

**Dr Ted Christie, Barrister and Mediator, Queensland Bar**

Dr Christie will be participating in a panel discussion on the interface between native title, environmental protection and cultural heritage at the upcoming **LexisNexis Native Title Summit QLD June 2009**. The special focus Dr Christie will bring to the Panel will be on sustainability and biodiversity. To reserve your place for more information, email: [nicola.mclintock@lexisnexis.com.au/](mailto:nicola.mclintock@lexisnexis.com.au/)

A full profile of Dr Christie can be found at the following link: [www.environment-adr.com/](http://www.environment-adr.com/)

**Source:** This article first appeared in the *LexisNexis Electronic Professional Development Newsletter – Hot Topics Papers* (Posted 26 March 2009) and has been reproduced with their kind permission.

**REDUCING CARBON DIOXIDE EMISSIONS: CAN A SUSTAINABLE SOLUTION FOR CLIMATE CHANGE BE AN EFFECTIVE ALTERNATIVE TO THE EMISSIONS TRADING SCHEME? (1)**

*“A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because the opponents eventually die, and a new generation grows up that is familiar with it.”*  
**Max Planck 1858-1947**

The above statement by the German philosopher, Max Planck, captures the ongoing controversy created by the divergent opinion that exists within the scientific research community as to the reasons for causation for climate change. There is a long held belief that science generates exact knowledge with logical certainty. The reality is that this is a misconception as divergent scientific opinion on any issue will always, invariably, exist.

In this regard, the Supreme Court of the United States in *Daubert v Merrell Dow Pharmaceuticals Inc.*, 509 U.S. 579 (1993) identified a number of considerations to ensure that scientific evidence was “*both relevant and reliable*”. One such consideration was whether the theory or technique in question “*has attracted widespread acceptance within a relevant scientific community*”.

There would be little dispute that the international scientific community would accept the validity of this conclusion by the US Supreme Court. It is consistent with the central “test” employed by scientists to determine the reliability of an experimental finding or theory - widespread consensus. Whilst legal principles arising from US Supreme Court decisions are not binding on Australian courts, they may have persuasive value. The decision in *Daubert’s* case has been referred to, or followed, in a small number of cases decided by Australian and UK courts.

**Atmospheric Carbon Dioxide Emissions and Climate Change**

Carbon dioxide emissions arising from the use of fossil fuels for energy production account for around 70% of Australia’s greenhouse gas emissions; the stationary energy sector contributes around 50% of total Australian emissions (2). Applying the “widespread acceptance test” within the climate change research community, two conclusions can be

made in terms of understanding the relation between atmospheric carbon dioxide emissions and climate change:

- i. A 3°C temperature increase will occur with each doubling of atmospheric carbon dioxide (Intergovernmental Panel on Climate Change); and
- ii. From high resolution atmospheric carbon dioxide back 80000 years, 100 parts per million (“ppm”) of the current 385 ppm atmospheric carbon dioxide arises from human activities since the industrial revolution (3).

### **Consensus Decision-Making and Climate Change**

Divergent scientific opinion and conflict over causation makes finding a solution for climate change, based on unanimity, an illusory bargain. This situation exists, notwithstanding that the balance of opinion within the international scientific community is markedly skewed towards widespread acceptance for greenhouse gases, such as carbon dioxide, to *contribute* to climate change.

At the very least, it could be argued that there is reason to assume that there is a relationship between atmospheric carbon dioxide emissions and climate change. In these circumstances, a precautionary approach is justified in order to find a solution for reducing carbon dioxide emissions; failure to act now, may well mean that allowing atmospheric carbon dioxide concentrations to continue to increase, over time, will lead to a situation where the adverse environmental impacts of climate change may become irreversible.

From a conflict management and resolution perspective, finding a solution for climate change should be based on consensus decision-making. Consensus decision-making provides flexibility in joint problem-solving and reaching agreement on how to reduce carbon dioxide emissions. Consensus does not mean total agreement on every part of the solution but willingness to accept the overall solution and to live and abide with the solution.

### **The Concept of Sustainability and the Environment**

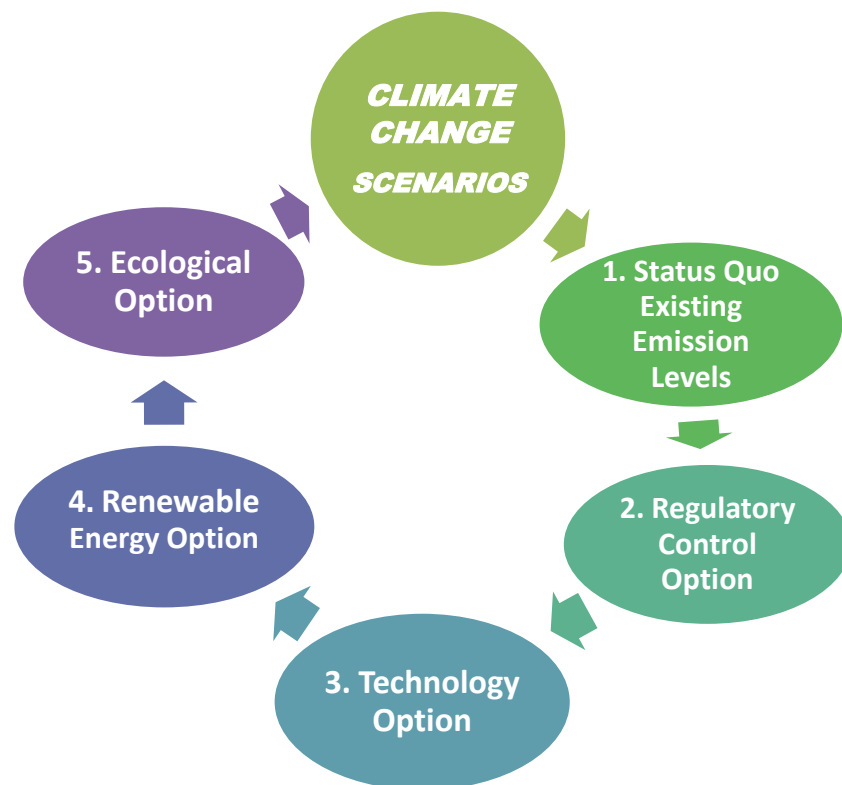
Sustainable development, as a unifying concept for environmental management and protection, had its origin in the “*Brundtland Report*” - released by the World Commission on Environment and Development in 1987. Acceptance by the UN General Assembly then followed. In 1992, two non-binding texts, having scope for sustainable development, were agreed to by the UNCED held at Rio de Janeiro: the *Rio Declaration on Environment and Development* that set out the relevant principles; and *Agenda 21*, a global plan of action.

Some of the key elements and objectives for sustainability identified in the “*Brundtland Report*” include (i) meeting essential needs for food, energy, water (ii) conserving and enhancing the resource base (iii) reorientating technology and managing risk and (iv) merging environment and economics in decision-making.

Contemporary comments that the concept of sustainability is vague, or has become too diluted to have any practical value, overlook one central feature of the concept. That is, a country cannot achieve economic development when its environment becomes degraded; nor can it restore its environment in the absence of economic development (4).

## Multi-Objective Analysis: A Conflict Resolution Process for Finding a Sustainable Solution for Climate Change (5)

The process for finding a **sustainable solution** for reducing carbon dioxide emissions and climate change can be distinguished from the ETS model. The process for achieving sustainability requires a balancing of multiple objectives: *ecological*, *economic* and *social*. Where Indigenous traditional knowledge has a role in environmental management for climate change (e.g. biodiversity), sustainability extends to include a *cultural* objective.



**Figure 1.** The Multi-objective process: Finding a sustainable solution for reducing atmospheric carbon dioxide emissions and climate change.

### An Overview of the Multi-Objective Analysis Process

The objective of this process is to set a prescribed target to reduce atmospheric carbon dioxide emission by considering (i) the **rate** e.g. as some percentage reduction in the total carbon dioxide emissions for Australia, and (ii) the **stage(s)** for the reduction to be achieved. There are two dimensions to address these issues: **time** and **space**.

In terms of *time*, the issue is what should be the time-span for reduction? Should there be flexibility in the target for reduction by aiming for progressive reductions in emissions over defined periods of time?

Where there is scientific uncertainty in the effectiveness for a new technology to reduce carbon dioxide emissions, flexibility in the time for reaching a prescribed target is the appropriate path to take. A good example is “Carbon Dioxide Capture and Permanent Geological Storage” technology (or “CCS”). The capture, or separation, and transport of carbon dioxide are not in issue. But a new element for uncertainty does arise – the long-term

fate of carbon dioxide following geological storage e.g. whether it will dissolve in the liquid or whether it will form minerals, permanently binding the gas underground (6). Agreement on any new technology, such as CCS, becoming part of any sustainable solution for climate change should depend on the scientific uncertainty being resolved and validated with a risk management evaluation.

*Spatial boundaries* are also problematic. Not all options for reducing emissions have universal application throughout Australia as they may be site- or location-specific. There may be limits on the area of land involved.

Reafforestation has long been advocated and used as a desirable strategy to offset carbon dioxide emissions e.g. in 1988, a new coal fired power station in the USA funded a reafforestation project, over an area of 1000 km<sup>2</sup> in Guatemala, to absorb its carbon dioxide emissions. However, estimates for the area of land required to *stabilise* the total carbon dioxide emissions for Australia are enormous (7). Reafforestation should be seen as a sound cost-effective option for reducing emissions – but only as *part* of any sustainable solution.

### **(i) Evaluation of Options for Reducing Carbon Dioxide Emissions**

By reviewing *all* relevant and reliable information based on **conflict management** concepts, the scope for the following options to reduce emissions can be evaluated.

#### **Status Quo:**

The “status quo” is a measure of total Australian carbon dioxide emissions for a defined year e.g. 2000. The defined year of 2000 then acts as the “reference point” for ensuring targets set to reduce emissions are achieved along the prescribed time scale.

#### **Regulatory Control Option:**

This option was the subject of a blog posted on this site on 27 February 2009. It has a *time dimension*. Legislative amendment under the regulatory control schemes throughout Australia, based on environmental harm is required, before a uniform standard for carbon dioxide emissions could be prescribed to apply nationally. Legislative amendment would require carbon dioxide, as a contaminant or pollutant, to come within the legal meaning of “*environmental harm*”, as defined in each environmental protection statute. The regulatory control option has the potential to be applied universally throughout Australia, to all point sources of carbon dioxide emissions, as there is *no spatial dimension*.

A prudent path to take for prescribing a national emission standard aimed at achieving the “*lowest achievable carbon dioxide emissions*”, based on existing technology, would be to ensure it did not impose unnecessarily onerous obligations on industry e.g. to ensure electricity production costs did not become prohibitive, the level for any national emission standard that is set could be counterbalanced against the costs for capturing and disposing of carbon dioxide.

There are a number of issues in applying this option: (i) whether the national standard for carbon dioxide emissions should be applied uniformly to **all** point sources of emissions and (ii) whether some sectors should be targeted with a higher national standard to reduce carbon dioxide emissions?

#### **Technology Option:**

The CCS technology option is an essential complement to the regulatory control option by providing the potential for industry to achieve greater future reductions in emissions. The *time*

*dimension* is a major issue for the adoption of CCS technology - given there is scientific uncertainty associated with the long-term geological storage of captured carbon dioxide. It has been suggested that the application of this option may be as far away as 2015 (8). Resolving the scientific uncertainty for CCS technology should lead to a further reduction in carbon dioxide emissions at some later time. Future adoption will be dependent on CCS research resolving the uncertainty associated with the disposal of liquid carbon dioxide.

The role for nuclear power remains as somewhat a dilemma. Concerns over disposal of nuclear waste, accidental escape and potential for weapons proliferation continue to exist. More recently, it has been claimed that nuclear power does not have a long-term role to play for climate change as worldwide supplies of cheap uranium will not last more than a few decades (9). One alternative, it could be argued, would be to assess the scope for liquefied natural gas (“LNG”) as one preferred, alternative energy source to nuclear power.

### **Renewable Energy Option:**

It is clear that the future will bring a much more efficient system of energy generation and that renewables will have a key role as part of any sustainable solution for reducing carbon dioxide emissions and climate change. The *spatial dimension* is a significant one for wind and solar energy. That is, should only locations of land within Australia that are both technically and commercially feasible for large scale renewable energy generation be evaluated?

### **Ecological Option:**

Reafforestation programmes should be directed towards specific problem areas, such as the burning of fossil fuels as well as deforestation e.g. clearing of regrowth in woodlands and clearing for woodchip. The concept of sustainability recognizes the contribution to exports made by coal and woodchip – but not at the expense of environmental quality. A Government that provided financial incentives for reafforestation programmes to offset atmospheric carbon dioxide emissions would be recognised, globally, as an environmentally responsible government.

The Leader of the Opposition in the Federal Parliament, Malcolm Turnbull MP, has advocated “*Bio-char Technology*” (or biosequestration) “*as the biggest opportunity in the near term for reducing emissions*” (10). But there appears to be both *time and spatial dimensions* that may limit its immediate adoption for a role in reducing carbon dioxide emissions. There is some scientific uncertainty for one key issue: whether bio-char has a wide or limited application for **all** Australian soils e.g. low organic matter, sandy soils; high organic matter, self-mulching cracking clay soils; soils with limited surface infiltration; and soils with impeded internal permeability (“sodium clays”). Some form of cost/benefit analysis (*for climate change and agriculture*) would be advantageous for identifying soil types and land areas within Australia in which bio-char could be part of any future, sustainable solution for climate change.

### **(ii) Reducing Carbon Dioxide Emissions: Evaluating Climate Change Scenarios**

The *Multi-objective Analysis* process is based on **conflict resolution concepts**. The process for finding a sustainable solution for climate change focusses on two of the key elements of **Principled Negotiation** of Fisher and Ury: (i) generating creative options for mutual gain and (ii) insisting that the agreed solution be based on objective criteria.

### **Principled Negotiation: Generating Creative Options for Mutual Gain**

This goal is achieved by constructing a *number of scenarios along a continuum of sustainability*. Climate change is seen as a land use problem. A *scenario* is a hypothetical construction of different land use options for reducing carbon dioxide emissions to offset climate change.

Different weight is given to ecological, economic and social objectives in each scenario. Each scenario will result in a different percentage reduction in carbon dioxide emissions.

Although an innumerable number of scenarios could be constructed, the process requires a finite number of scenarios - but with one proviso: that all feasible options for reducing emissions are included in one scenario that is to be evaluated. The continuum of scenarios is not fixed but may change after evaluation commences e.g. by increasing the national standard for emissions.

Options where scientific uncertainty exists – CCS and bio-char technology – are not used in the scenarios at this stage. However, as the scientific knowledge base changes, they may be introduced at a later stage of the defined time period scenarios are evaluated.

As a guide, some possible examples of scenarios to reduce carbon dioxide emissions that could be evaluated, **over a finite period of time viz. 2000-2020** are:

Scenario 1 “*The rights of one option to prevail over all others*”: A multiple use scenario in which the regulatory control option of a national emission standard applying uniformly to all point sources of carbon dioxide emissions predominates. Limited use of the renewable energy and reforestation options.

Scenario 2 “*Steady growth in the use of all options over time*”: A multiple use scenario in which the regulatory control option of a national emission standard applies uniformly to coal-fired power stations, high scale industrial emitters (e.g. iron or steel and cement production) and new motor vehicles, only. The reduction in the regulatory control option is balanced by greater use of the renewable energy and reforestation options.

Scenario 3 “*Alternative options to fossil fuels for energy production to prevail*”. A multiple use scenario constructed around all locations of land - that are technically and commercially feasible - being used for large scale renewable energy generation, financial incentives for reforestation programmes provided by Government to accommodate increased reforestation and all new industrial/energy producing facilities to be LNG based. No controls imposed on any point sources of carbon dioxide emissions.

Scenario 4 “*The Federal’s Governments planned Carbon Pollution Reduction Scheme*”. As proposed, an Emission Trading Scheme that would reduce greenhouse gas emissions by 5-15%, below 2000 levels, by the year 2020.

### ***Principled Negotiation: The Agreed Solution to be Based on Objective Criteria***

Agreement on appropriate criteria to evaluate each of the multiple objectives is paramount. The **same criteria** are used to evaluate all scenarios. Some examples for possible objective criteria for use in the evaluation of scenarios follow:

*Ecological Objective (Resource Management)*: Impacts on: biodiversity; ecologically critical habitat of threatened species

*Ecological Objective (Heritage Preservation)*: Protection and maintenance of World Heritage Listed Properties

*Economic Objective (National and State)*: Impacts on: gross domestic product; balance of payments of nation; employment/unemployment; mineral exports

*Economic Objective (Fiscal Consequences)*: Net fiscal consequences for Government and industry

*Social Objective (National Security):* Probability of catastrophic bush fires; impacts on food security and primary production

*Social Well-Being Objective:* Provision and costs of energy for the community

*Indigenous Peoples Interests Objective:* Promotion of Indigenous traditional knowledge for biodiversity

### **The Preferred Scenario**

The preferred scenario is derived from a systematic and consistent procedure which evaluates different mixes of options for addressing climate change. Each scenario results in differences in the percentage reduction in total carbon dioxide emissions as well as differences in ecological, economic, social and cultural impacts. Scenarios, having very different outcomes, are evaluated with a common set of criteria in order to identify the optimal balance for sustainability.

Decision-making is characterized by its flexibility. The preferred scenario may be one of the original set of scenarios evaluated. Alternatively, it could be a new scenario that is constructed based on the best features of all the scenarios evaluated. It will most likely comprise a mix of options that most effectively balances the multiple and conflicting objectives for sustainability and which secures as much available value as possible for Government, industry and the community.

### **Conclusion**

In signing and ratifying the *Kyoto Protocol*, Australia has done so believing that it is in the nation's best interest to take appropriate national action to address the global problem of climate change. By complying with the *Kyoto Protocol*, Australia's trustworthiness, prestige, influence, international honour and reputation, at the global level, is maintained (11).

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### **END NOTES**

(1) **The Author:** Dr Ted Christie, Barrister and Mediator, Queensland Bar and author of the cross-disciplinary book, *Finding Solutions for Environmental Conflicts: Power and Negotiation (New Horizons in Environmental Law Series)*, Edward Elgar, Cheltenham, UK (2008).

This is the second of two parts. **Part 1** outlined the potential for the regulatory control of carbon dioxide emissions, under existing Australian environmental legislation. See the following link: [http://pd.lexisnexis.com.au/LiveAssets/images/488/Newsletter/2009/HotTopicPaper\\_ClimateChangeFeb09.pdf/](http://pd.lexisnexis.com.au/LiveAssets/images/488/Newsletter/2009/HotTopicPaper_ClimateChangeFeb09.pdf/)

(2) Environment Protection and Heritage Council and the Ministerial Council on Mineral and Petroleum Resources, 'Draft Paper on Environmental Guidelines for Carbon Dioxide Capture and Geological Storage – November 2008'. <http://www.nepc.gov.au/taxonomy/term/25> (accessed 6 February 2009).

(3) Pease, CM 'Will "peak coal" limit warming?' (2008) 25[5] *The Environmental Forum (Journal of the United States Environmental Law Institute)* 18.

(4) Halpern, S. 'UNCED: Process and Documentation, Academic Council for the UN System (1992).

(5) For a detailed description of the multi-objective analysis process and its application see 'Sustainability and the Environment' Chapter 5, 105-32 and 'Managing and Resolving Environmental Conflicts by Negotiation', Chapter 10, 263-94, in, Christie, E *Finding Solutions for Environmental Conflicts: Power and Negotiation*, Edward Elgar, Cheltenham, UK (2008).

- (6) See Footnote (2); and Pellerin, C, 'International Forum Tackles CO<sub>2</sub> Emissions from Power Plants'. <http://usembassy-australia.state.gov/irc/us-oz/2004/12/15/wfl.html/> (accessed 6 March 2009).
- (7) See Christie, E. 'The greenhouse gases and environmental law' (1990) *Environmental and Planning Law Journal* **7**, 114-126.
- (8) See Pellerin, Footnote (6).
- (9) See Dujack, SR 'Keeping carbon down on the farm' (2008) **25**[2] *The Environmental Forum (Journal of the United States Environmental Law Institute)* 22.
- (10) Interview of Malcolm Turnbull MP by Kerry O'Brien, "The 7.30 Report", 24 February 2009. <http://www.abc.net.au/7.30/content/2009/s2500334.htm/> (accessed 25 February 2009)
- (11) Ferrey, S *Environmental Law. Examples & Explanations (3<sup>rd</sup> Edition)*, Aspen Publishers, New York, USA (2004).