



SUBMISSION: DRAFT ADVICE 2021

Engineering New Zealand (formerly IPENZ) is New Zealand's professional home for engineers. We are New Zealand's strongest and most influential voice on engineering issues, with more than 22,000 members who want to help shape the public policy agenda and engineer better lives for New Zealanders.

Thank you for the opportunity to provide comment on He Pou a Rangi Climate Change Commission's (the Commission)'s *Draft Advice 2021*. Our Governing Board, technical societies and membership support the [Government's Climate Change Response \(Zero Carbon\) Act 2019](#) and welcome the Government defining its role in leading New Zealand to carbon neutrality.¹ We recognise the path we are on must change and that engineers are pivotal in this transition.

We commend the work of the Climate Change Commission in forming its draft advice. This submission outlines our general support for the Commission's work, including the key principles driving the proposed response. While this submission will not directly answer each of the Commission's consultation questions, we provide comment on key engineering challenges presented by the draft advice. These engineering challenges must be addressed if we are to reach carbon neutrality. These include, but are not limited to:

- Renewable energy generation and storage
- Embodied carbon in the building and construction sector

In this submission we also provide the Commission with feedback on its 'key transitions' (page 55), Covid-19 recovery recommendations (page 129) and recommendations about abatement costs and the retirement of emission intensive assets (page 129).

For New Zealand to face into the challenges ahead, we must utilise and develop the expertise of the engineering profession. Engineers must be involved in the Government's future planning and we must work to further develop our engineering workforce to address the technical challenges we face.

¹ In forming this submission, Engineering New Zealand collaborated with its relevant technical groups, notably the Structural Engineering Society New Zealand, the Sustainability Society, Carbon and Energy Professionals New Zealand, the New Zealand National Committee of the International Institute of Refrigeration, and the Society of Chemical Engineers in New Zealand. We support the submissions of these groups, where they have submitted. We also support the New Zealand Construction Industry Council's submission.

WE SUPPORT THE COMMISSION'S KEY PRINCIPLES AND RECOMMENDATIONS

Overall, we support the Commission's key principles and recommendations as set out in the draft advice. This support is with the caveats outlined below.

We asked our members for their thoughts on the Commission's key principles as outlined on page 29 of the draft advice. Members who responded were generally supportive of the principles. The following principles were widely supported:

- Principle 1: Align with the 2050 targets
- Principle 3: Create options
- Principle 5: Transition in an equitable and inclusive way

We also asked our members for their views on the recommendations outlined in chapter 2. Most members responding supported the following concepts:

- Cross-party political support is needed to achieve emissions budgets (enabling recommendation 1)
- Legislative change is required to the Local Government Act, the Building Act and Code, national direction under the Resource Management Act (RMA), the proposed RMA reforms, implementation of the freshwater management framework and the 30-year infrastructure plan for New Zealand to reach net zero emissions of long-lived gasses (enabling recommendation 4)
- Funding and financing mechanisms are needed to enable emissions reduction plans to be implemented effectively (enabling recommendation 2 and 4)
- Partnerships between local and Central Government (enabling recommendation 4)

Members also showed support, although it was more limited, for:

- Limiting offshore mitigation for emissions budgets through domestic actions (budget recommendation 4)
- The development of a work plan (published by 31 December 2022) to support appropriate progress to achieve the Government's 2050 targets (progress indicator under enabling recommendation 4)

WE NEED TO PRIORITISE RENEWABLE ENERGY GENERATION AND STORAGE

Our most significant points of feedback for the Commission relate to New Zealand's renewable energy supply. Much of the Commission's advice assumes New Zealand's ability to rapidly transform the energy sector. Further analysis on the feasibility of this is needed. As the Commission points out on page 90, "the Government needs to plan to manage the risk around affordability and security of supply as a result of moving to a low emissions energy system". This is a matter of urgency.

The 2019 Interim Climate Change Commission's Accelerated Energy publication stated that 82 percent of New Zealand's electrical energy is currently renewable. The paper highlighted that significant work is needed to meet the majority of New Zealand's current electricity demands through renewable energy (hydroelectric, wind, solar and geothermal, among others). Relying on electricity to meet New Zealand's future transport, heating, cooking, and industrial needs requires significant investment. Furthermore, as the Commission's advice points out, natural gas and coal provide security of electricity supply. This security is particularly important during peak times, in dry years, or in the periods following natural disasters.

Society needs reliable, low-cost energy

The economy, and indeed society, are dependent on a reliable, low-cost supply of energy. The cost of energy (whether that be the cost of electricity or carbon-based energy sources) has considerable impact on industry and individual consumers. It goes without saying that the ability to afford energy to run a business or heat a home affects the wealth and health of New Zealand. Transitions to alternative energy processes and systems must consider these implications and their flow-on effects for industry and individual consumers. We must also consider our ability to maintain lifeline services following a natural disaster. To this regard, the Commission's principle 5 "transition in an equitable and inclusive way" is of great importance. We see this as beginning with the energy sector.

Prioritisation must be given to transforming New Zealand's energy sector

The Government must drive transformation of New Zealand's energy sector. This transformation is a minimum requirement for the country to transition to carbon neutrality. We need further options for renewable energy generation and storage. We need to ensure the low-cost security of supply. To do this we must know who is accountable for the secure supply of affordable energy and the timeframes they are working within.

EMBODIED CARBON IN THE BUILDING AND CONSTRUCTION SECTOR IS LARGELY MISSING FROM THE ADVICE

The building and construction sector accounts for approximately 20 percent of New Zealand's carbon emissions through both operational carbon and embodied carbon.² While the Commission's draft advice briefly discusses the operational energy efficiency of buildings, it does not cover embodied carbon emissions. As embodied carbon is around half the whole-of-life emissions attributed to the building, this is a significant omission in the advice.

The New Zealand Green Building Council (NZGBC) document [Under Construction](#) (19 August 2019) provides specific material-based improvement strategies for both residential and commercial buildings to reduce the embodied carbon in our new builds. Significant opportunities also exist in the building and construction industry to transition away from traditional carbon intensive materials and towards locally-sourced, low carbon materials. This would include the opportunity to significantly increase the proportion of locally and sustainably sourced timber in the construction industry, which may in turn impact on the Commission's forestry roadmap.

In 2020, the Ministry of Business, Innovation & Employment (MBIE) consulted on its new *Building for Climate Change* programme. Both [Engineering New Zealand](#) and the [Structural Engineering Society New Zealand](#) submitted to MBIE on the framework.

To promote industry transition, we advocate for a combination of regulatory changes and incentivisation. We support MBIE's intended actions through the *Building for Climate Change* programme, including "Reducing the whole of life embodied carbon footprint of buildings which includes greenhouse gas emissions generated from the construction materials, construction process, construction waste disposal, and disposal of the building when it has reached the end of its life". Embodied carbon reduction incentivisation would supplement existing government incentivisation schemes, such as the Energy

² <https://www.mbie.govt.nz/dmsdocument/11793-transforming-operational-efficiency>

Efficiency and Conservation Authority (EECA) co-funding schemes, which are already addressing operational carbon.

FEEDBACK ON THE COMMISSION'S "KEY TRANSITIONS"

The Commission's draft advice pivots around "key transitions" (table 3.1 on page 55). We asked our members for their views on whether they supported relevant key transitions as both *practical* and *possible*.

Of members that responded, there was **wide support** for the following key transitions:

- Transport
 - Encourage remote working for those who can
 - Encourage the switch to walking, cycling and public transport
 - Electrifying rail
- Buildings
 - Improve the thermal efficiency of buildings
- Electricity
 - Transmission and distribution grid upgrades
 - Expand renewable generation base
 - Achieve ~95 percent renewable generation
- Waste
 - Divert organic waste from landfills

Members surveyed had **limited support** for the *practicality* and *possibility* for the following key transitions identified by the Commission:

- Non-road transport:
 - Biofuel blending
 - Electrification of ferries and coastal shipping
- Buildings
 - No new gas heating systems installed after 2025
 - Start phase out of gas in buildings
- Waste
 - Improve and extend landfill gas capture

Transport

Further to the transport 'key transitions', we have [previously written to Government \(Waka Kotahi\)](#) in support of their focus on positioning public transport, walking and cycling as attractive transport options.

COVID-19 STIMULUS WORK MUST TAKE INTO ACCOUNT CLIMATE IMPACT

COVID-19 recovery

We are generally supportive of the Commission's advice regarding New Zealand's recovery from Covid-19. On page 129 of the draft advice, the Commission proposes the following:

c. Ensure that economic stimulus to support post-COVID-19 recovery helps to bring forward the transformational investment that needs to happen anyway to reach our joint climate and economic goals.

[...]

e. Require the Infrastructure Commission to include climate change as part of its decision and investment-making framework, including embedded emissions and climate resilience.

f. Investigate and develop plans to mobilise private sector finance for low emissions and climate-resilient investments.

We are broadly supportive of these actions, as well as the “progress indicators” on page 130:

b. Government to publish, as soon as possible and by no later than 31 March 2022, how the COVID-19 economic stimulus is helping to accelerate the climate transition.

The action above seems correct, and we look forward to its implementation and the change this will effect. New Zealand’s Covid-19 recovery work must include climate change as part of its directive.

FURTHER ANALYSIS IS NEEDED ON ABATEMENT COSTS AND THE RETIREMENT OF EMISSION INTENSIVE ASSETS

Abatement costs

We have significant concerns about the abatement costs proposed on page 129/130 of the draft advice and their impact on individuals, industry and the wider economy. We are particularly concerned about the impact of these costs on the affordability of energy. As outlined above, New Zealand’s future is dependent on a secure supply of relatively low-cost energy. Without transformation of New Zealand’s energy sector, we consider the cost to live and do business in New Zealand will continue to rise disproportionate to the rest of the world, and this will negatively affect New Zealand’s future prospects.

To further understand the impacts of this, we ask the Commission to provide further modelling to the public and Government on the impacts of the proposed abatement costs.

Retirement of emission intensive assets

Option d on page 129 proposes the Government “investigate and develop a plan for potential incentives for business to retire emissions intensive assets early”.

While we understand the Commission’s intent around this action, we suggest the Commission’s final advice to Government needs to include further analysis on the impacts of this option, both in terms of economic impact and the overall impact on emissions. In general, the production and purchase of new assets to replace functional assets is financially intensive and the production processes embody additional carbon into the new asset. So, while the operation of the new asset may be less intensive in terms of carbon emissions, both the financial and emission “cost” to replace the asset may not be justified by the result.

It is our view that the Government’s investment is better spent on the other “time-critical necessary actions” outlined on page 129.

WE MUST UTILISE AND DEVELOP NEW ZEALAND’S ENGINEERING WORKFORCE

There is a clear relationship between development of the infrastructure needed for New Zealand to reach carbon neutrality (i.e. further developing the infrastructure to support renewable energy generation) and the capability of the engineering profession to deliver projects. Much of the Government’s work ahead will

require specialist engineering skills. With New Zealand's small scale on the international stage, we are already struggling to retain and recruit engineers, particularly specialist engineers.

We see a few options for addressing this. In the first instance we need certainty in the pipeline of infrastructure work. This certainty will support us to develop our workforce appropriately.

We also need the Government to support the development of our workforce. This starts in our public education system, through the strengthening of the science, technology, engineering and mathematics education programmes. The Government can also support the professional placement of newly graduated engineers, as well as specialist training for experienced engineers. Further training and retaining engineers in New Zealand will decrease our dependence on the international market.

IN THE WORK AHEAD, WE MUST NOT LOSE SIGHT OF ADAPTATION

We understand the Commission is also tasked to provide independent, expert advice to Government on New Zealand's ability to adapt to the impacts of climate change. We would like to see all work resulting from the Commission's advice also addressing New Zealand's ability to adapt to the impacts of climate change.

CONCLUSION

Thank you for the opportunity to provide comment on the Commission's draft advice 2021. While we have not answered each of the Commission's consultation questions individually, we have sought to raise key points on the draft advice for the Commission's consideration. We look forward to the Commission's final advice.

The scale of work ahead is immense, and engineers are at the heart of this work. For New Zealand to succeed in reaching our Paris Agreement goals, engineers must be at the table and deeply involved in shaping the path ahead. Engineering New Zealand, together with its affiliated technical groups, welcomes the opportunity to be involved.

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