



Services for our Sustainable Future

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Low-emissions economy inquiry
New Zealand Productivity Commission
PO Box 8036
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A submission to the Low-emissions economy inquiry

Thank you for this opportunity to make a personal submission to the Productivity Commission. I have selected the most relevant questions to answer based on my experience.

I have nearly 40 years of practical chemical engineering experience in reducing carbon emissions through my work in industrial energy efficiency, energy management and more recently in smart grids. I have worked for business and Government. I have been on working groups for the Electricity Authority and the New Zealand Smart Grid Forum. I am now on the ARENA (Australian Renewable Energy Agency) advisory panel.

Q1 – How can the Commission add the most value to this inquiry?

I believe from my experience that we must act through considerably higher public funding of low carbon Demonstration projects at scale.

We must get on with some urgency to build these Demonstration projects to learn how we are going to integrate successfully the disruptive clean energy technologies that the world is bringing to market, now at a very fast pace indeed. My submission focuses on the important need to not only create innovation but to also up-skill and train all sectors of the economy to take up the natural benefits coming from a low-emissions economy. These part public funded Demonstration projects under-pin this strategy.

The Commission should report to Government that our public funding of low carbon energy RD&D (Research Development and **Demonstration**) is in dangerous shortfall which is a shocking failure considering the cost society is facing from climate change. Other countries are making this level of commitment and their businesses are taking a lead. I am not going to suggest an absolute level of commitment but \$50 million annually is not out of perspective for the challenges ahead based on our national GDP¹. Using this money in partnership with business, we could see well over \$100 million being spent each year. This is the level of commitment that is needed to make a difference.

¹ Stern et al suggests in their “Global Apollo Programme to Combat Climate Change” initiative in Paris in 2015 that countries should at a minimum be spending 0.02% of GDP on public funded clean energy RD&D projects.

Q11 – What are the main opportunities and barriers to reducing emissions from the use of fossil fuels to generate energy in manufacturing?

The main opportunity is to recognise the importance of using electric technologies to replace fossil fuels in industrial process heating. Electric process heating is more energy efficient than just burning fossil fuels in boilers and along with our renewable grid leads to a low-emissions economy. We led the world with our innovation 25 years ago when ECNZ (Electricity Corporation of New Zealand) had a specialist group dedicated to working in this area. I gave evidence at resource consent hearings about the emission benefits from electric process heating. This specialist work was discontinued in the competitive market and we have used cheap coal and gas ever since leading to our growth in carbon emissions. The main barrier is that we have lost this knowledge, these skills and experience and our process industries have lost their competitive edge. They will have stranded assets. The lack of a future carbon price could be seen as a subsidy to the fossil fuel industry.

Q15 – What are the main opportunities and barriers to reducing emissions in industrial processes?

We should be proud of our aluminium and steel melting operations because they are essentially electric processes and they use renewable electricity. These aluminium and steel products are sought after because their quality and lower carbon footprints.

The Commission should focus on the food processing sector reducing their carbon emissions which will be a bigger part of our sustainable future and the technology changes are within our capabilities.

The main opportunity is advancing the field of chemical engineering. I would like to bring to the Commission's attention the IChemE Chemical Engineering Matters work which New Zealand chemical engineers helped produce². Chemical Engineering Matters examines the cross-cutting challenges of: energy, water, food and wellbeing which will make up our sustainable society. New Zealand chemical engineers are also contributing to the global IChemE Energy Centre which is influencing energy policy in many countries³.

Q22 – What type of support for innovation and technology would best help New Zealand transition?

A new public fund is needed that supports at scale the Demonstration of low emissions solutions and solves the system engineering issues before they arise. There are many good examples around the world which the Commission should study. Two good ones from my perspective are with ARENA and the Low Carbon Network fund from Ofgem (the UK electricity regulator). I am happy to provide the Commission with evidence from these programmes that is creating the transformation and momentum for change which is urgently required. I would be willing to introduce the Commission to ARENA⁴.

² The Institution of Chemical Engineers (IChemE) publication called "Chemical Engineering Matters" can be found at http://www.icheme.org/media_centre/technical_strategy/chemical_engineering_matters.aspx

³ The IChemE Energy Centre can be found at: http://www.icheme.org/media_centre/technical_strategy/energy-centre.aspx?sc_trk=follow%20hit,{0D792DA4-E5D3-4ADF-854C-9478C33ADA27},Energy%20Centre

⁴ ARENA held an Innovating Energy Summit in Canberra in August 2017 which show-cased what they have achieved in getting Australia on their low-emissions journey. Videos from this Summit can be found at: <https://arena.gov.au/blog/energy-innovators-kane/>

The Commission should note that this fund is not a subsidy but an investment in proof of concept and collaboration between business and Government that creates the skills and experience to accelerate the uptake at scale of the technologies that New Zealand will need. Secondly there is a good case for public funding to be spent on climate change mitigation because of the huge cost to society from extreme weather events.

Q34 – Who are the most important players in driving forward New Zealand’s transition to a low-emissions economy?

Our teachers and academic leaders in our schools, universities and technical colleges are key to this success because we need to re-train and up-skill the work force. We need more young people to go into science and engineering careers. These are the stars of the future economy and our future business leaders.

Chemical engineering should be recognised as one discipline that under-pins this low-emissions economy. We train too few technical people in New Zealand if we want future aspirations for transformational change.

Q39 – What do you see as the main benefits and opportunities in New Zealand?

The main benefit must be our international competitiveness with our export products. Our food processing sector must strive towards the zero-carbon target in their products to compete on world markets. We should also be seen as a tourist destination of choice because of our eco-tourism sector, clean air in our smart cities and with our clean transport systems. Innovation in the RD&D clean energy area will lead to new businesses and employment.

Q40 – What does your long-term vision for a low-emissions economy look like?

If the Commission can achieve some positive action from this inquiry we could be the envy of the world in 20 years. We could have a totally renewable grid and an internationally recognised food sector using new energy technology like thermal solar and thermal storage. All our public buildings could use PV on microgrids to be more resilient against extreme weather events and earthquakes.

New Zealanders will be proud of their country in the low carbon world. We will have put aside the shame in being given two “fossil awards” in Paris in 2015 for our lack of vision and in-action⁵.

Thank you for reading my submission and please do not hesitate to come back to me if you would like further supporting evidence about the need for more public funding of low-emission Demonstration projects.



Stephen Drew, FiChemE

⁵ NZ’s second Fossil of the Day award at Paris Climate talks, New Zealand Youth Delegation, 10 December 2015