11 July 2022

Commerce Commission New Zealand
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Re: Submission on "Part 4 Input Methodology Review 2023"

Counties Energy Limited submission is in regard to the Commerce Commission's (Commission) *'Part 4 Input Methodology Review: Process and Issues Paper*' (the Paper).

Counties Energy is a consumer owned EDB that is exempt from price-quality regulation. Despite being exempt Counties Energy has for the last eight years calculated its price-quality path to provide guidance on annual changes to its line prices.

1. Impact and timing of decarbonisation

New Zealand's total annual electricity energy use in 2020 was 141.99 PJ[1] as compared to total carbon-based fuel in the same year of 362.52 PJ. With decarbonisation customers currently using the 362.52 PJ of carbon fuel will mostly switch to electricity[2] with the energy transported on EDB distribution networks. The speed of this transition is unknown; however, it will occur, and history shows that the transition can occur more rapidly than incumbent companies expect[3].

Over the next IM regulatory period 2025 to 2030 it now seems likely that there will be an accelerated uptake of EVs in New Zealand. This is due to the accelerating impact of climate change and major car companies switching their manufacturing base over to the production of EVs. Other factors likely to accelerate EV uptake is the entry of low-cost Chinese EV companies selling into the New Zealand market, continuation of the government EV subsidies and high petrol and diesel prices.

As the uptake of EVs occurs, and the wider conversation from fuels to electricity, under current practices EDBs will be required to invest in increased network capacity to be able to supply the resulting higher peak power demands. This will include all aspects of their networks from the requirement for more low voltage

[1] Latest available annual data from MBIE. https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/energy-balances/
[2] Biofuels will play a role and potentially green hydrogen. It should also be noted that electricity can be more efficiently used so 1 PJ of electricity will replace greater than 1 PJ of carbon-based fuel.
[3] Classic examples of the rapid uptake of new technology displacement being film cameras with digital cameras, push-button mobiles with smart phones and video rentals with online streaming.

fuse connections to peak demand capacity investments in distribution transmission and substations. The associated costs will be passed on to consumers albeit consumers will most likely benefit overall from lower energy costs[4].

2. EDB efficiency

Counties Energy's believes that the Paper does not differentiate the efficiency gains referred to MEUG in clause 5.45 and by ERANZ in clause 5.46 and the efficiency gains referred to by Solar Zero in clause 5.51. MEUG and ERANZ are referring to efficiency from operational gains that relate to a cost reduction for a certain activity and for which they proposed benchmarking. SolarZero is referring to efficiency gains from greater utilisation of an EDB's network.

We note that in Appendix A of the Paper it is stated that "Productivity is defined as the ration of a volume or monetary measure of outputs … to a volume or monetary measure of the inputs used in their production". EDB network utilisation is around 20-30%, consequently, increasing network utilisation to between 40% and 60% would double the output while not increasing the input, so doubling EDB efficiency. This is achievable with decarbonisation because most New Zealand distribution networks have a maximum capacity designed for a cold winter weekday afternoon, or morning, demand peak when there is increased residential demand for space heating[5] that coincides with commercial and industrial demand. Outside of this peak time there is spare network capacity that if used causes no increase in EDB costs.

In comparison, efficiency gains from benchmarking is a comparative analysis to identify EDBs that have higher input costs per output (i.e. per ICP or per km of network) compared to other EDBs. If the Commission used benchmarking to reduce the identified EDB operational cost, this at best will only provide minor incremental improvements and only for those EDBs that have been identified as being 'inefficient'[6]. Clearly, this will only provide minor efficiency gains compared to obtaining improved network utilisation.

Consequently, Counties Energy believes that it is critical for network utilisation to be improved if EDBs are expected to enable decarbonising without major capital expenditure. Otherwise, EDBs will continue to invest to ensure capacity during network peaks using traditional methods with the costs passed on to consumers. This is referred to in SolarZero's statement in clause 5.51 "on the Orion network there is enough spare capacity to enable charging of some 300,000 EVs at off peak times".

3. DSO enablement of flexibility services

There will inevitably be a large uptake of DER irrespective of what approach EDBs take, with households installing EV chargers and improved photovoltaic battery economics from lower technology costs and high electricity prices. At the same time continuing the IM unchanged is a poor strategy given many EDBs are

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[4] For example, household electricity bills will increase for charging EVs, but the cost of fully charging an EV battery is less than filling a vehicle with petrol or diesel for the equivalent miles.

[5] The peaks occur for only very short periods of the time because they are driven by infrequent winter cold weather events rather than regularly occurring during winter weekdays.

[6] It is exceedingly difficult to determine an EDBs efficiency because of the enormous number of variables outside of the EDBs control that determines operational costs per ICP or per km of network. For example, the higher the percentage of urban network the lower the operational cost, the higher the percentage of network undergrounding the lower the cost, the less step the terrain the lower the network cost and the lower the vegetation growth (around overhead lines) the lower the network costs.

risk adverse and will choose a guaranteed return over the riskier option of trying something new or innovative with uncertain returns. It will signal to EDBs to continue to invest in capital heavy options that provide a guaranteed return over the life of the assets. This is possible because decarbonisation can be delivered through a large capital investment to maintain reliability, deliver regulated voltage and provide additional network capacity, but it will be at a cost to all consumers.

Counties Energy believes that to avoid inefficient investment there will be a requirement to maximise network utilisation. This would be through measures such as managing the distribution network dynamically by using real-time smart meter data to understand network operating envelope[7] and integrating with customer-side DER technology through an energy retailer or DER Aggregators to reduce peak demand or peak generation, with slight adjustments to the customer experience, through an energy orchestration platform[8]. EDB's would need to bid for the DER resources.

To provide these smart alternatives to traditional investments, EDBs will need to invest, or contract Distributed System Operator (DSO) functionality. A distribution network operator (DNO) to DSO relationship would operate in a similar manner to how a Transmission Network Operator (TNO) and Transmission System Operator (TSO) operates today in the transmission space.

As with Transpower, the future DNO would continue to invest in the network building capacity, maintaining the network and operating the network. Similarly, as with the national transmission System Operator, the DSO will provide contracted capacity and demand and a dynamic reserve capacity market being bid into by energy retailers, generators and DER aggregators to commercial gain, which offsets the need for inefficient investment. There will be points of differences between the DSO and TSO operating models where it makes sense, but also a need for more co-ordination between the 'System Operator' (DSO, TSO) components of the transmission and distribution parts of the value-chain to provide a more informed view of demand, generation and capacity.

In addition to the DSO model, how the power quality is measured needs to change away from high voltage metrics like SAIDI and SAIFI. This is because the decarbonising solutions by customers will occur at the low voltage (LV) level and so there needs to be an increased emphasis on LV reliability. Furthermore, a change from reliability performance measures of the network needs to more availability performance measures to be introduced at an ICP level[9].

Lastly, improved network utilization will require increased operational costs, with new costs such as purchasing the rights to control EV chargers from an aggregator, to reduce capital expenditure. Under the current IM methodology, these new costs will not be capture in the new regulatory period if operating costs continue to be based on historic costs. In addition, the increased operating costs will replace capital expenditure that in turn lowers an EDB's RAB and, consequently, the profit it is able to make. To mitigate

[7] i.e. customer demand, asset capacity and network topology.

[8] The energy orchestration platform could undertake the following to manage network demand or generation peaks: release electricity from home batteries, reduce individual EV charger demand, reduce home solar generation or dynamically make transformer tap-changes to maintain regulated voltage levels.

[9] This already occurs in other markets such as telecommunications, where performance is measured by availability of service to the customer.

these issues either the IM will need to move to a 'total expenditure' (totex) model, or the Commission will need to improve IRIS incentives.

4. IRIS incentives

Counties Energy believes that the Commission's use of IRIS incentives needs to be reconsidered given the following issues:

- IRIS is reliant on the Commission being able to accurately forecast capital and operating expenditure which seems optimistic given the uncertainty for EBD investments from decarbonisation for the next regulatory period to 2030. For instance, Counties Energy has been approached by one customer to convert from fuel heating to electricity and this one requirement could result in a 15% to 25% increase in Counties Energy total peak demand. While this is significant decarbonising transport will have a significantly larger impact because three times more energy is used for transport compared to fuel for heating;
- For EDBs to improve network utilisation they will need DSO systems, but the resulting cost will increase operating costs and likely result in an IRIS financial penalty. To offset this penalty payment an EDB would need to obtain a future IRIS capital savings that offset the penalty payment, the time-value of money and the lost return that can be made on a capital investment. Consequently, a DSO strategy for a non-exempt EDB would be high risk. One way to reduce this risk would be a totex IRIS approach.
- The impact of global warming is impacting the operating costs of EDBs with a higher frequency of storms and greater wind speeds, which impacts overhead infrastructure. The impact of global warming will continue to increase and EDBs will need to increase operating and capital expenditure to mitigate the impact. Given this, and that electricity is now classified as a human "need" rather than a "want", EDBs will need to invest in more resilient network solutions and new network solutions[10].

Counties Energy would be happy to discuss any aspect of this submission.

Yours sincerely

Andrew Toop
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[10] An example of this reliance could be an investment in community batteries-decentralised solar and battery back-up for remote communities that provide ride-through of 3-4 hours for critical loads, which provides EDBs sufficient time to fix the fault.