

Energy Efficiency Incentive Issues

From the Electricity Networks Association

18 May 2009

Table of Contents

1. Introduction	1
Context.....	2
Summary of our views.....	3
2. Principles for applying section 54Q	5
Key concepts.....	5
Concepts to principles.....	6
4. Illustrative examples and suggested way forward	7
Reducing losses arising from the electricity lines service	7
Influencing the timing and level of consumption	8
Provision of other services	9
Appendix – Relevant sections from Part 4	11

1. Introduction

1. This paper, from the Electricity Networks Association (ENA), proposes principles for implementing the requirements under Part 4 in relation to energy efficiency incentives¹ and provides some examples as to how these principles may apply in practice. The ENA indicated in its submission of 15 April that it would be providing this further material,² which covers:
 - the context of these requirements
 - proposed principles for implementing these requirements
 - illustrative applications of principles to practical examples.
2. In this paper, which is not a formal submission, we summarise our thinking to date. We emphasise that our thinking continues to evolve on this issue and therefore our views expressed in this paper may change as this consultation moves forward. Nevertheless, we provide these views as input into the Commission's process at this point to foster a common understanding of the nature of the section 54Q requirements and possible ways to implement them.
3. ENA's contact person for this paper is:

Alan Jenkins
CEO Electricity Networks Association
P O Box 1017
Wellington

Tel: 04 4711335

Email: adj@electricity.org.nz

¹ Broadened under Part 4 of the Commerce Act to include demand side management and the reduction of energy losses.

² "Submission on the Process & Issues Paper on the DPP Reset", Electricity Networks Association, 15 April 2009.

Context

4. The relevant Part 4 clause with respect to requirements on the Commission in relation to energy efficiency is section 54Q, as follows:

54Q Energy efficiency

The Commission must promote incentives, and must avoid imposing disincentives, for suppliers of electricity lines services to invest in energy efficiency and demand side management, and to reduce energy losses, when applying this Part in relation to electricity lines services.

5. The ENA notes the following in relation to the section 54Q requirement:
 - The requirement is to “promote incentives” *and* to “avoid imposing disincentives”; the Commission’s actions must comply with both tests.
 - The incentives relate to “*suppliers of electricity lines services to invest in energy efficiency and demand side management, and to reduce energy losses*”. Notably, the subject of the test does not include others in the value chain (e.g. retailers, generators and transmission), or end consumers.
 - This requirement is a mandatory relevant consideration for the Commission whenever it is applying Part 4 to electricity lines services and does not provide the Commission the discretion to comply with this requirement in some instances but not in others. Thus it has implications for the Commission’s design of the Part 4 regime as a whole, inclusive of the default price-quality path (DPP).
 - This requirement took effect from April 2009 and the promotion of incentives and the avoidance of disincentives will need to be considered in the context of any reset and claw-back arrangements implemented as part of the transition from Part 4A to Part 4.
6. Electricity distribution businesses (EDBs), which are the suppliers of electricity lines services, are able to take a wide range of actions “*to invest in energy efficiency and demand side management, and to reduce energy losses*” (as per s 54Q). To help ground this discussion in commercial reality, the following list are examples of such possible actions that EDBs may take:
 1. Investing in equipment and systems to reduce the level of technical losses in delivering the electricity lines service.³ These investments might include, for

³ Technical losses refer to the loss of electrical energy from its transportation, as opposed to measured losses which also include measurement error and theft.

example, the use of low-loss transformers or reducing line losses by increasing the size of cables.

2. The provision of equipment, pricing signals and other measures targeted at connected parties, in order to improve system performance in areas such as power factor and voltage control, where reduced losses or an improved ability for demand side management would result.
 3. Changing the operation of the distribution network to alter power flows and reduce losses.
 4. Influencing the timing of, and potentially the level of consumption of electrical energy.
 5. Providing services that are separate from the electricity lines services and which enhance the efficiency of energy consumption, These include, for example, the provision of load management services, metering, off-network energy reduction initiatives, energy efficiency advisory services, distributed generation, and so forth.
 6. Other investments or activities, including innovation, research and development, which lead to improvements in the efficient use of energy.
7. However, a default price-quality path (DPP) structured along the lines of the current thresholds would not provide incentives for EDBs to take the actions listed above, but would impose disincentives (and thus would be contrary to section 54Q). The primary reason for this is that most of the benefits arising from these actions accrue to electricity retailers or end-consumers, and not to EDBs, and there is no mechanism for EDBs to earn revenue from these initiatives. Moreover, because distributors recover the costs of their operations through volumetric charges, undertaking activities that reduce demand result in both higher costs and lower revenues – a clear disincentive. EDBs need to be compensated in some way for taking these actions in order to have an incentive to do so.

Summary of our views

8. We consider the purpose statement of Part 4 (section 52A) and section 54Q taken together oblige the Commission to apply Part 4 to electricity lines services in such a manner that promotes incentives and avoids imposing disincentives for suppliers of electricity lines services to invest in energy efficiency and demand side management, and to reduce energy losses where:
 - a. The long-term benefits gained by the consumers of EDBs' services exceed the long-term costs to those consumers.

- b. The investment proposed by the EDB is the least cost means (most efficient use of scarce resources) of achieving those consumer benefits relative to other feasible alternatives.
 - c. The costs and benefits considered in (a) and (b) are those that would be accounted for if the market were workably competitive, including costs not under the control of the EDB (but would exclude, for example, unpriced effects such as unpriced effects of climate change).
9. We have applied these principles to three practical actions that EDBs could take to improve energy efficiency; the reduction of technical line losses, shifting (in time) or reducing the consumption of electricity, and providing services other than the electricity lines service. We suggest ways to progress each.
10. In relation to reducing lines losses, the Commission could promote incentives for EDBs to make efficient trade-offs between capital expenditures that reduce losses relative to what they would otherwise do by implementing a cost pass-through mechanism, whereby if a distributor investing in loss reduction could demonstrate that the benefits outweighed the costs, the relevant costs could be a “pass through” to prices.
11. In relation to shifting or reducing consumption of electricity, the Commission could ensure EDBs have incentives to take these actions, and do not face disincentives, by:
 - allowing EDBs flexibility in terms of their pricing structures, and ensuring there are mechanisms for EDBs to change their pricing structures, if they wish. This absence of prescription, and the ability to change pricing structures, would ensure that EDBs are able to develop pricing structures to influence the timing and level of consumption.
 - allowing EDBs to change their pricing levels in order to be compensated for them taking actions that reduce the level of consumption of electricity on their networks. For identified actions that reduce volumes (by either an actual or nominal amount) distributors should be able to increase prices to offset the volume decline.
12. Both of the above points need to be reflected in the input methodologies the Commission is obliged to develop in relation to pricing methodologies, and the specification and definition of prices (as well as reflected in the DPP itself). The ENA would welcome an opportunity to work with the Commission in the early stages of the development of these input methodologies.

13. In relation to EDBs providing other services (e.g. load management, metering, off-network energy reduction initiatives, energy efficiency advisory services, and distributed generation), one relevant input methodology the Commission is required to determine is the method for allocating common costs to the supply of the electricity lines service. The ENA considers ACAM⁴ would assist in meeting the section 54Q requirement of promoting incentives for EDBs to supply these other services, and to not impose disincentives. Thus the ENA recommends the retention of ACAM for the “allocation of common costs” input methodology.

2. Principles for applying section 54Q

Key concepts

14. The Commission is obliged to interpret and implement Part 4 in a manner that gives effect to the purpose of that Part (section 52A). Section 54Q is a mandatory relevant consideration on the Commission when implementing Part 4. If there is more than one approach to meet the section 54Q requirements, the Commission is obliged to select that approach that is most consistent with the purpose statement.
15. The purpose statement can be broken into three parts, as follows:
 - a. A statement of purpose, “to promote the long-term benefit of consumers” in the relevant markets.
 - b. A statement of the means of achieving the purpose, “by promoting outcomes that are consistent with outcomes produced in competitive markets...”.
 - c. That the outcomes promoted are such that suppliers of regulated goods and services:
 - (a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and
 - (b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and
 - (c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and

⁴ Avoidable Cost Allocation Methodology.

(d) are limited in their ability to extract excessive profits.

16. Section 54Q adds a further requirement on the Commission when applying Part 4 to electricity lines services. When applying Part 4 to electricity lines services, the Commission must “*promote incentives, and must avoid imposing disincentives, for suppliers of electricity lines services to invest in energy efficiency and demand side management, and to reduce energy losses*”.
17. To implement section 54Q, the Commission therefore needs to consider in relation to each market for electricity lines services (the relevant markets):
 - a. The consumers in that market and the long-term benefits those consumers should expect from the markets.
 - b. The outcomes produced in competitive markets (and hence the set of outcomes that could conceivably be promoted to achieve the identified long term benefits).

Concepts to principles

18. The first steps in applying section 54Q therefore are for the Commission to identify the consumers in the relevant market and the outcomes that would be produced in competitive markets that are to the long-term benefit of those consumers.
19. Consumers are defined as (s 52C) “*a person that consumes or acquires regulated goods or services*”. A long-term benefit to consumers would be any activity which provides consumers with benefits over the long-term that exceed the long-term costs to those consumers. A workably competitive market could be expected to deliver those long-term benefits to consumers through an economic efficient allocation of resources (within the legislative and other constraints that impede resource allocation).
20. Hence the Commission must apply Part 4 to electricity lines services in such a manner that promotes incentives and avoids imposing disincentives for suppliers of electricity lines services to invest in energy efficiency and demand side management, and to reduce energy losses where:
 - a. The long-term benefits gained by the consumers of EDBs’ services exceed the long-term costs to those consumers.
 - b. The investment proposed by the EDB is the least cost means (most efficient use of scarce resources) of achieving those consumer benefits relative to other feasible alternatives.
 - c. The costs and benefits considered in (a) and (b) are those that would be accounted for if the market were workably competitive, including costs not

under the control of the EDB (but would exclude, for example, unpriced effects such as unpriced effects of climate change).

21. The following section illustrates how these principles might apply in practice.

4. Illustrative examples and suggested way forward

22. In this section we provide some examples of how the proposed principles above could be applied to opportunities that EDBs face in practice.

Reducing losses arising from the electricity lines service

23. EDB's are able to take actions to reduce technical losses arising from the electricity lines services, by for example changing the quality and technical specification of their assets, and the manner in which they configure and operate their networks. However, these actions usually give rise to greater costs, and under current arrangements, provide no financial reward, as reduced losses are a benefit to retailers and their customers. As a result, the current regulatory arrangements do not meet the section 54Q requirement, as they do not promote incentives for EDBs to take these actions, and they do impose disincentives in relation to them.
24. The principles developed above suggest that the EDB should be permitted to charge for reducing line losses up to the point where it is in the long term interests of the consumer for it to do so (note this may involve the need to estimate the value to consumers of reducing losses). A workably competitive market could be expected to produce such an outcome.
25. However, the measurement of line losses, and their variance over time and across differing demand profiles on a network are complicated issues from a technical perspective. In addition, the data in New Zealand on total losses (i.e. technical and other, such as theft and measurement error) is very poor and not, in the main, under the control of EDBs. There is neither a ready to hand methodology nor good quality data to provide the basis for systematically measuring technical losses on electricity distribution networks in a way that is amendable to supporting financial incentives for EDBs to reduce such losses. We note the Electricity Commission has a "Loss Factor Review Panel" currently undertaking work relevant to some aspects of the measurement of losses.
26. However, it is not necessary to be able to measure system losses for the Commission to promote incentives for EDBs to make efficient trade-offs between capital expenditures that reduce losses relative to what they would otherwise do. For example, the Commission could implement a pass-through cost mechanism whereby a distributor investing in loss reduction could demonstrate, using a notional value

for losses, whether the benefits of the investment would be greater than the incremental costs. Where the benefits exceed the costs, the additional costs (e.g., a return and depreciation on the additional investment costs) could be treated as a pass-through cost in the DPP or customised price-quality path.

Influencing the timing and level of consumption

27. An EDB is able, through the structure of its prices, to influence the timing of consumption (e.g. with peak period charges), and the level of consumption (e.g. by weighting its charges toward kWh charge), to the extent that such price signals are reflected by retailers to end-consumers. An EDB is also able to influence the timing of consumption by providing load management services.
28. Shifting consumption to off-peak periods typically improves the efficiency of the system as it allows demand to be met by lower-cost fuel options, and reduces the extent of technical losses in transmission and distribution networks for a given level of consumption (as losses increase exponentially with load).
29. Ways in which the Commission could ensure EDBs have incentives to take these actions, and do not face disincentives, is for the Commission to:
 - allow EDBs flexibility in terms of their pricing structures, and ensure there are mechanisms for EDBs to change their pricing structures, if they wish. This absence of prescription, and the ability to change pricing structures, would ensure EDBs are able to develop pricing structures to influence the timing and level of consumption.
 - allow EDBs to change their pricing levels in order to be compensated for taking actions that reduce the level of consumption of electricity on their networks.
30. An EDB faces revenue risk when changing price structures, arising from uncertainty as to how consumers will respond. Any price-change mechanism needs to take this transitional issue into account. This could be achieved by, for example, allowing an EDB to re-balance price levels subsequent to trialling a new price structure for a period, or allowing some kind of ‘overs and unders account’ to reduce the risks of consumers reacting to price changes more or less than anticipated. Without such mechanisms the revenue risk to the EDB is likely to create sufficient disincentive for it to not make changes.
31. The above points need to be reflected in the input methodologies the Commission is obliged to develop in relation to pricing methodologies and the specification and

definition of prices, including identifying any costs that can be passed through to prices⁵ (for both default and customised price-quality paths). We note the Electricity Commission's current work on model distribution pricing methodologies is relevant to this issue, and the outcomes from these two work streams need to be aligned.

32. The ENA would welcome an opportunity to work with the Commission in the early stages of the development of these input methodologies.
33. We note that other regulatory requirements may inhibit efficient solutions, such as the low fixed tariff regulations.⁶ While the outcomes that result from these requirements might not be in the long term interest of consumers, the Commission must still meet all its regulatory requirements.

Provision of other services

34. EDBs are well placed to provide services, in addition to the electricity lines service, that enhance the efficient use of electricity. Examples of these services include load management, metering, off-network energy reduction initiatives, energy efficiency advisory services, and distributed generation. Some of these services may use some of the same assets used to provide the electricity lines service (e.g. as do some forms of load management). However, these services are in addition to and separable from the electricity lines service, which is defined in Part 4 as a conveyance service.
35. Under Part 4A the lines business was the subject of regulation, not a defined service as is the case under Part 4. The approach under Part 4A blurred the scope of regulation, and it was unclear whether the other services mentioned above were, or were not potentially subject to regulatory oversight. The approach taken under Part 4 is a very significant improvement in this regard, as the subject of regulation is a defined service, and nothing else. This improved approach to defining the subject of regulation provides a platform for the Commission to ensure EDBs have incentives to provide these other services.
36. One key policy issue that the Commission needs to address in order to ensure incentives on EDBs to provide these other services is intact is to clarify, as part of

⁵ There are referred to in subsections 52T (1) (b) and (c) (i) respectively.

⁶ Electricity (Low Fixed Charge Tariff option for Domestic Consumers) Regulations 2004.

the development of the relevant input methodology (i.e. allocation of common costs), the manner in which costs common to the electricity lines service and these other services are to be allocated.

37. This input methodology is defined in section 52T (a) (iii) as, “*allocation of common costs, including between activities, businesses, consumer classes, and geographic areas*”. In addition, section 52T (3) states “*Any methodologies referred to in subsection (1)(a)(iii) must not unduly deter investment by a supplier of regulated goods or services in the provision of other goods or services.*”
38. The Avoidable Cost Allocation Method (ACAM)⁷ is currently used for the allocation of common costs for information disclosure purposes. The ENA considers ACAM would assist in meeting the requirement under 52T (3) to not deter investment in other goods and services, and is also consistent with the section 54Q requirements of promoting incentives for EDBs to supply these other services, and to not impose disincentives.
39. Thus the ENA recommends the retention of ACAM for the “allocation of common costs” input methodology.

⁷ ACAM is defined in section 2.2.1 of the Commission’s “*Information Disclosure Regime Electricity Information Disclosure Handbook 31 March 2004 (as amended 31 October 2008)*” as: “ACAM assumes that the lines business activities of Transpower and EDBs are undertaken by the Line business, defines the Line business as the “stand-alone” business, and makes an assessment of the expenses, revenues, assets and liabilities (the “financial statement items”) that would be avoided by Transpower or an EDB if it did not operate their Other (“incremental”) business. The financial statement items (and components of financial statement items) that would not be avoided are allocated to the Line business, and the financial statement items (and components of financial statement items) that would be avoided are allocated to the Other business. Under ACAM, the “stand-alone cost” of a service is the cost that would be incurred if that was the sole service provided.”

Appendix – Relevant sections from Part 4

The purpose of Part 4 is:

52A Purpose of Part

(1) The purpose of this Part is to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—

(a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and

(b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and

(c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and

(d) are limited in their ability to extract excessive profits.

(2) In this Part, the purpose set out in subsection (1) applies in place of the purpose set out in section 1A.

The meaning of the term “electricity lines services under Part 4 is:

54C Meaning of electricity lines services

*(1) In this subpart, unless the context otherwise requires, **electricity lines services** means the conveyance of electricity by line in New Zealand.*

(2) However, none of the following are electricity lines services:

(a) conveying electricity solely for the supplier’s own consumption or for the consumption of the supplier’s associates:

(b) conveying electricity only from a generator to the national grid or from the national grid to a generator:

(c) conveying electricity (other than via the national grid) only from a generator to a local distribution network or from a local distribution network to a generator:

(d) conveying electricity by lines that are not connected, directly or indirectly, to the national grid:

(e) conveying electricity only by a line or lines that are mostly in competition with a line or lines operated by another supplier of electricity lines services that is not an associate of the person, provided that the competition is actual competition and not potential competition:

(f) conveying electricity if the total circuit length of all of the prescribed voltage electric lines provided by the supplier (or over

which electricity is conveyed by the supplier, as the case may be) is less than 25 kilometres:

(g) conveying electricity if the total amount of electricity conveyed to consumers by the supplier is less than 20 gigawatt hours per annum:

(h) conveying electricity if the total number of consumers to whom the supplier conveys electricity is less than 500.

(3) The prescribed voltage electric lines, the electricity conveyed, or the number of consumers to whom electricity is conveyed, when measured in relation to a supplier include, for the purposes of subsection (2)(f) to (h), the lines provided by, electricity conveyed by, or number of consumers of, any associate of the supplier.

(4) In this section, unless the context otherwise requires,—

associate has the same meaning as in section 12 of the Electricity Industry Reform Act 1998

consumer has the same meaning as in section 2(1) of the Electricity Act 1992

lines has the same meaning as in section 2(1) of the Electricity Act 1992

national grid has the same meaning as in section 2(1) of the Electricity Act 1992

prescribed voltage electric line means a line that is capable of conveying electricity at a voltage equal to or greater than 3.3 kilovolts.