

# CLIMATE CHANGE

## Position Statement

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engineering  
new zealand  
te ao rangahau

ENGINEERING  
CLIMATE ACTION

**THE TIME FOR ACTION IS NOW. WE NEED ENGINEERS TO BE CLIMATE ACTION LEADERS. ENGINEERS HAVE A VITAL ROLE AND RESPONSIBILITY IN MITIGATING, TRANSITIONING, AND ADAPTING TO CLIMATE CHANGE.**

## Summary.

Human-induced climate change is already affecting Aotearoa New Zealand. This will continue, and the negative effects will increase.

The time for action is now. We need engineers to be climate action leaders. Engineers have a vital role and responsibility in mitigating, transitioning, and adapting to climate change because many solutions require engineering, re-engineering, or rethinking our engineered environment. To lead we must understand the issues, develop collective solutions, work in partnership with Māori, and take action to ensure our professional work engineers better lives for all the people of Aotearoa.

Climate is and has always been of high importance to Māori. It is critical that that engineering professionals engage with te ao Māori and mātauranga Māori, iwi and hāpū, and local communities.

We must act in this decade. For too long we have debated the science and delayed doing things differently. We must treat climate change like the crisis that it is and act with urgency to limit warming to 1.5 °C above pre-industrial levels and avoid worse case scenarios.

Engineering New Zealand will be proactive in providing leadership, collaboration and support to members and the wider profession.

## Our position.

Anthropogenic (human-induced) climate change is a reality. There is overwhelming scientific evidence on the existence, cause, and physical impacts of anthropogenic climate change. We must unite and act with urgency to avoid irrevocable climate change. Between now and 2030 lies our greatest opportunity to do so.<sup>1</sup>

Although the climate is naturally always changing, anthropogenic climate change will have rapid, far-reaching and significant effects beyond normal variations. It will continue to be a central issue for Government, industry, and society. Our organisational position and response are guided by scientific evidence, best practice and member input.

Professional engineers, engineering technicians, engineering technologists and engineering geologists (engineering professionals) must be at the forefront of the response to climate change. Engineering

professionals design and drive the technology and systems needed to achieve net carbon zero, and to develop solutions that support society to adapt to the effects of climate change. They shape what is possible in society, directly affecting our ability to mitigate and adapt, and influencing behaviours, technology and system change.

**OUR ORGANISATIONAL POSITION  
AND RESPONSE ARE GUIDED  
BY SCIENTIFIC EVIDENCE, BEST  
PRACTICE AND MEMBER INPUT.**

Engineering New Zealand is here to support engineering professionals to respond to climate change. We will be a voice for action, a champion for better practice and a key avenue for collaboration. It's our job to enable our members, industry and Government to take action.

# Context.

Over the last four decades each decade has been successively warmer. In 2021, the Intergovernmental Panel on Climate Change stated “it is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.”<sup>ii2</sup> These changes include extreme events such as heatwaves, heavy precipitation, droughts and tropical cyclones.

The average global surface temperature is now 1.07 °C higher than pre-industrial times<sup>i1</sup>, and the mean global sea level has risen by 0.20m between 1901 and 2018, averaging a 3.7mm increase each year since 2006. The ocean is warming and acidifying, and glaciers and Arctic sea ice is retreating. Climate zones and extreme weather events are shifting poleward, and precipitation patterns over land are changing, influencing growing seasons.

We have the rest of this decade to cut emissions to limit warming to 1.5 °C above pre-industrial levels to avoid catastrophic impacts.<sup>iii3</sup> Mitigation, transition, and adaptation are all vital components of our societal response to climate change and need to be well underway before 2030.

## CLIMATE CHANGE IS ALREADY AFFECTING AOTEAROA NEW ZEALAND.

Anthropogenic climate change is not a distant nor short-term crisis – it is already happening. The effects of existing emissions and warming will continue to impact us into the future. On average our temperature has increased by 1.1 °C compared to pre-industrial times, and the moana (seas) surrounding Aotearoa New Zealand has warmed more quickly than the global average.<sup>iv4</sup>

**Anthropogenic climate change for Aotearoa New Zealand means:**<sup>v5 vi6 vii7</sup>.

decreases in snow and ice, and the potential complete loss of our glaciers

changing precipitation patterns; the south and west will get wetter, and the north and east will get drier

increases in intensity and frequency of extreme weather events – storms, flooding, landslides, fire weather, and droughts.

It will affect our energy production, infrastructure, agriculture, health, coastal ecosystems, water resources, and biodiversity.<sup>viii8</sup> Our vulnerability to climate change is heightened by our economic reliance on natural resources and climate stability for primary production and tourism.<sup>ix9</sup>

Although Aotearoa New Zealand is a small country, our actions matter. Annually, we emit 7.5 t CO<sub>2</sub>e<sup>2</sup> of carbon dioxide per capita and 16.9 tCO<sub>2</sub>e of all gases per capita.<sup>x10</sup> Collectively, this amounts to gross greenhouse gas emissions of 78.9 million tCO<sub>2</sub>e.<sup>xi11</sup> If we continue this way, our share of the global carbon budget will be exceeded in 2038. The global carbon budget supports Article 2 of the Paris Agreement, in particular:

**“Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognising that this would significantly reduce the risks and impacts of climate change.”<sup>xii12</sup>**

<sup>1</sup> 1850-1990 is used as an approximation for pre-industrial conditions as the earliest period of sufficiently complete observations.

<sup>2</sup> Tonnes of carbon dioxide equivalent.

# Our support.

## WE SUPPORT AOTEAROA NEW ZEALAND'S FOCUS ON CLIMATE CHANGE.

Climate change is increasingly prioritised in Government legislation, policy and funding decisions, shaping the rules of the game that influence engineering professionals and Engineering New Zealand alike. The Climate Change Response (Zero Carbon) Amendment Act 2019 has set a target for Aotearoa New Zealand to reduce net emissions to zero by 2050. The Government is progressing work to reduce emissions across several sectors in Aotearoa New Zealand.

### We have submitted on several relevant government proposals and support:

a whole of life approach, focusing on embodied and operational carbon in the building and construction sector

transforming New Zealand's energy sector and prioritising renewable energy generation and storage

alignment with international best practice

legislative change and financing to enable the transition to a net zero economy by 2050

transitioning in an equitable and inclusive way

collaboration between local and Central Government, iwi and hapū, and industry.

We support doing our part to reduce global emissions, and it is in our best interests to transition and adapt.

## TE TIRITI O WAITANGI AND TE AO MĀORI.

Engineering New Zealand acknowledges that climate action in Aotearoa New Zealand must be informed and guided by Te Tiriti o Waitangi and te ao Māori. Māori, as the long-standing kaitiaki of Aotearoa New Zealand, have extensive knowledge and experience when it comes to our natural environment and climatic systems.

It is vital that engineering professionals engage with tangata whenua and te ao Māori in their practice, and incorporate opportunities for mātauranga Māori to be applied in climate solutions. Indigenous and alternative worldviews are indispensable in rethinking the way we do things, to live within our planetary boundaries. Mātauranga Māori (Māori knowledge and knowledge systems) is valued within our Engineering Climate Action programme, enabling the programme to be culturally competent, contextually informed, and relevant.

## WE SUPPORT AN EQUITABLE AND JUST TRANSITION.

Evidence indicates that existing inequalities will be exacerbated by the effects of and responses to climate change.<sup>xiii</sup> Some communities and individuals will be disproportionately affected, due to geographic exposure to hazards and/or social vulnerability. We are already observing this trend as demonstrated by the extreme rainfall events and flooding in South Dunedin in June 2015. Most of the lowest lying areas in South Dunedin affected by the floods have social deprivation scores of between 8 and 10 (with 10 being the most deprived).<sup>xiv</sup> Many of these households could not return to their homes for weeks or months. Additionally, different sectors and industries may be more exposed to the physical impacts or more affected by the decisions we make to transition our society away from fossil fuels.

We support climate justice and a just transition. It is crucial that our solutions place the needs of marginalised and frontline communities at the centre, so that in addressing climate change we reduce inequity rather than increase it. Climate change is an opportunity to make changes to our society. We need to ensure that those who are least responsible for – and most vulnerable to – the effects of climate change benefit from our transition.

We also acknowledge that transitioning to a net zero economy will be costly (in terms of direct financial costs and wider in-direct costs). We need to ensure the costs of transition are quantified, transparent, and shared across society in a way that is equitable and just.

# Engineers' vital role.

Engineering professionals are vital to Aotearoa New Zealand's response to climate change. Alongside others we must lead society to mitigate our emissions, transition to net zero emissions and adapt to the impacts of climate change. Engineering professionals have, and are developing, the solutions society needs to better face into the climate crisis. The time for leadership and action is now.

Engineering professionals have a responsibility to proactively develop, adopt and implement technologies and systems that are sustainable and support the transition to net zero emissions. They must prioritise and champion the use of sustainable solutions and approaches, whether through the adoption of innovative technology or re-engineering processes and systems. From planning and designing the physical structures and communities we live and work in, to developing resilient infrastructure and creating new technologies, engineering professionals must create opportunities to partner and collaborate for a better future. We need to deliver better outcomes from project start to finish, considering whole of life implications.

## **Engineering professionals need to apply a climate and sustainability lens to all work undertaken, to:**

- identify opportunities to reduce embodied and operational emissions
- reduce, repurpose and refuse resource use, consumption and waste
- educate clients, the public and future generations on opportunities for mitigation, transition and adaptation
- work in harmony with the environment, actively enhancing the mana of te taiao as well as mitigating and minimising harm.

## **ENGINEERING PROFESSIONALS AS LEADERS**

Engineering professionals are well placed to lead climate work due to their knowledge and solutions-focused skill set. In many instances we have the solutions we need – the challenges and opportunities lie in translating and applying these solutions to national and local contexts. Engineering professionals must step up to support society to realise climate solutions in evidence-based, systemic ways. Aotearoa New Zealand needs engineering professionals to provide leadership, engagement, and partnership in support of the path ahead.

## **LEADING THROUGH PARTNERSHIP.**

Climate change is a complex issue that we cannot solve alone. Engineering professionals must be committed to working collaboratively, in partnership with iwi and hapū, as well as with other professions such as planners, project managers and architects, and sectors such as local and central government.

# Engineering New Zealand's response.

We have heard clearly from members that Engineering New Zealand must show leadership on climate change. There is a need for urgency alongside long-term planning, and for a holistic approach that acknowledges we must make fundamental changes to the way we live.

In response we have launched Engineering Climate Action, our programme to support members, industry, and the Government to take positive action to address climate change mitigation, transition, and adaptation. This includes the development, collation and dissemination of resources and training offerings for members. Developing the capacity and capability of engineering professionals is both an urgent and on-going priority of the programme. We are also strengthening our processes to ensure we have the right technical input from members on thought leadership and advocacy work.

Climate change is an expansive issue with work occurring across society. We will actively work to identify where we can collaborate and/or offer a unique contribution.

**We need your involvement and there are several ways to engage in Engineering Climate Action. If you would like to be kept informed of these, please email us at [climatechange@engineeringnz.org](mailto:climatechange@engineeringnz.org).**

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## WE WILL:

Encourage, support, and, wherever possible, require the engineering profession to be bold and proactive on climate change in their actions and what they demand of others

Clarify and promote the role and importance of engineering professionals in mitigating, transitioning, and adapting to climate change

Manage our own carbon footprint, and work to drive change across all our operations

Work in partnership with associated industries, professions and organisations, iwi and hapū, and foster collaboration across the engineering profession

Value te ao Māori and Mātauranga Māori in this programme and engage and partner with Māori in our climate work. This is supported and enabled by our Kimihia Rangahaua strategy which builds our internal cultural capacity and capability.

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