

09 May 2023

Climate Change Division
Ministry of Foreign Affairs & Trade
Wellington, New Zealand

Attention: Climate Change Division

To whom it may concern,

Response to public consultation on Updating Aotearoa New Zealand's Approach to International Climate Change Negotiations

The Institute of Geological and Nuclear Sciences Te Pū Ao ("GNS") welcomes the opportunity to provide feedback on "Updating Aotearoa New Zealand's Approach to International Climate Change Negotiations" for COP28.

GNS Science, Te Pū Ao, is New Zealand's national institute of geological and nuclear sciences. As a Crown Research Institute, GNS Science is strongly mission led. Through world-class science, we are focused on delivering economic, environmental and social benefits for Aotearoa New Zealand. We take seriously our role as contributors to the international body of climate science. GNS has undertaken decades of research in:

- The climate system – including Antarctica – to understand drivers and pace of change of the integrated ocean-atmosphere-hydrosphere;
- The discovery, exploration, and development of geothermal energy;
- Monitoring and understanding of the carbon cycle;
- Groundwater resources;
- Carbon Capture and Storage; and
- Mapping critical minerals, and hazard and risk science.

More recently we have added research into materials for hydrogen production; and environmental social science capability including policy and planning expertise, to better inform human responses to hazards including climate change impacts.

Our submission provides general feedback focused on areas that our organisation can comment on from a position of science expertise – particularly on science-based decision making, carbon offsets, mitigation, adaptation, and technology.

Science-based decisions are essential

We would like to acknowledge that MFAT's public consultation document is based on evidence which adequately frames the critical crossroads we are at internationally, and we congratulate MFAT for using difficult facts as the foundation on which to negotiate.

The message we would like the New Zealand representation delegation to hear is that the global community must insist on continually making decisions based on sound scientific evidence.



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There is little doubt that urgent action for both mitigation and adaptation is required, but we must temper enthusiasm for novel solutions by insisting that adequate scientific validation of the effectiveness of these actions is evident and provides insight that helps ensure we avoid unintended consequences.

In short, science and research underpin our current understanding of past, present, and future climate change and its likely impacts and has been clearly synthesised by the Intergovernmental Panel on Climate Change (IPCC). But it must continue to be used to guide our decisions to mitigate harm and safeguard the future.

GNS Science collaborates with a wide range of international and local research partners and we are committed to continuing work to understand drivers of climate change, identify tipping points and thresholds in the climate systems, and establish sound approaches to reduce and ultimately remove anthropogenic greenhouse gas emissions, adapt to unavoidable climate change impacts, and forecast future change and associated impacts.

Land and Ocean Carbon offsets

Carbon offsets, through management of land carbon (forestry, other land management) and potentially ocean carbon (blue carbon, coastal and offshore carbon sequestration) are likely to play a key role in international greenhouse gas emissions reduction efforts and climate change mitigation measures.

New Zealand has a significant role to play in understanding ocean-atmosphere carbon exchange due to our proximity to and support for Pacific nations, and our strong interest in the Southern Ocean on our back doorstep. Ocean and coastal (blue) carbon uptake are not currently credited internationally. Yet many NGOs and private enterprises are working to explore the potential for voluntary blue carbon credits. However, there is little guidance or methodologies available to credit this form of sequestration, and the science to assess and accurately quantify the potential is still being developed. We recommend the NZ delegation advocate for improved scientific understanding of carbon sequestration in oceans and coastal areas. This includes the development of clear and scientifically valid guidelines for ocean and blue carbon to be included in international reporting. Further, this is needed to avoid the public trust issues that already exist for land carbon offsets.

Most nations, including New Zealand, are using carbon offsets as a significant component of their Nationally Determined Contributions (NDCs) and other mitigation strategies. Further, there has been a rapid expansion of NGO and private enterprise carbon offsetting projects in the last few years. Some such projects are aligned with United Nations Framework Convention on Climate Change (UNFCCC) reporting frameworks and others are voluntary. There are two major issues with these projects:

1. The lack of consistent methodologies and regulation that mean it is difficult to evaluate the efficacy of such projects. This has resulted in growing scepticism of such offsets and risking social licence for development of future initiatives.
2. The current reporting frameworks (most importantly the IPCC Task Force on National Greenhouse Gas Inventories (IPCC TFI)) allow reporting of only some components of these offsets. Blue carbon is not currently included. It is worth noting that although

national emissions information is not bound by the IPCC TFI rules, most national and sub-national reporting tends to follow the IPCC TFI principles.

New Zealand should advocate for the development of guidelines and methodologies for evaluating and verifying carbon offsets, as well as support for pathways to include improved scientific information on carbon offsets (and emissions) in the reporting frameworks. Transparency and trust that these initiatives are effective is required to increase responsible uptake and investment. This may come through Subsidiary Body for Scientific and Technological Advice (SBSTA) and/or subsidiary bodies like the IPCC TFI, World Meteorological Organisation (WMO) and others. Some practical suggestions for standardisation are suggested in the following 'Mitigation' section.

Mitigation

New Zealand should advocate for increased scientific and operational capacity for greenhouse gas evaluation globally, in the Pacific and in New Zealand as there is a still a lack of sufficient data to perform required "Global Stocktakes."

The WMO is currently expanding the proposed Greenhouse Gas Monitoring Initiative¹ (GGMI) and it is expected to be approved at the WMO Congress in May 2023. This will link to WMO's existing Integrated Global Greenhouse Gas Information System (IG³IS)² that links greenhouse gas observing systems and information to policy outcomes, including NDCs. A key part of these initiatives is to support expanded greenhouse gas observations and outcomes in under-represented regions including the Pacific. There is an opportunity for MFAT to foster New Zealand science support of Pacific nations in greenhouse gas monitoring through infrastructure investment (monitoring systems), upskilling and financial project support.

There is a clear need for guidelines and agreed upon methodologies that governments, NGOS and the private sector can follow to demonstrate the validity of their carbon credits and offsets. Entities such as IPCC, UNEP and WMO have existing structures to support such developments. New Zealand should advocate for mechanisms to ensure that these credits are instead robust, reliable and validated.

GNS Science has experts that work in emissions verification and advocate for international transparency and consistency. If it is deemed helpful, we are available and willing to meet with MFAT delegates to discuss international scientific efforts in Greenhouse Gas Monitoring and reporting and build on the technical components discussed in this letter.

Adaptation

New Zealand should advocate internationally for indigenous-led/co-designed approaches to local adaptation needs. There should be explicit, evidenced consultation and collaboration with partners regarding their needs and priorities for climate adaptation. The delegates may want to engage with the Crown Research Institute community, including GNS, for case study

¹ <https://public.wmo.int/en/media/press-release/wmo-executive-council-endorses-global-greenhouse-gas-monitoring-plan>

² <https://ig3is.wmo.int/>

examples of projects which prioritise voice of Māori and Pacific Islands in setting targets, understanding needs, and acting as co-leaders of projects.

Evidence of what future climate scenario international finance is being used to adapt to is lacking in the commentary on adaptation. If there is capacity to, we recommend a comment on pathway dependency to guide appropriate adaptation investment. For example, adaptation approaches will likely be different under an SSP2--4.5 versus SSP3-7.0 future.

Adaptation investment must be based on science evidence and be supported by best practise guidelines for adaptation to a specified future scenario. Developing and exploring a range of path-dependent adaptation options would be prudent to guide use of international finance. In addition, greenhouse gas emissions associated with investing in certain adaptation infrastructure can be significant (embedded carbon) and should be avoided where possible. Flexible adaptive options should also be considered as a routine. We support the creation of a monitoring and evaluation framework to measure the effectiveness of climate finance for adaption purposes.

Technology

Whilst nature-based climate action is a useful tool to help mitigate the magnitude of climate change and its impacts, we encourage our delegates to advocate with urgency for continued gross emissions reductions. Technology has a role to play and GNS is advancing science research in multiple potential technological solutions, however we again repeat the critical message that any novel solution must have robust science evidence that it is an effective solution and that it minimises unintended consequences.

Many countries³ are looking to use geothermal energy in the transition from fossil fuels as it is an established technology and abundant renewable resource. For example, GNS has an established partnership with the Japanese Government to share our expertise in geothermal exploration and energy generation, this includes a GNS office and staff based in Tokyo.

New Zealand should advocate for enhanced collaboration to develop new geothermal technologies for the identification and characterisation of resources, and for energy extraction and conversion. This would accelerate the viability for geothermal energy to become a key component of the energy systems.

We would also like our delegates to advocate for recognition of the inequities that currently exist in the global energy system which – if mismanaged – may be perpetuated in a new energy future. Access to affordable energy storage will be crucial for a transition to a renewable energy system. As it is likely that there will be high global demand for this technology, we recommend that New Zealand advocate for smaller economies having equal access to these technologies as larger economies. Many countries are currently not self-sufficient in energy and are able to import energy through transported fossil fuels. As the world moves away from these fuels,

³ European Commission Geothermal Implementation Working Group - https://setis.ec.europa.eu/implementing-actions/geothermal_en
Global Geothermal Market and Technology Assessment (Feb 2023) - <https://www.irena.org/Publications/2023/Feb/Global-geothermal-market-and-technology-assessment>

there is a need to develop new technologies for the international transport of energy, particularly for countries with limited natural energy resources. New Zealand should advocate for the development of technologies that are affordable and have clear international standards to ensure interoperability.

Summary of recommendations

1. *The global community must insist on continually making decisions based on sound scientific evidence.*
2. *We recommend the NZ delegation advocate for improved scientific understanding of carbon sequestration in oceans and coastal areas.*
3. *New Zealand should advocate for the development of guidelines and methodologies for evaluating and verifying carbon offsets, as well as support for pathways to include improved scientific information on carbon offsets (and emissions) in the reporting frameworks.*
4. *New Zealand should advocate for increased scientific and operational capacity for greenhouse gas evaluation globally, in the Pacific and in New Zealand as there is a still a lack of sufficient data to perform required “Global Stocktakes.”*
5. *There is an opportunity for MFAT to foster New Zealand science support of Pacific nations in greenhouse gas monitoring through infrastructure investment (monitoring systems), upskilling and financial project support.*
6. *New Zealand should advocate internationally for indigenous-led/co-designed approaches to local adaptation needs. There should be explicit, evidenced consultation and collaboration with partners regarding their needs and priorities for climate adaptation.*
7. *Adaptation investment must be based on science evidence and be supported by best practise guidelines for adaptation to a specified future scenario.*
8. *We encourage our delegates to advocate with urgency for continued gross emissions reductions.*
9. *New Zealand should advocate for enhanced collaboration to develop new geothermal technologies for the identification and characterisation of resources, and for energy extraction and conversion.*
10. *Access to affordable energy storage will be crucial for a transition to a renewable energy system. As it is likely that there will be high global demand for this technology, we recommend that New Zealand advocate for smaller economies having equal access to these technologies as larger economies.*
11. *New Zealand should advocate for the development of technologies that are affordable and have clear international standards to ensure interoperability.*

Concluding remarks

Reducing the impact of climate change requires more than lowering Aotearoa New Zealand's emissions and requires international collaboration. Our comments are intended to support an

updated mandate to guide our participation at COP28, we have brought together knowledge and expertise from many areas across our organisation and hope that our feedback is carefully considered and useful. GNS Science would welcome the opportunity to engage to further develop any of these ideas.

Should you wish to discuss any of the content of this submission please do not hesitate to contact ^{s9(2)(a)} .

Yours sincerely

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General Manager Research Strategy and
Partnerships