

Global Warming can be Solved Using TecEco Technology

According to the Committee on the Science of Climate Change, 2001, National Research Council, USA "Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising."

That some gases, including water vapor, methane and carbon dioxide cause a "greenhouse affect" is irrefutable science, in fact without the "greenhouse affect" we would all freeze to death.

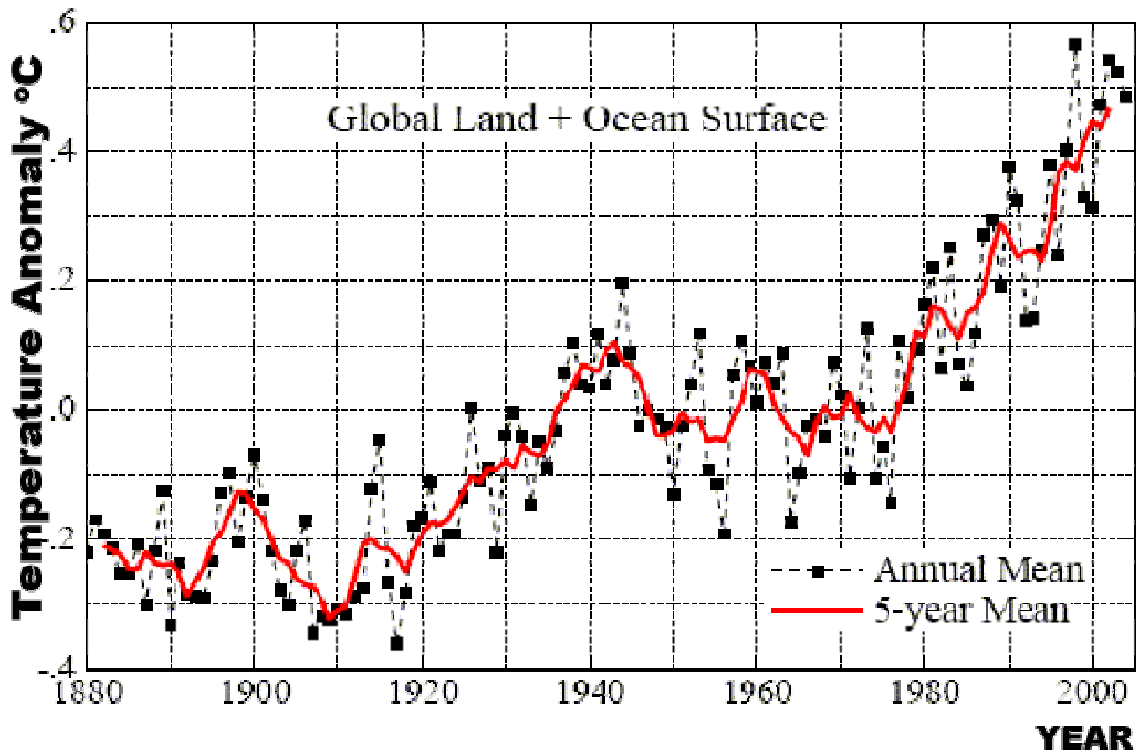


Figure 1 - Global Temperature Anomaly (GISS, 2005)

The rate of temperature change is currently ten times that of previous warming periods between periods of glaciation and this should be enough to convince the most ignorant of critics that global warming is something irreversible our activities on the planet are causing and not some short term climactic perturbation.

Prudence would dictate that we should be cautious and consider the implications of consuming such a high proportion of the world's fossil carbon increasing the level of carbon dioxide (CO₂) in the atmosphere by roughly 50% in just a few short years since the beginning of the industrial revolution. The level of carbon dioxide in the air is now close to 380 ppm and was only around 280 ppm when James Watt invented the steam engine.

Global temperatures are predicted to continue to rise and along with them there will be significant climate change because the largest variable affecting winds and currents is temperature.

Kyoto is now a treaty with the force of international law, however Australia has not joined along with the United States which is a major producer of carbon dioxide. Arguably, it is only a start and there is some doubt whether a legal rather than real economic price for carbon dioxide will be enough to cause us to reduce emissions sufficiently to turn the problem around. One result of not joining however is that Australian businesses will be shut out of the new emerging global emissions market already worth billions of dollars. Given that eco-cement and TecEco kiln technology is Australian and probably the most carefully thought out strategy we have to directly deal with the problem this is crazy to say the least.

The Kyoto protocol as a treaty will run until 2012 and comes amid a plethora of warnings that climate change is accelerating and we have only a 10-year window in which to turn the problem around. While a very small pocket of mostly economists remain unconvinced that climate change is being at least partially caused as a result of human intervention, most scientists are now talking about how much warming the Earth can withstand without catastrophic change such as the polar icecaps totally melting. The consensus is that the world may be able to cope with a two-degree rise in temperature from what it was around 1750. As temperatures have already risen by 0.6 degree C, anything above a further 1.4 degree C rise could be disastrous!

The problem is that even if we just stopped using energy from today onwards, we're already in trouble. Even though predicting future warming is difficult because of the large time lags between emissions and changes in climate. Britain's Hadley Centre for Climate Prediction and Research think that warming is already inevitable even if we stopped using fossil fuels. They predict that global temperatures will rise 0.5 degrees C from now to 2100 because of what we have already done, stabilising hundreds of years later at 1.6 degrees. This is because carbon dioxide lasts for between 50 and 200 years in the atmosphere.

In the past 50 years there have been significant changes due to the rise in average temperatures. The Arctic icecap has already lost an area the size of Tasmania since 1970 and the sea level has risen by at least 13 cm compared to an important benchmark recorded in 1841 at the Isle of the Dead which was part of a penal settlement in that same state where I live.

Recent reports have shown that melting of the polar caps is accelerating. The director of the British Antarctic Survey, Chris Rapley is reported to have said that "the giant is awakening" and that three ice streams were speeding up and discharging into the sea on the west Antarctic ice sheet raising the prospect of a more rapid sea-level rise.

Last year's Arctic Climate Impact Assessment study found that the North Pole was warming at twice the rate of the rest of the Earth. Some models in the report predicted the near disappearance of summer sea ice by the end of this century. Around the planet at least 100 animal species are on the move, searching for cooler habitats. Polar bears and some seal species that have nowhere to go would be pushed towards extinction.

It is not only animals feeling the heat. Many human communities face evacuation including peoples living on low lying islands in the Pacific or in large areas of Holland and Belgium known as the "low" countries. According to a report part-authored by the World Health

Organisation and presented to an international climate change conference in Exeter, Britain on the 1st to 3rd February 2005, the "modest" climate change we have seen since the 1970s has claimed 150,000 lives a year through disease, malnutrition and heat waves. There were other frightening predictions revealed at the Exeter conference. Of particular concern were the warnings from Carol Turley, head of science at Britain's Plymouth Marine Laboratory who said that the world's oceans were slowly turning acidic after absorbing about half the 800 billion tonnes of carbon dioxide humans have put into the atmosphere. If this occurs there will be a collapse in the food chain as "the whole composition of life in the oceans will change".

Although the Bush White House continues to downplay the urgency of global warming, some parts of the Bush administration have recognized the gravity of the situation. A report released in 2004 by the Pentagon's Office of Net Assessments said that by 2020, climate change could unleash a series of interlocking catastrophes including mega-droughts, mass starvation and even nuclear war as countries like China and India battle over river valleys and other sources of scarce food and water.

Australia is especially vulnerable because we are drought prone and our environment, including our reef, tropical rainforests and Kakadu is fragile. According to scientific papers produced by the CSIRO, a few degrees of warming would cause coral to die, snow cover to decrease, agriculture to suffer and the Murray-Darling Basin, the nation's food bowl, to suffer a drop of 12 to 25 per cent of its river flow.

Modeling has shown that with a two- to three-degree increase, 97 per cent of the Great Barrier Reef would be bleached every second year. Large losses in pasture growth and livestock carrying capacity as the result of less rainfall would occur in southern Australia, while the nation's already languishing water resources would become even more scarce.

Scientists think that the temperature rise can be limited to two degrees as a result of a 50 per cent cut in global warming emissions by 2050. The Australian environment Minister Ian Campbell describes the prospect of a two degree rise as "catastrophic." He comments on Australia's position thus "our position is (that) we believe climate change will have massive negative impacts on Australia's economy and unique bio diversity," yet we still have not joined Kyoto.

Many have been cynical about John Howard's dog like relationship with the USA. Is the reason we have not joined related to this? Would he have voted for Kyoto on a conscience basis? The fact is that our position on Kyoto is ridiculously contradictory. Our government does not dispute the science, but it will not join Kyoto. I was recently told by an underling in the department of environment that the treaty was flawed. We all know that. Ian Campbell says that without developing nations and the US, which is responsible for 25 per cent of global emissions and the third-largest per capita polluter in the world, the treaty will not fix the problem of global warming. We know the treaty will not fix the problem, but we should still join. Refusing to ratify the protocol, even though we were allowed an increase in emissions of 8 per cent above 1990 levels, a target we are apparently likely to easily meet, is crazy! We are one of the highest CO2 polluters per person in the world and need to show the rest of the world we are doing our share and committed to change.

According to the government Kyoto would hurt the nation's energy exports and energy intensive industries, exposing it to competition from developing nations such as China, with no binding targets in the first round. Joining Kyoto would be symbolic of our intentions to the rest of the world to do something and would allow Australian companies to more

easily trade in the new carbon market that is evolving, especially in Europe. The business case alone should be sufficient.

Conservationists and the Federal Opposition argue Australia should sign Kyoto, regardless of its shortcomings, as a matter of good faith and for a change they are totally correct on this. They also point out that Kyoto was always designed as a first step and never meant to engage developing nations in the first phase, as it was rich nations that had created the problem of global warming. Kyoto is a pilot treaty, what matters is the signal Australia sends to the rest of the world. What also matters to businesses like TecEco is the ability to factor into projects carbon credits.

Many "clean" businesses like TecEco will suffer until sense prevails in government circles. Others affected include, Global Renewable's, which captures greenhouse emissions from landfill, renewable energy companies like Pacific Hydro and Hydro Tasmania as well as tree-planting business such as CO2 Australia. The Australasian Emissions Trading Forum, representing these businesses, has calculated the lost opportunities could reach \$1.5 billion and they have not yet costed the beneficial impact of TecEco technology. Recent research shows even farmers could earn credits under Kyoto by changing land practices.

The labor environment spokesman Anthony Albanese has taken the opposite view as would be expected of an opposition. He says "it is extraordinary that we are going to meet our Kyoto target but not receive the benefit that ratification would bring to Australia in terms of economic opportunity." Correct Mr Albanese.

Some such as Meyer Hillman in his recent book (Hillman, M. and Fawcett, T. (2004). *How We Can Save the Planet*, London, Penguin Books.) push the case for carbon rationing. I cannot see this working without one person or country standing over another with the power of force. There is no doubt sequestration on a massive scale is at least also required and a more viable alternative.

Apparently the Bush Administration and the Howard Government are putting their faith in future technology discoveries. George and John, the technology is already here! You are welcome to talk to me any time.

The solution has to be holistically conceived and economically driven with as little interruption to the way we live as possible. Technological change towards greater sustainability will bring economic benefits not stagnation. Not only must we convert to non fossil fuel energy as quickly as possible but we must embark on sequestration on a massive scale using all the technologies we have. Such an integrated approach must be driven by economics or it will not happen. Putting a legal price on carbon through taxation mechanisms as in Kyoto could be just the trigger we need to initiate processes that put a real price on the gas. Carbon can however only become an economic resource with a change in the technology paradigm of the scale contemplated by TecEco as in the diagram below.

The TecEco Total Process for Saving the Planet

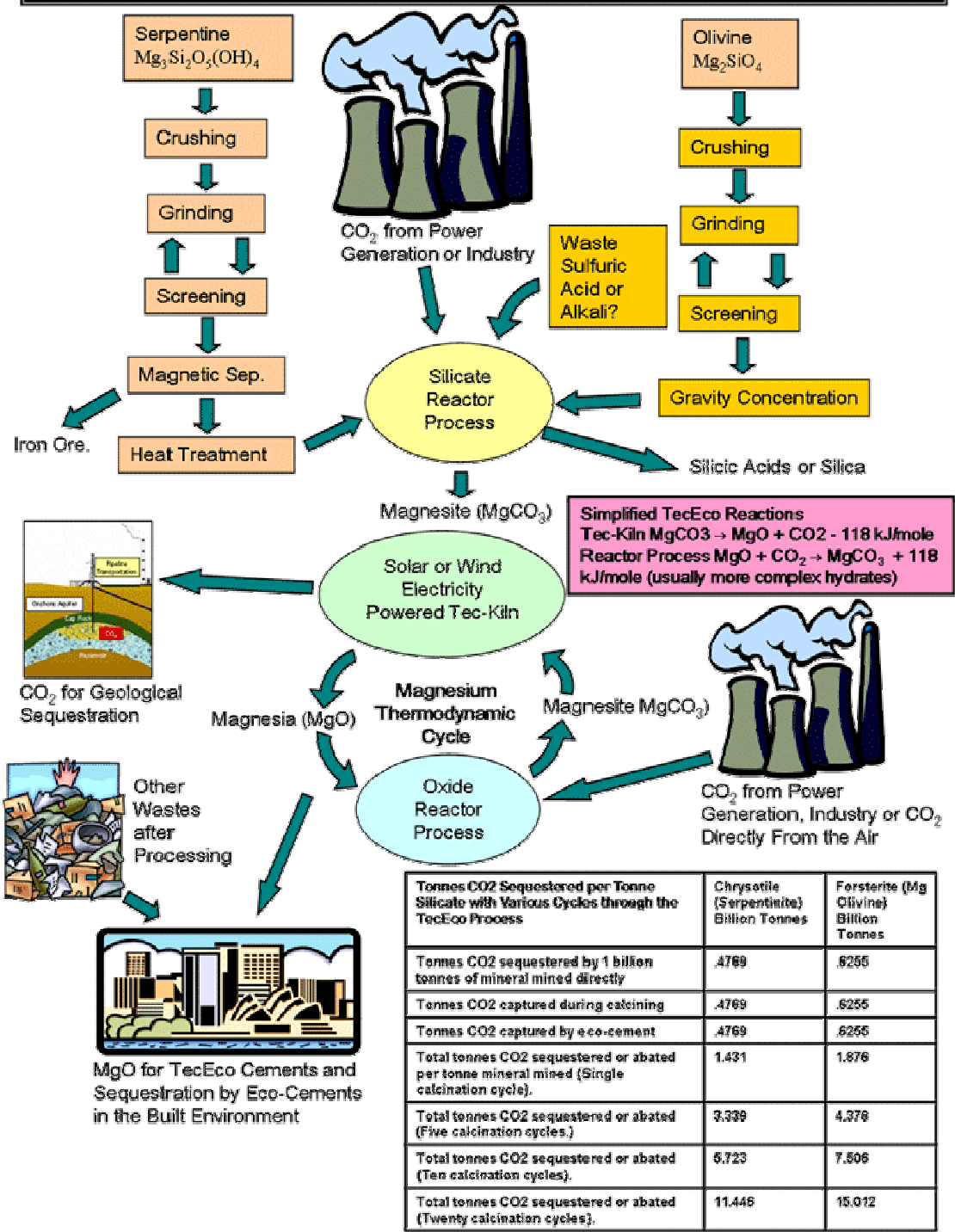


Figure 2 - The TecEco Process for Saving the Planet

For a modest billion tonnes of forsterite (this could also be peridotite or serpentinite) and twenty solar driven cycles of TecEco kiln technology we can turn the problem on its head

and start reducing the carbon dioxide gas in the atmosphere significantly. Compared to the 5 or 6 hundred billion tonnes of stuff we shove about the planet that's not much!

According to Dr John Wright, director of CSIRO's Energy Transformed Flagship Program, "It will have to be worldwide action. People will be driving more fuel-efficient cars and living in buildings that are more energy-efficient. We will be more conscious of the little things that have an accumulative effect, like turning lights off when you don't need them, and not heating or cooling entire houses, just sections. These are just the normal conservation activities that we should do now, but don't, because it is not a major blip on our consciousness."

I am going a lot further by advocating bio mimicry on a huge scale. We must like animals and plants find uses for carbon to construct our homes, in this way we can modify the carbon cycle with what amounts to industrial photosynthesis as in the diagram below.

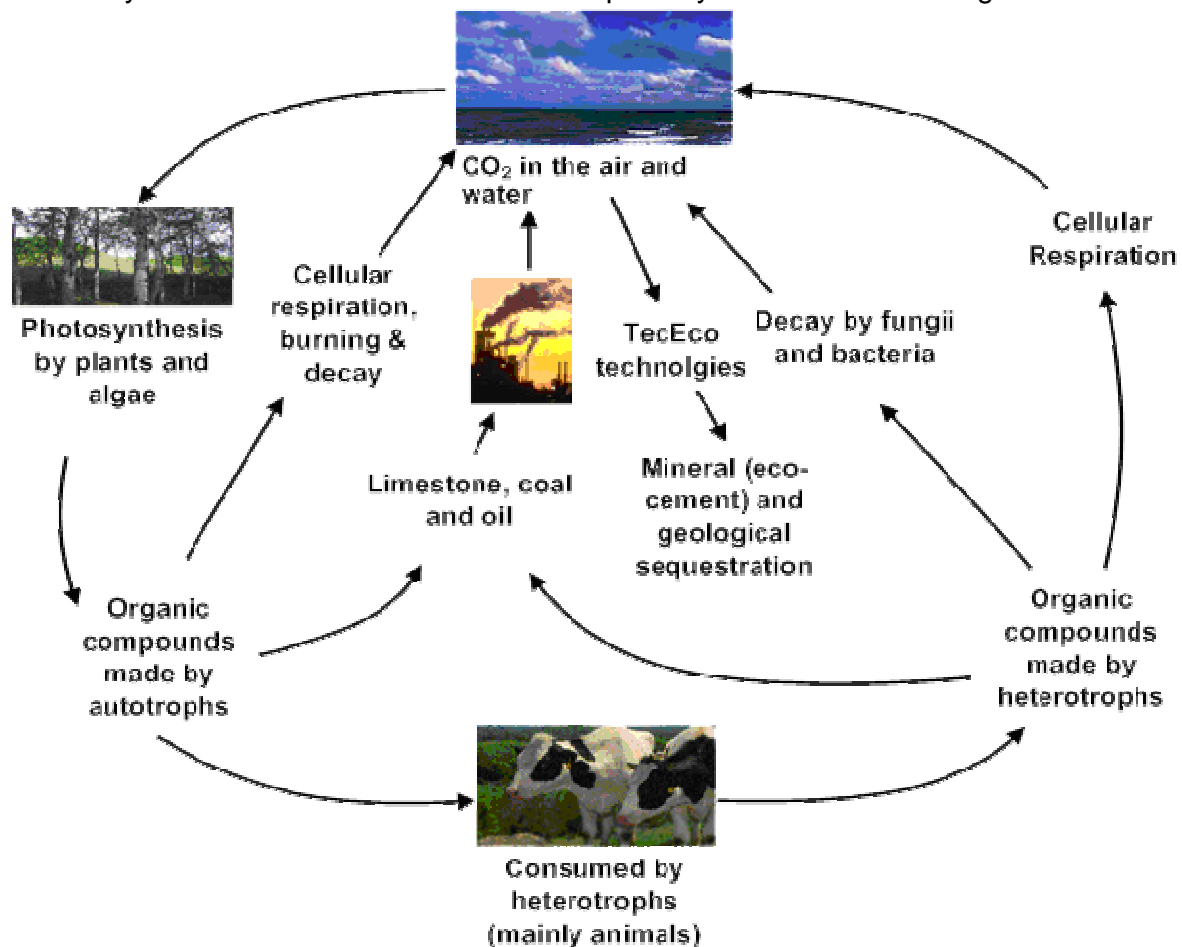


Figure 3 - The Carbon Cycle (Adapted from Kimball (Kimball, J. W., 2004)).

"It is going to be an almighty task to make those greenhouse cuts in that time," says Dr Wright. "Fifty years seems like a long time, but it will go quickly."

Why are the Australian government is moving on as though blindfolded? Why aren't they ceasing the opportunity TecEco are giving them to lead the world? I don't know. All I can tell my readers is that like my ancestor the John Harrison who solved the longitude problem and invented the watch, I am feeling the total frustration of it all. When will meaningful dollars emerge to move this great project forward on the scale we need it?

For more information visit the TecEco web site, especially Sustainability\TecEco Sequestration and the downloadable paper Mineral and Geological Sequestration Combined under Documentation\Political.

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