

IChemE Policy response

New Zealand Climate Change Commission Draft Advice report

Consultation response from the Institution of Chemical Engineers (IChemE)

The Institution of Chemical Engineers

The Institution of Chemical Engineers (IChemE) advances chemical engineering's contribution worldwide for the benefit of society. We support the development of chemical engineering professionals and provide connections to a powerful network of over 33,000 members in more than 100 countries.

We support our members in applying their expertise and experience to make an influential contribution to solving major global challenges, and are the only organisation permitted to award [Chartered Chemical Engineer](#) status and [Professional Process Safety Engineer](#) registration.

This response has been prepared through consultation with IChemE's members in New Zealand and draws on the Institution's position on climate change published in November 2020.¹ There are some questions that fall outside of the specific expertise of chemical engineers and therefore no comment has been made, however, elements that align with the Institution's position on climate change are supported.

IChemE New Zealand and its global colleagues would welcome an audience with the NZ Climate Change Commission to discuss and collaborate further.

In addition to this submission, IChemE New Zealand endorses the response made by Engineering NZ.

Our six big issues – future generations

Big issues question 1. Do you agree that the emissions budgets we have proposed would put Aotearoa on course to meet the 2050 emissions targets?

IChemE response: Agree

IChemE supports the position that emissions reduction must start now and be continuous. IChemE takes the position that we cannot afford to do nothing with regard to climate change. Any action to reduce our emissions is positive but must start now in order to minimize the cumulative and potentially

¹ <https://bit.ly/3ptN8C9>

irreversible impact of climate change. This aligns with IChemE's Position Statement on Climate Change to guide all chemical engineers, released November 2020.

Big issues question 2. Do you agree we have struck a fair balance between requiring the current generation to take action, and leaving future generations to do more work to meet the 2050 target and beyond?

IChemE response: Agree

IChemE agrees with the urgency and hence the "front end" loaded approach that the ministry is taking with establishing policy to push for action now.

There is significant evidence that to avoid irreparable social, economic and environmental damage, it is essential that we accelerate our efforts to decarbonise our economic systems and stabilise the levels of greenhouse gases in the earth's atmosphere. This requires immediate action to ensure that global average temperature rises are kept to a minimum. This approach requires stronger direction to reduce New Zealand's reliance on fossil fuels in some significant areas to reduce anthropogenic emissions of greenhouse gases.

Big issues 3. Do you agree with the changes we have suggested to make the NDC compatible with the 1.5°C goal?

IChemE response: Neutral

The expertise of chemical engineers does not encompass all areas of emissions and their reductions; therefore, we cannot provide an evidence-based view as to whether the actual NZ contribution is enough with regards to NDC compatible meeting the 1.5 °C goal.

Climate change is a global issue and while emissions reductions must also be global, it must also be fair and recognize the relative differences between regions, both in terms of historic contributions to emissions and vulnerability to the consequences of a warming planet. The changes suggested will contribute to global emissions reduction but other NDCs are also essential.

Big issues 4. Do you agree with our approach to meet the 2050 target that prioritises growing new native forests to provide a long-term store of carbon?

IChemE response: Neutral

The expertise of chemical engineers cannot provide an evidence-based view on the prioritization of growing new native forests over other options in the Draft Advice. IChemE's position is founded on Best Available Techniques (solutions must be designed to demonstrate the greatest positive outcomes for the environment and the economy) and is committed to proactively engaging with all affected

organisations in a manner consistent with our commitment to meet net zero carbon emissions and the UN Sustainable Development Goals.

Big issues 5. What are the most urgent policy interventions needed to help meet our emissions budgets? (Select all that apply)

IChemE response: both '*Investment to Spur Innovations*' and '*Pricing to Influence Investments*' policies should be prioritised together.

IChemE considers that these policy changes would be more effective by being employed in parallel to encourage a change in people's behaviours and enable "reducing emissions" solutions to be developed as a replacement for obsolescence or unfavourable ones.

The Institution considers it important to favour long term sustainability and social opportunities ahead of only focusing on immediate economics and/or short-term economic impact (e.g. Capex), especially in a post-COVID world.

Big 6. Do you think our proposed emissions budgets and path to 2035 are both ambitious and achievable considering the potential for future behaviour and technology changes in the next 15 years?

IChemE response: Neutral

At this time, it is not possible to determine whether the proposed budgets and plan will drive necessary changes in the technology and behaviour. As the nationally determined contributions are set, and targets identified, there must be full and robust technology needs analysis. Climate change requires not only mitigation but also adaptation and this should also be considered.

IChemE members would like to see initiatives drive a fair, safe, and sustainable transition process, specifically:

- a. support to transition (from coal and fossil fuels) where alternative energy technology or infrastructure already exists locally e.g. electricity or gas,
- b. consult with and support of the transition industries, natural gas (North Island) and the electricity generators, to keep operating safely and reliably; so, these industries are also encouraged to decarbonize (if viable) and move to a sustainable future. Knowledge of NZ assets that could be repurposed for sustainable services would also be understood if industry were involved.
- c. acknowledge the timeframes involved while be enabling for all new emerging technologies and infrastructure e.g. ensuring sufficient electrical capacity if people to move to electric vehicles,
- d. include a programme to redirect and re-skill current workforces who will have to move from fossil-fuelled industries to sustainable ones; and support the education, training, and application of skills of future workforces.

- e. a national, systems thinking approach be adopted with full and robust assessment of life cycles, their emissions, and any other potential impacts, together with a drive to a circular economy. For example, the fossil-fuel usage in 2035 may be exceeded if current fossil-fuel fired infrastructure has not reached end of life or longer-term is 're-lived' instead of replacement. Furthermore, fossil-fuels may be imported instead (if not available nationally) negating New Zealand's climate change outcomes.

Detailed questions regarding the advice

How we developed our advice

1. Do you support the principles we have used to guide our analysis?

IChemE response: Partially support.

IChemE's position on climate change is founded on Principles that align with the seven principles presented. IChemE's principles have more detail with: 'Systems Thinking', being 'Guided by UN Sustainable Development Goals', 'Training...' and 'Education'. For instance, the seven principles could also include:

- a. it is essential to complete "full and robust assessments of lifecycle, emissions and their impacts with regards to driving a circular economy",
- b. climate change actions "should minimize adverse impact and not shift...elsewhere – either geographically, socially, economically, or environmentally", and
- c. transition to a net zero carbon emissions will bring opportunities but also challenges to our members and the industries they work in and support.

Emissions budgets numbers

2. Do you support budget recommendation 1? Is there anything we should change and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Breakdown of emissions budgets

3. Do you support our proposed break down of emissions budgets between gross long-lived gases, biogenic methane and carbon removals from forestry? Is there anything we should change, and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Limit on offshore mitigation for emissions budgets and circumstances justifying its use

4. Do you support budget recommendation 4? Is there anything we should change, and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Enabling an enduring climate transition – intro

Cross-party support for emissions budget

5. Do you support enabling recommendation 1 on cross-party support for emissions budgets? Is there anything we should change and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Coordinate efforts to address climate change across Government

6. Do you support enabling recommendation 2 on coordinating efforts to address climate change across Government? Is there anything we should change and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Genuine, active and enduring partnership with iwi/Māori

7. Do you support enabling recommendation 3 on creating a genuine, active and enduring partnership with iwi/Māori? Is there anything we should change and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Central and local government working in partnership

8. Do you support enabling recommendation 4 on central and local government working in partnership? Is there anything we should change and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Ensuring inclusive and effective consultation, engagement and public participation

9. Do you support enabling recommendation 5 on establishing processes for incorporating the views of all New Zealanders? Is there anything we should change and why?

IChemE response: Neutral

This is a complex area that falls outside the expertise of chemical engineers.

Locking in net zero

10. Do you support our approach to focus on decarbonising sources of long-lived gas emissions where possible? Is there anything we should change and why?

IChemE response: Partially support

IChemE supports the focus on decarbonising long-lived gas emissions and believes it is essential to take a “global thinking’ approach i.e. full and robust assessment of lifecycles, their emissions and any other potential adverse effects, together with the drive to a circular economy.

Our members encourage taking a holistic approach, so global climate change outcomes may not be detrimentally affected e.g. with NZAS closure aluminium manufacture going offshore could utilise coal fired electricity, rather than hydroelectric.

11. Do you support our approach to focus on growing new native forests to create a long-lived source of carbon removals? Is there anything we should change and why?

IChemE response: Neutral

This is an area that falls outside the expertise of chemical engineers.

Our path to 2035

12. Do you support the overall path that we have proposed to meet the first three budgets? Is there anything we should change and why?

IChemE response: Partially support.

The expertise of chemical engineers does not encompass all areas of emissions and their reductions and therefore we cannot provide an evidence-based view as to whether the overall path proposed is enough to meet the first three budgets.

IChemE does take the position that we cannot afford to do nothing regarding climate change. Any action to reduce our emissions is positive and must start now to minimize the cumulative and

potentially irreversible impact of climate change. This aligns with IChemE's Position Statement on Climate Change to guide all chemical engineers.

An equitable, inclusive and well-planned climate transition

13. Do you support the package of recommendations and actions we have proposed to increase the likelihood of an equitable, inclusive and well-planned climate transition? Is there anything we should change, and why?

IChemE response: Neutral

Aspects of this that align with the principles contained within IChemE's position statement on climate change are supported. This includes alignment with the UN Sustainable Development Goals.

Transport

14. Do you support the package of recommendations and actions for the transport sector? Is there anything we should change and why?

IChemE response: Neutral

This is an area that falls outside the expertise of chemical engineers.

Heat, industry and power

15. Do you support the package of recommendations and actions for the heat, industry and power sectors? Is there anything we should change and why?

IChemE response: Support some of the actions

IChemE agrees we need to accelerate our efforts to decarbonize our economic systems and stabilize the levels of greenhouse gases in the earth's atmosphere. We aim to take a lead role in tackling climate change and are uniquely placed to take action across multiple industrial sectors to arrest and reverse the damage.

Specific comments on the package of recommendations /actions proposed below:

- a. Collaboration and inclusion with all energy users in the transition plan to utilising sustainable energy i.e. industries as well as large commercial operations. For example closely located hospitals, schools, pools, that rely on fossil fuel fired heating, could use common low grade heat from a larger facility.
- b. All technologies and innovations that could reduce emissions be included e.g. be fuel agnostic. The Draft Advice should propose recommendations that allow for this and have regional

differences to accelerate adoption of available technologies or pursuit of any renewable energy technologies rather than naming a few: electricity and biomass.

- c. The draft advice misses the short-term opportunities to reduce emissions i.e. LPGs and natural gases burn much more efficiently and cleanly compared to other fuels, hence should have a mid-long term focus rather than immediate. This infrastructure could be utilized to assist the transition further and potentially be repurposed in the future e.g. hydrogen, more sustainable for the NZ economy as the infrastructure already exists.
- d. Caution is also advised on the short term impacts on New Zealand industry (including those companies named the Draft Advice) as global emissions could increase if these were forced to close and production moved to other countries with less stringent operations.
- e. The availability of cleaner transition fuels (natural gases) across the North Island industry and domestic markets could also be limited if this industry was shut down early.
- f. The personal and economic impact on potential closures of major companies operating in these sectors is significantly understated in the Draft Advice. Investment and support for these workforces should be planned for as part of the transition process: e.g. NZAS alone has over 1000 staff and recent online articles have indicated another 1600 jobs indirectly connected to the smelter under threat (see www.stuff.co.nz website). Other online articles for the impacts of closure of Methanex (200+) and the gas industry on Taranaki, and RefiningNZ (~1000 jobs including staff) appear not to have been considered in the Draft Advice figures.

Agriculture

16. Do you support the package of recommendations and actions for the agriculture sector? Is there anything we should change and why?

IChemE response: Neutral

IChemE supports emissions reducing solutions that must be designed to demonstrate the greatest positive outcomes for the environment and the economy. This aligns with our Global Position Statement on Climate Change, released November 2020.

Specifically for Agriculture:

- a. The He Waka Eke Noa body of work should be supported and all available technologies deployed to ensure emissions reductions projected are achieved.
- b. The Draft Advice also focuses on a few options in this section, rather than broader inclusive policy direction. For instance, a comment about breeding low emissions sheep should be expanded and applied equally to any ruminants cows goats deer in the future etc.
- c. An initiative on planting trees and increasing biodiversity may not be the highest priority if New Zealand wants to achieve the best results reducing emissions. IChemE supports full and robust assessments of lifecycle, emissions, and their impacts with regards to driving a circular economy.

Forestry

17. Do you support the package of recommendations and actions for the forestry sector? Is there anything we should change and why?

IChemE response: Neutral

This is an area that falls outside the expertise of chemical engineers.

Waste

18. Do you support the package of recommendations and actions for the waste sector? Is there anything we should change and why?

IChemE response: Support some of the actions.

IChemE's position is founded on Best Available Techniques i.e. solutions must be designed to demonstrate the greatest positive outcomes for the environment and the economy, in which water and waste must be included as part of a circular economy, not solely as a sector. This aligns with IChemE's Global Position Statement on Climate Change, released November 2020.

Multi-sector strategy

19. Do you support the package of recommendations and actions to create a multisector strategy, and is there anything we should change?

IChemE response: Neutral

This is a complex area that goes beyond the expertise of chemical engineers. While chemical engineers can comment on some elements, they are not able to comment on others.

Rules for measuring progress

20. Do you agree with Budget recommendation 5 on the rules for measuring progress? Is there anything we should change any why?

IChemE response: Support some of the actions.

IChemE believes that it is important to have in place measurable, quantifiable data on emissions when considering performance indicators and utilizing methodologies for encouraging compliance rather than using a prescriptive punitive approach.

We also note this is an initial or interim report and will go through further revisions and updates as the commission has more in-depth information.

Our Nationally Determined Contribution (NDC)

21. Do you support our assessment of the country's NDC? Do you support our NDC recommendation?

IChemE response: Neutral

This is a complex area that goes beyond the expertise of chemical engineers. While chemical engineers can comment on some elements, they are not able to comment on others.

22. Do you support our recommendations on the form of the NDC?

IChemE response: Neutral

This is a complex area that goes beyond the expertise of chemical engineers. While chemical engineers can comment on some elements, they are not able to comment on others.

23. Do you support our recommendations on reporting on and meeting the NDC? Is there anything we should change, and why?

IChemE response: Neutral

This is a complex area that goes beyond the expertise of chemical engineers. While chemical engineers can comment on some elements, they are not able to comment on others.

Eventual reductions in biogenic methane

24. Do you support our assessment of the possible required reductions in biogenic methane emissions?

IChemE encourages the use and development of effective optioneering techniques (i.e. using full robust lifecycle assessments, their emissions and other effects, together with the drive to a circular economy) when delivering wide ranging technology base decisions.

The scale of the opportunity for emissions reductions in biogenic methane needs further investigation to be quantified and compared to other opportunities before embarking on this.

Other comments

IChemE encourages the use of planned policy driven initiatives to steer and encourage the reductions of emissions in New Zealand.

The Draft Advice should also provide directions on where Climate Change initiatives fit within New Zealand's overall government direction and priorities e.g. Water Reforms. Examples of specific issues that should be included in the Draft Advice include:

- a. Have initiatives that drive a fair, safe and sustainable transition process in its Path to 2035, and beyond to 2050.
- b. Be clear on priorities for the transition plan to reduce emissions and with regard to other government initiatives e.g. water reform;
- c. Includes a global “System Thinking” approach for all emission reducing solutions. Full and robust assessment of lifecycles, their emissions and any potential adverse impacts, together with the drive to a circular economy is essential and must be encoded in industry standards for planning, design, construction, operations, and decommissioning.
- d. Engagement with industry to understand the investments and options available for emissions reductions and/or innovations. Good understanding of all NZ's energy infrastructure, how sectors work, inter-relate and impacts other sectors / markets will prevent one sector being disadvantaged by decisions in another.
- e. Support the key industries like natural gas and the electricity generators to keep operating safely & reliably, while empowering them and others to move to more sustainable operational practices,
- f. Have incentives to encourage development of all emission reducing technologies and innovations as well as setting satisfactory commercial timeframes for infrastructure to be repurposed or established (e.g. hydrogen, future electricity supply and generation).
- g. Prevent offshore/oversea transfers of New Zealand emission reductions through forced closure of industry.
- h. Collaboration and support of chemical engineers who are uniquely placed to take action across multiple industry sectors, thereby contributing to the improvement of food and nutrition, security, water availability, energy and human health and wellbeing in New Zealand, and the global community.