

Submission

By

**THE
NEW ZEALAND
INITIATIVE**

To the Ministry for the Environment

on

**Phasing out fossil fuels in
process heat**

20 May 2021

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1. INTRODUCTION AND SUMMARY

- 1.1 This submission on “Phasing out fossil fuels in process heat” by the Ministry for the Environment (“MfE”) is made by The New Zealand Initiative, a think tank supported primarily by chief executives of major New Zealand businesses. The purpose of the organisation is to undertake research to contribute to the development of sound public policies in New Zealand to help create a competitive, open, and dynamic economy and a free, prosperous, fair, and cohesive society.
- 1.2 The New Zealand Initiative fully supports the government’s emissions targets, including the Paris climate agreement and net zero emissions of long-lived greenhouse gases from 2050. The question now is how to deliver these targets.
- 1.3 MfE proposes various options for process heat, including:
- Ban or cap on emissions from low and medium temperature processes, either for new or all assets.
 - Require industrial sites to prepare and give effect to an emissions plan, and
 - Prepare guidance for use in consenting processes.
- 1.4 It is not clear how these proposals can contribute any progress towards our emissions targets:
- 1.4.1 **Process heat is covered by the Emissions Trading Scheme.** The ETS caps emissions. Process heat is within the cap. Lower process heat emissions cannot, therefore, reduce overall emissions.
- 1.4.2 The government’s emissions strategy a) divides the economy into sectors, treating each sector in isolation, and b) uses bans to reduce emissions. **This is a siloed approach that is vulnerable to the ‘80/20 problem,’** the tendency for some fraction of emissions from a technology or sector to be very difficult to eliminate. For example, studies of the government’s 100% renewable electricity policy show near-vertical cost increases as the share of renewables approaches 100%. The government can cut more emissions sooner by avoiding the 80/20 problem. This requires a co-ordinated cross-sector strategy, not a siloed approach.
- 1.5 The government must answer the following question:
- How can the proposed policies for process heat contribute to New Zealand’s emissions targets if the ETS caps emissions and process heat is within the cap?*
- 1.6 Our concerns with MfE’s proposals for process heat are also relevant to proposals in other sectors, including transport.
- 1.7 The government’s strategy is so incompatible with our emissions targets that we are genuinely unsure whether the government understands its own systems.
- 1.8 We recommend the government either:
- Demonstrate how sector-level policies, including process heat, can reduce national net emissions in areas which are already covered by a binding ETS, or
 - Reconsider its emissions strategy.

2. EMISSIONS REDUCTION IS A CO-ORDINATION PROBLEM

2.1 The costs and disruption of lowering emissions vary enormously according to a) the value to individuals of the activities which lead to emissions and b) the availability of low emissions alternatives.

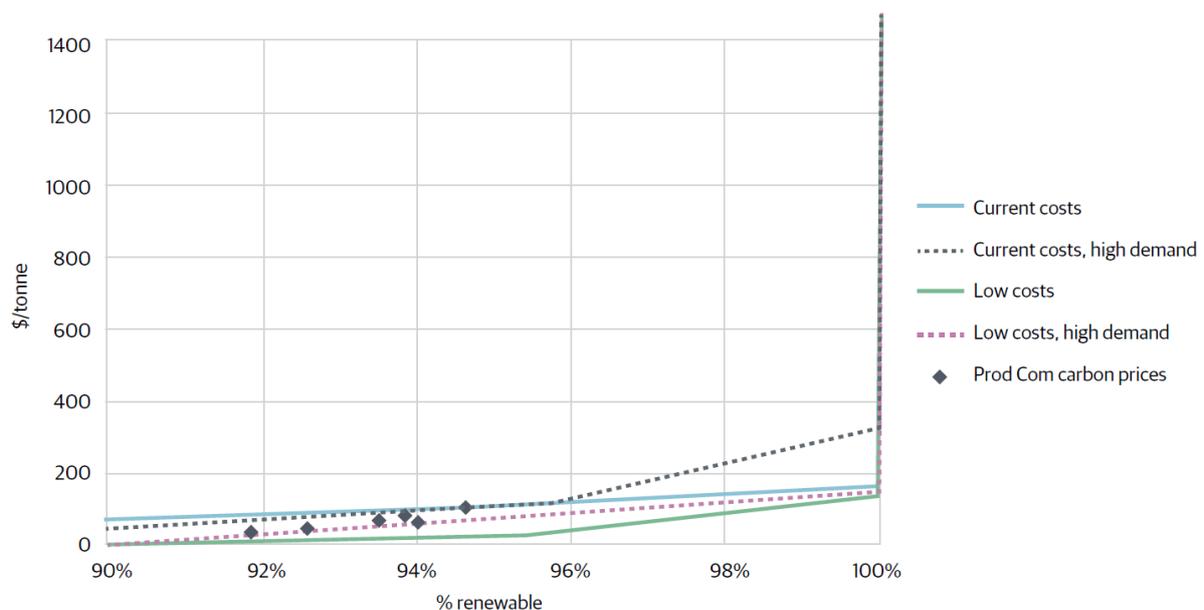
2.2 At some point, policies which target a technology, fuel or sector to lower emissions will reach diminishing returns. Beyond this point, further emissions reductions become prohibitively difficult. This is the 80/20 problem.

2.2.1 The 80/20 problem can multiply the cost of reducing emissions by 100 times or more.

2.2.2 For example, studies of the government's 100% renewable electricity policy show sharply diminishing returns as the share of renewables approaches 100% (Figure 1). The government could cut many times more emissions for the same cost as the 100% renewables policy by allowing some thermal generation and instead reducing emissions from other more effective sources.

2.2.3 Diminishing returns can set in earlier or later than the last 20%.

Figure 1: Diminishing returns on the government's 100% renewable electricity policy as renewables' share approaches 100%



Source: New Zealand Initiative (2019), *Switched On!*, Figure 10.

2.3 Emissions reduction is a co-ordination problem. Whether it is optimal to further reduce emissions from a particular source depends on the available alternatives across the economy.

2.3.1 In principle, reducing emissions at least cost can be achieved by equalising the marginal cost of abatement across all sources.

2.3.2 In practice, the government can cut more emissions sooner if it does not force further emissions reductions from sources after diminishing returns have set in.

- 2.3.3 A carbon price tends to equalise the marginal cost of abatement across all sources. This is why most economists think a carbon price, whether a carbon tax or a cap-and-trade scheme, is probably the most effective way to lower emissions.
- 2.4 That emissions is a co-ordination problem has consequences for policy design.
 - 2.4.1 Although emissions must come down in millions of places, actions are best co-ordinated in one place or with one mechanism e.g. a price. A centralised co-ordination function in some form provides network benefits: it can best reveal where in the economy emissions can be reduced most effectively.
 - 2.4.2 The government's emissions strategy is incompatible with solving a co-ordination problem.
 - 2.4.2.1 The government's strategy is siloed. It sets complementary policies for each sector of the economy, treating each sector in isolation. The approach sets a different implicit carbon price for each sector, which forgoes opportunities for potentially far greater emissions reductions.
 - 2.4.2.2 Worse, *each policy* in each sector could be its own silo with its own implicit carbon price. It is unclear complementary policies will be formulated with any real concern for cost-effectiveness. The government seems mostly uninterested in the cost-effectiveness of its emissions policies. Deeper siloing may substantially amplify the costs of reducing emissions.
 - 2.4.3 Later we argue resource consents are an especially unsuitable vehicle for reducing emissions given emissions is a co-ordination problem.

3. THE GOVERNMENT HAS NOT EXPLAINED HOW ITS EMISSIONS REDUCTION STRATEGY REDUCES EMISSIONS

- 3.1 The government is about to make substantial commitments under its emissions reduction strategy in process heat and elsewhere.
- 3.2 However, the government has not established how complementary policies can reduce emissions or contribute towards our emissions targets. We think this is an important question.
- 3.3 It may be passé to say complementary emissions policies cannot reduce emissions under a binding ETS. However, officials have not persuasively rebutted the point.
- 3.4 In its process heat paper, MfE offers several arguments for complementary emissions policies alongside the ETS:
 - 3.4.1 **The ETS price is not high enough to reduce emissions from process heat** (paraphrased from p15). Since process heat emissions do not say anything about national net emissions, MfE's concern is the product of its exclusive focus on process heat.

The lack of response to the ETS by process heat at current prices is a non-problem for national emissions targets *provided* this is the result of the ETS reducing emissions elsewhere in the economy at a lower cost than process heat can offer.

MfE should recognise that static emissions from process heat as a plausible outcome from a functioning, effective ETS. Furthermore, MfE should recognise the danger of overriding a functioning ETS with other policies is that this detracts from, not advances, progress towards our emissions targets.

3.4.2 “[F]irms generally prioritise short term business investments over sustainability decisions” (p16). Even if this is true, the ETS emissions cap is still binding and complementary policies will not reduce overall emissions. Business and consumer mistakes, including myopia, lead to a higher carbon price, but do not prevent the ETS from cutting emissions. We explain this [here](#).

3.4.3 “[M]any emissions reductions options... are not responsive to the NZ ETS price signal, due to the presence of barriers” (p17). MfE cites a document by MBIE which defines “barriers.” We have reviewed that document and find, except for regulatory barriers, what MBIE and MfE call “barriers” are “costs”. The distinction is crucial:

- If costs are treated as costs, this informs the discovery of the most effective ways to reduce emissions.
- If costs are treated as barriers to be forcibly overcome by policy makers, this prevents the discovery of the most effective ways to reduce emissions.

Officials should recognise that the failure of a particular technology to respond to a given ETS price might contain information about the relative merits of that technology as a source of lower emissions. It does not seem responsible to ignore this signal without checking its veracity. If the signal is good, complementary policies which override the ETS jeopardise our emissions targets. MfE does not seem to be aware of this possibility.

3.4.4 **Complementary policies are needed to prevent further investment in high-emissions assets.** This is questionable, for two reasons. First, such investments cannot raise emissions if the ETS caps emissions. Furthermore, investments that should not have occurred due to the ETS, but did, occur at investors’ own expense. Second, the ETS will deter investments in high-emissions assets if it is credible. Rather than assert the ETS has had only a “minimal impact” (p17) on investment in process heat, MfE should check.

3.4.5 **Stranded assets justify complementary policies.** “The establishment of new fossil fuel assets is likely to increase the costs of transitioning and the risk of stranded assets, and make it significantly harder to achieve New Zealand’s emissions reduction targets,” says MfE (p16). Unfortunately, MfE does not seem to recognise a credible ETS can ameliorate stranding risks. It would be more convincing to show complementary policies promise less stranding than the ETS. Officials might consider whether stranding risks can be better-managed by strengthening the ETS’s credibility. A more robust approach would consider all costs not just stranding.

3.5 We see no evidence that MfE has done the necessary work to understand if static emissions from process heat is the product of an effective or ineffective ETS. The distinction is crucial because it may determine whether complementary policies contribute to or detract from emissions targets. MfE seems unaware its proposals could override a functioning (or fixable) ETS.

- 3.6 As a submitter to the Climate Change Commission recently [said](#), referring to the Think Big energy projects:

One key reason for the shift towards electricity market liberalisation was uneconomic generation investment outside of merit order by Government central planners.

- 3.7 Complementary emissions policies similarly risk uneconomic investment in emissions reductions outside of merit order by Government central planners.
- 3.8 It is past time that MfE seriously considers the economy-wide emissions performance of the ETS. This question goes directly to the merits of the government's emissions strategy. It is frankly inexcusable that officials still do not know how well the ETS works, and where. MfE also needs to be more aware of the dangers of treating emissions from individual sectors in isolation.

4. EACH RESOURCE CONSENT IS ITS OWN SILO

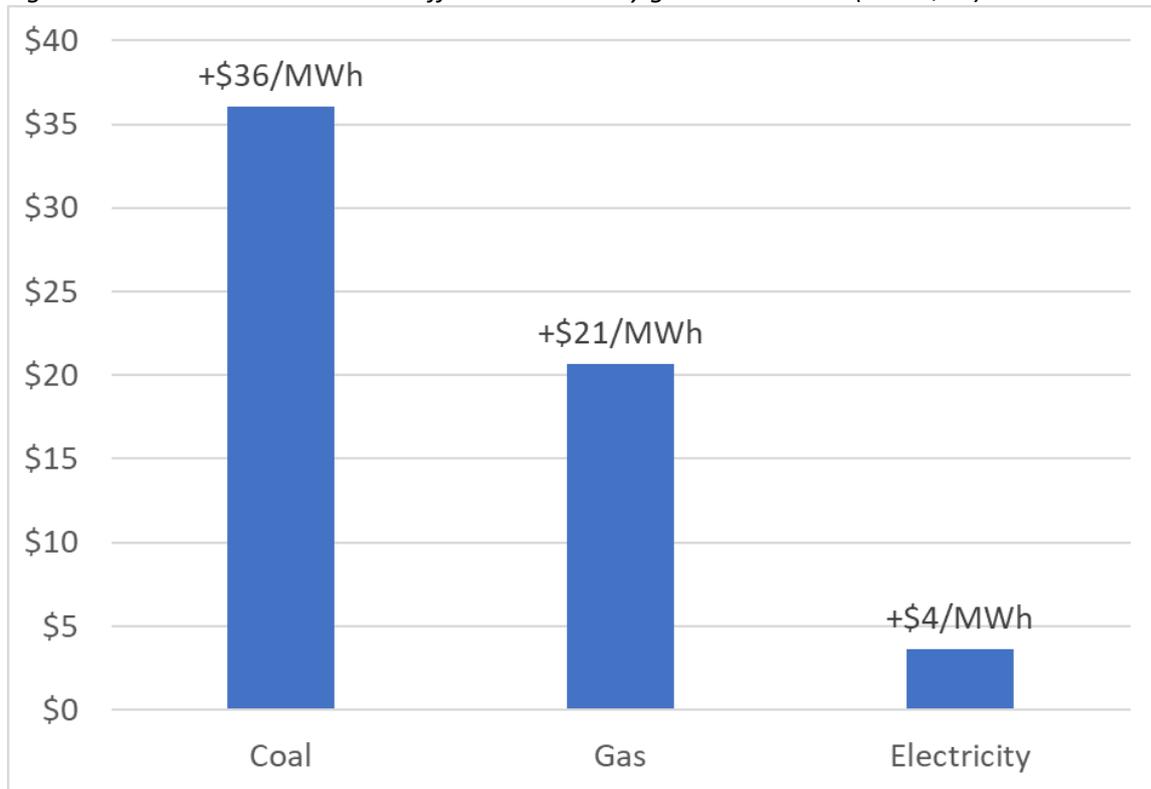
- 4.1 The government's emissions strategy divides the economy into sectors and develops complementary policies for each sector in isolation. This siloed approach is not an effective way to reduce emissions when emissions is a co-ordination problem.
- 4.2 Unfortunately, the government's strategy takes siloing to a deeper level by proposing to use resource consents from councils as a vehicle for reducing emissions.
- 4.3 In effect, this approach makes *each consent* its own silo, with its own implicit carbon price. As far as we know, the councils issuing consents will have no way to judge the relative merits of each consent application with respect to emissions.
- 4.4 It is hard to see any way the consents mechanism will not make it more difficult to reduce emissions. This approach not only risks adding enormous costs to emissions reduction, even higher than policies like 100% renewable electricity, but will do so in a way that is mostly invisible to policy makers and the public.
- 4.5 If emissions is a co-ordination problem, then policy makers should recognise co-ordination needs to occur in one place or with one mechanism which allows comparison of alternatives on a level playing field. Officials should therefore see the problems that are likely to follow from any attempt to reduce emissions one consent at a time. Consents are singularly unsuited to solving a co-ordination problem such as emissions.
- 4.6 The government's strategy invites an entirely uncoordinated actions to reduce emissions. We cannot see any merit in using resource consents, or any other mechanism in the RMA, to lower emissions. The government's strategy is plainly incompatible with national emissions targets.

5. ETS EFFECTS ON THE COSTS OF COAL AND GAS

- 5.1 Officials are sceptical about the effects of the ETS on investment. It is important to understand the profound effects of the ETS on coal and gas costs with a New Zealand Unit ("NZU") price of \$37. We estimate substantial effects on wholesale costs of gas and

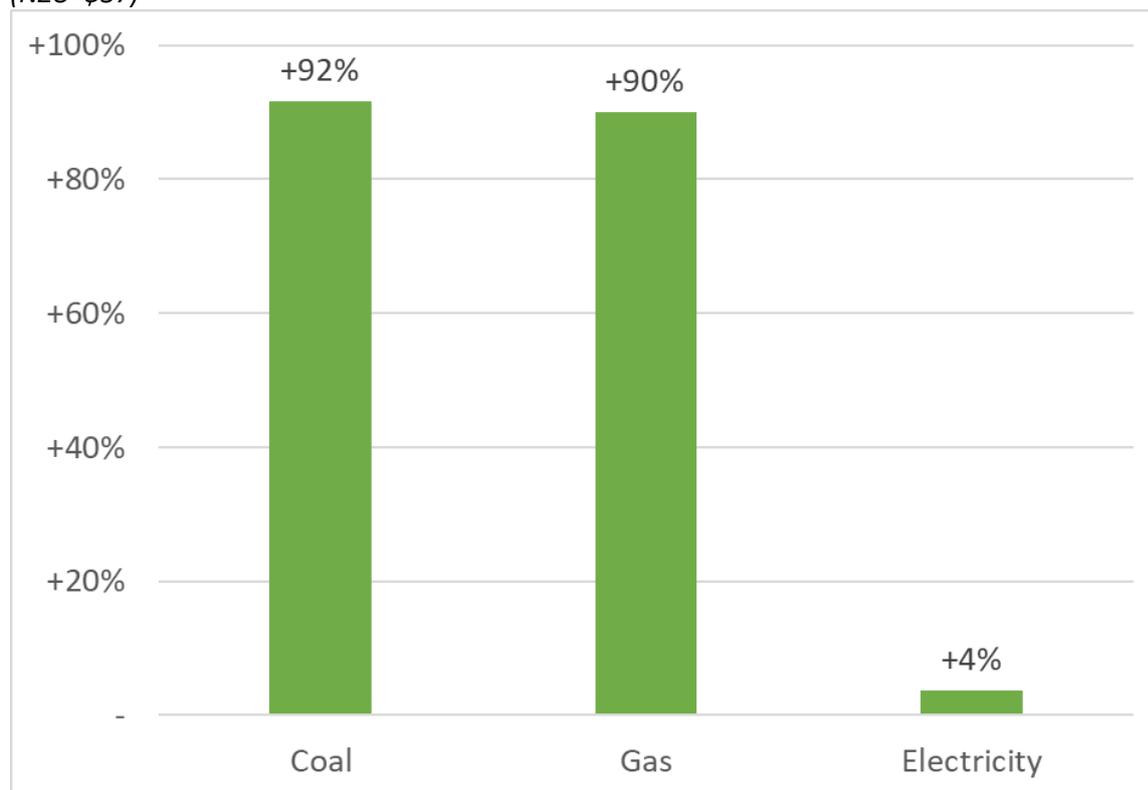
especially coal, but only a muted effect of the ETS on the wholesale cost of electricity (see Figure 2 and Figure 3).¹

Figure 2: Indicative estimated ETS effect on electricity generation costs (NZU=\$37)



¹ Our estimates of the percentage change in the wholesale cost of each fuel is relative to the average 5-year cost of each fuel type. Estimates should be treated as indicative only.

Figure 3: Indicative estimated ETS effect on wholesale costs of each fuel per megawatt-hour (NZU=\$37)²



5.2 This indicative analysis suggests at NZ\$37 the ETS nearly doubles the cost of coal and natural gas, based on average wholesale prices over five years.

5.3 Given the relatively comprehensive coverage of the New Zealand ETS across most of the economy, these estimates suggest the ETS may be creating significant incentives on emissions-intensive activities. Anecdotally, the ETS is having a substantial effect on investment decisions in the energy sector.

5.4 Any assumption of muted ETS incentive effects must be tested urgently given the central role that assumption seems to play in policy makers' thinking. We are somewhat disappointed MfE continues to believe the ETS has no significant impact based on a survey from 2018 (p17). Since then, NZU prices have risen by around 70%.

6. CONCLUSION AND RECOMMENDATIONS

6.1 The government's emissions reduction strategy does not appear to be compatible with our emissions targets. Reducing emissions in silos and using technology and fuel bans all-but guarantees inflated costs to reduce emissions. The government's strategy should anticipate the 80/20 problem, recognise its threat to our emissions targets, and avoid it – but does not.

6.2 Moreover, officials do not seem to understand how the ETS interacts with other policies, nor the conditions which determine whether the ETS is effective. The result is a failure to realise complementary emissions policies, whether in process heat or in most other sectors, may

² The proportional effect of the ETS on gas is comparable to coal because although gas is less emissions-intensive per unit of energy, the average wholesale price for gas is approximately half of coal.

contribute less than nothing to our emissions targets. This risk deserves the full attention of the institutions responsible for climate change policies.

6.3 We return to the question we posed at the start of this submission:

How can the proposed policies for process heat contribute to New Zealand's emissions targets if the ETS caps emissions and process heat is within the cap?

6.4 We look forward to the government's response.

6.5 We recommend the government either:

- Demonstrate how sector-level policies, including process heat, can reduce national net emissions in areas which are already covered by a binding ETS, or
- Reconsider its emissions strategy.

6.6 Thank you for reading this submission.

7. RESPONSES TO CONSULTATION QUESTIONS

We respond to selected questions below.

Problem definition, objectives and scope

1. Do you agree with this characterisation of the status quo? If not, please provide evidence to support your views.

We **strongly disagree** with MfE's characterisation. Defining the problem with respect to process heat emissions is counterproductive in the sense that a siloed strategy based on that definition pre-empts discovery of the most effective ways to reduce emissions. The government proposes no mechanism that will prevent its siloed strategy from suffering the '80/20 problem' in each sector and technology it targets. This siloed approach will not deliver New Zealand's emissions targets.

2. How would you describe the status quo? What other factors should be considered?

New Zealand's targets are based on net emissions. Removals will almost certainly play a role in reducing emissions to net zero. Given this, the emissions problem for each sector does not simplify down to achieving zero gross emissions. Instead, the problem is to discover the optimal contribution to gross emissions reductions from each sector, including process heat. This is a co-ordination problem, because each sector's contribution depends on what is going on in other sectors.

3. Do you agree with the characterisation of the problem regarding the regulatory gap in the RMA? If not, why not?

We **disagree**. MfE has not established any regulatory gap in the RMA, which would require some demonstration that the RMA is a suitable vehicle for reducing emissions. There is no more of a regulatory gap in the RMA on emissions than on taxes or healthcare. Consents are not suited to solving a co-ordination problem like emissions. We have argued each consent is effectively its own silo. Each silo sets a different implicit carbon price, which prevents discovery of the most effective ways to lower emissions. All of this is deeply counterproductive to our national emissions targets.

4. Do you agree with the characterisation of the problem regarding the regulatory backstops to support the NZ ETS? If not, why not?

We **disagree**. It is around the other way: the proposals have the ETS as the backstop for regulations.

We have no view on questions 5 through 8.

Preferred RMA national direction instrument

9. Do you agree that the preferred option (a NES supported by a targeted NPS) will be the most effective way to achieve the policy objectives and to reduce implementation costs and uncertainty for local authorities, applicants and consent holders? If not, why not?

We **disagree** because it is not an effective way to reduce emissions. The essential features of any solution to a policy objective to achieve and maintain net zero emissions at least cost is a) a single price on carbon, because a single price enables the discovery of opportunities to reduce emissions for the least cost b) the carbon price (or the policy which produces it) is credible.

10. Do you agree with the impact analysis of this option?

We cannot find any impact analysis.

11. In your view, what is a fair and reasonable duration for consents that would balance the need for investment certainty with the need to improve energy efficiency and reduce emissions over time?

The government's proposal to use consents to manage emissions reduction is deeply counterproductive to emissions targets.

Preventing discharge of GHG emissions from new fossil fuel assets

12. Should the ban on new coal-fired assets for low and medium temperature requirements be implemented through a prohibited activity rule in national direction? Should there be any exemptions for small-scale coal-fired assets (for example, below 50kw, 2 MW or 100 tonne/year) or flexibility to consider site specific constraints through consenting processes?

We fully support the commitment to our emissions targets. We oppose all of these options because they threaten the successful delivery of our emissions targets. It is somewhat disturbing that public servants working full time on climate change do not realise this.

13. Do you agree with the approach to avoid new fossil fuel assets (excluding coal) unless it can be demonstrated there are no feasible alternatives, and where the applicant prepares a GHG emission plan, and complies with relevant best practices? Are there more effective and efficient ways to achieve this outcome?

We **disagree**. If the problem is the discovery of the most effective ways to reduce emissions across the economy, the government should recognise the counterproductive nature of using blanket rules to cut emissions. The government's strategy all-but guarantees greatly diminished emissions benefits due to the 80/20 problem.

14. How can national direction and guidance best assist applicants and consent authorities to assess economically and technically feasible alternative fuel options?

By providing or removing barriers to a level playing field for emissions. A level playing field enables the discovery of the most effective ways to reduce net emissions.

15. Should the policy approach for new process heat assets target specific fossil-fuel sources or should it take a fuel neutral approach? In your view, what is the best approach to define thresholds and requirements?

The government's approach should be fuel-neutral, technology-neutral and sector-neutral because this best-supports discovery of the most effective ways to reduce emissions.

16. Referring to each option, what are the likely compliance costs and impacts on your firm? Who are the small to medium size industry users that could struggle to meet the requirements?

No opinion.

17. What supporting initiatives are needed to transition away from fossil fuels in new industrial sites?

Strengthen the ETS, reduce its compliance costs, and independently measure its emissions performance.

Phasing out fossil fuels in process heat

18. Is there anything that you feel has been overlooked in this section with regards to the reality of your businesses' industrial practices? Or for local government: is there anything that you feel has been overlooked in this section with regards to the reality of consenting practices?

No opinion.

19. Is 2037 an appropriate 'phase-out' date for low and medium temperature coal process heat requirements? Is it necessary to include a review date within the national direction instrument (potentially around 2025) to assess the development of alternative fuel markets closer to the phase out date?

The government's approach needs to be reset. The existence of a phase out date is deeply counterproductive to the country's net emissions targets.

20. Should there be a longer lead-in time for existing coal-fired assets that are currently permitted before these are subject to the NES consent requirements?

No opinion.

21. Is it appropriate to phase out other (non-coal) fossil fuels in existing industrial assets through consenting processes and best practice requirements?

Absolutely not. This is an especially counterproductive approach to our emissions targets. Please see section 4 of this submission.

22. Is a more flexible approach for the re-consenting of other (non-coal) fossil fuel-fired assets warranted/needed?

As noted, using consents to reduce emissions is counterproductive.

23. Should there be a set phase-out date for other (non-coal) fossil fuels, including natural gas? What are the potential benefits and risks?

See response to 19.

24. Should the NES require regional councils to review consent conditions of significant GHG emitters with long-term permits to help reduce emissions? What are the benefits and risks?

No. Using consents in this way is totally contrary with national net emissions targets.

25. What are the appropriate size (operating capacity and/or volume of emissions) and/or consent duration thresholds to trigger a review of existing discharge permits? What is a realistic and achievable timeframe for regional councils to undertake a review of the discharge permits for large emitters in their region?

See responses to 19 and 24.

26. Referring to each option, what are the likely compliance costs and impacts on your firm? Who are the small-to-medium size industry users that could struggle to meet the requirements?

No opinion.

27. Is there anything that has been overlooked in this section with regards to the reality of business practices? For local government: is there anything that you feel has been overlooked in this section with regards to the reality of consenting practices?

See response to 19.

GHG emissions and best practice requirements

28. Do you agree with the proposed thresholds for small sites being between 100 and 2,000 tonne CO₂-e/year and large sites, being over 2,000 tonne CO₂-e/year, in the preparation of a GHG emissions plan?

No. A threshold is unnecessary, and a threshold means excluding opportunities to effectively reduce emissions.

29. Do you agree with the proposed requirement that GHG emissions plans for large sites be reviewed/certified by a 'suitably qualified expert'? Should this be limited to larger sites?

Strongly disagree. See responses to 19 and 24. Counterproductive to emissions targets.

30. What guidance and templates would be useful to help industry and councils prepare and review GHG management plans?

The government should recognise councils and individual industries are not the right places to allocate decision making about emissions. Neither has access to the information they need to understand how and where they can effectively reduce emissions. Asking councils and industry groups to take on this role jeopardises delivery of national net emissions targets. The government's proposals are misguided.

31. How should best practice requirements be incorporated into national direction? What factors should councils consider when determining what is economically and technically feasible at the site-level?

No opinion.

32. For large boilers and combustion plants, should an emission limit value be included in the consent conditions, based on the specific application outlined in the GHG emissions plan (fuel use x emission factor), as occurs in Europe and the US?

Absolutely not.

33. Referring to each specific schedule, do you agree with the content of the GHG emissions plans for small (Schedule 1) and large (Schedule 2) sites?

No opinion.

34. In your view, are the materials referenced in Appendix Two appropriate for each sector and across sectors?

No opinion.

35. Is there anything that has been overlooked in this section with regards to the reality of business practices? For local government: is there anything that you feel has been overlooked in this section with regards to the reality of consenting practices?

No opinion.

Non-statutory guidance on non-industrial emissions

36. Do you support the development of non-statutory guidance on how to consider wider GHG emissions (direct and indirect) through RMA planning and consenting processes?

Since the target is to reduce national net emissions, no.

37. What are the key areas that guidance needs to cover?

No opinion.

38. How can this guidance complement work underway to support emission reductions in other sectors, including urban development, transport and electricity generation?

No opinion.

39. Is there anything that has been overlooked in this section with regards to the reality of business practices? For local government: is there anything that you feel has been overlooked in this section with regards to the reality of consenting practices?

No opinion.