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NZ Productivity Commission  
PO Box 8036. The Terrace,  
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via On-Line submission

## **Submission on the Productivity Commission draft report**

# **Low-emissions Economy (April 2018)**

Thank you for the opportunity to submit on your Low-emissions Economy report of April 2018.

Your overall objective is aligned to SEF's objectives of *promoting information and supporting action which will help move New Zealand towards a sustainable energy future.*

### **Market led solutions and direct regulation**

SEF supports your finding 12.4 and recommendation R12.3, i.e. integrating distributed energy resources (DER) into the electricity system. Pricing is essential for this, as is competitive access to distribution infrastructure at a reasonable cost. The fact that there will be some stranded network assets, generally owned by incumbent power companies, should not be used as reason to obstruct private investments in efficient sustainable technologies.

Account should be taken of the fact that it is becoming economic for some householders to install PV+batteries and to disconnect from the grid altogether. An increase in the number of consumers for whom being off-grid is a rational economic choice rather than a life-style statement, will have implications for grid demand and the centralised generation. These scenarios need to be modelled for the long-term.

On direct regulation, today's air quality regulation prevents commercialisation of new-technology home wood burners, which could potentially meet the winter peaks and even dry-year home heating which are still unsolved problems in your six scenarios and even in Transpower's ambitious all-electric scenarios.

SEF supports all three recommendations R15, noting your recognition that energy efficiency reduces peak demands. However, building regulations still encourage cheap hard-to-heat housing and need to be revised to recognise low-carbon policies. Advances in solar water heating, heat pumps, insulation and glazing technologies provide opportunities to update the building code.



## Science and Innovation

On science and innovation, development of efficient wood combustion in houses was funded in the late 1970s by DSIR, and led to today's "approved" wood burners. Further development is needed for advances in ultra-low emission wood burning, leading to dual-fuel residential and institutional heating appliances using electricity when it is in surplus, and wood, wood chip or pellets at winter peaks or especially in dry years.

## Expansion of Forestry

Expansion of forestry is presented in your report as "having to continually plant more and more land in forests." This is wrong because it ignores utilisation. In fact, significant carbon is sequestered in timber-framed buildings – New Zealand is at the forefront of developing wood for commercial buildings and high-rise. For housing, the embodied energy in thick-walled (140mm) fully insulated buildings and the resulting reduction of heating (and cooling) loads is critical to a low-carbon energy system. Utilisation of residues from harvested forests are a neglected resource that can provide both residential and industrial energy to replace fossil-fuel heating with long term CO<sub>2</sub> emission reductions.

## Electrification of Transport

Your report's Section 11 on transport, is almost entirely about the vehicles not the planning that provides other options for moving people and freight. Local authorities could be drivers of change, and some cities, including Wellington, have significant "Low Carbon" policies. SEF supports Recommendation R11.5 – working with local councils to use pricing to reduce congestion. But we note that finding F11.15, that rail and coastal shipping, is not taken further to a recommendation is short-sighted. The statement "a large proportion of freight carried by road is not economically contestable" should be challenged from a long-term perspective. SEF considers both rail and coastal shipping to be essential features of a low-carbon economy in the long-term.

SEF doubts that private transport will be electrified to the extent that your scenarios suggest. The attraction of battery electric vehicles (BEVs) is currently the absence of road user charges, subsidised charging stations, and some preferential road use. When consumers have to pay full costs, BEVs will be far less economically attractive to consumers buying electricity at retail prices. Limited range BEV's may be used as a second car, but BEVs are inherently unsuited to widespread use in NZ as the primary family car.

In contrast, plug-in hybrid EVs (PHEVs) are ideally suited to widespread use in NZ as the family car. They suit the Kiwi's preference big SUV vehicles. PHEV's are free from range-anxiety and not limited by the time and location issues of recharging. If PHEVs are also granted preferential road use concessions, they could well become the vehicle of choice for middle income New Zealanders' family cars. PHEV's might supply 80% of the eventual EV market in NZ. Market modelling is needed to determine a more credible figure.

The modelling in your report is flawed in defining PHEVs as "*low-emission vehicles that produce zero or near zero tailpipe GHG emissions*". PHEV's typically have a range of about 50km on battery before they switch to become a petrol hybrid vehicle - and a not very efficient one at that. In real-world general use by busy people unconcerned with micro-managing daily cost, the proportion of mileage driven on electricity with a PHEV could well be 50% or less. Behavioural modelling is needed to determine a more credible figure.

Your modelling should be revised to include credible ratios of PHEV to BEV uptake and electricity to petrol use in PHEVs. If these ratios are 80% and 50%, then the GHG emissions from the NZ EV fleet would be 40% of an equivalent fossil-fuel fleet - not 0%.

A problem with the reality of PHEVs is that the vehicle emissions intensity is unpredictable, depending on the user's daily circumstances and lifestyle, so PHEV's are not amenable to vehicle import standards based on emissions intensity.



## **Energy Storage for Dry Year Energy Supply**

Concerns about NZ's history of energy shortages in dry years are questionable given that these were also periods that wind and solar power facilities, if available at the time could well have produced enough energy to maintain hydro storage capacity to ride through a crisis. Therefore, before making recommendations relating to dry year contingency plans to investments in thermal backup storage capability (e.g. in terms of coal stock-piled at Huntly or the construction vast, potentially leaky, gas storage facilities holding costly thermal fuel for prolonged periods) there needs to be a forward-looking study of the prognosis for the coincidence of low availability of rain, sun and wind together over prolonged periods. The study should consider the need for the EA to change the electricity market conditions to appropriately value the use of the existing 4000GWh of hydro reservoir storage. The study should also assume that there will be more wind and solar power along with associated battery storage facilities to mitigate the daily intermittency of the renewables. These batteries could be installed by network grids and householders (possibly with EV batteries connected under V2G arrangements for reserve use) to be available to the grid to support the better use of existing hydro reservoir storage.

## **Scenarios**

The focus on defined scenarios to “calculate” future emissions suffers from the limitations of their underlying assumptions. All “pathways” have near-50% increase in electricity demand (despite the last decade when energy efficiency was the main reason demand was flat). All transport “pathways” are about the vehicles themselves not the urban design that drives the use of vehicles. No scenario puts decentralisation of electricity and fuel supply (e.g. PV and wood heating) as a low-carbon option.

The Government's Climate Change Committee needs to be resourced to study additional scenarios, in particular one or more in which Energy Efficiency First is the driving policy, as is the case of the EU's Directive of November 2016.

## **Conclusion**

The Productivity Commission's Low Carbon Economy is too rooted in the idea of economic growth as a driver of well-being, and too focused on the short-term imperatives of “business” as society's investment decision-makers. We believe that local bodies are a more appropriate focus for low-carbon planning, and that distributed energy including photovoltaic and biomass are the best means of providing resilient energy for households, commerce and industry.