Jemena Electricity Networks (Vic) Ltd

2016-20 Electricity Distribution Price Review Regulatory Proposal

Revocation and substitution submission

Attachment 9-7 Heugin - Benchmarking Victorian metering expenditure from 2009 to 2014

Public

6 January 2016

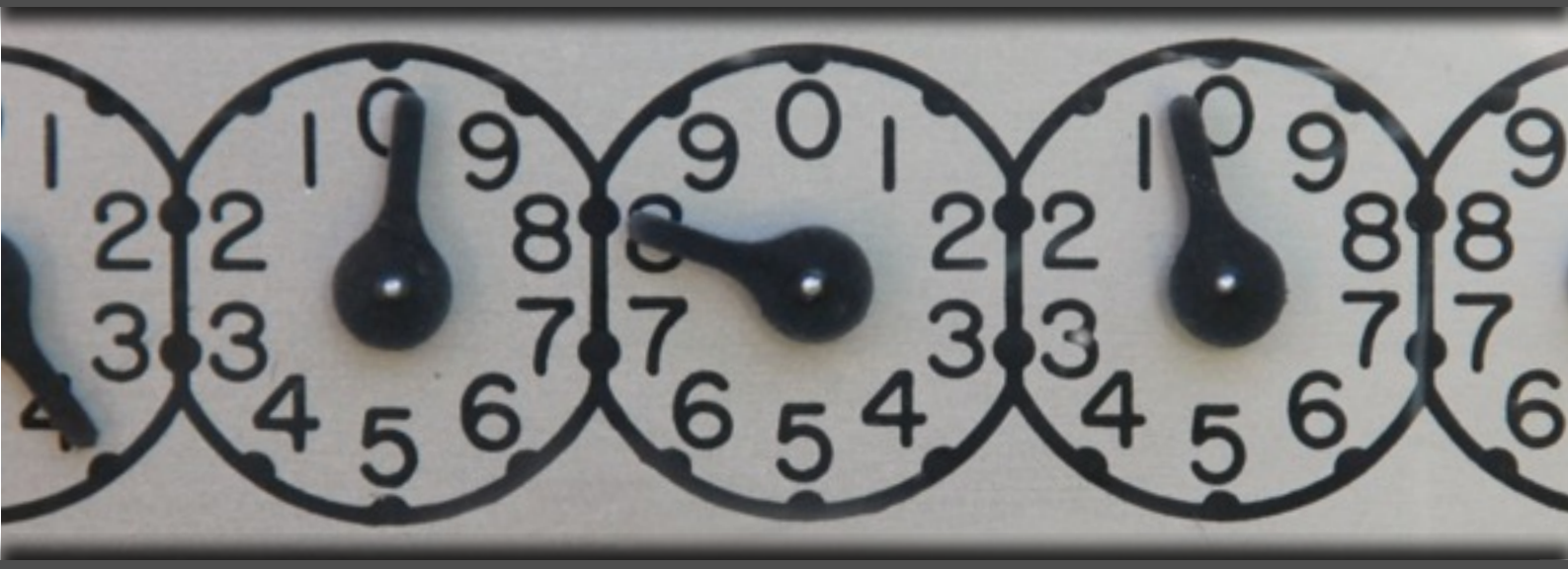
Advanced Metering Infrastructure Expenditure

Benchmarking Victorian metering expenditure from 2009 to 2014

huegin

09 September 2015

Version: 1.1



www.huegin.com.au

Level 10, 2 Elizabeth Plaza, North Sydney, NSW 2060

02 9409 2400

Executive summary

Benchmarking challenges

The limited dataset available in terms of both sample size and reporting consistency means that the techniques employed by the AER to benchmark DNSP opex for network services are unlikely to provide any meaningful indication of the relative efficiency of Victorian metering expenditure. Paramount to any benchmarking exercise is that comparisons are made on a like for like basis - the current Regulatory Information Notices make it difficult to compare expenditure at any level deeper than total expenditure.

Techniques used in this report

This report uses three different benchmarking methods. They are:

1. Aggregate category analysis,
2. Activity based category analysis, and
3. Total Factor Productivity.

Given the limitations of the dataset Huegin does not favour one method over another. Huegin believe all three should be used holistically to give an indication of the relative cost outcomes between the five Victorian DNSPs.

Benchmarking results

When economies of scale are accounted for, Jemena are achieving outcomes similar to CitiPower and Powercor (both of which the AER and other parties have put forward as the "frontier" businesses). Using category analysis, Jemena benchmark below the median for variable costs and are in between United Energy and AusNet Services for fixed costs.

The results of Total Factor Productivity analysis indicate Jemena are the 4th ranked DNSP however when fixed costs are removed Jemena's performance is similar to CitiPower, Powercor and United Energy.

Contents

Introduction

This chapter outlines the report context, our letter of instructions and the credentials and experience of Huegin and its personnel who contributed to this report.

1

Context for this report

Advanced Metering Infrastructure (AMI) was installed in all Victorian residential and business premises following the Advanced Metering Infrastructure mandate in 2006. The smart meter rollout has resulted in the installation of almost 2.8 million meters throughout Victoria.

The Advanced Metering Order in Council requires the Commission to take into account the expenditure of a benchmark efficient entity over the regulatory period to ensure metering expenditure by businesses over the period can be considered efficient. The techniques the Commission may make use of include category level and aggregated category benchmarking.

In addition:

"The Commission may have regard to (but is not limited to), both for the benchmark efficient entity and the distributor:

(A) capitalisation policies: and

(B) any allocation of costs between distribution services that are metering services and distribution services that are not metering services."[1]

This guidance indicates that benchmarking will be used to determine the efficiency of DNSP metering expenditure over the regulatory period with consideration given to, among other things, the different cost allocation methods between the Victorian businesses.

Our instructions

Huegin has been asked to prepare this report by Jemena. The subject of this report is the relative performance of the Victorian electricity distribution businesses for the provision, maintenance and reading of electricity meters for customers consuming less than 160 MWh per annum.

Specifically, we were asked to use category benchmarking and aggregated category benchmarking techniques to measure the relative metering performance of Victorian DNSPs between 2009 and 2014.

Our complete instructions from Jemena are attached as Annex C to this report.

The qualifications and experience of report contributors

Huegin is a significant contributor to the body of knowledge for benchmarking as applied to businesses in the National Electricity Market (NEM).

The Huegin team has an appropriate mix of tertiary education and professional experience commensurate with the requirements of the task to use benchmarking techniques to measure the metering performance of Victorian DNSPs. Qualifications and headline experience of those members who have contributed to this report include:

- Jamie Blair. BEng (Chemical): Jamie is a Director in our Sydney office. Jamie is the lead author of major domestic and international benchmarking studies for the electricity industry. Jamie provides regulatory support to numerous Distribution Network Service Providers (DNSPs) throughout Australia.

1 51.8 B (c) (iii) Advanced Metering Order in Council

- Oliver Skelding. BA (Economics), MEc: Oliver is a Senior Analyst in our Sydney office. Oliver has a Masters of Economics, specialising in Econometrics and is a major contributor to both the analysis and written articles on economic benchmarking relied upon by over 80% of the DNSPs operating in the NEM.

All contributors have read and understood the Practice Note CM7: Expert witnesses in proceedings in the Federal Court of Australia, June 2013. As lead author, Jamie Blair certifies that this report complies with Practice Note CM7. In accordance with the Guidelines, I confirm that I have made all inquiries that I believe are desirable and appropriate, and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Court.

16 January 2015

Signed | Date

Huegin expertise

Huegin focuses on providing analytical decision support which requires a knowledge of the way in which complex systems, such as electricity networks, work. Our team has significant experience in, and ongoing exposure to, operations improvement across many sectors including the electricity distribution sector. Given the ongoing drive for performance improvement in the electricity industry, a key focus in recent years has been understanding and modelling the drivers of performance and cost, as well as the degree to which businesses can influence these.

- Understanding and modelling the drivers of performance: The drivers of performance were first presented in the Australian DNSP benchmarking report in 2012. Since that time Huegin has continued to refine an explanatory model addressing the different drivers affecting Australian DNSPs. The effect of these eight drivers has been quantified and shown to significantly influence the results of benchmarking analysis.
- Understanding the degree to which drivers can be influenced: Huegin has developed a framework for explaining the degree to which organisations can influence the drivers of performance and cost. This framework highlights the need to understand the degree to which businesses can manage costs and performance when looking to assess relative performance and efficiency.

In addition to understanding and applying the benchmarking techniques as favoured by the AER, Huegin has focussed on the utility of benchmarking for supporting performance improvement decisions in the context of the Australian electricity industry.

The Huegin approach to benchmarking continues to evolve through the ongoing accumulation of this operational experience, application of specialist skills and research on the approaches and outcomes of benchmarking in other jurisdictions and industries.

This experience includes many benchmarking investigations on behalf of Australian DNSPs, notably a 2012 report of the costs and differences between many of the Australian networks and selected international networks. The purpose of that report was to provide a basic analysis of key issues in benchmarking and to share information amongst the businesses that was not available to them prior to the AER's publication of the Regulatory Information Notices (RINs). Note that the 2012 report and the data relied upon pre-dated the RINs in their current format and the data and analysis therefore differ from the current context, the draft decision and this report.

This highlights the sensitivity of benchmarking outcomes to context, time and data which will be explored throughout this report. Successful application of benchmarking for the purposes of performance comparison and decision making requires fluency in specialist techniques. The techniques regularly used by Huegin include econometric analysis, statistical analysis and advanced mathematical techniques. Despite benchmarking being

relatively new in the context of revenue setting in Australia, it has been applied in various ways in a number of industries and jurisdictions. Huegin continues to critically review the approaches and outcomes of benchmarking as applied by organisations such as the Office of Gas and Electricity Markets (OFGEM) in the United Kingdom. Ongoing knowledge is developed, applied and tested by Huegin in various ways including:

- The development of reports and submissions,
- The completion of investigative analyses,
- The ongoing development of the Conduit benchmarking portal, and
- Ongoing participation in industry forums.

Based on the specialist knowledge developed, Huegin is able to comment authoritatively on the application and utility of benchmarking in the context of regulating Australian DNSPs operating in the NEM.

The challenges of benchmarking metering expenditure

Benchmarking metering expenditure for the five Victorian DNSPs is hampered by the dataset available. These limitations include:

1) A limited dataset, and

2) Inconsistent and non-standardised data.

2

A limited dataset

In the recent Annual Benchmarking Report produced by the Australian Energy Regulator (AER) the data from the 13 DNSPs that form the National Electricity Market was augmented with DNSPs from Ontario and New Zealand to provide a dataset large enough to implement the AER's benchmarking techniques[2]. One of the challenges with benchmarking the metering expenditure of the Victorian DNSPs is the lack of comparator businesses outside Victoria. A dataset of five businesses means that parametric based techniques such as least squares regression and stochastic frontier analysis will lack any meaningful explanatory power[3].

In addition, benchmarking is generally interpreted as a zero-sum exercise in that there are "winners" who are labelled efficient and "losers", perceived as being inefficient. Using only five businesses, all of which were on or close to the efficient frontier in the AER's 2014 opex benchmarking analysis, there is a risk that metering expenditure will be construed as being inefficient solely because there are not enough comparator firms available.

This report will use aggregate category analysis, activity based category analysis and total factor productivity analysis to benchmark the metering expenditure of the five Victorian DNSPs between 2009 and 2014. These methods don't rely on statistical inferences and are therefore not restricted by small dataset available.

Inconsistent and non-standardised data

In addition to a small dataset, different cost allocation methods and inconsistent cost reporting restrict the ability to draw valid inferences from any benchmarks using disaggregated data.

Table 1 below illustrates one of these differences in the waycosts are accounted for between the businesses - using the proportion of total costs between 2009 and 2014 allocated to new meter installation and meter replacement.

DNSP	New meter installation	Meter replacement
Jemena	20%	0%
AusNet Services	1%	10%
CitiPower	5%	21%
Powercor	5%	27%
United Energy	3%	15%

Table 1: Cost Allocation Variation Between Businesses

We would expect businesses with similar cost allocation methodologies to have similar cost breakdowns. However looking at this table it is clear that this is not the case. Differences between cost allocation methods are not isolated to just new meter installation and meter replacement costs - other examples include other metering costs, communications expenditure and IT expenditure. Taken together with meter installation and replacement costs these categories constitute between 60 and 75% of DNSP metering expenditure over the period.

In addition to the different cost allocation methodologies are a number of anomalies in the data that may indicate differences in the years costs are allocated or errors in reporting. As an example, in 2014 AusNet Services replaced 41,296 Type 4 meters but reported no costs for this category. It is for this reason that throughout the

2 Stochastic frontier analysis, least squares regression and multilateral total factor productivity were the benchmarking techniques implemented

3 The current dataset has five DNSPs over six years, a sample size of 30. A rule of thumb suggested by Green (1991) when conducting regression analysis is a minimum sample size of 50+8p where p is the number of predictors.

report we have used totals over the six year period and where averages have been calculated we have used the total expenditure over the period divided by the total volume of work undertaken.

The benchmarking techniques considered in this report are:

1. Aggregate category analysis;
2. Activity based category analysis; and
3. Total factor productivity analysis.

None of these three methods rely on parameter estimates and are therefore more suited to benchmarking a small and non-standardised dataset.

Techniques used in this report

The aforementioned data limitations mean that the techniques employed by the AER to benchmark opex for network services are unlikely to yield meaningful insights into the cost outcomes of the Victorian DNSP metering programs. The techniques used in this report are:

1. Aggregate category analysis;
2. Activity based category analysis; and
3. Total Factor Productivity.

3

Aggregate category analysis

In this report aggregate category analysis is the comparison of aggregate expenditure between businesses. This can be either total expenditure or total expenditure per meter depending on whether the costs are considered to be fixed or variable.

Advantages

- Results are less likely to be influenced by the different accounting practices of the five businesses because all costs (opex and capex) are considered,
- The use of total expenditure mitigates the impact of capex/opex tradeoffs, and
- It is simple to implement and understand.

Disadvantages

- Businesses may have legitimate exogenous circumstances that influence their costs that management are unable to mitigate. In these cases, using total expenditure per meter and interpreting the results as differences in efficiency will punish businesses that have unfavorable network circumstances; and
- Aggregate expenditure per meter provides no meaningful indication of the areas in which businesses can improve.

Approach used

One of the disadvantages of using an aggregate expenditure benchmark is that different exogenous circumstances beyond the control of management can influence the results. Given that all five businesses are within Victoria, the problem of accounting for differences in operating environments is less convoluted than if businesses from outside Victoria had been included however they are no less important to the outcome.

Scale is one such exogenous factor that we have considered in this benchmarking exercise. This report uses aggregate expenditure per meter (the meter population for each business in 2014) for variable DNSP costs and aggregate expenditure for fixed costs.

Fixed costs are largely independent of the volume of meters installed. By including this expenditure on a per meter basis, DNSPs with a smaller number of meter installations will appear less efficient. An example of a fixed cost is a CEO - every business will incur similar costs however when "normalised" on a per customer or km basis, the result will not be an accurate reflection of the efficiency of CEO expenditure. The costs we have identified in this report as being fixed are IT infrastructure opex and communications infrastructure opex. Whilst there is not a clear demarcation in the information contained in the Category Regulatory Information Notices (RINs), we believe that IT and Communications opex provides a useful representation of the fixed costs of the metering program for two reasons. These are:

1. CitiPower and Powercor have indicated in their Budget and Charges Application that the costs in this category are incurred for IT maintenance, support and data analysis. These are costs that all the businesses will incur regardless of the number of outputs (however they are measured) produced by a business. For example, in terms of data analysis it matters little whether it is data for 300,000 meters or 600,000 meters the process and the resources required to analyse the data will be the same across the businesses.
2. Using the Category RIN data all the DNSPs reported combined opex of between $50M and $60M which suggests that the costs for this category are relatively independent of the number of meters installed (CitiPower and Powercor split these costs and have therefore been aggregated).

Using this split between fixed and variable costs, we have benchmarked IT and Communications opex at an aggregated level and have normalised the remaining expenditure over the period using the meter population in 2014.

Activity based category analysis

Activity based category analysis uses Category RIN data to benchmark the businesses at a disaggregated level. In this report Huegin have combined different expenditure categories into an activity that has then been used to form comparisons. For example, new meter installations and meter replacements have been combined into a single activity. This approach has been used to mitigate the impact of different cost allocation practices between the businesses in the sample.

Advantages

- Cost drivers can be used to normalise the data or provide the unit costs for each activity. For example, installation expenditure per meter installed; and
- The results provide an indication of which activities businesses are doing well relative to their peers and vice versa.

Disadvantages

- Different cost allocation methodologies mean that it is difficult to get like for like comparisons; and
- If significant environmental variables exist then the results may be due to the influence of these exogenous circumstances and not relative levels of efficiency.

Total factor productivity analysis

Total factor productivity analysis means that multiple outputs and inputs can be aggregated to get a single productivity index between businesses. The outputs used in this analysis are three of the activity groups used in the activity based benchmarking. They are:

1. Number of Type 4 meters installed or replaced;
2. Number of Type 4 meters repaired, maintained or investigated; and
3. Scheduled and remote meter reading.

Total expenditure over the period has been used as the single input.

Advantages

- Multiple outputs can be aggregated into a single output index to provide an overall indication of business performance; and
- Weights can change over time to reflect the changing output mix (for example more maintenance expenditure over time instead of meter installation).

Disadvantages

- Like category analysis techniques, the results can be influenced by the presence of environmental variables or the impacts of scale; and
- Different cost reporting will have an impact on the weightings for each output (we have attempted to mitigate this issue by using average output weights for each business over the period).

Benchmarking results

The only benchmark in which Jemena appear above the median is for Communications and IT opex. It should be noted CitiPower and Powercor, with their ability to share fixed costs, are significantly below the other three businesses for this cost category.

For all other benchmarks Jemena is at or below the median of the five businesses in the sample.

4

Aggregate category analysis

Benchmarking fixed costs

As highlighted in Chapter 3, Communications and IT opex have been considered in this report to represent fixed costs for each of the businesses benchmarked. These costs include operating expenditure for positions such as data analysis and IT maintenance and support - costs that every business in the benchmarking study will incur regardless of the number of meters installed. If the costs are relatively independent of the volume of output then "normalising" for the number of meters installed will result in larger businesses (in terms of output) appearing more efficient.

The bar chart in Figure 1below shows the total costs incurred between 2009 and 2014 for these two opex categories.

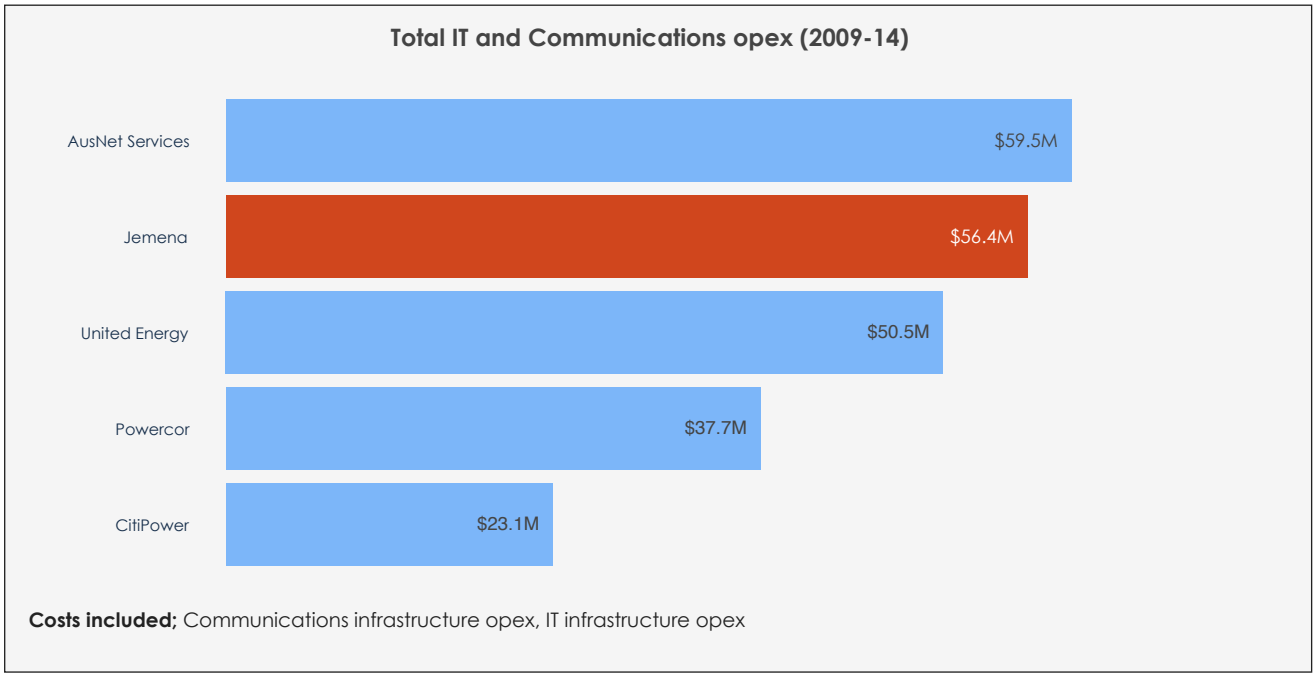


Figure 1: Total IT and Communications Opex

The graph above clearly demonstrates that Powercor and CitiPower have spent considerably less in this category than the other three Victorian businesses. In terms of fixed costs, CitiPower and Powercor operate from a single IT platform[4] which enables them to spread IT and communications costs across the two businesses (emphasis added below).

"In-house costs associated with IT maintenance ***across CitiPower and Powercor Australia*** *include four FTEs to manage the Service Suite maintenance contract and provide production support to the Business, two FTEs to support Data Analytics, five FTEs to support IEE maintenance and support, four FTEs to support UIQ, five FTEs to support the USB and five FTEs to support infrastructure."*[5]

CitiPower and Powercor will appear efficient in this expenditure category by virtue of their ownership structure. The graph in Figure 2 below shows CitiPower and Powercor aggregated to give a more accurate indication of the fixed costs of providing metering infrastructure between 2009 and 2014.

4 Page 62, CitiPower's Budget and Charges Application 2012-15

5 Page 76, CitiPower's Budget and Charges Application 2012-15

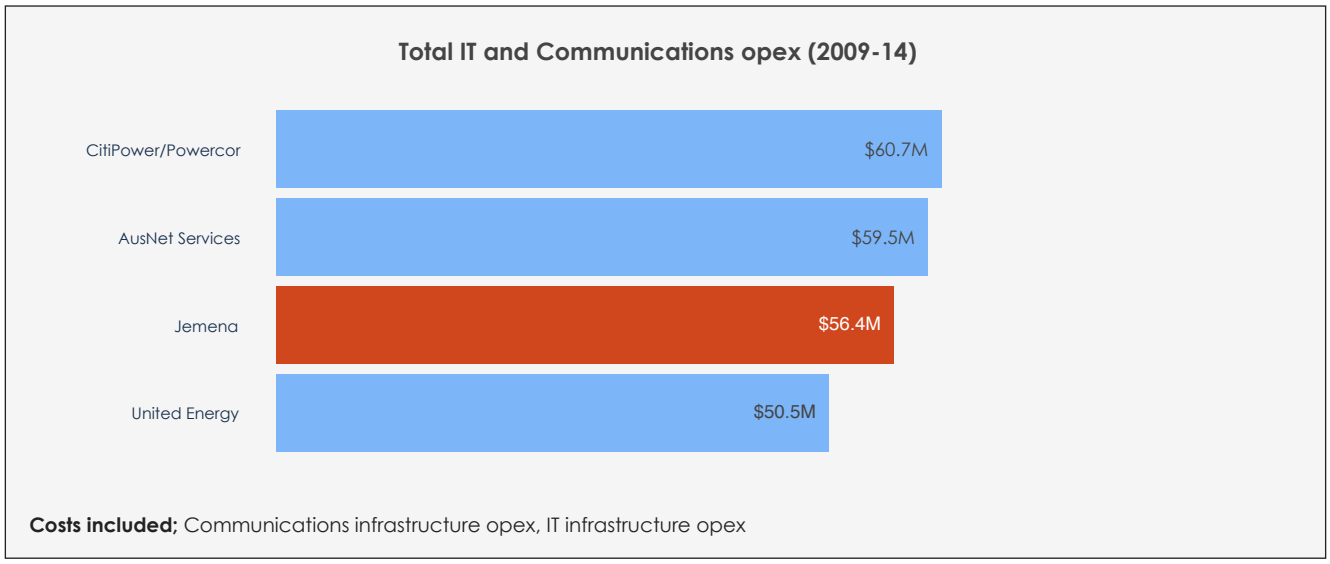


Figure 2: Total IT and Communications Opex - CitiPower/Powercor Aggregated

Benchmarking variable costs

Variable costs are those that increase as meter volume increases[6], for example expenditure on meter installations or meter replacements will increase as the number of meters installed or replaced increases. For these costs it is important to normalise for meter volume. In this report all expenditure between 2009-2014 except IT and Communications opex has been included within the variable cost category. It should be noted that Jemena and United Energy incurred additional IT capex for systems not required by the three other Victorian businesses. These costs, amounting to $23.3M for Jemena and $22.5M for United Energy have been excluded from the results on the right in Figure 3 below.

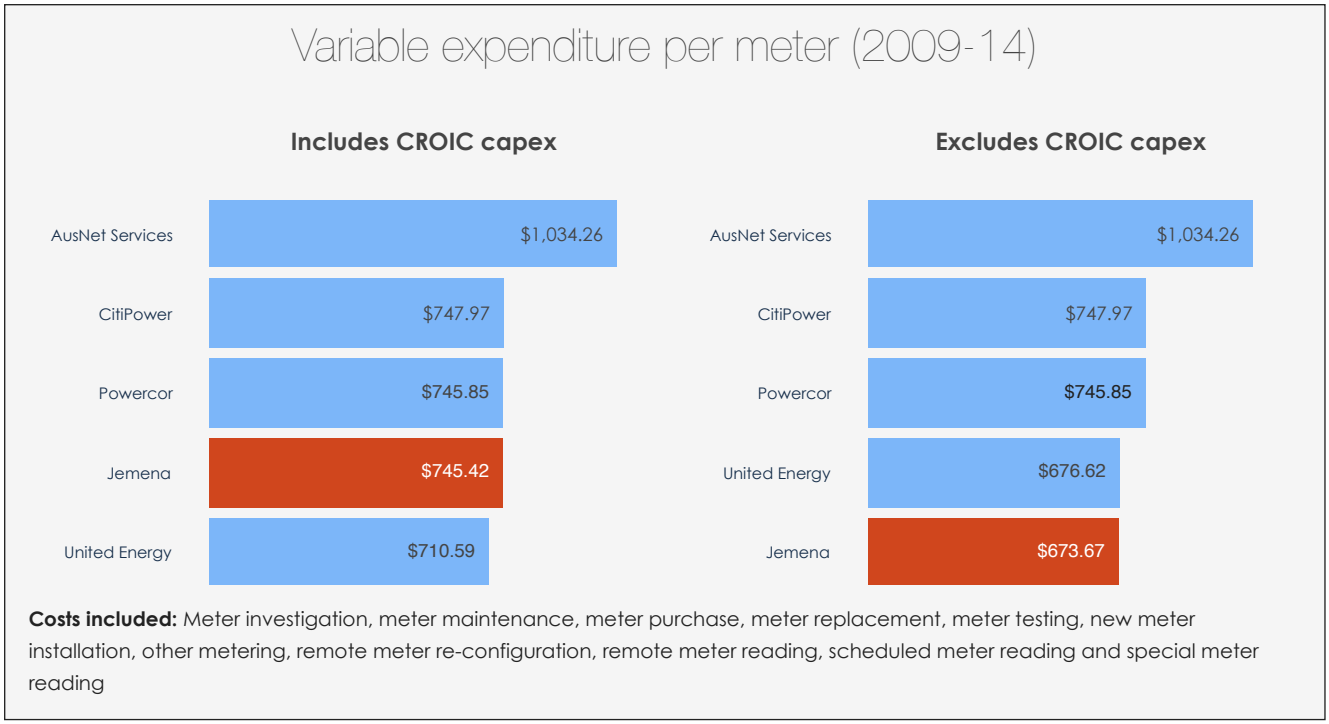


Figure 3: Variable Expenditure

6 Given that the Category RINs do not separate fixed and variable costs we have used IT and Communications opex for fixed costs and all other metering expenditure has been considered a variable cost.

Normalising on a per meter basis, Jemena is the median business of those benchmarked using total variable metering expenditure and the lowest when IT capex has been normalised for CROIC capex. Over the timeframe used, these variable costs amounted to 91% of the total expenditure for the five businesses combined.

Why are fixed and variable costs important?

In light of the different cost allocation methodologies and apparent discrepancies in the RIN data, aggregate category analysis is likely to be the most reliable technique in comparing metering expenditure between the Victorian DNSPs. That being said, how fixed and variable costs are accounted for will have a large impact on the benchmarking results. Using the two extremes provides an example of why the split between fixed and variable costs matters. At one end we could assume that all costs incurred during the metering rollout are fixed, in this case expenditure is independent of the number of meters installed and total expenditure benchmarks can be used. At the other extreme, all costs could be considered variable and total expenditure per meter would be a more appropriate measure. The graph in Figure 4 below shows the rank of the five businesses when using total expenditure (appropriate for fixed costs) and total expenditure per meter (appropriate for variable costs).

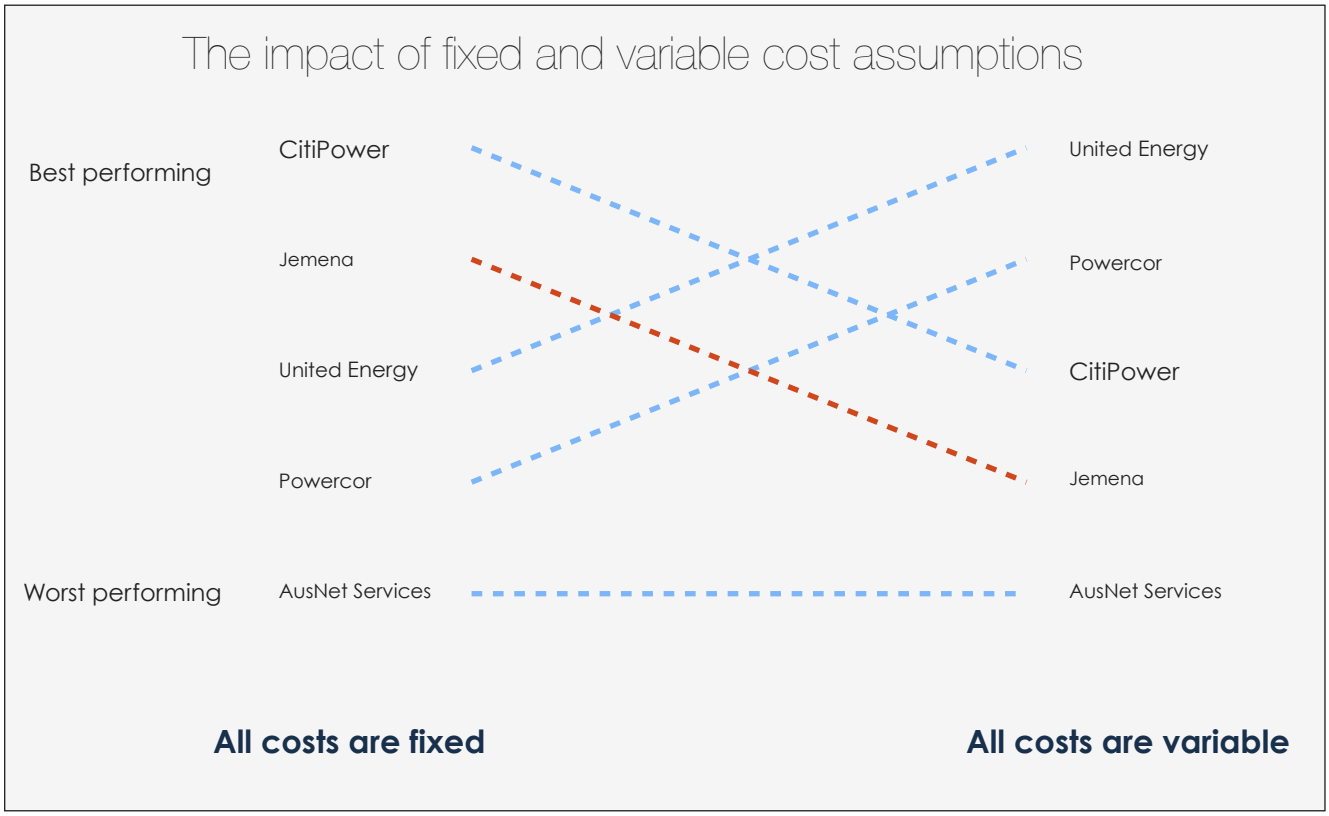


Figure 4 - Changing Fixed and Variable Cost Assumptions

Businesses that have a larger meter population in 2014 appear more efficient when a per meter measure is used while smaller businesses will appear better using total costs. This highlights the need to identify fixed and variable costs when using aggregate expenditure to measure DNSP performance. In this report we have used IT and Communications opex as a proxy for the fixed costs the businesses have incurred during the rollout. These costs form around 9% of the total expenditure over the period.

Aggregate Category Analysis Summary

Jemena benchmark well using variable costs per meter and have the lowest variable costs per meter when IT capex is normalised for CROIC capex. Jemena have the second highest costs over the period for IT and Communications opex (fixed costs), it should be noted however that CitiPower and Powercor may not provide a realistic indication (when taken individually) due to their cost sharing arrangements.

Activity based category analysis

Inconsistencies in the data and accounting methodologies between the five businesses mean that different cost categories have been aggregated into similar activities by Huegin to provide more like for like comparisons. One advantage of activity based category analysis is that total expenditure can be normalised by the volume of work undertaken to get a unit cost of the activity. The different activities used are outlined below.

- Meter investigation, meter maintenance and meter testing;
- Meters purchased;
- Meters installed and meters replaced; and
- Remote, scheduled, special meter reading and remote meter reading re-configuration.

The benchmarking results for each of these activities are presented below. The average unit cost is the total expenditure between 2009-14 for the activity divided by the total volume of work undertaken over the benchmark period.

Given the differences in cost allocation these results are more useful as a check of the aggregate category benchmarking results. For all activities Jemena is at or below the median of the five businesses benchmarked. The benchmarks in Figure 5 below account for around 56% of total industry metering expenditure over the period (with IT, Communications and Other expenditure forming the remainder).

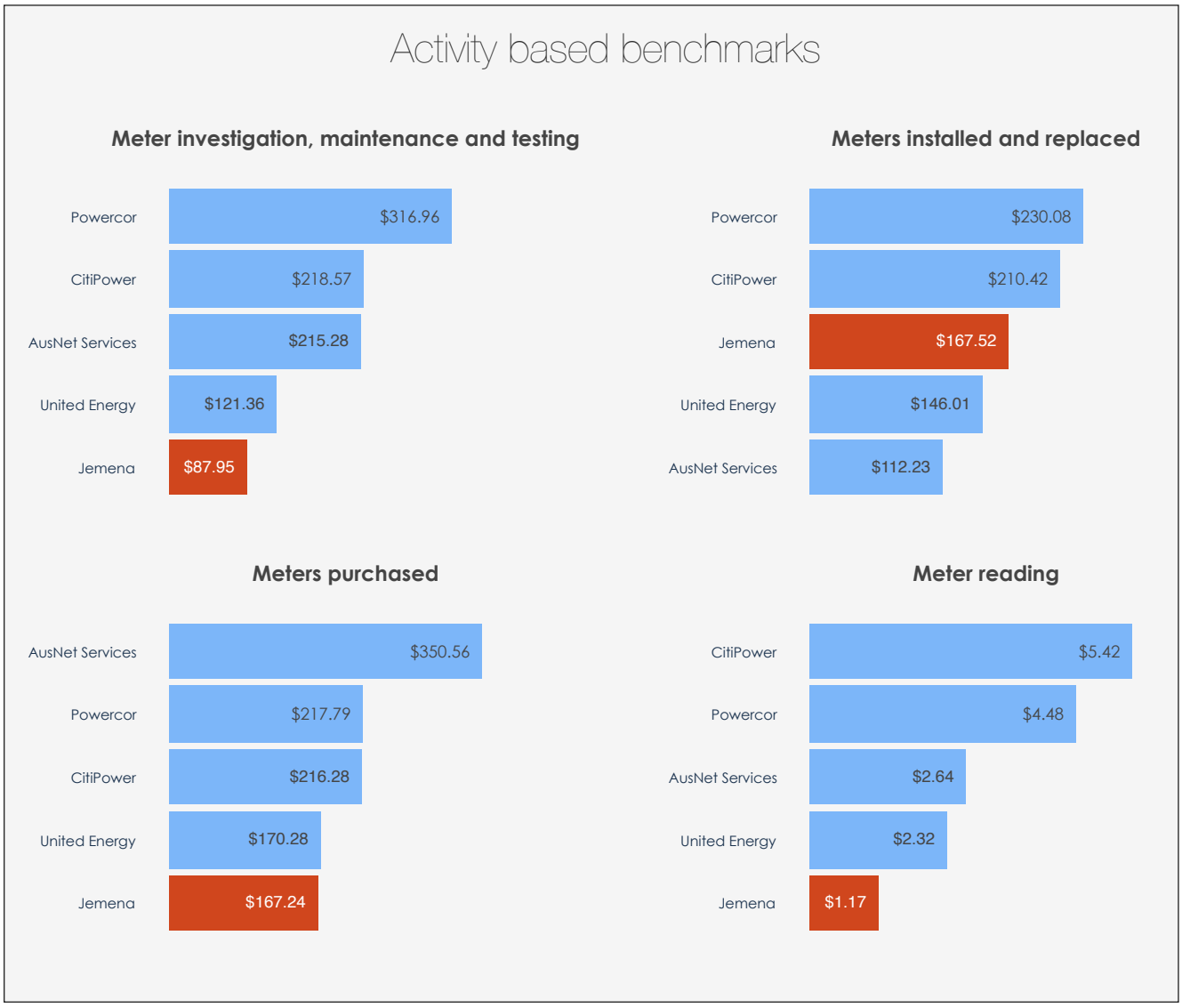


Figure 5 - Activity Based Benchmarks

Total Factor Productivity analysis

One of the disadvantages of the activity based category analysis is that it can be difficult to get an overall perspective of business performance. In addition, there has been significant expenditure in IT and Communications systems that will not get picked up in the activity category analysis. A technique that has been used by the AER in its benchmarking of distribution and transmission businesses is total factor productivity. Using the different activity aggregates and the expenditure associated with each Type 4 category, a single TFP score over the period can be calculated[7]. Given the fluctuation of expenditure data from year to year the outputs have been weighted using a six year year averages for each business and the volume of output summed over the period.

The three outputs used and their respective weights (industry average) were:

1. Meters installed or replaced (84.7%);
2. Meters maintained or inspected (2.0%); and
3. Meters read[8] (13.2%).

Total expenditure over the period was used as the single input (the sum of both capex and opex)[9].

TFP has the advantage that over time, as the expenditure pattern shifts from installation to maintenance and repair the weights can be adjusted to reflect the changing mix of metering outputs.

The total factor productivity scores are presented below.

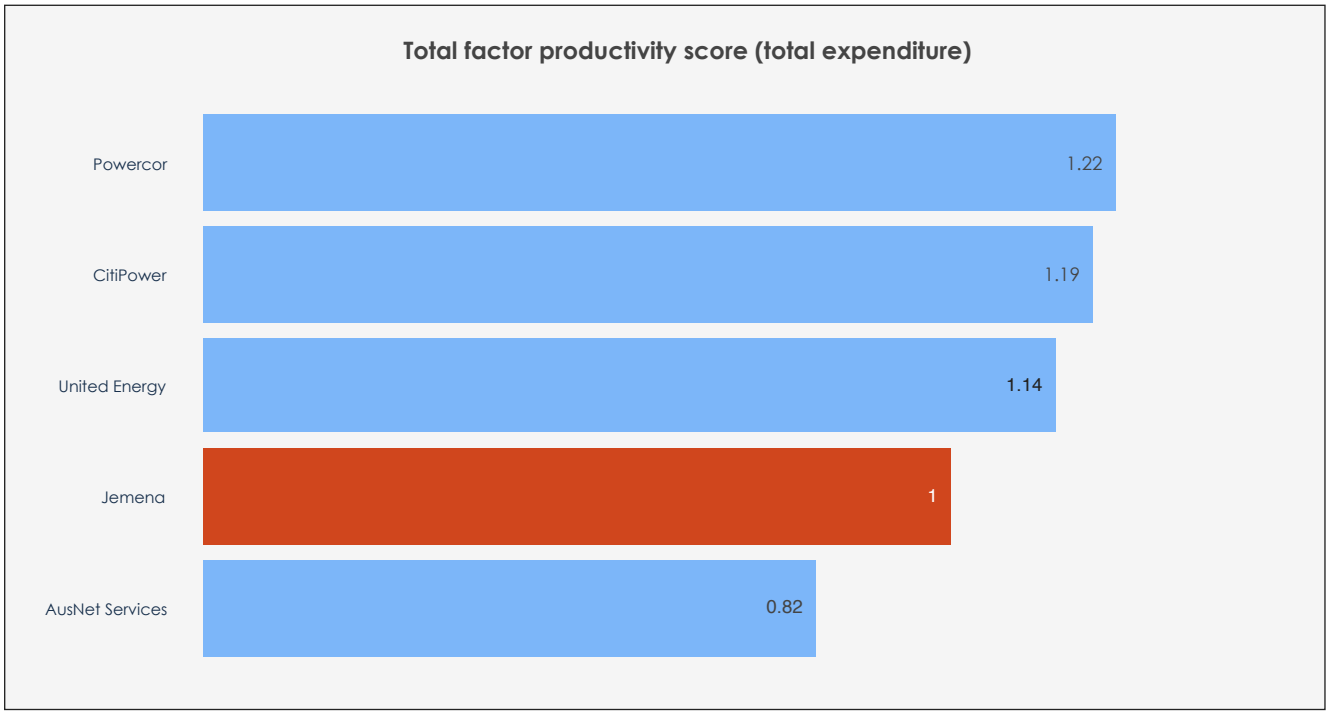


Figure 6 - TFP Scores - Totex

Jemena has the smallest output through which to spread its fixed costs - Jemena installed/replaced 329K meters over the period which was fewer than CitiPower (335K), Powercor (867K), United Energy (629K) and AusNet Services (734K); Jemena was also unable to share costs across businesses. The TFP results with a weighting of

7 The Tornqvist TFP model endorsed by the AER for benchmarking DNSP total factor productivity has been used with the different activity expenditure amounts used to get output weightings

8 Communications opex has been included within this category to from an output weight

9 See Appendix for data source and adjustments made

around 85% for meter installation and replacement meaning that the results will be similar to a measure of total expenditure per meter installed/replaced. Once again it is likely that the impact of having fixed costs spread across a smaller output index means that Jemena, as the smallest business, appears worse off using this measure. This is compounded by CitiPower, the only DNSP with a similar number of installed meters, apparently sharing costs with Powercor. The influence of scale on the TFP results have been mitigated in Figure 7 below by using what Huegin assumes to be the variable costs only (all costs other than Communications and IT opex).

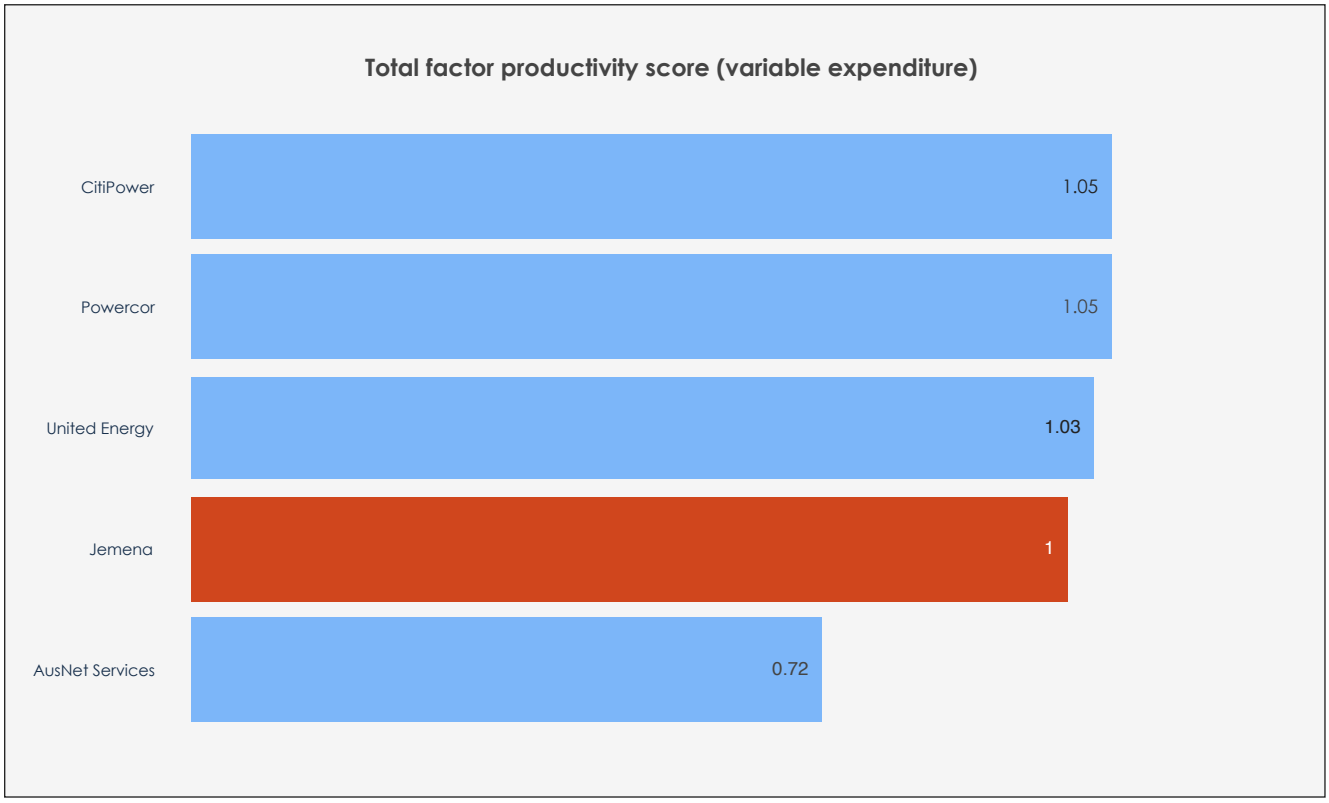


Figure 7 - TFP Scores - Variable Expenditure

These results suggest that after accounting for scale, Jemena has exhibited similar levels of productivity over the period to United Energy, CitiPower and Powercor.

Total Factor Productivity Analysis Summary

For both fixed and variable expenditure Jemena are the fourth ranked business in the sample. CitiPower and Powercor's cost sharing mean that it is difficult to separate to what extent Jemena's total and variable expenditure benchmarking results are due to the influence of fixed costs or due to relative differences in efficiency. Ideally we would compare Jemena's results to CitiPower (its closest comparator in terms of meter installations / replacements albeit with a higher meter density) for an indication however CitiPower hasn't incurred the actual total costs that a single business would have incurred during the meter rollout period.

To account for CitiPower's shared costs we have added an amount to CitiPower's expenditure over the period that potentially reflects the fixed costs of the metering rollout. CitiPower and Powercor spent a combined $61M on IT Opex over the six year period, we have used this amount to assume the actual IT opex costs CitiPower have incurred in providing metering outputs (instead of $23.1M over the six years $60.7M has been used)[10]. We note that this figure is likely to be a conservative estimate of the cost advantage because it doesn't include IT capex, communications or other expenditure also shared between CitiPower and Powercor.

10 This figure has been used because we consider IT opex to be largely a fixed cost , CitiPower and Powercor share a single IT platform and non-volume based costs are split 50:50.

Table 2 below shows the resultant TFP Scores of Jemena and Citipower (original and normalised) under this approach.

DNSP	TFP Score
Jemena	1
CitiPower (original)	1.19
CitiPower (normalised)	1.03

Table 2: Effect of Normalising Jemena Peer for Shared IT Opex

The table above indicates that most of the difference in measured performance over the period between Jemena and CitiPower is likely to have been caused by the different cost sharing arrangements of DNSPs. When this is accounted for, the efficiency gap between Jemena and CitiPower is much smaller than an aggregate total factor analysis would suggest. The AER and other parties have indicated that CitiPower and Powercor should be considered the benchmark against which prudence is measured[11], there is little indication from any of the three benchmarking techniques used in this report that Jemena's level of efficiency is materially different from CitiPower's when the results have been normalised for the fixed IT opex costs associated with the metering rollout.

11 Pages 14, 28 and 29 http://www.aer.gov.au/sites/default/files/AMI%202015%20charges%20determination%20-%20for%20publication%20%5BPDF%5D.PDF)

Annex A

Data used for Total Factor Productivity

Output Index data

Category RIN data has been used to aggregate the different outputs over the time period (2010-14). Data for Type 4 meters has been used.

DNSP	Output	Volume (09-14)	Weight
Jemena	Meters installed / replaced	328,662	82.61%
Jemena	Meters maintained or inspected	15,487	2.88%
Jemena	Meter reading	757,110	14.52%
CitiPower	Meters installed / replaced	335,251	82.77%
CitiPower	Meters maintained or inspected	11,716	3.72%
CitiPower	Meter reading	842,001	13.51%
Powercor	Meters installed / replaced	867,139	87.41%
Powercor	Meters maintained or inspected	13,601	2.25%
Powercor	Meter reading	1,860,566	10.34%
AusNet Services	Meters installed / replaced	734,475	71.32%
AusNet Services	Meters maintained or inspected	4,779	1.35%
AusNet Services	Meter reading	2,248,495	27.33%
United Energy	Meters installed / replaced	629,483	97.45%
United Energy	Meters maintained or inspected	3,153	0.42%
United Energy	Meter reading	1,564,610	2.13%

Input Index data

Total expenditure values have been taken from the AMI Charges Model data. For United Energy and Jemena the following amounts have been removed (distribution IT expenditure on CROIC):

1. United Energy: $22.6M
2. Jemena: $23.4M

Expenditure values are the sum of the following categories from the AMI Charges Model data:

1. Capital expenditure; Remotely read interval meters & transformers, IT, Communications, other
2. Operating and maintenance expenditure

DNSP	Total expenditure ($M) - 2009-14
Jemena	286.5
CitiPower	248.6
Powercor	597.6
AusNet Services	786
United Energy	466.7

Annex B

Testing the sensitivity of the TFP results

One of the difficulties, highlighted in Chapter 1, with benchmarking the metering expenditure of the Victorian DNSPs is the lack of standardisation of the data and also differences between the businesses on when metering costs are accounted for. The TFP results presented in the report use a six year time period of 2009-2014. TFP results have been obtained using three different scenarios to test the sensitivity of the results. These scenarios are;

1) Use 2009-2014 data and average output weights for each DNSP;

2) Use 2010-14 data; and

3) Use 2010-14 data and industry average output weights

The TFP results for both total expenditure and variable expenditure are included below.

Scenario	Total expenditure		Variable expenditure	
	DNSP	Score	DNSP	Score
Scenario 1	Powercor	1.22	Powercor	1.05
	CitiPower	1.19	CitiPower	1.05
	United Energy	1.14	United Energy	1.03
	Jemena	**1**	**Jemena**	**1**
	AusNet Services	0.82	AusNet Services	0.72
Scenario 2	Powercor	1.13	**Jemena**	1
	CitiPower	1.12	United Energy	0.98
	United Energy	1.11	CitiPower	0.97
	Jemena	1	Powercor	0.95
	AusNet Services	0.75	AusNet Services	0.64
Scenario 3	Powercor	1.14	**Jemena**	1
	CitiPower	1.12	United Energy	0.97
	United Energy	1.10	CitiPower	0.96
	Jemena	1	Powercor	0.95
	AusNet Services	0.74	AusNet Services	0.63

Annex C

Letter of instruction

Expert Terms of Reference – Benchmarking metering services

4 September 2015

Contact Person

Matthew Serpell

Manager Asset Regulation & Strategy

matthew.serpell@jemena.com.au

Jemena Limited

ABN 95 052 167 405

321 Ferntree Gully Road
Mt Waverley VIC 3149

Postal Address:

Locked Bag 7000
Mt Waverley VIC 3149

Ph: (03) 8544 9000

Fax: (03) 8544 9888

Contents

1 Background

Jemena Electricity Networks (Vic) Ltd (**JEN**) is an electricity distribution network service provider in Victoria. JEN supplies electricity to approximately 300,000 homes and businesses through its 10,285 kilometres of distribution system. JEN's electricity distribution system services 950 square kilometres of northwest greater Melbourne.

2 Scope of Work

JEN wishes to engage a suitably qualified expert to develop a model and report that benchmarks the relative performance of the Victorian electricity distribution businesses for the provision, maintenance and reading of electricity meters for customers consuming less than 160 MWh per annum.

The Expert will provide an opinion report that describes the benchmarking techniques adopted and its findings.

The benchmarking approach should employ best practice techniques and be consistent with the requirements outlined in the advanced metering infrastructure order in council (2015) cost recovery order in council (**CROIC**) as gazetted by the Victorian Government on 30 Jun, 2015 (No. S 186), an extract of the relevant sections are provided in **Attachment 1** to this request.

3 Deliverables

At the completion of its review the Expert will provide an independent expert model and report detailing the relative performance of the Victorian electricity distribution businesses for the provision, maintenance and reading of advanced metering infrastructure. Without limitation, this model and report must:

- be of a professional standard capable of being submitted to the Australian Energy Regulator (**AER**);
- clearly set out all findings and the reasons for those findings, justify the method(s) applied, separate facts from opinions, and explain all the assumptions made;
- contain a section summarising the Expert's experience and qualifications, and attach the Expert's curriculum vitae (preferably in a schedule or annexure);
- identify any person and their qualifications, who assisted the Expert in preparing the report or in carrying out any research or test for the purposes of the report;
- summarise JEN's instructions and attach these term of reference;

- include an executive summary which highlights key aspects of the Expert's work and conclusions, and;

- (without limiting the points above) carefully set out the facts that the Expert has assumed in putting together his or her report, as well as identifying any other assumptions made, and the basis for those assumptions.

The Expert is to provide an electronic (Excel) version of its benchmarking model(s), including any proprietary model(s) provided by a third party. These models should contain all input data with linkages to the outputs.

Use of the report

It is intended that the Expert's report will be submitted to the AER. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied on by both JEN and the AER. The Expert agrees that the Intellectual Property Rights developed or created by the Expert in performing the services (as described in this document) to JEN (including the development and preparation of the report) (whether by the Expert, its related bodies corporate, its employees, contractor or agents) (**Developed IP**) will from the date that the Developed IP is developed or created will be owned by and vest in JEN.

"**Intellectual Property Rights**" means all present and future rights conferred by Law or in relation to any copyright, trademarks, designs, patents, circuit layouts, plant varieties, business and domain names and other results of intellectual activity in the industrial, commercial, scientific, literary or artistic fields whether or not registrable, registered or patentable.

The AER may ask queries in respect of the report and the Expert will be required to assist JEN in answering these queries. In addition, the AER may choose to interview the Expert and, if so, the Expert will be required to participate in any such interview.

The report will also be reviewed by JEN's legal advisers to provide legal advice to JEN about its rights and obligations under the National Electricity Law, the National Electricity Rules and jurisdictional laws (including the CROIC). The Expert will be required to work with JEN's legal advisors and personnel to assist them to prepare JEN's revised regulatory proposal in response to the preliminary determination and substitute determination made by the AER for the 2016 to 2020 regulatory control period and with the transition adjustment made under the CROIC.

If JEN chooses to challenge any decision made by the AER in relation to the regulatory proposal that appeal will be made to the Australian Competition Tribunal and the Expert's report may be considered by the Tribunal. JEN may also seek review by a court and as such the report may be subject to consideration by that court. The Expert should therefore be conscious that the report may be considered as part of these processes, including in connection with the review of a dispute between the AER or JEN as to the appropriate level of JEN's distribution tariffs and / or forecast operating and capital expenditure over the regulatory period from 1 Jan 2016 to 31 Dec 2020. Due to this, in carrying out the requirements of these terms of reference, JEN requires that the Expert comply with the Federal Court requirements for expert reports, which are set out in **Attachment 2**.

The Expert must be available to assist JEN in connection with the work defined in the scope of works (Section 2), until such time as the regulatory proposal, including subsequent appeals (if any), is finalised.

Compliance with the code of conduct for expert witnesses

Attachment A is a copy of the Federal Court's Practice Note CM 7, entitled "Expert Witnesses in Proceedings in the Federal Court of Australia", which comprises the code of conduct for expert witnesses in the Federal Court of Australia (the Code of Conduct).

The Expert is required to be familiar with the Code of Conduct and comply with it at all times in the course of the engagement by JEN. In particular, the expert report prepared for JEN should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Code of Conduct.

In particular, the report should contain particulars of the timing, study or experience by which the Expert has acquired specialised knowledge. The report should also state that each of the Expert's opinions is wholly or substantially based on the Expert's specialised knowledge.

It is also a requirement that the report be signed by the Expert and a declaration that:

> "[the expert] has made all the enquires which [the expert] believes are desirable and appropriate and that no matters of significance which [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report."

As noted previously, JEN requires a copy of these terms of reference to be attached the Expert's report, as well as copies of the curriculum vitae of each of the report's authors.

4 Conflicts

The Expert is to promptly identify and disclose any current or future realised or potential conflicts of interest.

5 Timetable

The Expert will deliver its required output to JEN as follows:

- A benchmarking model – **7 Sep 2015**
- a final written report – **7 Sep 2015**

6 Terms of Engagement

The terms on which the Expert will be engaged to provide the requested advice shall be as provided in accordance with the Panel arrangements applicable to the Expert.

ATTACHMENT 1: ADVANCED METERING ORDER IN COUNCIL EXTRACT

5I.8A In any case where an application pursuant to clause 5L is made, the matters the Commission must also take into account include the expenditure of a benchmark efficient entity over the entirety of, or any part of, the initial regulatory period.

5I.8B For the purposes of clause 5I.8A:

(a) Benchmark efficient entity:

(b) In determining what may be or is a benchmark efficient entity the Commission may have regard to (but is not limited to):

(i) meter density; and

(ii) number of meters subject to regulation under this Order.

(c) Benchmarking methods:

(i) The Commission may make use of either or both category level benchmarking and aggregated category benchmarking;

(ii) Note: See section 2.4.1 of the AER's *Expensiture Forecast Assessment Guideline for Electricity Distribution*, November 2013.

(iii) The Commission may have regard to (but is not limited to), both for the benchmark efficient entity and the distributor:

(A) capitalisation policies; and

(B) any allocation of costs between distribution services that are metering services and distribution services that are not metering services.

(d) Benchmarking:

(i) That a distributor is the only distributor that incurs particular expenditure or engages in a particular activity is not a matter, and is not to be taken as a matter, that prevents or limits the use of benchmarking;

(ii) That a benchmark efficient entity might not have incurred particular expenditure or engaged in a particular activity is not a matter, and is not to be taken as a matter, that prevents or limits benchmarking of that entity against a distributor and *vice versa*;

(iii) The Commission is not bound to proceed on the basis that the starting point for benchmarking is what a distributor has in fact done but may instead proceed from the starting point of what a hypothetical benchmark efficient entity would have done;

(iv) Without limiting clause 5I8B(c)(iii), the Commission may proceed on the basis that a benchmark efficient entity's remotely read interval meters become logically converted remotely read interval meters at either or both different rates and different times from the rates and times at which the distributor's remotely read interval meters become logically converted remotely read interval meters; and

(v) The Commission may disregard (in whole or in part):

(A) expenditure with respect to Distribution IT Systems where such systems are required for all customers of a distributor and not just for distribution services that are metering services; and

(B) expenditure with respect to Distribution IT Systems where that expenditure has been or is sought to be brought into account as expenditure for the purposes of standard control services.

(C) Note: For Distribution IT Systems, see also the scope of a distributor.

(vi) Clauses 5I.8B(c)(i)-(v) do not limit the matters that the Commission may have regard to when benchmarking.

ATTACHMENT 2: FEDERAL COURT PRACTICE NOTE

Practice Note CM 7
EXPERT WITNESSES IN PROCEEDINGS IN THE FEDERAL COURT OF AUSTRALIA

Introduction

1. Rule 23.12 of the Federal Court Rules 2011 requires a party to give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).

2. The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence[1], and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Guidelines

1. General Duty to the Court[2]

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert's Report[3]

[1] As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

[2] The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

2.1 An expert's written report must comply with Rule 23.13 and therefore must

(a) be signed by the expert who prepared the report; and

(b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and

(c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and

(d) identify the questions that the expert was asked to address; and

(e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and

(f) set out separately from the factual findings or assumptions each of the expert's opinions; and

(g) set out the reasons for each of the expert's opinions; and

(ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above[4]; and

(h) comply with the Practice Note.

2.2 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that* [the expert] *believes are desirable and appropriate and that no matters of significance that* [the expert] *regards as relevant have, to* [the expert's] *knowledge, been withheld from the Court*."

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court[5].

[3] Rule 23.13.

[4] See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

[5] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565,

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports[6].

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

[6] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240