GREENPEACE

AUSTRALIA PACIFIC

Submission to The Standing Committee on Industry and Resources

Inquiry into Resources Exploration Impediments

July 2002

Executive Summary

Greenpeace welcomes the opportunity to comment on the Government's Inquiry into Resources Exploration Impediments. There are now well established arguments as to why society needs to move away from fossil fuels, which are the main cause of climate change.

Earlier this year the United Nations Intergovernmental Panel on Climate Change (IPCC) in its Third Assessment Report found "new and stronger evidence" that human activity is influencing the climate largely through burning fossil fuels such as coal, oil and gas.[1] Climate change is predicted to have far reaching and on balance negative economic, social and environmental consequences. Human health and settlements, agriculture, forestry, biodiversity, water and coastal resources will be affected.

The threat of global climate change demands a shift away from using fossil fuels. The primary objective of the United Nations Framework Convention on Climate Change (UNFCCC), which has been ratified by Australia, is *"the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."* [2] In order to prevent this dangerous climate change we can only afford to use 25% of the world's existing fossil fuel reserves.[3] This means we have to phase out fossil fuels and replace them with renewable energy and fuels.

Greenpeace recommends that Federal and state governments need to develop as a matter of urgency a transition strategy to switch from fossil fuels to renewable energy and fuels so that it can occur in an orderly and manageable fashion, but within a timeframe necessary to prevent dangerous climate change.

Introduction

The environmental, economic and social impacts of climate change must presents a significant constraint to continued mineral and petroleum exploration in Australia. In 2001 the Intergovernmental Panel on Climate Change reported that "there is new and stronger evidence that most of the observed warming over the last 50 years is attributable to human activities". [4] A projected temperature increase of 1.4 – 5.8 degrees C above 1990 levels by 2100 will be accompanied by rising sea levels, more intense precipitation events in some countries, increased risk of drought in others ad adverse effects on agriculture, health and water resources. In May 2001 16 academies including the Australian Academy of Science urged individuals, businesses

[1] IPCC (2001) *Third Assessment Report - WG I Climate Change 2001: The Scientific Basis, Summary for Policy Makers.* See http://www.ipcc.ch
[2] Framework Convention on Climate Change (FCCC), Article 2. United Nations, 1992.
[3] Greenpeace (1997) *Fossil Fuels and Climate Protection: The Carbon Logic.* Greenpeace International, Amsterdam.
[4] ibid.

and governments to take prompt action to reduce greenhouse gases. [5] Such action requires a transition from greenhouse gas producing fossil fuels to clean energies such as wind and solar.

Since forging the Kyoto Protocol in 1997, the world's governments, scientists and industry have grappled with the central problem of greenhouse pollution abatement. All the while, industrial emissions of carbon dioxide, the major greenhouse pollutant, have continued to rise. Since Kyoto, the planet has continued to slide toward its ecological limits.[*]

In recent years the world has experienced extraordinary climatic events. 1998 saw the strongest El Nino phenomenon ever.[6] Extreme droughts and floods followed, with hot dry conditions and devastating forest fires throughout South East Asia and Papua New Guinea. The Southern US suffered the worst droughts ever recorded and severe flooding in Peru, China and the Indian Subcontinent left millions homeless. [7] 1998 was also a bad year for storms and cyclones.[8] Hurricane Mitch swept through Central America killing 18,000 and displacing 3 million people.

These impacts were reflected in economies around the world as insurance companies scrambled to reassess liabilities for natural disaster.[9] Canada recorded the worst ice storm ever, setting a new benchmark for the largest single insurance pay out for a natural disaster (US$1.5 billion). In the same year devastating coral bleaching events were experienced on reefs around the world, including Australia's Great Barrier Reef.

Establishing a strategic vision

While the vast majority of countries around the world are committed to CO_2 emission reductions, governments in Australia have failed to grasp the fundamental imperatives of global warming. Policy remains stubbornly focused on fossil fuel development with inadequate support for renewable energy.

At a policy level, State and Federal Government support for fossil fuels remains unwavering. Australia is pushing ahead with a new form of fossil fuel

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[5] Joint statement on 'The Science of Climate Change' issued by the Australian Academy of Sciences, Royal Flemish Academy of Belgium for Sciences and the Arts, Brazilian Academy of Sciences, Royal Society of Canada, Caribbean Academy of Sciences, Chinese Academy of Sciences, French Academy of Sciences, German Academy of Natural Scientists Leopoldina, Indian National Science Academy, Indonesian Academy of Sciences, Royal Irish Academy, Accademia Nazionale dei Lincei (Italy), Academy of Sciences Malaysia, Academy Council of the Royal Society of New Zealand, Royal Swedish Academy of Sciences and Royal Society (UK), 17 May 2001.

[*] See Appendix 1document, Fossil Fuels and Climate Protection: The Carbon Logic; Greenpeace; 1999. This document details the ecological limits for carbon dioxide emissions, above which ecological systems may be unable to adapt.

[6] World Meteorological Organisation 1998 WMO Statement on the status of the Global Climate WMO, Switzerland

[7] ibid.

[8] ibid.

[9] Flavin, C & Dunn, S 1997 Rising Sun, Gathering Winds: Policies to Stabilise the Climate and Strengthen Economies WorldWatch Institute, Washington

(and greenhouse pollution) with the Stuart Oil Shale Project in Queensland, brown coal developments in Victoria and new coal fired power stations.

The Stuart Project is uneconomic without government subsidies yet stages 1 and 2 would increase Australia's greenhouse gas emissions by at least 2.25% above 1990 levels. The recent Cabinet decision to provide further assistance to the Stuart Project went against advice from all government departments consulted.[10]

With Australia's greenhouse gas emissions in excess of 17% above 1990 levels, it is clear that existing greenhouse policy in Australia is failing to achieve emissions reductions. Greenhouse policy must provide a constraint to fossil fuel development in order to deliver substantial, real and timely reductions in greenhouse gas emissions.

The long term driver to meet the international challenge of climate change is the Kyoto Protocol. The Australian Government has stated that it will not ratify without US involvement and targets for developing countries. Seventy six countries have now ratified including Japan and the EU. Australia too must play its role in the international effort to reduce emissions and ratify the Protocol so that it can come into force without delay.

Implementation of the Kyoto Protocol is important as a first step, but to keep within the planet's ecological limits, further reduction will be necessary in the second commitment period and beyond.

Australia must begin to grapple with the imperatives presented by climate change and the Kyoto agreement. A timetable must be set for the transition away from fossil fuels – the major cause of the problem to clean renewable energies and fuels.

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[10] Leaked Cabinet document, 'Government Support for Shale Oil', 6 May 2002.

Fossil Fuel Inertia

The ecological limits of climate change

The primary objective of the United Nations Framework Convention on Climate Change (UNFCCC), which has been ratified by Australia, is *"the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."* [11] The UNFCCC goes on to state that *"Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."*[12]

The United Nations Advisory Group on Greenhouse Gases (UNAGG)[13] has identified the following ecological, or environmental, limits for rates and magnitude of temperature increase and sea-level rise which would allow ecosystems to adapt naturally to climate change, thereby meeting the objective of the UNFCCC.

Global mean temperature:

- Maximum rate of 0.1 degree C per decade
- Maximum long term (beyond 2100) increase of 1.0 degree C above pre-industrial levels

They found that global mean temperature increase beyond 1.0 degree C *"may elicit rapid, unpredictable and non-linear response that could lead to extensive ecosystem damage."*[14]

Sea level rise:

- Maximum rate of 20mm per decade
- Maximum increase of 20cm above 1990 levels

According to UNAGG, limiting sea level rise to 20mm per decade would *"permit the vast majority of vulnerable ecosystems, such as natural wetlands and coral reefs, to adapt. Beyond this rate of (sea level) rise damage to ecosystems will rise rapidly."*[15]

The European Union set a policy objective to limit the global mean temperature increase to 2 degrees C. However, this would not meet the

[11] Framework Convention on Climate Change (FCCC), Article 2; United Nations; 1992.
[12] ibid.
[13] Rijsberman F.J. and Swart R.J. (eds) 1990 Targets and Indicators of Climate Change; Stockholm Environment Institute for the United Nations Advisory Group on Greenhouse Gases (UNAGG)
[14] ibid.
[15] ibid.

objective of the UNFCCC, as illustrated by a report from the UK Hadley Centre for Climate Prediction and Research.[16]

Current Australian Government policies fail to identify or reflect the need to stay within the ecological limits necessary to prevent dangerous climate change.

RECOMMENDATION: That Australian Government policy on resource exploration recognise the constraint of climate change and be based on the objective of staying within the ecological limits as defined by the United Nations Advisory Group on Greenhouse Gases in order to prevent dangerous levels of climate change and meet the objective of the UNFCCC.

The policy implications of ecological limits

The rate and magnitude of global temperature increase are primarily governed by the amount of carbon dioxide (CO_2) or its equivalent in the atmosphere. Therefore, CO_2 emissions need to be controlled to ensure Australia can meet the objective of the UNFCCC by staying within the ecological limits.

The major source of CO_2 is the use of fossil fuels – oil, coal and gas. According to the CSIRO, 75% of Australia's greenhouse gas emissions come from fossil fuel sources.[17] According to the IPCC, a doubling of CO_2 in the atmosphere could cause temperature increases between 1.4 and 5.8 degrees C over 1990 levels by 2100.[18]

It is clear that to meet the objective of the UNFCCC and stay within the ecological limits as defined by UNAGG, action must be taken to address the current unsustainable use of fossil fuels.

Staying within these ecological limits requires levels of CO_2 in the atmosphere to be stabilised at or below 350 parts per million volume (ppmv). This means reducing emissions below current levels. Given this knowledge it is possible to calculate a global carbon budget giving the total amount of carbon that can be emitted to the atmosphere over the next 100 years.[19]

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[16] Climate change and its impacts: Stabilisation of CO_2 in the atmosphere; Hadley Centre for Climate Prediction and Research, The UK Meteorological Office for the UK Department of the Environment, Transport and the Regions 1999. The full report can be found at www.met-office.gov.uk/sec5/CR-div/CoP5/contents.html.

[17] Dr Chris Mitchell, CSIRO Division of Atmospheric Research; Presentation to the Australian Government's Coordination Committee on Science and Technology; June 1999. From Climate Change Newsletter; Volume 11 Number 3; October 1999; Australian Bureau of Rural Sciences

[18] op cit.

[19] For more details of the carbon budget and the ecological limits see Appendix 1 document, Fossil Fuels and Climate Protection: The Carbon Logic; Greenpeace; 1999.

The carbon budget amounts to 225 billion tonnes (GtC). This figure contrasts sharply with IPCC estimates of business as usual (under scenario IS92a) emissions of 1400 billion tonnes of carbon to the year 2100.[20]

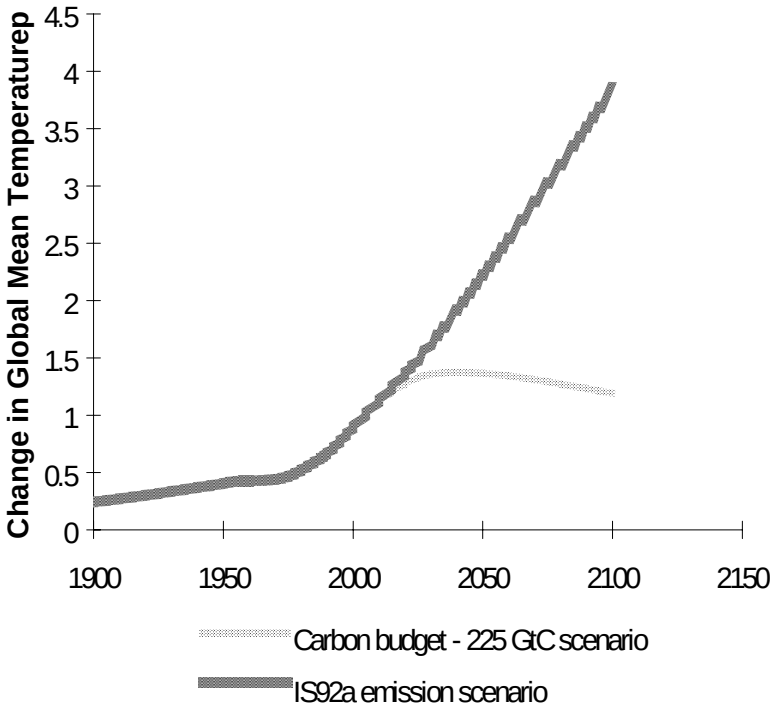

Figure 1: Changes in global mean temperature under IPCC business as usual scenario (IS92a) compared to stabilising temperature change by adopting the carbon budget

The carbon budget of 225 billion tonnes is around 25% of known fossil fuel reserves and a very small fraction of total estimated fossil fuel resources. The sobering implication of this figure is that the budget will be exhausted in 30 to 40 years under a business as usual scenario. To stay within these ecological limits 75% of fossil fuel reserves can never be used. In order to prevent dangerous levels of climate change fossil fuels must be phased out and replaced with renewable energies and fuels.

[20] Leggett, J et. al. 1992 op. Cit.

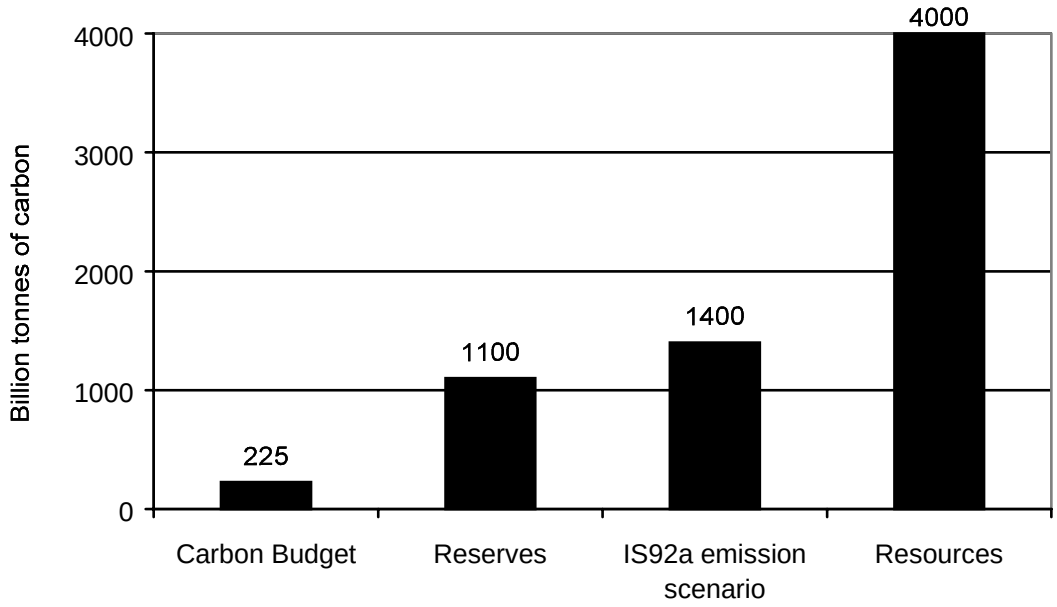

Figure 2: Comparison of amounts of carbon released under the carbon budget, the IPCC business as usual scenario, and from fossil fuel reserves and resources

Current Australian Government policies fail to address the need to phase out fossil fuels and replace them with renewable energy in order to stay within the ecological limits necessary to prevent dangerous levels of climate change.

Recommendation: Greenpeace recommends that Federal and state governments need to develop as a matter of urgency a transition strategy to switch from fossil fuels to renewable energy and fuels so that it can occur in an orderly and manageable fashion, but within a timeframe necessary to prevent dangerous climate change.

Government support for continuing fossil fuel development in Australia

Fossil fuel exploration and development in Australia is continuing under a business as usual approach, rather than declining, as it must if Australia is to help prevent dangerous levels of climate change. This continued development of fossil fuels makes it more difficult for Australia to meet its Kyoto target which the Government has committed to meet[21].

75% of Australia's greenhouse gas emissions come from fossil fuels.[22] Despite the Australian Government's acknowledgment that "dealing with climate change will be a key issue for the 21st century",[23] Government policy continues to actively encourage and support the development of fossil fuels.

The continued business as usual development of fossil fuels has been exacerbated by the failure to include a national "greenhouse trigger" (for major fossil fuel developments) in the Environment Protection and Biodiversity Conservation Act. Currently, the majority of fossil fuel developments fall under State, rather than Federal, jurisdiction but it is the Federal Government that is responsible for Australia's commitment under the UNFCCC and the Kyoto Protocol.

Australia's climate change responsibilities are falling between the gaps, with the Federal Government failing to provide leadership on the issue and actively encouraging continued fossil fuel developments. At the same time State Governments have no requirements to limit fossil fuel developments. One recent example includes on-going Federal and State support for the Stuart Oil Shale Project.

CASE STUDY: THE STUART OIL SHALE PROJECT -

A GREENHOUSE DISASTER IN THE MAKING

A new and potentially enormous source of greenhouse pollution is currently being developed near Gladstone in Queensland with strong government support. Australian company Southern Pacific Petroleum (SPP) is currently commissioning an experimental pilot plant to test a new technology to extract oil from shale rock. If the Stuart Project is successful, SPP has stated its intention to develop its other oil shale deposits in Queensland.

These deposits contain approximately 29 billion barrels of oil - more than 10 times the total oil resource in the Bass Strait. The development of all these deposits could increase Australia's greenhouse gas emissions by 227-1380% over 1990 levels.

[21] Under the Kyoto Protocol, Australia has committed to a target of limiting the growth in our greenhouse gas emissions by 8% over 1990 levels by the first commitment period of 2008-2012.

[22] Dr Chris Mitchell CSIRO 1999 op. Cit.

[23] Dr David Kemp, Speech delivered at RIIA, Chatham House, London 15 July 2002, 'Australia's Approach to Climate Change'.

Shale oil is a fossil fuel – like coal, oil or gas. It is extracted from shale rocks through a process that heats the rock to 500°C. Due to this energy intensive process shale oil emits more carbon dioxide than any other fossil fuel, even more than conventional oil or brown coal.

The Stuart Project is planned as a three stage development. Stage 1 is currently undergoing commissioning and will produce 4,500 barrels of oil per day.

The approval process for Stage 2 is currently underway. Stage 2 is planned for 2003 and would produce an additional 14,800 barrels a day. Stage 3 would produce an additional 65,000 barrels a day by 2007.

The Stuart Shale Oil Project is uneconomic without Government subsidies, which has promised excise exemptions worth around $240 million. The Federal and Queensland Governments have offered over $300 million in subsidies to the Stuart project.

The attempt to develop an oil shale industry in Australia runs counter to the need to stop dangerous climate change and will make it incredibly difficult, if not impossible, for Australia to meet its Kyoto target.

RECOMMENDATION:

- **that the existing excise exemption on naptha from shale oil be removed;**
- **that there is no increase or extension of existing government financial support for the development of oil shale, including that provided through fuel taxation, and;**
- **that there is no new government financial support for the development of oil shale.**

RECOMMENDATION: That the Australian Government does not approve Stage 2 of the Stuart Oil Shale Project.

Counting the Costs

Climate Change Impacts – Threats to the Great Barrier Reef

The impacts of climate change for Australia could be considerable. Chief among these is catastrophic damage to the Great Barrier Reef. This has been recognised by the IPCC; *"Australia's coral reefs, including the Great Barrier Reef, are among the region's most sensitive environments to sea-level rise and climate change …"* [24]

Coral bleaching: Coral bleaching occurs when corals expel symbiotic photosynthetic algae essential for coral growth. This occurs in response to stresses imposed by high ocean temperatures which, when frequent or severe enough, can lead to coral death. [25] In 1998, reefs around the world experienced the worst coral bleaching on record.[26] Based on aerial surveys carried out by The Great Barrier Reef Marine Park Authority (GBRMPA), up to 88 percent of inshore reefs along the Queensland coast were affected.[27]

In 2000, the Global Coral Reef Monitoring Network (GCRMN), a group of government bodies, scientific institutes and non-governmental organisations involved in reef monitoring from more than 80 countries, released its bi-annual report on the state of the world's coral reefs. The report found: [28]

- 16% of the world's coral reefs were "effectively lost" in nine months during the coral bleaching event of 1997-98
- *"Reef recovery is dependent on few or no repeats of the extreme event of 1997-98, at least not within the next 20 to 50 years which will be the time required for many of the reefs to recover to structures resembling those before the bleaching".*
- *"We are being forced to recognise that human reliance on burning fossil fuels and clearing rainforests is leading to changes in global climate, and that events like the extensive coral mortality [of] 1998 may occur more frequently and devastatingly in the future; and not just to coral reefs."*

The bleaching event of 2002 on the Great Barrier Reef was more severe than the event of 1998, making this bleaching event the worst ever recorded according to the GBRMA.[29] The GBRMA reported that "should warm water events increase in severity, duration or frequency in the future, coral bleaching is likely to become increasingly severe in the GBR".

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[24] Basher R et. al. 1997 op. Cit.
[25] Hoegh-Guldberg, O 1999 Climate Change, Coral Bleaching and the Future of the World's Coral Reefs, Greenpeace, Sydney
[26] ibid.
[27] Great Barrier Reef Marine Park Authority 1998 Latest on Coral Bleaching Media Release 23/4/98
[28] Global Coral Reef Monitoring Network; Status of the Coral Reefs of the World: 2000, 2000. See www.nova.edu/ocean/9icrs/liveweb/1024_3.html for a copy of the executive summary.
[29] An overview of the bleaching event is available on the GBRMPA web site http://www.gbrmpa.gov.au/

A report by Ove Hoegh-Guldberg; *Climate Change, Coral Bleaching and the Future of the World's Coral Reefs*, commissioned by Greenpeace, finds that unless serious action is taken to stop dangerous climate change, severe coral bleaching episodes like that experienced in 1998 could increase in frequency and severity worldwide, with annual occurrences by 2030-2070. Bleaching episodes of this frequency would be catastrophic for the Great Barrier Reef.

The loss of this unique ecosystem would cost Australia billions of dollars in lost revenue from tourism and fishing. Tourism on the Great Barrier Reef generates approximately $1.5 billion a year.[30] In addition, damage to the reef could have an impact on the coastal protection it provides, resulting in further economic impact on human settlement and agriculture.

Coral bleaching is only one of many impacts of global warming on the Great Barrier Reef, others include;

Extreme rainfall: The frequency of extreme rainfall events across northern Australia has increased over the past 100 years.[31] Climate change projections show further substantial increases over the next century.[32] More extreme rainfall will increase sediment run off and decrease salinity in enclosed waters, thereby damaging coral reefs. The IPCC has concluded: *"Any increase in extreme rainfall events and sedimentation would be likely to have major impacts on river, lake, estuarine, and coastal waters - particularly the Great Barrier Reef - and lead to reduced aesthetic values and reduced recreation and tourist use."*[33]

Cyclones: Cyclones cause major destruction within reef ecosystems as high wave action breaks coral formations. If tropical cyclone frequency and/ or intensity increases due to climate change[34], large-scale damage to the Great Barrier Reef would result.

Sea level rise: Coral severely weakened by coral bleaching, physically damaged from increased storm and cyclone events, and suffering reduced growth rates from increased water temperature and dissolved CO_2 may be unable to grow to match rising sea levels. Corals would then be drowned by the rising oceans.[35]

Carbon dioxide concentrations: Since the Industrial Revolution, human activities have increased the atmospheric concentration of carbon dioxide

[30] Hoegh-Guldberg, O 1999 op.Cit
[31] Plummer, N., Hennesssy, K.L., Lavery, B.M., *et al*. (1998) Trends in Australian Climate Extremes Induced during the Twentieth Century. In: Proceedings Climate Reduction for Agricultural and Resource Management, Australian Academy of Science, Canberra
[32] See Fig 3 in Pittock, A.B. (1998) Coral Reefs and Environmental Change: Adaptation to What? *American Zoologist*
[33] Basher R et. al. 1997 Regional Impacts of Climate Change: IPCC Special Report
[34] Pittcock, A et. al. 1997 'Climate Change, Climatic Hazards and Policy Responses in Australia in Downing, T & Olsthoorn, A (eds.) Climate, Change and Risk, Routledge, London
Pittock, A.B. (1998) op cit.
[35] Glynn, P.W. (1996) op cit

(CO_2) from around 280 parts per million volume (ppmv) to over 350 ppmv. Some of the CO_2 released by human activities is absorbed by the ocean, increasing the concentration of dissolved inorganic carbon and slightly increasing acidity. Inorganic carbon levels (in the form of aragonite) in the ocean are critical to corals because they use these dissolved chemicals in laying down their skeletons. New laboratory research suggests that a doubling of pre-industrial CO_2 concentrations and associated changes in ocean chemistry would reduce coral calcification growth rates by 10 - 30 percent.[36] This could reduce the capacity of reefs to grow, repair themselves or keep pace with rising sea levels.

Climate Change Impacts - Costs to Australian Agriculture

The rural sector accounts for a large part of Australia's export earnings and any changes in yield would have a significant impact on the national economy. Yet, agriculture is highly susceptible to climatic change. The IPCC has concluded that Australia is particularly vulnerable to climate changes because of its tropical/ subtropical latitude, its scarce water sources and fact that crops already grow at or above their optimum temperatures.[37]

The severe drought of the early 1990's caused a drop in production of several key agricultural products (mainly grain and wool), while the 1994-95 drought caused a drop in production of almost 50% on the previous year and losses of $2 billion.[38] In March 1997, Cyclone Justin cost an estimated $130 million in losses to North Queensland's banana and sugar crops.[39] Damages of $12 million were caused to Mildura grapevines on a single day in January 1990 when temperatures hit a maximum of 47◦c.[40]

Warmer environments are likely to cause the spread of pests and disease to areas where favourable conditions did not previously exist. The number of cattle ticks is expected to increase and spread south incurring national costs of $18-192 million.[41] A CSIRO study into the cattle disease, blue tongue, found that increased rainfall and a rise in temperature would extend the area of infection 150km southward.[42]

The combined effect of more droughts, more floods and more pest plagues could lead to high economic costs for Australian agriculture. Increased heavy rainfall could wash away topsoil and reduce agricultural production while

[36] Gattuso, J.-P., Frankignoulle, M., Bourge, I., *et al.* (1998) Effect of calcium carbonate saturation of seawater on coral calcification, Global and Planetary Change, in press
[37] Basher, R.E., Pittock, A.B., Bates, B., *et al*. (1998) op cit
[38] Greenpeace 1997 Risking Australia: The Impact of Climate Change Greenpeace, Sydney
[39] Crops bear brunt of cyclone Justin, Australian Financial Review, 25 March 1997
[40] Pittock, A.B. (1998) op cit
[41] CRC for Tropical Pest Management, CSIRO Division of Entomology, 1996
[42] Ward M.P., 1994, The Use of Discriminate Analysis in Predicting the Distribution of bluetongue virus in Queensland, Veterinary Research Communications 18: 63-72

storms and cyclones could cause millions of dollars in damage to crops.[43] Short-term increases in CO2 will lead to increased plant growth but in the long-term, higher CO2 levels will result in low-protein crops (wheat experimentally exposed to double CO2 was found to contain less than 9% protein).[44] Low-protein crops are less nutritious to livestock and fetch a lower price on global markets.[45] These costs have yet to be adequately quantified or included in economic modeling associated with climate change.

Appendices

Appendix 1 Fossil Fuels and Climate Protection - The Carbon Logic

Appendix 2 Response to the Supplementary Report for the Environmental Impact statement for Stage 2 of the Stuart Oil Shale Project

List of Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
AGO	Australian Greenhouse Office
COAG	Coalition of Australian Governments
CO_2	Carbon dioxide
CSIRO	Commonwealth Scientific and Industrial Research Organisation
FCCC	Framework Convention on Climate Change
GtC	Giga tonnes of carbon
IPCC	Intergovernmental Panel on Climate Change
ppmv	Parts per million volume
PMSEIC	Prime Minister's Science, Engineering and Innovation Council
SEDA	Sustainable Energy Development Authority
SHW	Solar Hot Water heaters
SPP	Southern Pacific Petroleum
UNAGG	United Nations Advisory Group on Greenhouse Gases
UNFCCC	United Nations Framework Convention on Climate Change

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[43] Reilly, J., Baethgen, W., Chege, F.E., et al., 1996, Agriculture in a Changing Climate: Impacts and Adaptation, in Watson, R.T., Zinyowera, M.C., Moss, R.H., et al. (eds), Climate Change 1995, Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses, Cambridge University Press, Cambridge

[44] CSIRO Plant Industry Commission Group, 1997, Plants in a Greenhouse World, CSIRO, Canberra

[45] ibid.