Kyoto Protocol

Opposing Paradigms or Room for Convergence: the Australian Dilemma

by Vincent Cusack*

The Sixth Conference of Parties (COP6) to the Framework Convention on climate change ended without agreement at The Hague, on November 24–25, 2000. In the aftermath of the breakdown, a host of newspaper and television reports across the globe applied various levels of colourful and dramatic language to highlight the level of despair surrounding the failure. One of the most cited comments used came from the British Deputy Prime Minister, John Prescott, as he left the talks saying he was "gutted" following the lack of achievement.[1] But among the doom and gloom is the sense of inevitability that agreement must be reached at the next round of discussions if there is to be any hope of redressing the huge problem of global warming for future generations. So what were the stumbling blocks and what needs to be done to reach consensus between the main opposing groups?

This article provides an overview of the contrasting approach taken by the two main opposing groups, the

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European Union and the Umbrella Group led by America. It continues with an exploration of the Australian position on climate change and will argue for a much more constructive role from Australia and the United States at the next round of negotiations. It suggests that the Umbrella Group is operating from an outdated paradigm and that the twin aims of economic growth and sustainable development can be achieved. Finally it supports a much greater role for renewable energy and will argue that this is also the best means of bridging the gap between the United States and China, under the Clean Development Mechanism.

While there were over 180 nations represented in The Hague the climate change summit failed to produce a satisfactory outcome because the main industrialised countries could not agree on the specifics, required to mitigate global warming. In essence, the two opposing groups resumed their positions adopted at Kyoto, with the European Union arguing for a greater reduction of fossil fuel use and the Umbrella Group insisting on unrestricted emission trading and the inclusion of carbon sinks to offset their emission targets.[2] The Umbrella Group was formed towards the final stages of the Kyoto summit and consists of a number of countries with similar interests including the United States, Canada, Japan and Australia.[3] These countries rely heavily on fossil fuels to produce energy and have at various times been influenced by the large well-organised interest groups. In the United States, for example, prior to the negotiations at Kyoto, the fossil fuel industry spent US $13 million on an advertising campaign warning against the economic consequences of setting legally binding emission targets.[4] In Australia, the Federal Government based its entire greenhouse strategy on research conducted by the Australian Bureau of Agriculture and Research Economics, which was funded by the fossil fuel companies. This research was not only criticised by the environmental groups but was found by the Commonwealth Ombudsman to be inappropriate, poorly planned and could be perceived as favouring the fossil fuel industries.[5]

Another main area of contention is the opposition, mainly by the US, to excluding the larger developing countries from voluntary emission reduction targets. These countries include China, India, South Korea and Brazil, whose participation in the process would increase the likelihood of US ratification. In fact, just months before the Kyoto conference the US Senate made it clear that it would not ratify any climate change treaty without the developing countries engaging in meaningful emission reduction.[6] This position has the strong backing of the American business lobby who holds the view that emission reduction will have a severe negative impact on economic growth. This drives the fear of a loss of competitiveness, which could result in a shift in investment and employment opportunities to countries without commitments. Of course the developing countries oppose any binding targets that could potentially impede their transition to greater prosperity. The Small Island Developing States (SIDS) of the South Pacific, in particular, are more concerned with rising sea levels and are the most vulnerable to continued climatic change. They argue for the richer nations to take the initiative and redress the environmental problem that was largely created by the process of Western industrialisation.[7] Thus, the SIDs align themselves with the larger developing countries to strengthen their overall position in the climate change negotiations.

The long road to an effective climate change treaty began in 1988 when the United Nations and the World Meteorological Organisation established the Intergovernmental Panel on Climate Change (IPCC) to examine the science and economics of a changing climate.[8] In June 1992, the United Nations Framework Convention on Climate Change was signed at the Earth Summit in Rio de Janeiro. This was an historic treaty whereby over 150 countries accepted the dangerous threat of global warming and agreed to limit anthropogenic interference with the climatic system.[9] This was followed up with the First Conference of the Parties to the Framework Convention on Climate Change, in Berlin in 1995. It was here that the delegates agreed to move away from ineffective voluntary commitments and work towards a more permanent structure for mitigating climate change.[10] Also in 1995, the IPCC brought down its second report and while there may not have been "absolute" scientific certainty, the majority of countries supported its conclusion that the balance of evidence suggested a discernible human influence on global climate.[11] This position was advanced with further negotiations but it was COP3 at Kyoto, Japan in 1997, which set (subject to ratification) legally binding reduction targets for greenhouse gas emissions.[12] Yet despite the advancements at Kyoto there were many difficult issues left unresolved and a full agreement could not be reached.

While the Protocol moved towards stronger commitments it allowed for the inclusion of a number of measures which were designed to assist countries through collaboration to meet their targets. These measures became known as "flexible mechanisms" without which it is unlikely that agreement could have been reached but of course, added considerably to the overall complexity of the Treaty. These mechanisms included joint implementation, emission trading and the surprise element of the negotiations, the clean development mechanism (CDM).[13] Under the Protocol, joint implementation involves cooperative projects to reduce emissions between two parties with commitments. It was originally proposed by Norway before the 1992 Earth Summit and was designed to encourage investment from Annex 1 (or industrialised) countries to exchange capital and technology for ecological space in developing countries.[14] It was rejected at the COP1 conference in Berlin in 1995 because of concerns that Annex 1 countries could refrain from actively pursuing innovative greenhouse gas reduction measures. The other project-based mechanism is the CDM which, under Article 12, enables Annex 1 countries to gain credits for project investments in non-Annex 1 (or developing) countries. There are a number of conditions contained in this section, including that the project activity shall have "real, measurable and long-term benefits related to the mitigation of climate change".[15]

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In addition, the initial concept of Joint Implementation was extended and reintroduced in a different format at Kyoto. Thus, under Article 17 emission trading is permitted between Annex 1 countries, to assist in meeting their commitments in Article 3. However, there was one notable qualification that "any such trading shall be supplemental to domestic actions".[16] This was specifically included to overcome concerns that Annex 1 countries might use this provision instead of embarking on real emission reduction strategies. Emission trading operates under free market principles with the intention of providing the least cost-effective measures of meeting the requirements of the Protocol. It is modelled on various emission permits and credit schemes[17] and is at least in theory relatively straightforward. For example, large polluting industries would be required to own permits equal to the amount of carbon they emit. If they achieved a significantly lower target they would be free to sell the excess permits on the free market to another industry which failed to meet its specific target.[18] These schemes have been implemented at a national level and are likely to be more successful there than in the complex international arena.

Indeed, this was the area where negotiations broke down at The Hague resulting in the suspension of COP6 until May/June 2001. The parties failed to reach agreement over emission trading and carbon sequestration or "sinks", the process whereby trees and vegetation soak up carbon during photosynthesis. The European Union (EU) have consistently argued for real emission cuts and sought to place restrictions on the capacity for offsetting targets in sinks. At Kyoto in 1997, the former German Environment Minister, Angela Merkel, called for a "50 per cent cap on the amount of a country's obligation that can be achieved through trading".[19] At The Hague, the EU maintained its position of placing a quantitative cap on the use of the flexible mechanisms, with the French President, Jacques Chirac, calling on the US to make a real commitment. He said that "the US alone emits a quarter of the world's greenhouse gases, so it's the Americans who should be called upon to cast aside their hesitation that emission cutting would cost them their economic growth".[20] Yet, despite further opportunity for clarification at COP4 and 5, it would appear that the main opposing groups constructed extremely biased assessments of the provisions contained in the Protocol. The Umbrella Group led by America and supported by Australia, Canada and Japan insisted on a larger role for carbon sinks. Eileen Claussen, a former member of the US negotiating team and now president of a leading Washington Climate Change group, summed up the position of the Umbrella Group. She said, "If we take carbon sequestration and market mechanisms out of the equation or bog them down with such overly restrictive rules that nobody uses them then we are limiting our ability to meet our environmental objectives".[21]

In an effort to break the deadlock between the EU and the Umbrella Group, the Dutch Environment Minister and Chairman of the Conference Jan Pronk introduced a compromise paper in the final days of COP6. While the paper addressed the contentious mechanisms it was ambiguous in certain areas and was criticised by all parties. The German Environment Minister, Juergen Trittin claimed that the paper significantly weakened the text of the Kyoto Protocol and added "that the benchmark for us is environmental integrity".[22] The document allowed for the inclusion of sinks but not to the extent that the US wanted. The US sought 100 million tonnes of carbon credits each year for effective forestry management to offset its industrial emissions. However, under the Pronk proposal the American claim was halved to 50 million tonnes.[23] Yet despite coming so close to an agreement, the EU rejected the proposal because it was feared that the Umbrella Group and America in particular could apply a broad interpretation and avoid making real emission cuts at home. The French Environment Minister defended her tough stance and laid the blame squarely with the Americans. She claimed that for "three years we had a dialogue of the deaf with the US but now it is no longer keeping up its position of inflexible arrogance".[24] It remains to be seen if the EU gamble pays off as the new Bush administration may be even more supportive of American industry and could be less willing to compromise at the next round of negotiations.

Ironically, the American position is strengthened by the fact that it is the largest single emitter of greenhouse gases. The Protocol will only come into effect 90 days after 55 per cent of the Annex 1 signatories have ratified it. These countries must also account for 55 per cent of the entire Annex 1 emissions. Since the US's share is 38 per cent, it is extremely unlikely that the Protocol will enter into force without its participation.[25] This is arguably a significant reason why Australia took such an intransigent position at the climate change negotiations and closely aligned itself with the US. As such, Australia had to endure a raft of criticism for its stance at COP3 in Kyoto in 1997. It opposed flat rate targets for greenhouse gas emissions and while the majority of countries agreed to an average five per cent reduction, Australia achieved an eight per cent increase above the base year levels of 1990. In addition, during the final stages of the discussions Australia gained a remarkable concession with the inclusion of land clearing in baseline emissions.[26] This advantage to Australia could have been advanced with strong support for the Kyoto Protocol backed up with tangible domestic policies designed to achieve real emission cuts. Instead, Australia adopted an extremely cautious approach and placed too much emphasis on carbon trading and sinks.

While Australia is considered a small global emitter of greenhouse gases it ranks third highest among industrial nations on a per capita basis. The dominant source of its emissions come from energy intensive industries and coal fired power stations in particular. In 1996, for example, 79 per cent of its total national emissions came from energy with stationary sources, including power stations accounting for 55 per cent.[27] Australia relies heavily on the fossil fuel industry for energy, exports, employment and overall economic growth. Therefore it was not surprising that an Australian conservative government led by John Howard enthusiastically accepted the advice of Professor Ian Noble in 1997 that trees could play a major

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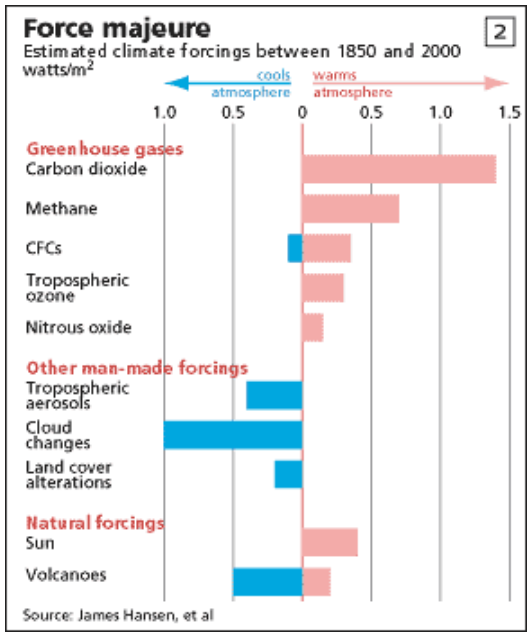
role in the uptake of CO_2 emissions.[28] Emission trading and sinks is now the preferred option for Australia since it has yet to make significant use of renewable energy, and any cutback on fossil fuels could have a negative impact on economic growth. In addition, it is becoming widely accepted that vast quantities of trees will have to be planted to tackle the enormous salinity problem in Australia. Hence, carbon trading has the potential to become an important source of revenue and encouragement for tree plantations throughout regional and rural Australia.

Salinity is by far the largest social, economic and environmental problem confronting Australia. It has resulted from replacing deep-rooted perennial trees and vegetation with European style annual crops which use lower amounts of rainfall. Salinity currently affects around 2.5 million hectares of farmland and is expanding at an alarming rate of 3 to 5 per cent a year, at an annual cost of 270 million dollars.[29] It has the potential to affect 12 million hectares and inflict significant damage to buildings, entire towns and numerous Australians through asset loss and poor water quality. As such, salinity is a clear example of the economic cost associated with environmental degradation. Moreover, the lack of early intervention to counter this huge problem can perhaps provide an invaluable insight into the Australian psyche. The cause of salinity was identified as early as 1924, when a Western Australian engineer, Walter Ernest Wood, published the first scientific paper on the subject.[30] Despite the clear link between removing native vegetation and rising water tables, land clearing continued on a massive scale until the 1980s. In fact Queensland lagged behind the other States and has rushed to beat pending legislation curtailing the practice of land clearing. The extent of this clearing in Queensland between 1995 and 1997 amounted to around 340,000 hectares per year of both regrowth and virgin timber.[31] While some sympathy can be allowed for the difficulty of introducing unpopular restrictive measures, governments of all persuasions failed to act in the overall national economic and environmental interest by not addressing the cause of salinity at a much earlier date.



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It is likely that these decisions were influenced by the prevailing view in Australia that nature could be used purely as an "economic resource" to meet human demands without much thought to the limits of natural resources. This view was central to all industrialised countries and stemmed from the anthropocentric mechanistic version of reality formulated by Rene Descartes.[32] Under this doctrine the natural world is theorised as a machine with no intrinsic value. This encouraged a human relationship of domination and control of nature.[33] As such, the pursuit of economic growth over the environment became the dominant social paradigm and was central to shaping the ideas, beliefs and values of humans over a number of decades. While this view has been vigorously challenged in many quarters it remains a commanding force among Australian decision-makers. This, combined with an abundance of mineral reserves and a lack of new technology production, has led many economic analysts to refer to Australia as an old economy.[34] Indeed, despite the recent huge success of the Olympics, an opportunity was lost to redress this perception and showcase some contemporary Australian innovation to a global audience during the opening or closing ceremonies.

One such area particularly suited and which is likely to play a significant role in the new economy is the expanding technology of renewable energy. A number of European countries are already well advanced in the use of cleaner forms of energy production. Germany, Denmark and the Netherlands are among the highest users of wind power in Europe.[35] It is no coincidence that these countries have made meaningful contributions to emission reduction and are well on course to meet the requirements of the Kyoto Protocol. For example, Denmark has a "Windmill Law" which requires Danish power companies to pay 85 per cent of the retail price of electricity from wind power producers.[36] By not having to rely heavily on fossil fuels for producing energy, Denmark has set a new emission reduction target of 50 per cent by 2030. This remarkable achievement can be contrasted with countries in the umbrella group such as Australia, Canada and Japan which have a much lower use of wind power or other forms of renewable energy. In fact, just days after signing the Kyoto Treaty, the Australian Government conceded that the electricity-pricing regime would impede the chances of meeting its emission targets.[37] Under the present pricing system the distance between the point of generation and the customer is not accounted for. This in effect provides a subsidy to remote, usually coal-fired power stations and discourages the use of cleaner forms of energy systems.

Australia has, however, taken tentative steps towards increasing its use of alternative energy. The Federal Government has introduced legislation which will require electricity retailers to source an additional two per cent of their electricity from renewable energy. This mandatory requirement is intended to be phased in during 2001 and will increase Australia's overall use of renewable energy to 12 per cent.[38] Yet, this does little to offset its dependency on fossil fuels and it is extremely unlikely that Australia will be able to meet its generous target of an eight per cent

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increase without emission trading or sinks. It would appear that Australia is restricted by its Government's ideological view of the world which prevents it from recognising the full economic potential of renewable energy. This view was highlighted during a recent television interview, when the Australian Prime Minister John Howard remarked that the Bush administration would be better on trade for Australia, because "it will be less beholden to the union movement, less beholden to the environmental push".[39] In contrast, the British Prime Minister Tony Blair has recognised the potential to combine both economic growth and environmentalism. In a recent speech he argued that "we can be richer by being greener" and has backed this up with constructive policies.

Britain has now claimed to be leading the world in emission reduction. Under the Kyoto Protocol it agreed to a 12.5 per cent cut in emissions but is on target for a 23 per cent reduction of gases linked to global warming.[40] The Environment Minister Michael Meacher has conceded that some of the credit must go to the former Conservative Government for closing down large parts of the coal industry and switching to natural gas for generating power. Nevertheless, the Blair Government has continued the momentum with policies designed to encourage motorists to use cleaner energy.[41] Due to fuel tax changes, a litre of LPG now costs half the price of unleaded petrol and diesel. In Australia, the recent rise in world crude oil prices has highlighted its dependency on petrol and diesel for transport with demonstrations across the country. While protests were common in a number of countries, they occurred in Australia despite the Government having already reduced excise on fuel for heavy road vehicles. The cut in excise was designed to offset the predicted rise of fuel under its new goods and services tax but the measure failed, due to world pricing arrangements.[42] Yet even though there is no excise on LPG and it is much cheaper than petrol or diesel, it is a significantly under-utilised fuel in Australia. One reason for this, as found by a recent Western Australian Select Committee inquiry into the petroleum industry, is an inadequate underdeveloped market that can only be improved with competition.[43] Similarly, despite attempts to increase competition there are still relatively few players in the energy market throughout Australia.

Notably, deregulation of the energy markets in Western Europe and the US has significantly increased competition and provided an enhanced opportunity for renewable energy. Some of the giants of the petroleum industry have responded with a long-term view of investment returns. Royal Dutch/Shell and BP Amoco are at the forefront with a US $500 million investment in renewable energy over five years.[44] While there are many sceptics who doubt the sincerity of such a move, the company established Shell International Renewables based on the belief that renewable energy will command 5–10 per cent of global energy needs by 2020, with the potential to rise to 50 per cent by mid-century. With population growth and an expected rise in energy demand of around two per cent per year, this share of the market, if fulfilled, represents an enormous earning capacity for renewable energy.[45] Moreover, if global warming is to be curtailed the heavy polluting practices of Annex 1 countries must not be transferred to non-Annex 1 countries. This was the reason for the CDM provision in the Kyoto Protocol, which would enable the Annex 1 country to gain emission reduction credits and perhaps an additional benefit of future export opportunities while assisting the host country to adopt cleaner renewable energy.

It should be noted that not all non-Annex 1 countries are impoverished and indeed China is the second largest emitter of greenhouse gases next to the US, which is why the Umbrella Group argues for its inclusion in emission reduction targets.[46] Other non-Annex 1 countries include India, Brazil, Indonesia, Singapore, Malaysia and Thailand who are also considered to have transitional economies. Since Australia is located in the Asia Pacific region it is ideally located to take advantage of the CDM, should it have readily marketable technology. An Australian company, Solar Systems Pty Ltd, has recently designed a new super solar dish that tracks the sun to maximise output.[47] The dish multiplies the intensity of the sun 500 times and ensures the sun's rays are focused directly on to efficient solar cells. In conjunction with Australian Inland Energy, Solar Systems is building the first solar farm based on this new technology, in Broken Hill, New South Wales, with the help of a million dollar grant from the Federal Government. The solar site will be the largest in Australia, covering 20 hectares and will produce one megawatt of power.[48] The company is also negotiating with a number of south-east Asian countries in the hope of securing future contracts, as the venture is commercially viable and would meet the requirements of the CDM.

Australia's national science organisation, CSIRO, is working on a range of energy programmes including cogeneration plants, solar and wind designs and coal efficiency projects.[49] One exciting new development is a hybrid energy system suitable for large power generation stations. The system integrates natural gas and solar thermal energy, is around twice as efficient as existing coal-fired power stations and produces significantly lower levels of greenhouse gases for the same energy output.[50] If it meets expectations during testing it could have enormous potential for domestic and export markets for its economic efficiency and contribution to greenhouse gas reduction. Similarly, a Sydney engineer, Bryan Roberts, has spent over thirty years researching and perfecting a huge "gyromill" which would literally take wind power to new heights.[51] He has calculated that the flying windmill would get maximum benefit from the earth's jet streams at four kilometres above the ground. The craft would be tethered to the ground by specially designed cables and the power fed down aluminium wires embedded in the cables. While the project has its share of sceptics, Roberts is extremely confident that it will work and is now concentrating on proving its financial viability. David Eccles, an engineer who previously worked for the Australian Energy Company, North Power, agrees that "it can be cost effective, would tap into a large renewable energy resource and is worth a trial".[52] However, at this stage the Australian Greenhouse Office has rejected his application for a grant and Roberts is trying to secure funding. ➨

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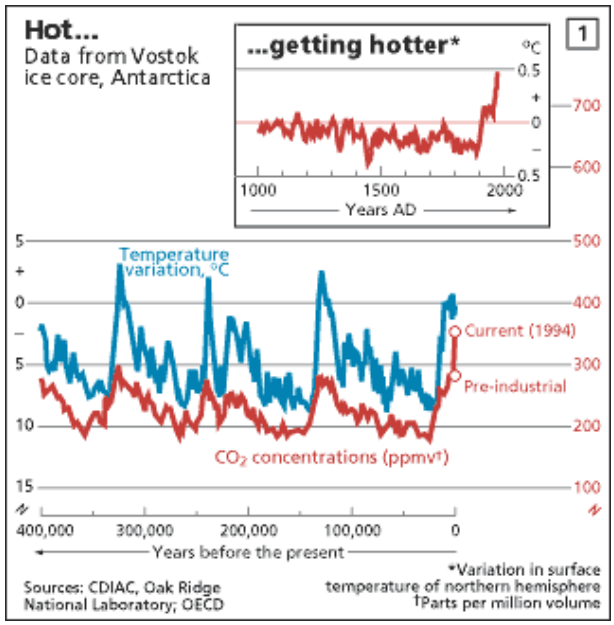
Yet if Australia wishes to remain competitive in the global economy it must be prepared to fully explore all possibilities. It is time for the Umbrella Group countries to let go of the outdated paradigm that sustainable energy and economic growth are incompatible. In fact, the Worldwatch Institute in Washington conducted a study in 1990 and found that renewable energy creates more jobs than conventional energy.[53] In addition to its impressive emission reduction target, Denmark has secured half of the global market for wind turbine technology. In 1997, wind turbine manufacturing accounted for 59 per cent of global sales, which injected around one billion US dollars into the Danish economy.[54] Moreover, renewable energy is now the fastest growing global technology with enormous potential for export. The International Energy Agency has estimated that the global market for renewable energy will increase from 13 gigawatts (GW) in 1995 to 43 GW in 2010, which is an increase of over 230 per cent.[55] In 1998, the Australian environment minister's parliamentary secretary, Senator Ian Macdonald, acknowledged that the international market in environmental technology is already worth some US $400 billion a year. He went on to say that "it is pretty easy to see why the old paradigm of the environment or economic growth is becoming so obsolete and is no longer relevant".[56] Hence, Australia and the other countries in the Umbrella Group need to direct more resources into renewable energy research and back this up with extensive marketing campaigns. This would place Australia in a much stronger position to meet its Kyoto target, and to export renewable energy technology to a range of countries in the Asian Pacific region, including China.

It is no secret that the US would prefer the larger non-Annex 1 countries such as China and India to have binding emission reduction targets as part of the Kyoto agreement. Yet these countries will not make any commitment until the US shows leadership and fully engages in the Protocol.[57] It is unclear at this stage if the Bush administration will take an even tougher stance but if Australia assumes its role as unofficial mediator at the resumption of COP6, it must work hard to convince the umbrella group that an agreement is the best outcome for all. Of the three flexible mechanisms, the CDM is the only one with the potential to bridge the gap between the US and China. The Chinese rely on inefficient coal-fired power plants and have canvassed the possibility of utilising more nuclear plants as a means of combating greenhouse gases and meeting increasing energy demands.[58] The US is concerned at such a trend, since the same technology is used for generating power as for manufacturing nuclear weapons.[59] Due to this and other safety concerns, nuclear energy was rejected as a CDM in The Hague, although Japan, along with the uranium producing countries of Canada and Australia, supported its inclusion. Therefore, perhaps the US can be persuaded to reach agreement at the next round of talks if greater efforts are made to use the CDM in China and other non-Annex 1 countries.

Finally there appears to be an extraordinary over-acceptance of so-called "natural disasters" in Australia, which perhaps can be traced to the pioneering spirit and harshness of the country over the centuries. Yet there is abundant evidence to suggest that the frequency, intensity and cost of droughts, storms, floods and bushfires has significantly increased in recent years.[60] The economic costs associated with these weather patterns are enormous and are often overlooked when formulating public policy. For example, in addition to damage and production loss incurred by the property owners, "natural disaster relief" cost the Australian Federal Government $280 million between 1989 and 1994.[61] In the same weekend that the climate change talks broke down in The Hague, the Federal Government pledged tens of millions of dollars to flood-damage victims in New South Wales. In 1999, the State Government of New Jersey enacted legislation which dedicated US$50 million to repair homes damaged by tropical storm Floyd.[62] In the UK, the insurance group Royal & Sun Alliance has estimated that the recent storms during the harsh winter of 2000 will cost them £100 million.[63] At COP6, a leading expert on global warming from the insurance industry claimed that "natural disasters" associated with extreme weather patterns could bankrupt the world economy by 2065.[64] Hence, there is simply too much at stake to continue ignoring all the costs associated with climate change, and the Umbrella Group countries in particular must take responsibility and embark on real emission cuts.



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Conclusion

Real emission reduction can only be achieved with a transition to cleaner technologies for energy generation and transport. This may require a significant paradigm shift among the leaders in some countries to recognise that this does not have to be to the detriment of economic growth. The Kyoto Protocol is a serious attempt to mitigate global warming and address the environmental and economic cost of extreme climate change. It contains the flexible mecha-

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nisms to enable countries to manage this transition at least cost but also included restrictions to maintain the overall environmental objectives. At COP6, the Umbrella Group insisted on unlimited emission trading but appear to have ignored that, under Article 17, this must be "supplemental to domestic actions" for meeting emission reduction targets. In addition, the CDM was included to assist non-Annex 1 countries to "contribute to the objectives of the Convention" but contains no provisions for carbon sequestration under Article 12. Yet by embarking on "real project investments" in non-Annex 1 countries, the CDM remains the best opportunity of including the larger non-signatories such as China and India while allowing them to sign up to the Protocol at a later date. It is now time for the larger Annex 1 countries such as the US, Canada and Australia to show leadership and make a genuine commitment to achieve the targets agreed to at Kyoto. Moreover, it is likely that the countries most advanced in renewable energy designs will not only achieve their targets much more easily but will also be significantly better placed in the technology era of the new economy.

Notes:

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[9] Brown, C. (1997) Facilitating joint implementation under the framework convention on climate change: toward a greenhouse gas emission reduction protocol. *Environmental and Planning Law Journal,* October, p. 357.

[10] *Supra* n 7 p. 115.

[11] At the time of writing the IPCC has just released its Third Report which contains even more compelling evidence of the impact of human and industrial activity on climate change.

[12] *Kyoto Protocol to the United Nations Framework Convention on Climate Change,* Article 3 (1).

[13] Werksman, J. (1998) The Clean Development Mechanism: Unwrapping the Kyoto Surprise. *RECIEL*, v 7, p. 147.

[14] Goldemberg, J. *et al.* (1997) Is joint implementation a realistic option? *Environment,* Washington, November. See http://proquest.umi.com/pqdweb.

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[16] *Ibid* Article 17. See also, Cullet, P. (1999) Equity and flexibility mechanisms in the climate change regime: Conceptual and practical issues. *RECIEL,* v 8, p. 172.

[17] The most common example used is the sulphur dioxide emission trading scheme in America.

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[21] *Supra* n 1 p. 1.

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[26] *Supra* n 17 p. 55.

[27] *The National Greenhouse Strategy*. Commonwealth of Australia, 1998 p. 99.

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[36] *Ibid* p. 16.

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