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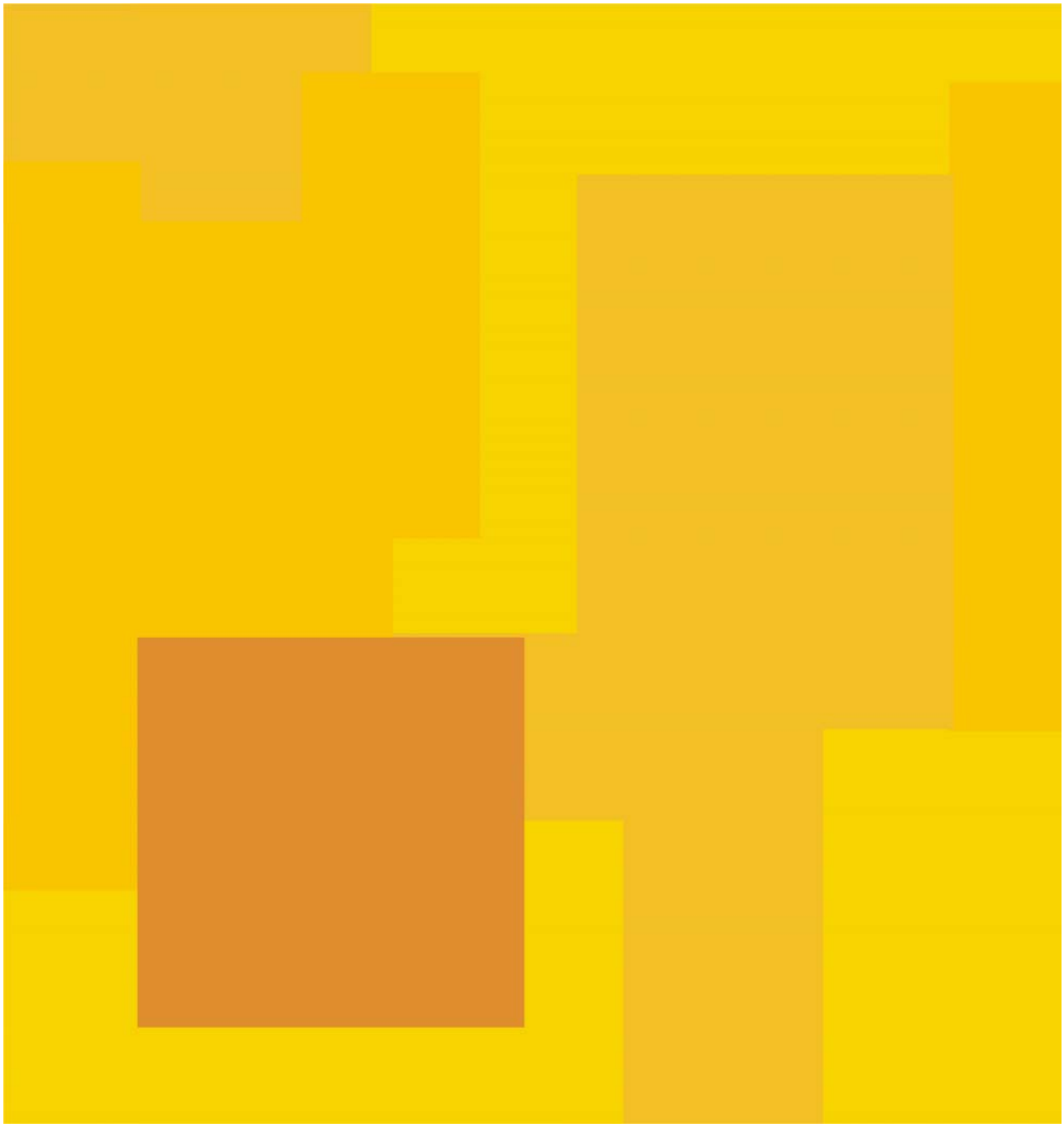
EnergyAustralia Comments on cost-benefit analysis of smart metering and direct load control; Final report for the Ministerial Council on Energy Smart Meter Working Group

April 2008



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Introduction

This document provides EnergyAustralia's detailed comments on the final report for the Ministerial Council (MCE) on Energy Smart Meter Working Group on the cost benefit analysis of smart metering and direct load control, and supporting documents (henceforth collectively referred to as the CBA). A number of regulatory and policy matters arise from the CBA which will be addressed in EnergyAustralia's response to the Regulatory Impact Statement (RIS), issued on 8 April 2008 by the Standing Committee of Officials of the Ministerial Council on Energy.

Key points

EnergyAustralia considers the CBA findings confirm the existing MCE policy in support of a mandated, accelerated, deployment of smart metering to the mass market. EnergyAustralia supports the key CBA conclusion that, overall, smart metering benefits are likely to exceed transitional and ongoing operating costs. Thus, smart metering has the potential to deliver significant long term benefits to the electricity industry, consumers and Australia, and thereby advance the National Electricity Market objective. EnergyAustralia appreciates that, while there is some uncertainty and potential variability in the eventual costs and benefits of a national rollout, there are strong indications that, overall, and for most customers, the benefits are likely to exceed costs.

EnergyAustralia agrees that smart metering benefits have the potential to advance the MCE policy objectives to:

- reduce peak demand, promote energy efficiency and greenhouse benefits;
- promote consumer enablement and provide a platform for other demand side response measures and new technologies;
- promote retail competition and improve pricing outcomes for most vulnerable customers; and
- promote efficiency and innovation in business operations.

These objectives are facilitated by a smart metering environment through more timely and accurate market settlement, and tools for customers and retailers to respond effectively to this data.

EnergyAustralia notes that actual costs and benefits under a mass deployment of smart metering will be highly sensitive to the detailed content of the national minimum mandatory functional specification announced by the Ministerial Council for Energy (MCE) at its meeting in December 2007 (henceforth referred to as the 'functional specification'). EnergyAustralia considers that some of the uncertainty over net benefits acknowledged in the CBA can be effectively managed by developing the detailed functional specification, within policy guidelines as determined by MCE, through co-regulatory arrangements, including the Technical Working Group process established by MCE in December 2007. This point will be discussed in greater detail in EA's submission to the RIS published on 8 April 2008. At this time, however, EnergyAustralia notes that based on its findings, it does not support the mandatory inclusion of in-home displays in the functional specification.

EnergyAustralia has assessed the CBA findings, to the extent possible given uncertainty over the detailed functional specification and available knowledge of existing and emerging technical solutions. While it does not challenge the overall findings of the CBA, EnergyAustralia does not agree with the assessment of individual benefits. Its key concerns are that:

- retail market efficiency benefits are omitted or under-estimated and as a result the level of demand response may need to be reviewed;
- there are methodological inconsistencies that result in demand response benefits being omitted or incorrectly estimated; however

- the Network component of demand response benefits may have been over-stated.

The key differences between EnergyAustralia's assessment and the CBA in relation to its network area are as follows:

- some transitional and recurrent advanced metering infrastructure (AMI) costs, and the cost implications for retailers, appear to have been omitted or under-estimated;

- the avoided meter cost and network businesses efficiency benefits appear to have been over-estimated;

- the overall demand response benefit appears to have been under-estimated (but within this category the Network component appears overstated); and

- retail market competition and consumer benefits also appear to have been under-estimated.

Introduction

This submission has two parts:

a) In part one, EnergyAustralia puts forward its views on smart metering costs and benefits, based on its mass market deployment of manually read interval meters, its strategic pricing trials and its AMI technology trials. This includes a substantial discussion of the key rationale for smart metering relative to accumulation metering – to address current major inefficiencies in retail markets.

b) In part two, EA comments on the overview report (stream one) identifying areas where costs and benefits are in EA's view incorrectly estimated or omitted. Notwithstanding these concerns, EA considers the CBA supports a continuation of the existing MCE policy in support of an accelerated mass market deployment of smart metering nationally. While it has reviewed all the supporting reports, it does not propose to comment on them individually. Where appropriate, comments on the supporting reports are made in the context of the overview report.

Part one: Context for EnergyAustralia comments

EnergyAustralia

EnergyAustralia owns and operates Australia's largest electricity distribution network by customer numbers and business size and is a large retailer of electricity and gas, with around 1.5m customers. It also owns Testing Certification Australia (TCA), which is a major supplier of metrology and meter data related services in the NEM.

Interval metering

EnergyAustralia is making substantial investments to roll out manually read interval metering to all customers in its network area consuming over 15MWh per annum and to all customers on a new and replacement basis. The expenditure for this rollout was approved by the jurisdictional regulator (IPART), largely in recognition of the value of improving the efficiency of retail markets. EnergyAustralia's manually read interval meter rollout began in 2004 and it now has over 270,000 customers with manually read interval meters, of which 127,000 are for customers using less than 15MWh per annum.

At present over 132,000 mass market retail customers in EA's network area are billed on time of use retail prices (although these are not quite cost reflective retail prices or CRRP). Relative to regulated flat retail tariffs, the majority of customers are better off under regulated time of use retail tariffs.

EnergyAustralia recognises that the limited deployment of manually read interval meters does not capture the potential significant incremental benefits of an accelerated smart metering program. Accordingly, it is undertaking pricing studies and smart metering technology trials in order to improve its understanding of smart metering costs and benefits.

Strategic pricing studies

EnergyAustralia Network has undertaken a two-year pricing study known as the Strategic Pricing Study (referred to as the SPS). Customers began to join the study from early 2006. Results show potential to reduce electricity demand on peak days.

- On average over the four Dynamic Peak Pricing (DPP) events called in summer 2007, customers in two key trial groups reduced peak consumption by around 27%.
- There is little evidence that customers are shifting consumption to either the shoulder or off-peak periods in response to DPP events during summer.
- The conservation effect dominates load shifting behaviour on DPP days, showing significant daily energy reductions of around 6-7% for the DPP products on DPP days.
- There was very limited difference in demand response between the DPP in-house display (IHD) and non IHD group, indicating IHD's may not have a material effect on the demand response.
- Customers with air conditioners had a greater ability to respond to DPP events, mainly through conservation during the afternoon peak.

AMI/smart metering

EnergyAustralia is advanced in trialling and investigating smart metering on its own network. It currently operates around 7,000 meters on a trial basis under its Advanced Metering Infrastructure (AMI) pilot project (excluding the Home Area Network).

EnergyAustralia's experience so far has shown there are numerous operational challenges with implementing smart metering and AMI. These have led us to recognise the need for caution in estimating the costs, benefits, and capabilities of smart metering, and in estimating the extent to which the market and customers will respond to price signals and new retail products and services.

Evaluating smart metering costs and benefits

Potential benefits from smart metering can be divided into:

- Retail market efficiency improvements enabled by interval consumption meter data resulting in:
    - avoided generation and network capacity, and generation fuel costs, to the extent consumers forego electricity consumption, including at peak price periods;
    - reductions in greenhouse gas emissions to the extent there is a reduction in consumption in overall (taking into account the relative emissions intensities of peak and off-peak generation);
- operational efficiencies (network and retailer);
- avoided meter and load control replacement costs;
- service improvements and new products; and
- improved retail market competition.

By contributing to the efficiency of the supply chain, and reducing substantial mismatches between price and cost, these benefits are in the long term interests of consumers.

Retail market efficiency

At present retail electricity markets in Australia (and in most other countries) are not efficient. The problem is that wholesale prices paid by retailers for delivering electricity for individual consumers do not correspond to wholesale costs. As a result, it is likely that excessive resources are being applied to electricity infrastructure and generation fuel. The result is an opportunity cost – resources are diverted from alternative uses that are valued more highly. The opportunity cost occurs in respect to the highest (or peak), not the average, cost of generation fuel and generation/network capacity. The opportunity cost extends to greenhouse emissions reduction.

Any reduction in the opportunity cost, for example due to customers opting to forego consumption when faced with the CRRP, is an economic gain, not a loss to society, as indicated in the CBA. This is because electricity would no longer be supplied under conditions where its marginal cost is greater than its marginal value to consumers.

Australian retail markets are currently not fully efficient due in part to the use of accumulation meter data, not interval meter data, for a large proportion of the market settlement. Settlement for mass market customers with accumulation meters uses deemed consumption profiles, not actual consumption data.

The deemed profile represents deduced consumption for every half hourly trading interval for each network area after all measured consumption (including for street lighting) has been deducted, less an estimate for transportation losses. In some jurisdictions, such as NSW, the deemed profile is referred to as a net system load profile (NSLP), from which controlled load (for example for electric hot water) has also been deducted.

NSLPs are calculated by NEMMCO in the NEM. Deemed profiles are applied to market settlement between retailers and:

1. NEMMCO for physical energy (spot market);
2. energy trading counterparties (for example generators) for settlement of financial hedges against physical energy prices; and
3. with local electricity distribution networks for electricity transportation services (both transmission and distribution).

NSLPs represent the average or deemed consumption pattern of large groups of consumers without interval meters. This means that all retailers (both first and second tier) pay the same wholesale price for the delivered energy, irrespective of the actual cost of the delivered energy for individual customers, or groups of customers.

Figure 1 shows the error in calculating the core costs of goods sold (COGS)[1], being both energy and network purchase costs, based on deemed (or average) COGS instead of actual COGS based on interval meter data.[2] The flat line represents the deemed (or average) cost, while the red line represents the "true" cost.

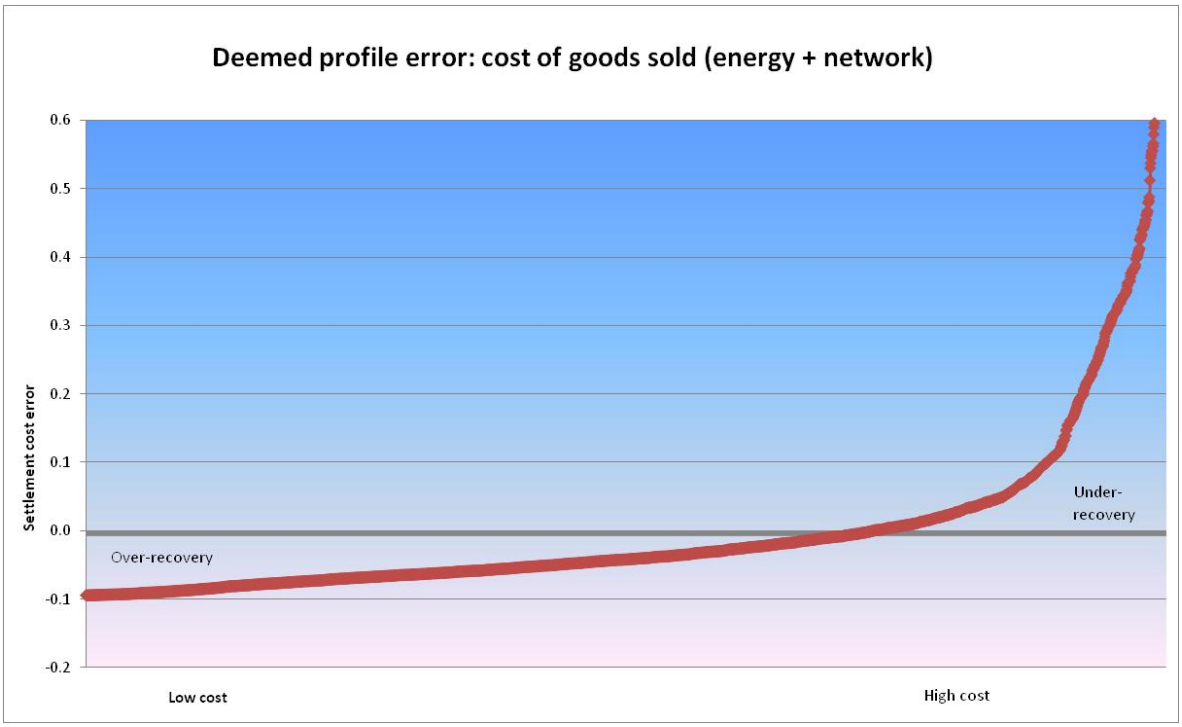

Figure 1

[1] The core costs of goods sold (COGS) in this example relates to core total wholesale energy purchase costs plus network (distribution and transmission costs). Some other aspects of COGS are not included, such as the purchase of NSW Greenhouse Abatement Certificates and Mandatory Renewable Energy Certificates. As these items are also settled against the deemed profile, there is no change to the distribution presented above, but the total value of the under or over-recovery would increase. Core COGs represents more than 80% of the total retail price.

[2] The data are drawn from a representative sample of approximately 200,000 customers in EA's network with interval metering. Customers are ranked according to the cost of supply based on interval data settlement going left to right from the lowest to the highest cost. Because of the commercial sensitivity of the data it has been normalised. In this example, there is no difference between overall retail settlement prices and hence the under and over-recoveries cancel each other out. Wholesale electricity prices in the two cases are identical and relate to the NSW physical market. 2007 NSW pool price data was not used but if they were the settlement error would be greater than represented here because of the high incidence of high pool price events. Wholesale network prices in the two cases are different in that in the accumulation data example flat network prices are used whereas under the interval data example EnergyAustralia's time of use network prices are used.

For 75% of customers, under deemed settlement, the retailer is subject to an over-recovery relative to actual cost. However, for the remaining 25% of customers, the retailer is subject to an under-recovery. The two sides cancel each other out in total.

Note that the graph refers to the basis on which customers are settled in the wholesale market by retailers, and does not reflect cross subsidies between retail consumers based on actual retail tariffs. In EnergyAustralia's case, as a large number of EnergyAustralia customers have transferred to time of use retail prices, the graph does not represent the actual cross subsidy between EnergyAustralia customers.

The major cause of the discrepancy between actual and deemed cost is variations in wholesale energy costs, not variations in wholesale network costs. EnergyAustralia has estimated that, on a per MWh basis more than 75% of the differential in COGS pricing is attributable to wholesale market pricing and less than 25% relates to network pricing.

The average value of peak generation is substantial. In a typical year peak generation prices (over $300/MWh) occur for less than half of one percent of trading intervals (approximately 2 days a year) and account for only 0.65% of annual energy consumption. However, they typically represent around one third of the total wholesale cost of electricity. In 2007, the average wholesale physical price was $46.69/MWh but the average wholesale peak price was $1,926.28/MWh.

Operational efficiencies

Smart metering offers the potential of substantial operating efficiencies across the supply chain. The types of benefits have been described in detail in the CBA.[3]

Avoided meter and load control replacement costs

Smart metering would replace existing meters and load control infrastructure, avoiding the need for costly replacement programs. These avoided costs have been described in detail in the CBA.[4]

Service improvements

EnergyAustralia supports the findings in the CBA report that smart metering also offers potential for service improvements across the supply chain.

Retail competition implications

Market settlement based on interval data will result in better price signals to retailers and encourage them to take measures, both price and non-price, that contribute to a reduction in peak consumption and possibly also overall consumption by end-users. The majority of consumers who are contributing to the over-recovery identified above have an incentive to switch to retail contracts that offer price reductions, possibly including time related charging. This will lead to an unwinding of transfers between customer groups over time, provided retail market competition is effective (including consumer information).

Retailers would be able to offer price reductions to many customers without detriment to retail gross margins. As noted earlier the majority of customers would benefit from these arrangements. The removal of retail cross subsidies would be expected to lead to more cost reflective retail prices for high cost customers and provide signals for appropriate consumer responses.

[3] See Cost Benefit Analysis of Smart Metering and Direct Load Control: Final Overview Report, by NERA Economic Consulting, chapter 6.
[4] Ibid.

Part two: comments on overview report and modelling

Introduction

This part provides EnergyAustralia's comments on the *Cost Benefit Analysis of Smart Metering and Direct Load Control; Final Overview Report* (stream one), dated 22 February 2008. The comments follow the structure in the report and the section numbering of that report is used for ease of reference.

Methodology and approach (section 3)

EnergyAustralia is concerned that the methodology adopted by the consultants does not address the issue of inefficiencies in retail markets, which form the basis for its current (manually read) deployment of interval meters with the approval of the relevant regulator. This omission results in substantial shortcomings in the analysis and is a key reason the modelling results should be treated with extreme caution unless substantially modified.

Inconsistencies in application of methodology

Another key concern with the methodology relates to inconsistencies in the treatment of benefits between different stakeholders. This matter is explained in more detail below.

Assumed functionality (section 3.2)

EnergyAustralia notes that the proposed national minimum functionality is not defined in detail and that this constrains the accuracy of any estimates of costs and benefits. On the other hand, provided the functional specification is not locked in prematurely, the eventual functional specification that is implemented can be modified to ensure that the incremental benefit of an individual feature does in fact exceed its cost. Accordingly, EnergyAustralia considers that the uncertainty acknowledged in the CBA should not cause policy makers undue concern, provided they recognise the importance of leaving open the detailed definition of the smart metering functional specification.

The focus of the CBA is the smart or Advanced Metering Infrastructure (AMI) systems that are developed and operated by various market participants. These individual AMI systems will form an overall Smart Metering Information System (SMIS) that will operate in participating jurisdictions. Because of the disaggregated nature of the major Australian energy markets, EnergyAustralia considers there are strong reasons for developing a single SMIS, nationally.

SMIS refers to the end to end system for the implementation of smart metering and retail market settlement. It includes: customers, multiple metering services providers and communications systems; multiple network and retailer systems and possibly more than one market information system, nationally. The SMIS represents the collective of all the individual AMI and related smart metering systems developed by individual market participants and metering service providers. The SMIS will encompass a large number of participants, as summarised in the table below.

Participants in Smart Metering Information System (SMIS)	
Party	*Approximate number*[5]
Customers	Circa 8 million
Meter vendors	10
Metering service providers	16
LNSPs	16
Retailers (active mass market)[6]	15
Market operators	2

A major impediment to the development of the SMIS is the transactions costs of devising and implementing contracts and data systems operating between the parties. This includes the development of a national regulatory framework and a co-regulatory decision making process to minimise transactions costs. The difficulty of achieving coordinated decision making on the design and implementation of the SMIS represents a key rationale for a government mandate and other interventions to support accelerated mass market deployment of smart metering. However, the costs of developing and operating a SMIS do not appear to have been fully recognised and incorporated into the CBA.

Scenarios (section 3.3)

EnergyAustralia agrees with the finding that there are significant advantages in a Network led rollout. As EnergyAustralia noted in its November 2007 submission, it is recognised the scenarios are not defined relative to the existing regulatory arrangements – the National Electricity Rules (NER). This significantly limits the usefulness of the CBA in terms of informing public policy decisions (the RIS). EnergyAustralia will comment on policy issues in its submission to the RIS.

EnergyAustralia is concerned over the decision not to identify metering costs and benefits separately and instead combine them with network costs and benefits in the benefits analysis. The omission of any reference to existing regulation may also have contributed to the difficulties in the methodology outlined below. The CBA assumed throughout that smart metering costs and cost savings sit with networks.[7] Most notably, the scope of the CRAI Network benefits (stream 2) report spans both metering and network benefits without transparently separating these. By contrast, under the National Electricity Rules (NER), smart metering costs sit with retailers. The lack of separation reduces the transparency of the scenario analysis and may contribute to the inconsistencies in the application of the methodology identified below, which in turn result in the incorrect estimation of both benefits and costs. Most notably, it may have resulted in the apparent under-estimation of ongoing metering costs from the CBA.

[5] Many parties span multiple activities, for example EA is a metering service provider, an LNSP and a retailer.
[6] Source: Table 3 of the KPMG report on retailer impacts (Stream 3) on page 21. To the extent smart metering entails changes to retail licence conditions and equivalent instruments, it is possible all retailers may need to be engaged.
[7] See for example IBID p156: 'As has been discussed in section 5.1 there are considerable potential benefits to distributors associated with avoiding the costs associated with managing and collecting customer usage data...'

Key assumptions (section 4)

Rollout timeframe

Key elements of the smart metering technology solution discussed in the CBA are immature and the technologies are evolving rapidly. The Victorian process has revealed the limited ability of meter vendors to deliver devices capable of complying with the Victorian mandatory functional specification.

As an illustration of the speed and scope of technology change, it is notable that the main communications solution identified in the March 2008 CBA is mesh radio. This contrasts with the draft CBA published in September 2007 under which the main communications solution was a combination of power line carrier (PLC) and distribution line carrier (DLC). Technology uncertainty needs to be taken into account in terms of the timeline for any regulatory mandate (this is discussed in detail in EA's submission to the draft Regulatory Impact Statement issued on 8 April 2008).

Assessment of costs (section 5)

EnergyAustralia considers the lower end of the estimated range of the total cost of implementing smart metering is likely to be lower than actual implementation costs. This conclusion is based on a view that some costs may be omitted, while others may be under-estimated. Submissions to the Victorian regulator on AMI cost recovery, as acknowledged in the CBA, also lend support to this conclusion. As noted earlier, part of the range of uncertainty relating to the total cost may be managed in the process for the detailed definition of the functional specification. However, significant costs are independent of this process and it is therefore important that these costs are neither omitted nor under-estimated.

A summary of the key differences between EnergyAustralia's estimate and the CBA estimate is provided below.

- Meter hardware costs: EnergyAustralia's experience with purchasing first generation AMI meters indicates higher costs per NMI than the costs in the CBA. Over a third of EnergyAustralia's installations have load control and many have three phase meters. This significantly increases the costs compared with single phase AMI meters. In order to avoid premature technological obsolescence and meet the anticipated National functional specification, it is expected that the cost of meters will be on the higher side of the range identified.
- Meter installation costs: EnergyAustralia's experience with installing AMI meters on a door to door basis has resulted in costs to install single phase AMI meters that are significantly higher than those presented in the CBA. EnergyAustralia has not yet been able to determine the costs of installation at a similar scale to that expected in a full AMI deployment. While lower costs are possible, there remains uncertainty until tested. Two factors which can significantly impact installation costs, and which are not fully addressed in the CBA, are the costs associated with rewiring meter boards due to meter configuration consolidation and costs associated with installations that require rewiring due to the age of the installation. Significant uncertainty exists in determining the costs (and the responsibility for remediation) associated with installations that require extensive rewiring due to the age or condition of existing installation. Three phase installations with load control do not appear to have been considered in the CBA.
- Communications infrastructure costs: The cost estimates assume a narrowband solution is capable of meeting the functional specification. Whether this is so may depend on the development of the detailed functional specification. EnergyAustralia notes that the essential service nature of electricity supply means that the smart metering system will be subject to data security requirements and standards but this does not appear to have been incorporated into the CBA estimates. As a result of security requirements, data packet overhead for traffic over

the communications network may preclude some of the low bandwidth communications technology options. The Department of Communications Technology and the Arts circulated a confidential document titled "Incident Response in Control Systems Environments: Network Security Architectures 1.0" dated October 2007 that is relevant to this matter. A further consideration is that broadband solutions may offer advantages in terms of interoperability and lower recurrent costs.

- Recurrent smart metering costs: The allowance for recurrent smart metering costs is not transparent in the CBA and may require further articulation or review.
- Transitional and operating costs for distribution businesses: The implementation of AMI touches every part of a LNSP's operations. The highly pervasive impact of AMI means that all the IT/business systems throughout the LNSP will require AMI enablement. These costs are significantly understated in the National CBA. As an example, the existing EnergyAustralia Outage Management System (OMS) receives its primary information concerning outages from customers phoning EnergyAustralia. If EnergyAustralia has an AMI system then there would be an IT/Business systems connection between the AMI system and the OMS as well as a capability within the OMS to use and respond to the AMI system. This capability does not currently exist and would have to be built if the AMI system is to be used by the OMS. The cost in the CBA of between $0.4m and $0.6m for a large LNSP to integrate, build and commission this capability does not represent the full cost a large LNSP would incur.
- Transitional and operating costs for retail businesses: The implementation of smart metering has far reaching implication for retailers' operations. However, it appears that these implications may have been under-stated in the CBA due to the under-estimation of current inefficiencies in retail markets. Accordingly, it is possible that the notion that strategic investment in new systems is optional for retailers is not correct. While it recognises that retailer investments will be made on the basis there are sufficient offsetting benefits, EnergyAustralia cautions against setting unrealistically low expectations of the retailer cost implications of smart metering.
- Market Settlement and Meter transactions Management: In EnergyAustralia's view, the Victorian AMI process has usefully revealed that the extent of information and business systems changes for the National Electricity Market Management Company (NEMMCO) business systems is substantial and far greater than had been previously anticipated. Consequently, EnergyAustralia is concerned the CBA estimate may under-state this cost.
- Program management costs: EnergyAustralia notes that program management cost estimate is based on an overseas example that applies to a vertically integrated entity. It notes that this does not take into account the higher transactions costs associated with a disaggregated market structure and the consequential requirement for co-ordinated decision making over the design and operation of a single end-to-end SMIS spanning multiple consumers; metering vendors/owners; metering services providers; networks; retailers and more than one market operator. As noted throughout this submission, EnergyAustralia suggests a co-regulatory process is required to provide for co-ordinated decision making on the SMIS, as well as the detailed functional specification. While this is a cost-effective approach, it appears it has not been incorporated into the overall cost estimate.

Assessment of benefits (section 6)

EnergyAustralia agrees that potential benefits are substantial and could exceed costs provided the functional specification is appropriate and flexible. However, it does not agree with the assessment of individual benefits. It considers that business efficiencies and avoided metering costs are over-estimated, while demand response benefits are under-estimated. There are three key problems with the assessment benefits:

- Overall retail market efficiency benefits are omitted or under-estimated and hence the demand response estimates may require revision;
- There are methodological inconsistencies that result in the omission or under-estimation of demand response benefits from a given level of demand response; and
- An excessive portion of overall benefits is incorrectly attributed to Networks.

Consequently, the following CBA conclusions on the following matters require review and potentially substantial modification:

- The size of consumer benefits;
- The size of retailer relative to network benefits;
- The contribution of avoided network augmentation to the estimation of total demand response benefits;
- Potential retail market competition benefits;
- The size of reetailer transitional and ongoing costs;
- The estimated size of the demand response benefits of option 3 (non smart metering DLC) relative to that of the demand response benefits from smart metering options; and
- The regional analysis – for example the feasibility of smart metering in some jurisdictions.

Business efficiencies/service quality improvements (6.1)

As discussed below, it appears that a number of metering related benefits have been incorrectly attributed to networks. It also appears that consumer benefits have been omitted or understated.

Avoided Cost of New and Replacement Metering (6.2)

The value of avoided costs depends on policies for the replacement of the existing meter fleet. The avoided meter costs estimated in the CBA could not be achieved without a substantial change to existing meter replacement policies. However, it is unlikely such a change would be approved by Local Network Service Providers (LNSP) Boards or regulators.

Historically, excluding the introduction of interval metering, EnergyAustralia has typically replaced only 1 or 2% of its meter population per annum. This has resulted in an ever aging meter population with some meters having recorded ages of up to 100 years. Accordingly, it appears the counterfactual on which the avoided metering cost benefits have been calculated would not apply for EnergyAustralia.

Retail market efficiency

The substantial benefits of retail market settlement based on interval data, as identified in Part One above, are entirely omitted from the CBA. As a result, the demand response estimates may require review.

In addition, methodological inconsistencies, discussed in the following sections, result in demand response benefits, derived from a given level of demand response, to be significantly under-estimated. Further, while EnergyAustralia considers that overall demand response benefits have been under-

stated, at the same time it is concerned that the network component of demand response benefits may have been over-stated.

The CBA makes an unfounded presumption that retail markets settled on accumulation metering data are economically efficient. This presumption is reflected in the unsupported assertion that any foregone consumption as a result of a move to cost reflective tariffs based on settlement by interval data represents an economic cost.

> NERA overview report page 26 (emphasis added): '*For demand reductions brought about by either a general energy conservation effect or enhanced responsiveness to ToU and CPP tariffs, there is a cost to consumers from the lost opportunity to benefit from the amount of electricity use that was curtailed. This arises over that which they would have paid to use [sic]. The cost to customers has been estimated by NERA and reflects a net loss to society, rather than a transfer.'*

As discussed in Part One, the contrary is true – foregone consumption as a result of efficient retail markets represents an economic gain to society as resources are no longer misapplied to producing a marginal unit of output at a cost that is above its marginal value to consumers. EnergyAustralia notes that the Retailer Impacts report by KPMG correctly acknowledges the existence of inefficiency in retail markets and helpfully discusses the problem in some detail. However, the pricing error using deemed profiling is considered to be less than 20% which is a substantial under-statement.

The modest retail cross subsidy[8] estimate by KPMG appears to have been excluded from the modelling in the overview report. The exclusion appears to be based on the analysis in the NERA consumer report (stream 4). There it is assumed that overall wholesale prices on a per customer basis are efficient. The problem definition is limited to the lack of price signals between different times of day but then goes on to state that 'The tariffs are set to recover all of the costs associated with supplying electricity to an end user...'.[9]

In the CBA, it is assumed that 43% of customers voluntarily take up ToU tariffs. It seems reasonable to assume that the majority of this 43% is likely to consist of customers on the left hand side of the settlement cross subsidy graph (Figure 1) reproduced below. The CBA suggests that, for the 57% majority of customers remaining on flat tariffs, prices do not change as a result of the take-up of ToU. This includes the customers on the right hand side who are withdrawing from the transfer. The conclusion that prices do not change for customers remaining on flat tariffs is debatable.

[8] KPMG Retailer Impacts Report (stream 3) page 33.
[9] NERA consumer impacts (stream 4) report at page 7.

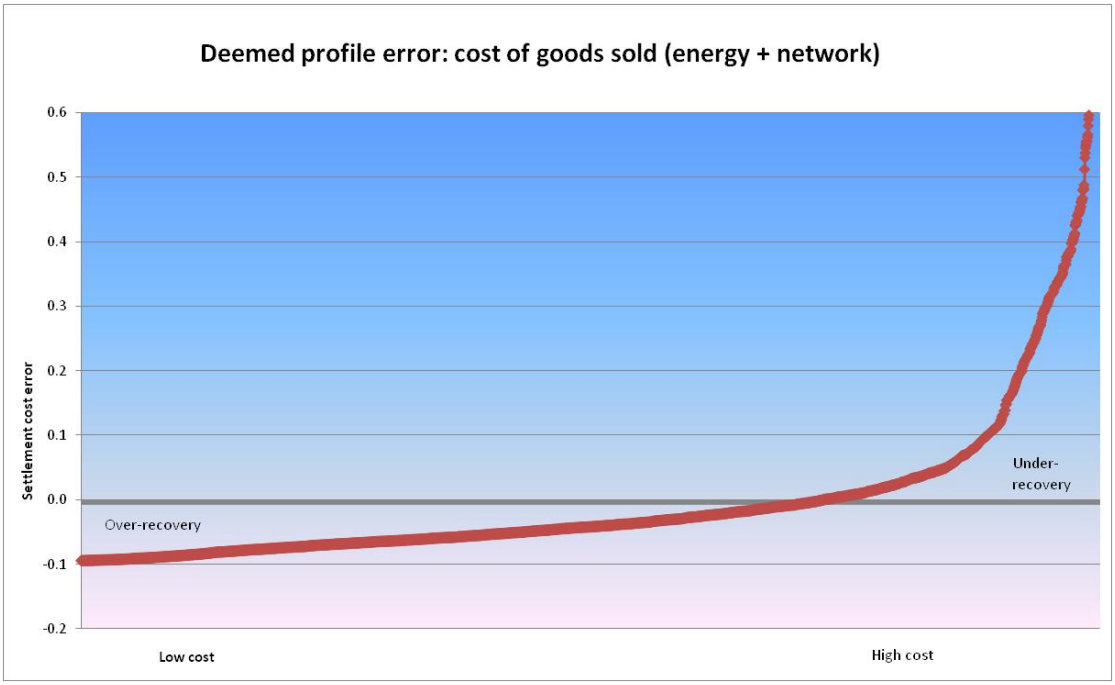

Figure 1

All wholesale (COGS) settlement prices would be affected by the introduction of universal interval metering, including for the retailers of those customers electing to remain on flat tariffs. The only retail prices that would remain unchanged is in relation to those customers whose consumption perfectly matches the deemed profile.

This means that flat retail prices would eventually change (increase), as a consequence of a substantial move toward time of use (or simply lower flat tariffs) by lower cost customers. The change in flat prices would also apply to any remaining regulated retail prices, provided they continue to be set on a cost-reflective basis. The main potential problem with any remaining regulated retail prices is that the delay between price resets may create a delay in the full unwinding of the transfers between customer types, to the detriment of retailers required to offer regulated tariffs. Accordingly, to the extent retail prices continue to be regulated following the introduction of smart metering, and thereby delay the transition to more efficient retail markets, there may be a reduction in the present value of potential benefits from smart metering.

The alternative to rising flat retail prices is that all retailer margins would decrease, but this possibility is not provided for in the CBA. The CBA assumption that the majority of customers would be unaffected by interval metering is not correct. This may result in under-estimation of the demand response and possibly also the level of greenhouse gas emissions reductions.

National assessment (section 15)

Stakeholder analysis (15.2)

EnergyAustralia does not agree with the finding that 80% -200% of the total benefits from a smart meter rollout (in the case of NSW) are attributable to Networks[10] and therefore that the main regulatory issue inhibiting the deployment of smart metering is shortcomings with the economic regulation of Networks.[11] Rather, it appears that a substantial portion of benefits have been incorrectly attributed to Networks, and that substantial non-network benefits have been omitted entirely.

[10] See NSW benefits table in appendix C to the NERA Overview (Stream 1) Report.
[11] See NERA, Ibid. at pp199-200.

EnergyAustralia notes that the CBA findings on the types of benefits from smart metering are not supported by any international studies of which it is aware. Indeed, in international findings non-network benefits typically constitute the majority of total benefits. While the difference may in part reflect the strong emphasis on network related services in the proposed functional specification, EA considers it more likely that network benefits represent less than half total benefits in Australia.

Two key inconsistencies in the benefits methodology result in benefits being incorrectly attributed to Networks:

- significant retailer benefits are treated as transfers; and
- the distinction between first and second round effects;

This problem was identified in EA's November submission but it was neither remedied nor addressed in the final CBA.

These inconsistencies also mean that the estimated dollar value of demand response benefits is understated relative to a given estimated level of demand response. As a consequence, if the estimated demand response in the CBA were accurate, the translation of that demand response into demand response benefits is not accurate.

The existence of the inconsistencies in the CBA is revealed by the CBA conclusion that Network benefits are maximised under Scenario 2 (Retailer led rollout), while retailer benefits are maximised under Scenario 1 (Network led) – see table below. Under scenario 2, even where smart metering is assumed to be a sound investment, retailers would suffer a loss of $2.8billion while networks would gain almost $5billion in benefits and receive more than 200% of total benefits. This compares with Scenario 1 where network benefits are "only" $3.3billion.

Extract from National assessment of stakeholder benefits under retailer and network led scenarios (Appendix C to NERA overview report)				
National (high)	**Scenario 1**	**Scenario 2**	**% Scenario 1**	**% scenario 2**
Network	3,275	4,979	83%	207%
Retailer	279	-2,816	7%	-117%
Consumers	324	191	8%	8%
Market	55	55	1%	2%
National	3,933	2,409	100%	100%

These results are not credible and indicate deep flaws in the analysis. The results also highlight that the impact of the inconsistencies and omissions are material rather than negligible.[12]

The inconsistencies may lead to the incorrect conclusion that networks would be able to fund a smart metering deployment from within the current regulated allowance for metering services. This conclusion is incorrect on a forward looking basis. (It is also incorrect on a pricing basis given that under current economic regulation, networks will continue to be able to recover the cost of their historical metering investments, less any disposal value.)

The first inconsistency in the method is that significant retailer benefits are treated as transfers and hence excluded from the quantification of benefits. This includes any reduction in energy purchase costs (other than an allowance of 2% of the reduction for transaction costs) and any reduction in working capital costs, as a result of improvements in retail market efficiency.[13]

[12] Contrast with NERA Ibid. page 27 '...as a result, whether or not these transactions are treated as transfers does not change the picture presented in the cost benefit analysis.'
[13] See NERA, Ibid. pp 26-27.

Leaving aside the proposition that any decrease in energy purchase costs is entirely due to CRRP reducing generator market power, then such a decrease is a real economic gain, not merely a transfer. If it were the case that the reduction in expected wholesale prices is entirely due to a reduction in generator market power, then policy makers would be advised to consider options designed to reduce generator market power.

Lower energy purchase costs reflect real cost savings on a forward looking basis in the form of reduced generator fuel costs and avoided current and future generator capacity charges implicit in wholesale prices. As noted earlier, peak energy prices historically represent around one third of physical wholesale prices so the value of reductions in wholesale energy purchase costs may be material.

Any reduction in the value of generators (for example peaking generators) would not be a transfer. Instead, it would be excluded from the CBA on the basis the analysis is forward looking (just as the value of the existing metering stock is excluded from the analysis).

This point also illustrates that the method used in the CBA is contingent on the current structure of the competitive energy market, under which retailers and generators are usually separate entities. It is notable that metering and network services are separable and indeed under the current NER separation is potentially required once meters are capable of being read remotely.[14] Inconsistently, however, the CBA notably does not treat any reduction in metering costs as a result of smart metering as a transfer. Similarly, a distribution business could be separated into a network operator and a network asset owner. In this case, a deferred capital expenditure benefit could (incorrectly but consistently with the approach adopted in the CBA) be deemed merely to be a transfer from the network asset owner to the network operator.

Similarly, in the CBA, any reduction in retailer working capital costs is treated as a transfer from consumers because early payment means they lose the time value of delayed payment. This overlooks the fact that retailer working capital costs are currently recovered in the form of higher retail prices than otherwise.[15]

Consequently, if working capital costs were reduced following the introduction of smart metering, this would only be a transfer if there was no corresponding decrease in retail tariffs. EnergyAustralia considers that retailers generally do not hold market power sufficient to increase the real level of retail tariffs, as implied in the CBA. In the event retail market competition is not sufficient to constrain market power, it seems unlikely that regulators would permit what amounts to an effective increase in the real retail tariff.

EnergyAustralia notes that changes in bad debts that are “system costs” rather than merely transfers have been incorporated into the analysis. It is unclear why this transfer is treated differently from other transfers.

The treatment of retailer transfers contrasts with Networks where no transfers are provided for.[16] Indeed, the reverse is true. The value of avoided revenue loss from electricity used at premises between move out and move in is attributed to Networks.[17] However, in NSW, the revenue loss affects Retailers, not Networks.

As acknowledged in the concluding chapter of the overview report (but not in the quantification), any net reduction in metering costs under scenario one would be transferred to retailers in the form of reduced

[14] See 7.2 of the National Electricity Rules.
[15] See for example recent decisions by jurisdictional regulators on regulated retail tariffs, including http://www.escosa.sa.gov.au/webdata/resources/files/071130-AGLStdgContract_FinalDecision_Part_A_Public.pdf
[16] See for example Appendix C, National costs and benefits by stakeholder ($m) to the NERA report Ibid.
[17] See CRAI Network Impacts (Stream 2) report at page 49.

regulated metering charges. Further, under scenario 2 (Retailer led), for example, there would be substantial transfers from Networks to Retailers, reflecting the fact that Networks would be purchasing a portion of metering services from retailers (and would no longer be able to charge retailers metering services Networks are not providing).

The second key inconsistency in the method relates to the application of the distinction between first and second round effects. EnergyAustralia accepts this distinction is valid and that the scope of the analysis needs to have clear limits.

It appears, however, that major Network benefits have been treated as first round effects and hence incorporated into the analysis, while the major non-network benefits have been treated as second round effects and hence excluded from the analysis. This approach is not consistent.

An obvious example of this inconsistency is deferral of network capital expenditure which is treated as a first round effect. EA considers it implausible to include such deferral as a first round effect. Deferral is contingent on (a) retailers implementing some form of CRRP and (b) an overall consumer response that results in a reduction in the growth of peak coincident network demand. Accordingly, network deferral is clearly a second or even third round effect.

Urban, rural and remote assessment (15.3)

Principally as a result of the limitations of the analysis in terms of retail market efficiency, EA considers the conclusions for the urban, rural and remote assessment need to be treated with considerable caution. Once retail market benefits are included, materially different results are likely.

Functionality (15.5 & 15.6)

As noted throughout this submission, EnergyAustralia considers the analysis has not addressed the benefit of the core smart metering functionality – functionality one: the collection and use of half hourly interval consumption data for all consumers for the purpose of retail market settlement. There appears to be no discussion of the value of this functionality in the overview report.

The public policy rationale for mandating the national deployment of core smart metering functionalities has been set out in a draft Regulatory Impact Statement (RIS) issued in April 2008. The CBA suggests the sole test for definition of the proposed mandatory national functional specification for smart metering is whether estimated benefits exceed estimated benefits. In other words, a positive benefit to cost ratio (BCR) finding is considered a sufficient as well as necessary condition for incorporation of a specific function into the national functional specification. EnergyAustralia does not agree this is a sound criterion for decision making on this matter and will address this point in more detail in its submission to the RIS.

EnergyAustralia proposes that the functional specification should be limited to those areas where benefits exceed costs (inclusive of the full costs of regulation) and where there is a significant risk that market failure may not deliver an economic outcome. This is likely to result in a much smaller number of the incremental smart metering functionalities (on top of the 9 core functionalities) being incorporated into a national minimum functional specification.

EnergyAustralia does not support the mandatory inclusion of in home displays (IHD) in the functional specification. Based on the experience from pricing trials, and its understanding of the implementation costs, it is unlikely that the benefits will exceed the costs. If benefits were to exceed costs, it is not obvious that market failure would occur and hence there is no obvious policy rationale for inclusion of

IHDs. Systems interoperability and a possible requirement to provide an interface to a home area network, is likely to be the key means of addressing the risk of market failure.

We note the rationale for mandating certain incremental functionalities is based on no incremental cost because industry is incorporating the functionality into the standard smart meter in any event. It is concerned the cumulative cost of these functionalities, in terms of both meter cost and communications bandwidth requirements, may compromise this assumption.

Interoperability and standards

EnergyAustralia considers interoperability and common standards is potentially an important barrier to the efficient accelerated mass market deployment of smart metering, given the disaggregated market structure of the Australian industry. It considers the need to ensure interoperability is central to the policy rationale for government intervention in the metering space. EA considers that interoperability and common standards definition should be given priority in the development of a national regulatory framework and this is more important than developing a detailed functional specification.

The discussion assumes narrowband communications standards.[18] EnergyAustralia questions whether these standards are relevant or desirable depending on:

- the detailed functional specification;
- the likely direction of Commonwealth policy on the security of communications in the electricity supply industry;
- the desirability of adopting best practice technical design for all carrier and enterprise grade communications systems, including internet protocol standards;
- The desirability of building in some head-room into the communications system to minimise the risk of early obsolescence

EnergyAustralia considers that bandwidth requirements for smart metering are likely to preclude some low bandwidth options.

Rollout scenarios against objectives (section 17)

EnergyAustralia supports a network led rollout (scenario 1) on the basis that metering services have natural monopoly characteristics and hence metering competition as envisaged under a retailer led rollout (option 2) is not feasible. This matter will be addressed in detail in EnergyAustralia's response to the RIS.

EnergyAustralia considers that the net benefit from scenario 3 is generally overstated relative to the other scenarios because of the omission of retail market benefits from the analysis.

Conclusions and recommendations (section 18)

Risks and uncertainties (18.1)

As noted earlier, given the risks and uncertainties that exist at present, it is clearly premature to lock in a detailed functional specification via regulation. It is also inappropriate to regulate specific functions unless there is a demonstrated market failure. The detailed functional specification provides a key means of addressing risks and uncertainties identified in the analysis to ensure an overall positive outcome is achieved.

[18] NERA Ibid. p181-185

Conclusions on jurisdictional analysis Smart metering scenarios (18.2)

While EnergyAustralia is cautious about commenting on costs and benefits outside its network area, it suggests that if the omissions and inconsistencies in the CBA method identified earlier were remedied, then the jurisdictional results may change. For example, once retail market efficiencies are fully incorporated into the analysis, the difference in overall net benefits between NSW and the ACT may narrow because the two jurisdictions face similar wholesale energy market costs.

Smart metering scenarios (18.3)

The report notes that *'the justification for a mandatory rollout of smart meters ... is that the costs and benefits... will accrue over a number of stakeholders'*[19]. However, it also notes that: *'the above rationale for mandating a rollout on the expectation of a split of benefits between stakeholder groups does not hold on the basis of the estimates presented in this report.'*[20] It then argues that *'as a result [of network benefits being passed through to retailers in the form of lower regulated network charges] it would still remain necessary to mandate a rollout of smart meters, as no one stakeholder group has a positive business case to undertake such a rollout as a commercial exercise*'.

The above analysis ignores the principal regulatory barrier to a network led rollout, which relates to the current NER. Under the NER, except under limited conditions associated with access to difficult sites for manual meter reading, once meters are capable of being read remotely, networks may only provide metering services if they are appointed by the relevant retailer.[21] This problem was acknowledged by the Victorian government's decision to seek to derogate from the NER on this matter, in support of its smart metering policy.

While EnergyAustralia agrees there is a public policy rationale for a mandated accelerated rollout of smart metering, it notes that such a rationale is not suppled in the CBA. The split benefits – market failure hypothesis is contradicted by the CBA findings. While benefits are in fact more widely dispersed than indicated in the CBA, this does not in itself imply a market failure. Similarly, as no analysis of the feasibility of competition in smart metering services is provided, the rationale for the proposal to create exclusive smart metering franchises for competitive tendering is not fully explained or supported in the CBA.[22]

Non-smart metering DLC scenario (18.4)

The non-smart metering DLC scenario does not address the central issue of retail market inefficiencies. As discussed earlier, this is the main rationale for moving from manually read accumulation metering to interval metering that is capable of being remotely read. However, the issue of retail market inefficiencies has largely been omitted from the CBA and as a result attractiveness of the non-smart metering DLC scenario appears over-stated relative to the smart metering alternatives.

Qualitative benefits (18.5)

A substantial qualitative benefit that could be expected from smart metering is the increase in the competitiveness of retail markets as a result of the improvement in retail market efficiencies afforded by smart metering. Key benefits not identified or not given full credit in the CBA include:

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[19] NERA, Ibid. p199
[20] NERA, Ibid. p199
[21] See section 7.2 of the National Electricity Rules, available on the Australian Energy Market Regulator's website.
[22] NERA, Ibid. p201

- the likely significant deepening of retail competition as a result of opportunities for both consumers and retailers to benefit from unwinding the material imperfections in current retail pricing; and
- a possible change in the propensity for consumers to switch retailers as a result of the substantial reduction in waiting time (up to 3 months due to manual meter reading cycles) between electing to switch retailers and the switch occurring; and

Consumer assessment (18.6)

The analysis materially under-estimates the implications of retail market settlement by interval data, for the reasons explained earlier. The conclusion that DLC offers a higher potential retail price saving for consumer may not be correct.[23] The consumer impacts analysis does not identify the opportunity for energy prices to decrease for up to 75% of customers.

Consumer benefits are limited to network service enhancements.[24] The consumer impacts analysis report (stream 4) does not identify a number of likely consumer benefits in the form of retail service and product enhancements. Likely consumer benefits that appear to have been omitted from the overall analysis include:

1. Accurate bills

2. Lower electricity bills for the majority of customers and greater ability to manage (reduce) energy costs for all

3. Choice of billing cycle with the opportunity of smaller, more frequent billing at a discount

4. Greater opportunity to change retail products and retailers

5. Likelihood of greater innovation in retail tariff structures and other product attributes, as a result of deeper retail competition.

Implications for greenhouse gas emissions (18.7)

EnergyAustralia acknowledges the problems of quantifying greenhouse emissions reduction as a result of the introduction of smart metering. EnergyAustralia suggests that, if retail market efficiencies were incorporated into the analysis, the greenhouse emissions benefits estimate may need to be modified.

In addition, by providing a mechanism that is likely to result in the substantial unwinding of transfers (subsidies), smart metering has important equity advantages for the 75% of customers who stand to benefit. By decreasing the likelihood that the cost of carbon charges falls unduly on vulnerable customer groups, smart metering would facilitate the introduction of carbon charges. Customer protection measures could instead by focused on vulnerable customers within the 25% of customers who would face higher overall electricity costs.

[23] NERA, Ibid. Page 151: 'Direct load control programs, because of an assumed annual payment of $75 for participation in the program deliver the greatest benefits...'.'.
[24] See NERA Consumer Impacts report (stream 4) pp 111-112.

Transitional, regulatory, legal and technical issues (18.8)

The consultants undertaking the CBA were instructed to ignore the existing regulation of metering services.[25] This instruction significantly limits the value of the discussion on transitional, regulatory, legal and technical issues in the CBA.

In EnergyAustralia's view the barrier to the rollout of smart metering in Australia is not identified in the CBA. Problems with the existing regulation of metering and uncertainty over the future constitute the key obstacle to the mass market deployment of smart metering.

Under the NER, the relevant retailer is responsible for paying for metering services and the retailer selected by each end-use customer may elect to be the responsible person (metering services provider) for Types 1-4 meters. The relevant network may be the responsible person for Types 1-4 meters provided the retailer has elected to accept an offer from the network. Networks are obliged to provide standing offers.

In 2006, in line with the recommendations of a Joint Jurisdictional Review of Metrology, the Australian Energy Market Commission (AEMC) acceded to a NEMMCO proposal to change the definition of metering types. As a consequence, if a meter is capable of being read remotely, then it is deemed to be a Type 1-4 meter. The only circumstances under which Networks can be the responsible person for meters capable of being read remotely, without being elected by retailers, is for difficult to access sites.

Types 1-4 meters are contestable. Manually read meters, including Type 6 (accumulation meter) and Type 5 (interval meter) are currently not contestable, pending a scheduled further regulatory review.

The NER mean that, if a Type 5 meter (a manually read interval meter) is upgraded by the addition of communications to enable remote reading, then the meter is automatically reclassified to be a Type 4 meter. In other words, the meter is now contestable.

EnergyAustralia's deployment of over 270,000 Type 5 meters was in part based on the option to upgrade these meters to smart meters. However, as soon as they are upgraded, the meters become contestable and the upgrade cost cannot be recovered from regulated network tarriffs. Once contestable, it is possible retailers may not elect the Network to be the responsible person, in which case the metering installation and possibly a portion of the metering asset cost cannot be recovered.

Accordingly, under the NER, networks need to obtain agreement from all licensed retailers to undertake an accelerated mass market rollout of smart meters. However, all the indications are that, without significant government intervention and a mandate, agreement from all retailers is not feasible.

Similarly, it is not feasible for retailers to undertake smart metering, given the fact manually read metering is currently a network monopoly and the possibility smart metering may become a network monopoly in the future. This uncertainty is highlighted by the Victorian proposal to derogate from the NER.

EnergyAustralia does not agree with the main CBA conclusions on regulatory and legal matters. It considers changes to remove the contestability of the mass market deployment of smart metering should be addressed by the MCE at the earliest opportunity.

[25] NERA, Overview report (stream 1) at p.207