
Submission to the Electricity Authority

on

Enabling mass participation in the
electricity market

Made on behalf of 16 Electricity Distribution Businesses

*PwC submission on
behalf of a group of 16
electricity distributors*

10 July 2017

Introduction

Overview

1. This paper forms our submission on the Electricity Authority's (Authority) Consultation Paper, "Enabling mass participation in the electricity market – how can we promote innovation and participation" released on 30 May 2017 (the Consultation Paper). This submission has been prepared by PricewaterhouseCoopers (PwC) on behalf of the following 16 Electricity Distribution Businesses (EDBs):
 - Alpine Energy Limited
 - Aurora Energy Limited
 - EA Networks
 - Eastland Network Limited
 - Electricity Invercargill Limited
 - Marlborough Lines Limited
 - Nelson Electricity Limited
 - Network Tasman Limited
 - Network Waitaki Limited
 - Northpower Limited
 - OtagoNet Joint Venture
 - The Lines Company Limited
 - The Power Company Limited
 - Top Energy Limited
 - Waipa Networks Limited
 - Westpower Limited.
2. Together these businesses supply 23% of electricity consumers, maintain 39% of total distribution network length and service 62% of the total network supply area in New Zealand. They include both consumer owned and non-consumer owned businesses, and urban and rural networks located in both the North and South Islands.
3. We trust this submission provides useful input to your consultation on the Consultation Paper. We would be happy to answer any questions you may have regarding this submission.
4. The primary contact for this submission is:

Lynne Taylor
Director
PricewaterhouseCoopers
lynne.taylor@nz.pwc.com
09 355 8573

Summary

5. The first part of this submission summarises the views of the EDBs who support this submission. In the second part, we have included answers to those questions from Appendix A to the Consultation Paper that are of most direct relevance to the EDBs who support this submission.

Mass participation in the electricity market is a positive policy objective

6. The EDBs who support this submission support the Authority's policy intent, demonstrated in the Consultation Paper, to promote innovation and competition by enabling more participation in the electricity market and the technologies that underpin it.
7. We agree that increased and broader participation in the market is expected to deliver improved consumer outcomes, for example:
 - customer-specific innovations such as more diverse retail offerings (including spot pricing) and service options;
 - consumer opportunities to broaden participation in all aspects of the market, whether as generators, peer-to-peer traders or by contributing in load management activities;
 - operational improvements achievable through the potential offered by new technologies to obtain efficiencies, improve resilience and defer or reduce investment; and
 - environmental and economic benefits as the sources and end uses of energy become more efficient.
8. Many of these opportunities have already resulted in increased participation in the market under the existing market structure. But some are still at an emerging stage and it is not clear yet how the market will evolve to accommodate significant increases in active consumer participation.

Mass participation presents challenges as well as opportunities

9. The opportunities offered by the technologies and market evolution that will enable more participation also give rise to new challenges.
10. Consumer engagement will be important to ensure beneficial changes in consumer behaviour are sustained over the long term. Industry will need to ensure consumers are educated, and that changes are not made in a manner that unfairly penalises those who are not ready, not informed, cannot afford or are unable to participate.
11. The industry will also need to work together to manage the transition of theoretical innovation to real market change. This includes sharing data and managing the risks presented by increased numbers of participants, such as cyber security in an increasingly virtual network.

Policy support helps mass participation

12. Mass participation can be best supported through a collaborative and co-operative approach between and across the industry, particularly in the early stages when it is not clear how the market will evolve, and before new systems and technologies have become proven or familiar.
13. The EDBs who support this submission welcome the approach, shown by the Authority in the paper, of facilitation rather than regulation. A well facilitated evolving market should improve uptake of new opportunities, which should improve competition and reduce the need for further regulation.

14. Current policy settings, and the regulatory regimes which support these policies provide a market structure which is focussed on meeting the long term benefits of consumers. The existing legislation (for example Part 4 of the Commerce Act and Part 3 of the Electricity Industry Act) are designed to meet this objective. In doing so, the current regulatory settings appropriately address:
 - the boundary between the provision of competitive and monopoly services;
 - incentives for efficient operation and investment;
 - meeting consumer needs;
 - allocation of risk; and
 - roles, responsibilities and commercial arrangements between industry participants.
15. More participation in the electricity sector is currently occurring under this existing regulatory framework, and as a result consumers and other suppliers have opportunities to participate in the market, and/or access new services.
16. It is not clear yet what the commercial models for these new technologies might look like in the long term. However, legislative certainty can be expected to facilitate increased participation and thus undue and premature regulatory intervention should be avoided. The regulatory cost and compliance burden should also be minimised at all stages of the supply chain - including for consumers and suppliers.
17. There will also be opportunity to observe how mass participation in electricity markets develops overseas. The Authority could assist the New Zealand market by observing and learning from offshore experience.

Distributor involvement in market development is important

18. The EDBs who support this submission note that the paper has raised concerns that the involvement of regulated suppliers in an evolving competitive market might inhibit or dilute competition and therefore the potential benefits for consumers. However, we believe distributor involvement in the evolving market is critical to its success and that existing regulatory settings, as well as increased competitive pressure on distributors, will ensure distributor involvement does not result in detrimental outcomes.
19. Many of the opportunities offered by new technology present potential benefits, and potential challenges, to distribution networks. Excluding distributors from participating in these opportunities not only risks lower uptake through lack of confidence or familiarity with new technology, but may impact on network performance if distributors increasingly lose sight of the impact of bi-directional and unpredictable flows on their networks. In addition, networks need to understand how network demands are evolving in order to make efficient investment decisions.

Further considerations

20. There are opportunities for distributors to improve their pricing structures to better reflect the services they provide. Many distributors are actively developing new pricing plans, however these will take time to implement, as consumer impacts and preferences, together with retailer feedback, must be fully considered prior to implementing substantive pricing changes.
21. There is a role for the Authority in supporting distribution pricing reform. Cost reflective distribution pricing signals are critical to delivering long term benefits for consumers as new products and services in the electricity market become more available.
22. The EDBs who support this submission welcome the recent announcement by the Minister of Energy to further consider the LFC regulations, a significant barrier to more efficient distribution pricing. More equal access to the ICP data held by retailers is also required for distributors to

effectively evolve their pricing plans. It may be that some oversight by the Authority is needed to facilitate the provision of information required to progress more cost reflective distribution pricing, including more widespread access to smart meters.

23. As the market evolves, there may also be a need to revisit how market participants are defined, or how participation is enforced. As new participants enter the market it will be important that all parties who should be subject to oversight and obligations under industry regulation are properly identified.

Mass participation as a positive policy objective

Mass participation can benefit the whole market

24. The EDBs who support this submission support the Authority's policy intent, demonstrated by the paper, to promote innovation and competition by enabling more participation in the electricity market and the technologies that underpin it.
25. Mass participation has the potential to benefit consumers and participants at all levels of the market. Consumers already participate in network load management through hot water ripple control, and have the opportunity to reduce their energy costs through increased competition as a result of more diverse retail offerings, including spot pricing, and through the ability to manage load, self-generate and self-supply with solar panels and batteries.
26. As new opportunities develop, consumers may also benefit from improved reliability and resilience offered by new network management technology including both physical (e.g. grid-scale batteries) and virtual (e.g. home energy management systems feeding into demand response aggregators) as well as opportunities to be more active in the market through peer-to-peer trading.
27. New technology also offers distributors the opportunity to efficiently manage the cost of providing traditional network services while at the same time improving the services offered. New network alternatives may allow deferral, reduction or even avoidance of capital expenditure on traditional network assets, with additional focus on operating systems and LV networks.
28. New technologies that are set to enable mass participation may also have environmental and broader economic benefits, by promoting cleaner and more efficient sources and end uses of energy, such as Electric Vehicles.
29. The opportunities identified in the paper are consistent with those being experienced, or at least anticipated, as energy markets evolve internationally. The EDBs who support this submission welcome the opportunity to be involved in ensuring those opportunities are adopted in the New Zealand market where they are in the long term interests of consumers.
30. Many of these opportunities have already resulted in increased participation in the market under the existing market structure. But some are still at an emerging stage and it is not clear yet how the market will evolve to accommodate significant increases in active consumer participation.

What opportunities and challenges do mass participation offer?

31. Traditionally distribution networks have largely been passive platforms for the relatively predictable, unidirectional flow of electricity and the role of distributors has focussed on ensuring a long term stable, efficient and reliable electricity distribution service.
32. As innovation spreads and market participation increases, network models will become non-linear both physically, with bi-directional power flows, and commercially, as new types of market participants are accommodated. Central to this evolving market will be the smart grid, which will play a key role in managing demand and supply through smart systems that balance grid technical constraints against customer preference and activity while allowing industry participants to manage risk and make a fair return.
33. Mass participation offers opportunities to the industry, but also raise new challenges, which will need to be managed. In its paper *"Energy Policies of IEA Countries – New Zealand 2017 Review"*

the International Energy Agency characterised the opportunities and challenges facing distribution networks thus:

“Distributors across IEA member countries are at the forefront of a major transformation in electricity system operation and use, which is occurring as a result of the combination of liberalisation, decarbonisation policies and the rapid development and deployment of innovative distributed generation and storage technologies.

This transformation is raising a range of new challenges for maintaining power system security and reliability, with distributors increasingly being required to manage a much more complex operating environment with more dynamic and far less predictable real-time power flows.

This requires investment in adequacy, innovative system operation and regulatory clarity.”

34. One of the benefits offered by mass participation is increased consumer awareness and incentives driving behavioural change – for example the use of time-of-use tariffs to encourage active consumers to shift consumption from peak to off-peak. However, the potential benefits of these innovations rely on consumer behaviours changing in a lasting manner. If consumers revert to their original behaviour, the value is lost. Active and meaningful engagement with consumers is important to ensure the value offered by new market opportunities is ongoing.
35. Industry will need to ensure consumers are educated, and that changes are not made in a manner that unfairly penalises those who are not ready, not informed, cannot afford or are unable to participate.
36. Current development and innovation in the industry is resulting in a proliferation of potential opportunities that are still in theoretical or early trial stage. The challenge for industry is to translate ideas into reality. A collaborative approach across the industry, where trial offerings can be supported into the marketplace, and innovations are not being developed in a vacuum will be important in managing the transition from theory to reality.
37. New technologies work differently from the traditional grid, have a different lifecycle, involve different commercial arrangements and carry a different risk profile. They therefore require different commercial models that allow utilities to make a trade-off between opex and capex and take account of the different risk. Suppliers will increasingly be able to compare smart grid approaches with traditional grid reinforcement or construction.
38. We note that this is not a new concept, and distributors have achieved significant benefits through investments in ripple control, and working directly with customers on demand response initiatives such as load shedding, investment in alternative supply options and peak pricing.
39. Increased opportunities for participation in the market will mean increases in interactions between participants. Many of these interactions will occur in the ‘virtual’ network. Industry needs to consider how it will manage data sharing, cyber security and supply chain risks in the context of a dynamic and increasingly digital market.

Promoting and encouraging mass participation

40. The EDBs who support this submission believe that the most efficient market will be one that is allowed to evolve as much as possible without intervention. However, there will be steps the industry can take to enable uptake of new opportunities.
41. It will not be possible to identify all enabling factors ahead of time, but the following principles should help identify them:
 - co-operation and collaboration is needed across and between industry participants and regulators;
 - regulatory structures and arrangements should provide certainty and avoid complexity and high compliance costs;
 - market structures should favour inclusion of as many participants as possible, rather than exclusion of particular groups, to ensure the most efficient models develop.

Co-operation and collaboration

42. Mass participation can be best achieved through a collaborative and co-operative approach between and across the industry, particularly in the early stages when it is not clear how the market will evolve, and before new systems and technologies have become proven or familiar.
43. The EDBs who support this submission welcome the approach, shown by the Authority in the paper, of facilitation rather than regulation. A well facilitated evolving market should improve uptake of new opportunities, which should improve competition and reduce the need for further regulation.
44. Co-operation between innovators and policy makers should assist early identification of any changes required to existing rules, either to better enable a proposed innovation, or to remove unintended barriers posed by regulations that were drafted in the context of traditional network and market structures.
45. Collaboration between distributors and parties wanting to offer new services to consumers on their networks will ensure that:
 - network compatibility is addressed during the design phase;
 - distributors have the opportunity to understand unproven and unfamiliar technology so that they are more likely to adopt it;
 - distributors are able to maintain visibility of the impact of new services on their network, e.g. multi-directional flows in peer-to-peer trading, enabling them to manage changing supply and demand profiles on their networks and maintain power quality, network stability and reliability; and
 - new offerings are therefore available to consumers as quickly as possible.
46. The importance of collaboration is becoming evident in industry efforts to develop and implement distribution tariff reform. Co-operation between distributors and retailers will help overcome issues of data security, quality and accessibility that have been experienced so far. A co-operative approach should also help overcome consumer wariness of, or outright opposition to, cost-reflective pricing changes.

Avoiding undue complexity

47. Complexity, whether in regulation or commercial terms and structures, could delay or inhibit consumer uptake of new opportunities. The regulatory cost and compliance burden should be minimised at all stages of the supply chain - including for consumers and suppliers. Distributors will have to adapt to manage increasing numbers of participants seeking access to their networks, and it will be important to ensure that access is manageable for all. Many individual consumers may prefer to participate through an intermediary, such as peer-to-peer trading platforms, or virtual power stations. This should help to keep their terms of participation simple, and will also assist distributors' network management and maintain a proportionate regulatory burden on the industry.
48. We note that existing access terms have to date effectively accommodated early examples of increased participation, such as spot pricing models and the early adoption of small-scale distributed generation.

Inclusion of all industry participants

49. The EDBs who support this submission believe that the most efficient market will develop if all potential participants are allowed to participate. It is particularly important for all participants to be involved while technologies are still unproven. Pre-emptive intervention may prevent efficient market development and is not in the long-term interests of consumers.
50. Distributors will play a key role in the development and facilitation of increased and innovative participation in the electricity market. Their networks are the physical platform that will deliver new services and opportunities to consumers and new players in the market. Many of these opportunities could be characterised as network services, meaning that distributors themselves will find themselves as new players in the market – not only as facilitators but as consumers and/or providers of these new network services.
51. The community ownership model of many distributors – including many of the EDBs who support this submission – mean that distributors are well-placed to understand the needs of, and to design new services that deliver long-term benefits to, their consumers. They also have strong incentives to act in the long term interests of the communities they serve.
52. Distributors will also play a key role in helping the market overcome challenges presented to existing network infrastructure by new services and the technologies that enable them. For example, the growth in solar installations has the potential to impact significantly on power quality and voltage regulation. To ensure networks are not compromised, distributor involvement in the development of solar connection requirements will be crucial.
53. Individual distributors are well-placed to assess the benefits new technology and services offer to their individual networks. For example, batteries offer rural networks the opportunity to improve services to remote areas in a cost effective way – a utilisation of that technology that is unlikely to be considered by parties developing services for urban network support.
54. The Authority observes that distributors may be reluctant to use third parties to provide network services because they are unfamiliar or unproven. However, if distributors are allowed to participate in the development of new network services, those services will be more likely to be:
 - developed in a way that effectively and meaningfully support the network, and distributors in their provision of network services, including as facilitators of participation in the smart grid;
 - developed in a way that meaningfully engages consumers and supports their increased participation in new market opportunities on the network; and

- utilised by other distributors who were not early adopters of new technology, and who may otherwise have been reluctant to do so in the absence of distributor involvement in the development of those services.
55. The paper's observation that distributors may not utilise third party provider network services because they have commercial incentives not to, even if the third party services would deliver cost savings, is not correct and not supported by existing industry practice. Distributors are incentivised under Part 4 of the Commerce Act to seek efficiencies, the benefits of which are, under section 52A, required to be shared between them and their consumers. However, the fact that a service is offered by a third party does not necessarily mean that it is more efficient. If a distributor could acquire network services that meet their operational and quality standards as well as their network security requirements and risk tolerance, and do so at a lower cost to what they could provide in-house, their incentive – both commercially and regulatory – would be to acquire them from the third party.
 56. Distributors have already demonstrated their willingness to acquire network services from third parties. Third party investment in hot water ripple technology and smart meters are already utilised by distributors in their network management, indicating that distributors look externally as well as internally to find efficient network solutions.
 57. The EDBs who support this submission note the Authority's concerns about potential anti-competitive behaviour by distributors seeking to limit competition for new opportunities on their networks. Distributors are conscious not only of the regulatory implications of engaging in such behaviour (i.e. under Part 2 of the Commerce Act), but also the commercial and reputational consequences, and are therefore unlikely to do so.

Do we need to do anything now?

Availability of ICP information

58. Distribution pricing innovation will be an important factor in encouraging and supporting the uptake of some new opportunities. Improved price signals will help support consumer demand response and home energy management products, as well as promoting efficient uptake of new technology such as solar P.V.
59. The EDBs who support this submission welcome the Minister of Energy's recent announcement that the low fixed charge regulations are to be reviewed, as they pose a significant barrier to distribution pricing reform.
60. One issue that has arisen in the course of pricing redesign is access by distributors to individual ICP data, which is held by retailers. Requests for that data for the purpose of pricing reform have been challenged by some retailers. It may be that some oversight by the Authority is needed to facilitate the provision of information required to progress more cost reflective distribution pricing. Co-operation between distributors and retailers may also help overcome this and other issues that have been identified in the context of tariff reform, such as the security and quality of data, and compatibility of information and billing systems.

Identification or definition of industry participants

61. There may be a need to revisit how participants are defined, or how participation is currently enforced. The Authority identifies that there are some parties (such as apartment building owners) who are technically "participants" but are not registered. As new participants enter the market it will be important that all parties who should be subject to oversight and obligations under industry regulation are properly identified.
62. This may require a combination of public education, collaboration with new entrants, and a review of existing legislation.

Access to smart metering

63. Smart meters will underpin many of the new services and technologies needed for mass participation. Although more than 70% of New Zealand homes have a smart meter¹, the roll-out is slower in some areas of the country. Those consumers will be unable to fully benefit from new market services unless smart meters become universally accessible.
64. There may be a role for the Authority to facilitate an improved smart meter roll-out, such as through increased oversight of the sector. A targeted review may help identify any challenges being experienced in delivering smart meters to the remaining 30% of households, and whether anything can be done to overcome them.

¹ Electricity Authority, *“Smart Meters: Enhancing Competition and Enabling New Consumer Technologies”*, 13 September 2016

Submission Template Questions

Question	Comment
Q1. What is your view of the potential competition, reliability and efficiency benefits of more participation?	Increased participation has the potential to deliver significant benefits to energy consumers, and to the energy industry. It also has the potential to create additional complexity and as a result cost, if market structures do not facilitate good decision making and information availability. This could for example impact on reliability if networks have insufficient information about activities which impact their LV networks, and investments which may be required to manage additional complexity – for example, equipment to manage voltage regulation as a result of expanding solar investment.
Q2. What is your view of the opportunities to promote competition and more participation in the electricity industry?	The opportunities identified in the paper are consistent with those being experienced, or at least anticipated, as energy markets evolve internationally. The rate of uptake, and therefore the extent of opportunity offered, differs for each. These opportunities are currently available to participants under the existing market arrangements. Facilitating access to opportunities as they develop should ensure they are actively considered and, where viable, developed by a range of potential parties. There are also opportunities to observe developments outside of New Zealand, and the Authority could take an active role in monitoring international developments.
Q3. What other issues might inhibit efficient mass participation? Please provide your reasons.	<p>One issue not identified in the paper is the readiness of consumers to participate in a market that incentivises them to change their behaviour. Attempts to implement tariff reform to reduce inefficient investment in solar P.V. have met with resistance. The majority of consumers are still “energy content” and are unlikely to uptake new opportunities that they perceive will involve more active involvement by them in their energy management unless the benefits are clear and accessible. For example consumers might understand the benefit of charging their EV at a lower rate overnight but some consumers may be concerned about the impact on their bill of needing to use other appliances “on peak”. On balance, some consumers may be reluctant to voluntarily move to time of use or spot pricing.</p> <p>Other consumers do not have the resources to invest in technology that would help them better manage their energy consumption – even in “old” new technology such as energy efficient heating appliances (e.g. heat pumps) and lighting (e.g. LEDs). Others, such as apartment dwellers or renters, may not be able to install new technology such as solar panels and batteries. Some consumers do not yet have access to smart</p>

Question	Comment
	<p>meters.</p> <p>Industry will need to ensure consumers are educated, and that changes are not made in a manner that unfairly penalises those who are not ready, not informed, cannot afford or are unable to participate. Facilitation or increased oversight by the Authority may be needed to improve access to smart meters and to assist distributors to develop and implement more cost reflective pricing by engaging with consumers and various lobby groups who may resist pricing reforms.</p>
<p>Q4. What is your view of the opportunities for network businesses to obtain external help to provide aspects of the network service using competition or market mechanisms?</p>	<p>New network services will give network businesses the opportunity to continue to improve both the efficiency and standard of the service they provide to their consumers, as well as improving network resilience. Many of these opportunities will come from third party innovators either from within (e.g. other distributors, load aggregators) or without (e.g. software and communications companies) the traditional industry participants. Other networks may choose to invest in their own R&D or develop new service offerings which may be targeted at their own customer base (for example developing more cost effective remote rural supply options) or a wider market.</p> <p>Network businesses already work with external providers for network and non-network services, and engage with other market participants on an equal terms basis.</p>
<p>Q5. What do you think are the main challenges to be dealt with to increase the use of competition in supplying network services? What are your reasons?</p>	<p>The challenge is how new opportunities can be supported to move from theoretical or trial phase into fit-for-market offerings. Distributors and regulators will play a key role in facilitating this transition. Regulators can facilitate by changing existing “traditional” rules where they might inhibit development of new services – for example making market access easier for new participants, or developing data protocols to ensure efficient market operation. Distributors will play a key role as the platform that facilitates the delivery of these new services and will require access to information about the new services in order to adequately plan for network investments, such as in the LV network and adequately meet customer demand for network services.</p> <p>In addition, pricing signals are currently not always well aligned with the existing network services provided, which may result in poor decisions by consumers and service providers for new and emerging services. There is significant investment in network pricing development underway at present, however this will take time as regulatory impediments remain, ICP based information is not readily available to some distributors seeking to analyse potential new pricing structures, metering and billing systems will require modification,</p>

Question	Comment
	impacts on consumers need to be understood and managed, and there are vocal lobby groups resisting network pricing innovation.
Q6. What is your view on whether open access is required and what would be the elements for an effective open access framework?	An open access framework facilitates the evolution of new market opportunities. Access terms should be as simple as possible. Individual consumers must also have the option of participating via an intermediary. There are currently significant safeguards under the Commerce Act Part 4 regulatory regime for EDBs and Part 3 of the Electricity Industry Act which limit how and when network businesses participate in contestable market activities, and requires networks to operate transparently and on equal terms with other participants.
Q7. How effective are the existing arrangements for open access? What are the problems?	Existing arrangements have been effective so far for increased participation by a range of new participants, including end consumers. Any new arrangements should not favour any one party over another, as broad opportunity for participation has the potential to deliver a wider range of options for consumers.
Q8. What type of distributor behaviours and outcomes should the Authority focus on to understand whether changes are required to support open access?	<p>Existing protections against anti-competitive behaviour (Part 2 of the Commerce Act) and the structural separations in Part 3 of the Electricity Industry Act should be sufficient to deal with the sorts of behaviours identified in the paper, if they were to eventuate.</p> <p>It is important to note that in the context of the evolving market, where different participants might be vying to compete to provide similar services, it is not just distributors who might be in a position of power. Some distributors who are in the process of developing more cost reflective pricing structures are experiencing difficulties in obtaining ICP data from retailers for this purpose. Appropriate sharing of information among incumbent market participants will facilitate good decision making, innovation and ultimately investments which deliver long term benefits for consumers such as those noted in the paper.</p>
Q9. What changes to existing arrangements might be required to enable peer-to-peer electricity exchange?	<p>The increase in the number of individuals seeking to access the network will mean the industry will need to find a balance between:</p> <ul style="list-style-type: none"> (a) Making new opportunities available and maximising the benefits to consumers right through the value chain; and (b) Maintaining network reliability and integrity in the context of increased and unpredictable volumes; (c) Ensuring compliance is proportional at all stages of the supply chain.

Question	Comment
Q11. What is your view of the possibility for, and impact of, any current or future blurring of participant type? What are your reasons?	To maximise active consumer involvement in an evolving market, the industry should ensure that there are avenues for them to 'participate' without inadvertently becoming a participant.