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## TRUSTPOWER SUBMISSION: EMERGING TECHNOLOGY PRE-WORKSHOP PAPER

### 1 Introduction

- 1.1.1 Trustpower Limited (Trustpower) welcomes the opportunity to provide a submission to the Commerce Commission (the Commission) on its *Input methodologies review: Emerging technology pre-workshop paper* (the Pre-workshop paper).
- 1.1.2 Trustpower is a member of the Electricity Retailers Association of New Zealand (ERANZ). We endorse the ERANZ submission on the Pre-workshop paper. Our submission emphasises some of the key points in that submission, discussing how emerging technologies have been treated in Australia, what we consider the definition and scope of the regulated service is, how we consider battery storage should be treated by the input methodologies (the IMs), and that we consider a market-led approach would best promote consumer choice and competition.

### 1.2 Trustpower's interest in this IMs review

- 1.2.1 Trustpower is a renewable power generator and multiproduct retailer, headquartered in Tauranga. Trustpower was founded in 1924 as a local power authority, the Tauranga Electric Power Board, and has developed into one of New Zealand's best performing companies in the generation, wholesale, and retail trading sectors of the electricity industry.
- 1.2.2 Unlike the other generator-retailer members of ERANZ, the majority of Trustpower's generation assets are embedded within distributors' networks, rather than being connected to Transpower's transmission network. Trustpower owns and operates a total of 20 hydroelectric power schemes (comprising 38 stations), two wind farms, and one diesel peaking station, across New Zealand.
- 1.2.3 Trustpower's assets have provided network support services to Transpower for many years (including in the national ancillary services markets and demand-response scheme). Many of the distributed generation assets perform similar functions at the distribution level, particularly those that have controllable reservoirs up stream.

- 1.2.4 In our view, the functions that these assets provide are very similar, if not direct substitutes, for those provided by grid-scale batteries. If any of our dispatchable hydro stations were to be fitted with pumps (thus becoming pumped storage plants), they could draw load off networks as well.
- 1.2.5 Trustpower therefore has a direct interest in the outcomes of this Working Paper. We have the ability to provide network support services to distributors and look forward to being able to do so, alongside other non-network solutions, within a competitive framework.
- 1.2.6 Trustpower also owns and operates three embedded hydro stations and two embedded wind farms in Australia, alongside a large grid-connected wind farm. We have been following the Australian regulator's workstream on the treatment of batteries under Australian regulation, and quote extensively from its conclusions through the remainder of this submission.

## **2 The electricity sector is undergoing significant change due to emerging technologies**

- 2.1.1 The electricity sector worldwide is undergoing significant change. This change is largely fuelled by emerging disruptive technologies. These technologies are creating new markets and services that disrupt, and sometimes replace, existing ones.
- 2.1.2 All elements of the electricity supply chain are likely to be affected by emerging technologies. Electricity distribution businesses (EDBs), as well as all other businesses in the electricity sector, need to be cognisant of the coming changes, and alter their business models accordingly.
- 2.1.3 We are beginning to see examples of disruptive technologies and business models in the New Zealand electricity sector. Notably, Flick Energy, Powershop, and SolarCity have introduced new business models and are disrupting traditional retail markets.
- 2.1.4 As technology continues to develop, consumers will be offered an increasing number of services to choose from. For example, Tesla envisions a future combining solar PV and battery storage to generate electricity at scalable capacities. Ultimately, consumer choice will determine how the electricity sector changes.
- 2.1.5 Now, more than ever, regulators need to be mindful of their impact on competitive markets in the electricity sector, so that these markets are able to thrive, and provide consumers a selection of innovative services to choose from. Regulation should not stifle or impede the competitive deployment of emerging technologies, or the competitive operation of existing technologies in offering the same services as new technologies.
- 2.1.6 Regulators in other jurisdictions are also reviewing how emerging technologies should be treated by regulation. The Australian Energy Market Commission (AEMC) recently examined how battery storage should be treated under Australian regulation.<sup>1</sup> Its report traversed largely the same ground as the Commission is currently undertaking. We agree with the findings of the AEMC report, and would encourage the Commission to consider the AEMC's findings when reaching its decision on how to treat emerging technologies.

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<sup>1</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>

### 3 Definition and scope of the regulated service

3.1.1 This section outlines our interpretation of the definition and scope of the regulated service. We first outline why we disagree with the Commission's approach, namely that we consider that the Commission's interpretation is overly inclusive, and in effect seeks to redefine the regulated service.

3.1.2 We then outline our approach, namely that:

- a) The plain and ordinary meaning of conveyance of electricity by line should be adopted;
- b) The regulated service should be interpreted in light of the purpose of Part 4; and
- c) The focus should be on the *function* of the technology, rather than the technology itself.

### 3.2 The Commission's interpretation of the regulated service is overly inclusive and seeks to redefine the regulated service

3.2.1 The Commission's approach, as outlined in their Pre-workshop report and slide pack, is to ask:

a) Is what the supplier is doing part of the service, where the service:

- i. Is the conveyance of electricity by line; and
- ii. Is not excluded by any of the exceptions in s54C(2)

and then asks:

b) In relation to assets: is the asset used to provide the regulated service?

c) In relation to activities: is the cost attributable to the regulated service?

3.2.2 Accordingly, the Commission considers that emerging technologies may be included in the regulated service when they are used to provide or support the regulated service. Battery storage is used as a case study, and is deemed to fall within the regulated service as it is capable of providing a number of benefits to the regulated service.

3.2.3 We agree that the focus should be on the *uses* of technologies, or the *functions* that they perform. However, we disagree with the Commission's interpretation of the regulated service. We consider that the Commission's interpretation is overly inclusive, and seeks to redefine the regulated service by expanding the scope and scale of regulated activities.

3.2.4 As outlined above, we note the potential for emerging technologies to redefine the electricity sector and transform traditional supply chains. However, we consider that the regulated service is fixed, as prescribed by the Commerce Act 1986. It is simply the conveyance of electricity by line.

3.2.5 The conveyance of electricity by line, unlike other facets of the electricity supply chain, such as generation, has been subjected to regulation as it is recognised as having natural monopoly characteristics. Accordingly, we consider that the definition of the regulated service cannot, and should not, be stretched to include contestable services.

3.2.6 In order for regulation to be effective, and competitive markets to thrive, we consider that there needs to be a clear delineation between the regulated and non-regulated elements of the electricity supply chain. The AEMC also came to this conclusion.<sup>2</sup> We consider that the Commission's current approach unnecessarily blurs those lines.

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<sup>2</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, p4. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>

### 3.3 We support ERANZ's interpretation of the regulated service

3.3.1 We support the ERANZ interpretation of the regulated service, namely that:

- a) The plain and ordinary meaning of the regulated service (the conveyance of electricity by line) should be adopted. This does not include network support services, such as the functions provided by distributed generation or battery storage; and
- b) Expanding the scope of the regulated service to include such contestable services would contravene the purpose of Part 4.

3.3.2 This view is also reflected in the AEMC report, which noted that regulation should only be contemplated where competitive forces cannot deliver the required benefits to consumers.<sup>3</sup>

### 3.4 The focus should be on the functions of the technology

3.4.1 As noted above, we agree with the Commission that the focus, when assessing whether or not a technology falls within the regulated service, should be how it is used, or the functions that it performs. This is raised in the ERANZ submission, which states:<sup>4</sup>

*"The Commission should assess emerging technologies in terms of the services they provide, and then assess those services in the context of the purpose of Part 4 to determine the appropriate regulatory treatment."*

3.4.2 The AEMC also determined that the functions performed by battery storage technologies should be the focus when considering reviewing regulatory frameworks. Regulators should not focus on the technologies, but rather on the functions those technologies perform:<sup>5</sup>

*"When considering how regulatory frameworks accommodate new technologies, it is the functions they perform that need to be the focus, not the technologies themselves. It is our view that while storage and particularly battery storage may become more pervasive, the functions it performs are not different to other types of technology and can be accommodated within the existing regulatory frameworks. For instance, many of the functions that storage devices could perform can also be performed by a generator, and so the devices in many cases can be treated as a generator of the same size in a similar commercial context."*

3.4.3 We agree with this view. As discussed above, many of our distributed generation assets are able to provide the same network support services as batteries. From our perspective, regulation should be agnostic to the technology employed.

## 4 Treatment of battery storage – a case study

4.1.1 This section outlines our thoughts on how battery storage should be treated by the Commission. The Commission used battery storage as a case study of how emerging technologies would be treated under the IM's.

4.1.2 We disagree with the Commission's treatment of battery storage.

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<sup>3</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, p4. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>

<sup>4</sup> ERANZ, "Emerging Technologies Workshop Submission", 4 February 2016, p6.

<sup>5</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, pi. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>

4.1.3 We consider that battery storage is a contestable service, akin to generation, and does not fall within the regulated service. We also consider that that all battery storage services should be treated the same way, regardless of whether they are embedded in the network, or beyond the point of supply. Batteries are largely capable of performing the same functions at any point in the network.

## **4.2 Battery storage is a contestable service, performing the same functions as distributed generation and other forms of network support**

4.2.1 We do not consider that battery storage falls within the plain and ordinary definition of the conveyance of electricity by line. This is also supported by the AEMC. The AEMC considers that battery storage is a contestable service, falling outside of the regulated service. It considers that any storage device should be treated as a generator as it performs the same function – exporting electricity to the grid. We agree with this approach.

4.2.2 As noted in the ERANZ submission, battery storage does not possess natural monopoly characteristics.<sup>6</sup> Battery storage is fundamentally different to the traditional lines services provided by EDBs. This would hold true with most other emerging technologies.

4.2.3 The Commission outlined a number of network support functions that battery storage may offer to the regulated service, namely: avoiding or deferring the need for investment in traditional network assets, improving reliability of the network, and reducing transmission charges.<sup>7</sup> We agree that these services benefit the regulated service. However, we disagree that these services perform the function of conveying electricity by line.

4.2.4 These services are currently provided by other technologies, such as pumped hydro-generation, and other flexible and dispatchable co-located load and generation. In the future these services could also be performed by home batteries, grid-scale batteries, solar PV, home automation services, and electric vehicles with V2G capability. Battery storage, and these other technologies, are akin to pumped hydro-generation. While pumped hydro stores water to convert into electricity when required, battery storage stores electricity to inject into the grid in the future when required.

4.2.5 Dispatchable demand (such as hot water cylinders) also operates in exactly the same way as storage, by reducing load (akin to increasing outflow from storage) and increasing load (akin to filling storage) as and when required. While hot water cylinders have been controlled in this manner for decades in New Zealand, the potential for control of other appliances – heat pumps and other space heaters, fridges and freezers, for example – is significant. In North America, for example, third parties are now remotely controlling heat pumps completely independently of the retailers and network companies, and monetising the value of this flexibility for consumers.

4.2.6 It is important that New Zealand’s regulatory framework allows these consumer-led competitive models and markets to emerge and thrive in this country.

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<sup>6</sup> AEMC, “Integration of Energy Storage - Regulatory Implications: Final Report”, 3 December 2015, p1. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>

<sup>7</sup> Commerce Commission, “Input methodologies review - Emerging technologies: Pre-workshop paper”, 30 November 2015, p 18.

## 5 The counter-factual: a market-led treatment of emerging technologies

- 5.1.1 This section outlines our thoughts on how a market-led treatment of emerging technologies would best promote consumer choice and competition. It outlines how the benefits of battery storage and other emerging technologies would be better realised through competitive markets, how clearly defining the regulated service would facilitate a market-led approach by providing certainty, and how procurement rules should be established to ensure efficient market-led solutions are provided where possible.

### 5.2 We support a market-led approach to emerging technologies

- 5.2.1 We support the market-led approach outlined in the ERANZ submission at section 4. We consider that a market-led approach to the deployment of emerging technologies would best promote consumer choice and competition. Including emerging technologies in the regulated service, be it in whole or part, would distort the competitive markets for otherwise contestable services.
- 5.2.2 The AEMC report noted that network-led solutions would undermine competition and consumer choice by providing unfair advantages to EDBs where:<sup>8</sup>
- 1. The network business is able to cross-subsidise a competitive service from its regulated activities. A cross-subsidy may impede competition in the competitive market.*
  - 2. In the course of performing its regulated activities, the network business acquires commercially sensitive information that may provide it with an advantage in a competitive market. Metering data or load profile data are examples.*
  - 3. The network business is able to restrict competition in a competitive market by restricting access to infrastructure or providing access on less favourable terms than to its affiliate.*

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<sup>8</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, p11. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>

5.2.3 As described at 4.2.3 above, the Commission outlined a number of benefits that battery storage could provide to the regulated service. We consider that each of these benefits would be provided by competitive markets, as explained in the ERANZ submission:<sup>9</sup>

- *the regulated service provider would be prepared to pay for the benefits delivered to the regulated service up to the level of the next best alternative investment (say, investment in traditional (poles and wires) technologies).*
- *the emerging technology service provider will want to charge the regulated service provider an amount that at least compensates for the investment and operating costs of the battery investment, less the benefit of revenue streams received from other services the technology may provide (e.g. provision of ancillary services, energy arbitrage benefits to the consumer).*
- *while the emerging technology service provider will want to charge more than this amount, if there are competing providers (which may include an arms length associate of the regulated service provider) then there will be downwards pressure on the price of the network benefit.*
- *competing emerging technology service providers will deliver innovative service offerings and terms that best suit consumer's needs.*
- *an EDB can signal where on its network batteries would be most beneficial by posting differing prices by feeder (say). Where capacity expansion investment is required in the near term a higher network benefit price is offered, where capacity expansion investment is not needed for many year the posted price will be low. The price can signal information about the network that is either held closely within the EDB or may be difficult to ascertain from published material such as the Asset Management Plan.*

5.2.4 The Commission's approach also assumes that the benefits to the regulated service outweigh the benefits of a market-led solutions. We would encourage the Commission to consider the counter-factual, looking at the value of unregulated services that could be offered by market-led solutions.

5.2.5 The AEMC examined this in its report. The AEMC received submissions from network businesses that a network solution incorporating battery storage to provide network support and other services would be more efficient than individual customers purchasing battery storage devices themselves. However, the AEMC disagreed with those submissions, noting that consumer choice and preference should drive the development of the energy market, and that it is important that the investment case of a consumer or retailer is not distorted by the actions of network businesses.<sup>10</sup>

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<sup>9</sup> ERANZ, "Emerging Technologies Workshop Submission", 4 February 2016, p15-16.

<sup>10</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, piii. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>.

## 5.2.6 The AEMC report further stated:<sup>11</sup>

*Utilising the competitive market frameworks currently in place will allow consumer preferences to drive how the sector develops. New business models will be tested and those that offer value to consumers will thrive while those that do not will vanish. The way consumers value storage and associated services will determine the deployment of this technology and competition between providers will keep costs low. A consumer-led deployment is not necessarily orderly – but consumers are generally in the best position to decide what works for them. We are wary of proposals that seek to impose solutions or particular technologies on consumers at the expense of competition, especially where they result in consumers bearing the risks of the technology deployment.*

## 5.3 The Commission should clarify the scope of the regulated service

- 5.3.1 The Commission would best facilitate market-led solutions by clarifying the scope of the regulated service, providing certainty to industry. The Commission could achieve this by clearly outlining the functions performed by natural monopoly businesses to convey electricity by line. Where a service does not perform one of those traditional functions, it does not fall within the regulated service. Where a service performs functions that benefit the regulated service, such as network support services, the EDB may contract for those services, as currently occurs with distributed generation.
- 5.3.2 The AEMC highlights that a lack of clarity between regulated and unregulated services could be damaging to competitive markets:<sup>12</sup>

*It will [...] be very important in the context of storage, but indeed other potential technologies such as smart meters, home energy management systems, 'smart homes' and electric vehicles, that the line between regulated and non-regulated services is clear, and that the ring-fencing guidelines are robust and strongly enforced. Any lack of confidence in the practical reality of separating multiple revenue streams from a single asset, and only financing the regulated services from regulated revenue, will be damaging to the market and could potentially deter investment by non-network participants.*

## 5.4 Procurement rules should dictate full exploration of market-led solutions

- 5.4.1 We consider that EDBs should be required to go to the market and tender for services that benefit the regulated service. As noted in the ERANZ submission, if the EDB wishes to compete in non-regulated markets, it should do so on a transparent and arms-length basis.<sup>13</sup>

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<sup>11</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, pii. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>.

<sup>12</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, p12. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>.

<sup>13</sup> ERANZ, "Emerging Technologies Workshop Submission", 4 February 2016, p16.

5.4.2 This was also the approach adopted by the AEMC:<sup>14</sup>

*We have already seen a number of players entering the Australian storage market and there is nothing to suggest this market is not able to deliver the sorts of products and services required by consumers, network businesses and large-scale generators. Network businesses should only be allowed to own storage behind the meter through an effectively ring-fenced affiliate that separates this activity from the provision of regulated network services. There are however a range of options available to them, through commercial arrangements with other service providers, to leverage the benefits of storage.*

## 6 Summary

6.1.1 In summary, we consider that:

- The Commission should reassess its interpretation of the regulated service, looking at the plain and ordinary meaning of the conveyance of electricity by line, and the purpose of Part 4;
- The Commission's approach to the regulated service should focus on the functions of the emerging technology, rather than the technology itself. This is particularly important with the Commission's approach to battery storage. We consider that the functions performed by battery storage are already being performed by distributed generators;
- Battery storage is a contestable service, performing the same functions as distributed generation and other forms of network support;
- The Commission should consider the potential for a market-led approach to emerging technologies as a counter-factual to regulation; and
- The Commission should facilitate a market-led approach by clarifying the regulated service, and putting in place procurement rules for when EDBs seek to invest in contestable emerging technologies themselves.

6.1.2 For any questions relating to the material in this submission, please contact me on 07 572 9888.

Regards,



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<sup>14</sup> AEMC, "Integration Of Energy Storage - Regulatory Implications: Final Report", 3 December 2015, pii. Available at: <http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/AEMC-Integration-of-energy-storage,-final-report.aspx>.