



16 November 2020

James Stevenson-Wallace  
Chief Executive  
Electricity Authority  
Level 7, Harbour Tower, 2 Hunter Street  
Wellington 6143  
New Zealand

By email: James.Stevenson-Wallace@ea.govt.nz

**TPM impacts on grid-connected battery investment**

Dear James

Contact Energy is concerned that the Electricity Authority's benefit-based and residual charges may unintentionally undermine investment in new technologies, notably grid-connected batteries.

These concerns have come to light as we investigate investment in a 100 MW grid-connected battery. Its purpose would be to provide peaking generation, instantaneous reserve and voltage support. A key benefit of the additional instantaneous reserve is that greater utilisation of the existing capacity of the HVDC will be possible and therefore additional transmission investment (e.g. the fourth submarine cable) can be deferred.

We have proposed the voltage support role to Transpower who has been highly supportive of the concept. Collectively, these services will benefit all consumers and are strongly aligned with the Authority's purpose statement, and potentially reduce the market's reliance on thermal generation and support the Government's wider decarbonisation goals.

To perform these services, the battery will need to be frequently charged and discharged. The intention is to charge during off-peak periods when there is a surplus of electricity and transmission capacity and then discharge the battery during periods when demand is high or other generation is scarce. The Authority has confirmed that under the current TPM a grid-connected battery is treated as a "Load Customer" rather than a "Generator". Based on the existing Regional Coincident Peak Demand (**RCPD**) charge, this approach does not lead to a material transmission charge as there is no effect on peak demand and no additional transmission costs are incurred.

However, by replacing the existing RCPD charge with the unavoidable Anytime Maximum Demand (**AMD**) charge, a grid-connected battery will incur a charge regardless of whether it is charged during periods when there is an abundance of transmission capacity.

In addition, the removal of the existing RCPD charge has the potential to materially increase peak demand. Grid-connected batteries are likely to be the most cost-effective way of meeting this higher peak demand (and without the carbon emissions of a gas-fired peaker). But the same set of policy changes that create the need for grid-connected batteries also actively discourages them.

We estimate the benefit-based and residual charges for a 100 MW grid-connected battery to be ~\$7 million each year. This estimate is based on NZ Steel having an average AMD of 170 MW from 2014 – 2018 and the Authority calculating an uncapped residual charge for NZ Steel of \$11.9 million. By the same logic, transmission charges (connection, benefit-based and residual charges) for a 1,000 MW pumped hydro

scheme (such as what the Government is currently investigating at Lake Onslow) could be in the order of \$100 million per annum. At a smaller scale, the economics of fast charging for electric vehicles will also be undermined by the new TPM.

Under the existing TPM, a grid-connected battery would pay approximately \$0.5 million per annum in the way of connection charges depending on location but nothing in the way of interconnection charges. This would mean that a 100 MW battery with a capital cost of approximately \$100 million would generate a small positive return on investment under our calculations. However, the addition of the new interconnection charges under the new TPM (PV of interconnection charges of approximately \$80-90m over the life of the battery) would make this investment uneconomic. Transmission charges of this magnitude mean that a grid-connected battery would simply not get built and more expensive alternative options would be required, such as gas-fired peakers, transmission solutions and voltage support devices.

We do not believe that the new TPM intended to discourage investments in grid-connected batteries, as opposed to discouraging inefficient investment in behind the meter batteries for the purpose of avoiding transmission charges. We note, for example, the Authority is currently updating the rules that cover how energy and reserve from batteries are offered under the Code. The objective of this work is to enable new generation technologies to participate in the wholesale electricity market. We fully support this work, however the TPM undermines this objective.

We think the TPM requires a discrete amendment to reflect the unique characteristics of grid-connected batteries which are effectively both a generator and a load customer. The cleanest way to amend the TPM, without revisiting or relitigating other elements of the TPM, would be to expand the scope of the Prudent Discount Policy to include grid-connected batteries, and investments like hydro pumped storage schemes that would operate like a battery. To our knowledge, there was no discussion of grid-connected batteries as part of the TPM review. As a result, the emergence of these technologies meet the “material change in circumstance” threshold to revisit the TPM.

We have spoken to Transpower and Authority staff and agree with their assessment that Transpower has no discretion under the new TPM Guidelines to create a ‘carve-out’ for grid-connected batteries.

We appreciate the desire of the Authority to draw a line under the TPM review. We share these sentiments. However, an amendment is required to avoid creating a perverse outcome of the lowest cost and lowest emission generation solution to meet peak demand being priced out of the market because it is treated as a load customer for the purposes of transmission charging.

Given its significance and wider consequences for the acceleration of key renewable generation projects, we request that the Authority work with stakeholders to rapidly develop an amendment to the TPM that is well targeted, reflects actual costs and minimises market distortions.

Yours sincerely,



James Kilty  
**Deputy Chief Executive Officer**

Copy to: Alison Andrew, Chief Executive, Transpower  
Chris Bunny, Deputy Chief Executive, MBIE