
**Submission to “Review of Section 62 of
the Electricity Act 1992 ‘Continuance
of Supply’ (2013 Review)”**



**NIWA Client Report: AKL-2007-080
September 2007**

NIWA Project: CNCK0851

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Authors

Rilke de Vos
Rob Urselmann

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National Institute of Water & Atmospheric Research Ltd
269 Khyber Pass Road, Newmarket, Auckland
P O Box 109695, Auckland, New Zealand
Phone +64-9-375 2050, Fax +64-9-375 2051
www.niwa.co.nz

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1. Background comments

1.1 Introduction to NCCES

The NIWA National Centre for Climate–Energy Solutions (NCCES) covers all aspects of NIWA’s research that can help New Zealand on issues such as renewable energy, energy efficiency, greenhouse gas reductions, reducing the environmental impacts of energy use, and new business opportunities related to these areas.

The NCCES has provided outreach on energy issues since 2001. The centre is a recognised provider research, analysis and solutions pertaining to climate – energy interaction. Recent work by this centre, relating directly to this review submission includes:

- Energy sources for rural communities,
- Maori aspects on energy and emissions, and
- Renewable energy resource evaluations.

1.2 History

The NZ system of centralised generation with national transmission and distribution has historically been a cost-effective, reliable and efficient mechanism of energy delivery. The Rural Electrical Reticulation Council (RERC) work undertaken between 1945 and 1997 provided, as anticipated, an economic stimulant and advantage to the growing rural industry over international competition.

With the original decision to electrify the rural environment via a national grid and RERC, the cost of our electricity infrastructure was normalised, through the cross-subsidy, across *all electricity consumers* in order to support *equitable growth* of the NZ economy.

1.3 Objective of cross-subsidy

The ‘discussion document’ points out that a key assumption has been made, namely that the “current policy requiring line charges to rural and urban areas to be pegged will remain”. We assume this stems from the core government-of-the-time objective to stimulate the rural environment by avoiding rural consumers from being charged relatively “unfair” high charges for their energy supply i.e. remaining social equitable.

It would appear that the cross-subsidy outcome is a natural and reasonable result of the intention to provide socially equitable access for all to electricity. The fact that this policy is linked to lines-supply appears to be a result primarily of the original time when lines provided access to the newly developed cheap and abundant centralised energy supply resulting from large hydro and the huge Maui gas field.

It is noted that, the group of rural energy consumers that are not grid-connected do not benefit from this policy objective, and are fully exposed to the true cost of their energy and alternative electricity supply.

The choice between lines and alternative appears unrelated to the cross-subsidising issue.

1.4 Stakeholders

In our view there is another significant stakeholder to be considered for all options, which is the **overall NZ socio-economy** (“NZ Inc”).

Broadly speaking we think that;

“NZ Inc” desires an integral solution which provides quality *energy services* to all consumers that is delivered in a efficiently, fairly, reliably and in an environmentally sustainable manner”

Consumers desire certainty of *energy services* at affordable prices. The worst outcome for them is uncertainty associated with “sudden death” of their lines supply.

Lines Co’s want to be able to generate a commercial return on their assets and to make viable investments. Although we agree with this MED statement, we are under the impression that Lines Co’s, by their nature (a monopoly under the current governance rules), will be able to make a viable business return, irrespective of the selected option. It is acknowledged that lines-only business have a limited ability to expand. Changing the obligations under S62 will provide an incentive for their business to extend “beyond lines” in an open competitive market.

“Market” will be looking for new opportunities to expand. However, having a capacity to expand implies that the energy economy must, in nett, be providing more funding. Repeal of clause 6 gives this market a convenient driver for expansion, but this will come at the expense of the group of consumers forced against the wall by “sudden death” of their supply lines.

1.5 Five consumer groups

For the purposes of this discussion, we identify five (5) classes of electricity consumer:

1: Pre-1993 urban consumers on ‘economic’ lines: these consumers are paying the cross-subsidy.

2: Pre-1993 rural consumers / economically robust but receiving the cross-subsidy. Having economic wealth, this group is subsidised by urban consumers that may be significantly worse off than they are and yet results in further “wealth transfers from community to individuals”. Although this group, being well organised, will no doubt have a strong voice. Their socio-economic status is in principle sufficiently robust to accommodate exposure to the full market forces.

3: Pre-1993 rural consumers / economically poor: Already struggling, this group is reliant upon government support (e.g. income, health) to remain viable and open to commercial opportunity. The wellbeing of this portion of the consumers would be seriously adversely affected by exposure to full market forces. The question for this group is therefore, not ‘if’, but ‘how’ to support them if government desires to maintain these rural communities.

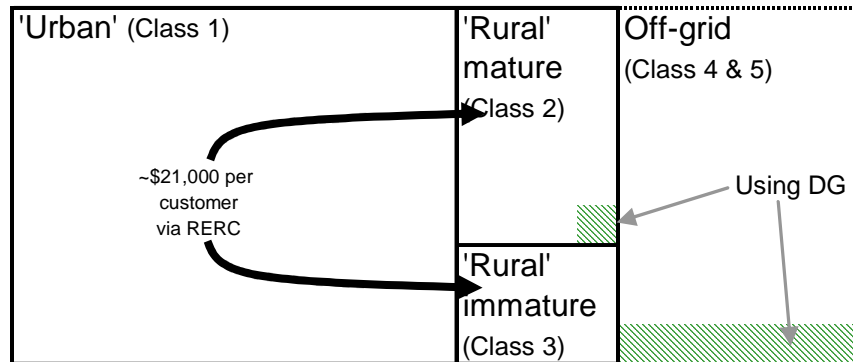
4: Post-1993 connected rural consumers: This group has paid for their own connections. This group has paid for but not necessarily benefited from cross-subsidy due to the young age of their infrastructure. Is it “fair” to expect them to contribute to cross-subsidies in the first place?

5: Consumers that are not connected to the national grid. This group of consumers already carry the full cost of their energy services. Part of this group use alternative systems mentioned in the discussion document (class 5A) whilst others, having limited funds, are energy poor (5B). If the objective of the cross-subsidy is to support rural development, then this group misses out.

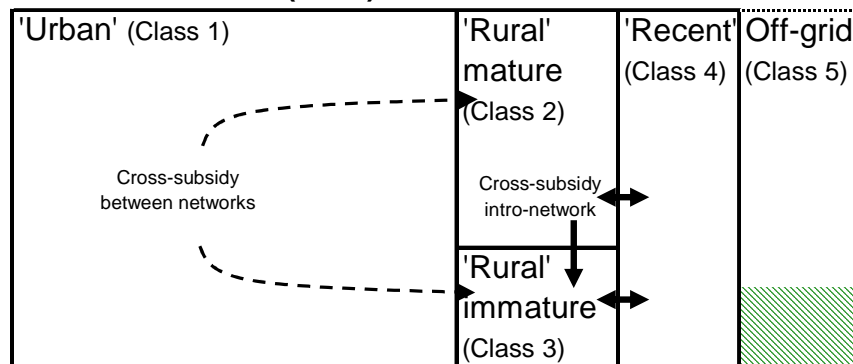
The cross-subsidy relationship between consumers is illustrated schematically in Figures 1 below. NOTE: Areas are not indicative of group size.

Figure 1 – Schematic of consumer cross-subsidy relationships

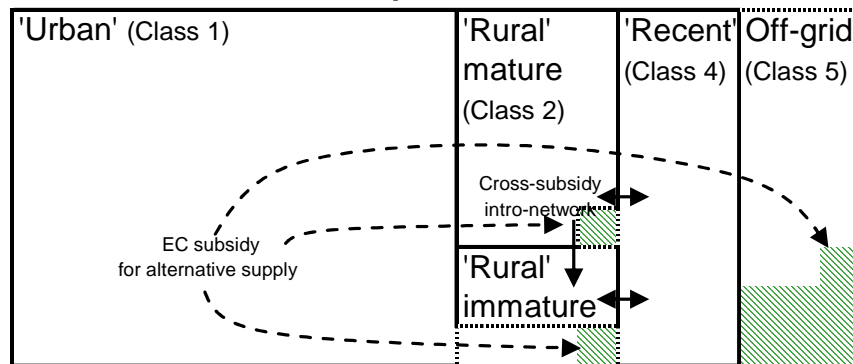
Situation Pre-1993



Current situation (2007)



Potential effect of S62 repeal



The question of cross-subsidy should focus on the underlying intent of that subsidy, not on the method of supply delivery

1.6 “Uncertain” supply

The discussion document makes clear reference to observation that the economic impact of maintaining ‘uneconomic lines’ is marginal (see Statement # 50). Certainly when the costs of the maintaining a centralised system are shared across the system, it is difficult for alternatives to compete. However when marginal costs (and associated capital spikes) are considered e.g. replacement of line following storm of vegetation damage, alternatives can be considerably more ‘economic’.

For this reason, very few consumers are likely to be isolated from the system until a large capital spend is required. Timing of the capital spend is “uncertain”, consequently supply duration would also be uncertain.

1.7 DG optimism

If market incentives such as feed-in tariffs, net metering etc. were available to potential electricity generators, the distributed generation market would have significantly more incentive. Without serviceable lines, potential generators would have an increased barrier to revenue. The MED discussion paper currently only considers contraction of the network, and seems to fail to consider the possibility of DG growth.

1.8 Market innovation

Whilst we agree with statement # 111, that current (prescriptive) practise restricts change in the supply market innovation & competition, we observe that other government policies are likely to have equal or greater impact on the alternative (renewables) market development, e.g. feed-in tariff, 90% RE target, carbon trading, net metering policy etc.

Relative to 1993, the relative costs of alternative technologies have reduced and can be competitive to:

- a. marginal grid supply (see e.g. example given PowerCo), or
- b. network infrastructure.

Therefore the section 62 is still serving to protect *that* portion of the rural community which are unviable when exposed to full market forces.

1.9 ‘Electricity’ versus ‘Energy Services’

For the purpose of clarity, the NCCES wishes to identify the difference between *energy services* (e.g. power, light, heating) and the supply of *electricity*. Whether continuance of supply, is interpreted as *energy services* or *electricity* will have a considerable impact. Where the optimisation of unit cost of the lines network is driven principally by *maximising throughput*, optimisation of the ultimately desired energy services are at least equally governed by *maximising efficiency*.

Experience shows that the core energy services requirement can be met with a drastically lower amount of total energy than the “average consumer electricity use” through means of consumer awareness, efficiency measures, economic incentive and appropriate energy supply. The impact and cost of these considerations include income and health support requirement.

The outcome of this review, in combination with other government policies, can therefore significantly influence the national drive toward energy efficiency and environmental impact.

We recommend that the review objective be slightly rephrased “to ensure that affected consumers continue to have access to quality **energy services** after 2013 and that it is delivered efficiently, fairly, reliably and in an environmentally sustainable manner.”

2. Feedback on proposed options

In order to provide an ‘unbiased, logic based’ feedback, we have ranked each of the proposed options against each of the objective criteria. The criteria we used were:

- Overall objectives as identified in statement #9
- A NZ economic growth (growth) objective
- A indication of compliance (admin) burden.

The impact on two consumer groups (class 1 & class 3) was considered. We arbitrarily weighted each of the objectives with a relative merit factor (see Table 1).

Table 1 – Option analysis summary

Scoring (5 = Most favourable; 0 = Least favourable)

Ranking (5 = most favourable; 0 = Least favourable)

	Efficient	Fair	Reliable	Environ	Growth	Admin
Weighting	1	3	1	2	2	0.5

Urban consumers (Class 1)

	Efficient	Fair	Reliable	Environ	Growth	Admin	Score	Rank
A Lines	2	3	5	4	3	2	31	3
B Supply	3	3	5	3	4	4	33	4
C Cutoff	5	0	0	2	2	1	13.5	0
D With assist	4	1	1	2	2	3	17.5	1
E Supply-limited	4	2	2	2	2	4	22	2
F Supply-subsidy	0	4	5	4	4	4	35	5

Rural / economically poor consumers (Class 3)

	Efficient	Fair	Reliable	Environ	Growth	Admin	Score	Rank
A Lines	3	3	4	4	3	2	31	4
B Supply	2	3	3	3	4	4	30	3
C Cutoff	0	0	0	2	2	1	8.5	0
D With assist	1	1	1	2	2	3	14.5	1
E Supply-limited	1	2	3	2	2	4	20	2
F Supply-subsidy	4	4	3	4	4	4	37	5

The following comments support the above analysis:

Option A: maintains what is currently a robust, efficient and environmentally friendly system with relatively low cross-subsidies.

Option B: Allows a new optimal total system solution, *provided* definition and quantification of energy supply is a shared agreement between provider and affected consumer.

Option C: Effectively a cut-off (with notice). Albeit favourable for the majority of (urban) consumers, it has an unacceptable high impact on group 3 consumers (remote, poor). If lines failure due to sudden network damage (e.g. storm or earthquake) is included the cut-off timing becomes virtually random, which imposes an unacceptable planning risk for the consumer as he might have to have available an alternative supply whilst paying line-charges until the actual failure moment.

Option D: Somewhere between B and C.

Option E: Exactly the same as B if not reviewed and acted upon before end of term (i.e. reduced liability to Lines Cos' and increased liability to consumer with increased age of infrastructure / risk of failure).

Option F: When following the original 'socially equitable' principle, the spreading of subsidy burden over all grid-connected consumers instead of those in the Lines Co's area appears a 'fair' solution. The magnitude of the subsidy is in question and cost of compliance should be minimised. Lines Co's can farm-out their supply responsibility if desired, which in turn could stimulate healthy growth in the energy alternatives market. Focus on energy services instead of electricity stimulates energy efficiency measures.

In conclusion, for both class 1 & class 3 consumers, option F is the most favourable of those considered.

3. Alternative option

Based on our experience with introducing “new / alternative” energy technologies into communities which are unfamiliar with these technologies has highlighted that consumers will resist these technologies, *unless* the consumer is fully aware of and understands the whole technology of the system. The consumer must be aware of the financial, environmental and social impacts, *and* have a leading role in defining what is an ‘appropriate’ system for their situation.

Our suggested option therefore is a modification of option F, namely the **continuation of energy services (with subsidy), where *consumer consent* is required prior to lines alternatives being developed and introduced. It is proposed that the subsidy be operated as an open tender system to the EC.** The EC would award funds to the ‘best rated’ submissions, when funds become available.

The option places the onus on the lines companies to engage with and educate their ‘uneconomic’ consumers. The informed consumer can effectively participate in defining what constitutes an appropriate alternative system is significantly to be capable of maintaining and operating the system.

Without the required monopoly inherent with a lines network, there is a place in the ‘market’ for companies to take on a service role to the consumers. (This is to some degree analogues to Telecom’s local loop versus mobile phones; there are now many consumers that no longer have a fixed line). If such companies would take over the responsibility to maintain systems “efficiently, fairly, reliably and in an environmentally sustainable manner” then, in our view, this would fulfil the same obligation as the Lines Co’s have for the lines network. Indeed there might be a place for a “rural services Co” that services a variety of systems: energy services, rural internet, and the farm equipment.

The ‘continuance of supply’ does not need to come direct from the lines companies.

We expect the impacts on stakeholders to be as follows:

Government: The administrative burden could be minimised through pragmatic utilisation of the existing EC levy.

“NZ Inc”: A socio-economic lowest-lifecycle-cost option must be the preferred solution to the nation as it stimulates the triple-bottom-line whilst providing for its weaker social members.

Consumers:

Class 1 (‘economic’ / urban): There is likely to be little influence on the economics and reliability of supply to this group. A small increase in EC levy will be offset by lower lines charges and less cross-subsidy to ‘uneconomic’ lines.

Class 2 (‘uneconomic’ / robust): Depending on financial & reliability benefits, this group can elect for continued lines or subsidised alternative.

Class 3 (‘uneconomic’ / poor): This group, already struggling financially, is most likely to be on ‘uneconomic lines’. This option guarantees a continuation of energy services to this community, thereby providing the opportunity to become Class 2 (i.e. economically mature).

Class 4 (post-1993): Impact is likely to be similar to Class 1 & 2.

Class 5 (off-grid): Will be able to compete for subsidies, and therefore be on a level footing with other consumers (i.e. socially equitable).

Lines Co’s: Can optimise network to most economic solution and, if desired, branch out into new non-monopolistic opportunities in the expanding ‘market’.

Market: New customers and subsidies, stimulate innovation and expansion whilst minimising opportunistic advantage being taken from uninformed consumers ‘with their backs against the wall’.

4. Recommended actions

NIWA encourages MED to undertake the following actions prior to making recommendations to the minister.

1. Consider social equity impacts on each consumer group, for each of the proposed options.
2. Consider the impact on the NZ economy as a whole, including long term land use trends (e.g. agricultural practise such as returning land to forest) of “uncertain” energy continuity to rural areas.
3. When considering, efficiency of delivery, consider total *energy services* and non-energy *social* costs (e.g. income support).
4. Define current levels of cross-subsidy, and determine the likely number and social status of those consumers likely to be affected by the options and / or the amount of cross-subsidy.
5. Initiate large scale awareness and familiarisation for affected or concerned consumers, including regional demonstration projects.
6. Alternatives analysis should consider moderate / community scale distributed generation, and not just local scale (see Chapter 6 of discussion). Moderate scale generation would likely benefit from the maintenance of lines for export revenue. Without lines maintenance opportunities for both customer / would be generator & Lines Co could be lost.

5. MED Questions for ‘continuance of supply’ review options.

PLEASE NOTE: The Options A/B and C/D in the Questions have been relabelled to be in line with the Options in the discussion document.

5.1 Option A: Continuance of supply by lines with no expiry date.

5.2 Option B: Continuance of supply, using lines or alternatives, with no expiry date.

a) Should access to electricity supply for pre - 1993 connections be maintained with no expiry date? What issues could this raise?

According to the discussion document, there will only be a small cross-subsidy in scheme of things. Continuance of lines supply has limited cost impact and maintains consumer certainty. However, it does not encourage market innovation and, more importantly, does little to nothing to improve national energy services supply economics (including energy efficiency). A blanket continuance of lines supply, with cross-subsidy appears unfair to those post-1993 consumers that have paid or are paying the full cost of their connection.

b) What expectations should there be from consumers around price, quality, reliability and capacity for continuance of supply (either by lines or by alternatives)?

Consumers should be able to expect energy supply that is ‘appropriate’ to their individual situation. The needs of a remote holiday bach with very occasional use are vastly different from that of a remote shearing shed or dairy farm.

c) What scope is there for remote rural consumers to be supplied using alternative supply methods or for example, the method outlined in paragraph 47?

Alternative supply methods depend on each individual consumers situation, however the entire service area of an ‘uneconomic’ line should be an aggregated exercise since the line is either on or off.

The cost indications provided in Chapter 6 of the discussion document are all small-scale individual systems. For those remote communities situated ‘at the end of the line’ the option of an islanded network can be already cost-effective. This mainly serves to highlight that there is no “one solution fits all” approach.

The cost reduction measures outlined in statement # 47 are, in our view, unrelated to 2013 since these technical options if feasible can be deployed now.

The use of different supply contracts, particularly regarding reliability, exposes the consumer to potentially more supply risk than ‘alternative’ supply. Therefore these lines options should be considered with the same level of caution as the provision of ‘alternative’ supply.

Where a line is currently serviceable to a customer, the grid will be very cost effective. Line failure (see Section 1.6 above), can dramatically alter the economics, and make distributed generation viable.

d) To what extent should there be a subsidy from other network users to those in remote, rural areas? (e.g. domestic urban consumers to domestic rural, remote consumers).

In a principally competitive economy such as New Zealand, mature economic players should expect to be exposed to the full market forces without blanket subsidies from other consumers. *However*, if there are other socio-economic drivers that desire to stimulate the rural environment (which is likely) than those drivers should be clearly identified and a lines-subsidy justified against these drivers directly.

e) If the continuance of supply is by lines or alternatives, should lines companies be able to cross-subsidise alternative-supply customers from lines-connected customers?

If “the government expects distribution companies to keep any changes to rural line charges in line with urban line charges” it can be assumed this stems from the core objective to avoid rural consumers from being charged relatively “unfair” high charges for their energy supply. If the cross-subsidy does not apply to alternative-supply then this would totally negate the assumed objective of this government policy. The choice between lines and alternative is one of minimising total-system cost, and unrelated to cross-subsidising energy supply.

f) What terms and conditions for continuance of supply do consumers that were connected after 1993 have in their contracts?

5.3 Option C: Continuance of supply expires but lines companies provide information on intentions in advance.

5.4 Option D: Continuance of supply expires but lines companies assist transition from lines supply to alternative.

a) *If an advance notice period is used, what length of time should it be?*

The 'period' should be linked to consumer consent, rather than a time frame. In the case of a time frame, one could argue that there is no incentive on the lines companies to ensure that the consumer is actually fully aware of and familiar with all the pros and cons of the alternatives. Particularly the remote, and therefore at-risk, consumer typically has limited access to phone, internet and other information sources.

The required time-period for consumers to prepare for alternatives is also very dependant on the availability of *knowledgeable and accessible* alternative suppliers. There are only a limited number of such suppliers in NZ, which can only grow at a certain rate. If the 'release' of lines consumers is too large and happens too quick then, as much as they would like, the 'market' will not be capable of properly engaging the consumers and providing and delivering appropriate quality systems.

b) *What other requirements could or should be placed on lines companies if continuance of supply expires?*

If lines failure due to sudden network damage (e.g. storm or earthquake) is included the cut-off timing becomes virtually random, which imposes an unacceptable planning risk for the consumer as he might have to have available an alternative supply whilst paying line-charges until the actual failure moment. This event should be excluded as reason to stop supply.

c) *What role would you expect the retailer to take as the continuance of supply expires and a change in supply is signalled?*

d) *At what point after a lines company has assisted a transition should its responsibility cease?*

A Lines Co responsibility can cease if and when the consumer is satisfied with the performance of the alternative system. This can be either the consumer being happy to take full responsibility him / herself *or* if there is another 3rd party that, like the Lines Co does for lines, provides the service role for the alternative systems. If there remains a cross-subsidy on the lines this should transfer to the alternative.

5.5 Option E: Continuance of supply for a limited time beyond 2013.

a) Should the transition period be extended?

Without clear direction and direct action, extending the transition period only pushes the issue forward.

b) If so, how long should it be extended for and what should happen at the end of the period?

n/a

5.6 Option F: Continuance of supply, using lines or alternatives, with no expiry date but subsidy is from *all* electricity users.

a) What issues are there with creating and employing a different subsidy mechanism in order to socialise the costs across all electricity users?

When following the assumed social equitable principle, spreading the subsidy burden over all grid-connected consumers instead of those in the Lines Co's area appears a 'fair' solution. The same principle should apply equally for energy services.

The magnitude of subsidy is linked directly to the number of customers accepting alternative generation, and the cost of alternative energy services. This can be quantified on the back of Lines Co estimates of 'uneconomic' lines. To minimise the cost of compliance and keep alternative generation at arms length of Lines Co's, we believe a pragmatic extension of the EC levy would be appropriate.

Focus on energy services instead of electricity stimulates energy efficiency measures. To promote this, any subsidy should be based on energy consumption (as the EC levy) rather than fixed (lines) charges.

The question of cross-subsidy should focus on the underlying intent of that subsidy, not on the method of supply delivery.