

**Review of Section 62 of the
Electricity Act 1992
‘Continuance of Supply’
(2013 review)**

Discussion paper

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Executive Summary

Section 62 'Continuance of Supply' of the Electricity Act 1992 (the Act) provides that electricity lines companies must maintain line services to connections established as at 1 April 1993. This section expires on 31 March 2013. Unless amended, once this section expires, consumers connected to lines which are not commercially viable (i.e. uneconomic) will face uncertainty about access to electricity at affordable prices. The section is being reviewed now to decide whether section 62 should be amended. The review presents a range of feasible options for consultation in order to ensure that affected consumers continue to have access to electricity after 2013 and that it is delivered efficiently, fairly, reliably and in an environmentally sustainable manner.

This discussion paper identifies a number of options for 'continuance of supply' after 2013. Options identified are:

- a. Continuance of obligation to maintain line function services with no expiry date;
- b. Continuance of obligation to maintain supply, using lines or alternatives, with no expiry date;
- c. Continuance of obligation to maintain line function services expires but lines companies provide information on intentions in advance;
- d. Continuance of obligation to maintain line function services expires but lines companies assist transition from lines supply to alternatives;
- e. Continuance of obligation to maintain supply, using lines or alternatives, for a limited time beyond 2013;
- f. Continuance of obligation to maintain supply, using lines or alternatives, with no expiry date but subsidised by all electricity users.

There is no preferred option identified at this stage, and the discussion paper seeks input from stakeholders to identify any other feasible options.

A key assumption is that current policy requiring line charges to rural and urban areas to be pegged will remain. This policy is set out in paragraph 99 of the current Government Policy Statement on Electricity Governance (GPS 99, October 2006):

The Government expects distribution companies keep any changes to rural line charges in line with urban line charges. The Electricity Commission should monitor developments in rural charges.

The paper considers the impacts of each of these options on the following groups of stakeholders: consumers (both rural and urban); lines companies; and 'the market' for alternative supplies. Broadly speaking, we think that consumers will want certainty of supply at affordable prices; that lines companies will want to be able to generate a commercial return on their assets and to make viable investments; and that 'the alternative supply market' will be looking for new opportunities to expand.

We seek your feedback on your preferred option and on any other feasible options you think will achieve the objective. We will then analyse the submissions, making our

recommendations on continuance of supply and any proposed changes (if necessary) to section 62 of the Act to Ministers by the end of 2007.

1. Introduction

1.1 What does section 62 'continuance of supply' mean?

1. Section 62 of the Electricity Act 1992 (the Act) provides that lines companies are to continue to supply line function services to places supplied as at 1 April 1993, unless certain circumstances apply. These circumstances include overdue payment for the line services, storm damage to the line, and servicing of the line for safety. In all circumstances the disruption to supply can only last as long as the circumstance lasts; e.g. following storm damage the obligation requires the line service to be resumed.
2. This provision remains in place until 2013. Subsection 6 of section 62 states that the section expires on 31 March 2013 and, as of 1 April 2013, will be deemed to be repealed.
3. Section 62 of the Act does not apply to consumers who connected to lines after 1993. We would expect the terms and conditions for continuance of their supply to be part of a connection contract.
4. Section 7 of this paper briefly describes how section 62 of the Act came to be enacted. Its full text is provided in Appendix 1.

1.2 What is the problem?

5. Stakeholders most likely to be affected by the expiry of section 62 are those consumers on lines that are considered uneconomic, such as those to remote rural areas. Many of these consumers are uncertain about arrangements for their electricity supply after 2013, such as what would happen to supply after a storm has damaged the lines. If section 62 is repealed and the requirement for continuance of supply expires, lines companies would no longer be legally obliged to maintain connection.
6. Consumers might need to arrange their own method of electricity supply by alternative sources and could face higher energy costs, and ongoing requirements in terms of maintenance of systems, managing quality and responding to failure. The number of consumers affected by the expiry of section 62 of the Act depends on the intentions of individual lines companies. We do not have a detailed picture of these consumers or their total number, but we know that by 1985 around 16,000 connections were made in remote rural regions using approximately 17,000km of line under a subsidy scheme administered by the Rural Electricity Reticulation Council.
7. Lines companies are likely to initially continue to supply after 2013 on lines considered uneconomic, but when maintenance or upgrade costs become too high, or lines fail after a storm, there is a possibility that lines may not be repaired or replaced. In order to maintain line service, consumers could be required to contribute to the repair / replacement costs.
8. In June 2005, the Minister of Energy announced that a review of section 62 of the Act would take place in 2007. Carrying out the review in 2007, well before the section expires, allows sufficient time for legislation to be amended (if considered necessary) and time for people to adjust any new regime.

1.3 Objective of the review

9. The objective of the review is to consider what new arrangements, if any, should be put in place to ensure that affected consumers continue to have proper access to an electricity supply that is efficient, fair and reliable and delivered in an environmentally sustainable manner.
10. A number of options identified as possible new arrangements are outlined in this paper, along with an indication of each option's potential impacts on different stakeholder groups. The paper raises a number of questions for consideration. It seeks views on options and impacts and invites suggestions of any additional options/impacts that should be considered.
11. The impact of each of the options is presented from the perspective of different stakeholder groups. These groups are identified as:
 - Consumers supplied by lines that would be uneconomic to maintain and / or replace if damaged or worn out. They are most likely to be located in remote rural areas;
 - Consumers whose line charges contribute to any implicit or explicit subsidy of lines charges (mainly urban consumers);
 - Lines companies that own the lines (there are 28 such companies);
 - 'The Market', being those individuals or businesses that could potentially compete or partner with lines companies for supplying energy to consumers in remote rural areas.
12. The key assumptions are outlined prior to the presentation of options.

1.3.1 Supporting information

13. Sections 6, 7 and the appendices contain information on:
 - the indicative costs of alternative electricity supply i.e. supplying electricity by methods other than by lines;
 - historical background to why section 62 was enacted and the role of the Rural Electrical Reticulation Council (RERC) in subsidising the building of uneconomic lines to farming regions;
 - the text of section 62 of the Electricity Act 1992;
 - the Terms of Reference (ToR) for the review.

1.4 Process

1.4.1 Consultation

14. The purpose of this discussion document is to highlight the implications of the expiry of section 62 in March 2013 for connections made before 1993, identify a range of feasible options that could address the problem of uncertainty of supply beyond

2013, and indicate the impacts arising from each option. This paper does not recommend a specific option and requests feedback from submitters as to which option, or any other option not considered here, best addresses the review's objective.

15. *The Ministry of Economic Development (MED) confirms that the substantive Regulatory Impact Analysis elements are included at the appropriate level in the discussion document, up to the level of impacts of options. The approach complies with the Code of Good Regulatory Practice. A preferred option is not yet identified.*
16. Once we have received and considered your submission, these options (including any additional options identified through consultation) will be further analysed for their impacts before we finalise our recommendations to Ministers. Further cost-benefit analysis may be undertaken following analysis of submissions in order to inform the policy proposals.
17. The Ministry of Economic Development will make recommendations to the Minister of Energy on future arrangements and any proposed changes to section 62 of the Act by the end of 2007.

1.4.2 Submissions

18. Submissions are due by 5pm, Friday 28 September. The Ministry requests that submissions are made in writing (either by email, post or fax), or by filling in the online submissions form:
 - i. Email: electricity@med.govt.nz.
 - ii. Post: 2013 review
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Energy and Communications Branch
Ministry of Economic Development
PO Box 1473
Wellington
New Zealand
 - iii. Fax: +64 4 473 7010
 - iv. Online at www.med.govt.nz/2013review
19. The Ministry intends to publish the submissions on its website at www.med.govt.nz/2013review
20. Respondents should note that written submissions or comments provided to the Ministry of Economic Development on the discussion paper will be subject to the Official Information Act 1982 (OIA). The OIA requires the information to be made available unless there is good reason, pursuant to that Act, to withhold the information; and that this good reason outweighs the public interest in making the information available. The Ministry will consider that you to have consented to publishing when you make a submission, unless you clearly specify otherwise, with reasons.

2. Assumptions and proposed assessment criteria

21. This section sets out the Ministry's assumptions and proposes criteria for evaluating the outcomes of each option.

Assumptions

2.1 Urban and rural cross-subsidy

22. Current government policy is to peg changes in line charges to rural areas to changes in line charges to urban areas, as set out in the Government Policy Statement on Electricity Governance (GPS, October 2006, paragraph 99) :

'The Government expects distribution companies keep any changes to rural line charges in line with urban line charges. The Electricity Commission should monitor developments in rural charges.'

23. The statement reflects the importance of affordable electricity access in rural areas, but its implications are that remote rural consumers are likely to pay line charges that are lower than they would be if they paid the full cost of supply. Hence there is an explicit degree of cross-subsidy from other users of the network. This review is undertaken on the assumption that this government policy will continue, and the review therefore does not examine in detail the prices paid by consumers for their electricity supply.
24. Some consumers do not, and likely will not, face the full costs of supply by lines so the impacts for lines companies and consumers need to be considered in this context. For example, even if the costs of alternative supply were lower than the true costs of line supply, consumers in remote areas would be likely to face increased costs if they were to switch from supply by lines to alternatives.

2.2 The economics of line supply

25. Supplying electricity by lines could be considered uneconomic for two main reasons:
- i. When the revenue generated from the consumers connected to the line is insufficient to meet the costs of maintaining the line, including asset renewal. In a business sense, this means the asset (the line) generates a negative return and network assets used elsewhere must generate a higher return to cover the full cost of supply across the line company's network.
 - ii. When it would be a lower cost to supply the same area by an alternative means (i.e. not by long distribution lines). This concept of 'uneconomic' is used by the Commerce Commission in its direction to lines companies on how to value their network assets.

2.3 Lines companies' asset valuations

26. A lines company values its network assets using a valuation methodology called Optimised Deprivation Valuation (ODV). One part of the method requires that a lines company consider its network as comprising many segments and evaluate whether, for each segment, it is possible to provide the same service, at lower cost to users of

the network, by an alternative means. If so, then that portion of the network is deemed uneconomic. This is called the Economic Valuation (EV) test and its result is to reduce the asset value of the network. A company does not have to undertake an EV test if it is thought that the reduction in value would be less than 1% of the total network value.

27. The line companies' disclosure statements show that none have made any Economic Valuation adjustments. This implies that any portion of their network deemed to be uneconomic cannot be more than 1% of each company's total asset valuation. This may change (become greater than 1%) as lines become due for replacement and investment is required.

2.4 What is alternative supply (alternatives)?

28. Alternative supply (alternatives) can mean two things:
- i. Any method to generate and supply electricity to an area that is not connected to a line company's network. These are broadly termed 'remote area power systems' or 'off-grid generation' and can include supply to individual households or to a local 'islanded' network.
 - ii. Any method by which electricity use can be reduced to better enable alternative supply; for example, by substitution with another energy source (such as using gas bottles for heating and cooking, or wood burners for space and water heating) and/or by using electricity more efficiently.
29. Technologies available for generating electricity off-grid include micro-hydro, geothermal, solar photovoltaic, micro-wind and diesel/petrol generators. These technologies and their relative economics are discussed further in **section 6**. In addition to these more established technologies, pilot research is underway that examines newer technologies; for example, fuel cells and hydrogen storage.
30. Also being considered, but outside the scope of this paper, is the potential for on-farm/in-forest generation of electricity using bioenergy for both off-grid use and national distribution.
31. A May 2006 study by East Harbour Management Services (EHMS) on the potential for small-scale generation (the alternatives) in NZ¹ assumed that the expiry of section 62 would influence uptake. One reason given for a fixed continuance of supply period (1993 – 2013) was that further development and cost reduction in alternatives to lines would occur during that time.
32. Alternative systems that supply electricity will also have ongoing maintenance costs and need to be understood in terms of their capacity, quality, reliability and complexity.
- *Capacity* relates to the maximum power that can be drawn - which determines what appliances can be used together.

¹ Parliamentary Commissioner for the Environment 'Micro generation potential in New Zealand - a study of small-scale generation potential' (May 2006). http://www.pce.govt.nz/reports/allreports/1_877274_41_0.shtml

- *Quality* relates to the voltage stability of supply – sudden spikes, for example, can damage computer equipment.
 - *Reliability* means the ability to switch appliances on when required – noting the ability of a distribution company to switch off hot-water or other facilities for certain time periods.
 - *Complexity* means the ease with which such systems can be maintained / repaired, and the level of expertise required to do so.
33. Alternative energy sources such as gas bottles or wood burners will also have ongoing maintenance requirements. For example, gas bottles need to be filled periodically, which raises issues of whether the consumer is responsible for that (and hence needs transport and a nearby supplier) or a company delivers (but at what cost); and whether the fuel for a wood burner may be collected (essentially free but takes time) or must be bought.

2.5 Proposed assessment criteria

34. The government's objective is for all classes of consumer to have access to electricity that is delivered in an efficient, fair, reliable and environmentally sustainable manner².
35. The following assessment criteria, applied to the consideration of the outcomes for each option, are proposed:
- Efficient (e.g. assess whether lines business have incentives to maintain and invest in supply infrastructure; assess whether the resources for maintaining access to electricity are being used in the best way).
 - Fair (e.g. assess whether remote, rural users will continue to have access to electricity at reasonable prices, comparable with supply to other users;
 - Reliable (e.g. assess whether the option leads to enabling sufficient, reliable supply; assess the change in level of involvement required of the consumer);
 - Environmentally sustainable (e.g. assess whether the outcome is consistent with climate change considerations).
36. The New Zealand Energy Strategy, proposing the future direction for energy policy in New Zealand, is expected to be finalised in October 2007. This review of the 2013 obligation takes that strategy work into account.
37. This review does not discuss any other element of the electricity regulatory framework, but it takes into account proposed changes to the Electricity Industry Reform Act 1998.

² Principal objective for the Electricity Commission 172N Electricity Act 1992

3. Indication of line companies' current policies

38. Approximately half of the lines companies mention continuance of supply after 2013 in their Asset Management Plans³. Several lines companies comment that this issue is under consideration and policy has not yet been developed. Where lines companies do have a policy for 2013, around two thirds have indicated that they are likely to continue current arrangements to supply existing consumers after 2013. These policies include:

- Developing a strategy for managing uneconomic lines by conversion to single phase 11kV lines as the most viable and sustainable solution for ongoing supply by lines.
- Intending to contribute to supply of customers on marginal lines post 2013, although it is unclear whether this will be through lines or alternative methods.
- Noting that there is a business opportunity for distributed generation but yet to investigate this.
- Suggesting that discontinuing line supply would most likely be considered in an economic valuation at the time of asset renewal or when significant vegetation control is needed.

39. Some observations made by lines companies on the issue were:

- *Consumers are only satisfied by secure supply and electricity cannot be partially maintained, so the infrastructure must always be in working order;*
- *As the 31 March 2013 date is arbitrary there will be many lines that will remain in service after that date so impacts on consumers will be felt when lines need replacing rather than as the date passes;*
- *Consumers will never opt for alternative systems because they are never faced with the true costs of supply as government policy requires that increases in rural line charges cannot be greater than increases in urban line charges i.e. there is an explicit cross-subsidy;*
- *To make a remote rural line economic the line charge paid would have to increase substantially – by more than double;*
- *On a per connection basis, the level of subsidy from urban to rural consumers is not significant;*
- *Ongoing supply by lines to remote rural areas requires consideration of asset renewal and management of vegetation costs;*
- *A consumer will always prefer supply by lines because they have no responsibility for the ongoing maintenance.*

³ These are available on the companies' websites.

4. Summary of options

40. A number of potential options are outlined in the table below.
41. Each option is discussed in more detail in section 5. Under each we outline indicative impacts for key stakeholders, and put some issues and questions on which we seek your feedback

Option	Brief description
a. Continuance of obligation to maintain line function services with no expiry date.	Subsection 6 of section 62 is repealed so that line function services must be supplied in perpetuity.
b. Continuance of obligation to maintain supply, using lines or alternatives, with no expiry date	Subsection 6 of section 62 is repealed so that services must be supplied in perpetuity, but lines companies can choose whether this is by lines or through an alternative method such as remote area power system (RAPS).
c. Continuance of obligation to maintain line function services expires but lines companies provide information on intentions in advance	Requirement for lines companies to provide information on intentions and notification if they intend a change in, or removal of, supply to consumers.
d. Continuance of obligation to maintain line function services expires but lines companies assist transition from lines supply to alternative.	Requirement for lines companies to assist in management of a transition to alternative provision where they wish to no longer maintain 'uneconomic' lines.
e. Continuance of obligation to maintain supply, using lines or alternatives, for a limited time beyond 2013.	2013 date in subsection 6 is changed, and section 62 continues until a new expiry date. Lines companies could maintain supply via alternatives or lines.
f. Continuance of supply, using lines or alternatives, with no expiry date but subsidy is from all electricity users.	The subsidy required to maintain connections on uneconomic lines is recovered from all electricity users.

5. Indicative impacts on stakeholder groups for each option, with questions

42. Each option will create a range of impacts for each stakeholder group. This section seeks to broadly identify what impacts would result to each. The criteria for evaluation (section 2.8) will be applied to the outcomes (the collection of impacts) for each option.
43. If you think other impacts should be taken into consideration please set them out in your submission.

5.1 Continuance of obligation to maintain line function services with no expiry date

44. Subsection (6) of section 62 of the Act would be repealed, meaning that section 62 of the Act would no longer expire in 2013, and lines companies would be required to continue to supply line function services to those places supplied in April 1993 with no date of expiry.

Impacts

45. **Lines companies** – Assets will continue to be used that are not generating a commercial return. Over time the return will also decrease (and can be negative) and the cross subsidy in the network will continue and increase.
46. This would potentially increase costs (and therefore reduce the value of the business) for the lines company relative to the expiry of section 62 in 2013. The ability to cross-subsidise from other consumers would need to continue to be sanctioned, either by government policy statements or even by legislation.
47. A lines company could seek to improve the economics of lines supply to remote rural areas by replacing lines with lower cost technology (e.g. replacing 3-phase power with single phase) or using different supply contracts for less economic consumers (e.g. providing for lower reliability standards).
48. Lines companies would still be in a position to apply to the Minister for approval to disconnect the line, but would probably have to propose an alternative for supply.
49. **Consumers** – Remote, rural consumers on uneconomic lines would have certainty of supply. The price they could expect to pay for lines charges would depend on the evolution of future government policy regarding rural / urban pricing. The relative prices of lines services may differ between network regions as different networks have a different proportion of services to uneconomic areas.
50. If supply to these ‘uneconomic’ areas is maintained this could increase the level of cross-subsidy required from other network users, particularly as lines begin to need significant upgrading. Preliminary information from lines companies indicates that the size of this cost on a per-consumer basis is likely to be small, but this could depend on the relative proportions of the economic and uneconomic segments of the network.

51. **Market** – If the requirement is to supply by lines with no expiry date, the market opportunities for suppliers and proponents of alternative supply systems would be very constrained and the potential for innovation and development reduced.

5.2 Continuance of supply, using lines or alternatives, with no expiry date

52. Subsection (6) of section 62 of the Act would be repealed, meaning that section 62 of the Act would no longer expire in 2013. Lines companies would be required to continue to supply either by lines or by alternative supply in perpetuity. Other parts of section 62 (when supply can cease temporarily) would also need to be redrafted.

Impacts

53. **Lines companies** – It is likely that there would be increased business and compliance costs for lines companies relative to the expiry of section 62 in 2013. Lines companies would be required to continue supply in some areas on assets that are not paying for themselves. If companies can supply by alternatives closer to load this may be a cheaper option, but even then the revenue may not be sufficient to recover the cost of supply.
54. Lines companies would be the party responsible for making the decision on how best to supply, but this could impact on the level of consumer involvement required if the company sought to deliver electricity by alternative means, including substituting for electricity by using other energy sources (e.g. bottled gas for cooking).
55. New business opportunities would eventuate as lines companies might be expected to develop new knowledge and expertise in respect of remote area power generation. Expertise could potentially be applied to other distributed generation solutions more generally in the network. However obtaining this knowledge and expertise would be costly and require time and commitment. Presumably companies would not invest in alternatives to lines unless it was more economic to do so.
56. Proposed changes to the Electricity Industry Reform Act 1998 will allow lines companies to own, maintain and sell generation (energy) in areas outside their own network areas.
57. **Consumers** – There would be greater certainty for consumers if the continuance of supply was maintained, but they might have to adapt to an alternative method of supply if that were more economic. Future prices would depend on the evolution of government policy regarding rural / urban pricing and whether the policy would apply to alternative methods as well as lines.
58. We expect that many consumers would prefer a subsidised lines supply with no maintenance responsibility rather than an alternative system that could require a greater level of change and ongoing involvement. However there may be consumers that want to take advantage of the opportunity to change and are interested in having greater control over their energy supply.
59. There would need to be consideration of the ongoing quality, reliability and capacity of supply and the amount that customers were willing and able to pay to be supplied with electricity. Other energy sources such as gas bottles and wood burners can

substitute for electricity used for heating, but the responsibility for maintenance would fall to the consumer.

60. **Market** – Other market solutions and providers (e.g. retailers) may be cut out if lines businesses are responsible for supplying alternatives, but on the other hand the supply obligation could enable an alternatives market if lines companies contract out to suppliers to fulfil their obligation. However if the alternative supplier failed then it would still fall to the lines company to maintain connection.

5.1 and 5.2 Questions (Continuance of supply with no expiry date, using lines or alternatives)

- a) Should access to electricity supply for pre - 1993 connections be maintained with no expiry date? What issues could this raise?
- b) What expectations should there be from consumers around price, quality, reliability and capacity for continuance of supply (either by lines or by alternatives)?
- 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?
- 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).
- 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?
- f) What terms and conditions for continuance of supply do consumers that were connected after 1993 have in their contracts?

5.3 Obligation to maintain line function services expires but lines companies provide advance information on intentions.

61. Under this option section 62 would expire on 1 April 2013 but lines companies would be obliged to provide notice to their customers if they intend a change in, or removal of, line supply to consumers.
62. This would require a modification to the Act to replace the continuance of supply by lines with a requirement that any proposed changes to line supply to pre-1993 consumers be notified and explained by lines companies.

Form of information requirements on lines companies

63. Listed below are potential ways that lines companies could provide information:
- **Minimum notice period** – lines companies could be required to provide a minimum advance notice period (e.g. 3 or 5 years) to stakeholders prior to removing supply by lines, to allow consumers time to implement alternative supplies.
 - **Type of information to be provided** – lines companies could provide, for example, an energy audit for a consumer to identify alternative supply

opportunities, or provide information and contact details for alternative suppliers.

- **Degree of notification/contact with affected consumers** – notification would first be done directly with consumers, and then possibly more widely via public forum, the press, or Internet website.

Impacts

64. **Lines companies** –They would no longer have a legal obligation to maintain line service function to connections established as at 1 April 1993.
65. We think it is likely that lines companies would initially continue to supply after 2013 on uneconomic lines, but when maintenance or upgrade costs become too high, or lines fail after a storm, there is a risk that they could choose not to repair / replace them.
66. Lines companies would face a small cost of providing information when intending a change in supply, but this would only occur if the company had identified that the supply change would be economically beneficial.
67. **Consumers** – Consumers are already expressing concerns about security of supply and affordability after 2013. Distribution assets could already be deteriorating if lines companies will no longer be legally obliged to maintain line function services into the future to uneconomic areas. Uncertainty around supply could reduce if lines companies are required to notify their intentions.
68. However being notified that supply conditions are changing would itself generate uncertainty regarding timing and costs of the new arrangements. Consumers might need to arrange their own method of electricity supply by alternative sources and would need to pay full costs, and also face ongoing requirements in terms of maintenance of systems, managing quality, and responding to system failure.
69. Consumers could form co-operatives to take over ownership and maintenance of lines to their properties. This would require lines companies to ensure that lines and associated fittings were at 'a reasonable standard of maintenance or repair' before being transferred, as outlined in section 2(5) of the Electricity Act 1992.
70. **Market** – The market for alternative supply solutions and the potential for market innovation are very likely to be increased if the obligation to maintain supply is allowed to expire with conditions, but it depends on the demand from consumers for affordable and reliable systems, and what information is required to be provided by lines companies.
71. There is some prospect that hybrid supply arrangements could emerge, such as supply to a community of several houses using a generator in combination with a local 'islanded' network (i.e. a network that is not connected to the distribution network).
72. There is also a potential opportunity for remote rural lines to be retained in order to transport and sell electricity generated in remote regions (by distributed generation), which would improve the economics of the line.

5.4 Obligation to maintain line function services expires but lines companies assist in transition to alternative supply.

73. This option would oblige lines companies to provide assistance to those customers they propose to disconnect after 2013 through managing a transition to alternative arrangements for electricity supply.
74. Section 62 of the Act would require modification to replace the current obligation to maintain line supply with an obligation on lines companies to assist consumers in a transition to alternatives where they propose changes to supply arrangements to customers connected on 1 April 1993.

Form of assisted transition obligations on lines companies

75. Potential obligations could include:
- **Brokering / advisory function between consumers and alternative suppliers:** Lines companies broker solutions / advise solutions between consumers and alternative suppliers.
 - **Installation of alternatives:** Lines companies take an active role to ensure alternatives are installed, either by taking responsibility for installation, or by contracting for another supplier to install alternatives for consumers.
76. A decision would be required about the point at which such obligations would be discharged.

Impacts

77. Many of the costs and benefits of this proposal and impacts for stakeholders will be similar to the impacts outlined under the option above. In addition:
78. **Lines companies** – would face increased costs of compliance as they would be required to manage consumers to alternative supplies. However, it should be noted that lines companies are unlikely to remove lines unless the costs of doing so would be lower than the costs of continuing lines supply, so costs should be lower relative to any ongoing supply obligation.
79. **Consumers** – would face less uncertainty, as lines companies would be required to manage consumers on to a new form of electricity supply. However, in the longer term, consumers may still face some uncertainty after the lines company had discharged its obligation to provide connection to an alternative supply, as there is the potential for increased uncertainty about the respective roles and obligations of the lines company, the consumer and any other person involved in the transition arrangements.
80. For this reason, the requirements on lines companies and an exit strategy would need to be clearly defined, so consumers would be certain about who is responsible for ensuring continued electricity supply.
81. **Market** – This should increase the size of the market for the delivery of alternative supply solutions.

5.3 and 5.4 Questions (Expiry of obligation but with additional requirements on lines companies)

- a) If an advance notice period is used, what length of time should it be?
- b) What other requirements could or should be placed on lines companies if continuance of supply expires?
- 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?

5.5 Continuance of obligation to maintain supply, using lines or alternatives, for a limited time beyond 2013

82. Section 62(6) of the Act would be modified to extend the date at which section 62 of the Act expires. This extension could last for a period ranging from five years (2018) to ten years (2023) or more. Together with an extension, changes could be made so that the Act would also include requirements for information and transition assistance as discussed previously.
83. Although this option would delay the expiry of section 62 of the Act, once the new expiry date was reached, stakeholders would face similar issues to those outlined under the status quo, unless an extension of the date for expiry of section 62 could be put in place together with one of the other options previously outlined.
84. However, an additional five to ten year transition may allow further time for development of alternative technologies to lines at a lower cost than currently, and time for consumers to prepare for change. As noted in section 7, costs of alternatives may decrease relative to the cost of supply by lines, especially if lines require investment.

Impacts

85. **Lines companies** would face increasing maintenance costs as lines are made to last even longer prior to expiry of the transition period. We think it unlikely that lines companies would invest in alternative supply options if there was uncertainty about what happens again at the end of the period.
86. **Consumers** An extension of the transition period would temporarily provide increased certainty for pre-1993 consumers, until the transition period again came close to expiry. However there could be increases in unreliability of supply as the use of lines that are already in need of replacement is extended for a few more years.
87. **Market** The incentives to supply and develop alternative systems may be stifled if the period is extended but there is uncertainty about what happens next. The removal of the continuance of supply by (subsidised) lines is a market driver for the ongoing development of alternative systems. The expected future reduction in costs of alternative supplies depends also on the extent to which markets overseas are taking up such systems.

5.5 Questions (Continuance of supply for a limited time beyond 2013)

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

5.6 Obligation to maintain supply, using lines or alternatives. with no expiry date subsidised by *all* electricity users

88. This would be a regulatory framework which would require a new legal instrument to fund the ongoing subsidy of electricity services to consumers connected to lines as at April 1993.
89. The cost of subsidizing commercially non-viable services would be levied on the electricity industry, and would ultimately be recoverable through retail electricity charges. This would change the incidence of subsidy from users within a distribution network to users across all networks (i.e. socialisation of the costs of supplying uneconomic regions).

Impacts

90. **Government** – There would be (as yet unquantified) costs to set up and administer such a new scheme. The costs are expected to be significant. The legal mechanism could be similar to that used in the past (a levy on electricity sales) and administered by a government body (previously the RERC).
91. **Consumers** – Consumers in remote rural areas would have certainty that electricity supply to connections as at April 1993 would be maintained. The supply method employed by the lines company would alter the level of involvement required by them. Most consumers of electricity would be subsidising the small proportion of users on uneconomic lines (around 16,000 consumer connections were made on 17,000 kilometers of line using RERC subsidy).
92. **Lines companies** – Those with a sizeable proportion of lines built using RERC subsidy may benefit from a scheme whereby the costs of maintaining those connections could be recovered from a wider base than just the company in question. Such a scheme would be likely to introduce further administrative cost for all network companies as they would need to demonstrate the areas to which a subsidy would be applied.
93. **Market** – Other market solutions and providers (e.g. retailers) may be cut out if lines businesses are obliged to take on an expanded role of supplying alternatives in perpetuity. However, there may be an increased demand for alternative supply systems if lines companies adapt their business model to accommodate alternative supply methods.

5.6 Questions (Continuance of supply using lines or alternatives with no expiry date subsidised by *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?

6. Indicative unit costs (c/kWh) of alternative supply

94. The following table provides some indicative unit costs for alternative supply systems. Expected system lifetime is shown and unit costs were calculated under discount rates of 5% and 10%. 'Unit cost' includes the capital cost of the generating technology, fuel, maintenance and safety requirements needed to produce a unit of electrical energy (kWh).
95. Note that each technology produces an annual energy output generally much less than the 'average' domestic consumer requirement of 8,000 kWh, (although domestic demand per inter-connection point in a remote region may be much less at around 4,000kWh), which increases the likelihood that the electricity requirement would need to be met from more than one source. Electricity demand can be reduced if additional methods to substitute for electricity are used or electricity efficiency measures taken. For example, bottled gas could be used to provide for cooking, water heating and refrigeration (substitution) and lighting can be provided by compact fluorescents.
96. Many remote area power systems may be composed of more than one type of generation and could also include additional costs for equipment such as inverters and battery storage.
97. For supply by lines, the current price⁴ paid per unit of electricity ranges from 19 – 26 c/kWh, with the high end of the range more likely for rural services. This unit cost includes delivery cost i.e. the cost of the wires, poles and transformers to convey the electricity. For an average annual domestic requirement of 8,000kWh this results in an annual bill of \$1,500 - \$2,100.
98. Information on standard replacement costs and assets lives of distribution infrastructure⁵ shows that cost of the infrastructure per kilometre ranges from \$12,000 - \$50,000, depending on the line voltage and current capacity. A single phase SWER (single wire earth return) line that could supply remote rural areas that did not need three-phase power is given as \$21,000 per km. Additional costs are incurred if lines run across difficult terrain; for example, the replacement costs for a 3.5km line running across steep hilly terrain to service a single remote farm was quoted at \$150,000.⁶
99. The use of unit costs for comparison does not convey the delivery risk of the technology (or put another way, the certainty that the supply will be available when needed).

⁴ MED price schedule for February 2007
http://www.med.govt.nz/templates/MultipageDocumentTOC____25111.aspx

⁵ *Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Business*, 30 August 2004, Commerce Commission

⁶ MED / Federated Farmers field trip to a woolshed at the end of a 3.5km line, courtesy of PowerCo

100.

Technology (all off-grid)	Capital Cost \$	Annual operating cost \$	Energy output kWh/year	Lifetime of technology	Present Value Cost (\$)		Present Value Energy (kWh)		Unit cost over lifetime; 5% discount rate	Unit cost over lifetime; 10% discount rate
					5%	10%	5%	10%	Unit Cost c/kWh	Unit Cost c/kWh
Rooftop wind (1.5 kW) including installation	15,000	90	3,000	20	16,121	15,766	40,387	28,541	40	55
Stand-alone micro-wind (5KW) including battery	62,100	1,350	7,500	15	76,112	72,368	85,347	64,546	89	112
Micro-hydro (1KW) including battery	17,250	300	4,000	25	21,478	19,973	63,878	43,808	34	46
Solar Photovoltaics (2KW) including battery	46,000	400	2,600	30	52,149	49,770	47,468	27,110	110	184
Diesel Generator (3.2KW)	5,000	1,800	4,400	15	23,683	18,691	50,070	37,867	47	49
Petrol Generator (4.5KW)	5,700	1,990	2,000	15	26,355	20,836	22,759	17,212	116	121
Stirling Engine*	8,500	650	3,850	15	15,246	13,444	43,812	33,133	35	41

* 3,500kWh heat and 350 kWh electricity; gas-fired.

All capital and operating costs, and energy output figures, sourced from East Harbour Management Services (EHMS) paper 'Microgeneration Potential in New Zealand' May 2006, except the diesel generator figure (sourced by MED). The costs for the 1.5 kW rooftop wind were updated (August 2007).

101. Including the costs of energy storage for the intermittent renewable technologies can increase the costs of off-grid systems significantly. In some cases, the cost of energy storage can be greater than that of the generation equipment⁷. EHMS cites an example where costs of inverter, battery storage and voltage regulator forms almost 60% of total cost of system. These costs may also decrease in the future, but again, it is unclear the extent to which this will occur.

102. The costs of installing and maintaining off-grid power systems will vary depending on the combination of components installed and the energy output required. The Energy Efficiency and Conservation Authority estimates that:⁸

- A mid-range system suitable for an average household using 8,000kWh/year using solar panels or a wind turbine as the primary energy source would typically cost between \$15,000 and \$25,000. A micro-hydro system would cost approximately \$12,000 to \$15,000 to set up.
- A system with solar panels or a wind turbine, micro-hydro generator, batteries, inverter and a diesel or petrol generator could cost up to \$60,000. In addition to these installation costs, maintenance and operating costs can be significant, particularly for batteries and for systems with moving parts such as turbines.

⁷ Page 72, EHMS, Micro generation potential in New Zealand.

⁸ EECA, Fact Sheet 2 – Stand-alone power systems.

7. Historical background

7.1 The Rural Electrical Reticulation Council (RERC)

103. The Rural Electrical Reticulation Council (RERC) was established under the Electricity Act 1945. It administered a fund to subsidise lines construction, mainly to farmers in remote areas as this was where post-war productivity growth was achieved⁹. The fund was created by a levy on all Electrical Supply Authorities of the time.
104. The RERC was disbanded in 1997 as reticulation was all but complete and the environment in which supply authorities operated was corporatised. Continued subsidisation was considered no longer appropriate as it was recognised that it involved significant wealth transfers from the community to individuals¹⁰. The subsidy per connection was \$21,210 (1985 dollars)¹¹, although the connected consumers were also required to make capital contributions that were paid off over a number of years (usually ten).
105. Information from RERC details how many kilometres of line were erected by supply authorities with subsidy assistance from 1948 to 1989. This information has been used to produce the following graph which shows approximately what proportion of the networks of today's lines companies were built using subsidy¹². By 1985, 16,865 kilometres of lines had been constructed to serve around 16,229 customer connections.
106. The graph shows that some rural network areas (Marlborough, Buller, The Lines Company, Top Energy and Horizon) have over 35% their network created from subsidised lines. At the other end of the scale there are large urban - based companies such as Vector, Electra and Orion that have only a small proportion of their network made up of such lines.

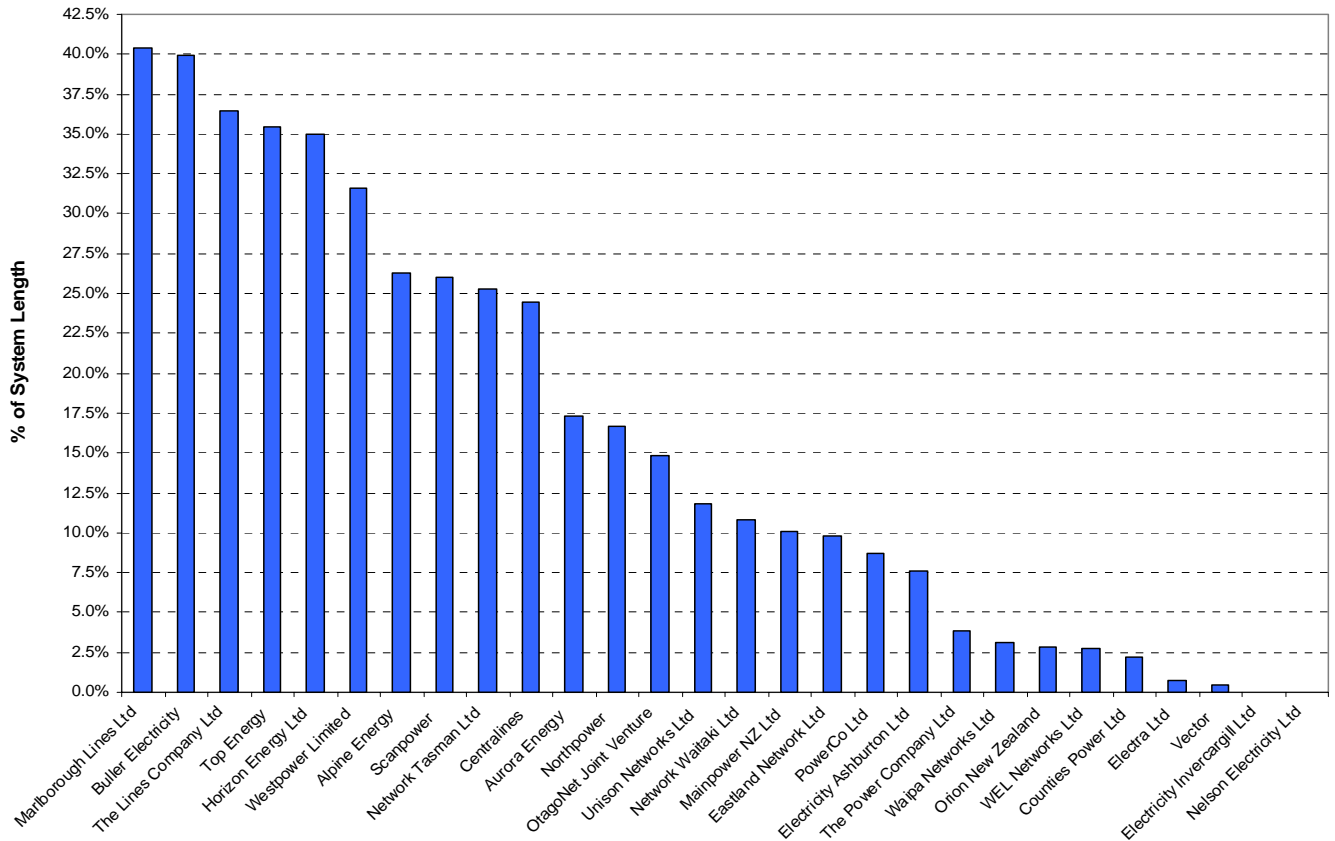
⁹ *Two per Mile – a History of the Rural Electrical Reticulation Council*; Susan Paris, 1996, Morris Communications Group.

¹⁰ *Future role and functions of the Rural Electrical Reticulation Council* – report to the Minister of Energy, April 1991.

¹¹ *Two per Mile*

¹² *Two per Mile (Appendices)*

107. **Figure 1: Estimate of the proportion of lines built in each network area with RERC subsidy**



108. In 1992 the supply authorities were corporatised to improve economic efficiency in electricity supply. Because of concerns about excessive price increases, especially in remote rural areas, government policy at the time was to require the maintenance of lines in existence as at 1 April 1993, and to cap the rate of any line charge increases to 15% per annum.

7.2 Energy Sector Reform 1992

109. The Energy Sector Reform Bill 1992, enacted as the Electricity Act 1992 was formed, included provision for maintaining universal supply to all existing lines, meaning that lines would be maintained in perpetuity. Officials at the time gave several reasons for why the Government did not anticipate excessive pressure on costs to remote rural consumers:

- Lines companies would use normal price averaging for broad geographical areas to minimise administrative costs; and / or
- Companies would marginally cost remote lines (i.e. the customers would face only the costs of the part of the line that gets the electricity just to them);

- Lines companies are likely to be responsive to local community concerns to avoid undue price impacts on rural customers;
- It was also considered that there was scope for reducing the cost of remote lines – local co-operatives taking over maintenance, lowering the quality of lines (which may have been over-engineered) and developing local area supply.

110. However when the Bill was discussed at the select committee a 20-year sunset clause was added. This provided for the obligation to maintain supply to existing lines to expire in 2013, and be deemed to be repealed.

111. Reasons for including the sunset provision were:

- An open-ended (i.e. in perpetuity) obligation would make it difficult for companies to value it;
- The need not to restrict the environment for change;
- The prospect of new technologies being developed that would substitute for electricity supply by lines;
- The obligation to serve distant consumers and to charge them no more than other customers involved a subsidy that would be difficult to maintain in the face of competition.

112. This latter point was made in a different market framework, when lines companies still had retail interests.

Appendix 1: Full text of ‘Continuance of Supply’ section 62 Electricity Act 1992

(1) In this section, — Designated electricity distributor, in relation to a place, means the person who is, for the time being, the operator of—

(a) The works used for the purposes of supplying line function services to that place on 1 April 1993; or

(b) Any works subsequently used, including works that replace works to which paragraph (a) applies, for the purposes of supplying line function services to that place:

Existing electricity distributor means any electricity distributor that, immediately before 1 April 1993, was the holder of a licence issued under section 20 of the Electricity Act 1968 and in force immediately before that date.

(2) Except as provided by this Act or any regulations made under section 169 or by written agreement with a particular consumer (whether entered into before or after 1 April 1993), where, on 1 April 1993, an existing electricity distributor was supplying line function services to any place, the person that, in relation to that place, is for the time being the designated electricity distributor must not cease to supply line function services to that place without the prior consent of the Minister or of every consumer who would be affected by the cessation of those services.

(3) Nothing in subsection (2) applies where a designated electricity distributor ceases to supply line function services to any place in any of the following circumstances:

(a) Where the designated electricity distributor is entitled to cease to supply line function services by reason of the failure of any consumer to pay any money due on account of—

(i) The supply of those line function services to that place; or

(ii) The supply of electricity to that place:

(b) Where cessation of supply is rendered necessary for reasons of safety or in order to carry out maintenance or upgrading work:

(c) Where cessation of supply results from circumstances beyond the control of the designated electricity distributor, including (without limitation) fire, earthquake, lightning, inevitable accident, act of God, or force majeure.

(4) Where, for any of the reasons referred to in subsection (3) of this section, [a designated electricity distributor] ceases to supply line function services to any place, that cessation of services may continue only for so long as any 1 or more of those reasons continues to exist.

(5) Except as provided by subsection (3) of this section, every [person] commits an offence and is liable on summary conviction to a fine not exceeding \$10,000 and to a further fine not exceeding \$1,000 for every day or part of a day during which the offence continues who, in contravention of subsection (2) of this section, ceases to supply line function services to any place.

(6) This section shall expire with the close of the 31st day of March 2013, and on the 1st day of April 2013 this section shall be deemed to have been repealed

Appendix 2: Terms of reference

Context

On 2 June 2005 the Minister of Energy announced a review would take place in 2007 of Clause 62 of the Electricity Act 1992. Subsection 6 of Clause 62, at 31 March 2013, repeals the obligation of lines companies to supply line function services to places supplied in April 1993. Lines built after April 1993 are not affected by this clause.

The review will be led by the Electricity group, Ministry of Economic Development.

Clause 62 mandates that electricity distributors continue to operate line services to areas supplied on 1 April 1993. The exceptions are:

- Where there is a provision under the Electricity Act or any regulations made under Section 169, or a written agreement with a particular consumer; or
- When the electricity distributor has prior consent of the Minister of Energy or of every consumer who would be affected by the cessation of those services; or
- Where the electricity distributor is entitled to cease supply due to the failure of the consumer to pay for the supply of those line function services (or the supply of electricity); or
- Where cessation of supply is rendered necessary for reasons of safety or in order for maintenance or upgrade work to be carried out; or
- Where cessation of supply is the result of circumstances beyond the control of the electricity distributor (e.g. fire, earthquake, force majeure).¹³

Proposed Scope for the 2013 review

The objective of the review is to consider what, if any, arrangements should be put in place to ensure affected communities continue to have an electricity supply after 2013.

The review will consider

- whether or not the obligation should be allowed to expire;
- If the obligation expires, whether there is a role for alternative provisions, for example, obligations on lines companies to assist remote areas to develop local generation if they want to cease providing line services.
- If the obligation continues, whether it should continue permanently, or be reviewed again at a later date

The timing of the review, through 2007, allows sufficient time for more detailed options to be canvassed and considered and for any legislative amendments to be made if necessary.

Matters that the review will examine to inform the options include:

1. The purpose behind clause 62 and if that purpose is still valid
2. Identifying consumers likely to be affected by the expiry of section 62 and the manner in which they will they be affected

¹³ If supply ceases for any of these last three reasons, supply must be resumed if the reason ceases to exist.

3. Reviewing the development of new technologies for alternative supply options not connected to the distribution network and the economics of those technologies.
4. Understanding the economics of rural or remote lines that may be affected by the expiry of section 62.
5. Understanding the implications for lines companies' business.
6. Assessing how the range of options will be affected by:
 - proposed changes to the Electricity Industry Reform Act 1998 (relaxing the restrictions on line companies generating or selling electricity).
 - Government policy that changes in rural line charges are kept in line with urban line charges (GPS paragraph 99)
 - Regulation of the electricity lines businesses under part 4A of the Commerce Act and
 - the Electricity Commission's model distribution pricing methodologies
7. How other infrastructure services (telecommunications, postal services) to remote communities are provided and whether there are applications to the provision of electricity.

NOTE the engagement process may raise additional matters that require examination.

Proposed review process and timeframe

The Electricity Group, Ministry of Economic Development, will initially engage with identified stakeholders for input. A full public consultation will be undertaken through the release of a discussion document canvassing options and issues to proceed with a formal submission process.

<i>Date</i>	<i>Action</i>
November 2006 - February 2007	Key stakeholder engagement Data gathering/research
March - June 2007	Policy development process, drafting discussion document
August 2007	Discussion document released for public consultation and submissions
September – October 2007	Analysis of submissions
End October 2007	Recommendations to Minister
End November 2007	Proposal to Cabinet