Review of Victorian Distribution Network Service Provider's Advanced Metering Infrastructure 2015 Charges Revision Applications

Prepared for the
Australian Energy Regulator

December 2014

1 Executive Summary

On 29 August 2014, Jemena (JEM), United Energy Distribution (UED) and AusNet Services (formerly SP AusNet) lodged Charges Revision Applications totalling $138.1 million in excess capital expenditure and $10.2 million in excess operational expenditure. CitiPower and Powercor's applications were within budget.

On 2 September 2014, The Australian Energy Regulator (AER) engaged Energeia Pty Ltd (Energeia) to undertake a limited review of Victorian Distribution Network Service Provider's (DNSPs) 2015 Charges Revision Applications against the criteria specified in the 22 December 2011 Order in Council (OIC).

Review Scope

The scope of Energeia's review has been limited to focus on the highest risk, highest value excess expenditure categories based on our risk assessment approach. This was agreed with the AER to include metering installation capex for JEN, UED and ANS, PMO capex and opex for UED and ANS, and metering and communications capex and meter reading opex for ANS due to potentially included WiMax costs.

In scope excess expenditure categories totalled $113.6 million, or 78% of the total excess expenditure claimed by the three Victorian DNSPs in their 2015 Revised Charges Applications.

Review Approach

In light of the AER's determination of efficient costs for 2013, Energeia's overall approach to assessing the efficiency of excess expenditure in 2013 first sought to identify and quantify the changes in conditions that drove the excess expenditure, and then sought to identify the DNSP's response to the change in conditions to ensure an efficient outcome, as well as the reasonableness of that outcome relative to efficient costs.

Energeia's review methodology involved the following two part approach to meet the AER's review requirements as described in their Request for Proposal (RFP):

- review the relevant sections of each DNSP's Charges Revision Application,
- assess the relative size and risk for each excess expenditure category, and
- agree the scope of the detailed review of high value, high risk expenditure with the AER.

Based on the results of its initial review of the budget proposals, Energeia focused its review on the excess expenditure categories assessed as high value and high risk by:

- identifying the chain of events leading to the change in conditions and assessing their controllability,
- identifying the key options available at the time and assessing the DNSPs own approach and results,
- developing questions to help clarify or supplement information provided by the DNSPs,
- undertaking independent research, analysis and modelling as required,
- developing an independent estimate of the efficient level of excess expenditure, and
- comparing DNSP's excess expenditure against our estimate of the reasonably efficient level.

Efficient costs were estimated in light of clause 5I.7B of the OIC, the performance of comparable businesses, the experience of our personnel rolling out meters, and independent research and analysis.

Resolving Issues

Where a DNSP's Charges Revision Application did not contain sufficient information for Energeia to form a view as to whether they met the OIC tests for excess expenditure, Energeia developed questions to address its specific areas of concern.

DNSPs were each sent 9 questions to address these issues, with a request to respond within five business days due to tight timeframes. Energeia considered each DNSP's response, and met with them via telephone to address any remaining questions. Follow-up materials provided by most DNSPs were also reviewed and any additional questions managed via email and conference calls until all issues had been addressed.

Energeia acknowledges the pressure these requests put on each DNSP, and would like to thank their regulatory managers in particular for their understanding, support and cooperation.

Appendix 1 contains Energeia's responses to letters issued by the DNSPs in response to our report. This report has been revised where appropriate to reflect changes described in the appendix.

Review Findings

Energeia reviewed over 70 documents totalling over 3,600 pages submitted by the DNSP's. The result of our assessment of in-scope expenditure against each of the given regulatory tests is shown in Table 1.

Table 1 – Excess Expenditure Assessment Summary

	Applications			Energeia			Difference		
Excess Category	**JEN**	**ANS**	**UED**	**JEN**	**ANS**	**UED**	**JEN**	**ANS**	**UED**
Meter Capex		$ 22.40			$ 20.30			-$ 2.10	
Installation Capex	$ 15.76	$ 19.90	$ 25.71	$ 11.83	$ 19.90	$ 20.80	-$ 3.92	$ -	-$ 4.91
Comms Capex		$ 17.40			$ 5.71			-$ 11.69	
PMO		$ 3.60	$ 4.71		$ 0.40	$ 0.11		-$ 3.20	-$ 4.60
Meter Opex		$ 4.40			$ 0.11			-$ 4.29	
Total	$ 15.76	$ 67.70	$ 30.42	$ 11.83	$ 46.42	$ 20.91	-$ 3.92	-$ 21.28	-$ 9.51

Source: Energeia

Based on our review and independent investigation, Energeia believes that the excess expenditure can, in most of the cases we have been able to investigate, be reasonably attributed to material changes in their conditions. Our independent research and analysis found the most significant changes in conditions to be 10-16% higher labour market prices, changes in the forecast mix of inputs, and 2-10% higher rates of no access.

Our analysis has concluded that a reasonably efficient level of PMO excess expenditure for UED and ANS to be no more than 5% higher than the AER approved budget, and reasonably efficient metering installation excess expenditure to be $3.9 and $4.9 million lower than the levels claimed by JEN and UED, respectively. We have concluded ANS's meter, communications and meter reading related expenditure to be $18.1 million higher than efficient levels, due to inclusion of disallowed WiMax costs.

Importantly, our review has found that two of the Victorian DNSPs, CitiPower and Powercor (CP/PAL), were exposed to the same changes in no access and labour market conditions as the other DNSPs, yet they delivered their program largely on time and within their AER approved budget allowance. This outcome has played a significant role in our assessment, particularly with respect to our conclusions around the reasonably efficient level of PMO excess expenditure.

Energeia has not found CP/PAL's example to be as relevant for suburban meter installation costs due to significant differences between urban, suburban and rural networks installation cost factors. JEN and UED have suburban networks, which would be expected to be lower cost to install than urban or rural. This is because they are expected to involve fewer, harder to access commercial and multi-unit dwellings than urban and less travel time than rural networks.

While Powercor's rural meter installation costs may typically be used as the benchmark for the rural ANS, Energeia decided against this approach due to the potential for differences in contractual pricing mechanisms to largely explain the variation. Had labour prices actually declined over the period, Powercor would have faced significantly higher costs relative to a market price linked contract. Energeia's assessment therefore focused estimating the efficient level of labour price increases assuming a market price linked contract.

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Disclaimer

While all due care has been taken in the preparation of this report, in reaching its conclusions Energeia has relied upon regulatory guidance from the Australian Energy Regulator (AER) and information provided by the Distribution Network Service Providers (DNSPs), including third party consultants. 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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2 Background

The Victorian Government announced the rollout of Advanced Metering Infrastructure (AMI) for all customers consuming less than 160MWh per annum in 2006. The Government subsequently decided that electricity distributors would be given an exclusive mandate to roll out the meters.

The regulatory arrangements relating to the rollout were originally set out in an August 2007 Order in Council made under sections 15A and 46D of the Electricity Industry Act 2000, and an amending order made on 25 November 2008. The Order in Council was revised on 10 December 2013, and this is the version referenced throughout the remainder of this report as the 'OIC'.

The OIC sets out the regulator's role and is the primary regulatory instrument which guides the determination of revenue and prices for metering services.

3 Overview

The AER engaged Energeia Pty Ltd (Energeia) to undertake a limited, seven week review of Victorian DNSPs' 2015 Charges Revision Applications for AMI against the regulatory criteria outlined in Section 4. The project timeframe was extended following a change to the OIC extending the timeframe for the AER.

Energeia's undertook a detailed assessment of 5 excess expenditure categories by reviewing DNSP supplied information against the regulatory criteria, working closely with the AER and DSNPs to resolve any information gaps. Energeia's review considered a number of spreadsheets and over 70 documents totalling over 3,600 pages provided by DNSPs in support of their proposals.

This report documents the approach and outcomes of Energeia's review of DNSP excess expenditure against the specified regulatory criteria.

4 Review Scope and Approach

In light of the AER's determination of efficient costs for 2013, Energeia's overall approach to assessing the efficiency of excess expenditure in 2013 first sought to identify and quantify the changes in conditions that drove the excess expenditure, and then sought to identify the DNSP's response to the change in conditions to ensure an efficient outcome, as well as the reasonableness of that outcome relative to efficient costs.

Energeia's review methodology involved the following two part approach to meet the AER's review requirements as described in their Request for Proposal (RFP):

- review the relevant sections of each DNSP's Charges Revision Application,
- assess the relative size and risk for each excess expenditure category, and
- agree the scope of the detailed review of high value, high risk expenditure with the AER.

Based on the results of its initial review of the budget proposals, Energeia focused its review on the excess expenditure categories assessed as high value and high risk by:

- identifying the chain of events leading to the change in conditions and assessing their controllability,
- identifying the key options available at the time and assessing the DNSPs own approach and results,
- developing questions to help clarify or supplement information provided by the DNSPs,
- undertaking independent research, analysis and modelling as required,
- developing an independent estimate of the efficient level of excess expenditure, and
- comparing DNSP's excess expenditure against our estimate of the reasonably efficient level.

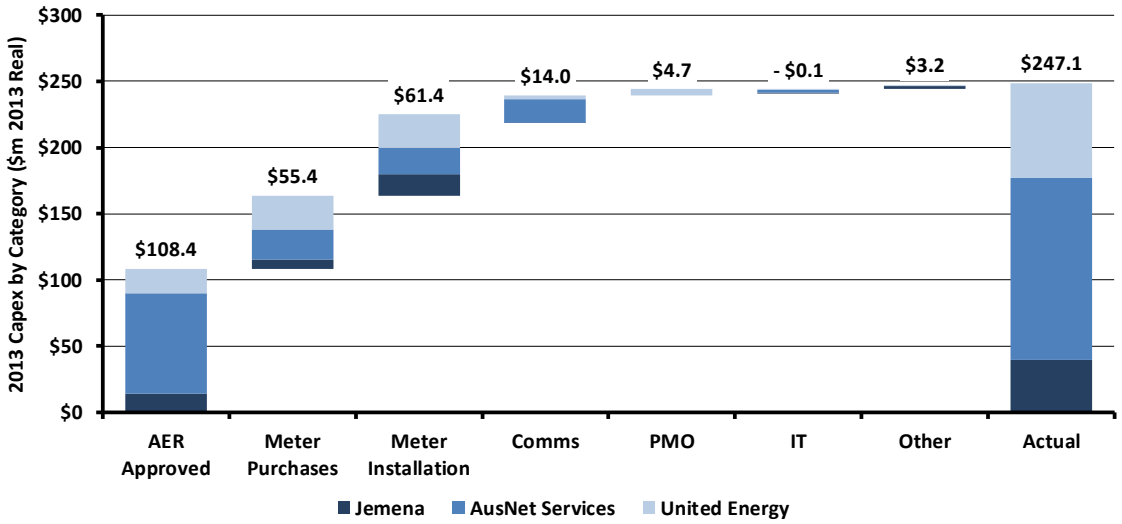
Efficient costs were estimated in light of clause 5I.7B of the OIC, the performance of comparable businesses, the experience of our personnel rolling out meters, and independent research and analysis.

The following sections detail Energeia's approach to reviewing and testing the 2015 Revised Charges Applications, including resolving any issues.

4.1 Expenditure Categories

The scope of Energeia's review was limited to the highest value, highest risk categories of excess expenditure to efficiently allocate scare review resources.

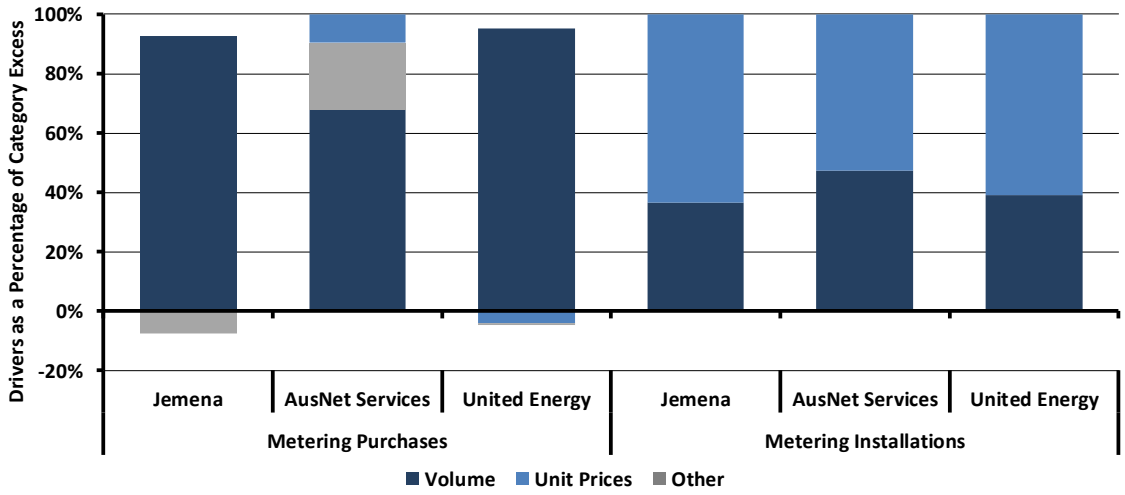
Figure 1 – Excess Expenditure by DNSP and Category



Source: CitiPower, Jemena, Powercor, AusNet Services and United Energy Distribution

Total excess expenditure by DNSP, category and driver is presented in Figure 1, which highlights the relatively greater size of excess expenditure in the meter purchase and installation categories. In comparing the two categories of expenditure, Energeia identified that meter purchases were largely driven by relatively low risk changes in volumes, as shown in Figure 2. Meter installation expenditure was therefore higher risk.

Figure 2 – Excess Meter Installation Expenditure by DNSP and Category



Source: CitiPower, Jemena, Powercor, AusNet Services and United Energy Distribution

Following Energeia's preliminary review and assessment, the scope of excess expenditure subject to detailed review and assessment was agreed with the AER to include metering installation capex for JEN, UED and ANS, PMO capex and opex for UED and ANS, and metering and communications capex, and meter reading opex for ANS due to the high risk them including disallowed WiMax expenditure.

Other categories of excess expenditure have been agreed with the AER to be out of scope for our review.

4.2 Regulatory Tests

4.2.1 Scope

Energeia first assessed the excess expenditure under review against the within scope activities criteria under Schedule 2 of the OIC.

Energeia notes that according to clause 5I.2(a)(1) of the OIC, auditor reports prepared under clause 5H.2 are not conclusive as to whether the expenditure is for in scope activities.

Energeia's assessment of whether excess expenditure met the criteria was based on the experience of its personnel deploying advanced metering infrastructure and their technical knowledge of the relevant regulatory obligations, metering services and advanced metering infrastructure related technologies.

4.2.2 Prudency

Energeia then reviewed DNSP's in scope excess expenditure against the following OIC[1] criteria:

> 5I.7 Where t-1 is any other year in the initial regulatory period, the Commission may refuse to include in the building blocks an expenditure excess if the distributor has not satisfied the Commission that the expenditure excess is prudent.
>
> 5I.7A For the purposes of clause 5I.7, the expenditure excess is prudent where that expenditure excess reasonably reflects the efficient costs of a business providing the Regulated Services.

[1] *Victoria Government Gazette, No. S 314*, Victorian Government Printer, 25 November 2008.

In order to apply the prudency test, Energeia developed an independent estimate of the reasonably efficient level of expenditure for each of the targeted expenditure categories based on the following OIC criteria:

5I.7B For the purposes of it being satisfied that an expenditure excess reasonably reflects the efficient costs of a business providing the Regulated Services, the Commission may take into account:

(a) where the expenditure excess is a contract cost, whether the contract was let in accordance with a competitive tender process; and

(b) the matters set out in clause 5I.8.

5I.8 The matters that the Commission may take into account include the following:

(a) the information available to the distributor at the relevant time;

(b) the nature of the provision, installation, maintenance and operation of advanced metering infrastructure and associated services and systems;

(c) the nature of the rollout obligation;

Note: See clause 14 and Schedule 1.

(d) the state of the technology relevant to the provision, installation, maintenance and operation of advanced metering infrastructure and associated services and systems;

(e) the risks inherent in a project of the type involving the provision, installation, maintenance and operation of advanced metering infrastructure and associated services and systems;

(f) the market conditions relevant to the provision, installation, maintenance and operation of advanced metering infrastructure and associated services and systems;

(g) any metering regulatory obligation or requirement; and

(h) any other relevant matter.

4.2.3 Efficiency

In light of the AER's pre-existing Determination of efficient costs for 2013, Energeia's approach to assessing the efficiency of excess expenditure in 2013 first sought to identify and quantify the changes in conditions that drove the excess expenditure, and then sought to identify the DNSP's response to the change in conditions to ensure an efficient outcome, as well as the reasonableness of that outcome relative to efficient costs.

In essence, efficient costs are the product of management processes designed to ensure that sustainably least cost options are systematically chosen and effectively implemented from a reasonable range of feasible alternatives. Energeia therefore sought to identify the change, the least cost management approach adopted, the range of feasible options, the basis for the selected option, and the effectiveness of its implementation.

Given the significant uncertainty and risk associated with the AIMRO programs, it was particularly important to take the information available to the businesses at the time into account when considering the efficiency of any decision to incur excess expenditure. In considering any alternative courses of action that may have been taken, Energeia strove to demonstrate that necessary information would have been available. This often required additional, independent research on our part.

4.2.4 Reasonableness

With respect to the OIC requirement that excess expenditure be reasonably efficient, Energeia adopted 5% a margin. We applied this margin to our estimate of efficient excess expenditure to take into account potential estimation error as well as to provide a reasonable level of tolerance around it.

4.2.5 Contract Cost

In determining whether excess expenditure is reasonably efficient against clause 5I.8, clause 5I.7 of the OIC appears to require the AER to also take into account whether or not the excess expenditure is a contract cost and whether or not the contract was let in accordance with a competitive tender process:

> 5I.9 When taking into account whether a contract was let in accordance with a competitive tender process, the Commission must have regard to:
>
> (a) the tender process for that contract;
>
> (b) whether there has been compliance with that process; and
>
> (c) whether the request for tender unreasonably imposed conditions or requirements that prevented or discouraged the submission of any tender that was consistent with the selection criteria.

Energeia's assessment of whether excess expenditure met the above criteria was based on the experience of its personnel procuring advanced metering infrastructure and their technical knowledge of DNSP tendering processes and the market for advanced metering infrastructure related technologies and services.

4.2.6 Out of Scope

Other regulatory tests have been agreed with the AER to be out of scope for our review.

4.3 Resolving Issues

Where DNSP's Charges Revision Applications did not contain sufficient information for Energeia to form a view as to whether they met the particular regulatory test, Energeia developed questions to address its specific areas of concern.

DNSPs were each sent 9 questions to address these issues, with a request to respond within five business days due to tight timeframes. Energeia considered each DNSP's response, and met with them via telephone in some cases multiple times to address any remaining questions. Follow-up materials were also reviewed and any outstanding issues managed via email and conference calls until all had been addressed.

Energeia acknowledges the pressure these requests put on each DNSP, and would like to thank their regulatory managers in particular for their understanding, support and cooperation.

4.4 Out of Scope

Anything not specified as being in scope for Energeia's limited review of DNSP's 2015 Charges Revision Applications is out of scope, including:

- Assessment of excess expenditure categories other than those listed in Section 4.1
- Assessment of 2012 excess expenditure
- Assessment of whether DNSP's met the best efforts criteria

5 Review Outcomes

Energeia reviewed over 70 documents totalling over 3,600 pages from the DNSP's in support of their Charges Revision Applications. The result of our assessment of in-scope expenditure against each of the given regulatory tests is shown in Table 2.

Table 2 – Excess Expenditure Assessment Summary

	Applications			Energeia			Difference		
Excess Category	**JEN**	**ANS**	**UED**	**JEN**	**ANS**	**UED**	**JEN**	**ANS**	**UED**
Meter Capex		$ 22.40			$ 20.30			-$ 2.10	
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Total	$ 15.76	$ 67.70	$ 30.42	$ 11.83	$ 46.42	$ 20.91	-$ 3.92	-$ 21.28	-$ 9.51

Source: Energeia

Based on our review and independent investigation, Energeia believes that the excess expenditure can, in most of the cases we have been able to investigate, be reasonably attributed to material changes in their conditions. Our independent research and analysis found the most significant changes in conditions to be 10-16% higher labour market prices, changes in the forecast mix of inputs, and 2-10% higher rates of no access.

Our analysis has concluded that a reasonably efficient level of PMO excess expenditure for UED and ANS to be no more than 5% higher than the AER approved budget, and reasonably efficient metering installation excess expenditure to be $3.9 and $4.9 million lower than the levels claimed by JEN and UED, respectively. We have concluded ANS's meter, communications and meter reading related expenditure to be $18.1 million higher than efficient levels, due to inclusion of disallowed WiMax costs.

Importantly, our review has found that one of the Victorian DNSPs, CP/PAL, were exposed to the same changes in no access and labour market conditions as the other DNSPs, yet they delivered their program largely on time and within their AER approved budget allowance. This outcome has played a significant role in our assessment, particularly with respect to our conclusions around the reasonably efficient level of PMO excess expenditure.

Energeia has not found CP/PAL's example to be as relevant for suburban meter installation costs due to significant differences between urban, suburban and rural networks installation cost factors. JEN and UED have suburban networks, which would be expected to be lower cost to install than urban or rural. This is because they are expected to involve fewer, harder to access commercial and multi-unit dwellings than urban and less travel time than rural networks.

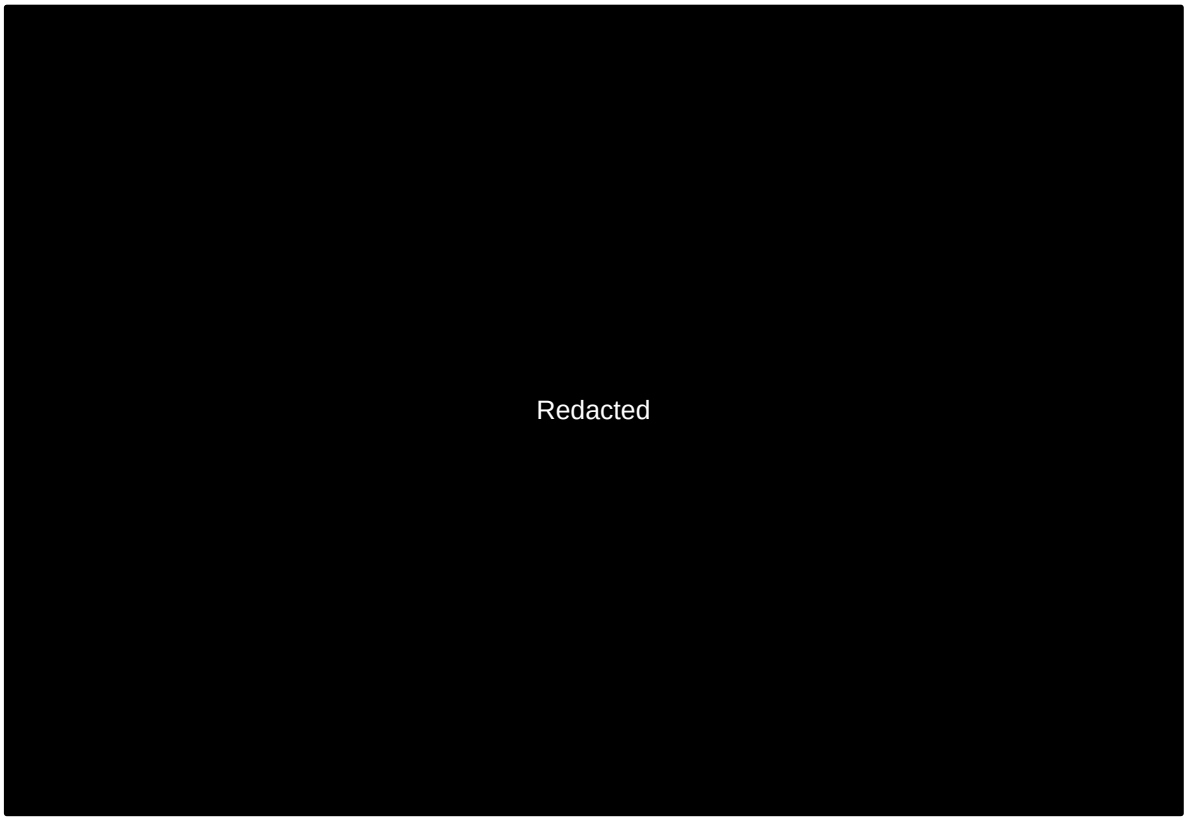
While Powercor's rural meter installation costs may typically be used as the benchmark for the rural ANS, Energeia decided against this approach due to the potential for differences in contractual pricing mechanisms to largely explain the variation. Had labour prices actually declined over the period, Powercor would have faced significantly higher costs relative to a market price linked contract. Energeia's assessment therefore focused estimating the efficient level of labour price increases assuming a market price linked contract.

Energeia's assessment of DNSP's in-scope expenditure against the relevant regulatory tests is detailed in following sections.

5.1 Jemena

Jemena's 2015 Charges Revision Application included $25.6 million in excess expenditure, of which $15.8 million was for metering installation costs, as detailed in Table 3.

Table 3 – Jemena Excess 2013 Expenditure by AusNet and Energeia Category



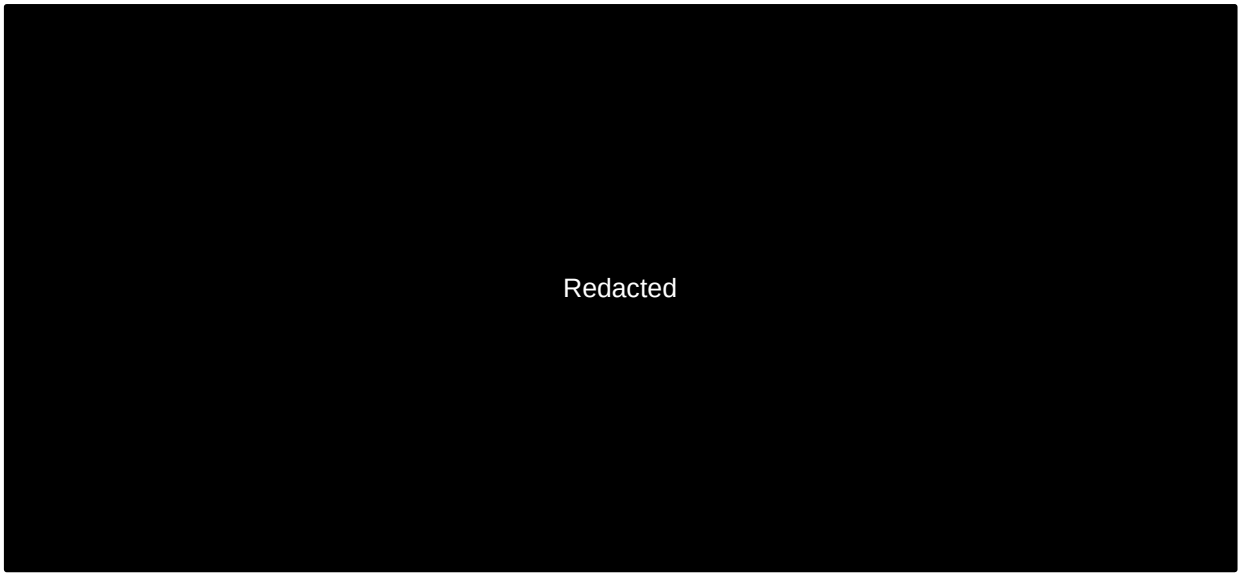
Source: Energeia

The following sections detail Energeia's assessment of Jemena's highest risk, highest value expenditure categories against the OIC criteria using the methodology outlined in Section 4.

5.1.1 Meter Installation Capex

In its Final Determination on the 2012-2015 AMI budget application, the AER approved $4.2 million for the installation of 48,647 meters in 2013 at a unit rate of $86 per site.[2]

Figure 3 – AER Allowed 2013 Installation Costs by DNSP

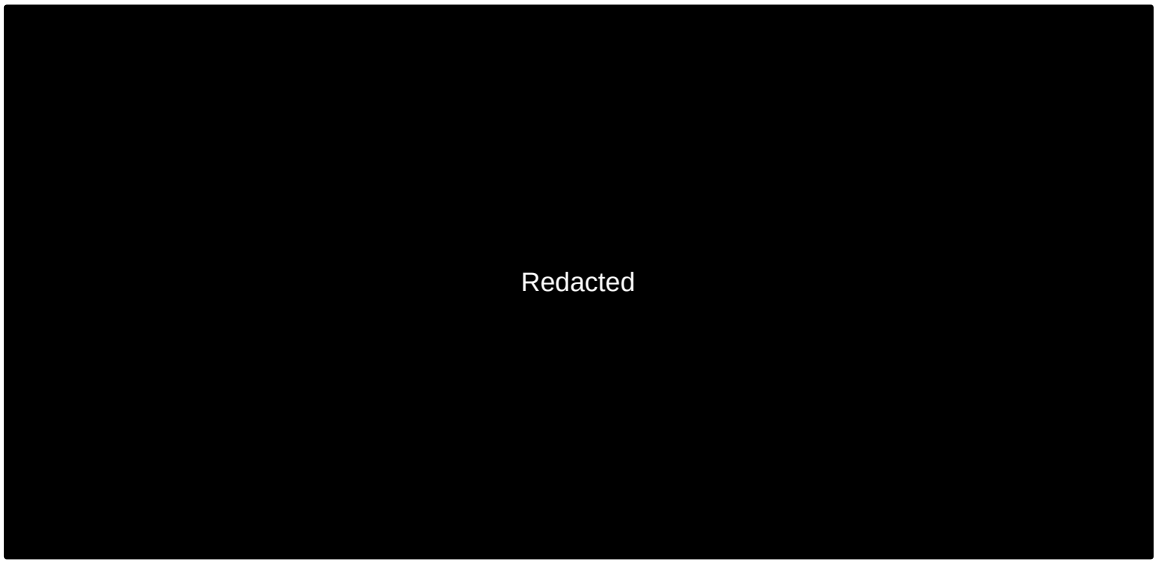


Source: CitiPower, Jemena, Powercor, AusNet Services and United Energy Distribution

Jemena's AER approved installation cost per meter is compared to other DNSPs in Figure 3. It shows that Jemena's approved unit price per meter was the lowest at the time, just below UED.

In its 2015 Charges Revision, Jemena revised its meter installation expenditure to $20.0 million. This is $15.8 million higher than the efficient level of expenditure determined by the AER.

Figure 4 – Jemena's Meter Installation Excess Expenditure by Driver



Source: Jemena

[2] *Victorian Advanced Metering Infrastructure Review, 2012–15 budget and charges applications, CONFIDENTIAL VERSION,* AER, October 2011

The main reasons for the excess expenditure in metering installation costs given by Jemena and displayed in Figure 4 include:

- Higher installation labour costs
- Change in volume mix (e.g. higher truck support and pricing)
- Higher installation volumes

The following sections summarise Jemena's reasoning and Energeia's independent research analysis of the expenditure excess against the regulatory criteria.

5.1.1.1 Higher Installation Labour Costs

The AER determined $86 per site to be the efficient cost in 2013 under the OIC. This was based on information provided by Jemena in their February 2011 subsequent AMI budget period budget application.[3]

Jemena's revised charges application seeks $94 per site above the AER's approved efficient costs, mainly due to:

- Increase in metering installation service provider's base rate
- Use of three additional installers
- Out of hours work, including penalty rates
- Metering installation service provider's sub-contractor incentive pass-through
- Safety enhancements required by EnergySafe Victoria[4]

The main reason for the increase in these costs, according to Jemena, was the failure of the metering installation provider to install the forecast number of sites at the forecast contract rates, which was in turn driven by the following key changes in market conditions:[5]

- Changes in the prevailing wage rates;
- Changes in customer attitudes towards meter installation; and
- Changes in the number of supervisors required by EnergySafe Victoria.

Energeia's reviewed each of these drivers against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether Jemena's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Although a great deal of related information was provided, including:

- No access rates[6];
- Actual installation rates relative to target[7];
- Average meter installations per Full-Time-Employee (FTE) per day[8]; and

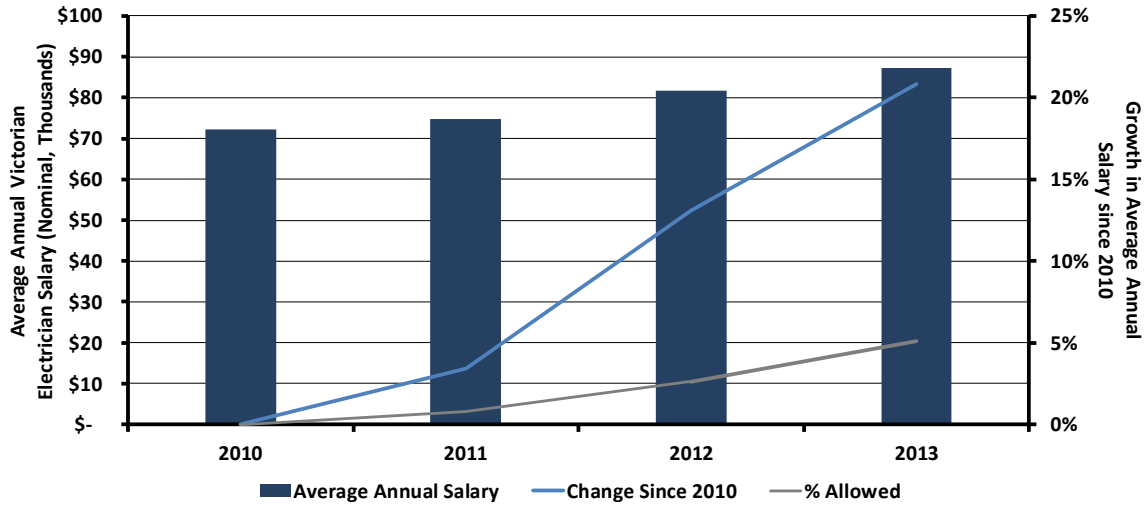
[3] *Jemena Electricity Networks (Vic) Limited, Advanced Metering Infrastructure Roll-out Subsequent Budget Application,* 28 February 2011
[4] *Jemena Electricity Networks (Vic) Limited, AMI Charges Revision Application for CY2015, Appendix D, Expenditure Excess Explanation for CY2013 (Confidential),* 29 August 2014, p 28 and pp 34-35
[5] *Ibid,* pp 24-25
[6] *Ibid,* p 16
[7] *Ibid,* p 28
[8] *Ibid,* p 20

- Installers recruited, trained and in place by week[9].

However, Jemena did not specifically quantify the changes in the prevailing market wage rates, nor the change in customer attitudes. The change in supervisors required was quantified.

Energeia analysed changes in the prevailing wage rate by comparing the average cost of an electrician in Victoria at the time the Subsequent Budget Applications were prepared (see Figure 5). Energeia realises that not all meter installers were qualified electricians, however, we believe this category of labour to be an appropriate, publically available benchmark that would have been available to DNSPs at the time.

Figure 5 – Average Annual Electrician Salary in Victoria 2010 to 2013



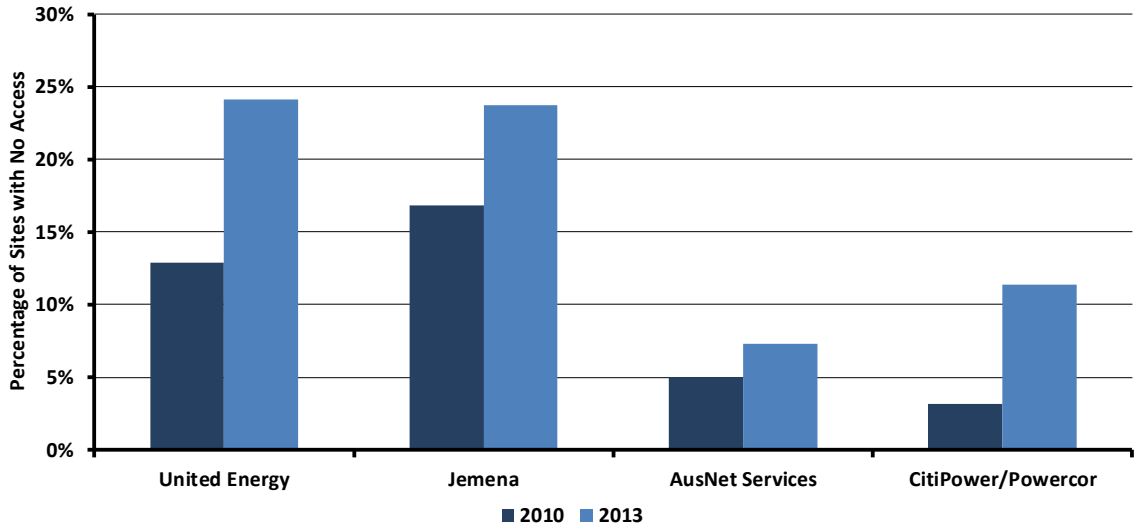
Source: Seek.com

The analysis shows that prevailing wage rates moved up significantly from when the budgets were developed in 2010, and were 16% higher than the AER real cost escalator allowance for outsourced labour by 2013[10]. Based on this finding, Energeia concluded that an efficient business would not pay more than 10-16% above the installation rates previously determined by the AER to be efficient, all else being equal.

In addition to the change in the real cost of labour since the budgets were approved, Jemena identified a change in the quantity of labour required, due to changes in customer's attitudes to the meter rollout. For a variety of reasons, which each of the DNSPs document in detail in their applications, the level of customer refusals to allow smart meters to be installed rose substantially over the period, as shown in Figure 6.

[9] *Ibid,* p 21
[10] *Victorian distribution final decision 2011-2015 - Appendices, Appendix K*, AER, 29 October 2010, p 255

Figure 6 – Average No Access Rates for Meter Installation in 2010 and 2013



Source: United Energy Distribution, Jemena and AusNet Services

Energeia's approach to estimating the impact of an increase in no access on efficient costs was to adjust the travel portion of the total installation labour cost by the change in no access rates. The additional labour estimated to be required due to higher no access rates leading to greater distances between accessible sites and multiple visits was priced at the market rate for labour described above.

Each of the three DNSPs averaged 8 installs per day, or just under 1 hour per day per install based on a 38 hour work week[11,12,13]. Assuming installation once at site accounts for 45 minutes on average, reflecting difficult sites towards the end of the installation, Energeia assumed the remaining time was for travel to and from site. The change in no access was multiplied by travel time to arrive at the travel weighted impact.

Table 4 – Estimated Increase in Efficient Unit Costs of Meter Installation

Change	United Energy	Jemena	AusNet
Additional Travel Labour	0.5%	1.5%	2.5%
Higher Priced Labour	11%	13%	8%
Total Adjustment	*12%*	*14%*	*11%*

Source: Energeia

Table 4 displays the results of Energeia's calculation of the change in efficient meter installation unit costs due to key changes in labour price and travel time conditions since the December 2010. It reflects the conditions listed in the OIC clause 5I.8, including changes in market conditions, information available to the DNSPs at the time, the risks inherent in such a project and the nature of the service.

It is important to note that the calculations reflected in Table 4 also impact Energeia's estimate of the change in total efficient meter installation costs due to changes in installation volumes. This is because the unit price adjustment must be applied prior to the adjustment for changes in metering volumes.

5.1.1.2 Change in Volume Mix

Jemena is claiming $4.5 million in excess expenditure due to changes in the level of truck support required for metering installations than they had included in their 2012-15 Subsequent Budget Proposal. Jemena

[11] *Attachment 10*, AusNet Electricity Services, Tab *Installations per person*, Cell C5:ED5
[12] JEN MRO Summary Data Sep2009 - Dec2013 - CONFIDENTIAL.xlsx, *Jemena Electricity Networks (Vic) Limited,* Tab *JEN MRO*, Cell G38:G53
[13] *7 to 9 UE MRO Summary Data Sep 2009 - Dec 2013.xslx*, United Energy, Tab *UE MRO*, Cell G38:G53

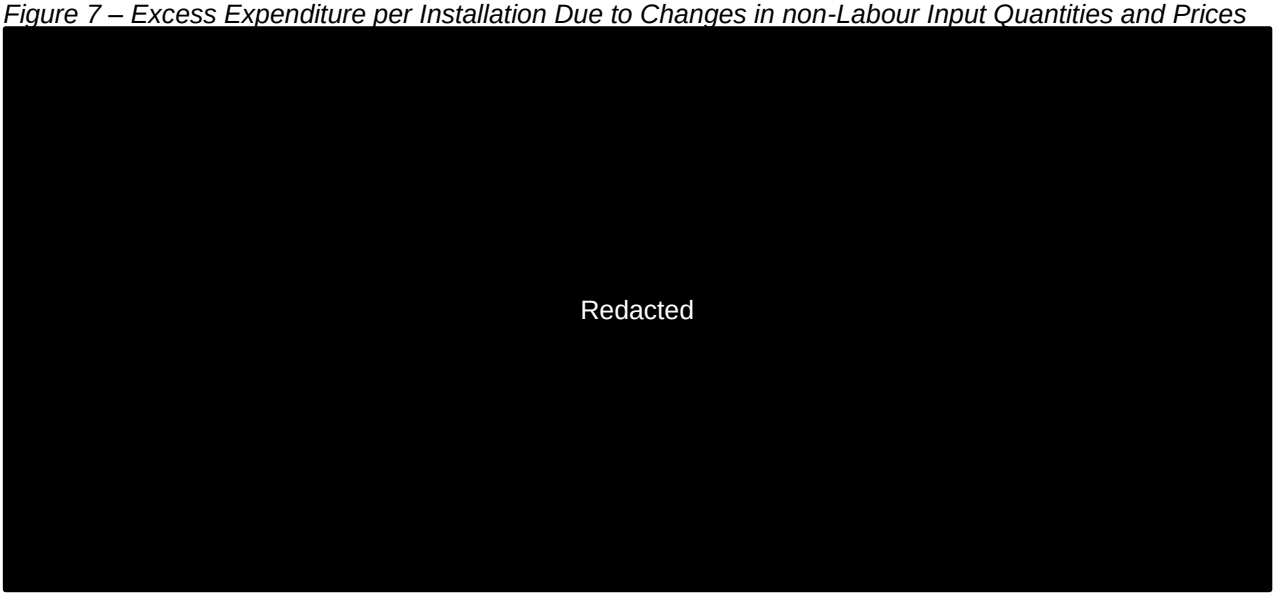
provided a reconciliation from the figure listed in the AER's Final Determination back to the primary modelling used to derive it to satisfy Energeia's request for substantiation of this claimed change in input volumes[14].

Jemena is also claiming $1.36 million in excess expenditure due to a pricing error in their 2012-15 Subsequent Budget Proposal regarding the cost of truck support. Again, Jemena provided a reconciliation from the figure listed on the AER's Final Determination back to the primary modelling used to derive it to satisfy Energeia's request for substantiation of this claimed change in input prices[15].

While a pricing error and change in inputs assumed may be out of the control of the DNSP, the efficient meter installation price originally determined by the AER was based on detailed analysis of the comparative efficiency at the time, i.e. benchmarking. In assessing whether the change in installation costs reflected efficient costs, Energeia therefore sought to compare Jemena's experience to the closest comparator, UED.

UED also experienced a change in its assumed mix of volumes, however, once corrected to exclude changes in labour prices already addressed in the previous section, this represents an additional $20 per site. Based on the results of our analysis, shown in Figure 7, Energeia therefore conclude that up to $20 of Jemena's excess expenditure due to changes in truck support volumes and pricing reflect efficient costs.

Figure 7 – Excess Expenditure per Installation Due to Changes in non-Labour Input Quantities and Prices



Source: United Energy Distribution, Jemena and AusNet Services, Energeia

Based on the above analysis, Energeia conclude that $2.3 million is the efficient level of excess meter installation expenditure due to changes in the volume mix allowed under clause 5I.7A of the OIC. $2.3 million represents the additional $20 per site multiplied by the total number of sites installed in 2013.

[14] *JEN Meter Install (Truck Support) AER Allowance.xlsx, Jemena Electricity Networks (Vic) Limited,* Tab *Install Cost Summary*, Cell F78

[15] *JEN Meter Install (Truck Support) AER Allowance.xlsx, Jemena Electricity Networks (Vic) Limited,* Tab *Install Cost Summary*, Cell F77

5.2 United Energy Distribution

United Energy Distribution's 2015 Charges Revision Application included $53.5 million in excess expenditure, of which $25.7 million was for metering installation costs, as detailed in Table 5.

Table 5 – UED's Excess 2013 Expenditure by UED and Energeia Category

Source: UED, Energeia

The following sections detail Energeia's assessment of UED's highest risk, highest value excess expenditure categories against the OIC criteria using the methodology outlined in Section 4.

5.2.1 Meter Installation Capex

In its Final Determination the AER approved $2.7 million for UED's installation of 32,684 meters in 2013 at a unit rate of $83 per site.[16]

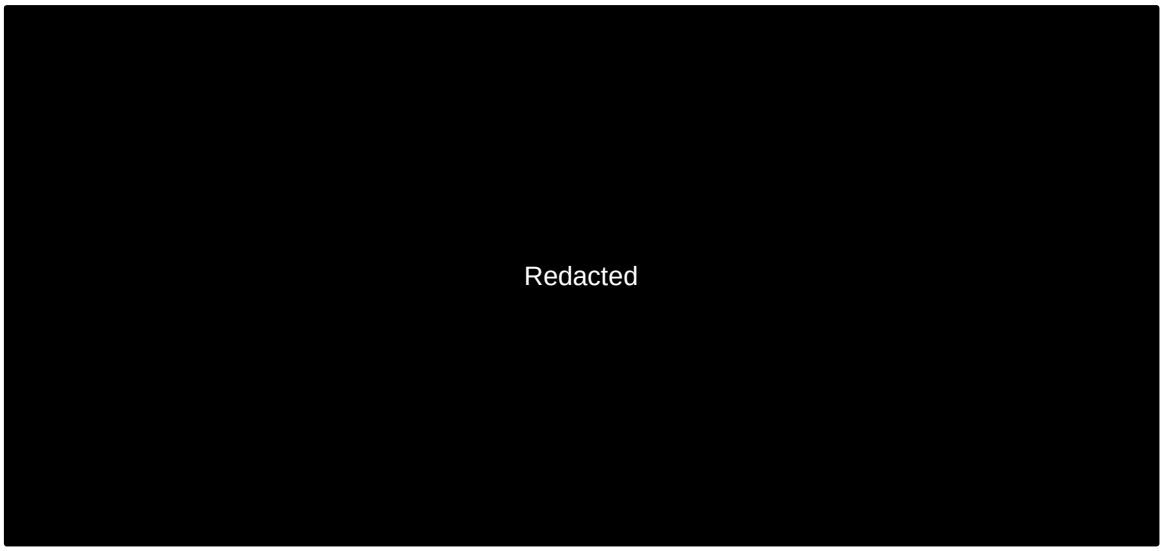
UED's approved installation cost per meter was previously compared to other DNSPs in Figure 8. It showed that UED's approved installation cost per meter was the second lowest at the time, just above Jemena's.

In its 2015 Charges Revision Application, UED revised its meter installation expenditure to $28.4 million. This is $25.7 million or $75 per site higher than the efficient level of expenditure determined by the AER, and is broken out by Energeia's excess expenditure drivers in Figure 8.

Similarly to Jemena and AusNet Services, UED claimed that their excess metering installation expenditure was mainly due to efficiently managed[17] higher no access rates[18], tight labour market conditions[19], changes in the volume mix and safety requirements, all of which led to higher installation unit prices.

[16] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications,* AER, October 2011
[17] *United Energy AMI Installation Program, Review of Prudency (Historical Expenditure),* Evans & Peck, 19 June 2014, pp 56-57
[18] *United Energy AMI Installation Program, Review of Prudency (Historical Expenditure),* Evans & Peck, 19 June 2014, p 56
[19] *United Energy AMI Installation Program, Review of Prudency (Historical Expenditure),* Evans & Peck, 19 June 2014, p 57

Figure 8 – UED's Meter Installation Excess Expenditure by Driver



Source: United Energy Distribution

Energeia's reviewed each of these drivers against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether UED's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Energeia's review found that the change in no access and labour market conditions were both outside of UED's control. However, the impact of these uncontrollable changes on their 2013 unit prices was within their control through their contracting and service provider management decisions.

Changes in the site mix was found to be largely outside of UED's control, except for certain items such as:

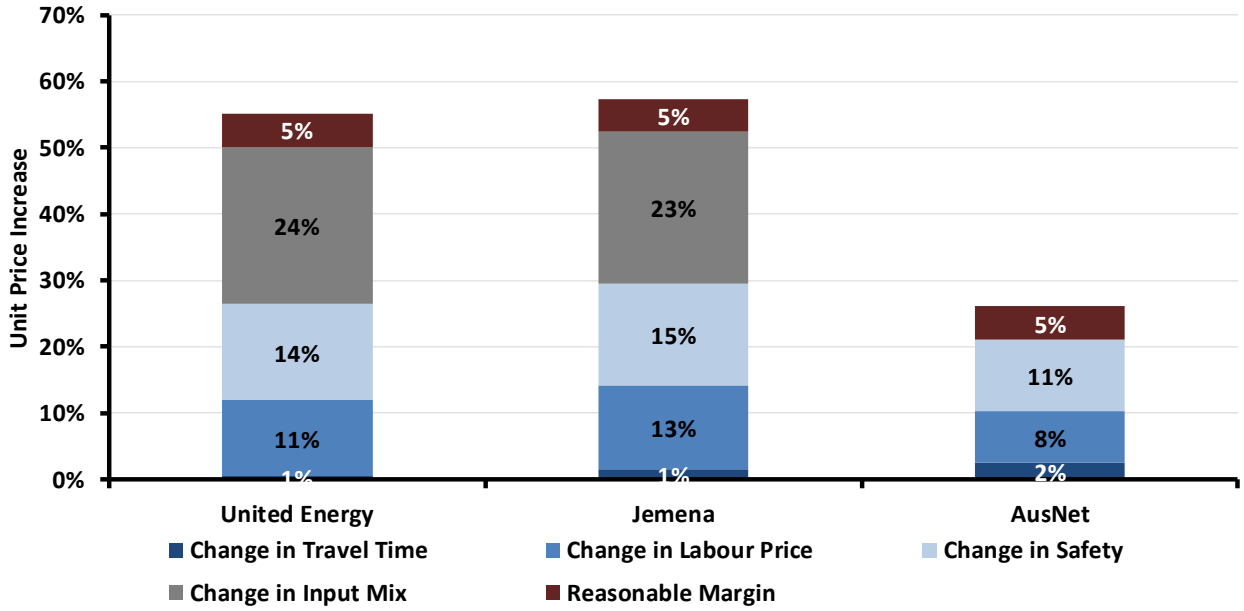
- Rate of meter installation truck support
- Rate of meter panel rewiring

Energeia focused on these costs in particular due to their relatively large share of the overall cost variation, the somewhat discretionary nature of these costs and the potential for these tasks to be influenced by the service provider in the interest of increasing their average unit price.

Energeia's methodology for assessing the efficiency of UED's management of higher labour price drivers was outlined in Section 4. Applying it to UED's circumstances in terms of no access rates across and higher average travel times leads us to conclude that an efficient business would see a $22 or 26% increase due to labour price increases, including a $12 per site or 14% adjustment for changes to safety rules.

The build-up of Energeia's estimate of reasonably efficient metering installation excess expenditure for UED, JEN and ASN by driver is presented in Figure 9.

Figure 9 – Estimated Reasonably Efficient Meter Installation Unit Price Increases by DNSP and Driver



Source: United Energy Distribution, Jemena and AusNet Services, Energeia

Applying an overall 50% adjustment to the AER approved $83 per installation results in a $125 per meter efficient cost benchmark, or $131 with a 5% margin. This is below UED's actual $159 per installation expenditure. We therefore conclude that the $4.9 million of excess expenditure for meter installation capex due to increases in meter installation unit prices does not meet the requirements of clause 5I.7A of the OIC.

5.2.2 Program Management Office Capex

In its Final Determination on the 2012-2015 AMI budget applications, the AER approved $2.4 million for the Program Management Office (PMO) capex.[20]

In its 2015 Charges Revision Application, UED revised its PMO expenditure to $7.1 million. This is $4.7 million higher than the efficient level of expenditure determined by the AER.

The key driver of the higher than allowed PMO expenditure cited by UED was the termination of their contract with Jemena and transition to management of the program themselves[21]. The decision to incur this additional expenditure occurred after 18 months of attempting to work with Jemena to get the program back on track.

Energeia's reviewed each of the key drivers of UED's PMO excess expenditure against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether UED's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Energeia's independent research and analysis found there were material, largely uncontrollable changes in conditions that contributed to UED's program falling significantly behind from June 2010 and their decision in June 2013 to take over the PMO function from 31 July 2013. The key changes include:

- Higher no access rates increasing labour requirements and meter installer attrition
- Below market allowances for labour due to higher than allowed real cost increases

[20] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications*, AER, October 2011

[21] *United Energy 2015 AMI Charges Revision Application, Appendix C - Review and Explanation of United Energy's 2013 AMI Expenditure,* United Energy, 26 June 2014, p 38

Together, these changes impacted on the meter installation service provider's ability to attract and retain the necessary number of metering installation employees to keep the program on schedule. However, this was an ongoing issue since June 2011 when UED missed the OIC installation target for the first time. By the end of 2012, UED's program had been significantly behind schedule for at least 18 months.

The key options available to UED since their program fell behind the OIC installation targets in June 2011 included enforcing its contract's performance management provisions with Jemena, or terminating the contract and taking over the program themselves. UED investigated both options, ultimately taking over all AMI related activities from Jemena on 31 July 2013, more than 18 months after falling behind schedule.

Table 6 – Estimate of Victorian DNSP Program Performance Relative to OIC Targets

Target		United Energy	Jemena	AusNet Services	Powercor	CitiPower
Jun-10	5%	Feb-10	Dec-09	May-10	Apr-10	Apr-10
Dec-10	10%	Jul-10	May-10	Nov-10	Jun-10	Jul-10
Jun-11	25%	Aug-11	Jul-11	Oct-11	Dec-10	Feb-11
Jun-12	60%	Apr-13	Apr-13	Nov-12	Mar-12	Jul-12
Jun-13	95%	May-14	Feb-14	Oct-13	Mar-13	Jan-14

Note: Yellow indicates 0-6 months, orange 6-12 months behind target.

Source: Energeia, United Energy, Jemena, AusNet Services, Powercor and CitiPower

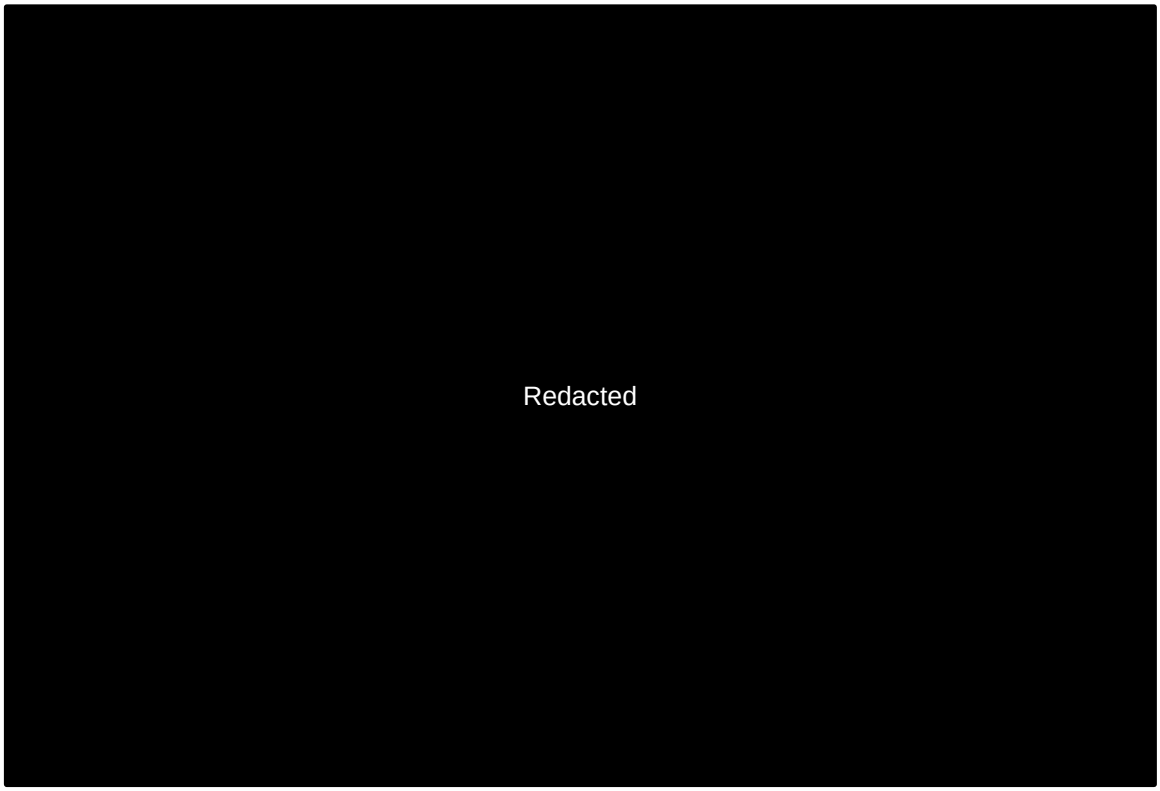
Given all five DNSPs were exposed to the same uncontrollable program delays, and that CitiPower and Powercor in particular were able to manage these impacts, as shown in Table 6, Energeia has concluded that CitiPower and Powercor's management outcomes with respect to program management costs and schedule performance represent the efficient outcome with respect to clause 5I.7A of the OIC.

Adjusting the AER determined efficient level of PMO expenditure by 5% to represent a reasonably efficient level as we believe is appropriate under clause 5I.7A of the OIC results in a reasonably efficient PMO excess expenditure of $0.2, or $4.5 million less than the amount claimed by UED.

5.3 AusNet Services

AusNet Services' 2015 Charges Revision Application included $70.5 million in excess expenditure, broken out in Table 7 by expenditure category.

Table 7 – AusNet Services Excess 2013 Expenditure by AusNet and Energeia Category



Source: Energeia

The following sections detail Energeia's assessment of the highest risk, highest value expenditure categories against the OIC criteria using the methodology outlined in Section 4.

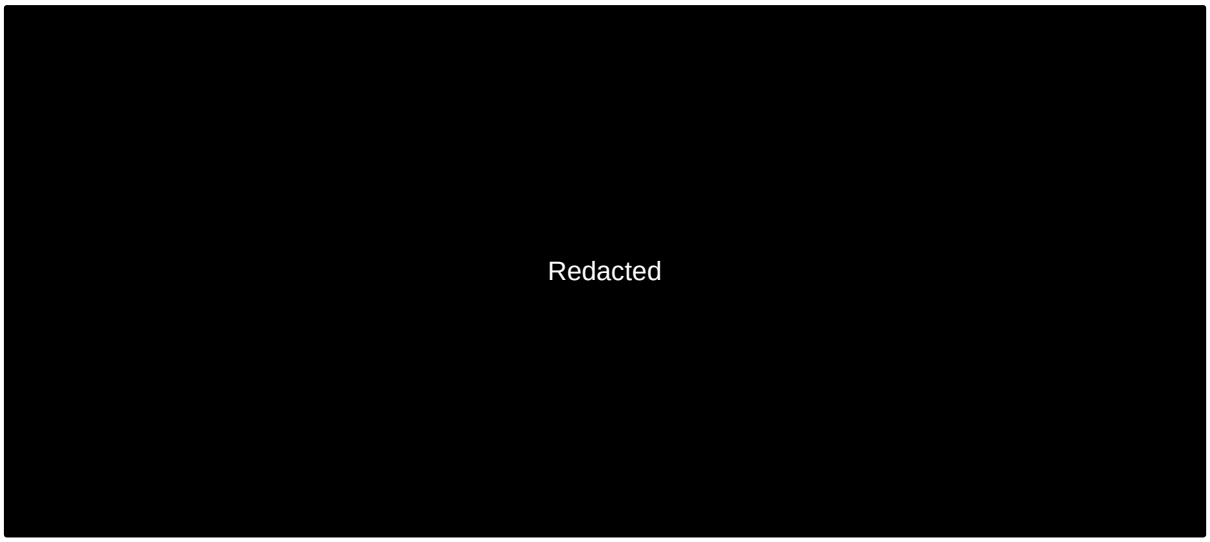
5.3.1 Meter Capex

In its Final Determination on the 2012-2015 AMI budget application, the AER approved $37.7 million for the purchase of 142,589 meters in 2013 at a unit rate of $264 per site.[22]

In its 2015 Charges Revision, AusNet revised its meter purchase expenditure to $60.1 million. This is $22.4 million higher than the efficient level of expenditure determined by the AER.

[22] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications*, AER, October 2011

Figure 10 – AusNet's 2013 Meter Excess Expenditure by Driver



Source: AusNet

The main reasons for the excess expenditure in metering installation costs given by AusNet and displayed in Figure 10 include:

- Changes in Volume of Installations
- Changes in Inventory
- Changes in Unit Prices

Energeia's reviewed each of these drivers against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether AusNet's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Energeia's review found that the each of these changes were controllable by AusNet in that AusNet controlled the volume of installations through its contracts and program management, controlled inventory through its purchase orders and unit prices through its decision to not switch to mesh technology.

In regard to whether AusNet's management of higher volumes and inventory in 2013 was efficient, Energeia found that while the higher volumes were the result of inefficient program delays (see below), these delays didn't appear to result in an inefficient volume variation (e.g. more meters per site) or inventory costs.

Energeia's review found that AusNet's higher unit prices reflected the cost of WiMax meters, which the AER had already disallowed in its Final Determination.[23] We have therefore concluded that the $2.1 million of excess expenditure for meter capex does meet the requirements of clause 5I.7A of the OIC.

5.3.2 Meter Installation Capex

In its Final Determination on the 2012-2015 AMI budget applications, the AER approved $16.7 million for the installation of 142,589 meters in 2013 at a unit rate of $117 per site.[24]

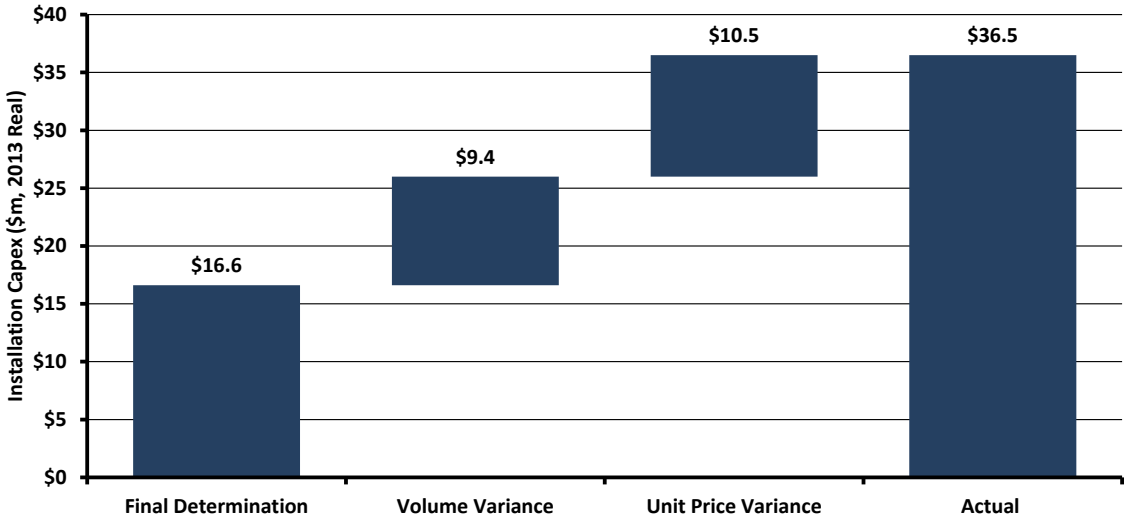
AusNet's approved installation cost per meter was compared to other DNSPs in Figure 11. It showed that AusNet's approved installation cost per meter was the second highest at the time, just below Powercor's.

[23] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications,* AER, October 2011

[24] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications,* AER, October 2011

In its 2015 Charges Revision Application, AusNet revised its meter installation expenditure to $36.5 million. This is $19.9 million higher than the efficient level of expenditure determined by the AER.

Figure 11 – AusNet Services' Meter Installation Excess Expenditure by Driver



Source: AusNet Services

The main reasons for the excess expenditure in metering installation costs given by AusNet and displayed in Figure 11 include:

- Higher installation labour costs (unit price variance)
- Higher installation volumes

Similarly to Jemena and UED, AusNet Services claimed that their excess metering installation expenditure was mainly due to higher no access rates and tight labour market conditions, which in turn led to higher installation unit prices, and that their management of these changes was reasonably efficient.[25]

Energeia's reviewed each of these drivers against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether AusNet's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Energeia's review found that the change in no access and labour market conditions were both outside of their control. However, the impact of these uncontrollable changes on their 2013 volumes and unit prices was within their control through their contracting and service provider management decisions.

Energeia's methodology for assessing the efficiency of AusNet Services' management of higher unit price drivers was outlined in Section 4. Applying it to AusNet's circumstances in terms of no access rates across and higher average travel times leads us to conclude that an efficient business would see a 29% increase due to labour price increases, including an 11% adjustment for changes to safety rules.

Applying a 29% adjustment to the AER approved $117 per installation results in a $151 per meter efficient cost benchmark, or $159 with a 5% margin. This is below AusNet Services actual $149 per installation expenditure. Energeia therefore concludes that the claimed $10.5 million excess expenditure for meter installation capex due to increases in meter installation unit prices is reasonably efficient and therefore meets the requirements of clause 5I.7A of the OIC.

[25] *Advanced Metering Infrastructure, 2015 Charges Revision Application,* AusNet Electricity Services, 29 August 2014, pp 16

5.3.3 Communications Capex

In its Final Determination, the AER approved $14.2 million for AusNet's communications capex.[26]

In its 2015 Charges Revision Application, AusNet reported actual communications installation capex of $31.5 million. This is $17.4 million higher than the efficient level of expenditure determined by the AER.

The main reasons for the excess expenditure in communications capex given by AusNet were:

- Higher tower installation costs (unit price variance); and
- Higher installation volumes[27]

Despite the AER's determination that AusNet Services WiMax communications expenditure did not meet the OIC test, and subsequent adjustment to reflect the cost of mesh communications expenditure, AusNet Services appears to have included WiMax related costs in its 2015 Charges Revision Application.

Energeia nevertheless reviewed each of AusNet's claimed excess drivers against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether AusNet's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Customer resistance to WiMax costs may not have been controllable, but the decision to deploy WiMax was under AusNet Services control. Energeia's previous review of AusNet Service's WiMax expenditure found it represented a substantial departure from the commercial standard. We therefore conclude that WiMax related excess communications capex does not meet the requirements of clause 5I.7A of the OIC.

Based on this conclusion, Energeia recommends that the AER allow $5.7 million of the $17.4 million in claimed excess communications capex to account for the volume variation in 2013. This represents the difference between the AER's approved communications expenditure over the 2012 and 2013 period ($43.8 million), less the amount already expended in 2012 ($24.8 million) and a 5% margin.

5.3.4 Meter Reading Opex

In its Final Determination, the AER approved $2.8 million for meter reading opex assuming 302,137 meters were installed by the end of 2012 and a further 142,589 meters were installed in 2013.[28] This represents an annual unit price of $33.50 per meter, based on an average of 71,295 manually read meters in 2013.

In its 2015 Charges Revision Application, AusNet reported actual meter reading opex of $6.8 million. This is $4.2 million higher than the efficient level of expenditure determined by the AER.

The main reason for the excess meter reading opex given by AusNet was the program falling behind, leading to a greater number of meters needing to be read manually than assumed by the AER.[29]

Energeia reviewed AusNet's claimed excess driver against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether AusNet's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Energeia's review found that AusNet's meter reading opex included 384,900 meters being read manually over 2012, primarily due to their earlier decision to deploy WiMax, which delayed the installation program. WiMax related delays therefore accounted for all $4.2 million of the excess expenditure.

[26] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications,* AER, October 2011, p 122
[27] *Advanced Metering Infrastructure, 2015 Charges Revision Application,* AusNet Electricity Services, 29 August 2014, pp 19-20
[28] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications,* AER, October 2011
[29] *Advanced Metering Infrastructure, 2015 Charges Revision Application,* AusNet Electricity Services, 29 August 2014, p 25

Based on the results of our review, Energeia recommends that the AER disallow the meter reading opex excess of $4.2 million, less a 5% reasonableness margin, on the basis that it does not meet the requirements of clause 5I.7A of the OIC.

5.3.5 Program Management Office Opex

In its Final Determination on the 2012-2015 AMI budget applications, the AER approved $6.9 million for the Program Management Office (PMO) opex.[30]

In its 2015 Charges Revision Application, AusNet revised its PMO expenditure to $11.7 million. This is $3.6 million higher than the efficient level of expenditure determined by the AER.

The impact of negative media and competition for meter installation resources were cited by AusNet Services as the key drivers of the higher than allowed PMO expenditure. Energeia did not find any references to the impact of AusNet's WiMax decision on the higher than allowed PMO expenditure.

Energeia's reviewed each of these drivers against the criteria of whether they were controllable or uncontrollable, and if they were controllable, whether AusNet's management of the change in conditions operated efficiently by taking measures to minimise costs where possible.

Energeia's independent research and analysis found there were material, largely uncontrollable changes in conditions that contributed to AusNet's 2013 PMO expenditure. The key changes include:

- Higher no access rates increasing labour requirements and meter installer attrition
- Below market allowances for labour due to higher than allowed real cost increases

Together, these changes impacted on the meter installation service provider's ability to attract and retain the necessary number of metering installation employees to keep the program on schedule. However, this was an ongoing issue since before June 2011 when AusNet missed the OIC installation target for the first time. By the end of 2012, AusNet's program had been significantly behind schedule for at least 18 months.

The key options available to AusNet since their program fell behind the OIC installation targets in June 2011 included enforcing its contract's performance management provisions, sourcing alternative meter installation service providers or providing the service themselves. AusNet investigated each of these options, ultimately delivering most of the work themselves through their unregulated affiliate, more than 18 months after it had missed its first target in June 2011.

Given the fact that all five DNSPs were exposed to the same uncontrollable program delays, and the fact that CitiPower and Powercor were able to manage these impacts, Energeia has concluded that CitiPower and Powercor's management outcomes with respect to program management costs and schedule performance represent the efficient PMO expenditure outcome with respect to the OIC test.

Adjusting the AER determined efficient level of PMO expenditure by 5% to represent a reasonably efficient level as we believe is appropriate under clause 5I.7A of the OIC results in a reasonably efficient PMO excess expenditure of $0.3, or $3.8 million less than the amount claimed by AusNet.

[30] *Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 Budget and Charges Applications*, AER, October 2011

Appendix 1 – Responses to DNSP's Letters

Following the issuing of our draft report to the AER, who in turn circulated it to the Victorian DNSPs, the AER receive letters from each of the Victorian DNSPs raising issues with Energeia's report.

Energeia considered and responded to over 60 specific claims and information contained in the 4 separate letters over 7 business days, which was a challenging timeframe.

In summary, Energeia has agreed with the following key issues raised by the Victorian DNSPs with our draft analysis:

- Business as usual volumes had not been excluded from our estimate of the allowed cost per install for Jemena and UED.
- 2013 labour price increases should only have been applied to the 2013 volumes. 2012 price increases should have been applied to catch-up volumes.

We have adjusted our estimate of efficient excess expenditure, and the revised estimates are provided in Table 8 below.

Table 8 – Energeia's Revised Estimate of Efficient Excess Expenditure

Reasonably Efficient

	Applications			Energeia			Difference		
Excess Category	**JEN**	**ANS**	**UED**	**JEN**	**ANS**	**UED**	**JEN**	**ANS**	**UED**
Meter Capex		$ 22.40			$ 20.30			-$ 2.10	
Installation Capex	$ 15.76	$ 19.90	$ 25.71	$ 11.83	$ 19.90	$ 20.80	-$ 3.92	$ -	-$ 4.91
Comms Capex		$ 17.40			$ 5.71			-$ 11.69	
PMO		$ 3.60	$ 4.71		$ 0.40	$ 0.11		-$ 3.20	-$ 4.60
Meter Opex		$ 4.40			$ 0.11			-$ 4.29	
Total	$ 15.76	$ 67.70	$ 30.42	$ 11.83	$ 46.42	$ 20.91	-$ 3.92	-$ 21.28	-$ 9.51

Altogether, Energeia has modified its estimate of the efficient level of excess expenditure for UED, Jemena and AusNet by $0.27 million, $0.90 million and $-0.09 million, respectively.

The negative adjustment to AusNet's efficient costs is due to revising our assessment of efficient metering expenditure to reflect the AER's FD based on our conclusion that an efficient business would have changed to mesh and recovered its schedule by 2012, as outlined in our previous report.[31]

The following sections provide our specific responses to the issues raised by the DNSPs.

[31] *Review of Responses to the AER's Draft WiMax Determination,* Energeia, November 2012

1 Jemena

1.1 Letter Dated 26 November 2014

Jemena 2015 Charges Application – Prudent expenditure assessment

I refer to the email from Craig Madden of 21 November 2014 attaching a report by Energeia which contains Energeia's conclusions on its review of metering installation capital expenditure for Jemena Electricity Networks (Jemena). I understand that staff intends to recommend to the Australian Energy Regulator (AER) that the outcomes of the Energeia report with respect to Jemena be adopted when the AER makes its determination on Jemena's 2015 charges revision application. I also understand that the AER Board will be considering its determination on either 28 November 2014 or 3 December 2014.

The result of Energeia's assessment is that $4.8 million for the 2013 calendar year of the excess capital expenditure sought by Jemena in its 2015 charges revision application should not be included in the building blocks for 2015 charges. Jemena has significant concerns as to the logic and reasoning upon which Energeia has reached its conclusions. Jemena does not believe the AER can, or should, rely on the Energeia report in its current form in making its determination of Jemena's 2015 charges revision application.

The Energeia report does not properly engage with the matters set out in Jemena's charges revision application that relate to excess installation capital expenditure. Further, it does not engage with these matters by reference to clauses 5I.7, 5I.8 and 5I.9 of the Cost Recovery Order in Council (CROIC). The Energeia report even fails to undertake its assessment of the excess expenditure amount by reference to its own stated process which is set out on page 2 of its report, which would have included:

- identifying the chain of events leading to the change in conditions and assessing their controllability; *and*
- identifying the key options available at the time and assessing the service provider's own approach and results.

The Victorian government's revision of the Order in Council on 21 December 2011 made fundamental changes to the criteria against which the AER is required to assess excess expenditure.

Originally, the criteria (Clause 5I.7) required the AER to establish that expenditure was not competitive let, if contracted, and a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances. The December 2011 OIC made substantial changes, which required the network to prove that the excess expenditure was prudent, with prudent defined (Clause 51.7A) as reasonably reflecting the efficient costs of a business in the circumstances.

The December 2011 OIC goes on to list additional criteria that the AER may consider as part of satisfying itself that the excess expenditure met the 5I.7A criteria.

It is therefore not a requirement for Energeia to consider any or all of 5I.7B, 5I.8 or 5I.9 in responding to the AER's scope of work.

In assessing Jemena's excess expenditure against the December 2011 OIC criteria, Energeia developed and applied an approach which we believe best addresses the December 2011 OIC requirements. These are detailed in Section 4.2 of our report.

One particular matter that appears to receive no attention in the Energeia report is how changes in policy (both government and regulatory policy) have had significant (and difficult to quantify) impacts on installation costs. Energeia notes that, in light of the significant uncertainty and risk associated with the meter rollout programs, "it was particularly important to take the information available to the businesses at the time

> into account when considering the efficiency of any decision to incur excess expenditure" (p 10). However, it is not at all clear that Energeia has had regard to the detailed information provided in Jemena's charges revision application on the changes in government and regulatory policy and the impacts that these have had on the program. This information is set out in Appendix D to our application. It is simply not possible to assess whether the excess expenditure was prudent in the absence of policy context as it existed and changed over the relevant period.

In applying our assessment approach, Energeia has reviewed all 1,749 pages and 140 megabytes of Jemena's submitted documents and spreadsheets, including materials submitted under previous reviews, as well as 1,867 pages and 140 megabytes from other DNSPs. We have also conducted our own independent research into the timing, impacts and efficient responses to changes in the regulation, policy and market conditions by a business providing the Regulated Services over the period to 31 December 2013.

Table 9 - Key Factors Impacting on the Efficiency Costs of a Business Providing the Services

Category	#	Change	Occurred	Impacted	Assessed	Reference
Regulatory Requirements	R1	Enhanced safety rules	2011-2013	Supervisory labour and installation costs	Yes	C-E31
	R2	No Controlled Load	2009-2013	Increased skips until solution ready	Yes	No change
Market Conditions	M1	>CPI labour price growth	2011-2013	Labour availability and pricing	Yes	C-E24
	M2	Labour availability	2011-2013	Installation rate	Yes	No change
Nature of AMI Services	A1	Higher truck support, etc.	2011-2013	Installation unit costs	Yes	C-D35
	A2	No access rates	2009-2013	Scheduling and travel time	Yes	F-H13
Rollout obligation	O1	Government review	2011	No access rates	Yes	C-E7

Note: References are with respect to the Installation Capex tab

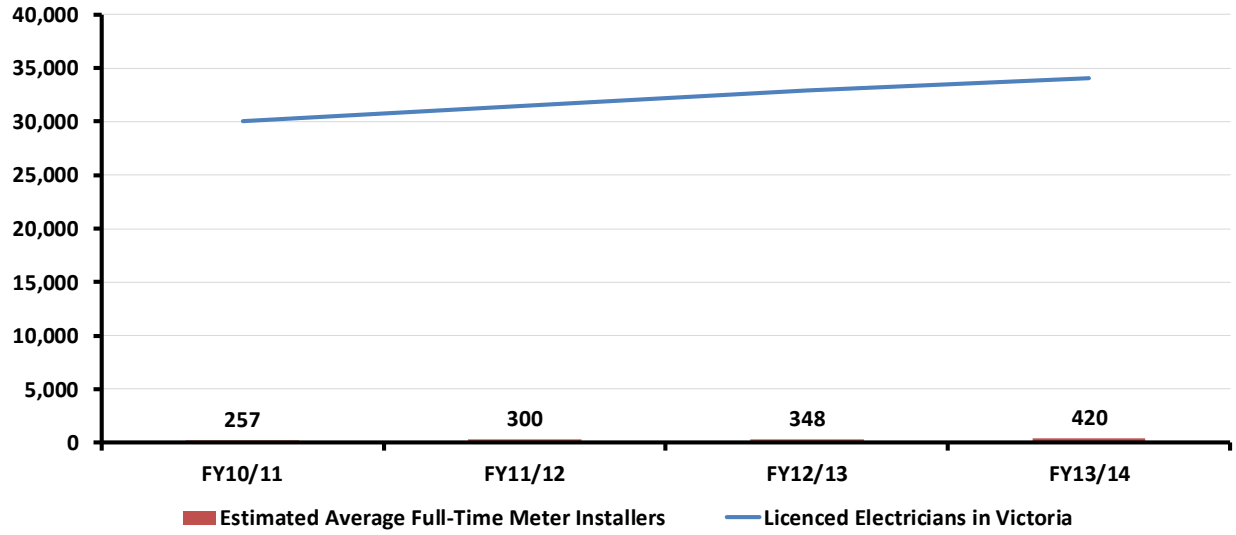
Table 9 summarises the key market, policy and regulatory changes we have explicitly factored into our assessment. This is not an exhaustive list of the factors, rather, they are the key factors we have independently concluded would have impacted on the efficient costs of a business providing the Regulated Services. We believe it covers all of the key changes in conditions raised by Victorian DNSPs, including Jemena, whose key contributing factors were summarised in Appendix D as:

> 11. Contributing factors have included, but are not limited to:
>
> - higher than forecast refusal rates that were experienced over the course of the rollout, which has extended the overall time period over which the rollout is being undertaken; and
> - the impact of the ToU tariff moratorium and eventual introduction of an opt-in approach to ToU tariffs, which first necessitated JEN to delay installing over 50,000 complex meter sites until 2013, and then resulted in JEN needing to introduce two-element meters, support for multi meter AMI sites, re-developing the IT solution to support variants and combinations of meters and tariffs which were not budgeted for.

Energeia also independently investigated Jemena's assertion that there was a meter installer labour shortage in the market[32]. The results of this investigation were contained in the excel spreadsheet, and displayed in Figure 12 below, but were not specially mentioned in the report due to our conclusion that a labour shortage was not credible based on the number of qualified electricians in the state relative to the size of the AMI program (<1% of market).

[32] *Jemena Electricity Networks (Vic) Limited, AMI Charges Revision Application for CY2015, Appendix D, Expenditure Excess Explanation for CY2013 (Confidential),* 29 August 2014, page 53.

Figure 12 – Number of Electricians in Victoria Relative to Victorian Meter Rollout Requirements



We do recognise that the average number of installers picked up significantly in 2013, and that higher than CPI labour price increases reflected tightness in the labour market. However, the tightness would only have impacted labour availability where contracts were below market rates.

Energeia's conclusion also rested on Jemena's own statement that the installation service provider's rates were below market, which appears to be the primary reason resources were not forthcoming[33]:

> - JEN's AMI budget application for the CY2012-2015 regulatory period was based on utilising the services of its single AMI Installation Vendor (Service Stream) to complete the rollout by May 2013. This strategy became unsustainable, necessitating the adoption of a number of other initiatives to ensure that JEN used its best endeavours to complete the rollout by December, 2013. Amongst other things, JEN had to engage additional installation vendors, as well as having to re-negotiate its original contract with Service Stream (**SSIS**) to increase the rates paid to SSIS's sub-contractors to market levels. These issues are key drivers of JEN's overspend on installation costs, which in total, accounts for $4.2M of the expenditure excess.

Energeia notes that while we considered the best endeavour requirements under Clause 14 of the 22 December OIC, we found that it had not changed since the Final Determination. The FD had already established the efficient costs of Jemena providing the Regulated Services, which was subject to the best endeavours clause. We further considered whether the key changes in conditions would have impacted on the efficient costs of meeting the best endeavours clause, and concluded that none would have changed the efficient costs of meeting the best endeavours clause above the adjusted amounts.

Our consideration was not included in the report as we focused on what we viewed as the most material issues and drivers of increases in the efficient costs of a business providing the Regulated Services.

> Insofar as the report fails to take into account relevant considerations, such as the government and regulatory policies that prevailed over the relevant period, the report appears to take into account irrelevant considerations, and in a number of cases it is entirely opaque how the information has been taken into account. For example, Energeia states (p 12) that Citipower / Powercor where exposed to the "same changes in no access and labour market conditions as the other DNSPs, yet they delivered their program largely on time and within their AER approved budget allowance". Energeia goes on to say that "this outcome has played a significant role in our assessment" (p 12). It is not apparent from the report how Citipower / Powercor outcomes are of relevance to an assessment of Jemena's excess expenditure amounts and how those outcomes have been taken into account vis-a-vis Jemena.

[33] *Ibid*, p viii

The quotes referenced above are drawn from three paragraphs that operate together to explain why Energeia has not applied CP/PAL's benchmark to Jemena's installation capex.

> The Energeia report correctly includes that the excess expenditure has resulted from material changes in conditions. Further, the report concludes that the most significant changes in conditions are higher labour market prices, changes in the forecast mix of inputs, and higher rates of no access.
>
> In addition to the failure of considering the change in market conditions and addressing the matters outlined in the charges revised application, the fundamental failing of the Energeia report is in how it assesses what quantum of excess expenditure would be prudent in light of the material changes in conditions, as set out by reference to: increases in labour costs; increases in no access rates; and change in volume mix. Each of these are dealt with below.

As explained above, Energeia reviewed and quantified the impact of the changes in key market conditions.

> **Higher installation labour costs**
>
> To allow for higher labour market prices, the Energeia report simply looked at how average annual electrician salaries in Victoria had increased over the period 2010 to 2013 and deducted from this the AER real cost escalator allowance for outsourced labour in 2013, to arrive at an increase of 16 per cent (p 16). Energeia state that it believes this category of labour to be an appropriate, publicly available benchmark that would have been available to DNSPs at the time. This approach disregards the detailed information that Jemena provided on the difficulties it faced in sourcing and retaining contractors to undertake the installation activities in a manner that would, insofar as practicable, allow Jemena to meet its obligations. This material is set out Appendix D of Jemena's charges revision application (see for example pages 10, 21, 22, 31, 32 of Appendix D).

In developing an estimate of the efficient costs of a business providing the Regulated Services, Energeia used what we believed to be the most relevant category of publically available labour prices to index the efficient installation labour unit price, as determined by the AER in their Final Determination. The approach therefore quantifies the impact of a change in key conditions on an efficient operator. It is also based on publically available information available at the time.

For the reasons outlined above, Energeia concluded that Jemena's difficulties in retaining contractors were primarily due to under-market rates being offered under the contract. In trying to rectify this situation, Energeia's conclusion is that Jemena accepted a higher increase than the change in conditions justify for an efficient business providing the Regulated Services.

Energeia's analysis attempted to estimate what the appropriate efficient cost increase would have been at the time and compared it to Jemena's actual[34]. This may or may not be the cost that Jemena actually realised, particularly if the cost increase was not the result of a competitive tender process, and/or did not consider the option of internally providing the services.

> If the AER were to adopt the recommendation of Energeia without further investigation, the AER would fail to properly consider whether the excess expenditure was prudent and would fail to take into account relevant matters as required by 5I.8 including:
>
> - the nature of the rollout obligation;
> - the market conditions relevant to the provision, installation, maintenance and operation of advanced metering infrastructure and associated services and systems; *and*

[34] Revised AER Metering Modelling, Tab *Installation capex*

- any metering regulatory obligation or requirement.

Each of these factors is addressed in Table 1.

> A superficial analysis of increases in average annual electrician salaries in Victoria does not tell the story as to why Jemena was finding it so difficult to source additional contractors for the installation program and why installation rates were increasing. The market dynamics Jemena was facing at the time in retaining and attracting installers are dealt with in Appendix D of the charges revision application.

For the reasons outlined above, Energeia concluded that Jemena's difficulties in retaining contractors was primarily due to under-market rates being offered.

> Energeia notes that Jemena has not specifically quantified the changes in the prevailing market wage rates (p 14). This is unsurprising. The changes in the prevailing market wage rates are in effect captured by the increases in the installation rates that were market tested.

This conclusion begs the question of whether the increase in installation rates were indeed market test, and whether the installation rates were efficient. Taking meter installation in-house may have been the lowest cost, most efficient option, but it does not seem to have been seriously considered at the time.

> **No access rates**
>
> Energeia's assessment of the impact of no access rates on labour installation costs similarly fails to take into account the material provided by Jemena on this issue. It is not sufficient to simply adjust the travel portion of the total installation labour cost by the change in no access rates as Energeia has purported to do.

In applying our assessment approach, Energeia has reviewed all 1,749 pages and 140 megabytes of Jemena's submitted documents and spreadsheets, including materials submitted under previous reviews, as well as 1,867 pages and 140 megabytes from other DNSPs. We have also conducted our own independent research into the timing, impacts and efficient responses to changes in the regulation, policy and market conditions by a business providing the Regulated Services over the period to 31 December 2013.

Energeia's estimate of the change in no access rates is based directly on data provided by Jemena.

In estimating the efficient costs of a business providing the Regulated Services, Energeia developed a model of installation costs to specifically quantify the effect of an increase in no access rates on installation unit costs, primarily due to additional travel time (see Section 5.1.1).

Energeia's approach estimated what the appropriate efficient cost increase would have been at the time and compared it to Jemena's actual[36]. This may or may not be the cost that Jemena actually realised, particularly if the cost increase was not the result of a competitive tender process, and/or did not consider the option of internally providing the services.

> **Change in volume mix**
>
> In relation to change in volume mix, Energeia simply compares Jemena's experience to UED. Energeia apparently takes UED's installation costs, "corrects" them to exclude changes in labour prices, and determines that the additional cost faced by UED for changes in assumed mix of volumes is an additional $20 per site (p 18). Energeia concludes that $2.3 million is the "efficient" level of excess meter installation expenditure due to changes in the volume mix (p 18). However, there is no analysis of:
>
> - whether the change in volume mix apparently experienced by UED is of the same magnitude that Jemena has experienced;

[36] Revised AER Metering Modelling, Tab *Installation capex*

- whether the options open to UED to limit increases in installation costs as a consequences of changes in assumed mix of volumes to $20 per site were options that were feasibly open to Jemena; and
- whether there are any other exogenous factors that might impact on why Jemena's efficient costs of change in volume mix might be higher than those of UED.

As described in Section 4.2.3, Energeia's approach started from an assumption that each DNSP's allowed costs were efficient, and that any change in cost must be demonstrated to be due to an uncontrollable factor or an efficiently controlled factor to represent an efficient cost.

Energeia's approach estimated what the appropriate efficient cost increase would have been at the time and compared it to Jemena's actual[37]. This may or may not be the cost that Jemena actually realised, particularly if the cost increase was not the result of a competitive tender process, and/or did not consider the option of internally providing the services.

In practice, Energeia assessed the efficient cost of a business providing the Regulated Services by adjusting costs provided by UED to avoid double counting the effect of labour price increases.

Energeia notes that UED's additional costs for truck support by alone were around half of the $20 per site figure we assessed to be efficient. We included costs for the full range of changes in UED's volume mix, less labour cost variations to avoid double counting, to mitigate the chance of relying on a too narrow sub-set of input costs which might naturally vary between DNSPs.

Model errors

In the time that has been available by Jemena to review the Energeia report, and on the basis of the information that has been provided in connection with that report, Jemena has identified at least one calculation error, as set out in the paragraph below. Until Jemena is provided with all of the material underlying the Energeia report and with a reasonable opportunity to review that material, Jemena is not in a position to otherwise respond to any other calculation errors that may have occurred.

Energeia have incorrectly calculated the AER base allowance for meter installations by using the total of meters installed rather than the total mass rollout (MRO) meters installed, they have used and MRO + business as usual (BAU) meter install number and under calculated the base allowance as $77.70 whereas the base allowance for JEN is $86.29 per meter. Taking into consideration the labour escalation factors indicated by Energeia for JEN (64%) and the volume of MRO meters installed 115,164 this equates to an error of $1.23m unfavourable to Jemena.

Energeia has reviewed and agrees with Jemena that the calculation was incorrect due to the inclusion of business as usual volumes. Jemena and UED's estimates both separated out business as usual volumes.

This effectively reduced the estimate of the AER approved unit price that was then adjusted based on each of the efficient cost increases due to uncontrollable or efficiently managed changes in conditions. We agree with Jemena's revised calculation, and have updated our report accordingly.

[37] Revised AER Metering Modelling, Tab *Installation capex*

1.2 Letter Dated 28 November 2014

Jemena 2015 Charges Application – Model Assessment

On 26 November, 2014 Jemena wrote to the AER raising concerns about relying on Energeia's report 'Review of Victorian Distribution Network Service Provider's Advanced Metering Infrastructure 2015 Charges Revisions Applications' (***report***) that attempted to assess the efficiency of Jemena's excess expenditure in its 2015 charges revised application. Since this time Jemena has received a copy of the model that was used to calculate an alternative view of the excess expenditure. Subsequently, Jemena has undertaken a review of this model and identified a number of erroneous and questionable calculations that must be corrected to assist the AER in forming a valid opinion about the appropriate level excess expenditure.

Jemena wishes to highlight that the review undertaken is not comprehensive noting that:

- The model was received on the 26th of November and, given the times to respond, the analysis has been constrained to a preliminary review only; *and*
- The model uses data from other Victorian Distribution Businesses (DBs) however due to confidentiality concerns this information has been redacted, consequently the calculated outputs are not fully reviewed.

Despite these limitations Jemena has identified the following errors thus far:

1. The reference to the allowed number of mass roll out (**MRO**) meter installations indicates that report has sourced the data from the 2012-15 Budget Application. Jemena notes that it appears to have mistakenly sourced the data from a cell in Jemena's excess expenditure document which includes both the business as usual (**BAU**) meter forecast as well as MRO volumes. To correct for this anomaly the number of meters in the calculation should reduce from 54,017 installations to 48,647 causing the adjustment to drop from $4.823m to $3.596m

   The value of this anomaly is $1.2M.

This was included in the first letter and has been addressed above.

2. Cell D59 (Installation Capex) has a comment "RCampbell: Value hardcoded as it derived from C60"; looking at the Formulae in C60 the comment appears to be incorrect and the formula should have referred to C59. The model appears to source total spend on volume mix (truck support) from United Energy and divide it by the number of installations. The approach has benchmarked a rate per install based on United Energy truck support volume mix changes and no data is available in the report to validate the report estimates.

   The report appears to be using a volume of trucks as a unit rate adjustment and is ignoring the $1.3m of unit rate adjustment presented in Jemena's submission; further; Jemena do not understand why a benchmark rate would be applied to a volume.

   The value of this anomaly is $2.2M.

The comment is incorrect, but the calculation it refers to is correct and we have therefore not changed our estimate in this case. A row had been deleted and the comment not updated. The number of actual installations is used to calculate the cost per installation, not the number of truck rolls.

3. A five per cent reasonableness margin allowance is hard coded within "Miscellaneous Figures for Report" (and Installation Capex, cell D35), however, there is no basis for using this value. Jemena considers a more appropriate value can be drawn back to the Cost Recovery Order In Council contingency amounts from 2013 at a rate of ten per cent.

   The value of this anomaly is $720k.

The reasons for Energeia's application of a 5% margin are detailed in Section 4.2.4.

4. The report has calculated travel based on a 'no access' delta from 2010 using 17% rather than the rate from the time of the budget submission of 13.62% (Jemena's response to draft determination). The allowance submission assumed 'no access' rates are based on 2009 proportions of 6% which is only marginally higher than previous large meter replacement programs. If corrected, the travel time would be 4.2% in lieu of 1% if the allowance base was correct.

   The value of this anomaly is $83k.

Energeia has used the 2010 average number given the proposals had been developed at the end of 2010. We do not see why a business would assume a 2009 number, particularly given it was significantly lower than the trend in 2010. Likewise, we do not understand why a single month would have been used, particularly when it was lower than the average of the previous 12 months.

If anything, we would expect an efficient business to have reviewed international trends around no access to inform their forward assumptions. This would have identified significant customer resistance to smart metering in California, Texas and Ontario throughout 2010 reported in the New York Times[38,39,40].

5. The 'no access' rate for Jemena has a substantially larger impact than just travel time:

   a. The Neutral Integrity Test Point (NITP) program and its costs are a reflection of a 'no access' treatment plan and incurs a cost at a weighted average rate of [redacted] per meter in 2013. Escalators for labour do not consider the exceptional actions and response of Jemena to address 'no access' beyond travel time that must be accounted for.

      The value of this anomaly is $1.8m

Energeia's approach estimated what the appropriate efficient cost increase would have been at the time and compared it to Jemena's actual[41]. This may or may not be the cost that Jemena actually realised, particularly if the cost increase was not the result of a competitive tender process, and/or did not consider the option of internally providing the services.

For example, this program may have been effective at increasing the number of installations, but it would not have been an efficient cost to incur if it cost more than our estimate of the efficient level of cost increases for installation capital expenditure due to changes in conditions since the AER's FD.

---

[38] *A Rough Rollout for Smart Meters in Texas*, Kate Galbraith, The New York Times, 9 March 2010. http://green.blogs.nytimes.com/2010/03/09/a-rough-roll-out-for-smart-meters-in-texas/?_php=true&_type=blogs&_r=0 (Last accessed 5/12/14)

[39] *'Smart' Meters Draw Complaints of Inaccuracy*, Tom Zeller Jr, The New York Times, 12 November 2010. http://www.nytimes.com/2010/11/13/business/13meter.html?pagewanted=all (Last accessed 5/12/14)

[40] *Questioning the 'Smart' in Smart Meters,* Tom Zeller Jr, The New York Times, 12 November 2010. http://green.blogs.nytimes.com/2010/11/13/questioning-the-smart-in-smart-meters/ (Last accessed 5/12/14)

[41] *Revised AER Metering Modelling*, Tab *Installation capex*

b. Jemena also incurred a 'no access' refusal fee of [redacted] for sites refused after the job started equivalent, this is equivalent to [redacted] per site.

The value of this anomaly is $160k

This is another example of what Jemena found to be effective at increasing the number of meter installers, but it may not have been at an efficient cost level.

c. Higher 'no access' has resulted in the need for three additional installers at the tail of the MRO program, the report has not considered the best endeavours obligation in light continued 'no access' and the remediation actions step change in fixed costs for multiple installers to fulfil the best endeavour obligations.

The value of this anomaly is $1.86M

This is another example of what Jemena found to be effective at increasing the number of installations, but it may not have been at an efficient cost level.

2 AusNet Services

2.1 Letter Dated 27 November 2014

Response to Energia's report on the 2015 AMI Charges Application

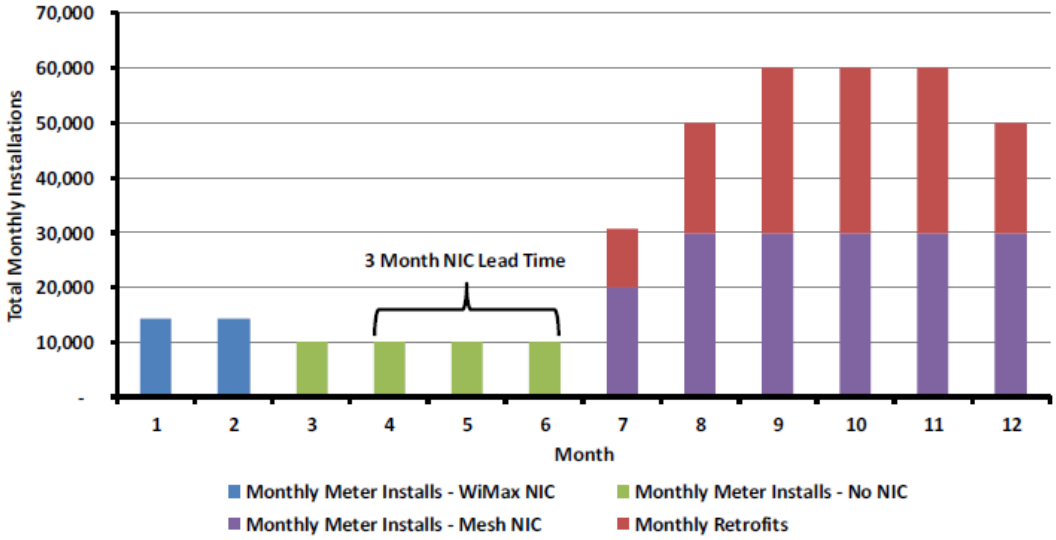
AusNet Services appreciated the opportunity to discuss with the AER the outcomes from Energeia's report on the AMI 2015 Charges Application. This consultative and considerate approach is one that AusNet Services greatly values in our dealings with the AER.

As mentioned during our teleconference, AusNet Services does not agree that the amount of meter reading opex disallowed by Energeia was fair and reasonable as there were errors of fact and reasoning in Energeia's report. Specifically, Energeia has:

- Incorrectly modelled the efficient metering costs in its own analysis; and
- Incorrectly attributed the entire increase in meter reading costs in 2013 to delays caused by the adoption of the WiMax technology.

Energeia's conclusion that the excess metering expenditure was due to WiMax was on the basis that AusNet's inefficient decision to continue installing WiMax post February 2011 was a primary contributor to their program falling behind.

Figure 13 – Monthly Meter Installation and Retrofit Profile



In our previous assessment of AusNet's WiMax program, based on the analysis shown in Figure 13, we found that if they had adopted mesh in February of 2011, they could have caught up on their installations and remote reading targets by 2012. In other words, had they made the efficient decision, they would not have had more than the allowed number of meters to manual read in 2013.

> AusNet Services is also concerned with the reasoning, the benchmarking approach for the Project Management Office (PMO) decision and that the benchmarking data relied upon has no been provided.

Energeia's assessment of the efficient costs of a business providing the regulated services with respect to PMO excess expenditure was based on our consideration of all the key changes in conditions listed in Table 1, the installation performance of CP/PAL in the face of these changes, and the known program delays due to AusNet's decision to deploy WiMax.

Almost all of this information has been provided in the report or in the accompany spreadsheet. The only information not provided is the detailed, month by month installation data used to estimate each DSNP's program performance relative to the OIC installation targets. We understand that this data has been claimed commercial in confidence by each of the businesses, including AusNet.

> **Meter Reading Modelling Analysis**
>
> After reviewing Energeia's supporting workings on meter reading opex, AusNet Services believes that there is an error in Energeia's calculations in the *WiMax Capex* tab in the *2013 Expenditure (2015 charges application) AER Metering Modelling AUSNET 141126v2.xlsx* file provided by the AER on 26 November. The formula for the 2013 *Calculated actual manually read sites* (cell F15) is inconsistent with the formula for the 2012 year.
>
> The amount for 2013 has been calculated as the average amount of meters installed in 2013 only whereas in the 2012 year, the amount of manually read sites was based on the average amount of meters installed in 2012 plus the amount of meters installed in 2013 plus the amount of meters to be installed in 2014. In 2013, AusNet Services installed 245,476 meters and had 24,083 meters yet to be installed to complete the roll-out. As 24,083 meters had yet to be installed as part of the roll-out, these meters still had to be manually read and need to be added to the calculation. Therefore, the 2013 *Calculated actual manually read sites* (cell F15) should be amended to be: F7/2+G8.
>
> AusNet Services has provided an amended spreadsheet showing corrections to the Energeia analysis.

AusNet is correct that there was an error in cell F15 as it should have included 24,083 of meters to be installed in 2014. However, this error is immaterial because Energeia's assessment of the efficient costs of a

network business providing the Regulated Services is based on the number of installations and price per installation AER's amended FD for the reasons provided above (i.e. program recovery by 2012).

We have nevertheless corrected the tab in the spreadsheet by removing the cell and using the AER's FD allowance of $2.39 million for the efficient level of meter reading in lieu of our previous incorrect estimate of $2.47 million using the previous pro-rata based approach, an $80,000 difference. This reduces are estimate of a reasonable level of excess expenditure from $0.19 million to $0.11 million.

> **Meter Reading Gap Analysis**
>
> Energeia has acknowledged several exogenous factors that have affected the roll out of AMI meters throughout their report. For example, higher rates of refusals, changes to the roll out
>
> timing to prudently control costs arising from changes in labour market conditions and ongoing impacts caused by the 2011 Government review. The ex-post prudency assessment performed by Deloitte Access Economics (Deloitte) performed on behalf of AusNet Services also highlighted the following factors had impacted meter reading costs
>
> - Delays due to fewer than expected logical conversions of installed meters, which related both to delayed meter capex, installation labour market pressures and technical issues including management of the IT program;

Energeia attributes delay in logical conversion and the IT program largely to AusNet's WiMax technology strategy and associated IT architecture. Energeia's analysis and conclusion regarding DNSP claims of installation market tightness in the context of resource availability have been addressed in our response to Jemena's letters. The same considerations apply to our consideration of AusNet's claims.

> - Delays caused by the review of the AMI Program in 2011 and associated regulatory changes;

Energeia reviewed the impact of the review on increases in no access rates in Section 5.3.5 of our report. The quantified impact on AusNet's program in 2013 was found to be among the lowest at 7% no access sites, representing an overall increase in activity of 2% above the levels prevailing at the time AusNet's 2013 budget had been developed and approved by the AER.

> - Costs associated with the need to continue reading meters for customers that refused an AMI meter, due to the implementation of the Victorian Government's approved 15 step consumer issues management plan; and

Energeia's view is that an efficient business would have continued hitting its installation targets, as CitiPower and Powercor did even with higher rates of no access, as the impact of a 2% change in the overall number of no access sites relative to the program would be immaterial.

> - Declining productivity (and rising costs per meter) resulting from lower manually read meter density, to the extent this wasn't provided for in the AER budget.

It is also important to recall that 5% of sites were unable to be accessed by AusNet in 2010, before the government's review. It is therefore not credible to assert that manual meter reading could have been eliminated entirely once an area had been visited.

As the program approaches 93% completion, the higher rate of no access would drive higher costs in terms of additional manual meter reads that would otherwise not be necessary. This is because the rate of no access in 2010 would have allowed a rollout down to 95% completion, at least in theory.

Interestingly, AusNet's program reached 96% completion by the end of 2013, suggesting they had overcome the 7% average rate of no access in 2013 by the end of the year.

> However, ignoring these findings, Energeia attributes all the delay to communication problems stating that "384,900 meters were being read manually over 2013 due to their decision to deploy WiMaX".[1]

> As at 31 December 2013, AusNet Services had just 137,550 meters not communicating which implied that only these meters were impacted by WiMax instead of all the meters. Alternatively, approximately 173,000 meters had not been logically converted as of that date. This delay to logical conversion was driven by the factors outlined above and were not related to the subsequent issues identified in January 2014 (which are not relevant to the current excess expenditure assessment under OIC criteria 5I.8 (a)).

As described above, following our review of AusNet's and other DNSP's materials, and independent research and analysis of the impact of various changes in conditions, Energeia assessed efficient meter reading costs of a business providing the Regulated Services as those determined by the AER in their amended FD, which reflected switching to mesh in February 2011 and avoiding higher than efficient levels of program, communications and meter reading costs in 2013.

> In conclusion, AusNet Services considers that this information demonstrates the Energeia statement is an error of fact and reasoning given the factors outlined above.
>
> **Project Management Office Costs**
>
> AusNet Services does not consider the Energeia analysis of PMO costs to be sound or consistent with other analysis presented in the report.
>
> For example, Energeia clearly acknowledges and accepts "material and largely uncontrollable changes in conditions that contributed to AusNet's 2013 PMO costs".[2] Elsewhere in the report Energeia recognises that one of the major factors of Powercor's management of these same issues, in particular higher labour costs, was a result of choosing fixed rate contracts over variable or market price linked contracts. They rightly recognise that this choice does not go to prudency per se, as the choice will be shown to be good or bad only in hindsight as costs either rise or fall relative to the fixed price.
>
> As a result of this analysis, they recognise that AusNet Services management of higher labour costs was prudent, including the delays taken to ensure labour costs were minimised under the new labour market conditions, approving the excess meter installation capex.

Energeia's assessment of the efficiency of AusNet's meter installation excess expenditure in Section 5.3.2 was limited to meter installation expenditure itself. Energeia concluded that the expenditure was efficient because it was at or below our assessment of the efficient level of expenditure by a business providing the Regulated Services as required under the December 2011 OIC.

In forming our view, we did not presume that installing meters later than originally planned was necessarily inefficient, if there were no additional per unit costs involved in doing so. Had AusNet included additional costs due to delays in their meter installation capex above the level we assessed as the efficient level, we would have assessed this expenditure as not efficient.

Our assessment of AusNet's PMO costs were similarly and consistently assessed against Energeia's estimate of the reasonably efficient costs of a business providing the Regulated Services, as required by the December 2011 OIC. However, in this category of expenditure and given the key changes in conditions listed in Table 1, we concluded that an efficient business would not have incurred higher than originally allowed expenditure because the program wouldn't have been behind and the business would have recovered any material additional costs due to contractor non-performance through their contract.

> In contrast, Energeia's assessment of AusNet Services' PMO costs, despite acknowledging the same material exogenous issues, finds that it is appropriate to benchmark directly with Powercor's PMO costs and delivery timelines.

While the comparison to an efficient network business providing the regulated service (Powercor) under similar changes in circumstances relative to the AER's FD, our assessment of efficient program management behaviour and costs was also informed by AusNet's previous inefficient decisions regarding WiMax resulting in significant program delays.

> This creates several logical inconsistencies in that:
>
> - it finds the management of the meter installation costs to be prudent in the section approving those installation costs but the costs of that management to be imprudent in the section examining the management costs; likewise

AusNet's performance relative to an efficient level varied between these two cost categories, hence the difference in our assessment of which was efficient and which was not. Higher costs in one area to deliver efficient costs in another area are not necessarily efficient themselves, even where had they not been incurred the overall cost would have been higher. The reason for this in AusNet's case is that the situation itself (delays due mainly to their WiMax decision) should have been avoided in the first place.

> - that it is inappropriate to benchmark a variable price labour contract with a fixed term labour contract in one section but that it is appropriate to benchmark the two management cost pools when it had already recognised the management task in the two businesses was completely different in nature;

The difference was due to AusNet's own decisions and actions, namely their decision to continue with their WiMax technology strategy post February 2011, not due to a change in the key conditions listed in Table 1 occurring since the AER's FD that uniquely affected AusNet.

> AusNet Services is further concerned that while benchmarking is inappropriate in these specific circumstances, that the data relied upon for that benchmarking exercise has not been provided for review.

As described above, the only benchmarking related information not already provided to AusNet is the monthly installation rates of the other DNSPs that underlie Table 6 in our report. This data has been claimed confidential by the DNSPs, including AusNet.

> In conclusion, AusNet Services does not consider that Energeia has provided sufficient evidence to justify a cut to the PMO costs.

3 United Energy Distribution

3.1 Attachment to Letter Dated 28 November 2014

> […]
>
> **2.2 United Energy's concerns**
>
> Energeia's prudency assessment of United Energy's meter installation expenditure is invalid and reflects a number of factual errors for the reasons set out below.
>
> **A. Energeia wrongly concludes that United Energy's efficient installation costs depend on the average earnings of electricians in Victoria between 2010 and 2013.**
>
> As noted above, Energeia's benchmark costs for meter installations are derived from average earnings of Victorian electricians between 2010 and 2013 as reported by 'seek.com'. United Energy's view is that Energeia's analysis contains a number of errors of fact, as set out below:
>
> 1. Energeia's benchmark is derived from labour rates for Victorian electricians. However, United Energy engages service providers such as Service Stream, SkillTech, Lend Lease, Tenix and Zinfra. United Energy is not equipped to engage installers directly. The terms and conditions offered by United Energy's service providers will not simply 'pass through' labour rates.

In developing an estimate of the efficient costs of a business providing the Regulated Services as required under the December 2011 OIC, Energeia used what we believed to be the most relevant category of publically available labour prices to index the efficient installation labour unit price, as determined by the AER in their Final Determination.

Energeia's approach therefore quantifies the impact of a change in key conditions on an efficient network, not necessarily UED. It is also based on publically available information available at the time.

Under our approach, Energeia estimated what the appropriate efficient cost increase would have been at the time and compared it to UED's actual to assess the effectiveness of UED's approach[43]. Energeia's estimate may or may not be the same as the cost that UED actually realised, particularly if the cost increase was not

[43] *Revised AER Metering Modelling*, Tab *Installation capex*

the result of a competitive tender process, and/or did not consider the option of internally providing the services.

While UED may not have been equipped in 2013 to run their own installation program, Energeia's view is that an efficient business would have included this option in their assessment of strategies to bring their program back under control once it fell behind the OIC schedule from June 2011.

> Assuming an efficient business decided to continue with its existing provider initially as UED did post June 2011, an efficient business would not have accepted the under-performance of its service provider for 24 months, and would have changed installers or brought the installation in-house by Apr 2012.

2. Using data from 'seek.com', Energeia concludes that labour rates for installers should not exceed the growth rate in average earnings for electricians in Victoria. Energeia also states that the average earnings for Victorian electricians is a "publically available benchmark that would have been available to DNSPs at the time" and, by implication, should have been factored into United Energy's contracting decisions for meter installations.

There are several errors in relation to Energeia's position, which are listed below:

i. United Energy's contracting strategy delivers efficient installation costs by creating competitive tension between service providers. The rationale for this contracting approach is explained in section 5.5 of the Evans & Peck report. Contrary to Energeia's assertion, therefore, the data from 'seek.com' on average earnings for Victorian electricians would be of no interest to United Energy's management or board, and would be regarded as irrelevant.

As stated in Section 4.2, Energeia's approach also included a test of the effectiveness of UED's own approach to efficiently controlling excess expenditure. The efficiency of UED's approach, which Energeia notes appears to be superior to the previous, single vendor, scale based approach, falls short of Energeia's estimate of the efficient costs of a business providing the Regulated Services.

Energeia disagrees with UED that the cost of labour would be regarded as irrelevant by an efficient business. An efficient business would have considered the option of bringing meter installation in-house, particularly where there was a risk of the market not delivering the services efficiently, e.g. at higher cost than could be achieved by hiring the resources and managing them directly.

ii. Even if the average earnings for Victorian electricians from 2010 to 2013 were relevant (which it is not), this data would only have been available in 2014. As a matter of fact, therefore, data from seek.com for the period 2010-2013 would not have been available at the time of United Energy contract re-negotiations with Service Stream in October 2011 or August 2013.

The information source would have been available at any time to an efficient business providing the Regulated Services when comparing the self-performance option against the single vendor option chosen initially, or the multi-source market option eventually chosen. It would also be used by an efficient business as part of contract extension negotiations with the single vendor.

UED correctly identifies that the market labour rate in 2011 and 2012 would have been different than the rate in 2013, do the year on year increase in the real price of labour.

Energeia has therefore revised its estimate of the efficient change in labour prices to align with our assumptions regarding when an efficient business would have caught up its program, being by the end of 2012. The 2013 rate has been applied to AER approved 2013 installations only.

iii. Energeia assumes that efficient installation costs should track average earnings for Victorian electricians. However, the market for installers tightened significantly during 2013 as the 31 December deadline approached. In these circumstances, there is no basis for concluding that changes in installation labour costs would be aligned with changes in the earnings of Victorian electricians.

Energeia agrees the market price for electricians in Victoria from seek.com shows that salaries increased each year above the rate allowed by the AER. However, as explained above, an efficient business providing

the Regulated Services would have completed their installation catch-up in 2012, and that portion of meter installation capex would be exposed to the 2012 rate at worst, or potentially the 2011 rate if prices had been locked in by contract in 2011. Only the approved 2013 installations might have been exposed to the 2013 price increase if no fixed price contracts had been in place.

> iv. Energeia's benchmark is predicated on a proposition that a company is inefficient if it incurs above average increases in labour costs. This is an error of fact. By definition, growth in average earnings reflects a distribution around the average. There is no basis for concluding that companies that pay more than average are inefficient. By setting its benchmark based on an average growth rate, Energeia has set a downwardly biased estimate of efficient costs. As already noted, the benchmark proposed by Energeia is not appropriate in any event.

Energeia agrees that a business could be efficient if it paid above average rates for labour, but only if it were to achieve above average rates in productivity. UED has not presented evidence that its installation service providers achieved above average rates of productivity. If UED's installation service providers were more productive, then they would install more meters per day than the AER determined efficient level, generating a lower unit price to offset their higher salaries.

In any case, Energeia's independent analysis of average installation rates per day showed UED's rates were comparable to Jemena's and AusNet's. CitiPower and Powercor's rates were not available.

> 3. Energeia applies a single cost benchmark throughout 2013, which implies a 'steady state' installation rate throughout the year. In reality, United Energy's installation rates doubled following the company's decision to take direct control of the program. As explained in the Evans & Peck report, the engagement of additional installers in the latter half of 2013 significantly increased the average cost per installation:
>
> > "Initially the additional contractors' costs were dominated by the training, mobilisation and productivity ramp up costs to establish themselves in the program. The hourly rates arrangements agreed with Lend Lease, Tenix and Zinfra maximised participation by enabling the contractors to recover these costs. The productivity and effective unit rates achieved by these contractors were monitored to identify their relative performance over time and to inform decisions about retaining or terminating installers due to price-performance issues."
>
> Energeia's benchmark cost for meter installations makes no allowance for the training, mobilisation and productivity ramp up costs associated with the engagement of additional installers. It is a factual error for Energeia to apply a constant benchmark throughout 2013 in circumstances where United Energy's operations changed markedly in June 2013.

Energeia's assessment of the efficient costs of a business providing the Regulated Services concluded that an efficient business would have recovered any material additional costs due to contractor non-performance through their contract with the non-performing contractor.

> United Energy's submission and accompanying expert reports contain extensive information explaining the company's decision to bring the installation program in-house and demonstrating the prudency of the resulting expenditure. United Energy is concerned that Energeia has not considered this material.

Energeia has reviewed 1,218 pages and 90 megabytes of UED's submitted documents and spreadsheets, including materials submitted under previous reviews, as well as 2,398 pages and 190 megabytes from other DNSPs. We have also conducted our own independent research into the timing, impacts and efficient responses to changes in the regulation, policy and market conditions by a business providing the Regulated Services over the period to 31 December 2013.

UED's material was very helpful in understanding UED's drivers and approach, and its associated costs.

As stated in Section 4.2, Energeia's approach also included an independent test of the effectiveness of UED's approach to efficiently controlling excess expenditure. Effectiveness was assessed in a number of ways depending on the availability and nature of comparable benchmarks, as described in our report.

B. Energeia should have considered the impact of the rollout obligation on United Energy's installation costs in accordance with clause 5I.8(c) of the CROIC, but did not.

United Energy was required to use its best endeavours to complete the AMI rollout program by 31 December 2013. By June 2013, United Energy's rollout program was significantly behind schedule, and the Board concluded that the installation program should be brought in-house. The Essential Services Commission made the following observations in relation to this decision[4]:

> "When United Energy did take over management of its own rollout program, it engaged more installers and so doubled the installation rate. The Commission has therefore considered whether this action was taken soon enough.
>
> United Energy was contractually bound in the joint program and, through this, also bound to the single third-party installer. For practical and contractual reasons, United Energy could not readily withdraw from either arrangement without risking its rollout program.
>
> From late 2012 to early 2013, United Energy made preparations to change those arrangements and accelerate the rollout. However, its expert's advice at the time was that United Energy lacked the essential resources needed to manage the project directly. United Energy accepted the expert's advice and improved its internal capability to directly manage the project. It brought the project in-house from June 2013 and the benefits were seen in a doubling of the rate of meter installations.
>
> The Commission considers that, in light of the information available to United Energy at the time, it was reasonable for United Energy to take over direct management at the time it did."

United Energy's decision to bring the installation program in-house, and the consequential doubling of installation rates, inevitably led to increased installation costs. United Energy's Board considered this action necessary in order to comply with its best endeavours obligation. As noted above, the Essential Services Commission has vindicated the Board's decision.

As already discussed, Energeia's view is that an efficient business providing the Regulated Services would recover additional costs due to non-performance of a contractor from the contractor through its contracts.

SCOPE – MATTERS NOT ASSESSED

The scope of the audits and the Commission's conclusions did not extend to matters of economic regulation. Such matters not assessed by the Commission include the efficiency and prudency of any expenditure and determining whether the expenditure is within the scope of the AMI program. Additionally, the audits did not assess technical matters such as the reliability of metering components.

With respect to the relevance of the Commission's report to the prudency and efficiency of UED's actions, Energeia notes the Commission's statement on page 2 of their report above.

Clause 5I.8(c) specifically identifies the nature of the rollout obligation as one of the factors to be considered in a prudency review. Evans & Peck's independent expert report highlighted the trade-off between satisfying the rollout obligation and minimising installation costs[5]:

> "To assess the prudency of United Energy's decisions under the current version of the CROIC, we have examined the key phases in its installation program. In this regard we note that United Energy faced an obligation to use its best endeavours to complete the rollout program by 31 December 2013. In response to
>
> this obligation, we also recognise that United Energy took action to increase installation volumes with the intention of balancing its best endeavours obligation against the costs of accelerating installation rates."

As discussed previously, the best endeavours condition had not changed since the AER's FD, and the efficient costs of meeting this condition had already therefore been included in the AER determined efficient cost allowance. The change in conditions in Table 1 did lead to higher efficient costs, which we have made allowances for in our estimate of efficient excess expenditure.

In reaching its conclusion that United Energy's expenditure was prudent, Evans & Peck again noted the relevance of the best endeavours obligation and the options available to United Energy[6]:

> "Evans and Peck's analysis has found that each of the cost overrun factors is justified, given United Energy's best endeavours obligation and the unavoidable delays in the rollout program. The costs arising in relation to each of these factors is regarded as prudent, taking into account the market conditions and the options available to United Energy."

Energeia disagrees with Evans and Peck's conclusion that there were unavoidable delays in the rollout program by 2013 for the reasons discussed above. Our view, based on the first-hand experience of our personnel managing meter rollouts, is that an efficient business would have managed a program that fell behind the OIC June 2011 target by the end of 2012, 18 months later.

United Energy is concerned that the Energeia Report does not discuss:

- Evans & Peck's findings; or
- United Energy's decision to bring the installation program in-house; or
- The cost implications for United Energy in satisfying its best endeavours obligation.

Instead, Energeia's benchmarking approach implicitly assumes that all distributors faced the same circumstances in 2013. This is factually incorrect. Energeia's approach should have considered the material presented by United Energy, which demonstrated that its expenditure was prudent with reference to the factors in clause 5I.8, including its best endeavours obligation.

By failing to consider the cost impact on United Energy of meeting its best endeavours obligation, Energeia's benchmarking approach does not properly capture United Energy's efficient installation costs.

Energeia has in its view focused on the most relevant issues and materials with respect to the efficient costs of a business providing the Regulated Services as required by the December 2011 OIC. Our view of the key changes in conditions since the AER's FD was made are listed in Table 1, and the effect of each on the efficient costs of a business providing the Regulated Services has been considered as part of our review, with specific adjustments made in consideration of the key differences between network areas.

C. Energeia's prudency assessment should have considered the market conditions for installers in accordance with clause 5I.8(f) of the CROIC, but did not.

The prudency of United Energy's installation expenditure depends on the prudency of its contracting strategy, which in turn reflects the prevailing market conditions. As already noted, United Energy needed to ramp up its installation rate in order to satisfy its best endeavours obligation. As other distributors were also behind schedule to varying degrees, installers were commanding a premium in the market as contractors competed to retain and recruit additional resources. These market conditions significantly affected installation costs in 2013.

The issues of:

- whether an efficient business would have been behind schedule in 2013;
- whether there has been a change in the best endeavours condition; and
- what the efficient level of labour price adjustments would have been;

have already been addressed above.

Evans & Peck's independent expert report provided detailed commentary on the market conditions for installers and assessed United Energy's contracting strategy in that context. For example, in June 2013 Evans & Peck commented that[7]:

> "The market conditions made it impractical to seek fixed prices per installation and the timeframe for compliance meant that it was not possible to conduct a formal competitive tender. United Energy's contracting approach was effective in establishing competitive tension between alternative suppliers, and was prudent given the constraints."

The issues of whether an efficient business would have been behind schedule in 2013 has already been addressed above.

> In contrast to Evans & Peck's approach, Energeia's cost benchmark for efficient installation costs does not have regard to the specific market conditions in 2013. Instead, as already discussed, Energeia's analysis is based on average earnings for Victorian electricians between 2010 and 2013.

Energeia's cost benchmark is based on the change in the market price for electrician skilled labour from when the AER's FD was made to when the costs would have been incurred by an efficient business, as described above.

> If Energeia had considered the market conditions in its prudency assessment as required by clause 5I.8(f), it would have engaged with the material in the Evans & Peck report and considered the prudency of United Energy's actual contracting strategy. United Energy notes that the Energeia Report highlighted the importance of examining each company's expenditure decisions in the light of the available options[8]:
>
> > "In essence, efficient costs are the product of management processes designed to ensure that sustainably least cost options are systematically chosen and effectively implemented from a reasonable range of feasible alternatives. Energeia therefore sought to identify the change, the least cost management approach adopted, the range of feasible options, the basis for the selected option, and the effectiveness of its implementation.
> >
> > Given the significant uncertainty and risk associated with the AIMRO programs, it was particularly important to take the information available to the businesses at the time into account when considering the efficiency of any decision to incur excess expenditure."
>
> Despite Energeia's description of how a prudency review should be conducted, this is not the approach adopted in the remainder of the Energeia Report. Instead, Energeia's cost benchmark for meter installations is a 'one size fits all' approach that is incapable of considering United Energy's contracting strategy or the impact of the market conditions from June 2013, particularly as the 31 December 2013 deadline approached.

Energeia's review concluded that an efficient business providing the services would have taken action following missing its June 2011 OIC installation milestone that would have led to the recovery of its program by the end of 2012. This may have involved changing its sole supplier in favour of a multi-supplier option, or taking the installation program in-house.

Our cost benchmark is common among each of the DNSPs insofar as it reflects the average salary of electricians in Victoria over the period. It has been tailored, however, based on the actual change in no access conditions faced by each DNSP including UED.

> **2.3 Conclusion - Meter installation costs**
>
> The Energeia report sets a benchmark cost for meter installations with reference to the growth in Victorian electricians' average annual earnings, as reported by 'seek.com'. Not only is this data source inherently unreliable, it is irrelevant to United Energy's contracting strategy. Contrary to the assertion made by Energeia, no rational business would have considered the average earnings of Victorian electricians in its decision-making. The benchmark derived using this approach is invalid.

Energeia's view is that an efficient business would have considered the prevailing market price for meter installation labour and changes in those prices since the AER's FD as key inputs into its decision making regarding the most efficient course of action to pursue when managing its meter installation contract from June 2011, when its installation program had first began to under-perform.

> Moreover, as explained above, Energeia's benchmarking approach incorrectly assumes that all distributors faced the same circumstances in 2013. This is factually incorrect. Energeia's approach should have considered the material presented by United Energy, which demonstrated that its expenditure was prudent with reference to the factors in clause 5I.8, including the best endeavours obligation.

All DNSPs faced the same market price for labour, and the same market price for installation services, which would vary depending on when the pricing was obtained. Energeia notes that the key costs to be considered under Clause 5I.7A are those of an efficient business, not necessarily those of UED.

Indeed, the efficiency of United Energy's meter replacement expenditure cannot be assessed without considering the factual circumstances in which the expenditure decisions were made. Despite acknowledging this in its report[9], Energeia adopts a simplistic and invalid benchmarking approach. In addition to being flawed for the reasons already noted, a benchmarking approach cannot address the substantial information provided by United Energy or consider the matters listed in clause 5I.8 of the CROIC.

Given the serious deficiencies detailed above, United Energy considers that the AER should redirect Energeia to consider the material presented by United Energy and the factors listed in clause 5I.8 of the CROIC.

3.2 United Energy's concerns

Energeia's prudency assessment of United Energy's PMO expenditure is invalid, and reflects a number of factual errors for the reasons set out below.

A. Energeia fails to apply its stated approach to assessing the efficiency of United Energy's 2013 PMO expenditure.

Energeia's analysis of PMO costs does not follow the approach described in section 4.2.3 of its report. In particular, it has not "sought to identify the DNSP's response to the change in conditions, the least cost management approach adopted, the range of feasible options, the basis for the selected option, and the effectiveness of its implementation"[13]. Moreover, Energeia's report provides no meaningful assessment of "whether UED's management of the change in conditions operated efficiently by taking measures to minimise costs where possible"[14].

As noted in further detail in section C below, there was ample evidence available to Energeia demonstrating that United Energy's management responded in a prudent, timely and efficient manner to the changed circumstances it faced during the rollout program. Energeia's failure to apply the analytical approach it set for itself, coupled with its failure to properly examine the available evidence, led it into error in setting its proposed 2013 PMO expenditure benchmark for United Energy.

As stated in Section 4.2, Energeia's approach also included a test of the effectiveness of UED's own approach to efficiently controlling excess expenditure. The efficiency of UED's approach, which Energeia notes appears to be superior to the previous, single vendor, scale based approach, falls short of Energeia's estimate of the efficient costs of a business providing the Regulated Services.

Energeia has provided more detailed information in this Appendix regarding our assessment of what an efficient business providing the services would have done, for example:

- Increased contract prices in 2011 by no more than the real increase in the price of labour and the additional efficient costs due to no access rates above that allowed by the AER in its FD
- Managed their contracts to recover the schedule by the end of 2012 by changing program managers and/or meter installation service providers and/or bringing the program in-house
- Recovered any material additional costs associated with recovering their schedule by the end of 2012 through their contractual remedies

Before examining that evidence, we explain below that Energeia's misunderstanding of the reasons for United Energy's 2013 PMO expenditure also contributed to its error.

B. Energeia has not fully understood the reasons for United Energy's additional PMO expenditure in 2013.

Energeia states[15]:

> "The key driver of the higher than allowed PMO expenditure cited by UED was the termination of their contract with Jemena and transition to management of the program themselves. The decision to incur this additional expenditure occurred after 18 months of attempting to work with Jemena to get the program back on track."

Energeia's characterisation is not an accurate description of the drivers of United Energy's additional PMO expenditure in 2013. As noted in Appendix C of United Energy's 2015 AMI Charges Revision Application, the key reasons for United Energy's higher-than-budgeted PMO expenditure in 2013 are as follows:

- The AER's approved budget made no allowance for project office costs beyond 30 June 2013, as the program was forecast to be complete by that date.

This was the timeline proposed by UED and accepted by the AER as efficient in their FD.

- Project delays beyond United Energy's control, coupled with the best endeavours obligation to complete the program by 31 December 2013, required the project office activities to be continued.

Energeia disagrees with UED regarding the controllability of its project delays, for the reasons detailed in our report and this Appendix.

- United Energy's actual project office costs in the second half of 2013 reflected its decision to bring the installation program in-house. This decision was prudent, and the costs incurred were managed efficiently.

Energeia disagrees with UED's assertion that its decision to take action more than 18 months after its program had fallen behind, or the decision to recover any materially higher costs as a result from its customers rather than its contracts, reflects the efficient costs of a business providing the Regulated Services for the reasons explained in our report and this Appendix.

In short, delays in the program, which Energeia itself has stated were "largely uncontrollable"[16] were the principal underlying driver of United Energy's 2013 PMO expenditure. These delays contributed to the difficulties faced by the joint program, and United Energy's decision to bring the installation program in-house.

Energeia has not said in its report that the delays were uncontrollable, rather that certain changes in conditions contributing to the program delays were uncontrollable (see Section 5.2.2).

As explained below, Energeia's misunderstanding of the underlying causes of United Energy's 2013 PMO expenditure lead it into error in selecting an expenditure benchmark that fails to consider United Energy's circumstances, despite:

- Energeia's recognition that those circumstances were beyond United Energy's control; and
- ample evidence that United Energy's responses under the circumstances it faced were prudent, timely and efficient.

C. Energeia's prudency assessment of United Energy's PMO expenditure does not consider United Energy's circumstances as required by clause 5I.8 of the CROIC.

Energeia's analysis ignores United Energy's circumstances and erroneously adopts the PMO costs of another distributor (CitiPower and Powercor) as the basis for determining a benchmark PMO cost for United Energy. This approach assumes erroneously that United Energy's PMO costs should not exceed those of CitiPower/Powercor, even though United Energy's circumstances were materially different.

Energeia has not adopted the PMO costs of another distributor. We have adopted the costs of an efficient business providing the Regulated Services. We have estimated these to be the AER's determined efficient

PMO costs, plus a margin, as explained in our report. The AER determined efficient PMO costs are those of UED's, not CitiPower and Powercor's.

> Energeia regards CitiPower/Powercor as an efficient benchmark for PMO costs because it has delivered the project on time and on budget. In particular, Energeia states that[17]:
>
> > "Importantly, our review has found that two of the Victorian DNSPs, CitiPower and Powercor (CP/PAL), were exposed to the same changes in no access and labour market conditions as the other DNSPs, yet they delivered their program largely on time and within their AER approved budget allowance. This outcome has played a significant role in our assessment, particularly with respect to our conclusions around the reasonably efficient level of PMO excess expenditure."

As stated in Section 4.2, Energeia's approach also included an independent test of the effectiveness of UED's approach to efficiently controlling excess expenditure. Effectiveness was assessed in a number of ways depending on the availability and nature of comparable benchmarks, as described in our report.

In the case of the PMO, Energeia did consider Powercor and CitiPower's program management cost and schedule performance benchmarks as part of our independent assessment of the effectiveness of UED's own actions. However, we did not rely on them exclusively. Energeia also considered the experience of its own personnel managing meter rollout programs and managing under-performing contractors.

> Energeia's assumption that CitiPower/Powercor faced exactly the same conditions as United Energy is factually incorrect, and has led Energeia to establish an invalid benchmark for PMO costs. A valid benchmark would need to be developed from a detailed analysis of the decisions taken by each company in order to assess whether cost differences truly reflect differences in efficiency. For example, United Energy faced much more significant delays than CitiPower/Powercor as a result of the moratorium on time of use tariffs. However, the different outcomes in relation to this complex issue cannot reasonably be attributed to differences in efficiency.

Energeia has not claimed that CitiPower/Powercor faced 'exactly the same conditions' as UED. Energeia stated CitiPower/Powercor were exposed to the 'same changes' in two specific conditions, namely labour and access rates (see Section 1). Energeia's analysis did find that UED faced a 10% increase in no access rates compared to an 8% increase in no access rates for CitiPower/Powercor by 2013. However, Energeia's view is that that is not a sufficiently significant difference in conditions to justify the difference in UED's schedule or cost performance relative to CitiPower/Powercor.

> The Energeia report also fails to recognise that United Energy's circumstances required it to bring the installation program in-house in order to satisfy its best endeavours obligation. It is therefore a factual error to conclude that United Energy could have taken a course of action to achieve Energeia's benchmark PMO cost. Energeia should have considered United Energy's actual circumstances and available options as required by clause 5I.8 of the OIC. Moreover, Energeia should have considered whether its proposed benchmark reasonably reflects the efficient costs of a business providing the Regulated Services (clause 5C.3 of the OIC). This also requires consideration of United Energy's actual circumstances, and not simply the addition of an arbitrary 5% margin on the "AER determined efficient level of PMO expenditure"[18].

Energeia has provided detailed information regarding our assessment of what an efficient business providing the services would have done, for example:

- Increased contract prices in 2011 by no more than the real increase in the price of labour and the additional efficient costs due to no access rates above that allowed by the AER in its FD
- Managed their contracts to recover the schedule by the end of 2012 by changing program managers and/or meter installation service providers and/or bringing the program in-house
- Recovered any material additional costs associated with recovering their schedule by the end of 2012 through their contractual remedies

Energeia have estimated the efficient PMO costs in 2013 to be the AER's determined efficient PMO costs in 2013, plus a margin, as explained in our report.

As already noted, the Essential Services Commission's recent best endeavours compliance report examined in detail United Energy's decision to bring the installation program in-house. The Commission specifically noted that United Energy's circumstances differed to those faced by the other distributors. The Commission concluded as follows:[19]

> "The Commission has considered the information that was available to United Energy at relevant times. The Commission also considered whether the actions that United Energy then took, or omitted to take, failed to mitigate or actually increased the risk of not reaching the rollout target.
>
> Several matters that significantly delayed United Energy's rollout – such as the time-of-use tariff moratorium and low productivity of installers – also affected other distributors. But United Energy was more affected than other distributors by access refusals.
>
> [...]
>
> When United Energy did take over management of its own rollout program, it engaged more installers and so doubled the installation rate. The Commission has therefore considered whether this action was taken soon enough.
>
> [...]
>
> The Commission considers that, in light of the information available to United Energy at the time, it was reasonable for United Energy to take over direct management at the time it did.
>
> The Commission concludes that United Energy has demonstrated that, to the extent practicable and acting on the basis of the information then available, it used best endeavours to meet the AMI rollout target."

Energeia's analysis confirms that UED faced a greater increase in the number of no access sites between 2010 and 2013 than the other businesses, nearly double that of Jemena. However, as previously quoted from the report, the Commission's conclusions were with respect to the best endeavours obligation, rather than the prudency or efficiency of UED's actions.

In its independent expert report, KPMG also examined the circumstances under which United Energy decided to assume responsibility for the meter rollout (MRO) from Jemena. KPMG stated[20]:

> "The expert comments that the transfer of the management of the MRO from Jemena to United Energy required significant planning of the contractual arrangements, business processes and systems (for example, see United Energy, AMI Delivery Operations Management Plan). The expert also comments that it was entirely consistent with the actions of a prudent manager for United Energy to not implement the plan, until the planning and associated risk management was complete. To have implemented the transition without adequate preparation and planning would have been a high risk strategy inconsistent with prudent management, which could have significantly increased rather than mitigated the risks to the MRO. The expert comments that a prudent operator would be expected to adopt a conservative timetable to minimise the risks of transition failure.
>
> Nonetheless for United Energy to have commenced the revised arrangements within two months of board approval to effect the transition, without to the best of the expert's knowledge, major disruption to the MRO or realisation of risk, is a significant achievement consistent with a high degree of preparation prior to the approval."

The KPMG report concluded that:

- The extension of the rollout program and hence the continuation of the project office expenditure beyond June 2013 was prudent.
- The levels of project office activity and expenditure beyond June 2013 were prudent.
- Expenditure incurred to effect the transition of project office management from Jemena to United Energy was prudent.[21]
- United Energy's prudent project PMO expenditure in 2013 was $7.1 million[22].

Energeia has provided detailed information regarding our assessment of what an efficient business providing the services would have done, for example:

- Increased contract prices in 2011 by no more than the real increase in the price of labour and the additional efficient costs due to no access rates above that allowed by the AER in its FD
- Managed their contracts to recover the schedule by the end of 2012 by changing program managers and/or meter installation service providers and/or bringing the program in-house
- Recovered any material additional costs associated with recovering their schedule by the end of 2012 through their contractual remedies

Energeia have estimated the efficient PMO costs in 2013 to be the AER's determined efficient PMO costs in 2013, plus a margin, as explained in our report.

> An analysis of United Energy's 2013 PMO expenditure in accordance with clause 5I.8 of the OIC would have considered United Energy's particular circumstances, in light of the above findings of the Essential Services Commission and KPMG. Energeia failed to do this. Instead Energeia fell into error by simply adopting a benchmark based on the actual costs incurred by another distributor facing circumstances that differed materially from United Energy's, in spite of compelling evidence that United Energy responded efficiently and prudently to its particular circumstances.

Energeia considered the KPMG and the Commission reports among the range of materials considered, and the circumstances of a business providing the Regulated Services efficiently. We have considered UED's actual costs, and compared them to our estimate of efficient costs. We do not agree that CitiPower/Powercor's circumstances differed materially from UED's with respect to the range of key changes in conditions listed in Table 1 for the reasons already described.

> **3.3. Conclusion - PMO costs**
>
> On the basis of the evidence and analysis set out above, we contend that Energeia's assessment of United Energy's 2013 PMO costs is invalid as it is founded on errors of fact, and does not meet the requirements of clause 5I.8 of the OIC.
>
> As already noted, in support of its 2015 AMI Charges Revision Application, United Energy submitted two independent expert reports by Evans & Peck and KPMG, and an explanatory paper (Appendix C), which together provide evidence to demonstrate to a very high standard that United Energy's actual PMO expenditure in 2013 was prudent and efficient, and satisfies the requirements of the OIC. Energeia's report does not provide any meaningful assessment or consideration of this material.

Energeia has assessed and discussed the material to the degree we believe it is relevant to an assessment of the efficient costs of a business providing the Regulated Service.

It has not, for the most part, provided information we could use as part of our testing of the effectiveness of UED's response to the changes in its conditions since the AER's FD.

For example, it never considered the potential to in-source the program at lower cost or to recover materially higher costs due to contractor non-performance through contract remedies.

> The AER should direct Energeia to reconsider the material presented by United Energy, and to remedy the factual errors described above. United Energy is confident that if Energeia undertakes this task in accordance with the requirements of the OIC, then Energeia will conclude that United Energy's prudent PMO expenditure in 2013 was $7.1 million.

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 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 15MWh and 160MWh 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.

Smart Grid Design and Development

Energeia was engaged by a major Australian utility to develop a smart grid solution for minimising the costs and carbon intensity of generating power in a remote island energy system. The engagement included designing a fit-for-purpose smart grid concept, developing functional and technical specifications, supporting market engagement, modelling project costs and benefits, and developing the project business case.

Smart Grid, Smart City Proposal Support

Energeia was engaged by a DNSP to support the development of their winning proposal for the $100M Smart Grid, Smart City project. The engagement included the development of a retailer value proposition and engagement strategy, development of the project's delivery and operating models, and development of related proposal documentation.

Network of the Future Design

A top tier field services provider engaged Energeia to support the development of a Network and Substation of the Future concept design and development roadmap. The engagement included researching international best practice, facilitating a number of concept development workshops with project stakeholders, developing the client proposal, and sourcing the skilled resources needed to deliver it.

Future Operating Model Design

An Australian DNSP engaged Energeia to support the development of their Future Operating Model blueprint and roadmap to 2026. The engagement included facilitating a series of whole-of-business workshops to gain strategic alignment on the DNSP's future customers, network and organisation, and the development of documentation to support stakeholder engagement and communication.

Embedded Networks for Electric Vehicles

Energeia was engaged by a leading electric vehicle infrastructure company to review the existing market arrangements around embedded networks and to provide recommendations regarding how these arrangements may be used to support the deployment of electric vehicle charging infrastructure.

Appendix 3 – Resumes of Key Personnel

EZRA BEEMAN

MANAGING DIRECTOR

PROFILE

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 – 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 an 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.

DR RORY CAMPBELL

SENIOR CONSULTANT

PROFILE

Rory has over 17 years of energy market experience, with senior management experience across the private and public sectors. In his career, Rory has developed strong analytical, modelling and problem solving skills across a wide range of complex areas including energy trading, energy technologies, financial modelling, risk management, project management, strategic analysis of energy and carbon markets and wider energy market policy.

Prior to joining Energeia, Rory was a Senior Director at the Australian Energy Market Commission. In this role, Rory gained extensive experience in delivering successful complex regulatory projects and leading multi-disciplinary teams across a large range of subject matters involving widespread industry consultation and input. Rory was a foundation member of the senior management team that built the AEMC from the ground up into a well-functioning, achieving organisation.

QUALIFICATIONS

- Doctorate of Philosophy (Ph.D.) in Pure Mathematics, University of NSW (1999)
- B.Sc. with 1st Class Honours in Pure Mathematics, University of NSW (1990)

SUMMARY OF EXPERIENCE – AEMC

As Senior Director at AEMC, reporting directly to the Chief Executive, Rory was responsible for:

- Leading the Technical and Reliability team, which handled all matters of a technical nature in the energy markets, ran the 'Power of Choice' review into demand-side participation, investigated the interactions between physical and financial markets, and provided support to the AEMC Reliability Panel.
- Leading the Distribution and Transmission Networks team, which looked after matters relating to networks, including connections, metering, economic regulation of networks and all work streams that emerged from the 'Power of Choice' review.

Key achievements and projects led include:

- Power of Choice: giving consumers options in the way they use electricity – a review which explored options for demand side participation in the electricity market and which produced a wide ranging recommendations made and mostly accepted by Ministers
- Connecting embedded generators to distribution networks – a rule change which improved the process for connecting embedded generators for the benefit of connection applicants, distributors and consumers
- Distribution network pricing arrangements – a rule change to implement the regulatory investment test for distribution which changed the way electricity distribution networks are upgraded, along with requiring distributors to report annually on future upgrades and the potential for demand side initiatives to defer physical network upgrades
- Energy Market Arrangements for Electric and Natural Gas Vehicles – a review into the likely impacts of the uptake of these vehicles in the future and any changes to markets required to accommodate them
- Prudential and financial improvements – a series of rule changes and reviews aimed at improving the prudential standards of the electricity market to mitigate the impact of a creditor to the market becoming insolvent

- Short Term Trading Market – Establishment of a Brisbane gas hub – necessary changes made to ensure the Brisbane STTM could be established on time

SUMMARY OF EXPERIENCE – ERARING ENERGY

As a Senior Trader – Energy Derivatives, Rory was responsible for:

- Pricing, modelling, negotiating and executing electricity derivative structures with Eraring's customers for the purpose of hedging forward future electricity generation.

Key achievements include:

- Successfully managed the oversold and unprofitable derivatives position Eraring inherited from its predecessor organisation
- Negotiated and executed a mallee plantation to generate greenhouse abatement certificates which offset Eraring's carbon emissions
- Voted Contract Trader of the Year by industry peers in 2003

SUMMARY OF EXPERIENCE – RAND MERCHANT BANKING

As an Energy Trader, Rory was responsible for:

- Transfer pricing from the wholesale desk to the retail business.
- Modelling and forecasting customer load profiles.
- Building software applications to retrieve and analyse electricity market date.
- Proprietary trading of electricity derivatives.
- Formulating and implementing methodologies for trading limits**.**