

When I agreed to come here to speak to you, I thought I was taking on a fairly easy task. The global warming issue was one I have been following fairly closely over the years and there was quite a lot of new information that I was excited to have an opportunity to share with you. Sir Nicholas Stern had just released his *Review on the Economics of Climate Change*. Finally the economy was being brought into the equation. At last, I thought... now people will listen.

But what has happened? Suddenly global warming, or climate change as some prefer to call it, has suddenly become “mainstream”. It’s everywhere – on the television, talk back radio, in the newspapers. Even Rupert Murdoch has recently announced that the entire News Limited juggernaut is to be “carbon neutral” by 2010.

All very encouraging. But to my dismay I found myself swamped with new information. Every time I thought I’d worked out what I would tell you, there was another gigantic mountain of media clippings and notes for me to try to work into this little talk.

Then Graham made matters worse just a few days ago by saying that some of you were keen to learn more about “carbon trading”. Now I had to fit that in as well!

With a focus on the Sutherland Shire.

And all in less than an hour allowing for questions!

So here we go.

Energy and materials are consumed in the production of commodities and waste is generated by our consumption of them.

A fairly mundane statement, but one that lies at the heart of the serious dilemma facing our planet over the next few years.

Put very simply: there are too many of us, using too many resources, too quickly.

Our Shire's garbage statistics say it all:

In 2005/06, the per capita tonnage was 433.63 kg with more than 50% going to landfill. And that doesn't include the 9189.24 tonnes collected in the 2005/06 "Council Clean-up" – only 5% of that was recycled. This Clean-up tonnage is increasing every year. 9000 tonnes of lounges, cupboards, plastic chairs, suitcases, computers, clothes baskets... all sorts of things that once upon a time we saw as repairable and reuseable but are now viewed as disposable.

Where does all this waste come from? It is generated by our consumption of resources, many of which are materials that have formed over many millions of years.

The three receiving the most public attention at the moment are water, coal and oil.

Back when the Shire had 50,000 people, and Sydney half its current population, there was plenty of water. There is still more than enough water. It's not the drought. We've doubled our population. Today instead of one or less cars per family, we have three. The Shire is full of swimming pools when we used to go to the beach.

Twice the population uses at least twice the water. And nobody is willing to use less. Sydney Water asks us to "limit" our water use to 300L per day per person but the honey farmer in Mudgee is content with 300L per week for a family of four. All of it from a tank!

It is our greed and demand for immediate satisfaction of our every wish that is the problem.

A couple of years ago, Mr Iemma promised the people of Menai that they would be able to wash their cars, water their lawn and fill their swimming pools. So he is building a desalination plant.

The recent heavy rains in the Greater Sydney region and forecasts of further winter rains enable the Government to defer construction of its multi-million dollar Desalination Plant at historic Kurnell.

Sydney's 11-dams-system will rise well above 40% of its capacity – surely good news for the Government which for over a year has made repeated promises not to begin construction unless dam levels fall below 30%.

There is absolutely no need to rush construction. The Premier's *Metropolitan Water Plan* (2006) says the plant could be built in 26 months and the Premier himself has said that even if dam levels fall as low as at the drought's lowest point (2004) "enough water would be available in the network of 11 dams to supply Sydney for another three to four years" (letter, 13.3.07).

The Pilot Testing Plant erected on the Government's 45 ha Kurnell site is a more than adequate *precautionary measure* allowing 3-4 years before the "30% trigger point" prompts a start on the 26-month construction.

This logic is unassailable. Followed, it will save Kurnell residents the ripping up of their streets for pipe-laying, preserve Botany Bay from environmental damage (8km of pipe-trenching), and immediately release 2-3 billion dollars for spending on rail/road upgrades while measures of water-capturing and water-recycling are proceeding to make Sydney drought-proof.

If you must water your lawn, use grey-water or install a water tank!

Coal is another issue that has received a lot of media attention recently, whether because of its role in global warming (something I will talk about in more detail later), or because of the damage its mining causes to nearby communities.

Alarming images of coal mining damage to a waterway making up 30% of the Woronora Dam catchment prompted the establishment of the WaterFirst group, a coalition including Sutherland Shire Environment Centre, Rivers SOS, NSW Nature Conservation Council, The Colong Foundation for Wilderness and the Total Environment Centre.

Underground mining subsidence has cracked and drained the Waratah Rivulet completely dry for almost two kilometres of its length, with a further proposal to take mining downstream and under the dam's storage area itself.

Chair of Sutherland Shire Environment Centre, Phil Smith said: "A river that provides Sutherland with a significant percentage of its water has been cracked and completely drained in sections by longwall mining. There are also pollution issues.

“Apart from the issues faced by the coal industry on climate change, there are absolutely no excuses for allowing our drinking catchment to be so badly damaged. The very reputation of the Iemma Government's water policy is at stake here.”

WaterFirst called on the Government to:

- a) Ensure that drinking water catchments are preserved so that the ability of these areas to collect and transmit water is not affected by mining operations. Under no circumstances should mining operations be allowed to cause surface cracking in these precious catchments;
- b) Establish underground mining prohibition areas of one kilometre around streams, upland swamps, water supply structures, aboriginal heritage areas, and mining protection zones for other vulnerable areas like cliffs and rock overhangs, and ensure that these controls be made mandatory for all current, as well as future, underground coal mining operations.
- c) Ensure effective pollution licensing for underground mines in drinking water catchments so that companies are heavily prosecuted for causing any damage to streams and water catchments, and particularly for causing any surface cracking; and

d) Develop a Protection of the Environment Policy that makes drinking water catchment preservation the primary consideration for mining operations in these areas.

A recent presentation to Sutherland Shire Council by the group resulted in a unanimous show of support and concern. They have asked the Council's Environmental Science Unit to prepare a submission to the Government's inquiry into mining in catchment areas.

A "Day of Action" has been organised for this Sunday. A rare chance to access our "protected" Woronora catchment area... and to see the irreparable damage coal mining has already done to these pristine streams, and to consider the consequences if a proposal to expand mining underneath Woronora reservoir itself is approved!

Sydney Catchment Authority has agreed to allow a number of people to enter the Special Area to inspect the damage.

Coal is important. Not only is it the mainstay of the New South Wales economy, it is the primary fuel used in Australian power plants. At current rates of extraction it is estimated that we have 100 years of black coal (the type used in steel production) and 600 years of brown coal (which is used in power plants) remaining. Sounds like a long time? But what then? Shall we be known in the history books as the civilisation that used up millions of years of carbon storage in just a few hundred years?

(The answer is nuclear, say some. Clean. No greenhouse problem. But if the whole world used nuclear power for its current energy needs the total supply of uranium would be gone in just 30 years.)

The third resource of concern at the beginning of the 21st century is oil.

At the beginning of the 20th century it supplied only 4% of the world's energy; decades later it had become the most important energy source. Today oil supplies about 40% of the world's energy and 96% of its transportation energy.

Since the shift from coal to oil, the world has consumed over 875 billion barrels. Another 1,000 billion barrels of proved and probable reserves remain to be recovered.

From now to 2020, world oil consumption will rise by about 60%. Transportation will be the fastest growing oil-consuming sector. By 2025, the number of cars will increase to well over 1.25 billion from approximately 700 million today. Global consumption of petrol could double.

Oil is the raw material for: petrol, diesel, jet fuel, motor oils, grease, wax, tar, asphalt, kerosene, LPG, fuel oil. Oil is also used to make plastic bags, bottles and cups, Styrofoam, and synthetic fabrics like polyester and nylon. It is used in fertilizer, photographic film, crayons, antiseptics, deodorant, pantyhose, hearing aids, house paint, contact lenses, vitamin capsules, life jackets, nylon rope, cortisone, footballs... the list goes on and on

It is difficult even to contemplate a life without oil, it is so much a part of our everyday life.

The plastics that fill our garbage bins are derived from oil. Yes, we can “recycle” some of them (Sutherland Shire Council now accepts plastics 1-7 for recycling), but by far most of them end up in landfill – wasted. We joke about “a moment on the lips, a lifetime on the hips”. Well, when it comes to oil the reverse is true: “A million years to create, a moment destroy”. The oil that we use today has taken millions of years in formation, being made of billions of tiny organisms that long ago died and sank to the bottom of primeval oceans to be buried by tonnes of sand and dirt.

But supplies of oil are not limitless. The argument is not about “if” but “when” we will reach “peak oil” (that point at which it starts to become harder and harder to extract oil from the ground). It is likely that the day has already been and gone.

Apart from our shameful garbage bins, Sutherland Shire’s main contribution to oil depletion is in our use of motor vehicles. Motor vehicle registrations have increased steadily for many years as we have progressed from one to two to three or even more car households. Our pattern of residential development with many peninsula type settlements lacking good access to public transport has made motor vehicle use a perceived necessity.

There is a definite need in the Shire for better and more frequent public transport and provision of safe and clearly marked cycleways and facilities.

But while the number of vehicles has been increased, there has been a steady decrease over the past few years in the distances travelled and the number of trips, especially on weekdays. This may be attributed to more localised trips being undertaken for activities such as shopping and recreational or social purposes.

Most trips within the Shire are of less than 10km and could easily be made by bike. Cycling is cheap, healthy, good for the environment and fun. We just need better facilities!

Natural resources such as coal, oil, or natural gas, take millions of years to form naturally and cannot be replaced as fast as they are consumed. Eventually they will be used up. But they are severely undervalued in monetary terms. If these materials were valued with consideration to their replacement value, they would cost us much more.

However, especially for the past 150 years, we have looked on them as almost free. Basically their only cost has been the cost of extraction.

But there's no such thing as a free lunch, is there? and as we might expect, there are consequences from burning all these little animals and plants that were buried so long ago to form these products on which we have become so dependent.

Earlier this year, the vast majority of the world's scientists finally agreed that mankind's use of fossil fuels (i.e. oil, coal and natural gas) was contributing to the observed climate changes.

The Intergovernmental Panel on Climate Change found that the world has, on average, warmed 0.7°C over the past century. It predicts that warming will continue, with an increase in average global temperature of between 1.8 and 4°C by 2100.

Using fossil fuels releases greenhouse gases. These include: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); sulphur hexafluoride (SF₆); hydrofluorocarbons (HFCs); and perfluorocarbons (PFCs). These six gases form an ever-increasingly dense layer around the earth which prevents the heat from the sun from escaping, in exactly the same way a greenhouse keeps the plants warm.

While a thin layer of carbon dioxide and water vapour has always been necessary to keep the earth from being too cold, our constantly increasing contribution is now believed to be forcing us headlong into a climate disaster.

Each of the greenhouse gases has a different capacity to heat the atmosphere, called its global warming potential. So, the global warming contribution due to atmospheric emission of a kilogram of a particular greenhouse gas is compared to a kilogram of carbon dioxide. For example, methane is 31 times more powerful than CO₂.

Although CO₂ is the least potent of the greenhouse gases, it is the most significant in terms of global warming because it is produced in such large quantities. Thus, emissions are commonly referred to as though they were equivalent to a given volume of carbon dioxide and are referred to as CO₂-equivalent.

The scientists have agreed that the nations of the world need to act *together* to overcome this global problem. (That would be a first, I think. But let's not be too pessimistic.)

Kyoto was a first step.

The Kyoto Protocol is an agreement made under the United Nations Framework Convention on Climate Change (UNFCCC). Countries that ratify this protocol commit to reduce their emissions of carbon dioxide and the five other greenhouse gases, or to engage in emissions trading if they maintain or increase emissions of these gases.

The Kyoto Protocol now covers more than 160 countries globally and over 55% of global greenhouse gas emissions. Notable exceptions to the countries that have ratified the Kyoto Protocol are the United States, and Australia.

In 2003, Australia topped the list of 36 developed nations with emissions of over 26 tonnes of CO₂ equivalents per person. That's right. Australia has the highest per capita emissions of greenhouse gases. The United States rated fourth with 23.4 tonnes of CO₂ equivalents per person.

With only around 0.3% of the world's population, Australia is responsible for 1.6% of the greenhouse emissions. If you include the emissions that result from our coal exports the figure increases to over 3% of total global emissions.

But having agreed on the need to reduce emissions, the difficulty is to try to find a way to achieve this while preserving our high standard of living. A way of life that depends on economic growth and ever increasing use of resources.

The recently released *Report of the Task Group on Emissions Trading* is intended to contribute to public discussion and the development of policy on the role of emissions trading in delivering least-cost reductions in greenhouse gas emissions.

The *Report* claims that a combination of economic growth and reduction in greenhouse gas emissions is achievable and sites the examples of Japan and the United States. However, it is important to note that while each of these countries did report reductions in emissions *per unit of GDP*, their *absolute* level of emissions actually increased.

It is *absolute* levels of greenhouse gases in the atmosphere that need to be reduced. We will not survive by just slowing down our rate of increase.

Getting fatter more slowly is not going to make us healthy.

The report goes on to claim that “to date, Australia is one of the few countries likely to meet its Kyoto Protocol target based solely on domestic actions. This is a significant achievement, but it has relied in large part on a reduction in land clearing.”

Anyone of you who reads *The Land* newspaper will be aware that this result has been at great expense to our farmers who have not been compensated for the loss of productive land that is now unable to be used.

This also means that this achievement has been a once off event, like raiding the piggy bank. We have not changed our fossil fuel usage and are now faced with the need for even greater cutbacks in emissions.

The challenge that confronts governments (and oppositions) today, is whether or not Australians are prepared to sacrifice the overflowing garbage bins of today in order to provide a future for subsequent generations. Or are we serious when we talk about “spending the kids’ inheritance”.

- ❑ Carbon emissions have already pushed up global temperatures by half a degree Celsius.
- ❑ If no action is taken on emissions, there is more than a 75% chance of global temperatures rising between two and three degrees Celsius over the next 50 years.
- ❑ There is a 50% chance that average global temperatures could rise by five degrees Celsius.

The global environmental impact is huge:

- ❑ Melting glaciers will increase flood risk
- ❑ Crop yields will decline, particularly in Africa
- ❑ Rising sea levels could leave 200 million people permanently displaced
- ❑ Up to 40% of species could face extinction

- ❑ There will be more examples of extreme weather patterns

But the *economic* impact (which seems to get us all to react more immediately) is even more frightening. Sir Nicholas Stern, former head of the chief economist of the World Bank, estimates that:

- ❑ Extreme weather could reduce global gross domestic product (GDP) by up to 1%.
- ❑ A two to three degrees Celsius rise in temperatures could reduce global economic output by 3%
- ❑ If temperatures rise by five degrees Celsius, up to 10% of global output could be lost. The poorest countries would lose more than 10% of their output
- ❑ In the worst case scenario global consumption per head would fall 20%
- ❑ To stabilise at manageable levels, emissions would need to stabilise in the next 20 years and fall between 1% and 3% after that. This would cost 1% of GDP.

He compared the economic impact posed by global warming as comparable to that of the Great Depression and both World Wars combined.

So what are the humanity's options?

- ❑ Reduce consumer demand for heavily polluting goods and services
- ❑ Make global energy supply more efficient

- ❑ Act on non-energy emissions - preventing further deforestation would go a long way towards alleviating this source of carbon emissions
- ❑ Promote cleaner energy and transport technology, with non-fossil fuels accounting for 60% of energy output by 2050

The steps taken will be much the same regardless of which of our two major political parties system gains control at the next election: carbon trading schemes (also called emissions trading schemes), perhaps promises of “no new coal-fired power stations”, varying levels of subsidy/rebates for renewable energy use.

Most hopes are pinned on the success of carbon trading schemes. A *global* market needs to be created for carbon pricing.

Carbon trading schemes are an attempt to put a value on carbon. Whether the carbon is being emitted from a power station (emission trading) or is found in the trunks and leaves of trees (a carbon sink) or buried as highly pressurised CO₂ in a disused mine or oil well (geosequestration – another type of “carbon sink”).

Such a scheme already exists in NSW. The NSW Greenhouse Gas Abatement Scheme was introduced in January 2003. Electricity retailers must meet mandatory targets for reducing the emission of greenhouse gases from the production of the electricity they supply or use.

The NSW target for emission was 7.27 tonnes of CO₂-e per capita by 2007. This target is 5 per cent below the level determined in the Kyoto Protocol baseline year of 1990. The target levels will be maintained until at least 2012. If participants fail to meet targets, they are required to pay a penalty per tonne of emissions above their targets.

Abatement certificates are issued by accredited organisations for low-emission generation of electricity, reduced consumption of electricity and capture of carbon from the atmosphere by forests. Each certificate is equivalent to 1 tonne of CO₂ equivalent associated with the consumption of electricity.

This is what fuelled (for lack of a better word) things such as the Easy Being Green campaign run earlier this year in the Shire, where household were offered free energy saving light globes and household audits.

Emissions trading is an extension of the “polluter pays” or “load based licensing” schemes already in existence in Australia.

Simplistically, a target tonnage of emissions is set and a value per tonne (\$20 is the amount being bandied about at the moment) is set for emissions over the target level.

Producers who do not meet the target are then forced to purchase “carbon credits” to pay for their extra emissions.

This forces up the price of production for goods that involve high emissions levels (e.g. electricity from coal fired power stations), and makes industries with lower emissions (e.g. solar panels, solar hot water, wind turbines, tidal or wave power, geothermal, clean coal technologies, even the unpopular nuclear) more affordable and investment in associated infrastructure more attractive.

The difficulties facing the Australian Government are the need to determine the immediate and long term targets (that is, the rate of change that the economy can bear) and the need to try to act in concert with trading partners and competitors.

So what do you think will it be? Will we see the whole world acting together for a common good? Will Australia and the United States continue to fill their garbage bins and worry about obesity and watering their lawns while attempting to convince China and India of the need to progress slowly and responsibly?

Or will the past few thousand years, and especially the last hundred, be a better predictor of human nature and our future?