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Advanced Metering: Competition and Data Access

Prepared for

Vector Limited

Authorship
This document was written by John Small and Reuben Irvine
John.Small@covec.co.nz | (09) 916 1966

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Contents

Executive Summary

The Electricity Authority ('EA') has issued a consultation paper on advanced metering infrastructure ('AMI') that concerns the nomination of the metering equipment provider ('MEP') and access to data. It proposes two changes to the Electricity Industry Participation Code ('the Code') which are:

- "Consumers have the right to nominate whether the retailer or the distributor appoints the metering equipment provider (MEP); and

- Consumers would be granted the right to obtain access to their own advanced metering infrastructure (AMI) data at no cost for the purpose of verifying their bills."

Vector, which has a substantial smart metering business, asked Covec to review the consultation paper, including by analysis of competition in the smart metering industry, efficient pricing of smart meter data access, and likely impacts on dynamic efficiency. We agree that these are important issues arising from the consultation paper.

In preparing this report we have reviewed the structure of the smart metering industry, its recent history in New Zealand and the anticipated future developments towards smart grids internationally. We have also studied the consultation paper in detail, and drawn some inferences about the underlying issues that the EA perceives.

In our view, the consultation paper reveals that the EA is primarily concerned to ensure that all parties (retailers, distributors and consumers – which we refer to as 'end users') have appropriate access to metering data at efficient prices. There seems to be a particular concern over the position of distributors (lines companies). We agree it is important for all parties to have good and efficiently priced access. However we found no evidence in the consultation paper that there is, or has been, any difficulty or complaint about data access or its pricing.

Instead, the consultation paper talks about incentives that MEPs might have to block access or 'over-charge' for it. We believe that these incentive-related arguments are not valid, particularly in relation to the provision of data to lines companies. Our conclusion can be reached in two quite different ways, each of which tests different statements in the consultation paper.

- This is not a situation in which MEPs or their affiliates have an incentive to harm their competitive rivals by blocking access or over-charging for it. Lines companies do not compete with each other, and nor do retailers compete with lines companies.

- The consultation paper argues that MEPs will charge (lines companies) their opportunity cost, which it says are well above marginal cost. We explain that (because data usage is non-rivalrous) in this case the opportunity cost of data access is equal to the marginal cost that would be faced by MEPs to provide this data.

The consultation paper tries to fit competitive industries (electricity retailing and metering) into a theory of harm that relies on a natural monopoly selling access to its downstream rivals.

Our first conclusion is therefore that the "problem" suspected but not evidenced in the consultation paper does not actually exist. We consider that if there really was a problem there would be some concrete evidence of it, such as disputes between MEPs and lines companies over access to data or the price of that access. Moreover, the EA should first critically evaluate any complaints it may have received to understand whether they are requests for unwarranted regulatory assistance or firm evidence of genuine policy concerns.

Secondly, if there is a problem of the type perceived in the discussion paper, there is an obvious and simple solution to that problem. It is to use the Code to set clear expectations that data access will be provided to lines companies, or any other parties, and identify some economic principles to guide the pricing of that access. This would have the effect of creating a right that could be enforced through private mediation or arbitration if necessary. In the event that this simple system subsequently proved inadequate, the EA could reconsider the matter in light of the evidence of inadequacy.

It follows that the EA's first proposal (to give end users of electricity the right to nominate the party that appoints their MEP) is either redundant or directed at something other than a data access issue. If implemented, the proposal itself would affect competition in the smart metering industry, but the consultation paper does not analyse that competition.

Our analysis starts by defining the relevant market, which we consider to be a market for the supply of "a cluster of three products (namely smart meters, monitoring and data provision), to residential ICPs in New Zealand (i.e. a national market)". This is an 'intermediate' market, upstream from electricity retailing, in which metering services are supplied by MEPs to their customers, i.e. retailers. Retailers then use these metering services in the process of providing electricity to end users. Being an intermediate market, the buyers and sellers of metering services are firms rather than end users.

We then assess competition in this market by considering all of the factors identified in recent EU competition guidelines as being indicative of competition in markets for electronic communications services (a category that includes smart metering). Our conclusion is that while there are some economies of scale in the back office and IT systems of smart metering suppliers, this is offset by significant countervailing bargaining power on the part of the customers of MEPs (retailers). The smart metering industry in New Zealand appears workably competitive.

We have heard the view that retailers are currently "regulating" the metering market. That misconstrues the position in our view. Competition and regulation are alternative ways of exerting discipline over suppliers, but they are quite different constructs. The metering market is workably competitive, so competition (not regulation) is keeping metering suppliers focused on providing good service at reasonable prices. Moreover, if

the EA has doubts about the effectiveness of metering competition it should undertake a competition analysis to test these doubts.

We then consider the way we would expect data access to be priced. In practice, there is intense (tender) competition for business of retailers who are the primary customers of MEPs. We understand that the data needs of lines companies vary widely and that some of these needs are for relatively coarse data, at least in the spatial dimension where there is no real need for ICP level data. We would expect the costs of providing this relatively coarse data to lines companies to reflect the 'by-product' nature of this demand. There is a resulting incentive for MEPs to supply data to lines companies at a price that is broadly in line with the full incremental cost of extracting the data. This is consistent with the pricing we observe in respect of access to electronic payments data and property data.

Some lines companies would like much more detailed data access however, and this may become increasingly common as smart grids develop. As and when the data needs of lines companies begin to resemble that of retailers, we would expect some convergence in the prices each are charged. That may lead to price increases over time for some lines companies, in line with their data needs and the increased costs of meeting them. As this transition occurs, competition between MEPs can be expected to maintain downward pressure on overall rates of return in MEP businesses in relation to sales to retailers. A non-discrimination clause in the Code would ensure that this pressure on prices to retailers would also work to limit the potential prices charged to lines companies (or any small retailers that might have limited ability to enter into reciprocal arrangements as envisaged in paragraph 3.2.8).

Our third main focus is dynamic efficiency. One of the difficulties in analysing dynamic efficiency is that assessment can sometimes rely on a subjective view of what type of investment is efficient. Such is the case here. Our analysis of smart metering futures worldwide suggests that the present situation in New Zealand, where retailers and lines companies are the primary users of smart metering services, seems likely to continue. The actual and desired targets of innovation are more nuanced and efficient retail tariffs (for the benefit of retailers and end users) and smart grid developments (for the benefit of lines companies and end users).

Set against this view of the efficient direction for future investment and innovation, the discussion paper looks rather odd. In particular, it is proposed that end users only be lobbied when *they* are being offered a new AMI service. It seems likely that this will divert research and development towards things that can be marketed directly to end users, rather than to firms (retailers and lines companies) that are themselves seeking to innovate.

A second risk to dynamic efficiency arises from placing the nomination decision in the hands of perhaps the least informed of all possible decision-makers: the end user of electricity. The result could be that poor quality firms, possibly affiliates of smaller lines companies not subject to close regulatory scrutiny, could establish and survive. The intermediate nature of the metering market means that metering is an input cost for retailers and end users pay for metering services via their monthly power bill. The EA

seeks to rearrange this structure, forcing end users to choose even though they are not actually direct buyers of metering services.

By way of analogy, phone companies often lease fibre-optic links and on some inter-city routes there are several providers of such links. Telecommunications consumers use these links when they make and receive calls, but it would be very odd to force consumers to pick which link supplier their telecommunications provider used. Doing so would introduce a significant random element into trades in the intermediate market: decisions would be made by consumers in almost complete ignorance of the operation of that market, rather than by experienced and sophisticated phone companies. This is what the EA is proposing here, that end users of electricity be called upon to make decisions about the operation of an intermediate market in which they have no direct involvement and very little understanding.

Our final concern with the EA's nomination proposal is that it may well annoy and confuse end users, particularly older individuals. There is experimental evidence supporting the notion that, on some matters, individuals prefer not to choose. Those end users of electricity who already struggle with the fact that they have two power suppliers (a lines company and a retailer) may not appreciate being forced to select a third. Consequently, the EA's proposal has the potential to effectively generate a new 'regulatory burden' on end users.

In conclusion, we consider that the consultation needs to be completely reconsidered. At present, it:

- Imagines a problem that probably does not exist;
- Ignores the most obvious and low cost solution to that (alleged) problem; and
- Instead proposes a system that will:
    - expose end users to lobbying;
    - divert innovation away from its most valuable goals; and
    - allocate decision making to the least informed parties.

1. Introduction

The primary function of an electricity meter is to measure power usage so that the customer can be billed. This function is ancillary to, and necessary for, the retailing of electricity. The metering function can be broken down into several distinct components: hardware provision; communications with the meter; and the processing of resulting data into useful information.

These three basic functions are performed in different ways for older legacy electricity meters and newer 'smart' meters. Moreover, within the smart meter category there are different types of hardware, and different ways of providing data.

The Electricity Industry Participation Code ('the Code') identifies six categories of electricity meter that vary in accuracy and other dimensions. The vast majority of meters (over 95%) are category one meters used for residential connections. In recent years, more than 20% of the almost two million (category one) residential connections in New Zealand have had smart meters installed.

Metering is covered in part 10 of the Code. The Electricity Authority has issued a consultation paper[1] proposing to amend part 10 to provide that:

- "Consumers have the right to nominate whether the retailer or the distributor appoints the metering equipment provider (MEP); and
- Consumers would be granted the right to obtain access to their own advanced metering infrastructure ('AMI') data at no cost for the purpose of verifying their bills."

These proposals are said to address concerns that "parties controlling AMI data have incentives to inefficiently impede competitor access to this data". The EA says that its proposal is superior to the next best alternative, which is to retain the current arrangements over appointing the MEP (i.e. for retailers to continue to make this decision) but provide for "a compulsory disputes resolution scheme to promote efficient access to AMI data by third parties".

Vector has asked Covec to investigate and report on issues arising from the Consultation Paper, including analysis of:

[1] Electricity Authority, "Advanced Metering Infrastructure: Nomination of the MEP and access to data", 17 May 2011.

- The extent to which the New Zealand metering market is (or is not) competitive;
- The most efficient way of setting prices for access to metering data;
- The likely impacts of the EA's proposals on dynamic efficiency in the metering market (especially – are metering firms likely to be incentivised to innovate and invest under the EA's proposals?); and
- A general economic critique of the analysis in the EA's consultation paper.

In our view, the issues on which Vector has requested advice are important and relevant to the EA's consultation paper.

We infer from the two changes proposed that the EA perceives that there are two problems in the metering industry at present. One is that retailers have an advantage over lines companies in respect of providing metering services. It seems that the first proposal (giving end users the right to choose which of its suppliers chooses the metering provider) is aimed at redressing this perceived imbalance. We infer from the second proposal that the EA perceives a risk that end users may be blocked from having access to the data generated from the meter in their premises.

In the balance of this report, we:

- Define the relevant market and assess competition in that market (section 2)
- Consider the pricing of data access, including with reference to similar trades in other parts of the economy (section 3);
- Analyse the likely implications of the EA's proposals for dynamic efficiency (section 4); and
- Review the remaining economic issues arising from the consultation paper (section 5).

2. The Metering Industry

The Consultation Paper does not present any structured analysis of competition, but it does suggest that there are competition problems in the metering industry. This is clear from the executive summary, which refers to:

> "concerns that parties controlling AMI data have incentives to inefficiently impede competitor access to [meter] data".

Outlining the benefits it envisages from its proposed Code changes, the EA again points to a competition issue:

> "This option should promote efficient access to AMI data by creating competitive tension amongst and between retailers and distributors".

These statements show that the EA considers that the metering industry is insufficiently competitive. In this section, we assess that view using a conventional analytical structure. We begin with a short discussion of the evolution of the industry and its current structure, and then look more closely at competition issues.

2.1. Background and Structure

Whereas in some countries metering functions are performed by electricity network owners, a distinct metering industry has emerged in New Zealand. The reasons can be traced back to the vertical separation of lines companies from electricity retailing in the late 1990s. The separation process typically involved lines companies divesting their retail businesses, at which time they were free to either retain or sell the meters. At the time, there were around 40 electricity lines companies. Many chose to sell their meters, which thereby came to be owned by electricity retailers.

For a time, there were concerns that having retailers owning meters might impede competition between electricity retailers. However the industry evolved in ways that alleviated such concerns and meter ownership is now rarely mentioned as an inhibitor of retail competition. In the Electricity Market Review, the submissions relating to metering were focussed instead on:[2]

- technical standards for meters; and
- ownership/control of metering functions.

[2] Electricity Technical Advisory Group and the Ministry of Economic Development, October 2009, "Improving electricity market performance: Summary note on recommendations taking account of submissions", pp.35-36.

The Review did note that "it is important also that meter specifications do not act as a barrier to customer switching", but this comment is itself focused on specifications for meters rather than their ownership.[3]

Metering service providers in New Zealand include some firms that are owned (or partly owned) by lines companies and some that are owned by electricity retailers. In principle and in law, any person can establish and operate a metering business.

Contractually, it is the retailers who are primary customers of metering companies in New Zealand. This is because of their ongoing need for reliable billing information. And since retailers can (and some do) self-supply metering functions, it is fair to describe retailers who use third party metering companies as outsourcing their metering functions. We understand that in recent years two large retailers have called competitive tenders for the supply of metering functions.

This industry structure has not prevented and may have stimulated the deployment of smart meters to residential customers. Indeed, it has been argued that this deployment has been too rapid, and that it should be halted until certain technical standards are determined. This was the recent view of the Parliamentary Commissioner for the Environment, who called for "a moratorium on the roll-out of advanced meters until regulations are in place for: communication protocols; and the inclusion of HAN-functionality into advanced meters before they are installed".[4]

By contrast, some lines companies have tended to be more concerned with the ownership and control of metering functions, pointing to the future emergence of "smart grids" that are expected to have more distributed generation, a subsequent demand for two-way metering and the potential for more advanced load control capabilities. Such a future is widely anticipated. However it seems that, at the present time, lines companies have quite varied demand for meter data, especially when compared with retailers.

Nevertheless, since metering in New Zealand is a distinct industry, there is no apparent reason why lines companies cannot compete in it. Indeed, Vector is currently the largest provider of metering services in New Zealand. The following table shows the approximate structure of the industry at present, based on estimates we have obtained from Vector. This includes a breakdown of legacy and smart meters.

Vector has the largest market share, followed by Trustpower, Metrix (owned by Mighty River Power), Arc (owned by Meridian Energy) and Contact Energy. The remaining metering suppliers consist largely of smaller lines companies. According to the data we have received, none of these smaller suppliers have more than 3% of the total market.

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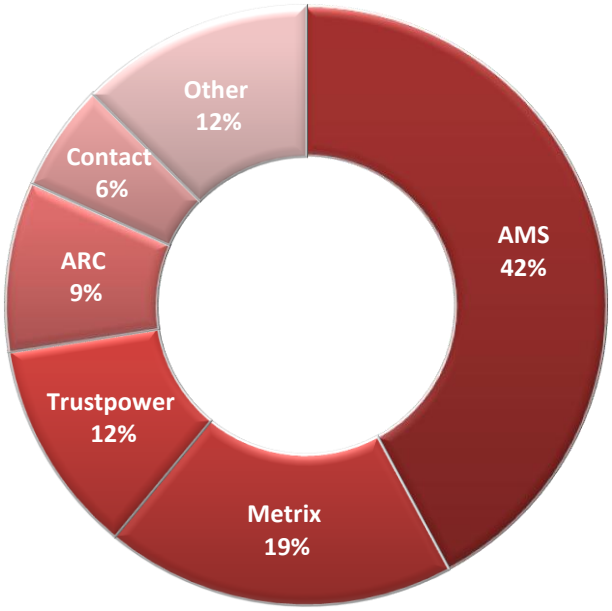
[3] Electricity Technical Advisory Group and the Ministry of Economic Development, August 2009, "Improving Electricity Market Performance Volume one: Discussion paper", paragraph 156.

[4] Parliamentary Commissioner for the Environment, Submission on the Improving Electricity Market Performance discussion document, page 4.

Table 1: Estimated number of meters by metering service providers and meter type

Meter Owner	Advanced	Legacy	Total Meters
AMS	243,000	560,000	803,000
Metrix	170,000	190,000	360,000
Trustpower		220,000	220,000
ARC	130,000	45,000	175,000
Contact Energy		110,000	110,000
Other	2,000	235,288	237,288
Total	**543,000**	**1,360,288**	**1,905,288**

Figure 1: Estimated share of metering market



The distribution of market shares is sometimes viewed as an indicator of competition in an industry, in which case the most frequently cited statistic is the HHI, which is the sum of squared market shares. Lower values of the HHI indicate a more fragmented and potentially a more competitive industry. The HHI for the metering market is currently 2,439. This is within the range (1500 – 2500) classified as "moderately concentrated" by the US Department of Justice.[5]

This value can be usefully compared with the HHI for the retail electricity sector, using market share information reported by the Ministry of Economic Development.[6] The latest data are for 2009, at which time the HHI was 2106, the lowest figure over the period 2004-09 inclusive.

[5] http://www.justice.gov/atr/public/guidelines/hmg-2010.html

[6] See Table 6b on this page:
http://www.med.govt.nz/templates/MultipageDocumentTOC____43958.aspx

It would be a serious error to use concentration statistics such as the HHI as the sole indicator of competition. However, it is worth noting the metering industry is not substantially dissimilar in concentration as the retail electricity industry in New Zealand.

These data and HHI statistics reflect all metering activity rather than just smart meters, for which supply is somewhat more concentrated. However smart metering is a strategy open to any supplier of legacy meters. For example, we understand that Trustpower, which has approximately 19% of the metering market (and 11% of the retail electricity market), does not currently supply smart metering services. If the retail division of Trustpower decided that smart metering was sufficiently valuable, it could readily deploy smart meters. We therefore consider that these concentration statistics are a reasonable indication of actual and potential competition in smart metering activities, and of actual competition in legacy metering.

2.2. Competition

To consider the intensity of competition in metering more closely, we need to start by defining the relevant markets. Once the markets have been defined, we can more accurately assess the extent of competition.

2.2.1. Market Definition

The first step in market definition is to consider the product (or service) at issue and decide whether there are:

- Substitute products to which customers would turn in the event of a price increase; and/or
- Complementary products that should be included because they are typically bought and sold within the same trading relationship.

There is no close economic substitute in demand for an electricity meter, or for the ancillary services of communications and data provision. Each of these things can be supplied in different ways however.

Legacy meters are sometimes supplied as a stand-alone item, with the monitoring and data provision products being provided by retailers or outsourced to third parties. However in the case of smart meters, there is typically (but not necessarily) a single firm that provides the meter, monitors it and provides the data from it. Thus, the relevant market for smart metering services may include a cluster of three complementary products: the meter itself, the monitoring and the data provision. Factors that point towards this market definition include:

- Existing commercial practice;
- The need for the cost of smart meters to be recovered over time; and
- Strong economies of scope between monitoring and data provision.

It may be that smart meter supply could be reasonably split out from this cluster of products but doing so would not change the competition analysis in any material way. We therefore proceed on the basis that the relevant product market is for a cluster of three complementary functions: meter supply, monitoring and data provision.

There appears to be a strong case for defining a separate market for residential smart meter services, which is distinct from that for supplying smart meter services for other end user groups (small-to-medium sized enterprises, commercial and industrial users). The main reason is that the meters are different and not substitutable. It appears from the consultation paper that the EA is most interested in the mass metering market, which in any case contains the vast majority of all meters in New Zealand.

Regarding geography, we note that suppliers of smart meters operate nationwide. As with retail electricity, the intensity of competition may vary regionally, but the fact that several firms offer smart metering services nationally points towards a national geography for the relevant market.

Regarding the functional dimension of this market, the market for meters and metering services is an upstream 'intermediate' market in which MEPs sell primarily to retailers. In turn, retailers use these metering services in the process of providing electricity to end users in the downstream market retail electricity market.

Regarding the customer dimension, there could be an argument for defining separate markets for metering services purchased by retailers, and those purchased by lines companies. It seems that at present these two groups have quite different demands and the costs of serving each will also differ. Also, once a retailer has entered into a contract with a MEP for a group of end users, it is in a stronger bargaining position with respect to subsequent purchasers of data access. Our main conclusions would not change if this adjustment was made.

Accordingly, we consider that the relevant market for analysis is a market for the supply of

- A cluster of three products (namely smart meters, monitoring and data provision)
- to residential ICPs
- in New Zealand.

2.2.2. Competition in Smart Metering

To assess the health of competition in smart metering, we follow the standard approach of considering the nature of any barriers to entry or expansion, and whether there is countervailing bargaining power. The following specific examples of things that can indicate barriers and/or countervailing bargaining power are drawn from the EU guidelines on assessing substantial market power in the electronic communications

sector.[7] We consider them appropriate here, in part because smart metering is based on electronic communications.

Barriers to Entry or Expansion

There are many potential sources of barriers to entry or expansion, most of which are patently not relevant to smart metering. For completeness, we start by summarising the reasons each of these obvious potential sources is not relevant, and then look in more detail at the remainder.

- Regulation
    - There are no regulations that limit the number of smart metering suppliers. Regulations concern the need for retailers to ensure metering is provided, and the accuracy of meters rather than the number of suppliers, so this is not a barrier to entry or expansion.

- Network effects
    - Metering relationships are bilateral, between the retailer and the end user. End users do not get more value from metering when there are more retailers using the same MEP. The switching of customers between retailers, combined with the tendency for meters to remain in place, means that in practice retailers tend to use more than one MEP, and this tendency is more pronounced for growing retailers. We conclude that network effects are not a barrier to entry or expansion.

- Excess capacity
    - End users tend to only have one electricity meter. Most back office and MDMS systems are likely to have some spare capacity, but this is unlikely to represent a barrier to entry because of unit demand at the end user meter level.

- Capacity constraints
    - As noted above, existing MEPs are likely to have some spare capacity in their back office and MDMS systems, so they have the potential to expand. Doing so requires capturing a greater share of the ICPs, but this is not a capacity constraint that deters expansion.

- Control of key infrastructure
    - End user meters are relevant to competition between MEPs. But that competition is for the business of retailers and end users switch retailers from time-to-time. Once appointed, MEPs can either swap out the meter (which would be normal if it is a legacy meter) or agree terms with its supplier (which appears to be a situation in which both parties would benefit from agreement). We understand that it is generally commercially feasible to install a new meter. This means there is no "essential facility" that is a natural monopoly to which MEPs need access in order to compete. By contrast with pipe or wire networks, the

[7] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52002XC0711%2802%29:EN:HTML

costs of installing a meter are low relative to the cost of the equipment itself, so meters are not sunk assets.

- Access to financial resources
  - All of the current and potential future suppliers of smart meters are well established businesses (retailers or lines companies). They can be assumed to have good access to capital for prudent business initiatives.

- Intellectual property rights
  - We are not aware of any intellectual property rights that might constitute a barrier to entry or expansion in smart metering.

- Economies of scope
  - Some smart metering customers that could have self-supplied chose instead to outsource these functions (Contact and Genesis). This suggests that economies of scope are not so great as to constitute a barrier to entry or expansion.

- Vertical integration
  - There is some vertical integration between smart metering and electricity retailing (Arc-Meridian and Metrix-MRP) but this is not the norm (as it is between retailing and generation for example). Potential entrants into smart metering, or existing firms seeking to expand, would not need to also enter the retailing sector.

- Access to retail distribution channels
  - The primary customers of smart metering companies are retailers. These are readily identifiable and approachable. The fact that a MEP seeking to win a retailer's business would need to offer the retailer a better deal than they currently receive is not a barrier to entry or expansion.

There are two other factors that are potentially relevant here: sunk costs and economies of scale. Smart metering companies typically have sunk capital into their back office and MDMS systems. The capacity of these systems can also be expanded with the addition of incremental capital.

Ultimately, the strength of scale economies (combined with the size of the market) will determine the sustainable market structure for smart metering in New Zealand, i.e. the number of firms that can be accommodated in the long run with each operating at (or close to) their efficient scale. It may turn out that just a few firms, each operating at efficient scale, are sustainable in the long run. That situation could be described as a barrier to entry, but it would be an efficient barrier because adding more firms would increase unit costs.

We conclude that there appear to be no barriers to entry or expansion in the smart metering industry that would warrant policy concern.

Countervailing Bargaining Power

When buyers of services have significant countervailing bargaining power it is difficult for firms to increase prices and/or reduce quality. An assessment of countervailing bargaining power is therefore complementary to an assessment of barriers to entry and/or expansion. Indicators of countervailing bargaining power include the following:

- A few, relatively large buyers;
- Buyers that are able to self-supply;
- Buyers that are co-ordinated;
- Buyers that are sophisticated; and
- Buyers that have good information about prices and costs.

Electricity retailers are the customers of MEPs. Retailers are few in number, relatively large, and sophisticated. The metering divisions of MRP and Meridian show that self-supply is entirely feasible. The fact that Contact and Genesis initially issued a joint call-for-tenders shows that co-ordination is feasible.

2.2.3. Conclusion on Competition in Smart Metering

Based on the above analysis we consider that it is reasonable to classify the broader smart metering market as workably competitive. There are likely to be some economies of scale in the back offices and MDMS components of the industry, but that has not prevented apparently robust competition between the three main existing providers. Barriers to entry and expansion seem relatively low, and it is clear that buyers in this market have significant countervailing bargaining power.

3. Pricing of Data

The consultation paper expresses the view that:

> "parties in control of AMI data ("access providers") have incentives to charge data access prices that represent their opportunity cost for use of the data, as they know it is costly for other parties to install a second meter at the ICP."

The EA's reference to the metering providers' opportunity cost suggests that such parties lose the ability to do something else when they pass data to others. In general terms, the opportunity cost of an action or choice is the value of the next best alternative: the thing one foregoes. Most choices have opportunity costs. For example, our decision to work on this metering issue means that there are other things we cannot do: the highest valued "other thing" is our opportunity cost. It follows that opportunity costs are rather personal and subjective; outsiders can sometimes have difficulty predicting the "something else" that is foregone.

The EA does not explain what metering companies forego when they pass metering data to other parties. An important point to keep in mind here is that data usage is not rivalrous: it is entirely possible for two (or many) people to use the same data simultaneously. So one thing metering companies are definitely not foregoing when they provide data, is their own use of the same data.

Moreover, the consultation paper presents no evidence regarding actual prices currently charged for data, and just a hint of how it might assess whether such prices were consistent with its objectives. In this section we discuss principles that could be used to set and assess prices for data access, and some examples of data access pricing from other markets.

3.1. Principles

The consultation paper (at 3.3.7(d)) outlines three principles that it might guide the decisions of an arbitrator of a dispute over data access prices:

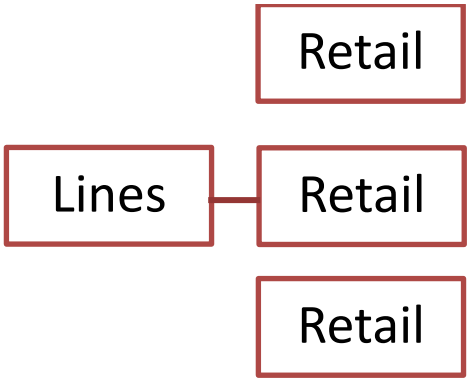
(i) the access price must lie between incremental cost and standalone cost;

(ii) the arbitrator's focus should be on the long-term benefits to consumers [i.e. end users], and in particular on the dynamic efficiency consequences of the proposed prices; and

(iii) the arbitrator should seek to replicate the outcomes of a workably competitive market, with particular regard to the pricing of services to competitors in such markets. In order to promote innovation and investment in AMI, it is proposed that in deciding on the access price the arbitrator should consider whether the price should transition from standalone cost to incremental cost over a period of up to five years.

Our main concern with these principles is that they are disconnected from the realities of the smart metering sector. The reference to 'AMI' in (iii) could be replaced by a reference to any other form of infrastructure without affecting the sense or value of the principles. Indeed, they bear a strong resemblance to some of the thinking of the Commerce Commission in its recent Input Methodologies work, which concerned natural monopolies.

We are also puzzled by the reference to "the pricing of services to competitors in such markets". This is consistent with, and may be causally connected to the EA's apparent view (paragraph 3.2.6) that metering service providers have an incentive to "stymie competition" through the pricing of data access. However, the structure of the metering sector and its interactions with the wider electricity industry (both currently and in the future if the EA's proposal is implemented) suggests that this analytical framework is inappropriate. To understand this point, consider the following diagram:



Here, all retailers within the competitive retail sector require an essential input supplied by a monopoly lines company. If the lines company also owns a retailer (indicated by the connecting line), then it is "selling services to competitors". And if there are some economic profits in the retail sector, then the lines company has an incentive to seek a larger share of that sector, including by discriminating in favour of its own retailer when selling the essential input. Notice in particular that:

- there is market power in one sector;
- the firm with that market power also competes in the other sector; and
- the potential to "stymie competition" occurs in the competitive sector.

Now compare this to the situation with metering. In what follows, it is important to keep in mind that the first of the EA's two recommendations makes it possible (if they can successfully lobby the end user) for lines companies to nominate the MEP, for the reason that this will improve the access lines companies have to metering data.

The first point to note is that, in general, the metering market is not a monopoly but is better characterised as workably competitive. The market power in the above (lines / retail) example is largely absent. Firms cannot price discriminate unless they have some market power, so competition will tend to constrain the *ability* of MEPs to discriminate

in favour of their affiliates. However competition between MEPs occurs periodically when retailers put contracts up for tender, and it may not actually prevent price discrimination.

Nevertheless, for any metering company with an affiliate, the lines companies (being the potential buyers of metering information whose position the EA apparently seeks to improve) do not compete in the same downstream market as that affiliate. Consequently, the metering company has no *incentive* to discriminate in favour of their affiliates. This is an important point, so we will explain it from the perspective of each potential affiliate type.

- Vector is a lines company with an affiliated metering company AMS. Vector does not compete against any other lines company, so AMS has no incentive to discriminate in favour of Vector when presented with requests for data by another lines company.

- Mighty River Power ('MRP') is a retailer with an affiliated metering company Metrix. MRP does not compete against any lines company, so Metrix has no incentive to discriminate in favour of MRP when presented with requests for data from by any lines company.

Since metering companies have no incentive to discriminate in favour of their affiliates, there is no problem here that needs EA intervention to resolve. Accordingly we doubt the need for pricing principles. However for completeness, we will now consider the way we would expect meter data to be priced.

As noted above, retailers are the main customers of metering companies. We understand that both Contact and Genesis have run competitive tenders for metering services in recent years. The pricing that emerged from these tenders is likely to be the best indicator of competitive pricing for metering data that is currently available in New Zealand.

Retailers attach the highest value to metering data. This is clear from the existing contractual structures, and also from the fact that metering companies build and operate sophisticated Metering Data Management Systems (MDMS) that give retailers direct access to their databases. Retailers ultimately pay for MDMS investment, so it would not continue to occur unless they attached sufficient value to this particular, and rather costly, form of data access.

We understand that some lines companies (the group whose access the EA seems concerned about) currently have no need for this form of data access, but let us for the moment focus on those that would like such access, and assume that once appointed by a retailer, the MEP has a degree of incumbency advantage.[8] In that case, we might observe MEPs requesting higher prices from lines companies, even though the services provided were similar. A non-discrimination clause in the Code could address this risk.

[8] This advantage is limited by the fact that dual metering could occur, as the consultation paper notes at paragraph 3.2.4.

Over time, we would then expect to observe similar prices for similar services, however both parties (retailers and lines companies) would pay competitive prices because competition between metering companies would exert downward pressure on prices and tend to limit overall rates of return to MEPs.

Now assume that lines companies do not need or want a level of data service consistent with MDMS. We can usefully divide this category into two parts depending on whether the lines company wants:

- Monthly deliveries of usage data at the ICP level; or
- Less frequent deliveries of more aggregated data.

There are existing market trades for the first of these categories, the pricing of which could be used as a comparator. For example, AMS supplies data in this way to MRP. We could envisage that over the next decade there might emerge some demand for this form of data access by lines companies.

Currently, lines companies are more likely to want the second form of data access. Lines companies tend to plan network investment at the level of feeder lines into neighbourhoods, rather than at the ICP level. Their data needs are likely to be irregular in both the time and space dimensions, in patterns dictated by network investment plans. From the perspective of metering companies, this trade would be very much a by-product. Consequently, they would have an incentive to provide this data at prices that reflect the full incremental costs of supply plus a mark-up to contribute towards overheads.

3.2. Examples from Other Markets

There are some other sectors in New Zealand that are broadly consistent with the lowest level of data access discussed above. They are situations where data sales are possible as a by-product of another more valuable function. Three such cases are

- Electronic payment records;
- Stock market information flows; and
- Real estate prices.

3.2.1. Electronic Payments Data

There are two companies in New Zealand that provide switching services for electronic retail payments facilitated by EFTPOS and credit cards. One of these companies, Paymark, also offers data for sale to the general public.

This occurs in two ways. Paymark itself offers a service called "My Market Select" which helps firms keep track of electronic payments (which indicate revenue levels)

aggregated across between 5 and 30 nominated merchants.[9] The benchmarking reports are issued weekly with daily breakdowns also available. There is a set-up fee of $150 for this service, after which the subscription is $50/month (excl GST).

More tailored data are available from BNZ MarketView.[10] This firm draws its raw data BNZ cardholder transactions processed on the Paymark switch. It then develops customised reports that are used by economists working on retail distribution issues, retail development planners and other relatively sophisticated users. There is no standardised pricing because there are no standardised reports. Instead, quotes are provided based on the requirements of the user. Covec has used this service on numerous occasions, paying up to a few thousand dollars for timely, accurate and well targeted data.

3.2.2. Stock Market Information

The primary business of the New Zealand stock exchange is the operation of trading platforms. However it also sells access to information relevant to, and arising from trades over those platforms, though its NZX Data division. According to its website[11]

> NZX Data provides real-time, delayed, end of day and historical data to customers generated by trading activity on NZX's markets. NZX Data is available directly from NZX or through licensed Data Distributors including Bloomberg, Thomson Reuters, IRESS and Interactive Data.

The pricing for this data service is not described on the NZX website.

3.2.3. Real Estate Price Data

When real estate is traded in New Zealand, certain information about the trade must be disclosed to official agencies. The resulting data is repackaged and sold on, by two companies, Quotable Value (which is an SOE) and Terralink.

QV describes itself as "New Zealand's largest valuation and property information company". It sells property information as online reports for between $12 and $85 (including GST).[12] More customised reports are also available following a quotation (in much the same way as MarketView).

Terralink operates a service called Property Guru, which it describes as:[13]

> a web-based property information application that allows you to deliver quality service to your clients by accessing the best property information including:
>
> - REINZ recent sales statistics;

[9] https://www.paymark.co.nz/market_reporting_more

[10] http://www.marketview.co.nz/index.html

[11] http://www.nzx.com/nzx-customers/

[12] http://www.qv.co.nz/onlinereports/

[13] http://www.terralink.co.nz/property-information/property-guru/

- Comparative Market Analysis (CMA);
- Sales and valuation data;
- Highest quality aerial imagery;
- Ownership and title information;
- Extensive listing histories;
- Mapping and measuring tools to accurately locate properties and nearby amenities;
- Powerful search and prospecting tools.

This service seems to be targeted at intermediaries rather than end-users; there are no prices quoted for standardised reports.

3.3. Conclusion on Pricing for Data

The consultation paper does not argue that any parties are being over-charged for metering data. Instead, it expresses the opinion that MEPs might have an incentive to over-charge, and proposes to address that risk by giving end users the right to decide whether the lines company or the retailer will appoint the MEP. From this, we infer that the EA perceives that MEPs have an incentive to over-charge lines companies for data.

If this is the EA's view, we disagree. The main reason for our disagreement is that lines companies do not compete with other lines companies or with retailers, so the incentive to "stymie competition" by over-charging a rival is absent.

Regarding the expected pricing for metering data, we note that lines companies and retailers are likely to want different data services. Whereas retailers need monthly readings at the ICP level, lines companies are less likely to want online access to databases and will probably prefer a higher level of spatial aggregation (e.g. at the neighbourhood level rather than the ICP level). Since such data reports are in the line of a by-product for smart metering companies, these companies have an incentive to provide these report at a price that reflects the full incremental cost of extraction. In the future, lines companies may need more timely and detailed data, similar to the current needs of retailers. In that case we would expect the prices paid by lines companies to increase and the prices paid by retailers to fall. If both types of users need similar data, they will tend to pay similar prices while competition between metering providers maintains downward pressure of overall rates of return.

To provide greater certainty that this outcome would eventuate, the EA could simply impose a non-discrimination clause in the Code. Such a clause would also address any risk that a small or new retailer could receive discriminatory treatment because of its lack of ability to exact retribution (as envisaged in paragraph 3.2.8).

4. Dynamic Efficiency

Dynamic efficiency refers to a pattern of investment and innovation that is as timely and well directed as possible. While straightforward to define and describe it can be rather more difficult to recognise. However for practical purposes, policy makers address dynamic efficiency when they try to set industry conditions in such a way that firms will have both the *incentives* and the *ability* to invest.

We have noted above (¶ 2.2.2) that current and potential future smart metering companies in New Zealand are generally off-shoots of either a lines company or a retailer, and that they consequently have reasonable access to financial resources. The ability to finance investment and innovation is therefore not of major concern, and is unlikely to be affected by the EA's proposals.

No prudent board will allocate capital to poor quality projects however, so the ability to invest needs to be coupled with the prospect of reasonable returns before it will be approved. It is the prospect of reasonable returns that generates incentives for investment.

To consider dynamic efficiency issues we will briefly review the recent past, the likely need for investment in the future, and then analyse the potential impact of the EA's proposals.

4.1. The Recent Past

Within the last decade, around 545,000 smart meters have been installed in New Zealand. Three companies (Vector, Metrix and Arc) have emerged as nation-wide suppliers of smart metering services.

At approximately $200/meter, this represents an investment of $110m on meters alone. In addition to the meters, a range of IT system investments are required including communications, database development and user-friendly online interfaces for customers so that the data can be readily used for billing purposes.

An important motivation for this investment has been to reduce ongoing expenditure on meter reading. These cost savings (which accrue to retailers) have helped to under-pin the business case for smart meter roll-outs.

However smart meters also have the potential to promote dual goals of energy efficiency and greater value from existing usage. Time of use metering, for example, permits customers to more accurately recognise the value/cost of their own usage in a time-sensitive way. This can allow retailers to offer more sophisticated tariff menus, so that relatively price-sensitive customers can select tariff plans that give them the opportunity to save money by managing load during times of system-wide stress and consequent high wholesale prices.

The potential for these new uses adds to the incentive for smart metering providers to invest in more meters and in better back-office systems.

4.2. Potential Future Needs

There is a significant effort underway worldwide to develop "smart grids". While terminology differs, the idea is that there is potential to manage and use existing power networks more efficiently by increasing the use of new technology and communications networks. Simplifying greatly, smart grids could in future be used for:

- More sophisticated management of power systems; and
- New forms of communication.[14]

Within the power system category, there is a clear trend towards renewable generation which brings with it greater intermittency and a correspondingly greater need for more accurate flow/network management. Some of this new generation may be distributed within low voltage networks (solar generation prices are falling for example), raising demand for two-way metering and again increasing the complexity of network management.

There are already technologies available for communicating over power lines, and there is potential for greater usage of these. It is conceivable that high bandwidth technologies could emerge for mass market adoption.

Smart grid initiatives are still in their early stages of development. In the USA, the National Institute of Standards and Technology say that[15]

> "...tomorrow's Smart Grid will be one of the greatest achievements of the 21st century. By linking information technologies with the electric power grid—to provide "electricity with a brain"—the Smart Grid promises many benefits, including increased energy efficiency, reduced carbon emissions, and improved power reliability."

In motivating a "super smart grid" that links most of the countries of Europe, Battaglini et al (2008) say that:[16]

> "To reach the EU target on emissions reduction of 80% by 2050, the European electricity system and its infrastructure need to be reinvented with the aim of reaching 100% renewable electricity by 2050."

While there are some initiatives already underway in New Zealand that have been labelled "smart grid" projects,[17] it seems fair to say that smart grids are a work in progress both in New Zealand and internationally. The direction is clear, but a

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[14] http://en.wikipedia.org/wiki/Power_line_communication

[15] http://www.nist.gov/smartgrid/

[16] A. Battaglini, J. Lilliestam, C. Bals and A. Haas, 2008, "The Super Smart Grid", European Climate Forum, available at http://www.supersmartgrid.net/wp-content/uploads/2008/06/battaglini-lilliestam-2008-supersmart-grid-tallberg1.pdf

[17] For example, Transpower's NNI initiative was reported as such last year http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=10670455

significant research and development effort will be needed to start realising the potential of smart grids.

4.3. Incentives to Innovate

There seems to be universal agreement that more innovation in smart metering is highly desirable. Even critics of the recent history of the industry in New Zealand, such as the Parliamentary Commissioner for the Environment, perceive a need for more rather than less functionality. How then are the EA's proposals likely to affect the incentives for innovation?

Regarding dynamic efficiency, the consultation paper says (¶ 3.1.6(c)) that

> "Access to AMI data by different parties has the potential to promote improvements in efficiency over time in a wide range of ways – e.g. enhanced load control and consumer value-added services."

We agree, but consider that "different parties" already have access to AMI data. The real question is whether the nomination mechanism proposed by the EA, which in itself does nothing to promote "different parties" having access to data,[18] will promote or harm incentives to innovate.

In our view, there is a significant risk that the proposed nomination process will shift the focus of innovation away from the development of smart grids and more nuanced and efficient tariff menus. At present, smart metering research and development is aimed at these objectives. However under the EA's proposal, the attention of suppliers could be diverted towards developing new services for end users. Such new services are required before marketing/lobbying campaigns are implemented, so they will become a natural focus of competitive research and development.

This seems rather odd, especially when set alongside the consultation paper's complete lack of discussion of the smart metering needs of end users (beyond access to data for bill verification). Our reading of the consultation paper suggests that the EA considers lines companies to be the sector that is in some sense under-assisted by the status quo. Our review above of potential future needs suggested that smart grid development and smarter tariff development were objectives that smart metering innovation could support. Yet the EA, without identifying any shortfalls in the development of innovative offers for end users, proposes a system that will divert competitive effort towards such offers.

While the goals of innovation are likely to shift in undesirable ways under the EA's proposals, there is also a risk of less innovative activity overall. Compared to the current relatively long-term contracts between retailers and MEPs, the two-year window proposed by the EA before end users can be lobbied to select a new MEP nominator is rather short. Consequently, we would envisage that the timeline for cost recovery on

[18] The consultation paper recognises this at paragraph 3.3.4, which (discussing the two nomination options considered) says "regardless of the option chosen, regulation would be required to ensure that data is provided to parties seeking it in an acceptable format".

smart meters would also shorten, which would increase the annual price for smart metering and slow down the rate of deployment.

Finally, by obliging the end user to choose the MEP nominator, the EA's proposal puts this decision in the hands of those least well equipped to compare suppliers. The outcome could be that inefficient firms are able to establish and remain in business, to the detriment of overall welfare. For example, it is possible that some of the smaller lines companies that fall below the threshold for regulation by the Commerce Commission could establish smart metering companies and use internal cost allocation to favour these affiliates over more efficient rivals.

In summary, we consider that the EA's proposals have several negative implications for dynamic efficiency. They are likely to shift the focus of innovation away from the fields that have been identified as having the largest potential gains, increase prices and therefore reduce the rate of deployment, and permit inefficient firms to establish and survive.

5. The Consultation Paper

In its introduction to the Part 10 review project (section 2.2) the EA classifies issues into two groups, the second of which is a view that the existing Part 10 does not fully accommodate the developments in smart metering. It goes on to say (¶ 2.2.2) that:

> A key issue relating to the second area (the uptake of advanced meters), is about providing participants with access to AMI data.

The reference to participants excludes end users, which is arguably reasonable given the focus on the code. We also agree that relevant participants should be able to gain access to AMI data.

It seems that something (unspecified) happened during the previous consultations on Part 10 that added a second issue to the question of data access. At the end of section 2.4 the EA says:

> As a result of the submissions received from the third consultation round, the Authority is investigating the policy issues around two key areas of the proposed metering code. A decision on these policy issues is required in order to complete the proposed new metering code. These policy issues are in regard to:
>
> (a) the party that nominates the MEP; and
>
> (b) the terms of access to AMI data.

These correspond directly to the consultation paper's two proposals: one proposal concerns the party that nominates the MEP; and the other proposal is that end users should get access to their own data. To understand the thinking behind the nomination issue, we now consider the way the EA defines the problem it seeks to solve.

5.1. Problem Definition

In paragraphs 3.2.3 to 3.2.8, the consultation paper sets out the EA's view of the problem it seeks to resolve. It starts by observing (correctly) that a single meter at each ICP is the lowest cost way of providing metering services. However contrary to paragraph 3.2.4, this does not tell us that there are necessarily economies of scale and scope. Even if economies of scale and scope did exist they would not necessarily imply a natural monopoly service or imply anything in particular about the desirability of intervention. The unit cost of placing one meter at each ICP would not decline with scale; it would be approximately constant. Nor can we infer anything about economies of scope without considering other activities beyond the supply of a meter.

We disagree that "mobile phones also exhibit economies of scale and scope" (¶ 3.2.4 of the consultation paper). Like metering, any economies of scale or scope in the mobile phone industry arise further back in the network than the customer equipment (i.e. the handset or electricity meter).

The next two paragraphs (3.2.5 – 6) have been discussed in section 3.1 above. They argue that MEPs might set prices for data access in line with their opportunity costs, which are greater than their marginal costs, and which would "stymie competition". As we have observed above, the use of data is non-rivalrous: two or more parties can use easily the same data simultaneously. So MEPs are not foregoing any opportunity to use data when they provide it to others.

However let us consider the situation of most apparent concern to the EA: a lines company wants data from an MEP appointed by a retailer. In this situation, what is the opportunity cost of providing data? It is that the MEP forgoes use of the resources needed to extract and deliver the data. The best estimate of the monetary value of those resources is their cost to the MEP. Consequently, in this context, opportunity cost and marginal cost are essentially the same in dollar terms. The divergence perceived by the EA is therefore non-existent. It follows that the "stymie competition" risk perceived by the EA is also non-existent.

Interestingly, this conclusion is that same as the one we reached in section 3.1 above, though we started from a different place. The analysis above was based on the reference to "the pricing of services to competitors" in ¶ 3.3.7 (d)(iii), which we found to be an inappropriate description of the sale of data by an MEP to a lines company.

In summary, we consider that the EA's problem definition does not disclose or reveal any actual problem.

5.2. The Proposal

The consultation paper considers two ways to address the perceived problem. They are very similar:

(a) the MEP is nominated by either retailers or distributors, apparently with the EA making the choice;

(b) the MEP is nominated by either retailers or distributors, with end users making the choice.

It seems (¶ 3.3.11) that the EA considers that under option (a) it would choose the retailer as the nominator of the MEP (i.e. the status quo). However, because of the perceived problem it considers that a compulsory arbitration process would be needed in this case. It proposes to use final offer arbitration and to require the arbitrator to select a price that lies between incremental and stand-alone costs.

The reference to incremental and stand-alone costs supports our view that the EA is concerned with situations where a retailer is the main customer and a distributor also wants data. In that case, under reasonable assumptions about the nature of the data currently required, the provision of data is a by-product which metering companies have an incentive to sell at prices that approximate the MEPs opportunity cost, which is also its marginal cost.

In any case, we consider that the incremental and stand-alone cost boundaries proposed by the EA are redundant. MEPs can be expected to set prices in this region anyway. Any prices below incremental cost would represent a subsidy from the MEP to the lines company; and prices above stand-alone cost would not be paid because the lines company would be better off bypassing the MEP.

While the proposed arbitration process seems un-necessary and the guidance for it redundant, we do see some risks with it. In particular, whereas the EA sees prices falling over time (from stand-alone to incremental cost) we think that the reverse may occur, particularly if lines companies begin to want more sophisticated forms of data access over time.

We realise that this option (status quo plus arbitration) is not being advocated by the EA. If it was to be further considered, we suggest that further thought should be given to the likely evolution over time in the nature of the data access demanded, and that only then should pricing be considered.

5.3. Long-Term Benefit of End Users

The EA proposes that end users will "have the right" to nominate which of its two suppliers (lines company or retailer) is entitled to choose the MEP. When the proposal is framed this way as an empowering right, it may seem unambiguously beneficial. This picture changes however when one considers how, in practice, the proposed change will be manifest.

In practice, we would expect that any changes will be initiated by lines companies asking end users to transfer the nomination right to them. Presumably the retailer will respond with a similar request, but even if they do not, the end user will be obliged to make a choice. This imposes a cost on end users.

What is the corresponding benefit? Either way, the end user will have the right to access data from their own meter (assuming the EA's second proposed change is adopted). It is possible that price competition might benefit end users who allow the lines company to nominate the MEP, but there is no expectation or prediction of this in the consultation paper, and there are reasons to think it is unlikely:

- the bulk tendering processes currently used by retailers must already deliver competitive prices for AMI services; and

- individualised direct marketing of the type lines companies would need is far from costless.

It therefore seems reasonably likely that end users will be annoyed rather than advantaged by being asked to choose which firm nominates its MEP. Anecdotal evidence suggests that end users took some time to understand the change from one to two electricity suppliers; it is not clear that adding a third choice will be well received.

There is some literature that is consistent with the view that end users might prefer not to be obliged to decide who nominates their MEP. Brennan (2005)[19] presents a model in which end users prefer not to choose their electricity supplier and shows that in this case competition can decrease welfare. In the context of health care, researchers at Stanford University have reported[20] that both young and old adults experience "ambiguity aversion", preferring to make no choice at all rather than an ambiguous risky choice.

In summary, there will be a direct cost to end users if they are obliged to decide whether the lines company or retailer appoints the MEP. Any benefit end users receive from this intrusion has not been clearly articulated in the consultation paper; it appears at least uncertain.

[19] Timothy J. Brennan, 2005, "Consumer Preference Not to Choose: Methodological and Policy Implications" Resources for the Future Discussion Paper 05-51, available online at http://www.rff.org/RFF/Documents/RFF-DP-05-51.pdf

[20] http://healthpolicy.stanford.edu/research/choosing_not_to_choose_ambiguity_aversion_in_younger_and_older_adults/