ENERGY 83

Canberra, 11-13 May, 1983

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ENERGY 83

TOWARDS AN ENERGY POLICY FOR AUSTRALIA

CANBERRA
11-13 MAY 1983

POSITION PAPERS

ERRATA

TAYLOR, CURNOW, HOPKINS, WALL

ENERGY RESEARCH, DEVELOPMENT AND DEMONSTRATION IN AUSTRALIA.

Page 1

Year	Basic Research	Applied Research	Development
1976-77	34.2%	55.2%	10.6%
1979-80	30.7%	56.5%	12.8%

Page 5

TABLE V
NERDD PROGRAM FUNDING 1978-1983

Year	NERDD Program-Funds Committed
	$M
1978-79	15.537
1979-80	25.815
1980-81	18.506
1981-82	19.384
1982-83	16.848
Total	96.090 *

Source: Department of National Development and Energy

* Does not include $0.577m for R&D information projects not associated with any Technical Standing Committee.

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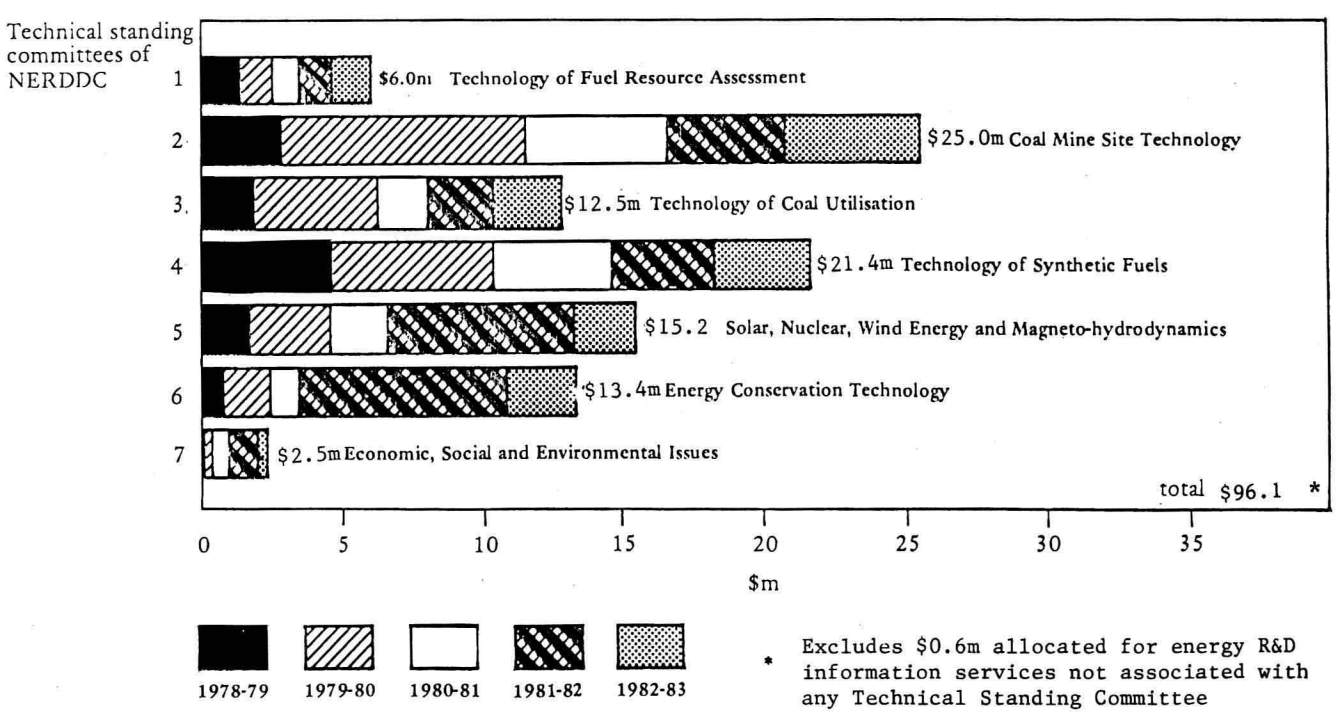

Figure 2 National Energy RD&D Program - Funds Committed 1978-79, 1979-80, 1980-81 1981-82 and 1982-83.

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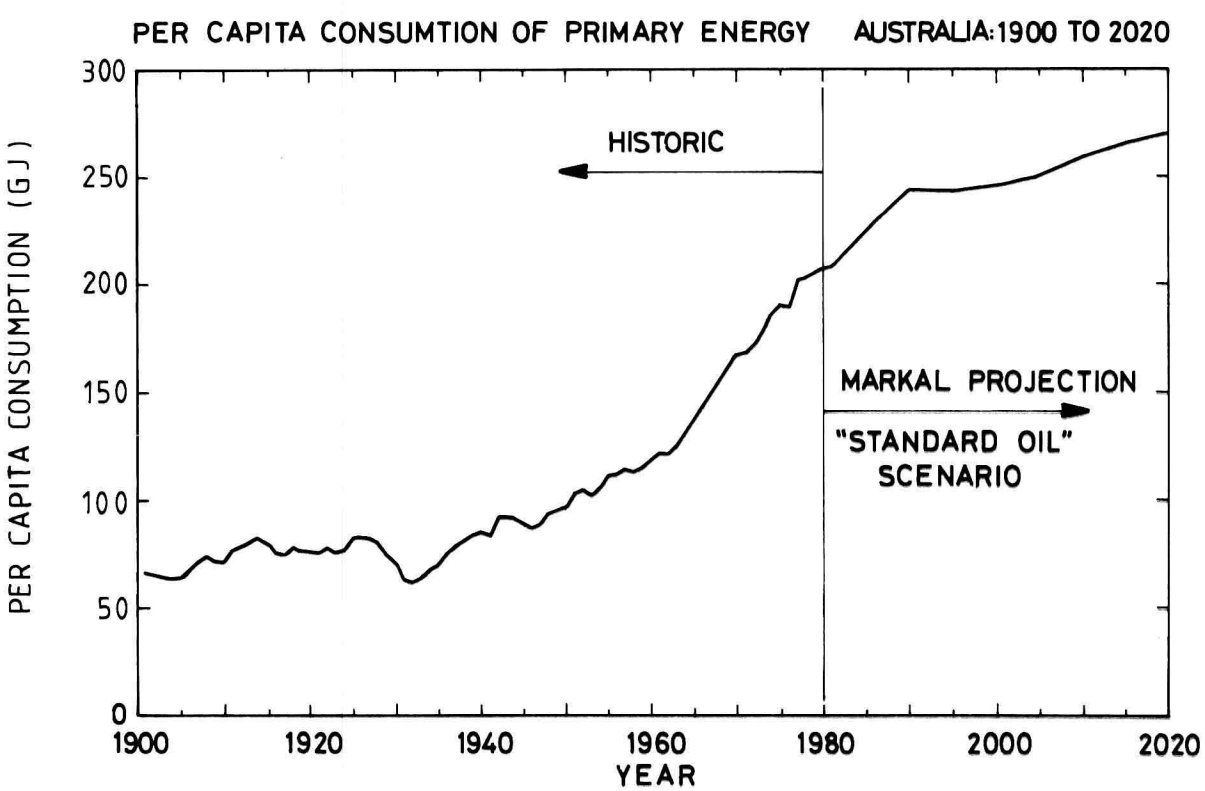
ERRATUM

Wilcox et al. Position Paper A6

p. 126 Replace Figure 3 by that below.



TOWARDS AN ENERGY POLICY FOR AUSTRALIA: POSITIONS AND CONSIDERATIONS IN 1983

THE CONFERENCE COMPENDIUM

The purpose of this Compendium is to provide material relevant to consideration in Conference of longer term energy policies for Australia. The principal part of that material is contained in the seventeen Position Papers. An account of how these papers were developed is also given so that the coverage and perspective presented can be better understood. Key issues identified in these papers will help to set the agenda for the workshop sessions of the Conference. Whilst the material provided is extensive, it will be supplemented during the Conference by individual addresses of distinguished speakers on topics shown in the program. Their speeches will be issued separately. Also, participants in the Conference may find it useful to peruse again some of the major policy statements that have been issued by governments. These are not provided as such in the Compendium, but for convenience, a short bibliography of them is included. Also, organisational representatives or individual participants in the Conference may wish to table or bring to notice other writings they consider relevant to the objectives of the Conference. A listing of those so made available will be passed to the Conference Rapporteur for recording, as appropriate in the proceedings of the Conference.

Sponsored and Organised by:

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Responsibility for the contents of this compendium rests upon the authors and not the sponsoring organisations.

Energy 83 Conference
Joint Organising Committee,
11 National Circuit,
Barton, A.C.T. 2600

CONTENTS

POSITION PAPERS

PREFACE

This Compendium includes seventeen Position Papers prepared by separate Working Parties, drawn from members of the sponsoring organisations, who have sought in a "learned society" framework to draw together material, data and viewpoints they consider will foster informed discussion at the Energy 83 Conference, which seeks to look at Australia's energy futures for the next twenty years and beyond. The material selected and the viewpoints put are the responsibility of the Working Parties alone and not necessarily those of the sponsoring organisations nor the parent enterprises of individual members. I am sure, however, that Working Party members would wish me to express our appreciation of the support they have received from their enterprises in time, resources and information.

The Position Papers have been grouped into three main categories, namely those dealing with —

A. Policy factors affecting energy use and development

B. Resource and production factors both as opportunities and limitations,

C. Utilisation factors stimulating or inhibiting energy consumption.

As is to be expected, the "A" group of papers deal with broader aspects and to some degree draw on the more detailed sectoral papers in groups "B" and "C". However each Working Party has identified what it considers to be the key issues in its areas of review and these have been brought together in the introductory section of the Compendium.

It remains for me to thank the many contributors to this Compendium both direct and indirect for what has been a most substantial voluntary effort, which I hope will stimulate professional and public debate on Australia's energy situation not only at the Conference, but beyond. I would also like to thank the members of the Joint Organising Committee who have assisted in this and in many other aspects of the preparations for the Conference.

S.K. Langley, A.O.
Chairman,
Joint Organising Committee

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WORKING PARTIES

GROUP 'A' POLICY FACTORS AFFECTING ENERGY USE AND DEVELOPMENT

TOPIC A1 — 'Australian Energy Supply/Demand Pattern Changes Since 1977'

E.D.J. Stewart (Convener)
B.B. Bennett
G.M. Folie
N.A. Galwey
J.C. Miller
J.L. Symonds
J. Tysoe

TOPIC A2 — 'Economic Aspects of Energy Policy'

G.W. Edwards (Convener)

TOPIC A3 — 'Human Resources for Energy Developments in Australia'

B. Rawlings (Convener)
R.H. Arthur
J. Bowdler
L.A. Endersbee
N.W. Fisher
J.R. Hamilton
M. Messenger
F.J. Miller
D.J. O'Connor
R.A.H. Simpson
E. Stokes

TOPIC A4 — 'Environmental and Social Aspects of Energy Policy'

H.J. Higgs (Convener)
J.R. Burton
F.G. Fisher
G.G. Kelleher
D. MacRae
H. Saddler
K.P. Stark
G. Willcox
R. Bilger (to March '82)

TOPIC A5 — 'Energy Research, Development and Demonstration in Australia'

G.H. Taylor (Convener)
W.R. Curnow
R.G. Hopkins
T.F. Wall

TOPIC A6 — 'Energy Scenarios and the Role of Modelling'

G. Willcox (Convener)
P. Essam
D. Filmer
H.J. Higgs
D. James
G.G. Kelleher
D. MacRae
H. Saddler
H.K. Worner

GROUP 'B' RESOURCE AND PRODUCTION FACTORS BOTH AS OPPORTUNITIES AND LIMITATIONS

TOPIC B1 — 'Coal'

T.G. Callcott, H.R. Goode (Conveners)
N.A. Brown
J. Cramsie
R.G. Davies
M.A. Johnson
G.R. Rigby
F.F. Roxborough
I. McC. Stewart
K. Sullivan

TOPIC B2 — 'Synthetic Liquid Fuels in Australia'

R.A. Durie (Convener)
G.R. Drewe
P. Huggins
I. McC. Stewart

TOPIC B3 — 'Liquid Fuels — Petroleum'

A.L. Salusinszky (Convener)
H.W. Baddams
J. Harry
D. Nicklin
T. Ramsey
I. Shedden
G. Shiels

TOPIC B4 — 'Gas Supply Until 2000 : Some Policy Options'

R.D. Palmer (Convener)
D. Boddam-Whetham
J. Burnside
P.R. Eiszel
J.E. Hayes
R. Hutchinson
D. Polglaze

TOPIC B5 — 'Nuclear Energy'

J.L. Symonds (Convener)
A. King
J.O. Reynolds
H. Saddler
R.K. Warner
R.E. Wilmshurst

Addendum to B5

Z.J. Holy
J.J. Thompson

TOPIC B6 — 'Energy from Biomass'

R.G.H. Prince (Convener)
J.P. Barford
D. Barrett
R.B. Brooks
I. Gorrie
P.F. Greenfield
J.S. Keniry
K.D. Kirby
A.G. Lane
I.G. Prince
B.J. Ralph
P.A.D. Rickard
G.A. Stewart
B. Wonder

TOPIC B7 — 'Solar Energy'

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R.E. Collins
M. Kingsmill
W.R. Read
L.G. Turner
E.A. Woodley

GROUP 'C' — UTILISATION FACTORS STIMULATING OR INHIBITING ENERGY CONSUMPTION

TOPIC C1 — 'Electric Power'

I.W. Meldrum, I.W. Steele (Conveners)
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TOPIC C2 — 'Energy Use — Industry'

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TOPIC C3 — 'Energy Use — Transport'

N.F. Gentle (Convener)

TOPIC C4 — 'Energy Use and Conservation in Buildings'

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E.R. Ballantyne
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A. Van Ocken

INTRODUCTION

1. PURPOSE AND CONTEXT

The purpose of this Compendium is to provide material relevant to consideration in conference of longer term energy policies for Australia. Policy analysis and formulation even in the short term ought to be recognised as a considerable intellectual challenge involving the examination and synthesis of many political, social, economic, environmental and technical factors. When the examination is extended over a time frame of 20 years or longer this is a still more daunting task, if approached in a rigorous manner. This is the challenge to be faced if 'policy paralysis' is to be avoided on the one hand or arbitrariness of and inconsistency in decisions are to be minimised on the other hand. Thus it must be clear to both 'policy makers' and the 'community-at-large' that the Energy 83 Conference within its bounds has faced this challenge, if they are to accept its considerations as professionally valid in the full sense of that phrase.

The approach taken towards this goal involves three stages:-

- First, an extended preparatory stage has sought to identify and dimension the nature of the many factors involved and the policy issues they raise. This phase is documented in this Compendium.

- The second phase is the Conference process itself when viewpoints will be put in Plenary Sessions by lead speakers active in policy development or implementation and in Workshop Sessions when these viewpoints and issues raised or factors identified in the Preparatory Phase will be considered by all participants along with other relevant concerns that may be brought to notice. The Conference program is summarised at page

- A third or post-Conference phase is envisaged as a crystallisation phase when appropriate policy conclusions or recommendations arising from the Conference are consolidated under the aegis of the Joint Organising Committee.

The Preparatory Phase leading to this Compendium has itself proceeded in three steps, namely -

- drafting and review of Position Papers by the respective Working Parties (see list of Contributors)

- consideration in a special workshop of 'energy scenarios' and the extent to which these might give a common focus to individual Working Party considerations (see Position Paper A6).

- co-ordination and listing of key issues raised by the various Working Parties (see 'Key Issues'.

No provision has been made in the Conference Program for presentation of this Compendium as a whole or in part. Also it is to be provided to participants in advance of the Conference. Thus some outline needs to be given in this introduction of the policy orientations that have emerged and the topic coverage adopted.

2. POLICY PERSPECTIVES

Whether the material provided in this Compendium is adequate and relevant to its purpose remains to be seen. However, as Saddler (1982) has emphasised in 'Energy in Australia' 'on a subject of such direct concern to so many people as energy policy - in other words so political - there is no single correct position'. Also that any writings '...must express a point of view. Particular statements of fact may be right or wrong but the same cannot be said about the process of choosing facts for presentation'.

Whilst considerable effort has been made to ensure that the facts in this Compendium are not wrong, those presented (or not presented) must inevitably express a point of view. However the process by which it was compiled, as will be outlined later, should also have ensured that a diversity of viewpoints has emerged.

The task has not been an easy one for the contributors as even for Australia (where the energy debate has only recently begun to widen), writings on energy policy would already fill many shelves, if they were all publicly available and could be brought together as a collection. Thus, ideally this Conference Compendium might in one volume -

- summarise and review these writings to the extent that they are available;
- list trends and issues that seem to be important in various analyses;
- provide ready access to data on the 'current energy situation' and;
- add background or unpublished information where this is available and relevant.

Also given its purpose, the Compendium must extend beyond material ordinarily put to 'learned societies'. Not only must it cover a wide range of disciplines and issues, but it must present speculations on and about factors and assumptions affecting future energy forms and demand patterns. Such speculations will reflect even more strongly 'political' viewpoints as they necessarily embody attitudes on what ought to be the aims and objectives of Australian society as a whole and regionally. Questions of social values are normally shunned by technologically based 'learned societies'

even more than speculation on alternative futures, but they inevitably arise once a decision is taken to discuss energy policy options.

3. COVERAGE

It must be emphasised that the preparation of the Compendium has been a voluntary undertaking in a 'learned society' framework aimed at raising the level and widening the scope of the energy debate in Australia. It is not the result of an inquiry pursued with the backing of Parliamentary or Royal Commission type powers nor a study undertaken with the investigatory resources available to a governmental advisory committee asked to make recommendations on specific issues.

As will be apparent, there are currently a number of major energy issues in Australia not addressed in the Position Papers that are beyond the scope of 'learned society' investigations due to the substantial effort required to analyse their particular complexities, the 'hard' political stand governments (and instrumentalities) have taken on them and the differing strongly held viewpoints even amongst participants in this Conference on these issues. It might be asked, given such significant gaps in coverage, whether there remains any substantial policy issues that the Conference can usefully examine? An optimistic response might be that if the sort of longer term policies that this Conference can examine had been openly addressed earlier then the present difficulties might not have been so great or, conversely, the Conference may help to minimise such difficulties in the future.

Another major difficulty faced by the contributors is that there has been a major change in the energy situation, both nationally and globally, since work began on the Position Papers more than two years ago. This situation has not yet stabilised, in fact the rate of change of energy supply/demand patterns is still accelerating. Thus the Working Parties could not simply carry their topics forward from bench marks set in the 1977 Conference or fill in gaps not then covered. This situation has also inhibited the co-ordination stage that was to have followed the issue of the 'First Compendium' and the 'Scenario Workshop', in particular the finalisation of the 'A' group of policy orientated papers.

Also it will be noted that no overall summary or commentary is given in this Compendium on:-

- current official statements on energy policy (but see Position Paper A1); or
- the policy recommendations of the 1977 Conference on energy and their current validity.

However, individual Working Parties have addressed these policies or recommendations as appropriate to their topics.

4. COMPENDIUM STRUCTURE

The structure of the Compendium has been largely set by the original proposal of the Joint Organising Committee that three types of Position Papers should be prepared dealing with -

A - Policy factors affecting energy use and development
B - Resource and production factors both as opportunities and limitations
C - Utilisation factors stimulating or inhibiting energy consumption.

Seven major sectors were identified in Group B and four in Group C but it was left to Working Parties to develop their topic as they thought fit and to discuss directly questions of overlaps with or gaps between adjoining sectors. No serious demarcation difficulties have become apparent between these groups.

The original briefing for Working Parties suggested that the Position Papers

- be prepared for use in seminar discussions;
- identify areas where action since 1977 has been appropriate and adequate as well as those where new initiatives are needed with the emphasis on policy implications;
- focus on human resources and the impact of energy projects on the community as well as non-renewable resource depletion policy;
- do not overlook technical aspects and alternatives but do not review such aspects in technical detail as referece can be made to authoritative works.

The 'B' and 'C' groups of papers largely reflect these and other suggestions; they build on the 1977 foundations with the deeper insights now available and offer significant overviews of the respective topic areas. They are reinforced by the substantial body of established professional practice and experience in each sector.

The 'A' Group of Position Papers was seen as providing reorientated and widened approaches (in the context of technologically based 'learned societies') to discussion of energy policy through consideration of macro-energy issues and patterns. The approaches considered were -

- overall reviews of the total energy scene with special attention to the policy and actions of Government and their impacts;

- summations of issues raised in the Group B and C papers;

- analyses of the interactions of economic, environmental and social policies on energy policies;

- examination of R.D.& D. influences on and human resources available for energy policy development and implementation.

These Position Papers break new ground for this type of Conference and it was hoped that they would provide the main material for discussion on policies This aim may not have been fully met as the difficulties and constraints discussed above have borne particularly heavily on the contributors in this Group. However, these Papers should lead discussion on a broader front 'Towards an Energy Policy for Australia' and may start to frame the agenda for later 'learned society' discussion on this issue as the decade unfolds.

January 1983

H.J. HIGGS
Papers Co-ordinator

KEY ISSUES

SCHEMA Many issues have been raised for consideration in the Position Papers which form the main part of this Compendium. These reflect the concerns of the specialist Working Parties as they have analysed their particular subject. The Position Papers should be referred to directly for an appreciation of factors bearing on an issue or the context in which it arises. To present the issues in their totality in relation to energy policy formulation and to facilitate their consideration in the Conference Workshop Sessions, the issues have been abstracted and listed under the four major topic groups set for the Workshops, namely, the relationships:-

1. Energy - People and the Environment
2. Energy - Planning, Scenarios, R.D.& D. and Financing
3. Energy - Conservation
4. Energy - Fuel Alternatives, Tariff and Pricing Policies

The reference code of the Position Paper in which an issue was raised is given after each issue in the list. The order of listing does not express any priority or weight and where similar issues have arisen in more than one Position Paper, these have been coalesced where practicable. It is, of course, not expected that all issues will be considered in the workshop sessions whilst other important issues may be raised by Plenary speakers or other participants in the Conference.

1 ENERGY - PEOPLE AND THE ENVIRONMENT

1.1 Will the per capita demand for energy in 20 years time be the same as today? What would be the effect on individuals of a per capita growth rate of historical proportions or will per capita demands decrease due to changing social values or reduced economic expectations? What would be the effect on individuals? (A4).

1.2 How is the nexus between economic activity and energy consumption changing? Can the growth rate of the economy increase if the energy growth rate decreases? (A4).

1.3 Will the interests of citizens as owners of the public energy enterprises and of natural resources be improved by private sector participation in the generation of electricity and the supply of natural gas? (A2).

1.4 Should public energy authorities pay an annual 'dividend' on the State's - or people's - investment? (A2)

1.5 What would be the effect of doubling the size and concentration of energy systems on society as a whole? What are the inherent limitations on the rights of society-at-large or management and operating staff in maintaining system stabilities? What are the intergenerational environmental costs? (A4).

1.6 What are the energy demands of post-industrial societies? What consideration should be given to low energy/sustainable society futures? (A4).

1.7 How, at the professional level, can specialised skills in the energy field be retained in Australia? (A3).

1.8 Should a new umbrella specialist manpower organisation be established? Should a standing committee of the Conference be established to make forecasts of the needs for particular groups of people in the energy field over a 15 year horizon? (A3).

1.9 How can the national education effort be made adaptive to the flexibility required and changes implicit in future energy systems? (A3. C1).

1.10 How critical is the limited fresh water availability in Australia to energy production? Is there sufficient for electricity generating stations (e.g. Latrobe Valley) and/or for liquid fuel conversion processes? (A4).

1.11 What are the likely consequences for Australia of global increases in carbon dioxide? Will the effect of this increase become unarguably evident before climatic change is inevitable? When will this be evident? What would Australia's response be to global pressures on setting a 'plateau' level for fossil fuel consumption as a contingency precaution? Would this lead to nuclear or renewable energy options or both? Should policy as well as scientific studies be expanded in view of the potential impact on energy strategies? (A4. B1).

1.12 What are the prospects of energy exploitation of the deep ocean beds or in Antarctica and the implications for Australia? (A4).

2 ENERGY - PLANNING, SCENARIOS, R.D. & D. and FINANCING

2.1 What should be the approach to energy policy on economic grounds

- either to accept that the best information on the national cost of using energy fuels in Australia is provided by their price in world markets?
- or to assume government planning and regulation can produce a better outcome than the (international?) market? (A2).

2.2 Should a stock-piling policy be developed, particularly for base lubricating oils? (B3).

2.3 How should guidelines for optimum ratios between crude oil production rate and reserves be determined? (B3).

2.4 How should a policy for the continued reduction of fuel oil yield in the oil refineries be developed? (B3).

2.5 What effort should be allocated to the development of national scenarios of energy supply and demand to the year 2000? Should the two major sponsoring groups of Energy 83 take an active interest in such efforts if not involvement? (A6).

2.6 Should scenarios take into account not only technological developments and options, but economic and social inputs as well as public sector policies? (A6).

2.7 Should the conclusions of Energy 83 be taken into account in the construction of scenarios AND the development of alternative forecasts based thereon? (A6).

2.8 What scenarios should be used to provide the basis of dialogue with the public sector in respect of the planning, research and provision of energy supplies and of energy systems management? (A6).

2.9 How can the assumptions adopted for computer models, particularly in relation to manpower aspects, be evaluated? (A3).

2.10 Is the level of energy R.D.& D. in Australia appropriate? (A5)

2.11 Is Australian energy R.D.& D. concentrated in the most appropriate areas? (A5).

2.12 Are Australian energy R.D.& D. funds allocated most appropriately to the different phases of energy technology development? (A5. B7).

2.13 Is there an appropriate balance for energy R.D.& D. as between the various sectors of the community? (A5).

2.14 Is there a satisfactory relationship so far as funding energy research is concerned as between State and Federal Government? (A5).

2.15 Does the NERDD Program function satisfactorily? (A5).

2.16 Is enough being done to provide the necessary manpower skills for energy R.D.& D. (A3. A5).

2.17 Is the flow of information to and between those engaged in energy R.D.& D. adequate? (A5).

2.18 Is there adequate interchange and collaboration between Australian research projects and related projects in other countries (particularly IEA projects?) (A5).

2.19 Is there enough funding for research into economic, social and environmental issues? (A4).

2.20 Should R.D. & D. be concentrated on the basic problems of heat transfer modelling processes, control systems, measuring systems and thermodynamic analysis of new and existing processes? (C2).

2.21 Should the energy analysis developed by Linhoff be applied to all NRRDEC projects? (C3)

2.22 In this time of rapidly advancing technology, how should the electric power industry co-operate with organisations engaged in the development of new technology and how should it use the benefits from new technology as it becomes available? (C1).

2.23 What is the effect of the competing demands for capital between energy systems and other social objectives? Which energy systems should be favoured if national investment funds are limited? (A4).

2.24 Should the actions of the Loan Council which are making it necessary for alternative financing schemes to be investigated including full or part private ownership, with possible consequential effects on Australia's economy in the broadest sense and on the community, be reviewed and further investigated? (C1).

2.25 Should the subsidising of particular sectors of electricity consumers be removed from the Supply Authorities' areas of responsibility and taken over by Government? (C1).

2.26 Is encouragement of generation by private organisations either in parallel with or isolated from the Supply Authorities' system needed where this provides optimum economy? (C1).

2.27 Should State or quasi-State energy enterprises as a whole be transferred to private enterprise? (A2).

2.28 Should existing incentives for crude oil exploration and development in Australia be kept at the present level of about one billion dollars per year? (B3).

2.29 Should a unified method of determining the relative costs of all energy sources be established? (B7).

3 ENERGY - CONSERVATION

3.1 Whilst the 1977 Conference estimated that between 15% and 25% of energy used in industry could be saved by conservation programs and the National Industrial Energy Management Scheme (NIEMS) seeks to bring this possibility home to industry, major savings are yet to be achieved. Does this imply a more fundamental

study of industrial processes in Australia is required? (A4. C2).

3.2 How is increasing energy used related to output and manpower productivity? (C2).

3.3 How can industry norms for energy use be established and what is the effect of new technology on these norms? How can these be proselytized in industry? (C2).

3.4 Will information on the effects of energy savings on cost structures, spin-off benefits, pitfalls and the promotion of industry norms encourage management action on energy conservation? (C2).

3.5 What energy savings can be achieved by use of 'waste' energy in industrial processes by co-generation of electricity for general distribution? (C1. C2.)

3.6 How can electrical energy be used more efficiently in the commercial sector, and in Tasmania and the Northern Territory? (C2).

3.7 What is the role of fluidised bed combustion of washery wastes? (C2. B1).

3.8 As the raising of one fuel price leads to fuel substitution, should all fuel prices be raised to encourage significant levels of overall fuel conservation? (C2).

3.9 Has the movement away from petroleum fuels to natural gas and electricity use in buildings diverted attention from the need to reduce energy consumption overall? (C4).

3.10 As urban public transport can be more fuel efficient than the private car, if high load factors can be achieved, how can its greater use be fostered? Alternatively, should systems of car and van pooling be encouraged? What initiatives are required by governments? (C3).

3.11 What fuel savings are attainable through traffic management systems? What emphasis should be given to fuel conservation in the development of traffic management schemes in comparison with other objectives? (C3).

3.12 Are slurry pipelines fuel efficient systems for the transport of coal? How should the introduction of this new transport scheme be managed? (C3).

3.13 Although rail has greater fuel efficiency in the long distance transport of non-bulk freight than road transport, what policy initiatives are necessary to balance this advantage against quality of service advantages of road transport? (C3).

3.14 Would a co-ordinated national strategy for energy conservation in buildings achieve substantial reductions in the energy consumed in existing buildings and contain the additional energy requirements of future buildings? Is a longer term target reduction of 25% in total final energy consumed by building realistic? (This would correspond to 92 Petajoules per annum or about 4% of national energy consumption). (C4).

3.15 As economic factors and price structures are not sufficient in themselves to initiate appropriate energy conservation practices in the building sector, what additional measures should be taken? (C4).

3.16 What Government action is required to develop a co-ordinated national strategy for energy conservation in buildings? (C4).

4 ENERGY - FUEL ALTERNATIVES, TARIFF AND PRICING POLICIES

4.1 Will major transitional programs to renewable energy systems be triggered by environmental and social factors rather than by depletion of non-renewable resources? Will such programs gather significant momentum in the next 20 years? Will the economic lifetimes of the massive investments in existing and projected non-renewable energy systems be foreshortened? What will determine investment priorities in renewable systems - existing interests - the market place - government policies? (A4).

4.2 Should more active policies be introduced to demonstrate the wider application of renewable energy systems to society's needs? Should a 10% contribution rather than a 1% contribution be sought in the next 20 years? If so, what stimulus is required? (A4).

4.3 What is the environmental balance between physical solar energy systems and biomass systems? Do renewable systems offer greater employment opportunities and diversity than centralised systems? (A4. B6. B7.)

4.4 Should disincentives to the use of solar or other energy sources, resulting from subsidies and similar support to selected sources be removed, or equal subsidies to all sources be granted? (B7).

4.5 What are the prospects of a need for nuclear energy power systems arising in Australia in the next 20 years? What further actions are needed or would be advantageous in the uranium industry for health, safety and environmental protection? How should these be covered in a revised Atomic Energy Act? (A4. B5).

4.6 What is the likelihood of the Australian community accepting nuclear power systems in the foreseeable future? (A4. B5).

4.7 Are the generic environmental problems of massive liquid fuel conversion processes from oil shales and coal intractable? Are the carcinogenic risks tolerable? Do these problems together with the technological, logistic and economic uncertainties foreclose this as an energy option in the time frame? (A4. B1).

4.8 Since the technology for synthesising liquid fuels from natural gas is the simplest, should gas exports be reduced to provide for this option? Should recoverable reserves of natural gas be retained in the ground for strategic purposes as a practical form of bulk storage? Would such a policy also require government support for establishing the synthesising industry as this cannot be justified on normal commercial considerations? (B2).

4.9 Is Australia maintaining, and able to hold, its status with overseas buyers of coal in relation to the cost/performance value of coal (i.e. price/quality effect)? Do we have or need the expertise in the users' techniques of assessing the cost and performance of Australian coals in their applications? (B1).

4.10 Will coal demand in Australia be affected by any possible change in the large central electricity generating systems which apply in most States, bearing in mind the problems and pressures of finance, electricity price hikes, potential for improved efficiency of use of primary energy, etc.? (B1)

4.11 Should there be any special encouragement given to favour the purchase of diesel powered passenger vehicles over petrol powered passenger vehicles? (C3).

4.12 What initiatives are required to expand the use of LPG and possibly CNG as alternative automotive fuels? (C3).

4.13 Nature has endowed some States more lavishly in their indigenous resources. Would development of our energy resources be more economical and equitable if they followed a policy developed nationally rather than State by State? (B1. B4).

4.14 What are the problems in achieving the degree of co-operation and co-ordination required for inter-state energy transfers? (B1. B4).

4.15 What principles should govern the interstate pricing of energy so that the supplying State, the receiving State, the producers and the consumers all receive their appropriate share of the benefits? (B4).

4.16 What increase in the user price of energy, especially of liquid fuels, above free trade prices is appropriate for

- constructing and maintaining transport infrastructure?
- raising revenue for general government activities?
- advancing the national goal of self-sufficiency in liquid fuels? (A2).

4.17 Is taxing fuel for transport infrastructure sound in principle or is it a matter of constitutional and administrative practicality? (A2).

4.18 How should Australia's energy wealth be managed to achieve a less unequal distribution of income? (A2).

4.19 How strong is the case for a substantial increase in consumer prices of petroleum products as an indirect tax that should be increased relative to income taxes? (A2).

4.20 What effect do taxes on Australian energy exports have

- in improving world prices?
- on prices to domestic users? (A2).

4.21 How far can or should producer prices for energy be held below world prices? Who gets the difference? (A2).

4.22 Will opportunity cost pricing of natural resource inputs improve the economic performance of public energy enterprises? (A2).

4.23 What are appropriate tariffs and enabling conditions that would encourage co-generation in industry where there is a requirement for electric power and process heat? (C1. C2.)

4.24 How will the relative prices of electricity and diesel fuel change and how will this affect the prospects for railway electrification? (C3).

PLENARY TOPICS

1. The Australian Constitution and Energy Policy

   - What are the constraints to energy development inherent in the Constitution?
   - Will the Constitution be appropriate to Australian energy needs?

2. Energy and Environment Interaction

   - Role of new technologies
   - Effects on development planning, project programs and costs

3. People for Power

   - Australian and offshore manpower resources
   - Technological education and training
   - Industrial relations aspects

4. National Power Planning

   - Source selection (coal, gas, hydro, nuclear)
   - Interstate interconnections long-term
   - Co-generation with industry

5. Financing Power Generation - Public and Private Ownership

   - Traditional public financing
   - Private financing
   - Taxation and legal aspects of private ownership

6. Field Pricing Policies

   - World market trends
   - Government interference
   - Transport tariff burdens
   - Parity pricing and opportunity costing
   - Effect of changes of government

7. Rational Consumer Tariffs

   - Subsidies for special consumers
   - Principle of consumer pays
   - Effect on export competitiveness
   - Effect on industry location

8. World Energy Prospects to the Year 2000

9. Australia's Role in World Energy - Now and Future

10. Conference review

    - Summary by Institution/Institute member
    - Response by Australian Government