**Enabling Mass Participation in the Electricity Market**

**Electricity Authority consultation, June-July 2017**

enabling-mass-participation-paper.pdf (PDF, 268 KB)



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| Question | | Comment |
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| Q1. | What is your view of the potential competition, reliability and efficiency benefits of more participation? | Mass market participation is more than a "benefit" – its absence creates a false market, like one hand clapping. Domestic consumers, who provide half the industry's revenues, show in surveys that they increasingly dislike their power companies. More mass-market participation requires pricing that rewards either or both investment and behaviour change. |
| Q2. | What is your view of the opportunities to promote competition and more participation in the electricity industry? | The biggest opportunities are non-electric heating and end-user heat storage, which perfectly complement rooftop solar. Together with batteries, these provide the flexibility that could enable major expansion of wind and geothermal to support export industries. |
| Q3. | What other issues might inhibit efficient mass participation? Please provide your reasons. | The biggest barrier to electricity industry support of mass participation is culture, giving priority to shareholder value, and regulation to maximise "economic efficiency" instead of physical efficiency. The EA treats consumers as passive: the big industry players determine consumers' choices. - "Competition is a process of rivalry between firms seeking to win customers' business." |
| 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? | To enable mass participation, distributors should publicise their asset management plans detailing which of their planned expenditures could be deferred through demand management – a "statement of opportunities" for consumers to invest or change behaviour. As the consultation document says, there's about $750m per year at stake – a huge opportunity for alternatives to network assets. |
| 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? | The obvious challenge is the need to bundle network prices into the retail bill. The other "challenge" is any corporate strategy that values the asset base for its financial benefit to shareholders, rather than as part of an evolving infrastructure built to serve consumers. "Competition", (or better, coordination) of energy efficiency and alternative fuels with centralised supply has the potential of maintaining profitability and consumer confidence, so long as asset management is aimed at financial and physical sustainability, not profit maximisation. |
| Q6. | What is your view on whether open access is required and what would be the elements for an effective open access | |

| Question | | Comment |
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| | framework? | |
| Q7. | How effective are the existing arrangements for open access? What are the problems? | |
| Q8. | What type of distributor behaviours and outcomes should the Authority focus on to understand whether changes are required to support open access? | |
| Q9. | What changes to existing arrangements might be required to enable peer-to-peer electricity exchange? | |
| Q10. | What are the costs and the benefits of enabling peer-to-peer electricity exchange? | Peer to peer exchange is important and should be encouraged. |
| Q11. | What is your view of the possibility for, and impact of, any current or future blurring of participant type? What are your reasons? | Any form of price-responsive demand makes a consumer in effect a market participant. How the rules (code) deals with this – I am not certain. – but it is important. |
| Q12. | What types of participation are or might be prevented because the party is not recognised as a participant? What are the potential impacts? | |
| Q13. | What challenges might new forms of generation, such as virtual power plants, or small and dispersed generators, face in entering the market? | Coordination of small generators – described here as “virtual power plants”, is a complex strategy for creating flexibility in generation. Much simpler would be a strategy of flexibility in demand. Probably the biggest opportunity is dual fuel thermal energy storage, exemplified by a hot water cylinder being heated by a wetback when the power price is high, and an electric element when the price is low. Thermal storage is far, far, far cheaper than battery storage – and represents an opportunity to sell kilowatt-hours when they would otherwise be wasted. |
| Q14. | What changes might be required to the rule book to facilitate the emergence of virtual power plants or demand response? | |
| Q15. | Would the functioning of the market for hedges and PPAs and the availability of finance be improved if there were greater transparency of long-term prices and greater standardisation of terms and conditions for long-term contracts? | |

**Additional comments**

The most important forms of active mass participation in New Zealand’s electricity market are those that reduce demand at times that supply is most costly – winter peaks, and dry years. Residential consumers can do much to reduce those demands when the cost savings are greatest.

In the past, ripple control was an effective means of reducing supply costs. With corporatisation, companies’ focus shifted away from cost-minimising to profit-maximising. Since scarcity enables market prices to rise, companies learned to manage scarcity to their own advantage, rather than to prevent it.

Mass-market consumers view electricity as an essential service, and say that prices should be minimised, reflecting costs, and not be driven by market power. They are disillusioned by the continuing price rises - to the extent that many are investing to reduce their power bills, ranging from home insulation to efficient appliances to solar energy. The Authority has the role of market monitoring, and has inquired on several instances where high prices have been queried, as to whether they resulted from market power . I believe the Authority should investigate whether this year’s high winter spot prices are economically efficient, or whether they reflect market power.

The Authority’s consultation documents are founded on its decision-making and economic framework – including “cost-reflective and service-based pricing”. As explained in the TPM second options paper last December, mass market consumers are clearly exacerbators of winter peak and energy loads. Today’s pricing folds these loads into bundled retail bills, with all residential consumers paying the same price regardless of their peak loads. More service-based pricing would charge the costs of peak and winter energy most to those who use the most electricity at peak times (see para 45 of the executive summary). It would correspondingly reduce pricing to those who can reduce winter peak and/ or energy – especially if they do so on request of the company.

A critical peak pricing option would be the single most important way for mass-market consumers to opt to reduce costs on the power system for a lower power bill. This should be a priority for the Authority to enable and encourage. It could possibly replace the current regional coincident peak demand charge in transmission pricing, and its equivalent in distribution pricing.

It is physical efficiency not economic efficiency that can mitigate winter high costs. The paramount technology is surely home insulation – of ceilings, floors where possible, and in many cases, walls. Window double and even triple glazing are probably economic at today’s electricity prices.

Flexibility is highly valuable, and electric batteries are not the only means to provide storage. Large highly insulated hot water cylinders could be switched off for lengthy times during times of supply storage – storing hot water is far cheaper than battery storage!

One new technology could make as big a difference to New Zealand’s electricity market as is now observed with solar rooftops. This is the ultra-clean downdraft wood burner, preferably combined with generous hot water storage in a very well insulated tank of up to 2000 litres, fitted also with an electric element.

Two models of downdraft double chamber wood-burners have been demonstrated; one is now being manufactured on a small scale. Most regional councils refuse to allow them to be installed because they cannot be tested according to the official wood burner standards, Australian/New

Zealand Standards AS/NZS 4012/4013. A revised wood burning standard, the Canterbury Method, requires much-reduced emissions but cannot be applied to downdraft burners, because it requires a new-design wood burner to first pass the 4012/4013 standard. The downdraft burner cannot be loaded by the prescribed method.

Downdraft wood burners yield extremely low pollution levels. They are convenient because you don’t have to use lots of kindling; you can start the fire from the leftover charcoal bed with some meths as a starter. You can then load a whole day’s firewood into the fuel bin, the driest on the bottom. Near the top you can even load some green wood, as the wood loses moisture as it falls down the fuel bin, and the smoke and moisture react with the burning charcoal to produce a very clean burning fuel gas – mostly hydrogen + carbon monoxide. Controls are still being developed for fully automatic control.

Wood-burners go hand in glove with rooftop solar. They produce most of their energy in winter, whereas solar energy is maximised in spring and summer.

Wood burners have particular value in reducing electricity system peaks on the coldest days. The ability of downdraft burners to burn poorly seasoned wood cleanly enables them to also provide extra energy in dry years. In years when spot prices are low, a dedicated (local) firewood plantation can be left to grow – to be harvested only when dry-year spot prices prevail. This winter, for example, spot prices are very high, Today (July 11) they are more than double what they have been in recent years, and still rising. Merchants in Wellington have run out of dry firewood.

Resilience is perhaps the most important feature of wood burning. During power outages, wood burners keep homes warm and (if there is a cooktop) enable cooking and water heating. Future wood burner designs can easily incorporate thermoelectric generators. For a pellet burner, this would be big enough to run the auger and any combustion control, allowing it to be fully functional in a power outage. Thermoelectric generators would include USB ports to enable devices to be charged; larger thermoelectric generators together with batteries could even power appliances in the house. The cost of thermoelectric generators is on a par with costs of solar panels.

None of these challenges lie within the scope of the Authority’s work. But if the Authority were to mandate pricing options which allowed the mass market to reduce their power bills to the degree that they reduced electricity system costs, then wood burning for home heating, especially new-technology downdraft burners, could become commercially viable.

Here is a real opportunity for network companies to support the development, and pricing options, to enable clean efficient wood burners to respond flexibly to winter peaks and dry years. With clean dual-fuel hot water systems, companies could even augment their loads when electricity is in surplus, while flattening peaks when supply is costly.