Electricity Networks Association
7th Floor, Wellington Chambers, 154 Featherston Street
PO Box 1017
Wellington, New Zealand 6140
Telephone: 64-4-471 1335 *Fax:* 64-4-496 5209

E-mail adj@electricity.org.nz

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The Registrar
Commerce Commission
PO Box 2351
Wellington 6140

By email: registrar@comcom.govt.nz

Submission on the Commerce Commission's Statement of Preliminary Issues – 700 MHz Spectrum Applications

1. Our interest in the radio spectrum

1.1 The Electricity Networks Association (**ENA**) represents all companies that manage the local electricity networks throughout New Zealand. These companies are referred to throughout the submission as electricity network businesses (**ENB**s).

1.2 ENBs are an integral part of the electricity supply chain, distributing power to consumers through regional networks of overhead wires and underground cables. Some of the largest distribution network owners are publicly listed or owned by local government but most are owned by consumer or community trusts. Apart from a small number of major industrial users connected directly to the national grid, all consumers are connected to a distribution network operated by an ENA member. The services our members provide are essential to the delivery of electricity, and underpin all key social and economic activities.

1.3 Our members have two primary interests in the allocation of radio spectrum: to ensure that adequate communications channels are available to them to manage the speedy restoration of essential power supply services in the event of a civil emergency or catastrophic event, and to reserve the channel capacity that will be required to handle increasingly significant two-way and multi-directional flows of communications and data as investment in so-called smart network technologies proceeds.

1.4 In 2012 ENA established a working group to investigate the radio spectrum requirements associated with these interests, and to examine other areas where power supply and national welfare issues may be enhanced by better use of spectrum options.

2. *The relevant market*: Emergency response issues

2.1 In our view it would be sensible to look very carefully at the scope for taking early and pre-emptive steps to ensure that key infrastructure providers have adequate spectrum available to them to handle emergency requirements in New Zealand, and to examine – in parallel – the scope that exists to integrate such spectrum use with day-to-day network communication capabilities as these emerge, e.g. to ensure that power loads can be shifted or reduced to respond to various contingencies, and – most importantly – to assist in locating and rectifying faults and damage to infrastructure.

2.2 We are conscious that New Zealand is considerably more exposed to potentially cataclysmic natural events than most other countries. We have very long and exposed coastlines, the potential for extreme weather events, recent and very real earthquake experiences, and volcanic risks.

2.3 Especially significantly, New Zealand's electricity supply is unusually reliant on a handful of 'chunky' components – a few major generators, the HVDC link, and limited hydro storage that is very exposed to dry year events. A failure affecting any one of these components could have a cascading impact on national power supply.

2.4 ENBs provide services that underpin nearly all other emergency response capabilities, ranging from water supply to communications, and that support a wide spectrum of vital activities (fuel pumping, lighting, banking & finance, livestock maintenance, food supplies and so forth).

2.5 In a crisis situation, recent experiences have demonstrated the problems of the communication services market, and in particular its inability to adequately support key infrastructure providers when their needs are greatest.

2.6 Accordingly, our working group has been looking very carefully at the best options for the delivery of the applications needed to minimise the impacts of future emergencies. Linking an increased portion of available spectrum to general telecommunications activities may compound problems experienced in emergency communications.

3. *The relevant market:* Smart networks and multi-directional communications

3.1 The advent of technologies for integrated power system and end-user load management via so-called *smart networks* is an exciting feature of 21st century electricity distribution. Smart network policies are being actively promoted in virtually all major economies, and promise large national benefits through peak load modulation, power quality improvements, rapid fault restoration, and new customer services

3.2 ENA has undertaken in-depth analysis of the costs and benefits of early adoption of smart network options in New Zealand. This work indicates that very considerable direct benefits can be expected, along with a potentially vast array of indirect benefits as new services emerge: [1]

Potential Direct Benefits to New Zealand from Smart Network Deployment

	BENEFITS	PV ($million)		
		Worst case	Possible outcome	Optimistic case
1	Deferred generation capex	$200	$400	$400
2	Deferred TX capex	$182	$363	$436
3	Reliability, power quality and customer engagement	$132	$264	$396
4	Deferred DX capex	$129	$258	$310
5	Carbon saving from less fossil fuel base load build	$84	$168	$168
6	Less distillate use	$26	$27	$27
7	Metering	$8	$17	$25
	SMART NETWORK BENEFITS	**$761**	**$1,496**	**$1,761**

	COSTS			
1	Metering	$380	$201	$201
2	Changes to network planning	$220	$120	$90
3	Improved demand forecasting	$219	$119	$89
4	Demand response	$199	$78	$59
	ADDITIONAL SMART NETWORK OPERATING COSTS	**$1,018**	**$518**	**$439**

Benefit cost ratio (BCR)	Worst case	Possible outcome	Optimistic case
All benefits / all costs	0.7	2.9	4.0

3.3 The new technologies that make smart networks possible are closely intertwined with current and emerging radio communication technologies. As these technologies increase the level of interconnection and interaction among service providers, businesses, households and appliances, new vulnerabilities to cyber attack are already emerging. Protocols for data protection are becoming important, and secure communication channels are becoming vital. In our view it will be beneficial to all interests involved in spectrum allocation to gain an understanding of the complementary gains that integrated network

[1] The case for deployment of smart network technologies in New Zealand. Electricity Networks Association, July 2012

and communications development can deliver, and of the safeguards needed to secure those gains.

3.4 The European Utilities Telecom Council (EUTC) last year concluded that:

> *The implementation of Business Radio communications systems to support Smart Grids could be optimal in providing resilience and preventing outages. As the radio communications system can monitor all facilities on the network and issue commands to prevent imbalances in networks, it allows the impact of any outage to be minimised and supplies to be restored more quickly than would be the case without private radio systems. It also incurs benefits not accounted for such as in the positive environmental impacts, green energy production etc. The environmental benefits will remain active at all times as an element of gas turbine generation…will be averted through better generation management.* [2]

3.5 The allocation of part of the available spectrum for smart network development seems likely to provide benefits to the economy and the public that far outweigh any direct benefits to the service providers involved. For regulated businesses such as ours this poses additional problems around investment decisions. Some of these problems are addressed in our Smart Networks report, and consideration may need to be given to regulatory policy changes. Again, this is an area where concentrating spectrum rights in the hands of the established telecommunications providers may lead to sub-optimal outcomes.

4. Summing up

4.1 We consider that the Commission's views on the relevant market should take into account the wider value of spectrum to other infrastructure providers, most notable the role that dedicated spectrum access might play in enabling electricity networks to cope with emergencies, and the emerging scope for spectrum access to facilitate improved electricity network services.

4.2 Research by the EUTC into the value of radio spectrum to utilities emphasises the economic value that seems likely be gained by ensuring that spectrum access by electricity networks is optimised:

> *"… societal benefit of spectrum used by the electricity industry to ensure reliable operation of the electricity supply network may have a*

[2] The Socio-Economic Value of Radio Spectrum used by Utilities in support of their operations, EUTC 13 January 2012
http://www.google.co.nz/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CB8QFjAA&url=http%3A%2F%2Feutc.org%2Ffileshare%2Ffiles%2F375%2FEUTC_Spectrum_Group_-_Meeting_Documents%2FSocio-economic_value_of_Spectrum_used_by_utilities.pdf&ei=ebt8UKyXKoiTiQfZ64G4AQ&usg=AFQjCNFvstawApGAYS2tm3IJp_64Kr9MRQ

societal benefit 50 to 150 times the economic value of the electricity itself." [3]

4.3 We consider it vital for adequate spectrum availability to be reserved for essential infrastructure providers. New Zealand has unusual vulnerabilities to natural events, compounded by a reliance on a handful of key electricity supply components, making it especially important to consider the role that dedicated spectrum rights might play in emergency situations.

4.4 In parallel, the current global trend towards smart electricity network systems that rely on secure, integrated multi-party communications creates opportunities to maximise the national benefits from radio spectrum allocation.

4.5 Our working group has been engaging with MBIE and other interested parties to better understand the ways in which spectrum access might best be applied to electricity network priorities, and will be better placed to consider spectrum market issues in 2014. We would prefer to see allocation options remain open until then.

Alan Jenkins
Chief Executive

[3] Ibid page 5