

SUBMISSION to the
NATIVE VEGETATION LAWS, GREENHOUSE GAS ABATEMENT AND
CLIMATE CHANGE
SENATE INQUIRY

By Ian McClintock

EXECUTIVE SUMMARY

I strongly oppose the Carbon Pollution Reduction Scheme for a number of fundamental reasons of significant importance for and pertinent to the agricultural sector.

There are fundamental assumptions being made by the Government in respect of the veracity of the science underlying anthropogenic global warming (AGW), now being re-titled as 'climate change', that a growing body of respected scientists, across a wide spectrum of related fields, are challenging.

It is claimed that the science is 'settled' and that there is a 'consensus' amongst the overwhelming body of scientists and the Intergovernmental Panel on Climate Change (IPCC) that the increase in human induced emissions of greenhouse gasses are 'very likely' (with 90% or greater probability) to have been the principle cause of the warming that has occurred over the last century and a half.

There are significant elements in these assumptions that now appear to be at odds with the facts, the observations, and the underlying science that raise questions about the impartiality, comprehensiveness and accuracy of the climate data that is being used by the IPCC in its Reports, the basis of the Government's response on these issues.

Of particular significance and concern for our livestock industries is the methodology employed to calculate the claimed major agricultural emission, livestock methane. The UNFCCC (United Nations Framework Convention on Climate Change) emissions calculation rules are fundamentally flawed as they ignore the scientifically well accepted 'carbon cycle' that operates under these circumstances.

Emissions of methane from livestock and their by-products are calculated and included, however carbon captured and removed from the atmosphere by photosynthesis by the plants the livestock ate is not calculated or included. As a result only half of the carbon cycle is included in the calculations. Livestock do not increase atmospheric carbon concentration.

The Global Warming Potential (GWP) of livestock methane is not distinguished from fossil methane (which does add carbon to the atmosphere).

This clearly and unambiguously grossly overstates agricultural emissions, which in turn seriously disadvantages and unfairly discriminates against the agricultural sector.

In view of the growing uncertainty surrounding the underlying science, the flawed agricultural emissions calculation methodology and the widespread, adverse and escalating impact the 'Carbon Pollution Reduction Scheme' (CPRS), will have on the farming sector, and the economy as a whole, I add my voice to those calling for a Royal Commission, with wide ranging Terms of Reference, to hold a comprehensive Inquiry into the science of 'Climate Change'.

INTRODUCTION

For at least twenty years now there has been a largely one-sided proposition put to the people by the media and supported by a number of (but certainly not all) scientists that anthropogenic (man-induced) emissions of greenhouse gasses (GHG's) are the

predominant cause of the warming that has occurred since about the middle of the nineteenth century.

This is based on the well recognised and accepted theory that water vapour (the major greenhouse gas) and the trace gasses carbon dioxide (CO₂), methane (CH₄), Nitrous oxide (N₂O), etc., have raised the temperature of the Earth to make it habitable for life on Earth as we know it today.

The AGW hypothesis then goes on to postulate that raising the trace gasses above their natural levels will result in rising temperatures and if this is allowed to continue much beyond about 2°C, it could result in a runaway greenhouse effect that would be catastrophic for mankind and the environment.

If this is 'very likely' to occur as claimed, then you would reasonably expect that there would be a significant body of sound empirical evidence available to support the theory.

EMPIRICAL EVIDENCE

A careful study of the IPCC (and other supporting) Reports however most surprisingly fails to provide any empirical (hard, measurable, repeatable, observable, not theoretical or circumstantial) evidence that supports the theory.

The IPCC in fact only rely on sophisticated computer models and circumstantial evidence for their claims.

This will almost certainly come as a surprise to many who may not initially believe it to be true. This statement however is not an opinion or a belief, it is simply a fact that can be readily verified.

One simple test that can be applied is, if there was any empirical evidence that supports the theory then we would have all heard about it ad nauseum. Despite the many billions of dollars that have now been spent trying to find some, this vital and essential quest has been in vain.

There is good evidence that warming has occurred since the end of the 'Little Ice Age' about 1850, at an average, non-accelerating rate of some 0.5°C per century and that this has occurred in smaller cycles of warming and cooling. The globe however has not warmed over the last 15 years despite a significant increase in mankind's emissions. Global temperatures are currently well below the very lowest temperature forecast by the IPCC.

The evidence of melting glaciers and ice, ocean temperature, sea levels, etc, is evidence that warming has occurred but in itself does not point to the cause of the warming. It could and may in fact be caused by a multitude of factors, including variables not included in the IPCC computer models. In any case this is circumstantial evidence only and it therefore does not provide a satisfactory or sound basis for the introduction of far reaching legislation such as the CPRS.

In addition to the lack of supporting empirical evidence there is a range of empirical evidence that indicates that while additional greenhouse gasses (GHG's) do have a warming effect, this is very much smaller than that predicted by the IPCC who predict an approximately linear increase in temperature.

SURFACE ENERGY CHANGES FROM CO₂ IN THE ATMOSPHERE

Figure 1. As the concentration of CO₂ increases, there is increased radiation back to the surface of the earth (the greenhouse effect). This is measured in Watts per square metre

(left axis). However the relationship is not linear. In fact doubling the concentration of CO₂ from 400 ppm to 800 ppm only increases the radiation from CO₂ at the surface by some 10% or 3.2 Watts per square metre. (Results derived for US standard atmosphere and cloudless sky from MODTRANS, a University of Chicago on-line calculator of energy in the atmosphere. MODTRANS is an international and IPCC accepted standard for atmospheric calculations).

The effect of these GHG's on temperature is logarithmic in effect, as can be seen in the above graph, with a significant warming occurring with the first 20 ppmv (parts per million by volume) of CO₂ and declining rapidly until at about 250 ppmv a doubling will cause only a minor increase in temperature.

The major greenhouse gas is water vapour and it has a wide radiation spectrum at which it is active as a greenhouse gas. This spectrum partly overlaps the most important frequencies at which carbon dioxide is active (at around 15 microns)

Methane has a couple of very small regions where it absorbs strongly, about 3.5 and 8 microns.

These radiation bands are already largely saturated at current atmospheric levels.

Fig.2. Absorption of ultraviolet, visible, and infrared radiation by various gases in the atmosphere. Most of the ultraviolet light (below 0.3 microns) is absorbed by ozone (O₃) and oxygen (O₂). Carbon dioxide has three large absorption bands in the infrared region at about 2.7, 4.3, and 15 microns. Water has several absorption bands in the infrared, and even has some absorption well into the microwave region. There is already sufficient CO₂ in the atmosphere to absorb almost all of the radiation from the sun or from the surface of the earth in the principal CO₂ absorption bands. (Data from ref. [1], page 93; original data are from Howard et al [21] and Goody [22]).

The gaps or 'windows' in the total radiation spectra (above) allow long wave radiation (heat waves) to escape into space.

Outgoing long wave radiation (OLR) is at a maximum near 10 microns.

Increasing atmospheric temperature increases the rate of evaporation from the oceans.

This has three significant effects that act to mitigate the overall warming effect.

It takes a lot of energy to turn liquid water into water vapour and this reduces the temperature of the top layer of the ocean.

The additional water vapour in the atmosphere allows cloud cover to increase. Low level clouds reflect some 50% of the incoming short wave radiation from the sun, back out into space, reducing the warming that otherwise would have occurred.

Strong currents of hot air at the tropics rise directly into the upper atmosphere where they physically remove heat from the Earth's surface and vent it into space.

These and other mechanisms combine to provide the Earth with a type of inbuilt thermostat that works to limit the degree of global warming.

TEMPERATURE CHANGES AT THE SURFACE FROM CHANGES IN CO₂ CONCENTRATIONS

Figure 3. Increased radiation forcing results in an increased surface temperature. However with 70% of the earth's surface as ocean, evaporation reduces the temperature

increase by approximately a factor of two. Doubling the CO₂ concentration to 800 ppm with a 3.2 Watts per square metre radiation increase, gives a surface temperature increase of 0.3 °C. IPCC modelling suggests that this level of CO₂ will be reached in 2100 with their “business-as-usual” projection.

The IPCC projection that this level of CO₂ will cause an increase of some 3°C (and possibly as high as 6°C) is not borne out by these facts and so some further assumptions need to be made.

The computer models assume that the major warming comes from increased atmospheric water vapour precipitated by the (small) warming caused by the minor GHG's.

It is further assumed that all this heat is retained in the troposphere (the lower atmosphere) where it will cause warming.

The empirical evidence from satellites that measure the outgoing longwave radiation (OLR) (heat waves) from our planet, show that OLR increased at the end of the last century, providing a reduction in retained global heat, venting it to space.

There is no evidence that the IPCC assumptions actually occur in reality. Not one of the IPCC 's climate predictions has ever eventuated.

There is much other evidence available that appears to call into question the assumptions and claims made by the IPCC. By any fair minded assessment the science is certainly not ‘settled’.

This all needs to be brought out in a public Inquiry so that it can be presented, referenced, discussed and verified so that it can be incorporated in a balanced appreciation of the state of the climate.

CALCULATING AGRICULTURAL EMISSIONS

Australia, having signed the Kyoto Protocol, must employ the rules designated by the United Nations Framework Convention on Climate Change (UNFCCC) when calculating agricultural emissions in respect of the Australian National Greenhouse Gas Inventory.

These rules however unfortunately embody a major distortion in their methodology in respect of calculating GHG emissions from livestock.

Livestock emissions are incorrectly claimed in the accounts to be net emissions whereas in fact they are clearly gross emissions. This comes about by calculating (not measuring) the emissions of methane (CH₄) from livestock.

Only half of the well-accepted carbon cycle has therefore been included in the calculations. If the calculations were done correctly livestock would be found to be very close to being carbon neutral and possibly carbon positive taking into account the carbon sequestered into the soil as a result of the grazing regime. Livestock do not increase atmospheric carbon concentration unlike fossil methane, volcanoes, wetlands, etc.

This is totally unacceptable as it inflates the agricultural emissions to some 16% of Australia's total, implying that the industry is the second highest emitter. In fact if the calculations incorporated the complete carbon cycle as it should, agricultural emissions would fall dramatically to inconsequential levels.

OFFSETS

Under the revised CPRS a range of (i) Kyoto compliant CPRS offsets, (ii) voluntary market (non- Kyoto compliant) offsets and (iii) CPRS opt-in offsets, are proposed and it is claimed by ABARE that these will by 2030 result in a positive outcome for agriculture by 2030 when the increased costs will be more than offset by the income made from

reductions in agricultural emissions as a result of these 'offsets'.

There are many assumptions made in their computer modeling to achieve this outcome that are highly likely not to be borne out in practice.

The modeling indicates that the livestock sector are likely to benefit most when it is (confidently) assumed that technology and management practices will become available to significantly reduce emissions from this sector.

As detailed above livestock emissions are incorrectly calculated. Livestock do not increase atmospheric carbon concentration. This immediately reduces emission reduction potential from this source.

While it may be possible to reduce direct livestock methane emissions under intensive and ideal conditions, attempts to do so under rangeland conditions are likely to result in reduced rates of growth, prolonging the 'finishing' time and resulting in an actual net increase in total emissions per head. (See the discussion in Methane below.)

Avoided deforestation, is Kyoto compliant, however this option is no longer available as clearing for agricultural production has been banned in every State, without any compensation being paid to the adversely effected farmers. This is costing farmers some \$600,000 per year.

Regrowth and reforestation forests are now an opt-in possibility on land legally cleared between 1990 and 31 December 2008. This is a very limiting provision and plantation timber on cleared agricultural land will reduce agricultural production and water runoff and availability.

"Many of the technologies and practices are not likely to be implemented on a large scale in Australia because they are too costly, or apply only to small-scale activities or may not be judged to be 'additional'" (ABARE 2010).

"There is a high degree of uncertainty surrounding the 'potential' volume of soil sequestration available in Australia. Furthermore, it is difficult to ensure the permanence of soil carbon sequestration" (ABARE 2010).

Increased soil carbon has soil fertility and production benefits and it also offers by far the greatest terrestrial opportunity to sequester carbon, however it is not a Kyoto compliant offset.

As a proposed non-CPRS voluntary offset option the value of soil carbon sequestered in this way is likely to be significantly reduced in value, reducing the incentive to invest in this form of sequestration.

The biggest disincentive however is likely to be the very high risks (not considered by ABARE) attached to accepting payments for sequestering soil carbon over a period of years, which could be lost very quickly due to drought, fire, etc, over which the farmer has no control. These offset payments would then most likely have to be repaid at the current (almost certainly higher) market price. This could bankrupt or severely financially hurt the farmers involved.

The necessity to comply with a complex range of internationally accepted principles of:

Additionality

Permanence

Verifiability and measurability

Independent audit

Registration

Will add additional levels of bureaucracy, compliance and possibly legal costs, risks, etc.

that will all have to be paid for, and could significantly reduce any benefits obtained. It is extremely hard to permanently increase soil carbon under broadscale farming (cropping) regimes as work by the CSIRO over twenty years at “Oxton Park” Harden, NSW, utilizing the very best conservation farming techniques, demonstrates.

IMPACT OF THE CPRS ON AGRICULTURE

While agricultural emissions will now not be included in the CPRS, the costs of electricity, fuel, chemicals, fertilizer, labour (eventually), etc., will all be progressively increased as a direct result of the CPRS, and Minister Wong has indicated that agriculture will have to “pay its fair share” (one way or the other). These added production costs will progressively put our industry at a significant competitive disadvantage.

Reforestation of cleared agricultural land will reduce productivity and our ability to provide food and fibre to an exponentially increasing world population, a counterproductive outcome.

The cost increases will be significant and incapable of being ‘passed on’, so that on top of the liabilities imposed by successive years of drought, increased regulation, rising interest rates, rising A\$, etc., these added costs could push many thousands of farmers into bankruptcy and seriously impact on the viability of most others.

These imposts will in turn destroy the lifeblood of many rural towns and villages, threaten future food security, increase food prices, reduce agricultural export income and eventually the standard of living of every Australian. The notable exceptions are the rent seekers who stand to gain billions of dollars through exploiting, unproductively, the vast sums of money raised and churned by this process.

METHANE

Approximately 80% of atmospheric methane emanates from non-livestock sources and atmospheric levels of this gas have been relatively static since about 1999, but with a spike in 2007 clearly unrelated to agriculture. Emission and absorption of livestock methane is in equilibrium, they are not increasing atmospheric methane levels so accusing them of something they are not doing is wrong and will have severe and counterproductive outcomes for the industry and those who depend on it.

Methane levels also naturally fluctuate with variations in global temperature and other factors such as the El Nino Southern Oscillation, volcanic eruptions, the levels of OH radicals in the atmosphere (that oxidize & break CH₄ down into CO₂, etc.), humidity and ultraviolet radiation flux, as well as from anthropogenic causes.

Methane is present in the atmosphere at the trace level of some 1,700 ppb (billion) by volume compared to CO₂ at 386 ppmv (million). The total methane in the atmosphere is of the order of 5.1 G tonnes compared to more than 2,900 G tonnes of CO₂.

The atmospheric concentration of Methane is significantly higher in the Northern hemisphere than in the Southern one.

GLOBAL WARMING POTENTIAL

This distinction is important for a number of reasons.

The GWP, is a figure calculated to compare the greenhouse effect or potency of the various gasses compared to CO₂, which has a GWP of 1.

The IPCC calculated methane as having a GWP of 11. When CH₄ breaks down in the atmosphere it releases carbon dioxide (CO₂), water vapor (H₂O) and Ozone (O₃). They therefore add the GWP effects of these gasses to the original methane GWP, effectively doubling it to 21-25.

However this is based on the unique IPCC estimate that CO₂ has an atmospheric residency time of 100 years, (possibly as long as 200 years). The many other scientifically conducted experimental data and observations however show that CO₂ has an atmospheric residency of some 5 years.

“In order for increased human carbon dioxide emissions to cause accelerated global warming, the climate models need to assume that carbon dioxide remains in the atmosphere for a very long time, up to 100 or more years.

“Since the IPCC’s task is to prove any global warming is due to human CO₂ emissions, they decided to proclaim that carbon dioxide was long-lived in the atmosphere – a fabricated assumption.

“They did this despite the overwhelming majority of peer-reviewed studies (and corroborating empirical measurements) finding that CO₂ in the atmosphere remained there a short time.

On this basis methane should only be apportioned a much lower total combined GWP (because of the shorter atmospheric residency time of CO₂ (the major breakdown greenhouse product).

While there may be some justification for this in relation to new carbon derived from fossil sources, this is not the case for livestock as the carbon in the CH₄ has been previously recycled out of the atmosphere and is consequently not adding any new carbon to the atmosphere.

In fact for every tonne of CH₄ emitted by livestock 2.75 t of CO₂ have been removed from the atmosphere, so to be correct livestock CH₄ should be accorded a GWP of some 8.25. These corrections would reduce the claimed impact from livestock significantly and this highlights the autocratic, flawed, imprecise and inadequate nature of the current inventory process.

While it is possible to reduce methane production from cattle and sheep under certain ideal conditions of high digestibility feed, the conversion of lower digestibility roughage material into energy is enhanced by reducing the quantity of Hydrogen present in the gut. Over many thousands or possibly millions of years this has been most efficiently achieved by methanogens in the gut that produce and emit CH₄ from the animal, to improve rumen fermentation efficiency.

While it is possible to introduce methanogenic inhibitors into the gut to reduce the quantity of methane emitted, this will, under any but ideal conditions reduce the growth rate of these ruminant animals.

Under ideal conditions of high digestibility feed, fodder intake per head is increased and so therefore CH₄ emissions per head are also increased, however because of the (relatively) rapid resulting growth, CH₄ emissions per kg are reduced, as indicated in the following graph.

In view of the fact that livestock are not increasing the level of atmospheric methane and are not increasing atmospheric carbon, to penalize them for something they are not responsible for, is discriminatory and obviously unfair.

THE BENEFITS OF INCREASING CARBON DIOXIDE

You rarely here about the benefits of CO₂ in this one sided debate, yet they are substantial and very important.

Plants were developed when CO₂ levels were very much higher than today as records of historic plant leaf stomata and other data testify. That is why plant production has improved by some 15% in recent times and why many greenhouse operators inject CO₂ into their greenhouses to maintain a level of 1000 – 1500 ppmv CO₂, it significantly improves plant growth rates and yield.

Higher levels of CO₂ also improve water use efficiency, disease resistance, root growth and rhizobia bacteria efficiency that increases nitrogen uptake. In some cases this can also reduce N₂O emissions.

If atmospheric CO₂ levels fell to 250 ppmv some important plants would stop growing and if it fell to 200 ppmv or below, most plant life would be unable to survive. Plants are now living at the lower end of their CO₂ range and would continue to benefit until at least a level of 1500 ppmv was attained. This would be impossible to achieve even if all the known fossil fuel reserves were burnt.

Historically levels of 1000, 5000, 10,000 ppmv CO₂ and higher , were common and prevailed when plant life was evolving. There is no scientific dispute about this, and the world did not suffer from runaway global warming.

Over geologic time there is an observable long-term downward trend in atmospheric CO₂ levels as it has become locked up in sediments, gas, oil, coal, rock, etc.

There are no valid criteria by which CO₂ can be categorized as a pollutant, on the contrary it is vital for life. Every cell in our bodies and in most living organisms is based on carbon.

COMPUTER MODELS

Computer modeling is the key tool relied on by the IPCC to substantiate its claims of AGW.

The question that needs to be asked is, are these mathematical representations of the highly complex, dynamic and numerous variables and factors able to be so accurate that they can predict the future?

There is a big question mark about this. In the box below are some comments by John Reid on the veracity of climate models.

It has been estimated that over 5 million variables would be required to construct a model of the climate here on Earth and that only 6 or 7 of these variables have the requisite level of confidence to be certain that they are accurate.

As the level of confidence declines, best guesses must be made by the modelers who then run the program to check the output. If it does not appear to be correct they ‘tweak’ the inputs until an output within the range of expectations is arrived at. This is not science.

MISSING INPUTS

There are many contributing factors that are so little understood that they are not included in the models at all or only to a very limited degree.

Key areas here are the influence of the magnetic flux of the sun and its effect on the strength of the solar wind that shrouds the Earth and protects it from most galactic cosmic rays (GCR’s).

It has been shown experimentally that when the sun is magnetically quiescent, (as it is now) the strength of the solar wind declines, allowing more cosmic rays to penetrate into our atmosphere.

When these GCR's hit our atmosphere at just under the speed of light, they shatter into a shower of thousands or millions of sub-atomic particles. The heaviest of these, called muons, are able to penetrate right through the atmosphere and form suitable nuclei to enable the formation of the minute cloud particles that form together as clouds.

It has been shown that low level clouds (less than 3,000 m) are the single biggest determinant of global temperatures as they reflect about 50% of the incoming short wave radiation (light rays) back out into space.

There is a close correspondence between low level cloud cover here on Earth and the magnetic flux of the sun. The sun was at magnetic maxima towards the end of the last century when average global temperatures were increasing. The sun is now less magnetically active, again corresponding with the declining average global temperatures recorded in recent years.

None of this crucial and influential material is included in any of the IPCC computer models.

CLIMATEGATE

Adding to all the doubts raised by the above is the exposé of a large number of emails on November 19th 2009 between the top scientists that had a crucial role in advising the IPCC on climate matters, known as 'Climategate', and later 'Glaciergate', 'Amazongate', etc.

These emails have been verified as genuine by the University of East Anglia, and show a long history of the manipulation of climate data, 'tricks', 'homogenizing', 'beefing-up', etc, the blocking of any papers that challenged or disagreed with any of the 'accepted' concepts from publication in 'Peer Reviewed' journals, the denial of access to data and computer programs to check results, and a range of other scientifically unacceptable activities.

Climategate has shattered the myth that the most exacting, careful, and rigorous analysis of what is a crucially important and valid question to investigate, has been carried out. "The emails reveal a small team of incompetent scientific cowboys, abusing almost every aspect of the framework of science to build a fortress around their 'old boys club', to prevent real scientists from seeing the shambles of their 'research'."

"As an increasing number of highly qualified scientists slowly began to realise that the 'climate change; fraternity was a facade, the veil began to drop on what has already become clear as the greatest scientific fraud in the history of mankind."

The moment and significance of this scandal cannot be exaggerated. It has destroyed the credibility of the IPCC and its Reports that are based on this plethora of corrupted data.

The IPCC may well never recover.

CONCLUSION

The claims made by the IPCC are now shown to be in considerable doubt.

The impacts of the CPRS on agriculture and the Australian economy will increasingly reduce living standards.

The CPRS cannot have any effect on reducing global temperatures. China alone every four months increases its emissions from new coal fired power stations, equal to Australia's total.

There are major benefits to agriculture from increasing atmospheric carbon dioxide levels. These in turn will flow on to the whole community.

For this and the many other reasons discussed above, the introduction of the CPRS is opposed.

Whether everyone agrees with this analysis or not, it has nevertheless provided more than the requisite level of uncertainty and doubt to ensure that before policy is implemented based on such suspect and disputed science that;