



SUBMISSION

Date: 16 July 2019

To: Select Committee for the “Zero Carbon Bill”

Subject: Submission of Sean Rush Energy & Infrastructure Law Limited

Introduction

I am an energy and infrastructure lawyer and owner of ‘Sean Rush Energy and Infrastructure Law Limited’. After the government’s announcement to ban oil and gas exploration last year I decided to return to Victoria University of Wellington this year to study for a Masters in Science (Climate Change Science and Policy) with a view to refocusing on low emission technology. The course has been illuminating with the first half year now complete.

One completed course, CCSP401, addresses the ‘physical science’, which is the scientific basis for anthropogenic global warming (**AGW**). It is taught by scientists active for the Inter-governmental Panel on Climate Change (**IPCC**), James Renwick and Dave Frame. That course, along with several legal, economic and paleoclimatic electives, were passed with an “A” average.

This submission offers some thoughts that arise.

My organisation would like to make an oral submission.

The scientific basis

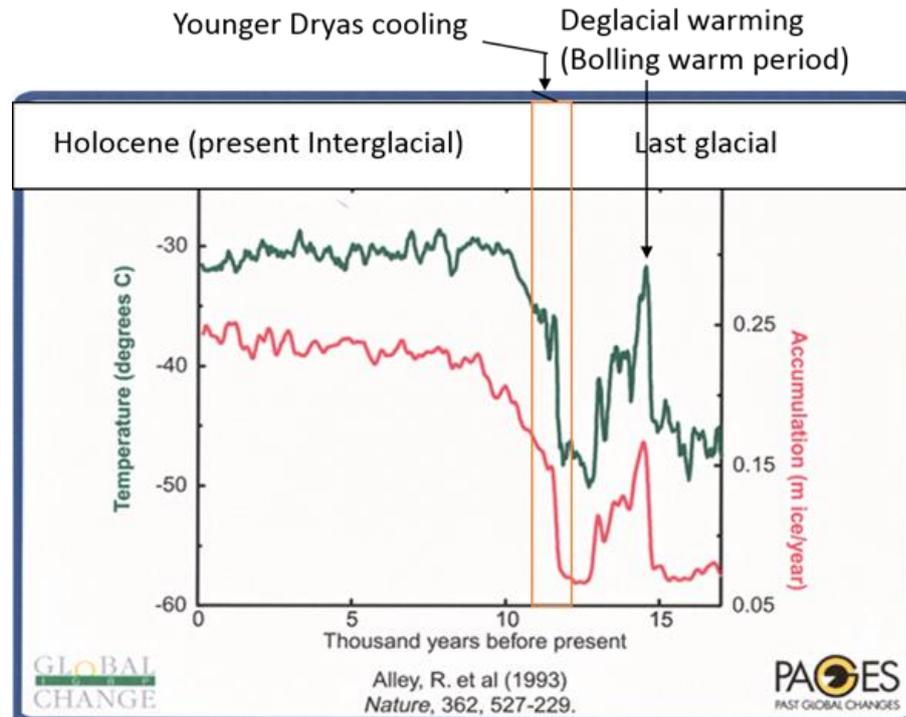
Context

There is considerable agreement between scientists that greenhouse gases (**GHGs**) trap longwave infrared radiation. In fact, without them the planet would be -18°C as opposed to the 15°C that we currently enjoy. Of that 33°C that the greenhouse effect naturally achieves, only 1.5°C is attributable to CO_2 at the preindustrial level of 280ppm. There is also broad agreement that a doubling of CO_2 will add a further 1°C of warming, although it is not clear over what timespan this would arise. Further feedbacks, positive or negative, may add or reduce the warming caused from CO_2 however the exact sign – positive or negative is still a matter of considerable debate – clouds in particular remain a key outstanding variable.

The recent moderate increase in global average temperature needs to be put in historic context. The period in which humans have evolved and flourished is known as the Holocene and commenced 10,000 years ago. During this time global temperatures have been unusually stable. Prior to the Holocene, the late Pleistocene, saw much larger changes ($3 - 5^{\circ}\text{C}$) in global temperatures over a matter of decades. These temperature oscillations commence with the Dansgaard-Oeschger events which occurred repeatedly from 80,000 years to 14,000 years ago. These consisted of abrupt warming events over a matter of decades followed by gradual cooling. The last of the Dansgaard-Oeschger events was known as the “Bølling-Allerød” interstadial which commenced about 14,500 years ago which resulted in intense and abrupt (years to

decades) warming of up to 20°C. This was followed by the “Young Dryas” cooling period which recovered just as quickly around 10,000 years ago. Thereafter the Holocene itself commenced with periods that were warmer than the present. In fact, the latest research by Marcott et al (2019)¹ show that 25% of the last 10,000 years have been warmer than current temperatures.

Figure 1: Temperature changes from the Bolling warm period, the Younger Dryas through to the modern warming period.



Marcott et al (2019) also note that global temperatures had been declining throughout the Holocene. In fact, the period that the IPCC are now referring to as the “pre-industrial” is known as the “little ice age” (LIA). This period of time is the coldest in the last 10,000 years, largely associated with a 2°C change in the North Atlantic. Importantly, throughout the transition from the Pleistocene to the peaks of the early Holocene warming period, broadly, the natural environment thrived. None of the known five mass extinction events occurred despite the magnitude of the warming and cooling events being several orders higher than what has been recently experienced – the Great Barrier Reef survived. This message of comfort is echoed by the IPCC, working group 1, in its latest full report known as the Fifth Assessment Report (AR5)²:

“Abrupt climate change’ is defined in this IPCC fifth assessment report (AR5) as a large-scale change in the climate system that takes place over a few decades or less, persists (or is anticipated to persist) for at least a few decades and causes substantial disruptions in human and natural systems. There is information on potential consequences of some abrupt changes, but in general there is ‘low

¹ Shaun A. Marcott, Jeremy D. Shakun, Peter U. Clark and Alan C. Mix, “A Reconstruction of Regional and Global Temperature for the Past 11,300 Years” *Science* 339 (6124), 1198-1201.

² IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley(eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535

confidence' and little consensus on the likelihood of such events over the 21st century.”³

Natural Variability and CO₂

The possibility of recent warming being driven by natural forces is not new. In their Fourth Assessment Report (**AR4**) the IPCC acknowledged that pre-1950 warming, which is of a similar rate to the more recent warming, was substantially driven by natural forces. That honest conclusion does not appear in AR5 nor in the more recent IPCC report known as SR1.5. However, recent studies in the peer review literature are causing scientists to think again about recent warming and modelled projections.

Gebbie et al (2019)⁴ suggests that climate models are projecting high levels of warming than what will actually occur because they are failing to account for deep ocean warmth that is actually warming the surface from below. They estimate that 25% of recent warming may be attributable to deep ocean warmth that is not accounted for in IPCC models.

Similarly, Christie et al (2018)⁵ concludes that IPCC models are exaggerating projected warmth by a factor of three based on their analysis of tropospheric temperature records from two of the three major climate satellites and weather balloons (radiosondes). It is in the troposphere that we would expect to see warming appear most strongly if CO₂ was having the effect modelled by the IPCC.

Lewis and Currie⁶ published their view of the climate sensitivity to doubling CO₂ levels, concluding that the resultant warming would be in the order of 1.5°C, which is the lower range acknowledged by the IPCC.

Masters et al (2014)⁷, Stevens (2015)⁸, Schwartz et al (2014) and Skeie et al (2014)⁹ also found comparably low values of the equilibrium climate sensitivity.

The IPCC in AR5 published the below chart in regard to model performance. As can be seen observations are tracking at the very bottom of the near-term projections.

³ AR5 Technical Summary TFE.5 | Irreversibility and Abrupt Change, p. 70.

⁴ Gebbie and Huybers, *“The Little Ice Age and 20th-century deep Pacific cooling”* *Science* 363, 70–74 (2019). <https://science.sciencemag.org/content/363/6422/70.full>

⁵ John R. Christy, Roy W. Spencer, William D. Braswell and Robert Junod *“Examination of space-based bulk atmospheric temperatures used in climate research”* INTERNATIONAL JOURNAL OF REMOTE SENSING, 2018 VOL. 39, NO. 11, 3580–3607 <https://doi.org/10.1080/01431161.2018.1444293>

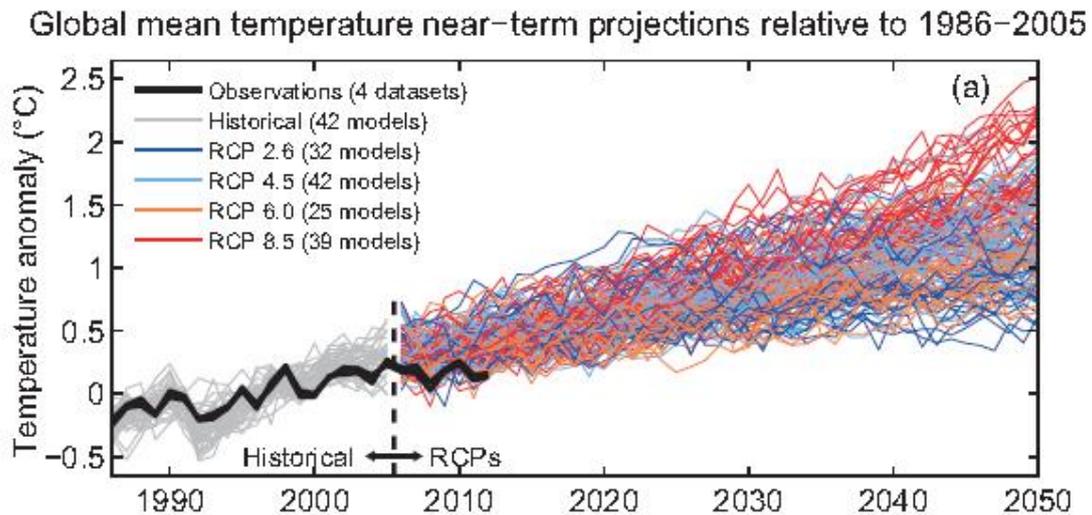
⁶ Lewis N., Currie J., *“The Impact of Recent Forcing and Ocean Heat Uptake Data on Estimates of Climate Sensitivity”* *Journal of Climate* Vol. 31, August 2018.

⁷ Masters, T. *“Observational estimate of climate sensitivity from changes in the rate of ocean heat uptake and comparison to CMIP5 models”* *Clim Dyn* (2014) 42: 2173. <https://link.springer.com/article/10.1007/s00382-013-1770-4>.

⁸ Bjorn Stevens *“Rethinking the Lower Bound on Aerosol Radiative Forcing”* *JCLI*, June 2015 <https://journals.ametsoc.org/doi/full/10.1175/JCLI-D-14-00656.1>

⁹ Skeie, R. B., Berntsen, T., Aldrin, M., Holden, M., and Myhre, G.: *“A lower and more constrained estimate of climate sensitivity using updated observations and detailed radiative forcing time series”*, *Earth Syst. Dynam.*, 5, 139-175, <https://doi.org/10.5194/esd-5-139-2014>, 2014. <https://www.earth-syst-dynam.net/5/139/2014/>

Figure 2: from AR5 Technical Summary Figure TS.14, page 87



Consequently, whilst there is wide consensus that greenhouse gases trap infra-red radiation, there is no consensus as to the effect such may have on planetary temperatures – the good news is we can say that the effect on temperature appears to be in the lower end of that which are projected.

In so far as New Zealand is concerned, the IPCC gave this reassuring statement in AR5:

“It is very likely that temperatures will continue to rise over New Zealand [note this is not a cause of concern in itself]. Precipitation is likely to increase in western regions in winter and spring, but the magnitude of change is likely to remain comparable to that of natural climate variability through the rest of the century. In summer and autumn, it is as likely as not that precipitation amounts will change.”¹⁰

This appears to say that what we can expect in terms of changes will not be materially different to the variability that New Zealand experiences naturally anyway. This is consistent to how the atmosphere’s dynamic response to climate change is taught to students at Victoria University – areas of high variability will experience more subtle changes. It is therefore important that New Zealand politicians do not impose hardship by policy that is in excess to that which the climate might impose.

IPCC integrity and the Absence of Democratic Safeguards

Whilst I am broadly supportive of technically viable de-carbonisation measures (provided they do not result in undue hardship) I worry that New Zealand is handing its democratic institutions to faceless, unelected scientists and bureaucrats that are influential with the IPCC. Every aspect of Government policy, including Ministerial portfolios, regional or local body politics, is now informed by the models created and approved by the IPCC – agriculture policy, energy, foreign aid, transport, tourism – you name it, and climate change scientists and their models are telling us how we should manage it, mitigate it, or adapt to it. Most of these policies will attract resources away from special needs areas – as a former criminal and family lawyer, my biggest concern is the inter-generational domestic violence that has been allowed to proliferate in New

¹⁰ AR5, chapter 13 page 1275.

Zealand for generations. I would welcome a focus on a 'zero domestic violence' target but instead we seem to be captivated by foreign scientists and their model predictions that have a claimed level of long-term predictive accuracy in defiance of any modelling ever seen and the principles of chaos theory which all acknowledge apply most appropriately to climate models. And who has ever seen or had access to these models? I'm at university and I haven't.

So who are these faceless, unelected, unaccountable individuals? Many are foreign officials, each with their own biases and Government agendas and pre-conceived notions of equity – many are members or associated with activist organisations or lobby groups promoting a variety of non-climatic agendas or are otherwise conflicted.

Whilst most of the IPCC work is performed by hard working and honest scientists, the IPCC has not been without controversy. In particular, senior IPCC figures have been found to have presented the science in a manner that achieves political objectives, rather than as an objective, balanced, fulsome assessment.¹¹ A summary of such issues, and proposals for reform, are set out in IPCC Expert Reviewer, Professor Ross McKittrick's *"What is wrong with the IPCC? Proposals for Reform."*¹² In fact, to respond to such criticisms, the Inter-Academy Council undertook a review of the IPCC's processes and whilst many recommendations were made, it is hard to see if they have been adopted – for example, the conflicts of interest policy requires all participating scientists to declare any conflicts – but this declaration is not open to the public or even Governments, but only given to the working group Coordinating Lead Authors.

It is these concerns and concerns like those raised by McKittrick that go to the heart of this submission – where are the democratic safeguards that New Zealanders are entitled to in so far as the IPCC is concerned?

In the course of my studies I had cause to review a section of the AR5 dealing with urbanisation and "land use land change" (LULC) effects on the global temperature record.¹³ In summary, there is an undisputed influence that arises where weather stations are affected by urbanisation and the changes in land use. The most obvious example is where the weather station which once resided in pristine countryside is now next to a motorway or airport which has heat sources that are not relevant to the climatic temperature record. Over time this may look like temperatures are rising. When added to all other station data that have the same issue, a warming trend may be observed that is an artefact of the measurement process rather than GHGs.

The IPCC suggest that any warming by such influences are already addressed by adjusting the raw data either by local weather bureau scientists or by the scientists that use this local data in the global data sets.

Of major concern was that my review showed a propensity by the IPCC to downplay any conclusions reached by scientists that contradicted their conclusion that these urbanisation effects have low impact on the global temperature records. The starkest example is the treatment of Fall et al (2010).¹⁴ The conclusion of it authors, which was submitted to the IPCC in

¹¹ In particular the infamous 'Hockey Stick' was constructed deliberately to send a political message – that recent warming was unprecedented for a 1,000 years even though some proxies did not line up with this and so were eliminated and the longer 5,000 year record shows warmer temperatures through natural variability.

¹² Available at https://www.thegwpc.org/images/stories/gwpc-reports/mckittrick-ipcc_reforms.pdf. Hard copy attached.

¹³ Page 189 of AR5 working group 1.

¹⁴ Fall, S., D. Niyogi, A. Gluhovsky, R. A. Pielke Sr., E. Kalnay, and G. Rochon, 2009: "Impacts of land use land cover on temperature trends over the continental United States: Assessment using the North American Regional Reanalysis." Int. J. Climatol., 10.1002/joc.1996. <https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/joc.1996>

earlier drafts of AR5 and accepted for inclusion, was "As most of the warming trends that we identify can be explained on the basis of LULC [land use and land change ie. Non-GHG effects] changes, we suggest that in addition to considering the greenhouse gases-driven radiative forcings, multi-decadal and longer climate models simulations must further include LULC changes."

Clearly this is an important conclusion in direct contrast that that of the IPCC's. But although the IPCC accepted it for inclusion in AR5, its treatment omitted the key conclusions and simply summarised the paper merely as "consistent with observations".

Similar treatment was given to Zhang et al (2010).¹⁵ In the second round of expert comments to AR5 one of its co-authors, Dr Ren, suggested it be referenced because it is the most up to date study on China (an important area for urbanisation studies because of the changes that can be observed using modern equipment – many of these changes will have occurred to OECD based cities in the last 19th or early 20th centuries). It's key findings are that urban influence is significant, at least 27% of the warming trend and "should be eliminated". Again, this is significant: if non – greenhouse gas influences are responsible for up to a third of warming then people need to know. They found no warming in the 6th area, Northwest China, because of artificial oases that caused an urban cooling effect.

However, the IPCC's treatment of Zhang et al (2010) painted quite a different picture. It failed to include the key 'high urbanisation' finding but rather noted that Zhang et al 2010 "found no evidence for urban influences in the desert North West region of China despite rapid urbanization." However, the IPCC neither mentioned that this was a secondary finding nor that there is a good explanation as to why temperatures had fallen – the area had artificial oases built. When I asked Dr Ren for his thoughts he responded that: "It is a pity that the authors of the chapter make such a mistake, or perhaps they simply deliberately made such a wording so as to support their conclusion."

McKittrick and Michaels 2007,¹⁶ co-authored by Ross McKittrick noted above, suggest that up to half the global rise in temperature can be attributed to socio-economic non-climatic factors that show a trend where poorly funded weather bureaus show enhanced warming because they are not properly funded to ensure their weather stations comply with WMO standards or have staff with the competence to properly adjust the temperature record to filter out non-climatic influences, such as urban heat island or land use changes. It was the precursor to this paper, McKittrick and Michaels 2004, that become embroiled in the "Climate Gate" controversy because the Coordinating Lead Author for AR4 was determined to "re-define the peer review process" if he had to in order to keep it out of AR4.¹⁷

Paper after paper reviewed in this section alone of AR5 were not summarised in a fulsome and honest manner. The peer review system allows this to happen because once comments on the second draft are received, there is no further opportunity to give feedback – that's it, the IPCC make their own decision behind closed doors – the Official Information Act does not apply.

¹⁵ Zhang AY, Ren GY, Zhou JX, Chu ZY, Ren YY, Tang GL (2010), *On the urbanization effect on surface air temperature trends over China*. January 2010, Journal of Meteorological Research 68(6):957-966.

¹⁶ McKittrick, R. R., and P. J. Michaels, 2007: Quantifying the influence of anthropogenic surface processes and inhomogeneities on gridded global climate data. *J. Geophys. Res. Atmos.*, 112, D24S09. <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2007JD008465>

¹⁷ Commentary on this issue available at <https://climateaudit.org/2009/12/17/climategatekeeping-2/>

Ultimately the IPCC concluded on urbanisation as follows: *“it is indisputable that UHI and LULC are real influences on raw temperature measurements”* but that based *“primarily on the range of urban minus rural adjusted data set comparisons and the degree of agreement of these products with a broad range of reanalysis products, it is unlikely that any uncorrected urban heat-island effects and LULC change effects have raised the estimated centennial globally averaged LSAT trends by more than 10% of the reported trend. (high confidence, based on robust evidence and high agreement)”*

How could this statement of ‘high agreement’ be made given the number of papers suggesting otherwise? Here it may be pertinent to note that the IPCC cited 9 papers supporting its conclusion, all of which had the same co-author and who was the Coordinating Lead Author for this section in AR4 whose findings were based squarely on his own work.

This would not be acceptable in the private sector or anywhere else for that matter. Indeed, IPCC rules state that matters of controversy should be discussed and finalised before the final version is issued but this does not seem to take place – the IPCC simply ignore what they don’t like or massage conclusions that are contrary to their own to minimise any damaging effect. Had this section of the IPCC report been a prospectus, then the promoter would be guilty of misleading by omission – a serious type of fraud. If I, as lawyer, presented papers to a judge in this manner I would breach my ethical duty to not mislead the Court.

Just to test that what I was seeing wasn’t an aberration, I decided to audit AR5’s most publicised ‘consensus’ statement. Armed with the links to prior drafts and expert comments, I revisited the ‘consensus’ statement from AR5’s Summary for Policy Makers (“SPM”): *“It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century. {10.3–10.6, 10.9}”*

I could not locate the statement in the references provided 10.3 – 10.6, 10.9. The closest is in Chapter 10 that says *“It is extremely likely that human activities caused more than half of the observed increase in GMST from 1951 to 2010.”* (Chapter 10, Executive Summary).

There is a world of difference between ‘more than half’ and ‘dominant’ – the latter has connotations of power and influence whereas the former is a mere statistical statement.

In the draft SPM and final draft SPM, the language used was ‘more than half.’ 2 or 3 countries complained asking whether this was weaker or stronger than AR4 which used the term ‘most’ with some advocating for stronger language. Each time the response from the Coordinating Lead Author was: *“The wording “more than half” is the assessed final draft wording of chapter 10, and is therefore used here. Statement is not directly comparable to the AR4 which was only considered the effect of greenhouse gas concentrations.”*

But after expert comments had closed, the “dominant cause” language was inserted, which indeed went further than AR4 but did not reflect the language in the body of AR5 that was left with the ‘more than half’ terminology. We have no way of knowing how this happened, on whose initiative or with what justification.

So what we have here is a clear acknowledgement by the Coordinating Lead Authors as to what their duties were to the integrity of the main body, that the scientists had signed off on, but the language was adjusted anyway to achieve a higher impact than that which the text justified and in breach of the IPCC processes.

I followed up with the Ministry for the Environment (“MFE”). It is the MFE’s responsibility to coordinate New Zealand’s efforts in contributing to the IPCC reports. They send delegates to

the working group sessions in which the final line by line review takes place and the reports are accepted on behalf of all New Zealand. The response I received suggests there is no final review process, no checking by a scientist to make sure the reports present the science fairly. Nothing, for example, like the verification process a prospectus would go through prior to issue. And yet these reports are now assuming more importance to our democracy than policy developed under traditional safeguards, such as the Official Information Act, judicial review and the periodic opportunity to elect other policy makers.

Consequently, my submission is that:

1. The current IPCC documents, AR5 and SR1.5, be audited to ensure scientific integrity and identification of political influences before the Climate Change Commission issues its periodic advice.
2. That the CCC publicly cite and justify the scientific sources upon which it relies.
3. That the UN be lobbied to ensure that IPCC processes, including selection of scientists, report drafting, and final draft discussion and conclusions, be subject to the kind of safeguards expected in a modern democracy – access to data, an enforceable adherence to their own processes and some form of public accountability.

On a more general note, the new legislation should provide for a suite of ancillary matters – legislation for carbon capture and storage; a state agency to coordinate efforts and fast track resource consenting and funding.

Kind Regards

“Sean Rush”

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