it *will* facilitate will provide greater scope for application of renewable energy sources and low greenhouse impact sources across eastern Australia. There will be greater scope for these potential sources to gain access to a wider market enabling them to more easily compete. ...
- Renewable energy sources in one state may be able to be more easily shown to have cost advantages against the construction of new coal-fired power stations in another State.
- Dispatch of generation across a larger interconnected system provides a greater opportunity for priority dispatch of greenhouse friendly sources.
- A larger interconnected system allows consideration of a greater diversity of potential sources and access to, for example, gas fields in States that would otherwise be inaccessible.

6.7 In its own Greenhouse Response Strategy paper, the Queensland Government has recognised the importance of lowering greenhouse gas emissions and its first objective is to reduce them in the energy sector. A further objective is to increase the proportion of energy supplied by alternative energy technologies that have lower rates of emission than fossil fuels.

6.8 The Commonwealth Department of Primary Industries and Energy also claimed that there will be the opportunity for reduced greenhouse gas emissions through interconnection, although the statement is qualified with the proviso that the degree of saving 'is difficult to quantify' at this stage. The submission noted the UK experience where the introduction of a more competitive electricity market resulted in a shift away from coal powered electricity generation to gas, and the fact that ABARE has forecast an increase in the use of gas for electricity generation in Australia.

6.9 While giving evidence to the Committee, the First Assistant Secretary of the Department's Electricity and Gas Reform Task Force, Mr Michael Todd, reiterated: 'We assess that the greenhouse impact of Eastlink in the context of a competitive electricity market is one in which the emissions are lower than otherwise would have been the case, but we are not in a position at this stage to quantify the impact'.

6.10 On behalf of the two State Governments involved in Eastlink, Mr Todd stated:

... New South Wales and Queensland have both recently announced significant initiatives towards improving energy efficiency and encouraging renewable greenhouse friendly technologies. Queensland has committed some \$35 million to demand management and renewable energy technologies, In the case of New South Wales, the New South Wales government has recently announced the creation of an energy service company to assist New South Wales companies in meeting greenhouse gas emission reduction targets set in the national greenhouse response strategy. Other initiatives, for example, include a joint project between Pacific Power and the University of New South Wales to develop low cost, high efficiency solar cells.

6.11 In supporting the view that Eastlink would help reduce greenhouse gas emissions, Mr Anthony Davis, who represented Global Energy Network International, also noted that with interconnection would come the infrastructure to make fuller use of renewable alternatives which had lower rates of greenhouse gas emissions.

Community Concerns

Depth of Community Concern

6.12 While few submissions to the Committee addressed in detail the subject of greenhouse gas emissions and global warming, many submissions made brief mention of it, indicating a high level of community awareness of Australia's international responsibilities in this matter. As noted in the submission made by the Northern Rivers Energy Action Network, 'There is increasing sensitivity in the community about the environmental impact of coal generated electricity, in particular the emission of greenhouse gasses'.

6.13 In these submissions, there was a high level of concern expressed that Australia was not meeting its target of reducing greenhouse gas emissions and the opinion frequently expressed that Australia should do more to reduce the use of energy sources that contributed to these emissions.

Implications Of Interconnection

6.14 Many submissions argued that if Australia seriously wanted to reduce greenhouse gas emissions there was no choice but to reduce electricity production from coal fired generators. But they believed that Eastlink would serve only to encourage an increase in the use of coal by transporting electricity generated in the coal-fired power stations of the Hunter Valley to Queensland, thus increasing the consumption of highly polluting energy sources and increasing dependence on fossil fuels.

6.15 The Lockyer Against Eastlink Group noted that ironically, since Australia became a signatory to the Climate Change Convention in 1992, five new coal fired power stations have been commissioned: Mount Piper and Redbank in NSW, Loy Yang B in Victoria, Stanwell B in Queensland and Collie in Western Australia. The submission concluded: 'Eastlink appears another in this series of energy decisions that will continue to increase our potential CO₂ emissions'.

6.16 Another submission suggested that: 'large independent generators of power will produce power to maximum production and will then absorb this production. Often this absorption will be encouraged with "dumping" prices. A far more desirable aim would be the efficient use of limited resources producing the lowest amount of greenhouse gases'.

6.17 And a submission from the Australian Democrats argued that although Queensland had signed an agreement to reduce its greenhouse gas emissions to 20% below its 1990 level by 2005, it was in fact on track to increase emissions by 38%.

6.18 The Armidale Branch of the National Parks Association commented that since the advent of the Hilmer reforms in energy industries, both Federal and State governments appear to be neglecting their responsibilities to the National Greenhouse Strategy. As evidence of this, the Branch points out that nowhere in any of the Eastlink documentation is there any reference to power authorities seeking alternative, less polluting forms of electricity generation. The Branch submission argued that in fact Eastlink was a 'prime example of Commonwealth and States ignoring these responsibilities and combining to create a national competitive market in electricity generated from non-benign resources'. Further, the submission noted: 'The [Eastlink] Project Concept Report on page 2 admits that "Under present trading arrangements savings from interchange of power would arise through substitution of coal based generation for higher cost peaking generation over short periods, and may be quite modest for the foreseeable future. However, emerging national markets may change this...'

6.19 The Branch submission then argued that if Queensland took its obligations on greenhouse gas emissions seriously, and developed gas-based and other options available for peak generation, it would have little need for power from NSW. Queensland has good reserves of gas as well as coal, but gas has much lower production Of CO₂ than coal (in the ratio of 15 to 25). Gas turbines are cheaper and quicker to install than coal fired generators, and can be turned on and off quickly, although some cost more to run. They are invaluable for peak generating capacity and are therefore a good option for reserve.

6.20 Gas fired generators, co-generation, combined-cycle generations renewable energy resources and a sustained effort in demand side management, could reduce greenhouse gas emissions and supply additional energy for the next 15 years. While electricity generated by other forms of energy than co could be transferred along Eastlink, the funding that is going into Eastlink lessens the opportunity for finding to be out into alternative, sustainable form of electricity generation. The submission concluded that Eastlink would remove all incentive for demand side management:

To the extent that the State and Federal Governments set the agenda for electricity supply reform solely on an economic rationalist basis there is no hope for true reform of the industry or for Australia to fulfil its international commitments regarding Greenhouse Gas reduction.

6.21 Finally, the joint submission by ACI and Greenpeace presents a analysis of possible changes in greenhouse gas emissions as a result (Eastlink. Two scenarios are considered: (1) that Eastlink is intended to provide Queensland with access to NSW generators for use as reserve plant and to supply spinning reserve; and (2) that existing Queensland generators are use as reserve plant and to provide the spinning reserve, while electricity imported from NSW. Because both States have a heavy reliance of fossil fuel the two scenarios are similar in terms of level of greenhouse emissions and an alteration in emissions would occur as a result of transmission losses through the interconnection. The analysis concluded that 'there is potential for very small increase in greenhouse emissions, attributable to Eastlink Stage 1'.

Lack of Strategy for Demand Management

6.22 Criticism was made of *Powerlink* that it lacked an overall strategy to reduce levels of electricity consumption, that it had a 'meet the market' philosophy which encouraged consumption. The Allora State School P&C noted in its submission that because power authorities require a minimum payment, regardless of how much electricity is consumed, there is no incentive for small consumers to save.

Transmission Losses

6.23 Many submissions to the Committee expressed the concern that transmission losses from Eastlink would be high. These submissions noted that power generated in the Hunter Valley and sent to Queensland would result in losses much greater than if the electricity was generated closer to where it was to be used. These submissions argued that when electricity is taken from coal fired power stations and sent long distances, high transmission losses meant that a higher proportion of the coal used is wasted, contributing to pollution and, more specifically, to greenhouse gasses.

6.24 One submission pointed out that the nearest generator in NSW is 650 km from Brisbane. In calculating the losses incurred, the author accepted the Power Authority position that Eastlink would be 'super efficient' and that losses would only be 2% per 100 kilometres, and concluded that total transmission losses for electricity transferred from NSW to Brisbane would be 13%. If the Eastlink line, or any other part of the transmission route was not 'super efficient', then this level of loss should be considered to be a minimum.

6.25 Yet the *Transgrid* submission claimed that; 'The interconnection does not inherently cause additional losses on the system. Losses are caused by the dispatch of generation across the system affecting the power flows throughout the network. The interconnection offers the opportunity to share reserve capacity and dispatch generation in an "environmentally friendly" manner taking into account potential losses'.

Conclusions

6.26 The question of impact on greenhouse gas emissions hinges on whether Eastlink will increase the use of coal fired power stations.

6.27 Opponents of Eastlink have argued that if Queensland is to buy electricity from NSW, there would be an increase in the use of coal fired power stations in NSW. This would not only be inefficient in terms of line losses but would result in an increase in the burning of coal and consequently greater production of greenhouse gases.

6.28 Proponents of Eastlink have claimed that it would allow for a more efficient use of resources in both NSW and Queensland by allowing reserve sharing. This would postpone the need for new power generating capacity to be constructed.

6.29 Because there is almost no data available which relates specifically to Eastlink, the Committee is unable to make a decision as to which is the more likely outcome. However, the Committee notes that the potential does exist for greenhouse gas emissions to increase. The Committee therefore recommends that the Commonwealth Government investigate in detail the likely impact of Eastlink on coal consumption and the implications of any change in that consumption for greenhouse gas emissions having regard to its international obligations.

CHAPTER 7

RENEWABLE ALTERNATIVES

Term of Reference (d) the viability of the use of renewable energy sour including hydro-electricity to provide electricity to Queensland consumers.

7.1 As with other issues relating to Eastlink, opinions as to the viability of renewable alternative electricity generating systems were polarised.

7.2 The two power authorities involved believe that alternative electricity generating options have a role but that they cannot supplant the position that Eastlink will hold in the formation of a national grid. *Powerlink* makes it clear that Eastlink has an integral part in a comprehensive Queensland Government energy strategy which also includes demand side management, renewables and cogeneration: 'The policy is not Eastlink or alternative energy - it is Eastlink and alternative energy'.¹

7.3 Opposing this, community groups and individuals argued that Queensland's increasing energy needs could and should be met through a combination of renewable energy generating options, increased attention to demand side management and increased incentives for energy conservation.

Community Opinion

Extent of Community Involvement

7.4 Considerable community resources were invested in submissions to the 'Committee canvassing the range and efficiency of renewable alternatives. For example, the submission by South East Queensland Against Eastlink provided over 100 pages of information about renewable alternatives. The combined Greenpeace/AC17 submission presented an analysis of Queensland's foreseeable electricity needs and the cost effectiveness of Eastlink against various renewables. And the Sustainable Energy Industries Council of Australia sent a comprehensive submission which addressed predictions of energy demand and alternatives for fulfilling that demand. From the submissions sent to the inquiry, the Committee was given a very strong impression that the general public is interested and involved in alternative electricity generating options.

Philosophical Change Needed

7.5 Taken together, the submissions indicated a widespread opinion that reliance on fossil fuels was no longer in Australia's interests because of the global implications of pollution and the greenhouse effect. As indicated by the content of the submissions, many people were not only aware of other options, but were keen for those options to be supported by governments to a greater degree than is happening at present.

7.6 In addition, the view was also frequently expressed that the community would be very willing to participate in energy saving programs. People see such programs as cost effective and able to provide at least partially, if not fully, for the projected increase in Queensland's power requirements over the next decade.

7.7 The prevailing view was that Australia, and in particular Queensland, should diversify its means of electricity generation, move away from large coal-fired power stations, and increase commitment to alternative renewable energy sources and energy conservation measures.² A number of submissions recommended that the Committee read Gavin Gilchrist's book *The Big Switch - Clean Energy for the Twenty-First Century*.

7.8 More generally, the view was expressed that it was time for governments to comprehensively address global environmental problems, and that electricity generation was one important way in which governments could make a significant impact by investing in renewable energy alternatives and fully adopting energy efficiency programs. The benefits of such a policy would extend to employment, and to the expansion of exports throughout the AsianPacific region.

7.9 The opinion was often expressed that a general philosophical change was required for governments to move away from the view that big, centralised electricity generating systems were better than small decentralised alternative renewable systems.

7.10 As summarised in one submission: 'Without this influence, the large conglomerates used to producing power in traditional ways will continue to recommend to government the systems and technology they are used to. Worse, in order to keep the organisations and their own employment intact, there will be a tendency to continue to recommend more of the same, rather than new or different ideas. We will simply end up with more Lake Pedders, as Eastlink surely is'.

7.11 Concern was expressed that the current system of electricity generation in Australia, which directly links profit to the volume of electricity sold, perpetuates thinking along the lines of 'big solutions'. The belief that change is needed was well summarised with the statement that Eastlink is 'last century's solution to next century's needs'.

Alternatives Considered

7.12 The submission provided by South East Queensland Against Eastlink noted:

A range of proven renewable energy technologies are available to provide end-use needs cleanly and efficiently and many are in service in Queensland. These include:

- solar water heaters for pools, homes and commerce
- solar efficient building design
- solar thermal process heat for industry
- solar thermal electricity wind energy systems for electricity and water pumping
- wood heaters and boilers
- process heat and electricity from bagasse
- photovoltaic electrical power supply systems
- mini and micro hydro-electric systems micro hydro-pumping systems
- greenhouses
- crop drying
- timber drying
- salt drying

Research continues into all these technologies and developments to date are very encouraging. Further significant advances will occur before 1998, and enormous advances are likely within the life of any new coal fired power station which may be built in the next few years. Special areas of interest include low cost solar thermal power stations, wind turbines, photovoltaics and remote area power supply systems. Energy storage is another area of progressive development, particularly for electrical energy systems. Many of these technologies are well proven and economical. Others are near economic and become even more so if social and environmental costs are included. Much research is now focused on reducing production costs.

7.13 In summary, Professor Ian Lowe in a recent article argued that: 'all these alternatives look better value economically and politically than carving a swathe through hundreds of kilometres of farmland.'

Economics of Alternatives

7.14 The economic viability of alternatives, compared to Eastlink, will largely depend on the parameters used within comparisons. For example, the cost of photovoltaic cells may not compare favourably with Eastlink if current prices are used. However, if comparisons use anticipated prices, for five years hence when Eastlink would be commissioned, then photovoltaics may well be competitive. More importantly though, if adequate funding is never invested in research, development and initial production of alternative, sustainable energy generation systems, they will never become competitive. Just as conventional sources of power such as coal and gas fired power stations needed massive government support and subsidisation when they were first being developed, alternative systems need strong support before they will become truly competitive.

7.15 When unconventional forms of electricity generation are compared with conventional forms they are frequently disadvantaged. The main reasons for this are, firstly, research and establishment costs of alternative sources are often included in comparisons when they should not be included because similar costs for conventional installations have long been paid for. This favours the continued use of large conventional power stations. Secondly, costs related to environmental damage caused by some conventional forms of power generation (such as coal) are not usually included in comparisons when they should be, because many alternative forms of electricity generation do not have high environmental costs. Opponents of Eastlink claim that the environmental damage caused by the construction of the power line 'may run into millions of dollars'. The inclusion of environmental costs would probably favour small renewable forms of power generation.

7.16 Further it was argued in evidence to the Committee that because Eastlink is narrowly focused on a 'big picture', cost/benefit analyses fail to take into account the potential advantages of decentralised energy strategies, such as regional employment. People believe that it will be hard for power authorities to take on the role of energy service providers offering advice on energy efficient strategies (particularly to large commercial consumers) and to promote energy systems that cause least greenhouse gas production, when they clearly favourable solutions.

7.17 Finally, many people living in rural areas aspire to some degree of self-sufficiency and would prefer to install stand-alone solar systems. However, subsidies provided by large power authorities for connection to the main grid undermine the potential for environmentally sound, self-sufficient energy sources.

Other Solutions - Demand Management & Energy Conservation

7.18 In rejecting the Eastlink proposal, many submissions from Queensland not only called for greater use of alternative sustainable sources of electricity generation, but suggested greater attention to demand management options to reduce power requirements and a shift in thinking from 'consumption' to conservation'.

7.19 A submission from the Australian Democrats stated that energy saving is more cost effective than energy generation at a ratio of about 1:2-3. Estimates of the amount of energy which can be saved through conservation programs are around 20-25%. In Queensland, this would result in about 1000mw of electricity, double that which would be transferred through Eastlink.

7.20 While the QEC claims that there is going to be a 4.9% increase in demand for electricity which will be needed by 1998, to save 4.7% of the State's electricity would only require the installation of solar hot water systems in 33% of the

State's households'. At the moment the penetration rate for solar hot water systems is only 5% in Queensland, while it is 25% in Western Australia and 40% in the Northern Territory.

7.21 Other suggestions for demand management and energy conservation included were:

- to provide incentives for solar hot water;
- off-peak use of freezers and hot water;
- incentives to for home owners to put in insulation;
- compulsory requirement for insulation, solar hot water, off peak connections for freezers, etc in new homes;
- introduce totally flexible working hours to spread the use load;
- more widespread use of solar power;
- increased use of energy efficient lamps;
- architectural advice;
- stand-alone hybrid-systems with servicing agreements;
- change from electricity to gas for cooking, hot water and heating;
- the adaptation of houses designs to increase solar efficiency;
- consumer education;
- price structuring incentives;
- and greater use of energy efficient technologies (appliances).

7.22 In addition, suggestions were made as to how Queensland could increase its generation of electricity without having to construct Eastlink, including; the use of existing power line corridors which already service the major centres by either upgrading current installations or by constructing additional towers along them; the construction of new (alternative) power generation plants where they can be connected directly into existing corridors; upgrade and reactivate closed power stations; and upgrading existing power stations to increase capacity.

Tully Millstream Hydro-Electric Augmentation Project

7.23 The Tully Millstream Augmentation Project is located halfway between Cairns and Townsville, on the Tully River. It would expand the existing Tully Falls Scheme which was built in the 1950s and which is based on the Koombooloomba Dam located in the rainforest catchment of the Upperjully River (a fall of 450m). A new tunnel would drop water direct from the Koombooloomba Dam, 700m to generators deep in the mountains at the level of the coastal plain (water being fed back into the river 19km downstream) and water storage would be supplemented with the construction of two other small dams.

7.24 The new power station would have a -capacity of 600mw, from three 200mw generators. The scheme would have a seven year construction time and a test tunnel has already been driven into the mountain at the site where the power station would be located. The cost of feasibility studies and works to date have been \$26m and the estimated cost of the project is about \$700m in current prices. The estimated maximum workforce during construction would be 1100.

7.25 The Tully Millstream Action Group presented evidence in its submission that the scheme had considerable advantages over other proposals for supplying Queensland's future power needs, including Eastlink. They argued that it was superior in terms of economics, environmental impact and greenhouse gas emissions, and would have other secondary benefits such as tourism, recreation and agriculture (irrigation capacity is built into the scheme).

7.26 Representatives of the Tully Millstream Action Group gave evidence to the Committee at the public hearing in Toowoomba, travelling at their own expense from Atherton. In arguing a case for the project, the Action Group pointed out that the area of real deficiency of electricity supply in Queensland was in the far north, an area which was forced to import 85% of its electricity. Cairns, they noted, is as far from Brisbane as Melbourne is, and Cape York is as far away from Brisbane as is southern Tasmania. North Queensland is rich in resources and has vast tourist potential and the area is expected to have one of the highest growth rates in Australia.

7.27 In their submission, the Action Group argued that the proposed interconnection between NSW and Queensland was one where two areas of surplus electricity supply were being linked. Eastlink, they concluded, was 'not a satisfactory solution to the supply of large power deficiency in the north of Queensland'.

7.28 However, while a number of other submissions to the Committee were in support of the Tully Millstream project, others submissions opposed it. These submissions argued that although hydro-electricity is a clean and renewable resource, the construction of supplementary dams, roads and tunnels raises other land management issues. Simply by the nature of their location, dams inundate areas of highly fertile soils. These soils are now in short supply and the protection of prime agricultural land is important. Both NSW and Queensland have already lost large areas of its most fertile agricultural lands through inundation.

7.29 Other submissions commented that the Tully Millstream project was potentially environmentally damaging as it would result in the loss of a large area of important animal habitat and would reduce the region's biodiversity. If the site was in a world heritage area, two submissions argued, the project would probably not be allowed. One submission concluded that the Tully Millstream project was 'brilliantly engineered but environmentally challenging'.

7.30 In discussing potential environmental impact, the Tully Millstream Action Group emphasised that because the scheme is an augmentation of an existing scheme, the environmental impact would be minimal. Powerlines would follow existing routes and the proposed new access road would be located in open woodland, not rainforest.

Conclusion

7.31 Throughout the current inquiry, the Committee was impressed by the knowledge and enthusiasm that community groups and individuals hold for alternative renewable forms of electricity generation.

7.32 The Senate Standing Committee on Industry, Science and Technology in its 1992 report, *Gas & Electricity - Combining Efficiency and Greenhouse*, stated that Queensland would be an ideal place to further research on renewables and recommended that the development of a national grid must not preclude the further development of options such as demand management, cogeneration and new technologies.

7.33 Despite the outcome of the Eastlink interconnection, the Committee reiterates the opinion expressed in the *Gas and Electricity Report* that Queensland would be an ideal place for increased research and development of renewable energy options.

A B Ferguson
Chairman

MINORITY REPORT
Senator John Woodley - Australian Democrats

The Australian Democrats believe that the Committee's Report provides a good outline of the many issues involved in the Eastlink proposal and endorse the Committee's findings. In particular, the Committee's findings and recommendations on the social impacts, the weight of public concern about Eastlink, the unsatisfactory public consultation and Environmental Impact Assessment processes, and the need to ensure adequate and accurate compensation to those effected should be noted.

Additional Recommendation Given the enormous amount of money which will be expended on Eastlink, the Democrats believe the governments involved should reconsider their commitment to the proposal until such time as the concerns outlined in this Report and in these additional comments have been adequately investigated. Such investigations must be open to public input and scrutiny.

Broader environmental consequences

The Democrats believe the evidence provided to the Inquiry shows

- a continuing lack of support by governments or the electricity industry for encouraging the reduction of electricity consumption throughout the community, and
- an ongoing failure to provide serious support or encouragement to alternative energy options, and
- little or no consideration given to the potential impact of Eastlink on greenhouse gas emissions.

The ACF and Greenpeace submission found that Eastlink is highly unlikely to satisfy the Qld Government's resource acquisition criteria. In comparison with the alternatives modelled, Eastlink is the least likely to result in Greenhouse gas savings. There are a number of alternatives which have a higher probability of providing CO2 savings at lower cost than Eastlink.

The question of impact on greenhouse gas emissions hinges on whether Eastlink would mean the ongoing use of coal fired power stations at the expense of options that would mean lower greenhouse emissions.

Health impacts

The Democrats also believe the evidence provided to the Inquiry, particularly by Dr Richard Lubin, on the potential health effects of exposure to Electro-Magnetic Fields was scientific and credible. As a minimum, electricity authorities should abandon their current approach of trying to discount or ridicule such evidence. All future projects which involve the potential of public exposure to EMF should take the possible health impacts into consideration.

The Competitive Energy Market

Changes within the market system were seen as necessary to bringing changes to the electricity industry. The assumption that large centralised power stations and long distance transmission will continue as the dominant technology were seen as underlying Eastlink. It needs to be emphasised that Eastlink is seen by many submissions as not being necessary for effective trading in the competitive energy market.

"Eastlink highlights the changed world of the energy industry. Eastlink and the NGMC are seen as commodity vendors trying to sell more electricity as opposed to the developing of an energy services Market (*Lockyer against Eastlink submission*)

" The majority of customer benefits resulting from participation in the competitive energy market will occur without physical interconnection." "Investment in energy efficiency as an alternative to Eastlink would increase customer choice and could be the beginning of a competitive market in Queensland that treated demand and supply side investments as interchangeable" (*Greenpeace/ACF*)

The ongoing failure of governments and electricity authorities to seriously consider or promote reduction in energy consumption levels throughout the community, or to adequately encourage alternative energy production must be acknowledged.

An investment of public monies of the magnitude which Eastlink requires needs to be justified at least against the next best option. The Democrats believe that the power authorities involved should make available to the public a more detailed cost/benefit analysis of Eastlink- and alternatives to Eastlink.

The scope for benefits from the interconnection of the electricity grids between Queensland and NSW has long been advocated by the electricity industry, Whilst the industry may well benefit, it is less clear how much economic or environmental benefit there is for the wider community

As the submission from Greenpeace and ACI outlined, the majority of customer benefits resulting from participation in the competitive electricity market will occur without physical interconnection. (*Greenpeace/ACF p 2 Para 4*)

Statements at a Committee hearing by representatives from the Federal Department of Primary Industries and Energy clearly illustrated that Eastlink is part of the ongoing implementation of the National Competition Policy. The Democrats' concerns about the negative social consequences, particularly for people in rural areas, of the Hilmer reforms embodied in the Competition Policy have been voiced repeatedly in the Senate and elsewhere. The widespread community concerns about Eastlink are just one more demonstration of the fact that there is the potential for a very big downside to Hilmer and the National Competition Policy.

Conclusio

Until there is a serious commitment to action in these areas, the community will continue to face many more Eastlinks in the future, with an ongoing repetition of the problems that have been identified in this Report.

Senator John Woodley, Australian Democrats

**LIST OF SUBMISSIONS RECEIVED FROM
ORGANISATIONS AND INDIVIDUALS**

No.	Submission	State
1	Allora Landcare Group, Allora	QLD
2	Sarah Moles, "Umgawa", Allora	QLD
3	Michael Batt, Uralla	NSW
4	Marie Johnston, Allora	QLD
5	Joseph Sweeney, "Hillview", Killarney	QLD
6	Lindsay Stewart, "Moray", Guyra	NSW
7	N. Scholl	
8	W. Marshall, "Gone by Chance", Guyra	NSW
9	Joe Delahunty, Allora	QLD
10	P.C. Huillier, Biloela	QLD
11	Ann Baker, Koreelah	NSW
12	S.W. Skipper, "Ollera", Guyra	NSW
13	Hope Delahunty, Allora	QLD
14	Maxwell O'Brien, Glen Innes	NSW
15	Ingrid Matuzelski, "Bony Mountain", All	QLD
16	Jim Kerr, "Fordsdale", Ma Ma Creek	QLD
17	Ted & Preuda Groom, Guyra	NSW
18	John & Lise Leatherbarrow, Allora	QLD
19	E. Finlay, Clifton	QLD
20	June Gilmore, Clifton	QLD
21	Anne Waugh, Wandsworth	NSW
22	Mr & Mrs T.H. Anderson, Armidale	NSW
23	A.J. Martin, "Willandra", Guyra	NSW
24	Harry Castle, "Hazelwood", Helidon	QLD
25	A. & S. Wallace, Grantham	QLD
26	Confidential	NSW
27	A. J. & R. J. Franklin, Clifton	QLD
28	Denver Kanouski, Brigalow	QLD
29	R. J. & E. A. Bell, "Bellview", Inverell	NSW
30	N. Lumn, "Laureston", Inverell	NSW
31	Rev. Father E.V. Murray, St. Patrick's Presbytery, Allora	QLD
32	Garry Verri, "Bar Gary", Tenterfield	NSW
33	Robert Martin, "Stockbridge", Guyra	NSW
34	John and Gwen Peters, Allora	QLD
35	Geoff & Mary Cooney, Allora	QLD
36	M. Vietheer, Helidon	QLD
37	Ian Olsson, Australian Transmission Line Avoidance Society, Sunnybank	QLD
38	E. Mulligan, "Ellerslie", Guyra	NSW
39	F.O. McCann, "Creslea", Allora	QLD
40	Phillip & Julia Rose, TarwelP, Armidale	NSW
41	D.D.R. Long, "Harmony Hills% Clifton	QL
42	K. & C. Jaques, Clifton	QLD
43	Condamine Catchment Co-ordinationg Committee, Allora	QLD
44	P. Shalice, Toowoomba Field Naturalist Club Inc., Toowoomba	QLD
45	A. C. Butler, "Tabletop", Allora	QLD
46	T. E. Richardson, Camboya	QLD
47	Margaret Miller, Grantham	QLD
48	Ross and Beryl Waters, "Rodbeny", Guyra	NSW
49	Dr P. Howden, Macleay Island	QLD
50	Mr and Mrs Mays, Deception Bay	QLD
51	Mrs M.E. Wright	
52	Mr and Mrs Cumming, "RockpooP, Armidale	
53	Ian Moller, Ferny Grove	QLD
54	Richard Jones, Member of the Legislative Council, Sydney	NSW
55	L. Fenner, "Nevilton", Clifton	QLD
56	E. Brumpton, "Spring Valley", Allora	QLD
57	Wayne Rowe, Beenleigh	QLD
58	V. Sambell, "Verona", Inglewood	QLD
59	H. Deucker, Grantham	QLD
60	Peter Hutcalfe, President, National Parks Association of NSW, Armidale Branch	NSW
61	G. S. Mulligan, "Glenore", Guyra	NSW
62	Maric Mulligan, "Glenore", Guyra	NSW

63	Ben Mulligan, "Glenore", Guyra	NSW
64	P. J. & S. Mulligan, "Glenore", Guyra	NSW
65	Naomi Mulligan, "Glenore", Guyra	NSW
66	Confidential	
67	Anne Waugh, Wandsworth Community, Wandsworth	NSW
68	James Jackson, Secretary, Tenterden Bush Fire Brigade, Guyra	NSW
69	James Jackson, banchory Park, Guyra	NSW
70	James Jackson, Chairman, Guyra Landeare Group, Guyra	NSW
71	John Hartmann, Bald Blair Action Group	NSW
72	L.R. & M.D. Ward, "Millic Vale" ' Guyra	NSW
73	Gary & Kathy Harm, "Mount Whitestone", Grantham	QLD
74	Paul Sutton, Grantham	QLD
75	Pauline Sutton, Grantham	QLD
76	Mrs J. Jackson, Guyra	NSW
77	JR. Wurth, "St. Omer", Stanthorpe	QLD
78	Michael Vickery, Guyra	NSW
79	John Flerning, "Marinka" Ben Lomond	NSW
80	Allan Kleidon, Gatton	QLD
81	R.S. Gibbs, Cunnamulla	QLD
82	Mrs Gwendoline Croft, "Milparinka", Guyra	NSW
83	Mrs Noela Gibbs, Allora	QLD
84	Janelle Brazel, "Morven West, Guyra	NSW
85	Mr R. Robertson, Guyra Shire Council, Guyra	NSW
86	R.E. & L.M. Coddington, Armidale	NSW
87	G.C. Seibel, Warwick	QLD
88	M.C. Ruffle, Clifton	QLD
89	L. Schumacher, Gatton Shire Council	QLD
90	Confidential	NSW
91	Commonwealth Department of Primary Industries and Energy, Canberra	ACT
92	A.J. Peterson, "Grace Vale", Old Koreelah	NSW
93	Ms Clare Cotton, Warwieffi	QLD
94	J.W. Deacon, "Eldersfield", Allora	QLD
94A	J W Deacon, Supplementary Submission	QLD
95	Mr & Mrs Johnson, "Wavehi 11% Armidale	NSW
95A	Mr & Mrs Johnson, "Wavehi P, Armidale	NSW
96	Denis & Jenifer Wright, "Ascot Park" Black Mountain	NSW
97	Mrs Betty Moore, JP, Inverell	NSW
98	John Saunders, Warwick	QLD
99	Sue & Gwen Jephcott, "Orana Falls" Armidale	NSW
100	Mrs R.A. Ford, "Norwood", Guyra	NSW
101	M.M.T. Long, "Harmony Hills" Clifton	QLD
102	B.A. Birley, Secretary, Wheatvale State School, Warwick	QLD
103	E. McGarva, Grantham	QLD
104	Anne Finlay, "Melva" Dalveen	QLD
105	Chris Riggs, Warwick	QLD
106	E. Horrocks, Grantham	QLD
107	C.D & J.1). Wilford, Armidale	NSW
108	Leanne Johnson, Allora State School P&C Association	QLD
109	K.W. McNamara, Lockyer Valley Against Eastlink, Gatton	QLD
110	K.W. McNamara, Guyra	QLD
111	Judith Frills, Waverley Pastoral Co., Guyra	NSW
112	Cathie Diete, Gatton	QLD
113	G.A. & H.M. Bennett, "Hillsborough", Guyra	NSW
114	Margaret Bloomfield, Killarney	QLD
115	E.H. & D.M. Lackey, "Coochooboonah", Inverell	NSW
116	Mrs P. Buckhell, "Elmore Station" Inverell	NSW
117	Roger Sambell, "Verona", Inglewood	QLD
118	B.M. Smith, "Rurelstone", Warwick	QLD
119	Betty & Grahame Windolf, Gatton	QLD
120	Maureen Hallaran, "Wanderlea", Glen Innes	NSW
121	Gregory & Katherine Tighe, Guyra	NSW
122	Darryn and Melinda Windolf, Gatton	QLD
123	Garry Noumann, Ma Ma Creek	QLD
124	Dr David G. Ure, Toowoomba	QLD
125	Neil Evans, "Balcara Stud", Grantham	QLD
126	Imelda Ivey, Warwick	QLD
127	Terry and Lynette Sauer, Armidale	NSW
128	Paul and Sharron Windolf, Gatton	QLD
129	Jillian Foley, "Dallyn", Armidale	NSW
130	A. & R. Friend, Matheson	NSW
131	B.J. and P.M. Bridge, Toowoomba	QLD
132	Mrs Noelene Miller, "Glenroy", Guyra	NSW
133	D.A. & B. Leek, Gatton	QLD

134	Robert Bauer, Gatton	QLD
135	R. Bauer, President, Mount Sylvia School Parents and Citizens Association	QLD
136	Confidential	
137	Dr G Edwards and Mr A. Davis, Global Energy Network International, Milton	QLD
138	Jennifer Anderson, Taloola", Glen Innes	NSW
139	Lock Rogers, "Wattletop", Guyra	NSW
140	Christina Peebles, Northern Rivers Energy Action Network, Rosebank	NSW
141	Julie Pratt, Secretary, Traprock Branch, South-East Queensland Against Eastlink/TOTA, Stanthorpe	QLD
142	Jason Neville, State Secretary, Australian Democrats, Queensland Division, Brisbane	QLD
143	W.J. Coward, Glen Innes Natural Resources Advisory	NSW
144	Electricity Supply Association of Australia Ltd, Melbourne	VIC
145	Dr Muriel Soden, Alligator Creek	QLD
146	I. Rosser, Warwick	QLD
147	A.J. and D.M. Chandler, Allora	QLD
148	Tom Cilmore MLA and Lawrence Springborg MLA, Brisbane	QLD
149	Z.P and L.M. Hoey, Santalea Santa Gertrudis Stud, Clifton	QLD
150	Mrs I. Burge, Clifton	QLD
151	D.C. Williams, "Crestview", Armidale	NSW
152	Andrew Futter, "Tirranna", Glencoe	NSW
153	B.H. Burge, Clifton	QLD
154	Jennifer Granger, Guyra	NSW
155	George and Mona Ward, "Reedy Creek", Guyra	NSW
156	Lisa Weldon, Allora	QLD
157	Bev Christensen, Allora	QLD
158	Alan Geelan and Patricia Sly, Blacktown	NSW
159	Roger Alsop, Roger Alsop Consulting, North Ryde	NSW
160	John and Cathy Cowley, Allora	QLD
161	Neil Chandler, Allora	QLD
162	Holly Norton, Mt Whitestone	QLD
163	Cathy Chandler, Allora	QLD
164	John Lovelace, Chairman, Condamine Catchment Committee Toowoomba	QLD
165	Mr and Mrs Van Luyn, Grantham	QLD
166	W.A.K.A (Warwick/AlloraJKarara Action Group)	QLD
167	June Small, Warwick	QLD
168	G.G. Retchly, Gatton	QLD
169	Richard Lutz, Mt Whitestone	QLD
170	L.N. and L.B. Chandler, Clifton	QLD
171	Mr A.D. Gamgee, Yangan State School, Yangan	QLD
172	J. Jackson, "Banchory Park" Guyra	NSW
173	R. Gertz, Allora	QLD
174	P.J. Gould, "Yandooya", Warwick	QLD
175	Neil Baxter, Grantham	QLD
175A	Neil Baxter, Grantham	QLD
176	Kathryn Steel, Gatton	QLD
177	Dr M.H. Repacholi, Royal Adelaide Hospital, Adelaide	SA
178	Graeme Stringer, Dental Surgeon, Warwick	QLD
178A	Graeme Stringer, Dental Surgeon, Warwick	QLD
179	Torgils and Alma Sorlie, Allora	QLD
180	L.S. and A.P. Braithwaite, Allora	QLD
181	Mehta McWhinney, Warwick	QLD
182	Anthony Lawler, Warwick	QLD
183	D. and R. McHardie, Allora	QLD
184	A. Dyhers, Allern	QLD
185	J. and S. Hendon	QLD
186	M. Brien, Allora	QLD
187	G.M. Fraser, Warwick	QLD
188	L. Nolan, Allora	QLD
189	J. Julilla, Warwick	QLD
190	J. Gurrie, Allora	QLD
191	P.R. Long, Gympie	QLD
192	Dr Higson, Australian Nuclear Association, Sutherland	NSW
193	Desiree Mahoney, Convenor, The Brisbane Valley Greens, Esk	QLD
194	Confidential	
195	B.A. Smith, Allora	QLD
196	PM Wren, Allora	QLD
197	C.J. Lawler, Allora	QLD
198	T. Beaver, Warwick	QLD
199	J.R. Nitschkis, Warwick	QLD

200	Andrew W. Wood, Swinburne University of Technology	VIC
201	Maree Lawler, "Hillview"	QLD
202	J. Whistler, Secretary, Lockyer Against Eastlink Group Inc.	QLD
203	Tully Millstream Action Group	QLD
204	B.G. Finlay, Finlay Pastoral Company	QLD
205	David Cleary	QLD
206	LG. Agnetts	QLD
207	Murray Davis	QLD
208	Karlee Holborn, "The Cottage"	QLD
209	Joan Rawkins	QLD
210	Beniadine Bradshaw	QLD
211	Nola Adarns	NSW
212	Sue Cowley, Allora	QLD
213	Mrs E. Genson, Toowoomba	QLD
214	Mrs Diane Jones, Warwick	QLD
215	John & Kim Hynes	
216	Ian Flux, Warwick	QLD
217	Edna Goodwin, Warwick	QLD
218	Christine Brassington, Helidon	QLD
219	Ray & Anne Clarke, Warwick	QLD
220	Maria Jeloudev, Warwick	QLD
221	Electricity Transmission Authority Sydney	NSW
222	TeMY and Uta Larsen. TOTA, Guyra	NSW
223	Dr Colin Roy, Australian Radiation Laboratory, Yallambie	VIC
224	Gloria Bradfield, Warwick	QLD
225	Ian Bradfield, Warwick	QLD
226	Susan and John Sypkens, Arraidale	NSW
227	David Lawler, "Hillview", Warwick	QLD
228	John and Helen Lewis, "Montrose", Warwick	QLD
228A	John & Helen Lewis. Supplementary Submission	QLD
229	M.Lawler, South East Queensland Against Eastlink	QLD
230	A.J. & L. B. Sparksman, "Mascotte Park"	QLD
231	Bill Major	QLD
232	Gerard Walsh, "Coobesha"	QLD
233	Peter Briggs, "Hendon Fields"	QLD
234	John Atherton, "Lockyer Resource Management Group"	QLD
235	Mrs N. Henry, "Rocky Pond"	QLD
235A	Mrs N. Henry, "Rocky Pond"	QLD
236	Sarah Henry, Kids of the Corridor	QLD
237	Robert William Doro, "Carline"	QLD
238	P.A. Pearce	QLD
239	Jim Petrich, The Cattlemen's Union of Australia Inc.	QLD
240	The Davies Family	QLD
241	Dennis Murray, Waterview	NSW
242	Mr & Mrs N.L. Baigent, Aspley	QLD
243	Stephanic Keys, Toowoomba and Region Environment Council, Toowoomba	QLD
244	Matt Keys, Surfrider Foundation, Burleigh Heads	QLD
245	Gwen Orman, Grantham	QLD
246	G.E.Reid, Laidley Shire Council, Laidley	QLD
247	Mrs E.J.Smith, Armidale	NSW
248	Helen Kennedy, Councillor of Sevem Shire, Glen Innes	NSW
249	Robert Snow, Warwick	QLD
250	Patricia Kennett, Toowoomba	QLD
251	Mr and Mrs Finlay, "Reatta"	QLD
252	Dr Brian McLaren, Allord	QLD
253	Cameron Way, Armidale	NSW
254	Roy Fox	QLD
255'	Martin Simons,	
256	Jeffrey and Julie Kalinowski, Ma Ma Creek	QLD
257	Sue Gordon, "Rockmont", Allora	QLD
258	Katherine Evans, "Te Marua", Armidale	NSW
259	Keith Tarlo, Greenpeace and Peter Kinrade, Aust. Conservation Foundation	QLD
260	Harold van de Wiel, Aspley	QLD
261	Dr Liz Stringer, Warwick	QLD
261A	Dr Liz Stringer, Warwick	QLD
262	Mrs Jean Burge, "The Hollow", Allora	QLD
263	EV Murray, Ministers Fraternal, Allora/Clifton	QLD
264	Tannymorel State School, Warwick	QLD
265	Pilton State School, P&C Association, Clifton	QLD
266	Black Plains State School, P&C Association, Clifton	QLD
267	Ian Maemillian, Melbourne	VIC
268	Mr Joe Casteleijn, Redland Bay	QLD

269	Mr Derek Newton, Stanthorpe	QLD
270	Powerlink Queensland	QLD
271	Mr Les Dalton, North Carlton	VIC
272	Dr Richard A. Luben, Riverside California	USA
273	Sustainable Energy Industries Council of Australia, Inc	ACT
274	Dr Mark A Israel, California	USA

LIST OF PUBLIC HEARINGS, BRIEFINGS AND INSPECTIONS

Public Hearings were held as follows:

10 October 1995	Toowoomba
12 October 1995	Armidale
7 November 1995	Melbourne
8 November 1995	Canberra

Inspections were held as follows:11 October 1995 Toowoomba/Warwick

- Springdale (proposed 500 Kv substation site) via Reynolds Lane and Helidon Hills Lookout.
- Ma Ma Valley via Vietheer farm to view proposed powerline route, existing powerlines and gas pipeline and Harms Biodynamic Farm.
- Informal local gathering at Kieran MacNamara's home and lookout over valley to Paradise Mountain (morning tea with 30 locals).
- Brief stop at Mt Whitestone State School).
- Allora via Heifer Creek Road and New England Highway
- Street parade, Allora
- Fred McCann's Property at Tabletop, meet DPI Soil Conservation Officer.
- Drive via Yankee Gully Road to view Koala habitat & breeding area for Red-tailed Cockatoo affected by proposal.
- Fly Massie to Armidale

13 October 1995 - Armidale/Guyra

- Visit Heritage Listed Property "Ollera", Guyra (Bill & Linda Skipper)
- Visit "Come by Chance", Tenterden, via Guyra (Mr Graham Marshall and neighbouring property owners)
- View substation site, east of Armidale
- Visit "Carwell (Phillip & Julia Rose)

LIST OF WITNESSES**Toowoomba (10 October 1995)**WAKA (WarAick/Allora/Karara Action Group) &
South East Queensland Against Eastlink

Mrs Sue Gordon	Co-Chairperson, SEQAE
Mr Dennis Long	Member
Mrs Helen Lewis	Spokesperson, SEQAE
Mr Roy Fox	Member
Dr Graeme Stringer	Member
Mrs Sarah Moles	Member

St Patrick's Presbytery

Rev Father E.V. Murray

Lockyer Against Eastlink

Mr Kieran McNamara	
Mr Bruce Boyes	Committee member
Mrs Judy Whistler	Secretary
Mr Brian Clarke	Adviser
Mr Peter Frieze	Adviser
Ms Kim. Easton	Adviser
Mr Mike Gregory	Adviser

Gatton Shire Council

Mr Bernie Sutton	Mayor
Ms Nelly Carew	Councillor

Laidley Shire Council

Mr Doug Smith	Manager - Planning Services
Mr Rod Towner	Councillor

Global Energy Network International (QL-D)

Mr Anthony Davis	Queensland Affiliate Co-ordinator
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Traprock Branch, SE Queensland Against Eastlink/TOTA

Mr Lloyd Finlay	Chairperson
Mrs Julie Pratt	Secretary
Mr Beau Ferrier	Member

Tully Millstream Action Group

Mrs Jancene Wallwork	President
Mrs Jennifer Brownie	Secretary

Kids of the Corridor

Ms Sarah Henry	Member
Mr Ian Lewis	Member
Ms Gretta Flentschel	Member
Mr Justin Cowley	Member

Toowoomba Environment Council

Mr Lee Mason	Executive Committee Member
Mr Simon Hughes	Executive Committee Member
Mr Michael Gregory	Technical Adviser, Environmental & Ecological matters

Armidale (12 October 1995)TOTA - Totally Opposing The Eastlink Grid

Mr Terry Larsen	Co-ordinator
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Dr Rob Davidson	Spokesperson
Mr Stan Bolden	Spokesperson
Mr Keith Stevenson	Member
Ms Kym Kilpatrick	Spokesperson, Health

Guyra Shire Council

Mr Stuart St Clair	Mayor
Mr Roydon Robertson	General Manager

Bald Blair Action Group

Mr John Hartman	Chairman
Mr David Henderson	Secretary

National Parks Association of NSW

Mr Peter Metcalfe	President
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Glenrac (Glen Innes Natural Resources Advisory Committee)

Mr Jim Coward	Vice-Chair
Mr Denis Haselwood	Representative, Dundee Landcare Group
Mr Murray Coward	Representative, Guyra Landcare Group

Tenterden Bush Fire Brigade, Guyra Landcare Group and
"Banchory Park"

Mr James Jackson	Representative
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<u>Dr Brian McLaren</u>	Veterinarian
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Phillip & Julia Rose "Carwell"

Melbourne (7 November 1995)

Electricity Supply Association of Australi

Mr Keith Orchison	Executive Director & Chief Executive Officer
Mr Michael Dolan	Assistant Director & General Counsel & Manager EW Advisory Group

<u>Dr Michael Repacholi</u>	Scientist
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<u>Dr Andrew Wood</u>	Scientist
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<u>Dr Colin RZ</u>	Scientist
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EMF Advice

Mr Ian Macmillan	Representative
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Canberra (8 November 1995)

Department of Primary Industries & Energy

Mr Mike Todd	Electricity & Gas Reform Task Force
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Mr Denis Toivonen	Electricity & Gas Reform Task Force
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Australian Bureau of Awicultural Research and Economics (ABARE)

Dr Roger Stuart	Manager, Energy Economics Branch
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<u>Dr Richard Luben</u>	Scientist
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Professor Mark Israel

Scientist