

1	<p>What are your views on the scope of the Authority’s review of distribution pricing in the face of evolving technologies?</p>	<p>The pricing options omit the most economic one of all, namely pricing of critical peak events notified to consumers a day ahead or even 1 hour ahead. Smart phone apps should make this far easier than was the case not long ago.                  .....The “evolving technologies” omit household wood burners being developed which can assure emissions low enough to be permitted as of right in city airsheds. These are the most affordable technologies to reduce winter peaks, especially critical peaks. They can be made dual-fuel, with buffer tanks storing heat for use later or in other rooms, that can be heated with electricity when it is cheap, to save firewood.                  .....“Scope” also includes the time-frame of analysis - around 10 years in the NZIER analysis, which “finds” solar investment will cause non-solar prices to <b>rise</b> [exec summ p. D]. Yet in the longer term competitive technologies will cause all prices to <b>fall</b> (s.8.3.4) The EA’s purpose, long-term benefit of consumers, requires the longer viewpoint, reflecting the long lifetimes of both company and consumer-owned assets.</p>
2	<p>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.</p>	<p><u>Now</u>: Appliances including LEDs, computers, TV and fridges, are becoming more energy efficient due to world trends.                  .....<u>Progressively</u>: improved insulation of building structure and windows (e.g. triple glazing), will cut winter peaks.                  .....<u>Within a decade</u>, solar PV and household battery storage – these are most influential in summer.                  .....<u>Within a decade</u>, commercial availability of advanced gasifier burners suitable for polluted airsheds, most influential in winter.                  .....Reasons for these estimates: First 3, follow world technology trends; 4<sup>th</sup>, wood burning is now suppressed by air quality regulation but the positive benefits of this innovation, especially for resilience and climate change mitigation, and for creating a new manufacturing export opportunity, will overcome that suppression.</p>
3	<p>What is your view of 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?</p>	<p>I agree with both statements. The solution, in brief, should be to give consumers a choice between a tariff loaded towards peak charges with extra reward for price response to critical peaks, or one loaded towards energy charges (today’s). If the peakiest residential consumers were incentivized to invest in alternatives to meet critical-peak winter needs, one wouldn’t have to force unwanted peak charges on the others. Diversity is security.</p>
4	<p>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</p>	<p>Investment that’s “inefficient” by business modeling can make excellent sense to those householders who intend to stay in their houses long-term. Many people whose children have flown the nest are investing in PV to ensure a comfortable, energy-rich retirement. So I disagree that PV investment is necessarily “inefficient”. Long-term benefit of consumers should reflect asset lifetimes much longer than the 10 year focus of this consultation document.</p>

	consumption-based approach?	
5	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?	I have every expectation that vehicle charging will attract specific tariffs that give benefit to both distributors and customers. So that “potential” inefficiency will not be realized.
6	What is your view of the potential for [consumer-owned] battery technology to defer or avoid investment to augment distribution networks?	Depends on location; in urban areas with summer max demand, may be more cost-effective for batteries to be in substations, especially using modern lead-acid batteries (cheaper than lithium). Consumer-owned batteries are most likely in mesh-block locations with high income. In locations vulnerable to storm damage, consumer-owned batteries add resilience, and are likely to add more value than batteries in substations.
7	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?	Why the focus on electricity-only solutions? Alternative pricing options should promote long-lived consumer investments that add diversity and resilience (attributes not priced today). Pricing structures need to overcome the high-first-cost barriers to investment by low-income consumers. ...S 7.4.4 outlines alternative distribution structures, especially variable charges based on a consumer-chosen capacity limit (with appropriate penalty for exceeding it), or consumption charges that vary based on time of use. Such pricing structures would promote efficient investment in several technologies that could reduce consumer costs and distributor costs simultaneously. On-site energy storage of either electricity or heat are amongst the most efficient evolving technologies.
8	What is your view of distributors’ options for structuring their pricing?	This section, s 6.1.9, says. “Finally, distributors should consider consumer preferences.” That’s <u>wrong</u> ! As evolving technologies offer consumers the chance to compete with network services, lines companies need to consider consumer preferences <u>first</u> , otherwise companies are vulnerable to the consumer-driven death spiral. .....The regulator’s inappropriate attitude is well illustrated in 6.1.3 and 6.1.4 – “Prices that recover all the cost must be marked up above incremental cost [to ensure revenue recovery]. ... These markups could result in changes (distortions) to consumers’ decisions about how they use the network or make investments [e.g. rooftop solar]. And so they should! Revenue recovery should not be guaranteed as the lines monopolies are becoming challenged by approach to price parity for solar vs centralised supply. Changes are not necessarily distortions. .....6.2.4 – “consumers should have information and tools to respond to new pricing signals.” Strongly agree! In my opinion, consumers should have incentives and corresponding tools to choose one or more of:

		<p>...a) control kWh demand</p> <p>...b) control kW demand, without or preferably with notification of critical times; the latter more valuable</p> <p>...c) reduce power factor in locations where this adds significant costs</p> <p>.....I am describing these options as consumers would see them, not as regulators who pay more attention to economic models than to consumers.</p>
9	What needs to occur for distributors to amend their distribution pricing structures to introduce more service-based pricing?	<p>The primary requirement for the necessary change is culture change. New Zealand was very good at creating culture change in the 1980s when the lines companies were corporatized - education seminars were held for all trustees which explained the new objectives, with shareholder value now overriding customer value. Those lines companies that retained community ownership became able to accommodate both types of values; those who couldn't lost the most or all of the community control they once had.</p> <p>.....The culture-change needed now is to recognise that the regulated former monopoly needs to cooperate with its competitors, using the evolving technologies to reduce actual costs on both sides, for the true long-term benefit of consumers. In today's culture where shareholders demand growth, this is a major culture-change.</p> <p>.....The other requirement is for "service-based pricing" to be defined and implemented in a way that protects both corporate and community resilience in a world facing increasing threats including climate change, cybersecurity, and vulnerability to investor-state disputes. Technology, regulation, and even electricity laws will have to change to mitigate those threats, Where those technology changes threaten the prevailing business-as-usual model, the business model will also have to change.</p>
10	Would a change to the applicable rules encourage change to pricing structures?	<p>The changes above will probably require a change to the Low Fixed Charge regulation to promote variable capacity charges and variable demand charges to be charged as daily charges. In any district these must be trialled first at a pilot level. The Lines Company requirement for a variable demand charge to apply for a whole year is onerous and not cost-reflective – two to three months should be a maximum. The detail must reflect the actual cost structure of each lines company, and must be trialled in stages before widespread use in each lines district. A simple alternative must always be available for consumers who value convenience over bill-minimising; the fairness of that must be independently assessed. The simple tariff would probably be similar to today's low fixed charge tariff, with the unit rate increased as necessary to recover costs incurred by that consumer (individual or aggregate consumer.)</p>
11	What incentives could be introduced to encourage change?	<p>Incentives for distributors: a change to the LFC regulation to enable variable capacity and demand charges as an option (but not imposed).</p> <p>.....Incentives for all NZ society to encourage <u>efficient</u> adoption of new technologies, including:</p> <p>a) independent research to better understand customer viewpoints on both pricing and new technologies. The essential question is what suite of technologies is most effective in giving consumers power to reduce their power bills, or to choose instead to enjoy more convenience at prices that reflect costs.</p>

		<p>b) Funding of development of innovative information systems, such as use of smart phones to replace the costly and inflexible Home Area Networks. Apps need to be developed with interfaces that elderly or computer-challenged people can use effectively.</p> <p>c) Funding of pre-commercial development of advanced gasifier burners with heat storage. This is the most important technology for New Zealand to integrate the variable hydro resource into the small isolated electrical grid. Its winter maximum supply complements rooftop solar's summer maximum, and its provision of winter peak electricity addresses the most common critical peak shortage. Finally, its ability to burn poorly seasoned wood efficiently with barely detectable smoke creates a potentially significant dry-year resource. Development needs to include automation of the ratios of primary and secondary air over a variety of fuel charges, to reduce or nearly eliminate operator error.</p> <p>d) Together with rooftop solar and batteries, efficient wood burning offers the greatest potential to create resilience and climate change mitigation, while satisfying the wish of many consumers to be more independent of centralised electricity or gas supply, or to enjoy a focused radiant heat source.</p>
12	What other options would ensure distribution pricing structures are service-based?	<p>The main missing tariff option is critical peak pricing.</p> <p>The main missing consumer option is efficient wood burning.</p> <p>Both of these suggest pricing structures which reward consumers for reducing system-wide distribution costs, namely both real-time peak, and critical-peak pricing, and dry-year conservation "deals" (to replace the Official Conservation Campaigns recently foreshadowed by Transpower).</p>
13	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?	<p>Yes, two sources for suggestions: RMI "Rate Design for the Distribution Edge" and Regulatory Assistance Project "Smart Rate Designs for a Smart Future". Summary:  RMI – <a href="http://www.rmi.org/elab_rate_design">http://www.rmi.org/elab_rate_design</a></p> <p>New technologies and service offerings can enable a simple customer experience</p> <p>Rates should keep the utility viable by encouraging economically efficient investment in both centralised and distributed energy resources (DERs.)</p> <p>Customer bills should be relatively stable, with dynamic pricing and price response to manage high-cost occasions.</p> <p>Rate design should recognise positive as well as negative impacts of DERs on cost of service.</p> <p>Price signals should encourage investment in assets that optimize economic efficiency, improve resilience and flexibility, and reduce environmental impacts in a technology-neutral manner.</p> <p>RAP – <a href="http://www.raponline.org/document/download/id/7680">www.raponline.org/document/download/id/7680</a></p> <p>A customer should be able to connect to the grid for no more than the cost of connection to the grid.</p> <p>Customers should pay for grid services and power supply in proportion to how much they use these services and how much power they consume.</p>

		Customers that supply power to the grid should be fairly compensated for the full value of the power they supply. In contrast, the EA and Castalia “pricing principles” are fraught with economic content that means nothing to consumers, and analysis that supports business-as-usual models and thus stifles technology change for the long-term benefit of consumers.
14	Do you have any suggested improvements to the distribution pricing information disclosure requirements in App’x B?	No comment on information disclosure requirements, save that I hear from several trust-owned distribution companies that these are extremely onerous and do not provide community benefit commensurate with the high cost of the disclosures.
15	What other issues with the current distribution pricing arrangements should the Authority address?	One issue dominates. Competition from evolving technologies threatens to strand some assets of most distributors. Distributors can use pricing strategies, including high fixed charges, to try to slow consumers’ uptake; regulators can allow returns from assets that are not used and useful. Or they can both choose to price to integrate all the capabilities of consumer-owned assets into the grid operation. The Authority should strongly promote the integrated path. <a href="http://blog.rmi.org/blog_2015_07_01_the_grid_is_at_a_fork_in_the_road">http://blog.rmi.org/blog_2015_07_01_the_grid_is_at_a_fork_in_the_road</a>
16	How will New Zealand-specific circumstances influence the effects of evolving technologies in this country?	NZ is unique in the supply-side dominance of its regulatory system, which now defines “long-term benefit of consumers” as ignoring wealth transfers from consumers to near-monopoly suppliers. I have heard international electricity experts say they are envious of New Zealand’s effectively uncapped wholesale prices and other light-handed regulatory features. Also the NZ electricity system is unique physically in its ~80% renewable sources, small isolated grid, and major opportunities for <u>both</u> energy efficiency and renewable energy in residential, commercial and industrial markets. NZ could become a world leader in integrating evolving technologies into the grid.

