

**Department of Mechanical Engineering**

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**Re: Submission on the Productivity Commission TOR**

1 Oct 2017

[info@productivity.govt.nz](mailto:info@productivity.govt.nz)

I am one of the world leaders in the field of Energy Transition Engineering. The *Low-emissions economy* Issues paper – August 2017 is a good review of the way policy makers have understood the economy and the issue of fossil fuel in the past. The world has already begun the transition that will take place this century. The most important things for the government to understand about the energy transition are:

1. The future is not like the past
2. Humans have problem solving and opportunity seeking capabilities that do not depend on the future being like the past and in fact are enhanced by disruption and challenge
3. Engineering is the way the built environment and infrastructure currently in place will change in ways that are productive and achieve multiple benefits

The Issues paper has largely not recognized the *way* that it is possible to achieve the transition to a productive, profitable, regenerative low-carbon economy that is actually a better place for all New Zealanders. It is not a criticism to say that the leaders who prepared the position paper based it largely on past knowledge, experience and perceptions. But this is a new century of new challenges and – just like all of the fields of engineering that emerged last century have brought us to where we are now – the new fields of Transition Engineering with specialties in urban form, transportation, electricity and fuels, agriculture, manufacturing, processing, communications and sensing, buildings, materials and water, will change these existing assets and processes one project at a time. I agree that New Zealand in 2050 and 2100 will look very different. If you think about what that really means, some of the most important work to be done will be in engineering and re-engineering.

My main feedback is that the best policy for productivity through the energy transition would be to support the research, education, training and application of Transition Engineering in industry, property development, infrastructure and local bodies (much like fire safety and natural hazards).

Sincerely,

A handwritten signature in black ink that reads 'Susan Krumdieck'.

Dr. Susan Krumdieck  
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Director of Advanced Energy and Material Systems Laboratory (AEMSLab)  
Co-Founder, Global Association for Transition Engineering (GATE)  
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