Advanced Metering Infrastructure

2012-15 Budget and Charges Application

SP AusNet's Submission in response to

AER's Preliminary View on Amendments pursuant to the Australian Competition Tribunal's Orders

Submitted 14 September 2012

SP AusNet
A member of Singapore Power Group

About SP AusNet

SP AusNet is a major energy network business that owns and operates key regulated electricity transmission and electricity and gas distribution assets located in Victoria, Australia. These assets include:

- A 6,574 kilometre electricity transmission network indirectly servicing all electricity consumers across Victoria;
- An electricity distribution network delivering electricity to approximately 640,000 customer connection points in an area of more than 80,000 square kilometres of eastern Victoria; and
- A gas distribution network delivering gas to approximately 605,000 customer supply points in an area of more than 60,000 square kilometres in central and western Victoria.

SP AusNet's purpose is 'to provide our customers with superior network and energy solutions.' The SP AusNet company values are:

- Safety: to work together safely. Protect and respect our community and our people.
- Passion: to bring energy and excitement to what we do. Be innovative by continually applying creative solutions to problems.
- Teamwork: to support, respect and trust each other. Continually learn and share ideas and knowledge.
- Integrity: to act with honesty and to practise the highest ethical standards.
- Excellence: to take pride and ownership in what we do. Deliver results and continually strive for the highest quality.

For more information visit: www.sp-ausnet.com.au

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Executive Summary

Introduction and Background

This submission sets out SP AusNet's response to the document *AER Preliminary View: Advanced metering infrastructure review for SP AusNet's 2012–15 budget and charges applications*. The AER Preliminary View seeks to address the matters remitted by the Australian Competition Tribunal in *Appeal by SPI Electricity Pty Ltd [2012] ACompT 1*.

The Tribunal determined that the AER made a material error in concluding that SP AusNet's 2012-15 budget for WiMAX communications should be reduced by $72.2 million. The Tribunal concluded at paragraph 137 that there is a need to determine the extent to which incurring the proposed expenditure is not prudent. Specifically, the AER must determine the amount, if any, of SP AusNet's proposed expenditure that involves a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances.

The AER Preliminary View sets out the AER's views on the outcome of a reconsideration of SP AusNet's choice of communications technology. Based on advice from its consultant, Energeia, the AER finds that SP AusNet should have switched to a Mesh solution. The AER Preliminary View is that of the $72.2 million of expenditure remitted back to the AER by the Tribunal for further consideration, $60.5 million is not prudent.

SP AusNet notes that the Tribunal emphasised that the AER must have regard to SP AusNet's particular circumstances in its reconsideration. At paragraph 129, the Tribunal highlighted that SP AusNet had already successfully rolled out 170,000 meters and the AER had accepted the higher costs associated with WiMAX. SP AusNet is concerned that the AER has not given any consideration to these matters in its Preliminary View.

The AER adopted a reconsideration date of 28 February 2011 and a 15 year assessment timeframe. SP AusNet has previously submitted analysis to the AER that employed a later assessment date and a shorter timeframe for the purposes of the cost-benefit analysis. For the purposes of this submission, however, SP AusNet now adopts the AER's approach.

SP AusNet engaged KEMA as independent experts to undertake a cost benefit analysis of the technology options open to SP AusNet at the reconsideration date. KEMA's AMI and Smart Grid team is a worldwide leader in planning, designing, and implementing advanced communications, AMI, distribution and substation automation and Smart Grid utility systems. SP AusNet adopts KEMA's analysis for the purpose of this submission, KEMA's report and model are provided as Annexures to this submission.

KEMA's Key Findings

KEMA's report finds a number of problems with the AER Preliminary View and the Energeia Report that materially affect the validity of the AER's conclusions. A key finding made by KEMA that undermines the AER's conclusions is that the Mesh solution cannot be implemented in the timeframe proposed by Energeia.

KEMA's expert opinion is that a prudent company in SP AusNet's circumstances would require 5 months to complete the procurement of the necessary AMI infrastructure and metering end-points, and to enter into a contractual agreement with a provider. In contrast, the Energeia Report assumed that this would be completed in 2 weeks.

In KEMA's view, the first commercial launch of the new operational partial AMI system encompassing some 180,000 meters would have occurred in mid-2012 at the earliest, some 16 to 17 months into the switching and implementation process. By mid 2013, i.e. 28 months after the decision to switch technologies is made on 1 March 2011, a total of 707,000 smart meters could have been installed, integrated, and operational using a Mesh solution. Energeia assumed that the Mesh solution could be implemented in 10 months.

It is important to remember that the AER's task is to determine the amount of SP AusNet's proposed expenditure, if any, that involves a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances. SP AusNet rejects Energeia's implementation timetable on the grounds that it is unrealistic and unsubstantiated. A prudent business would plan on the basis of KEMA's advice regarding an achievable implementation timetable.

In addition to the timeframe for delivering a Mesh solution, KEMA's analysis differs from the Energeia Report in the following respects:

- KEMA has conducted a proper assessment of the coverage that can be achieved using Mesh radio given SP AusNet's territory. KEMA has determined that 93.5% coverage is achievable compared to the Energeia Report, which simply adopts Powercor's assumption of 97%.

- KEMA's estimates of the costs of switching to a Mesh solution are substantially greater than Energeia's.

- KEMA estimates the operating expenditure for the NMS under a Mesh solution to be substantially greater than Energeia's.

- KEMA has utilised SP AusNet's revised cost allocation spreadsheet, which provides a more detailed description of individual cost items. As a consequence, the Communication Operations cost for WiMAX is substantially higher than assumed by Energeia.

- KEMA has explained that differences in cost definitions and allocation methodologies create difficulties in comparing cost categories. To avoid errors, it is better to focus on the total costs of competing solutions rather than compare specific expenditure categories.

KEMA has provided a very detailed assessment of the two alternative technology options. KEMA's assumptions and approach are explained fully in its report and accompanying models. SP AusNet regards the report as highly reliable and considers that it provides a reasonable basis on which a prudent company would choose between the alternative options.

In addition to the problems with the Energeia Report identified by KEMA, SP AusNet notes that the Energeia Report uses information that could not have been available to SP AusNet,

assuming a reconsideration date of 28 February 2011. By way of example, the AER made assumptions in respect of Mesh costs using costs for Powercor and Jemena contained in the Final Determination, which was published by the AER in October 2011. Such information could not possibly have been available to SP AusNet at the time of the 28 February 2011 reconsideration.

KEMA's analysis, in contrast to the Energeia Report, only uses information that was available to SP AusNet in the period leading up to the reconsideration date.

Results of the quantitative analysis

The table below provides a summary of the estimated capital and operating expenditure of the two feasible options. These costs exclude the costs that would be incurred by SP AusNet in switching from its present WiMAX solution to the alternative Mesh solution. (Switching costs are estimated separately.)

Table 1: Capital and operating costs of WiMAX and Mesh options excluding switching costs

Cost Item	Present value costs (in $ M) over 15 years at Feb 2011		
	WiMAX	Mesh	Difference in Costs
Capital expenditure			
NIC Costs	76.1	47.5	28.6
Antenna Cost	19.7	10.1	9.6
Network and Backhaul Costs	56.8	46.8	10.0
NMS Costs	13.3	30.5	-17.2
MDMS Costs	17.7	17.7	0.0
Total capital expenditure	**183.6**	**152.6**	**31.0**
Operating expenditure			
Backhaul Communications	28.4	17.5	10.9
Communication Operations	60.4	15.1	45.3
NMS Costs	19.0	98.0	-79.0
MDMS Costs	15.0	15.0	0.0
Total operating expenditure	**122.8**	**145.6**	**-22.8**
Total capital and operating	**306.4**	**298.2**	**8.2**

The table above shows that before considering the costs that would be incurred by SP AusNet in switching from WiMAX to Mesh radio, the total present value capital and operating cost over 15 years of the WiMAX option exceeds that of the Mesh option by $8.2 million.

The KEMA report also provides a detailed estimate of switching costs. These costs are in addition to those shown above, and are attributable only to the Mesh option. The Mesh radio switching costs are summarised in the following table. The amounts shown are expressed in millions of dollars in present value terms.

Table 2: Mesh switching costs

Item	PV of cost ($ million at Feb 2011)
Replacement of WiMAX NICs	25.9
Purchase of Mesh Antenna	2.4
Mesh NICs for Meters fitted with no Comms Cards	16.6
Termination and remediation costs for WiMAX network	3.7
Additional IT Costs	1.1
Additional Meter Reading Costs	3.5
Additional PM costs	2.3
Additional Industry Costs	0.2
Additional IT Opex	1.1
Total	**56.8**

The table below provides a summary of the total costs of the two options[1]. The amounts shown are in expressed in millions of dollars in present value terms over 15 years at February 2011.

Table 3: Comparison of total costs of WiMAX and Mesh options including switching costs

	Present value (in $ M) over 15 years at Feb 2011		
	Cost of completing the WIMAX rollout	**Cost of adopting Mesh radio**	**Difference in Costs**
Capital expenditure	183.6	152.6	31.0
Operating expenditure	122.8	145.6	-22.8
Total capital & operating	**306.4**	**298.2**	**8.2**
Switching Costs	0.0	56.8	-56.8
Total Costs	**306.4**	**355.0**	**-48.6**

The analysis prepared by KEMA and summarised in the tables above shows that the total present value cost (over 15 years) to SP AusNet of adopting a Mesh solution exceeds that of the WiMAX option by $48.6 million. This difference comprises:

- the costs to switch from WiMAX to Mesh of $56.8 million; minus

[1] Note: Figures presented in this table may not reconcile exactly with figures presented in earlier tables due to small rounding errors.

- the lower capital expenditure and operating costs of Mesh compared to WiMAX over 15 years of $8.2 million.

Therefore, it must be concluded that SP AusNet adopted the lowest cost option (consistent with the commercial standard that a reasonable business would exercise in the circumstances) in continuing with WiMAX rather than switching to Mesh radio. Furthermore, KEMA has undertaken sensitivity analysis to test the robustness of its quantitative assessment. The sensitivity analysis shows that WiMAX remains the lowest cost option in each of KEMA's scenarios.

This submission provides details of the budget for 2012-15 that should now be approved by the AER.

Results of the qualitative assessment

In addition to the quantitative analysis set out above, SP AusNet has conducted a detailed qualitative assessment of the competing options in relation to the key considerations of:

- Compliance with the Order;
- Uncertainty and risk;
- Shareholder value implications;
- Customer prices and service; and
- Long term implications.

The table below explains the ratings applied in the qualitative assessment.

Rating	Description
	The option is unacceptable
	The option does not meet business needs
	The option meets business needs partially, but with significant gaps
	The option meets business needs with some gaps
	The option fully meets business needs

The following table presents a summary of the results of the qualitative assessment of the two options.

Option	Rating				
	Compliance	Uncertainty and risk	Shareholder value implications	Customer prices and service	Long term implications
1. Continue to roll out WiMAX					
2. Cease WiMAX and switch to Mesh					

The assessment shows that against all qualitative measures the WiMAX solution is preferred. This confirms the quantitative finding that WiMAX is the preferred option on the basis of minimising total costs. SP AusNet notes that if the converse conclusion had been reached – namely that Mesh was preferred on a quantitative basis – a prudent business would need to consider these qualitative factors carefully.

SP AusNet submits that a prudent business would only proceed with Mesh if it were highly likely to deliver materially lower costs without substantial risk of non-compliance with performance specifications or roll-out requirements. Specifically, in these particular circumstances, SP AusNet considers that a prudent business would only switch technology if the expected savings from Mesh (including switching costs) were at least 20% of the forecast WiMAX costs, and recovery of costs already spent was assured without any attendant performance or roll-out risks. This 20% threshold is consistent with the uncertainty associated with outturn costs, which is reflected in the Order's automatic cost recovery arrangements, which provide for the automatic cost recovery of up to 120% of the Approved Budget. In any event, significant performance and roll-out risks exist which would overcome the quantitative considerations. These risks are discussed below in Chapter 6.

For completeness, this submission also clarifies how the AER should conduct its calculation of the Approved Budget if, contrary to KEMA's expert opinion, the AER continues to find that SP AusNet should have switched to a Mesh solution. The explanation addresses significant methodological errors in the AER Preliminary View.

1 Introduction and Background

On 5 June 2012, SP AusNet provided to the AER its Reconsideration Submission in respect of the matters remitted by the Australian Competition Tribunal in *Appeal by SPI Electricity Pty Ltd [2012] ACompT 1*.

As part of the reconsideration process, the AER issued various requests for information, in relation to which SP AusNet has now fully responded.

On 18 July 2012, the AER provided to SP AusNet a draft report prepared by Energeia in response to a request for advice by the AER on the prudence of SP AusNet's proposed WiMAX expenditure over the 2012-15 budget period.

On 13 August 2012, the AER provided the following documents to SP AusNet:

1 An AER paper titled *Preliminary View*: *Advanced metering infrastructure review SPI Electricity Pty Ltd, 2012-15 budget and charges applications* (AER Preliminary View); and

2 The Final Energeia Report and supporting model: *Review of SP AusNet's WiMAX Related Expenditure,* August 2012 (Energeia Report).

This submission responds to these two documents and the underlying analysis.

The AER Preliminary View points out that the key reasons for the differences between its view and the position set out by SP AusNet in its Reconsideration Submission were:

1 A reconsideration date of 28 February 2011 being applied by the AER, rather than 19 May 2011 as applied by SP AusNet.

2 Examination by the AER of the WiMAX and Mesh radio costs over a 15 year timeframe, rather than for the 2012-15 period.

3 Differences in respect of the approach to the costs that would be affected if SP AusNet were to decide to switch to Mesh radio.

4 The commencement date of the switch to Mesh radio, being 1 March 2011 in the AER's view and 1 January 2012 in SP AusNet's view.

5 Differences in the assumed coverage of Mesh radio, with coverage of 97% being assumed in the AER's analysis, and 85% being assumed in SP AusNet's.

6 Differences in the estimated costs of switching from WiMAX to Mesh radio.

The AER's conclusion is that the commercial standard that a reasonable business would have exercised in SP AusNet's circumstances would have been, following the reconsideration as at 28 February 2011, to switch to Mesh radio. By deciding to incur the proposed WiMAX communications expenditure after this time, the AER says that SP AusNet substantially departed from this standard. The AER says that over a 15 year period from

2011 to 2025, the cost of WiMAX as at 28 February 2011 is 58% higher than for Mesh radio, including switching costs.[2] Over the 2012-15 budget period the difference is said to be 46%.

SP AusNet has considered the AER Preliminary View and the Energeia Report and now adopts a reconsideration date of 28 February 2011 and a 15 year timeframe for the analysis of the viable options. However, for the reasons set out in this submission, SP AusNet does not accept the conclusions set out in the AER Preliminary View, nor does SP AusNet accept the analysis contained in the Energeia Report.

SP AusNet engaged DNV KEMA ("KEMA") to provide expert analysis, given the information available to SP AusNet at 14 February 2011, by way of a 15 year cost benefit assessment of SP AusNet continuing with a WiMAX communication solution in comparison to adopting an RF Mesh solution. KEMA has also reviewed the assumptions made in the Energeia Report. KEMA's report and model are provided as Annexures to this submission.

SP AusNet submits that using the information available on 14 February 2011 is consistent with lodging the Submitted Budget on 28 February 2011. In contrast to the AER's approach, the information "cut-off" date of 14 February 2011 recognises that the Submitted Budget must be subject to an internal sign-off process. It is not feasible to amend the Submitted Budget to reflect information that only becomes available less than 2 weeks prior to the submission date.

As explained in this submission, KEMA's analysis demonstrates that the lowest cost communications option available to SP AusNet, in terms of total forward looking operating and capital expenditure and additional costs associated with switching from WiMAX to Mesh, would be to continue to rollout the WiMAX solution.

Qualitative assessment of a number of important considerations including risks relating to non-compliance with performance specifications and roll-out requirements also favour the continuation of the WiMAX solution.

To explain these conclusions and respond to the AER Preliminary View and Energeia Report, the remainder of this submission is structured as follows:

- Chapter 2 identifies a number of legal matters where the AER Preliminary View is inconsistent with the Tribunal's Reasons for Decision or otherwise falls into error.
- Chapter 3 discusses a number of methodological issues that are relevant to the reconsideration of the Submitted Budget.
- Chapters 4 and 5 examine the costs of delivering the Mesh and WiMAX solutions respectively, over the 15 year study period.
- Chapter 6 discusses the qualitative matters that are integral to the commercial standard that should be applied in the reconsideration.
- Chapter 7 presents a cost comparison of the Mesh and WiMAX solutions and concludes with an updated 2012-15 budget amount.

[2] See pages 5 and 6 of the AER Preliminary View.

- Annexure 1 presents KEMA's expert report.
- Annexure 2 provides a copy of the KEMA model.
- Annexure 3 provides templates on the costs of WiMAX as at 28 February 2011.
- Annexure 4 explains the errors with the Energeia's model.
- Annexure 5 sets out SP AusNet's process maps for switching to a Mesh solution.
- Annexure 6 sets out SP AusNet's AMI Comms Card and Antenna Installation Standard.
- Annexure 7 provides evidence that Mesh radio cannot satisfy the service specifications.
- Annexure 8 sets out WiMAX costs already incurred but not recovered by SP AusNet.
- Annexure 9 contains maps depicting SP AusNet's urban growth corridors, and the planned locations of WiMAX towers.

2 Legal considerations

2.1 Introduction

This chapter addresses a number of legal matters that are relevant to the AER's determination of the Approved Budget for 2012-15. The chapter explains why, in a number of respects, SP AusNet considers that the AER Preliminary View is inconsistent with the Tribunal's orders and reasons. In particular:

- Section 2.2 notes that the AER Preliminary View adopts a commercial standard that repeats the error identified by the Tribunal.
- Section 2.3 explains that the AER's approach to adjusting SP AusNet's Approved Budget for 2012-15 is inconsistent with the Order.
- Section 2.4 explains that the AER Preliminary View relies inappropriately on other distributors' cost information and therefore repeats errors identified by the Tribunal.
- Section 2.5 notes that the AER Preliminary View is not consistent with the Tribunal's decision in relation to the costs already incurred by SP AusNet.
- Section 2.6 explains that the AER's approach to 2011 switching costs is inconsistent with the Tribunal's reasons and wrongly assumes that SP AusNet is able to recover these costs when it now cannot.
- Section 2.7 identifies a number of issues with the Energeia Report, which lead to the conclusion that the report cannot be relied upon by the AER.

2.2 Commercial Standard

The AER's Preliminary View is that the commercial standard a reasonable business in SP AusNet's circumstances would have exercised would have been to fully reconsider its Submitted Budget for the 2012-15 budget period and in so doing, would have decided to switch to Mesh radio. The AER forms the preliminary view that deciding not to switch to Mesh radio and incurring the additional expenditure associated with WiMAX communications, as proposed by SP AusNet, involves a substantial departure from that standard.[3]

Such a conclusion simply repeats the error made by the AER in its final determination. As the Tribunal has made plain, under the Order it is necessary to determine whether prudency required that the proposed expenditure not be incurred when measured against the commercial standard that a reasonable business would exercise in the circumstances. It is not sufficient to conclude that SP AusNet had not reconsidered the technology options.

[3] See page 1 of the AER's Preliminary View.

The Tribunal has explained that the 'next step' is to determine whether any amount of expenditure is not prudent within the meaning of the Order. [4]

SP AusNet's Reconsideration Submission explained its approach to defining the commercial standard. In broad terms, the commercial standard is consistent with only incurring prudent expenditure. However, it also recognises that 'prudency' cannot be confined to financial considerations alone. Instead, the commercial standard should explicitly recognise SP AusNet's compliance obligations as well as a number of qualitative considerations, which must include a careful consideration of risk and uncertainty.

It is also important to note that the Tribunal has emphasised that the AER must have regard to SP AusNet's particular circumstances. At paragraph 129, the Tribunal noted that SP AusNet has already successfully rolled out 170,000 meters and the AER had accepted the higher costs associated with WiMAX:

> "Without determining this matter, for the purposes of this discussion it may be assumed that the benchmarks determined by the AER are reflective of the costs of an AMI roll out using mesh radio, if that technology were chosen from the outset. That is not the circumstances of SP AusNet, however. SP AusNet has embarked on its roll out using WiMAX. It has already installed over 170,000 meters and incurred significant expenditure. The commencement of the roll out using WiMAX technology was undertaken in light of the AER's earlier determination in which it accepted the higher costs associated with WiMAX as being prudent."

It is important that the AER's assessment of the commercial standard takes full account of these facts.

The AER Preliminary View does not make it clear whether the AER agrees with SP AusNet's proposed commercial standard. As noted above, the AER Preliminary View appears to repeat the error identified by the Tribunal. Furthermore, the AER Preliminary View does not address the question of what constitutes 'a substantial departure' from the commercial standard.

If the AER found that the Mesh solution best satisfied the commercial standard, the AER would then need to consider whether adopting WiMAX would constitute a substantial departure from this commercial standard. It is not enough to simply assert that any expenditure incurred by SP AusNet above the costs of a Mesh solution is imprudent.

In terms of the determining the costs of the Mesh solution, the AER must follow the Tribunal's reasoning. The Tribunal makes it clear that the AER would need to consider the cost of a complete roll out of Mesh radio, the costs already spent in the partial roll out of WiMAX and the costs associated with switching to a different technology at that stage[5]. It is evident from the AER Preliminary View that the AER has not followed the Tribunal's conclusions. In section 7.4 of this submission, SP AusNet comments further on this issue.

In this submission, SP AusNet has conducted a careful reconsideration of expenditure associated with an ongoing commitment to WiMAX against viable alternatives as at 28 February 2011 in accordance with the findings and reasons of the Tribunal.

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4 Paragraph 137 of the Tribunal 's Reasons.
5 Paragraphs 126, 129, 130 and 137 of the Tribunal's Reasons.

2.3 AER's proposed amendments to the Approved Budget

If the AER's Preliminary View is correct that incurring the proposed WiMAX expenditure is a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances (which is denied) it can only remove from the 2012-15 budget that expenditure that it establishes involves a substantial departure from the commercial standard.[6]

The AER:

1 does not have power to remove any expenditure from the 2012-15 budget where the expenditure is a contract cost (unless the AER establishes the contract was not let in accordance with a competitive tender process)[7];

2 is only permitted to remove expenditure from the budget that it establishes involves a substantial departure from the commercial standard;[8] and

3 is further restricted to removing only expenditure it establishes is not prudent in respect of the following categories:

- Meter supply capex;
- Communications infrastructure maintenance opex;
- IT opex.[9]

The AER's Preliminary View is to increase its Final Determination of SP AusNet's 2012-15 Approved Budget by $11.7 million, being in respect of Mesh radio switching costs it assumes would be incurred in the 2012-15 period.

There is a significant error in the AER's approach.

The AER's explanation of its proposed amendments to the Approved Budget is to say that had SP AusNet reconsidered its commitment to WiMAX as at 28 February 2011 and decided to switch to Mesh radio, SP AusNet would have incurred additional expenditure of only $11.7 million above its Approved Budget for 2012-15.

The AER has determined (in SP AusNet's submission, incorrectly) that a reasonable business in the circumstances would have switched to Mesh radio because the cost of WiMAX is approximately 58 percent higher than for mesh radio, including the costs to switch.

However, of that higher amount the AER is constrained, if it is correct in respect of finding that there has been a substantial departure from the commercial standard, to only removing those costs which fall within the three categories (listed above) of costs remitted by the Tribunal.

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6 Order clause 5C.3(b)(iv) and paragraph 138 of the Tribunal's Reasons.
7 Order clause 5C.3(a).
8 Order clause 5C.3(b).
9 Order 1(2) of the Tribunal's Orders of 26 March 2012 and page 1 of the AER's Preliminary View.

The AER is therefore required to determine the costs to SP AusNet of adopting the Mesh radio solution in relation to the three categories listed above, which include the costs already incurred by SP AusNet and the costs of switching to Mesh (which is discussed in further detail below).

In determining the costs to SP AusNet of adopting the Mesh radio solution the AER must act consistently with the analysis that supports its view that a reasonable business in the circumstances would have switched to Mesh radio and as constrained by the Tribunal's reasons on remitter. The AER's analysis of the costs of a Mesh radio solution adopts SP AusNet's circumstances of rolling out modular meters but in proposing amendments to the Approved Budget adopts an average of the Mesh radio costs of the other distributors, which costs are heavily dependent on the lower cost of integrated meters. This is a fundamental inconsistency.

Furthermore, rolling out integrated meters would not constitute a feasible Mesh solution. In particular, it would involve substantially greater switching costs than presented in this submission, as existing modular meters must be removed and then replaced by integrated meters. Customer service costs, notification for supply interruptions and safety issues would also add to the switching costs. Moreover, rolling out integrated meters would result in the delayed completion of the entire AMI project program, which would be unacceptable to Government. This issue is addressed further below.

2.4 AER's approach relies inappropriately on other distributors' costs

The AER states that the Tribunal "accepted that the benchmarks determined by the AER were reflective of the costs of an AMI rollout using Mesh radio if SP AusNet had chosen that technology from the outset"[10]. The AER refers to paragraph 129 of the Tribunal's reasons. The AER has taken the Tribunal's reasons out of context. The Tribunal actually said that "for the purposes of the discussion it may be assumed that the benchmarks determined by the AER are reflective of the costs of an AMI rollout using Mesh radio". The Tribunal therefore did not determine that the AER's benchmarks accurately reflected SP AusNet's costs of adopting a Mesh solution.

This is relevant to the AER's approach to its estimate of the Mesh radio costs, which relies on the Energeia Report. Energeia assumes that SP AusNet would be able to implement a Mesh radio solution achieving a coverage of 97% of its territory, (based on the Powercor's submission of 28 February 2011 in respect of its coverage), and using the same Mesh costs as those estimated by Powercor and Jemena Electricity Networks (JEN) in their February 2011 proposed budgets.[11]

The KEMA Report explains that Powercor's Mesh radio coverage and Powercor's and JEN's Mesh radio costs are not a reasonable basis on which to model the costs to SP AusNet of rolling out a Mesh radio solution in its territory as at 28 February 2011. These distributors have different geographical territories; customer densities; contractual arrangements and cost sharing arrangements that deliver economies of scale. These distributors would therefore achieve a lower cost than SP AusNet.

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10 AER Preliminary View, page 4.
11 Energeia Report, pages 12-13, 27-30.

By adopting other distributors' costs, the AER's approach fails to give adequate regard to the circumstances of SP AusNet as required by clause 5I.8 of the Order. It is also inconsistent with the reasons of the Tribunal at paragraph 130, where the AER's previous approach of determining what costs are not prudent by reference only to the Mesh costs of the other businesses was found to be an error of fact.

2.5 Costs already incurred

The AER notes specifically, and SP AusNet agrees, that the Tribunal identified that SP AusNet's costs already incurred in implementing its WiMAX solution are a relevant consideration for determining whether SP AusNet should have switched communications technology.[12]

However, the AER then reasons that it does not consider any costs already invested up to the point of a decision are relevant to the decision to switch. By failing to have regard at all to the costs already incurred by SP AusNet in implementing the WiMAX solution, the AER repeats the error made by it in its final determination. At paragraph 126 the Tribunal says:

> "The Approved Budget does not contain any allowance for the costs already incurred in installing the [178,000] meters and other aspects of the WiMAX solution already installed or committed to…"

At paragraph 130 the Tribunal says:

> "The AER's determination does not take account of the costs already incurred by SP AusNet in its WiMAX roll out….As a result of this failure, the determination by the AER of what costs are not prudent constitutes an error of fact."

The further consideration as remitted to the AER by the Tribunal must be undertaken in accordance with the Reasons for Decision of the Tribunal. In particular, if the proper application of the commercial standard leads to a decision to switch to the Mesh radio solution (which it does not), the AER must determine the budget for the 2012-15 in accordance with the Tribunal's findings. Specifically, the budget amount should include the cost of a complete roll out of Mesh radio; the costs already spent in the partial roll out of WiMAX; and the costs associated with switching to a different technology at that stage.

Costs already incurred are relevant to a reasonable business in SP AusNet's circumstances. A reasonable business would want to ensure it was going to be able to recover all costs already incurred, regardless of the technology solution selected going forward. As a minimum, a prudent business acting in accordance with the commercial standard would seek Government and regulatory assurances regarding the recovery of these costs. The Order is not immutable and recent experience shows the Victorian Government is willing to amend legislation to deny the recovery of costs adjudicated to be recoverable.

[12] Page 17 of the Preliminary View.

2.6 Treatment of 2011 Switching Costs

SP AusNet does not agree that costs incurred in 2011 cannot be included in the approved budget for 2012-15. The analysis on page 32 of the AER Preliminary View is that switching to Mesh on 28 February 2011 would have provided SP AusNet with the opportunity to recover switching costs incurred in 2011 through a revised budget for the 2009-2011 period. While this is technically correct, it fails to acknowledge the fact that in 2012 SP AusNet cannot now seek to amend that budget. The AER's reasoning has no practical application. It is also simply at odds with the Tribunal's Reasons.

The AER Preliminary View is in error because:

- It assumes that switching costs have already been incurred and recovered, when that is not the case; and
- It assumes that switching costs can be recovered through an adjustment to the 2009-2011 budget when they cannot be; and
- It excludes switching costs from the budget for 2012-15 when it is directed by the Tribunal to include them.

The AER notes that a Charges Revision Application in respect of actual costs incurred in 2011 would have enabled SP AusNet to recover those switching costs. Again, SP AusNet is not now able to incur the switching costs in 2011. The reality is that none of these options are now open to SP AusNet.

It was not until April 2012 that the Tribunal found that the AER's approach for determining the WiMAX related costs it considered not to be prudent was in error and remitted the $72.2 million back to the AER for reconsideration. While that reconsideration must be undertaken on the basis of information available on 28 February 2011, the practical reality remains that since that time SP AusNet has rightly continued to rollout its WiMAX solution and is not able to now amend its 2009-11 budget or include switching costs in the 2013 Charges Revision process.

By excluding switching costs from the 2012-15 budget assessment, the AER Preliminary View is deviating materially from the Tribunal's reasons at paragraphs 126 and 130.

2.7 Energeia report

The AER's Preliminary View is based on a cost benefit analysis undertaken in the Energeia Report. The KEMA Report identifies a number of specific limitations of the Energeia Report and where Energeia's assumptions are unsubstantiated, unsupported or otherwise considered to be unreasonable. In addition to the points made by KEMA, it is noteworthy that:

1 The Energeia cost benefit analysis relies on a unit price for Mesh modules, which is confidential to a third party and has only just recently been made available to

SP AusNet. It is information that could not have been in SP AusNet's possession as at 28 February 2011.[13]

2 There are many other instances of the Energeia Report using information that would not have been available to SP AusNet, assuming a reconsideration date of 28 February 2011. By way of example, the AER made assumptions in respect of Mesh costs using costs for Powercor and Jemena contained in the Final Determination, which was published by the AER in October 2011. That information could not have been available to SP AusNet at the time of the reconsideration.

3 The draft Energeia Report of 18 July 2012 relied on certain information by way of references to telecommunication solution and service providers (page 3), information provided by third party consultants (page 6), consultations with suppliers and service providers to determine what a reasonable timeline for switching would have been in the circumstances (page 19) and discussions with telecommunications solution and service providers about the costs that would have been known at the time (page 21).

SP AusNet noted it was imperative that it be informed of this material. Instead, in the final Energeia Report the references to this information provided by service providers and third party consultants has been deleted and no explanation has been given for their deletion. In some cases reference has now been made to other material, including for example the PG&E Mesh deployment (see, for example, page 23 of the final report). It is curious that Energeia's analysis between the draft and final report remain the same, but the sources for the assumptions have either been deleted or substituted. SP AusNet is denied a chance to adequately assess the material by reference to its proper source.

In addition to the points set out above and in the KEMA report, SP AusNet has undertaken its own review of Energeia's model, and has identified a number of errors in that model. Annexure 4 sets out the results of SP AusNet's review.

For the reasons set out in this submission and in the KEMA Report, the cost benefit analysis undertaken by Energeia is:

1 based on information not available to SP AusNet assuming a reconsideration date of 28 February 2011;

2 based on unsubstantiated and unreasonable assumptions;

3 contains numerous errors as explained in Annexure 4;

4 consequently is unreliable; and

5 cannot be relied upon by the AER to establish that incurring the proposed expenditure of $72.2 million is a substantial departure from the commercial standard.

[13] See also list of outstanding information sources sent to the AER on 24 August 2012 by letter from Johnson Winter & Slattery to Australian Government Solicitor.

3 Methodological issues

3.1 Introduction

This chapter addresses a number of methodological issues that are relevant to the reconsideration and the proper application of the commercial standard. The remainder of this chapter addresses the following matters:

- Section 3.2 identifies the feasible technology options.
- Section 3.3 comments on the date of the reconsideration.
- Section 3.4 explains that the AER's approach to the availability of information is inconsistent with the commercial standard.
- Section 3.5 sets out SP AusNet's position in relation to the expenditure timeframe.
- Section 3.6 explains the assumptions regarding compliance with Order rollout schedule which have been adopted by SP AusNet for the purpose of defining the implementation timeframe for, and estimating the cost of a Mesh radio solution.

3.2 Feasible technology options

The first step in the reconsideration is to identify the feasible options. SP AusNet's June 2012 Reconsideration Submission identified the following feasible options:

- Option 1: To continue with SP AusNet's plan to complete the roll out using predominately WiMAX communications;
- Option 2: To leave the existing WiMAX infrastructure in place and build a second Mesh network to complete the rollout; and
- Option 3: To discontinue the use of WiMAX technology and adopt a Mesh solution for the entire roll out, which is aligned with the approach adopted by other distribution businesses.

The AER's analysis compares only WiMAX and Mesh solutions (Options 1 and 3) because it considers these two technologies are the only feasible solutions in the relevant timeframe.[14] SP AusNet has now adopted the AER Preliminary View that WiMAX or Mesh radio are the only two feasible options.

As explained in Section 2.3, the Mesh solution would not be technically feasible if it involved the roll out of integrated meters. The additional switching costs and customer costs arising from this solution, together with the overall delay in completing the AMI project would prove unacceptable to Government.

[14] See page 15.

3.3 Date of reconsideration

The AER Preliminary View states that the relevant reconsideration date for the purposes of the remitter ordered by the Tribunal is 28 February 2011. SP AusNet's Reconsideration Submission and the analysis provided with it was undertaken on the basis of a reconsideration date in the months leading up to 19 May 2011. It remains SP AusNet's view that there are logical grounds for a reconsideration date as originally proposed.

However, having now considered the AER's Preliminary View on this issue, SP AusNet has changed its position and accepts that the relevant reconsideration date is 28 February 2011 and that the reconsideration would have taken place in the months preceding this date.[15]

3.4 Information relevant to the reconsideration

The AER Preliminary View explains that its analysis is conducted using information[16]:

1 known to be available to SP AusNet as at the reconsideration date, for both WiMAX and Mesh radio;

2 that would have been obtainable by a reasonable commercial business in the circumstances; and

3 from the AER's October 2011 Final Determination that is relevant to the reconsideration.

It is mandated by clause 5I.8 of the Order that the circumstances of SP AusNet and the information available to it at the relevant time be given fundamental weight. The Energeia Report on which the AER relies:

1 uses information that was not available to SP AusNet at 28 February 2011;

2 uses information which is derived from either:

(a) information submitted by other distributors such as Powercor on 28 February 2011 and not published on or before that day; and

(b) information derived from the AER's final determination of the 2012-15 budget for Powercor and JEN in October 2011.

This information was not available to SP AusNet as at 28 February 2011. The information did not exist and was otherwise not published or available to SP AusNet.

Furthermore, 28 February 2011 is relevant because it is the date that the Submitted Budget must be lodged with the AER. As such, it is inconceivable that new information that becomes available less than 2 weeks prior to that date could be included in the proposed budget. A prudent business considering a possible change in technology would need to

[15] As described by the AER on page 7 of the Preliminary View.
[16] Ibid, page 10.

engage with its Board, Government and the AER prior to lodging the submission. The decision process would be as follows:

- A recommendation based on cost–benefit analysis and qualitative considerations would be provided to the Board 2 weeks prior to the submission date of 28 February 2011.
- If the analysis concluded that a technology change were warranted, the Board would likely require management to engage with Government and the AER prior to lodging the submission to obtain an 'in principle' acceptance of the proposed change.
- The reconsideration of 28 February 2011 would take into account feedback from Government and the AER, but would not revisit the cost benefit analysis that formed the basis of the Board's decision.
- Further dialogue with Government and the AER would continue following the lodgement of the submission to ensure cost recovery and obtain assurance that any non-compliance as a result of the technology change would be regarded as acceptable in the circumstances.
- Discussions with SP AusNet's current and prospective external service providers would commence immediately prior to lodging the submission and would likely continue for a number of weeks thereafter. Additionally, SP AusNet must take care to ensure that future tender processes are not compromised.

While the detail of the above process may vary slightly depending on the particular circumstances, it is not possible to make changes to the proposed budget based on information that becomes available 'on the day'. Claims for confidentiality by distributors would prevent access to accurate cost information, in any event. It is also inconceivable that the earliest implementation date for a change in technology would be 1 March 2011.[17] The AER Preliminary View wrongly assumes that it is a simple matter to change technology, and that no forward planning or consultation with service providers, customers, regulators or Government would be required. The AER Preliminary View therefore fails to adopt a reasonable commercial standard; it is also inconsistent with the Order and the Tribunal's decision.

The AER Preliminary View also says that SP AusNet has used the AER's final determinations for Powercor and JEN to estimate some of the Mesh costs in its Reconsideration Submission. That is true, however, in reconsidering its position based on the AER's Preliminary View and the Energeia Report, SP AusNet's analysis of the Mesh radio costs is now based on the information identified in the KEMA report and only on information available at 28 February 2011. In practical terms, only information reasonably available leading up to 14 February 2011 could be employed in a reconsideration undertaken on 28 February.

The AER's Final Determinations published in October 2011, on any view, could not have been information available to SP AusNet for the purposes of a reconsideration on 28 February 2011. The AER notes that its Final Determination, while not known as at 28

[17] Ibid, page 10.

February 2011, "represents the AER's view of prudent mesh radio costs from 28 February 2011 because the final determination adjusted Powercor and JEN's 28 February 2011 Submitted Budgets to ensure the expenditure was in scope and prudent".[18] This statement emphasises that as at 28 February 2011, not only would SP AusNet not have had access to Powercor and JEN's submitted budgets, it could not possibly have foreseen the AER's adjustments to those Submitted Budgets. To fix SP AusNet with the Final Determination costs will be to take into account information that was not only unavailable in February 2011, but could never have been obtained or even anticipated until October 2011, by which time, according to the Energeia Report and the AER Preliminary View, SP AusNet should have already switched to Mesh radio.

Reliance on Powercor and JEN's proposed budget in February 2011 and the Final Determination budget costs of October 2011 is outside the scope of the reconsideration remitted by the Tribunal. The correct approach is to use only information available to SP AusNet in the period leading up to 14 February 2011, as KEMA has done in its attached report.

3.5 Expenditure timeframe and modelling approach

In its Reconsideration Submission, SP AusNet assessed three options over the 2012-15 budget period.

The AER Preliminary View takes the position that the decision to switch communications technology would be influenced by the higher initial costs in doing so, but a reasonable commercial business would also consider the ongoing costs over the life of the assets.[19]

The AER and the Energeia Report purport to compare the relevant expenditure over a 15 year timeframe from 2011 to 2025 discounted to the reconsideration date. The AER considers this timeframe is what a reasonable business in the circumstances would use because 15 years is the assumed meter assessment depreciation schedule under the Order and therefore represents a full rollout cycle.[20]

SP AusNet has reconsidered its position in this regard and has now presents its analysis of what is accepted to be the two viable options open to it as at 28 February 2011, being WiMAX or Mesh radio, over the period from 2011 to 2025. The 15 year timeframe and the reconsideration date are reflected in KEMA's modelling and report. It should be noted that KEMA's modelling approach is to break the costs down into three main areas:

- Costs of continuing with the WiMAX solution;
- Costs of adopting a Mesh solution; and
- Transition (switching) costs in moving from WiMAX to a Mesh solution.

[18] Page 11.
[19] Page 12.
[20] Page 13.

In accordance with the Tribunal's conclusions, the costs of a Mesh solution must include the second and third elements. In addition, for the purpose of setting a Mesh solution budget for the 2012-15 period, the WiMAX costs incurred to date would also need to be included.

KEMA's assessment approach is similar to the AER Preliminary View in focusing solely on the cost differences between the WiMAX and Mesh solutions. The relevant costs include operating and capital expenditure associated with communications infrastructure, NICs (WiMAX, NMS and 3G), antennas, NMS, Communication Operations and transition activities.

In its cost benefit analysis, KEMA has not examined costs that are independent of the choice of communication solutions, such as meter costs. Although these costs may be excluded from the cost benefit analysis (because they are the same for both options), these costs must be included in the 2012-15 budget.

The AER is entitled only to remove costs which it establishes are not prudent in respect of the three categories of costs remitted by the Tribunal.

3.6 Assumptions regarding compliance with Order rollout schedule

SP AusNet's Reconsideration Submission of June 2012 explained that a critical consideration in any decision to switch to an alternative technology is the extent to which the decision would enable SP AusNet to meet the rollout schedule specified in clause 14 of the Order.

Under clause 14, SP AusNet must use its best endeavours to install a remotely read interval meter (which is operational as a remotely read interval meter in accordance with the Specifications) for all of the metering installations for customers with annual electricity consumption of 160 MWh or less for which it is the responsible person on 31 December 2013 by that date.

At the time of this reconsideration (28 February 2011), the remaining AMI roll out milestones specified in Schedule 1 of the Order required the following percentages of remotely read interval meters to be installed and operational as a remotely read interval meter in accordance with the Specifications:

- 25 per cent by 30 June 2011;
- 60 per cent by 31 December 2012;
- 95 per cent by 30 June 2013; and
- 100 per cent by 31 December 2013.

In addition, SP AusNet must also comply with the Minimum AMI Service Level Specification, dated September 2008. The Minimum AMI Service Level Specification includes the following meter reading obligations for all meters, from 1 January 2012:

- No less than 95% being actual data from meters (with the remainder substituted) to be available by 6am the following day;

- No less than 99% of actual data within 24 hours of the time in previous point; and
- No less than 99.9% of actual data within ten business days from day the consumption occurred.

SP AusNet's Reconsideration Submission noted that:

- A failure by the company to meet its regulatory obligation to install AMI meters in accordance with clause 14, and by reference, Schedule 1 of the Order would expose SP AusNet to a very significant penalty (up to $597,250) for the contravention and a further penalty of up to $59,725 per day for a continuing contravention.
- It is technically possible that SP AusNet would lose its distribution licence as a result of non-compliance. For the purpose of its reconsideration, however, such a sanction is not regarded as a likely response for a failure to meet the AMI roll out timetable. Nonetheless, in its reconsideration of communication technologies the Board would be apprised of the extent to which different technology options exposed SP AusNet to the risk of non-compliance and the possible penalties, no matter how remote.

In relation to these matters, the AER Preliminary View states[21]:

> "The obligation upon SP AusNet under the AMI Order is to use its 'best endeavours' to meet the milestones set out in Schedule 1. As to what constitutes 'best endeavours' is a matter for the AER to determine on a case by case basis in accordance with the relevant requirements of the AMI Order.
>
> A reasonable business would mitigate the risks of potential non-compliance with the AMI Order by advising the (Victorian) Government and the AER at an early stage on these possibilities that may result from a decision to switch communications technology. If SP AusNet did fall behind in the rollout schedule, it could make representations to the regulator on matters the AER should have regard to in determining whether SP AusNet used its 'best endeavours' to comply with the rollout obligations.
>
> The AER considers SP AusNet's concerns about sanctions for non-compliance with the AMI Order are not well founded, in part because they do not factor in risk mitigation strategies. The AER considers that switching to mesh radio would not result in delays, and SP AusNet could have met its obligation under the AMI Order to use its 'best endeavours' to comply with the rollout schedule."

Assumptions regarding the extent of SP AusNet's compliance with each milestone and service level specifications have a significant bearing on the overall costs of implementing and completing the rollout of the Mesh solution. For instance, designing a 'pure' Mesh radio solution that would ensure that SP AusNet achieves 100% compliance with the service level specifications would require the parallel operation of Mesh and WiMAX communication technologies and associated systems for some time, and would therefore result in a very high cost estimate for the Mesh option.

[21] Ibid, pages 27 and 29.

Section 4.2 of this submission sets out details of the timeline for implementation of a Mesh radio solution. In designing this timeline, careful consideration has been given to the need for the timeline to be feasible, and to provide for the efficient delivery of the AMI roll out program using Mesh technology. Accordingly, the timeline for delivery of the Mesh option recognises that there is a trade-off between compliance with the rollout schedule on the one hand, and the cost of delivering the Mesh solution on the other hand. The timeline described in section 4.2 reflects an appropriate balancing of these two factors.

Specifically, under the timeline and the associated project plans for delivery of the Mesh solution it is recognised that SP AusNet is unlikely to be able to meet the intermediate milestones (at 31 December 2012, and 30 June 2013) specified in Schedule 1 of the Order. However, the timeline recognises the importance to Government of the ultimate milestone, which requires completion of the rollout by 31 December 2013.

4 Costs of delivering the Mesh solution over 15 years

4.1 Introduction

Based on KEMA's expert opinion, this chapter addresses the costs of delivering the Mesh solution in accordance with the Tribunal's decision and the methodology outlined in Chapter 3. The remainder of this Chapter is structured as follows:

- Section 4.2 sets out an appropriate timeline for implementing the Mesh solution.
- Section 4.3 addresses the issue of Mesh coverage for SP AusNet's territory.
- Section 4.4 sets out the estimated operating and capital costs of a Mesh radio solution over a 15 year horizon.
- Section 4.5 explains the switching costs that SP AusNet would incur if the Mesh solution were adopted.
- Section 4.6 sets out the other business stream costs that would arise as a result of adopting the Mesh solution.

4.2 Implementation timeline

SP AusNet's Reconsideration Submission developed an implementation timeline for a Mesh solution, assuming that the reconsideration occurred in the months leading up to 19 May 2011. SP AusNet's assessment indicated that if it were to implement a Mesh radio solution, it would commence switching in May 2011, start rolling out Mesh meters in January 2012 and complete the rollout in June 2014.[22] The timeline also assumed that SP AusNet would continue to rollout its WiMAX solution until 1 January 2012.

SP AusNet has reconsidered its assumptions in respect of the timetable for implementation and rollout for Mesh radio on the advice of KEMA. SP AusNet notes the following points in relation to the timeline, assuming a decision to replace WiMAX with Mesh radio communications is made on 1 March 2011:

1. For March and April 2011 SP AusNet would continue to roll out WiMAX enabled meters to ensure that it remains positioned to meet the Order requirement that 25% of meters be capable of remote reading by 30 June 2011. The Energeia Report misunderstands when it states that deployment of meters without a NIC from 1 March 2011 would not have impacted the 30 June target, that the meters need to be functional in accordance with the specifications. In contrast, SP AusNet notes the AER's views in its final determination that "the communications card and zigbee card

[22] Page 18 of the Reconsideration Submission.

represent an integral part of a 'remotely read interval meter' as defined by the Order".[23]

2. During those months, SP AusNet would hold discussions with the AER and Government with the following expected outcomes:

    a. Those discussions lead to regulatory and Government support for changing to Mesh so that the roll out of WiMAX-enabled meters can be stopped, but

    b. Whilst there may be some relaxation of the subsequent interim milestones for remotely read meters this will not lead to a relaxation of the final roll out target. SP AusNet therefore adopts the reasonable assumption that the Government will insist that the project should be completed on time.

3. Hence, according to 2(b) above, there will be a requirement to roll-out meters without any NIC cards until Mesh enabled meters are available from the factory.

4. Also in support of 3 above, if SP AusNet did not continue to roll-out meters until Mesh enabled meters were available from the factory, it would lead to a loss of the trained installation workforce over that period; additional costs of refresher training; and increased costs of acquiring replacement resources.

KEMA has undertaken a detailed analysis of the timeframes required to complete the transition to a Mesh solution. KEMA's expert opinion is that a prudent company in SP AusNet's circumstances would require 5 months to complete the procurement of the necessary AMI infrastructure and metering end-points, and to enter into a contractual agreement with a provider.

In KEMA's view, the first commercial launch of the new operational partial AMI system encompassing some 180,000 meters would have occurred in mid-2012 at the earliest, some 16 to 17 months into the switching and implementation process. By mid 2013, i.e. 28 months after the 1 March 2011 decision date, a total of 707,000 smart meters could have been installed, integrated, and operational using a Mesh solution.

The detailed timeline developed by KEMA is based on their expert opinion that the following activities and tasks are required to effect transition to a Mesh solution:

- Requirements Definition;
- Procurement Process;
- Logistical Planning & PMO (contract management; deployment management; schedule and budget tracking, etc.);
- Installation / configuration / commissioning of Communications and Support systems;
- Communications Systems and Facilities Integration & Testing / RF Optimisation

[23] See page 52 of the final determination for SP AusNet.

- IT systems Integration and Testing;
- Performance / Security / Regulatory Compliance Verification;
- Systems Acceptance Testing / Punch-list Items' Resolution;
- Additional Manual Reading of a Subset of Meters;
- As-built / Baseline System Documentation;
- Utility Staff Training; and
- O&M Procedures Development.

Estimates of the resulting switching costs are presented in section 4.5.

In sharp contrast to the transition tasks and timelines identified by KEMA, the Energeia Report assumes an implementation timeline for Mesh radio condensed to a 10 month period starting in February 2011. Energeia therefore assumes that SP AusNet meets the 1 January 2012 AMI services target.[24] For the reasons explained in the KEMA report, this assumption is entirely unreasonable and is not supported by an appropriately considered assessment of the time it would take to complete the steps outlined above from the time of the decision to switch to Mesh radio to implementation.

The AER relies on the Energeia Report to support its assumption that the implementation of Mesh radio could be condensed to 10 months. However, Energeia's opinion is said to be based on a review of implementation timelines from other Victorian DNSPs, PG & E and the experience of Energeia personnel deploying over 300,000 smart interval meters and 10,000 AMI meters.[25] Energeia says that its analysis of the start to finish time required by JEN and UED was around 9.5 months, based on receipt and installation of technology on 1 September 2009 to delivery of daily interval data to market on 14 June 2010.[26]

In relation to both the PG&E and JEN and UED examples, Energeia's assessment of the required timeframes is incorrect. In particular:

- To draw conclusions based on UED and JEN Energeia relies on material from July 2012, material not available to SP AusNet in February 2011. In any event the material relied on by Energeia shows that UED and JEN signed contracts on 10 December 2008 and the AMI delivery program commenced on 15 December 2008. The material Energeia relies on is high level, in summary form, without context and fails to consider the different stages of the business with UED and JEN building entirely new systems and SP AusNet integrating its AMI and non-AMI metering systems. Energeia also ignores the information that Citipower/Powercor were unable to deliver data to market until 2 December 2010.

- KEMA note that Energeia's reference to PG&E as a "relevant case" is a qualitative and highly subjective statement regarding PG&E's situation, as there is no foundation

[24] See page 13 of the Preliminary View.
[25] See page 23 of the Energeia Report.
[26] Page 23.

established to enable a comparison at any level; no comparative statistics are offered in terms of customer densities and distributions over the service area and as a fraction of total customer population and it is specifically stated that the PG&E timeframe was from after "contract award". There is therefore no basis for comparing PG&E's mesh experience with SP AusNet's, with respect to deployment costs, coverage, or performance, and no established predictive value in doing so.

Energeia assumes that the mobilisation, procurement and technology delivery could apparently occur in 2 weeks based on a 'proven' solution that was immediately available together with an already mobilised SP AusNet team.

For the sake of the reconsideration modelling exercise SP AusNet has assumed that any switch to Mesh would use Silver Springs Networks (SSN). However, this working assumption does not imply that SP AusNet would not conduct a full tender process both as a matter of good practice and in accordance with the incentives provided in the Order. KEMA explains that adopting the Energeia Report's rapid "sole source" approach would expose SP AusNet to a high risk of non-competitive pricing. It would not be a prudent approach.

KEMA's report explains that 5 months (compared to Energeia's assumption of 2 weeks) is an appropriate timeframe to complete the procurement of the necessary AMI infrastructure, metering end-points and to enter into a contractual agreement with a provider. KEMA set out the following tasks that would need to be undertaken:

- Develop the tender documentation, specifying the functional technical and performance requirements, the scope of the engagement, the timeline for the agreement's execution, and the contractual terms and conditions.

- Analyse the bids and proposals from the respondents; request best and final offers; and select preferred service provider.

- Negotiate and finalise a contract for the requisite equipment, systems, and services for the installation and deployment of the procured systems as well as for the requisite integration, testing, optimisation, and ongoing post-acceptance support and maintenance services. KEMA noted that these sourcing activities require skilled technical and contracts personnel.

Following placement of the initial order, the first shipment of product would take a lead time of 90 days.

As noted above, KEMA estimates a 28 month duration for the end-to-end process to procure, install, integrate and operationalise a total of 707,400 smart meters using a Mesh technology. The AER Preliminary View that this can be achieved in 10 months is not credible.

4.3 Estimation of Mesh coverage

The AER Preliminary View adopts a materially different assumption regarding the Mesh radio coverage compared to SP AusNet's Reconsideration Submission.

SP AusNet's June 2012 Reconsideration Submission assumed a coverage of 85% for Mesh radio with 15% 3G infill technology, which reflected SP AusNet's assessment at the time of that Submission of Mesh coverage for its territory. In contrast, the AER Preliminary View and the Energeia Report relied on Powercor's 2012-15 budget application submitted on 28 February 2011 to support an assumption that SP AusNet could achieve 97% Mesh radio coverage in its network area.

The AER says that SP AusNet and the Tribunal all agree that Powercor is a suitable comparator for SP AusNet. SP AusNet acknowledges that its Reconsideration Submission included Powercor cost information as submitted on 28 February 2011, however this submission was based on a much later reconsideration date (of May 2011). With a reconsideration date of 28 February 2011, Powercor's cost information would not have been available.

In any event, in relation to coverage SP AusNet did not rely on Powercor or any other businesses' information in its Reconsideration Submission. Contrary to the AER Preliminary View, the Tribunal's reasons do not support the use of Powercor's data in relation to coverage:

- In paragraph 129 the Tribunal says **"without determining the matter and for the purposes of the discussion** it may be assumed that the benchmarks determined by the AER are reflective of the costs of an AMI rollout using mesh radio".

- Paragraphs 179 to 182 state clearly that the Tribunal's conclusion is in respect of the substitution of the communications infrastructure maintenance opex, backhaul opex and IT opex, and not in respect of capital expenditure related to issues such as coverage.

KEMA's estimate of the bottom-up build costs of a Mesh network included an assessment of the achievable Mesh radio coverage for SP AusNet's territory. KEMA explain that Mesh networks require a certain density to form the mesh, and to provide reliable and predictable communications performance. If the customer density is very low, repeaters or relays must be put in place to form an adequate mesh. If the densities are too large, the mesh must be segmented to avoid interference. Terrain, foliage and buildings affect the performance of the networks as well and must be accommodated in the design. The designs include the number and location of access points, repeaters and relays, and back haul nodes. Finally the performance in the form of capacity, latency and reliability must be designed with the knowledge of the all these technical characteristics of the services territory.

On the basis of its modelling of SP AusNet's territory, KEMA concluded that a Mesh radio coverage of 93.5% could be achieved. It is worth emphasising that neither the AER nor Energeia conducted a technical assessment of the Mesh coverage that could be achieved for SP AusNet's territory.

KEMA's assessment is clearly superior to the AER's and Energeia's adoption of Powercor's assumed coverage of 97%, even if that information were available to SP AusNet as at 28 February 2011 (which it was not). For these reasons, SP AusNet adopts KEMA's conclusions for the purpose of this submission.

4.4 Summary of Mesh Radio costs

The AER Preliminary View argues that SP AusNet's Mesh radio estimate overstates costs.[27] However, the AER's analysis of SP AusNet's Mesh costs is based on the costs of other distributors, most notably Powercor.

KEMA explain that the use of Powercor as a proxy for SP AusNet's Mesh design does not reflect the different geographical, topographical and density characteristics of the different utilities. KEMA also highlight that the use of other proxies for IT systems does not reflect the ability of those other distributors to share costs where a single solution has being utilised by two utilities. KEMA also expresses concern that some of the costs that are used as proxies may reflect differences in cost allocation methodologies. Such differences create serious difficulties in comparing individual line items and emphasise the importance of focussing on the total costs of the solution.

KEMA explain that estimating the cost of a Mesh solution for SP AusNet requires detailed modelling to determine the system requirements, as defined by the Minimum AMI Functionality Specification for Victoria. The models determine the design and number of network devices including Mesh NIC cards, access points, relays and repeaters and backhaul facilities. KEMA's analysis provides predictions of the necessary facilities to deliver the adequate capacity, latency and reliability of the system to support the requirements.

KEMA's estimate of the costs a Mesh solution differs from the AER's estimate as modelled by Energeia. The key differences between the Energeia estimate of the Mesh radio costs and KEMA's estimates are as follows:

1 An assumption in respect of coverage of the Mesh radio network of 97%, compared to the analysis undertaken by KEMA which shows a coverage in SP AusNet's territory of 93.5%.

2 The assumption that the Mesh solution can be delivered within a 10 month period, compared to KEMA's assessment of 28 months.

3 Energeia's estimate of switching costs, which are discussed in further detail in section 4.5 below.

4 The operating expenditure for the NMS, which KEMA estimates to be substantially greater than Energeia's estimate.

The tables below show the capital and operating expenditure for Mesh radio in present value terms, in accordance with KEMA's advice.

[27] Page 20.

Table 4: Mesh radio capital costs (excluding switching costs)

Cost Item: Mesh capital expenditure	Capital expenditure ($ M in PV terms over 15 years at Feb 2011)
NIC Costs	47.5
Antenna Cost	10.1
Network and Backhaul Costs	46.8
NMS Costs	30.5
MDMS Costs	17.7
Total capital Expenditure	**152.6**

Table 5: Mesh radio operating costs (excluding switching costs)

Cost Item: Mesh operating expenditure	Operating expenditure ($ M in PV terms over 15 years at Feb 2011)
Backhaul Communications	17.5
Communication Operations	15.1
NMS Costs	98.0
MDMS Costs	15.0
Total operating expenditure	**145.6**

For the purpose of this submission, SP AusNet adopts KEMA's estimated cost of delivering a Mesh solution. Furthermore, SP AusNet reiterates that the AER Preliminary View does not provide an estimate of the costs that would be incurred by SP AusNet if it adopted a Mesh solution. Instead, the AER Preliminary View is based principally on Powercor's costs.

4.5 Summary of switching costs

As explained in Section 4.2 above, KEMA has provided a detailed assessment of the tasks and timelines that would be required to enable SP AusNet to transition to a Mesh solution. KEMA estimates additional costs totalling approximately $56.8 million would be incurred in the following cost categories if SP AusNet had adopted a Mesh solution:

Table 6: Mesh switching costs

Item	PV of cost ($ million at Feb 2011)
Replacement of WiMAX NICs	25.9
Cost of Mesh Antenna	2.4
Mesh NICs for Meters fitted with no Comms Cards	16.6
Termination and remediation costs for WiMAX network	3.7
Additional IT Costs	1.1
Additional Meter Reading Costs	3.5
Additional PM costs	2.3
Additional Industry Costs	0.2
Additional IT Opex	1.1
Total	**56.8**

KEMA provides detailed information in relation to each cost category and the basis of the estimated expenditure. For the purpose of this submission, it is helpful to discuss briefly the first four cost categories, which together comprise approximately $48.6 million or approximately 85% of the total estimated switching costs. As noted above, these costs arise if the Mesh solution were adopted, but do not arise if WiMAX is rolled out.

4.5.1 Replacement of WiMAX NICs

This activity involves the purchase and installation of the Mesh NICs in meters that had a WiMAX NIC. KEMA has provided SP AusNet with a list of task that would be required for a retrofit. This includes:

- Access (open metal box, remove NIC, antenna/antenna lead/antenna connection);
- Remove and Replace NIC, attach new antenna captive lead;
- Mount new antenna and secure/dress RF cable;
- Provision SSN NIC for required ID, subnet, and crypto keys using FS tool and record results/documentation; and
- Network Integration/Test/Confirmation that network has discovered and authenticated new NIC, NIC has discovered at least two routes, verify received Signal Level/Hop counts, test traffic OK, all indications good prior to conclude installation.

As per the contracted installer rates and agreed work procedure[28], SP AusNet is charged $[C-I-C] for the installation of a WiMAX NIC card and antenna. In KEMA's expert opinion, this activity takes 30 minutes on average[29] which leads to an hourly contracted rate of $[C-I-C] per hour.

KEMA has advised that installing a Mesh NIC card requires an additional step relating to network integration, testing, confirmation and firmware upgrades to the meter.[30] KEMA has advised SP AusNet that this additional step requires an additional 15 minutes of an installer's time.

Based on this information, the required time for installing a Mesh NIC card is 45 minutes (see Process Map in Annexure 5). Taking the hourly contracted rate of $[C-I-C] per hour, this equates to a cost of $[C-I-C] per installation.[31]

4.5.2 Cost of Mesh Antenna

These costs arise in relation to meters where WiMAX NICs are replaced and meters where no NICs are initially deployed. The antennas that may have been fitted for WiMAX are not suitable for Mesh so will need to be replaced.

Antennas need to be fitted to these meters at the same time the NICs are deployed. KEMA has not included any incremental costs for the removal of the WiMAX antenna, even where no Mesh antenna is fitted. KEMA estimates the costs of purchasing antenna for these meters is $2.4 million in present value terms.

4.5.3 Mesh NICs for Meters fitted with no Comms Card

These costs relate to the purchase and installation of the NICs for meters that have been rolled out without comms cards.

As per the contracted installer rates and agreed work procedure[32], SP AusNet is charged $[C-I-C] for the installation of a WiMAX NIC card and antenna. In KEMA's expert opinion, this activity takes 30 minutes on average[33], which leads to an hourly contracted rate of $[C-I-C] per hour.

Retrofitting a Mesh NIC Card into an AMI meter fitted with a WiMAX NIC card requires 2 distinct activities:

- removing a WiMAX NIC card and antenna; and
- installing a Mesh NIC card and antenna (if required)[34].

SP AusNet estimates that removing a WiMAX NIC card and antenna will require the complete reversal of the steps required for installation. As explained above, this is estimated by KEMA to take 30 minutes on average.

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28 See Annexure 5
29 KEMA, Technical advice, 29 August 2012.
30 KEMA, Technical advice, 29 August 2012.
31 This does not include the costs associated with purchasing the equipment and tools necessary to test a Mesh NIC card.
32 See Annexures 5 and 6.
33 KEMA, Technical advice, 29 August 2012.
34 It is estimated that 70% of all meters installed with a Mesh NIC card will require an antenna – see KEMA expert report.

Based on advice provided by KEMA and the process mapping undertaken by SP AusNet, the estimated time required to install a Mesh NIC card and antenna is 45 minutes on average (as per Section 4.5.1).

The estimated time to retrofit a Mesh NIC card and antenna into an AMI meter fitted with a WiMAX comms card and antenna is 1 hour and 15 minutes (see Process Map in Annexure 5). Taking the hourly contracted rate of $[C-I-C] per hour, this equates to a cost of $[C-I-C] per installation.[35]

4.5.4 Termination and Remediation Costs for WiMAX Network

These costs relate to the termination and remediation costs if deployment of WiMAX ceases. It comprises termination fees due under the contract with Motorola and the cost to remove towers that were constructed prior to 28 February 2011.

KEMA estimates the total termination and remediation costs to be $3.7 million in present value terms.

4.6 Other Business Costs

It is important to recognise that a decision to switch to a Mesh solution would require extensive discussions with Government and the AER regarding compliance and cost recovery. Senior management resources would therefore be diverted to these activities, with the business incurring an opportunity cost as a result. In addition, external legal advice would be sought to ensure that the company had addressed its compliance obligations appropriately.

While it is difficult to estimate these costs precisely, the total costs are likely to be more than $1 million. For this reason, a prudent company would not switch technologies unless the savings from doing so were expected to be substantial. This issue is discussed further in Section 6.7.

[35] This does not include the costs associated with purchasing the equipment and tools necessary to test a Mesh NIC card and the additional travel time for installers associated with the widespread installation.

5 Costs of delivering the WiMAX solution over 15 years

5.1 Introduction

This Chapter presents the costs of delivering SP AusNet's WiMAX solution over a 15 year period assuming that the reconsideration occurs during the period to leading up to 28 February 2012. The cost assessment is consistent with KEMA's expert report. KEMA has adopted SP AusNet's estimate of WiMAX costs, which is based on contractual offers and estimated resource requirements to satisfy the AMI Minimum specification.

The remainder of this Chapter is structured as follows:

- Section 5.2 provides a reconciliation between SP AusNet's June 2012 Reconsideration Submission and the costs presented in this submission.
- Section 5.3 provides an overview of the estimated WiMAX costs over the 15 year horizon.
- Section 5.4 examines network and backhaul capital expenditure.
- Section 5.5 examines NMS capital and operating expenditure.
- Section 5.6 sets out an overview of MDMS capital expenditure.
- Section 5.7 addresses backhaul communications operating expenditure.
- Section 5.8 examines communications operations expenditure.

5.2 Reconciliation of SP AusNet's WiMAX cost estimates

The table below provides a reconciliation of the forecast expenditure (2012-15) provided in the Reconsideration submission templates (provided in June 2012) and the Revised Reconsideration submission templates (provided September 2012). The forecast expenditure presented in September 2012 provides a greater level of detail. This has adjusted the Opex sub-categories but has not affected the total forecast.

Table 7: Reconciliation of SP AusNet's WiMAX cost estimates

Cost Category	2012-15 Forecast ($2011 $M)	
SP AusNet submission	**June 2012 templates**	**September 2012 templates**
Capital expenditure		
Meters	[C-I-C]	[C-I-C]
Communications	[C-I-C]	[C-I-C]
Information Technology	[C-I-C]	[C-I-C]
Other	[C-I-C]	[C-I-C]
Total Capital Expenditure	231.5	231.5
Operating expenditure		
Meter services	[C-I-C]	[C-I-C]
Meter Reading	[C-I-C]	[C-I-C]
Meter Data Management	[C-I-C]	[C-I-C]
Meter Maintenance	[C-I-C]	[C-I-C]
Communications Backhaul	[C-I-C]	[C-I-C]
Communications Network Maintenance	[C-I-C]	[C-I-C]
MMS and CNMS	*[C-I-C]*	*[C-I-C]*
Communications Operations	*[C-I-C]*	*[C-I-C]*
Technology trials	[C-I-C]	[C-I-C]
Project Management Office	[C-I-C]	[C-I-C]
Customer Services	[C-I-C]	[C-I-C]
Overheads	[C-I-C]	[C-I-C]
Industry PMO / Audit / Regulatory Submissions	[C-I-C]	[C-I-C]
IT Operating expenditure	[C-I-C]	[C-I-C]
IT operations	*[C-I-C]*	*[C-I-C]*
MMS and CNMS	*[C-I-C]*	*[C-I-C]*
Debt Raising	[C-I-C]	[C-I-C]
Movement in provisions	[C-I-C]	[C-I-C]
Total Operating Expenditure	139.5	139.5
Total AMI Budget (capital plus operating expenditure)	**371.0**	**371.0**

[36] Includes $ [C-I-C] of MDMS costs
[37] Includes $[C-I-C] of MDMS costs

The table below provides a reconciliation of the forecast expenditure of the categories that are relevant to the KEMA analysis.

Table 8: Reconciliation of the forecast expenditure relevant to the KEMA analysis

Cost Category	2012-15 Forecast ($2011 $M)	
SP AusNet submission	**June 2012 templates**	**September 2012 templates**
Operating expenditure		
Communications Backhaul	[C-I-C]	[C-I-C]
Communications Network Maintenance	[C-I-C]	[C-I-C]
MMS and CNMS (NMS)	*[C-I-C]*	*[C-I-C]*
Communications Operations	*[C-I-C]*	*[C-I-C]*
IT Operating expenditure	[C-I-C]	[C-I-C]
IT operations	*[C-I-C]*	*[C-I-C]*
MMS and CNMS (NMS)	*[C-I-C]*	*[C-I-C]*

5.3 WiMAX Costs

KEMA has analysed the costs of delivering WiMAX over the 15 year assessment period adopted by the Energeia Report and the AER Preliminary View.

The tables below show the capital and operating expenditure for WiMAX in present value terms, in accordance with KEMA's advice.

Table 9: WiMAX capital costs

Cost Item: WiMAX capital expenditure	Capital expenditure ($ M in PV terms over 15 years at Feb 2011)
NIC Costs	76.1
Antenna Cost	19.7
Network and Backhaul Costs	56.8
NMS Costs	13.3
MDMS Costs	17.7
Total Capital Expenditure	**183.6**

[38] Includes $[C-I-C] of MDMS costs
[39] Includes $[C-I-C] of MDMS costs

Table 10: WiMAX operating costs

Cost Item: WiMAX operating expenditure	Operating expenditure ($ M in PV terms over 15 years at Feb 2011)
Backhaul Communications	28.4
Communication Operations	60.4
NMS Costs	19.0
MDMS Costs	15.0
Total operating expenditure	**122.8**

The remaining sections of this Chapter discuss those cost categories where KEMA's views differ materially from the AER Preliminary View.

5.4 Network and backhaul capital expenditure

KEMA's estimate of these costs is slightly lower than those adopted in the Energeia Report. The principal difference arises because Energeia included additional capital costs to allow for customer growth. SP AusNet has assumed that future growth of meter numbers with WiMAX communication models will be driven by increases in density of urban areas already under WiMAX coverage and an expansion of Melbourne's urban growth corridors.

We would have expected future costs of new WiMAX towers to fill the gaps throughout these urban growth corridors. Attached at Annexure 9 are the maps of SP AusNet's urban growth corridors showing already planned WiMAX tower locations. At February 2011 we would have based our understanding of the network design for WiMAX towers on modelling performed in August 2010. Based on these assumptions we expect that only 5 or 6 additional WiMAX towers (that is, in addition to those already planned) would have been required over the period 2014-25.

Due to the uncertainty of forecasting urban growth over a period of up to 15 years SP AusNet has based forecasts on a steady, evenly distributed expansion of Melbourne's urban growth corridors based on organic growth over the past 24 months. All forecasts reflect of a high level view, as accurate predictions will require a full planning cycle including visual terrain inspections and land zoning inspection. This process will ultimately determine the location and type of WiMAX sites that can be built, which will ultimately determine site forecast.

KEMA estimates the Network and Backhaul cost to be $56.8 million in present value terms compared to $68 million estimated by the Energeia Report.

5.5 NMS capital and operating expenditure

KEMA has adopted SP AusNet's estimate of the NMS capital expenditure. KEMA notes that the Energeia Report incorrectly adopts the MDMS capital expenditure for 2011, rather than the NMS costs, which were considerably lower.

The replacement cost of the NMS is expected to be $15.0 million in 2019-20. KEMA's estimate for the WiMAX NMS capital expenditure is therefore $13.3 million in present value terms compared to the $16.2 million presented in the Energeia Report.

In respect of NMS operating expenditure, KEMA noted that SP AusNet's estimate is significantly lower than the Energeia Report. KEMA explains that this is because the costs estimated by Energeia included other costs that were not strictly related to the WiMAX NMS. The costs included in SP AusNet's estimate of NMS operating expenditure comprise: GridNet Maintenance and resources, SP AusNet Resources, 24*7 labour costs, training and MMS maintenance. The operating expenditure in present value terms is $19 million.

5.6 MDMS capital expenditure

In contrast to the Energeia Report, KEMA's view is that the MDMS solution should be independent of the choice of communication solutions. KEMA explains that the only difference in costs may relate to the interfaces to the NMS. For WiMAX, these interfaces have already been completed, whereas new interfaces would need to be developed for the Mesh solution.

KEMA's estimated capital expenditure for MDMS is $17.7 million in present value terms for both communication solutions. The Energeia Report had wrongly assumed that the MDMS costs would only be $13.6 million for a Mesh solution, and almost double for WiMAX at $25.5 million in present value terms.

5.7 Backhaul communications operating expenditure

KEMA notes that the Energeia Report unrealistically assumes that there are no backhaul costs associated with the WiMAX network. However, backhaul costs will be incurred as 3G meters are required to in-fill the estimated WiMAX coverage of 89.4%. In contrast to the Energeia Report assumed cost of zero, KEMA's advice is that the backhaul costs will be $28.4 million in present value terms.

5.8 Communications Operations

KEMA has adopted SP AusNet's costs for Communication Operations for WiMAX, which include: site leases of WiMAX infrastructure, Motorola costs, spectrum costs, training, and labour resources.

These costs are now estimated to be $60.4 million compared to the Energeia Report estimate of $27.5 million.

6 Qualitative considerations

6.1 Introduction

This Chapter addresses the qualitative matters that should be included in any prudent reconsideration of the AMI communications technology. This is because the business faces a number of issues in its choice of technology that cannot be captured fully in a quantitative cost-benefit analysis.

The AER Preliminary View appears to accept SP AusNet's view that the reconsideration must include qualitative matters. However, the AER concludes that its qualitative analysis supports its quantitative analysis that the Mesh solution should be adopted. However, SP AusNet notes that the AER's qualitative assessment is highly dependent on its view that Mesh radio can be implemented in 10 months.

As explained in Section 4.2 of this submission, a 10 month timeframe for implementing a Mesh solution is totally unrealistic. Furthermore, for planning purposes even if a compressed timetable were achievable in principle (which it is not), it would be imprudent to plan on such a basis. Prudency requires the development of a project plan that makes reasonable provision for contingencies to address unforeseen events and to manage emerging risks effectively. SP AusNet's Board or Executive would not accept a 10 month project plan as being feasible or reasonable.

SP AusNet's approach to the qualitative issues is to examine each feasible technology option on its merits. In contrast to the AER's approach, it is not simply a matter of checking whether the quantitative analysis is supported by the qualitative analysis.

The remainder of this Chapter adopts the same analytical approach as set out in SP AusNet's Reconsideration Submission:

- Section 6.2 considers compliance issues;
- Section 6.3 considers the uncertainty and risk associated with each option;
- Section 6.4 considers the shareholder value implications arising under each option;
- Section 6.5 examines the implications of each option for customer prices and service;
- Section 6.6 comments on any longer term considerations; and
- Section 6.7 provides an overall qualitative assessment of technology options.

As explained in the Reconsideration Submission, SP AusNet's assessment applies a rating to each option, based on the simple framework shown in the table below. The rating system is intended to assist in the ready identification of the preferred option, having regard to the qualitative matters addressed in relation to each key consideration.

Rating	Description
	The option is unacceptable
	The option does not meet business needs
	The option meets business needs partially, but with significant gaps
	The option meets business needs with some gaps
	The option fully meets business needs

6.2 Compliance with obligations

The AER says that it has not received any evidence to suggest that Mesh radio is not compliant with the Functionality Specification.

However, the AER has been provided with correspondence from the Victorian network businesses using a Mesh solution identifying that Mesh radio is incapable of meeting the Functionality Specification performance level in clause 4.4(a)(1). The AER acknowledged this fact in its Further Submissions to the Tribunal dated 5 March 2012.[40] The Tribunal made the following findings at paragraph 125 in relation to the issue of compliance:

> "The AER did not make an material error of fact in determining that there were other technologies, in particular mesh radio, that were viable alternatives to WiMAX. While it appears to be true that mesh radio is incapable of meeting the performance and functionality standards mandated by the Victorian Government, it also appears to be the case that SP AusNet's mix of technologies will fail to fully comply. Further, it is clear that the AER never laboured under the misapprehension that mesh radio, or other technologies, did meet the performance and functionality standards. The AER's determination was based on the view that no technology or mix of technologies could fully comply with the standards. The Tribunal is not persuaded that this is in error."

The AER also noted the ISC recommendation that the performance level in section 4.4(a)(1) be changed.[41] It remains, as at the date of this submission, that the performance level has not been changed and Mesh radio is incapable of meeting it. From 2009 onwards, SP AusNet and all other industry participants have been fully aware that Mesh radio could not comply with the minimum service level specifications. SP AusNet submitted evidence to this effect to the AER as recently as September 2011. This evidence is provided again as Annexure 7. Importantly, in February 2011 SP AusNet also held the view that WiMAX could satisfy the specified compliance obligations.

As explained in section 3.6, KEMA's Mesh solution is only feasible if two milestones in the Order are not met. The feasibility of the Mesh solution therefore relies on Government and

[40] See paragraph 16.
[41] Ibid.

regulatory approval to relax these compliance obligations. It is appropriate for the reconsideration to take account of these issues in deciding whether to continue with WiMAX or switch to a Mesh solution.

In light of these concerns, SP AusNet's assessment of the two options in terms of compliance is set out below.

Option	Rating	Comments and Analysis
1. Continue to roll out WiMAX		Meets business needs with some gaps. SP AusNet notes that based on the evidence before it, the Tribunal has formed a view that neither WiMAX nor mesh radio are likely to fully comply with the performance and functionality standards. At the time of the reconsideration however, continuing with the WiMAX technology is consistent with using best endeavours to meet the AMI roll out milestones.
2. Cease WiMAX and switch to Mesh		Meets business needs partially, but with significant gaps. The change in technology would create delays and prevent SP AusNet from meeting the intermediate AMI roll out milestones. There is also an increased risk that the final milestone (completion of the AMI rollout) would not be met. SP AusNet's Board would not adopt an option that involved an increased risk of non-compliance, unless regulatory and Government approval were obtained.

6.3 Uncertainty and risk

In SP AusNet's Reconsideration Submission, the following four sources of uncertainty and risk were identified as relevant to the choice of AMI communications technology:

- Contractual arrangements;
- Immature technology;
- Implementation and performance; and
- Project management.

The AER Preliminary View concludes that uncertainty and risk would not be an impediment to making a business decision to switch technology to Mesh radio because, according to the AER:

- The AER's assessment has recognised SP AusNet's obligations under its contracts for its WiMAX network deployment, spectrum and metering solution.

- While there may be some uncertainty surrounding contract break costs, the AER considers a reasonable business in SP AusNet's circumstances would have established appropriate internal governance to properly manage its risks.

- Although technical specifications may be difficult to specify if implementing Mesh radio over an existing WiMAX solution, the AER does not consider this problem would be as pronounced if SP AusNet switched to Mesh radio, given the successful implementation of the other Victorian DNSPs.

- While uncertainty and risk is inherent in changing technology, the AER considers the relative technology, implementation and performance risks of the proven Mesh radio solution are considerably less than the unproven and increasingly problematic WiMAX solution as at 28 February 2011. The AER stated:

    - On the one hand, Mesh radio was being successfully deployed by the other four Victorian DNSPs and one of the largest overseas AMI deployments as at February 2011 was a Mesh radio rollout.

    - Conversely, SP AusNet was experiencing problems and cost increases with WiMAX. For example, in July 2010, SP AusNet's Board was aware that the cost of the AMI program estimate had increased 19 per cent from the July 2008 business case due to WiMAX issues.

- The AER considers switching to Mesh radio at the appropriate time would not materially delay the AMI project.

- SP AusNet's assertion that it is unusual to change technology for an IT project is unsubstantiated. From a commercial perspective, it would be expected that any business acting reasonably would change technology if it became evident that the original decision was manifestly incorrect and the consequences of continuing with the original technology were unacceptable.

SP AusNet's view is that the AER's assessment of risk and uncertainty does not reflect SP AusNet's circumstances at the reconsideration date. In particular, the AER's characterisation of the WiMAX technology choice as being "manifestly incorrect" is inconsistent with:

- SP AusNet's view that Mesh radio does not comply with the technical specifications; and

- the fact that it was not known whether Mesh radio would encounter cost increases or implementation issues that were as significant or more significant than those experienced with WiMAX.

The AER's assessment is not a genuine consideration of SP AusNet's particular circumstances at the date of the reconsideration. Instead, the AER is examining the choice of technology with the benefit of hindsight by describing the Mesh radio solution as 'successful' at a time when it was no more or no less successful than WiMAX. Energeia relies on material from the AMI Program Office from July 2012 to support its views of Mesh radio's success.

At the time of the reconsideration, no stakeholder – including the AER – could compare the latest cost forecasts of the alternative technology choices because the information was not publicly available and the AER's scrutiny of these cost estimates would not be available until October 2011. If SP AusNet's choice of technology were "manifestly incorrect" in February 2011, it is curious that it was not described as such by the AER in its Draft Decision in July 2011.

The relative costs of the WiMAX and Mesh solutions only came to light over a relatively long period, partly through the regulatory process of scrutinising and comparing costs across different companies. It was not open to SP AusNet to undertake the same level of critical analysis, not least because each company's AMI cost information is confidential. The AER is conducting its assessment with the benefit of hindsight.

Section 10 of the KEMA report comments on the risks associated with a Mesh solution. KEMA notes that selecting proprietary, non-standards based, non-interoperable solutions presents financial, technical, and performance risk. KEMA notes two issues in particular:

- The Mesh system is proprietary and the selected vendor is the only provider of terminal devices, take out points, repeaters, and the required network management and data collection systems.

- One of the leading RF Mesh suppliers is a relatively small private company currently funded by venture capital and private equity; since this is a long term infrastructure investment, expected to function for 15 years or more, the vendor viability risk is a factor of prudence.

As already noted, KEMA's cost assessment of the Mesh solution assumes that the Government and AER would accept non-compliance with two milestones specified in the Order. While SP AusNet regards this assumption as a reasonable working assumption, it is also appropriate to recognise the risks if non-compliance proved unacceptable to the Government or the AER. In particular, KEMA have noted the very significant cost implications if SP AusNet were required to meet each of the milestones while switching to a Mesh solution.

Based on KEMA's views and the discussion above, the assessment of options in terms of uncertainty and risk is set out below.

Option	Rating	Comments and Analysis
1. Continue to roll out WiMAX		Meets business needs with some gaps. The continuation of WiMAX is not without risks and uncertainties, but these are regarded as manageable.
2. Cease WiMAX and switch to Mesh		Meets business needs partially, with significant gaps. The risks arise in relation to non-compliance with the Order requirements and SP AusNet's reliance on proprietary, non-standards based, non-interoperable solutions.

6.4 Shareholder value implications

SP AusNet's Reconsideration Submission explained that the company faces very significant penalties if it fails to meet its regulatory obligations to install AMI meters. In the event that SP AusNet were to face penalties for non-compliance with regulatory obligations, it may be in breach of debt funding covenants, and it may face difficulties in obtaining new debt funding, or refinancing existing facilities.

The AER Preliminary View concluded that[42]:

> "SP AusNet's concerns about sanctions for non-compliance with the AMI Order are not well founded, in part because they do not factor in risk mitigation strategies. The AER considers that switching to mesh radio would not result in delays, and SP AusNet could have met its obligation under the AMI Order to use its "best endeavours" to comply with the rollout schedule.
>
> Conversely, by continuing its rollout using WiMAX and incurring expenditure that may not be considered prudent by the AER could also damage its reputation. The AER does not consider a reasonable commercial business would continue to incur higher costs just to avoid the potential embarrassment that may result from switching technology."

Contrary to the AER's comments, SP AusNet did not suggest that it would continue with WiMAX because of the embarrassment from switching technology. As noted above, SP AusNet's concerns relate to penalties for non-compliance and the possibility of breaching debt funding covenants. These matters are relevant to a proper reconsideration of the technology option.

SP AusNet does not accept the AER's view that risk mitigation strategies can resolve the non-compliance issues. The AER's conclusions are predicated on the implementation timeframe proposed by the Energeia Report. KEMA has explained that this timetable is totally unrealistic. KEMA's implementation timetable and Mesh solution are only feasible if the milestones in the Order are not enforced. Therefore, shareholder value considerations remain highly relevant to the decision to either maintain the WiMAX rollout or switch to a Mesh solution.

SP AusNet's assessment of options in terms of shareholder value implications is set out below.

[42] Ibid, page 29.

Option	Rating	Comments and Analysis
1. Continue to roll out WiMAX		Meets business needs with some gaps. As already noted, based on the evidence before it, the Tribunal has formed a view that neither WiMAX nor mesh radio are likely to fully comply with the performance and functionality standards. At the time of the reconsideration however, continuing with the WiMAX technology is consistent with using best endeavours to meet the AMI roll out milestones. Such an approach therefore is consistent with maximising the company's prospects of meeting all regulatory compliance obligations, and thereby minimising the company's exposure to negative shareholder value impacts.
2. Cease WiMAX and switch to Mesh		Meets business needs partially, but with significant gaps. The change in technology would create delays and prevent SP AusNet from meeting the AMI roll out milestones. This increases SP AusNet's exposure to regulatory sanctions, and therefore increases the company's exposure to very significant negative shareholder value impacts. As already explained, this option could only be considered if regulatory and Government approvals were obtained.

6.5 Customer price and service

SP AusNet's Reconsideration Submission explained that customers' interests are served by ensuring that:

- The direct costs of the AMI program are minimised;
- The AMI program is delivered as soon as practicable so that the benefits of the AMI roll out can be secured; and
- The inconvenience associated with working in customers' premises is minimised.

In the AER Preliminary View, the AER agrees that potentially, some customers may be inconvenienced due to the requirement of a site visit to change the WiMAX NICs to Mesh radio NICs. However, the AER considers this inconvenience should be outweighed by the significantly lower costs of mesh radio.

In contrast to the AER Preliminary View, the cost of continuing with the WiMAX rollout is substantially lower than the cost of switching to the Mesh solution. Further details on the cost comparison are provided in Chapter 7. In addition, a switch to Mesh would inconvenience some customers, as the AER has acknowledged.

Based on the discussion above, the assessment of options in terms of customer price and service is set out below.

Option	Rating	Comments and Analysis
1. Continue to roll out WiMAX		Meets business needs with some gaps. This option has the lowest total cost over the reconsideration period, and therefore provides the best outcome in terms of customer price. As already noted, based on the evidence before it, the Tribunal has formed a view that neither WiMAX nor Mesh radio are likely to fully comply with the performance and functionality standards. However, at the time of the reconsideration, WiMAX technology provides a solution that minimises the risks of delays and non-compliance with the Functional Specifications. The WiMAX option therefore provides the highest likelihood that AMI meter services will accord with customer expectations and requirements.
2. Cease WiMAX and switch to Mesh		Meets business needs partially, but with significant gaps. Customers would be inconvenienced and concerned by the rework required in relation to the meters that have already been installed. In addition, any delay in the roll out program would also negatively impact customers.

6.6 Long term implications

The longer term business implications that are relevant to the choice of communications technology relate to:

- Contractor relationships and contract pricing; and
- Retention of in-house skills and intellectual property.

SP AusNet's Reconsideration Submission explained that adopting a Mesh solution would require the termination of contracts. SP AusNet noted that apart from the possibility of litigation, a decision to terminate current agreements may be interpreted negatively in a variety of markets in which SP AusNet seeks contracted services. SP AusNet also explained that if an option caused a significant delay to the AMI program it may prove difficult to retain in-house skills.

In the AER Preliminary View, the AER commented as follows:

> "The AER considers that a reasonable business should do what is in its best interests, including exiting contracts where necessary. Indeed, some of the contracts SP AusNet entered into with service providers gave SP AusNet the right to terminate at any time, or if the provider breached a clause of the agreement. The AER

> considers it unlikely that other service providers would interpret SP AusNet's decision to terminate a contract in such circumstances negatively." [43]
>
> "The AER considers that SP AusNet would need its program resources to implement the mesh solution, particularly given the AER's view that the timeline could be shortened and delays minimised. However, even if a smaller delay led to some resources being put on hold, the AER does not agree that this would be an impediment to making a decision to switch where mesh showed to be a lower cost option." [44]

While SP AusNet accepts that the resourcing issues should not be an impediment to adopting a Mesh solution, the AER understates the potential significance of terminating contracts with external service providers. It is true that a business should take action that is in its best interests, but this does not imply that it should have no regard to relationships with external service providers. It is self-evident that contractors will price risk of termination into future tender prices if SP AusNet terminates major contracts.

It should be emphasised that SP AusNet is not arguing that termination of a contract would preclude it from adopting a Mesh solution if this option involved a materially lower cost than WiMAX. Rather, SP AusNet considers that the implications for future contract prices need to be factored into the decision. As already noted, SP AusNet regards the commercial standard as requiring a proper consideration of the qualitative and quantitative aspects of the competing technology options.

Based on the discussion above, the assessment of options in terms of longer term implications is set out below.

Option	Rating	Comments and Analysis
1. Continue to roll out WiMAX		Fully meets business needs. Continuing with the rollout using WiMAX technology would avoid the potentially detrimental longer term impacts on SP AusNet's relationships with contractors, and on SP AusNet's ability to retain critical in-house resources and intellectual property.
2. Cease WiMAX and switch to Mesh		Meets business needs partially, with significant gaps. This option has negative longer term implications for SP AusNet's ability to continue to procure contractor services cost-effectively across a range of markets.

[43] Ibid, page 30.
[44] Ibid, page 31.

6.7 Overall qualitative assessment of technology options

The table below provides a summary of the qualitative assessment of each option in terms of the five key considerations examined.

Option	Rating				
	Compliance	Uncertainty and risk	Shareholder value implications	Customer prices and service	Long term implications
1. Continue to roll out WiMAX					
2. Cease WiMAX and switch to Mesh					

For convenience, the table below explains the ratings applied in the qualitative assessment.

Rating	Description
	The option is unacceptable
	The option does not meet business needs
	The option meets business needs partially, but with significant gaps
	The option meets business needs with some gaps
	The option fully meets business needs

The table shows that against all qualitative measures the WiMAX solution is preferred.

In relation to each qualitative consideration, SP AusNet rates the Mesh option as "meets business needs partially, with significant gaps". Consequently, while the Mesh solution would not be ruled out, a prudent business would only proceed with Mesh if it were highly likely to deliver materially lower costs.

While it is difficult to quantify "materially lower", for a technology project that is inherently uncertain a prudent business would not switch technology unless the expected savings from Mesh were at least 20% of the forecast WiMAX costs. The 20% threshold recognises the inherent uncertainty in the costs of the AMI roll out, which is also reflected in the Order's automatic cost recovery arrangements, which permit recovery of up to 120% of the approved budget. As explained in section 5.6, it also recognises the significant resource commitment that would be required from senior management and external legal advisors to negotiate a switch to Mesh radio.

7 Cost comparison and 2012-15 budget

7.1 Introduction

This chapter is structured as follows:

- Section 7.2 sets out a high-level comparison of the 15-year cost estimates of the two options presented in Chapters 4 and 5 respectively - namely, continuation of SP AusNet's rollout of the WiMAX solution; and switching to Mesh radio.

- Section 7.3 discusses the implications of the comparative costs of the WiMAX and Mesh options for SP AusNet's 2012-15 budget.

- Section 7.4 explains the implications of KEMA's cost benefit assessment for SP AusNet's Approved Budget for 2012-15.

- Section 7.5 sets out the steps that the AER must take to determine the amendments to SP AusNet's Approved Budget in accordance with the Tribunal's decision. It further highlights the potential additional cost implications if the AER determined that a switch to Mesh is prudent.

7.2 Results of Quantitative assessment

The AER's Preliminary View is that the quantitative analysis undertaken by Energeia shows that the costs a reasonable business in SP AusNet's circumstances would incur to adopt a Mesh radio option following reconsideration on 28 February 2011 would be substantially lower than if it continued its rollout with WiMAX. The AER says that the net present value of the Mesh solution would be $117.5 million lower than continuing with the WiMAX solution.

Contrary to the AER's Preliminary View, this submission and the attached KEMA report show that the total present value cost (over 15 years) to SP AusNet of adopting a Mesh solution *exceeds* that of the WiMAX option by $48.6 million.

The accompanying KEMA report provides a detailed explanation of the estimated cost of the two options.

The table below provides a summary of the estimated capital and operating expenditure of the two feasible options. These costs exclude the costs that would be incurred by SP AusNet in switching from its present WiMAX solution to the alternative Mesh solution. (Switching costs are estimated separately.)

The costs shown in the table below are expressed in millions of dollars present values (PV) over 15 years at February 2011.

Table 11: Comparison of costs of WiMAX and Mesh options excluding switching costs

Cost Item	Present value costs (in $ M) over 15 years at Feb 2011		
	WiMAX	Mesh	Difference in Costs
Capital expenditure			
NIC Costs	76.1	47.5	28.6
Antenna Cost	19.7	10.1	9.6
Network and Backhaul Costs	56.8	46.8	10.0
NMS Costs	13.3	30.5	-17.2
MDMS Costs	17.7	17.7	0.0
Total capital expenditure	**183.6**	**152.6**	**31.0**
Operating expenditure			
Backhaul Communications	28.4	17.5	10.9
Communication Operations	60.4	15.1	45.3
NMS Costs	19.0	98.0	-79.0
MDMS Costs	15.0	15.0	0.0
Total operating expenditure	**122.8**	**145.6**	**-22.8**
Total capital and operating	**306.4**	**298.2**	**8.2**

The table above shows that before considering the costs that would be incurred by SP AusNet in switching from WiMAX to Mesh radio, the total present value capital and operating cost over 15 years of the WiMAX option exceeds that of Mesh by $8.2 million.

As noted in section 4.5, the KEMA report also provides a detailed estimate of switching costs. These costs are in addition to those shown above, and are attributable only to the Mesh option. The Mesh radio switching costs are summarised in the following table. The amounts shown are expressed in millions of dollars in present value (PV) terms.

Table 12: Mesh radio switching costs

Item	PV of cost ($ million at Feb 2011)
Replacement of WiMAX NICs	25.9
Purchase of Mesh Antenna	2.4
Mesh NICs for Meters fitted with no Comms Cards	16.6
Termination and remediation costs for WiMAX network	3.7
Additional IT Costs	1.1
Additional Meter Reading Costs	3.5
Additional PM costs	2.3
Additional Industry Costs	0.2
Additional IT Opex	1.1
Total	**56.8**

The table below provides a summary of the total costs of the two options[45]. The amounts shown are in expressed in millions of dollars in present value terms over 15 years at February 2011.

Table 13: Comparison of total costs of WiMAX and Mesh including switching costs

	Present value (in $ M) over 15 years at Feb 2011		
	Cost of completing the WIMAX rollout	**Cost of adopting Mesh radio**	**Difference in Costs**
Capital expenditure	183.6	152.6	31.0
Operating expenditure	122.8	145.6	-22.8
Total capital & operating	**306.4**	**298.2**	**8.2**
Switching Costs	0.0	56.8	-56.8
Total Costs	**306.4**	**355.0**	**-48.6**

The analysis prepared by KEMA and summarised in the tables above shows that the total present value cost (over 15 years) to SP AusNet of adopting a Mesh solution exceeds that of the WiMAX option by $48.6 million. This difference comprises:

- the costs to switch from WiMAX to Mesh of $56.8 million; minus

[45] Note: Figures presented in this table may not reconcile exactly with figures presented in earlier tables due to small rounding errors.

- the lower capital expenditure and operating costs of WiMAX compared to Mesh over 15 years of $8.2 million.

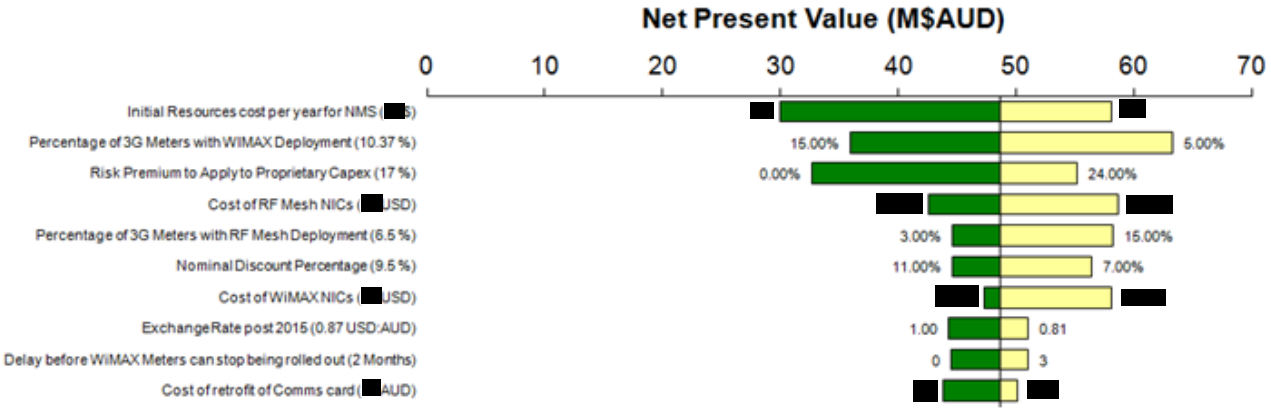
The AER has failed to establish that SP AusNet's decision to continue to incur WiMAX related expenditure over the 2012-15 budget period is a substantial departure from the commercial standard given the independent expert evidence provided by KEMA, which shows that:

1 the Energeia modelling of the Mesh radio and WiMAX costs is incorrect, unreliable and relies on information that would not have been available to SP AusNet as at 28 February 2011; and

2 a proper analysis of the two options, based on reasonable assumptions and restricted to the 28 February 2011 information, shows that the least cost option was to continue with the proposed WiMAX expenditure.

7.3 Sensitivity testing of results of quantitative assessment

KEMA's report notes that whilst the central estimate of the net present value (NPV) of retaining WiMAX is estimated to be $48.6 million, this is sensitive to a number of key parameters. The diagram below indicates the impact on the NPV of moving a single parameter from its expected value to the upper and lower bounds of the feasible range for that parameter value.



KEMA notes that the key parameters that impact on the NPV are as follows:

- Initial Resource costs per year for NMS: This has been set with a central value of $[C-I-C] per meter per year based on KEMA's experience in international deployment. If this unit cost could be reduced to $[C-I-C], the NPV of retaining WiMAX would be reduced by $18.7 million to $28.2 million.

- Percentage of 3G meters with WiMAX deployment: This has been set at 10.37%, which reflects SP AusNet's estimate as at February 2011. It is noted that by 19 May 2011, SP AusNet's revised coverage for WiMAX was assessed to be 85%, as explained in the SP AusNet's Reconsideration Submission. If WiMAX coverage was

reduced to 85% this would reduce the NPV of retaining WiMAX by $12.7 million to $35.9 million reflecting the higher cost of 3G operations compared to WiMAX. Conversely if it were possible to expand WiMAX coverage to 95% this would increase the NPV of retaining WiMAX by $14.7 million to $63.3 million.

- Risk premium to apply to proprietary capex: This has been set to 17% in line with KEMA's estimate of an appropriate premium to apply. If this was removed it would reduce the NPV of retaining WiMAX by $15.9 million, but an increase to the higher level of KEMA's range would increase the NPV of the difference between the options by $6.5 million to $62.8 million.

KEMA notes that no single parameter (or combination two parameters) if changed to the low end of the feasible range would be sufficient to make the NPV of retaining WiMAX negative.

7.4 Implications of cost comparison for SP AusNet's 2012-15 budget

The AER's Preliminary View is that the commercial standard that a reasonable business would have exercised in SP AusNet's circumstances would have been to fully reconsider its Submitted Budget and having done so made a decision to switch from WiMAX to Mesh radio.

For the reasons set out in this submission and the KEMA report, the Energeia modelling of the WiMAX and Mesh radio options as of 28 February 2011 is incorrect and unreliable.

SP AusNet's revised analysis confirms, using the AER's assumption of a 28 February 2011 reconsideration date and a 15 year period, that a reasonable business in SP AusNet's circumstances would have continued with its WiMAX communications solution. This is because the decision to continue to roll out WiMAX has a total present value cost which is $48.6 million lower than the best alternative feasible option, namely switching to Mesh radio. A reasonable business in SP AusNet's circumstances would not make a decision to incur unnecessarily additional costs of $48.6 million. Furthermore, as shown in Chapter 6, there is a number of important qualitative considerations that weigh against a decision to switch to WiMAX, notwithstanding the material increase in cost that would accompany such a decision.

Given the significant quantitative and qualitative disadvantages associated with a decision to switch to WiMAX, SP AusNet's proposed incurrence of the $72.2 million of expenditure remitted by the Tribunal is not a substantial departure from the commercial standard.

The analysis presented above and in the accompanying KEMA report confirms that the whole of the $72.2 million of proposed expenditure remitted by the Tribunal should be included in SP AusNet's Approved Budget for the 2012-15 period.

7.5 Required adjustments to the 2012-15 budget

The AER's assessment of the amendment to the Approved Budget for 2012-15 is to include $11.7 million in addition to the Approved Budget on the basis that this amount reflects the estimated switching costs to be incurred in that period. The AER therefore concludes that $60.5 million of the $72.2 million is not prudent.

As noted above, the AER's determination of the costs that are not prudent is in error.

The determination of amendments to SP AusNet's Approved Budget must be in accordance with the Tribunal's decision. Specifically:

At paragraph 126, the Tribunal states:

> "As was mentioned above, clause 5C.4, through clause 5I.8, of the AMI Order mandates consideration of, and the giving of fundamental weight to, the circumstances of SP AusNet. In determining what would constitute expenditure that is prudent for the purposes of determining the Approved Budget, the AER appears to have not had any consideration to the fact that SP AusNet has already installed approximately 178,000 meters with WiMAX technology. The Approved Budget does not contain any allowance for the costs already incurred in installing these meters and other aspects of the WiMAX solution already installed or committed to, nor the costs which would be involved in modifying or replacing meters or other equipment already installed to adopt the alternative technology on which the approved budget is premised."

At paragraph 130, the Tribunal states:

> "What is undoubtedly correct, however, is that such a business [a reasonable business in the circumstances of SP AusNet switching to mesh radio] would have to incur the costs of the complete roll out of mesh radio, as well as the costs already spent in the partial roll out of WiMAX. The AER's determination does not take account of the costs already incurred by SP AusNet in its WiMAX roll out or other costs associated with SP AusNet switching to a different technology at that stage, whether mesh radio or some other technology. As a result of this failure, the determination by the AER of what costs of SP AusNet are not prudent constitutes an error of fact."

Paragraph 132 states:

> "At this point it bears reiterating that the AER explicitly denies determining that the commercial standard it determined a reasonable business would exercise required the abandonment of the WiMAX technology and the adoption of mesh radio. Nevertheless, at one point in its contentions, it was asserted that the AER had considered the "sunk costs" of making such a change by reference to two experts reports available to it. The Tribunal concludes that the AER did not do so, as was its first position."

Paragraph 135 states:

> "Had the AER determined that the application of the commercial standard would have led to a decision on the part of SP AusNet to switch AMI technologies, then some part of the proposed expenditure may not have been prudent. T hat amount, however, would not have been calculated solely by reference to the benchmark companies, for whom switching costs were not applicable. As the Tribunal is entitled to assume that the AER correctly understood the regulatory regime, it is necessarily the case that the AER determined that the $72.2 million was the amount of expenditure found to be "not prudent" under clauses 5C.3 and 5C.4. This is clearly an error of fact because, as is discussed above, the AER's findings under clauses 5C.3 and 5C.4 were behavioural in nature and did not determine that any amount of expenditure was 'not prudent'."

At paragraph 138 the Tribunal states:

> "The reconsideration would have had to consider the various options, as the AER says, including the costs already incurred to the date of the new Submitted Budget being reconsidered if an alternative technology was to be adopted, the costs of switching to the new selected technology, as well as the delays involved in retreating from the WiMAX communications technology which the AER had first mandated, before the AER could have been satisfied in terms of clause 5C.3(b) of the AMI Order, and could have made the determination required by clause 5C.8."

If the AER accepts SP AusNet's assessment - set out in this submission - that SP AusNet's proposed incurrence of the $72.2 million of expenditure remitted by the Tribunal is not a substantial departure from the commercial standard, then the whole of the $72.2 million must be reinstated in full in SP AusNet's 2012-15 Approved Budget.

If the AER instead maintains its preliminary view that SP AusNet should have switched to a Mesh solution, then having regard to the Tribunal's decision, the following steps must be taken by the AER to determine SP AusNet's budget for 2012-15:

- The cost and revenue model used by the AER in its Final Determination must be adjusted to add back the foreign exchange and labour costs in accordance with the Tribunal's Orders 1(1) and 1(3).

- The AER's Final Determination cost and revenue model must be adjusted to adopt the modular meter costs as set out by SP AusNet in this submission. A Mesh solution that rolled out integrated meters would not be feasible from a compliance perspective and would also incur substantially greater switching costs than presented in this submission.

- The AER's Final Determination cost and revenue model must be adjusted to apply the correct forecast numbers of Mesh and 3G NICs, in accordance with the Mesh and 3G coverage assumptions set out in Annexure 3 of this submission.

- The AER's Final Determination cost and revenue model must be adjusted to apply the correct Mesh and 3G NIC benchmark unit costs as set out in this submission.

- The AER's Final Determination cost and revenue model must be adjusted to include the costs of switching from WiMAX to Mesh, as set out in this submission.

- The AER's Final Determination cost and revenue model must be adjusted to allow for the recovery in the 2012-15 period of WiMAX costs already incurred but not recovered if SP AusNet switches to Mesh, as detailed in Annexure 8.

The above elements address the costs that would have been incurred by SP AusNet if a Reconsideration had been made on 28 February 2011. However, the AER in setting the Approved Budget for 2012-15 would also need to deal with SP AusNet's actual circumstances today. Specifically, if the AER concludes that SP AusNet should have switched to Mesh, the Board may conclude that it would be prudent to switch to a Mesh solution now. In these circumstances, SP AusNet would seek to include the costs of a complete roll out of Mesh, as noted by the Tribunal at paragraph 129, including the following additional costs in its 2012-15 Approved Budget:

- Conversion to Mesh of all existing WiMAX meters rolled out since 28 February 2011 to the date of the AER's determination;
- The construction of a Mesh network;
- The additional costs of switching to Mesh associated with the substantially greater retrofit tasks and integration issues;
- The recovery of costs incurred to the date of the AER's determination, in accordance with the Tribunal's findings; and
- The potential costs that arise from non-compliance with the milestones in the Order and the inevitable delay in completing the AMI program.

Evidently, these costs will be significantly greater than those presented in this submission. Nonetheless, the inclusion of these costs will be required if the AER concludes that the prudent course of action is to switch to a Mesh solution.

Unless the AER adopted the approach set out above, its reconsideration of the Submitted Budget will necessarily fail to comply with the Tribunal's reasons. Moreover, for the reasons set out in this submission and the KEMA report, the whole of the $72.2 million must be reinstated in full in SP AusNet's 2012-15 Approved Budget.

Annexure 1: KEMA Report

[C-I-C] PENDING ADVICE FROM DNV KEMA

Annexure 2: KEMA model

[C-I-C]

Annexure 3: WiMAX Cost Templates 2012-15 Budget Period

[C-I-C]

Annexure 4: Identified errors in the Energeia Model

Energeia's analysis includes information that would not have been known to SP AusNet in February 2011.

INPUTS - 'Business Case_Nominal' Worksheet

	Title	Cell reference	Energeia model calculation	Error(s)
1	**Meter numbers**	Rows 5 – 10	The Energeia model has applied the meter volumes from its October 2011 Final Determination.	This information would not have been known to SP AusNet in February 2011.
2	**Proportion of meters by comms type**	I16, I21	The Energeia model has assumed that only 78.73% of the meters would be installed with a WiMAX NIC card with the remaining 21.27% of meters installed with a 3G NIC card.	As at 28 February 2011, SP AusNet was forecast to rollout 89.63% of the meters with a WiMAX NIC card and 10.37% with a 3G NIC card on average.
3	**WiMAX NIC card**	Row 38	The Energeia model has assumed that the base value of US$[C-I-C] for a WiMAX comms card will be inflated post 2015 according to CPI, leading to a cost of US$[C-I-C] by 2025.[46]	The Energeia model must include the price of the Zigbee chip of US$[C-I-C] in its analysis.
4	**3G NIC card**	Row 39	The Energeia model has assumed that the base value of US$[C-I-C] for a 3G comms card will be inflated post 2011 according to CPI, leading to a cost of US$[C-I-C] by 2025.	The Energeia model must include the price of the Zigbee chip of US$[C-I-C] in its analysis.

INPUTS - 'Meter Costs' Worksheet

	Title	Cell reference	Energeia model calculation	Error(s)
5	**Meter type**	J6 – M11	The Energeia model has used an average meter cost from the other four distribution businesses in its meter cost assumptions	Three of the other distribution businesses have installed Integrated Meters, which require a full meter removal and re-installation when switching communications solution. SP AusNet only installs Modular Meters which do not need to be replaced when switching from communications solution.[47]

[46] The Energeia model has correctly assumed that a Wimax comms card is contracted at a price of US$83 in 2011-2015.

[47] Should the Energeia maintain the use of Integrated Meters, the costs to switch will need to allow for the full removal of the existing WiMAX meter and the full replacement of the Mesh meter (including equipment and installation costs).

RESULTS – 'Business Case_Nominal' Worksheet

WiMAX CAPEX

	Title	Cell reference	Energeia model calculation	Error(s)
6	**'WiMax Network + Backhaul' Capex (2015)**	I49	The Energeia model has applied the following calculation: *(Jemena's 2015 Network and Backhaul Capex costs / Jemena's 2011-14 Network and Backhaul Capex costs) * (SP AusNet 's 2011-14 Network and Backhaul Capex costs) * 0.85*	The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. The Energeia model has also not provided a reference or justification for the adjustment of this cost by a factor of 0.85.
7	**'NMS' Capex (2011)**	E50	The Energeia model has incorrectly applied SP AusNet 's NMS Opex costs for 2011	The correct cell reference in SP AusNet's Budget template is 'AMI IT Capex Detail' WorkSheet, L47.
8	**'NMS' capex (2019-20)**	M50, N50	The Energeia model has not inflated the 2009 and 2010 nominal costs to $2011 when calculating the replacement cost in 2019-20	The 2009 and 2010 nominal costs should be inflated to $2011
9	**'MDMS' Capex (2011)**	E51	The Energeia model has incorrectly applied SP AusNet 's MDMS Opex costs for 2011	The correct cell reference in SP AusNet's Budget template is 'AMI IT Capex Detail' WorkSheet, L55.
10	**'MDMS' Capex (2019-20)**	M51, N51	The Energeia model has not inflated the 2009 and 2010 nominal costs to $2011 when calculating the replacement cost in 2019-20	The 2009 and 2010 nominal costs should be inflated to $2011

Mesh CAPEX

	Title	Cell reference	Energeia model calculation	Error(s)
11	**'Mesh Module Retrofit Installation' (2011)**	F57	The Energeia model has applied the total number of meters installed between February and December 2011 (100,644 meters) and a 'module install cost' of $[C-I-C].	If this cost is associated with replacing a WiMAX comms card with a Mesh comms card the cost per meter should be $[C-I-C] (see Process Maps attached).
12	**'Mesh Network + Backhaul' Capex (2011)**	E58	The Energeia model has applied Powercor's 'Metering and comms equipment purchase' and 'AMI installation services' costs from 2009-2011.	The Energeia model has failed to correctly inflate the 2009 and 2010 nominal costs to $2011. The Energeia model is incorrect in substituting Powercor's costs without understanding the comparative cost methodology between Powercor and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of costs between SP AusNet and Powercor.
13	**'Mesh Network + Backhaul' Capex (2012-15)**	F58 – I58	The Energeia model have applied 86 per cent of Powercor's 'Metering and comms equipment purchase' and 'AMI installation services' costs approved by in its Final Determination	The Energeia model is incorrect in substituting Powercor's costs without understanding the comparative cost methodology between Powercor and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of costs between SP AusNet and Powercor.
14	**'NMS' Capex (2011)**	E59	The Energeia model has applied Jemena's NMS capex costs from 2009-2011	The Energeia model has failed to correctly inflate the 2009 and 2010 nominal costs to $2011. The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.
15	**'NMS' Capex (2012-15)**	F59-I59	The Energeia model has applied Jemena's NMS capex costs from 2012-15	The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.

	Title	Cell reference	Energeia model calculation	Error(s)
16	**'NMS' Capex (2019-20)**	M59, N59	The Energeia model has applied Jemena's NMS capex costs for 2009-2012.	The Energeia model has failed to correctly inflate the 2009 and 2010 nominal costs to $2011. The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.
17	**'MDMS' Capex (2011)**	E60	The Energeia model has applied Jemena's MDMS capex costs from 2009-2011	The Energeia model has failed to correctly inflate the 2009 and 2010 nominal costs to $2011. The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.
18	**'MDMS' Capex (2012-15)**	F60 – I60	The Energeia model has applied Jemena's MDMS capex costs from 2012-15	The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.
19	**'MDMS' Capex (2019-20)**	M60, N60	The Energeia model has applied Jemena's 2009-2012 costs.	The Energeia model has failed to correctly inflate the 2009 and 2010 nominal costs to $2011. The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.
20	**'WiMax Network Remediation' Capex**	E61	The Energeia model has included a 'cost of breaking contracts' and 'demolishing communications towers cost' in 2011 following the switch to a Mesh communications solution of $[C-I-C] million.	The source of these costs has not been identified and SP AusNet disputes that these costs would be incurred in 2011.

Mesh OPEX

	Title	Cell reference	Energeia model calculation	Error(s)
21	**'Backhaul Communications' Opex (2011-15)**	E72 – I72	The Energeia model has applied 86% of Powercor's 'Backhaul Comms' Opex cost from 2011-15	The Energeia model is incorrect in substituting Powercor's costs without understanding the comparative cost methodology between Powercor and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of costs between SP AusNet and Powercor.
22	**'Communications Operations' Opex (2011-15)**	E73 – I73	The Energeia model has applied 86% of Powercor's 'Communications Operations' Opex cost from 2011–15	The Energeia model is incorrect in substituting Powercor's costs without understanding the comparative cost methodology between Powercor and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of costs between SP AusNet and Powercor.
23	**'NMS' Opex (2011-15)**	E74 – I74	The Energeia model has applied Jemena's 'NMS' Opex costs from 2011-15	The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.
24	**'MDMS' Opex (2011-15)**	E75 – I75	The Energeia model has applied Jemena's 'MDMS' Opex costs from 2011-15	The Energeia model is incorrect in substituting Jemena's costs without understanding the comparative cost methodology between Jemena and SP AusNet. Subsequently, the Energeia model has not explained the relevance of network size (based on customer numbers) to the adjustment of 'Software licence and maintenance' costs between SP AusNet and Jemena.

Note: The snapshot on the following page shows the location in the Energeia model of each numbered item listed in the tables above.

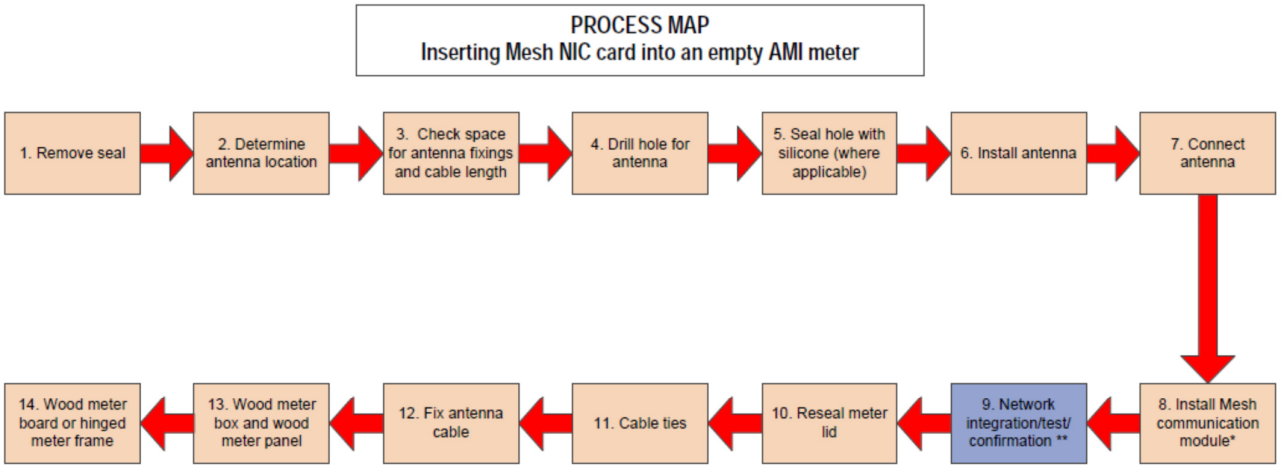
All dollars are discounted AUD 2011, unless otherwise indicated.

Inputs	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Meter Numbers															
Single phase single element	214,845	359,622	430,460	439,399	448,116	454,731	461,444	468,256	475,168	482,183	489,301	496,524	503,854	511,292	518,840
Single phase two element with contactor	31,910	110,918	149,576	149,576	149,576	151,784	154,024	156,298	158,606	160,947	163,323	165,734	168,180	170,663	173,183
Multiphase	2116	57,365	84,398	85,507	86,580	87,858	89,155	90,471	91,806	93,162	94,537	95,932	97,349	98,786	100,244
Multiphase with contactor	420	33,190	49,224	49,249	49,272	50,000	50,738	51,487	52,247	53,018	53,801	54,595	55,401	56,219	57,049
Multiphase CT connected	108	2,627	3,860	3,900	3,938	3,996	4,055	4,115	4,176	4,238	4,300	4,364	4,428	4,493	4,560
Total	249,399	563,724	717,518	727,630	737,482	748,368	759,416	770,627	782,003	793,547	805,262	817,149	829,212	841,453	853,875
PC Mesh Network Size	859,709		JEN Network Customers			304,474									
SPA Mesh Network Size	737,482		SPA Network Customers			793,547									
SPA Network Size Pro-rata	86%		SPA Network Size Pro-rata			261%									
WiMax					78.73%										
Total NICs	249,399	443,833	564,920	572,881	580,637	589,209	597,907	606,733	615,690	624,779	634,002	643,362	652,859	662,497	672,277
Antenna	249,399	443,833	564,920	572,881	580,637	589,209	597,907	606,733	615,690	624,779	634,002	643,362	652,859	662,497	672,277
3G - WiMax					21.27%										
Total NICs		119,890	152,598	154,749	156,844	159,160	161,509	163,893	166,313	168,768	171,259	173,788	176,353	178,956	181,598
Antenna		109,100	138,865	140,822	142,728	144,835	146,973	149,143	151,345	153,579	155,846	158,147	160,481	162,850	165,254
Extended Antenna		10,790	13,734	13,927	14,116	14,324	14,536	14,750	14,968	15,189	15,413	15,641	15,872	16,106	16,344
Mesh					97%										
Total NICs		546,812	695,992	705,801	715,357	725,917	736,634	747,508	758,543	769,741	781,104	792,635	804,336	816,210	828,259
		273,406	347,996	352,901	357,679	362,959	368,317	373,754	379,271	384,870	390,552	396,317	402,168	408,105	414,129
3G - Mesh					3%										
Total NICs		16,912	21,526	21,829	22,124	22,451	22,782	23,119	23,460	23,806	24,158	24,514	24,876	25,244	25,616
Antenna		15,390	19,588	19,864	20,133	20,430	20,732	21,038	21,349	21,664	21,984	22,308	22,637	22,972	23,311
Extended Antenna		1,522	1,937	1,965	1,991	2,021	2,050	2,081	2,111	2,143	2,174	2,206	2,239	2,272	2,305

Meter solution costs	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Meter Solution Costs - AUD															
WiMax Comms Card															
3G Comms Card															
Mesh Comms Card															
					[C-I-C]										
Antenna															
Extended Antenna															

Results	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
CAPEX - WiMax	**51,431,578**	**73,094,714**	**35,283,333**	**3,821,525**	**2,105,454**	**2,058,989**	**1,936,906**	**1,822,160**	**15,616,219**	**14,600,450**	**1,517,609**	**1,428,009**	**1,343,772**	**1,264,571**	**1,190,102**
WiMax + 3G Meter Comms Equipment	$ 28,142,183	$ 47,428,603	$ 20,788,300	$ 1,378,363	$ 1,354,419	$ 1,534,917	$ 1,597,294	$ 1,662,206	$ 1,729,756	$ 1,800,051	$ 1,873,203	$ 1,949,327	$ 2,028,545	$ 2,110,983	$ 2,196,770
WiMax NIC Retrofit Installation	$ 357,084														
WiMax Network + Backhaul	$17,264,567	$ 25,531,591	$ 18,304,437	$ 3,652,332	$ 1,688,011	$ 1,731,056	$ 1,775,198	$ 1,820,465	$ 1,866,887	$ 1,914,493	$ 1,963,312	$ 2,013,377	$ 2,064,718	$ 2,117,368	$ 2,171,361
NMS	$4,303,716	$ 3,945,627							9,018,627	$ 9,248,602					
MDMS	$1,364,028	$ 3,140,200	$ 3,220,589						20,147,865	$ 20,661,635					
CAPEX - Mesh	**$ 26,907,199**	**$ 55,398,848**	**$ 18,115,786**	**$ 4,075,366**	**$ 2,884,650**	**$ 1,232,099**	**$ 1,159,353**	**$ 1,090,960**	**$ 6,146,579**	**$ 5,749,361**	**$ 909,346**	**$ 855,885**	**$ 805,611**	**$ 758,331**	**$ 713,863**
Mesh + 3G Meter Comms Equipment		$ 33,478,620	$ 12,441,066	$ 819,622	$ 800,153	$ 953,909	$ 992,674	$ 1,033,015	$ 1,074,996	$ 1,118,682	$ 1,164,144	$ 1,211,453	$ 1,260,685	$ 1,311,918	$ 1,365,233
WiMax NIC Equipment Replacement		$ 6,542,534													
Mesh Module Retrofit Installation		$ 5,492,273													
Mesh Network + Backhaul	$12,649,960	$14,163,656	7,149,483	$2,015,548	$975,573	$ 1,000,450	$ 1,025,961	$ 1,052,123	$ 1,078,952	$ 1,106,466	$ 1,134,680	$ 1,163,615	$ 1,193,287	$ 1,223,716	$ 1,254,920
NMS	$4,824,730	$ 498,176	,064,440	$ 1,210,275	$ 1,148,201				$ 5,188,714	$ 5,321,026					
MDMS	$5,232,509	$ 492,020	$ 1,070,259	$ 1,319,407	$ 1,244,461				$ 5,552,982	$ 5,694,583					
WiMax Network Remediation	$ 4,200,000														
OPEX - WiMax	**6,352,028**	**10,874,695**	**10,005,170**	**9,743,481**	**9,128,449**	**8,528,036**	**7,967,113**	**7,443,085**	**6,953,525**	**6,496,164**	**6,068,886**	**5,669,712**	**5,296,793**	**4,948,402**	**4,622,927**
Backhaul Communications															
Communications Operations	$684,284	$ 3,141,013	$ 3,221,704	$ 3,304,145	$ 3,388,697	$ 3,475,108	$ 3,563,724	$ 3,654,599	$ 3,747,791	$ 3,843,359	$ 3,941,365	$ 4,041,870	$ 4,144,938	$ 4,250,634	$ 4,359,025
NMS	$4,303,716	$ 7,170,208	$ 7,138,379	$ 7,841,931	$ 8,078,937	$ 8,284,950	$ 8,496,216	$ 8,712,870	$ 8,935,048	$ 9,162,892	$ 9,396,546	$ 9,636,157	$ 9,881,880	$ 10,133,867	$ 10,392,281
MDMS	$1,364,028	$ 1,597,657	$ 1,638,557	$ 1,680,340	$ 1,723,189	$ 1,767,130	$ 1,812,192	$ 1,858,403	$ 1,905,792	$ 1,954,390	$ 2,004,227	$ 2,055,335	$ 2,107,746	$ 2,161,493	$ 2,216,611
OPEX - Mesh	**5,295,936**	**5,856,782**	**6,575,180**	**6,699,259**	**6,237,205**	**5,826,960**	**5,443,698**	**5,085,645**	**4,751,142**	**4,438,641**	**4,146,694**	**3,873,950**	**3,619,145**	**3,381,100**	**3,158,712**
Backhaul Communications	$314,054	$ 1,931,422	$ 3,146,317	$ 3,297,587	$ 3,452,552	$ 3,540,592	$ 3,630,877	$ 3,723,464	$ 3,818,413	$ 3,915,782	$ 4,015,634	$ 4,118,033	$ 4,223,043	$ 4,330,731	$ 4,441,164
Communications Operations	$2,464,673	$ 994,855	$ 1,020,323	$ 1,806,537	$ 1,852,604	$ 1,899,845	$ 1,948,291	$ 1,997,973	$ 2,048,921	$ 2,101,168	$ 2,154,748	$ 2,209,694	$ 2,266,041	$ 2,323,825	$ 2,383,083
NMS	$1,150,678	$ 1,491,952	$ 1,647,494	$ 1,776,606	$ 1,859,421	$ 1,906,836	$ 1,955,460	$ 2,005,324	$ 2,056,460	$ 2,108,900	$ 2,162,677	$ 2,217,825	$ 2,274,380	$ 2,332,376	$ 2,391,852
MDMS	$1,366,531	$1,995,533	$2,071,112	$1,938,244	$1,848,332	$ 1,895,464	$ 1,943,799	$ 1,993,365	$ 2,044,196	$ 2,096,323	$ 2,149,779	$ 2,204,599	$ 2,260,816	$ 2,318,467	$ 2,377,588

Annexure 5: Process Maps for Switching to Mesh Solution



Step number	*Time allowance (hours)*	*Source:*
1	Collectively, the orange steps will take, on average, half an hour. 0.5	SP 6.1.1
2		SP 6.1.2
3		SP 6.1.3
4		SP 6.1.4
5		SP 6.1.5
6		SP 6.1.6
7		SP 6.1.7
8		SP 6.1.8
9	0.25	KEMA
10	As above	SP 6.1.9
11		SP 6.1.10
12		SP 6.1.11
13		SP 6.1.12
14		SP 6.1.13
Total	0.75 hours	

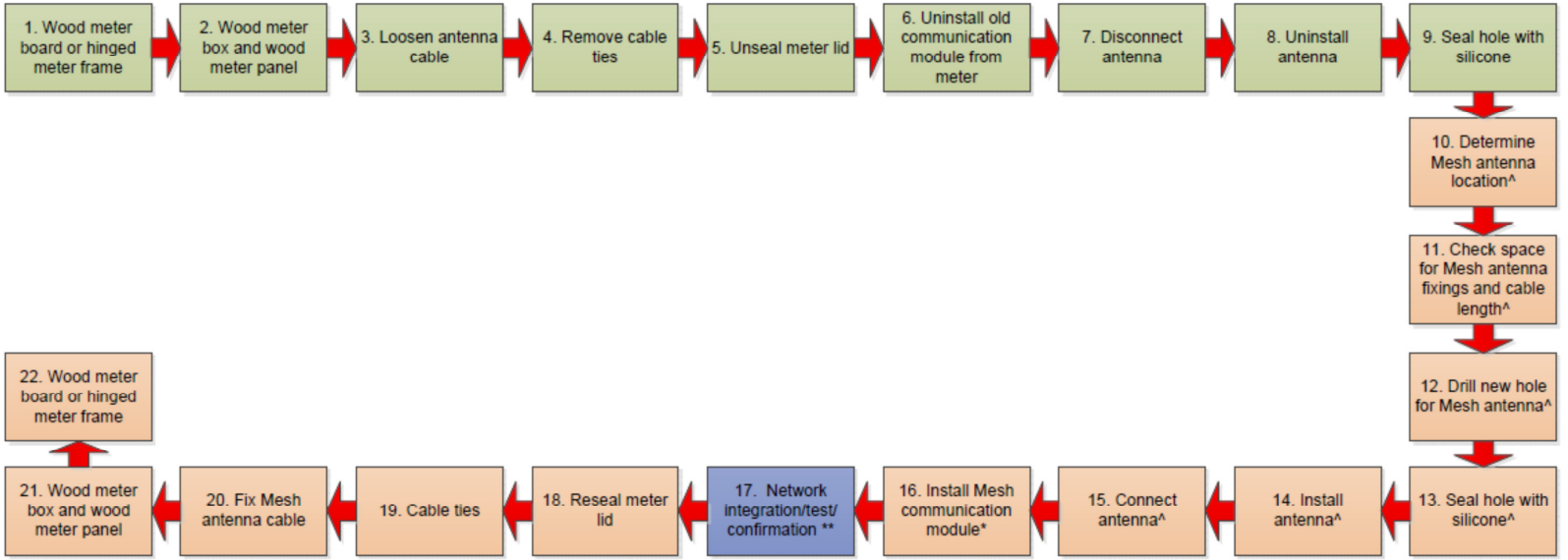
Notes:
The hourly rate of $[C-I-C] per hour does not include the following costs:
- travel time for installers
- equipment and tools to test Mesh NIC cards
- on-costs and overheads such as, installers trucks, equipment, payroll and administration costs.

*This step includes recording the NIC ID number.

** This step includes firmwave upgrade.

Sources:
SP 6.1.1 = Step 6.1.1 in SP AusNet, Electricity Distribution Standard: AMI Antenna Installation Standard (EDS 10-05) 16 November 2010.
KEMA = DNV KEMA, Technical advice, 29 August 2012.

PROCESS MAP
Retrofitting Mesh NIC cards into an AMI meter with a WiMAX NIC card



Step number	*Time allowance (hours)*	*Source:*
1		SP 6.1.13
2		SP 6.1.12
3		SP 6.1.11
4	Reversal of steps 13-16 and 18-22. It is assumed that the removal steps are equivalent to the installation steps.	SP 6.1.10
5		SP 6.1.9
6	0.5	SP 6.1.8
7		SP 6.1.7
8		SP 6.1.6
9		SP 6.1.5
10		SP 6.1.2
11		SP 6.1.3
12	Collectively, the orange steps will take, on average, half an hour.	SP 6.1.4
13		SP 6.1.5
14	0.5	SP 6.1.6
15		SP 6.1.7
16		SP 6.1.8
17	0.25	KEMA
18		SP 6.1.9
19		SP 6.1.10
20	As above	SP 6.1.11
21		SP 6.1.12
22		SP 6.1.13
Total	1.25 hours	

Notes:
The hourly rate of $[C-I-C] per hour does not include the following costs:
- travel time for installers
- equipment and tools to test Mesh NIC cards
- on-costs and overheads such as, installers' trucks, equipment, payroll and administration costs.

* This step includes recording the NIC ID number.

** This step includes firmwave upgrade.

^The need for these steps will depend on whether an antenna is required. It is expected that in 30% of meters, Mesh antennas will not be required. In such cases, the hole from the old antenna may need sealing. In the other 70% of cases, where a Mesh antenna is required, it is expected that new holes will have to be drilled etc.

Sources:
SP 6.1.1 = Step 6.1.1 in SP AusNet, Electricity Distribution Standard: AMI Antenna Installation Standard (EDS 10-05) 16 November 2010.
KEMA = DNV KEMA, Technical advice, 29 August 2012.

Annexure 6: AMI Comms Card and Antenna Installation Standard

[C-I-C]

Annexure 7: Evidence that Mesh radio cannot meet specifications

UNITED ENERGY Distribution

Jemena

7 August 2009

The Industry Steering Committee (ISC)

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Dear ISC Members

Clarification of Performance Level 4.4 (a) (1)

As part of our ongoing AMI program, we have recently completed the detailed design that will underpin our compliance to the Victorian mandate. This detailed design includes a design of the Local Area Network (LAN) by our mesh radio provider, Silver Spring Networks (SSN).

The LAN Design supplied by SSN primarily deals with the proposed locations for Access Points and Repeaters, but also provides detailed information on how the network addresses the Performance Levels outlined in the Minimum AMI Functionality Specification.

As part of the LAN Design, SSN have requested clarification surrounding Performance Level 4.4 (a) (1), pertaining to Controlled Load Management and Utility Control of Other Load and in particular, the target:

"Action performed at 99% of meters within 1 minute"

SSN have advised (see attachment) that unacknowledged messages can be delivered to at least 90% of meters in 8 minutes, but not the target noted above. SSN have also stated that they are not aware of any other AMI system that can meet this target.

This particular performance level was changed on the 25th September 2007 from "90% of meters in 10 minutes" to 99% of meters in 1 minute" to align with the National Process - with the agreement that it would be clarified at some future point in time.

As a result, we request that the ISC seek clarification of this performance level from the Minister with the recommendation that the performance level be set with the original target of "90% of meters in 10 minutes", which is consistent with the other performance levels in the Functional Specification.

To ensure that we can commence our rollout on 1 September 2009, we request that the ISC seek this clarification urgently and communicate to the Minister that the clarification is required no later than 31 August 2009.

Yours sincerely

Cameron Dorse
General Manager, AMI & Customer Services

[Attached – Performance Level Clarification, Silver Spring Networks]

23 July 2009

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GM Business Services & IT, AAM
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Australia

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Re: Performance Level Clarification for DPI Performance Level 4.4(a)(1)

Dear Cameron,

Silver Spring Networks (SSN) wishes to formally request clarification on Performance Level 4.4(a)(1) contained in Version 1.1 of the DPI Minimum AMI Functionality Specification.

This performance level relates to Controlled Load Management and Utility Control of Other Load, and in particular requires that:

> *"Action performed at 99% of meters within 1 minute".*

Recent design, analysis and field testing performed by SSN for the Jemena/UED AMI implementation has identified that this performance level is not technically feasible.

This analysis and testing has shown that:

- It can take up to 2 minutes for a Network Management System (NMS) to process the request,
- Whilst the minimum time to broadcast a message through the network may be as low as 1 minute under some scenarios, this performance level cannot be guaranteed,
- Analysis of the UED and JEN topographies shows that adding more equipment to the system will not meet the performance specification; and
- The backhaul network introduces additional delays further delaying the delivery of messages.

SSN believes that a technically feasible performance level for DPI Specification 4.4(a)(1) is:

> *"Action performed at 90% of meters within 10 minutes."*

This performance level is also in line with other DPI performance levels such as 4.6(a)(1) – emergency supply capacity limiting.

SSN advises that it is not aware of any AMI system that can meet the 1 minute target timeframe.

Yours sincerely,

Matt Ota
Vice President, Customer Operations
Silver Spring Networks, Inc.

Advanced Metering Infrastructure (AMI)
Industry Steering Committee (ISC)

AMI ISC DECISION PAPER — ITEM 5

Meeting Date:	6th October 2009
Meeting No.	28
Subject:	FWG Recommendation
Responsibility:	AMI Program Manager

Recommendation

As the NSMP specifications have not yet been finalised. The FWG **AGREED** that the Performance Level 4.4(a)(1) contained in version 1.1 of the DPI Minimum AMI Functionality Specification should be reverted back to the previously agreed target of;

"Actioned performance at 90% of meters within 10 minutes"

with a view to further review the performance level once the NSMP specification is finalized.

DECISION 1: The AMI ISC **APPROVES** the recommendation proposed the FWG.

Background

During the PDWG meeting 54, held on 24th August 2009, Jemena/UED tabled a letter outlining their concern relating to the Performance Level 4.4(a)(1) contained in version 1.1 of the DPI Minimum AMI Functionality Specification,

"Actioned performance at 99% of meters within 1 minute"

The PDWG agreed to reconvene the FWG to seek clarification of the performance requirements as specified in the Functionality Specifications. This item was highlighted as part of risk #18 in the September AMI ISC meeting.

A background summary was provided during the FWG meeting, key points to note:

- Originally the Performance Level 4.4(a)(1) was specified as

  "Actioned performance at 90% of meters within 10 minutes"

- However based on the NERA study and in anticipation of the National Smart Meter Program performance levels the Performance Level 4.4(a)(1) was changed to:

  "Actioned performance at 99% of meters within 1 minute"

- The AMI FWG Minutes from the 25th September 2007 meeting stated that:

  It was agreed to change the VIC functionality performance level to match the national performance level, noting that there is a review process for the VIC functionality spec which will allow for changes should that be necessary.

The FWG noted that the current Performance Level 4.4(a)(1), "Actioned performance at 99% of meters within 1 minute", is not practical or achievable.

The FWG further noted that the NSMP is currently discussing changing the performance level to a lesser standard of "Actioned performance at 90% of meters within 5 minutes", however this performance level has not yet been finalised.

Next Steps

AMIPO submits a letter, on behalf of AMI ISC, to the Minister to:

- seek clarification of this performance level
- recommend that the performance level should be reverted back to the previously agreed target of "Actioned performance at 90% of meters within 10 minutes", with a view to further review and align the performance level once the NSMP specification is finalized.

Annexure 8: WiMAX costs already incurred but not recovered

The table below summarises the WiMAX costs incurred by SP AusNet up to the reconsideration date of 28 February 2011, which have not yet been recovered.

SP AusNet Rollout costs to date										Costs incurred that are not recoverable		
		Costs provided to AER in Feb 2011 (2010 numbers not final) Source, budget and charges templates					Costs provided to AER in 2013 Revised Charges Application					
	$2011	2006	2007	2008	2009	2010	2011	2012	Total	2006 - 2010 incurred WiMAX costs	Jan - Feb 2011 incurred WiMAX costs	Total WiMAX costs incurred
	Meters											
	Comms											
	IT											
	Other											
Capex		**-**	**4,205,826**	**10,963,201**	**40,169,920**	**91,986,902**	**112,694,786**	**153,231,073**	**147,325,849**	**47,749,896**	**7,765,862**	**55,515,758**
	Meter Reading											
	Meter Data Management											
	Meter Maintenance											
	Comms Backhaul											
	Comms Network Maintenance											
	Technology trials											
	PMO											
	Customer Services											
	Overheads											
	Industry PMO/Audit/Reg submissions											
	IT opex											
	Debt raising											
	Movement in provisions											
Opex		**1,188,919**	**3,740,118**	**8,750,488**	**28,241,156**	**40,505,410**	**42,811,172**	**38,677,258**	**82,426,091**	**12,724,869**	**1,190,747**	**13,915,615**
Total		**1,188,919**	**7,945,943**	**19,713,689**	**68,411,076**	**132,492,312**	**155,505,958**	**191,908,330**	**229,751,940**	**60,474,765**	**8,956,609**	**69,431,373**

As described in Section 7.5 of this submission, the WiMAX costs incurred would need to be consider all the costs incurred at the time of the decision to switch.

Annexure 9: SP AusNet urban growth corridor maps

The maps shown below depict SP AusNet's urban growth corridors, and the planned locations of WiMAX towers.

[C-I-C]