Advanced Metering Infrastructure

2012-15 Budget and Charges Application

Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 - Reconsideration Submission

5 June 2012

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 620,000 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 572,000 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

This submission responds to an information request from the Australian Government Solicitor in relation to the Australian Competition Tribunal's decision[1] on SP AusNet's 2012-15 Budget and Charges Application for the Advanced Metering Infrastructure (AMI) roll out.

The Tribunal made three orders:

- Orders 1(1) and 1(3) concern the Tribunal's finding that the AER made errors of fact in relation to foreign exchange contracts and labour costs. Subject to the qualifications noted in this submission, SP AusNet accepts the approach proposed by the Australian Government Solicitor to give effect to the Tribunal's orders.
- Order 1(2) requires the AER's decision to reduce SP AusNet's proposed expenditure relating to the roll out of "WiMAX communications" to be remitted to the AER for further consideration. Sections 3, 4, 5 and 6 of this submission present SP AusNet's reconsideration of its technology options in accordance with the Tribunal's findings and the Australian Government Solicitor's information request.

In relation to the reconsideration of its technology options, SP AusNet has set out a proposed methodology that is consistent with the commercial standard that would be applied by a reasonable business in SP AusNet's circumstances. In particular, the methodology addresses the matters that SP AusNet's Board would expect to be included in an analysis that reconsiders the technology choice for a major project such as AMI. In light of the Tribunal's reasoning in relation to Order 1(2), SP AusNet considers that its proposed methodology should be accepted by the AER in its further consideration of SP AusNet's budget and charges application for the 2012-2015 budget period.

SP AusNet's methodology recognises that the choice of technology must examine objectively the costs of each feasible option by applying the best available information and assumptions at the time of the reconsideration. To give effect to this approach, SP AusNet has proposed that the relevant timeframe for the reconsideration is the months leading up to 19 May 2011. SP AusNet considers that this timeframe is most consistent with the reasoning in the Tribunal's decision. During this period, SP AusNet's AMI Subsequent Budget and Charges Application Submission, dated 28 February 2011, provided the current and best available cost estimate of the WiMAX solution over the 2012 to 2015 AMI budget period.

Three options have been identified as feasible options, as follows:

- Option 1: The base case is 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 closely aligned with the approach adopted by other distribution businesses.

[1] Appeal by SPI Electricity Pty Ltd [2012] ACompT 11.

Under each of the three options set out above, it is assumed that a 3G communications solution will be used to cover approximately 15% of the meter population which is located in the more remote areas of SP AusNet's service territory.

The quantitative analysis has examined the forward-looking costs that would be incurred under each option in order to complete the AMI roll out. As recognised by the Tribunal, at the time of the reconsideration, approximately 174,500 meters had already been rolled out with WiMAX communication technology. While the analysis suggests that mesh radio may have been a more cost effective option had it been adopted at the start of the AMI program, as noted by the Tribunal that option is not open to SP AusNet. The potential cost advantages of mesh radio are now completely eroded by:

- the additional costs of integrating WiMAX and mesh radio solutions in Option 2; and
- the additional costs of replacing existing WiMAX communication cards, towers and WiMAX related IT systems in Option 3.

An important factor in the cost analysis is the timeframes involved in implementing a change in technology. A prudent and cost-effective implementation process would need to take into account:

- the timeframes for conducting a competitive tender exercise for mesh radio service providers;
- the changes required to SP AusNet's AMI program, including changes to internal and external resources required to deliver the revised AMI program; and
- for Option 2, the need to continue to roll out WiMAX to make effective use of existing WiMAX towers. This is the cost of working out the converging of the two technologies.

SP AusNet's analysis indicates that the timeframes involved in implementing either Option 2 or Option 3 would delay the AMI program by 6 months, which would, in the absence of prior regulatory approval, lead to non-compliance with the AMI Order in Council. SP AusNet's Board would not adopt an option that involved such an increased risk of non-compliance unless appropriate regulatory and Government approvals were first obtained.

In any event, SP AusNet's cost analysis shows that continuing with the WiMAX communications technology (Option 1) is the lowest cost option on a forward looking basis, recognising SP AusNet's particular circumstances. Option 2 is the next lowest cost option, but it is approximately $25 million more expensive than Option 1, when integration and other implementation costs are taken into consideration. On the basis of the cost analysis alone, therefore, SP AusNet would continue to roll out the WiMAX communication solution (i.e. SP AusNet would reject Options 2 and 3).

Option 3 is the most costly of the three options. In effect, this option involves scrapping the sunk WiMAX costs already incurred in the 2009 to 2011 period, which are estimated to be approximately $72 million. Under this option therefore, customers pay twice for the functionality associated with the sunk WiMAX investment. Customers continue to bear the costs of the WiMAX infrastructure already installed, and they also bear the costs of replacing that infrastructure with its mesh radio functional equivalent.

However the methodology applied by SP AusNet in its reconsideration of technology options reflects the commercial standard of a reasonable business, so it is not limited to a quantitative assessment of the feasible options. In addition to evaluating the avoidable costs of all feasible options, SP AusNet's Board would also expect the company to consider important qualitative matters, including:

- compliance with applicable regulatory requirements;
- uncertainty and risk;
- shareholder value impacts;
- customer price and service impacts; and
- longer term implications.

For completeness, SP AusNet has undertaken a qualitative assessment of each option against the five key considerations noted above. The tables below provide a summary of outcomes and the rating description.

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

The table below explains the ratings used 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

For each of the key considerations examined in the qualitative assessment, the continuation of the WiMAX communication technology solution is identified as the preferred option. Options 2 and 3 are rated as "meets business needs partially, but with significant gaps" in relation to at least three of the five key considerations, while a rating of “does not meet business needs” was found to apply in relation to the remaining factors. The qualitative analysis therefore confirms the results of the quantitative analysis - that Option 1 is preferred.

The quantitative and qualitative analyses presented in this submission show that continuing with the roll out of WiMAX technology was the most economic option available to SP AusNet, given its particular circumstances in the months leading up to 19 May 2011. The results of the reconsideration set out in this submission demonstrate that SP AusNet's forecast expenditure for delivery of the WiMAX solution over the 2012 to 2015 budget period is prudent and meets the requirements of clause 5C.2 of the AMI Order in Council. Accordingly:

- the AER's determination should accept that SP AusNet acted prudently in continuing to roll out WiMAX communications technology, given SP AusNet's particular circumstances in the months leading up to 19 May 2011; and
- the AER should approve the re-inclusion of the amount of $72.2 million in an amendment to its Final Determination, dated October 2011.

1 Introduction and Background

This submission is SP AusNet's response to the Australian Government Solicitor's letter to Roxanne Smith of Johnson Winter & Slattery, dated 9 May 2012. The letter relates to proceedings[2] in which the Tribunal made the following orders:

- Orders 1(1) and 1(3) concern the Tribunal's finding that the AER made errors of fact in relation to SP AusNet's foreign exchange and labour costs; and
- Order 1(2), which requires the AER's decision to reduce SP AusNet's proposed expenditure relating to the roll out of "WiMAX communications" to be remitted to the AER for further consideration in accordance with the Tribunal's reasons. In particular, as noted in subsequent correspondence, the AER is to further consider the extent to which the amount of $72.2 million is to be approved as prudent expenditure.

The Australian Government Solicitor's letter seeks further information from SP AusNet to give effect to these orders. This submission responds to this information request as follows:

- Section 2 sets out SP AusNet's response on matters relating to orders 1(1) and 1(3) as requested in paragraph 5 of the Australian Government Solicitor's letter.
- Sections 3 to 6 address the information requests in relation to order 1(2) as follows:
    - Section 3 sets out SP AusNet's proposed methodology for SP AusNet's reconsideration of its ongoing commitment to WiMAX, in accordance with paragraphs 137 and 138 of the Tribunal's reasons.
    - Section 4 explains SP AusNet's proposal regarding the relevant timeframe for such a reconsideration.
    - Sections 5 and 6 conduct a quantitative and qualitative analysis of the technology options, respectively, in accordance with the methodology and timeframe proposed in sections 3 and 4.

[2] Appeal by SPI Electricity Pty Ltd [2012] ACompT 11.

2 Models for consideration in relation to Order 1(1) and 1(3)

Foreign Exchange

The AER's model "*SP AusNet – Adjustment to revised capex and USD breakdown.xlsx*" calculates the adjustment required to SP AusNet's metering capex budget ($15.85 million) resulting from correctly using the exchange rates contained in SP AusNet's forward foreign exchange contracts. SP AusNet agrees that this calculation is correct. SP AusNet notes that if the AER determines, under Order 1(2), any change in the meter unit US Dollar price then it must use an exchange rate equal to SP AusNet's hedging rate (as used in the model referred to above) when calculating the Australian Dollar impact of this budget adjustment.

Project Management

The AER's model "*Project management calculation.xls*" assigns the $1.7 million adjustment to be made to SP AusNet's Project Management operating expenditure budget in accordance with the Tribunal's Order 1(3) and reasoning in paragraph 228. SP AusNet accepts the method used to assign this expenditure across the 2012-15 period, noting that this adjustment is in relation to project management expenditure other than meter services expenditure.

3 SP AusNet's proposed methodology and principles

The Tribunal concluded at paragraph 137 that SP AusNet's ongoing commitment to WiMAX communications should have been carefully reconsidered by the company. The Tribunal further concluded that:

> *"The necessary next step is to determine whether, upon such a reconsideration, 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 evident that SP AusNet's methodology for the purpose of the current exercise should be consistent with the step described in paragraph 137. In developing the proposed methodology, SP AusNet also notes that neither the Tribunal nor the AER concluded that SP AusNet should change technology.

It follows from the above observations that the methodology must consider whether SP AusNet should have changed technology, given its particular circumstances. Furthermore, the Tribunal explained at paragraph 127 that the Order in Council limits the expenditure that the AER may remove from the submitted budget and, at paragraph 138, that it is the 'next step' that would allow the AER to establish how much of the proposed expenditure could or should be removed in accordance with clause 5C.8. The methodology must, to the extent it shows proposed expenditure is not prudent, identify the amount that is not prudent.

In addition to being consistent with the requirements of the Order in Council, the methodology employed in this exercise must explicitly address the errors that the Tribunal found in relation to the AER's Final Determination, as explained at paragraphs 126, 130 and 138.

Clause 5C.8 requires that where expenditure has been determined to be "not prudent", the proposed expenditure is to be reduced by no more than the amount determined to be not prudent under clauses 5C.3 and 5C.4. It is evident from the Tribunal's comments that the issue of whether expenditure can be determined to be "not prudent" depends on the commercial standard that a reasonable business would exercise in SP AusNet's circumstances. Clause 5C.4 requires that the AER must take into account and give fundamental weight to the matters referred to in clause 5I.8. SP AusNet's reconsideration and the AER's further consideration is thus framed by SP AusNet's circumstances by reference to clause 5I.8.

It is evident, therefore that the methodology must also capture the matters described in clause 5I.8.

In light of the above, SP AusNet adopts the following key considerations as relevant to the definition and application of the commercial standard in the context of reconsidering SP AusNet's choice of AMI communications technology:

- **Objectivity**. The commercial standard requires an objective approach to be taken in examining competing business options. It must be objective in terms of recognising the existing and possible future states of technology, the relevant market conditions and risks, in accordance with clauses 5I.8(g), (h) and (i). It is not appropriate to approach the task with a favoured solution in mind or through the use of inappropriate assumptions or analysis.
- **Compliance**. The commercial standard must have regard to the company's compliance obligations, in accordance with clauses 5I.8(f) and (j). The company's compliance obligations include regulatory compliance and contractual commitments.

An option that exposes the company to unacceptable or unmanageable risks of non-compliance would not be consistent with meeting the commercial standard.

- **Uncertainty and risk**. The commercial standard must have regard to uncertainty and risk, including technology risk and project risk in accordance with clauses 5I.8(g) and (h). There are two aspects in particular that should be recognised in the commercial standard. Firstly, information and analysis cannot be known with certainty, and therefore judgment will need to be exercised in this context. Secondly, the selected option must not unduly expose SP AusNet to on-going risk management issues, which may include safety; compliance; cost effectiveness; service performance and deliverability. An option that introduces unacceptable or unmanageable risks would not be consistent with meeting the commercial standard.
- **Shareholder value implications**. The commercial standard must be consistent with maximising shareholder value. The company's share price is the ultimate measure of shareholder value. An option that may damage the company's reputation and its share price will not be consistent with meeting the commercial standard.
- **Business-wide considerations.** The commercial standard must have regard to the company's overall commercial objectives. It is not appropriate to select an option that delivers the best outcome in relation to a specific project, if these benefits are outweighed by adverse consequences for other aspects of the company's performance.
- **Accurate and relevant information**. The information employed in the analysis must be accurate, relevant and current. The methodology must employ information that was available at the time, in accordance with clause 5I.8(d). The commercial standard must treat with appropriate caution any information or analysis that is regarded as speculative or uncertain.
- **Verification of analysis and assumptions**. For major decisions, the commercial standard would require robust testing and verification of the analysis and assumptions provided by management.
- **Customer price and service**. The commercial standard will have regard to customer concerns, particularly in relation to price and service impacts.
- **Longer term implications**. The commercial standard must have regard to any longer term implications arising from the selection of a preferred option. It is not appropriate to adopt an approach that delivers a short-term benefit but introduces higher costs or service issues in the longer term.

For the purpose of reconsidering SP AusNet's choice of AMI communications technology, SP AusNet proposes a cost-benefit methodology that incorporates consideration of the factors set out above. In accordance with good-practice decision analysis, quantitative assessment is applied in accordance with the Tribunal's Reasons. It is noted that the proposed methodology is consistent with the approach that a Board would expect to be applied in the reconsideration of the choice of AMI communications technology.

In applying the commercial standard to the particular task at hand, the following points are noted in relation to each key consideration:

- **Objectivity**. In this submission, SP AusNet has approached the task objectively, having regard to the information available at the time of the reconsideration. While SP AusNet will draw on some of the analysis that was available at that

time, the approach applied here involves the assessment of each option on an equal footing. There is no favoured solution in mind.

- **Compliance**. SP AusNet faces a 'best endeavours' obligation in relation to the AMI roll out. The commercial standard would need to weigh up any cost savings from changing technology against any possible delays in delivering the AMI roll out. This is a matter referred to by the Tribunal in paragraph 138 of its decision.
- **Uncertainty and risk**. Technology is inherently uncertain and risky. Given its experience and its particular circumstances, SP AusNet must not assume that uncertainty and risk will necessarily be addressed adequately through changes to existing risk management strategies. SP AusNet will need to consider objectively whether the potential benefits in changing communications technology are likely to eventuate in practice. In SP AusNet's circumstances, the commercial standard would require a high degree of confidence that the unexpected difficulties with the WiMAX technology are best resolved by adopting a different technology. Potential interface problems will be a key focus of attention. The immature state of technology also points to the importance of placing appropriate weight on issues relating to uncertainty and risk. In the context of the AMI roll out, a robust case to change technology must be established before such a recommendation could be accepted by a reasonable business.
- **Shareholder value implications**. Since AMI costs are subject to cost recovery arrangements under the terms of the AMI Order in Council, SP AusNet does not obtain any financial benefit by adopting one technology choice compared to another. The focus on shareholder value therefore relates primarily to the company's reputation and credibility.
- **Business-wide considerations**. It is important to identify any additional IT costs in relation to SP AusNet's regulated electricity and gas networks that would be expected to arise as a result of changing the communications technology. It would be incorrect to adopt an approach that was expected to minimise AMI costs, if this led to higher overall costs for network customers because of higher IT costs in the regulated businesses, for example. In this context, it is noted that the Tribunal observed (at paragraph 51) that: "The interface between WiMAX and SP AusNet's NMS is through the MMS. The data derived through that interface then impacts on a number of other business systems of SP AusNet, such as its Meter Data Management System, customer information system, enterprise application integration and data warehousing."
- **Accurate and relevant information**. It is evident from the Tribunal's decision that the analysis should not be conducted with the benefit of hindsight or using information which is commercially confidential to other network companies.
- **Verification of analysis and assumptions**. In preparing this submission, SP AusNet has provided details of its analysis and assumptions. SP AusNet would be pleased to provide further supporting information if required.
- **Customer price and service**. SP AusNet's analysis has regard to the cost implications for customers and the importance of managing customer concerns regarding the roll out program. To the extent that it impacts on customers, any decision by SP AusNet to change technology will need to be communicated clearly and effectively to customers.

- **Longer term implications**. SP AusNet must have regard to its relationships with external service providers if existing contracts for services are terminated and a new tender process for an alternative technology is conducted. The commercial standard requires SP AusNet to consider the impact on future contract rates and the quality of responses to future requests for services if existing contracts are terminated.

The points set out above illustrate the key issues that will need to be examined in considering whether a change in technology would satisfy the commercial standard. Necessarily, the methodology contains quantitative and qualitative elements. The commercial standard requires that these two elements are combined in a meaningful manner in order to arrive at a prudent decision. However, it is possible to address the quantitative and qualitative aspects of each option in turn, which is SP AusNet's approach in sections 5 and 6 respectively of this submission. SP AusNet's conclusions regarding the reconsideration of the communications technology and the assessment of the prudent costs have been set out in the Executive Summary of this submission.

4 Proposed period for the analysis

The AGS information request requires that SP AusNet provide information and estimates at the date SP AusNet would have been reconsidering its new Submitted Budget. It also requires SP AusNet to identify the relevant timeframe for such a reconsideration.

SP AusNet has identified the months leading up to 19 May 2011 as the relevant timeframe for such a reconsideration and about mid 2011 as the date when a decision would have been made on the choice of technology for the 2012 – 2015 subsequent AMI budget period.

At paragraph 67 of its Reasons the Tribunal summarises the AER's conclusions by reference to "significant cost increases", "significant difficulties in meeting operational targets", the "primary AMI solution does not provide adequate coverage" and "capability gaps". These matters were tested by SP AusNet before the Tribunal and are the matters which the Tribunal ultimately decided supported the AER's view that the proposed expenditure should have been carefully reconsidered.[3]

These matters were largely identified in the months leading up to, and were presented at, the AMI Executive Steering Committee meeting on 19 May 2011. Accordingly, that is the period for the reconsideration best in keeping with both the AER's determination and the Tribunal's Reasons.[4]

The following section provides further information on the implementation timelines for each technology option, based on a reconsideration during the months leading up to 19 May 2011.

[3] Paragraphs 119 to 123 of the Reasons.

[4] The timing of the matters to which both the AER and the Tribunal refer as supporting the need for a reconsideration of the Submitted Budget varies. For example, at paragraph 70, in relation to "cost increases", the Tribunal refers to the AER's statement of circumstances as at both 3 October 2011 and 19 May 2011. Similarly, in relation to "meeting operational targets", the AER had regard to information as at 19 May 2011 and October 2011 (paragraphs 81 and 82 of the Reasons). Another example is the Tribunal making reference in paragraph 126 to the costs already incurred in installing approximately 178,000 meters as being relevant costs for a reconsideration, presumably a reference to the 174,000 installed as at 23 September 2011 (paragraph 135 of SP AusNet's submissions and paragraph 46 of the Reasons).

5 Identification and quantitative assessment of the technology options

5.1 Identification of options, project timelines and key assumptions

5.1.1 Feasible options

SP AusNet has carefully reconsidered its commitment to WiMAX communications in accordance with the Tribunal's directions and the methodology described in section 3. As explained in section 4, the reconsideration is conducted in the months leading up to 19 May 2011.

The reconsideration commences by identifying the feasible options for providing communication requirements that accord with the technical specifications in the Order in Council. The feasible options are:

- Option 1: The base case is 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 closely aligned with the approach adopted by other distribution businesses.

In all of the three options set out above, it is assumed that a 3G communications solution will be used to cover approximately 15% of SP AusNet's territory. The adoption of this common assumption across all three options is consistent with identifying the lowest cost feasible options. A reasonable business in SP AusNet's circumstances would not consider an option that employed only mesh radio and/or WiMAX technology. This is because neither of these two options on their own is capable of providing the required communications functionality across the whole of SP AusNet's service territory.

SP AusNet has assessed the cost to complete the AMI program rollout for each of the options identified above by using a combination of:

- publicly available information;
- internally available information;
- assessments by SP AusNet subject matter experts; and
- assessments by external experts.

In relation to each option, an objective assessment of the costs has been undertaken in light of the information that was available at the time of the reconsideration. As explained in section 3 of this submission, it is not appropriate to conduct the analysis with the benefit of hindsight.

5.1.2 Project timelines

For each of the 3 options, it is important to assess the delays that may arise in completing the AMI roll out. The risk of delay is relevant to both the quantitative and qualitative aspects of the reconsideration. The qualitative issues relate to compliance, and are considered in more detail in section 6 of this submission. In relation to the quantitative assessment, the process for transitioning from the base case (Option 1) to either Options 2 or 3 will affect the cost analysis. For example, the transition process will affect:

- the earliest practical date at which mesh radio can be introduced without compromising due process, or SP AusNet's ability to obtain competitive pricing;
- the number of meters that are already served by WiMAX technology at the date of the transition;
- the additional manual meter reading costs; and
- the additional project management costs to effect the transition.

SP AusNet's cost analysis has not included any estimates of the financial penalties that the company may face if it fails to comply with the timeframes in the Order in Council. However, this issue is discussed further in section 6 of this submission.

SP AusNet's assessment indicates that adopting either Option 2 or 3 will delay the completion of the roll out until June 2014. While the sequencing of activities has been designed to minimise the delay, the building and integration of network and IT systems will take an additional 18 months to complete if either Option 2 or Option 3 were selected. Over that period, meters would continue to be read manually. In addition to the delay in the overall program, section 6.2.2 also explains that there would also be delays in SP AusNet's achievement of (and therefore compliance with) the milestones set in the rollout schedule of the AMI Order in Council.

It would not be prudent to commence the build and integration tasks until regulatory support is obtained from the Victorian Government and the AER. In order to minimise delay and the risks of incurring unrecoverable costs, the WiMAX roll out would continue until discussions with the Government and AER are concluded. Any delays in obtaining Government and regulatory support would further extend the forecast delay in the AMI roll out.

A further additional source of delay relates to the tender process, contract negotiations and appointment of service providers under either of Options 2 or 3. The estimated delay assumes that these processes can be completed in a relatively short timeframe, without any need to revisit technical specifications or reopen discussions with the Victorian Government or AER.

SP AusNet has developed the following timeline to explain the steps required to implement Options 2 and 3. Evidently, the specific details of the activities will differ between the two options, but the following key points are common to both:

- Discussions with the Victorian Government and the AER will be required.
- New tender processes will need to be conducted and orders placed.
- Mesh card technology will need to be tested.
- Retrofitting for some meters will be required.
- Changes to IT systems will be required.

Timeline – Transition from WiMAX to Radio Frequency Mesh		
TASKS		
May 2011	WiMAX Rollout Continues	Management / Board consideration of outcomes / recommendations of revision
June 2011		
July 2011		Discussion with Victorian Government / AER on recommendations, prudency test and cost recovery
August 2011		
September 2011		Finalisation of arrangements with Victorian Government / AER Board approval of recommendations
October 2011		Project Planning RFT process for alternative solution Orders for mesh solution placed
November 2011		
December 2011		
January 2012	Changes to IT System Interfaces for RF Mesh Data + 3G (15%)	Mesh meter rollout commences (meters in this first quarter will be without RF Mesh Communications cards)
February 2012		Testing of RF mesh cards and processes for installation and retrofitting
March 2012		
April 2012		Meters with RF communications cards are available in large quantities for installation
May 2012		
June 2012		
July 2012		Commence retrofitting of RF mesh cards to meters installed in January – March 2012 (Option 2)
August 2012		
September 2012		
⬇		
May 2013		
June 2013		
July 2013	Logical Conversions of Mesh Meters	RF Meter Installation complete (Option 2) Commence Retrofit of RF Mesh Communications Cards (Option 3)
August 2013		
September 2013		
October 2013		3G Meters installed (15% of meter requirements – Options 1, 2 & 3)
November 2013		
December 2013		All Meters installed
⬇		
June 2014		All meters operating as Remotely Read Interval Meters
⬇		
December 2015		New Meters / New Connections move to EDPR

5.1.3 Common Assumptions

Before turning to the cost analysis of each of the options, it is important to note the following assumptions that have been adopted in the analysis:

- The timeline developed above is applicable to Options 2 and 3, but not Option 1. This assumption reflects SP AusNet's expectation that continuing with the planned roll out using WiMAX communications (Option 1) will not result in any delays in delivery of the program.
- The costs beyond 2015 are common for all options. This assumption reflects the fact that the material differences between the costs of the three options arise over the 2012 – 2015 budget period. Therefore, for the purpose of SP AusNet's reconsideration of the options, it is reasonable to assume that from the end of 2015, there are no material differences between the costs of the three options. That said, it is noted that this assumption probably favours Option 2 because the costs of maintaining both WiMAX and mesh radio solutions may lead to higher operating expenditure.
- SP AusNet continues to use Landis & Gyr Modular meters, rather than undertaking a further RFT for meters in relation to Options 2 and 3. This assumption is consistent with minimising the forecast costs of Options 2 and 3, as modular meters can be retrofitted whereas wholly integrated meters do not allow retrofitting. In other words, under any other assumption, the forecast costs of Options 2 and 3 would be higher than the estimates contained in this reconsideration.
- Card replacement cost estimates assume the continued use of Landis & Gyr Modular meters. This assumption is consistent with minimising the forecast costs of Options 2 and 3.
- SP AusNet would select Silver Springs Networks as the RF mesh communications vendor in Options 2 and 3, as this provider is best placed to deliver services that accord with SP AusNet's needs. In view of its dominant position in the market, it is possible that in the circumstances, Silver Springs Networks may seek to exercise market power in terms of delivery, pricing, contractual terms and conditions. However, no explicit allowance has been made for this possibility in the costing of Options 2 and 3.
- For options 2 and 3 SP AusNet has determined that there are two major areas to be considered. The first is the *Cost to Switch* and the second is the *New rollout costs:*
    - **Costs to switch:** These are the new costs that would be incurred as a consequence of implementing the new technology. The costs included in this category are contract break costs, delay and re-training costs, new hardware and software costs and new integration costs.
    - **New rollout Costs:** These costs are the 2012-2015 budgeted WiMAX rollout costs minus the costs associated with the WiMAX solution, plus the additional new RF mesh related costs.

The following sections provide the quantitative assessments of each option.

5.2 Option 1

The base case is to continue with SP AusNet's plan to complete the current solution that includes the WIMAX communications solution for 85% of the meter population, and a 3G communications solution for 15% of meters.

5.2.1 Costs incurred to date

Paragraph 8(b) of the Australian Government Solicitor's letter asks SP AusNet to identify the costs incurred to the date of the reconsideration of the WiMAX solution. SP AusNet has determined that the total actual costs incurred in implementing the WiMAX solution as at 19 May 2011 were $72.1 million. Details are provided in the supporting spreadsheets accompanying this submission.

5.2.2 Forecast Costs for 2012-2015 AMI budget period

During the proposed period for the reconsideration, SP AusNet's AMI Subsequent Budget and Charges Application Submission, dated 28 February 2011, provides the current and best available cost estimate of the WiMAX communications solution. Although cost estimates subsequently increased above the budgeted amount, the relevant information and analysis did not exist at the time of the reconsideration. As noted in section 3, it is not appropriate to assess the prudency of SP AusNet's expenditure with the benefit of hindsight. Furthermore, the cost relativities of the competing options are likely to remain unchanged if an increased budget were assumed for Option 1. This is because a number of the cost estimates for items for Options 2 and 3 reflect incremental changes from the budgeted costs for Option 1.

The cost forecasts for Option 1 are provided in the table below.

Cost Category	2012-15 Forecast (2011 $M)
Capital expenditure	
Meters	[C-I-C]
Communications	[C-I-C]
Information Technology	[C-I-C]
Other	[C-I-C]
Total Capital Expenditure	231.5
Operating expenditure	
Meter Reading	[C-I-C]
Meter Data Management	[C-I-C]
Meter Maintenance	[C-I-C]
Communications Backhaul	[C-I-C]
Communications Network Maintenance	[C-I-C]
Technology trials	[C-I-C]
Project Management Office	[C-I-C]
Customer Services	[C-I-C]
Overheads	[C-I-C]
Industry PMO / Audit / Regulatory Submissions	[C-I-C]
IT Operating expenditure	[C-I-C]
Debt Raising	[C-I-C]
Movement in provisions	[C-I-C]
Total Operating Expenditure	139.5
Total AMI Budget (capital plus operating expenditure)	**371.0**
Costs allocated to other business streams as per CAM [5]	10.2
Total SP AusNet Customer Costs	**381.1**

5.2.3 Assumptions - Option 1

Details of the assumptions and analysis that underpin the cost estimates have previously been provided to the AER in SP AusNet's budget submission and templates, and in responses to questions from the AER and its consultants. For the purpose of the reconsideration, it is appropriate to adopt the same assumptions in establishing the base case.

[5] These are costs allocated to regulated business activities other than the AMI program, in accordance with SP AusNet's approved Cost Allocation Methodology.

5.3 Option 2

This option involves leaving the existing WIMAX infrastructure in place and building a mesh network to complete the rollout program.

5.3.1 Forecast Costs for 2012-2015 AMI budget period

The table below shows the costs of switching to the mesh radio and the new roll out costs, assuming that the existing WiMAX technology remains in place.

Cost Category	2012-15 Forecast (2011 $M)		
	Costs to Switch	New Rollout Costs	Total Mesh / WiMAX costs
Capital expenditure			
Meters	1.9	156.5	158.4
Communications	3.4	30.7	34.1
Information Technology	12.6	17.7	30.3
Other	0	0	0
Total Capital Expenditure	**17.9**	**204.9**	**222.8**
Operating expenditure			
Meter Reading	7.6	6.1	13.7
Meter Data Management	1.5	16.8	18.3
Meter Maintenance	0	5.4	5.4
Communications Backhaul	0	16.0	16.0
Communications Network Maintenance	0	28.5	28.5
Technology trials	0	0	0
Project Management Office	6.7	28.5	35.2
Customer Services	0	4.4	4.4
Overheads	4.4	6.5	10.9
Industry PMO / Audit / Regulatory Submissions	1.9	1.9	3.7
IT Operating expenditure	2.7	26.5	29.2
Debt Raising	0	2.9	2.9
Movement in provisions	0	0	0
Total Operating Expenditure	**24.7**	**143.4**	**168.1**
Total AMI Budget	**42.6**	**348.3**	**390.9**
Costs allocated to other business streams as per CAM[6]	4.7	10.2	14.9
Total SP AusNet Customer Costs	**47.4**	**358.4**	**405.8**

Further details of these cost forecasts are provided in the spreadsheets accompanying this submission.

[6] These are costs allocated to regulated business activities other than the AMI program, in accordance with SP AusNet's approved Cost Allocation Methodology.

5.3.2 Assumptions for Option 2, and cost comparison with Option 1

As already noted, the estimated cost of this option assumes that Landis & Gyr modular meters can be used for either WiMAX or RF mesh installations. If this is not the case, the costs associated with this option would be substantially greater than presented above.

The estimated cost of this option excludes the impact on work processes and procedures associated with the concurrent management of WiMAX and mesh radio solutions. For example, no cost allowance has been provided for the following impacts:

- faults and service trucks will be required to carry both WiMAX and RF mesh meter and communications cards.
- logistics and warehousing will need to provide both WiMAX and RF mesh meter and communications cards.
- logistics and purchasing will need to deal with an additional vendor in relation to the RF mesh communications cards.

In addition, it is expected that further analysis and resources would be required to determine the appropriate selection of WiMAX and mesh radio technologies where these solutions converge in SP AusNet's territory. The costs of such analyses have not been included in the estimates set out above.

The cost analysis summarised in the above table shows that the estimated total roll out cost of Option 2 for the budget period is $348 million, compared to $371 million for Option 1. However, the additional costs of switching to Option 2 are estimated to be approximately $43 million. As a consequence, the total estimated costs for Option 2 are approximately $20 million higher than Option 1.

On the basis of the cost analysis presented above, Option 1 is clearly preferred. It is important to note that the difference between the costs of Options 1 and 2 would be higher than $20 million if the analysis included allowances for:

- the eventuality that Landis & Gyr modular meters cannot be used;
- the work process issues described above; and
- the additional costs that would be incurred in other business streams as a result of moving to Option 2, which are estimated to be approximately $5 million.

In the time available, SP AusNet has not been able to cost these items, and on the basis of the cost analysis presented here, it does not seem necessary to include allowances for these additional costs. However, SP AusNet will provide further cost information as part of its submission should the AER's analysis suggest it is necessary.

5.4 Option 3

This option involves discontinuing the use of WiMAX technology and adopt a mesh solution for the entire roll out, which is closely aligned with the approach adopted by other distribution businesses.

5.4.1 Forecast Costs for 2012-2015 AMI budget period

The table below shows the costs of discontinuing the use of WiMAX and implementing a mesh radio solution instead.

Cost Category	2012-15 Forecast (2011 $M)		
	Costs to Switch	New Rollout Costs	Total Mesh forecast
Capital expenditure			
Meters	44.3	156.5	200.8
Communications	9.0	54.2	63.3
Information Technology	16.2	17.7	33.9
Other	0	0	0
Total Capital Expenditure	**69.5**	**228.4**	**297.9**
Operating expenditure			
Meter Reading	**7.6**	**6.1**	**13.7**
Meter Data Management	1.5	16.8	18.3
Meter Maintenance	0	5.4	5.4
Communications Backhaul	0	19.6	19.6
Communications Network Maintenance	0	30.8	30.8
Technology trials	0	0	0
Project Management Office	10.2	28.5	38.7
Customer Services	0	4.4	4.4
Overheads	4.4	6.5	10.9
Industry PMO / Audit / Regulatory Submissions	1.9	1.9	3.7
IT Operating expenditure	2.7	26.5	29.2
Debt Raising	0	2.9	2.9
Movement in provisions	0	0	0
Total Operating Expenditure	**28.2**	**149.3**	**177.5**
Total AMI Budget	**97.7**	**377.7**	**475.4**
Costs allocated to other business streams as per CAM[7]	9.5	10.2	19.7
Total SP AusNet Customer Costs	**107.2**	**387.8**	**495.1**

Further details of these cost forecasts are provided in the spreadsheets accompanying this submission.

[7] These are costs allocated to regulated business activities other than the AMI program, in accordance with SP AusNet's approved Cost Allocation Methodology.

5.4.2 Assumptions for Option 3 and cost comparison with Option 1

The cost estimate for Option 3 assumes that:

- Landis & Gyr modular meters are capable of in situ retrofitting of communications cards. If the AER assumes an average meter cost using integrated meters (such as those installed by UED and Jemena, for instance) then additional costs would be incurred for any form of changes to the configuration, as these integrated meters would need to be removed and replaced.
- SP AusNet has assumed that RF mesh cards can be retrofitted on site to the previous WiMAX installations although SP AusNet understands that the current RF mesh meters and communications cards are "paired" in the manufacturing stage with information being sent to the USA for later matching with the installation into the meter management and reporting system. Additional costs (which have been excluded from the analysis) would be incurred if this assumption turns out to be not applicable.
- No allowance has been made for the time and cost impacts that would arise in relation to potential meter failures during the retrofitting of the RF mesh communications card. Faulty meters are replaced under warranty in the normal course of the rollout but it would be unlikely that a wide scale retrofit would be covered under warranty.
- No additional costs have been included in the estimate to cover the handling of customer complaints as supply is interrupted; the costs of referrals to the Ombudsman; and issues relating to denial of access.
- No additional costs have been included in the estimate to cover the costs of issuing repeat statutory written notices that may be required to be given to customers in relation to the retrofitting of the communications cards.

The cost analysis summarised in the above table shows that the total roll out cost of Option 3 is $377.7 million, compared to $371 million for Option 1. On the basis of forecast roll out costs over the budget period, Option 3 is, therefore, less attractive than Option 1. However, the additional costs of switching to Option 3 are estimated to be approximately $98 million. Consequently, the total costs of implementing Option 3 are approximately $104 million higher than Option 1.

In effect, this Option involves scrapping the sunk WiMAX costs already incurred in the 2009 to 2011 period, which is estimated to be approximately $72 million.

It is important to note that the cost difference between these options will increase further if a cost allowance is made to address the customer issues noted above. The gap between the estimated costs of Option 3 and Option 1 will widen further if an allowance is included to reflect the additional costs that would be incurred in other business streams under Option 3. Those costs are estimated to be approximately $19.7 million.

As for Option 2, SP AusNet will provide further cost information as part of its submission should the AER's analysis suggest it is necessary.

5.5 Comparison of Options and conclusions

The table below provides a summary of the cost analysis for each of the Options. As previously noted, all options are based on 15% of the meter population communicate using a 3G network solution.

Cost Category	2012-15 Forecast (2011 $M)		
	Option 1: Base case WiMAX only	Option 2: WiMAX & Mesh	Option 3: Mesh Only
Capital Expenditure	231.5	222.8	297.9
Operating Expenditure	139.5	168.1	177.5
Total AMI Budget	**371.0**	**390.9**	**475.4**
Costs allocated to other business streams as per CAM[8]	**10.2**	**14.9**	**19.7**
Total SP AusNet Customer Costs	**381.1**	**405.8**	**495.1**
Extra cost of this option relative to option 1 ($M)	0	24.7	114.0
Extra cost of this option relative to option 1 (%)	0	6.5%	29.9%

The cost analysis shows that Option 1 is the lowest cost of the three options in terms of the total AMI budget. As explained in section 3, however, it is necessary to include an allowance for the additional costs that would be incurred in regulated business streams outside than the AMI program if SP AusNet made a decision to switch technologies. If these costs are taken into account, the cost disadvantage of Options 2 and 3, relative to Option 1, increase to 24.7 million and $114 million, respectively.

As noted above, some aspects of the cost analysis regarding Options 2 and 3 tend to under-estimate the likely total costs of these options. Given the outcome presented above – which shows Option 1 to be clearly preferred – it is not necessary to explore these additional cost items in further detail.

Although the cost analysis shows that Option 1 is preferred, section 6 conducts a qualitative assessment of each of the options. Unless the qualitative assessment provides compelling reasons to adopt Options 2 or 3, a reasonable business applying the commercial standard in SP AusNet's particular circumstances would continue to roll out WiMAX technology.

[8] These are costs allocated to regulated business activities other than the AMI program, in accordance with SP AusNet's approved Cost Allocation Methodology.

6 Qualitative assessment of the technology options

6.1 Introduction

As previously explained, SP AusNet's methodology entails the application of both quantitative and qualitative reconsideration of the communications technology for AMI. The purpose of this section is to present a qualitative assessment of the technology options, and to identify the preferred option in light of the assessment of relevant qualitative factors. Drawing from the list of key considerations set out in section 3, the qualitative assessment is undertaken with reference to the following:

- the extent to which each option is expected to facilitate SP AusNet's compliance with the mandated standards and rollout schedule;
- the uncertainty and risk associated with each option;
- the shareholder value implications arising under each option;
- the implications of each option for customer prices and service; and
- any longer term considerations.

Assessments of the technology options in terms of these key considerations are set out in the following subsections. The 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

There are two aspects of compliance that must be considered. These are:

- compliance with the prescribed Functionality Specifications; and
- compliance with the mandated rollout schedule.

Each of these aspects is examined separately below.

6.2.1 Compliance with Functionality Specifications

A critical consideration is the level of confidence that can reasonably be ascribed to the ability of a particular technology option to deliver outcomes that meet the requirements of the Functionality Specifications.

As noted in the Tribunal's decision (at paragraph 86), SP AusNet has been concerned that metering which uses mesh radio as its communications technology cannot satisfy the requirements of clause 4.4 of the *Advanced Metering Infrastructure Minimum AMI Functionality Specifications*. Paragraphs 88 to 90 of the Tribunal's decision provide a summary of the evidence that SP AusNet has relied on to form its view that a mesh radio option would be incapable of meeting the required specifications. This evidence includes an ISC discussion paper which records advice of the functionality working group to the effect that the relevant requirement was not achievable by mesh radio and the minutes from the ISC meeting of 1 December 2009 in which other participants in the electricity industry, particularly retailers, voiced their opposition to any relaxation of the requirement.

It is noted that the Tribunal's decision (at paragraph 125) concluded that:

> *"The AER did not make a 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."*

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. The relevant question for the qualitative assessment is the extent of compliance (or non-compliance) for each of the available communication options.

At the time of the reconsideration, SP AusNet's was aware that the other Victorian DNSPs had formally requested, in February 2010, a review of the obligation requiring the provision of meter data to market in order to lower the requirement because of the limitations of the wireless mesh radio technology. In the circumstances, it would be reasonable for SP AusNet to maintain its earlier view that mesh radio could not comply with the specifications, but not use this as a basis for rejecting it. It may be reasonable to argue that SP AusNet's risk of penalties would be lessened if it adopted the same technology as the other DNSPs. Using the same argument, however, would suggest that adopting an untried combination of mesh and WiMAX (Option 2) would tend to increase SP AusNet's exposure to penalties for non-compliance.

6.2.2 Compliance with rollout schedule

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 AMI Order in Council. Under that clause, 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 the reconsideration, the remaining AMI roll out milestones required the

installation of the following percentages of remotely read interval meters (and operational as a remotely read interval meter in accordance with the Specifications):

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

By mid 2011, approximately one-quarter of SP AusNet's meter roll out program had been completed.

A failure by SP AusNet to meet its regulatory obligation to install AMI meters in accordance with clause 14, and by reference, Schedule 1 of the Order in Council 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 purposes of this reconsideration, however, such a sanction is not regarded as a credible response for a failure to meet the AMI roll out timetable. Nonetheless, in its reconsideration of communication technologies the Board would be appraised 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 reconsidering the communication technology options, it is essential to examine the likely implications of each option for the achievement of each of the milestones set out in the Order in Council. In April 2011, KEMA provided the following advice regarding the likely delays if a reconsideration of WiMAX technology had been conducted in September 2009[9]:

> *"In our opinion whilst it was technically open for SPAN to revisit its decision to deploy the AMI WiMAX solution at the 20 September 2009, much of the existing detailed planning and design work would have been redundant. Such a change would cause major disruption to planned business changes, at significant commercial cost and the first meter deployments would have likely been delayed by 15 to 18 months."*

KEMA's advice was provided in April 2011, which falls within the timeframe in which SP AusNet's reconsideration of its technology choice is being conducted (i.e. the months leading up to May 2011). KEMA's advice is therefore relevant to SP AusNet's analysis of the competing options, noting however that the advice does refer back to the situation in September 2009. In this context it is noted that the advice foreshadows the likelihood of major disruptions and delays if there were a technology change away from WiMAX.

At the time of the reconsideration, SP AusNet's roll out program was focused on meeting the immediate milestone that 25% of meters must be installed by June 2011. The subsequent milestone of 60% of meters to be installed by December 2012 would have been impossible to satisfy if there had been any change to the communications solution.

6.2.3 Assessment of options: Compliance

Based on the discussion above, the assessment of options in terms of compliance with the mandated standards and rollout schedule is set out below.

9 KEMA, Expert Opinion, 15 April 2011.

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. Combined roll out of WiMAX and 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. SP AusNet's Board would not adopt an option that involved an increased risk of non-compliance, unless regulatory and Government approval were obtained.
3. Cease WiMAX and switch to Mesh		Meets business needs partially, but with significant gaps. The change in technology would create significant delays and prevent SP AusNet from meeting the AMI roll out milestones. 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

There are four sources of uncertainty and risk that must be considered. These are:

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

Each of these aspects is examined separately below.

6.3.1 Tender process and contractual arrangements

The success of the AMI roll out program depends on the effective delivery of services by outsourced service providers. Significant management resources are required to conduct competitive tenders to select outsourced service providers. The process will typically involve:

- Definition of SP AusNet's service requirements, including technical specifications;
- Establishment of a probity plan, evaluation process and criteria;

- An expression of interest to identify service providers that have the necessary capability;
- A formal request for proposal, including workshops with prospective service providers;
- Selection of preferred service provider(s) in accordance with the evaluation criteria and the probity plan; and
- Negotiation and execution of contract terms and conditions with the preferred service provider.

At the time of the reconsideration, SP AusNet had already conducted a tender exercise and signed contracts for the provision of a WiMAX communications solution. It is important to note that options that require a change in the existing technology will necessitate a new competitive tender process and amendments to existing contracts. There are a number of uncertainties and risks associated with these options, including:

- Uncertain 'break costs'. While SP AusNet will be able to estimate the costs of terminating or modifying existing contracts, there will be some uncertainty and risks associated with such a decision. Specifically, there is likely to be some negotiation around contract termination payments, and the final outcome may be subject to litigation. There may also be a need for consequential changes to other contracts, which could entail additional costs that have not been anticipated at the time of the decision to change technology.
- Uncertainty regarding the technical specifications. In particular, the requirement to implement a wireless mesh protocol over the top of the existing meter solution is not straightforward, and therefore it is difficult to specify. This will make the tender process more complex and the bids less competitive. The outcome of the tender process in terms of the tenderers' compliance with specification, and likely outturn costs will therefore be uncertain.
- Risk that bids are not competitive. The nature and timing of the tender process (i.e. a technology change midway through the AMI roll out program) increases the possibility that service providers will be either reluctant or unable to provide the requested services, or are only willing to do so at a premium price.

The uncertainty and risks noted above are likely to be more pronounced for Option 2, which combines the WiMAX and mesh radio technologies. This is because the technical challenges introduce more uncertainty in relation to the tender outcomes as a result of the increased difficulties in specifying the service requirements.

6.3.2 Immature technology

It is important to recognise that the roll out of smart meters involves the adoption of relatively immature technologies. This observation was highlighted by SP AusNet's assessment of the Wireless Mesh technology, which did not score highly in the competitive tender process conducted in 2008. The immaturity of the technology reflects the fact that there are very few examples of wide-scale implementation of smart metering in the world.

Following the 2008 tender process, the market for mesh radio meters and solutions has apparently developed, and competition between service providers is more prevalent. In contrast to SP AusNet's original decision to implement WiMAX, it may be arguable that mesh radio is the

more mature and less risky technology choice at the time of this reconsideration. However, this view ignores the potential complexity associated with combining WiMAX and mesh radio solutions. As noted by the Tribunal at paragraph 129, SP AusNet cannot approach the task as if mesh radio can be chosen at the outset:

> *"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."*

Regardless of the relative maturities (at the time of the reconsideration) of the two alternative technologies, there is no experience of any service provider successfully implementing a combined WiMAX and mesh radio solution for SP AusNet's particular IT systems. In the context of the reconsideration of SP AusNet's technology options, therefore, the maturity or otherwise of a 'clean sheet' mesh radio solution is beside the point, because it fails to address SP AusNet's particular circumstances.

More broadly, it remains the case that the technology required to deliver smart meters is immature – even if the mesh radio solution has advanced somewhat from its unsatisfactory state in 2008. With any immature technology, the risk of cost overruns and performance issues are high. It is important, therefore, that any estimated cost savings associated with a technology change include a reasonable allowance for uncertainty and risk.

In terms of uncertainty and risk, the problems associated with the WiMAX solution are better understood by SP AusNet's AMI project team and therefore subject to less uncertainty. This observation does not lead to the conclusion that the existing technology should be maintained, but rather that a greater allowance for uncertainty and risk should be made with respect to a change in technology.

6.3.3 Implementation and performance

An important source of uncertainty and risk relates to implementation and performance in terms of complying with the AMI Specifications. The technology choice must not introduce significant implementation issues that have the potential to cause consequential delays in the AMI project. In addition, performance risk is likely to increase with the complexity of the implementation. As already noted, SP AusNet's Board would not accept any increased risk of non-compliance.

In the reconsideration of SP AusNet's communications options, it is reasonable to note that more significant implementation issues arise with the combined WiMAX and mesh radio solutions.

6.3.4 Project management

It is important to recognise that a change in the choice of technology is an unusual decision for any IT project. Ordinarily, competing technology options are assessed at a point-in-time and only reassessed if it becomes evident that the original decision was manifestly incorrect and the consequences of continuing with the original technology are unacceptable. It is impractical to keep the technology choice decision under 'constant review' because project management and resources will, unavoidably, be predicated on a particular technology option.

It follows that a decision to change technology may introduce project management risks in terms of:

- Significant revisions to the project timelines and tasks;
- Reworking of completed tasks with consequential delays;
- A change in resource requirements, including the mix of skills needed;
- A potential loss of confidence in the overall project objectives and timelines, with a consequential impact on staff retention.

While the above risks do not preclude a decision to change the communications solution, they indicate that substantial expected benefits in terms of cost and performance are required to offset these risks.

6.3.5 Assessment of options: Uncertainty and risk

Based on 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. Combined roll out of WiMAX and Mesh		Does not meet business needs. This option has the most risks in terms of contract management, immature technology and performance risks. The option would only be acceptable if these risks could be quantified and if reasonable confidence could be established regarding the company's ability to manage these risks.
3. Cease WiMAX and switch to Mesh		Meets business needs partially, with significant gaps. The uncertainty and risks associated with this option are less significant than the combined WiMAX and mesh solution. This reflects the reduced complexity of this option and the alignment of SP AusNet's technology with other DNSP solutions.

6.4 Shareholder value implications

SP AusNet faces very significant penalties if it fails to meet its regulatory obligations to install AMI meters. In the limit, the company is exposed to the possibility of losing its distribution licence as a result of non compliance. Such exposures have potentially profound implications for shareholder value, and they must be examined carefully in any reconsideration of technology options.

On one view, it might be argued that the financial penalties faced by the company (up to $597,250) for a contravention of the Order in Council and a further penalty of up to $59,725 per

day for a continuing contravention do not have material shareholder value implications in the context of the company's market capitalisation of approximately $[C-I-C]. However, such a view would be incorrect because it ignores the very serious implications for investor confidence that would arise from any potential regulatory contravention by SP AusNet.

Utility stocks are generally perceived by shareholders as providing relatively stable, predictable investment outcomes. A breach or potential breach by SP AusNet of a regulatory compliance obligation relating to a critical and high-profile activity such as the AMI meter rollout would be highly inconsistent with investor's expectations of relative stability. Indeed, any potential breach of such a nature would be likely to shock investors, and result in the equity market adopting a negative outlook for SP AusNet. The impact of such a scenario on the company's share price – and the consequential erosion in shareholder value - would be many times greater than the direct cost to shareholders of any financial penalties imposed on the company.

Similar concerns arise from the perspective of SP AusNet's creditors. Given the importance of debt funding to SP AusNet in maintaining an efficient overall financing mix, the company strives to maintain a high credit rating, to ensure that it continues to have access to debt markets on the most favourable possible terms. Any erosion in the market's perception of SP AusNet's credit worthiness would be reflected directly and immediately through an increase in the cost of debt faced by the company.

A change in SP AusNet's circumstances such that the company faced heightened exposure to sanctions for regulatory non-compliance would be perceived negatively by credit markets. The imposition of sanctions on SP AusNet for a breach of regulatory obligations would certainly have a negative impact on the company's perceived credit worthiness. The impact of a consequential increase in the company's cost of debt would be many times higher than the direct cost of the sanctions themselves. (For instance, an increase of 10 basis points in the company's average cost of debt leads to an increase in interest costs of approximately $5 million per year.) 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.

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

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.

Option	Rating	Comments and Analysis
2. Combined roll out of WiMAX and Mesh		Meets business needs partially, but with significant gaps. As already noted, the change in technology would create significant 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. In the circumstances, SP AusNet's Board would regard the increase in exposure to negative shareholder value impacts as a major concern. The option could only be considered if regulatory and Government approvals were obtained.
3. Cease WiMAX and switch to Mesh		Meets business needs partially, but with significant gaps. The change in technology would create significant 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 noted in relation to Option 2, this option could only be considered if regulatory and Government approvals were obtained.

6.5 Customer price and service

Customers will be concerned to ensure 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 relation to the first issue, the direct cost considerations have been addressed in section 5 of this submission. It shows that the continuation of the WiMAX program is preferred in terms of minimising the direct costs of the AMI program.

In relation to the second and third issues, it is also apparent that a continuation of WiMAX is likely to be preferred to options that involve a change in technology. In particular:

- As already noted in section 5, SP AusNet has estimated that a switch in technology would add 6 months to the AMI rollout program. Delays of this duration would impact significantly on customers, as the delivery of the benefits provided by the smart meter program would be delayed by that period.
- A decision to conduct rework in relation to the WiMAX meters already installed will inconvenience customers and raise broader concerns regarding the AMI program.

SP AusNet would regard the replacement of existing WiMAX communications as highly undesirable from the perspective of customer service.

- As noted previously, performance risk is likely to increase with the complexity of the option chosen. This suggests that an option involving the implementation and use of multiple technologies concurrently (for instance, WiMAX alongside mesh radio) is less likely to perform in accordance with the Functionality Specifications. Such an outcome would be contrary to the interests of customers.

Based on the discussion above, the assessment of options in terms of shareholder value implications 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 budget 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. Combined roll out of WiMAX and Mesh		Does not meet business needs. The estimated 6 month delay in delivery of the benefits of the AMI meter program would result in significant negative impacts for customers.
3. Cease WiMAX and switch to Mesh		Does not meet business needs. Customers would be inconvenienced and concerned by the rework required in relation to the meters that have already been installed. The estimated 6 month delay in delivery of the benefits of the AMI meter program would result in significant negative impacts for 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.

Each of these issues is examined below.

6.6.1 Contractor relationships and contract pricing

A continuation with the existing WiMAX contracts does not raise any long term implications in terms of contractor relationships or contract pricing.

In contrast, options that require a change in technology would require existing contracts to be terminated or materially amended. The termination or modification of existing contracts with external service providers involved in the delivery of a high-profile and important program such as the AMI meter rollout is highly unlikely to enhance SP AusNet's ability to establish and maintain relationships with key external service providers. Apart from the possibility of litigation arising between SP AusNet and existing contractors, a decision to terminate current agreements may be interpreted negatively in a variety of markets in which SP AusNet seeks contracted services.

A possible outcome is that the willingness of contractors to participate in new tenders for AMI work (and indeed, for work in areas outside of the AMI program) would be reduced. This may affect the quality and number of responses to SP AusNet's requests for services in the future. It is also likely to have an unfavourable impact on contractor pricing, which will ultimately feed through to SP AusNet's customers.

6.6.2 Intellectual property and in-house capability

A continuation with the existing WiMAX contracts does not raise any long term implications for SP AusNet's ability to retain intellectual property and in-house capability.

In contrast, options that create a significant delay to the AMI program would require program resources to be temporarily let go or put on hold. As a result, SP AusNet would be exposed to the risk of losing valuable intellectual property and in-house skills. Rebuilding the necessary capability and intellectual property is likely to be hampered by the disruption caused by a decision to switch technology part way through a critical program. This disruption may have a negative effect on morale, and is likely to make it more difficult for SP AusNet to attract and retain the best staff.

6.6.3 Assessment of options: Long term implications

Based on the discussion above, the assessment of options in terms of long 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 its in-house capability that may arise if a decision were made to switch technologies part way through the AMI program.
2. Combined roll out of WiMAX and Mesh		Meets business needs partially, with significant gaps. This option exposes SP AusNet to the risk of deteriorating relationships with key external service providers, with negative longer term implications for SP AusNet's ability to continue to procure contractor services cost-effectively across a range of markets. Under this option, SP AusNet is also exposed to a heightened risk of loss of intellectual property and diminished in-house capability.
3. Cease WiMAX and switch to Mesh		Meets business needs partially, with significant gaps. Like option 2, 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. There is also a heightened risk of loss of intellectual property and diminished in-house capability.

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. Combined roll out of WiMAX and Mesh					
3. Cease WiMAX and switch to Mesh					

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

For each of the key considerations examined in the qualitative assessment, the continuation of the WiMAX communication technology solution is the preferred option.

Option 2 is rated as "meets business needs partially, but with significant gaps" in relation to three of five key considerations; and “does not meet business needs” in relation to the remaining two. Option 3 scores "meets business needs partially, but with significant gaps" on four considerations, and “does not meet business needs” in relation to the remaining item.

SP AusNet therefore regards the options that require a change in technology as being inconsistent with the qualitative aspects of the commercial standard that applies to a reasonable business in SP AusNet's circumstances.

The qualitative assessment indicates clearly that SP AusNet’s decision to continue with the WiMAX option – after reconsidering other technology options – would be prudent and in accordance with the commercial standard that a reasonable business would exercise in SP AusNet’s circumstances. The results of the qualitative assessment reinforce those of the quantitative assessment which concluded that Option 1 is preferred, on the basis that it involves the lowest estimated level of avoidable expenditure (as at May 2011) for the 2012 - 2015 budget period.