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N Z Productivity Commission

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Dear Robyn,

Please find below Wellington Electricity's review of Section 12 (Electricity) of the April 2018 draft report on a low emissions economy published by the Productivity Commission.

As part of our review, we have also included responses to the August 2017 issues paper which provides some further context to our thinking as an Electricity Distribution Company into areas of electrification of transport fleets.

I trust this approach is acceptable.

Apologies that our response has been released after the 8 June date for receiving comments. We hope that the comments below will be considered.

We would appreciate being able to present these views should there be an opportunity to discuss the comments below.

Please do not hesitate to contact the undersigned.

Yours faithfully

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Response to Low Emissions Economy, Draft Report April 2018

F12.1

Agree that the 2050 projections will be difficult to predict on the basis of competing demands for consented renewable central generation and the competing interests of residential generation and the development of Distributed Energy Resources.

F12.2

Government should avoid subsidies for Distributed Energy Resources (DER). There is likely to be a second market develop will allows at a distribution network level the management of DER's to complement the current energy market.

F12.3

The position of 100% renewable electricity needs to be rethought and widened to include 100% renewable energy. This will bring into play the transport sector for electrification and support the displacement of fossil fuels which make up roughly half of our energy usage.

R12.1

Agree with the electricity sector to remain subsidy free.

R12.2

Agree that the emissions reduction in electricity is sufficient and therefore there would be diminishing returns to artificially target a higher contribution. However widening the opportunity to increase renewable energy would be a much more pragmatic approach as it is more affordable and acceptable to the consumer. By targeting energy, it is likely that investment will also benefit the electricity percentage as a secondary issue.

Q12.1

The RMA dos need to be considered around constraints for wind. However the constraints around hydro are more difficult to mitigate. Further wind development is likely to be more favourable than hydro due to potential adverse effects.

F12.4

There will be a change to current business models for Distribution businesses to facilitate DER and DR into networks so that they effectively deliver benefits to consumers and across the supply chain.

It is likely that there will develop a digital secondary market for DR and DER.

R12.3

Pricing is one method to support adoption of DER and DR. However it won't be sufficient to allow the benefits to accrue to consumers and across the sector. There needs to be consideration of other digital platforms which can also consider the security of the low voltage part of the Distribution system upon which the DER and DR will trade. Without

this security oversight, the system will be subject to poor quality outcomes and more frequent loss of supply situations.

The Electricity Authority may not be thinking wide enough to consider sub-markets which support the wider energy market, ie the transactions are not happening at traditional reconciliation interfaces and are operating in real time, rather than half hourly.

R12.4

WE supports the role of the DSO to ensure stability of the electricity system which is interfacing directly with the DR and DER.

There needs to be closer coordination between the Electricity Authority and the Commerce Commission to ensure the coordination of asset investment and adoption of new technology to provide low emission facilitation is matched by the desire of pricing signals from the market.

F12.5

Agree that the EA will not be in a position to influence generation emissions. Also agree that minimising regulatory barriers is a sensible way to allow the degrees of freedom to manage uncertainty for the long term benefit of the customer.

Responses to August 2017 Issues Paper Questions

Q1

Value from the PC can be added by looking into how to transition to the LE state. Much of our regulation preserves the status quo and does not enable incentives to explore the innovation and R&D required to make changes to current business models.

It would be useful to explore how we change adoption rates for new technology amongst New Zealanders.

Q2

We seem to have a transport solution, but needs fleet leadership to assist implementation. Agriculture needs a large change to meet LE targets – we need to find a better way to make protein from cellulose rather than using bovines. Alternatively house the bovines to manage emissions and bring in and take away the food and waste from a closed system.

Q3

Emissions by farm should be balanced by the carbon sink each farm also brings to the wider emissions picture. Need to ensure there is no double counting of forestry and the problem harvesting removing the carbon sink. One of the dilemmas with dairy expansion is the inclusion of centre pivot irrigation which has removed traditional shelter belts and therefore removing trees on farm to balance the GHG production.

Q4

The opportunity is reviewing when methane is produced and using this to consider whether herds can be shifting into a building so methane is captured for part of the day. The building would also be used to capture waste which also mitigates further emissions. The moving of dairy stock for milking is a regular process, so moving under cover, with feed and water for half of the day would have an impact on emission reduction and utilise extending the existing milking structures.

Q5

Issues on alternative low emission land use will be important when the world markets add the methane emissions from the animal with the carbon miles from the shipping to get to overseas destinations. New Zealand should consider reassessing its international advantage of water and pasture space in developing other protein sources. This may require new developments for land use into farming insect proteins, which can be powdered and presented in a similar way to international markets.

Q6

NZ has a range of land productivity, with some poorer soils ideal for growing trees to sequester carbon. With the right incentives, farming would be able to balance or buy into land balances where forestry (native or production) could offset animal emissions. The barrier to this would be allocating some farms to raise trees and reduce animals, but this can be managed through a share trade between the separate businesses to set up a new structure.

Q7

There needs to be less siloed policy making around forests and combine the agriculture problem with the forestry solution to determine how this would work together.

Q8

Price & Range and charging infrastructure are often touted as barriers, but each of these have ready-made solutions which are not effectively developed, communicated or socialised.

The price of new EV technology can be ameliorated by second hand car purchases, which is well practiced by New Zealand vehicle owners. To get a stock of second hand vehicles, Government fleets should shift their 2-3 year old EV's into the market. Hence, leadership by Government to get new EV's into their fleets is important.

New vehicle price can be managed by taking an operational approach to the purchase price. Again, metered electricity can have a range of rates applied, so having an electricity meter integral to the vehicle is a natural development that allows recovery of a capital purchase price as part of its operation. This will see vehicles charging at 30c per litre (v \$2 for liquid fossil fuel) to be charged 50c per litre equivalent, hence lowering the purchase price and spreading this across the electricity charge.

Range is something drivers have concern about as they naturally think about their longest trip, rather than their average daily commute of 30-40km. Hence, city dwellers could see an EV as their "second" vehicle, until the EV range improves or vehicle owners look to lease a vehicle for long trips, releasing their capital tied up in car ownership – again this is an education issue and a societal belief in ownership above rental.

Charging Infrastructure has a bearing on where can I refuel (linked to range anxiety), however most residential vehicles will charge at home which will be perfectly adequate for daily work-home commutes. There could be advantages for Parking Buildings to adopt trickle charges, so that the 30-40km used to get to work is returned over the 8 hours spent in the carpark building. Street charging has been found to be problematic, so "charging as a service" is more likely to develop at shopping mall carparks or other 1 hour duration activities people engage in during their daily lives.

Q9

Government fleet adoption would assist seeding the cheaper second hand residential market. The finance lease approach of car sales lowering the purchase price and making a recovery as part of the electricity price with the car having on-board electricity metering and tariff management.

Q10

The main opportunity outside of passenger vehicles adopting EV technology, would be to use Hydrogen as the main heavy transport fuel, including public transport.

New Zealand has a rich wind resource, with Wellington being considered a transport hub as much of its consumables are trucked daily from Palmerston North. With both Wellington and Palmerston North having established wind resources, it would not be inconceivable to develop a hydrogen electrolysis model at each centre and run a trial of

hydrogen transport between the two centres. This would have spin offs for the Wellington public transport sector, including buses, trains and ferry fleets.

Q11

Industrial heat emissions will be a more difficult prospect due to the efficacy of coal. Biomass is worthwhile exploring. The CO₂ from coal can be used for greenhouse fuel, provided there are sufficient growers in proximity of the coal fired boiler flue gas.

Electric boilers or gas boilers would ultimately be the preferred solution; however this would create an on-cost for the manufacturer which could make their products less competitive on international markets.

Q12

The hydro firming effect from wind generation is a positive outcome for the NZ electricity market. The "spilling" of wind energy has a solution with the electrification of transport fleets, dry year risk and industrial heat but converting the "spill" into an energy storage media. This introduces the opportunity to use electrolysis to store hydrogen for transport, dry-year and industrial heat applications.

The focus on 100% renewable electricity is a short sighted target and Government needs to be encouraged to lift its aspirations to think big and aim at a 100% renewable energy target. It would be uneconomic to continue down the narrow target of renewable electricity when transport, operating on fossil fuels, accounts for 50% of our energy needs. Lifting our aspirations to bring electricity into transport fleets (hydrogen for heavy and public transport supplied by wind energy "spill") has a far better outcome for NZ.

From an electricity market perspective, there is necessary change at the consumer and network interface to ensure "behind the meter" renewables are encouraged to be flexible and take an active role in peak demand reduction. This would essentially become a digital secondary market which operates on a transparent platform allowing a consumer centric approach to reduce demand based on a market signal or increase consumption based on capacity headroom incentivising lower rates. The future of cost reflective pricing allows customers or aggregators to trade "behind the meter" generation and storage in concert with the network and retail requirements.

Q13

Climate patterns appear to introduce larger extremes of weather than the earlier 10 year period. This has an impact on network reliability as older assets, which deliver to more densely populated areas can be interrupted by stronger weather conditions.

Hence the renewable energy sources do need to consider operability over a wider operating range, where off-shore wind turbines are now being used on-shore to provide a more resilient infrastructure.

Q14

Electricity generation will still be required to meet security of supply expectations and operate in locations to deliver a reliable service despite a number of constraints.

Opportunity is to consider spill of wind being used for production of hydrogen through electrolysis to support heavy/public transport fleets and as a renewable fuel for dry year risk. This would then differentiate hydro storage with a hedge of hydrogen storage.

Q15

No comment

Q16

Healthy Homes projects where buildings are insulated to make them energy efficient and provide positive health benefits to residents are an effective initiative to reduce greenhouse gas emissions.

While arguably, burning clean, dry wood is carbon neutral, it would be a preferred result by continuing to extend the Healthy Homes initiative to include heat pump installation and removal of open fires.

Q17

We would be happy to provide "Energy from Waste" details from our Group's international experience in this area. The low population in New Zealand and its cheap landfill opportunity makes it difficult to compete with the higher cost Energy from Waste alternative.

Our Group is currently generating electricity from waste at Hampton Downs landfill which has a number of benefits and challenges.

There is limited opportunity to reduce emissions from waste.

Q18

Renewable energy into Transport fleets has a number of knock-on positive benefits as part of transitioning to a low emission economy.

Q19

Direct regulation benefits of removing RUC from Electric vehicles are a small incentive for car purchasers making a switch to an EV. However, there needs to be some Government leadership in fleet purchasing in order to provide a feedstock of good second hand vehicles to be released to the New Zealand public. This would be an area where direct regulation of Government vehicle fleets would benefit New Zealand.

Support the continuance of New Zealand maintaining market based approaches.

Q20

No comment

Q21

The benefits of electrifying transport fleets from our renewable electricity base allow market based incentives to be considered which have been adopted in Norway. These have tackled the new price gap between EV and petrol vehicles by taxing the ICE pollution in a way which puts EV pricing on a comparable footing on a lifecycle basis.

Q22

The electrification of transport fleets as a response to support a low emission economy will require the trial and piloting of new projects in order to ensure these concepts can be delivered in the real world.

There is already work being undertaken, supported by the Electricity Authority, for cost reflective pricing to ensure clear price signals are delivered for the recharging of EV batteries away from the peak congestion period of the electricity network.

Because electricity networks are Price/Quality regulated, the current regulation does not envisage new technology investment above the current poles and wires allowances.

There could be an incentive scheme which share additional costs of piloting or trialling new technology solutions in order to ensure adequate new investment supports the timely adoption of new technology solutions

Q23

No comment

Q24

Other Countries are using Green Funds which appear to be supplementing the additional costs of establishing low emission positions. While New Zealand has a strong culture of not having subsidies, if the cost of a fund is less than the future penalty cost of Carbon, then this approach should be considered further for projects that require additional starting capital to get them off the ground or are not able to be funded by traditional business models.

Q25

Regulation needs to be forward looking to enable some of the change anticipated. For the electricity sector, regulation is largely backward looking on the basis the regulator does not want to pick winners and leave it to market forces to predict the future. This is OK when there is no change and existing processes are sufficient for the environment, however when change is required, then the regulatory framework should incentivise the correct change in behaviour by rewarding achievable targets.

Q26

As a Price-Quality regulated business, any change needs to be carefully evaluated for the impact the regulatory system has on the business. The cost and effort to change from the status quo is enormous, hence change is often not considered on a single issue. Therefore the risk and uncertainty of change can create a dis-incentive to adopt change unless this has been trialled or a proof of concept project has been proven and is scalable across the business.

Therefore to assist in change, there needs to be the freedom and incentive to be able to invest in short term trial projects that allow the business confidence that the change is sustainable over the longer term.

Currently the Government has the opportunity to take a leadership role in the promotion of electric vehicles. It is difficult for businesses to embrace this change when

Government is not providing leadership of adopting EV for their fleets. If this is to be a Government led and supported initiative on a low emission economy then Government needs to lead by example and support business.

Q27

Transport has a large opportunity from a framework setting to bring electricity into the mix at a faster rate as an effective way of reducing emissions. It has clear social benefits and car manufacturers are now competition with a number of their models being made available into the market.

Q28

The current statutory framework does not drive the change needed, but appears to hold our behaviours at the status quo level. That is, it raises awareness to take care and not do any more as far as increasing emissions. The statutory framework does not convey the right incentives to reduce or make changes to a low emissions economy. If I wanted to buy a new vehicle, there is no outward guidance or consequence visible at the car yard as to the choices I could be making for my transport dollar when it comes to a low emissions outcome. Sure, there are more fuel efficient vehicles, which are a status quo outcome; there are no direct comparator electric vehicles which can demonstrate the advantages of how my spending choice impacts a low emissions future.

Q29

Not sure independence will work sufficiently well when the problem we are trying to solve requires collaboration and coordination across the economy and society.

Q30

Adaptability will be an important requirement for setting policy direction for a low emission economy.

Q31

Take care not to fall into the paralysis by analysis when considering past data sets as a guide to the future when you are anticipating a change to low emissions.

Changes in technology may require data to be gathered in different ways as part of a trial project to get the understanding of the change rather than from the review of historic records.

Q32

Yes, history dictates that one single approach will not receive everyone's support. Approach needs to be multi-layered to attract wide adoption.

Q33

Co-benefits around electrification of transport fleets are reasonably well understood and operate across a number of levels. There are clear benefits to consumers around household affordability and health benefits on lowering emissions. There is a financial (treasury) benefit of importing less oil. The list continues.

Further transport fuels involving Hydrogen wider this to larger transport fleets as well as produces a fuel which can be stored and provide dry year contingencies. It can also begin to offset industrial heats reliance on coal.

The Healthy Homes project would not have achieved its success if marketed on an energy efficiency platform – however the health benefits to the community and consumers in cold draughty homes made this initiative a success. There are also funding schemes built on the back of this project which would be useful for low emission projects.

Q34

This has to be Government led and Local Government supported with Policy and Regulation acting in concert for the change required to move from the existing to the new low emissions platform.

Q35

Limited ability to avoid low emission investments will mean that the existing transport remains for single vehicle homes and there in future is a way of showing the economics of transitioning to an EV which is cheaper than the petrol price they are paying for transport for an ICE vehicle. The economic case exists at an operational fuel basis, not quite there for the up-front purchase of the vehicle.

Some good work is being undertaken on clean fuels for space heating and this could be a requirement to ensure low income families receive space heating fuel which is certified.

Q36

The pillars of transport, agriculture, industrial heat and managing waste more effectively are strong areas to make the largest gains and encourage the greatest participation by the community and consumers who through supporting policy will be encouraged to make the correct low-emission decisions for their future.

Q37

I think we need to think differently about Methane (animals) and CO2 (transport). Both need to be phased and the decision on transport is an easier “sell” than the decision on methane, as methane has a rural sector reliant on its continuation for their prosperity and the Country’s.

Due to this different weighting, methane needs to be managed in a way that it is captured, rather than reduce the stock levels as a binding decision.

The transport solution is easier to achieve without affecting the livelihood of the community.

It may be a case of putting more effort into the low hanging fruit (transport) while we explore wider options for Methane reduction.

Q38

Emissions leakage is a big issue to consider, however it could provide interference with the clear message communities would require to take action towards a low emissions

future. We would be better to clean up our own back yard and develop strategic advantages in the export area because of this, rather than hang back and stay in the middle of the pack.

Who knows, with heavy transport fleet development we may also create a low-emission shipping solution so we have a clear advantage for our products being sold in international markets.

Q 39

The main benefits and opportunities of a low emission economy is New Zealand remaining positively differentiated from the rest of the world. Not only is there a greater opportunity to command a higher price for export products, but the Intellectual Property we gain from the transition will be valued by other Countries in order to buy this know-how from New Zealand and implement this into their own Countries. This will commercialise our low emission position.

Q40

New Zealand does need a shared vision for a low emission economy. The first pillar is low emission energy (not just electricity) this combines industrial heat, transport etc, the second pillar is forestry for Carbon Sinks, but include these where there are methane producing animals or carbon deals between land owners where poor land in trees can support pasture. The third pillar is food as this will be the selling point which differentiates New Zealand to the rest of the World.

Properly implemented, this investment will set up a level of low emission IP we can commercialise with the rest of the world as well as the markets for our low emission goods.