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Submissions
Electricity Authority
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By email: submissions@ea.govt.nz

SUBMISSION on –
Implications of evolving technologies for pricing of distribution services consultation paper

1. Introduction

Thank you for the opportunity to make a submission on Implications of evolving technologies for pricing of distribution services consultation paper. This submission is from Consumer NZ, New Zealand's leading consumer organisation. It has an acknowledged and respected reputation for independence and fairness as a provider of impartial and comprehensive consumer information and advice.

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2. Overview

A summary of our views on the implications of evolving technologies for the pricing of distribution services is set out in section 3. Our answers to the questions in the Consultation Paper are set out in the requested format in Appendix A below.

If you require any further information please do not hesitate to contact me.

Yours sincerely

Sue Chetwin
Chief Executive

3. Our view

We are pleased the Authority is consulting on the effects of evolving technology on distribution pricing, and share the Authority's concerns existing price structures may lead to premature investment in evolving technologies, and unnecessarily delayed investment in others.

New Zealand's unusually high proportion of renewable electricity generation means consumers are well-placed to use emerging technologies to reduce the proportion of their income spent on energy. Improving energy efficiency in this way also hastens the move to a low-carbon economy, as well as delaying the need for investment in new electricity infrastructure. Consumers need to be supported by clear policy and regulation as electric vehicles, battery storage, solar PV and other new technologies become widely-available. A revised approach to electricity pricing structures will play an important role in this.

However, we are concerned a move to distribution pricing structures which incorporate the different services provided by distributors (cost-reflective tariffs) could have adverse effects on consumers. These effects would be pronounced for those on low incomes if the tariff changes occurred too quickly, or were not accompanied by robust safeguards against sudden bill increases.

For example, an unintended consequence of a move to tariffs designed to better reflect the costs of the 'capacity service', and incorporate the long run marginal costs of investing in distribution networks, could be to increase the fixed component of the retail power price at times of peak demand. As this usually occurs on cold winter nights when the demand for heating is greatest, it could exacerbate fuel poverty (where greater than 10% of household income is spent on fuel), especially for vulnerable consumers on fixed incomes who often rely on inefficient electric space heaters. A University of Otago study found over 20% of respondents to a 2014 survey had experienced fuel poverty, which is thought to be a major contributing factor to NZ's comparatively high rate of winter deaths and hospitalisation[1].

We are also concerned the degree to which existing tariff structures may lead to over-/under-investment in evolving technologies has been overstated. In particular, we have concerns about the supporting NZIER paper *Effects of distribution charges on household investment in solar.* We acknowledge flat network charges could result in premature investment in PV, and that this premature investment could lead to PV owners not paying their 'fair share' of distribution charges and lead to bill increases for non-PV households. But we think the paper has overstated the extent of artificially high investment and bill increases for non-PV households, largely due to predicted rates of PV uptake which are at odds with other research on the topic, and which fails to take into account New Zealand's unique circumstances (see answer four in Appendix A for details).

In addition, we strongly oppose any move to a price structure represented by the counterfactual tariff in the NZIER's paper, where daily fixed charges are increased for most consumers, the mandatory low-fixed tariff option is removed, while consumption charges decrease across the board. This could have grave outcomes for those on fixed incomes who rely on inefficient, high power electric space heating at times of peak demand, and would therefore need to pay for a significant amount of maximum capacity

[1] Lawson, R., Williams, J. (2012). *The nature of fuel poverty in New Zealand*. Retrieved on 1 February 2016 from http://www.otago.ac.nz/csafe/research/otago055642.pdf

during winter. However, we acknowledge this counterfactual tariff is necessarily simplified for the purposes of the analysis.

Another concern with the points raised in the consultation paper is they may present an overly-optimistic view of the potential for electric vehicles (EVs) to replace a significant proportion of petrol vehicles in the short- to medium-term. While we share the Authority's enthusiasm for electric vehicles as a means for consumers to take advantage of New Zealand's high proportion of renewable energy to move away from fossil fuel based transport, local research has shown barriers in addition to current pricing structures preventing the large-scale adoption of EVs (see answer number five in Appendix A for details).

It's important policy-makers bear in mind EVs are likely to be adopted primarily by higher income individuals, and ensure pro-EV tariffs don't adversely affect lower income households which are unlikely to buy EVs in the short to medium term.

This leads into our general concern regulators need to weigh fairness considerations when setting distribution price structures. For instance, any changes to the structure of retail tariffs must take into account the needs of those who spend the highest proportion of their income on electricity, so pensioners and beneficiaries don't see any undue increase in their bills, which could exacerbate fuel poverty. That said, the consultation paper does an admirable job (see Case study: residential investment in solar) outlining how well-off PV-owning consumers can unfairly avoid paying fixed distribution costs, and shift them on to non-PV owning consumers who are more likely to be in lower socioeconomic groups, which we agree is an issue that needs addressing.

To summarise:

- We acknowledge existing distribution price structures may not be durable, and believe a review of tariff structures in light of evolving technologies is timely.
- We are concerned changes to price structures could unfairly impact consumers who are unwilling or unable to adopt PV, electric vehicles and battery storage.
- The risk of overstating the size of the inefficiencies resulting from artificially high solar PV uptake could lead to pricing structures which negatively impact vulnerable consumers, especially if the low fixed charge option is removed.
- We think the rate at which the evolving technologies discussed in the consultation paper will be adopted needs to be carefully reviewed before any changes are made to pricing structures.
- Changes to tariff structure need to occur gradually and must be accompanied by safeguards to prevent bill increases for those who spend the greatest proportion of their income on power.
- In our view, the most important pricing principle is (d), which promotes price stability and certainty for stakeholders. This should be given the greatest weight.

APPENDIX A

	Question	Response
Q1.	What are your views on the scope of the Authority's review? Please give reasons for your answer.	The technologies likely to affect electricity distribution services have been well covered by the consultation paper. However, the scope of the Authority's review should have taken into account the effect of distribution prices on consumers on low or fixed incomes, who are unlikely to adopt technology like solar PV, electric vehicles or battery storage in the short to medium term. Vulnerable consumers generally spend a far higher proportion of their income on electricity, when compared with well-off consumers who are likely to be the first to enjoy the benefits of these technologies. In addition, they are likely be hard-hit by any changes to tariff structures which result in higher peak charges.

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 of when you expect the technologies will have a material effect.	We believe most technologies that will have a significant effect on distribution prices are covered in section four of the consultation paper. Two related technologies not mentioned specifically in the report (but covered under the broad 'smart' appliance discussion) are smart water heating controllers and power diverter modules. Power diverters can channel surplus power from a residential PV system to an electric hot water cylinder when required, rather than selling it back into the grid. If cylinders are well-insulated, this could go some way to negating the counter-seasonal generation issue that means PV-owners often use the full capacity of the network. Another area not covered in section four was non-PV distributed generation. This includes micro-hydro schemes and small wind turbines. While we acknowledge that the uptake of these systems has not been, and is likely to remain, lower than PV-uptake, they should be taken into account. Hydro and wind generation have significantly higher capacity factors than PV, and do not have the same issues associated with PV's mismatch with New Zealand's demand profile. As a result, they do not have the same potential to result in inefficient distribution pricing. Micro-hydro schemes and small wind turbines therefore have the potential to be unduly penalised by a distribution pricing arrangement that seeks to avoid over-investment in solar PV, but skews too far towards discouraging over-investment in distributed generation in general. Their market penetration remains low, but falling costs or innovative new hydro / wind turbine technologies could make this technology more attractive for consumers, which would reduce the need for new investment in distribution infrastructure, especially for lines companies in rural areas.
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?	We share the Authority's concerns that existing price structures do not reflect the cost of the different services distributors provide, and acknowledge that the cost of premature investment in greater network capacity could be deferred by separating charges for transport, power quality, capacity and management services.

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?	We agree there is a risk consumption-based distribution prices could lead to over-investment in solar PV. However, we disagree with the extent of the issue as portrayed in the supporting NZIER paper *Effects of distribution charges on household investment in solar.* The paper argues the cost of artificially accelerated investment in solar as a result of current price structures (including low fixed charge tariffs, which the paper refers to as 'high consumption charges') could be between $2.7 billion and $5billion, which could lead to retail bills rising by around 10%. This is based on a large and enduring increase in the uptake of solar PV panels, to the extent that 40% of all suitable households will have it installed within five years, rising to 80% of the maximum possible number of installs within 10 years. However, a 2014 survey on consumer attitudes to solar power by the University of Otago's Centre for Sustainability found 4% of consumers own PV, with an additional 8% intending to purchase within the next five years. In addition, 43% said they'd never considered purchase, with another 19% saying they'd thought about it but rejected the idea.[2] The following year, the University of Canterbury Electric Power Engineering Centre showed a reduction in the rate at which installed residential PV capacity was increasing, which they said suggests residential PV is becoming less attractive as a result of the November 2014 cuts to buy-back rates.[3] In addition, New Zealand consumers do not receive government assistance for solar, or even any guarantee that buyback rates will not be subject to further reductions. In our view, this will further dampen residential uptake of PV. In light of this, the NZIER's predicted rate of solar uptake as a result of current pricing structures, and the resulting 10% retail power price increases appear highly unlikely, and based more on overseas experiences with solar than on New Zealand conditions.

[2] Ford, R., Stephenson, J., Scott, M., Williams, J., Wooliscroft, B., King, G., & Miller, A. (2014). *PV in New Zealand: The story so far*. Published by the Centre for Sustainability, University of Otago. Retrieved on 1 February 2016 from https://ourarchive.otago.ac.nz/bitstream/handle/10523/4992/PV%20Uptake%20in%20NZ%20The%20story%20so%20far%20140917.pdf?sequence=1

[3] Miller, A., Hwang, Michael., Lemon, Scott., Read, E. Grant., Wood, Alan. *Economics of Photovoltaic Solar Power and Uptake un New Zealand.* Presented at the EEA Conference & Exhibition 2015, 24 – 26 June, Wellington. Retrieved on 1 February 2016 from http://www.epecentre.ac.nz/research/EEA_2015/EEA_Paper_2015_PV%20Economics%20and%20Uptake-r12.pdf

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?	We agree there is potential for inefficient investment in networks if electric vehicle owners don't receive price signals that encourage them to charge their cars during off-peak hours. However, the low uptake and existing barriers to electric vehicles mean this is not likely to be a large issue for a number of years. Issues such as the need for better charging infrastructure, short driving ranges and enduring high capital costs of EVs will prevent them becoming widespread in the short term. We also agree with the Authority any changes to distribution prices are unlikely to affect the uptake of electric vehicles due to their high capital costs.
Q6.	What is your view of the potential for battery technology to defer or avoid investment to augment distribution networks?	We agree there is potential for battery storage to defer investment in network infrastructure by reducing consumption at times of peak demand. However, the market for home energy storage systems (of the type discussed in the consultation paper's case study on residential battery technology) remains very small. And despite far cheaper large scale domestic battery storage – like the Tesla Powerwall – they currently retail for a minimum of $5000 so still remain out of reach for most consumers. There remain questions over how the market for home energy storage will develop (analysts predict it will be tied to the uptake of electric vehicles). As such, the scenario outlined in the case study seems a few years away.
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?	Cost-reflective distribution pricing structures are likely to promote investment in heat pumps more so than LEDs, as a higher proportion of heat pump use occurs during peak times so they will become more attractive relative to less efficient heating options. In addition, the numerous 'smart' control features that have become commonplace on heat pumps will make them more appealing for consumers than other heating options which lack these features, such as wood-burners.
Q8.	What is your view of distributors' options for structuring their pricing?	No comment.
Q9.	What needs to occur for distributors to amend their distribution pricing structures to introduce more service-based pricing?	No comment.

Q10.	Would a change to the applicable rules encourage change to pricing structures?	No comment.
Q11.	What incentives could be introduced to encourage change?	No comment.
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?	We strongly support Castalia's recommendation that greater prominence should be given to distribution pricing principles that matter most. Specifically, we think pricing principle (d) (see below) should be preferred over other pricing principles: *"development of prices should be transparent, promote price stability and certainty for stakeholders, and changes to prices should have regard to the impact on stakeholders".*
Q14.	Do you have any suggested improvements to the distribution pricing information disclosure requirements in Appendix B?	No comment.
Q15.	What other issues with the current distribution pricing arrangements should the Authority address?	No comment.
Q16.	How will New Zealand-specific circumstances influence the effects of evolving technologies in this country?	New Zealand's unusually high proportion of renewable electricity generation means consumers are well-placed to use emerging technologies to reduce the proportion of their income spent on energy. Improving our energy efficiency in this way will also hasten the move to a low-carbon economy, as well as delaying the need for investment in new electricity infrastructure. But our small market size and isolation mean we are likely to experience higher costs for battery storage, solar PV and electric vehicles than other countries. Our unique load profile and the resulting counter-seasonal nature of PV generation, combined with the lack of government support, means PV will remain less attractive for New Zealand consumers than those in other countries, and predictions of PV-uptake need to take this into account.