Auckland Airport

2 February 2016

Electricity Authority
PO Box 10041
Wellington 6143
by email: submissions@ea.govt.nz

Dear Chair,

Re: Implications of evolving technologies for the pricing of distribution services

Auckland International Airport Limited (AIAL) welcomes and thanks the Electricity Authority for the opportunity to be involved in this economic regulation consultation.

Auckland Airport is in the position of operating a 'utility island', operating electricity, water supply and wastewater, stormwater, roading, fuel and gas networks of varying sizes and shapes.

While the precise attributes of these networks are dissimilar, certain principles are the same, and Auckland Airport has recognised that a consumption-based pricing model may not deliver the optimal funding approach for future utility infrastructure.

It should be noted however, and this paper should be read in the context of the customers of Auckland Airport's utility networks being commercial rather than residential.

Supportive of change in electricity distribution pricing design, Auckland Airport endorses the current approach of the regulator providing guidance on distribution pricing, and of simplifying the principles where possible – as per the Castalia recommendations.

This approach would enable each electricity distribution business (EDB) to implement a similar approach/principles in a manner that recognises and allows for the unique attributes of their local customer base to engender the best long-term outcomes.

Auckland Airport has committed to reviewing its distribution pricing structure. Once the optimal structure has been determined, any transition period should be able to be minimised to reduce uncertainty for our customers, and any complexity and/or costs incurred by our business in maintaining multiple pricing models for a period of time. Auckland Airport would support the Electricity Authority (EA) to endorse a rapid transition to a new pricing structure.

Our further responses to the consultation questions are set out in Appendix 1 below. If you require further information or wish to discuss this response, our contact person for this submission is Anthony McGivern, Commercial Manager – Utilities, 027 809 3949, anthony.mcgivern@aucklandairport.co.nz.

Signed on behalf of the Auckland International Airport Limited by

02-Feb-2016

Judy Nicholl
General Manager Aeronautical Operations

Appendix 1 – Responses to specific questions

Questions		Response
Q1.	What are your views on the scope of the Authority's review? Please give reasons for your answer.	The purpose of the review is to explore and improve the understanding around this issue (the impact and potential of emerging technologies) and to identify the tools available to effect meaningful influence within the electricity market to achieve the greatest value and efficient operations for the long-term benefit of consumers. Taking this into account the scope could be expanded to consider a greater remit of potential market mechanisms that are available, in order to effect the outcomes sought. Circa 32% (source; MBIE Energy Quarterly) of electricity is consumed within NZ's residential sector, of this distribution charges make up only 26.2% of the average residential consumer's bill, which averages at approximately $165 per month. Distributor prices could have minimal impact on the consumer. It would require a high degree of variation in distributor prices to create sufficient magnitude of variation in the total bill in order to influence the residential consumer's behaviour. Or the Distributor requires a greater relationship with the consumer in order to influence change that will benefit the long term interests of the network and ultimately consumer. Currently the commercial relationship with the consumer resides predominantly with the Retailer. Additionally, due to any retailers' products repackaging/rebundling of distributor pricing structures, the materiality of any distributor's market signal or influence is significantly eroded by the time it reaches the residential consumer. Within a consolidated billing framework, the distributors employ electricity retailers to bill everyone's customers, and network charges are subsequently recovered from the retailers. The value and costs of this arrangement need be reconsidered. The scope of the EA's review could be expanded to review all market mechanisms that are available to influence consumer behaviour, to ensure that the considerable efforts and resources (of both market governance and participants) are spent to achieve the greatest outcome.
Q2.	What other technologies do consumers invest in or use that are likely to have a material effect on investment or operation of distribution networks? Please give reasons for your answer and an estimate	House intelligence (residential equivalent of a commercial B.M.I.S.) and scheduling automation (such as Google's Android@Home application) are likely to have an increasing impact over time with regards to phase shifting residential consumption. The increasing availability of comparative Retailer and intra-day pricing information available via smart meters and mobile applications with further transform the consumption profile, enabling customers to

	of when you expect the technologies will have a material effect.	become much more selective and pricing signals (if available/transmitted successfully to the customer) to be more effective.
Q3.	What do you think about the Authority's concerns that existing distribution pricing structures do not reflect the costs of the different distribution services provided and may not be durable?	Historically consumption-based pricing was a fair proxy for establishing network charges due to the well understood and consistent profiles of consumers. However due to emerging technologies, in particular: • phase shifts in consumption being driven by uptake of distributed capacitance (e.g. batteries) and intelligent scheduling technology, • demand change resulting from the proliferation of distributed generation – such as solar (photovoltaic) panels, and • mode shifts in consumer behaviour, e.g. from fossil fuel to electric vehicle are all changing the profile of consumer use and not in an easily predictable manner. These changes are not happening equally in the same geographical areas either which results in greater magnitudes of distortion across the distribution grid. This supports the EA's view that the current structure of distribution pricing is not durable for the future. Auckland Airport's continuous drive to improve operations currently intends to shift the design of its tariff structure away from consumption-based towards a model that makes the consumer appropriately accountable for the costs that their decisions and actions drive. This initiative commenced in 2015 under the title of 'Future Infrastructure Funding' and involves the integrated approach to design of capital development contributions (IGCs) and operational charges (fixed, variable, capacity, service, maximum demand levels, etc.) via tariffs to enable the real impact of consumer decisions upon a network to be allocated and incorporated into customer decision processes.
Q4.	What is your view of the potential for a significant amount of inefficient investment in solar panels if distribution pricing structures continue to be based primarily on a consumption-based approach?	Auckland Airport has no view on the efficiency of residential investment in solar panels. However, reviewing solar (photovoltaic) power generation in isolation is becoming a legacy approach now that transactional battery technology is maturing – the historical out-of-phase nature of residential supply and demand is less of an issue. The combination of these technologies should be treated and modelled as a single product. Within the commercial and industrial sectors there is greater alignment between photovoltaic supply and demand and Auckland Airport remains committed to pursuing innovation, sustainability and emerging technology, and implementing solutions where there is a net benefit to be realised within the system, to the long-term benefit of the consumer.

Q5.	What is your view of the potential for inefficient investment in distribution networks if there is a high uptake of electric vehicles and distribution pricing structures continue to be based primarily on a consumption-based approach?	Auckland Airport's electricity network consists of predominantly commercial and industrial premises. Slow charge is less of an issue, however rapid chargers can result in unpredicted / unplanned increases or spikes in load which could be smoothed through the application of distributed grid storage (discussed further in response to Q6).
Q6.	What is your view of the potential for battery technology to defer or avoid investment to augment distribution networks?	The traditional electricity supply chain consists of Generator, GIP – Transmission – GXP, Distribution – Consumer... This traditional linear/radial model of the electricity supply chain (described in section 2.1 of the consultation papers) is rapidly being disrupted by a mesh architecture where the increasing quantities and impact of distributed generation and capacitance are resulting in distributors becoming responsible for connecting distributed supply to demand. Over the planning horizon of the National Infrastructure Plan 2015 there is considerable (capital and operational) investment panned for the entire supply chain; generation, GIPs, wholesale, transmission, GXPs as well as distribution-grids. There could be very significant value in the deferment of planned activity enabled via capacity and demand matching within local networks now that battery technology is maturing? Locating generation geographically much closer to consumption also has impacts upon the supply risk profile and reduction in line losses to further improve the efficiency of the system. The impacts of urban intensification (such as within the PAUP) upon upstream market functions would also be reduced by colocation of generation and consumption. The key benefits to inclusion of grid energy storage (e.g. transactional batteries) is intra-day demand curve smoothing (aka. peak lopping the metaphorical 'rush-hour') enabling deferment or elimination of investment in upstream infrastructure. A smoother profile also enables cheaper base load electricity generation to be more fully leveraged, and may also reduce the requirement for spinning and non-spinning reserve generation potentially reducing the end price per unit seen by the customer. The modular nature of batteries also means that capacity can be added or taken away (and moved to a different location) as local areas' profiles change. Critical factors to the optimisation of a network's design are the development time and the lifecycle of major infrastructure. In order to maximise outcomes (e.g. utilisation and commercial performance), the

		network operator with views of both supply and demand, and the current responsibility for the distribution network must be responsible for grid energy storage.
Q7.	What is your view of the potential for alternative distribution pricing structures to promote more efficient investment by consumers in heat pumps and / or LEDs?	Auckland Airport currently intends to investigate its pricing structure in light of emerging innovation and technology, and continue to improve/optimise all our systems (incl. pricing structures) as change occurs in the operating environment. A distribution pricing structure that educates consumers to the impacts of their behaviour, makes consumers accountable for the costs that their decisions and actions drive, and likewise returns a benefit to a consumer for any material outcomes they deliver to the network, would incentivise good practice. Costs, economics and operating environments change significantly over the life of utility infrastructure, so this pricing structure redesign would be outcome focused, not on any particular technology.
Q8.	What is your view of distributors' options for structuring their pricing?	Auckland Airport is currently reviewing its funding structure as per the response to Q3.
Q9.	What needs to occur for distributors to amend their distribution pricing structures to introduce more service-based pricing?	An early market signal that service-based pricing is the direction the industry will move towards will support the rapid movement of the industry. Operating a mix of consumption and service-based pricing models across a customer base will add duplication and complexity to operations (increasing costs), and treating customers differently in how they each fund infrastructure is neither equitable nor consistent with principles relating to subsidies across the market. A strong and early market signal to this effect would enable a short transition period, assisting simplicity and benefitting the customer by supporting transparency and stability and minimising disruption.
Q10.	Would a change to the applicable rules encourage change to pricing structures?	Prescriptive changes to the rules can result in unintended consequences that do not add value to the system and could obstruct the best intentions of participants. Guidelines or principles that participants are strongly encouraged to remain consistent with, would enable distributors to localise their implementation accounting for each micro network's attributes and requirements to deliver the right outcomes for the network and market overall.
Q11.	What incentives could be introduced to encourage change?	Service-based pricing design is a good practice that, when designed and implemented effectively, should drive fair and equitable funding of a network by the recipients of its benefits.

Q12.	What other options would ensure distribution pricing structures are service-based?	No comment.
Q13.	Do you have any suggested improvements to the distribution pricing principles in Appendix B? What are your views on the recommendations made by Castalia noted above and in Appendix B?	Auckland Airport endorses both the Principles as reasonable and Castalia's suggestions as improvements that would add value.
Q14.	Do you have any suggested improvements to the distribution pricing information disclosure requirements in Appendix B?	No comments.
Q15.	What other issues with the current distribution pricing arrangements should the Authority address?	Electricity infrastructure is expensive and has a long lifecycle. In order to optimise design, long-term performance and thus minimise consumer unit prices the distributor should remain responsible for network operations and the delivery of reliable supply, including all instances of grid-level energy storage, e.g. batteries.
Q16.	How will New Zealand-specific circumstances influence the effects of evolving technologies in this country?	No comment.