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This article talks about the South Australian Government initiative to legislate to reduce climate change.

What's hot!? The *Climate Change and Greenhouse Emissions Reduction Bill 2006*

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What's hot?, is the planet as one climate record after another gets broken, is the rapid thawing of the Tundra and the Arctic, is the increasing drought cycle in southern Australia as predicted in most greenhouse warming models, is that run away greenhouse effect may already be occurring as the vast deposits of carbon are released from the Tundra, and that climate warming is the greatest threat to biodiversity.

What's hot? is that a new approach to the value, use, and pollution of the atmosphere is required at an international level. Increasing evidence shows that the prevention of climate warming should be the paramount concern of humanity and that societies could collapse under the stress of a greenhouse world. Recent effects of climate change, including heat waves, droughts, violent storms, and floods will increase in size. These crises will be accompanied by destruction to life and property, loss of agricultural production, and loss of natural habitat – including marine habitat.

The Conservation Council of South Australia's General Meeting in August addressed '*Responding to Climate Change*'. Speakers were Maggie Hine, from the Climate Change Division, Department of the Premier and Cabinet, and Stephanie Williams from the Department of Environment and Heritage. The audience was large and the topic was 'hot' and to be legislated in the South Australian '*Climate Change and Greenhouse Emissions Reduction Bill 2006*' found at www.climatechange.sa.gov.au.

This '*Climate Change and Greenhouse Emissions Reduction Bill 2006*' to some extent defines the current state of climate warming and effects legislation to limit climate warming. Urgent measures are required to stop and hopefully reverse the effect of climate warming. However, the legislation fails to address two important issues, 1) it does not seek for the normalization of the atmosphere but only a 60% reduction of 1990 carbon dioxide levels by 2050, and 2) it does not have strong enough incentives for the reduction of emissions from industrial sources or from energy usage.

Marine conservationists should encourage the prevention of more climate warming. The marine environment is highly vulnerable to the effects of climate warming. Predicted effects include sea level rises due to the melting of ice and the expansion of sea water as it warms. This will cause coastal erosion and the loss of remaining coastal estuaries and marshes. Lowered salinity and warming waters will effect oceanic currents and alter the climates of whole regions. Higher air temperatures will cause stratification of the water layers in shallow bays and estuaries thus increasing the chances of dinoflagellate blooms and red tides. Areas of seagrass and other marine species will die from heat stress.

In spite of these threats very little has been done to prevent the climate warming crisis and governments have only recently begin to mobilize on the issue. Several countries that are particularly dependent on the profligate use of energy have resisted global agreements to address climate change. Nevertheless, at a global scale evolving policies plan to turning climate change around, through reducing carbon dioxide and methane emissions, and through the fixing and storage of carbon.

Even under the best current scenarios for the amelioration of climate warming the Earth will probably get hotter for fifty to one hundred years before beginning its cooling to normal. Carbon emissions can be reduced by using less carbon based fuels. The best thing would be to immediately adapt the economy to accommodate only a net fixation of carbon. However, all industries are based on the use of carbon emitting fuel sources including coal, oil and gas. Therefore, the manufacture and maintenance of non-carbon fuel sources themselves result in the short term increase of carbon dioxide, including the mining and processing of ore to yield uranium for nuclear reactors.

We still have some problems with technologies to ameliorate the crisis, but there are also opportunities for improved conservation outcomes. Carbon can be fixed by trees but this method of reducing atmospheric carbon dioxide is limited. As forests mature their net mass of carbon levels out and no more carbon can be absorbed. After this for increase in the amount of net fixed carbon more trees must be planted. The atmosphere already contains the carbon dioxide from previously cleared great forests, and the replanting of these forests is unlikely in the near future. However, there can be great advantages to conservation from the planting of carbon sinks besides carbon fixing.

If areas of low conservation significance are chosen for planting the climate can be moderated by trees, valuable timber produced, and areas for wildlife and recreation provided. Plantation forests could have a certain percentage of their area reserved for wildlife and never harvested, with these areas of high diversity distributed along roads and in recreation areas. This type of habitat matrix could support a very high diversity of plants and animals including endangered species and take pressure of protected areas.

To supplement the fixation of carbon by new forests, and to speed up the progress of climate normalization carbon dioxide could fixed by physical or chemical processes. A possible physical process is the deposition of frozen carbon dioxide under the sea floor. Surprisingly, natural deposits of carbon dioxide on the seafloor could be subject to sublimation and then explode to the surface thus releasing carbon dioxide. A chemical process for the removal of carbon dioxide from the atmosphere is its absorption by seawater in the ocean. The absorption of carbon dioxide is already occurring to the extent that some seawater is becoming unsuitable for the maintenance of native life forms, and perhaps should not be relied on as a major carbon sink.

Addressing the problems of global warming through the reduction of carbon dioxide emissions, and creating policies for abatement and adaptation to the effects of climate change on biodiversity were the main aims of the South Australian '*Climate Change and Greenhouse Emissions Reduction Bill 2006*'. At the heart of the legislation is a 60% reduction of the 1990 levels of greenhouse gas emission by 2050.

One widely discussed problem with the '*Climate Change and Greenhouse Emissions Reduction Bill 2006*' is that there appears to be little incentive for industry to engage in major programs for the reduction of carbon dioxide. The nature of 'Sectorial Agreements', a foundation of the policy, was widely discussed at the CCSA meeting. These 'Sectorial Agreements' agreements are between a greenhouse gas emitter and the State Government. They state a future emission target for the participant. The basis' of a secular agreements are; 1) Government representatives and sectors would reach a target for reduced emission, 2) Four year report on progress, and a 3) Review option with prescriptive measures which would be performance based. The agreements

can be with a person, industry, or business. The value of the agreements is that they define objectives, strategies, and methods.

Questions are also raised as whether the legislation really addresses the state of the climate crisis. There appears to be an immediate need to stop the emission of carbon dioxide and reverse the past damage, and a target of 60% reduction in carbon dioxide emission over another four decades seems very conservative. For instance the present over usage of oil will prevent many current uses in the near future; the optimistic forecast is a decline to a crunch in less than two decades. Considering the potential costs of climate warming to both society and biodiversity a target of zero net greenhouse emission within a shorter period could be more practical. There is a need for a complete restructuring of the economy and industry to achieve this goal. For instance to reduce the problems of emissions from transport, legislation should encourage urban consolidation and increased use of public transport. Building designs can also be optimized for energy usage.

What is really needed to address the issue of climate change is a major change in culture. The consumer society will have to change to a sustainable society. For too long have a small vested interest group profiting from increasing use of fossil fuels manipulated the world economy, politics, and society for their benefit. They have shown no regard for the destruction of public resources such as the atmosphere which is encouraged by their activities. Marine conservationists must support further efforts by the government to limit the negative ecological effects of these destructive industries and their associated cultures.

An important aspect of South Australia's approach to climate change is the abatement of negative effects and the adapting of ecosystems to probable environmental changes. These include the identification of vulnerable biodiversity assets, building resilience in ecosystems, improving ecological function and connectivity, and protecting terrestrial and coastal habitats from anticipated changes. These goals are limited by a lack of practical information – particularly of vulnerable coastal environments. Besides encouraging the government to directly address the causes of global warming marine conservationists should also encourage projects whose goal is increasing our knowledge of coastal biodiversity and the monitoring of the effects of climate change.

Nevertheless, in spite of the complexities of the issue, the enduring quality of the '*Climate Change and Greenhouse Emissions Reduction Bill 2006*' will be as a foundation and stepping stone to a general acceptance and implementation of sustainable management. Although there is a clear need for more powerful legislation on climate change, South Australia is already providing a global leader in addressing the problems of climate change.