THE NORTHERN TERRITORY OF AUSTRALIA

Copy No. .....

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CABINET DECISION

No......6240.....

Submission No.: 5365

Title: INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT

Cabinet approved the Submission to the Senate Standing Committee on Industry, Science and Technology on the contribution that Australian Industry, Science and Technology can make to reducing the impact of the Greenhouse Effect.

A. G. MORRIS
Secretary to Cabinet.

16 October 1989

THE NORTHERN TERRITORY OF AUSTRALIA

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FOR CABINET

SUBMISSION No: 5365

Title:	INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT
Minister	HON. S.P. HATTON, M.L.A.
Purpose:	TO SEEK CLEARANCE FOR A NT GOVERNMENT SUBMISSION TO THE SENATE STANDING COMMITTEE INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT
Relation to existing policy:	CONSISTENT
Timing/ legislative priority:	URGENT
Announcement of decision, tabling, etc:	N/A
Action required before announcement:	N/A
Staffing implications, numbers and costs, etc:	NIL
Total cost:	NIL

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Department/Authority: ....LAW.....

COMMENT ON CABINET SUBMISSION No.

TITLE: .INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE .EFFECT .....

COMMENTS:

There appear to be no constitutional or legal barriers to the proposal.

Meredith Harrison

SIGNED: MEREDITH HARRISON
DESIGNATION: A/ SECRETARY, DEPARTMENT OF LAW
DATE: 20 September 1989

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Department/Authority..... NORTHERN TERRITORY TREASURY .....

COMMENT ON CABINET SUBMISSION No.

TITLE: ..... INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT .....

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COMMENTS:

The Submission is supported.

SIGNED: N R CONN

DESIGNATION: UNDER TREASURER

DATE: 22 SEPTEMBER 89 ***CONFIDENTIAL***

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Department/Authority DEPARTMENT OF THE CHIEF MINISTER

COMMENT ON CABINET SUBMISSION No.

TITLE: INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT

COMMENTS:

The Inquiry is seeking advice on practical responses which can be made to reduce and eventually reverse the greenhouse effect.

The draft Submission contains some useful material in this respect but the Submission is far longer than necessary because it does not directly address the terms of reference.

Given that the Submission, quite properly, discusses and supports Australia expanding into nuclear waste processing and disposal, and the construction of the Darwin to Alice Springs rail-link as part of a national rail system, it may be more appropriate for the Submission to delete reference to the Conservation Commission compiling the Submission on behalf of the Government.

Margaret P. Lyons

SIGNED: MARGARET P LYONS

DESIGNATION: DEPUTY SECRETARY

DATE: 21 SEP 1989

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Department/Authority MINES AND ENERGY

COMMENT ON CABINET SUBMISSION No.

TITLE: INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT

COMMENTS:

This Department generally supports the Submission, however in the political, not technical, context. The Submission relies on fairly light-weight technical advice. It would be preferable to refer to the Institution of Engineers' policy on the greenhouse effect.

With regard to Attachment 1, the following comments are provided :

- page 5, paragraph 17, line 1 : Delete the word "fossil".
- page 5, paragraph 18, last sentence : It may be more economic to supply gas to the eastern seaboard from the Bonaparte Gulf and through the existing Northern Territory pipeline system.

SIGNED:

DESIGNATION: SECRETARY

Department/Authority ..... POWER AND WATER AUTHORITY .....

COMMENT ON CABINET SUBMISSION No.

TITLE: INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT

COMMENTS:

The Authority supports the Submission.

SIGNED:

DESIGNATION: CHAIRMAN

DATE: 21 September 1989

Department/Authority..... INDUSTRIES AND DEVELOPMENT .....

COMMENT ON CABINET SUBMISSION No.

TITLE: ..... INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT .....

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COMMENTS:

The Department supports the recommendations of the Northern Territory Government Submission to the Senate Standing Committee on Industry, Science and Technology.

In particular, the Northern Territory is in a position to contribute to, and benefit from, a national strategy for fossil fuel replacement by nuclear and solar alternatives.

The Territory should examine, and press strongly, the net environmental and economic benefits of an Australian nuclear power plan. The longer term feasibility if secondary processing of uranium in the Top End should also be studied under the assumption if the abolition of the Three Mines Uranium Policy, and a coal-fired plant replacement program for southern states.

SIGNED: O ALDER

DESIGNATION: SECRETARY

DATE: 20 SEP 1988

G. J. DUFFIELD, Government Printer of the Northern Territory

Department/~~Authority~~ PRIMARY INDUSTRY AND FISHERIES

COMMENT ON CABINET SUBMISSION No.

TITLE: INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT

COMMENTS:

There is no objection to the submission.

It should be noted, that this Department has not been given sufficient time in which to assess in detail the draft submission to the Senate Standing Committee. Nevertheless, there are no obvious disagreements with the text.

SIGNED:

DESIGNATION: SECRETARY

DATE: 20/9/85

CONFIDENTIAL

Department/~~Authority~~ TRANSPORT AND WORKS

COMMENT ON CABINET SUBMISSION No.

TITLE: INQUIRY INTO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT

COMMENTS:

The submission is supported. The Commonwealth/State and Territory Transport Authorities are liaising through the Australian Transport Advisory Council (ATAC) to address the transport aspects on a national basis.

SIGNED: I D GORDON

DESIGNATION: SECRETARY

DATE: 20/9/89

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RECOMMENDATION

1. It is recommended that Cabinet approve the attached Submission (Attachment 1) to the Senate Standing Committee on Industry, Science and Technology on the contribution that Australian Industry, Science and Technology can make to reducing the impact of the Greenhouse Effect.

BACKGROUND

2. In June 1989 the Northern Territory Government was invited to contribute to the Senate Standing Committee on Industry, Science and Technology inquiry into the contribution that Industry, Science and Technology can make to reducing the impact of the Greenhouse Effect. The Terms of Reference and membership details of the Committee are attached (Attachment 2).

3. The aim of the inquiry is to achieve practical responses to the problem caused by the Greenhouse Effect. As a starting point for the Inquiry the Committee recognises that adequate steps are being taken to improve the Greenhouse knowledge base. Accordingly the Terms of Reference do not relate to the cause and effects of the Greenhouse Effect.

4. The inquiry will concentrate on how industry, science and technology can contribute to reducing the impact of the Greenhouse Effect in particular:

- implementation of changes in energy production and distribution, consumption patterns, industrial production and government policies which would help us to slow and eventually reverse the global warming trend;

- the priority which should be accorded to such changes;

- technical, economic and institutional impediments to such changes; and

- realistic methods of overcoming these impediments.

CONSIDERATION OF THE ISSUES

5. International debate on the Greenhouse Effect has confirmed that there is irrefutable scientific evidence that the composition of the atmosphere has been, and continues to be, altered significantly by human activities.

6. The major causes of Greenhouse gas emissions are from burning fossil fuels, the loss of vegetation, and the emission of effluents from industry and agricultural processes.

7. Changes that are likely to occur as a result of the Greenhouse Effect can not be established precisely. Scientists predict however, that a warming of between 1.5 and 4.5 degrees centigrade will occur by the year 2030. Sea level is expected to rise between 0.2 and 1.2 metres and, in Australia, prevailing weather patterns are expected to move south. It is also anticipated that greater extremes in climate will be experienced, such as cyclones, flooding and drought.

8. In September 1988, the Northern Territory Government established an Advisory Committee on the Greenhouse Effect. The Committee has recognised three general response areas which include: the limitation of Greenhouse gas emissions; adaptation responses; and the capitalisation of any benefits that might result from climate change. In the immediate term the Northern Territory Government has given priority to responses that will attempt to slow down the rate of future Greenhouse gas emissions, at the same time allowing for the development of adaptive strategies.

OPTIONS

9. The options are to:

a) make a formal submission to the inquiry; or

b) not make a submission.

It is considered desirable that the Northern Territory Government make a formal submission to the inquiry.

10. The submission will provide the Standing Committee with information pertinent to the Northern Territory situation and will contain objective and informed comments regarding alternative energy sources, transportation issues, priority activities and Northern Territory Government policy.

PUBLIC IMPACT

11. Participation in the inquiry will be welcomed by most members of the public.

12. The Committee is seeking the views of industry groups, public utilities, State and Local Governments, and other organisations and persons with expertise in the subject of the inquiry.

FINANCIAL CONSIDERATION

13. No immediate or expected implications.

REGULATORY IMPACT

14. Not applicable.

EMPLOYMENT AND INDUSTRIAL RELATIONS

15. No effects anticipated.

COMMONWEALTH, STATE AND LOCAL GOVERNMENT RELATIONS

16. Co-operative strategies are being examined by all State and Territory Governments. Greenhouse issues will require considerable liaison between the Commonwealth and State Governments.

CO-ORDINATION AND CONSULTATION

17. The submission has been prepared in co-operation with the Department of Mines and Energy, the Department of Transport and Works, the Department of Primary Industry and Fisheries, the Department of Industries and Development, the Power and Water Authority, the Department of the Chief Minister and has been cleared with Treasury.

LEGISLATION

18. No legislation is required.

19. Substances that deplete the Ozone Layer are also Greenhouse gases. It is anticipated that Northern Territory legislation will be drafted as a consequence

of the recent adoption by the Australian and New Zealand Environment Council of a National Ozone Protection Strategy. Ozone legislation is only indirectly related to the inquiry.

PUBLICITY

20. Not applicable.

TIMING

21. The Submission should be lodged with the Secretary of the Senate Standing Committee is soon as possible.

STEVE HATTON 29/9/89

ATTACHMENT 1

A NORTHERN TERRITORY GOVERNMENT SUBMISSION TO THE SENATE STANDING COMMITTEE ON INDUSTRY, SCIENCE AND TECHNOLOGY: THE CONTRIBUTION THAT AUSTRALIAN INDUSTRY, SCIENCE AND TECHNOLOGY CAN MAKE TO REDUCING THE IMPACT OF THE GREENHOUSE EFFECT.

LIST OF CONTENTS

INTRODUCTION

1. The Northern Territory Government concurs that there is now conclusive evidence to support the Greenhouse theory and that the changes in the composition of the earth's atmosphere are of sufficient concern to prompt policy makers to consider responses immediately.

2. Governments are faced with a formidable task in responding to the Greenhouse Effect given that the impact cannot easily be quantified or qualified at a regional level. Just how much our climate will change, as a result of the Greenhouse Effect, in what ways, and how this will affect conditions is still open to argument and uncertainty.

3. The Greenhouse climate change scenario has the potential to be felt in all areas of our socio-economic and bio-physical environment. The key question is "how much certainty should Governments require before agreeing to take action".

4. The Northern Territory Government confirms that the major objective of any policy response to the Greenhouse Effect should be to limit or slow-down as far as possible the rates of temperature change and sea level rise, to buy time for long term strategies to be developed and to enable adaptation to climate changes that cannot be avoided.

5. It is arguable that there is little the Northern Territory can do unilaterally to limit climate change as a result of the Greenhouse. It has been estimated that Australia contributes around 2% of global Greenhouse Effect warming. The Northern Territory contribution is considered negligible in comparison with the more densely populated and energy consuming States of Australia.

6. Nevertheless, Australia contributes about 6 times the world average of carbon dioxide (CO_2) emission at a per capita rate. Therefore, if Australia is to have any influence on other countries in reducing Greenhouse gas emission rates and climate change, then domestic policies must be implemented in Australia in the first instance.

7. The need for a concerted global effort in reducing Greenhouse gases is paramount. This global effort places an obligation upon all Governments to respond, regardless of their relative contribution to the Greenhouse Effect.

8. In acknowledging the accumulating evidence relating to climate change, the Northern Territory Government established an Advisory Committee on the Greenhouse Effect in 1988. The Committee has comprehensive representation and comprises the necessary disciplines

to advise the Government on the possible implications of the Greenhouse Effect in the Northern Territory and to advise and recommend appropriate action.

9. The Committee is currently preparing a Greenhouse Effect Strategy for the Northern Territory. The Strategy will consider changes in the climate pattern and assessment of the likely social, economic and environment effects; and will develop appropriate responses.

10. The responses to the effects of Greenhouse induced climate changes are classified as follows:

(a) Prevention - limitation

(b) Adaptation

(c) Capitalisation

Education is also considered as a response and is to be given high priority by the Northern Territory Government.

11. Preventative Action is the primary objective of the Inquiry. It is also an area of immediate concern to the Northern Territory Government.

12. The focus of preventative action is the limitation of Greenhouse gas emissions by human activities. Energy and transportation requirements make up the bulk of Greenhouse gas emissions in the Northern Territory.

ENERGY PRODUCTION AND DISTRIBUTION

13. The Power and Water Authority (PAWA) is responsible for supply of water and electricity services to most communities throughout the Northern Territory. Generally these communities are remote from the main service grids and consequently require their own systems.

14. PAWA's reaction to the Greenhouse effect has been positive and includes the establishment of an internal Greenhouse Co-ordinating Committee specifically to address industry related issues. This committee complements the inter-departmental Northern Territory Greenhouse Advisory Committee, to which PAWA also provides input through representation on that Committee.

15. The Northern Territory electricity supply industry already has an interim Greenhouse strategy. The Northern Territory uses low carbon yielding natural gas as the primary generating fuel. The decision by the Northern Territory Government to transfer to gas-fired power was fortunate as this is now internationally recognised as the most attractive short to medium term means of reducing emissions of CO_2. Coal plants generate about 2-4 times the amount of CO_2 by comparison with gas-fired power plants.

16. Together with using natural gas, it is relevant that the Northern Territory uses this fuel efficiently in a state-of-the-art combined cycle gas turbine plant that generates electricity for Darwin's base load requirements.

17. Gas as a fuel substitution, is given considerable support by the Victorian SEC. In the "SEC and the Greenhouse Effect Discussion Paper" (July 1989), the substitution of low CO_2 emitting fuels, such as natural gas is given high priority.

18. The SEC points out that any large-scale use of natural gas would be dependant on resource availability. The SEC suggest that in the longer term, the delivery of NW Shelf gas to the eastern seaboard might extend the prospects for gas substitution. It may be more economic to supply gas to the eastern seaboard from the Bonaparte Gulf and through the existing Northern Territory pipeline system.

19. Electricity generation is inherently an inefficient energy conversion process. The Power and Water Authority anticipates in the mid-term that the Greenhouse Effect will "weight" future electricity generation developments towards more efficient plant. Fuel conversion efficiencies may be increased substantially using waste heat recovery systems.

20. Energy losses in the transmission system and distribution system account for around about 8% of total generation. Control facilities to minimise these losses will be assessed along with other options.

21. In the longer-term the Power and Water Authority envisages pressure on marketing electricity generated using fossil fuels where feasible energy options, such as tidal, nuclear or solar energy, may exist.

22. Energy conservation is considered a short-term, feasible component of an any CO_2 emission reduction strategy. The program outlined in the Victorian SEC discussion paper is supported by the Northern Territory Government.

23. Renewable energy such as solar, hydro, wind, and tidal sources have potential in remote locations. The main issues relating to their establishment are cost, technology limitation, and efficiency. Environmental considerations are of particular concern in relation to hydro-electric installations and wind farms. The solar energy alternative is discussed in the following section.

ENERGY ALTERNATIVES

24. Fossil fuels generate around 60% of all global electricity which, in turn, generates around 20 to 25% of CO_2 emissions.

25. Conservation is one answer as it can reduce the demand before replacement of fossil fuel power. Conservation strategies however, can only go so far to reduce Greenhouse gas emissions. As population and demand increase, so will energy use. The need for alternative energy sources such as wind, hydro, nuclear, and solar, therefore need further consideration.

26. Wind power produces both noise and visual pollution and is also seen as creating a safety hazard. A buffer zone between 300-500 metres is necessary to isolate the noise of a wind farm. Although costs in Britain are comparable with other power sources per unit of electricity produced, no country however, has been able to generate even 100 megawatts of wind power capacity a year.

27. Solar energy is at present, very expensive to install. Solar energy has to date been best utilised for the heating of domestic water and remote station power sources. High voltage work for industrial applications is still some time away.

28. Solar can most certainly be complementary to the major power sources in the short-term. The use of solar installations for domestic heating should be encouraged. The Northern Territory Government envisages Australia being a major global player in the field of solar research and development. This Research and Development will require Commonwealth support and incentive.

29. Hydro-electricity generation is probably the only other major energy source, apart from nuclear generation, which does not produce much in the way of Greenhouse gases. This power source however, also results in significant impacts on the bio-physical environment. For example, the Sardar Sarovar dam on the Narmada River in India will submerge around 140 square kilometres of forest land.

30. Australia can only lead by example. Whatever action we take now must also be within the framework of existing technology and economics. General technologies can contribute, some only available locally or with a very small reduction in emissions. Obviously the use of gas and energy conservation/efficiency methods will play an important role.

31. The Australian coal export industry is worth around A$6 billion per annum. Strategies to replace coal and reduce coal exports will have a substantial adverse

impact on the Australian economy. Choosing nuclear may however, offset this amount over the lifetime of the "nuclear" industry.

32. At a global level, base load electricity generation comes down to either coal or nuclear. It is known from various studies that the costs of both are comparable, depending on the location of coal relative to the demand point of electricity.

33. A very substantial proportion of the global warming, at today's population pressures, derives from developing countries in particular China, India, Indonesia and South America. Non-OECD nations in the past 15 years have increased electricity production by 146% and coal consumption by 70%, compared with 67% and 28% respectively for OECD nations. It is estimated that the developing countries account for 54% of fuel related CO_2 emissions, and the proportion is rising. In these countries, the energy demand created by increasing population and growing affluence cannot be contained by energy conservation alone. Coal is the most abundant regional energy source and it will not be possible to limit coal consumption to current levels.

34. Anything which can deter the less developed countries from burning wood, dung, coal and other fossil fuels should be seriously considered.

35. Australia has the power to encourage more nuclear usage overseas, by becoming more involved in downstream activities and the back end of the fuel cycle. Australia should claim its proportional role in the world's nuclear fuel cycle, concomitant with its 30% holding of cheap uranium reserves, but only 10% of the market.

36. The 1989 Nuclear Canada Yearbook indicates that the Canadian nuclear industry with 10% of the world's uranium reserves, exports 30% of the market, employs 30,000 people directly, the equivalent of 100,000 jobs overall, and contributes C$4 billion (A$4.5 billion) to the economy. Canada is the world leader in uranium production and exports, a position Australia should and could hold. Canada's 1988 production of almost 15,000 tonnes of uranium dwarfs Australia's 4000 tonnes. Canada receives more than one billion dollars from uranium exports alone. Furthermore, they operate 18 CANDU reactors which can produce nearly 13 gigawatts of electricity, with four more under construction. Toronto's electricity is among the cheapest in the world, about half the cost of Melbourne's.

37. There are now 429 nuclear reactors in 25 countries producing 17% of the world's electricity. Trebling these would replace coal; quadrupling would replace all fossil fuel electricity generation.

38. Nuclear power is not going to go away. It is, in fact, increasing in use, with more than 100 reactors under construction and 90 planned. Two came on line in the USA in 1988 and seven are still under construction there.

39. It is suggested that Australia can benefit by entering responsibly into the nuclear fuel cycle, opening more mines, enriching its own uranium and monetary earnings A$10 billion per annum.

40. The potential for total involvement in the nuclear fuel cycle would be in excess of A$25 billion per annum, and therefore of considerable assistance in overcoming our national balance of payments problem.

41. In particular, Australia is in a unique position to dispose of nuclear waste. This country has a suitable climate, stable geology and sparseness of population, which is relatively well-educated, plus an infrastructure of communication and manufacturing industry. The patent rights to the Australian invention of Professor Ted Ringwood, SYNROC, are held by an Australian company, Nuclear Waste Management Pty Ltd., of Adelaide. Justification of the process of complete immobilisation of the waste is well documented. It should be noted that the scheme also assists in non-proliferation and security.

42. The most significant way in which Australia can help emissions to be curtailed globally is by encouraging the major energy users to go more nuclear than they already are. This can be achieved by producing more uranium, (dispensing with the "Three Mines Policy") and aggressively marketing it.

43. An expansion into the waste processing and disposal industries will be a major incentive for European countries and Japan to expand their nuclear programmes. This would have the concomitant advantage of making a major profit, bringing expertise to Australia and creating a large, exciting new industry.

44. These conclusions are in line with the communique from the Toronto Conference of June 1988, at which one of the ways to reduce CO_2 emissions by 20% by the year 2005, was by "revisiting the nuclear power option". It is also in line with the European Commission's report to the Council of Ministers, that urgent action should be taken on energy conservation and efficiency, the development of new energy sources and the use of safe nuclear technology.

CFC EMISSIONS

45. CFC's and Halons are currently thought to be responsible for between 15-25% of the Greenhouse Effect. CFC's are also of concern because of their relatively rapid rate of increase (5-10% p.a.) in comparison to other Greenhouse gases.

46. The National Ozone Protection Strategy, adopted recently by the Australian Environment Council, aims to achieve a total phase-out of ozone depleting substances in Australia by the year 1998. The Northern Territory Government fully supports this initiative, and will implement procedures as necessary to assist the National effort to reduce damage to the ozone layer.

47. An interdepartmental committee is currently reviewing recommendations to ensure implementation of the Strategy within the Northern Territory. The Committee is also examining methods by which negative, regulatory proposals can be transformed into positive incentives for industry.

48. Positive benefits must be highlighted if global reduction in the use of CFC's is to be attained. There must be incentives of some kind in place to encourage the transition from long held practices to what, in many cases, will be new or different practices.

METHANE EMISSIONS

49. Methane has been estimated to contribute approximately 20% to Greenhouse Effect. Methane emissions primarily occur in the worlds rice belt and are associated with cattle populations, rice paddies and burning.

50. Opportunities for reducing methane emissions have not been explored to any major extent to date. Research into methane emissions should receive some priority attention given their contribution to the Greenhouse Effect and evidence that emission levels are increasing at about 1% p.a. It is notable that methane gas as an energy source is efficient and is suitable for rural conditions. Research and development into energy systems using methane fuel is supported by the Northern Territory Government.

TRANSPORTATION

51. The transport sector nationally contributes about 20% of the nation's Greenhouse Emission effect. About two thirds of this comes from private road transport, about one tenth from each of commercial road transport and off-road (farm and mining) transport use and a lesser component from sea and rail. These orders of magnitude probably apply also for the Northern Territory.

52. Improvement in transport fuel conservation warrant a high priority. The matter is already being addressed by the State/Territory/Commonwealth Transport Ministers through the Australian Transport Advisory Council (ATAC).

53. Benefits can also be obtained by reducing the constraints on the more energy efficient sea transport and by the early completion of the Darwin/Alice Springs railway to take greater advantage of the greater fuel efficiency of railway, for long distance travel.

REVEGETATION

54. The Northern Territory unequivocally supports State and National Tree Planting Programmes. The advantages of tree planting extend to other environmental issues such as salinity, soil erosion and habitat loss. Tree planting will also provide a major new storage of carbon once harvested.

BURNING AND BUSHFIRES

55. Each year in the Northern Territory millions of hectares are subjected to wild and controlled bushfires. In order to protect vegetation from fires it is now policy to manage fires during or soon after the wet season. Fires at this time of year are not as intense as dry season fires and do not kill saplings.

56. It is believed however, that the amount of CO_2 and methane emissions caused by bushfires in one year is less than the amount of CO_2 fixed by photosynthesising plants in the same area in one year. Although more research is needed to quantitatively examine this contribution it is not seen as a high priority to the Northern Territory Government.

PRIORITIES

57. Activities, programs and policies that provide for immediate to short-term reduction in Greenhouse gas emissions should be given priority. Major priority should be directed to the off-farm sector which is by far the largest contributor through transport, marketing, and processing systems.

58. Fuel substitutions, improving efficiency and energy conservation should all be considered as part of a package to reduce fossil fuel CO_2 emissions. Transportation fuel conservation must be considered in the overall reduction of energy conservation.

59. Other priorities in the short-term include:

- becoming an active member in the global nuclear fuel cycle
- phasing out CFC's and Halons
- introduction of revegetation programs; and
- research and development into alternative renewable energy sources.

IMPEDIMENTS

60. The list of impediments to reducing Greenhouse gas emissions is both substantial and complex. Impediments range from cultural conditioning to basic economic feasibility.

61. The principle impediment in the short-term is the perceived economic cost of adapting to change, installing improved systems or altering practices.

62. Other impediments include, available capital for investment in new and better technology, education and skill levels in industries and developing countries, private and public funding for research and development.

63. The Commonwealth, Three Uranium Mines Policy is an impediment to the export of nuclear energy for use overseas and an impediment to the contribution Australia can make internationally to the reduction of fossil fuel energy production.

METHODS OF OVERCOMING IMPEDIMENTS

64. Policy impediments are not seen as insurmountable. Policy by its very nature, should be dynamic and flexible and adapt to changes reflected in the socio-economic and bio-physical environment.

65. The Three Uranium Mines Policy does not reflect the changes that will be brought about by the Greenhouse Effect.

66. Revenue gained through uranium export and involvement in the international uranium fuel cycle could also alleviate the economic impediments mentioned above.

67. Coal exports will be affected by global policy and uranium is the key to offset both the economic impact and the current level of CO_2 emissions.

68. Increased funding for research and development into alternative energy, farm management, and industrial practices will help overcome research and development impediments.

69. Development of incentive packages, including pricing and taxing policies, to stimulate the use of energy efficient systems, including alternative energy sources, should be investigated.

70. Impediments can be alleviated through increased education and skills training to encourage earlier adoption of new technology.

71. International incentives and disincentives should be investigated in a bid to influence developing countries to reduce Greenhouse gas emissions. Unless the

Greenhouse effect is tackled on a global scale, much of our domestic effort will be in vain. This issue should be discussed in the United Nations forum to develop an International Greenhouse gas depletion (incentive) policy.

CONCLUSION

72. The contribution to the Global Greenhouse Effect by Australia, in terms of total Greenhouse gas emissions, is around 1-2%. The contribution made by the Northern Territory is clearly miniscule. Nevertheless, it is incumbent upon all governments, regardless of their relative contribution to the Greenhouse Effect to respond and address this most serious global issue.

73. It is noteworthy that gas-fired power generation in the Northern Territory is already in keeping with international and national short and medium term goals as the preferred fossil fuel alternative.

74. It is also noteworthy that neither coal nor oil are used as industrial fuel to any significant extent in the Northern Territory and that plans are being prepared for a gas reticulation network in the Darwin industrial area.

75. Domestic priorities include: energy conservation and efficiency programmes; alternative energy sources; CFC reduction; transport fuel conservation; revegetation; and education. It is clear however, that without substantial efforts at the international level these domestic activities will not alter the impact of climate change on Australia.

76. Nuclear energy is an alternative that should be considered as a feasible option. Australia has the opportunity to encourage nuclear energy production, particularly to countries that have no other power alternative except coal. With 30% of the earth's reserves of uranium, Australia is in a position to become the major player in the worlds nuclear fuel cycle. The Three Mines Uranium Policy should therefore be reconsidered as soon as possible.

77. Solar energy is an alternative that still requires much research and development. Australia, with the necessary incentives could become a world leader in solar energy appliances, installation and uses.

78. In the immediate term the Northern Territory Government supports and is committed to a response that will actively attempt to slow down the rate of future Greenhouse gas emissions.

79. At the local level, the Northern Territory Government has responded positively to this issue and has put in place the necessary machinery to plan for climate change.

80. At the national level, the Northern Territory is actively involved in making a contribution to meeting the Greenhouse challenge through participation on a special working group which has been established by the Australian and New Zealand Environment Council to report on co-operative strategies for adoption between States, Territories and the Commonwealth. This recognises that action on the Greenhouse Effect must be approached on a co-ordinated basis by all Governments.