

Jake Roos, [REDACTED]

BSc (Hons) 1<sup>st</sup> Class, Energy Management, MAppSc with Distinction, Energy Management, University of Otago

Thank you for the opportunity to give input on this vitally important matter. I am submitting to this consultation as an energy management and climate change mitigation professional with 14 years of experience. I am also submitting as a 36 year old that has a reasonable chance of living to see 2050 and beyond, and a father with children who certainly have. I am dismayed by the continuously upward trajectory of both the world's and New Zealand's greenhouse gas emissions, the dire warnings of the IPCC, IEA and OECD and other authoritative bodies and most of all by the almost total lack of effective action on the part of governments including my own to face up to what is an existential threat to human civilisation. Climate change is a 'wicked' problem, but it is not insolvable, and given what is at stake, we must solve it. Every emitter has responsibility to act, especially those in developed countries. But while voluntary action on the part of individual people, communities, businesses and other organisations to reduce their carbon footprint is useful, it is only central governments that can change the economic and infrastructural framework of their nations to put them on a pathway to net-zero emissions. That is why I strongly urge the Government to commit to a 40% reduction target for 2030 and more importantly begin working towards it immediately.

### **General comments**

- The Government must set an ambitious target for reducing national emissions from 2020 to 2030. This target should recognise NZ's high per capita emissions, our status as a developed country and the need to stay within the global, finite greenhouse gas (GHG) emissions budget that is consistent with limiting warming to less than 2°C, preferably less. Such a stance, backed by credible action, would be something New Zealanders could be rightly proud of on the world stage.
- An ambitious target that is not based on or supported by a credible action plan is not likely to be achieved. The consultation document lacks such a plan and the Government should establish one as an urgent priority.
- It must be acknowledged the Government's plans to maximise fossil fuel recovery in our territories is entirely at odds with limiting warming to less than 2°C. Proven reserves of fossil fuels are enough to exceed remaining the global 'carbon budget' (shown in figure 1 of the consultation document) several times over. It is a waste of time and resources looking for more given they cannot be burnt. The Government must end subsidies and encouragement for fossil fuel exploration and extraction in conjunction with implementing an aggressive GHG emissions reduction plan.
- The Government is has put too much focus on the uncertainties in its document. The Infometrics report that was used for this consultation, commenting on the shortcomings of their model, puts it succinctly: "Uncertainty should not be a reason for doing nothing. Instead policy should be cognisant of the risks (favourable and unfavourable) and seek to manage those risks."
- The Government has presented cost analysis that is inadequate in terms of:
  - The robustness of its assumptions. The costs presented are based purely on an increased carbon price, while excluding the agriculture sector, any effect on land use including forests, any other supporting policies and measures, any technological change or any negative-cost measures.
  - Exclusion of agriculture: It is not reasonable that other sectors should subsidise the agricultural sector for its greenhouse pollution indefinitely. Annual costs to taxpayers for this may eventually run into billions of dollars.

- Forestry's exclusion is highly significant: Scion Research has identified 1.8M Ha of marginal and erosion-prone land in NZ that could be forested for carbon sequestration and renewable liquid and solid fuel production.<sup>1</sup>
  - Supportive policies and measures could make it much easier for the country to adapt to a higher carbon price. For example directing more government transport spending into low carbon infrastructure like public transport and walking and cycling paths.
  - Not including negative cost measures: EECA has stated recently the current potential for energy efficiency in NZ is a \$2.4 billion annual saving to the country.<sup>2</sup>
  - Not including technological change: obviously technology changes are highly significant and would occur with a strong carbon price signal and/or government leadership.
  - Failure to quantify any of the co-benefits of taking action, particularly domestic action, or the costs of foregoing these co-benefits by relying very heavily on importing carbon credits from abroad. Published research quantifying such co-benefits exists already: e.g. the IEA report 'Capturing the Multiple Benefits of Energy Efficiency' of the University of Otago School of Medicine work on housing and health.
  - Failure to recognise the costs of unabated climate change impacts, which would in effect be unlimited in a runaway warming scenario: a scenario that our present business as usual trajectory would make very likely if not inevitable, as acknowledged in the document (at least 4°C degrees of warming by 2100, most likely leading to further warming after that).
- Public discussion on the topic would benefit greatly from a fuller analysis of costs and benefits being carried out and made available, a full presentation of the opportunities and options that are available to the country and having more time to consider them.
  - The European Union has committed to a 40% reduction compared to 1990. Our high agricultural (methane) emissions are a significant difference between NZ and the EU. NZ could set separate targets for different gases, with a higher one for CO<sub>2</sub> as it is the most long-lived greenhouse gas (as discussed in Box 3 of the consultation document), and that reductions in other gases will have a limited an effect unless CO<sub>2</sub> is reducing.

### **Specific comments and answers to consultation questions**

Page 5, box 1 – The Government should also recognise effects of climate change on other parts of the world having implications for New Zealand e.g. via political instability, war, mass migration, economic recession. It should also recognise that 2°C has been set as a threshold as warming beyond this is increasing likely to be self-perpetuating. If NZ finds itself still able to cope 3.5 °C warmer climate in 2100, it is likely only to be a transitory condition as temperatures continue to rise. Also it should be acknowledged warming beyond only 1.5 °C presents a serious threat to the viability of low-lying nations including many of our Pacific Island neighbours.

Page 6, paragraph 1 – The paper references large scale changes in land use being necessary to address climate change, but the economic modelling used for the document does not include any.

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<sup>1</sup> [http://www.scionresearch.com/\\_data/assets/pdf\\_file/0005/5783/Large-scale-bioenergy-from-forestry.pdf](http://www.scionresearch.com/_data/assets/pdf_file/0005/5783/Large-scale-bioenergy-from-forestry.pdf)

<sup>2</sup> Mike Underhill Chief Executive of EECA, presentation to Energy Management Association of NZ conference 25 May 2015.

Page 6, Figure 1 – I welcome the acknowledgement of a finite global CO<sub>2</sub> 'budget' and that all countries including NZ must do their fair share, but note that 2035 (when this budget will be exceeded at current rates of emissions) is only 20 years away, underscoring action to reduce must start as soon as possible, prior to 2020.

**Question 1 (a)** - I agree with objectives 1 and 3. I disagree with the assertion about affordability as it is phrased. If costs and benefits are to be distributed fairly, their distribution between the present and the future must be considered. Inaction on climate change might be 'affordable' in the short term but only by transferring higher and higher costs onto future governments and people, and limiting their ability to act. This is entirely at odds with the concept of fairness.

**Question 1 (b)** - The most important objective is 3: the contribution must guide NZ over the long term to a low emissions world. Movement towards such a world will be less costly the sooner it is undertaken, as increased sunk costs in 'high carbon' infrastructure can be avoided.<sup>3</sup>

Page 8 –paragraph 3 - NZ's high proportion of renewable electricity, and considerable untapped renewable energy resources potential as an advantage, not a disadvantage to taking action. Modelling by the University of Lincoln showed that 100% renewable electricity in NZ is possible through a mixture of building consented wind and geothermal generation projects, always using wind generation when it is available and a mixture of simple demand-side measures, including night water heating, ripple control, LED lighting and converting 15% of electric heating to pellet fires<sup>4</sup>. This would suggest 100% renewable electricity is attainable well before 2030 and that Government's ambition needs to be greater – namely converting a significant proportion of the vehicle fleet to renewable electricity as well.

Modelling by MBIE shows the Government is presently not on track to meet its 90% renewable electricity target for 2025 with their present policy settings<sup>5</sup> - of all the scenarios modelled by MBIE, only in the 'global low carbon' scenario did NZ meet the 90% renewables target .

Page 11 Box 5. Relying on international offsets also has a negative effect on NZ's balance of payments, as well as foregoing the co-benefits of domestic emissions reduction.

The emphasis on the importance of global forestry carbon accounting rules seems overstated. The amount of carbon sequestered in forests can be measured, and clearly if more land is forested than at present, more carbon is sequestered. Short term fluctuations from harvest will even out over the long term provided the total amount of forest land is not reducing.

Page 11 – bullet 'National circumstances/cost'. The source of the claim that NZ could not achieve as much as the European Union if it made an equivalent level of expenditure is not given. Also, making an international comparison is not likely to be meaningful given the weaknesses in the cost analysis presented in the document.

**Question 2.** NZ's status as a developed nation with high per capita emissions means that the country should set a target at least as ambitious as other developed nations. As a small, remote nation relying on the purity of its natural environment for a competitive advantage in world markets, NZ should be highly sensitive to the perceptions of its trading partners and should be pursuing a strong climate change mitigation programme to protect and maintain this advantage.

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<sup>3</sup> <http://www.iea.org/newsroomandevents/pressreleases/2011/november/the-world-is-locking-itself-into-an-unsustainable-energy-future-which-would-have-far-reaching-consequences-iea-warns-in-its-latest-world-energy-outlook.html>

<sup>4</sup> Shannon Page, Lincoln University, New Zealand. [The role of demand side management in the sustainable electricity system of the future.](#) National Energy Research Institute Conference 2013

<sup>5</sup> <http://www.med.govt.nz/sectors-industries/energy/energy-modelling/modelling/new-zealands-energy-outlook-electricity-insight>

**Question 3.** This question is loaded. Given the benefits of climate change mitigation have not been quantified and the costs are based on modelling with serious shortcomings, it is not clear what cost would actually be faced by NZ households for achieving a given target. As the costs and risks of inaction to New Zealanders in the future are unacceptably high, and the window of opportunity to act to avoid such an outcome is closing, the near-term costs in absolute terms are less important than the relative cost-effectiveness and overall sufficiency of different approaches for achieving an emissions reduction goal consistent with staying below the 2°C global warming threshold.

**Question 4.** As previously discussed, NZ's untapped renewable resources present a huge opportunity to de-carbonise our economy, which is itself a huge opportunity to unlock a wide variety of benefits for the country as briefly described on page 15 of the consultation document, and this deserves further public discussion initiated by the Government in the context of forming an emissions reduction/low and zero carbon transition plan for the country.

NZ's high agricultural emissions themselves may be an advantage if solutions for reducing them are developed and commercialised here as a result: exporting the methods and technologies would benefit the economy.

Page 16, paragraph 1. I note that the present policies are clearly inadequate for achieving an ambitious emissions reduction target. I suggest a cross-departmental approach is taken to assemble a new policy package.

Page 16, paragraph 2. It is asserted that the NZ ETS 'puts a price on every tonne of greenhouse gas emitted.' The NZETS does not put a price on every tonne of greenhouse gas emitted. The agricultural sector is exempt, representing half of NZ emissions. Many landfills are exempt. Apart from forestry many forms of land use change that would release soil carbon are exempt. Exemptions and free emissions unit allocations were granted to owners of pre 1990 forests. Some industries also receive free emissions unit allocations, effectively making most of their emissions exempt, or even acting as a windfall that subsidises emissions when over-allocation occurs.

Page 16, bullet 4. Heavy electric vehicles are presently not exempt from road user charges and the exemption for light EVs could be extended to them as well.

**Question 5.** Given staying within the 2°C limit gives very little time to implement incremental change, New Zealand should not wait for uncertainties to reduce before acting – what is certain is that we, like all nations, must eventually have net-zero carbon emissions before the global carbon budget is exceeded. The Government should set a clear objective of net-zero emissions, with an action plan and timetable, allowing for the public to plan, invest and innovate accordingly. By focussing on making maximum use of presently available technologies and by pursuing approaches that maximise the additional benefits, the costs of taking these actions may be reduced or outweighed - i.e. a low/no regrets strategy. Finally the Government could reduce uncertainty by not just funding research (e.g. into reducing agricultural emissions) but accelerating it and its commercialisation into usable technology as well.