Attachment 8.21

Energeia review of Ausgrid's metering tariffs

May 2014

Review of Ausgrid's Proposed Metering Tariff Arrangements for 2014-19

Prepared by ENERGEIA for Ausgrid

April 2014

1 Executive Summary

Under the current regulatory framework, Ausgrid, Endeavour Energy and Essential Energy, the NSW Distribution Network Service Providers (DNSPs), are the exclusive providers of Types 5 and 6 metering services, which cover 3.5 million residential and small business electricity connections in NSW.[1]

The Standing Committee on Energy and Resources (SCER) proposed a Rule Change Request[2] (Proposed Rules) to the Australian Energy Market Commission (AEMC) in October 2013 that would introduce competition in Types 5 and 6 metering services among Networks, Retailers or third parties including Demand Side Participation (DSP) service providers. Under the Proposed Rules, metering charges are required to be unbundled from standard control network service charges.

The AER's Framework and Approach (F&A) paper[3] for the 2014-2019 NSW distribution revenue determinations sets out new regulatory arrangements designed to support metering contestability in NSW from 2014/15. Specified metering services for Types 5 and 6 metering installation are to be re-classified as Alternative Control Services (ACS) from 1 July 2014 and prices regulated under a price cap control mechanism[4].

As a consequence of this reclassification, the NSW DNSPs are required to 'unbundle' their metering service charges from Standard Control Services (SCS) as part of the 2014-2019 determination, which involves the following main steps:

- Re-allocate Type 5 and 6 metering services from SCS to ACS;
- Developing forecasts of alternative control metering service costs; and
- Developing upfront, annual and exit charges for ACS metering charges consistent with the Proposed Rules, the AER's F&A paper and the Network Pricing Principles (clauses 6.2.5(d))

Energeia was engaged by the DNSPs to review their proposed approaches, methodologies and resulting proposals for ACS Types 5 and 6 metering services in accordance with the Terms of Reference (TOR) set out in Appendix 1. The engagement was managed by Ausgrid via a working group comprised of metering representatives from each of the businesses and Networks NSW (NNSW), the umbrella organisation.

1.1 The Likely Regulatory Framework

Under the TOR, Energeia was required to develop a view on the likely regulatory framework to apply to metering services in the future, including any anticipated transitional arrangements. Based on its detailed review of the range of relevant regulatory and policy papers and statements, Energeia concluded that the AER's decision to adjust DNSP's 2015-19 metering ACS prices would likely be based on the same approach the AER uses for SCSs. Energeia's conclusion is conservative, as alternative approaches are likely to be less severe.

[1] Types 1 to 4 metering services have been contestable in NSW for many years, for customers consuming more than 160 MWh per year.

[2] SCER, (October 2013), Introducing a new framework in the National Electricity Rules that provides for increased competition in metering and related services.

[3] AER, (March 2013), Stage 1 Framework and Approach Paper – Ausgrid, Endeavour Energy and Essential Energy.

[4] Ibid, p43.

1.1.1 The National Electricity Rules

While the Control Mechanism for SCS must be of the form CPI-X, or some incentive based variant of this approach, there is no constraint on the Control Mechanism for ACS, other than that it must be documented in the determination[5]. The Control Mechanism may, but does not need to, utilise elements of Part C (the Building Blocks determination for SCS)[6]. It is important to note that the approach adopted for determining ACS prices by the AER in previous determinations in other jurisdictions, has in practice differed little from that adopted for SCS[7].

1.1.2 The AER's Framework and Approach paper

The AER's Stage 1 Framework and Approach (F&A) paper sets out its intention to reclassify Types 5 and 6 metering services from SCS to ACS the use of a price cap control mechanism and the specification of ACS metering services to include the following sub-services[8].

- Metering provision;
- metering maintenance;
- meter reading; and
- meter data services[9].

Metering installation services at new and upgraded premises (where the upgrade is instigated by the customer) are unclassified and hence will not be regulated by the AER[10].

Importantly, no guidance is given in the F&A paper regarding the AER's basis for setting price controls, and in particular, whether they will use a building blocks approach, or some variant. The AER does state that it will determine the cost of providing each service, and set the price based on that cost.[11]

Energeia notes that a building blocks approach was adopted in the setting of Aurora's prices for ACS metering.[12] The AER chose to adopt a building blocks approach instead of the replacement cost annuity approach that was used historically in Tasmania. The AER considered that the RAB roll forward approach best satisfied the Rules criteria in that it was desirable for a consistent approach to be applied across the NEM and it provided for a more accurate recovery of efficient costs[13].

The classification of metering services as an ACS for NSW and ACT and the associated price control mechanism will apply to both the one-year transitional and the subsequent four-year regulatory control periods.

The AER's approach is that, for metering services that have been reclassified as ACS, there will be no change to the current pricing approach in 2014/15 because the Rules require the approach to cost allocation to be retained in the transitional year[14]. The costs of providing these services are already

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5 AEMC, (2014), *National Electricity Rules*, Clause 6.2.6(b).

6 Ibid, Clause 6.2.6(c).

7 For example: AER, (May 2014), Final Decision - South Australia distribution determination 2010-11 to 2014-15, pp. 254-274.

8 AER, (March 2013), Stage 1 Framework and approach paper, Ausgrid, Endeavour Energy and Essential Energy, p 8.

9 Ibid. Table 3, page 26.

10 Ibid. page 26 and 27.

11 Ibid. page 9.

12 AER, (April 2012), Final Distribution Determination, Aurora Energy Pty Ltd 2012-13 to 2016-17, page 39.

13 AER, (November 2011), Draft Distribution Determination, Aurora Energy Pty Ltd, 2012-13 to 2016-17, page 43.

14 AER, (January 2014), Stage 2 Framework and Approach – NSW Distributors, page 57.

captured in the SCS building blocks, which requires cost allocations in the transitional year to mirror those in 2013/14. For the subsequent period from 2015/16 to 2018/19, the AER will reconcile the cost of metering services in those years and adjust the standard control building blocks to reflect the reclassification of these services from SCS to ACS[15].

The AER acknowledges that it has not yet formed a view as to the necessity of an adjustment from prices in the Transitional Regulatory Control Period[16].

1.2 Energeia's Review Methodology

In undertaking this work, Energeia conducted its review as though it were acting on behalf of the AER in order to anticipate key issues with the DNSPs' proposals. This required Energeia to review the current and expected future regulatory framework, and any available precedents. The proposals were then assessed with respect to our view as to whether they reasonably satisfied the regulatory requirements.

In carrying out our review and providing guidance to Ausgrid, Energeia developed the following approach based on the AER's guidelines and our experience undertaking similar reviews of metering expenditure and pricing arrangements for DNSPs and the AER:

1. Initial Information Review
2. Investigation of Key Precedents
3. Initial Assessment and Validation
4. Draft and Final Assessment and Validation

Energeia met with the DNSPs multiple times over the course of the engagement to discuss our findings, conclusions and recommendations. Our issues with the proposals were discussed, options assessed on a collaborative basis, and refined approaches agreed and implemented by the DNSPs in most cases. In our view, this process led to a more consistent, optimised approach across the NSW businesses.

The outcome of Energeia's review of Ausgrid's ACS metering services proposal is set out in this report. Detailed recommendations are contained throughout the report in each of the relevant sections. The principal findings, conclusions and recommendations are summarised below.

1.3 Capital Expenditure Review

Based on its detailed review of the range of relevant regulatory and policy papers and statements, Energeia concluded that the AER's review of proposed metering ACS capex for the 2015-19 period would likely be based on the same approach the AER uses for its review of SCS capex.

Under clause 6.5.7 of the Rules, the AER is required to approve a DNSP's capital expenditure (capex) forecast if the AER is reasonably satisfied that it reflects each of the following capital expenditure criteria:

1. The efficient costs of achieving the capital expenditure objectives;
2. the costs that a prudent operator would require to achieve the capital expenditure objectives; and
3. a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

[15] AER, (December 2013), Letter to NNSW - ACS Prices for Transitional Regulatory Year, page 63.

[16] Ibid, page 62.

In assessing capex proposals, the AER Guidelines state its intention to undertake top down and bottom up assessments of the efficiency of capex forecasts on a category by category basis using a range of techniques on a case by case basis[17]. DNSPs are expected to show how their proposals represent the lowest sustainable cost to demonstrate their prudency and efficiency under the Expenditure Criteria[18].

Ausgrid's ACS metering services proposal forecasts $102.6 million in capex over the period, comprised of the following key capex categories[19]:

- $82.2 million of Type 5-6 metering capex, comprised of:
    - $25.6 million for reactive meter replacements;
    - $53.2 million for bulk meter replacements; and
    - $4.5 million for new and upgraded meter installations in the FY15 transitional year
- $13.7 million for Type 5-6 metering IT Systems;
- $7.5 million for furniture, plant, fleet, other, shared IT; and
- ($1.8 million) for non-system land disposal

Ausgrid's regulated new and upgraded expenditure only applies for the 2014/15 transitional budget and is 13% lower than 2013/14 expenditure.

We have not assessed Ausgrid's metering IT capex as it forms part of the broader suite of business cases relating to IT capital investment, which we have been advised are subject to a separate external review. Energeia conclude that Ausgrid's proposed replacement capex is reasonably likely to satisfy the capex objectives. This is based on our finding that its forecast bulk replacement volumes reflect failed sample testing results and historical in-situ meter failures and their intention to base their equipment prices on a least cost solution that will be competitively tendered.

The key issue is whether Ausgrid's installation approach is sustainably least cost, and Energeia therefore recommends that Ausgrid explain how their planned use of internal labour will achieve this. It may be that internal resources are multi-skilled, using external contractors will reduce the utilisation of its full-time resources and therefore raise costs, or that there are industrial constraints on greater outsourcing.

Although Ausgrid's bulk replacement programs represent an 97% increase over the current period, Energeia found that Ausgrid's planned resourcing ramp-up would be able to deliver the step change increase in replacement volumes in the 2016-17 provided that a resourcing strategy was put in place prior to 1 July 2016.

Energeia conclude that Ausgrid's proposed miscellaneous capex also reasonably satisfies the capex objectives based on our finding that it reflects Ausgrid's cost allocation method and is comparable to the other NSW DNSPs once differences in capitalisation policies are taken into account.

[17] AER, (November 2013), Better Regulation – Explanatory Statement – Expenditure Forecast Assessment Guideline, page 6.

[18] Ibid, page 127.

[19] Ausgrid (February 2014), *Attachment I: ACS for Type 5 & 6 metering services*, Table 9 and Table 10 and email correspondence with Ausgrid on 25/02/14.

1.4 Operating Expenditure Review

Based on its detailed review of the range of relevant regulatory and policy papers and statements, Energeia concluded that the AER's review of proposed metering ACS opex for the 2015-19 period would likely be based on the same approach the AER uses for its review of SCS opex.

The AER has formalised its operational expenditure (opex) review approach in its Guideline[20]. The AER's approach is founded on the assumption that the most recent complete year's operational expenditure (the revealed cost) represents an appropriate starting point to determine the efficient cost of operating the business, as the DNSP has a strong financial incentive to minimise this expenditure.

The AER plans to use benchmarking to form a view of whether the revealed expenditure is actually efficient and will establish what it considers to be an efficient Base Year in its determination. From that base, opex is forecast using what has been termed the 'base-step-trend' approach.

Ausgrid's operational expenditure forecast $140.0 million[21] is 2.4% lower than its historical metering opex of $143.5 million[22] over the current regulatory period in real terms. It is based on a 2012/13 Base Year and represents a flat expenditure profile in real terms over the regulatory control period.

Energeia conclude that Ausgrid's proposed opex is reasonably likely to satisfy the opex objectives. This is based on our findings that the Base Year is comparable with the previous 3 years of historical costs, there is a positive (downward) step change of 1.6% between the base year and 2014-15 due to the change in metering strategy, and there is a zero (flat) forecast opex trend, implying a 1% annual increase in efficiency when the growth in customer numbers is taken into account.

Energeia's assessment of the efficiency of Ausgrid's Base Year considered Ausgrid's higher customer density, which should relatively reduce their meter reading costs, use of type-5 meters, which should relatively increase their meter reading and data costs, and use of dual element and 3-phase solutions, which should relatively reduce their maintenance costs.

1.5 Asset Base Review

Based on its detailed review of the range of relevant regulatory and policy papers and statements, Energeia concluded that the AER's review of proposed metering ACS asset base for the 2015-19 period would likely be based on the same approach the AER uses for its review of an SCS asset base.

The Rules require the Regulated Asset Base (RAB) used in a building blocks determination to be based on the starting RAB and the AER's Roll Forward Model (RFM)[23]. Establishing a starting ACS asset base requires the carving out of ACS metering assets from the SCS RAB.

The NSW DNSPs developed a common approach to separating out their metering ACS asset base by directly allocating metering assets, and allocating shared assets according to the ratio of the metering assets to the non-shared assets in the SCS. The value of share load control portion of the RAB was calculated based on the proportion (%) of load control assets relative to the total of the opening metering RAB.

The approach to Weighted Average Cost of Capital (WACC) is aligned across each NSW DNSP and is intended to be based on their AER approved SCS WACC.

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[20] AER, (November 2013), Better Regulation - Expenditure Forecast Assessment Guideline for Electricity Distribution.

[21] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services.

[22] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Tables 6 and Table 8.

[23] AEMC, (2014) *National Electricity Rules*, Clause 6.3, 6.5

For depreciation, Essential Energy and Endeavour Energy have adopted an accelerated (5 year) depreciation schedule due to their relatively small metering RABs. Ausgrid is proposing to adopt a standard depreciation schedule as this would result in a substantial price increases for customers due to its relatively high RAB, and breach Ausgrid's CPI price commitment to its customers.

Energeia conclude that Ausgrid's approach to the WACC and unbundling its ACS metering assets from its SCS RAB is appropriate and consistent with the Rules. Ausgrid's standard lifetime depreciation approach is inconsistent with the approaches being adopted by the other DNSP's, however is reasonable as an accelerated approach could lead to a price shock to customers due to the large size of its metering RAB.

1.6 Pricing Review

Based on its detailed review of the range of relevant regulatory and policy papers and statements, Energeia concluded that the AER's review of proposed metering ACS tariffs for the 2015-19 period would likely be based on the same approach the AER uses for its review of SCS tariffs.

Prices for SCS charges are governed by the pricing Rules, which require that tariff classes group customers on an economically efficient basis avoiding unnecessary transaction costs[24], and that the revenue recovered by each tariff class lies on or between:[25]

1. An upper bound representing the stand alone cost of serving the retail customers in that class; and
2. a lower bound representing the avoidable cost of not serving those retail customers.

Prices should also be cost reflective and not distort efficient consumption, having regard to the associated transaction costs as well as customers' ability and likelihood to respond.

Ausgrid developed the following types of ACS metering charges to recover its annual revenue requirement from customers:

- An upfront charge for new and upgraded metering installations (capital contribution);
- an annual metering tariff; and
- an exit fee.

Ausgrid is proposing metering tariffs which are aligned with its network tariff classification. This is consistent with the approach being adopted by each of the NSW DNSPs.

Energeia found that Ausgrid's exit fee is consistent with the SCER's proposed rule change, and comparable industry benchmarks once Ausgrid's specific circumstances related to its ACS metering RAB are taken into consideration. Energeia therefore conclude it is reasonable.

Energeia conclude that Ausgrid's proposed meter ACS tariffs are reasonably likely to satisfy the Rules based on our finding that they have been set on a cost reflective basis reflecting capex and opex inputs previously assessed as reasonably satisfying the relevant Rules criteria.

Energeia recommends that Ausgrid consider calculating the LRMC, Stand-alone and Avoidable cost of its metering service prices, to demonstrate to AER that prices are fully compliant with the Rules.

[24] AEMC, (2014), *National Electricity Rules*, Clause 6.18.3(d).

[25] Ibid, Clause 6.18.5(a).

Table of Contents

2 Disclaimer

While all due care has been taken in the preparation of this report, in reaching its conclusions Energeia has relied upon information and guidance from the AER, information provided by Victorian Distribution Network Service Providers (DNSPs) and publically available information. To the extent these reliances have been made, Energeia does not guarantee nor warrant the accuracy of this report. Furthermore, neither Energeia nor its Directors or employees will accept liability for any losses related to this report arising from these reliances. While this report may be made available to the public, no third party should use or rely on the report for any purpose.

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3 Structure of this Report

The remainder of this report is structured as follows:

- Section 4 – Regulatory Requirements sets out the current and expected future regulatory requirements that the proposal must satisfy in order to be approved;
- Section 5 – Scope and Approach describes Energeia's scope of work and details our methodology for undertaking this review;
- Section 6 – Capital Expenditure reviews Ausgrid's proposed capital expenditure for metering services and its proposed approach for allocating the cost of shared expenditure;
- Section 7 – Operational Expenditure reviews Ausgrid's proposed operational and maintenance expenditure and its proposed approach to allocating the cost of shared expenditure;
- Section 8 – Regulatory Asset Base reviews Ausgrid's approach to establishing a Regulatory Asset Base (RAB) for ACS metering assets;
- Section 9 – Revenue Requirement reviews how Ausgrid's revenue requirement has been calculated from the above building blocks using the AER's Post Tax Revenue Model (PTRM);
- Section 10 – Metering Tariffs sets out Energeia's review of Ausgrid's proposed prices for new meters, metering services and exit charge

4 Regulatory Requirements

Ausgrid's metering prices over the 2014-2019 regulatory control period are regulated under Chapter 6 of the National Electricity Rules (the Rules), which sets out the terms of the AER's review, including the process and timing. These Rules are subject to SCER's proposed Rule changes, however, the AER is already aligning its approach as though the SCER's Rule Change Request were in effect.[26]

Based mainly on its review of the AER's F&A paper and recent regulatory precedents, Energeia has concluded that the AER is likely to apply the same or similar approach as used for SCS expenditure and prices to assessing Ausgrid's ACS metering expenditure and prices.

The following sections describe the basis and reasoning for our conclusion and outline the key regulatory requirements we expect the AER will apply to Ausgrid's proposed Types 5 and 6 metering services related charges and associated costs.

4.1 The National Electricity Rules

The Rules specify the national regulatory framework for classifying regulated services, controlling service pricing, and determining prices. This framework is applied by the AER to determine Ausgrid's proposed prices for ACS metering services.

4.1.1 Service Classification and Price Control

Chapter 6, Part B of the Rules allows the AER to classify a distribution service as either a direct control or a negotiated service. Direct control services can be further classified as standard control (SCS) or alternative control services (ACS). The Rules require the AER to keep the previous classification unless circumstances change. [27]

A determination is made to control revenue or prices or both for direct control services. While the control mechanism for SCS must be of the form CPI-X, or some incentive based variant of this approach, there is no constraint on the control mechanism for ACS, other than that its basis be documented in the determination.[28] The control mechanism may, but does not need to, utilise elements of Part C (Building Blocks Determinations).[29]

The approach adopted for determining ACS prices by the AER, however, has in practice differed little from that adopted for SCS.[30] This is the key reason for Energeia's view that the AER is likely to apply the same or similar assessment to Ausgrid's ACS metering expenditure and prices as they apply to Ausgrid's SCS expenditure and prices.

Given the relative expenditure involved, the AER's metering ACS review is likely to be less extensive than their SCS review, but we expect it to be nonetheless rigorous due to its implications for the development of a competitive market for ACS metering services.

4.1.2 Determining Annual Revenue Requirements

Where the AER chooses to make an ACS determination on the basis of a building blocks approach, it must specify the annual revenue requirement for each year based on the following building blocks[31]:

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[26] AER, (January 2014), Stage 2 Framework and Approach – Ausgrid, Endeavour Energy and Essential Energy.

[27] AEMC, (2014), *National Electricity Rules,* Clause 6.2.2(d).

[28] Ibid. Clause 6.2.6(b).

[29] Ibid. Clause 6.2.6(c).

[30] For example: AER, (May 2010), Final decision - South Australia distribution determination 2010-11 to 2014-15, pp. 254-274.

[31] AER (March 2013), Stage 1 Framework and approach paper, Ausgrid, Endeavour Energy and Essential Energy, page 58.

- indexation of the RAB;
- a return on capital for that year;
- the depreciation for that year;
- the estimated cost of corporate income tax of the DNSP for that year; and
- the forecast operating expenditure for that year.

Indexation of the RAB involves the addition of approved capital expenditure, the subtraction of depreciation and the indexation of the asset base using the AER's Roll Forward Model (RFM)[32].

DNSP's capital expenditure forecasts must be approved if the AER is reasonably satisfied it reflects each of the following capital expenditure criteria:[33]

1. the efficient costs of achieving the capital expenditure objectives;
2. the costs that a prudent operator would require to achieve the capital expenditure objectives; and
3. a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

4.1.3 Distribution Pricing Rules

Based on its detailed review of the range of relevant regulatory and policy papers and statements, Energeia concluded that the AER's decision to adjust DNSP's 2015-19 metering ACS prices would likely apply the same approach as they would for SCS prices.

Once each of the building blocks is determined, they are used as inputs into the PTRM to determine the DNSP's annual revenue requirement. The allowed revenue is then recovered through tariffs, which are proposed each year by the DNSP for assessment by the AER under the Network pricing Rules.

The AER must approve a pricing proposal if the AER is satisfied that:

1. the proposal complies with Part 1 of Chapter 6, any relevant clauses in Chapter 11 and any applicable distribution determination; and
2. all forecasts associated with the proposal are reasonable.

The key pricing Rule requirements in Part 1 that are relevant to this review apply to the design of tariff classes; design of tariff components and the recovery of allowed revenue.

Tariff classes must group customers together on an 'economically efficient' basis, and avoid unnecessary transaction costs.[34] Each customer must be a member of at least one tariff class, and ACS tariff classes must be separate to SCS tariff classes.

Under the Pricing Principles, the revenue recovered by each tariff class should lie on or between:[35]

1. an upper bound representing the stand alone cost of serving the retail customers who belong to that class; and
2. a lower bound representing the avoidable cost of not serving those retail customers.

Where a tariff is comprised of 2 or more charging parameters, the price for each parameter must take into account the Long Run Marginal Cost (LRMC) of providing the service, having regard to the associated

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[32] AEMC, (2014), *National Electricity Rules,* Clause S6.2.3(c)(1).

[33] Ibid, Clause S6.5.7(c)

[34] Ibid. Clause 6.18.3(d).

[35] AEMC, (2014), *National Electricity Rules*, Clause 6.18.5(a).

transaction costs and customers' ability and likelihood to respond. Residual costs are to be recovered in a manner that minimises distortion of efficient service consumption.

4.2 The AER's Framework and Approach paper

Under clause 6.8.1 of the Rules, the AER is required to publish two Framework and Approach papers at the commencement of each regulatory determination process to inform stakeholders of its intentions with respect to service classification and price control mechanism.

4.2.1 Service Classification and Control

The AER's Stage 1 Framework and Approach (F&A) paper sets out its intention to reclassify Types 5 and 6 metering services from SCS to ACS, the use of a price cap control mechanism and the specification of ACS metering services to include the following sub-services.[36]

- Metering provision
- metering maintenance
- meter reading; and
- meter data services[37].

Metering installation services are unclassified and hence will not be regulated by the AER.[38]

Importantly, no guidance is given regarding the AER's basis for setting price controls, and in particular, whether they will use a building blocks approach, or some variant. The AER does state that it will determine the cost of providing each service, and set the price based on that cost.[39]

Energeia notes that a building blocks approach was adopted in the setting of Aurora's prices for ACS metering.[40] The AER chose to adopt a building blocks approach instead of the Replacement cost annuity approach that was used historically in Tasmania. The AER considered that the RAB roll forward approach best satisfied the Rules criteria in that it was desirable for a consistent approach to be applied across the NEM and it provided for a more accurate recovery of efficient costs.[41]

Although the F&A paper is intended to provide guidance to the DNSPs and stakeholders regarding the AER's approach to key regulatory decisions, the AER notes that the classification of distribution services and the formulae that define each control mechanism may change in 'unforeseen circumstances'.[42]

Nevertheless, the F&A paper represents the best available information upon which to base a proposal for providing ACS metering and to assess the proposal against the expenditure criteria.

4.2.2 Transitional Arrangements

The classification of metering services as an ACS and the associated price control mechanism will apply to both the one-year transitional and the subsequent four-year regulatory control periods.

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[36] AER (March 2013), *Stage 1 Framework and approach paper*, Ausgrid, Endeavour Energy and Essential Energy, page 8.

[37] Ibid, Table 3, page 26.

[38] Ibid, page 27.

[39] Ibid, page 9.

[40] AER, (April 2012), Final Distribution Determination Aurora Energy Pty Ltd 2012-13 to 2016-17, page 39.

[41] AER, (November 2011), Draft Distribution Determination, Aurora Energy Pty Ltd, 2012-13 to 2016-17, page 43.

[42] Ibid, page 5.

The AER's Stage 2 F&A paper states that there will be no change to the current pricing approach in 2014/15[43]. The AER's approach for the subsequent period from 2015/16 to 2018/19 will be to reconcile the cost of metering services in these years and adjust the standard control building blocks to reflect the reclassification of these services from SCS to ACS[44].

The AER acknowledges that it has not yet formed a view as to the necessity of an adjustment from prices in the Transitional Regulatory Control Period.[45]

4.3 The AER's Expenditure Forecast Assessment Guideline

The AER is required under clause 6.2.8(a)(1) of the Rules to publish an Expenditure Forecast Guideline (the Guideline), setting out their approach to determining whether or not the proposed SCS expenditure reasonably satisfies the capital and operational expenditure criteria and the associated information requirements for carrying out their assessment. Energeia's view is that aspects of the Guideline are likely to be used in assessing Ausgrid's forecast ACS metering expenditure.

As described in the Guideline, the AER's assessment approach involves the following main steps:

1. Examination of the DNSP's proposal and other relevant information
2. Comparison of the forecast expenditure with an alternative benchmark estimate
3. Consideration of explanations for variations to the efficient benchmark
4. Publication of an Issues paper
5. Development of Draft and Final Determination

The AER is likely to apply a filtering process through a two stage review, whereby an initial high level review is undertaken to identify the key issues requiring more detailed consideration. These will be reported in an Issues paper, the responses to which will be factored into the draft and final determinations.

In reviewing the DNSP proposal and supporting materials, the AER expects the DNSP to demonstrate that it is making expenditure decisions under a quantitatively based economic framework consistent with minimising the long run cost of achieving the expenditure objectives.[46]

In assessing the reasonableness of specific expenditure forecasts, the AER will apply a range of qualitative and quantitative techniques on a case-by-case basis, including:

- Benchmarking, including econometric and category analysis
- Methodology review
- Governance and policy review
- Predictive modelling
- Trend analysis
- Cost benefit analysis
- Detailed project review

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[43] AER, (January 2014), Stage 2 Framework and Approach – NSW Distributors, page 57

[44] Ibid, (December 2013), AER Letter to NNSW - ACS Prices for Transitional Regulatory Year, page 63

[45] Ibid, pages 62.

[46] AER, (November 2013), Expenditure Forecast Assessment Guideline for Electricity Distribution, page 9.

A detailed explanation of each of these approaches is contained in the Guideline. The Guideline also details the AER's specific approach to assessing capital and operational expenditure forecasts, which is summarised in the following sections.

4.3.1 Capital Expenditure Assessment Approach

The AER intends to assess SCS capital expenditure forecasts using a combination of top down and bottom up approaches.[47] The AER's top down approach will involve a comparison of the proposed expenditure to peer DNSPs, adjusted for material differences in circumstances. Bottom-up approaches include detailed project reviews and cost-benefit assessments.

The AER expects the DNSPs to demonstrate the prudency and efficiency of their capital expenditure forecast by substantiating that it will result in the lowest sustainable cost (in present value terms) to meet the legal obligations of the DNSP.[48]

The AER expects the DNSPs to provide reasons for any variation between forecast and historical expenditure.[49] The AER also expects to see analysis of the opex/capex trade-off, demonstrating the efficiency of the choices made.

The AER expects demand forecasts to reflect industry best practice demand forecasting, which is described in a separate explanatory statement[50]. Energeia's view is that AER is likely to expect the same of forecasts used to underpin proposed ACS expenditure.

4.3.2 Operational Expenditure Assessment Approach

Operational expenditure is almost entirely recurrent and the AER therefor prefers to assess it against the operational expenditure criteria using the base-trend-step methodology.

Under this approach, the base year expenditure is assessed to determine whether it is a reasonably prudent and efficient starting point using the range of assessment techniques described in section 8 of this report. Any identified inefficiencies will be used to adjust the base year to an efficiency benchmark base year.

The trend is estimated using the historical change in output costs as a function of input prices, productivity growth and output quantities.

Step changes reflect structural shifts in the cost of supply, for example due to changes in the regulatory environment or the impact of an efficient investment on operational expenditure.[51] They can be due to both positive and negative change events. The AER plans to review these in detail to ensure each identified step conforms to the Rules expenditure criteria.

4.4 Proposed Future Regulatory Changes

The SCER published its draft Chapter 7 Rule change proposal in October 2013 to enable competition in metering services.[52]

The SCER's proposed Rule change package:

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[47] AER, (November 2013), Expenditure Forecast Assessment Guideline for Electricity Distribution, page 17.

[48] Ibid. page 17.

[49] Ibid. page 18.

[50] AER, (November 2013), Explanatory Statement - Expenditure Forecast Assessment Guideline.

[51] AER, (November 2013), Expenditure Forecast Assessment Guideline for Electricity Distribution, page 24.

[52] SCER (October 2013), Introducing a new framework in the National Electricity Rules that provides for increased competition in metering and related services, Rule change request.

- Establishes the national framework for metering competition;
- creates a new, independent Metering Coordinator role;
- separates this role from the network and retailer roles and allows customer choice;
- unbundles metering service charges from distribution use of system (DUoS) charges;
- sets exit fees based on the Regulated Asset Base (RAB) with a possible cap set by the Australian Energy Regulator (AER);
- requires pre-existing load management arrangements be supported when replacing meters; and
- requires AEMO to maintain the national minimum functional specification for smart metering.

Importantly, the proposed Rule changes allow the states to determine the following key policy and regulatory settings on a jurisdictional basis:

- minimum functionality requirements for new and replacement metering;
- allowing reversion to lower functionality metering; and
- extension of metering monopolies, e.g. Type 7.

The AEMC has yet to commence consultation on the proposed Rule change, but the AEMC has targeted implementation of the new regulatory arrangements by the end of 2014.[53] State settings are to be notified to SCER by the end of 2013.

Energeia expects these timeframes could enable market arrangements to be implemented by the end of 2015, with active competition as early as 2016.

[53] AEMC, (November 2012), Power of Choice Review, Final Report, Implementation Plan, page 6.

5 Scope and Methodology

Energeia was engaged by the NSW DNPSs to review each of their respective approaches to developing proposed metering tariffs for the 2014/15 transitional and 2015-2019 regulatory periods.

The scope of Energeia's review involved an assessment of each NSW DNSPs ACS metering charges proposal to the AER due 31 January 2014 against the regulatory requirements, and the provision of feedback and advice to each of them and Networks NSW as per the TOR listed in Appendix 1.

In carrying out our review and providing guidance to Ausgrid, Energeia developed the following approach based on the AER's Guideline and our experience undertaking similar reviews of metering expenditure and pricing arrangements for DNSPs and the AER:

1. Initial Information Review
2. Investigation of Key Precedents
3. Initial Findings
4. Draft and Final Assessment and Validation

The following sections describe each of the key activities undertaken by Energeia in carrying out these phases of work.

5.1 Initial Information Review

The AER intends to apply a two stage filtering process to its review of DNSP's regulatory proposals. The initial high level review will lead to the identification of key issues, development of an Issues paper consultation and, potentially, detailed further examination.

Energeia's approach was to examine the DNSPs' initial proposals in order to develop an issues and documentation register to manage and direct the flow of information towards priority issues. Priority was determined on the basis of the issues' associated expenditure. The greater the associated expenditure, the higher the issue priority and the greater the expected level of economic and technical justification.

The Initial Information Review phase involved the following steps:

- Examination of the proposal and other relevant material;
- Engagement with relevant Ausgrid personnel;
- Development of the primary and subsequent Requests for Information (RFIs)
- Development and management of an Actions Register
- Investigation of other relevant material, particularly key precedents and benchmarks

Each step is detailed in the following sections, including how any issues which arose during the course of the review were handled.

5.1.1 Engagement with Relevant Ausgrid Personnel

Meetings were held with the key Ausgrid staff listed in Table 5.1 during the Initial Information Review phase to discuss their approach to developing ACS metering tariffs, including their key assumptions, inputs and sources, models and supporting documentation.

Table 5.1 – Ausgrid Personnel Attending Initial Information Review Meetings

Name	Title
J. Reilly	Reset Program Manager – Metering and Ancillary Network
L. Narushevich	Regulatory Analyst
M. McQuarrie	Program Director – Reset 1519
J. Von Stieglitz	Executive Manager Data and Technical Services
B. Kobal	Metering Provision Strategy and Technology
W. Turner	Manager – Metering and Policy Development
C. Martlew	MDA Systems Manager

5.1.2 Requests for Information

Energeia developed a comprehensive Request for Information (RFI) that was used to assess the information provided by Ausgrid in support of its proposal and identify key issues. The RFI covered the following areas, based on a typical AER Regulatory Information Notice (RIN) and the AER's Guideline:

- Key metering policies and forecast assumptions, and in particular depreciation, cost allocation methodologies and volume risk (i.e. the effects of competition).
- Historical and forecast volumes of Types 5 and 6 metering for new and upgraded connections and meter replacements.
- Demand forecasting models and supporting documentation demonstrating that the forecasting approach reflects best practice.
- Historical and forecast capex for Types 5 and 6 metering by category
- Capex unit prices including metering installation labour, materials and meter equipment.
- Other capex benchmarking data, including meters per National Metering Identifier (NMI).
- Historical and forecast opex for Types 5 and 6 metering, including supporting documentation for any step changes between and within regulatory periods.
- Other opex benchmarking data, including meter tests, in-situ failure rates and data error rates per meter.
- RFM and PTRM and demonstration of compliance with clauses S6.2.3(c)(1), 6.5.1 and 6.4 of the Rules.
- Tariff classification and demonstrated compliance with clause 6.18.3(d) of the Rules.
- Proposed prices for new meters, annual service and exit fees and demonstration of compliance with clause 6.18.5(a) of the Rules and the AER's Stage 1 F&A paper.

The primary RFI and subsequent additional RFIs were tracked in a Document Register by the Energeia Project Manager and updated periodically.

5.2 Investigation of Key Precedents

In order to consider 'relevant other material' as per the AER's Guideline, Energeia researched a number of key issues to determine whether Australian and international precedents existed that may be relied upon by the AER in their assessment of Ausgrid's transitional proposal for Types 5 and 6 metering.

Targeted issues for investigation included:

1. **Metering Cost Allocation** – Whether shared ACS metering costs should be included in the revenue requirement on an incremental, stand-alone or shared basis is a key issue not addressed in the AER's Stage 1 F&A Paper.
2. **Weighted Average Cost of Capital (WACC)** – The revenue from ACS appears prima-facie to be riskier than for SCS, mainly because of the potential for lower actual ACS revenue due to competition. The efficient financing costs of benchmark companies were examined.
3. **Stranded Cost Recovery** – Cost recovery approaches for stranded assets, including embedded transitional charges prior to Full Retail Competition (FRC) and accelerated depreciation in Victoria as part of the smart metering program, were investigated.
4. **Metering Tariff Structures** – The best, non-distorting approach to ACS metering tariff structuring, such as whether the upfront cost of the meter should be separated from the ongoing cost of providing metering services.
5. **Metering Pricing Levels** – Benchmark prices for the assessment of NSW DNSPs is a key precedent that the AER is likely to consider. Prices have been approved for Types 5 and 6 metering services in Tasmania and the ACT.
6. **Metering Exit Fees** – The level and nature of charges for exit fees is a key issue, which has been addressed by the AER in South Australia. This precedent was examined for the AER's allowance for RAB and administrative costs in light of the SCER Proposed Rule.

The findings and conclusions from Energeia's investigation of each key issue are documented within the relevant sections of this document.

5.3 Initial Assessment and Validation

In its determination of ACS meter service prices, the AER must only approve Ausgrid's forecast operating and capital expenditures if it is satisfied that the total of each forecast is both prudent and efficient (clauses 6.5.6(c) and 6.5.7(c) of the Rules). In satisfying itself that the total forecasts are prudent and efficient, the AER has traditionally examined in detail the components of the expenditure forecasts to determine whether each material element satisfies the prudency and efficiency criteria.

Energeia's review of Ausgrid's ACS metering service proposal was framed in this context and directed at identifying the matters that Ausgrid could reasonably expect the AER to question or probe for further substantiation. These matters were assessed by Energeia based on materiality, regulatory rules and precedents, and Energeia's previous experience conducting reviews of electricity distribution business metering expenditure for DNSPs and the AER.

Under the TOR, Energeia was required to determine the appropriateness of Ausgrid's various approaches to developing their ACS metering services proposal, and to identify areas for improvement. Energeia therefore developed a collaborative review process that ensured a high level of engagement with key Ausgrid personnel and substantial validation of Ausgrid's and Energeia's analysis. It involved a two part assessment process to filter out the high priority issues and several rounds of validation.

The following sections detail each of the key steps undertaken as part of our Initial Assessment and Validation process.

5.3.1 Initial Gaps and Issues Assessment

Energeia undertook an initial assessment of Ausgrid's proposal and supporting documentation against the regulatory requirements, analytical framework agreed for the Final Report, and the key considerations specified in the TOR.

Consistent with the AER's Guideline, Energeia's Initial Assessment included:

- High level benchmarking;
- methodology review;
- governance review; and
- trend analysis.

The most appropriate methodology to apply was determined on a case-by-case basis.

Energeia developed a table of key issues and gaps to document and explain each gap or issue and to provide an initial recommendation for addressing it. The issues, gaps and recommendations were discussed with relevant Ausgrid personnel at a meeting described in section 6.3.3 below.

5.3.2 Industry Benchmarking

As part of its Initial Assessment, Energeia undertook category benchmarking of Ausgrid's forecast metering expenditure against its historical expenditure patterns, other NSW DNSPs and other Australian DNSPs (where information was available).

The key categories able to be benchmarked as part of our review include:

1. Meters per new and upgraded connection (NSW only)
2. Bulk meter replacements per 1,000 meters per year (NSW only)
3. Reactive meter replacements per 1,000 meters per year (NSW only)
4. Metering unit prices by metering type (NSW only)
5. Labour installation unit prices (NSW only)
6. Operational expenditure per customer per year (NSW only)
7. Upfront metering equipment prices by metering type (NSW only)
8. Annual prices for a single phase, single element Type 6 metering services
9. Annual prices for controlled load and solar PV secondary services (NSW only)

Benchmark graphs developed through this analysis are provided in the relevant sections of this report.

5.3.3 Discussion of Initial Findings

The results of the initial assessment were presented to relevant Ausgrid personnel listed in Table 5.2. As a result of this process, Ausgrid clarified aspects of its proposal and Energeia recommended areas requiring additional substantiation or more detailed consideration of alternative approaches.

Table 5.2 – Ausgrid Personnel Attending Initial Findings Meeting

Name	Title
J. Reilly	Reset Program Manager – Metering and Ancillary Network
L. Narushevich	Regulatory Analyst
M. McQuarrie	Program Director Reset
J. Von Stieglitz	Executive Manager Data and Technical Services
B. Kobal	Metering Provision Strategy and Technology
W. Turner	Manager – Metering and Policy Development
C. Martlew	MDA Systems Manager

A project management approach was adopted to track additional information that was provided to Energeia for incorporation in its draft report on its findings, conclusions and recommendations.

5.4 Draft and Final Assessment and Validation

Consistent with the AER's Guideline, Energeia developed it draft findings, conclusions and recommendations based on Ausgrid's updated proposal and supporting models. The results of our review were provided to the Ausgrid personnel listed in Table 5.3 prior to being incorporated into this report.

Table 5.3 – Ausgrid Personnel Attending Draft Assessment Meeting

Name	Title
J. Reilly	Reset Program Manager – Metering and Ancillary Network
L. Narushevich	Regulatory Analyst
M. McQuarrie	Program Director Reset
J. Von Stieglitz	Executive Manager Data and Technical Services
B. Kobal	Metering Provision Strategy and Technology
W. Turner	Manager – Metering and Policy Development

The detailed findings, conclusions and recommendations from our Draft and Final Assessment are provided throughout the following sections of this report.

6 Capital Expenditure

As outlined in clause 6.5.7, the Rules require the AER to approve a DNSP's capital expenditure forecasts if the AER is reasonably satisfied that it reflects each of the following capital expenditure criteria:[54]

1. The efficient costs of achieving the capital expenditure objectives;
2. the costs that a prudent operator would require to achieve the capital expenditure objectives; and
3. a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

In assessing capex proposals, the AER Guidelines state its intention to undertake top down and bottom up assessments of the efficiency of capex forecasts on a category by category basis using a range of techniques on a case by case basis. DNSPs are expected to show how their proposals represent the lowest sustainable cost to demonstrate their prudency and efficiency under the Expenditure Criteria.

Ausgrid's ACS metering services proposal forecasts $102.6 million in capex over the period, comprised of the following key capex categories[55]:

- $82.2 million of Type 5-6 metering capex, comprised of:
  - $25.6 million for reactive meter replacements;
  - $53.2 million for bulk meter replacements; and
  - $4.5 million for new and upgraded meter installations in the FY15 transitional year
- $13.7 million for Type 5-6 metering IT Systems;
- $7.5 million for furniture, plant, fleet, other, shared IT; and
- ($1.8 million) for non-system land disposal

In addition, $25.9 million in capex is forecast for new and upgraded metering installations over the period in the form of capital contributions through upfront meter charges. Therefore this amount of $25.9 million has been excluded from Ausgrid's proposed total capex of $102.6 million.

Ausgrid note that all capital expenditure quoted is post-PTRM[56]. Therefore all of the capex numbers in this report are post-PTRM.

The following sections describe Ausgrid's proposal and supporting documentation, and our associated findings, conclusions and recommendations for each specific capex category.

Where available, forecast information is provided for both Ausgrid's transitional regulatory proposal (2014/15) and its subsequent regulatory proposal (2015/16 to 2018/19).

6.1 Key Policies and Assumptions

The key policies impacting Ausgrid's capex forecasts are:

- Cost Allocation Methodology;
- Capital Contributions;

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[54] AEMC, (2014), *National Electricity Rules,* Clause 6.5.7(c).

[55] Ausgrid (February 2014), *Attachment I: ACS for Type 5 & 6 metering services,* Table 9 and Table 10 and email correspondence with Ausgrid on 25/02/14.

[56] Ausgrid, (2014), Email correspondence from Ausgrid to Energeia on19/03/14

- Metering Strategy; and
- Assumptions regarding the start and nature of metering competition.

Ausgrid's proposal is summarised in the following sections along with Energeia's assessment of its appropriateness.

6.1.1 Cost Allocation Methodology

Ausgrid's non-system shared expenditure includes common IT, common property, plant and equipment and integrated load control device.

Ausgrid's Cost Allocation Methodology (CAM) was last approved in 2009 and will be revised and approved as part of the transitional determination. The original CAM provided a high level description of Ausgrid's intended approach to allocating shared costs between SCS, ACS and unregulated functions.

Ausgrid's proposed approach to allocating non-system capex to ACS metering services is outlined in their supporting documentation[57].

Ausgrid's specific approach to allocating metering ICT costs for ACS metering services involved identifying the split of operational expense for the MSS – Cost Centre 7430 in 2012-13 that related to ACS metering services (68%) relative to SCS, ACS Ancillary Services and unregulated services (32% combined), and applying this weighting to forecast ICT metering expenditure[58].

Energeia found that Ausgrid's proposed ACS metering services CAM for forecast capex is consistent with their approved SCS CAM.

Energeia found that Ausgrid's approach to the allocation of specific ACS metering services ICT expenditure is consistent with their approved CAM.

Energeia conclude that the proposed CAM methodology for Ausgrid ACS metering services non-system and ICT capex is appropriate.

6.1.2 Capital Contributions Policy

Ausgrid is changing their capital contributions policy related to their metering ACS proposal to require customers to pay for the cost of new and upgraded metering, including the cost of the meter equipment, handling, inventory and a rate of return (based on a pre-tax WACC adjusted for tax treatment losses)

Ausgrid's upfront metering charge includes the cost of delivering the meter to the customer's Accredited Service Provider (ASP) to maintain competitive neutrality. This differs from the current approach whereby the meters are provided to ASPs free of charge, which would make it difficult if not impossible to compete unless the same pricing arrangements were followed.

[57] EnergyAustralia (January 2009), *Cost Allocation Method*, p11

[58] Ausgrid, (January 2014), AER Regulatory Submission 2014-19 – ICT Metering Alternative Control Services, page 6.

Energeia found Ausgrid's change in their capital contributions policy:

1. Is consistent with their SCS capital contributions policy;
2. is inconsistent with ACS precedents in Tasmania and the ACT;
3. sends a more cost reflective signal to customers; and
4. improves the market neutrality of the ACS metering prices.

Energeia therefore conclude that Ausgrid's proposed capital contributions approach is consistent with the Rules.

Energeia recommend that Ausgrid consider the alternative expensing approach being proposed by Endeavour Energy to minimise future exit fees.

6.1.3 Metering Strategy

Networks NSW was formed on 1 July 2012 to reduce costs across the 3 NSW DNSP operating businesses. Networks NSW is responsible for metering strategy and policymaking, and has issued a metering strategy that specifies the type of meters to be installed on a new and replacement basis.[59]

Networks NSW's approach to the selection of Type 5 and 6 meters for 2014-19 is aligned with the metering technology strategy developed by Networks New South Wales to apply from 1 July 2014[60]. This involves:

- The installation of accumulation meters (BASIC) for applications where total energy registration is all that is required (projected by Ausgrid to be 90% of new and upgraded installations); and
- The installation of Manually Read Interval Meters (MRIM) for applications where time based energy registration is required (projected by Ausgrid to be 10% of new and upgraded installations).

The Networks NSW strategy represents a significant change in metering strategy for Ausgrid in that it moves away from Type 5 metering as the default metering type in favour of a lower cost metering approach based on an electronic Type 6 meter yet to be procured.

The strategy allows the use of Type 5 metering for large business customers by default in order to manage their relatively greater potential impact on network peak demand growth. Replacements are to be made on a like-for-like basis, maintaining Type 5 functionality where it is being used to support a Time-of-Use tariff.

Energeia found that Ausgrid's metering strategy aligns with NNSW metering strategy, which specifies sustainably least cost meters based on an options analysis.

Energeia therefore conclude that Ausgrid's metering strategy is likely to support the Rule's expenditure objectives.

6.1.4 Competition Assumptions

A key assumption underpinning Ausgrid's proposal is that the effects of competition will be immaterial. If competition does have a material effect that the associated costs would be handled through a separate regulatory process such as a pass-through event or a transitional determination.

[59] Networks NSW, (August 2013), Board Paper for Meeting 28 August 2013

[60] Ausgrid, (February 2014), Ausgrid Attachment I: Alternative Control Services- Type 5-6 Metering Services, Section 3, page 7

This assumption enables forecasts to be based on historical trends and relationships, without the need to estimate the rate of meter churn and level of competition, both difficult tasks with no obvious regulatory or industry precedent upon which to rely.

Energeia found a high level of uncertainty regarding the start and scope of competition due to the proposed Rules and no obvious precedent upon which to base a forecast for the effect of competition.

Energeia concludes that Ausgrid's approach to dealing with the effects of competition in their proposal is appropriate.

Energeia recommends that Ausgrid specifically identify competition as a regulatory change event in their proposal, subject to a future pass-through determination.

6.2 Historical Capital Expenditure

Historical capex actuals are a key high level cost and delivery capacity benchmark, while the accuracy of historical capex forecasts supports the reasonable expectation of future demand and unit prices as required under the expenditure criteria.

To enable a comparison of like-for like, Energeia has converted Ausgrid's historical expenditure (capex and opex) to real 2012/13 dollars in this report using the historical inflation rates in Table 6.1 below[61].

Table 6.1 – Annual Inflation Rate (%) for the historical 2009-14 Regulatory Period

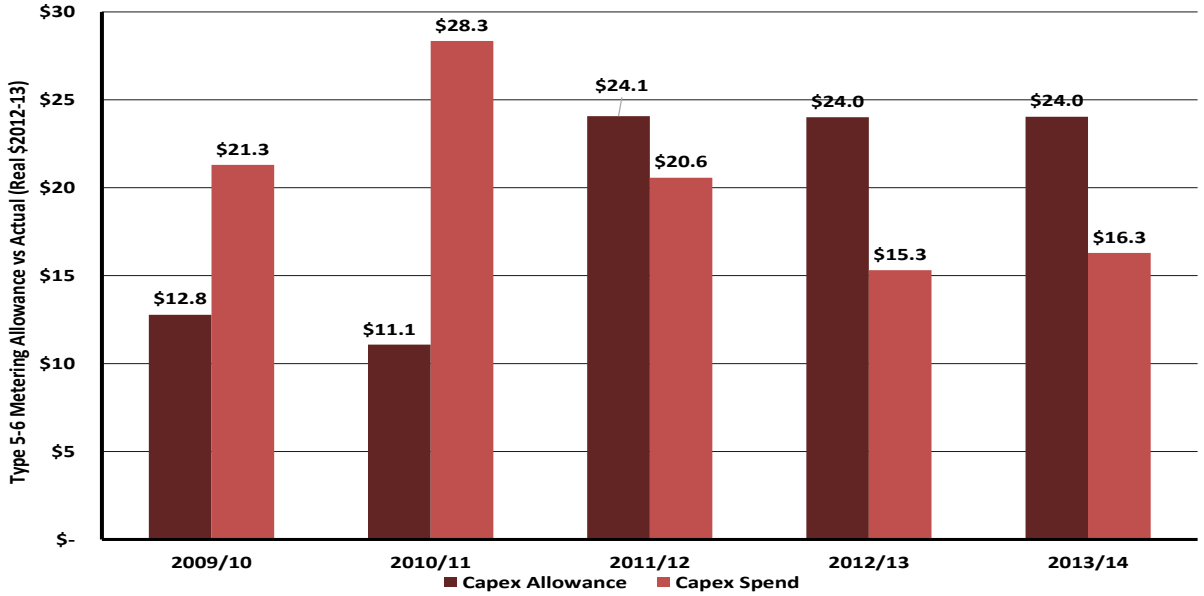
	2009/10	2010/11	2011/12	2012/13
Annual Inflation Rate	1.8%	2.8%	3.4%	1.8%

Ausgrid's historical capital expenditure and regulatory allowance are displayed in Figure 6.2. It shows Ausgrid's actual metering capex spend of $101.8 million over the 2009-14 period was 6.1% higher than its approved capex allowance of $96.0 million[62]. Ausgrid's average annual spend was $20.4 million per annum compared to its allowance of $19.2 million per annum.

[61] Endeavour Energy, (February 2014), *G-Metering Services_Unit Rate Model_Nominal,* historical 2009-14 inflation rates in the 'Calculation Variables' sheet

[62] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Table 11

Figure 6.2 – Estimated Metering Capex Allowance and Spend for the 2009-14 Regulatory Period



Source: Ausgrid

Ausgrid's proposal attributes the 2010/11 variation in expenditure compared to the allowance on the unplanned expenditure to metering upgrades for solar PV installations as a result of the NSW Government Solar Bonus Scheme[63]. Ausgrid also attributes the step change in the 2012/13 year due to re-allocation of budget to the *Smart Grid, Smart City* (SGSC) program, which involved meter installation.

Energeia found that Ausgrid's historical capex spend for the 2009-14 historical regulatory period was 6.1% higher than its capex forecast.

Energeia conclude that Ausgrid's capex forecasting methodology was reasonably reliable, noting the significant early overspend (due to some degree the NSW Solar Bonus Scheme), and transfer of budget to the SGSC program in the later years.

6.3 Forecast Capital Expenditure

Ausgrid's ACS metering services proposal forecasts $102.6 million in capex over the 2014-19 period, comprised of the following key capex categories[64]:

- $82.2 million of Type 5-6 metering capex, comprised of:
  - $25.6 million for reactive meter replacements;
  - $53.2 million for bulk meter replacements; and
  - $4.5 million for new and upgraded meter installations in the FY15 transitional year
- $13.7 million for Type 5-6 metering IT Systems;
- $7.5 million for furniture, plant, fleet, other, shared IT; and
- ($1.8 million) for non-system land disposal

[63] Ausgrid, (2014), Attachment I - Alternative Control Services for Type 5 and 6 Metering Services, page 2.

[64] Ibid, Table 9 and Table 10 and email correspondence with Ausgrid on 25/02/14.

In addition, $25.9 million in capex is forecast for new and upgraded metering installations over the period in the form of capital contributions through upfront meter charges. Therefore this amount of $25.9 million has been excluded from Ausgrid's proposed total capex of $102.6 million.

The following sections review Ausgrid's proposal and supporting documentation for each category of capex against the relevant regulatory requirements and in light of the AER's Guideline.

6.3.1 Unit Prices

Forecasts capex to be approved by the AER under the expenditure criteria, must be based on a reasonable estimate of future unit prices. Furthermore, the units themselves must be demonstrated to represent the lowest sustainable cost of meeting the DNSPs legal obligations.

The key inputs into the unit price for new and upgraded metering installations and replacement metering installations are meter equipment, handling and labour costs, which are described below.

Meter Equipment, Handling and Logistics Costs

The efficiency of Ausgrid's metering solutions is supported by the analysis undertaken by Networks NSW to determine the least cost approach to future meter purchases. The analysis is based on a cost benefit assessment of the alternatives, but the model itself has not been provided for review by Energeia.

Based on the analysis outlined in section 6.1.3, Ausgrid's forecast metering prices appear to be reasonably likely to comply with the expenditure criteria.

The reasonableness of a meter price forecast is typically demonstrated by the existence of a metering contract. No metering contracts are yet in place for Type 6 meters, but a procurement exercise is underway that could in Energeia's view provide an appropriate basis for determining reasonable future meter prices.

Ausgrid provided a detailed model which demonstrated how their meter equipment and handling prices had been developed for new and upgraded metering installations and replacement metering installations[65]. Meter equipment prices are based on an average of available quotations from meter suppliers (which Ausgrid will update upon finalisation of contractual arrangements[66]), as listed below:

- $20.00 for a B1 meter
- $88.30 for a B3 meter
- $86.50 for an E1 meter
- $143.67 for an E2 meter
- $202.00 for an E3 meter
- $519.00 for an E4 meter[67].

Ausgrid's meter handling costs are based on its recent actual costs associated with meter release, acceptance testing and handling costs. Ausgrid's per meter handling cost vary from approximately $13 to $19.50 per meter, based on 2013 YTD (July 2013 to October 2013) actual expenditure, extrapolated for the full 2013/14 year[68]. This method of using recent revealed cost demonstrates the reasonable expectation of costs.

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65 Ausgrid, (2014), 20140212 Metering (Capex) Plan v11 (clean) spreadsheet

66 Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Section 5.1, p11

67 Ausgrid, (2014), *20140210 Full Metering Plan v11 spreadsheet*, Meter Hardware Price sheet

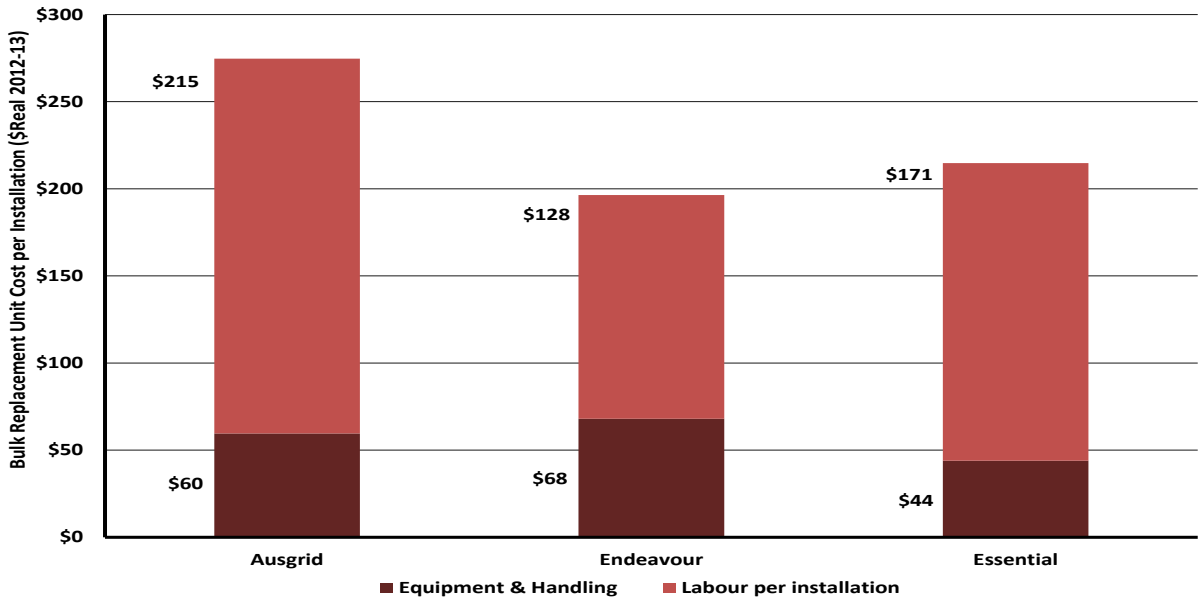
68 Ausgrid, (2014), 20140212 Metering (Capex) Plan v11 spreadsheet, Summarised sheet

Accredited Service Provider (ASP) logistics labour costs apply for new and upgraded metering installations. ASP logistics costs should be approximately the same each year. Ausgrid has calculated logistics costs at around $9 per meter for the 2014-15 transitional year and will normalise this into a weighted average total upfront metering equipment cost from 2015-16 onwards[69].

Bulk Meter Replacement Labour Costs

Figure 6.3 below shows a comparison of Ausgrid, Endeavour Energy and Essential Energy's bulk meter replacement unit costs per installation. This shows that Ausgrid's bulk meter replacement cost is the highest of the NSW DNSPs due to its labour cost of $215 per installation being the highest of the NSW DNSP's.

Figure 6.3 – Estimated Bulk Meter Replacement Unit Price per Installation



Source: Ausgrid, Endeavour and Essential

Energeia note that this may not be like-for-like comparison. Energeia had to make assumptions about the build-up of Endeavour Energy and Essential Energy's bulk replacement unit cost as this information was not available. This included assumptions about the meter-to-premise ratio for each of the NSW DNSPs bulk meter replacement programs, which was based on either the DNSPs actual estimated ratio of meters to NMIs for this program (Ausgrid) or an estimate based on broader company information[70].

Endeavour Energy has the highest ratio of meters per premise which would tend to lead to lower average bulk replacement labour costs due to lower travel time per installation on average and therefore greater installation efficiencies.

Energeia found that Ausgrid's forecast input prices for equipment are based on indicative market quotes from suppliers and input prices for labour are based on actual historical costs.

Energeia found that metering contracts were not yet in place, however a procurement exercise is underway that could provide an appropriate basis for determining reasonable future meter prices.

[69] Ausgrid, (2014), Representations from Ausgrid to Energeia in March 2014

[70] Endeavour Energy's has a ratio of 1.69 meters per premise; Ausgrid 1.33 meters per premise for 2014-19 bulk replacement program; Essential Energy 1.24 meters per premise for 2007-2019 new meter installations.

Energeia conclude that Ausgrid's forecast input prices are reasonable likely to comply with the expenditure criteria.

Energeia recommend that Ausgrid finalise their contracts prior to the AER's Final Determination to ensure they are considered by the AER.

Energeia also recommend that Ausgrid explain how their planned use of internal labour satisfies the capital expenditure criteria.

6.3.2 New and Upgraded Metering Installations

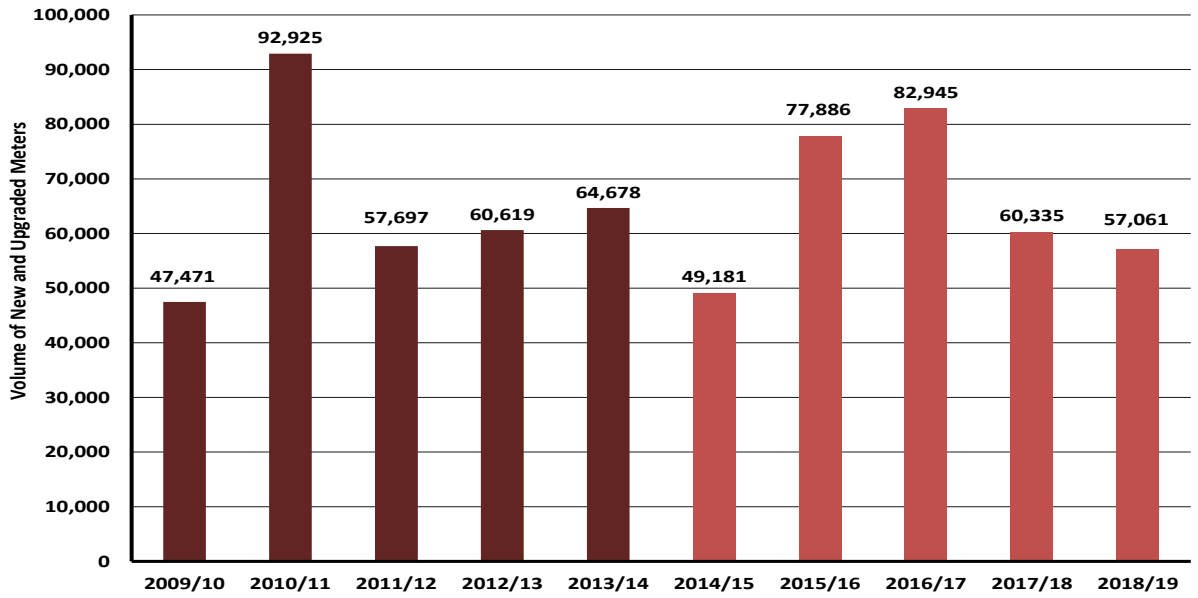
Ausgrid's new and upgraded metering capex forecast must be demonstrated to be prudent, efficient and based on a reasonable estimate of future volumes and unit pricing to be approved by the AER under the Rules for building block determinations for new and upgraded metering installations.

Unit prices were considered in section 6.3.1, the following sections review the efficiency, prudency and reasonableness of Ausgrid's forecast volumes and capex.

Forecast Volumes

Ausgrid's forecast volumes for new and upgraded connections per annum are presented in Figure 6.4 alongside historical rates. It shows that Ausgrid's forecast volume of 327,407[71] new and upgraded Types 5 and 6 metering installations for the 2014-19 period to be consistent with the 323,390 installations that occurred in the 2009-14 period, with an average of approximately 65,000 new and upgraded metering installations in each of the 2009-14 and 2014-19 regulatory periods.

Figure 6.4 – Historical and Forecast Volumes of Types 5 and 6 new and upgraded metering installations



Source: Ausgrid

Ausgrid's volume forecast includes 35,182[72] Type 5 new net Solar PV installations and 42,790[73] Type 5 Solar Bonus Scheme (SBS) Gross to net solar PV installations over the transitional (2014/15) and

71 Ausgrid, (2014), 20140210 Full Metering Plan v11 spreadsheet, Summarised sheet.

72 Ausgrid, (2014), 20140212 Metering (Capex) Plan v11 (clean) spreadsheet, 'NEW&UPGRADE' sheet

73 Ibid.

subsequent (2015/16 to 2018/19) regulatory periods. Ausgrid's forecasts in 2015/16 and 2016/17 also anticipate the conversion of all customers on the gross feed-in-tariff (FiT) to net metering.

Ausgrid's forecast volume of 7,036 new net solar PV installations per year for the 2014-19 regulatory period is based on its most recent installation data in the current regulatory period[74]. This is based on Ausgrid's extrapolated annual volume of 7,036 Type 5 new net solar PV installations for the period from January to November 2013[75], and is also consistent with FY10 figures (prior to impact of the NSW Government Solar Bonus Scheme).

Ausgrid's forecast volume of 42,790 conversions from gross to net is based on the GENR and GENR2 tariffed NMI's registered in the MBS system (E52895) in January 2014[76]. The forecast volume of these installations is driven by the cessation of the NSW Solar Bonus Scheme (SBS) program on 31 December 2016, the point at which payments will cease. Ausgrid has assumed that all of these conversions will occur over a 2 year period, starting from 6 months prior to expiry of the SBS in NSW, and 18 months after.

Energeia questioned the timing of replacements and whether 100% of Solar Bonus Scheme customers would convert their metering installation at the end of the scheme. However as these meters will be funded by the customer upfront, the meter replacement costs do not form part of the capital expenditure forecasts.

Forecast Expenditure

Ausgrid's forecast capex for new and upgraded metering connections is $30.4 million for the 2014-19 regulatory period, of which $4.5 million is part of Ausgrid's regulatory proposal for the 2014/15 transitional year and $25.9 million is to be recovered through capital contributions for the subsequent 4 year period from 2015/16 to 2018/19.

Figure *6.5* below shows Ausgrid's historical and forecast capex for new and upgraded metering installations[77]. Average new and upgrade capex was approximately $7.7m per year in 2009-14 and is $4.5m in the 2014-15 transitional year, a reduction of approximately 42% in new and upgraded metering costs between periods in real terms. Figure 7.5 has no capex for 2015-19 as Ausgrid is intending to recover the cost of new and upfront meters from 1 July 2015 from capital contributions.

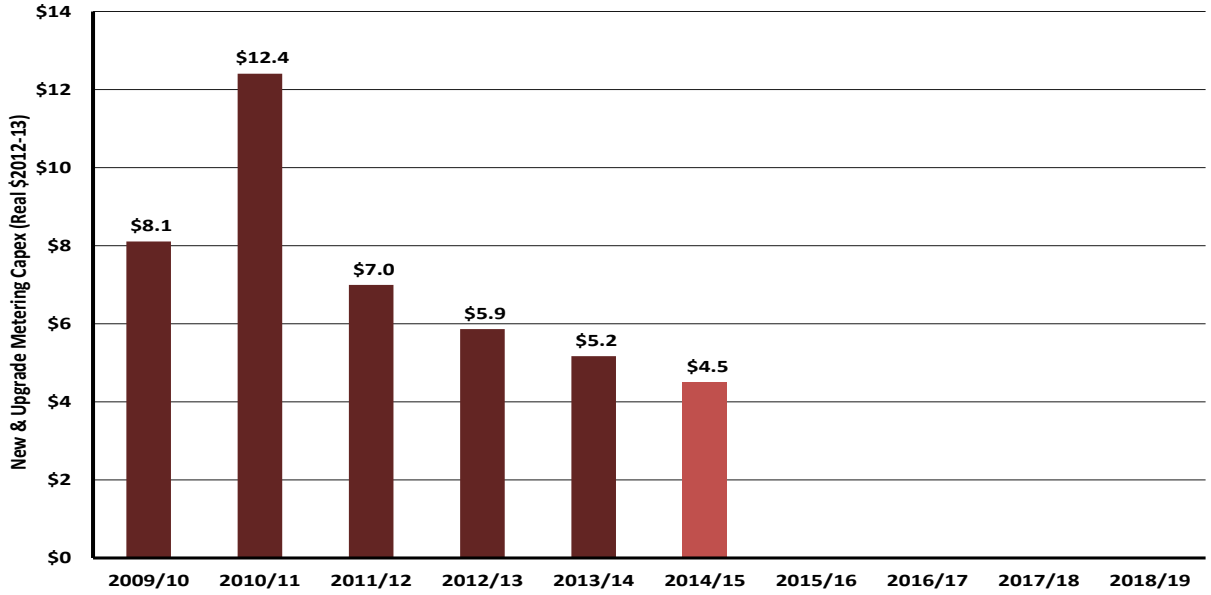
[74] Ibid.

[75] Ausgrid, (2014), *20140212 Metering (Capex) Plan v11 (clean) spreadsheet*, Historical New & Upgrade sheet

[76] Ibid, NEW&UPGRADE sheet

[77] Ausgrid, (2014), *Attachment I: ACS Type 5-6 Metering Services*, Table 6, p10, New and Upgrade budget of $32.7m.

Figure 6.5 - *Historical (2009-14) and Forecast (2014-19) new and upgraded metering capex*



Source: Ausgrid

Forecast metering expenditure in 2014/15 appears to be continuing a trend of significant cost reductions since 2011/12. Energeia would have expected to see a significant step change in costs in 2014/15 due to the change in metering policy from Type-5 to low cost Type-6 metering. However, it should be noted that equipment costs only reflect about half of the total cost of new and upgraded metering.

Energeia found that Ausgrid's volume forecast of new and upgraded metering installations is consistent with historical volumes.

Energeia found that Ausgrid's price forecast is based on NNSW metering strategy equipment.

Energeia found that the forecast budget for 2014/15 is 13% lower than 2013/14 expenditure and the forecast budget for 2014/15 is 42% lower than annual average capex for the 2009-14 regulatory control period.

Energeia conclude that the forecast volumes, which will be used in the setting of upfront charges due to the allocation of fixed costs, are reasonable.

6.3.3 Meter Replacements

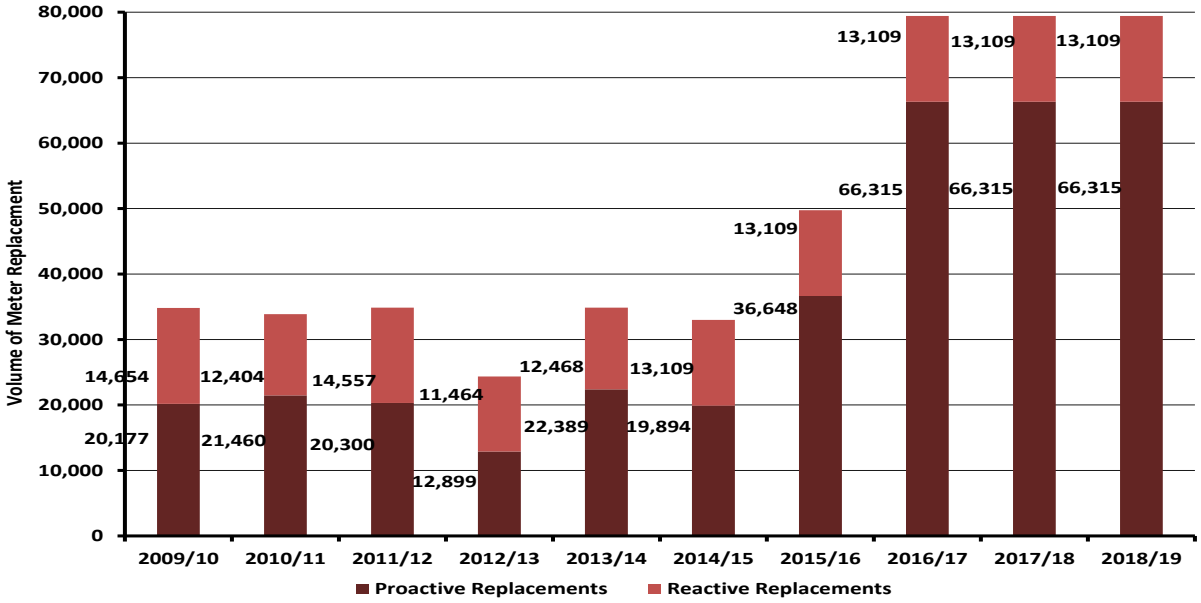
Meter replacement capex is comprised of reactive capex on in-situ meter failures and bulk replacement capex on failed metering populations. Ausgrid's replacement capex forecast must be demonstrated to be prudent, efficient and based on a reasonable estimate of future volumes and unit pricing in order to be approved by the AER under the Rules for building block determinations.

Unit prices were considered in section 6.3.1, the following sections review the efficiency, prudency and reasonableness of Ausgrid's forecast volumes and Capex for meter replacements.

Forecast Volumes

Figure 6.6 below shows Ausgrid is forecasting 321,034 meters[78] for replacement over the 2014-19 period. This is an increase in the replacement volumes as a proportion of Ausgrid's total meter population from 1.4% to 2.6% per year. This increase is primarily driven by the increase in bulk meter replacement.

Figure 6.6 – Historical and Forecast Volumes of Types 5 and 6 Meter Replacements



Source: Ausgrid

The forecast for the 2014-19 regulatory period assumes 65,481 meter replacements (bulk and reactive) per year, based on 51,097 bulk meter replacements and 13,109 reactive meter replacements each year[79]. The increase in the volume of bulk replacements is driven by meter population which have failed compliance testing and are proposed to be replaced over the 5 year 2014-19 regulatory period. There is no change in the volume of reactive meter replacements between regulatory periods.

Ausgrid's bulk replacement forecast reflects non-compliant meter populations identified through sample testing (a total of 260,009 meters). Ausgrid's sample testing found that the AZ, SD and BAZ meter populations have all whole failed[80].

Due to the large size of the BAZ meter population it was redefined into smaller sub-populations; BAZ 10-40 and BAZ 10-60. The testing associated with BAZ 10-40 has been completed and has been shown to be a failed sub-population. As of 11 March 2014, Ausgrid had completed over 80% of the BAZ 10-60- sub-population testing, and have advised that this sub-population testing is indicating a failed population, with only two more meters required to fail out of a remaining sample of 80 to be undertaken. For this reason, the BAZ 10-60 population has been included in the proposed proactive meter replacement volumes.

Energeia compared Ausgrid's forecast bulk replacement volumes against the other NSW DNSPs to provide a high level volume benchmark for assessing its reasonableness. The comparison in Figure 6.7 shows Ausgrid's forecast volumes are lower per customer than Endeavour and Essential but consistent with the expected mean lifetime (47 years) of the (electro-mechanical) metering assets being replaced.

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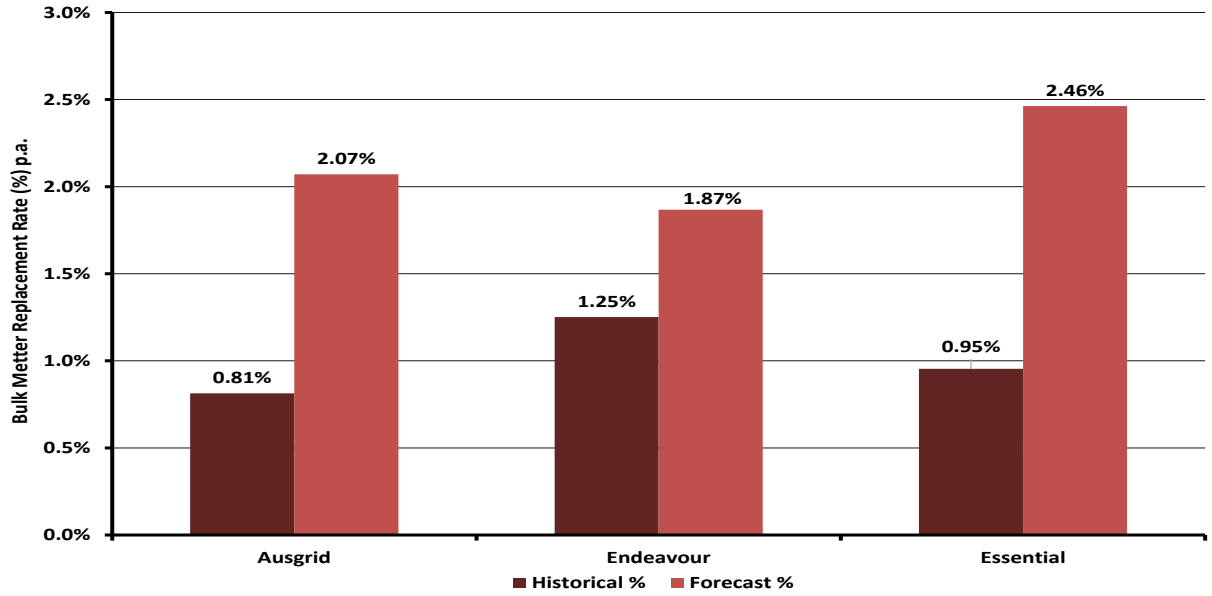
78 Ausgrid, (2014), 20140212 Metering (Capex) Plan v13 (clean), Summarised sheet

79 Ausgrid, (2014), 20140212 Metering (Capex) Plan v13 (clean), Summarised sheet

80 Ausgrid, (2014), Attachment I: ACS Type 5-6 Metering Services, Table 5, Page 13.

Figure 6.7 – Annual Bulk Replacements as a Percentage of the Meter Population



Source: Ausgrid, Endeavour Energy and Essential Energy

Ausgrid states that in determining the timeframe to replace the non-compliant meters it has sought to strike a balance between demonstrated past performance capability volumes, "an acceptable" timeframe to reach compliance and impacts to capital expenditure (and hence customer prices)[81]. As a result, it has sought to replace the identified meters over a 5 year period because:

- It demonstrates to AEMO a commitment to achieving compliance in a regulatory period based on current non-compliances
- A short period of time such as 2 or 3 years may stretch resources unreasonably and drive increased capital expenditure in the beginning of the period
- Ausgrid preliminary data indicates that other large meter population may need to be replaced in the subsequent (2019-2024) regulatory period, increasing delivery risk for longer timeframes

There is no change in the forecast volume for reactive meter replacements between the 2009-14 and 2014-19 regulatory control periods. Energeia questioned whether the volume of reactive meter replacements should reduce in the context of the increase in the bulk meter replacement program. Ausgrid explained that this was not the case as the mode of failure for reactive meter replacements is independent of the mode of failure for bulk meter replacements[82]. Reactive replacement is based on random failure of hardware which is more prevalent in (newer) electronic meters. In contrast, Ausgrid verbally informed Energeia in March 2014 that its bulk replacement program is driven by the accuracy drift of an entire population (typically older meters). Ausgrid's view was therefore that the replacement of the compliance-driven meter populations (bulk) would not reduce the random failure rate of the remaining meter hardware in the fleet (reactive).

Energeia compared Ausgrid's proposed reactive replacement volumes against the other NSW DNSPs to provide a high level benchmark of reactive replacement volume forecasts. Figure 6.8 shows Ausgrid's reactive replacement volume estimates to be approximately double that of Endeavour Energy and

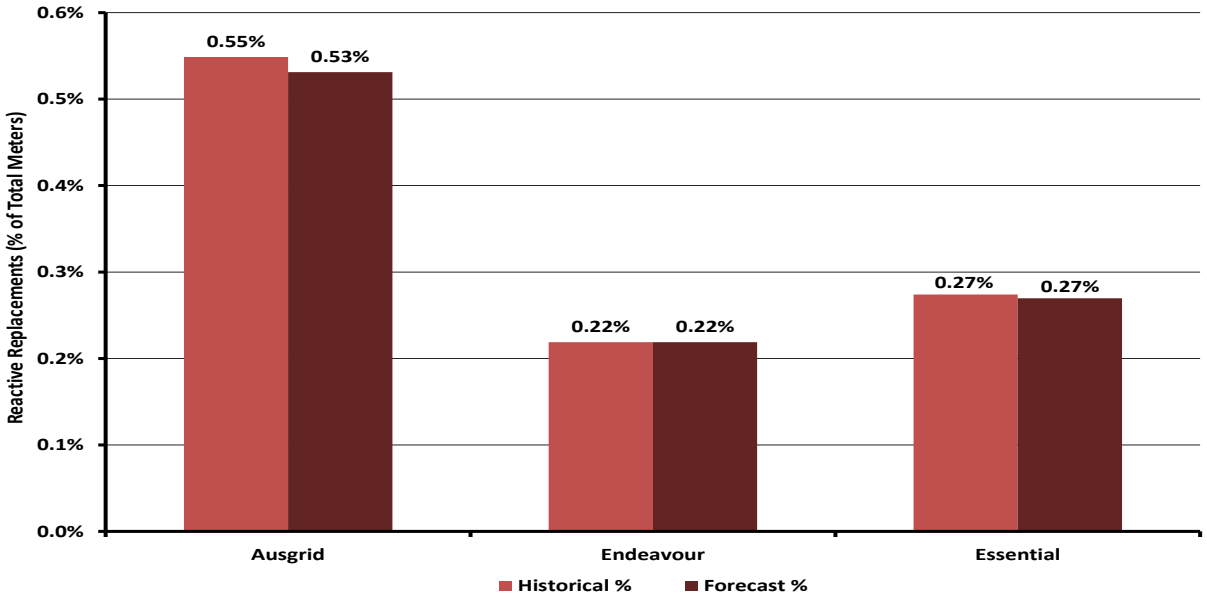
[81] Ausgrid, (2014), Attachment I: Alternative Control Services for Type 5 and 6 Metering Services, p. 11.

[82] Ibid, Section 5.3.1

Essential Energy's, noting that Endeavour Energy's forecast is an estimate based on its historical failure rate.

Ausgrid explained that its higher reactive meter replacement rate was driven by its higher population of electronic meters which have a higher random failure rate compared to mechanical meters[83]. In 2013, Ausgrid's interval meters had a 0.52% failure rate compared to non-interval meters 0.05% failure rate[84].

Figure 6.8 – Annual Reactive Meter Replacements as a Percentage of the Meter Population



Source: Ausgrid, Endeavour and Essential Energy

Forecast Expenditure

Ausgrid's forecast budget for meter replacements is $78.8 million[85] over the 2014-19 regulatory control period, as shown in Figure 6.9. $25.6 million is forecast for reactive meter replacements and $53.2 million is forecast for bulk replacements[86].

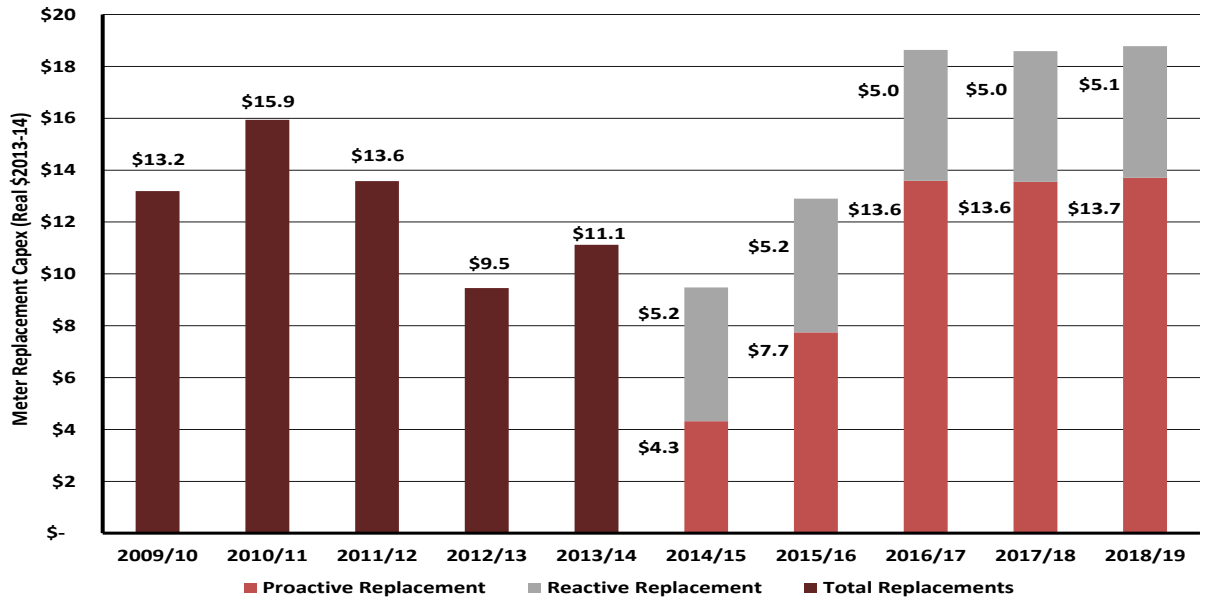
[83] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 and 6 Metering Services,

[84] Ibid.

[85] Ausgrid, (2014), 20140212 Metering (Capex) Plan v13 (clean), Summarised sheet

[86] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Table 10

Figure 6.9 – Actual (2009-14) and Forecast (2014-19) Replacement Capex



Source: Ausgrid

Energeia found that Ausgrid's forecast meter replacement capex for 2014-19 is 23% higher than the historical period due to the increase in replacement volumes as result of failing meter populations which are being replaced for compliance reasons. This implies a reduction in replacement unit costs of approximately 36% from the current regulatory period.

In terms of total metering population, bulk replacements represent an increase from approximately 0.8% of Ausgrid's meter population per annum in the 2009-14 historical period, to 2.1% in the 2014-19 forecast regulatory period.

Deliverability

Energeia note that the 97% increase in the volume of meter replacements between regulatory periods requires Ausgrid to demonstrate a clear resourcing strategy for delivering this step change in metering installations in the 2014-19 regulatory period.

Ausgrid has provided high level information of its resourcing strategy to deliver a 97% increase in volumes between the 2009-14 and 2014-19 regulatory periods, with a step change occurring in year 2 and 3 of the forecast regulatory period[87].

Ausgrid informed Energeia that in the short-term delivery, up until the end of 2015/16, would be achieved through the use of internal resources. Energeia notes that a resourcing strategy that addresses step increases in year 3 (commencing 1 July 2016) to year 5 of the forecast regulatory period needs to be in place prior to 1 July 2016 to address the deliverability of the proposed program.

[87] Ausgrid, (February 2014), Attachment I: Alternative Control Services – Type 5 and 6 Metering Services.

Energeia found that Ausgrid's bulk replacement volume forecast is based on compliance testing results.

Energeia found that Ausgrid's reactive replacement volume forecasts is consistent with its historical failure rate, and that Ausgrid's higher reactive replacement rate relative to the other NSW DNSPs is due to a higher proportion of electronic meters.

Energeia found that Ausgrid's volume forecasts exhibited a ramp-up to that could be delivered in the short-term through the use of internal resources and that a resourcing strategy will need to be in place prior to 1 July 2016 to ensure delivery of the step change increase in volumes in 2016/17.

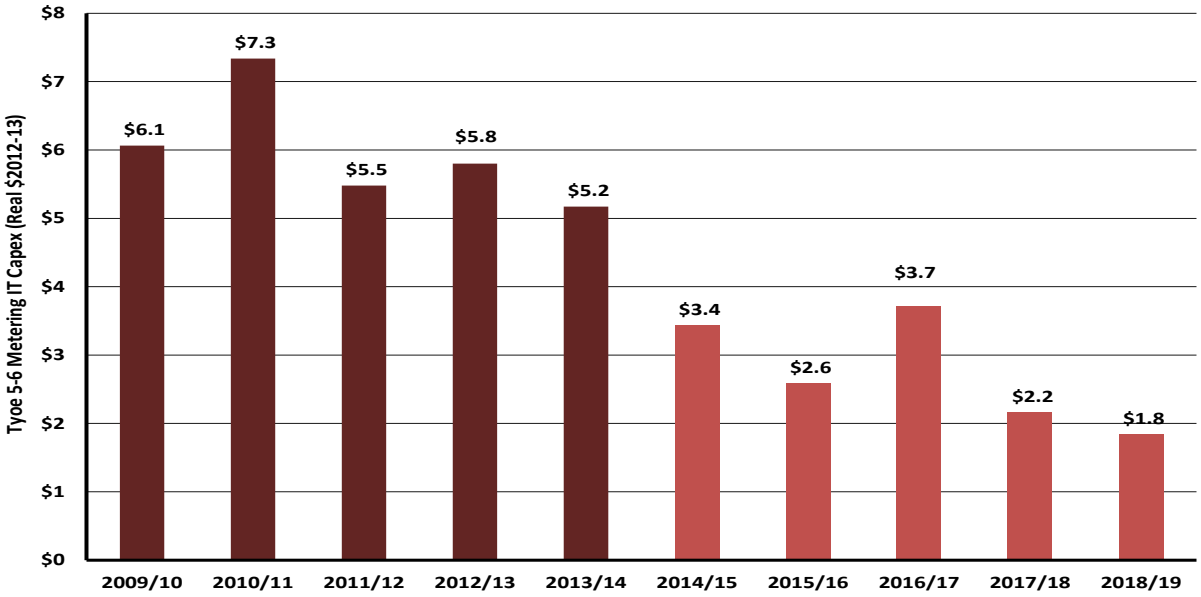
Energeia conclude that Ausgrid's forecast meter replacement expenditure is reasonably likely to comply with the expenditure criteria, noting labour unit pricing issues raised in the previous section.

6.3.4 Metering Information Technology

Ausgrid's metering systems capex forecast must be demonstrated to be prudent, efficient and based on a reasonable estimate of future volumes and unit pricing to be approved by the AER under the Rules for building block determinations.

The forecast capex budget for Types 5 and 6 metering IT is $13.7 million for the 2014-19 regulatory control period[88], as shown in Figure 6.10 below. Energeia has not assessed metering IT capex as Ausgrid advised it would be reviewed as part of an external review of the complete IT capital program.

Figure 6.10 – Historical (2009-14) vs forecast (2014-19) Capex for Metering IT



Source: Ausgrid

Energeia has not assessed metering IT capex as it is subject to a separate external review process undertaken by Ausgrid.

[88] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Table 9

7 Operational Expenditure

In recent determinations, the AER has adopted an approach to determining what in the AER's opinion constitutes a prudent and efficient forecast of DNSP operational requirements. The AER has formalised its approach in the November 2013 guideline on expenditure forecast assessment (the Guideline).[89]

The AER's approach is founded on the assumption that the most recent complete year's operational expenditure (the revealed cost) represents an appropriate starting point to determine the efficient cost of operating the business, as the DNSP has an incentive to minimise this expenditure. The AER plans to use benchmarking to form a view of whether the revealed expenditure is efficient and will establish what it considers to be an efficient base year in its determination.

From that base, operational expenditures are forecast using what has been termed the 'base-step-trend' approach.

The base year costs are projected with adjustments for:

- Scale effects – observed increase in operational cost per increase in output (service) required;
- Economies of scale – recognising that the marginal cost of increased volume is likely to be less than the average cost;
- Step changes in cost, arising from recurrent or non-recurrent events;
- Real cost escalation; and
- An efficiency factor.

Ausgrid's operational expenditure forecast $140.0 million[90] is 2.4% lower than its historical metering opex of $143.5 million[91] over the current regulatory period.

In developing its opex forecast, Ausgrid has selected 2012/13 as its base year, identified metering related costs in its financial accounts, applied its cost allocation methodology to shared accounts, and capped their forecast opex in real terms over the regulatory control periods.

In reviewing Ausgrid's Type 5-6 Metering opex forecast, Energeia has followed the AER's approach, testing Ausgrid's base year for efficiency using a number of indicative benchmarks.

The following sections describe Ausgrid's proposal and supporting documentation, and our associated findings, conclusions and recommendations.

7.1 Key Policies and Assumptions

The key policies impacting Ausgrid's opex forecast are its:

- Cost Allocation Method; and
- Metering Strategy.

Ausgrid's Metering Strategy policy was reviewed in section 6.1.3. Ausgrid's policies and assumptions for allocating operational expenditure is summarised in the following sections along with Energeia's assessment of its appropriateness.

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89 AER, (November 2013), Better Regulation - Expenditure Forecast Assessment Guideline for Electricity Distribution.

90 Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Table 8

91 Ibid, Tables 6 and Table 8.

7.1.1 Cost Allocation Method

Ausgrid has grouped metering services into the following categories in developing its forecasts of metering service operating expenditure:

- Meter reading;
- Meter maintenance;
- Meter data services;
- Metering ICT Opex; and
- Opex Overheads

Actual 2012/13 costs formed the basis for forecasting future operating costs for these services. The allocation of Opex between SCS and ACS for the service categories is discussed below.

Ausgrid has historically recorded direct operating costs associated with its metering business, and recorded between the costs of providing Types 5 and 6 metering services. The availability of historic cost data the meter maintenance, meter reading and meter data services in separate Type 5 and 6 categories, means that no cost allocation between standard control services and alternative control services was required. Nor was an allocation between Type 5 and Type 6 costs required for meter reading, maintenance and meter data services.

Ausgrid's approach to allocating ACS metering service ICT costs has been the same as that set out in its CAM. Ausgrid has apportioned the total metering related ICT opex costs using direct allocation to unregulated, ACS and SCS classifications with the splits shown in Table 7.1 below, which shows that 68% is apportioned to Type 5 and 6 ACS Metering Services[92].

Table 7.1 – ICT Service Classification

Metering Type	Service Classification	Proportion of Total ICT Opex
Types 1 - 4	Unregulated – Contestable Metering	10%
Types 5 and 6	Alternative Control Services – Type 5 & 6 Metering	68%
	Alternative Control Services – Ancillary Fee Services	5%
Type 7	Standard Control Services – Network and Unmetered	17%

Source: Ausgrid

In relation to the apportionment of indirect corporate overheads, Ausgrid has allocated overheads between SCS and ACS on the basis of the direct operating costs for respective services. This is standard practice, as set out in Table B of the Accounting Separation Code.

Energeia found that Ausgrid's approach to the apportionment of operating costs between SCS and metering ACS follows the processes established in Ausgrid's CAM, which was issued pursuant to IPART's Accounting Separation Code[93].

Energeia conclude that Ausgrid's application of its cost allocation method to metering ACS opex is appropriate.

[92] Ausgrid, (2014), AER Regulatory Submission 2014-19 ICT Metering Alternative Control Services.

[93] IPART, (April 1997), Accounting Separation Code for Electricity Distributors in NSW.

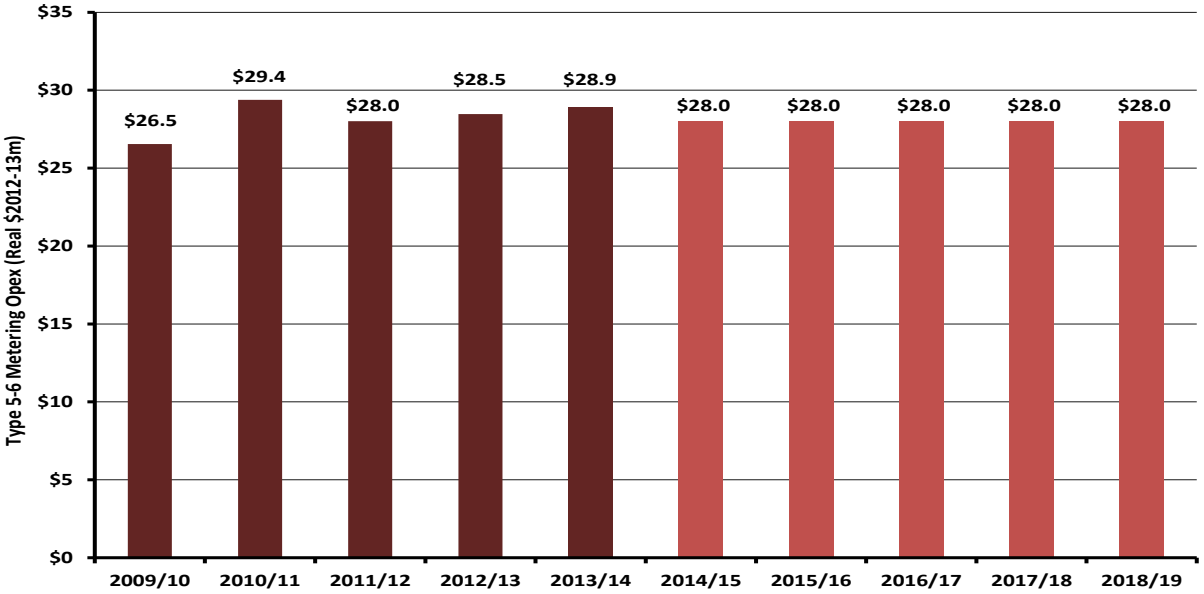
7.2 Historical Operating Expenditure

In addition to supporting the assessment of an appropriate base year, historical operational expenditure, along with historical numbers of services, provides the information necessary for the determination of each of the following key operational metrics used in the AER's base-step-trend assessment framework:

- Scale effects – observed increase in operational cost per increase in output (service) required;
- Economies of scale – observed changes in scale effects with changes in scale;
- Real cost escalation – observed increases in costs above CPI; and
- An efficiency factor – observed and expected future changes in operational productivity.

Ausgrid's historical and forecast operational expenditure are provided in Figure 7.1.

Figure 7.1 – Historical (2009-14) and Forecast (2014-19) Operational Expenditure



Source: Ausgrid

Ausgrid is forecasting Types 5 and 6 metering opex for the forthcoming regulatory control period of $140.0 million[94], which Energeia estimates to be 2.4% lower in real terms than the $143.5 million expended in the current regulatory period.

7.2.1 Trend

Energeia's analysis of Ausgrid's Type 5-6 metering operational expenditure has found that it has increased at a real rate of 2.3% per year between 2009/10 to 2013/14. Ausgrid explained that this increase was driven by its policy of increasing Type 5 metering to support ToU tariffs during the 2009-14 regulatory period. Ausgrid advised Energeia that the volume of Type 5 meters increased by approximately 13-14% per annum for the 3 year period from 2010/11 to 2012/13 and approximately 55% over this 4 year period. The unit cost of TOU orientated Type 5 metering is more than Type 6 metering. While the volumes of Type 5 meters increased by approximately 55% over 4 years, the overall costs in real terms only increased by 2.3%, demonstrating a reducing unit cost for Type 5 metering during the period.

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[94] Ausgrid, (February 2014), *Attachment I – ACS – Type 5 &6 Metering Services*, Table 6 (2014-19 forecast of $140.0m); consistent with Ausgrid, (2014), *Type 5-6 Meter Pricing Model 1.3 (rebalance solar),* Input – Forecast Expenditure' sheet

Ausgrid has provided the following explanations[95] for anomalies in historical Type 5 and 6 metering opex during the FY10-14 regulatory period:

- Meter maintenance costs for FY13 were $1.3 million lower than otherwise would have been due to the impact the *Smart Grids Smart City* project had on resources.
- Meter reading opex increased in FY13 and by more than growth in 2013-14 due to increased contract prices from outsourced companies.
- Metering IT Opex for FY11 was higher to increase operational expense following implementation of the IEEE interval metering IT system.

Energeia found that Ausgrid's historical opex increased in real terms over the period by 2.3% p.a.

Energeia found that the historical increase in total opex was driven by its policy of Type 5 metering in support ToU tariffs, with declining incremental costs.

Energeia conclude that the impact of Type-5 metering on the historical opex profile warrants careful consideration when assessing the efficiency of Ausgrid's Base Year and trends.

7.3 Forecast Operational Expenditure

In order for the AER to approve Ausgrid's forecast operational expenditure under a building blocks determination, it will need to be based on the AER's base-step-trend methodology, with the base year demonstrated to be efficient using an appropriate mix of the AER's assessment methodologies.

Ausgrid's 2014-19 metering opex budget of $140.0 million or $28.0 million[96] for each year of the regulatory control period. Table 7.2 below shows a breakdown of annual metering opex by metering maintenance, meter reading, meter data services, metering IT and metering overhead costs.

Table 7.2 – 2014-19 Annual Opex Forecast by Metering Service Type

Metering Opex Type	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Meter Reading	$8.0m	$8.0m	$8.0m	$8.0m	$8.0m	**$39.9m**
Meter Maintenance	$7.6m	$7.6m	$7.6m	$7.6m	$7.6m	**$37.7m**
Meter Data Services	$5.1m	$5.1m	$5.1m	$5.1m	$5.1m	**$25.7m**
IT Opex	$4.6m	$4.6m	$4.6m	$4.6m	$4.6m	**$23.1m**
Metering Overheads	$2.7m	$2.7m	$2.7m	$2.7m	$2.7m	**$13.4m**
Total	**$28.0m**	**$28.0m**	**$28.0m**	**$28.0m**	**$28.0m**	**$140.0m**

Source: Ausgrid

The following sections summarise Ausgrid's choice of base year, its efficiency, and the application of the step and trend components of the AER's methodology as stated in their proposal and supporting documentation. Energeia's findings, conclusions and recommendations are also reported.

7.3.1 Base Year

Ausgrid has selected 2012/13 as its base year due to it being the last full year of opex information available, and therefore reflective of its current costs. All NSW DNSPs decided to use 2012/13 as their opex base year.

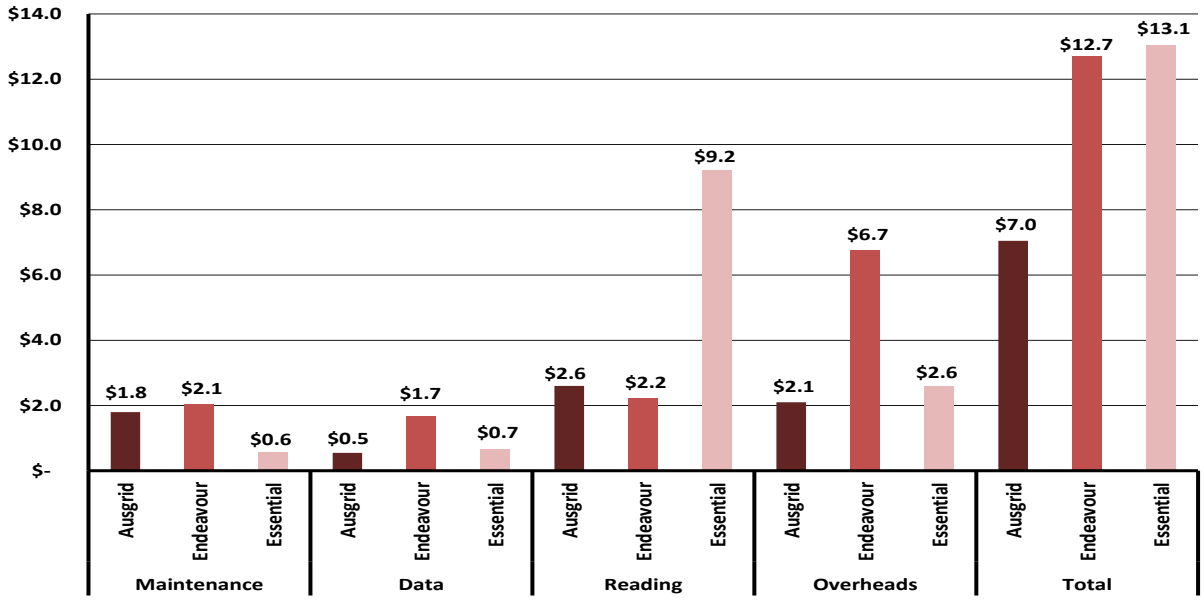
[95] Ausgrid (February 2014), *Attachment I – ACS – Type 5 & 6 Metering Services*, Section 4.4, page 13

[96] Ibid, page 3

Ausgrid does not address the efficiency of its base year in its proposal. Energeia has attempted to assess the efficiency of the proposed base year through analysis of historical expenditure (see Section 8.2.1) and high level benchmarking of subservice cost categories on a per customer basis.

Figure 7.2 compares Ausgrid, Endeavour and Essential's base year Type 6 Opex for meter reading, meter data services, meter maintenance, metering overheads[97] on a per meter per year basis.

Figure 7.2 – Metering Opex per Category per Type 6 Meter for NSW DNSP's



Source: Ausgrid, Endeavour and Essential

Energeia's analysis shows that Ausgrid has the lowest forecast Type 6 metering data services, overheads and total opex per meter per year of the NSW DNSP's. Ausgrid's meter maintenance and reading opex per meter per year are also comparable with Endeavour Energy.

In comparing operational expenditure across the three DNSPs, it is important to adjust for differences in their scale across each of the categories, e.g. customer density for meter reading, interval metering for data costs, meters per premise, meter age and electronic metering for maintenance.

For example Essential Energy's meter reading opex per meter per year is expected to the highest of the NSW DNSP's as it has a much larger network area, lower customer density and therefore higher average travel times. In comparison, Ausgrid's meter reading opex per meter per year are expected to be much lower due to its relatively small network area and high customer density.

Endeavour Energy's overheads are substantially higher than the other NSW DNSP's, which could also be due to a differences in capitalisation or cost allocation approaches.

Endeavour's metering policy to install multiple single phase meters for controlled load services would increase their meter maintenance costs on average. Their use of type-6 meters should make their data services lower cost than DNSPs that use type-5 metering.

Energeia found that Ausgrid's 2012/13 base year opex ($28.5m) was higher than previous years, reflecting increasing Type 5 volumes, but reflected a declining per customer price.

[97] Includes both metering opex overheads and ICT opex

Energeia found that Ausgrid's base year is consistent with expected trends due to the type-5 metering policy at the time.

Energeia conclude that Ausgrid's base year is reasonably likely to be efficient once their economies of scale, customer density and higher cost type-5 metering policy are taken into consideration.

7.3.2 Step Changes

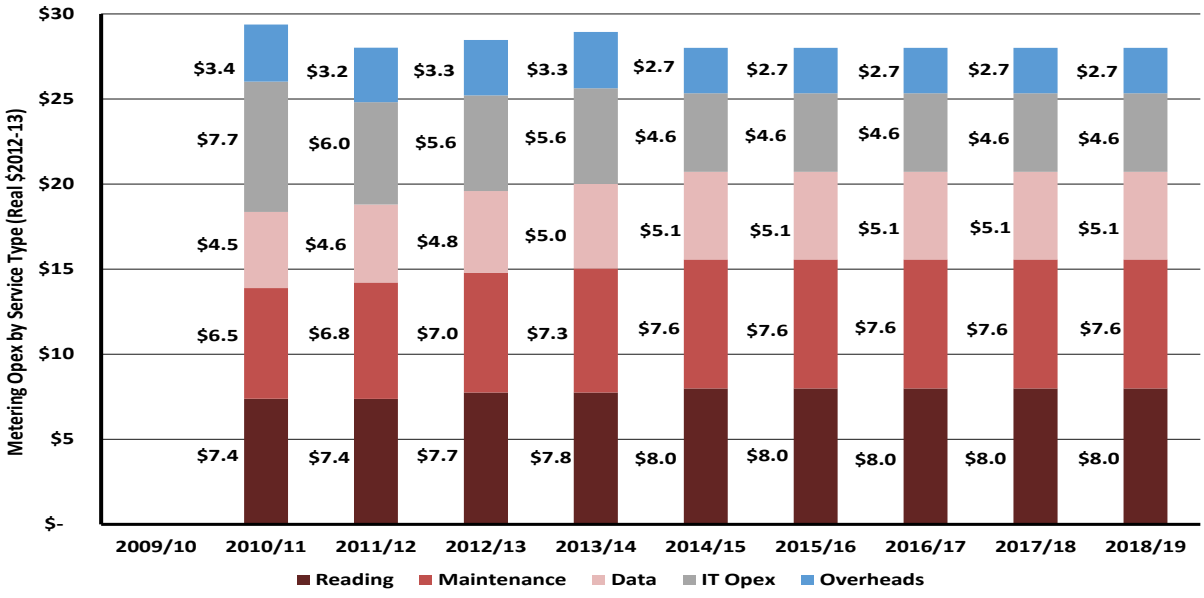
The AER's Opex assessment approach requires the determination of positive and negative step changes within and between regulatory control periods.

Given the change in metering strategy from 1 July 2014 to install low cost Type 6 meters for almost all new and upgraded metering installations, Energeia would expect to see a significant positive (downward) step change in the 2014/15 year.

Ausgrid's forecast Types 5 and 6 metering Opex for the forthcoming regulatory control period of $140.0 million[98] is 2.4% lower than the $143.1 million expended in the current regulatory period[99]. A positive (downward) step change of 1.6% in real terms between actual 2012/13 base year opex[100] and forecast 2014/15 opex has been applied by Ausgrid, with forecast metering opex remaining flat for the subsequent 4 years of the 2014-19 regulatory period.

In other words, Ausgrid are proposing a positive (downward) step change in 2014/15 metering opex that is slightly lower than the expected annual increase in customer numbers that year. While this may not seem like a lot, it should be recalled that the change in metering policy has an incremental impact on opex of new and upgraded customers only. It actually represent around two years of customer growth. Figure 7.3 below shows the breakdown of Ausgrid's historical and forecast Type 5-6 metering Opex by metering service type.

Figure 7.3 – Historical (2009-14) and Forecast (2014-19) Operational Expenditure



Source: Ausgrid

[98] Ausgrid, (2014), *Attachment I – ACS – Type 5 &6 Metering Services,* Table 6, 2014-19 forecast of $140.0m; consistent with Ausgrid, (2014), *Type 5-6 Meter Pricing Model 1.3 (rebalance solar),* Input – Forecast Expenditure' sheet.

[99] Ibid, Table 8, Type 5-6 metering opex

[100] Ausgrid, (2014), Metering Opex story history_energeia spreadsheet

Table 7.3 below shows the percentage change in Opex by metering services type between the 2009-14 and 2014-19 regulatory periods. It indicates that total forecast meter reading, maintenance and data services Opex has increased in real terms relative to historical Opex, while total forecast metering IT Opex and overheads have decreased in real terms.

As previously mentioned, Ausgrid explained that the overall increase in meter reading, maintenance and date services is due to its growth in Type-5 metering population over the period, an increase of Type 5 of approximately 55%. It is therefore more appropriate to look at the incremental cost, which has fallen.

Table 7.3 – Historical (2009-14) and Forecast (2014-19) Type 5-6 Metering Opex

Metering Opex Type	Average 2009-14	Average 2014-19	% Change
Meter Reading	$7.6m	$8.0	**6%**
Meter Maintenance	$6.9m	$7.6m	**10%**
Meter Data Services	$4.6m	$5.1m	**9%**
Meter IT Opex	$6.3m	$4.6m	**-26%**
Overheads	$3.3m	$2.7m	**-19%**
Total Metering Opex	**$28.7m**	**$28.0m**	**-2.5%**

Energeia found that Ausgrid is applying a positive (downward) step change of 1.6% in 2014-15, which more than accounts for the change in its metering policy.

Energeia conclude that Ausgrid's proposed step change is appropriate.

7.3.3 Forecast Trend

Ausgrid's forecast trend is for a flat opex profile in real terms over the 2014-19 regulatory period, despite adding 18,195 new customers each year on average for this 5 year period[101]. This appears to imply a 1% increase in efficiency each year to offset the percentage increase in customer numbers.

Energeia found that Ausgrid's proposed opex trend is flat and implies a 1% annual increase in efficiency due to its increasing forecasted number of customers.

Energeia concludes that Ausgrid's proposed opex trend reflects an increase in Opex efficiency that is consistent with historical trends.

[101] Ausgrid, (2014), *20140212 Metering (Capex) Plan v11 spreadsheet,* Project Delta New NMIs sheet.

8 Regulatory Asset Base

The Rules require the regulated asset base used in a building blocks determination to be based on the starting Regulatory Asset Base (RAB) and the AER's Roll Forward Model (RFM)[102]. The development of a cost reflective cost basis for the AER to determine the price cap for Alternative Control Services (ACS) requires the carving out of ACS metering assets from the Standard Control Service (SCS) RAB.

The NSW DNSPs developed a common approach to separating out their ACS metering RAB based on the direct allocation of metering assets, and the allocation of shared assets according to the ratio of the metering assets to the non-shared assets in the SCS. The load control portion of the RAB to remain in the SCS RAB was calculated based on the proportion (%) of load control assets relative to the total of the opening metering RAB.

The approach to Weighted Average Cost of Capital (WACC) was also aligned across each NSW DNSP. However, the approach to depreciation was not. Ausgrid has adopted standard depreciation schedules due to their relatively large metering RAB, which prevented them from following the five year accelerated depreciation schedule adopted by Essential Energy and Endeavour Energy.

Energeia's review of Ausgrid's approach to developing its opening RAB and applying the AER's RFM over the period has found:

1. The establishment of the opening ACS metering RAB is consistent with Ausgrid's CAM and the agreed allocation approach by NSW DNSPs and is therefore reasonable
2. The depreciation schedule and in particular the assumed standard asset lives are consistent with industry practice, protect customers from price shocks, and are therefore reasonable
3. The WACC will be based on the SCS WACC, and while ACS is riskier, is consistent with the AER's precedent in Tasmania and therefore reasonable

Based on these findings, Energeia conclude that Ausgrid's RAB and RFM outcomes are appropriate, subject to the confirmation of the historical and forecast customer capital contributions.

The following sections describe Ausgrid's proposal and supporting documentation, and our associated findings, conclusions and recommendations for each specific RAB related issue.

8.1 Key Policies and Assumptions

The key policies impacting Ausgrid's opening RAB and RFM are its:

- Asset Allocation Method;
- Depreciation Policy; and
- WACC assumption.

Ausgrid's proposal and supporting documentation is summarised in the following sections along with Energeia's assessment of its appropriateness.

[102] AEMC, (2014), *National Electricity Rules*, Clause 6.3, 6.5

8.1.1 Asset Allocation Method

The Rules require costs to be allocated according to an AER approved Cost Allocation Method (CAM)[103]. In order to be approved, the CAM must allocate costs on the basis of causality, or if this is not possible, in a manner that does not distort efficient consumption decision making.

Ausgrid's current, AER approved CAM covers the allocation of costs between SCS, ACS and unregulated services[104]. However, it was developed before the AER's decision to classify metering services as an ACS and revision of the document will be required for the 2014 review.

Ausgrid's approach to allocate assets from the SCS RAB to the opening metering RAB is as follows:

- The SCS RAB as at 1 July 2009 is rolled forward using actual capital expenditure, to establish the SCS RAB as at 30 June 2014. The RFM is used to perform this calculation, which will accompany Ausgrid's regulatory proposals on SCS and metering ACS;
- Those assets that are used to provide metering services are identified;
- Assets that are used solely for metering services are assigned to the ACS metering RAB; and
- Assets that are jointly used to provide both ACS metering services and SCS are allocated between the two services.

The following sections detail the approach used in allocating shared assets to the metering RAB.

Load Control Assets

Ausgrid's approach to allocating metering assets between standard control services and alternative control services is as follows:

- The estimated value of load control devices has been subtracted from the asset category of "Customer Metering and Load Control" to determine the value of metering assets; and
- The estimated value of load control devices has been subtracted from the "Customer Metering (digital)" asset category.

Other Shared Assets

In the absence of a direct causality, the remaining assets jointly used for standard control services and metering alternative control services have been allocated based on the ratio of the value of metering assets to the value of SCS assets, exclusive of the value of any shared asset categories.

Energeia found Ausgrid's asset allocation approach for establishing the ACS metering asset base is consistent with their CAM and the approach agreed to by the NSW DNSPs.

Energeia concludes that Ausgrid's Asset Allocation Method is appropriate.

8.1.2 Depreciation

The Rules require that depreciation for each year to be calculated for each asset class in the RAB based on the schedule proposed by the DNSP provided that it reflects the nature of the assets over its lifetime; is equivalent to the value of the asset when it was first entered into the RAB; and is consistent with the depreciation of modern equivalent assets[105].

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[103] AEMC, (2014), *National Electricity Rules,* Clause 6.15

[104] EnergyAustralia, (January 2009), *Cost Allocation Method.*

[105] AEMC, (2014), *National Electricity Rules*, Clause 6.5.5.

The residual life of Ausgrid's ACS metering assets and their proposed standard lives are the same as the SCS RAB categories from which they were derived, and are reported in Table 8.1. Energeia notes that Ausgrid's deprecation schedule differs to the other NSW DNSPs in that it is not using a 5 year accelerated depreciation approach to its opening RAB or expensing its replacement capex.

Table 8.1 – ACS Metering RAB Asset Lives[106]

Metering Asset	Remaining Life (Years)	Asset Life (Years)
Customer Metering and Load Control	14.45	25
Customer Metering (digital)	12.62	15
Furniture, fittings, plant and equipment	12.36	17.44
Land (non-system)	n/a	n/a
Other non-system assets	7.47	29.44
IT systems	3.19	5
Motor vehicles	6.42	10.24
Buildings	15	15
Equity raising costs	15	15

Source: Ausgrid

Energeia's investigation of regulatory precedents for alternative depreciation approaches found that the stranded metering assets of Victorian DNSPs were depreciated on an accelerated five year basis.[107] The size of the stranded assets was not publically reported, but it could reasonably be assumed that they were approximately half-way depreciated or less. However, a substantial price shock was involved.

Energeia found that Ausgrid's depreciation policy reflects standard industry practice and is consistent with the Rules.

It is inconsistent with the approaches being adopted by the other DNSPs, but is nevertheless reasonable as an accelerated approach is expected to lead to a price shock for customers.

Energeia concludes that Ausgrid's depreciation policy is reasonable.

8.2 Opening Value

Those assets that constitute the opening metering RAB and the allocation approach used to estimate their values are set out in Table 8 below.

[106] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services, Table 2, p6

[107] AER, (2011), Final Determination, Victorian Advanced Metering Infrastructure Review, 2012-15 budget and charges application, p32

Table 8.2 - Breakdown of Metering RAB Opening Value ($FY15)[108]

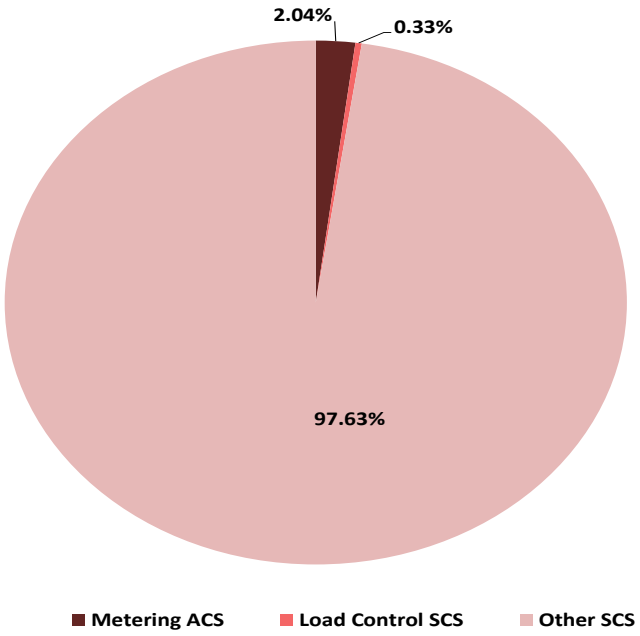
Metering Asset	Basis of Allocation	Millions
Type 5-6 Customer Metering	Direct value of Customer Metering and Load Control assets less the estimated value of load control relays used to provide standard control services.	$127.59
Type 5-6 Customer Metering (digital)	Direct value of Customer Metering (digital) assets less an allowance for the cost of load control facilities that would otherwise be required to provide standard control services.	$87.29
IT systems	IT systems directly associated with Types 5 and 6 metering	$28.13
Furniture, fittings, plant and equipment	Allocation between standard control services and metering alternative control services on the basis of the direct value of the associated assets (adjusted for load control).	$0.97
Land (non-system)		$1.45
Other non-system assets		$1.56
Motor vehicles		$2.60
Buildings		$5.99
Equity raising costs		$0.56
Total		**$256.15**

Source: Ausgrid

The outcome of this apportionment of the RAB is shown in Figure 8.1 below.

108 Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services

Figure 8.1 – Comparison of New ACS Metering RAB, Load Control SCS and Other SCS[109]



Source: Ausgrid

Energeia found Ausgrid's opening RAB reflects their asset allocation method. Energeia conclude that Ausgrid's opening RAB is consistent with the Rules.

8.3 Roll Forward Model

Ausgrid's implementation of the AER's RFM for the purpose of generating the estimates of annual depreciation and capital charges required by the Post Tax Revenue Model (PTRM) is mechanical in nature, does not involve the exercise of discretion and therefore does not require expert review.

Energeia have not reviewed the RFM to assess whether the inputs or functionality are correct, as this is outside the scope of our engagement.

[109] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 & 6 Metering Services

9 Revenue Requirement

Where the AER makes an Alternative Control Service (ACS) determination on the basis of a building blocks approach, it must specify the annual revenue requirement. The annual revenue requirement for each year must be calculated using the AER's Post Tax Revenue Model (PTRM).[110]

Ausgrid has decided to use the AER's PTRM to determine the annual revenue requirement to support the provision of its ACS metering services. The PTRM is the model that the AER has developed to model the revenue of standard control services (SCS). It should be noted that Endeavour Energy and Essential Energy have adopted an alternative, simplified approach to modelling their revenue requirement as their metering RAB is much smaller.

Energeia's review of Ausgrid's key policies, assumptions and annual revenue requirement calculation has found that:

1. The use of the DNSP's SCS WACC for its ACS WACC is consistent with regulatory precedent
2. Ausgrid's decision to use the PTRM is consistent with the regulatory framework, and reasonable in light of the significance of their RAB and the tax effects of capital contributions.

Based on these findings, Energeia conclude that Ausgrid's key policies and approach to calculating its annual revenue requirement are appropriate.

As Ausgrid's implementation of the PTRM is mechanical in nature, with no new discretion exercised other than the choice of WACC, Energeia has not reviewed the model's calculations or inputs.

The following sections summarise Ausgrid's proposal and supporting documentation related to the calculation of their annual revenue requirement, and our associated findings, conclusions and recommendations.

9.1 Key Policies and Assumptions

The assumed Weighted Average Cost of Capital (WACC) and cost of corporate tax are the key assumption that drive the PTRM. A review of the cost of corporate tax is outside the scope of Energeia's review, but the Ausgrid's assumption regarding the WACC used in its PTRM is discussed below.

9.1.1 Weighted Average Cost of Capital

The Rules require the allowed rate of return to be determined to achieve the allowed rate of return objective. The objective requires the rate of return to reflect the efficient financing costs of a benchmark entity with a similar degree of risk to the DNSP in respect of provision of standard control services.[111]

The nominal vanilla WACC Ausgrid uses for the revenue calculations in the PTRM is 8.52%[112], which is the same as Ausgrid's Transitional Proposal, of 31 January 2014, for the calculation of SCS revenues. Energeia notes that the actual WACC parameters will be adjusted by the AER at the time of its transitional determination to reflect market conditions closer to the determination.

Energeia's investigation of precedents for alternative, higher WACCs for ACS services with a price cap control mechanism due to their associated volume found that the AER has most recently approved Aurora's metering ACS prices on the basis of the Aurora's SCS WACC.

Energeia also considered the risk profile of the ACS metering business against that of the SCS network business, and whether to adjust the equity beta to reflect a higher level of risk (β_e). Energeia notes that the

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110 AEMC, (2014), *National Electricity Rules,* Clause 6.4

111 Ibid, Clause 6.5.2(c).

112 Ausgrid, (2014), Metering PTRM – 2014-19 spreadsheet, WACC sheet

SCS WACC will be based on a revenue cap, while the ACS metering services will be controlled using a price cap, and exposed to volume risk. However, as the proposed exit fee would mitigate to some extent the risk of asset stranding, the same value of $\beta_e = 0.80$ seems appropriate.

Energeia found that the risk of providing ACS is higher than that of providing SCS due to the potential volume effects of competition and therefore, prima facie, a higher WACC is reasonable.

However, Energeia also found that the regulatory precedent indicates the AER will set the ACS WACC at the level of the SCS WACC.

Energeia therefore concludes that Ausgrid's use of the same WACC as for SCS is appropriate.

9.2 Post Tax Revenue Model

The AER's PTRM implements the "accrual building block" approach to revenue modelling, as required by the Rules for standard control services. The model contains the following building blocks that are summed to determine the total revenue requirement:

- Return on capital;
- Return of capital (regulatory depreciation);
- Operating and maintenance expense; and
- Estimated taxation liability.

The principal inputs to the PTRM comprise:

- The RAB and Tax Asset Base, as determined from the Roll Forward Model (RFM);
- Forecast capital expenditure;
- Forecast customer contributions;
- Forecast operating and maintenance expenditure;
- Financial parameters, including CPI and the elements of the WACC calculation.

The various inputs to the PTRM are discussed in the relevant sections of this report. The outcome of Ausgrid's PTRM calculation, based on Ausgrid's figures as of March 2014, is shown in Table 9.1.

Table 9.1 – Building blocks calculation ($Millions p.a.)[113]

Building Block	2014/15	2015/16	2016/17	2017/18	2018/19
Return on capital	$21.83	$22.30	$22.21	$22.00	$22.09
Return of capital	$19.83	$22.86	$25.58	$20.82	$21.50
O&M expense	$28.54	$29.25	$29.98	$30.72	$31.49
Benchmark taxation liability	$1.48	$4.10	$5.25	$3.20	$2.70
Total revenue requirement	$71.79	$78.51	$83.05	$76.74	$77.78

Source: Ausgrid

[113] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 and 6 Metering, Table 14

Energeia found that Ausgrid's building blocks approach complies with the AER's PTRM approach outlined in clause 6.4 of the Rules.

Energeia concludes that Ausgrid's method of calculating the total revenue requirement is reasonable.

10 Metering Tariffs

There are no specific Rules governing Alternative Control Service (ACS) tariffs, nor has the AER provided specific guidance regarding metering ACS charges in its Stage 1 F&A paper. Energeia is therefore of the view that it would be reasonable to assume that the AER is likely to require that charges for ACS metering services comply with the same Rules as for Standard Control Service (SCS) charges, as outlined in Section 4.1.3 of this report.

Prices for SCS charges are governed by the pricing Rules, which require that tariff classes group customers on an economically efficient basis avoiding unnecessary transaction costs, [114] and that the revenue recovered by each tariff class lies on or between:[115]

1. An upper bound representing the stand alone cost of serving the retail customers who belong to that class; and
2. a lower bound representing the avoidable cost of not serving those retail customers.

Prices should also be cost reflective and not distort efficient consumption, having regard to the associated transaction costs, customers' ability and likelihood to respond.

Ausgrid developed the following types of ACS metering charges to recover its annual revenue requirement and capital contributions from customers:

- An upfront charge for new and upgraded metering installations (capital contribution);
- an annual metering tariff; and
- an exit fee for customers choosing to choose another provider.

Ausgrid is proposing metering tariffs which are aligned with its network tariff classification. Tariffs have been set on a cost reflective basis, based on Ausgrid's estimate of the forward looking costs to service that Type of network tariff.

The following sections describe Ausgrid's proposed ACS metering tariff arrangements and supporting documentation, and our associated findings, conclusions and recommendations.

10.1 Key Policies and Assumptions

The key policies and assumptions that Ausgrid has adopted in setting its ACS metering charges are:

- Capital contributions for new and upgraded metering to be recovered through upfront charges
- Appropriate classification of customers
- Appropriate classification of metering services
- Secondary services to be priced on an incremental cost basis

Ausgrid's proposal and supporting documentation is summarised in the following sections along with Energeia's assessment of its appropriateness.

10.1.1 Upfront Tariffs Policy

The decision to charge customers on an upfront basis for their choice of metering is a change from Ausgrid's current policy, whereby meters are free-issued to Accredited Service Providers (ASP).

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[114] AEMC, (2014), *National Electricity Rules,* Clause 6.18.3(d).

[115] Ibid, Clause 6.18.5(a).

The policy is considered to represent a new Australian precedent, as Energeia was unable to identify other examples of DNSPs charging customers on an upfront basis for metering equipment provided as part of the default service. Most DNSPs do have upfront charges for upgrading metering from the default service to recover the incremental cost of the higher spec meter, and the cost of its installation.

In light of the decision by Endeavour Energy and Essential Energy to charge on an upfront basis to eliminate RAB based exit fees by the end of the next regulatory control period, Networks NSW determined that the policy should apply for all the NSW DNSPs, including Ausgrid. This policy also provides a highly cost reflective signal to customers at a key decision point that impacts Opex.

Although there was some discussion around what should be included in the upfront charge other than the raw cost of the metering equipment, it was ultimately decided that the charge should also recover the costs that a competitive operator would seek to recover for meter hardware provision, logistics, handling and profit.

Energeia found that Ausgrid's upfront charge policy is cost reflective, competitively neutral and likely to reduce future exit fees.

Energeia conclude that Ausgrid's tariff policy is consistent with the Pricing Rules.

10.1.2 Customer Classification Approach

Ausgrid assessed the factors that drive metering services costs, in order to establish pricing that groups together customers with similar costs.

Ausgrid's analysis showed that the primary driver of forward looking service costs was whether interval data was required and the frequency of reading required. Ausgrid considered classification on the number of phases, but found that this was not a material driver of forward costs, and the difference in the cost of the metering equipment would be captured by the upfront metering charge.

Ausgrid's existing network tariff structure aligns well with the key cost drivers; specifically;

- Residential/Small Business Inclining Block Tariffs are almost exclusively serviced with BASIC meters on a quarterly meter reading route,
- Residential/Small Business Time of Use Tariffs are serviced with MRIM meters on quarterly meter reading routes,
- LV 40-160MWh Time of Use Tariff is serviced with MRIM meters on monthly meter reading routes.
- Controlled Load tariffs and Generator Tariffs are identified as secondary tariffs on existing NMI's thus can be easily removed from NMI based cost drivers, and;
- Metering equipment counts against network tariffs can be easily established.

Based on this cost of service analysis, and the alignment with existing network tariffs, Ausgrid developed the following customer classifications for the purpose of determining tariff classes for recovering its annual revenue requirement:

- Residential and Small Business Inclining Block
- Residential and Small Business Time-of-Use
- Medium Size Business Time-of-Use

Ausgrid has classified its customers according to their network tariff on the basis that this is the key driver of the type of metering service required, which in turn drives the cost of providing the service[116]. All of the NSW DNSPs are adopting this policy in order to group customers for the purpose of tariff setting.

Energeia's investigation of regulatory precedents found that Aurora Energy and ActewAGL are the only two Australian DNSPs to have had their Types 5 and 6 metering services classified as an ACS and both base their metering tariffs on the metering installation not the network tariff it supports117. Aurora Energy base their annual metering prices on the number of phases associated with the metering installation.

Ausgrid informed Energeia in April 2014 that it considered setting prices based on the number of phases. Ausgrid however found that the number of phases had minimal incremental operating cost impact relative to the cost of interval metering and reading frequency, both driven by tariff selection. In addition, discussions held with Aurora revealed that phase based charging resulted in significant billing issues due to the need to track and manage additional metering technical information for billing purposes.

Energeia found that the Ausgrid's customer classification policy is cost reflective and its alignment to network tariffs is appropriate.

Energeia conclude that Ausgrid's customer classification policy for annual metering tariffs is consistent with the pricing Rules.

10.1.3 Service Classification Approach

Ausgrid has broken down the cost of metering service provision into the following service classifications, which differ from the four basic services envisaged by the AER:

- Meter reading;
- Meter maintenance;
- Meter data services;
- ICT Opex; and
- Overheads

The service classifications that Ausgrid has nominated align with the organisational arrangements for the metering functions.

Energeia found that Ausgrid's service classification policy provides greater cost transparency than that of the AER's in its Stage 1 F&A paper. The additional categories can be easily allocated to the AER's categories if necessary.

Energeia concludes that the Ausgrid's service classification policy for annual metering tariffs is reasonable.

10.1.4 Secondary Tariff Policy

Secondary tariffs include DNSP managed load control services and upgraded metering to measure and record exported energy from, for example, rooftop solar PV generation.

[116] The adopted by Ausgrid is for metering tariffs to be based on the key cost drivers of the metering service, which aligns with its network tariffs.

[117] ActewAGL, (June 2013), Statement of Tariff Classes and Tariffs, page 18

There is no specific guidance around how secondary tariffs should be set, other than the general principles applying to SCS prices. Under the Rules, they could be based on shared costs, incremental costs, stand-alone costs or avoidable costs, for example.

For Ausgrid, secondary tariffs can, in some circumstances, be supported without an additional meter. For example, some of Ausgrid's Type-5 meters can be reprogrammed to support solar PV exports without replacing the meter. They may also support a secondary tariff if they happen to be a two channel model.

For primary and secondary metering service tariffs, Ausgrid has allocated historic capital expenditure based on the total number of meter population servicing the tariff, and hence secondary tariffs receive a portion of historic capital expenditure. Future meters will be paid for by customers, including any additional meters required to service secondary tariffs.

Ausgrid allocates operating costs on an incremental basis to secondary tariffs. The key driver of meter reading costs relate to meter readers attending the site. IT operating costs and meter data service costs are also primarily driven by the number of customers and not services. Meter maintenance costs are driven by the higher number of meters installed per premises, which are higher for secondary tariffs.

Energeia found that Ausgrid's secondary pricing policy is cost reflective, and does not distort efficient consumption decision making with respect to metering services.

Energeia concludes that the Ausgrid's incremental pricing policy for secondary services metering tariffs is appropriate.

10.2 Upfront Tariffs

Ausgrid is proposing to recover the cost of meters supplied to customers with new and upgraded connections via a cost reflective upfront charge based on the type of meter being installed.

The supplied meters would be installed at the customers' cost by accredited service providers (ASPs), as is the current practice. When commissioned, the meters would become Ausgrid's property and Ausgrid would read, maintain and eventually replace the meter. The cost of meter reading, maintenance and replacement would be recovered through annual metering charges.

In the same manner as with connection assets used to provide standard control services, the meter, overheads, installation and a profit margin would be treated as a capital contribution. As the meters would be owned by Ausgrid they would be required to be included in the accounting asset base (but not the RAB) at fair value, which would be the purchase price of the meters concerned, and potentially the install cost.

An important consideration in developing an upfront charge is that of competitive neutrality. If new meters were to be provided by Ausgrid at less than the cost of a commercial operator, it could undermine competition. Ausgrid has therefore structured an upfront price for meter provision that is considered to represent the costs that would reasonably be recovered by a commercial operator.

The upfront metering charges proposed by Ausgrid as the customers' contribution constitutes the following components:

- the purchase price of the meter hardware for each variant of Type 5 and 6 meters;
- non-hardware costs, e.g. logistics labour, meter release, acceptance test and handling costs; and
- a half-year of WACC (8.52%) applied to recover associated financing charges.

It should be noted that the AER's PTRM, used to calculate the required revenue for its metering ACS contains a taxation building block component. This would compensate Ausgrid for the NPV loss that would otherwise result from the taxation treatment of capital contributed assets, whereby the depreciation allowance is not indexed for the time value of money.

Ausgrid's proposed upfront charges for meters[118] are set out in Table 10.1 below.

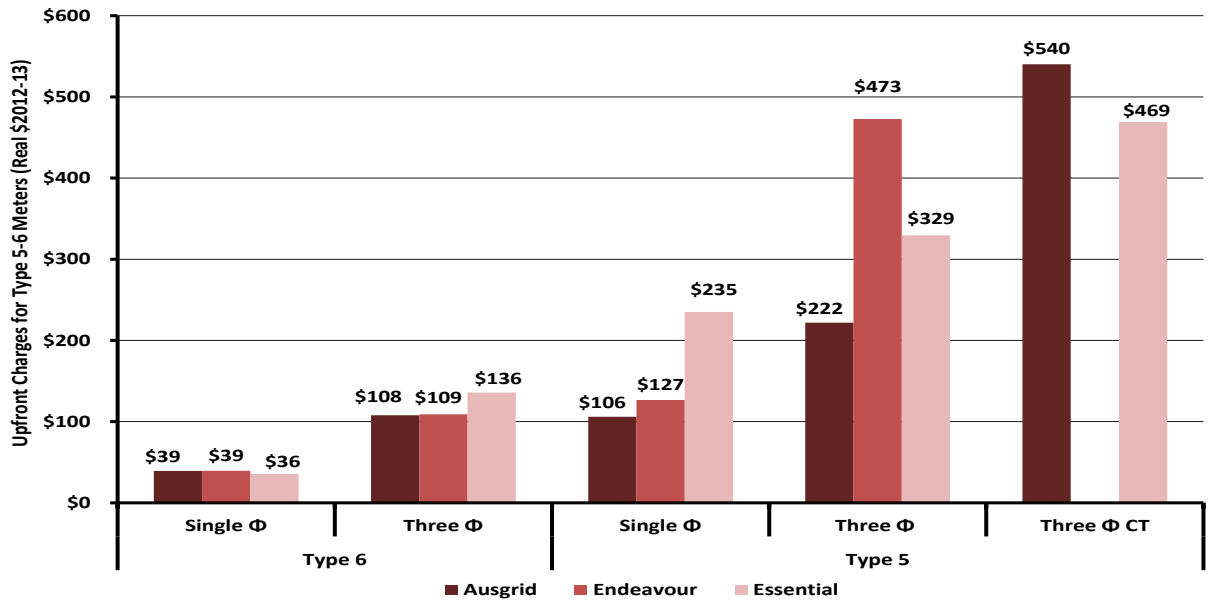
Table 10.1 – Ausgrid's Proposed Upfront Charges for Metering Equipment (GST exclusive)

Meter Type	Description	Upfront Charge (GST Excl.)
Type 6	Single Phase Single Element Two Wire Direct Connected Accumulation Watt-hour Meter	$40.14
	Three Phase Single Element Four Wire Direct Connected Accumulation Watt-hour Meter	$110.42
Type 5	Single Phase Single Element Two Wire Direct Connected Interval Watt-hour Meter	$108.57
	Single Phase Dual Element Two Wire Direct Connected Interval Watt-hour Meter	$167.39
	Three Phase Single Element Four Wire Direct Connected Interval Watt-hour Meter	$227.41
	Three Phase Single Element CT Connected Interval Watt-hour Meter	$553.60

Source: Ausgrid

As there is no other source of comparison, Energeia has compared the upfront meter charges for the three NSW DNSPs. This is illustrated in Figure 10.1 below.

Figure 10.1 – Comparison of NSW DNSPs' Upfront Charges for Metering Equipment



Source: Ausgrid, Endeavour Energy and Essential Energy

[118] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 and 6 Metering, Table 15, page 15

As they are all expected to purchase the same meters at the same prices due to a proposed Networks NSW led procurement, the only pricing difference should be overheads. The upfront charges proposed by the three NSW DNSPs are similar for the provision of the types of meters that cover most installations.

Energeia found that Ausgrid's proposed upfront tariffs reflect already assessed meter hardware and provisioning costs.

Energeia found that Ausgrid's upfront tariffs are consistent with their customer classification policy and are cost reflective for each respective customer class.

Energeia found that Ausgrid's upfront tariffs are comparable with the other NSW DNSP's.

Energeia therefore conclude that Ausgrid's upfront charges are consistent with the Pricing Rules.

10.3 Annual Tariffs

Ausgrid has designed its ACS metering charges to recover the cost of providing those services. Ausgrid has developed a cost allocation approach that scales the costs to be recovered by individual tariffs according to the forward costs of delivering that service.

10.3.1 Cost of Metering Services

Ausgrid's estimated cost of providing each metering subservice derived from the PTRM described in section 10 is set out in $2013/14 real dollar terms in Table 10.2[119]. Ausgrid's numbers have been used as the basis for the purpose of reviewing the reasonableness of their tariff development approach.

Table 10.2 – Cost of Metering Services

Metering Subservice	2014/15	2015/16	2016/17	2017/18	2018/19
Meter Reading Opex	$8.4	$8.6	$8.8	$9.0	$9.3
Meter Maintenance Opex	$8.0	$8.2	$8.4	$8.6	$8.8
Meter Data Services Opex	$5.2	$5.2	$5.2	$5.2	$5.2
ICT Opex	$4.7	$4.9	$5.0	$5.1	$5.2
Capital related Costs	$43.2	$49.3	$53.1	$46.2	$46.4
Overhead Opex	$2.7	$2.8	$2.9	$2.9	$3.0
Total	**$67.0**	**$73.8**	**$78.2**	**$71.8**	**$72.7**

Source: Ausgrid

In order to comply with the Pricing Rules, these costs must be recovered from customer classes based on the cost to serve each customer class[120].

Ausgrid's approach to the allocation of costs among the tariff classes involved a 2 stage process:

1. Allocation of direct metering costs, based on historical metering costs

[119] Ausgrid, (2014), Type 5-6 Metering Pricing Model 1.3 (rebalance solar) – 20140211 spreadsheet

[120] Ausgrid's costs were developed based on bottom up estimates, using its unit costs for Type 5 and 6 metering service (i.e. meter reading, data services, etc.).

2. Allocation of shared costs, based on the estimated relative effort of providing each service[121]

10.3.2 Tariff Pricing Methodology

NSW DNSPs developed a scaling system based on operational experience to efficiently allocate the cost of metering services to tariffs. The system involved the following key steps:

1. As the cost of servicing customer classes varies by service sub-category and DNSP, each NSW DNSP developed its own costs for providing each subservice to each customer class.
2. Total subservice revenue requirements for the year were then allocated to each customer class on a pro-rata basis using the scaling factors.
3. Cost reflective annual charges for each customer class were then calculated by summing up the pro-rata cost allocation from each of the subservice cost categories.

Ausgrid developed its subservice cost scaling factors for each class based on the following approach:

- **Meter Reading** – The cost of reading Type 5 meters is about 75% more than Type 6 meters. Medium size business tariffs have a monthly read and hence have a multiplying factor of three compared to the standard residential tariff which have quarterly read meters.
- **Meter Maintenance** – Maintenance costs are mainly driven by the number of meters, as each one ultimately requires testing. Maintenance costs were therefore apportioned on the basis of the number of meters per installation.
- **Meter Data Services** – Meter data costs are driven by the volume of data to be read based on Ausgrid's operational experience. Ausgrid's scaling factors for residential anytime tariff class is 1, while the scaling factor for medium sized business class (which is read monthly) is 2.2.
- **Information Technology** – IT costs are driven by the nature of the systems required to support the service. This is driven by the proportion of Type 5 and Type 6 metering ICT opex.
- **Capital Related Costs** – Opening RAB and new capex each year are allocated based on the ratio of meters per tariff.
- **Overheads** – Overheads are not attributable to causal factors so these costs were subdivided evenly, amongst the primary tariffs.

The scaling factors applied to secondary tariffs (Controlled load and Generator tariffs) were estimated on an incremental basis for the material cost categories of meter maintenance and capital related costs.

The scaling factors used to apportion metering service costs are shown in Table 10.3.

Ausgrid's capex revenue costs are recovered from all tariffs, weighted by the number of meters which provide that service for the year[122].

[121] The scaling system is described in the following section.

[122] Ausgrid, (2014), Type 5-6 Meter Pricing Model 1.3 (rebalance Solar) - 20140211

Table 10.3 – Cost Allocation Scaling Factors for Annual Metering Tariffs[123]

Network Tariff	Tariff Class		Read		Maintnance		Data		ICT Opex		Capex	Over-heads
	T5	T6	T5	T6	T5	T6	T5		T6	T5		
Residential IBT	EA010		1	1	1	1.2	1	1	1	1.1	1.15	1
Residential ToU	EA025		1	1	1.3	0	1	1	1	1.3	1.29	1
Controlled Load	EA030 EA040		0 0	0 0	0.2	0.8 0.8	0 0	0	0 0	0 0	0.64	0
Business IBT	EA050		1	1	1.2	1.8	1	1	1	1.3	1.77	1
Business ToU	EA225		1	1	1.2	0	1	1	1	1.3	1.23	1
LV 40-160 MWh ToU (System)	EA302		3	3	1.6	0	2.2	1	2.2	1.6	1.6	1
Generator	GGEN R2	GENR	0	0		0	0	0	0	0	0.63	0
		GGENR	0	0	0.7	0	0		0	0	0.66	
		NGENR	0	0		0	0		0	0	0.66	
		NGEN R2	0	0		0	0		0	0	0	

Energeia note (a): meter data services costs for Type 5 meters are expected to be higher than for Type 6 meters.

Capex weighting for 2014/15 only. Weighting for 2015-19 years changes marginally based on forecast number of meters to provide the service each year.

Source: Ausgrid

Energeia's review of the resulting cost scaling and allocation factors has found them to be reasonable in that they allocate higher costs to services with higher cost structures, e.g. monthly reading of manually read interval meters.

The resulting allocation of metering subservice costs to customer tariffs is shown in Table 10.4.

[123] Ausgrid, (2013), Type 5-6 Meter Pricing Model 1.3 (rebalance Solar) – 20140211

Table 10.4 – Metering Subservice Cost Allocation by Annual Tariff

Network Tariff	Tariff Codes		Reading	Maintenance	Data Services	ICT Opex	Capital Costs	Over-heads
	Type 5	Type 6						
Residential IBT	EA010		9.5%	5.8%	2.9%	11.6%	13.8%	20.0%
Residential ToU	EA025		16.2%	22.2%	22.6%	25.7%	15.5%	20.0%
Controlled Load	EA030 EA040		0.0%	3.5%	0.0%	0.0%	7.7%	0.0%
Business IBT	EA050		9.3%	8.4%	2.4%	11.3%	21.2%	20.0%
Business ToU	EA225		16.2%	21.2%	22.6%	25.7%	14.8%	20.0%
LV 40-160 MWh ToU (System)	EA302		48.7%	27.6%	49.6%	25.7%	19.2%	20.0%
Generator	GGENR2	GENR GGENR NGENR NGENR 2	0.0%	11.4%	0.0%	0.0%	7.8%	0.0%
Total			**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Ausgrid

10.3.3 Annual Metering Charges

The resulting annual charges for each metering service tariff are shown in Table 10.5. Energeia notes that the tariffs for residential and business IBT customers are virtually the same, the variation being due to the impact of different metering counts on allocated maintenance costs. A similar situation applies to the residential and business ToU tariffs.

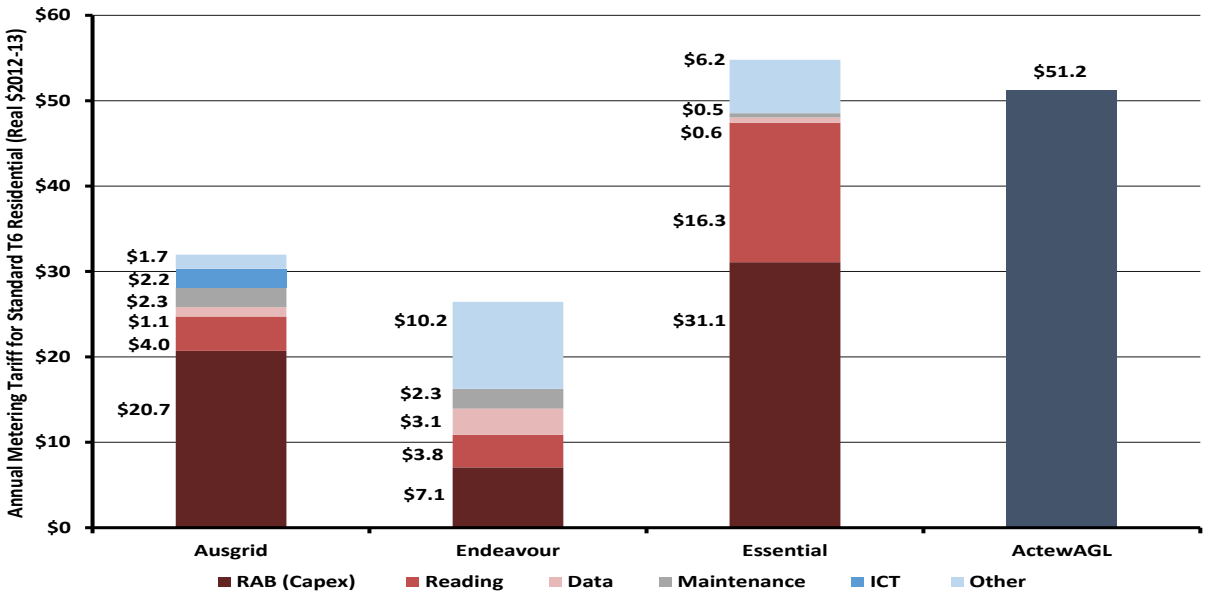
Table 10.5 – Annual Metering Charges by Tariff and Year[124]

Annual Metering Tariff	Code	2014/15	2015/16	2016/17	2017/18	2018/19
Residential IBT	EA010	$31.97	$34.86	$36.61	$33.36	$33.54
Residential ToU	EA025	$53.98	$57.74	$60.26	$57.16	$57.89
Controlled load	EA030 EA040	$12.92	$14.49	$15.40	$13.47	$13.51
Business IBT	EA050	$43.69	$48.07	$50.77	$45.70	$45.88
Business ToU	EA225	$52.52	$56.14	$58.55	$55.63	$56.36
LV 40-160 MWh ToU (System)	EA302	$85.96	$91.10	$94.72	$91.32	$92.78
Generator	GENR GGENR GGENR2 NGENR NGENR2	$16.21	$17.59	$18.40	$16.46	$16.46

Source: Ausgrid

Figure 10.2 compares the annual metering service charge components for a residential IBT service of each of the NSW DNSPs and ActewAGL. This comparison highlights the effect of Ausgrid's significant opening RAB on its annual charges, despite its relatively lower annual overhead and Opex costs. It also supports Ausgrid's position that its forecast expenditure is relatively efficient.

Figure 10.2 - Comparison of Annual Charge Components for Standard Residential IBT (T6) Tariffs



Source: Ausgrid, Endeavour Energy, Essential Energy

[124] Ausgrid, (2014), Attachment I: Alternative Control Services – Type 5 and 6 Metering 0 6 (BK edits 20140220), Table 16, converted from cents/day to $/year.

Energeia found that Ausgrid's proposed annual charges reflect already assessed forecast asset base, capex and opex cost inputs.

Energeia found that Ausgrid's annual tariffs and charges are consistent with their customer classification policy and are cost reflective for each respective customer class.

Energeia concludes that Ausgrid's annual tariffs and charges are consistent with the pricing Rules.

Energeia recommends Ausgrid consider calculating the LRMC, Stand-alone and Avoidable cost of its metering service prices, to demonstrate to the AER that prices have been set efficiently, and contain no economic cross subsidies.

10.4 Exit Fees

Exit Fees for customers choosing an alternative metering service provider are not required under the current Rules, nor are they mentioned in the AER's Stage 1 F&A Paper. They are described in the AEMC's Power of Choice Final Report and in the SCER's rule change proposal. Energeia is of the view that it is therefore reasonable for Ausgrid to develop Exit Fees based on the SCER's rule change proposal.

SCER's rule change proposal specifies that Exit Fees are to be set based on the ACS metering RAB and the operational costs attributable to transferring the customer to the alternative service provider.[125] The proposed rule requires that the metering asset be assumed to have half of its remaining life. No specific guidance is given regarding how operational costs are to be calculated in the Exit Fee.

Ausgrid proposes an exit fee where a customer or its retailer replaces a meter and removes Ausgrid's meter. This exit fee is intended to compensate Ausgrid for:

- the loss of revenue caused by reduction in the metering RAB, when the associated meter is removed; and
- the administrative costs associated with updating systems to implement the change in meter and meter data sourcing.

As in many instances customers did not choose their meter type, no distinction has been made between Type 5 and Type 6 meters in formulating the exit fee. The fee is instead based on the recovery of an average allocation of the RAB (depreciated asset value) to the number of NMIs.

The administrative cost component has been estimated based on the resources required to process the request, which Ausgrid estimates at 24 minutes per occasion, for an administrative officer. The exit fee and its components as calculated by Ausgrid are shown in Table 10.6.

Table 10.6 – Ausgrid's Metering ACS Exit Fee ($Nominal)[126]

Component of Fee	2014/15	2015/16	2016/17	2017/18	2018/19
RAB attributable to each NMI	$163.28	$161.91	$158.62	$155.14	$152.52
Administrative component	$33.84	$34.69	$35.55	$36.44	$37.35
Total exit fee	**$197.12**	**$196.60**	**$194.17**	**$191.58**	**$189.87**

Source: Ausgrid

[125] SCER, (October 2013), Introducing a New Framework in the National Electricity Rules that provides for increased competition in metering and related services.

[126] Ausgrid, (2014), Type 5-6 Meter Pricing Model 1.3 (rebalance solar) - 20140211

Energeia notes that Ausgrid's exit fee is higher than the other NSW DNSPs due to its significantly higher opening RAB. The administrative cost component is comparable.

Energeia's investigation of exit fee precedents found that the AER approved SA Power Network's exit fee for customers consuming above 100 MWh transitioning from ACS Type 6 service into the competitive market. The exit fee was determined at $232, which reflected a $170 capital cost component and a $62 administrative cost component.[127]

In Energeia's view, changes in the regulatory specification of the exit fee and Ausgrid's significantly higher RAB should be taken into consideration when comparing Ausgrid's exit fee to the one the AER approved for SA Power Network. For example, the AEMC's Final Report called for average remaining life of the metering asset class, compared to the SCER which recommended that the exit fee be based on the average depreciated value of the stock of the DNSP's existing Type 5 and 6 meters.[128]

Energeia found that Ausgrid's exit fee is consistent with the SCER's proposed rule change, and comparable industry benchmarks once Ausgrid's specific circumstances related to its ACS metering RAB are taken into consideration.

Energeia conclude that Ausgrid's exit fees are reasonable.

[127] AER, (May 2010), Final decision - South Australia distribution determination 2010–11 to 2014–15, pp 267, 272.

[128] SCER, (October 2013), Introducing a New Framework in the National Electricity Rules that provides for increased competition in metering and related services, page 12.

Appendix 1 – Terms of Reference

Review of NSW metering tariff arrangements 2014-15 to 2018-19

16 September 2013

Requested advice

Ausgrid, Endeavour Energy and Essential Energy ('the NSW DNSPs') seek a review of their approaches underpinning meter tariffs for the 2014-15 to 2018-19 regulatory period.

Proposal deadline

Proposals submitted before close of business 27 September 2013 will be considered.

Background

Every five years the NSW DNSPs submit Regulatory Proposals to the AER to set appropriate tariffs for the provision of Standard Control Services and Alternative Control Services. Recently, the AER changed its classification of Metering Services (Type 5 and Type 6) from Standard Control Services to Alternative Control Services.

The AER's re-classification of Metering Services requires the NSW DNSPs to propose separate tariffs for Metering Services. Previously, Metering Services were included as Standard Control Services and the NSW DNSPs recovered the associated costs in network tariffs.

Required report contents

The Final Report is intended to be provided to the AER as an independent review of the appropriateness of the NSW DNSPs' proposals. The Final Report should include, at least, findings in relation to the following:

- The likely regulatory framework to apply to metering services in the future including any transitional arrangements as anticipated by the various reviews.
- The appropriateness and robustness of the NSW DNSPs proposed models and methodologies (in light of the AER's likely assessment under the Rules, policy objectives and known risks).
- The appropriateness of the proposed revenue requirement, the proposed opening RAB, the proposed capex and opex forecasts and methodology applied to derive prices.
- The reasons for differences in the NSW DNSPs' proposals and the reasonableness of those differences.
- The appropriateness of the DNSPs' proposals in relation to the trade-off between customer equity and cost reflectivity in setting tariffs.
- Any need for transitional arrangements in tariff setting, for example any inter-temporal issues created by moving from an average cost price to a more cost reflective price.
- The appropriateness of the proposed meter tariffs and the incentives under the proposed tariff arrangements.
- Areas of improvement that, if adopted, might provide better demonstration to the AER the NSW DNSPs' proposals should be accepted or any areas of non-compliance with the Rules.
- Approach to, and demonstration of, compliance with price control mechanism.

Required considerations

- In forming its report the consultant should consider, at least:

- Business risks that might be realised under the recent policy changes in the provision of metering services and the future direction. For example, the AEMC's Power of Choice Review.
- The NSW DNSPs' sunk capital costs, forecast capex and forecast capex.
- The NSW DNSPs' metering technology strategy.
- The cost forecasting models proposed, including the basis of the opex and capex forecasts.
- The revenue models proposed, building blocks, annuity models that are used to determine revenue.
- The pricing models, if proposed, which might be separate from the revenue models.
- The separation of the sunk capital costs from the Standard Control Services RAB.
- Any customer concerns identified by the NSW DNSPs in their customer engagement studies or other customer issues from the consultant's research.
- Administrative considerations, such as billing systems.
- National Electricity Rules (including the Pricing Principles).

Other required materials

The NSW DNSPs will receive all underlying spreadsheets or other models used to calculate values relied in the Final Report and copies of materials referenced or relied on in the Final Report.

Selection of the consultant

Proposals should demonstrate understanding of the need for this work, the current regulatory environment and the NSW DNSPs' business environment. The NSW DNSPs will assess the proposals based on the how they demonstrate an understanding of the NSW DNSPs needs, the method of addressing those needs and the value for money offered by the proposal.

Deliverables and indicative timing

October – early November	Consultant to gather information, through interviews, phone conversations, emails, etc.
November	Draft reports to the NSW DNSPs (this might include a presentation to the NSW DNSPs Steering Committee)
January 2013	Final reports to the NSW DNSPs

Commercial arrangements

Ausgrid is undertaking this work on behalf of the NSW DNSPs. All contractual arrangements will be under Ausgrid's terms and conditions, which are attached. Proposals should be submitted on this basis.

Disclosure of interests

All proposals need to include a statement of any conflicting or potentially conflicting interests. Adequate description of the potential conflict must be provided for the NSW DNSPs to make an informed assessment of each conflict.

Appendix 2 – About Energeia

Energeia Pty Ltd (Energeia) based in Sydney, Australia, brings together a group of hand-picked, exceptionally qualified, high calibre individuals with demonstrated track records of success within the energy industry and energy specialist academia in Australia, America and the UK.

Energeia specialises in providing professional research, advisory and technical services in the following areas:

- Smart networks and smart metering
- Network planning and design
- Policy and regulation
- Demand management and energy efficiency
- Sustainable energy and development
- Energy product development and pricing
- Personal energy management
- Energy storage
- Electric vehicles and charging infrastructure
- Generation, including Combined Heat and Power (CHP)
- Renewables, including geothermal, wind and solar PV
- Wholesale and retail electricity markets

The quality of our work is supported by our energy-only focus, which helps ensure that our research and advice reflects a deep understanding of the issues, and is often based on first-hand experience within industry or as a practitioner of theoretical economic concepts in an energy context.

Energeia's Relevant Experience

Energeia's recent smart metering and smart grid related engagements are summarised below.

Review of a DNSP's Metering Business Cost to Serve

An Australian DNSP engaged Energeia to review their proposed metering business' cost to serve against alternative delivery models. Energeia developed a bottom-up cost to serve models for a full outsourced, in-sourced and optimal hybrid models covering the scope of metering services. This work demonstrated the DNSP's approach was substantially least cost and highlighted areas where it was not to management attention prior to submission of the proposal to the regulator.

Review of the Outlook for Competitive Metering Services

Energeia were engaged by an Australian DNSP to review the outlook for contestable metering services in each Australian state. The review looked at the key drivers of metering churn and this implications for metering competition in each state taking differences in each network's metering stock, e.g. basic, smart or interval, into account. The work identified significant market risks and opportunities, and identified a best practice new entrant, service offering and technology platform.

Development of a DNSP's Metering Asset Management Plan

Energeia was engaged by an Australian DNSP to develop an industry best practice, Rules compliant Metering Asset Management Plan (MAMP). Energeia documented the current and expected future regulatory framework for metering, engaged with leading DNSP metering businesses to benchmark the state of the art in metering asset management, and developed tailored MAMP based on the specific circumstances of the Australian DNSP.

Review of Victorian DNSPs' 2009-11 Advanced Metering Infrastructure Budgets

The Australian Energy Regulator engaged Energeia to undertake a review of Victorian Distribution Network Service Providers' (DNSPs) 2009-2011 budget proposals for Advanced Metering Infrastructure against the regulatory criteria specified in the revised Order in Council.

Review of Advanced Metering Infrastructure Enabled Load Control Performance Levels

A Victorian DNSP engaged Energeia to undertake a review of current load control enabling performance levels and to make recommendations considering the impact of updated use case benefits and communications cost information.

Review of Overseas Regulation of Smart Metering Information for Customers

An Australian jurisdictional regulator engaged Energeia to review the arrangements in place in comparable overseas jurisdictions and the experience of EnergyAustralia during their roll out of interval meters and ToU pricing to nearly 140,000 customers using between 15 MWh and 160 MWh per annum (p.a.).

Best Practice Regulation of Smart Metering

A smart metering vendor engaged Energeia to identify policy and regulatory options for improving the smart meter deployment in Victoria. The engagement included a detailed review of leading international smart metering deployments in California, Texas, Pennsylvania, Ontario and Sweden.

International Smart Meter Based Energy Retailing: Review and Recommendations

A top-tier Australian energy retailer engaged Energeia undertake a review of international deployments of smart metering and ToU based products to identify innovation and key lessons learned. The purpose of the engagement was to identify innovative products that the retailer could consider deploying across its smart meter enabled customer base.

Smart Meter Enabled Retail Product Development and Trialling

An Australian energy retailer engaged Energeia to support the design, development, justification and trialling of three innovative smart meter enabled electricity pricing plans that would save customers money, improve the retailer's margin and reduce customer churn.

Smart Meter Enabled Network Product Development and Trialling

A NSW DNSP engaged Energeia to support the design, development, justification and trialling of innovative, smart meter enabled network tariffs that could reduce network investment costs, save end user customers money and improve retailer margins. The engagement included the design of a robust sampling approach that would enable the rigorous quantitative assessment of product impacts on key performance indicators.

Review of Advanced Metering Infrastructure Related Threats and Opportunities in Australia

A top-tier Australian energy retailer engaged Energeia to undertake a review of emerging threats and opportunities in the electricity sector as it transitions to a more intelligent platform (smart grid) over the next five to ten years. The key area of focus was the deployment of advanced metering infrastructure and related customer energy technologies, products and services.

Appendix 3 – Resumes of Key Personnel

EZRA BEEMAN

MANAGING DIRECTOR

SUMMARY OF EXPERIENCE

Ezra Beeman has consulted on business strategy, asset transactions, contract structuring, energy and information technology, market design and industry regulation for company directors, executives and managers of major oil, gas and power companies across Europe, the Americas and the Asia Pacific region.

Ezra's industry career has spanned a number of strategic and internal advisory roles where he helped propel EnergyAustralia into a position of international leadership in smart metering, products and services. During his time with the company, he built a reputation for tackling some of the company's toughest challenges and achieving exceptional results.

In addition to his consulting and utility executive experience, Ezra is an internationally recognized expert on advanced metering infrastructure, wholesale and retail markets, customer research, and demand response.

QUALIFICATIONS

- Masters of Applied Finance, Macquarie University, Australia
- Bachelor of Arts in Economics and Philosophy, Claremont McKenna College, United States

SUMMARY OF EXPERIENCE AT ENERGEIA

As the Managing Director, Ezra has overall responsibility for achieving the company's vision of becoming Australia's leading specialist consultancy and industry research firm. Ezra is responsible for setting and delivering the company's research agenda and developing new business. In this role his major achievements have been:

- Advising and supporting 21 companies pursuing ground-breaking outcomes in FY10, representing a broad cross-section of Australia's energy industry.
- Developing a 20 year industry roadmap for the establishment of a smart grid in Australia on behalf of the Electricity Networks Association (ENA).
- Authoring two chapters of EnergyAustralia's winning proposal for the $100M Smart Grid, Smart City project and contributing to its overall development.
- Developing a smart grid solution for minimising the costs and carbon intensity of generating power in a remote system on behalf of Hydro Tasmania.

- Reviewing over $2 billion in Victorian distribution network's smart grid budget proposals on behalf of the Australian Energy Regulator (AER).
- Creating a continuous improvement process for promoting best available technology for energy efficiency and carbon reduction on behalf of Newcastle City Council.
- Identifying international best practice in smart meter enabled retail pricing and related customer protections on behalf of the Essential Services Commission (ESC) of Victoria.
- Developing a business plan and authoring a winning proposal for the supply of electrical vehicle charging infrastructure on behalf of ChargePoint Australia.
- Creating a value framework, integrated network and retail price and benefits capture strategy to maximise the value of demand response on behalf of a new entrant retailer.
- Estimating the market and network value of demand response across a range of service levels on behalf of CitiPower-Powercor.
- Identifying the key risks and opportunities related to smart metering and the emerging smart energy market strategy on behalf of Origin Energy.
- Authoring major studies of the smart energy market, personal energy management and electric vehicles on behalf of Integral Energy, Hydro Tasmania, Energex and Ergon.

SUMMARY OF EXPERIENCE ENERGY AUSTRALIA

As the A/Mgr – Alliance Strategy, Ezra was responsible for managing the implementation of two Alliances to deliver up to $1.5B in capital projects over five years. In this role his major achievements were:

- managing the legal and commercial negotiations to achieve commercial alignment, and developing a comprehensive Alliance implementation plan, including a resourcing model for $8B capital program

As the A/Executive Mgr – Strategic Services, Ezra was responsible for the coordination of the Executive team on behalf of the Executive General Manager, Network. His duties included:

- providing advice to the Executive General Manager, Network; Strategy development, business planning and divisional communication; performance measurement, monitoring and reporting; Board, ministerial and inter-divisional interfaces and coordination of the executive management team

As the Mgr – Network Metering & Pricing Strategy, Ezra was responsible for the formulation, justification and delivery of company's strategic pricing and metering initiatives. His responsibilities included:

- leading the development and delivery of the $500M Advanced Metering Infrastructure (AMI) strategy, which included Australia's largest technology pilot & customer research study
- driving the deployment of Australia's largest smart metering fleet and representing the Division during a $70M strategic metering procurement

As the Network Business Consultant, Ezra was responsible for internal business consulting, including:

- providing strategic advice to senior management on B2B, metering, pricing and retail services; managing retail market interfaces, including internal service providers; managing strategic initiatives including the Time-of-Use (ToU) / interval meter rollout; leading negotiations between EA Network, retailers and end-users, and increasing faltering ToU project output from 2,500/ year to 16,000/ year.

SUMMARY OF EXPERIENCE CAMBRIDGE ENERGY RESEARCH ASSOCIATES

As the Senior Associate, Global Gas & Power, Ezra provided expertise to the group's four regional gas and power teams. Projects included:

- overseeing the Asia Pacific gas and power component of a Board level strategy project; lead author of long-term N.A. gas scenarios study and editor and co-author of regional Latin American power sector briefings.

As an Associate Director, European Power, Ezra was a senior member of a team serving 50 clients. His role was responsible for the network sector, retail & wholesale markets and player strategy, ad-hoc client advisory service and new business development. In this role Ezra's achievements were;

- becoming the youngest Associate Director in the company's history; leading projects on retailer entry and a international investment framework; developing a pan-European pricing model for due diligence on $800M IPP; providing Board level due diligence to a major trading bank's generator investment in South Australia.

Ezra Beeman has published more than 15 articles and papers in his field of expertise.

HARRY COLEBOURN

SENIOR REGULATION ADVISOR

SUMMARY OF EXPERIENCE

Prior to joining Energeia, Harry was the Executive Manager Regulation and Pricing at EnergyAustralia. In that role Harry was responsible for representing EnergyAustralia in political, regulatory and business circles and for pro-actively influencing the development of the regulatory regime for distribution and transmission infrastructure businesses.

QUALIFICATIONS

- Master of Business Administration, The University of Sydney
- Master of Engineering Science, Monash University
- Bachelor of Engineering (Honours), University of New South Wales
- Bachelor of Science, University of New South Wales

SUMMARY OF ENERGY EXPERIENCE

Providing advice to government and industry on:

- Regulatory frameworks for electricity markets and infrastructure businesses;
- Governance and liability issues for market institutions;
- Interpretation of, compliance with and changes to electricity Rules and Legislation;
- Network economic, pricing and metering issues;
- Risk management issues associated with participation in electricity markets;
- Approaches to network access and network planning;
- Demand management and embedded generation strategies.

SUMMARY OF CONSULTING EXPERIENCE

Since retiring from EnergyAustralia in July 2008, Harry has carried out consulting work for a number of organisations:

- Currently assisting ETSA Utilities with strategic regulatory advice and drafting sections of their 2009 initial regulatory proposal;
- With PricewaterhouseCoopers, developed the Power and Water (NT) public response and strategic plans to embody the recommendations of an Independent Enquiry into their equipment failures late in 2008. That response covered a broad range of distribution network activities from day to day maintenance through to long term planning and management reporting; and
- Assisted EnergyAustralia with strategic regulatory and pricing advice and drafting of sections of their revised 2009 regulatory proposal.

- Negotiating the compliance reporting framework and ensuring effective reporting to retain EnergyAustralia's Distributor's Licence and National Electricity Rules compliance.
- Strategic and tactical oversight of EnergyAustralia's network pricing and customer connection policies, including the development and marketing of new pricing products, such as Time of Use, seasonal and controllable load offerings and congestion pricing experiments.

SUMMARY OF PREVIOUS EXPERIENCE

As the Manager Network Pricing for TransGrid, was responsible for all aspects of network pricing at TransGrid, including the regulatory approval process, publication and application of transmission network prices.

Responsible for the negotiation and development of uniform Network Pricing arrangements
for the Australian National Grid, as the NSW representative on an interstate team.

In 1999 was engaged by Pacific Power and TransGrid as a consultant on transmission network pricing for the Zhejiang Province in China. Developed pricing procedure and linear programming software to calculate prices for this transmission network.

In earlier positions, was responsible for:

- The TransGrid Bulk Supply Planning function and the integration of plans with those of Distributors. Also for high level commercial and technical negotiations between TransGrid and external bodies such as interstate supply authorities and other State Departments.
- Principal author of a comprehensive 30 years strategic plan for the development of the State transmission system and a major contributor to the Gibbs inquiry.
- A diverse range of engineering maintenance activities.
- Harry is the author of over 20 articles and publications, mainly in the field of energy economics and has presented in Australia and overseas.
- Harry is a member of the Institution of Engineers and Technologists and the Electric Energy Society of Australia.