Cost Benefit Analysis of Smart Metering and Direct Load Control

Workstream 3: Retailer Impacts - Phase 2 Consultation Report

Ministerial Council on Energy

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Contents

Inherent Limitations

This report has been prepared as outlined in Section 2. The procedures carried out in preparation of this report constitute neither an audit nor a comprehensive review of operations.

No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by the officers of the Department of Resources, Energy and Tourism ("RET"), who were consulted as part of the process.

KPMG has indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

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The findings in this report have been formed on the above basis.

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This draft report will be finalised after feedback from stakeholders.

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1 Executive summary

In April 2007, the Council of Australian Governments ("COAG") endorsed a staged approach for a national roll-out of electricity smart meters to areas where the benefits for consumers outweigh the costs. In July 2007, the Ministerial Council on Energy ("MCE") project managed by the Department of Resources, Energy and Tourism ("RET") engaged a consortium of consultants to undertake a cost benefit analysis. It involves assessing the cost and benefits of a smart meter roll-out assuming different smart meter functionalities and a number of scenarios.

Phase 1 examined the incremental costs and benefits of various additional functionalities, over a roll-out of 'basic' smart meters. It resulted in the definition of smart meters (with particular functionalities) on which to undertake Phase 2 of the analysis. The Overview Report describes these functionalities in detail. Phase 2 involves a full cost benefit analysis of a roll-out of smart meters over existing technology. It also involves examining the impacts at a jurisdictional (and regional) level, and the impacts of the various delivery scenarios.

KPMG has been engaged to undertake the 'Retailer Impacts' part of the cost benefit analysis. In particular, to provide an assessment of:

- The products (e.g. more cost reflective tariffs) retailers may offer and to whom; and
- The potential impacts on the retailers' recurrent costs, although we also discuss a number of the broader implications of smart meters for retailers.

These issues are the subject of this report. The purpose of the report is to provide some of the basis for a public consultation process on the costs and benefits of smart meters.

Retail product offers

It is evident that there is a significant degree of uncertainty amongst retailers about:

- The more cost reflective tariffs offers they might make with smart meters; and
- The market share those offers might win.

There is also limited market evidence on which to form an independent view, particularly in relation to take-up rates.

Our analysis therefore also relies to some extent on an 'in principle' assessment of the factors that are likely to influence take-up rates and the strength of those factors.

Our conclusions are indicative best estimates and it would be a mistake to attach significant weight to their precision.

The available evidence suggests that it would be optimistic to assume that, just because smart meters will enable retailers to introduce more cost reflective tariffs reflecting each customer's load profile, this will happen broadly across small customers in the foreseeable future. The technology lowers the barriers to retailers introducing such tariffs, but the benefits for many customers might be too small to make it worthwhile for retailers to market these products aggressively. They may also meet customer resistance to the tariff changes that might logically be made.

The more likely outcome is that retailers offer more cost reflective tariffs to a significant minority of the market, perhaps up to half of it. Retailers might also offer more sophisticated cost reflective tariffs (e.g. Direct Load Control - "DLC" - tariffs) to a subset of these customers.

It also seems likely that the tariffs retailers offer will be different to what may be 'ideal' from the perspective of sending the most cost reflective prices signals possible to customers. This would be consistent with the need to produce offers to which customers are most receptive (i.e. are saleable in mostly competitive retail markets).

To deliver these and any higher levels of take-up, it is also likely to be necessary to engage in substantial customer education and information campaigns. There may be a role for Government in this scenario to support the efforts of retailers to get more customers on to cost reflective tariffs. From the retailers' perspective, that support is likely to include price deregulation and, perhaps, assistance with broader marketing campaigns on the importance of using energy more wisely.

Price regulation is one tool that could, however, also be used for this purpose. For example, it seems likely that if network tariffs are made more cost reflective that retailers will typically seek to pass them through. Using network and particularly retail price regulation in this way may not be the most effective way of achieving the ultimate objective (i.e. more demand side response), and may come with other costs (i.e. undermining retail competition).

Retailers in general believe that a mandatory roll-out of smart meters is likely to be an expensive way of targeting customers who might accept and respond to more cost reflective tariffs. Retailers are, however, strongly of the view that, if there is to be a mandatory roll-out of smart meters with a key objective of encouraging more demand side response, then the functionality should ensure that the smart meters are capable of communicating with a Home Area Network. Their reasoning is that, if smart meters are going to have any impact on customer behaviour, they need to be able to provide very simple signals and ways for customers to respond, and that this functionality might assist in this process.

Retailers' recurrent costs

Our analysis of the impacts of smart meters on retailers' recurrent costs is subject to some similar constraints to those that were imposed on our analysis of the benefits. In this case, the uncertainty is a function of the limited information the retailers have been able or prepared to provide to assess the impacts of smart meters on their recurrent costs.

Our analysis suggests that a roll-out of smart meters will lead to:

- Increases in the retailers' recurrent operating costs over the transitional period of about 8.0%, above an efficient benchmark cost. We assume the transition period is effectively three years after the installation of a smart meter; and

- Reductions in the retailers' recurrent operating costs over the longer term of between 5.0-11.0%.

It is possible that the transitional cost increases could be significantly higher than this, given that the execution risks of a smart meter roll-out are high. It is also possible, however, that the reductions in recurrent cost could grow over time if retailers are able to develop cost effective ways of exploiting all the functionalities that smart meters provide, and they transform the market as much as some people believe they might.

To the extent that customers take-up and respond to more cost reflective tariffs, and DLC tariffs in particular, there are also likely to be significant savings in the retailers' hedging costs. There may also be some benefits for retailers' other costs and in terms of customer retention.

Our conclusions both in terms of the impact of smart meters on retail product offers or retailers' recurrent costs are not materially different by jurisdiction.

The impact of the scenarios

We do not believe that the scenarios will have a substantial impact on the retailers' incentives to introduce more cost reflective tariffs, or to generate efficiency improvements. Provided the functionality provides a capability retailers will use it if they believe customers will value it.

Assessment against MCE objectives

We are only in a position to assess the decision to have a mandatory roll-out of smart meters against the MCE's objectives within the context of our examination of 'retail impacts'. This is likely to be too narrow a perspective to assess these issues appropriately. Nevertheless, we discuss them briefly below here and understand the Overview Report addresses these matters in further detail and from the perspective of the overall cost benefit analysis.

From a retail impacts perspective, the threshold question is, in principle, whether metering services for small customers is a natural monopoly or not. In particular, whether competition or regulation is the better way of providing metering services for small customers.

If regulation is a better way of providing metering services, then a mandatory smart meter roll-out is likely to assist in furthering some of the MCE's objectives. If metering services is properly a competitive market activity, then it is difficult to see how a mandated smart meter roll-out would further the MCE's objectives substantially.

Whether metering services for small customers is a natural monopoly is a major question in its own right. While there are clearly significant economies of scale in parts of metering services (e.g. manual reading), we are not aware of any compelling evidence to suggest that metering services is a natural monopoly. A number of parties (e.g. policy makers in NZ and the UK and the ACCC in Australia) have concluded that competition in metering services is preferable to regulation.[1]

That is not to say that mandating a roll-out smart meters would have no benefits in relation to some of the MCE's objectives under this scenario, but it does imply that the rationale for mandating a roll-out needs to derive from another form of market failure (e.g. perhaps within the distribution sector). We are not in a position to form a view on whether such market failures exist, at least within the context of this study.

The MCE's objectives are as follows.

1 Reducing demand for peak power, with consequential infrastructure savings (eg network augmentation and generation);

2 Driving efficiency and innovation in electricity business operations, including improving price signals for efficient investment and contracting;

3 Promoting the long-term interest of electricity consumers with regard to the price, quality, security and reliability of electricity;

4 Promoting competition in electricity retail markets;

5 Enabling consumers (including residential, business, low- and high-volume users) to make informed choices and better manage their energy use and greenhouse gas emissions;

6 Manage distributional price impacts for vulnerable customers;

7 Promoting energy efficiency and greenhouse benefits; and

8 Providing a potential platform for other demand side response measures and avoiding discrimination against technologies, including alternative energy technologies.

Of these, objectives 2 to 5 are most relevant to this report. Objective 1 relates more to upstream and distribution impacts, while objectives 6-8 are more related to consumer impacts, and the interaction of benefits with other demand side options.

Objective 2 - Driving efficiency and innovation in electricity business operations, including improving price signals for efficient investment and contracting

As discussed above, a roll-out of smart meters will allow for some greater efficiency in the retail business operations. The extent to which smart meters drive other innovation in electricity retail operations will largely be a function of the value customers ascribe to the services smart meters can provide, particularly more cost reflective price signals. To the extent that it does, it will also lead to consequential benefits in terms of improving price signals for efficient investment and contracting (i.e. by encouraging retailers to focus more on demand side options for managing

[1] We understand that the ACCC found that remote reading was potentially competitive, but that manual reading remained a natural monopoly due to significant economies of scale.

their price exposures). The analysis in this report suggests, however, that the proportion of small customers that would ascribe material value to the services smart meters can provide is open to question.

Objective 3 - Promoting the long-term interest of all classes of electricity consumers

Whether it achieves this objective, is largely a function of the issues outlined above on the nature of metering services. In particular, whether competition or regulated monopoly is the better way of providing metering services for small customers.

Objective 4 - Promoting competition in electricity retail markets

Whether it achieves this objective, is also largely a function of the issues outlined above on the nature of metering services. A mandatory roll-out is likely to impact on the range of products the retailers offer (or at least the timing with which this occurs), which may assist in promoting retail competition for those customers interested in those offers. There is also a significant risk, however, that for the rest of the market it will constrain competition as it might create additional complexities that make these customers even less interested in actively participating in the market, and responding to more cost reflective tariffs.

Any promotion of competition is in our view likely to be modest.

Objective 5- Enabling customers to make informed choices and manage better their energy use and greenhouse gas emissions

More consumption and price information being made available will allow customers to make more informed consumption decisions, but the impact of this will depend on how much consumers make use of the provided information (i.e. whether they value it).

Impact of the scenarios on furthering the MCE's objectives

The scenarios for delivering a mandatory roll-out will not substantially alter how well it furthers the MCE's objectives because achieving this, from a retail perspective at least, is primarily a function of the rationale for the mandatory roll-out, not how it is delivered. In general terms, however, options that expand the scope for competition in delivering the outcome are likely to provide more benefits than those that do not, provided they are feasible.

2 Introduction

In April 2007, the Council of Australian Governments ("COAG") endorsed a staged approach for a national roll-out of electricity smart meters to areas where the benefits for consumers outweigh the costs.[2] In July 2007, the Ministerial Council on Energy ("MCE") project managed by the Department of Resources, Energy and Tourism ("RET") engaged a consortium of consultants to undertake a cost benefit analysis. It involves assessing the cost and benefits of a smart meter roll-out assuming different smart meter functionalities and a number of scenarios.

Phase 1 examined the incremental costs and benefits of various additional functionalities, over a roll-out of 'basic' smart meters. It resulted in the definition of smart meters (with particular functionalities) on which to undertake Phase 2 of the analysis. The Overview Report describes these functionalities in detail.

Phase 2 involves a full cost benefit analysis of a roll-out of smart meters over existing technology. It also involves examining the impacts at a jurisdictional (and regional) level, and the impacts of the various delivery scenarios. This is the subject of this report.

The scenarios for the roll-out are:

- Distributor led;
- Retailer led;
- Direct load control; and
- Central communications.

The Overview Report describes these functionalities and scenarios in more detail.

This report addresses Phase 2 only, but contains analysis developed in Phase 1 which is relevant to Phase 2.

KPMG has been engaged to undertake the 'Retailer Impacts' part of the cost benefit analysis. In particular, to provide an assessment of:

- The products (e.g. more cost reflective tariffs) retailers may offer and to whom; and
- The potential impacts on the retailers' recurrent costs, although we also discuss a number of the broader implications of smart meters for retailers. A separate workstream examines the transitional costs to retailers, which is why our focus is on recurrent costs, but we use the term loosely to cover more than just retailers' recurrent operating costs.

The purpose of the report is to provide a basis for a public consultation process on the impacts of smart meters on retailers.

[2] For this report a 'roll-out' means introducing smart meters other than by the voluntary actions of the market.

The conclusions in this report *do not* address whether a roll-out of any smart meters would deliver benefits that exceed the costs. It merely addresses how the impacts on retailers might influence the benefits and costs.

2.1 Approach

To assess the incremental impacts on retailers of a roll-out of smart meters, we have:

- Held discussions with retailers;
- Request relevant information from the retailers and reviewed that evidence;
- Identified and reviewed the market evidence on the impact smart meters might have on the:
  - Retailers' development of retail products (i.e. the develop of more cost reflective tariffs);
  - Retailers' recurrent costs; and
- Drawn conclusions about the impact of smart meters on retail products and retailers' recurrent costs.

Qualifications

A national roll-out of smart meters to all small customers is an undertaking that few countries have tried, particularly in the context of contestable retail electricity markets. Given this, there is a high degree of uncertainty about the impacts it might have. For example:

- Australia's retail electricity market is at a comparatively early stage of development. The introduction of full retail competition is yet to occur in some jurisdictions and is in its infancy in others.
- Retailers hold widely divergent views about whether they would offer different retail products, what these might be and who they might offer these products to if there were a roll-out of smart meters. In short, there is some uncertainty about how the introduction of smart meters might impact on the market's development, even for those who know the market the best; and
- Retailers were unable or unwilling in the time available to provide estimates of the impact on their recurrent costs of the introduction of smart meters. Where we provide estimates of the impact on retailers' recurrent costs of a roll-out of smart meters they are indicative only.

Attempting to estimate the impact of smart meters therefore asks questions that arguably go beyond the capacity of the available evidence to answer.

This report also identifies a number of constraints that are likely to limit the extent to which retailers respond to a roll-out of any smart meters by offering more cost reflective tariffs, assuming that absent these constraints they have some incentive to do so. Section 5 identifies the most important of these constraints. Our assessment of the benefit *assumes* the removal (by technology development or government intervention) of these constraints.

We acknowledge that an assumption of unregulated tariffs for domestic users is inconsistent with the current situation in most Australian jurisdictions. This assumption is necessary to assess how the market might operate where it is uninhibited by regulation. If we assume that price regulation exists, it requires further assumptions on the level of those regulated prices in each state, as this will also have an important impact on the level of competition. Sections 5.7, 6.6 and 6.7 contain discussions on the situation regarding price regulation and its possible impacts on competition.

2.2 Outline of report

This report provides the output of our analysis. In particular:

- Section 3 outlines the nature of retail energy markets;
- Section 4 summarises the retailers' broad views on smart meters;
- Section 5 examines the evidence on the potential impact of smart meters on retail products;
- Section 6 draws conclusions on the implications of smart meter overall and by jurisdiction for retail products;
- Section 7 examines the evidence on the potential impact of smart meters on retailers' recurrent costs;
- Section 8 draws conclusions on the implications of smart meters overall and by jurisdiction for retailers' recurrent costs;
- Section 9 draws conclusion on the implications of the delivery scenarios.

3 Retail electricity markets

This section provides some context for identifying the potential retailer impacts of a national roll-out of smart meters. In particular, it outlines:

- The nature of electricity retailing; and
- Provides a brief overview of the current state of the Australian retail electricity market.

3.1 The nature of electricity retailing

We summarise the nature of electricity retailing by briefly examining it from the customer's and the retailer's perspective, focussing on the mass (primarily domestic) market.

In the Loy Yang case the Federal Court accepted that there are separate retail markets for the supply of electricity to:

- Residential and small business customers; and
- Industrial and commercial customers.[3]

In practice, it may also be more accurate to describe the small user market as an energy rather than an electricity market (e.g. as dual fuel capability is one of the key features sought by consumers). The ACCC has considered this issue in a number of recent merger reviews, but has not been required to form a firm view on how best to define the market.

For the purpose of this report we focussed on the retail electricity market only.

3.1.1 The customer perspective

From the customer's perspective the electricity retail purchase decision (i.e. who to buy from and on what terms) involves a transaction which is:

- Of relatively low transaction value;
- Of relatively low emotional value; and
- Difficult for the typical consumer to understand.

They do, however, typically attach considerable value to the underlying product, particularly if deprived of it (i.e. its reliability). But this is not an outcome a retailer controls.

These transaction features have important implications for the nature of the market.

[3] Australian Gas Light Company (ACN 052 167 405) v Australian Competition and Consumer Commission (No 3) [2003] FCA 1525, paragraphs 280 and 595.

Transaction value

Table 1 outlines the average domestic and business users' annual electricity consumption, and the cost of that consumption in 2002-03.[4]

Table 1: Electricity sale and costs in 2002-03

Energy and customer type	*Use (GWh pa)*	*Use per customer (kWh pa)*	*Average price (c/kWh)*	*Average cost ($/pa)*
Electricity – residential	52,902	6,595	13.17	869
Electricity – business	128,471	119,912	9.77	11,720

Source: ESAA, Electricity Australia 2004. This is the last year for which price data was reported by the ESAA

The average domestic customer spent approximately $869 per annum on electricity in 2002-03 (roughly $960 in today's dollars, although this may slightly overstate the increase – see below).[5]

This average, however, disguises at least two 'types' of electricity user: those who use gas for most of their space and water heating needs and those that do not. Those using gas for these end users will typically have electricity bills considerably below the average for their level of energy use, and vice versa. For example, the Australian Bureau of Statistics' Household Expenditure Survey 2003-04 suggests that the average household spent $1,227 per annum on domestic fuel and power in 2003-4 or $23.59 per week.[6]

Comparing household expenditure on energy relative to other goods and services provides an indication of the relative financial importance of the energy purchase decision.

Table 2 illustrates average weekly household expenditure on goods and services in 2003/04. It shows that for the average household, energy accounts for 2.7% of expenditure and that energy is one of the smallest categories identified. The average household spends similar amounts on alcoholic beverages or gambling, although behavioural economics suggests that consumers do not always assess the same level of expenditure on different goods in the same way.[7]

Table 2: Average weekly household expenditure on goods and services 2003-04

Good or Service	*Average Weekly Expenditure ($)*	*Contribution to Weekly Household Expenditure (%)*
Current housing costs	135.02	15.3
Domestic fuel and power	**23.59**	**2.7**
Food and non-alcoholic beverages	152.87	17.3
Alcoholic beverages	23.32	2.6
Tobacco products	11.55	1.3
Clothing and footwear	35.26	4.0
Household furnishings and equipment	52.00	5.9
Household services and operation	56.14	6.4
Medical care and health expenses	45.78	5.2
Transport	139.25	15.8
Recreation	112.78	12.8
Personal care	17.20	2.0
Miscellaneous goods and services	78.69	8.9
Total goods and services expenditure	*883.45*	*100.0*

4 Business includes all non-domestic customers.
5 To compare these dollar amounts we have assumed an inflation rate of 2.5% per annum.
6 Australian Bureau of Statistics, Australian Household Expenditure Survey: 6530, 2003-04.
7 Australian Gaming Council, Factsheet: Gambling expenditure, June 2007.

In recent times the amount of expenditure might have increased somewhat with the higher penetration of air conditioning and rising electricity prices in some jurisdictions, but the overall change in electricity expenditure as a proportion of total weekly expenditure is likely to have been modest.

Figure 1: Retail electricity price index (Australia)[8]

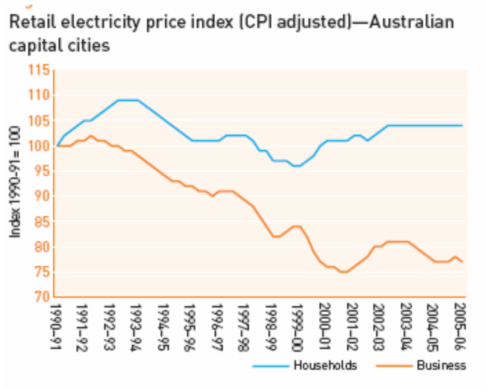

Figure 2: Retail electricity price movements (capital cities)[9]

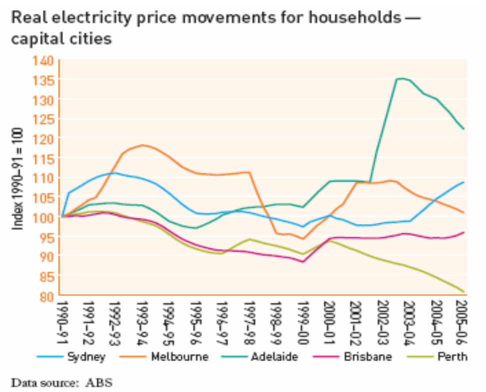

Figure 1 which highlights the change in real electricity prices since 1990-91, supports this assumption. In particular residential prices since 2003 have remained relatively stable. Figure 2 identifies the differences in household electricity price movements across the different capital cities, the differences are due to a number of factors, including competition, load profiles and network charge differences.

In addition, in 1998-99 the ABS estimated that domestic fuel and power accounted for 2.6% of household expenditure.

[8] Australian Energy Regulator, State of the Energy Market 2007, July 2007
[9] Ibid.

Implications

The data in Table 2 implies that if the average customer were in a position to achieve a 10% reduction in their energy bills by switching retailer, this would reduce their household expenditure by 0.25%. Similar metrics apply to decisions on whether to accept different supply terms, such as a more cost reflective tariff.

It should not be surprising therefore to find that consumers devote comparatively little attention to the electricity purchase decision (i.e. who to buy from and on what terms).

The attention customers currently give to making a related decision - deciding how much electricity to consume - highlights the relatively low importance consumers attach to the electricity purchase decision. Households make these decisions when they use energy and when they acquire durable goods that consume electricity and gas (e.g. houses, appliances).

Policy makers have known for many years that energy (running) costs have traditionally had a low priority in these decisions. For example, in 1991 the International Energy Agency stated *"most historical records of individual decisions on energy efficiency point to high implied discount rates – at least 35% - and, in some cases, as much as 200%."*[10]

Some policy makers conclude that these discount rates are disproportionately high. For example, in 1993 the UK Department of Environment concluded: *"Consumers appear to require very much higher rates of return from capital investment in energy efficiency than from investment in energy supply or in other goods and services."*[11]

Policy makers typically cite a variety of market 'barriers' or 'failures' to explain such observations (e.g. a lack of information, split incentives).[12] The typical consumer affords energy costs so little importance in making these decisions that many governments have introduced various forms of regulatory intervention in these markets to increase the degree to which consumers take energy costs into account.

Government interventions include thermal building standards, minimum energy standards and voluntary energy labelling for appliances. Government interest has increased in more recent times with the growing recognition of the external costs of energy consumption that are not factored into the price (e.g. climate change), although there would appear to be a more direct policy response to this market failure (i.e. to increase energy prices).

The importance placed by consumers on how much electricity to use may increase with the introduction of a price signal in respect of greenhouse gas emissions. There is now broad based and bipartisan support for introducing a carbon trading system which all parties acknowledge will increase electricity prices. The price signal would, however, have to be substantial to change significantly the amount of money the typical household spends on electricity. For example, tripling the wholesale price of electricity would increase final electricity prices by

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[10] International Energy Agency, 'Energy and Environment Series: Energy Efficiency and Environment', OECD, Paris, 1991, page 83.

[11] Evidence submitted by the UK Department of Environment to the House of Commons Environment Committee, 'Energy Efficiency in Buildings', Fourth Report, Session 1992/03, Volume II, HMSO, London, Nov. 1993, page 3.

[12] Productivity Commission, The Private Cost Effectiveness of Improving Energy Efficiency, Inquiry Report No. 36, 31 August 2005.

about 80%, and increase average household expenditure on energy from 2.7% to up to 4.8% of total expenditure.[13]

Emotional value

Customers also typically attach low emotional value to the electricity purchase decision. It is what marketing professionals often describe as a "low involvement" product.[14] These are typically low cost frequently purchased items. The decision on how much energy to use is a frequent decision, whereas the decision on which retailer to buy from and on what terms is less frequently made. The retailers we spoke to were strongly of the view that the electricity purchase decision involves a low involvement product.

The customer's demand for electricity derives from the services it enables (e.g. as a reliable source of heat, light, refrigeration etc.). Electricity has few other intrinsic attributes of value to consumers; indeed, it has few other attributes tangible to consumers at all (e.g. it is colourless, odourless, largely noiseless). Similar issues are relevant to the decision on who to buy from.

As retailers have indicated to us as part of this project, the vast majority of customers simply *"do not care"* about the product or who serves them.[15] Because it is such a low involvement product customers tend to be reactive rather than proactive in deciding who serves them and on what terms (e.g. the type of prices they pay).

A report by the UK Department of Trade and Industry (DTI) presented market research on switching suppliers, for a number of products with similarities to energy.[16] It researched the following markets: car and home insurance, fixed line and mobile telephones, current account and mortgage banking services, and energy. It stated in relation to energy that:

> *"Consumer interest in these markets is low, and switching has been primarily triggered by proactive sales visits/approaches from energy companies and by the familiarity of some suppliers…"*[17]

It also expressed some surprise regarding the levels of switching in energy, given the limited economic benefits. It stated:

> *"Despite the relatively high levels of switching in-home energy, only nominal savings are expected as a result of switching in these markets."*[18]

A minority (about 7% currently) of Australian customers do, however, consciously buy 'green' electricity even though it is more expensive than the best available offer.[19] This implies that some are attaching some environmental values to their electricity purchase decision.

[13] Assuming an energy costs of about 40% of the final cost of electricity (or $400 dollars on a typical bill of $1,000). Increasing the energy cost to $1,200 would increase the final cost of electricity to $1,800.
[14] Kotler, P., Adam, S., Brown, L., and Armstrong, G., 'Principles of Marketing', Prentice Hall, 2001, page 128.
[15] Many of retailers we spoke to expressed views of this nature, particularly non-incumbents who have to persuade customers to move away from their incumbent supplier.
[16] The Department of Trade and Industry, 'Switching Supplies', a research study commissioned by the Consumer Affairs Directorate, United Kingdom, November 2000.
[17] Ibid., page 17.
[18] Ibid., page 11.

Complex purchase decision

The electricity purchase decision is also a relatively complex one. The relative infrequency with which consumers are required to make the decision on who serves them and on what terms (e.g. every 2-3 years), and the newness of the decision, exacerbates this complexity.

The aforementioned UK study found customers (for energy and mobile phones in particular), had difficulty comparing offers and interpreting information provided to them. For example, only 9% of energy consumers (the lowest of the products in the survey) said that finding the best package for them was "*very easy*" and the qualitative research indicated that these findings were probably overstated. In the qualitative research "*people struggled to interpret information on mobile phones as well as energy in a way that was personally relevant to them.*"[20]

These conclusions appear to be consistent with those drawn from behavioural economics, which demonstrates that consumers often rely on "*intuition and rules of thumb to make decisions, often without perfect knowledge.*"[21]

3.1.2 The retailer perspective

Electricity retailing to the mass market is a low margin business due to the nature of the service and the limited value customers place on it. This section focuses on the mass market from the perspective of a retailer that is attempting to be major player in this market.

The service

Electricity retailers provide consumers with ways to buy electricity to satisfy some of their stationary energy needs. The offer has three key components:

- A price structure charged for access to energy and for the amount of energy consumed;
- A method by which customers pay; and
- Associated terms (e.g. the length of the contract).

Electricity retailing involves the following key functions to deliver these key components:

- Sales and marketing (e.g. to generate revenues by retaining and winning new customers);
- Billing and revenue collection (e.g. to generate cash inflow);[22]

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[19] ERAA, Research shows NSW consumers reacting to Climate Change at the ballot box and in the home, 2 April 2007. Approximately, 7% of domestic customers in NSW have green tariffs. Of those who have not switched to a green tariff 33% said the reason was cost, 21% said the reason was time; and 19% said they did not know about; 15% said they do not like switching.
[20] Ibid., page 9.
[21] The Economist, 'All too human', 12 October 2003, page 76.
[22] Sometimes the metering and or meter reading function are also included.

- Customer service (e.g. to manage customer communication at reasonable cost); and
- Risk management (e.g. minimise energy costs by managing input cost risk).

The first function is a profit centre, while the last three functions are largely cost centres.[23]

There are two key drivers of the economics of electricity retailing:

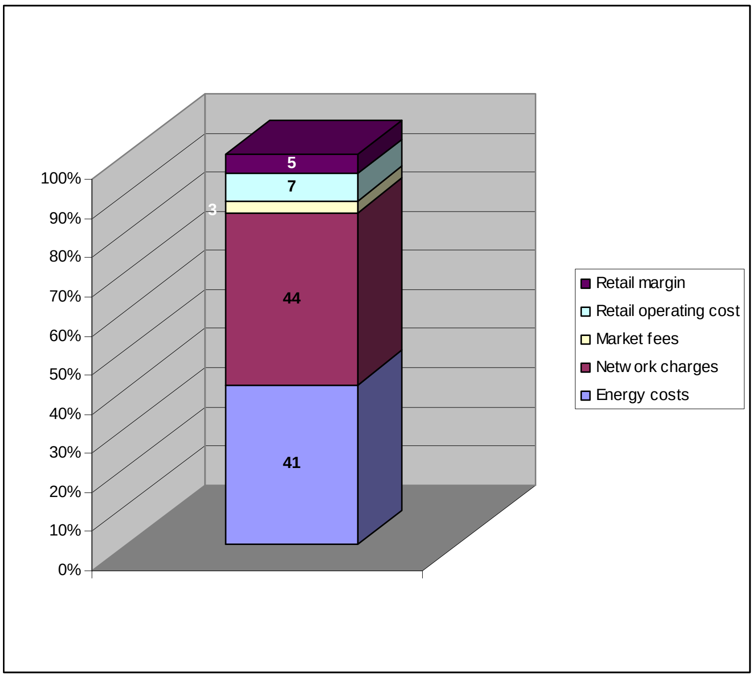
- Retail margins; and
- The nature of retail costs.

Retail margins

Figure 3 shows the proportion of the final price of electricity for a typical Victorian domestic customer broken down by supply function.[24] While the relative contributions of networks and energy may vary by jurisdiction (e.g. with higher energy costs), we would expect the retail costs and margin to be relatively consistent.

It shows retail operating costs (including margin) account for about 12% of the final price of electricity. The retailers' costs are a modest proportion of customers' bills.

Figure 3: Composition of typical final domestic electricity prices in percent



[23] Energy trading can also be a profit centre, but it is a function that can and usually is undertaken separately to energy retailing (i.e. it is similar to the distinction between stock broking and proprietary trading).

[24] Charles River Associates, 'Electricity and Gas Standing Offers and Deemed Contracts (2003)', December 2002. These proportions are for an average residential consumer's bill in Victoria.

Section 8 provides an indicative break-down of a retailer's operating costs, and identifies the costs that smart meters might influence (e.g. call centre costs, bad debts). The margin typically incorporates other costs that smart meters might impact on (e.g. working capital). Energy costs typically incorporate the cost of hedging, which is another cost that smart meters might influence. Customer acquisition (investment) costs are typically included in the margin. Section 8 also describes these two costs in further detail.

In terms of retail margins, most regulators (when given the chance to set retail margins) typically allow retailers to earn a regulated margin of up to about 5% (usually expressed as an EBIT margin on revenue) on small customers that do not choose an alternative supplier.[25] Although there is some evidence that the market might require somewhat higher margins than this.[26]

If we assume that the typical domestic electricity bill is about $1,000 per annum, the retailer makes about $50 per customer – before interest and tax. This leaves around $70 per customer for a retailer's operating costs on the above illustrative example.

The available margin per customer is therefore modest in relation to the overall bill, and small variations around the mean can change that profitability considerably. For example, one retailer we spoke to stated that *"if a customer calls you more than a couple of times a year, you have probably just lost your margin on that customer"*. Another retailer explained that for this reason *"retailers really do not want their customers to care"* about the product. It can also mean that small reductions in costs can improve margins considerably.

The margins retailers operate on tend to constrain the degree to which they are in a position to offer differentiated tariffs. Energy retailing is therefore a service which, for the mass market, involves a low degree of customisation and customer contact. Retailers tend to operate mass marketing campaigns and make their competitive offers very similar to existing offers to overcome customer inertia (e.g. similar tariffs, but with a discount). Australian retailers typically sell electricity door-to-door or over the phone via specialist contractors and so offers must be saleable in these environments.

Where retailers have similar input costs it is also difficult for them to offer price reductions that are likely to be attractive enough for significant numbers of customers to switch. Their costs are simply too small to make a major difference to the types of discounts they can offer. This also has significant implications for how they compete (e.g. vertical integration to get input cost advantages and non-price efforts at acquiring and retaining customers, such as building brand loyalty).

Given the way the market currently works, the 'ideal' domestic customer typically is one that:

- Pays on time, ideally by direct debit;

[25] KPMG, Benchmarking retail operating costs and margins, September 2006. The most recent decision by IPART allows a 5% EBITDA margin, which apparently reconciles to an EBIT margin of about 4%. It, however, provides a separate allowance for customer acquisition costs. IPART, Final Report and Determination – Promoting retail competition and investment in the NSW electricity industry – Regulated electricity retail tariffs and charges for small customers 2007-2010, June 2007.

[26] KPMG, Benchmarking retail operating costs and margins, September 2006.

- Does not communicate frequently with the retailer;
- Is disinclined to switch; and
- Is a relatively large user of electricity and gas. Large users are generally more attractive because retailers recover the margin mostly in the unit price, which also explains why dual fuel customers are more attractive, and has potential implications for the unwinding of the load cross subsidy (see Section 5.2.1). Customer acquisition costs are however largely independent of volume.[27]

With a roll-out of smart meters, the *load profile* of the customer may get added to this list. This, however, will depend on the extent to which retailers are able to introduce more cost reflective tariffs and target customers with a lower cost profile. In principle, there is no reason why customers with different load profiles should be more or less profitable *per se,* but in practice this is often not the case. In other words, customers with different load profiles can be more or less profitable for particular retailers.

The key constraints on retailers introducing any new tariffs are likely to include:

- The minimum savings or other perceived benefits required to make it saleable to consumers;
- The ability to identify, target and market to the relevant customers cost effectively; and
- The cost of introducing and marketing new products and the minimum numbers of potential customers required to make new products commercially feasible.

A roll-out of smart meters will enable retailers to introduce more cost reflective tariffs, but they will have to find ways to address these constraints. As one retailer summarised:

> "*the key question a retailer will ask itself is: are more cost reflective tariffs going to increase the $50 margin I can make on the typical customer?*"

The nature of retail costs

The retailers' costs are primarily either fixed or customer-related. These are respectively a function of the:

- Information technology systems (and to some extent the capital) required; and
- Processing each customer (i.e., information available to bill the customer, sending bills etc.).

In broad terms, the fixed costs are probably a somewhat larger proportion of the total. For example, slightly less than half the operating costs of retailer are probably largely fixed.[28]

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[27] Although the discount may need to be higher for more attractive customers.
[28] KPMG, Benchmarking retail operating costs and margins, September 2006.

Recent market developments reflect the importance of the fixed costs. In particular, the major retailers have focussed on getting larger by acquisition, sometimes appearing to pay a significant premium. In other words, electricity retailing would appear to involve significant economies of scale. The alternative explanations are that they may hope to gain some exploitable market power, or that they do not expect these customers to shift as much as those they acquire in the market.

Two recent acquisitions highlight this:

- In 2007 AGL Energy issued a prospectus to part fund its acquisition of Powerdirect.[29] The acquisition added 470,000 customers to its business (an increase of 17%). AGL Energy expects that it will reduce its cost to serve by 4%.[30] In other words, a 17% increase in customer numbers, on a large base, should reduce the cost to serve by 4%; and

- In 2006 Origin Energy acquired Sun Retail.[31] This acquisition added 833,000 primarily electricity only customers. Origin now has about 1,800,000 electricity and 880,000 gas customers (of which most are dual fuel). It stated that the scale benefit due to the acquisition would be around $10 per customer, on an existing cost to serve of $118 per customer. This implies that an increase in customer numbers of 31% should reduce the cost to serve by 8-9%.

It is also worth noting that some retailers are much larger than this, where they are in a position to be (e.g. British Gas in the UK has about 13 million gas customers and 6 million electricity customers).

The response of incumbent retailers to the threat of losing customers perhaps highlights the importance of customer related costs. Faced with this threat, retailers have two basic options:

- To lower prices across the board and retain volumes (i.e. customers), or

- To retain prices and be prepared to lose customers.

The market evidence suggests that incumbent retailers are generally reluctant to reduce prices across the board to maintain market share (see Section 5.3). In other words, they have often been prepared to lose a material proportion of their customers (they do, however, subsequently try to win these customers back on market contracts). Instead, they seek to retain customers in part by relying on their inertia, rather than matching the best available prices.

Losing customers would appear to allow for some reductions in costs (and some margin retention), whereas reducing prices to all customers implies no reduction in costs (and significant margin erosion).

Inevitably there is some tension between the desire for scale and the desire to retain margins on their customer base to the greatest extent possible.

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[29] AGL Energy, Prospectus: Institutional Placement of 56,550,000 new shares at $16.50 per share, February 2007.
[30] This is after the reduction expected by Project Phoenix (see below).
[31] Origin Energy, Acquisition of Sun Retail, 27 November 2006.

The way the capital market values retail energy businesses also provides an indication of how it sees the nature of the business. In the capital markets, one of the most commonly used metrics of the relative cost of acquiring a retail business is the cost per customer.[32]

This valuation metric implies that a retailer's portfolio of customers is in effect its primary asset (e.g. like the loan book of a bank). Moreover, there is an expectation that it will keep this asset largely intact. The prices recently paid by AGL Energy and Origin Energy for the Queensland retail businesses may support the perception they are to some extent buying a 'franchise' at least in respect of a large proportion of the customer base. For example, paying around $1,000 per customer implies in simple terms that it will take about 20 years to get this investment back, if each customer provides an EBIT of $50 per annum. The alternative explanation is that they expect on average to earn significantly higher margins than the regulators allow, and certainly the acquirers claim they have paid lower multiples than suggested above.[33] There is, however, some other evidence to support this 'franchise' view (see Section 5.3).

Key implications

The key implications of the above are that the key drivers of a retailer's competitiveness are:

- Volume – to generate the necessary scale economies;
- Low cost to serve – to maintain competitiveness; (e.g. both AGL and Origin have major cost reductions initiatives in place at the moment, as does TRUenergy);[34]
- Low customer acquisition (and retention) costs; and
- Risk management – to control input costs.

3.2 The Australian retail electricity market

Table 3 outlines the market share of retailers in the electricity market for 2006.[35]

[32] Australian Financial Review, 'Australian Energy poised', 6 August 2003, page 27. See also Australian Financial Review, 'AGL needs up to $500m equity for Pulse', 1 July 2002, page 16. See also the Allen Consulting Group, Review of the Gas Code: Commentary on Economic Issues, Report to BHP Billiton, August 2003.
[33] CRA International, Impact of Prices and Profit Margins on Retail Energy Competition in Victoria, 8 November 2007.
[34] Via Project Phoenix AGL is aiming to reduce its cost to serve per customer from $91 to $68 (prior to the acquisition of Powerdirect). It involves cost reductions of $60M from the retail business, and investing $80-100M in IT to save $30-40M in operating costs. AGL, A new AGL scheme booklet release (revised), 29 August 2006, page 26. Origin Energy is also proposing to reduce its cost to serve down to $70 per customer in a few years once it has a single billing system. TRUenergy also has an agreement with IBM to implement new retail systems that will provide greater efficiencies and enable it to compete in the national market. The new retail platform is to be implemented in late 2008. See Power Industry News, 'TRUenergy lifts performance', Edition 555, 20 August 2007.
[35] UBS Australia, Australian Utilities Structure 2006.

Table 3: Electricity customers by retailer - 2006[36]

Retailer	No. (M)	%
Origin Energy	2.09	22%
AGL	1.93	20%
Energy Australia	1.25	13%
Synergy	0.83	9%
Integral Energy	0.82	9%
Country Energy	0.78	8%
TRUenergy	0.65	7%
International Power	0.35	4%
Aurora	0.26	3%
Ergon Energy	0.17	2%
ActewAGL	0.15	2%
PAWA	0.07	1%
Red Energy	0.07	1%
Victoria Electricity	0.07	1%
Jack Green	0.03	0%
Total	*9.52*	*100%*

* Percentages do not equal 100 due to rounding.

There are two major private electricity retailers in Australia - AGL Energy and Origin Energy and a couple of mid-size private sector players - TRUenergy and International Power. There are also a number of smaller private sector players.

Some of data in Table 3 is, however, slightly misleading because:

- The two major private sector players (and TRUenergy) all have significant shares of the retail gas market, whereas this is not the case for most of the publicly owned retailers. They are therefore more dominant in the retail *energy* market than this data suggests; and

- A number of the smaller players have grown significantly in recent times (e.g. we understand that Victoria Electricity has a couple hundred thousand customers) and there have been a number of other new entrants (e.g. Australian Power and Gas).

It is evident that a variety of policy and regulatory issues are currently having a significant impact on the Australian retail electricity market and its structure. The key factors include:

- Government ownership in several jurisdictions;

- The absence of full retail contestability, or its recent introduction;

- Regulation of the retail electricity market, including price regulation (the level of which is a key factor influencing the level of switching observed in some jurisdictions); and

[36] We have updated this data for recent transactions (i.e. AGL acquiring Powerdirect, Origin acquiring Sun Retail and International Power buying EnergyAustralia out of their joint venture) with the best available information. We have not changed the total number of customers, or the market share of the smaller players (even where we know they have changed) where we do not know from who they have won these customers.

- The complications brought about by state based regulation.

Where relevant, this report discusses these issues in further detail (e.g. Section 5.7 discusses the constraints price regulation can impose).

First Data Utilities' World Retail Energy Market Rankings have judged the Victorian and South Australian markets amongst the three most competitive markets in the world.[37] The other markets deemed to be the most competitive are in the United Kingdom, Texas, Norway and New Zealand. Section 5.2 summarises the key features of these markets relevant to this study.

It would seem reasonable to assume that with further privatisation in Australia there would be a reduction in the number of retailers to perhaps three or four major (probably vertically integrated) retailers. This would be consistent with developments in the most competitive and least regulated electricity markets in other countries.

3.3 Conclusion

The nature of electricity retailing and the development of Australia's market may have an impact on the extent to which a roll-out of smart meters or advanced smart meters results in retailers offering more cost reflective tariffs. Section 5 discusses the key issues in further detail.

[37] First Data Utilities, World Energy Retail Market Rankings: Utility Customer Switching Research Report, Third Edition, June 2007. Its assessment or rating appears to relate only to the level of switching.

4 Overview of retailer views on smart meters

This section outlines the retailers' general views on a mandatory roll-out of smart meters. We have drawn these views from our discussions with following parties:

- ActewAGL;
- Aurora Energy;
- AGL Energy;
- Australian Power and Gas;
- Country Energy;
- Energy Australia;
- Ergon Energy;
- Jack Green;
- Power and Water Corporation;
- Origin Energy;
- Red Energy;
- Synergy;
- TRUenergy;
- Victoria Electricity; and
- The Energy Retailers Association of Australia.

We have also participated in a number of workshops where retailers have presented material from various smart meter trials and other related views.

We conducted the interviews under the Chatham House rule, and thus do not attribute any views.

The summary provided is our perception of the retailers' views on the key issues as a whole.

4.1 Interpreting retailer views

The retailers' views differed widely on several key issues, including what the benefits of smart meters might be in terms of retail products.

In assessing the retailers' views it may be necessary to try to separate their views on what might be good public policy from what might provide them with commercial advantages. This does not necessarily mean that their views on the former are invalid; just that they are potentially driven by imperatives which are not relevant to whether the benefits of a national roll-out will exceed the costs. For example:

- Many retailers would appear to have 'moved on' from the debate about whether a roll-out of smart meters is good public policy or not, because of the decision in Victoria. Rather than trying to influence this decision, they are now focussing on ensuring that the roll-out is in, or at least not contrary to their interests, to the greatest extent possible. For example, retailers are now not questioning the merits of the policy as much as it would reasonable to expect, given their apparent views (see Section 4.2).

- Retailers currently operate under particular 'rules' which influence the nature of the competition between them (e.g. the use of accumulation meters). Their focus is on how best to make money given these 'rules'. Any change in the rules creates uncertainty and possibly the need for significant changes to their business model, for uncertain benefits. This may make them reluctant to embrace change, and the implications (e.g. for retail products).

- Australia's retail electricity market is still at a comparatively early stage of development. The introduction of full retail competition is yet to occur in some jurisdictions and is in its infancy in others. The major retailers (e.g. AGL Energy, Origin Energy and TRUenergy) are undertaking major business reengineering projects to establish systems capable of operating on a national basis. Smaller retailers are unlikely to devote significant time and resources until a roll-out is about to have a major impact on the market and their operations within it.

Retailers consequently appear to see the introduction of smart meters as an inconvenience more than threat, but not generally as an opportunity. Section 4.2 discusses the more specific views of retailers in this regard.

4.2 Mandatory roll-out

There is wide opposition amongst energy retailers to a *mandatory* roll-out of smart meters. Many retailers commented that their views on this issue were, however, now irrelevant as it appeared inevitable that a roll-out would occur.

The key reason for the opposition is a view that a mandatory roll-out of smart meters will not generate significant benefits in terms of demand side response (although some retailers saw that they might provide other benefits for customers). Retailers generally do not believe that customers will value or demand (in material numbers) the more cost reflective tariffs that smart meters allow. They also believe the associated demand reductions will be modest.

Given that the vast majority of customers are reactive this is likely to mean that retailers will not be inclined to introduce more cost reflective tariffs across their customer base. Retailers therefore believe that a mandatory roll-out of smart meters is likely to be an expensive way of targeting customers who might accept and respond to more cost reflective tariffs.

The typical view is that it is likely to be very difficult to sell retail products by focussing on tariffs as the customer does not understand them and is not interested in investing the time necessary to understand them. This is simply because their bills are not significant enough for them to care. One retailer stated our salespeople *"never talk about tariffs when trying to win a customer"* – all they do is offer the same basic offer, but with some alternative benefit. The retailer also stated that if you talk about tariffs *"you are dead"* in terms of making sales.

A key theme of the retailers' response was that, if the objective is to change consumer behaviour, then merely rolling out smart meters is unlikely to be sufficient, even if retailers do offer more cost reflective tariffs. They believe there would be a need for a substantial and prolonged customer education program.

Retailers are particularly surprised that governments would seek to mandate a roll-out of smart meters, while at the same time continuing to regulate retail prices. Retailers believe it is unlikely that smart meters will make a significant difference to the products retailers offer whilst prices remain regulated.

They also believe that governments do not appear to appreciate what retailers see as a fundamental contradiction in their policies. In other words, to the extent a smart meter roll-out is successful in encouraging the introduction of more cost reflective tariffs; it is likely to lead to price shocks for some customers, including some 'vulnerable' customers. Avoiding price shocks is, however, presumably why policy makers regulate prices.

Section 5.7 discusses these issues in further detail.

Other views

One retailer is opposed to a mandatory roll-out because they believe it is an unnecessary intrusion into the market and because they believe it will "*stifle innovation*". It was particularly concerned about a mandated roll-out led by distributors, and would much prefer a competitive market model. The same retailer argued that the take-up of smart meters would be *"zero"* if the customer has to pay for the meter, although they saw this potentially changing if prices have to increase substantially to meet environmental constraints over time. It was, however, the most optimistic in regard to what would happen to retail products with a mandatory roll-out. We understand that it believes that this would create the critical mass in the market that would enable the cost effective introduction of mass consumer products. It suggested that:

- Up to 50-66% of customers on accumulation meters would end up on some form of Time of Use pricing; and

- A small proportion of these (probably less than 10%) would end up on some form of Critical Peak Pricing. This may include some form of DLC (either voluntary or mandatory interruptible) tariff, which maintains a simple structure, but offers some form of discount. In other words, it would be similar to how retailers currently compete, but with a different driver for the discount. It would rely on some form of direct load control via the smart meter and associated communication infrastructure.

This retailer indicated that they would be likely to lead the process of introducing more innovative tariffs and believed that customers would over the longer term respond, particularly as pressure grows to address the environmental implications of energy use. In other words, regulation might play a role in shifting customer behaviour as their understanding of the issues improves.

Section 6 discusses these issues in further detail.

At the other end of the spectrum most other retailers suggested that the proportion of customers that would end up on more cost reflective prices would be significantly less than this. Some suggested that it may be a niche market, perhaps around 10% of customers, similar to the number of customers who are currently on green tariffs. We would note, however, that the market penetration of green tariffs has increased over the last few years from about 2%.

Others suggested that there might be a somewhat larger segment (but minority) of the market that may find the savings that they could achieve on more cost reflective tariffs attractive, and equally that they would re-price their offers to customers that become very expensive to serve (as these customers are unlikely to shift anyway).

It was apparent from the discussions that the basis for the views of many of the retailers on benefits is intuition rather than substantive analysis. A number indicated that it was too early to tell and that much would depend on how the deployment occurred.

Only three retailers endorsed a mandatory roll-out.

- One retailer was in favour of a mandatory roll-out, but not because it foresees much product innovation in regard to cost reflective tariffs, but because of the other benefits it might provide to customers (improved services). It stated that it cannot find a business case for introducing more cost reflective tariffs that derive significant benefits for it (but is in the process of commencing a trial to assess various aspects of the benefits smart meters with in-home displays might provide as a marketing tool to customers);

- One retailer stated that they were keen to see smart meters penetrate the market and believe that smart meters would influence the market's development, but were more ambivalent about whether it needed to be mandatory. This retailer indicated that it could see both sides of the argument, but that it might be more cost effective to undertake a widespread roll-out. It saw the market responding with product innovation, but did not see itself as leading that process; and

- In our Phase Two discussion another energy business endorsed the mandatory roll-out.[38]

Only one retailer indicated that it was likely to be proactive in using the new technology to introduce new tariffs.

All others suggested that they would follow the market. This may be important given that, at the margin, most of the competition emanates from smaller retailers, as they are typically

[38] Although our discussions with the retail part of that business suggested they had a different view.

offering the best deals. This end of the market tends to focus on matching what the larger players do, but doing it better (i.e. by having relatively lower cost operating models and by being quicker to respond). Their focus is on building scale by growing volume rapidly; in the first instance to reach profitability. They are unlikely to initiate the introduction of more cost-reflective tariffs, implying that this will only happen if the larger players start the process and it becomes so widespread that it forces the smaller players to respond.

4.3 Recurrent cost implications

Section 7.1 outlines the views we received from retailers during our consultations with them on the recurrent cost implications of smart meters. In short, those views were that the retailers' recurrent costs would be about the same or somewhat lower with smart meters.

4.4 Functionality

It was a common ground amongst retailers that, if a mandatory roll-out of smart meters were to occur, a higher functionality would generally be preferable. Even those who were most negative towards the benefits of smart meters held this view. Their reasoning is as follows:

- If smart meters are going to have any impact on customer behaviour they need to be able to provide very simple signals and ways for customers to respond;
- Some of the additional functionality of smart meters should assist in this process; and
- Therefore, where the additional costs of improved functionality are modest, it would seem reasonable to opt for the higher functionality.

In other words, this might increase the market penetration of any more cost reflective retail offers and/or make customers more responsive to them. Retailers thought the additional functionalities are likely to provide other benefits to distributors (in the first instance) or customers (in terms of the quality of service).

4.5 Scenarios

Retailers expressed differing views about whether the different approaches to delivering smart meters or advanced smart meters would alter the benefits and costs.

The key views expressed were as follows:

- At least three retailers believe that ensuring that the obligation does not lie with the distributors is crucial. In their view a distributor led approach would lead to a lowest common denominator approach that would stifle innovation and risk stranding investment by opting for technologies that the market does not value and/or which risks premature obsolescence. They also believe that the apparent economies of scale in a distributor led roll-out might not be as large as thought (because retailers believe that there would need to be several waves of effort to cover any particular region), and because some retailers have larger scale than many distributors. For example, both AGL Energy and Origin Energy are larger than a number of distributors, albeit across the broader market.

- A number of retailers believe the key is to ensure that as many aspects of the process as possible are open to competition (such as competitive tender processes, even if distributors ultimately take the lead role). They also saw that there needs to be one set of national rules, with contestability around all aspects of delivering to those rules using an open approach to communications.

- Other retailers are happy for distributors to lead the roll-out, *provided* that the key decisions on functionality are made by the retailers, who are the party that will ultimately have to sell the benefits to customers.

- Some retailers believe that placing the obligation with them might act as a barrier to entry, particularly for small new entrants. It may in effect require them to become asset managers and place further constraints on new entry, by requiring additional capital that is scarce and expensive for businesses at that stage of their development (e.g. new billing systems). Some also saw it increasing the cost of small retailers relative to large retailers.

Overall, there is no consensus amongst retailers on these issues, but some retailers have strong views on these issues. Section 9 discusses these issues in more detail.

5 Evidence relating to retail products

A roll-out of smart meters would in the first instance reveal the 'cross subsidy' that currently exists between small customers on the basis of their load profiles (i.e., the load profile cross subsidy). Settling customers using accumulation meters according to the Net System Load Profile ("NSLP") conceals the cross subsidy by implicitly assuming that all customers have a load profile that is same as the NSLP.

For the purposes of this report, we define 'cross subsidies' as prices or tariffs that the market may not bear because they are not completely cost reflective. This definition of cross subsidy is similar to the economic definition. It covers prices that may be unsustainable in a competitive environment from a retailer's perspective, given the way in which it incurs its costs. In other words, prices that are either below the marginal costs incurred for a particular customer (and therefore must be subsidised by another customer), or are above the level at which another retailer is prepared to provide the service (and therefore exposes the retailer to the risk of 'by-pass'). In practice, where the market is prepared to bear the cross subsidy, it is probably more accurately described as price discrimination, which is typically considered to be efficiency enhancing.[39]

Revealing the load profile cross subsidy would mean that the profitably of customers would vary with their load profiles. In principle, this creates both:

- An opportunity particularly for non-incumbent retailers to introduce retail products for customers with flatter load profiles which would lower their electricity bills; and
- A threat to incumbent retailers that they would lose their (newly) more profitable flatter load profile customers and reduce profit margins if they do not respond by:
  - Offering these customers more cost reflective prices; and
  - Increasing prices to customers subsidised now (i.e. those with the peakiest load profiles), despite the difficulty of doing so.

  In principle, this threat might be sufficient for incumbent retailers to undertake this rebalancing process across their customer profile (i.e. introduce more cost reflective tariffs for everybody).

Below we identify and examine the evidence which may inform the extent to which this might occur. In particular, we examine:

- The key drivers of the potential changes in retail tariffs;
- Efforts to remove other cross subsidies in retail electricity tariffs;
- The relevant international evidence;
- The use of more cost reflective tariffs amongst larger users;

[39] Section 6.7.2 discusses this issue in further detail.

- The use of more cost reflective tariffs amongst smaller users;
- Evidence from the various trials currently underway; and
- The constraints imposed by other government policies and regulations, and other issues.

5.1 Drivers of potential changes in retail products

In principle, smart meters should lead to significant changes in retail products because freely functioning markets tend to unwind cross subsidies. In practice, however, this process is typically subject to certain variables and constraints.

The key variables are likely to include the:

- Impact on bills; and
- Number of customers affected.

The key constraints are likely to include the:

- Costs to the customer of bearing more cost reflective prices. The customers' 'costs' might include transaction costs (e.g. the time to find and understand the more cost reflective prices and being prepared to accept any risks they impose). A significant proportion of customers will in the first instance pay more under cost reflective tariffs, which is unlikely to encourage customers to take them up; and
- Costs to the retailer of charging more cost reflective prices. The retailer faces costs in developing and marketing more cost reflective prices, which it is likely to compare against the other ways of attracting customers (e.g. by offering dual fuel capability).

The overall competitiveness of the market may also play an important role. For example, less competitive markets would typically be less effective at unwinding any particular cross subsidy.[40]

So while markets tend to unwind cross subsidies (because the customers who are currently bearing the costs will not tolerate them), a particular market may tolerate or not fully unwind what in theory appears to be material cross subsidy.

The pressure provided by functioning markets thus provides the only real test of whether a particular 'cross subsidy' is unsustainable.

There is therefore some uncertainty about the extent to which the retail electricity market might unwind the load profile cross subsidy, and/or the timeframe over which this might occur. The

[40] This may well have implications for jurisdictions that do not have full retail contestability but are nevertheless proposing to roll-out smart meters (i.e. regulated prices will need to deal with pricing any cross-subsidy issues).

best available guidance about the extent to which the market will unwind the load profile cross subsidy probably comes from the evidence on:

- The size and nature of this particular cross subsidy; and
- How this market and similar markets function.

5.1.1 Size and shape of the load profile cross subsidy

There is evidence to suggest that the load profile cross subsidy is material.

Certain parts of Australia have some of the world's peakiest electricity load shapes and thus relatively low asset utilisation. For example, in Victoria and South Australia the last 10% of maximum demand occurs for less than 20 hours per year and yet requires up to 10% of invested capital.[41] This implies that those creating the peak are imposing significant costs on those with flatter load profiles. For example, the Victorian Essential Services Commission has estimated that the cross subsidies between those domestic customers that do not have air conditioning and those that do, could be as much as $200 per customer per annum.[42] Section 6 provides further examples.

This does not necessarily mean that this situation is economically inefficient.

The Trowbridge Study

In September 2003 Trowbridge Deloitte undertook a study for the Essential Services Commission in Victoria.[43] The study attempted to estimate the *energy* cost cross subsidies in the Victorian electricity market amongst small customers. In particular, it sought to identify differences between the estimated actual cost of energy for specific customer classes and the cost of energy currently implicit within the incumbent retailers' standing offers for these customer classes.

It evaluated the level of cross subsidies by comparing the incremental energy costs associated in moving from the current Net System Load Profiling methodology to a customer group's 'true' consumption pattern. It also considered the energy costs associated with the current standing offer tariffs and the potential price change if a full roll-out of smart meters was to occur. It noted that energy costs were typically 35-45% of the typical customers' bill.

The study concluded that for those residential customers on a general purpose tariff that the range of outcomes would be from -5% to 15% for the years 2000-02. A positive outcome indicates that a customer group's energy cost is likely to be lower under the current profiling arrangements than it would be if based on the customer group's 'true' cost of energy (receive a cross subsidy). A negative outcome indicates the customer group's is likely to be higher under

[41] Energy Response, IEA Demand Side Response Workshop, 11 November 2005.
[42] Victorian Essential Services Commission, Installing Interval Meters for Electricity Customers, November 2002.
[43] Trowbridge Deloitte, Customer Energy Cross Subsidies in the Victorian Electricity Market, September 2003.

the current profiling system than if based on the customer group's true cost of energy (pay a cross subsidy).[44]

In other words, this customer group would have paid up to 15% too little or 5% too much compared to what it would have paid in the absence of profiling.[45] In total, therefore these customers might have (based on a hypothetical typical domestic customer with a bill of $1,000, of which 40% is energy costs), paid either $60 too little or $20 too much per customer in any particular year.

In aggregate the cross subsidy paid by this customer group could be very substantial in any particular year based on this analysis.[46]

It also noted that the range of cross subsidies can be large *within* customer groups, so the transfers between a flat and peaky load general domestic customer could be considerably beyond the ranges indicated above.

It also seems possible that the inter-customer group cross subsidy has reduced over the last few years as more larger users have moved onto smart meters, but the cross subsidy between the remaining customer groups and within these groups has increased.

Shape

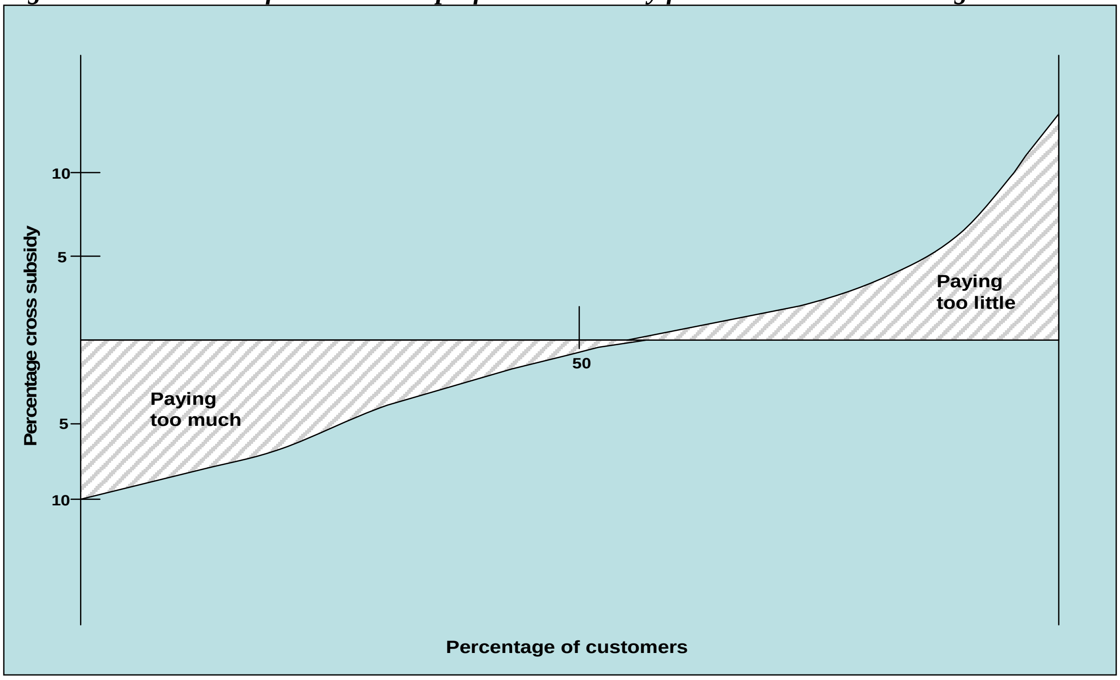
The shape of the cross subsidy (e.g. the number of customers paying – or receiving - the cross subsidy and the amount they are paying) is presently unknown, but Figure 4 below provides an example of what it *might* look like for domestic customers. It and the figures it contains are illustrative only.

[44] Ibid., page 4. EnergyAustralia has questioned the applicability and relevance of this data, as Section 6.3.1 discusses.

[45] Based on using simulated pool outcomes for the years 2000-02. Trowbridge simulated potential pool price outcomes by combining forecast demand allowing for different weather scenarios with price/demand relationships associated with more recent market outcomes. The weather scenarios include more extreme weather than that experienced during either of 2001 and 2002 (both of which we unusual years but for different reasons – 2001 had high summer prices and 2002 had high winter prices). It notes that is approach produces a more robust analysis than its other approaches to estimation. The range for customers on general purpose tariffs was the largest for any customer group.

[46] It also noted that the study focuses cross subsidies associated with wholesale pool price outcomes, and that if it had estimated cross subsidies on the basis of hedge contract prices, the range of cross subsidies would decrease. For example, if it were assumed that a retailer would attempt to set prices on their average expectations across these years as Trowbridge simulates, then the average of these simulated pool outcomes produces an average range of -3% to 7%) or bills that were $28 too low or $12 too high compared to what they would pay absent profiling. In aggregate these still represent significant transfers between customers.

Figure 4: Illustration of what the load profile cross subsidy for domestic customers might look like



The shape of the cross subsidy may also be of importance in how retailers deal with it.

If, for example, there are a relatively large number of customers currently paying a relatively small amount of money to a few large winners, then it might take longer for the cross subsidy to be unwound or it might only be unwound for a relatively small group of customers. This is because non-incumbent retailers may be less able to offer significant enough savings to these newly profitable customers, for it to place significant pressure on the incumbent retailer to rebalances its tariffs. The incumbent is likely to re-price the customers who are the major beneficiaries of the subsidy, but other retailers are unlikely to compete for these customers in the shorter term because their prices will have to increase first.

If, however, there are a small number of customers paying a relatively large amount of money to a relatively large group of small winners, then there is likely to be greater pressure for the cross subsidy to be unwound. This is because the non-incumbent retailer is more able to offer significant enough savings to these newly profitable customers to get them to switch, and thus place more pressure on the incumbent to respond accordingly. In the first instance, removing the cross subsidy will lead to lower bills for these customers which may influence their incentive to respond to the price signals, but presumably only in the short term.

Given that air conditioning is the end use that ‘drives’ most of the peakiness in domestic load and its high market penetration in some jurisdictions, it seems likely that the threshold point for the typical domestic customer (i.e. whether they would be winners or losers under more cost reflective tariffs) may be a ‘peaky’ as opposed to a ‘relatively flat’ air conditioning user.

In our view, it is likely that there is a relatively large group of relatively flat users who are each paying a smaller group of peakier users. There is also likely to be a subset of even flatter users (e.g. those without air conditioners) who are paying relatively large amounts to peakier users, and a small group of particularly peaky large users who are benefiting significantly under the present arrangements.

Overall, this may make it more somewhat more difficult to unwind the load cross subsidy, except for those customers near to the two extremes of the profile.

Section 6 investigates this issue in further detail.

5.2 General evidence on the treatment of cross subsidies

The best way to highlight the costs of removing the load profile cross subsidy is reviewing the available evidence from similar markets.

At a general level, there is evidence of consumers demanding and responding to differential pricing. For example:

- Variable usage charges are not uncommon for other services and products (e.g. mobile phones). The development of more competition in Australian domestic banking appears to have led to a major change in how banks charge customers (e.g. lower interest rate margins and higher transaction charges). Whether these services are sufficiently similar to electricity to provide a reliable indication of what might happen is less clear;

- The introduction of retail competition itself reveals a form of cross subsidy based on a customer's propensity to shift. The evidence suggests that the market now prices this propensity or, more accurately, the indifference to switching (see Section 5.3).

- The benefits of providing dual fuel offers in the retail energy sector (and sharing the associated cost savings) has been exploited by the market; indeed, in the UK, 80% of switches occur for this reason;

- The retail electricity market is unwinding, at least to some degree, some of the other cross subsidies in retail tariffs, albeit in ways that do not necessarily involve more cost reflective tariffs (see Section 5.2.1);

- Certain customer groups in the electricity sector appear to respond to the incentives created by pre-payment meters. In Tasmania, they have a market share of about 20%;

- In Norway about 16% of households are on electricity contracts tied directly to spot prices; and[47]

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[47] S., Littlechild, 'Competition and contracts in the Nordic residential electricity markets', 23 July 2005, pre published paper later published in Utilities Policy.

- There is evidence of customers responding in certain trials to cost reflective prices (see Section 5.6).

There is also evidence to suggest that the market might be willing to bear the load profile cross subsidy to a greater extent than theory might predict.

At a general level, the evidence is that:

- There are numerous examples of 'cross subsidies' that may appear to be unsustainable persisting in markets (i.e. price discrimination is common). For example, non-motorists would appear increasingly to be subsidising motorists' fuel costs when they shop at Coles or Woolworths, due to the discounted fuel vouchers these supermarkets provide.[48] Non-motorists shopping at these supermarkets would appear to be paying each average motorist shopping at these supermarkets and using these fuel vouchers about $73 a year.[49]

  This also shows, however, that certain customers are responsive to petrol prices. In this case, the level of expenditure is higher and it may be easier to switch supplier and modify behaviour (i.e. consumers may believe petrol consumption is more discretionary and there are more substitutes). We understand that in addition to investing time to find cheaper sources of petrol, there has also been recent changes in the type of vehicles purchased.

- If the cross subsidies identified by the ESC are correct then there would appear to be a strong incentive for customers and or retailers to offer smart meters to customers who could receive the benefit (i.e. up to $200 per year). This would appear to imply a quick pay back period, one that may even be attractive to domestic consumers.

  While there would appear to be some other barriers to accessing these benefits (see Section 5.7), none would appear to be insurmountable. Retailers did not appear to be agitating excessively to get some of these constraints removed prior to discussion about a smart meter roll-out commencing, so that they could install smart meters for more customers.

  In their response to the draft regulatory impact statement Polymeters Response International note that:

  > *"retailers could have led their own smart meter roll-out under type 4 metering arrangements from the time that the ACCC derogation expired, but none have chosen to do so."*[50]

  Moreover, there have been no major moves by the market to smart meters, where some of the key constraints have been removed (e.g. price regulation in the UK and NZ).[51] Nor was competition in NZ active prior to the introduction of profiling, partly because it required the use of a smart meter.

- A report by Energetics for ESCOSA apparently found there was *"no evidence that small customers would accept more complicated structures with the introduction of smart*

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[48] Gans, J., King., S., Supermarkets and Shopper Dockets: The Australian Experience, Melbourne Business School, University of Melbourne, 16 July 2004.

[49] Assuming the average motorists uses 35 litres of petrol a week and gets a discount of 4 cents per litre. ANZ trends in household expenditure, December 2005 www.anz.com.co.economics.

[50] Polymeters Response International Limited, Response to Regulatory Impact Statement Draft 2007/103, page 3.

[51] As noted in section 5.3.2, one New Zealand government retailer is proposing to roll-out smart meters for around 0.1 million households.

metering"[52] They have also found low take-up rates in certain jurisdictions where smart meters are voluntary.

- Unwinding the load profile cross subsidy has significant implications that would appear to be at odds with the conventional retail business model and customer preferences (i.e. simple retail product offers). This would appear to be in contrast to some of the other cross subsidies the market has addressed, as discussed above. The changes brought about by the roll-out of smart meters would therefore need to create sufficient incentives for customers to demand that retailers modify this business model.

- Other cross subsidies exist in retail tariffs (e.g. by volume and by creditworthiness). The market is unwinding these cross subsidies to a degree, but generally not by sending more cost reflective price signals (as Section 5.2.1 illustrates), at least in the way that would be necessary to address the load profile cross subsidy and encourage demand side response.

- The load profile cross subsidy may also be more difficult to remove than the volume and creditworthiness cross subsidy, as it imposes complexity and risks on consumers they may not be willing to bear (a requirement to monitor and change their behaviour).

- Unwinding the load profile cross subsidy creates losers who are likely to be resistant to moving to Time of Use tariffs, which might slow the process or that they end up on a more punitive flat price. The only advantage the incumbent retailer has in this case is that the customer is only likely to be attractive to other retailers in the event that they accept either undesirable outcome.

5.2.1 The volume cross subsidy

Retailers are typically attracted to larger than average customers in the mass market. This is because the unit price typically incorporates their margin, which means that larger than average customers are more profitable than smaller than average customers. For example, AGL recently released its 2007 Full Year Results, which included reporting lower gross margins. The Sydney Morning Herald noted that: "*The company had also made up for the losses by signing up new customers in NSW. However, NSW customers were spending less than their Victorian counterparts, so gross margins for the year in the retail business were down by 5.5 per cent."*[53]

Retailers could, however, provide offers that have a higher fixed charge to reflect the margin and a correspondingly lower per unit charge. On this basis, they would be able to offer larger users lower bills. If reflected across the customer base, all customers would be equally profitable, and the retailers would not bear volume risk.[54]

This would also appear to have the advantage of making mass marketing campaigns easier to manage and would be simple to achieve from a retailer's perspective, at least operationally.

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[52] Energetics, Electricity Pricing Structures for Customers with Interval Meters, Public Report for the Essential Services Commission of South Australia, March 2003

[53] Sydney Morning Herald, AGL aims high for earnings, customers, 23 August 2007, page 33.

[54] This can be more difficult for incumbents because it implies that prices for smaller users have to increase to maintain profitability and price regulation make not allow for this, particularly if it imposes side constraints on the rebalancing of tariffs.

For the largest (and smallest) users the volume cross subsidy is likely to be material. For example, if the average user has a bill of $1,000 a variable charge of $900 and an average unit of price of 15c/kWh, they would be using 6,000 kWh per year.[55] The $50 per customer EBIT margin identified in Section 3.1.2 would therefore account for 0.83c/kWh of the unit price.

This means that the user that is:

- Fifty per cent greater than the average user is paying a margin of $75 per annum (i.e. or 50% more than they 'should'); and

- One hundred per cent greater than the average user is paying a margin of $100 per annum (i.e. double what they 'should').

Conversely, smaller than average users are typically paying too little.

Retailers are not typically unwinding this cross subsidy across the board by rebalancing fixed and variable charges. This may be because:

- Most customers dislike high fixed charges, even though they may be better off under them;

- It is difficult to successfully sell particular tariffs to customers; and

- The benefits for many customers around the average consumption level would be small, and many would be worse off, albeit only modestly.

Instead, retailers typically target customers with some other form of discount and focus more on those users that are more profitable under existing tariff structures. This removes the cross subsidy to some degree (i.e. to the extent customers are willing to switch), but not necessarily by charging more cost reflective prices that will assist in encouraging demand side response.

This would appear to highlight the difficulty retailers perceive in addressing the underlying cause of the cross subsidy where it would results in tariff changes that customers may resist.

It is worth noting, however, that a move to higher fixed charges appeared to occur in NZ for some time, but the Government intervened on social policy and environmental grounds. In 2000 the Government noted that consumers *"have suffered from continuing increases in the fixed charge elements of the power bill. This impacts more severely on smaller consumers, especially low income consumers."*[56] This resulted in a Low Fixed Charge tariff policy, which encourages electricity companies to offer at least one tariff with a low fixed charge.

We understand that tariff component rebalancing related more to the fixed charges associated with network than the margin *per se*, however, the practical impact is similar. It also shows that more cost reflective prices might result in significantly higher fixed charges in parts of the industry and thus lower incentives to reduce their consumption. Section 6.7 discusses this issue in further detail.

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[55] These figures are for illustrative purposes only, but are close enough for the purposes of this example.
[56] Ministry of Economic Development, 'Power to the Consumer', October 2000.

5.3 Competitive retail electricity markets

5.3.1 United Kingdom

The British energy market is the world's largest with a reasonably long history of full retail competition (1999), without price regulation (2002).

In the British market there are now:

- Six vertically integrated energy companies: Centrica (British Gas), Innogy (controlled by German company RWE); London Energy (controlled by French company EdF); Powergen (controlled by German company E. On); Scottish Power; and Southern and Scottish; and

- No major independent retailers. The combined market share of the other retailers is about 0.5% and a number of these are non-for-profit organisations.[57] There are no niche market retailers offering different types of services on any significant scale.

The experience from the UK suggests that incumbent retailers are generally not reducing prices to match the offers of non-incumbents across the board to maintain market share. In other words, they have often been prepared to lose a significant proportion of their customers but retain margins on the remainder. For example, the incumbent retailers have typically lost about 50% of their market share.

Ofgem reports that customers are typically missing out on savings of up to about £100 per annum generally (and up to £150 per annum) by not switching supplier.[58] This is up to about 10% or more of the average domestic consumers electricity and gas bill.[59] These margins appear to have reduced somewhat in recent times, after significant wholesale price volatility.[60]

Incumbent retailers therefore appear to be prepared to 'price' the typical customer's reluctance to switch (i.e. customers' transaction costs). In other words, they are prepared to allow their prices to diverge from that of their competitors to a degree. This situation has persisted despite recent wholesale market events that have required incumbents to significantly increase and then decrease their prices.

More generally, competition in the UK market appears to have gone through a number of stages:

- In the first instance the discounts were primarily related to different forms of payment;

- Then retailers began offering dual fuel (and 80% of switching occurs for this purpose); and

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[57] Stephen Littlechild, Smaller Suppliers in the UK Domestic Electricity Market: Experience, Concerns and Policy Recommendations, 29 June 2005.
[58] Ofgem, Energy efficiency can help reduce impact of energy price rises, October 2005.
[59] Ofgem, Factsheet 66: Updated household energy bills explained, May 2007.
[60] Ofgem, Domestic Retail market Report, June 2007.

- Retailers are now offering a wider range of products and services in an effort to leverage off their relationship with the customer and build brand loyalty. They are also collaborating with the providers of other services (e.g. supermarkets).

The most recent developments in the market are as follows:

- Over 9 million gas and electricity customer accounts (about 20% of the market) are on 'innovative' products. This includes 6 million customer accounts on fixed rate products (i.e. contracts), and 2.5 million customer accounts are on on-line tariffs;[61]

- About 350,000 households have chosen a green tariff (1.3% - a much lower proportion than Australia, but more recently signs have emerged that this is changing[62]);

- There is no evidence that customers are demanding the use of smart meters to allow for the introduction of cost-reflective tariffs. Ofgem is, however, in the process of undertaking a trial of smart meters and there is a requirement on retailers to provide customers with an in-home display if they request one;[63] and

- In terms of energy services, Ofgem notes that all energy suppliers market some products and services, including free home energy surveys, discounted loft and cavity insulation, energy efficient boilers and numerous energy saving appliances. These would appear to be efforts either to increase marginal revenues per customer and/or assist with customer loyalty and retention.

  Some retailers are starting to offer contracts that reward customers for saving energy (e.g. one retailer is launching a program where customers can earn credits by reducing their consumption or choosing electronic billing). The credits can then be used to buy more energy efficient appliances. Ofgem states:

  We expect suppliers to increasingly develop product offerings in this area in response to government's climate change commitments and as metering technology evolves.[64]

  These developments may well have implications for the sorts of offers retailers might start making in Australia.

In the British market switching rates have declined from their peaks, although wholesale price volatility in the UK recently caused a significant amount of switching.

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61 Ofgem, One in Five Households Choose an Innovative Energy Deal, 4 July 2007.
62 Essa news, British Gas launches green energy tariffs, 6 August 2007, page 7.
63 ESAA news, Consultation begins on UK interval meters, 13 August 2007. Ofgem has also removed the 28 day rule that allowed customers to switch supplier only four weeks after signing up with another. It is understood Ofgem expects this to make it easier to offer longer term deals including the installation of energy-saving measures. ESAA news, Ofgem halves the number of energy supply rules, 6 August 2007. Ofgem, First trials for smart energy meters in Britain are to begin, Press Release,12 July 2007.
64 Ofgem, Domestic Retail market Report, June 2007, page 16.

5.3.2 New Zealand

The New Zealand market has a longer history with allowing competition with price deregulation than the UK. However, it has a number of similar features. These include:

- A concentrated (and vertically integrated) market. The five largest retailers have about 97% of the market;[65]

- Incumbent retailers have a market share of about 67% across all networks;

- A current switching rate of about 8% per annum, after earlier being much higher;[66]

- A discount between the weighted average retail charge of the incumbent retailers and the weighted average retail charge of the cheapest retailer of about 7%.[67] In 1999, the margin was about 9%. We understand that the margin has been as low as 4% in 2002.[68]

Other notable features in respect of the New Zealand market are that:

- There was almost no activity in the small users end of the market, prior to the introduction of profiling as it typically required the installation of a new (smart) meter;

- There are currently three players in the smart meter market which appear to be focussing on business users, and the retailers are out of this market as meter owners (and have almost no involvement with smart meter reading).[69]

- One retailer (the Government owned Meridian Energy) is now embarking on a smart meter roll-out to 100,000 households in Christchurch.

The NZ experience has implications for the roll-out scenarios as Section 9 discusses.

The New Zealand Electricity Commission is also in the process of considering issues around smart metering.[70]

5.3.3 Texas

Texas is the US state with the most active retail market, although price regulation exists. It would appear to have:

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[65] http://www.electricitycommission.govt.nz
[66] First Data Utilities, World Energy Retail Market Rankings: Utility Customer Switching Research Report, Third Edition, June 2007.
[67] http://www.electricitycommission.govt.nz
[68] The typical margin appears to be lower than in the UK which suggests that New Zealanders may have a higher propensity to shift for smaller savings. The NZ market is considerably smaller and there are also relatively few customers able to benefit from dual fuel offers (although this is likely to make their electricity bills relatively high).
[69] Stream information, presentation to the Electricity Commission, November 2006. In New Zealand there is competition for metering services.
[70] Electricity Commission, Advanced Metering, June 2007.

- Two incumbents with a market share of 66% as at September 2006;
- Forty active retailers in the market, two of which have several hundred thousand customers;
- About 7% of domestic customers signing to non-incumbent retailers each year; and
- Margins between the average and best available competitive offers of a similar magnitude to those in the UK and NZ (between the incumbent's offer and the best available).[71]

It is also rolling out smart meters.

5.3.4 Norway

Norway would appear to have:

- Incumbents with about 77% of the household market; and
- The Norwegian Water Resources and Energy Directorate notes that *"in general incumbent suppliers tend to operate with slightly higher prices than independent suppliers"*. In the second quarter of 2005, the average difference was about 6%.[72]

The Norwegian market is also notable for the large swing in switching rates both seasonally and across years (and the high level of re-switching amongst switchers – around three times). Utilities are able to alter prices as frequently as every two weeks and a significant proportion of users are on spot market contracts (including 16% of domestic customers – the figure in Sweden is 4%, but a much larger proportion of large users).

We understand that there are several reasons for this:

- Retail competition in Norway reportedly started with these floating rate offers;
- More Norwegians dislike paying the risk premium associated with fixed price offers, as we understand is also illustrated in the proportion of consumers who choose fixed interest rate loans; and
- More Norwegians are tolerant of electricity price fluctuations, which have a longer history there due to its electricity system's dependence on weather.

5.3.5 South Australia and Victoria

South Australia and Victoria have the most active retail electricity markets in Australia. They have some notable similarities with the above markets.

[71] Public Utility Commission of Texas, Scope of Competition in Electricity Markets in Texas, January 2007, page 60.
[72] Norwegian Water Resources and Energy Directorate, Supplier switching in the Norwegian end user market – 2nd quarter 2005.

Some of the key features of the South Australian market are:

- A reasonably concentrated and vertically integrated market;
- A current switching rate of about 15%;
- An incumbent with 64% of the domestic market, a significant minority of which appear to be on market contracts with the incumbent;
- Nine competitors that have captured 36% of the market; and
- All retailers are offering at least one market contract at a discount to the standing contract where the discount ranges from 2-12%. Most retailers also incorporate other price and non-price benefits in their offers. Non-incumbents would appear to offering the larger discounts.[73]

Some of the key features of the Victorian market are:

- A reasonably concentrated and vertically integrated market;
- About 25% of households switched retailer in 2006;
- The incumbents have a market share of about 87%;[74]
- Independent research undertaken by the ESC showed that market contracts are able to provide consumers with lower bills (in the order of 5.5-7.5% over the standing price). In addition, a range of other incentives are on offer.[75]

5.3.6 Conclusion

The experience across these markets varies, but there would appear to be several important similarities that are relevant to whether retailers might introduce more cost reflective tariffs across the board to unwind the load profile cross subsidy:

- First, the most active markets display a high degree of market concentration (and vertical integration). This may say something about the general competitiveness of retail electricity markets.
- Second, it would appear about half the customer base has been willing to switch to non-incumbent retailers for savings of 5-10% of the value of their bill. Conversely, at least at this stage of the markets' development, up to half of the market appears to be unwilling to switch for such savings. In other words, incumbent retailers typically charge prices that permit such a discrepancy, even though these customers can easily exploit it by switching.

[73] NERA, Review of the Effectiveness of Energy Retail Market Competition in South Australia, Phase 2 Report for ESCOSA, June 2007.
[74] UBS, Australian utilities structure 2006.
[75] ESC, Customers seeking competitive deals in retail energy market, 13 December 2006.

In effect, they would appear to be pricing these customers' indifference to switching for relatively modest savings.

Given this, it may well be difficult to interest most of these customers (i.e. customers who are disinclined to switch) to accept more cost-reflective tariffs that either:

- Would save them a similar amount of money, if they are currently flat load customers and stay the way; or

- Might save them similar amounts of money, if they accept such a tariff and change their behaviour.

Given the added complexity of such an offers it seems reasonable to conclude that the savings would have to be larger than those outlined above to encourage significant take up.

It is possible this might change as these markets mature further, but it seems that this may take some time given the maturity of some of these markets and the higher savings these remaining customers may need to switch.

5.4 Existing more cost reflective tariffs amongst large users

The market evidence shows that amongst larger uses, retailers typically charge more cost reflective prices (including passing through network tariffs). In terms of energy costs, this is typically in the form of:

- A flat price - albeit one that reflects the customer's load profile. The price signal still gets through in these circumstances - albeit in a more diluted way; or

- Some form of Time of Use pricing, particularly for some small or medium size enterprises.

There is some evidence of retailers using smart meters amongst small to medium size users as a way of providing more competitive retail offers (e.g. Powerdirect).

We are unaware of data on this market, but we understand that the majority of large users are generally not inclined to prefer Time of Use based products. We also understand that there is little involvement even amongst larger and more sophisticated energy users in actively managing their demand (e.g. via DLC tariffs).

Retailers typically do not value this capacity very highly even when it is relatively 'firm' (i.e. they control the decision to shed load). In our experience, retailers share up to 50% of the savings with the customer (but usually less), and value voluntary load reduction much less because typically it does not obviate the need to hedge via more conventional means.

The large user market is a fundamentally different because individual bills (and margins) are large enough for retailers to tailor customer specific tariffs. For example, it seems unlikely that the flat rate (but load profile reflective) form of pricing would be appropriate for the domestic market because it would imply different tariffs for many types of customer and the costs of such an approach are likely to be prohibitive. Section 6.3 discusses this in further detail.

What happens in the large user market is likely to be of limited relevance to the mass market. The reluctance of large users to accept price volatility and risk is, however, worth noting because it seems reasonable to assume that less sophisticated energy users would, if anything, be more reluctant.

5.5 Existing more cost reflective tariffs amongst small users

A significant minority of domestic customers are already on some form of Time of Use tariffs. There are also a number of initiatives under way to increase that proportion.

5.5.1 EnergyAustralia's introduction of time of use tariffs

We understand that EnergyAustralia has introduced Time of Use retail tariffs for the mass market and there are currently around 120,000 customers on these tariffs. This is supported by the large scale deployment of manually read interval meters (for 250,000 meter installations). In addition, EnergyAustralia is currently piloting AMI technologies. It currently has less than 7,000 meters capable of being read remotely and providing key smart metering functionalities.

We understand that ToU retail tariffs have been introduced by IPART as part of a staged transition toward more cost reflective regulated retail prices. The second price block in the inclining block tariff structure has been steadily increased relative to the first block. This creates an incentive for larger customers to switch from flat tariffs to time of use tariffs. Clearly, as part of this arrangement, there would be an element of over-recovery built into the inclining block tariff structure for larger customers offset by under-recovery for smaller ones. We understand that the projected take up of ToU is taken into consideration in the annual retail tariff reset process.

We understand from our consultations that the distribution division of EnergyAustralia's business is driving the roll-out, which it has justified largely in terms of the benefits to the network business in terms of deferred capital expenditure. It seems likely however that any benefits would only accrue to the business for up to 5 years (because regulators reassess its capital expenditure requirements every five years as part of the price review process by the regulator). It would also presumably be losing revenues over the intervening period if customers responded to those price signals. Indeed, the data would appear to suggest that its retailer has lost revenue (see below).

All new installations and existing installations which have a meter upgrade (consuming below 40MWh per annum) must install a smart meter (Type 5 or better) and must be placed on the *LV Energy40 TOU* network price.

To support the roll-out of smart meters, EnergyAustralia has introduced Time of Use network tariffs. The key tariff for smaller users has the following charges (excluding GST):

- A peak price of 12.8c/kWh for 2pm-8pm on working weekdays;

- A shoulder price of 2.4c/kWh for 7am-2pm and 8pm-10pm on working weekdays; and
- An off-peak price of 0.6c/kWh all other times.[76]

The relativities are therefore as follows:

- Peak and off-peak 21 times; and
- Peak and shoulder 5.3 times.

Truly peak responsibility cost reflective pricing might justify even higher peak prices and lower prices at all other times.

The retail business also has a regulated retail PowerSmart Home tariff for customers with smart meters. It has the following charges (excluding GST):

- A peak price of 25.1c/kWh for 2pm-8pm on working weekdays;
- A shoulder price of 8.9c/kWh for 7am-2pm and 8pm-10pm on working weekdays and 7am-10pm on weekends and public holidays; and
- An off-peak price of 5.1 c/kWh all other times.

The relativities are therefore as follows:

- Peak and off-peak 4.9 times; and
- Peak and shoulder 2.8 times.

EnergyAustralia makes identical offers to market agreement customers, within its network area who have smart meters.

Alongside the introduction of ToU retail tariffs, EnergyAustralia has also introduced ToU network tariffs. These are gradually being extended to all customers in EnergyAustralia's network area with consumption above 15MWh per annum and apply to new and upgraded connections to the network. We understand that the objective of ToU network tariffs is also to move over time toward tariffs that are cost reflective. We understand that EnergyAustralia expected that, over time, this will result in better utilisation of existing network assets and potentially the deferral of network capital expenditure in the future. If successful, this would result in future network prices that are lower than they would otherwise be.

According to EnergyAustralia.

> *A survey of 3,000 PowerSmart Home customers shows that 94% of customers have found their bills are the same or cheaper than what they would have paid under the traditional flat pricing system, often without changing the way they use electricity. In fact, customers saved an average of 10% compared to what they would have paid under flat pricing, while some customers were able to save*

[76] Integral Energy has a similar tariff but fewer customers on smart meters.

> *more than 30%. Of the small number of customers whose bill was higher, the increase was mostly less than 5%.*[77]

It should be noted that EnergyAustralia (distribution) is targeting the roll-out to customers who are likely to benefit from the installation of smart meters and Time of Use tariffs. More recent work suggests that households are saving on average $45 a year on their electricity costs compared to EnergyAustralia's standard domestic rate.[78]

Our conversations with retailers suggest that they believe these types of programs risk eroding their margins.

Several other retailers (e.g. Country Energy) are also installing smart meters on a new and replacement basis, but are less commonly introducing Time of Use tariffs at this stage.

As we understand it the retailers are not always passing these more cost reflective tariffs through to customers. In their response to the Phase 1 reports the Energy and Water Ombudsman of NSW ("EWON") states that:

> *"some customers have complained to EWON that following the installation by their distributor of a Type 5 meter at their premises, they have either been unable to transfer to a retailer of their choice, or their retailer of choice has cancelled their contract and transferred them back to their standard retailer. In both scenarios the reasons appear to be that 2nd tier retailers do not have the capability in their billing systems to be able to bill the customer using TOU pricing."*[79]

As noted below, this may partly be because retailers are not yet in a position to do so cost effectively and that there are not enough customers on these tariffs yet to make it worth their while.

5.5.2 United Energy's summer network tariffs

In 2001 United Energy introduced some more cost reflective network tariffs in its distribution area. This included introducing for all tariffs a seasonal split for summer (November to March inclusive) and non-summer, with higher energy prices in the former. The loading on the summer tariff was about 20% higher than that applying in the non-summer period.[80]

5.5.3 Changes in off-peak electricity water heating tariffs

In 2003 in Victoria the Government made a decision on regulated retail prices from the 1 January 2004. We understand that this provided the businesses with some flexibility to rebalance tariffs with the context of an overall cap on the average regulated retail price. In particular, it gave the businesses the flexibility to increase the off-peak unit rates associated with certain electricity storage water heating tariffs (Residential GD/GR + Dedicated Y6/YT, J6/JT).

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77 EnergyAustralia, Introducing PowerSmart Home.
78 Power Industry News, Smart Meter Offer, Edition 558, 17 September 2007.
79 Energy and Water Ombudsman NSW, Letter in response to Smart Meters Cost Benefit Analysis, Phase 1 – National Minimum Functionality, page 4.
80 It also has a Summer Demand Incentive Charge as part of a smart meter tariff. It involved a special charge for demand usage during the period 3-6pm on summer workdays for customers with smart meters.

We understand it now has a specific Community Service Obligation subsidy on off-peak electricity tariffs.

The government considered this appropriate because many of these tariffs were recovering less than the cost of supplying the energy at those times (i.e. overnight and in the mid afternoon). Indeed, in some parts of rural Victoria, the peak demand was occurring in 'off-peak' times due to the 'success' of the formerly government owned businesses in selling these tariffs.

Many businesses took the opportunity to rebalance these tariffs, increasing the off-peak rate in the case of one retailer by over 44% and reducing the on-peak rate by less than 4%.

5.5.4 Conclusion

The evidence in Section 5.5 presents a somewhat mixed picture. In relation to the first two examples we understand that typically retailers are either not competing for these customers or, if they are, are not passing through the price signals.

This may be partly because they are not yet in a position to do so cost effectively and that there are not enough customers on these tariffs yet to make it worth their while.

The last example provides an instance of where retailers were willing to change tariffs to make them more cost reflective. In this instance, however, the rebalancing affected a distinct class of customers (i.e. those on a separate tariff) and it is unlikely that other retailers were going to compete actively for these customers, while they were loss making. This might have assisted in allowing incumbent retailers to make the necessary changes. In other words, the customer was unlikely to leave because they were unlikely to get a better deal elsewhere.

A number of retailers have indicated that if there were numerous customers on Time of Use tariffs, that they would inevitably develop offers that are broadly consistent with them. This is consistent with how they currently approach the market. In other words, if the incumbent retailer uses smart meters to introduce more cost reflective tariffs across the board, the market is likely to follow (i.e. base offers on the incumbent's offer). As Section 4.2 indicates one retailer has indicated that it is likely to be proactive introducing more cost reflective tariffs, which may mean that the market has to follow it where it is the incumbent (as is occurring to some degree in NSW).

A key question may therefore be whether the incumbent retailer responds by introducing more cost reflective tariffs across the customer base. A key question for policy makers is whether they can facilitate this process, whilst ensuring the offers remain attractive to customers. Section 6.7 investigates this issue in further detail.

5.6 Smart meter trials

There are a number of trials occurring in Australia (and around the world) on the use of smart meters, and more particularly on the:

- Development of more cost reflective tariffs;

- Willingness of customers to accept more cost reflective prices; and
- Willingness of customers to respond to those prices.

The key trials are those being undertaken by:

- Energy Australia[81];
- ETSA Utilities (although this is not a smart meter trial)[82];
- Country Energy[83]; and
- Integral Energy.[84]

A number have produced encouraging levels of customer response, which might encourage retailers to introduce more offers.

It is perhaps worth noting that Government owned and integrated distribution and retail businesses are taking the leading role in undertaking trials. In some cases it would appear that the distribution parts of these businesses is driving the trial (as is the case for EnergyAustralia). The ETSA Utilities trial is focussing on demand reductions for the purpose of deferring network investment.

Two retailer led trials are in preparation or in the early stage of development (Origin Energy as part of a Solar Cities project and we understand another retailer is planning a trial). The latter will, however, we understand not involve any incentive payments and its focus is on how in-home displays might enable service improvements to customers.

All these developments are likely to inform how retailers might respond, in the broader market, with a roll-out of smart meters, and the sorts of tariffs they might offer.

Country Energy describes the key lessons for retailers as follows:

- Customer education is the key;
  - The offer needs to be simple;
  - Most customers on continuous or incline block tariffs have limited understanding of Time of Use structures;
  - Ongoing customer education is likely to be important;

[81] Alex Miller, Energy Australia, Summer and Winter Results from EnergyAustralia's Strategic Pricing Study, 16 May 2007.
[82] ETSA Utilities, Demand Management Programme, undated presentation. See also ETSA Utilities, Annual Demand Management Compliance Report, August 2007.
[83] Ben Hamilton, General Manager Corporate Strategy, Smart metering and customer trials: A retailer perspective, 30 July 2007.
[84] Integral Energy, trails update, 19 June 2007.

  - Smart metering and innovative pricing will not solve every challenge facing retailers;
  - It can, however, form an integral part of a demand management suite; and
- Retailers should be actively preparing for mandated metering roll-outs (i.e. trials and technology testing), or risk being left behind.[85]

5.7 Constraints

There are a number of constraints that are likely to influence the extent to which a smart meter roll-out leads retailers offering more cost reflective tariffs. It may also be important to assess the evidence in terms of current market activity in light of these constraints.

The key constraints include:

- Price regulation;
- The form of price regulation;
- The risk of re-regulation;
- The limited ability of retailers to compete for metering services; and
- Split incentives.

Retailers are particularly concerned about the issues around price regulation.

5.7.1 Price regulation

Most retail electricity markets in Australia and overseas (with certain exceptions including the UK and NZ) retain price regulation. Price regulation is highly likely to distort activity in the market, unless the regulated prices are set at 'true' safety net levels (i.e. the levels at which all customers can be charged a cost reflective price). In practice, most regulators are unlikely to set regulated prices at these levels, because it will not achieve their objectives. Absent this, price regulation limits the proportion of customers for whom retailers are likely to want to compete, and thus distorts competition and stifles innovation.

Price regulation does not necessarily stop non-incumbents from trying to win the more profitable customers from incumbents by offering lower prices, but it is likely to constrain the ability of the incumbents to respond because often they cannot recoup the lower profitably by increasing prices to less profitable customers. It therefore encourages incumbents to respond via non-price measures (other ways of making customers less inclined to shift for bill reductions, which are often quite small).

[85] Ben Hamilton, General Manager Corporate Strategy, Smart metering and customer trials: A retailer perspective, 30 July 2007.

Retailers may still unwind some cross subsidies under price regulation; however, the amount of customers for whom this is feasible is likely to be a smaller subset of the customer base.

Price regulation is, however, also likely to introduce a lack of flexibility and risk aversion which imposes its own constraints because of the risk that energy costs might increase beyond those recoverable under the regulated prices. This is likely to distort retailers' behaviour because it is a risk they cannot manage. This is likely to impact on how they approach and compete in that market with price regulation.

It is perhaps worth noting, however, that where governments have removed price regulation, it does not appear to have encouraged retailers to develop particularly more innovative and cost reflective tariffs (or use smart meters more broadly). It would appear therefore that price regulation is of itself not the most important barrier to the introduction of more cost reflective tariffs, with a roll-out of smart meters. It is, however, likely to be another significant barrier.

5.7.2 The form of price regulation

The form of price regulation can exacerbate the constraints price regulation imposes. Simple average price regulation has the undesirable features outlined above. In some jurisdictions, however, regulators also control prices at the tariff or tariff component level, or the speed with which these tariffs can change (via side constraints). This can mean that the cross subsidies cannot be unwound and further undermines a key purpose of having retail competition.

5.7.3 The risk of price re-regulation

Retailers also see constraints emerging even with a smart meter roll-out and price deregulation. In short, their argument is as follows:

- Smart meter enable more cost reflective tariffs;
- But this is unlikely to happen while prices are regulated;
- If prices are deregulated, and the roll-out of smart meters has the desired impact on the market, many customers will see higher bills. This is particularly true if retailers introduce Critical Peak Pricing;
- The politicians are unlikely to find this appealing, as there will be losers - some of whom are vulnerable customers; and
- It would therefore be a 'brave' retailer that embarked upon this approach.

There would appear to be some merit in this argument. Section 5.2.1 provides one example from NZ of where price deregulation led to price re-regulation.

From a retailer perspective, it reveals a seemingly rather fundamental contradiction in government policy. Price regulation to protect customers from price shock and potentially rolling out smart meters which, to the extent it is successful, actively encourages price 'shock'.

It is not obvious that governments can expect to achieve these two policy objectives simultaneously, unless they use other mechanisms (i.e. the welfare system) to compensate vulnerable customers who receive price shocks.

Some retailers are concerned about price regulation re-emerging even if the roll-out of smart meters does not have the desired impact. In short, their argument is as follows:

- Smart meters enable more cost reflective tariffs;
- The market might not respond as governments hope either because governments do not deregulate prices or because customers are not interested;
- Governments then realise they have created a 'white elephant' and feel compelled to require retailers to offer more cost reflective tariffs to justify the original decision; and
- Governments therefore start requiring retailers to offer particular types of tariffs.

Retailers are of the view that this is likely to produce outcomes that do not achieve the ultimate objective. In other words, regulating tariffs in this way is unlikely to result in simple tariffs that to which consumers are receptive and responsive. Retailers also believe it will compromise the retail market in a variety of other ways, which are unlikely to be in the interests of customers (i.e. invite 'gaming' by retailers to maximise their position in re-regulated market such as relying on complex regulated tariffs as a way of discouraging switching).

Section 6.7 discusses some of the policy issues associated with regulating to encourage more cost reflective pricing, with a roll-out of smart meters.

5.7.4 The scope of retail competition

The space in which retailers can compete is constrained by rules regarding the scope of competition (e.g. in metering services).

In principle, this does not preclude retailers from identifying customers who would benefit from smart meters and investing in those smart meters themselves. In practice, it may however reduce their ability to do so by limiting their ability to generate the necessary scale in the market to be competitive.

By way of example, in the Victorian gas sector, the cost of metering services is approximately 5% of final price of gas for the average residential customer, which equates to about $37 per customer.[86] A study by Pricewaterhouse Coopers estimated the likely savings from gas meter contestability at up to 10% of cost of metering services.[87] The ESC considered this to be the upper bound on the basis that there is already considerable competition in the market for gas meter services – such as tendering out and third party service provision. On this basis it decided to retain exclusivity for these services, as it decided for electricity.

[86] Assuming consumption of 60 GJ.
[87] Essential Services Commission, Review of Gas Meter Service Responsibilities, Final Decision, September 2005.

Where governments have introduced competition for metering services (e.g. NZ and UK), it does not appear to have led to a significant amount of activity by retailers. It would not therefore appear to be the most important barrier to retailers introducing more cost reflective tariffs, with a smart meter roll-out.

Section 9 investigates the issue of competition in metering services in further detail as it is relevant to the relative benefits of the roll-out scenarios.

5.7.5 Split incentives

To some degree retailers and distribution businesses share the benefits that smart meters might provide. Some policy makers identify split incentives as a market 'failure' to the uptake of more energy efficient appliances (e.g. the landlord – tenant problem).[88] In other words, this acts as a constraint on the more widespread use of smart meters.

Split incentives, however, arise in numerous circumstances and, where the benefits are sufficient, the market would normally find a solution to this problem (i.e. via contract). In the case of the benefits of more cost reflective retail electricity prices there would also appear to be at least some differences in the nature of the benefits that might flow to retailers and distributors and therefore the requirements of any price signals that produce benefits for the parties. It is likely that some of the benefits associated with more cost-reflective tariffs for retailers and distributors will coincide, where more cost-reflective prices lead to sustained reductions in peak demand. In all other cases, it is less likely that the benefits will coincide.

5.8 Conclusions

The available evidence which may inform the extent to which smart meters might lead to retailers actively marketing more cost reflective tariffs would appear to be somewhat mixed.

It appears to suggest that it might be optimistic to assume that, just because smart meters will enable retailers to introduce more cost reflective tariffs, this will happen broadly across the customer base in the foreseeable future. The technology lowers the barriers to retailers adopting such an approach, but the benefits for many customers might be too small to make it worthwhile for retailers to pursue. They may also meet customer resistance to the necessary tariff changes.

The more likely outcome would appear to be that retailers offer more cost reflective tariffs to a small but significant segment of the market. Retailers might also offer Critical Peak Pricing to a subset of these customers. It also seems likely that the tariffs retailers offer are different to what may be ideal from the perspective of sending the most cost reflective prices signals possible to customers. This would be consistent with the need to produce offers to which customers are most receptive.

To the extent that the incumbent retailer introduces more cost reflective tariffs (for a significant proportion of their customer base), however, it seems likely that the market will follow.

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[88] Productivity Commission, The Private Cost Effectiveness of Improving Energy Efficiency, Inquiry Report No. 36, 31 August 2005.

It is possible that governments could therefore intervene to regulate the outcomes they want in terms of retail tariffs. In other words, require retailers to offer cost reflective tariffs. Whether this is likely to produce outcomes that are consistent with the ultimate objective (i.e. tariffs to which customers are receptive and respond by changing their behaviour) is, however, more open to question. Section 6.7 discusses these issues in further detail.

Realising the potential benefits of smart meters in terms of cost reflective pricing is also likely to require addressing a number of political and regulatory constraints (i.e. price regulation and the level of regulated prices, and the risk of price re-regulation).

6 Implications of smart meters for retail products

This section examines the potential implications of smart meters for the products retailers might offer and, more importantly, actively sell given that most customers are likely to be reactive.[89]

It builds on the analysis in Section 5 by:

- Defining the types of retail products that the retailers might offer in more detail;
- Identifying the variables that are likely to influence the take-up of these products;
- Examining the impact these variables might have on the three types of cost reflective tariffs that retailers might offer;
- Analysing how the situation might vary by jurisdiction (and regionally where relevant); and
- Discussing the key issues associated with regulating retail product offers.

This section also addresses where smart meters might enable retailers to offer products that differentiate their services, which may have benefits for them (in terms of customer loyalty and retention) and/or for customers.

The basis for the views we present on retailer product offers include our:

- Conversations with retailers and review of the (limited) information they have provided;
- Review of the available market evidence; and
- Market experience.

Our conclusions should be read in the context of the qualifications in Section 2.1 of this report.

Appendix A summarises the products we assume retailers might offer in relation to more cost reflective tariffs.

6.1 Possible retail product offers

Section 5 provides a broad overview of the issues in relation to smart meters and the potential for introducing more cost reflective tariffs. This section investigates these views in more detail.

There are basically three different types of more cost reflective tariffs that various parties have indicated smart meters might facilitate and which might lead to more demand side response.

- Greater penetration of Time-of-Use ("ToU") tariffs – which provide price signals for pre-defined time bands of consumption across a day, week or season;

[89] Where we discuss retailers offering tariffs in this section we typically mean actively selling those tariffs.

- Critical Peak Price ("CPP") tariffs – which send a more focussed price signal about the costs of consuming at peak times. This might be a charge for a few hour periods on a number of days (e.g. 10-15 days) per year. Customers would retain full control over the decision on how much to consume during those periods;[90] and

- Direct Load Control ("DLC") tariffs– may typically involve providing a discount off an existing tariff offer (although it might also involve a more cost reflective underlying tariff as well). These tariffs have a similar objective to CPP tariffs, but are mandatory instead of voluntary. In other words, the retailer and/or distributor would control the time periods over which the interruption applies and execute the interruption.

6.2 Variables affecting the take up of more cost reflective tariffs

There are likely to be two key types of variables that affect retail product offers and the take-up of more cost reflective tariffs:

- Broad market conditions; and

- Customer and retail specific variables.

6.2.1 Broader market variables affecting retail product offers

Several broader market variables are likely to affect the nature of retail product offers and the take-up of more cost reflective tariffs that are largely beyond the control of customers and retailers. These variables include:

- The nature and level of retail price regulation;

- The nature of distribution tariffs and the risks of not passing through more cost reflective distribution tariffs, where they exist; and

- The overall competitiveness of the wholesale and retail electricity markets.

In assessing the extent to which these variables might influence the take-up of more cost reflective tariffs generally we assume, as Sections 2.1 and 5 note, that:

- Price regulation does not act as a constraint on the activity of retailers. This does not necessarily mean that there is no retail price regulation, but it does mean that those regulated prices are set at levels that do not perversely constrain retailer behaviour; and

- Retailers act solely in response to the commercial incentives created by a competitive retail energy market.

We note that these are particularly strong assumptions.

[90] Over time per kW charges based on the customer's peak demand at times of system peak demand might evolve, perhaps similar to how transmission charges are sometimes applied.

For example, in some jurisdictions either full retail contestability ("FRC") is not in place, retail price regulation exists (and may be set at levels that constrain market activity) and the businesses are government owned. Some retailers have indicated that, in light of the current institutional circumstances in some jurisdictions, some Governments might effectively enforce the take-up rates of more cost reflective tariffs by regulation. This might involve dictating the types of tariffs that retailers (and distributors) can provide.

We discuss the issues surrounding mandating retail and network price regulation to support a smart meter roll-out and the related policy issues in further detail in Section 6.7.

The competitiveness of the market

The competitiveness of the markets overall and in particular jurisdictions is also potentially an issue. In general terms, the more competitive markets are, the more likely it is that prices will be cost reflective. In the Australian markets that are operating with the least constraints (e.g. Victoria and South Australia), it appears that the markets are amongst the most competitive retail electricity markets in the world. Recently, there have been two failures of retail businesses and the capital markets 'punished' AGL Energy for missing its profit forecasts, which was partly due to its inability to meet what may have been optimistic forecasts in relation to retail margins and the impact of higher wholesale prices.

Where the market is operating with the least constraints, vertical integration is more common and all the major players would appear to be seeking greater levels of vertical integration. Vertical integration is a way in which retailers can manage their wholesale price risk, but should not reduce their incentive to introduce more cost reflective tariffs *per se*. It might, however, reduce the hedging benefits to retailers of more cost reflective tariffs (i.e. retailers will compare the cost of hedging via the financial market, with the cost of physical hedging either via vertical integration or via the use of more cost reflective tariffs (and DLC tariffs in particular).

It is possible that the introduction of smart meters could increase the competitiveness of the market and thus the degree of switching. Retailers appear to be uncertain about the extent to which this might occur. The uncertainty is a largely a function of the same uncertainty about whether customers will find more complex and cost reflective tariffs attractive (as Section 6 discusses in detail).

If they do find more complex tariffs attractive, then smart meters are likely to increase the degree of competition between retailers; if they do not, then the degree of competition between retailers may be unchanged. It is also possible that the degree of competition might reduce if customers find more cost reflective tariffs too complex and/or policy makers force customers onto them. In these circumstances, they might create a barrier to switching and reduce the competitiveness of the market.

Based on the information currently available, our view is that smart meters are likely to increase the degree of competition in the market, but only modestly. The reasons for this view are that:

- In the first instance, smart meters only *change* the types of customers that are most attractive to retailers (e.g., from large users to large flatter profile users); and

- Smart meters may, however, also increase the *degree* to which the relevant customers are attractive to retailers. This is because it may reveal a cross subsidy that is larger and for a greater proportion of customers (i.e., it can provide the basis for providing larger discounts to some customers that are likely to encourage more switching).

But the willingness of customers to switch more broadly may limit the extent of this effect if they are obliged to take more price risk. Where switching levels are already relatively high, the incremental benefits might also be too modest to encourage significantly more switching.

To the extent that smart meters increase the competitiveness of the market, there are likely to be some 'spillover' benefits for all electricity consumers, which may further some of the MCE's roll-out objectives.

6.2.2 Customer and retailer variables affecting retail product offers

A number of variables, both from a retailers' and customers' perspective, are likely to influence the uptake of these tariffs generally and by jurisdiction. Some of these are mirror images of each other but have different implications for the two key parties in the transaction.

For customers the key variables are likely to include:

- The initial impact, if any, on the customer's bill;
- The customer's willingness to take more price risk;
- The customer's willingness to switch for savings (where they will be an immediate beneficiary) or prospective savings dependent on behavioural change (where they will not save or be an immediate loser);
- The complexity of the offers and how easy it is for the customer to respond;
- How the information about usage is communicated to customers (e.g. via an IHD); and
- Environmental concerns.

As Section 3.1.2 notes the key issue for retailers is whether offering more cost reflective tariffs is going to assist in enhancing or maintaining margins. If it is not, then they are unlikely voluntarily to offer (i.e. actively sell) more cost reflective tariffs. For retailers the key variables that may influence their margins and therefore their propensity to offer more cost reflective tariffs are likely to include:

- The extent of the load cross subsidy (i.e. the underlying market prices) and its distribution;
- Customers' willingness to switch for savings or prospective savings dependent on behavioural change;
- The costs of introducing more cost reflective tariffs; and

- The benefits of introducing more cost reflective tariffs in terms of:
  - Customer retention and winning new customers; and
  - Managing exposure to wholesale price risk and the cost of hedging and the alternative ways to manage price risk.

Sections 6.3 to 6.5 examine how and the extent to which these variables might influence the take-up of the three tariffs identified. Our conclusions in relation to the take-up of more cost reflective tariffs generally are indicative best estimates only, based on limited information. It would be a mistake therefore to attach significant weight to their precision.[91]

Section 6.6 examines how the importance of these variables might differ by jurisdiction and Section 6.7 examines the issues in relation to using price regulation to support a roll-out of smart meters to achieve demand side response.

6.3 Time of Use tariffs

As Section 5 discusses, a key benefit of smart meters is that they will reveal the load profile cross subsidy inherent in current tariffs reliant on accumulation meters. This might allow non-incumbent retailers to 'cherry pick' those customers who are currently paying too much on flat tariffs based on the Net System Load Profile, by moving them on to ToU tariffs.

It is important to note that just because smart meters reveal the load profile cross subsidy, does not necessarily mean that retailers will voluntarily offer ToU tariffs to win these customers. For example, from the retailers' perspective there may be more cost effective ways of unwinding the cross subsidy (i.e., introducing tariffs that are more cost reflective in the broadest sense of the word), but these may not produce as much demand side response:

These more cost effective ways could involve either:

- Offering flat rate tariffs, but tariffs that more accurately reflect the profile of customers and the costs they impose. This is how the market operates for the vast majority of larger users (as Section 5.4 identifies). In the mass market this is, however, unlikely to be effective except for large groups of customers with similar profiles, as the cost and complexity of having tariffs tailored to particular small customers is likely to be too high.

  This approach would still provide a more cost reflective price signal to customers than their existing tariff. In other words, if they change the profile of their consumption, it will affect the price they pay when they renegotiate their price, probably when their contract is renewed. The delay in receiving the benefits and the uncertainty about what they might be may, however, weaken the incentive for customers to act. These incentives might be weakened further if small users are priced according to the broad customer profile group they belong to, as shifting to another group might be more problematic.

[91] To the extent that retailers move to introduce more cost reflective tariffs we assume that would occur relatively early in the roll-out. The key constraints are likely to be the capacity of their systems to manage such tariffs and the minimum number of customers necessary to enter the market. The latter is unlikely to be particularly high.

- Offering essentially the same flat rate tariffs, but with larger up-front discounts to the more attractive customers. This is how the market appears to be addressing the volume cross subsidy for small users currently in the mass market (as Section 5.2.1. identifies).

  In this case, it is less obvious that this would provide much more cost reflective price signals, because the discount might not be in a form that links it to the customer's profile, in a way that is meaningful to the customer. For example, there is limited connection between some of the discounts retailers offer today and the fact that the customer is a particular type of electricity user.

  This approach would, however, involve the retailer assuming more price risk, but they may still form the view that these are still more attractive offers to customers despite the higher margin they would implicitly need to earn, and the slightly higher net price the customer would have to pay compared to if they accepted a ToU tariff.

Retailers are likely to test all these methods and may end up offering a variety of them to different market segments (e.g., ToU only to customers more prepared to take price risk).

Notwithstanding how retailers address the load profile cross subsidy, to the extent that non-incumbent retailers are successful in winning customers in these ways, it will place pressure on incumbent retailers to re-price those customers who are currently paying too little on flat tariffs, so they can compete with the non-incumbent retailers for the more attractive customers.[92] In doing this, incumbent retailers are also likely to use one of the above methods.

In our view, customers are more likely than retailers to 'drive' the take-up of ToU tariffs in the sense that:

- The majority of the benefits will in the first instance flow to customers (at least for those who are currently being subsidised);
- The benefits for retailers are primarily about retaining existing (but newly profitable - larger customers with flatter loads – all else being equal) customers and winning this type of customer;
- Overall these offers are unlikely to be particularly margin enhancing for the retailers except to the extent it results greater market share; and
- Retailers are unlikely to derive significantly greater value from ToU tariffs, because any demand reductions are likely to be modest, take time to realise and not be particularly firm.

The key variables on the customers' side that are likely to influence the up-take of ToU tariffs are:

- The impact on their bills;

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[92] It is also possible that some of the newly less attractive customers will already be on contracts because, under profiling, their load profile did not matter and higher volume customers tend to be more attractive.

- The customer's willingness to take price risk; and
- The complexity of the offers and how easy it is for the customer to respond.

The key variables on the retailers' side that are likely to influence the up-take of ToU tariffs are:

- The extent of the cross subsidy (i.e. the underlying market prices) and its distribution;
- The number of customers affected;
- Their willingness to take price risk and to accept more complex offers; and
- The costs of introducing more cost reflective tariffs.

6.3.1 The take-up of ToU tariffs

In our view it would be reasonable to assume that:

- For bill savings of greater than (say) 10% a majority of customers will be prepared to move and thus create a competitive threat to the incumbent retailers;
- For bill savings of between (say) 5-10% a significant minority of customers will be prepared to move; and
- For bill savings of between (say) 0-5percent a minority of customers will be prepared to move.

We believe that these assumptions are broadly consistent with the market evidence in relation to retail competition (i.e., switching suppliers); but, if anything, may be at the optimistic end of the spectrum particularly insofar as ToU tariffs are concerned. This is because the switching evidence typically relates to similar offers, whereas these offers may:

- Be more difficult for the customers to understand, especially if they involve ToU tariffs. Although some existing tariffs are also complex, and the evidence suggests most customers have significant difficulty understanding their energy bills today. Section 3.1.1)[93]; and
- Involve them in taking more risk (i.e. if they consume more at certain time they could pay more), especially if they involve ToU tariffs.

For example, switching for identifiable upfront bill savings is likely to be more attractive to most customers than shifting for similar upfront savings, provided their consumption pattern remains the same. It creates the risk that they may have to pay more if they change their behaviour and, given how little knowledge customers generally have of their energy use, this is likely to create considerable inertia.

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[93] Some existing tariffs for example have inclining blocks.

Bill savings that are dependent on changes in behaviour are likely to be somewhat less attractive again, due to the need to change behaviour and the associated risks.

We think it is reasonable to expect that:

- Some non-incumbent retailers will target those customers who will save significant amounts (i.e., above 10%) of money under more cost reflective offers and actively sell these tariffs to them. The key difficulty that they will experience in doing this is that, after the introduction of smart meters, they will have no more information to go on about identifying who these customers are than they had before the introduction of smart meters. The incumbent retailer will know but the non-incumbent will not, unless the customer is prepared to share their usage information with the prospective retailers.

  Some non-incumbent retailers we spoke to were less concerned about this potential constraint saying that they could potentially get the critical information they need about a customers' use from questioning them about their energy use and that the most relevant information is prospective in any case; but the available information would be retrospective. There may, however, be a role for mandating that the customers' profile information is available to all retailers, but as we understand it, current consumer protection laws create broader constraints on the information retailers are able to access.

- Incumbent retailers to watch market developments closely and be prepared to start offering more cost reflective tariffs to these customers relatively quickly if it became apparent that they risked losing a significant number of their (newly) more attractive customers.

The critical variable is the extent and distribution of the load profile cross subsidy (i.e. how many customers would benefit and lose and by how much). Unfortunately, information on the extent and distribution of the load profile cross subsidy is very scarce (due to the lack of smart meters) and, to the extent that retailers have access to this information, they are likely to regard it as commercially sensitive.

The information we are aware of is as follows:

- As Section 5.1.1 indicates, the Victorian ESC has estimated that load shape cross subsidy could be up to $200 per customer per annum.

- Work by EnergyAustralia for its network area suggests that the average non-air conditioning customer is paying $70 too much to the average air conditioning customer who is paying $86 too little.[94] Other work by EnergyAustralia suggests that for some load shapes it:

  > *"would expect energy costs (at least for retailers, if not customers) could double from their current level. This reflects the fact that, historically, in NSW, up to 50% of the energy costs is driven by price spikes. The differing exposure to price spikes is the key reason for variations in energy purchase costs between the three NSLPs."*[95]

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[94] EnergyAustralia, Increasing Block Network Tariff: Follow-up presentation to IPART's Pricing Issues Consultation Group, 18 June 2003. This would appear to relate to energy costs only.
[95] Energy Australia, Cost Benefit Analysis of Smart Metering and Direct Load Control: Phase One Report, 7 November 2007. This does not necessarily imply that costs would double. The submission also notes that the differences in energy costs for the three NSW NSLP's is substantial – typically more than 20%. It also asserts that

- Charles River Associates in work for Integral Energy on the impact of air conditioning on its network concludes that the cross subsidy might be in the range of $80-110 million per annum, which equates to between $110-151 per customer per year.[96]

We can therefore only provide a best estimate of the extent to which unwinding the load profile cross subsidy would provide:

- Material enough savings to warrant most customers considering more cost reflective offers;
- The number of customers who could access savings of this magnitude; and
- The number of customers who would be prepared to move onto a ToU tariffs to access these savings.

It seems reasonable to assume that for a significant minority of customers the savings will be reasonably material (e.g. above 5% of their annual electricity bill).

On this basis, it would not be unreasonable to assume that up to about 30% of customers would end up on ToU tariffs.[97] We note that this assumption is at the high end of the range of the retailers' views and therefore may be somewhat optimistic, as retailers may seek to address the issue in other ways if they do not believe customers will be attracted to ToU tariffs because of the risks they entail.

6.4 Critical Peak Price tariffs

As Section 5 discusses, another potential benefit of smart meters is the opportunity to send highly targeted price signals to customers that enable customers to reduce their bills by actively managing their demand and, in particular, the 'high price' times at which they consume.

This can also happen under ToU tariffs, but CPP tariffs are likely to be more effective for this purpose because they send more precise price signals, which could lead to larger savings for more targeted customer responses.

While, in principle, these tariffs will also unwind the cross subsidies in existing tariffs they are more focussed on attracting customers willing to alter their behaviour in response to price signals. This is because a customer who is unwilling to do this risks paying more.

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this may undermine the applicability or relevance of the 2003 Deloittes/Trowbridge report conclusions (referred to in Section 5) on the cross subsidy in Victoria of 15%. It is unclear, however, why results generated in NSW make Victorian results inapplicable or irrelevant. Nevertheless, this work was referred because it is comprehensive and available, and to illustrate the cross subsidy issue generally rather than to draw specific conclusions from it. It also relates to the entire load profile cross subsidy for customers on the NSLP at that time.

[96] Charles River Associates, Impact of Air Conditioning on Integral Energy's Network, May 2003. This would appear to relate to network costs only. The per customer figures assume at the time Integral had about 725,000 customers.

[97] Slightly different assumptions about the relative take-up of these tariffs are made in Appendix A because several cases are used in the quantitative analysis, but the overall quantum of take-up is within the bounds we suggest is possible.

To the extent that there is a take-up of CPP tariffs, in our view customers are more likely than retailers to 'drive' this in the sense that:

- The majority of the benefits will in the first instance flow to customers for those willing to alter their behaviour, but wanting to retain the flexibility to decide if and when they do it;
- The benefits for retailers are likely to be primarily about retaining existing customers and winning new customers who are in this part of the market (i.e. price sensitive and willing to change behaviour);
- Overall these offers are unlikely to be particularly margin enhancing for the retailers except to the extent it results greater market share; and
- Retailers are unlikely to derive significantly greater value from CPP tariffs because any demand reductions are likely to take time to realise and are not particularly firm. If they get a significant number of customers on these tariffs it may assist in limiting hedging costs, because some of the potential reduction is likely to be for all practical purposes firm, but this process would likely take some time.

The key variables on the customers' side that are likely to influence the up-take of CPP tariffs are:

- The potential impact on their bills;
- The customer's willingness to accept price risk; and
- The complexity of the offers and how easy it is for the customer to respond.

The key variables on the retailers' side that are likely to influence the up-take of CPP tariffs are:

- The number of customers willing to take price risk and accept more complex offers, but wanting to maintain control of their consumption decisions;
- The attractiveness of these customers; and
- The costs of introducing more cost reflective tariffs.

There is also the possibility that a proportion of these customers may be attracted to such offers not just because they offer the potential to save money, but also because they might be perceived (and perhaps marketed) as a 'green' option, even though the environmental benefits (as opposed to system efficiency benefits) are perhaps limited. For example, customers on CPP tariffs could consume more energy overall and increase their greenhouse emissions, even while limiting consumption in critical peak periods.

6.4.1 The take-up of CPP tariffs

Based on our discussions with retailers and the market evidence, it might be reasonable to assume that the take-up of CPP tariffs is not likely to be more than 10% for the following reasons:

- There is limited evidence to suggest that the majority of customers are willing to bear significant electricity price risk;
- Even if they were prepared to accept price risk, with the intention of saving money by altering their behaviour, the additional savings are likely to be relatively modest for the typical customers (perhaps up to 5% of the bill or about $50 per annum);
- These offers are only likely to be attractive to a niche of the market that want to do something (either for the modest additional savings and/or perhaps they believe it is the 'right thing to do'), but also want to retain the flexibility to consume as they like at peak if they want to. This means that any bill savings are likely to be assessed in the context of a relatively high, albeit implied, risk weighting; and
- This offer is only likely to be of marginal benefit to retailers (given it is non-firm), so we might expect them to develop and offer such tariffs but not necessarily proactively sell them as a means of competing in the mass market.

6.5 Direct Load Control tariffs

DLC tariffs are in essence an alternative form of CPP tariff. The key difference is that the customer losses the flexibility over whether they respond to the price signal by giving the retailer (or distributor) the capacity to control aspects of their consumption. This difference, however, has some important implications, including that:

- It provides the retailer with firm demand side response and something of value to it in controlling its input costs; and
- It allows the retailer to share the additional benefits with customers on this basis. In other words, instead of under CPP the customer only benefiting after the fact when their bills come in, the retailer is in a position to pre-pay the customer for the benefits.

In our view, retailers are more likely than customers to 'drive' the take-up of DLC tariffs in the sense that:

- While the benefits will, in the first instance, flow to customers, it involves customers giving up the flexibility to use electricity as they want. Although, in practice, the impacts on lifestyle and comfort levels are likely to be modest, many customers may be unwilling to take the risk;
- Retailers may be able to use this approach as a marketing tool to provide upfront savings to win some customers, as this is similar to how the market currently works; and

- It has the potential to be margin enhancing for retailers if it provides firm demand reductions because it will reduce the need to incur hedging costs.

The key variables on the customers' side that are likely to drive the up-take of DLC tariffs are therefore:

- The potential impact on their bills (in the form of upfront discounts); and
- The willingness to lose flexibility in relation to aspects of their electricity use.

The key variables on the retailers' side that are likely to drive the up-take of DLC tariffs are therefore:

- The potential discount they can provide to customers;
- The number of customers who might be willing to trade flexibility over consumption for a larger discount; and
- The net value of the hedging benefits to the retailer.

6.5.1 The take-up of Direct Load Control tariffs

Based on our discussions with retailers and the market evidence, it would be reasonable to assume that the take-up of DLC tariffs is not more than 10% for the following reasons:

- This is a derivative of the CPP tariff;
- It offers potentially higher benefits to customers in terms of bill reductions, but at a cost that many customers are likely to perceive to be too high. Amongst large users, for example, the take-up of DLC tariffs is very low. Large users are running a business and therefore may be more focussed on retaining operational flexibility than domestic users for whom the issues is likely to be about more comfort levels and risk. However, large users are typically sophisticated energy users (e.g. have a dedicated energy manager), whereas most domestic users are not; and
- It offers potentially higher benefits to retailers (in terms of hedging costs), but they will compare the cost of achieving those benefits via DLC tariffs, to the cost of achieving those benefits in other ways. The potential benefits are larger than for CPP, but still might be insufficient to encourage many customers to take-up DLC tariffs purely for economic reasons. In addition, the transaction cost of aggregating all these small users to produce material demand side response is likely to act as a constraint.

It seems likely that for the vast majority of customers the costs are likely to outweigh the benefits, even where retailers actively promote these DLC tariffs. We understand that the focus groups undertaken by the Consumer Impacts workstream have indicated higher preparedness to consider DLC tariffs rather than CPP.

6.6 Jurisdictional analysis

This section identifies the features of the market in each jurisdiction that might impact on type and up-take of more cost reflective tariffs. In particular, it identifies:

- The broader features of those markets; and
- The customer and retailer specific features of those jurisdictions that might impact on the retailers' propensity to offer more cost reflective tariffs and their take-up.[98]

Key conclusions

Our key conclusion is that it is highly likely that over time the take-up of more cost reflective tariffs will vary by jurisdiction. Below we indicate the circumstances that might lead to higher or lower levels of take-up in particular jurisdictions. On the basis of the available market evidence we are not, however, in a position to make judgements on the extent to which this will occur in particular jurisdictions. We have not therefore formed quantitative views on whether the take-up of more cost reflective tariffs will be higher or lower in any particular jurisdictions.

The reasons for this approach are as follows:

- As Section 6.2 notes, it would be a mistake to attach great weight to the precision of our general conclusions on the take-up rates of the more cost reflective tariffs. Forming quantitative conclusions in each jurisdiction based on any variation around our general conclusions would involve making such a mistake and, in effect, estimating on an indicative estimate.
- A number of factors are likely to influence take-up rates of more cost reflective tariffs. It is also likely to be a function of the how well particular retailers market them.[99] So, while it is easy to identify numerous reasons why the take-up of more cost reflective tariffs *might* vary by jurisdiction, it is not possible to say with any degree of certainty the extent to which take-up *will* vary by jurisdiction. There is simply too little information and too much uncertainty to make credible judgements on these matters.

  The way in which the retailers responded to our questions on this issue reflects this. The retailers who are active in a number of jurisdictions used their experience of developments in relation to retail competition generally to guide where they thought smart meters *might* have the greatest impact. For example, they have noted that there are some differences in the price consciousness of electricity customers by state (see below).

  In the absence of better information, this does not seem to be an unreasonable approach. It is one that we adopt, in part, in drawing our general conclusions on take-up rates. This approach is, however, of itself quite revealing. It shows that, in relying on related benchmarks, the retailers:

[98] These comments on this section only relate to customers connected to the main electricity grid in each jurisdiction.
[99] For example, the evidence suggests that many customers do not accept the lowest price offers in choosing their retailer.

- Are uncertain about what might be the impact of smart meters; and
- Have not undertaken (or, if they have, are not willing to divulge) in-depth analysis of how customers are likely to respond to more cost reflective tariffs.

For example, because customers in a particular jurisdiction are more willing to shift for relatively smaller changes in bills, means that they are more price conscious. This should mean that it is easier to get their attention to tariffs that provide the opportunity to lower their bills. This does not necessarily mean, however, that they will be more willing to take-up more cost reflective tariffs because these imply taking greater risk. Indeed, it is possible that these customers may be more price conscious but also more risk averse.

Where there is currently no full retail competition, there is even less information on which to form a view about customers' propensity to take-up more cost reflective tariffs. Regional analysis suffers even further from these problems.

- We are unaware of any compelling market evidence and/or research that indicates electricity consumers differ by jurisdiction, although there are likely to be some differences. The information we have seen is anecdotal. We understand that the Consumer Impacts workstream has run some focus groups which have revealed some qualitative differences in preferences, but not enough to form firm jurisdictional views.
- One of the most important variables that is likely to influence take-up in the short term is the potential benefits for customers (i.e., the number of customers that can make material bill savings) or, on the retailers' side, the extent of the cross subsidy. The retail tariffs we suggest in Appendix A capture this variable because they reflect differences in underlying market prices (e.g., in the ratio between off-peak and peak prices and off-peak and CPP prices), and therefore in the demand side response.

6.6.1 Overview

The table below provides an overview of the key features of the jurisdictional markets.

Table 3: Key features of jurisdictional markets possibly relevant to more cost reflective tariffs

Feature/ Jurisdiction	*Part of NEM*	*Ownership of incumbent retailers*	*FRC*	*Price regulation*	*Winter or summer peaking*
ACT	Yes	JV	No	Yes	Winter
NSW	Yes	Public	Yes	Yes	Winter (but summer close)
NT	No	Public	No	Yes	Summer
QLD	Yes	Private*	Yes*	Yes	Summer
SA	Yes	Private	Yes	Yes	Summer
Tas.	Yes	Public	No	Yes	Winter
Vic.	Yes	Private	Yes	Yes	Summer (but winter close)
WA	No	Public	No	Yes	Summer

* Except for rural small customers

6.6.2 Australian Capital Territory

Market position

The key features of the ACT market are as follows:

- An active retail market that the relevant regulator has indicated should be price deregulated[100];
- Surplus capacity in networks and less of a critical peak issue;
- Winter peaking, but with a move to using gas more for space and water heating.[101] Smart meters might have additional benefits for some ACT customers because the NSLP reflects the situation in NSW and ACT combined;
- Installation of electronic manually read interval meters for all new and replacement;
- Existing ToU tariffs have different cut-off points for commercial and residential tariffs;[102] and
- A requirement to comply with the ACT Government's climate change policy.

Retailer and customer specific issues

The above factors are likely to mean that the benefits of smart meters are likely to be lower in the ACT in terms of the price differentials they can exploit.

The relative wealth of the customer base might mean that they are somewhat less inclined to be attracted to offers that provide relatively small savings, compared to some other jurisdictions (see below).

6.6.3 New South Wales

Market position

The key features of the NSW market are as follows:

[100] ICRC, Retail prices for non-contestable electricity customers, April 2006.
[101] Insignificant penetration of pool pumps.
[102] For the purposes of estimating the benefits of more cost reflective tariffs the ACT has been rolled into NSW.

- Retail price regulation which until recently would appear to have constrained the development of the market (i.e., the switching rates observed were much lower than in Victoria and South Australia, but have increased in recent times);

- Slowly changing from winter peak to alternating between winter and summer peaks, with the growing penetration of air conditioning (which is now around 70%);

- A greater focus than other jurisdictions on redeveloping existing suburbs in preference to new subdivisions and on multi-unit housing;

- The electricity businesses are undertaking significant investment in smart metering in the form of manually read interval meters where they can make a business case for it. In practice, we understand that the distribution businesses have been leading this investment (see Section 5.5). As a result, NSW has the largest number of smart meters installed in Australia. Their policy is, in practice, to install electronic manually read interval meters (type 5) for all new and replacement meters;

- The business are putting some of the customers on ToU tariffs (Country Energy has 145,000 smart meters installed to date but these predominantly read as ToU but billed using traditional tariffs and EnergyAustralia has 250,000 manually read interval meters in place for smaller users, with about 120,000 customers on ToU tariffs).[103] Regulation is currently driving the up-take of more cost reflective tariffs at least in relation to network tariffs, and might continue to do so absent other changes;

- The regulatory environment also provides some incentive for demand side management (through the 'D factor' – which allows for the recovery of costs but not lost revenues) in the network price control where it provides a least cost solution to meeting an emerging network constraint; and

- The BASIX NSW Planning Instrument, which amongst other things, encourages the use of gas and non-electricity intensive heating systems.

Retailer and customer specific issues

We are not aware of any evidence to suggest there are material differences compared to other jurisdictions in relation to NSW customers and retailers. The generally flatter load profile in NSW and the twin peaks compared to South Australia and Victoria might mean it is somewhat more difficult to avoid as much cost on the supply side.

The major retailers who are active in a number of jurisdictions indicated that with the market in an earlier stage of development it was too early to form a view on whether customers are more or less likely to take-up cost reflective tariffs.

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[103] Country Energy, NSW Jurisdictional Consultation, 16 October 2007; Energy Australia, Cost Benefit Analysis of Smart Metering and Direct Load Control: Phase One Report, 7 November 2007.

6.6.4 Northern Territory

Market position

- Not part of the NEM and no wholesale electricity market, but rather a vertically integrated utility with some independent generation;
- Installation of an electromechanical accumulation meter for all new and replacement meters; and
- Relatively flat load profile by virtue of the climate and the more continuous use of air conditioning.

Retailer and customer specific issues

The avoided costs for the 'retailer' in this sense are more directly the costs of avoided generation and deferred generation investment, rather than the indirect costs of hedging. Nevertheless the underlying economic benefits would be the same. That said due to the nature of the customers' demands it would seem likely that the underlying benefits are different (more akin to improving energy efficiency) and perhaps more difficult to achieve through cost reflective pricing of the type for which smart meters allow.

6.6.5 Queensland

Market position

- Partial retail competition, with FRC commencing 1 July 2007. No retail competition for many of Ergon's rural customers and they receive significant subsidies from customers in South East Queensland (in the order of $500-$1,000 per customer);
- Private and government owned incumbent retailers (in part of Ergon's area where there is no competition);
- Peak demand growing significantly faster than total consumption (i.e., about 30% compared to 20% since 2000);
- Has around 2,400MW of controlled load (or 850 MW in winter and 500MW summer – on a diversified basis);
- Meter replacement policy is for the installation of an electronic manually read interval meter (type 5) for all new and replacement;
- Flatter load profile by virtue of the climate and the more continuous use of air conditioning;
- A high proportion of rural and remote customers;

- Regulated domestic tariffs currently more structured around inclining block tariffs and encouraging controlled loads;
- No domestic ToU or CPP pricing;
- Legislation requires site visit for reconnection; and
- ClimateSmart 2050 policy involves a focus on renewable and low-emission technology, increased use of gas in electricity generation (13-18%), feed-in tariff for solar power, energy efficient buildings, energy choices, home energywise tools.

Retailer and customer specific issues

The retailers we spoke to indicated that with the only recent introduction of retail contestability, it is still too early to tell how customers will react to competition or more cost reflective pricing.

6.6.6 South Australia

Market position

- On some measures regarded as one the most competitive retail markets in the world, although in the earlier stages of the market's development this was assisted by regulation;
- Very peaky electricity demand profile by virtue of hot dry summers and use of summer only air conditioning, which has a high market penetration;
- Highly urbanised, slightly older population profile;
- System peak demand is growing at 2.3% per annum while total consumption is expected to grow at 1.3% per annum;
- Network demand management program as part of the 2005 Electricity Distribution Price Review;
- Direct load control system;
- Installation of an electromechanical accumulation meter for all new and replacement; and
- Little evidence to date of any existence of use of ToU tariffs in South Australia.

Retailer and customer specific issues

All the major retailers suggested that, in their experience, customers in South Australia are more likely to shift for relatively small savings than customers in Victoria.

Retailers considered that this may make them more likely to consider more cost reflective tariffs where that offered the same possibility, but involved more risk. This is possible, but South Australians would also appear to be more risk averse in relation to one similar product (e.g. home mortgages), where a significantly higher proportion of South Australian customers prefer fixed rate mortgages.[104] This work also shows, however, that the majority of Australian household borrowers are prepared to take interest rate risk at the present time.

Aurora Energy is understood to be targeting South Australia in the first instance with its pre-payment meters (which offer both certainty on costs and some ToU capability), although this may also be because there are restrictions on the use of prepayment in some other states (e.g. NSW).

This combined with the nature of the demand profile, might mean that South Australia is a relatively attractive jurisdiction for smart meters or greater use of DLC.

6.6.7 Tasmania

Market position

- No full retail competition but in October 2007 the Tasmanian Government commissioned the state regulator, OTTER, to undertake a cost benefit analysis;
- Winter peaking, no needle peaks, peak period mainly associated with hot water usage;
- Load factor of 70% relatively high when compared to mainland load factors;
- Limited number of remotely read and interval meters;
- Below 150 MWh consumers have either Type 6 or prepayment meters;
- Approximately 30,000 controlled load, dedicated circuit customers;
- About 42,000 households have a prepayment meter – 20% of total customers. Widely accepted by consumers, most of whom are on ToU tariffs;
- Previous interval metering analysis conducted by OTTER in 2006 showed no basis for supporting a mandated roll-out;
- Installation of an electronic manually read interval meter (type 5) for all new and replacement meters for customers consuming 150MWh and above per year; and
- Installation of manually read accumulation meters for all new and replacement meters for customers consuming below 150MWh per year.

[104] Australian Financial Review, Moves to fixed-rate mortgages growing, 15-16 September 2007, page 3. South Australia has the highest proportion of residential fixed-rate home loans at around 36%, whereas the other Australian states are between 23-28%.

Retailer and customer specific issues

Tasmania would appear to have relatively less potential for demand side response to reduce system costs (compared to some other jurisdictions), but some part of its customer base seems to be attracted to pre-payments meters that provide greater certainty over costs and the ability to manage these costs. It would appear that at least part of the market that smart meters might exploit is already being served by the pre-payment meters.

6.6.8 Victoria

Market position

- On some measures regarded as one the most competitive retail markets in the world;
- Peaky electricity demand profile by virtue of hot dry summers and use of air conditioning, which have a high market penetration;
- Direct load control system with ageing infrastructure means that these customers will be placed on interval meters with ToU tariffs, at least in relation to their previously controlled load, when the current system is no longer functional. It is understood that might involve as many as 500,000 households.[105] Whether that leads to more cost reflective ToU tariffs in relation to other time periods remains open to question; and
- Decision to roll-out remotely read interval meters to all customers.

Retailer and customer specific issues

All the major retailers suggested that in their experience customers in Victoria are slightly less likely to shift for relatively small savings than customers in South Australia, but nevertheless, believe it is a highly competitive market with switching levels well above what most observers expect to be the long term rate.

6.6.9 Western Australia

Market position

- Not part of the NEM, with wholesale electricity market with the following features:
  - Energy and capacity market;
  - Day ahead (as opposed to a spot market);

[105] Consumer Utilities Advocacy Centre, St Vincent de Paul Society and the Alternative Technology Centre, Submission to the Cost Benefit Analysis of Smart Metering and Direct Load Control: Phase 1 Reports for the Ministerial Council on Energy's Smart Meter Working Group, 1 November 2007, page 8.

- Contracted physical market as opposed to a pooled financial market;
- Installed capacity of 4,000MW compared to 40,000MW+ for the NEM;
- Maximum prices of $484 per MWh as opposed to $10,000 per MWh; and
- Independent Market Operator is accountable for ensuring adequate installed capacity – the Reserve Capacity mechanism.

- No full retail competition at the present time (the current threshold is 50 MWh per annum). The Government is currently undertaking a major review of the State's electricity industry (Electricity Market Review), to cover:
  - The need for more cost reflective tariffs (although the focus here would appear to be on revenue sufficiency in the first instance);
  - A cost benefit analysis on FRC; and
  - Consideration of a smart meter roll-out.
- Installation of an electronic manually read interval meter (type 5) for all new and replacement;
- Approximately 1.75% of residential electricity customers are on ToU tariffs;
- Residential flat tariffs have been unchanged since 1997 and may not be fully cost reflective;
- Currently has about 100,000 smart meters in use, which could be interval read (manually) but are not being read as such at the present time; and

Summer peaking due to air conditioning load with 82% of Western Australian homes having air conditioners installed. Western Power is currently seeking 6,000 volunteers to trial the cycling of air conditioners to assess impacts on comfort levels.[106] We understand that Western Power has registered 1,000 customers to participate in the air-conditioning cycling trial in Perth metro.

Retailer and customer specific issues

The possibility of demand side reductions attracting capacity payments might assist the retailer in justifying aggregating demand side response.

6.7 Smart meters and price regulation

As Section 6.2 indicates, some parties have indicated that given the circumstances in particular jurisdictions, it is possible that the relevant governments might mandate the take-up of more cost reflective (retail and distribution) tariffs.

[106] Power Industry News, 'Perth DM Project', Edition 558, 17 September 2007. Customers will be offered $100 to participate or have the option of having that amount donated to a charity.

6.7.1 Retail price regulation to support smart meters

It is possible that with retail price regulation take-up rates might be significantly higher than otherwise would occur. It is also possible that these tariffs might deliver additional benefits. Several points are worth making in this regard:

- It is unlikely that requiring that retailers merely offer (i.e. have) a particular type of tariff is going to be very effective in increasing take-up, given that:

  - The vast majority of customers are reactive rather than proactive; and

  - Retailers already offer a wide range of tariffs on their websites that might be attractive to particular segments of the market.

  A requirement to offer more cost reflective tariffs is therefore unlikely to encourage particularly high levels of take-up, or higher levels of take-up than would occur in the absence of such a requirement. If, however, retailers are required to reflect distribution charges on customer bills, these will typically be passed through to customers. However, it may have implications for the ability of retailers to win customers by offering readily understandable alternatives.

  Even if policy makers required retailers to market these tariffs more proactively, it is not obvious that this would be very effective if the retailers' agents found that the regulated offers were less easy to sell than other offers. If this was the direction policy makers wanted to go, then it might be necessary to dictate all offers, but this may have its own costs, as discussed below.

- Assuming policy makers regulated to ensure a higher take-up of cost reflective tariffs than otherwise would occur, the next question is whether this would lead to more demand side response to those tariffs by customers.

  It is open to question whether it is reasonable to assume that customers will respond in the same way if they forced onto more cost reflective tariffs, than if they do so voluntarily. In particular, if customers do not think their electricity bills are large enough to warrant taking action to reduce them (e.g. by voluntarily moving onto a more cost reflective tariff); it is not obvious why they would respond to such tariffs, if they are forced onto them. Their willingness to change behaviour has not changed; the only thing that has changed is their tariff and the potential benefits or costs of responding or not.

  There is broader evidence to suggest that you will not always get the same response by compelling economic agents to act, than you will get from voluntary action, and of them responding unpredictably to regulation, which often limits its effectiveness.[107]

  We do not believe therefore that it would be prudent to assume that customers will respond in the same way if public policy forces them to do something that they would not do voluntarily. It is also likely to produce some other distortions (see below).

[107] Stephen Levitt and Stephen Dubner, Freakonomics, Penguin 2006.

- If policy makers use regulation to dictate the take-up of more cost reflective tariffs, then it raises an additional policy question that goes beyond this study but is nevertheless relevant. The question is whether regulating the types of tariffs that retailers offer represents sound public policy. In principle, this question would warrant a completely separate cost benefit analysis that goes to the merits of having price regulation and ultimately retail competition, not least because regulating tariffs might impact on the customers' incentive to switch. The cost benefit analysis of a roll-out of smart meters would, in essence, become redundant because regulation would have dictated the outcome.

6.7.2 Distribution price regulation to support smart meters

Economic regulators, however, already set the prices for the use of the transmission and distribution network, or at least the constraints within which network tariffs are set. This will not change with the introduction of smart meters, and so their may be scope for policy makers to dictate the types of network tariffs that distributors can charge and thus what the retailer pays.

It would then be up to the retailer to determine whether it would pass these charges on to the final consumers, and there would be risks for retailers if they decided to do otherwise, as discussed below.

In Section 5 we noted that:

- For larger users retailers, typically pass on network charges, and charge on a different basis for energy;
- Retailers are not always passing through the more cost reflective tariffs some networks are introducing, but this appears to be because:
  - In some cases, their systems are not ready to deal with a large number of customers on more complex tariffs; and
  - The number of customers on these deals is relatively modest and not worth the retailers focussing on, at least at this point in time.[108]

Where retailers choose not to pass through the exact distribution tariffs they charge for particular customers, they will seek to bundle the tariffs such that they probably seek to collect the same amount of revenue from the relevant customer group as a whole. However, in the process, they will likely bear some volumetric risk which they will also seek to recover in a higher margin.

Our prevailing assumption is that in the mass market retailers will generally try pass on the more cost reflective price signals sent by networks. This is consistent with the available market evidence, the retailers' views and their commercial incentives.

The only caveat we would attach to this is, however, that in the mass market we believe that this will be subject to a 'complexity constraint'. In other words, if the network tariffs serve to

[108] Section 5.5.1 discusses this issue in further detail.

complicate retail offers to the extent they become too difficult to sell (i.e. to get customers to shift), then it is possible that some retailers might revert to less complicated deals that they believe are more attractive and saleable to customers. In doing so, they might be prepared to absorb some price risk in the belief that any higher margin they have to charge is more than offset by the otherwise more attractive offers they can make to customers.

The net effect would be that customers pay slightly more than they otherwise would by accepting offers that they find more attractive because the retailer is bearing some risks on their behalf. There is evidence to suggest that this is a plausible outcome (e.g. there is evidence that of those customers that switch many do not take the lowest available offer and that other things such as brand are important)[109].

In this respect, it is also worth noting that the retailers will view the associated risks from a portfolio perspective, and from that perspective, the risks might be more manageable than they appear by considering isolated examples.

Other implications

Requiring the use of particular distribution network tariffs (e.g. charge for networks on a kW basis for all customers) would also represent a departure from the approach economic regulators typically take to network price regulation. The approach of most Australian regulators to setting network tariffs at the moment involves:

- Setting the overall price (or revenue) cap that distributors can charge (or recover);
- Requiring that particular tariffs are between incremental and stand alone costs (typically a wide range);
- Using the form of price control (e.g. a tariff basket approach) to provide the network business with an incentive to set tariffs on an efficient basis; and
- Using side constraints to ensure this process occurs without entailing undue price shocks for the customer.

The economic rationale for mandating particular network charges would therefore require some thought, and raises a number of broader issues that relate to the appropriate regulation of network businesses.[110] It would require some thought because:

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[109] The Department of Trade and Industry, 'Switching Supplies', a research study commissioned by the Consumer Affairs Directorate, United Kingdom, November 2000.

[110] For example, charging on actual peak demand is likely to expose distributors and retailers to higher revenue volatility which is likely to have implications for their costs and thus prices. It can also result in those parties having perverse incentives to *increase* peak demand because it will increase revenues. Policy makers can overcome the second problem by changing the form of price control (e.g., to a revenue cap). There is, however, likely to cause some volatility in prices because the price per kW reflects expected demand but revenues will reflect actual kW and future prices will need to take account of the differences (i.e., there is a need for a correction mechanism). Some parties argue, however, that revenue caps provide inappropriate disincentives to connecting customers, pricing and potentially investment.

- It might lead to less efficient outcomes from an economic perspective; and
- Regulators might either be unable or unwilling to pursue this approach.

In the past, regulators have avoided embracing any notion that one way of recovering sunk costs is any more efficient than any other way (i.e. they have been reluctant to accept the principle of Ramsey pricing).[111] This is because while Ramsey pricing typically improves economic efficiency, it is discriminatory and many perceive it to be 'unfair'.[112] In addition, it can lead to outcomes that are quite different to average cost pricing principles (which is in effect what policy makers would be seeking to mandate). In fact, Ramsey pricing can lead to higher fixed prices for the use of network services and lower variable charges, where they are no network constraints. This is because there may be benefits in encouraging higher use in these circumstances. This is the situation New Zealand found itself in, as Section 5.2.1 describes.

[111] This refers to prices that recover more sunk costs from those customers whose behaviour these higher prices is least likely to be influence (i.e. customers with the most inelastic demand). It is possible to apply the same principles to the structure of prices.
[112] This is because it more closely reflects each customer's willingness to pay and minimises the distortions associated with price signals that do not do this.

7 Evidence on retailer recurrent costs

To assess the implications of a smart meter roll-out for retailers' recurrent costs we outline:

- Retailers' views from our consultations and from the information provided by them;
- Retailers' views from the work of Frontier Economics;
- The views of the Bayard Group; and
- Any information available from the various other trials, roll-outs or other considerations of smart meters, which is in the public domain.

We also discuss a number of the broader implications for retailers from smart meters.

7.1 Retailer views from our consultations

The typical view of retailers is that the introduction of smart meters is unlikely to make a significant difference to their recurrent costs.

The basis for the retailers' views appeared to be largely intuition based rather than substantive analysis, and with this in mind they came with major caveats.

A number of retailers were not prepared to speculate, noting that there are too many variables about how the roll-out would occur and the market would operate. A number indicated that the best available information is part of the report prepared by Frontier Economics, and directed us to it.

The retailers we spoke to who offered a view indicated that they believed their operating costs would either be about the same or somewhat (but not significantly) lower. Some were of the view that there would be significant increases due to complexity in process costs related to the storage, management, and validation of data. This may also require some additional steps in processes. However, they were also of the view that other cost reductions (e.g. potential benefits in working capital and bad debts), would offset these increases.

Retailers attached two key caveats to these views.

- In the short term, recurrent costs would be higher as the businesses adjusted to the new world (e.g. they would expect significantly higher number of calls, particularly if some customers began to see large increases in their bills and sought to understand the new tariffs); and
- While costs might be lower, there was a greater risk that they could be significantly higher rather than lower (i.e. in the event that the process was not executed as effectively).

Some retailers also suggested that smart meters would likely involve them taking more risk (e.g. market and trading risk) than under the current arrangements, but with greater demand side response there may be benefits from them doing so. They may, however, have some more choice in this regard.

There are some costs in terms of investment in communications (for some functionality) and retail product development that would be optional for the retailer, and which they would only incur presumably if the benefits to them out weighed the costs.

The cost imposed on retailers could also vary depending on the how the roll-out is achieved (e.g. where they may be competition in metering). For example, the potential costs on retailers in terms of potentially stranded investment (for example, under a retailer-led roll-out, there may be potential costs in terms of stranded metering investments), or on competition in the retail market more generally in terms inhibiting switching. Section 9 investigates this issue in further detail. The experience of New Zealand (as Section 5.3.2 discusses), is likely to be relevant here.

These views are broadly similar to the views expressed by retailers to Frontier Economics, even though a number of the retailer representatives we spoke to were not particularly familiar with this work.

Information request as part of Phase 2

As part of Phase 2 of this study we held further consultations with retailers on the impacts on their recurrent costs and specifically requested further information in conjunction with the Transitional Costs Workstream. In particular, we requested information on:

- If the retailer adopted a passive strategy (i.e. did not actively pursue strategies that seek to utilise the benefits that smart meters can provide) in response to the roll-out then what might be the:
  - Transitional costs impacts on your business?
  - Ongoing cost impacts on your business?
- If the retailer adopted a more active strategy to exploit the benefits of the increased functionality that smart meters provide, what might be (over and above the required expenditure under the passive strategy) the
  - Transitional costs impacts on your business?
  - Ongoing cost impacts on your business?

The purpose of this approach was to attempt to get a better understanding of the unavoidable cost impacts on the retailers, and to differentiate those costs from more discretionary cost impacts. It would be reasonable to assume that retailers would only incur the discretionary costs if the (private) benefits to them exceeded these costs.

The response to the information requested has been modest in terms of:

- The number of written responses provided;
- The data provided in those responses; and
- The rationale supporting the qualitative views provided.

The lack of time available to respond would appear to have played a significant role in the level of response and the detail contained in those responses, but it would also appear to reflect the limited amount of thought that has been given to the prospect of a smart meter roll-out.

Retailer One

Retailer One indicated that under the passive approach, the transitional costs impacts largely relate to the need to receive and manage interval data for all its customers on a daily basis. This would require it to invest to support the following functionalities:

- Remote reading (daily);
- Import/export metering; and
- Load management at meters through a dedicated controlled circuit.

This retailer indicated that they would incur annual opex of $1.87 million per annum. This estimate was based on capex expenditure of $12.4 million and an assumption that opex costs are typically 15% of capex costs.[113] The costs also relate to remote daily reading ($1.07 million); import/export metering ($0.64 million); and load management at meters through a dedicated control circuit ($0.16 million).

This retailer also identified an additional $1.59 million per annum in opex associated with data aggregation to build/purchase a data aggregation engine and store interval data. The cost categories it identified are aggregator, hardware, data storage and network costs.[114]

In regard to discretionary expenditure, this retailer identified opex of $0.22 million per annum associated with supporting an IHD.[115]

Retailer Two

Retailer Two indicated that under the passive approach it envisaged transitional costs of $21.7 million for opex and $24.6 million for capex. To utilise smart meters it envisaged $28.0 million for opex and $25.6 million for capex. It stated that the total ongoing costs were unknown (i.e. the opex costs indicated above are transitional).

[113] These costs relate to CIS. MDM, B2B and Trading System costs.
[114] It also identified $1.25 million in capex requirements for this purpose.
[115] For CIS and B2B gateway costs. It also identified $1.45 million in capex.

Retailer Three

Retailer Three indicated that the cost of the passive strategy would not be dissimilar to an active strategy and that only the cost of the marketing campaigns would be incremental under the latter.[116]

In terms of operating costs, Retailer Three identified costs in the areas CIS/CRM activities including: CIS initiated messaging and service orders; receipt of meter data; aggregation by product; and comparison of and invoicing by product.

It indicated other costs in the areas of gateway to B2B; MDMs; Energy Trading and B2B Interface, but did not quantify these costs, other than suggesting that it would cost $6 million to update the forecasting system with additional functionality development, storage and CPU. This expenditure would appear to be a capital rather than operating costs.

In terms of transitional operating costs, Retailer Three identified a 20% increase in customer queries to the call centre, on a total quantity of two million, at a cost of $6.5 million.

In terms of on-going operating costs, Retailer Three identified $500,000 on an ongoing basis for product management, and $2.5 million for call handling. It also suggested that under the direct load control scenario these costs would be $3.5 million. All these costs would appear to be discretionary, rather than unavoidable.

In terms of benefits (in the form of cost savings, it identified:

- A cost saving of $25 million nationally (based on 500,000 special reads at $50 per read). These are cost savings to the retailer, but incurred by the distributors;
- A cost saving of $2 million dollars for 'genuine' dual fuel opportunities. This is based on saving 50-60 cents per bill, which equates to $2 per customer per year;
- A cost saving of $3 million on customer response. This is based on 2 million customers and a customer elasticity of demand of -0.1;
- A cost saving of $2 million nationally for remote disconnect for non payment;
- A cost saving of $2.5 million nationally for remote disconnect on move-out. This is based on $50 per instance and 50,000 occurrences (i.e. 10% of special read numbers);
- A cost saving of $800,000 per annum to provide power factor corrections to customers which will enable them to reduce their bills;
- A cost saving of $120,000 in relation to import/export metering to avoid the costs to install and undertake meter exchanges for this functionality;

[116] It stated that a passive approach would involve the maintenance of customers, revenue, and risk profiles associated with customers. Risk profile maintenance will entail utilising data from the smart meters and reflecting distribution tariffs into retail tariffs. Under the active strategy Retailer Three assumed it would develop two generic products.

- A cost saving of $700,000 for supply capacity control;
- A cost saving of $1.2 million in avoided energy purchase costs for load management at meters through a dedicated control circuit. Under the retail led scenario it assumes these benefits would be $10 million;
- A cost saving of $1.2 million in avoided energy purchase costs for interface to other load control device;
- A cost saving of $1.2 million in avoided energy purchase cost for interface to the home area network;
- A cost saving of $2.4 million associated with the provision on an in home display;
- A cost saving of $800,000 in reduced marketing costs with an in home display, based on 2 million households (or 40 cents per customer);
- A cost saving of $12 million per annum and $30 per annum for MDA fees times 2 million customers, based on the assumption that a new market entrant (under Scenario Four) would reduce these costs by 20%; and
- A cost saving of $1.2 million in avoided energy purchase cost for remote configuration.

It is very difficult to interpret this information because on the lack of definition around what the costs and cost savings are exactly (e.g. whether they are transitional or recurrent), what is driving them and the unit cost of the activities being undertaken.

Retailer Four

One retailer indicated transitional incremental costs of between $2M-$5M, which would translate into around $1.10-2.60 per customer for it, but based on the assumption that its existing systems had the capability to process the data generated by the smart meters, and based on certain assumptions about data streams and metering technologies.

It also indicated ongoing costs of around $1M per annum, but noted the risk that these could be much higher if industry protocols were not optimised.

In terms of benefits it estimated savings in the order of $6.5M-$12.5M in costs to serve, which would translate into around $3.60-$6.60 per customer per annum. It also identified a number of other benefits in terms of retention benefits, margins on new products sold to customers (after a five year period) and hedging benefits. These rely on it being able to successfully offer new more cost reflective tariffs. In total, these benefits are in the order of $11.5M-$15M (or about $6.30-7.90 per customer per annum over the longer term).

7.2 Frontier economics

The ERAA recently published work undertaken by Frontier Economics on retail costs associated with a roll-out of smart meters. The work comprised two reports:

- Stage 1: A desktop literature review of existing and planned smart meter trials and mandated roll-outs in Australian and overseas jurisdictions, focussing on any cost benefit analysis undertaken and the extent to which retailers' costs were factored into the analysis;[117] and

- Stage 2: Consultation with ERAA members to gain a deeper understanding of retailer implementation and integration issues and costs of a smart meter roll-out.[118]

The Stage 1 report examines 11 smart meter programs in Australian and overseas jurisdictions. It primary conclusion in relation to the consideration of retail costs is that:

> *"it is difficult to ascertain whether retailer costs have been taken appropriately into account in these analyses."*[119]

The Stage 2 report examines the implementation costs of smart meters. Specifically, the work involved understanding the likely costs to retailers of implementing the necessary changes to facilitate a roll-out of smart meters to residential and small business customers.

To gather this information, Frontier Economics used a survey. The key assumptions were that:

- Both manually read and two-way metering technologies were considered;

- The functionality of retailers' systems was based on measuring unavoidable costs. They were assumed to include:

  - The establishment and maintenance of their own metering data repository;[120]

  - Basic interval-based metering products, but not sophisticated products such as would enable Critical Peak Pricing tariffs;

- The Distributor would be the responsible person under the Rules, with responsibility for meter provision (including installation and maintenance) and metering data services; and

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[117] Frontier Economics, Interval meter implementation costs – Stage 1 Literature Review, A report prepared for the Energy Retailers Association of Australia, July 2007.

[118] Frontier Economics, Interval meter implementation – Stage 2 Retailer cost data, A report prepared for the Energy Retailers Association of Australia, July 2007.

[119] Frontier Economics, Interval meter implementation costs – Stage 1 Literature Review, A report prepared for the Energy Retailers Association of Australia, July 2007, page 56.

[120] Frontier Economics conclude that this is cost is reasonable based on their unavoidability criteria but do not explain why. If it were removed, capex would likely be replaced with some higher operating costs to reflect the purchase of this service. It also includes the costs of some rudimentary or basic interval meter products, but not dynamic Critical Peak Pricing tariffs on the basis that is the major reason for introducing smart meters. Some of these costs would not be unavoidable, however, if the retailer chose not to respond by introducing more cost reflective tariffs.

- Discount future nominal expenditures (we understand over 10 years) by 3% per annum to derive a figure in terms in real $2006.

Retailers were asked to submit their estimates on a base case of no roll-out of interval meters. We understand that 7 retailers responded to the data request in respect of a manually read interval meter roll-out and 5 retailers responded to the data request in respect of a remotely read interval meter. However, in some cases the data sets were not complete.

The categories of information requested in relation to operating costs were as follows:

- Meter data management
  - Settlements – increased costs due to the need to manage much greater amounts of data;
  - External aggregation – no longer required as the IT investment allows this to be done in-house;
  - New and replacement meters – costs relating to the updating of databases to reflect new and replacement interval meters; and
  - IT opex – costs related to operation of augmented IT infrastructure.
- Business systems
  - Exceptions management – costs of exceptions numbers and time to resolve them may rise with the implementation of interval meters; and
  - IT opex – higher costs relating to operation of augmented IT infrastructure.
- Other
  - Training – costs of staff training to become familiar with each retailer's new responsibilities and capability under the roll-out;
  - Process development – resources may be required to develop new business procedures to support the management and use of interval meter data;
  - Mail advice – the costs of activities aimed at mitigating call centre costs (see below);
  - Call centre – back and front office call numbers and duration may increase (decrease) if customers query interval data (query bills less);
  - Complaints – cost of dealing with complaints may rise (fall) if customers query interval data (query bills less); and
  - Management overheads – management overheads may increase to reflect the greater complexity and investment in retailing activities.

Results

Table 4 reproduces data in the Frontier Economics report.

Table 4: Frontier Economics estimates of retail operating costs under a smart meter roll-out 2006

Retailer operating costs under a smart meter roll-out				
	Manually read		Remotely read	
	Simple average cost per customer ($)	Average of the retailer cost per customer ($)	Simple average cost per customer ($)	Average of the retailer cost per customer ($)
Settlements	0.15	0.28	0.24	0.47
External aggregation	0.91	1.53	-0.85	-1.42
New and replacement meters	1.44	2.22	1.26	2.22
IT Opex	1.36	1.59	1.93	2.46
Exception management	1.36	1.43	4.45	6.38
IT Opex	1.71	3.27	3.07	5.58
Training	0.16	0.18	0.30	0.41
Process development	0.47	0.88	0.60	1.10
Mail advice	0.38	0.57	0.48	0.72
Call centre	0.70	0.64	0.91	0.88
Compliants	0.73	0.55	0.82	0.64
Managemet overheads	0.24	0.53	0.25	0.60
Totals	*17.4*	*23.72*	*13.46*	*20.04*

* Please note that the breakdown of operating costs is inconsistent with the totals for the manually-read smart meters. We understand that this is because some parties did not provide a total cost breakdown (and presumably have significantly higher costs).

They key results are as follows. For the shift from the status quo to manually read smart meters:

- A simple average (retail operating) costs per customer increase of $17.40; and
- An average of the retailer cost per customer increase of $23.72.

For the shift from the status quo to remotely-read smart meters:

- A simple average (retail operating) costs per customer increase of $13.45; and
- An average of the retailer cost per customer increase of $20.03.

It is our understanding that these figures are the NPV of the incremental cost per customer over a 10-year period. In other words, they are not necessarily the same as any change in the annual recurrent (i.e. sustainable) costs per customer. This is because the data is likely to contain the higher initial ‘recurrent’ costs of operating in the new environment. Most of the costs categories identified would appear to be largely recurrent. The only possible exceptions to this are new and replacement meters as the cost is described as “*costs relating to the updating of databases to reflect new and replacement interval meters*” and some aspects of training.

If annualised, the increases would appear to be in the order of $1-2 per customer per annum, including the potentially higher transitional ‘recurrent’ costs. This suggests that the truly recurrent cost changes are likely to be significantly less than this, and may even be negative on the data provided by the retailers. This is because a significant proportion of the costs might be included in early years and at least some of the operating cost increases are likely to be a function of higher capex requirements (see below).

One retailer indicated that a typical rule of thumb used in the industry is that for any incremental capital expenditure, it is reasonable to assume that this will increase operating costs by about 15% of the amount of capital expenditure. The above costs would appear to be broadly consistent with the assumed level of capital expenditure reported to Frontier Economics (i.e. the capital costs per customer for the remotely read smart meters is in the range of $29.49-47.27).

Conclusion

It is important to note that the Frontier Economics work is of limited relevance for Phase 2 of this study, as it does not address all the additional functionalities addressed (i.e. it would not allow for Critical Peak Pricing). In addition, the Transitional Costs Workstream has also assessed those capex requirements to be modest, and much less than those included in the Frontier Economics report. Our conversations with retailers suggest that the requirements for additional capex to be modest, and so therefore will be the related IT operating expenditure requirements.

7.3 Bayard Group

The Bayard Group has produced analysis that outlines its views on the benefits to retailers of smart meters.[121] The Bayard Group is a global energy measurement business which describes itself as *"the unrivalled market leader in electricity meters"* and as a party which *"has a strong position in the rapidly growing advanced or smart metering systems market."*[122]

It concludes that the benefits are worth $41 per customer per year, on the basis of the following benefits for:

- Working capital management ($25 per customer per year);
- Revenue assurance ($4 per customer per year); and
- Financial risk management ($12 per customer per year).[123]

Working capital management

It assumes that the basic functionality will provide accurate meter reads and the extended functionality will provide reads for monthly billing, e-billing and payment (via IHD) and remote payment.[124] It believes that the service outcome will be reduced working capital and bad debts.

[121] The information presented here is based on a powerpoint presentation by Bayard. As a result, we have been unable to establish in detail the basis for the estimates.
[122] See www.bayard.com.au
[123] It also includes per customer benefits on an NPV basis but we have been unable to reconcile these numbers, with those on a per customer basis. The former may reflect the number of customers affected directly. Using a 10% real pre-tax discount rate, a 15 year asset life, a 15 year discount period and a 3 year roll-out.
[124] Remote payment is not part of the advanced functionality assessed in this study for the MCE.

It concludes that these benefits are worth $25 per customer per year. This appears to be based on a net present value of the reduction in opex of $125M or $90 per customer, which reflects the cash flow benefit of billing monthly. This figure appears to include the benefits of monthly billing, bad debt reduction, prepayment, e-billing, and reductions in re-worked bills and complaints.

Most of these benefits would appear to be associated with advanced functionality.

Revenue Assurance

It assumes that the basic functionality will include real time tamper detection and the extended functionality will include remote turn-off. The service outcomes this would provide is that it would eliminate vacant premise consumption and reduce theft.

It concludes that these benefits are worth $4 per customer per year. This appears to be based on:

- A $50M reduction in capex requirements ($36 per customer) associated with a 15% penetration of prepayment meters;

- A $31M reduction in the NPV of opex ($22 per customer) associated with eliminating/reducing theft and tampering;

- A $41M reduction in the NPV of opex ($29 per customer) associated with reducing the quantum of bad debt; and

- A $10M reduction in the NPV of opex ($7 per customer) associated with identifying closed accounts/premises.

Most of these benefits would appear to be associated with the advanced functionality.

Financial risk management

It assumes that the basic functionality will allow for critical peak energy pricing and the extended functionality will allow for selective curtailment and granular daily load forecasts. The service outcomes that this would provide are reduced exposure to high spot prices and avoidance of catastrophic losses.

It concludes that these benefits are worth $12 per customer per year. This appears to be based on $60M reduction in capital requirements (or $43 per customer).

Most of these benefits would appear to be associated with the advanced functionality.

Other quantified benefit categories

It also identifies some other benefit categories including billing operations, load management and customer service, but does not appear to include these numbers in its overall estimate.

It suggests that the benefits of these are as follows:

- Billing operations - $38M in opex (or $28 per customer). This is comprised of the:
  - Benefits of electronic billing of $23M in NPV terms (or $17 per customer); and
  - Benefits of reducing the cost of reworked bills of $15M in NPV terms (or $11 per customer).
- Load management - $67M in opex (or $48 per customer)[125]; and
- Customer service - $9M in opex (or $7 per customer). This is comprised of the benefits of reduced complaints/account queries/estimated reads.

Bayard also identifies costs of $40 per customer per year, but does not break these down by who incurs these costs.

Other benefits

Bayard identifies a number of other benefits to retailers including:

- A streamlined accruals process (based on actual energy flows);
- Customer-selected billing dates;
- Unusual loads (e.g. marijuana farms); and
- Supply limiting (kW ‘cap’ for essential services).

7.4 Other considerations of smart meters

As Section 7.2 indicates the available information on retailers’ costs from other smart meter trials is limited. We highlight the key evidence from those investigations that have addressed these issues in detail.

[125] It assumes that a customer incentive payment of $10 per year is made to generate these savings (which has been netted out of the estimates).

7.4.1 Victoria

The ESC's initial cost benefit analysis allowed for $30M for retailers' IT systems. Half of this was assumed to provide for the functionality of smart meters and half was assumed to accommodate the volume of smart meters. It did not appear to specifically account for retailer operating costs.

Department of Infrastructure

The Department of Infrastructure has undertaken work looking at advanced smart meter functionality.[126] The consultants draft report considered the merits of adding communications to smart meters the subject of the ESC's mandatory roll-out decision.

The main benefits of an advanced smart meter roll-out would largely arise from:

- Avoided cost of manual normal cycle meter reads (45%);
- Avoided cost of special meter reads and (manual) de-energisations and re-energisations (35%);
- Additional demand response benefits (7%), due to accelerated roll-out - not the technology used *per se*;
- Avoided cost of battery replacement (6.5%);
- Avoided retailer costs, mainly due to reduced demands on call centres (5% or $12M in net present value terms); and
- Reduced portable data entry costs (2%).

Only one of these costs is strictly relevant to retailers in the first instance (although under different delivery scenarios they might be). The report states as follows:

> *4.5 Avoided Retailer Costs*
>
> *With the implementation of advanced communications enabling remote meter reading there is a range of areas where retail costs will be reduced. The largest of these appears to be call centre costs. Information from retailers would indicate that there are savings in relation to calls regarding, estimated bills, meter reader issues (including access and presence of readers on customers' properties), delayed bills and other categories. In some cases Retailers showed savings as a percentage of calls avoided, in other cases they were just dollar estimates. It is our opinion that in some cases the avoided costs are underestimated.* [127]

[126] CRA International and Impaq Consulting, Advanced Interval Meter Communications Study: Draft Report, 23 December 2005.

[127] CRA International and Impaq Consulting, Advanced Interval Meter Communications Study: Draft Report, 23 December 2005, page 58.

7.4.2 Office of the Tasmanian Energy Regulator

In 2006 the Office of the Tasmanian Energy Regulator undertook a cost benefit analysis of a roll-out of smart meters in Tasmania.[128] It relation to retailer costs it found an increase in operating costs in the following categories for the first four years:

- Customer call centre on the assumption that will contact their retailer more often;
- Billing; and
- IT operating costs with the implementation of a new system. It also assumes that IT operating costs will remain more expensive than under the base case, on the assumption that data handling will be more expensive.

It also notes that Aurora Retail considered a range of other capital and operating costs, and advised that these would net out to zero in incremental terms.

Overall this would appear to imply a marginal increase in retailer's recurrent costs from a smart meter roll-out.

7.4.3 RET: Ministerial Council on Energy

In 2006 EMC[a] conducted a meta-analysis of the results of trials and cost benefit analyses in relation to electricity smart metering.[129] Its review identified a number of benefits for retailers (or customers) including:

- Improvements to cashflow through billing and collection improvements;
- Reduced theft;
- More practical prepayment options;
- Improved customer service; and
- Trading risk management benefits.

[128] OTTER, Costs and Benefits of the Rollout of Interval Meters in Tasmania, Final Report, October 2006. Its definition of a smart meter was a remotely read interval meter with potential for remote automatic load control at periods of peak use if set up when the meter is installed.
[129] ECM[a], Electricity Smart Metering: Meta-Analysis of Results of Trials and Cost Benefit Analyses: Summary Report, 19 December 2006.

8 Implications of smart meters for retailer recurrent costs

This section examines the potential implications of smart meters for retailers' recurrent costs.

The basis for the views we present on retailer's recurrent costs include our:

- Conversations with retailers and review of the (limited) information they have provided;
- Review of the available market evidence; and
- Market experience.

Our conclusions should be read in the context of the qualifications in Section 2.1 of this report.

8.1 Approach

Section 7 provides a reasonably consistent range of views on the potential impacts of a roll-out of smart meters on retailers' recurrent operating costs, with the exception of the Bayard work. This work, however, covers some wider potential benefits as well (e.g. for working capital and hedging costs).

In this section we provide an indicative assessment of the likely impact on retailers' recurrent costs of a roll-out of smart meters.

To do this we:

- Take an indicative estimate of retailers' efficient recurrent costs;
- Allocate those recurrent costs to key retailer activities; and
- Make an indicative assessment within each of those categories about the likely impact of smart meters.

As Section 7 indicates the retailers have not been able to provide much data on the impacts on their recurrent costs. This has significantly complicated the analysis. We are therefore not in a position to form firm quantitative views on these matters and our estimates on the impact of a roll-out of smart meters on retailers' recurrent costs are indicative only.

8.1.1 Retailers' recurrent costs

There is limited information in the public domain about the actual recurrent costs of retailers or what retailers typically refer to as the 'cost to serve'. It is highly likely that those costs vary significantly by retailer, amongst other variables, based on:

- Their size;
- Their efficiency (e.g. state of their systems);

- Whether they are incumbent retailers or not; and
- The rules and regulations under which they operate.

This means that depending on these and other variables the costs that a smart meter roll-out imposes on particular retailers:

- Would be extremely difficult to determine; and
- Would vary significantly by retailer.

We do not believe it would be possible to assess the cost on a retailer-specific basis, and aggregate that information to a national level, without detailed cost information from retailers. Even then, given the inevitable differences in the way particular retailers may account for certain costs, it is unlikely that this would yield particularly useful information.

Even if it were to yield useful information, it may not provide particularly relevant information.

Each retailer's position, in terms of the costs a smart roll-out would impose, is undoubtedly highly relevant to it. From the perspective of an economic cost benefits analysis, however, the relevant costs are those imposed on an efficient retail business. This is because it is reasonable to assume that an 'inefficient' retailer will bear the other costs in any case, at least at some stage, in moving to best practice. Given this, the analysis bases the impact of smart meters on a somewhat hypothetical counterfactual (i.e. the incremental costs of smart meters on the efficient cost of retailing). It any case, the base case is merely there to providing a consistent starting point to work to examine the potential impacts of smart meters.[130]

This approach is consistent with how capital costs have been estimated.

8.1.2 Assumption about efficient recurrent operating costs

For the purposes of this analysis we assume that the efficient recurrent operating costs of a retail business are in the order of $70 per customer per annum.[131]

The basis for this assumption is that both AGL Energy and Origin Energy have indicated that they are aiming to get their costs to around this level as a result their current business

[130] The efficient cost might also vary by jurisdiction, depending on the view you take about the geographical dimensions of the retail energy market. While it may do so due to regulatory constraints and the different opportunities for scale by jurisdiction, given we are concerned about the incremental impacts we do not believe that this is a material issue.

[131] It is important to note that this cost to serve only relates to operating costs and excludes energy purchasing costs and any more capital related costs. The latter typically includes costs such as customer acquisition costs and working capital, although for ease of reference we have included the working capital benefits in our summary of the cost to serve, because we do not have a robust independent benchmark for these costs on a cost per customer basis. It has no bearing on the cost benefit analysis because the $70 per customer is not used directly in the cost benefit analysis and the working capital benefits are treated as a transfer payment in any case, as we understand it. It is our understanding that customer acquisition costs are typically amortised due to the fact that they provide retailers with benefits over the life of the contract with the customers and possibly beyond.

reengineering processes, although that process will take several years and involves substantial investment (see Section 3.1).

It is quite possible that neither business will achieve this level of cost, or achieve it over the time frame they are expecting. We note that in both cases their current cost to serve is significantly higher than $70 per customer per annum.

We also note that a number of regulators have formed the view that the efficient operating costs of retailers are at least this amount, but typically not substantially in excess of it.[132] Most of these are around the $70-85 per customer, but they are not always entirely comparable because of what regulators include in the 'cost to serve'. It is certainly possible to get higher costs to serve depending upon what is included in it and the particular circumstances taken into account in particular jurisdictions, and estimates that appear to cover all of the retailers' costs have been made of up to $160 per customer, with a cost to serve of around $95 per customer.[133]

A number of retailers have recently expressed concern about the $70 per customer being an 'aspirational' target.

We propose using it only for the purpose of this process to provide a basis from which we estimate the benefits over the longer term for smart meters, which may well involve a different and in all probability more concentrated retail market.[134] Whatever level of cost to serve this process leads to, however, is likely to set the competitive benchmark against which all other retailers will have to compete.

We do not believe the cost to serve base assumption that we have used has a significant impact on the estimates of cost or benefits, given the nature of those estimates. Moreover, the estimates are broadly in the range of the evidence provided by retailers.[135] If a higher base estimate is used the savings would in percentage terms be slightly but not substantially lower, because there are some fixed costs in some cost categories that would need to change (e.g. call centre).

8.1.3 Assumption about efficient recurrent operating costs by activity

We use the outcomes of previous KPMG benchmarking work to allocate those costs to particular functions or activities.[136] Table 5 provides the breakdown in costs per customer in dollar and percentage terms, using KPMG's benchmarks and based on the assumption of $70 per customer per annum for total costs.

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[132] KPMG, Benchmarking retail operating costs and margins, September 2006. IPART, Promoting retail competition and investment in the NSW electricity industry: regulated electricity retail tariffs and charges for small customers 2007-2010, Electricity – Final Report and Determination, June 2007.

[133] LECG, SA Standing Contract Electricity Prices: Price Path Review and Inquiry: Summary report on efficient and prudent retail operating costs and margin, August 2007.

[134] KPMG's work for EnergyAustralia in the context of NSW review of retail prices recommended a cost to serve for regulatory purposes of about $88 per customer for a new entrant mass market retailer, but based on certain assumptions which included a customer base of 250,000 customers. KPMG, Benchmarking retail operating costs and margins, September 2006.

[135] We have spoken to three retailers who have suggested that our indicative dollar savings are not unreasonable.

[136] KPMG has undertaken a number of retail operating cost benchmarking studies. The most recent one in the public domain is KPMG, Benchmarking retail operating costs and margins, September 2006.

Table 5: Assumed retail recurrent operating costs by activity

Retail operating cost by key activity	%	$ per customer per annum
1. Billing and customer collection		
Billing	5%	3.4
Data validation	2%	1.1
Customer transfer	4%	2.8
Payments processing	13%	9.3
Bad debt expense	4%	2.7
CIS	20%	14.0
Sub-total		
2. Call centre costs	10%	6.7
3. Overheads		
Office and administrative service costs	18%	12.6
Energy trading costs	3%	1.8
Customer communications	15%	10.3
Pricing and risk management	3%	2.0
Settlements	1%	1.0
Regulatory	3%	2.4
Total	100%	70

* Percentages do not equal 100 due to rounding.

These are, however, not the only categories of a retailer's 'recurrent' costs that smart meters might impact upon; indeed, there are other categories of costs that may well be more affected. These costs are:

- Working capital requirements; and
- Hedging costs (and potentially prudential capital requirements).

We discuss these in further detail below.

The following sections discuss the categories of costs that might change as a result of a roll-out of smart meters.

8.2 Transitional impacts

The introduction of basic smart meters is likely to have a number of implications for retailers' recurrent costs. In the short term, retailers have indicated that it might be reasonable to expect transitional increases in the following 'recurrent' costs:

- Customer communications;
- Call centre; and
- Various other costs.

8.2.1 Customer communications

Customer communication costs include those associated with informing customers of:

- The availability of offers and payment options;
- Their rights under an applicable retail code or customer charter;
- The connection and disconnection process applying to the market; and
- The cost of ensuring that the retailer's brand is sufficiently distinguishable.

In the short term it would be reasonable to expect a significant increase in customer communication costs. These costs will be necessary to explain the:

- Nature of the changes being brought about by the roll-out of smart meters;
- Timing of those changes and to keep customers informed about ongoing developments; and
- Likely implications for customers and to assist them in preparing for the changes.

There are also likely to be costs associated with communicating the new tariffs that retailers develop.

While it is possible that distributors could undertake some of this communication (particularly if they are leading the roll-out), it is likely that the retailers would want to control this process even if they were taking a passive approach. This is because they would likely want to retain their role as the key point of contact with the customer, and would also want to manage the process to ensure that other costs did not increase unduly (e.g. call centre costs).

Our benchmarks assume that a retailer will incur customer communication costs of about $10.30 per customer per annum.[137] During the roll-out we think it is reasonable to assume that these costs will increase by about 20% for the period of the roll-out, or by approximately $2 per customer per annum. This will include the costs incurred in:

- Advertising campaigns in the press to build awareness of the changes;
- Bill inserts to provide more details on the changes; and
- A customer communications officer to manage these aspects of the roll-out.

8.2.2 Call centre

The key drivers of call centre costs, excluding IT, are:

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[137] Although these costs are unlikely to vary on a per customer basis to the same degree as other costs (e.g. billing). They are expressed on this basis to assist with the cost benefit analysis.

- The cost of the labour of manning the call centre; and
- The amount of labour required which is function of the number of calls with which they have to deal (and the time taken to deal with them).

The number of calls and the time taken to deal with them is likely to be a function largely of:

- Certain aspects of the retailer's communications (e.g. the complexity of tariffs and billing information as, in practice, the majority of calls relate to high bill enquiries); and
- Regulatory requirements in relation to those communications.

In the short term it would be reasonable to expect a significant increase in call centre costs, notwithstanding the efforts to manage these costs via the communication campaign. These costs will be necessary:

- To deal with questions about the roll-out and the implications for customers; and
- To address customer queries as they start to receive their bills, particularly for those that are on more cost reflective tariffs.

Our benchmarks assume that a retailer will incur call centre costs of about $6.70 per customer per annum. This assumes that a call centre would on average receive up to two calls per customer per year.

During the roll-out we think it is reasonable to assume that calls will increase by about 20% for the period of the roll-out, or up to 2.4 calls per customer per year. This would increase the cost per customer to approximately $8.50 per customer per annum, or by $1.80 per customer per annum for the period of the roll-out.

8.2.3 Other

There is likely to be an increase in some other costs during this transitional period, including areas such as IT operational,[138] billing, dealing with regulatory requirements and customer complaints (e.g. ombudsman complaints), and general management time devoted to the roll-out.

It is, however, very difficult to form any view about what these costs might be, based on the available information.

We think it would be reasonable to assume costs of about $2 per customer per annum to deal with these other costs.[139]

[138] This likely to be required to ensure the new systems are working and retain the operation of the existing manual systems over the intervening period. In most cases, however, it is likely to involve the replacement of manual processes with automated processes.

[139] This assumes that there is a 5% increase in other costs not already accounted for in the above.

8.3 Recurrent cost impacts

The costs that are likely to change on a recurrent basis include:

- IT operational costs;
- Customer communication costs;
- Call centre costs;
- Bad debt expense;
- Working capital costs;
- Wholesale load forecasting costs;
- Other; and
- Hedging costs (and potentially prudential costs), which is addressed in Section 8.4.

These are considered in turn below.

8.3.1 IT operational

IT operations costs relate to the cost of managing and operating the IT infrastructure the retailer has.

It would be reasonable to expect that IT operations costs increase with the increase in capital investment. To estimate these costs we have:

- Taken the additional capital costs estimated by the Transitional Impacts Workstream; and
- Applied a 15% estimate for ongoing IT operations costs, as a proportion of the capital expenditure.

8.3.2 Customer communications

It would seem reasonable to assume that there would be some recurrent increase in customer communication costs with a smart meter roll-out, particularly if there is an expectation that retailers will offer and customers will take-up more cost reflective tariffs in significant numbers. The key reasons are as that:

- The retailers will have more tariffs, and more complicated tariffs; and
- To be fully effective these tariffs will require more communication with the customer (e.g. providing feedback on CPP events etc.).

Some of this communication may occur through the technology provided, but there is also likely to be need for occasionally providing the information via more conventional means.

Our benchmarks assume that the retailers incur customer communication costs of about $10.30 per customer per annum. It is probably reasonable to assume a 5% increase in customer communication costs over the longer term, or an increase of about $0.50 per customer per annum.

8.3.3 Call centre costs

Over the longer term it would seem reasonable to expect that the transitional increase in call centre costs will decline again. There are a couple of factors that would likely affect the ongoing call centre costs with a roll-out of smart meters.

There may well continue to be a higher number of calls in relation to bill enquiries for some time as customers get used to more cost reflective tariffs and the greater impact changes in end use behaviour, will have on bills. It is also likely, however, that these calls will be of shorter duration and lead to less complaints because the retailer will have access to better and more timely information to share with customers.

In this regard, we understand the Victorian retailers have previously indicated (particularly in relation to the remote read functionality):

- Reductions in cost of high bill enquires ($0.425M per annum). We understand that this is based on some US experience which shows that with more timely information it is significantly easier to address these complaints (i.e. because people can more readily see the link between their behaviour and the outcome); and

- Reductions in Ombudsman complaints ($0.207M per annum). We understand that this relates to the reduction in high bill enquires.

This translates into savings in the order of $0.25 per customer per annum if the same savings are available across the jurisdictions.

8.3.4 Bad debts

Bad debts are a significant cost for retailers. Our benchmarks suggest a bad debt expense of $2.70 per customer per year based on a percentage of bad debts to revenue of 0.33%.[140]

A simple example illustrates the importance to retailers of managing bad debts. If we assume that a 'typical' customer does not pay a quarterly bill (of say $250) the retailer loses its margin

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[140] While bad debt expense is an important cost to retailers, it is less obvious that it is an 'economic' cost. From an economic perspective it might represent a transfer payment between, in the first instance, the retailer and the customers, and ultimately between all other customers and bad debt customers. This would appear to be the view taken in Victoria. See footnote 146 below. The accruing of bad debts may also have an effect on consumption behaviour.

of $12.50 (assuming a 5% margin). However, it may still incur costs of up to $237.50. This means that one customer who does not pay, can remove the margin on up to 19 other customers.

It is evident that a significant number of consumers have difficulty paying their energy bills. For example, the Victorian Utility Consumption Survey suggests that about 12% of households experienced difficulties in paying their energy bills in 2001 (down from 15% in 1996).[141] On this basis, vulnerable customers are a significant subset of all customers (i.e. about 230,000 Victorian households). It also shows that about 15% of those customers, who reported having some trouble paying their energy bills in 2001, reported "always" having trouble paying their energy bills.[142] According to this data, in Victoria there are approximately about 195,000 customers who had temporary payment difficulties in 2001, and 35,000 customers who always had payment difficulties. In other words, about 1.8% of customers indicated permanent difficulties in paying their energy bills.

We understand that actual domestic disconnection rates for non-payment of bills in 2005/06 ranged from: 0.2% of customers (Victoria) to 0.9% (NSW) and 1.1% (SA).

We understand that the Victorian retailers have previously indicated (particularly in relation to the remote read functionality) a reduction in process cost of bad debt of ($0.225) per annum.[143] This translates into savings in the order of $0.10 per customer per annum if the same savings are available across the jurisdictions. If it is assumed that these activities result in a 15% improvement in the bad debt expense than otherwise would be incurred, then the savings in bad debt expense itself would be in the order of $0.50 per customer per annum.

8.3.5 Working capital

Retailers require substantial working capital to cover the period for which they are making payments and receiving customer's payments.[144] In particular, they typically pay for the use of the network and energy far quicker (e.g. monthly) than they receive payment from customers (e.g. typically three monthly in arrears).

Our benchmarks suggest that typical debt days outstanding are around 63 days.[145] This requires working capital of about $114 per customer in capital requirements or $16 per customer per annum.

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[141] Roy Morgan Research, 'Victorian Utility Consumption Survey 2001', June 2002.

[142] In 1996 respondents were asked if they "regularly" had trouble paying these bills. For electricity and gas respectively, 34% and 27% indicated that they regularly had problems paying their bills.

[143] In the Victorian instance, they appear to have identified bad debt expense as a transfer payment, but the process costs of bad debt as an economic benefit. We have relied on the estimates of the Victorian retailers in relation to bad debts, working capital and wholesale load forecasting costs, as communicated by Impaq Consulting to us.

[144] Much of the reduction in working capital is likely to represent a wealth transfer in the first instance. In other words, if retailers are reducing their working capital requirements by bringing forward customer payments, the reduction in working capital costs to the retailer is likely to be matched by the reduction in the interest the customer would otherwise earn on this money. One energy business argued that working capital and hedging costs are not transfer payments (although they made no comment on bad debt costs).

[145] Based on work also undertaken in the context of the NSW retail electricity price review. See KPMG, Addendum to Benchmarking Report on Retailer Operating Costs and Margins, October 2006.

To the extent that smart meters can facilitate reductions in working capital requirements through faster payment there are likely to be benefits to retailers. In particular, we understand the Victorian retailers have previously indicated (particularly in relation to the remote read functionality):

- A reduction in working capital costs with a value of $2.860M per annum; and
- An alignment of gas and electricity readings for dual fuel billing ($0.29M per annum). As we understand it, this is also primarily a working capital benefit (i.e. you can read the electricity meter the same day as you are billing for gas).

This translates into savings in the order of $1.30 per customer per annum if the same savings are available across the jurisdictions.[146]

Monthly billing, working capital and bad debts

One of the product enhancements that basic smart meters might facilitate is monthly billing using accurate consumption data. This might have further benefits for retailers' working capital and bad debt expenses.

Monthly billing has the potential to reduce this period considerably. Our benchmarks suggest that monthly billing would effectively reduce the debt days outstanding from 63 days to 29 days, or by 54%.[147]

Monthly billing would therefore effectively reduce the working capital necessary in relation to these customers, which we have estimated otherwise would be $114 per customer in capital requirements (or $16 per customer per annum), to $52 per customer in capital requirements (or $7.34 per customer per annum). This represents an overall reduction of about $8.50 per customer per annum.

Monthly billing might also assist customers in paying their bills in a timely manner. This is because the bills will be more regular, of a more consistent amount, and may be of a more manageable amount for customers who are having difficulty paying. With electricity typically paid on a three monthly basis in arrears, customers can face higher bills than they were those expecting which may force them into payment difficulties, particularly if other unforeseen expenses arise. The evidence suggests that consumers who are having difficulty paying their bills attached a high priority to their energy bills.[148]

There are, however, costs associated with monthly billing. The two most important are the cost of sending bills and the costs of payment processing and collection. These costs are proportional to the billing frequency, in other words a move from quarterly billing to monthly

[146] There may also be some transaction cost savings in relation to the management of working capital. These savings are likely to be very marginal and we are unable to quantify them.
[147] Based on work also undertaken in the context of the NSW retail electricity price review. See KPMG, Addendum to Benchmarking Report on Retailer Operating Costs and Margins, October 2006.
[148] Indeed the evidence from the Victorian Utility Consumption Survey and the anecdotal evidence suggest that after rent/mortgage, energy bills are the next priority for consumers to pay. Other bills such as credit cards, car expenses, council rates, water, phone, and personal loans are typically afforded a lower priority.

billing is likely to increase these costs by a factor of up to 300%. Our benchmarks suggest that the costs are likely to be prohibitive (i.e. as both billing and payment processing and collection costs increase by this amount), unless electronic payment is part of the monthly billing proposal.

The extent to which the potential benefits of monthly billing are truly a function of basic smart meters is therefore questionable. This is because retailers could (absent any regulatory constraints) move to monthly billing (with electronic payment) now. Indeed, in other countries (e.g. NZ and the UK) monthly billing is more widespread on the basis of accumulation meters. In Australia, some retailers already offer this facility, for example TRUenergy offers two payments options along these lines (Budget Easyway and Flexi Plan) and Victoria Electricity uses monthly billing for all customers.

A similar situation applies to prepayment.[149]

The fact that monthly billing is not more widespread suggests that with accumulation meters (and any regulatory requirements), the additional benefits of monthly billing provides are not substantially above the costs.

Smart meters might, however, provide additional benefits by making this process easier to manage, and providing customers with more confidence in the process (i.e. less need for estimations and reconciliations) thus increasing the take-up of monthly billing.

8.3.6 Wholesale load forecasting

We understand the Victorian retailers have previously indicated (particularly in relation to the remote read functionality) the retailers have indicated a benefit associated with improved wholesale forecasting accuracy of $1-10 million per annum.

These benefits might relate to better energy purchases practices and risk management, product development and financial reporting. It may also influence capital requirements.

This translates into savings in the order of $0.40-4.10 per customer per annum if the same savings are available across the jurisdictions.[150]

8.3.7 Other

It is also possible that there might over time be reductions in some of other costs. These may include:

- The costs for data validation and settlements. The amount of data to be processed would increase significantly, but the quality of that data should improve over time (and the latter would continue to occur via NEMMCO). However, in these cases:

[149] It can offer even larger benefits in relation to working capital (and bad debts). However, prepayment does not require smart meters as the experience from Tasmania shows (although they might facilitate it), but a number of jurisdictions prohibit pre-payment tariffs (e.g. Victoria).

[150] Given that some of these costs are likely to be similar in nature to the hedging benefits we identify below, for the purposes of the cost benefit analysis it is assumed that 50% of the benefits involve transfers.

  - The reductions in these costs are likely to be modest and difficult to quantify; and
  - These activities represent a modest proportion of retailers' recurrent operating costs (i.e. around 1%) in any case.[151]

- The automation of certain processes might lead to some labour cost reductions, but we have seen no evidence to draw firm conclusions in relation to the possible impact on retailers' costs;
- There are likely to be some revenue gains for retailers in certain circumstances. We understand that in certain jurisdictions there are no disconnects in move out situations, and an associated loss of revenue. The cost to the retailer in these circumstances is about $1 per customer per annum in those jurisdictions where there is currently no disconnection on move out. However, we understand it will not apply in all circumstances in the relevant jurisdictions;[152] and
- Certain savings on management time that with better information can be more directed to value adding activities.

In our view it would not be unreasonable to assume that retailers could achieve additional cost reductions, of perhaps $1.70 per customer per annum.[153]

8.3.8 Conclusions on recurrent costs

The available evidence suggests that a roll-out of smart meters will lead to:

- Increases in the retailers' recurrent operating costs over the transitional period, of about $5.80 per customer per annum or about 8.3%; and
- Reductions in the retailers' recurrent operating costs over the longer term, perhaps between $3.70 and $7.40 per customer per annum, or by about 5.3-10.6%.

There are likely to be other benefits for retailers in relation to other costs as well, including hedging and possibly some other capital related costs, as this report notes.

It is possible that the transitional cost increases could be significantly higher than this amount, given that the execution risks of a smart meters roll-out are likely to be high. It is also possible, however, that the reductions in recurrent cost could grow as retailers learn to exploit the functionalities that smart meters provide.

[151] We assume that the net settlement system would remain because global settlement raises a number of issues that go well beyond the scope of this study.
[152] Impaq consulting.
[153] This is 5% of the residual costs not covered in the analysis of other costs.

8.4 Demand side response retail benefits - hedging costs

There are potential benefits to retailers that are a function of the extent to which more cost reflective tariffs lead to demand side response. To the extent that this is the case, this may allow retailers to incur lower hedging costs (i.e. not to hedge as much) and perhaps influence the price of hedging in the market.[154]

As Section 6 notes, this is most likely to be the case where customers are on DLC tariffs. There may also be some benefits for customers on CPP (and possibly ToU) tariffs, but in these cases, the benefits are likely to take longer to materialise and identify, and they are likely to be less firm. As a result, they are less likely to provide a substitute for hedging. It is possible, however, that with a significant pool of CPP customers, retailers might be able to regard some of the prospective demand side response as effectively firm (e.g. after accounting for 'diversity'), which may provide some demand side benefits.

Hedging costs typically refer to the premium over wholesale market prices that retailers typically incur to fix the price they pay for the energy provided to customers. A retailer's hedging costs will vary depending on a large number of variables, including:

- The size and profile of its energy demands;
- The extent to which it chooses to manage its exposure to wholesale price volatility and the instruments it uses to do that (e.g. financial or physical); and
- The market prices of those instruments.

In the absence of smart meters the size and profile of a retailers energy demands are impacted by NEMMCO's settlement methodology which uses a Net System Load Profile (NSLP) to profile all basic meter customers. All 2nd tier basic meter customers (excluding controlled load customers) within the same distribution region are profiled using the same NSLP. The NSLP is therefore an average profile which embeds cross subsidies between customers whose load profile is better than the NSLP and customers whose load profile is worse than the NSLP.

The introduction of smart meters will enable this cross subsidy to be unwound and also enable retailers to more readily identify and win / retain customers with favourable load profiles. The unwinding of this cross subsidy means that retailers will be charged the 'true' wholesale cost of their customers.

[154] Much of the reduction in hedging costs is likely to represent a transfer payment between the sellers and buyers of financial products, rather than economic benefits in the first instance. But developments in the physical market (for example because generators will be less profitable which will have implications for their investment etc.) will ultimately reflect a proportion of these wealth transfers. This does not mean that there will not be economic benefits associated with reducing these costs. For example, there may be 'second round' benefits in the following forms: reductions in the other costs of managing hedging, working capital and bad debts; impacts on prices that have second round effects on consumption; and dynamic impacts on the players active in these markets to further improve their efficiency over time. These second round impacts are, however, often likely to be an order of magnitude smaller than the benefits identified for retailers and they are also much more difficult to estimate, even though over the long term dynamic efficiency gains are often the most important.

As the retail function is typically not about bearing trading risk (to the extent that this is possible), it is reasonable to assume that most retailers would generally seek to manage their exposure to wholesale price risk.

Making an accurate assessment of hedging costs for retailers is a major undertaking because of the degree to which they are specific to the business and they vary over time.

In the recent price review of retail prices in NSW, IPART stated that *"Frontier Economics estimated that the cost of virtually eliminating price volatility from the conservative point on the efficient frontier was around $9/MWh."*[155] This appears to be around 15-20% of the market price allowed by IPART. This is about on average 7% of the final price of electricity.

In the current environment it is quite possible that the cost is somewhat higher than this, perhaps around 25%. This suggests that the cost of achieving this risk adverse position could be as high as 10% of the final price of electricity.

For the typical $1,000 per year customer this suggests these costs are in the order of $70-$100 per year.

It seems reasonable to assume that to the extent that customers accept and act upon the more cost reflective tariffs that retailers may offer, then this may impact upon:

- The degree of risk retailers are exposed to, particularly at times of demand peaks;
- The retailers' level of prudential requirements (see below);
- The amount or efficiency with which they can hedge;
- Perhaps the price of acquiring those hedges (i.e. the second round impact might involve changes in the market price of hedging); and
- The ability for retailers to obtain incremental revenues through opportunities including selling any controlled load capacity either to NEMMCO's Reserve Trader or to a distribution business to assist in managing their network peaks. These additional revenues would, in part, be in lieu of any reduction of the cost or volume required to be hedged.

For example, if customer response reduced these hedging costs by 10% this could provide very significant savings to the retailer of $7-10 per customer per year.[156] If the demand response is at the high end of expectations, then it is possible that the reduction in hedging costs might be in excess of 10%.

[155] IPART, Promoting retail competition and investment in the NSW electricity industry: regulated electricity retail tariffs and charges for small customers 2007-2010, Electricity – Final Report and Determination, June 2007, page 84.

[156] We are of the view that this is not an unreasonable assumption, if it is also assumed there is a strong demand side response. This is broadly consistent with the savings identified under the various functionalities that influence demand response under functionalities (15, 16 and 17). It is also broadly consistent with the findings of Bayard.

These are clearly highly significant potential savings for the retailer (i.e. much larger than the likely savings in recurrent operating costs) from smart meters, if it results in considerable demand side response.

As indicated above, the benefits to retailers will depend on their position (i.e. whether they are long generation or not) and may influence their incentive to utilise more cost reflective prices to minimise their hedging costs, at least in the short term.

Prudential requirements

A retailer of electricity is required to meet NEMMCO's prudential requirements in order to trade in energy in the national electricity market. This ensures that the generation sector is paid for energy delivered to the pool, and that the payment occurs in a timely manner by the retailers who purchase energy in the wholesale market on behalf of their customers.

The prudential capital requirements are broadly a function of:

- Assumed energy purchases;
- Multiplying that annual energy expense by:
  - NEMMCO's required days of cover over the number of days in a year (42/365); and
  - A volatility factor, which varies by region of the NEM.[157]

It is possible that, to the extent that customers accept and act upon the more cost reflective tariffs retailers may offer that this may impact on the volatility factor NEMMCO estimates. There is also likely to be a smaller effect on total energy purchases.

8.4.1 Estimating the benefits for retailer hedging costs

We examine the benefits for hedging costs by using information provided by the Customer Impacts Workstream on the demand side impacts of:

- Basic (i.e. remotely read) smart meters. In effect, the impact of ToU and CPP tariffs;
- For smart meters with an interface for other load control devices (i.e. functionality 15, 16a and 16b provide the capability to control new air conditioners, albeit in different ways, while functionality 16c provides the capability to control existing air conditioners through provision of a thermostat to replace an existing remote control); and

[157] Volatility factors will vary between states reflecting the various states load factor and other market conditions. Our research into the NEMMCO web site suggests a volatility factor of 2.4 for NSW. See NEMMCO, Method for Determining Maximum Credit Limit and Prudential Margin, Version N0. 5, 23 May 2007. The recently high spot prices have prompted NEMMCO to launch a review of the Maximum Credit Limits, see Power Industry News, High Prices Spark Credit Review, Edition 558, 11 September 2007.

- For smart meters with an interface to home area network using an open standard (i.e. functionality 16).

The Customer Impacts Workstream provides two cases a base case and a high case, the latter of which includes a 3% consumption effect.

To value the hedging benefits to retailers we note that peak caps ($300/MWh strike for calendar year 2008) are currently trading for about $20-30/MWh across the NEM. The long term price of such caps is, however, likely to be about half of this (i.e. around $10-15/MWh).[158]

There are also likely to be some transaction cost savings in relation to hedging costs. These are likely to be up to 2% of the face value of the avoided hedge transaction.

Basic smart meters

The Consumer Impacts Workstream produces demand reduction of between 407-754 MW for the base case and the high case respectively by 2030 for all jurisdictions.[159] On the basis of this demand reduction and the above assumptions, the results by 2030 for all jurisdictions are:

- Hedging cost reductions of between $12.2-$22.6 million per annum;[160]; and
- Transaction cost reductions of between $240,000 and $450,000 per annum.[161]

Basic Smart Meters and Functionalities 15, 16a and 16b

The Consumer Impacts Workstream produces demand reduction of between 732-1,674 MW for the base case and the high case respectively by 2030 for all jurisdictions. On the basis of this demand reduction and the above assumptions, the results by 2030 for all jurisdictions are:

- Hedging cost reductions of between $19.5-$55.2 million per annum; and
- Transaction cost reductions of between $390,000 and $1,100,000 per annum.

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[158] Conditions in the market and the drought have significantly increased prices above what is likely to be their long term norm. For the purposes of estimating the hedging benefits we assume a current price of $25/MWh in 2009 for jurisdictions in the NEM falling to $12.5/MWh in 2010 and beyond for all jurisdictions. Otherwise we do vary the prices by jurisdiction nor do we adjust for the cost of carbon, as we believe neither will have a major impact on the outcome given how approximate the primary assumptions are. We also assumed that the demand reductions under basic smart meters are only valued at 50% due to the lack of firmness associated with these reductions. We also assume that the hedging benefits are relevant to the Northern Territory, even though there are no explicit hedging cost savings because it is vertically integrated. We do this to ensure the results are comparable. This also illustrates why hedging costs are a transfer. They are not avoided in the Northern Territory, but presumably NT Corporation is still trying to achieve the same standards in terms of reliability as generators in the other states and incurring similar costs in doing so.

[159] Rounded to the nearest MW

[160] Rounded to the nearest $0.1 million. For practical purposes all these numbers are real as at 1 July 2008.

[161] Rounded to the nearest $10,000.

The above with Case 16c

The results by 2030 are very similar to the preceding case because it is assumed that almost all air conditioners are replaced by that time (i.e. the effects of the retrofit are effectively redundant). The low case has demand savings of 752 MW as opposed to 732 MW. This produces low range hedging cost reductions of $20.7M and transaction cost reductions of $410,000.

It does, however, achieve the demand reductions sooner. For example, by 2016, the savings under the base case are approximately 416 MW for the new air conditioners only, whereas they are about 535 MW with new and retrofitting.

Direct Load Control

The Consumer Impacts Workstream produces demand reduction of between 403-806 MW for the base case and the high case respectively by 2030 for all jurisdictions. On the basis of this demand reduction and the above assumptions, the results by 2030 for all jurisdictions are:

- Hedging cost reductions of between $24.2-$48.4 million per annum; and
- Transaction cost reductions of between $480,000 and $970,000 per annum.

Conclusions on hedging costs

There is significant potential for smart meters to reduce significantly retailers hedging costs over the longer term. Moreover, to the extent that smart meters lead to higher take-up rate of more cost reflective tariffs (and DLC tariffs in particular) and customer response, then the reductions in retailers' hedging costs will be greater.

8.5 Jurisdictional analysis

Key conclusions

It is highly likely that the costs impact on retailers, whether that be in terms of transitional or recurrent (net) costs, will vary be jurisdiction; not least because the retailers are starting from different points (as Table 3 in Section 6.1.1 indicates).

As Section 8.1.1 discusses these different starting points are highly relevant to the retailers. For example, the response of the retailers (and Retailer Two in particular) to our information request, as outlined in Section 7.1, highlights the extent to which the costs imposed on retailers will vary. As Section 8.1.1 also discusses, however, it is not obvious that these differences are particularly relevant from the perspective of an economic cost benefits analysis. This is because it is likely that retailers will incur these costs anyway, at least over time.[162]

Within this context, it is not obvious why the costs imposed on retailers will vary significantly by jurisdiction. The retailers will undertake similar activities, requiring similar resources which are likely to impose similar costs, except perhaps were state specific regulation imposes certain obligations on the retailers in that jurisdiction.[163]

On the implications for reductions in recurrent costs (i.e. benefits), where they relate to these activities a similar conclusion applies.

Where the reductions in recurrent costs relate to demand side response, however, the benefits for retailers will vary to the extent that there are variations in the:

- More cost reflective prices charged (which are captured in Appendix A), which reflect expected developments in the market regarding prices;
- Assumptions regarding take-up rates; and
- Assumptions regarding demand elasticity.

We understand that the Customer Impacts Workstream discusses the assumptions about elasticity by jurisdiction in its report.

Section 6.6 discusses some of the key jurisdictional differences by jurisdiction in more detail.

[162] This might not be the case if FRC is not introduced in those jurisdictions, but a decision that FRC is not in the jurisdiction's interests may well have implications for whether a smart meter roll-out would pass a cost benefit analysis.
[163] It is worth reiterating that our assumptions on take-up assume such constraints are removed.

9 Implications of the scenarios

This section examines the implications for retailers of the scenarios for a smart meter roll-out In particular, the implications for:

- Retail product offers;
- Other retailer (and customer) impacts; and
- Retailers' recurrent costs.

9.1 The scenarios

The scenarios for the roll-out are:

- Distributor led;
- Retailer led;
- Central communications; and
- Direct Load Control

The Overview Report describes the scenarios in more detail. The key features are that:

- Distributor led - distributors would be obligated to roll out smart meters to all their customers. Each distributor would be responsible for provision of the communications network. Distributors would be responsible for the meter provider ("MP") and meter data aggregator ("MDA") roles across their network(s). They will undertake these roles themselves.
- Retailer led - retailers would be obligated to roll out smart meters to all their customers. Retailers would be responsible for the appointment of MPs and MDAs for their customers. They may appoint themselves to these roles or they may appoint others to these roles. However, under the retailer-led scenario, there is no obligation on distributors to perform the MP or MDA roles. MDAs will have responsibility for the meter communications network. This will be an open access communications network that enables any smart meter to receive/send communications with any MDAs. For the purpose of this scenario it is assumed that this function is not outsourced to the distributors. MDAs would communicate with other relevant market participants through national B2B mechanisms.

  In effect, this model provides retailers with a responsibility for rolling out smart meters to their customers wherever they might be, rather than customers in particular locations, as under the distributor led roll-out. It also provides for competition in the MP and MDA roles.[164]

- Central communications - simular to the retailer led roll-out. This scenario assumes that there is a single shared communications network with open protocols to all meters. In addition, this scenario assumes the provision of a central meter data management system ("MDMS") by NEMMCO, the WA IMO and NT respectively, and these market operators undertake the MDA role. All parties requiring access to meter data would be able to access this data and the assumption is that this would obviate the need for multiple MDMS systems (performing validation, substitution and estimation) within MDAs, retailers and the distributors. However the distributors and retailers would still require interval meter data stores to feed CIS systems for retail and network billing. Specifically, the central MDMS would provide the source data for retailer and network billing, as well as for market settlement.

  In effect, it allows for the possibility of achieving economies in communications network infrastructure over and above that envisaged under the retailer led scenario.

- Direct Load Control ("DLC") – this scenario assumes that there is a mandatory requirement for distributors to offer DLC devices, which are installed on all air conditioners, pool pumps or other relevant devices in constrained and high-growth areas. Distributors are obligated to offer and install the DLC devices if the offer is accepted. This scenario assumes that there is no mandatory roll-out of smart meters.

9.2 Implications of the scenarios

The comments below focus on the first three scenarios.

It is worth noting at the outset that there are very diverse and strongly held views amongst the retailers (and other parties) on the merits of the different options for a smart meter roll-out, with retailers supporting all three scenarios.[165] In the UK, by contrast, the Energy Retail Association recently opted for a regional franchise model, with competition for the right to operate the franchises.[166]

It is also worth noting that the scenarios raise issues that arguably go beyond the merits of different ways of delivering a smart meter roll-out; but rather go to the merits of having competition in metering services. For example, whether:

- Metering services are for practical purposes best considered to be a natural monopoly. For example, both the UK and New Zealand have contestable markets for metering services but

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[164] In practice, it appears that there could also be competition in these markets under the distributor led scenario. So these scenarios capture two differences.

[165] Indeed, many parties would appear to have more strongly held views on this matter, than on the benefits smart meters might provide. This may be instructive since the benefits were less of an issue than the roll-out scenarios (i.e. control over the process).

[166] Energy Retail Association, Response to the Department of Business Enterprise and Regulatory Reform consultation on energy billing and metering. October 2007.

in New Zealand, one government-owned retailer has decided to introduce smart meters as Section 5.3 discusses; and

- Having competition in metering services would have any other costs in terms of retail competition more broadly.

We are only in a position to form a view on these broader questions within the context of our assessment of retail impacts. This is likely to be a too narrow perspective to assess these issues appropriately. Nevertheless, we discuss them briefly below here and we understand the Overview Report addresses these matters in further detail.

9.2.1 Retail product offers

The key issue in relation to retail product offers is whether the different roll-out scenarios are likely to have an impact on the products retailers develop and offer to customers, particularly in relation to more cost reflective tariffs. In principle, the impacts might be on:

- Whether retailers' decide to develop more cost reflective tariffs;
- The types of more cost reflective tariffs the retailers develop and offer; and
- How they market those tariffs and there expected take-up.

Some retailers have argued that a retailer led roll-out would lead to tariff creation with more innovation and effectiveness in critical load reduction than any of the other scenarios. One argued that the retailer led scenario would:

> *"provide the retailer with a competitive advantage to provide customer tailored products and service offerings based on the consumer's response function to elicit a change in consumption in response to price signals."*[167]

While in principle this might be a possible outcome, within the context of a decision to have a mandatory roll-out or not (see below), we are not aware of any evidence to support these assertions.

Indeed, this argument would appear to more relevant to the question of whether there should be a mandatory roll-out, rather than who should lead it. In other words, once it is mandatory then presumably there will be a specification regardless of who leads the roll-out. The critical issue for policy makers is to get that specification right, if there are concerns about particular parties having different incentives in the event that a basic minimum functionality is mandated.

Similarly, it also argued that under the direct load control scenario the retailer benefits will be minimised and less likely to be achieved because it would only enable the capture of transmission and distribution benefits and that this would reduce the profitability and likelihood of retailers offering more comprehensive load management activities which enable the most effective customer response. It is not obvious to us, however, why the direct load control

[167] Confidential submission by a major retailer to our information request.

scenario would preclude using it to capture retail benefits, even if the capacity were 'owned' by the distributors. For example, distributors could lease the right to control the capacity to retailers and would presumably do so, if it was of more value to retailers than distributors.

There would also appear to be some contradiction in arguing that DLC used by distributors would provide minimum benefits to retailers and that it would also reduce the profitability of retail initiatives. Any DLC initiatives will, however, reduce the profitability of other initiatives retailers might undertake to manage wholesale price risk and therefore may 'crowd' them out. Again, however, this argument would appear to more relevant to the question of whether there should be a mandatory roll-out (of DLC in this case), rather than who should lead it.

It is possible that the scenarios could have some implications on access to meter capabilities, innovation and service levels over time if only a minimum functionality is mandated, and potential enhancements emerge that have different benefits for retailers and distributors.

In our view, it is difficult to envisage why the roll-out scenario (if there is to be one) would have a significant impact on the propensity of retailers to offer more cost reflective tariffs, assuming the underlying functionality of the smart meters is the same.

The key reasons are that:

- If smart meters provide functionalities that and retailers believe have value, then we would expect retailers to utilise them regardless of who leads the roll-out; and
- The factors that will determine whether they have value (as Section 6 discusses at length) would not appear to be related to who leads the roll-out.

If the functionality of the smart meters varies by scenario then the benefits might vary, but this is a separate issue (see below). Even if they did vary we would expect any differences in respect of retail product offers as they relate to more cost reflective tariffs to be modest. For example, manually read interval meters allow for the introduction of ToU and CPP tariffs (although the latter may be somewhat less effective due to the delay in getting information back to the customer on the relationship between their behaviour and their energy use). If the retailers saw substantial benefits in these types of tariffs, a lower functionality could achieve a significant proportion of the benefits, and you might expect to observe retailers pursuing these benefits.

In addition, as we understand it, many of the additional functionalities of smart meters require discretionary expenditure by the retailer outside the meters themselves. This means that the retailers will only invest in these functionalities if the benefits outweigh the costs. If this is the case, then any lost opportunities in relation to who undertakes the roll-out will be modest.

Will the scenario impact on functionality?

The more relevant question may therefore be whether the different delivery scenarios might impact on the functionalities of the meters. Part of the objective of the current process is to ensure that this is not the case. If this happened, there may be some impact on the retailers' ability and or incentive to introduce new products, where those products are reliant on the functionality of the meter itself.

Given the current process, however, the best way to address this issue would appear to be to ensure that the retailers, who ultimately are the party who have to sell most of the benefits to customers, play a key role in determining what functionalities the smart meters should include.

9.2.2 Other retailer (and customer) impacts

The issue in this case is whether the different roll-out scenarios would have an impact on the other products retailers might develop and offer to customers.

In principle, that impact might be on the range of products the retailers offer and /or the effectiveness with which they can offer them.[168] Some retailers have argued that a retailer led roll-out would lead to more innovation in product development generally. One has suggested that in the large user market, retailers have developed more innovative metering solutions which have lowered costs and led to better outcomes for customers.

To the extent that the more innovative products relate to the functionality of the smart meter, then, again, we would again expect retailers to utilise those functionalities regardless of who leads the roll-out, if they see value in them.

It seems likely that, with distributors controlling all aspects of the process, certain rigidities could occur in the provision of the associated services, which limit the effectiveness with which retailers can operate (e.g. the timely and effective provision of information and the services retailers need to compete with as much autonomy as possible). How material these interferences would be is, however, more difficult to establish.

This is, however, true of regulation generally and therefore goes to the broader question of having it in preference to competition.

Competition versus monopoly in metering services and ownership

Much of the debate between the scenarios would appear to be really about this underlying question. This issue goes to whether metering services is a natural monopoly (or at least has significant economies of scale) versus the extent to which competition can result in lower costs and more innovation in the provision of these services. It also goes to whether having competition in metering services might impact on the competitiveness of the broader retail market.

These are significant questions in their own right, which the Overview Report addresses in some detail.

We offer the following observations from a retail impacts perspective.

[168] There could also be innovation in functionality itself over time, rather than just of the use of functionality. Offers other than retail electricity products might be developed by retailers.

In principle, the wider the range of services over which the retailers can compete, the larger the benefits retail competition ought to be able to provide.[169] Given the limited services and margins on which retailers compete currently, there would appear to be considerable merit in trying to expand that range as far as is possible. Moreover, in our view, the onus of proof ought to be on those parties that are arguing that regulation should be preferred to competition.

In practice, the evidence appears to be less clear.

There are at least two countries (e.g. the UK and NZ) that have fully contestable markets (FRC and no price regulation) and competition in metering services.

We are unaware of evidence to suggest that retailers in those jurisdictions are offering substantially different services by virtue of having competition in metering services. For example, as far as we aware, there are no retailers offering to install smart meters as part of energy service packages for domestic users (e.g. offering to amortise the cost of the meter over the contract period).[170]

The NZ evidence suggests that competition was not very effective prior to introducing profiling mainly because of the constraints that metering issues placed on switching. In other words, it created a barrier to switching by requiring meter churn.

NZ was one of the first countries to introduce full retail competition (i.e. down to the domestic customer level) in its electricity industry. Domestic customers have had choice since April 1993. In practice, however, very few domestic customers took the opportunity to switch retailers because it typically required the use of an interval meter. In July 1998 the NZ Government announced a package of reforms as part of the *Electricity Industry Reform Act 1998*. This required the corporate separation of network and energy businesses and the development of low cost switching arrangements to enable consumers, for whom interval meters were not yet an economic alternative, to change retailers. At the time the NZ Government stated:

> "Barriers to retail competition: Owners of local electricity companies have the incentives (sic) to deter competition in retailing by: failing to provide low cost systems to enable customers to switch retailers;…[171]

As a result, in April 1999 the Government introduced deemed profiling with a switching protocol. This coincided with competition becoming much more widespread.

This suggests that the benefits of having competition in metering services may be modest but that it can in certain circumstances impact on the degree of competition in the broader market. The New Zealand experience would suggest that requiring a meter change on retailer switch (particularly on entry as a contestable customer) can create a barrier to switching, but says

[169] This implies that including the functionality to communicate with a Home Area Network could increase the scope for competition, but only if it is believed that having competition in metering services would not produce meters with this functionality. This may be possible in the case of a distributor led roll-out and if this functionality is not mandated.

[170] This may, however, also say something about the value of smart meters themselves.

[171] http://www.med.govt.nz/templates/MultipageDocumentPage____5652.aspx

nothing about the churn effects of retailer responsibility for meters *per se* once meters are in place.[172]

It does show, however, that retail competition, because of the limited benefits on offer, is susceptible to actions that inhibit the ability of retailers to motivate customers to shift. Even if the risk of influencing this motivation is low, the cost if it occurs is likely to be high in terms of retail competition.

Within the context of this study, we are not in a position to form a firm view on these matters. We note, however, that the practical challenges of effectively implementing a mandatory smart meter roll-out are likely to be substantial, and not dissimilar in scale to the challenges of implementing FRC itself. There would appear to be similar risks that the process could impact on the broader market if not managed appropriately.

9.2.3 Retailer recurrent costs

This key issue in relation to retail recurrent costs is whether the different roll-out scenarios are likely to have an impact on the total costs of the roll-out and the allocation of those costs between the various parties.

As we understand it, the scenarios are likely to have an impact on both the quantum of costs and who bears them.

This is, however, predominantly an issue for the transitional costs and we understand that the Transitional Costs workstream captures these costs. To the extent that the transitional costs fall more heavily on retailers, then their recurrent IT operational costs will also increase, which they also capture.

Beyond that, however, it is less obvious that the scenarios will have a material impact on the retailers other recurrent costs unless it impacts on the broader market as we discuss above (e.g. leads to meter churn and higher costs and or complexity of transferring data and customers).

If, however, the roll-out only occurs in certain jurisdictions (or happens over quite different timeframes) then this is likely to have a significant impact on retailers' costs due the cost of maintaining different systems and business processes for the relevant jurisdictions. It is also likely to have some impact on their interest in pursuing the benefits that smart meters might provide (as Section 5.5.1) notes.

We are not in a position to estimate the additional costs that retailers might incur in these circumstances given the information constraints that exist, but we would not expect them to be substantial. The real costs in these circumstances are likely to be borne by customers in terms of the effectiveness of competition if the scenario hinders the switching process. It is possible that regulation could be used to manage this situation but the effectiveness of using regulation in these circumstances is likely to be questionable.

[172] As discussed, we are aware that one New Zealand government-owned retailer is rolling out smart meters. We further understand that the two largest retailers in New Zealand may have recently released a Request for Proposals to supply up to one million smart meters but we have not been able to verify the details.

9.3 Other alternatives

There may be other feasible roll-out scenarios which could have some advantages. In particular, a possible alternative is a rollout where the timing and scope of investment was determined by the market, but with some encouragement to early action through a government incentive. Such a rollout could operate in the following way:

- Governments indicate that they are prepared to subsidise (via a levy on network tariffs if necessary) a roll-out of smart meters (of at least a given functionality);

- The roll-out will be undertaken in several tranches of particular size, defined by the amount of subsidy the Government is prepared to provide. This could involve subsidies in each jurisdiction if necessary;

- The Government calls for tenders for the subsidy from parties who are prepared to commit to getting the greatest number of final customers (and/or load) onto more cost reflective tariffs (of specified varieties), that require the use of a smart meter or DLC capability;

  Alternatively, the Government could call for tenders from those who are prepared to accept the lowest subsidy to roll-out a specified number of smart meters (or DLC capability) and to get a specified number of customers onto more cost reflective tariffs.[173]

- The Government would assess the tenders and award the subsidy to the consortia that can commit to providing (and are prepared to underwrite) the required outcomes. Penalties could apply in the event that the consortia did not subsequently achieve those outcomes.

- We think it is reasonable to expect that distributors and retailers would identify the areas where it is likely to be the most feasible to achieve these objectives and develop consortia to deliver the outcome and share the benefits.

Under this approach market participants would have to decide:

- On the technology to achieve these objectives and how best to acquire it. Smart meters and DLC would compete on an equal footing;

- On how to get customers on to more cost reflective tariffs; and

- How to optimise the sharing of benefits between distributors and retailers, to the extent that this lead to the best outcomes.

Another alternative is to provide per unit subsidies for every customer a retailer can attract onto smart meters and/or more cost reflective tariffs, although it might be more difficult under these circumstances to achieve economies of scale in smart meters costs.[174]

There would be a range of complexities and costs associated with this approach but we believe it is an approach that it may well be worth considering in further detail. We understand that this

[173] It might also be possible to specify some equity outcomes in terms of who gets the smart meters.
[174] Although the subsidies per customer could increase the higher the market penetration the retailers achieve.

approach has similarities to that now advocated by the Energy Retailers Association in the UK, as we discussed in section 9.2.

In our view there would be considerable merit in policy makers considering more market-based approaches, if they want to optimise the effectiveness of a smart meter roll-out. This is because it provides an opportunity to learn by doing, whilst hastening the uptake of smart meters compared to the status quo.

A Assumed retail tariffs with smart meters

This appendix summarises the assumptions we propose in regard to the retail products retailers might offer residential and small business customers in relation to more cost reflective tariffs and our approach used in determining these products.

For the purposes of Phase 2 we developed four tariff products by customer segment and State:

- A flat tariff product was developed based on those currently offered by retailers;
- A Time of Use (ToU) product was developed to differentiate between peak, off-peak and (if required) shoulder periods;
- A Critical Peak Price (CPP) product was developed to allow for critical peak pricing; and
- A Direct Load Control (DLC) product was developed to allow for demand controlled products.

In deriving the tariffs we have made the following simplifying assumptions:

- No allowance was made for any changes to network tariffs and their potential pass through implications on retail tariffs; and
- The tariffs have been derived pre any adjustment for the cost of carbon. The impact of the cost of carbon was derived by CRA International and would be a direct pass through to consumers. This assumption is detailed later in this appendix

A.1 Approach

In determining the products we utilised the following approach:

- The tariffs were developed on the basis of revenue neutrality per jurisdiction;
- Where possible, the time definitions of peak, off-peak and shoulder periods were based on those currently used by the major incumbent retailer within each jurisdiction;
- The definition of the CPP parameters were based on discussions with retailers relating to similar products currently being trialled;
- The discount offered for DLC products was based on the likely benefits available to retailers (primarily through lower hedging costs).
- The revenue neutrality calculation was undertaken on the following basis:
  - A total revenue pre smart meters was calculated using current flat tariffs and an estimate of total volume as determined by NERA;

- A total revenue post smart meters was calculated using:
  - An assumed take up by product (ToU, CPP and DLC);
  - An estimate of total volume and load profiles as determined by NERA;
- The tariff parameters post smart meters were determined to balance total revenue pre smart meters to total revenue post smart meters; and
- Where the incumbent retailer offered a ToU product the derived rates we have used were kept as close as possible to the actual rates within currently offered products as possible.

The following sections detail our proposed retail products and the key assumptions used in deriving the associated tariffs.

A.2 Potential Time of Use products

A.2.1 Residential

The following table (Table A.1) summarises the rates we propose retailers may offer in developing a ToU product for residential consumers, for comparison purposes the table also contains a flat (non ToU) rate based on those currently offered by retailers.[175]

Table A.1

Indicative time of use tariffs					
ToU - rates (c/KWh GST exclusive)					Flat comparison rate (c/KWh GST exclusive)
State	Peak	Off Peak	Shoulder 1	Shoulder 2	Flat
WA	24.70	8.00	14.95	12.00	13.94
NSW / ACT	24.59	7.58	8.72	N/A	12.22
QLD	23.18	7.48			14.00
Vic	24.89	7.52			13.46
SA	25.40	8.53			17.00
TAS	21.20	8.00	11.00		14.00
NT	17.14	12.33			15.01

[175] In practice, NSW and the ACT would have separate tariffs post a full roll-out (as indeed would all retailers), but for practical purposes it was considered with NSW because the market benefits are calculated this way.

The following table (Table A.2) summarises the definitions of the time periods associated with the ToU products.

Table A.2

ToU - time period definitions				
State	**Peak**	**Off Peak**	**Shoulder 1**	**Shoulder 2**
WA	Summer: M-F 11am-5pm Winter: M-F 7am-11am, 5pm-9pm	All days 9pm-7am	Summer: M-F 7am - 11am, 5pm - 9pm Winter: M-F 11am - 5pm	Weekends 7am - 9pm
NSW / ACT	M-F 2pm - 8pm	All days 10pm - 7am	All other times	
QLD	M-F 7am - 9pm	All other times		
Vic	M-F 7am-7pm	All other times		
SA	M-F 7am-9pm	All other times		
TAS	M-F 6:30am - 11am M-F 4:30pm - 10pm	All days 10:30pm - 6:30am	All other times	
NT	All days 6am - 8pm	All other times		

A.2.2 Small business

The following table (Table A.3) summarises the rates we propose retailers may offer in developing a ToU product for small business consumers, for comparison purposes the table also contains a flat (non ToU) rate based on those currently offered by retailers.

Table A.3

Indicative time of use tariffs					
ToU - rates (c/KWh GST exclusive)					**Flat comparison rate (c/KWh GST exclusive)**
State	Peak	Off Peak	Shoulder 1	Shoulder 2	Flat
WA	22.40	10.12			15.50
NSW / ACT	25.10	8.75	12.50		14.00
QLD	25.70	9.33			17.30
Vic	22.10	9.94			16.50
SA	23.50	10.00			17.40
TAS	20.10	8.20			14.00
NT	20.00	12.58			17.50

The following table (Table A.4) summarises the definitions of the time periods associated with the ToU products.

Table A.4

ToU - time period definitions				
State	**Peak**	**Off Peak**	**Shoulder 1**	**Shoulder 2**
WA	Summer: M-F 8am-10pm Winter: M-F 9am - 11pm	All other times		
NSW / ACT	M-F 2pm - 8pm	All other times	M-F 7am - 2pm M-F 8pm - 10pm	
QLD	M-F 7am - 9pm	All other times		
Vic	M-F 7am-11pm	All other times		
SA	M-F 7am-9pm	All other times		
TAS	M-F 7am- 8pm	All other times		
NT	All days 6am - 8pm	All other times		

A.3 Potential Critical Peak Price products

The following table (Table A.5) summarises the rates we propose retailers may offer in developing a critical price product for residential consumers. As previously discussed we have assumed that retailers are unlikely to develop CPP products for small business consumers.

Table A.5

Indicative Criticial Peak Price product					
	Rates (c/KWh GST exclusive)				
State	Peak	Off Peak	Shoulder 1	Shoulder 2	Critical Peak Price
WA	24.70	7.60	14.20	11.40	98.80
NSW / ACT	24.59	7.20	8.28	N/A	122.95
QLD	23.18	7.11			115.90
Vic	24.89	7.14			124.45
SA	25.40	8.10			127.00
TAS	21.20	7.60	10.45		84.80
NT	17.14	11.71			68.56

We developed the CPP product rates based on discussions with retailers and the feedback from their current product trials. Our approach can be summarised as follows:

- The ToU rates for shoulder and off peak were developed by applying a 5% discount to the rates from Table A.1, no discount was applied to the peak price. The discount incorporated reflects the need to provide customers with an incentive to utilise this product in preference to the standard ToU product; and

- The CPP rate was set as either four (4) or five (5) times the peak period rate. This is based on retailers' experience from their current trials that have observed diminishing returns (in relation to demand response) for CPP's in excess of 5 times the peak rate. We would expect any load control tariffs to provide similar price variations; although the way those benefits are shared with customers might differ.

The parameters assumed in relation to the nomination of CPP periods were determined based on retailers current product offering and can be summarised as follows:

- Retailers or distributors can nominate up to 12 CPP days in any one year.
- The CPP period would be for a duration of 4 - 5 hrs during the peak time of day (approx 12 - 4 or 5pm); and
- Retailers must provide customers 2 – 24 hours notification prior to any CPP period.

A.4 Potential Direct Load Control Products

The rates we propose retailers may offer in developing a DLC product for residential consumers are assumed to be identical to the flat rates as detailed in Table A.1. As previously discussed we have assumed that retailers are unlikely to develop DLC products for small business consumers.

The level of discount that retailers are likely to offer residential consumers is based on the level of benefit available to retailers through a reduction in hedging costs through demand response during peak periods.

We have assumed that the discount will be up to approximately 10% of the annual bill or $75 - $100 per annum.

A.5 Key assumptions

In applying a revenue neutral approach to developing the potential tariffs two key categories of assumptions were required. The categories are as follows:

- Annual volume and load profiles; and
- Product take-up rates.

As previously discussed the tariffs detailed above are exclusive of the cost of carbon, the assumed carbon cost impacts on wholesale energy prices has been derived by CRA International and is detailed later in this appendix.

Different ToU and CPP prices would produce different outcomes in relation to demand reduction. However, the outcomes in terms of demand reduction are much more sensitive to product take-up rates than they are to what are likely to be relatively small changes in these tariffs under different assumptions. This is because of the generally low price elasticity of demand.

A.5.1 Annual volume and load profile

The annual volumes and load profiles used in deriving the tariffs were based on half hourly load forecasts (by State) provided by NERA. We grouped the half hourly consumption into the time periods described above and the tables below summarise the final assumptions used in this regard:

*Table A.6 – Residential Annual Volume Assumption**

Annual Volume Break-Down (GWh)							
	NSW	NT	QLD	SA	TAS	VIC	WA
Critical Peak	433	6	298	124	63	228	96
Peak	5,704	332	12,617	3,533	1,869	6,403	2,316
Off Peak	7,481	289	18,698	3,868	1,416	13,218	4,115
Shoulder 1	13,382	-	-	-	1,863	-	2,279
Shoulder 2	-	-	-	-	-	-	2,077

*- NSW includes ACT

*Table A.7 – Small Business Annual Volume Assumption**

Annual Volume Break-Down (GWh)							
	NSW	NT	QLD	SA	TAS	VIC	WA
Critical Peak	256	7	215	56	48	167	113
Peak	4,069	435	9,687	1,463	1,762	6,681	5,089
Off Peak	7,545	251	10,381	1,293	1,902	5,837	6,667
Shoulder 1	5,673	-	-	-	-	-	-
Shoulder 2	-	-	-	-	-	-	-

*- NSW includes ACT

A.5.2 Product take up rates

The rationale for the product take-up rates used in deriving the tariffs is discussed in Section 6.1 to 6.5 of the report. The tables below summarise the final assumptions used in this regard.

For residential tariffs we have provided the assumptions on two bases:

- If smart meters have DLC related functionality (i.e. functionalities 15 and 16); and
- If smart meters have no DLC related functionality.

Table A.8 – Residential Product Take Up Rates (smart meters with DLC functionality)

Product Take Up Rates - with DLC functionality							
	NSW	NT	QLD	SA	TAS	VIC	WA
Tariff #1: Flat	*55.0%*	*55.0%*	*55.0%*	*55.0%*	*55.0%*	*55.0%*	*55.0%*
Tariff #2: TOU	*30.0%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*
Tariff #3: TOU + CPP	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*
Tariff #4: DLC	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*
TOTALS	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*

Table A.9 – Residential Product Take Up Rates (smart meters with no DLC functionality)

Product Take Up Rates - no DLC functionality							
	NSW	NT	QLD	SA	TAS	VIC	WA
Tariff #1: Flat	57.5%	57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Tariff #2: TOU	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%
Tariff #3: TOU + CPP	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Tariff #4: DLC	-	-	-	-	-	-	-
TOTALS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A.9 – Commercial Product Take Up Rates

Product Take Up Rates							
	NSW	NT	QLD	SA	TAS	VIC	WA
Tariff #1: Flat	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Tariff #2: TOU	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Tariff #3: TOU + CPP	-	-	-	-	-	-	-
Tariff #4: DLC	-	-	-	-	-	-	-
TOTALS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

A.5.3 Cost of Carbon

As previously discussed the tariffs detailed above are exclusive of the cost of carbon, the assumed carbon cost impacts on wholesale energy prices has been derived by CRA International. These impacts would be treated as a pass through charge by retailers and would be in addition to the tariffs.

The table below summarises the final assumed cost of carbon impacts on wholesale energy prices:

Table A.9

Cost of Carbon (c/KWh)							
Year	NSW	NT	QLD	SA	TAS	VIC	WA
2012	1.23	1.12	1.19	0.89	0.01	1.81	1.06
2013	1.23	1.10	1.17	0.83	0.01	1.80	1.06
2014	1.23	1.10	1.14	0.80	0.01	1.80	1.05
2015	1.64	1.45	1.48	0.93	0.02	2.20	1.40
2016	1.64	1.48	1.44	0.71	0.01	2.08	1.35
2020	1.53	1.45	1.26	0.33	0.01	1.92	1.30
2025	2.23	1.79	1.84	0.86	0.02	2.48	1.44
2030	2.68	1.82	2.27	0.71	0.02	2.36	1.85