

Ruminant Methane – A Layman’s Explanation.

We are warmed by the sun. Its energy enters our atmosphere and much of it bounces back upward into space. The greenhouse gases of water vapour, plus trace gases, CO₂, methane nitrous oxide and ozone interact with the outgoing energy. Their molecules vibrate, absorb the outgoing energy and then lose it in collisions with other gases, and re-emitting it in all directions. It is the countless billions of interactions every second that keeps our planet warmer than it would be without these gases. Otherwise, it would be very cold.

The earth’s outgoing energy can only interact with each greenhouse gas in certain, defined bands/frequencies. It’s like tuning your radio – you can only pick up a radio station at a particular frequency. Water vapour operates across a very wide spectrum of frequencies – imagine picking up the same radio station across almost the whole bandwidth.

However, CO₂ can only interact in much narrower bands and methane’s two small bands are weak and operate in only two very confined frequencies. At these two points, water vapour is much more dominant masking the effectiveness of methane to do much absorbing and re-emitting.

Over New Zealand our atmosphere carries a tiny amount of greenhouse gas – about 1% of all the atmosphere. Water vapour hogs this 1% with approximately 16,000 ppm (parts per million). CO₂ is a poor second at around 400 ppm and methane a measly 2 ppm.

So, water vapour does the heavy lifting at 85% of the absorbing and re-emitting, CO₂ does around 15% leaving only minor action by methane. It’s simply too insignificant to measure.

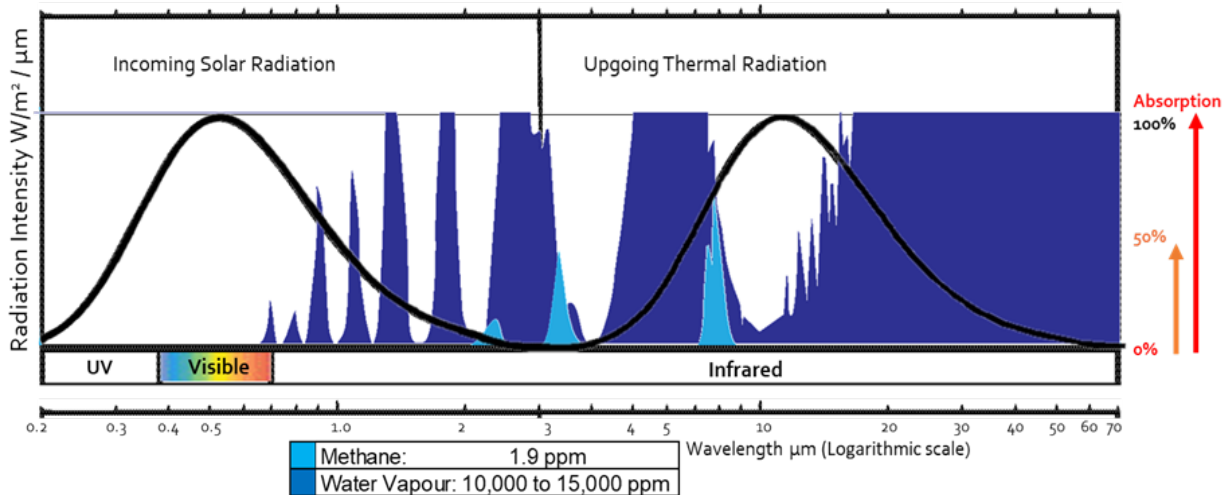
Ruminant methane is only 14% of all global methane emissions and New Zealand has barely 1% of the world’s ruminants. It is simply not possible to measure ruminant methane’s trivial impact on temperature, let alone New Zealand’s.

So, how does the IPCC and the dozens of scientists who claim climate change is ruinous get it so wrong. Firstly, the work on measuring CO₂ and methane is done in models that completely ignore water vapour. They only refer to water vapour to use it as a multiplier. They did this because the atmospheric concentration of water vapour is highly variable between locations and times, from 10 ppm at the poles to 5% (50 000 ppm) in humid tropical air.

Secondly, their models which have proven to be running far too hot ignore real atmosphere and are only calculated in unrealistic dry, air in a laboratory. This radically over-emphasises methane.

The amount of basic research that focuses on methane, particularly ruminant methane is surprisingly minor with policy makers having little robust science to follow. That is now changed.

Radiation Absorption Bands for Water Vapour and Methane



In recent years scientists have been working to improve the accuracy of their findings about methane. In 2016 scientists Etminan, Myhre, Highwood and Shine found methane's warming ability was overstated by at least 14%. Then came another group at Oxford University led by Professor Miles Allen who discovered the IPCC had exaggerated ruminant methane's warming ability by a massive 300% to 400%. The IPCC then corrected its earlier stand in its latest report – AR6.

Now, even more scientists like Wijngaarden and Happer, Allison and Sheahan, Coe, Wiegleb and others have been able to use real air for their experiments and then check them against reality. They have pulled methane's warming ability right down to an absurdly low level where it is impossible to measure accurately. Their data marries up with actual satellite results very precisely, proving their findings to be correct.

That is what happens in science. It evolves. New findings add to, change, or refine older science.

The focus must always be on "current science". It becomes the status quo until it is refuted or modified further.

Farmers, the community, the government, departmental officials should be shouting this information from the rooftops. The nation will be saved from farming being taxed heavily, reduced exports and driving the economy into ruin. The continuing silence can only mean something else besides sound science is involved.

What happens in the atmosphere could all be likened to a game of 'bullrush' or 'sally over' we used to play as kids. The players in the middle are the greenhouse gases – 8,000 of them are water vapour, 200 are CO₂ and only one (yes just 1 is methane). A photon of energy tries to cross the field. Who is likely to absorb it?? Its blindingly obvious. But it is worse than that. The one lonely methane molecule can only catch photons in two very narrow sections and only half the field whereas water vapour can roam over most of it.

Note: There are other valid arguments opposing the taxing of ruminant methane. They include reference to Article 2 of the Paris Accord stating that no restrictive action on methane should be taken if it affects food production. Any taxing of New Zealand's methane would inevitably lead to leakage – some other country with a much worse carbon footprint, worse environmental record and high costs of production filling the shortfall in a hungry world.

Sources:

“The Impact of CO₂, H₂O and Other “Greenhouse Gases” on Equilibrium Earth Temperatures’ – Coe, Fabinski, Wiegleb (2021).

“Radiative Forcing of Carbon Dioxide, Methane and Nitrous Oxide: A Significant Revision of the Methane Radiative Forcing”, M. Etminan, G. Myhre, E. J. Highwood and K. P. Shine (2016).

“Dependence of Earth’s Thermal Radiation on Five Most Abundant Greenhouse Gases”. W. A. van Wijngaarden & W. Happer.

<https://www.youtube.com/watch?v=CqWv26PXqz0> Sheahan.

Allison-Sheahan FINAL The Journal SEPT 2018 V6. October 16, 2018

Recent comments by Dr Doug Edmeades. MSc (Hons), PhD, Dip Mgt, ONZM.

on recent fundamental research by Wijngaarden and Happer, was clear: When compared to the other GHGs i.e., water and carbon dioxide - methane is irrelevant!

Relative to the thinking behind He Waka eke Noa, which is based on IPCC models, this is a paradigm shift. The belief that methane has any practical effect on the earth’s temperature is false and therefore taxing methane is irrelevant.

Step back a little. The Earth absorbs and emits energy from the sun. In the absence of greenhouse gases (GHGs) the emitted energy would pass through the atmosphere out into space. But some of this energy is absorbed by the GHGs (water, carbon dioxide, methane and nitrous oxide) and then re-emitted



ted in all directions – some coming back to Earth and warming it. The net effect of this coming and going of energy is that the temperature of the Earth is about +15 degrees cen-

tigrade. Without these GHGs it would be about -18 degrees C. GHGs keep the Earth warm by ‘trapping’ some of the energy emitted by the Earth.

This emitted energy doesn’t come in ‘bulk’, but in certain defined frequencies – just like radio waves but on a grander scale. The frequency of the emitted energy depends in part on the physical-chemical properties of the individual gases. It just so happens that water “operates” across a broad spectrum of frequencies, whereas carbon dioxide and methane have very narrow bands, which are in fact overlapped, and to some extent masked, by the water spectrum.

The concentration of the four GHG gases in the atmosphere is also an important factor. Water ‘weighs in’ at about 15,000 ppm, carbon dioxide about 400 ppm and methane less than 2 ppm. Nitrous oxide is irrelevant at this scale. When the concentration of the GHGs is considered, together with the respective emission spectra, the calculations show that water dominates the scene and makes up about 85% of the GHG effect with carbon dioxide at about 15% and methane is irrelevant.

How come? How and why is this so different from the narrative that the IPCC and its followers, i.e. your government and its agencies, have been promulgating?

First up, the IPCC believes, based on their models, that water enhances the GHG effect of carbon dioxide, viz. an increase in carbon dioxide, resulting in an temperature increase that increases the amount of water in the atmosphere, which in turn enhances the warming.

We have heard this story ad nauseum recently as an explanation for the recent high intensity flooding events in New Zealand. This cannot be true because it would result in runaway global warming, which clearly has not occurred on Earth on a geological scale of time.

The IPCC models are problematic for another more telling reason. The calculations and hence conclusions regarding the effects of the various GHGs are based on an atmosphere which does not contain water! Not only is it missing the point about the important role of water, it is also the reason why it can glibly claim that methane is 28 times, and nitrous oxide 300 times, more

potent than carbon dioxide.

With Wijngaarden and Happer’s proven model, we can at last do some numerical experiments. It turns out that increasing the current methane concentration will have a negligible practical effect on the Earth’s temperature.

Hence developing policies to limit methane emissions is a waste of money. So too, increasing the atmospheric carbon dioxide concentration from its current level will have negligible effect on temperature.

Who to believe? It is now accepted that the IPCC models over-estimate the current and projected temperature of the Earth by several degrees, relative to the observed temperatures coming from the satellites.

It is standard scientific practice to abandon, or modify, models if they are inconsistent with the empirical data. In the case of Wijngaarden and Happer the calculated emissions from the GHGs agree with the data coming from the satellites. QED.

• Doug Edmeades spent 20 years as a MAF soil scientist at Ruakura and in 1997 established his own science consulting business agKnowledge.