

## Addressing Climate Change – Learn from Others

### Summary

All of the issues presented in the Garnaut Review Terms of Reference have been discussed at length over the past 30 years. Rather than “re-inventing the wheel” it is far more efficient to leverage off the work already done by others.

Of great relevance are the concepts of “Natural Capitalism”, “Peak Oil” and “Mobilizing to Save Civilization”.

An independent governing body is needed to manage the world's natural resources, similar to the way the World Bank and Reserve Bank manage the economy. This body will also be responsible to educate people across the globe in resource and population sustainability, including those in poor but populous countries.

### Why fight Climate Change

There are a number of assertions that are supported and explained by reputable sources.

- The current trend of Climate Change is to be avoided (refer to the IPCC 4<sup>th</sup> Assessment Report<sup>1</sup>).
- Humans contribute to Global Warming (refer to the CSIRO's “Humans do contribute to global warming”<sup>2</sup>).
- Climate Change is not a furphy (refer to the Department of Climate Change's “Climate Change - An Australian Guide to the Science and Potential Impacts”<sup>3</sup> and the CSIRO's “Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions”<sup>32</sup>).
- The costs of inaction far outweighs the costs of action (refer to the Stern Review's “Report on the Economics of Climate Change”<sup>4</sup>).
- Greenhouse gases are a significant cause of Global Warming (refer to Denman, Brasseur et al's “Climate Change 2007: The Physical Science Basis”<sup>5</sup>).
- Climate Change can be influenced by humans (refer to Lester Brown's “Plan B 3.0 – Mobilizing to Save Civilization”<sup>6</sup>).

There are sceptics regarding Climate Change, and Anthropogenic Global Warming in particular. Their arguments have been criticised at length (refer to Grist Magazine's “How to Talk to a Climate Skeptic”<sup>7</sup>), including the film “The Great Global Warming Swindle” (refer to the Australian Meteorological and Oceanographic Society's “The Great Global Warming Swindle – a critique”<sup>8</sup>).

Much of the debate centres on specific details within the science, or with the reporting of the science, and loses sight of the larger question: “What is the wisest thing to do, given the uncertainty and risk?” (refer to the Manpollo Project's “How it all Ends”<sup>9</sup> and supporting material).

There are significant benefits to be gained from enacting policy on Climate Change, far beyond the Garnaut Review's Terms of Reference. Anthropogenic Global Warming is but one aspect of a larger problem: human society, in particular western civilisation, is not sustainable (refer to Professor Ian Lowe's “Shaping a Sustainable Future”<sup>10</sup>). The most obvious place to start is with curbing CO<sub>2</sub>

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emissions, which addresses both problems, including the pervasive problems from passing peak oil production (refer to Lovins, Datta et al's "Winning the Oil End Game"<sup>11</sup>), and gathers the momentum to continue to address the wider issues.

Carefully engineered Climate Change policies will also provide a framework and basis for addressing the larger problem of sustainability. A similar argument exists for addressing sustainability, in that it is far less costly to address the issue now and in a controlled manner, than when faced with overwhelming problems later. The issue regarding sustainability can be simplified as follows: demand cannot continue to grow in a closed system (refer to McKinney et al's "Environmental Science: Systems and Solutions, Fourth Edition"<sup>12</sup>). Neither can supply. In terms of CO<sub>2</sub> emissions, the rate of emissions cannot continue to exceed the rate of absorption.

The question of "What is the wisest thing to do, given the uncertainty and risk?" can be expanded as: "What is the cost/benefit of taking action now?" versus "What is the cost/benefit of not taking action now?", summarised as follows:

#### Act Now

Costs: Potentially significant economic, political and social upheaval; significant administration and research costs.

The nett costs are not known.

Benefits: More efficient industries and appliances; a framework for addressing other global issues; the time to introduce change in a controlled manner.

#### Do Not Act Now

Costs: Potentially significant environmental, political, social, health and economic problems.

The nett costs are not known.

Benefits: More funds are available to address other urgent problems.

Taking action against uncertain costs is analogous to buying insurance, or performing database backups. It is worth doing if the costs of mitigation are less than the costs of potential problems.

The scientific research strongly suggests that there is a high probability of significant problems from Global Warming, which would result in having to act later anyway, and having to make significant changes while also battling overwhelming problems.

If done thoughtfully, the fight against Global Warming can be self-funding, if the worst CO<sub>2</sub> offenders in each social category (i.e. government, corporate, individual) are required to help fund the battle.

There are many different aspects to global issues such as Climate Change. In addition to the much-discussed issues regarding the environmental, political, social and economic aspects, we need to also consider the moral aspects of the problem: "Is it right to continue to impact the natural systems that we share with other species and hold in trust for future generations?" The decisions we make now choose the future for others.

We need to scale up the fight against Climate Change for the following reasons:

- The costs of mitigation is far less than the costs of the problems.
- The costs of mitigation can be offset by those who fall below required targets.
- Fighting Climate Change facilitates research and improvements in efficiency and technology.
- Acting against Climate Change provides a platform for addressing other global problems.

- On a global scale, it is morally the right thing to do.

### ***Where we are now***

Australia has a terrible record when it comes to some of the primary measures of impact on Climate Change:

- Australia is one of the worst emitters of greenhouse gases, coming 15<sup>th</sup> out of 223 countries (refer to the Energy Information Administration's "International Energy Annual 2005"<sup>13</sup>).
- Australia is one of the worst per-capita emitters of greenhouse gases, coming 11<sup>th</sup> out of 223 countries (refer to the Energy Information Administration's "International Energy Annual 2005"<sup>13</sup>).
- Australia has one of the worst per-capita environmental footprints, ranked 6<sup>th</sup> (refer to the WWF's "Living Planet Report"<sup>14</sup>).
- Australia is one of the biggest suppliers of fossil fuels, ranked 27<sup>th</sup> (refer to the Energy Information Administration's "International Energy Outlook 2007"<sup>15</sup>).

Ironically, this also places Australia in a good position to excel in any global initiative that involves incremental improvement, such as a global carbon trading scheme.

Additionally, being a large exporter of fossil fuels, Australia is also well-positioned to encourage other countries to participate in a global emissions-reduction framework. Reducing oil and coal exports, while other countries continue to deplete their reserves, also positions Australia to capitalise on new technologies that make use of the unique chemical properties of carbon, such as nanotubes.

Worldwide, recent observations show growing emissions of CO<sub>2</sub>, which is expected to get worse with the industrialisation of the most populous countries, China and India. India seem to have forgotten Mahatma Ghandi's wisdom, "If we took to similar economic exploitation, it would strip the world bare like locusts".

On the positive side, Australia has a number of initiatives worth continuing and expanding, such as:

- CSIRO's research into Climate Change<sup>16</sup>.
- CSIRO's reporting of Climate Change in Australia<sup>17</sup>.
- Australian Government's Department of Climate Change's "Greenhouse Friendly"<sup>18</sup>.
- Sustainability Victoria's Business Plan 2007-2010<sup>19</sup>.
- City of Darebin's "Sustainable Homes"<sup>20</sup>.
- City of Moreland's "Sustainability Street"<sup>21</sup>.
- Australian Conservation Foundation's "Green Homes"<sup>22</sup>.

There are many more initiatives, at the international, federal, state, municipal, and community levels. The danger is, if there are too many organisations, the message becomes fractured, disparate and without clear direction.

## ***How did we get there***

Human society places unsustainable demands on the planet, due to overpopulation, the wish for a high standard of living, and the inability to pull everyone together for a global cause.

### The “Five Why's” technique

Starting with the assumption that our present society is unsustainable:

Why? – Our demands for energy, land, water and food exceed what the world can supply.

Why? – Our population has increased beyond sustainable limits, and with population increase comes increased demand.

Why? – We do not know what these limits are.

Why? – We expanded assuming that the world's resources were infinite.

Why? – We focus on our own community instead of seeing the global picture.

Mankind is one of the very few animals that deliberately outgrow its food source. Even in countries suffering from starvation, the average family has way more than 2.1 kids, although very few survive to adulthood. We get so focused on our own immediate needs that we do not ask ourselves the wider questions: “Why on earth do we need 6.6 billion people in the world?”; “Why do we need 21 million people in our country?”; “Why do we need 3 million people in our city?”; “Why do we need 5 people in our family?”

There are people that rationalise inaction with the argument, “Well, no matter what I do, it's the developing countries that will cause the problem, so I might as well do nothing”. However, considering that just 20% of the world population, including Europe, North America and Australia, uses 80% of the world resources, the bulk of the onus is on the so-called “developed” countries to start changing. With such affluence comes the capability and responsibility to take a leading role.

However, if the population is reduced, then so is demand, which stifles growth, which is the basis of the OECD economies. It is not a decision that a politician is keen to make. So "action" falls to the little people instead of the federal governments. We find little communities, local governments and individuals are taking up the challenge.

Technological solutions were developed to get as much as we can from our farms, and to improve water quality to some extent. But this too has its limit, that is the ability of the planet to meet the collective needs of each human of a finite number of C, H and O atoms.

It is thought that we will not reach peak food production until around 2030, although hunger is rampant due to economics and distribution difficulties. Energy demands, however, are increasing even faster than the population, so we will hit an energy crisis first, with the pundits reckoning that if we have not reached peak oil production already, then we will within the next few years. This will severely impact the price of all things, and our treasured “standard of living”.

Another major problem of limiting population, apart from our economy based on “limitless growth”, is education. In India the difficulty is in educating the masses, in getting the word to the people, especially with the level of illiteracy and the focus on sheer survival.

According to the United Nations report on population, the ten countries likely to contribute most to world population growth over the next 30 years are: India, China, Pakistan, Nigeria, Ethiopia, Indonesia, United States of America, Bangladesh, Zaire, and Iran, in that order.

These countries are indirectly declaring war on the rest of the world, by using more than a fair share

of the global resources.

### ***Where we want to be***

“Hard” measures of Environmental Impact (refer to the OECD's “Key Environmental Indicators”<sup>23</sup>), that focus on quantifiable and directly relevant factors, include:

- Climate Change – CO<sub>2</sub> and greenhouse gas emission intensities.
- Ozone Layer - ozone depleting substances.
- Air Quality – SO<sub>x</sub> and NO<sub>x</sub> emission intensities.
- Waste Generation – municipal waste generation intensities.
- Freshwater Quality – waste water treatment connection rates.
- Freshwater Resources – intensity of use of water resources.
- Forest Resources – intensity of use of forest resources.
- Fish Resources – intensity of use of fish resources.
- Energy Resources – intensity of energy use.
- Biodiversity – threatened species.

For Climate Change specifically, the measures include:

- Index of greenhouse gas emissions (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFC, HFC, SF<sub>6</sub> emissions).
- Atmospheric concentrations of Greenhouse Gases.
- Global mean temperature.
- Energy efficiency (Energy intensity, Economic and fiscal instruments).

Note that there is a new economic measure, the Index of Sustainable Economic Welfare. While it is imperfect, it is better than GDP (refer to the Friends of the Earth's “ISEW”<sup>24</sup>):

ISEW = personal consumption  
+ non-defensive public expenditures  
- defensive private expenditures  
+ capital formation  
+ services from domestic labour  
- costs of environmental degradation  
- depreciation of natural capital

“Soft” measures of Climate Change (refer to the World Resources Institute's “Climate Analysis Indicators Tool”<sup>25</sup>), that consider indirect factors, include:

- Greenhouse Gas Emissions.
- Socio-Economic Indicators (capability).
- Natural Factor Indicators (capacity).

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There is currently no single authoritative body to establish and enforce targets, and to educate and sustain a fight against Climate Change. Hard and unpopular decisions will need to be made. Such decisions extend beyond city, state and national borders, and beyond the short reign of governments.

Simply put, if a resource is limited, then it must be rationed. Also, if a resource spans national boundaries, then a global authority must manage it.

The big problem is overpopulation, which can be managed by rationing resources while trying to educate the masses. The smaller but more urgent problem is our over-reliance on oil, manageable by rationing our oil use while we develop technology to harness renewable sources.

Back during World War 2, food and other items were scarce, so people were issued “coupons” to ration the number of items per person. Once society starts thinking globally and accepts that global resources (such as land, food, water, wood, oil and clean air) are limited, then we can start a similar system of rationing.

There have been attempts to calculate a sustainable “ecological footprint” (refer to the Global Footprint Network's “Current Methods for Calculating National Ecological Footprint Accounts”<sup>26</sup>), the one most popularly used is 1.8 ha per person. While not perfect, this is a good place to start.

Research into Climate Change and its mitigation will require refinements and shifts in the policies and targets. Whatever system is chosen to manage Climate Change, it must have a set of parameters that can be tuned to accommodate new research and technology. It must be better than the current economic governance, where the Federal Bank can only adjust a single parameter to try to steer the economy.

Our society is obsessed with the dollar. Every product has a price attached. Additionally, food items are required to display ingredients. We can expand this idea to require that all products and services display the price, the ingredients and also the environmental cost (refer to the United Nations Environment Program's “Life Cycle Management: A Business Guide to Sustainability”<sup>27</sup>). This cost would be for the entire lifecycle, from harvesting raw materials through production, transportation, usage and disposal. Just as we have the World Bank, we need a global authority to manage and ration the world's resources.

The difficulty is that once a person, or a country, has used their quota, what then? What are the consequences, and who will enforce them?

The problem of educating a population is currently considered an issue for the respective governments. This approach is not working, however, as the word is not getting heard. Education will likely be another part of the global authority's role in managing the world's resources.

The development of technologies to harness renewable energy sources is already happening, but far too slowly to be taken up *en masse*. There are still too many “blockers” that divert the funding that is required for research. More momentum is required, but at the moment there are so many organisations pushing “sustainability” that their power is fractured and their voices are lost. Yet again, we need a central authority to lobby the governments and private investors and get some focus and momentum.

## ***Roadmap to get there***

We can and do influence each of the spheres in which we live: ourselves (as individuals), our social unit (family, household), local communities, national entities, and world organisations. It is easier to start at home, to get the ball rolling, and carry that momentum onto the other, larger entities. It is

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better to perform one-off actions that have a big continuous impact, rather than minor changes that might not be sustained.

We will likely hit an oil shortage first, especially in our affluent societies, before we feel the pain from inadequate food, water, or air. Frantically seeking additional oil fields, or improved technology to get a better yield, are short-term solutions. At some point the energy required to extract the oil will exceed the energy content of that oil. A better solution is to reduce our reliance on oil, and reduce our demand.

That is the easiest and most urgent issue to tackle. And it can be done by individuals. As we expand outward through the social structures that surround us, the extra influence means that we can look at the deeper problems too, such as population and education policies.

### The individual

Each of us have the ability to reduce our consumption. Not just walking instead of driving, but by cutting our energy use, and also by looking at our buying habits. If we buy things that require a lot of oil to make and to transport, then we can look at other options, such as buying locally. Of these, food has the highest environmental impact, with the next being clothes. There are many “checklists” and “action plans” in circulation, and some “environmental footprint calculators” include total household expenditure in their list of items.

### The household

The majority of Australian electricity is generated from coal-fired generators. Households can look at how to reduce our reliance on such generated electricity. As well as reducing energy usage (eg. through improved house design), households can produce their own electricity (solar and wind). It is quite possible to generate enough electricity to be self-sufficient, and live “off-the-grid”. The average Australian home uses 6000 kWh per year, mainly in heating and cooling. So installing solar panels is only part of the solution; energy consumption must also be reduced. Note that manufacturing solar panels takes a lot of energy, but it is believed that they break even in 2-6 years out of a 25-30 year life.

### Local communities

A lot of people are willing to do something to combat Climate Change, but are paralysed by inertia, and are simply in need of leadership and direction. There are a number of little eco-villages appearing, places that decide to generate their own electricity. That may be beyond most communities. Some more immediate things that can be done include: a community garden, car pooling, and a borrowing service.

A program that's been successfully implemented is “Sustainability Street” (refer to the City Of Moreland's “Sustainability Street”<sup>21</sup>).

### National entities

Several inhibitors are present: the people with vested interests, political myopia, and the power of propaganda. Yet they are also the people that can make the biggest changes, via population policies, environmental policies and enforcement.

Sadly, mainstream media don't like the idea of reducing our consumption. Advertising is their “bread and butter”.

However, as more people become vocal, and organisations wish to be seen as “green”, we might be able to get the colossus to take its first baby steps. Any movement towards sustainability is positive. With our senior powerbrokers with their heads firmly stuck in the “bottom-line economics” desert,

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perhaps they will be more accepting of interim steps, such as “Ecological Economics” and “Natural Capitalism” (refer to Paul Hawken, Amory B. Lovins, and L. Hunter Lovins “Natural Capitalism: Creating the Next Industrial Revolution”<sup>28</sup>).

### World organisations

The world has limited resources, that do not respond to “national borders”. Therefore, the resources need to be managed and rationed by a global authority. Part of this involves education, especially in the poor populous countries.

The global authority must also have arms in local agencies in each country, a structure similar to that of the World Bank and the Federal Reserve Bank. Australia's local agency, as well as establishing and enforcing targets, will need to invest heavily in an education campaign.

The science of Climate Change has been around for over 30 years. The IPCC was established in 1988, and the First Assessment Report in 1990. Yet still our CO<sub>2</sub> emissions continue to increase. It is clear that a strong educational campaign is required, such as presenting the fight against Climate Change as a full-scale war, requiring intelligence operations and mobilisation. In this scenario, it is blatant that exporting fossil fuels, the ammunition of the enemy, is very unwise.

Initiatives need to be integrated within current systems, by identifying processes that can be intercepted (“hook points”). One example is to require that during the transfer of land, there is a requirement that any dwelling is assessed and upgraded to comply with energy efficiency standards.

Some policies are pretty straightforward, like providing significant funding for research into renewable energy technologies, and tax breaks for using such technologies. This is necessary as a government policy because renewables cannot compete economically yet with fossil fuels, because all of our infrastructure is set up for fossil fuels. So we need an institutional push to help renewable energy sources mature enough that they can compete with the relatively and easy and available fossil fuels. That is why we need the government body to fill in where the free market cannot accomplish what needs to happen. The free market will not make renewables competitive until the fossil fuels become scarce, which looks like it probably will not happen until well after the climate undergoes some irreversible changes. The market does some things well, but despite some peoples belief in the omnipotence of the market, there are some things that it just does not do well, because of the long lag times between stimulus and response in a complex system, the market is doomed to failure in trying to address this problem.

Other obvious policies include higher fuel efficiency standards for vehicles, and subsidies for creating the infrastructure for the manufacture, distribution, and storage of hydrogen and biofuels.

### Cap and Trade

A policy called cap-and-trade is already in place in much of the world, and although its implementation certainly has some wrinkles to be worked out, it's pretty clever. Done well, it can accomplish the goal of making sure that total emissions remain below a specified level, yet individual emitters are allowed flexibility to make changes and adapt. It also links financial economy with carbon emissions, so that companies who do better at reducing their emissions are financially rewarded at the expense of companies that do poorly. It harnesses some of the best dynamics of markets in order to accomplish a greater good that no single company—or the market itself—could ever afford to pursue on its own.

Lord May suggested one problem is that the burden and benefits are not distributed equally across the players, or the nations in this case. The example given was that a prairie dog takes a personal risk in giving an alarm call, but all colony members benefit and, by taking turns as alarm giver, each

individual's group benefit exceeds the occasional risk. But any such arrangement is immediately vulnerable to cheats who enjoy the benefits without paying the risk-taking dues. Another example given was the Tragedy of the Commons, which describes a "commons", where all inhabitants of a village can graze their cattle. Left unregulated, each individual will add stock, until the commons is overgrazed. If some socially responsible individuals limit themselves, they will be economically disadvantaged in the short run, whilst still suffering the long-run degradation of the commons by their less inhibited neighbours.

The Cap and Trade system will only work if it is embraced and enforced globally. Recalcitrant nations will need to be excluded from any exchange that involves capped resources.

### Natural Capitalism

No one would run a business without accounting for its capital outlays. Yet most companies overlook one major capital component--the value of the earth's ecosystem services. It is a staggering omission; recent calculations place the value of the earth's total ecosystem services--water storage, atmosphere regulation, climate control, and so on--at \$33 trillion a year. Not accounting for those costs has led to waste on a grand scale. But now a few farsighted companies are finding powerful business opportunities in conserving resources on a similarly grand scale. They are embarking on a journey toward "natural capitalism," a journey that comprises four major shifts in business practices. The first stage involves dramatically increasing the productivity of natural resources, stretching them as much as 100 times further than they do today. In the second stage, companies adopt closed-loop production systems that yield no waste or toxicity. The third stage requires a fundamental change of business model--from one of selling products--to one of delivering services. For example, a manufacturer would sell lighting services rather than lightbulbs, thus benefitting the seller and customer for developing extremely efficient, durable lightbulbs. The last stage involves reinvesting in natural capital to restore, sustain, and expand the planet's ecosystem. Because natural capitalism is both necessary and profitable, it will subsume traditional industrialism, the authors argue, just as industrialism subsumed agrarianism. And the companies that are furthest down the road will have the competitive edge.

More than a decade ago, Amory Lovins and John Holdren and a few others pointed out that people do not want barrels of oil or kilowatt-hours of electricity or cubic meters of gas; instead they want heat, light, drivepower, mobility. That simple insight more than doubled the number of potential solutions to the energy crisis by allowing for demand-side answers. That insight, borne of a simple question, created an energy revolution.

All goods and services must factor in the earth's ecosystems. One of the models is for the producing companies to have to pay for disposal, or replacing items due to failure or obsolescence, thus making companies invest in more robust practices, such as the ability to replace individual components without replacing the whole unit. So the company provides the whole end-to-end *service*, and not just the *product*.

Radically increased resource efficiency is the first principle of Natural Capitalism. It offers not only increased profits, but also the solution to most of the environmental dilemmas facing the world today. It greatly slows depletion of resources at one end of the economic process, and the discharge of pollution—resources out of place—at the other end. It creates profits from not having to pay for either. And it also buys time, forestalling the threatened collapse of natural systems.

That time should then be used to implement the other three principles of Natural Capitalism. These are:

- Eliminate the concept of waste by redesigning the economy on biological lines that close the loops

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of materials flows;

- Shift the structure of the economy from focusing on the processing of materials and the making of things to the creation of service and flow, so as to reward resource productivity and loop-closing; and
- Reverse the planetary destruction now underway with programs of restoration that invest in natural capital.

Together the four principles of Natural Capitalism enable businesses to behave as if ecosystem services were properly valued. Behaving in this way will begin to reverse the loss of such services, while increasing profits.

#### Learn from others

Some countries are already a long way ahead of Australia, such as Germany's excellent uptake of solar panels, and New Zealand getting over 70% of their energy from renewable sources. These countries do not have greater resources than Australia, nor have they got better researchers. They simply have visionary leaders that look to the long-term, and are able to synchronise the involvement of key players.

There already exist several detailed guides for implementing initiatives that will mitigate the problem of Climate Change:

- Earth Policy Institute's "Plan B 3.0: Mobilizing to Save Civilization"<sup>6</sup>.
- Rocky Mountain Institute's "Winning the Oil Endgame" regarding "Peak Oil"<sup>11</sup>
- Amory Lovins' "Natural Capitalism"<sup>28, 29</sup>
- Natural Capitalism Solution's "Climate Protection Manuals"<sup>30</sup>
- Handbook of Environmental Economics<sup>31</sup>

There is no need to reinvent the wheel. The road has already been laid out for us.

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