

Replacing the New Zealand Energy Efficiency and Conservation Strategy 2011- 2016

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INTRODUCTION

1. The Straterra¹ submission on the draft² replacement New Zealand Energy Efficiency and Conservation Strategy 2017–2022 (NZECS) focuses on the industrial process heat sector - in particular, the production, processing, blending and use of coal in this sector, which includes the commercial use of coal, e.g., to heat large buildings and facilities³. The submission deadline of 7 February is noted.
2. In preparing this submission, Straterra has consulted with energy experts, Fonterra, PEPANZ, and with the BusinessNZ Energy Council (BEC), of which Straterra is a member. Straterra was also represented on the BEC project team which has been developing “Deep Dive” case studies using an energy scenarios approach, one on energy targets, and the other on energy-related carbon dioxide emissions.
3. Straterra supports the BusinessNZ and Fonterra submissions in their entirety.

EXECUTIVE SUMMARY

4. At face value, the overall approach of the NZECS is logical; however, the pursuit of energy efficiency and a more productive economy may conflict with the third element of the NZECS goal of reducing greenhouse gas emissions. Straterra encourages amendment of this goal to avoid reference to the climate change issue.
5. We seek early engagement with Government on the development of the Process Heat Action Plan, and on strategy for investment in research, development and demonstration of technologies on energy-related matters. This could occur in the context of the BEC.
6. The NZECS makes frequent reference to New Zealand’s response to the climate change issue. While this issue is strongly linked to those of energy and the economy, the Energy Efficiency and Conservation Act 2000 (viz. ss5, 10 and 21, refer to Appendix 1) contains no reference to climate

¹ Straterra represents NZ minerals production, exploration, research, services, and support
<http://www.straterra.co.nz/>

² <http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-strategies/consultation-draft-replacement-new-zealand-energy-efficiency-and-conservation-strategy>

³ Commercial use of coal includes heat for hospitals, universities and schools in the South Island.

change, which is addressed separately and appropriately under the Climate Change Response Act 2002. We encourage officials to consider carefully the question of scope for the NZEECS.

7. Straterra challenges the assertion that the greatest potential for reducing carbon from energy use on current technology and without adversely affecting the economy lies in industrial process heat (noting this logic is justified in the case of transport). No evidence for this assertion in respect of industrial process heat has been provided in the NZEECS.
8. To be clear, Straterra's knowledge and experience is that the industrial process heat sector, in terms of energy-related emissions, is in fact among the most challenging in which to reduce carbon, and we provide more detail in answers to specific questions.
9. Certainly, the coal sector must be part of the transition to a lower-carbon economy. Straterra explores options in "Let's Talk About Coal"⁴. We conclude that the transition will take time, and will depend on the research into, and development and uptake of cost-effective technologies that currently do not exist at scale.
10. It is noted that an increase in energy efficiency may or may not translate into reducing carbon emissions, as observed in the MBIE factsheet⁵ accompanying the consultation. An increase in energy productivity (economic output per unit of energy consumption) could well lead to increased emissions, depending on the rate of economic growth. (It is, perhaps, for this reason that climate change is not mentioned in the Energy Efficiency and Conservation Act 2000.)
11. In a similar vein, reducing the percentage that gas contributes to total electricity generation could lead to more gas actually being used because the generation would come from smaller, less efficient plants. So, New Zealand's getting closer to the 90% renewable electricity generation target could be accompanied by an increase in CO₂ emissions.
12. In summary, Straterra advocates for smart and informed policy on energy, the economy and climate change. The NZEECS is part of this context, however, should not interfere with the Climate Change Response Act 2002.

ANSWERS TO QUESTIONS

1. Does the proposed goal capture what you see as the desirable future state from the promotion of energy efficiency, energy productivity and renewable energy in New Zealand?

The proposed goal of the NZEECS contains the difficulty that promoting energy efficiency and a productive economy via this Strategy could lead to more greenhouse gas emissions. In that event, the goal would be unachievable. We recommend deleting the reference to emissions.

⁴ <http://www.letstalkaboutcoal.co.nz/>

⁵ <http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-strategies/consultation-draft-replacement-new-zealand-energy-efficiency-and-conservation-strategy/factsheet.pdf>

The industrial process heat sector, for example, is more likely to offset emissions under the Climate Change Response Act 2002 regime than reduce emissions because there are currently no cost-effective technologies, at scale, for emissions reductions. This outcome is addressed at present under the NZ Emissions Trading Scheme.

2. Where do the challenges and opportunities lie for energy efficiency and renewable energy in New Zealand over the next five years?

A key challenge is to reduce the greenhouse gas emissions intensity of the industrial process heat sector, in particular, coal users, without leading to industrial contraction⁶. The reasons are, chiefly:

- There is currently no cost-effective alternative to the use of coal, at scale, as a source of industrial and commercial process heat in the South Island.
- Coal is a metallurgical input into steel, cement and lime-making, and, therefore, the energy contribution of coal use in these industries is challenging to replace with other energy sources.
- Biomass technology has a long way to go before this can make measurable inroads into the sector (refer to Let's Talk About Coal <http://www.letstalkaboutcoal.co.nz/future-of-coal/>).
- New Zealand's carbon price is increasing, despite inadequate action on carbon markets and prices internationally⁷, and this will adversely affect emissions-intensive, trade-exposed businesses, of which there are many. As matters stand, if carbon prices rise too highly, NZ businesses will close, in favour of overseas businesses in places where there is little or no price on carbon, and less investment will come to NZ than might otherwise have occurred.

As to renewable energy, there are clearly opportunities to increase the percentage contribution of renewables to electricity generation in New Zealand, via geothermal, wind and hydro, and, to an extent, solar. This is, of course, important for increased conversion of transport to electric, and this should be arguably be the emphasis of the NZEECS, as the area of greatest opportunity.

Straterra's view on these issues is consistent with recent work of the BusinessNZ Energy Council⁸.

As explained in the executive summary, the achievement of the 90% renewable electricity generation target could be accompanied by an increase in GHG emissions if there is decreased efficiency of the gas-fired component of electricity generation.

⁶ Refer also to <https://www.bec.org.nz/projects/deep-dive-energy-targets>

⁷ For example http://carbon-pulse.com/28778/?utm_source=CP+Daily&utm_campaign=f0679b1092-CPdaily06012017&utm_medium=email&utm_term=0_a9d8834f72-f0679b1092-110252217

⁸ <https://www.bec.org.nz/projects/deep-dive-energy-targets>

3. Do the proposed objectives and priority areas capture the key contributions that are needed to achieve the goal?

The objectives are broadly supported. In the case of objective 1, businesses in the industrial process heat sector would probably pursue energy efficient practices in any case, and the extent to which they are able to pursue renewable energy options would lie largely outside of their control.

An issue with the priority area of “*renewable and efficient use of process heat*” (page 9), as explained under question 2 and elsewhere, is that the industrial process heat sector has little or no ability to adopt renewable energy at scale because of the absence of cost-effective technologies. The issue here is one of R & D and the uptake of technologies that do not yet exist.

4. Does the focus on what each group can contribute resonate with you? Do you think anyone is missing?

Not answered.

5. Taken together, do you think the proposed goal, objectives and priority areas will set a clear direction for action to unlock our energy productivity and renewables potential?

No. The direction in the NZEECS is at odds with New Zealand’s climate change policy, which provides for the offsetting of emissions under the NZ ETS, as discussed elsewhere in this submission. The industrial process heat sector will be very unlikely to reduce emissions within the timeframe of the NZEECS, and may even increase emissions in absolute terms.

Note that the Energy Efficiency and Conservation Act 2000 is silent on the climate change issue, for a very good reason, we consider - to avoid unnecessary and counterproductive legislative duplication with the Climate Change Response Act 2002.

6. What specific actions could help us to achieve the goal of the Strategy? What, if any, additional costs would you face if those actions were implemented? Please quantify if possible

We suggest starting with the facts and evidence.

The statement on page 10 – “*Process heat offers one of our largest cost-effective opportunities to improve energy efficiency and switch from fossil fuels to renewable energy*” – is of concern, for the following reasons:

- As explained under question 2 and elsewhere in this submission, there is no cost-effective alternative to coal as a source of industrial process heat, at scale, in the South Island.
- North Island coal users could theoretically switch to gas (another fossil fuel), noting that the economics of doing so would need to be assessed case by case.

- Coal is an essential metallurgical input into steel-making and the manufacture of cement and lime, for which there is no commercial alternative at this stage.
- The Bioenergy Association concedes⁹ that only 3.5MW of capacity in woody biomass could be added to New Zealand every year, cf. Fonterra’s Edendale plant with a capacity of 140MW. In other words, there is a long way to go with this technology.
- No evidence is provided in the NZEECS that process heat offers a cost-effective opportunity.

We suggest caution with the following statement, also from page 10: “[Efficiency improvement in the industrial process heat sector] *could also play a significant role in meeting New Zealand’s 2030 emissions reduction target, while helping industries to be more competitive and meet their productivity goals.*”

At issue is that improvements in energy efficiency could be accompanied by economic growth or expansion, i.e., more productive output for the same energy input or release of GHG emissions (alluded to in the MBIE fact sheet accompanying the consultation). In this scenario - a likely scenario, we suggest - there will be little or no progress towards meeting New Zealand’s 2030 target. Emissions could even increase, and that outcome is provided for under the Climate Change Response Act 2002.

Furthermore, the coal sector in New Zealand accounts for around 7% of New Zealand’s total GHG emissions, based on the Ministry for the Environment’s Greenhouse Gas Inventory. So, a 14% reduction in emissions from this sector would have a 1% benefit for NZ’s emissions, i.e., an insignificant contribution. At present the only way to achieve a 14% reduction would be via industrial contraction, and that would be significant.

In any event, progress towards meeting New Zealand’s 2030 Paris Agreement target will depend on NZ emitters with high marginal costs of abatement having access to carbon markets at affordable prices. As matters stand, and to the best of our knowledge, NZ emitters face the highest carbon price in the world, with the first tranche of industry protection removed on 1 January 2017¹⁰. While outside the scope of the NZEECS, Straterra records its view that this approach is unfair and misguided. We will continue to advocate to Government for smart and informed climate change policy¹¹.

In terms of actions to achieve the goal (with our suggested amendments), insofar as the industrial process heat sector is concerned – to “*support New Zealand to be an energy efficient and productive economy*”, we note the following:

- The NZ coal sector continues to fund research into optimising coal blends, and other measures for increasing the energy efficiency of coal-fired boilers;
- Individual firms, e.g., Fonterra, have their own energy efficiency programmes, and one method of improving energy efficiency is via economies of scale (which may or may not deliver lower GHG emissions in absolute terms);

⁹ <http://www.radionz.co.nz/news/business/317177/bioenergy-sector-concedes-heat-still-left-in-coal-industry>

¹⁰ <https://www.beehive.govt.nz/release/ets-one-two-subsidy-be-phased-out>

¹¹ <http://www.letstalkaboutcoal.co.nz/>

- Firms such as NZ Steel have already achieved much in the way of energy efficiency. This should be recognised.
- Research and development in biomass should continue, as a long-term solution.
- Government should maintain a watching brief on developments with carbon capture and storage overseas¹², with a view to scoping any opportunities in New Zealand;
- Research has been done in New Zealand on co-generation - the use of fossil fuels and renewables to produce both electricity and industrial process heat – an area ripe for policy development to achieve more energy efficiency and emissions reductions.

7. Do you agree that the preferred targets will be measureable and meaningful targets, and support the objectives and actions?

On the proposed target of a *“Decrease in industrial emissions intensity of one per cent per annum on average between 2017 and 2022”*, this will probably be achieved in any case, so this target is realistic, although has nothing to do with energy efficiency and conservation (Energy Efficiency and Conservation Act 2000). It is noted there is continuous improvement in energy efficiency occurring for coal-fired boiler efficiency, and one outcome would be decreased emissions intensity. Note also that absolute emissions from this sector could increase, accompanied by economic expansion, as argued elsewhere in this submission.

In summary, the proposed target is realistic, however, may be meaningless in the context of the NZEECS. A measure of emissions intensity is not a measure of energy efficiency or economic productivity.

As well, there is a point of confusion in our minds - is the 1% a year in addition to expected business-as-usual improvements? Or not? In footnote 13 on page 10, we are provided with the following statement: *“This is in addition to the 10 per cent efficiency gains expected to occur under business as usual”*, which introduces an idea that does not appear to be addressed in the main text, raising questions. Is this 10% per year? Or 10% over the timeframe of the NZEECS? How does this relate to 1% a year? What is meant by efficiency in this text? Clarification of these issues is desirable.

We have not sighted the MBIE / EECA analysis, *“scheduled for publication in early 2017”*. We are advised this will be published in April 2017, too late for us to consider in preparing this submission. We would welcome engagement with MBIE on this publication when released.

On behalf of the NZ coal sector, Straterra seeks early engagement with Government on the Process Heat Action Plan, which we think would focus on R & D and uptake of cost-effective technologies, at scale, that do not yet exist.

In the same vein, Straterra seeks early engagement with Government on the proposal to *“Support increased investment in energy research, development, and demonstration (RD&D) to help foster*

¹² For example, <http://www.iea.org/topics/ccs/>

innovation in the development and deployment of next generation technologies and ensure future productivity gains”.

8. How can we ensure that energy data and research generates knowledge and understanding that can help to unlock our energy productivity and renewables potential?

The first thing is to avoid confusion between energy and emissions intensity, and confusion over the conversion of energy into economic output and release of GHG emissions in absolute terms.

We need data and research that clarify the trade-offs being made in the pursuit of energy efficiency. For example, improved energy efficiency in the industrial process heat sector could deliver increased productivity, and with that economic expansion and increased GHG emissions.

Appendix 1: Energy Efficiency and Conservation Act 2002

Excerpts from the governing legislation are provided below to demonstrate that the EEC Act 2000 contains no reference to the climate change issue or related policy.

Section 5 Purpose

The purpose of this Act is to promote, in New Zealand, energy efficiency, energy conservation, and the use of renewable sources of energy.

Section 10 Purpose and contents of strategy

- (1) The purpose of a strategy is to give effect to the Government’s policy on the promotion in New Zealand of energy efficiency, energy conservation, and the use of renewable sources of energy.
- (2) The strategy must state—
 - (a) the Government’s policies in relation to the promotion in New Zealand of energy efficiency, energy conservation, and the use of renewable sources of energy; and
 - (b) the objectives to be pursued to achieve the Government’s policies in relation to the promotion in New Zealand of energy efficiency, energy conservation, and the use of renewable sources of energy; and
 - (c) targets to achieve those policies and objectives, being targets that are measurable, reasonable, practicable, and considered appropriate by the Minister; and
 - (d) means by which those policies and objectives, and any such targets, are to be achieved; and
 - (e) such other matters as may be necessary to achieve the purpose of this Act.

Section 21 Functions

- (1) The function of the Authority is to encourage, promote, and support energy efficiency, energy conservation, and the use of renewable sources of energy by—
 - (a) advising the Minister on any matter relating to or affecting— energy efficiency and conservation, and the use of renewable sources of energy in New Zealand; or (ii) the functions of the Authority:
 - (b) assisting the Minister to prepare and administer a strategy:

- (c) promoting public awareness in New Zealand of the importance of energy efficiency and conservation, and the use of renewable sources of energy:
 - (d) promoting practices and technologies to further energy efficiency, energy conservation, and the use of renewable sources of energy:
 - (e) arranging for the conduct of research, assessments, demonstrations, and studies:
 - (f) monitoring and reviewing the state of energy efficiency, energy conservation, and the use of renewable sources of energy in New Zealand:
 - (g) publishing relevant information, research, and other material:
 - (h) carrying out such other functions and duties as are conferred or imposed on it by any enactment.
- (2) The Authority must perform its functions to achieve the purpose of this Act, and in accordance with the strategy for the time being in force.
- (3) Subsection (2) does not limit [section 14\(2\)](#) of the Crown Entities Act 2004.