Review of SP AusNet's WiMax Related Expenditure

Prepared by ENERGEIA for the Australian Energy Regulator

August 2012

1 Executive Summary

The Australian Energy Regulator (AER) engaged Energeia Pty Ltd (Energeia) for advice regarding the prudency of SPA's proposed expenditure on a WiMax based telecommunications solution as part of its Advanced Metering Infrastructure (AMI) solution required under the Victorian revised Order in Council (OIC).[1]

Specifically, the AER sought expert advice regarding whether SP AusNet's (SPA) plans to incur WiMax related expenditure over the 2012-2015 budget period represented a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances.

This advice is necessary for the AER to respond to the Australian Competition Tribunal's (the Tribunal) order to amend the AER's Final Determination in accordance with the revised OIC.[2]

In providing its advice, the AER requested that Energeia describe the relevant commercial standard, when and how it would have been applied, including the relevant circumstances, what the outcomes would have been, and the implications for SPA's 2012-2015 budget under the revised OIC.

Scope and Approach

The scope of Energeia's review was mainly limited to applying the prudency test to SPA's proposed WiMax related expenditure.

Energeia's approach to addressing the AER's requirements in their Request for Proposal (RFP) was to:

- identify an appropriate scope of expenditure,
- develop an appropriate approach to apply the relevant regulatory tests,
- identify and review relevant background materials,
- identify the relevant commercial standards,
- identify the timing and outcome of their application,
- identify the circumstances relevant at the time, and
- identify the prudent level of expenditure for 2012-2015 under the revised OIC.

Determining whether SPA should switch to a mesh telecommunications solution given its current circumstances, and not those leading up to the time any decision would have been taken by a reasonable commercial business, was out of scope.

Review Findings

Energeia found that applying the appropriate commercial standard under the prudency test required a detailed commercial assessment of the relative costs and benefits of WiMax compared to alternative telecommunication solutions as at 28 February 2011.

Due to the potential impact of SPA's telecommunication solution on other AMI solution components and upstream systems and processes, Energeia found that the relevant expenditure relating to this assessment would have included capital expenditure related to communications Network Interface Cards (NICs or modules) installed in meters, the communications network, WiMax network deployment remediation, the

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

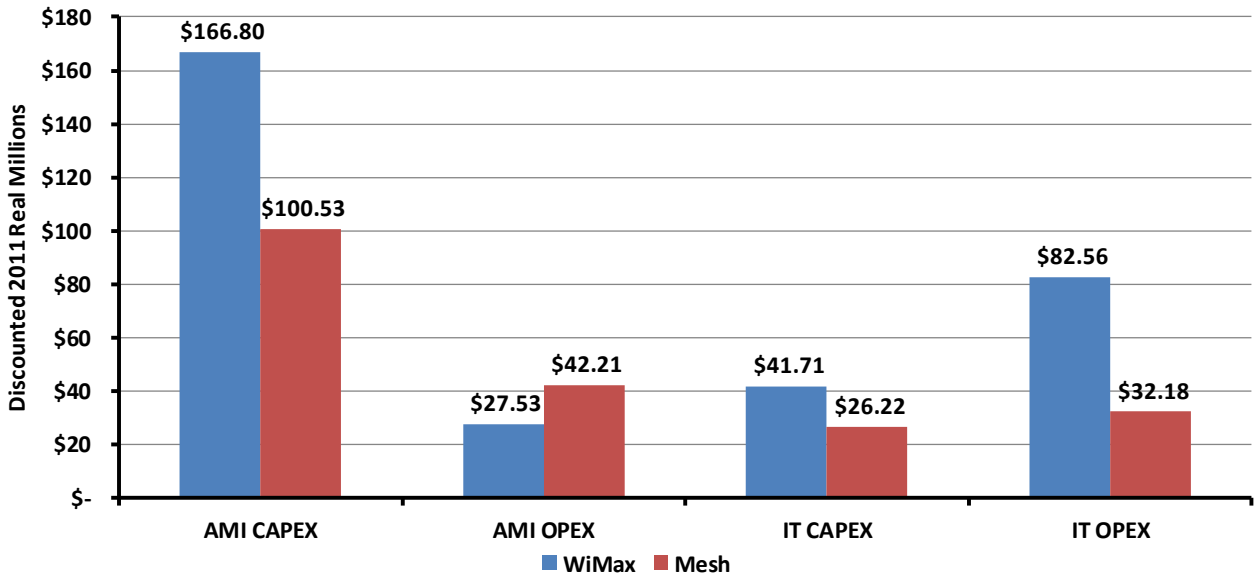
[2] Appeal by SPI Electricity Pty Ltd [2012] AComT 11.

Network Management System (NMS), the Meter Management System (MMS), the Meter Data Management System (MDMS), system integration and project management. It would also have included operational expenditure related to meter reading, meter data services, meter maintenance, communications network maintenance, backhaul communications, and IT support services related to the NMS, MMS and MDMS.

As part of its review and identification of relevant background materials, Energeia considered documents submitted by SPA, Powercor (PC) and Jemena (JEN) during the 2009-11 and 2012-15 budgeting processes, as well as further information submitted by SPA for the purpose of the remittal. Energeia also undertook independent desktop research of the Pacific Gas & Electric Company's (PG&E) mesh deployment and reviewed documents submitted for the AER's assessment of SPA's revised budget variation.

The key documents and sources we have relied upon are footnoted in this report.

Figure 1 – WiMax and Mesh Solution Related Expenditure 2011-2025 as at 28 February 2011

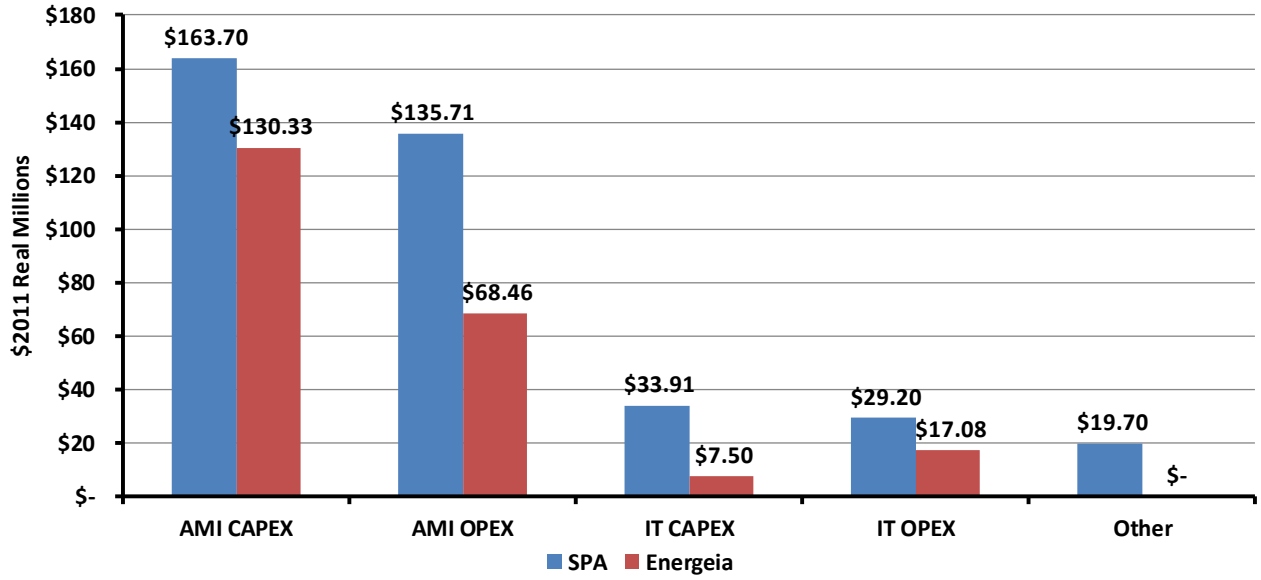


Source: SPA, AER, Powercor, Jemena, Energeia

The results of our assessment of what a reasonable commercial business in the circumstances would have assessed as the present value of all WiMax and mesh related costs over a fifteen year timeframe as at 28 February 2011 are given in Figure 1. Based on this assessment, Energeia found that a prudent company would not have incurred more than the amount required for the mesh telecommunications solution over the 2012-2015 period, which is compared to SPA's estimate for mesh in Figure 2.

Based on the results of our mesh solution assessment, Energeia's review has found SPA's proposed 2012-2015 mesh expenditure to be $158.8 million higher than prudent under the OIC test. This is comprised of $59.8 million in capex and $79.4 million in opex. Of this, we estimate switching costs to be $11.7 million, compared to SPA's estimate of $107.4 million. This assessment has been limited to the prudent costs associated with a mesh solution only.

Figure 2 – Mesh Solution Related Expenditure 2012-2015



Source: SPA, AER, Powercor, Jemena, Energeia

Energeia's conclusion is based on the information we believe would have been available to reasonable commercial business as at 28 February 2011. The key developments that have led to the change of our view since our 2009 advice[3] include changes in assumptions regarding mesh's likely network coverage from 85% to 97%, and 68% higher costs for WiMax NICs relative to mesh NICs than previously assumed in the business case approved by the SPA Board in July 2008.[4]

Energeia recognise that our recommended budget allowance does not include some of the switching costs we originally highlighted in our 2011 advice to the AER.[5] Our statement at the time was based on the presumption of moving to mesh from 1 January 2012, and not 28 February 2011. Based on our investigation of the time required to move to mesh and the incremental impact on SPA's program, we have found most of the significant incremental costs of switching would be incurred prior to 1 January 2012. A comparison of our detailed cost estimates with those of SPA is presented in Figure 3.[6],[7]

[3] Review of Victorian DNSP's AMI Budget Applications 2009-11, Energeia, July 2009.

[4] Board Meeting No: 06/08, AMI – Business Case Revision, 16 July 2008, SPA (confidential).

[5] Review of Victorian DNSP's AMI Budget Applications 2012-15, Energeia, July 2011.

[6] Some minor elements have been omitted from the original table where no difference exists.

[7] Energeia has estimated SPA's equivalent meter capex excluding the cost of meters and installation.

Figure 3 – Energeia and SPA's 2012-2015 Mesh Solution Expenditure Estimates

2012-2015 Expenditure (2011 $M Real)	SPA			Energeia			
Mesh Switching Option	Switch	Rollout	Total	Switch	Rollout	Total	Reasons for Difference in Energeia Switching Estimates
Total CAPEX	**$ 69.52**	**$128.09**	**$197.61**	**$ 11.73**	**$126.10**	**$137.84**	
AMI CAPEX	**$ 53.31**	**$110.39**	**$163.70**	**$ 11.73**	**$118.60**	**$130.33**	
Mesh + 3G Meter Comms Equipment	$ 44.26	$ 56.19	$100.46	$ 11.73	$ 69.86	$ 81.60	Assumes some switching costs incurred in 2011
Mesh Network + Backhaul	$ 9.05	$ 54.20	$ 63.25	$ -	$ 48.73	$ 48.73	Costs only based pro-rata PC costs
IT CAPEX	**$ 16.21**	**$ 17.70**	**$ 33.91**	**$ -**	**$ 7.50**	**$ 7.50**	
NMS	$ 1.37			$ -	$ 3.66	$ 3.66	Assumed included in pro-rata JEN costs
MDMS	$ -			$ -	$ 3.85	$ 3.85	Assumed included in pro-rata JEN costs
System Integration	$ 14.84			$ -	$ -	$ -	Integration costs included in build costs for NMS and MDMS
Total OPEX	**$ 28.27**	**$136.63**	**$164.91**	**$ -**	**$ 85.54**	**$ 85.54**	
AMI OPEX	**$ 25.57**	**$110.13**	**$135.71**	**$ -**	**$ 68.46**	**$ 68.46**	
Meter Reading	$ 7.56	$ 6.13	$ 13.69	$ -	$ 6.13	$ 6.13	Assumes no delay in cut-over to AMI services
Meter Data Management	$ 1.53	$ 16.76	$ 18.29	$ -	$ 14.23	$ 14.23	Assumes no delay in cut-over to AMI services
Backhaul Costs	$ -	$ 19.62	$ 19.62	$ -	$ 14.17	$ 14.17	Assumed included in pro-rata PC costs and discounting
Communications Network	$ -	$ 30.76	$ 30.76	$ -	$ 6.96	$ 6.96	Assumed included in pro-rata PC costs
Project Management Office	$ 10.23	$ 28.47	$ 38.70	$ -	$ 18.56	$ 18.56	Assumes existing budget sufficient
Overhead Costs	$ 4.39	$ 6.54	$ 10.93	$ -	$ 6.54	$ 6.54	Assumes no delay in cut-over to AMI services
Industry PMO / Audit / Regulatory	$ 1.86	$ 1.86	$ 3.71	$ -	$ 1.86	$ 1.86	Assumes existing budget sufficient
IT OPEX	**$ 2.70**	**$ 26.50**	**$ 29.20**	**$ -**	**$ 17.08**	**$ 17.08**	
NMS	$ 2.65	$ 26.50	$ 29.15	$ -	$ 8.03	$ 8.03	No IT operational switching costs identified
MDMS				$ -	$ 9.05	$ 9.05	
NON-AMI	**$ 9.50**	**$ 10.20**	**$ 19.70**	**$ -**	**$ -**	**$ -**	
IT - Other Business Streams	$ 9.50	$ 10.20	$ 19.70	$ -	$ -	$ -	Could not substantiate costs

Source: SPA, AER, Powercor, Jemena, Energeia

Although Energeia has found, based on the information we have been able to access, that the comparable costs show a very strong commercial case for moving to the relatively proven and low cost mesh solution as at 28 February 2011, there may be differences in benefits that justify investing in the higher cost solution. However, Energeia has not been presented with any such incremental benefits in the course of this review, and we therefore believe our assessment represents the prudent level of expenditure to be approved by the AER and recovered through metering charges under the revised OIC.

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2 Disclaimer

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

For further information, please contact:

Energeia Pty Ltd
L20 Tower 2
201 Sussex St
Sydney NSW 2000
T: +61 (0)2 9006 1550 F: +61 (0)2 9006 1000
E: info@energeia.com.au W: www.energeia.com.au

3 Background

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

The regulatory arrangements relating to the rollout are set out in an August 2007 OIC made under sections 15A and 46D of the Electricity Industry Act 2000, and an amending order made on 25 November 2008 (revised OIC). The revised OIC sets out the regulator's role and is the primary regulatory instrument which guides the determination of revenue and prices for metering services.

The revised OIC requires the AER to determine if the activities proposed by DNSPs over the period 2012-2015 are required to deliver the specified AMI services. Although there is no efficient costs review of the distributors' budgets, the AER may nevertheless reject a budget application, or part thereof, if it determines that the activities, or part thereof, are not required to deliver AMI services, or that the costs will not be incurred by the DNSP to deliver those services, or that a reasonable commercial business would not commit to such expenditure in the circumstances.

The AER made a Final Determination on the DNSP's AMI 2012-2015 budgets on 31 October 2011 under the revised OIC, which SPA appealed on 30 November 2011 to the Tribunal pursuant to Section 29(2) of the National Electricity (Victoria) Act 2005 (Vic).

The appeal was based on the assertion that the AER's Final Determination was wholly or partially based on an error of fact in a material respect. The material errors of fact submitted by SPA involved foreign exchange contracts, WiMax communications, maintenance, IT, and communications backhaul expenditure, project management and customer service.

In its decision issued on 26 April 2012, the Tribunal ordered that the AER's Final Determination of SPA's 2012-2015 budget bet set aside to allow it to be revised to reflect the agreed changes to foreign exchange costs, reconsideration of the meter supply expenditure, and the agreed changes to the labour costs.

In its reasons for decision, the Tribunal decided that the AER had made a material error of fact in determining $72.2 million of SPA's proposed WiMax expenditure was not prudent without first determining the level of prudent expenditure under the revised OIC.[8] Key issues that would need to be addressed as part of the determination of prudent costs included the cost of switching, including those due to any delays involved.

The AER engaged Energeia in June 2012 to advise on the prudency of SPA's proposed expenditure on its WiMax based telecommunications solution as part of its AMI solution required under the revised OIC.

Specifically, the AER sought expert advice regarding whether SPA's proposal to incur WiMax related expenditure over the 2012-2015 budget period represented a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances.

In providing its advice, the AER requested that Energeia describe the relevant commercial standards, when and how they would have been applied, including the relevant circumstances, what the outcomes would have been, and the implications for SPA's 2012-2015 budget under the OIC.

[8] Appeal by SPI Electricity Pty Ltd [2012] AComT 11, page 30.

4 Scope and Approach

Energeia's approach to addressing the AER's requirements in their Request for Proposal (RFP) was to:

- identify an appropriate scope of expenditure,
- develop an appropriate approach to apply the relevant regulatory tests,
- identify and review relevant background materials,
- identify the relevant commercial standards,
- identify the timing and outcome of their application,
- identify the circumstances relevant at the time, and
- identify the prudent level of expenditure for 2012-2015 under the OIC.

Determining whether SPA should switch to a mesh telecommunications solution given its current circumstances, and not those leading up to the time any decision would have been taken by a reasonable commercial business, was out of scope.

5 Findings and Conclusions

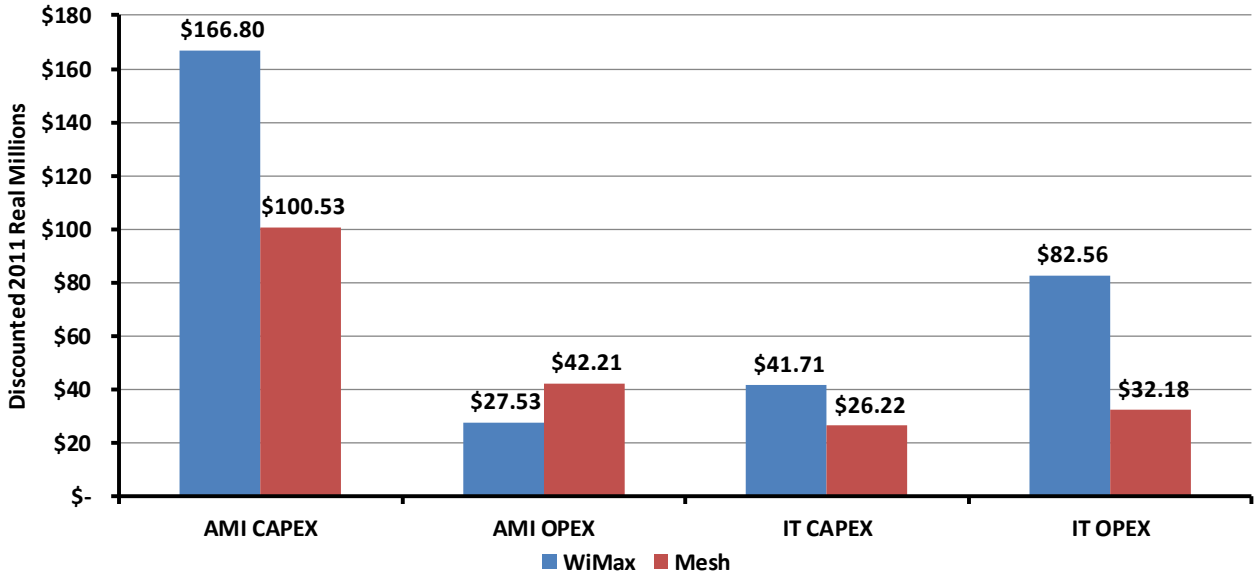
Energeia found that applying the commercial standard under the revised OIC prudency test described in Section 5.1 below required a robust assessment of the relative 15 year costs and benefits of WiMax compared to a mesh based telecommunication solution as at 28 February 2011.

Due to the potential impact of SPA's telecommunication solution on other AMI solution components and upstream systems and processes, Energeia found that the relevant expenditure relating to this assessment would have included capital expenditure related to NICs installed in meters, the communications network, WiMax network deployment remediation, the NMS, the MMS, the MDMS, system integration and project management. It would also have included operational expenditure related to meter reading, meter data services, meter maintenance, communications network maintenance, backhaul communications, and IT support services related to the NMS, MMS and MDMS.

The results of our assessment of what a reasonable commercial business in the circumstances would have assessed as the present value of all WiMax and mesh related costs over a fifteen year timeframe as at 28 February 2011 are given in Figure 4. Based on this assessment, Energeia found that a prudent company would not have incurred more than the amount required for the mesh telecommunications solution over the 2012-2015 period, which is compared to SPA's estimate for mesh in Figure 5.

Based on the results of our mesh solution assessment, Energeia's review has found SPA's proposed 2012-2015 mesh expenditure to be $158.8 million higher than prudent under the OIC test. This is comprised of $59.8 million in capex and $79.4 million in opex. Of this, we estimate switching costs to be $11.7 million, compared to SPA's estimate of $107.4 million. This assessment has been limited to the prudent costs associated with a mesh solution only.

Figure 4 – WiMax and Mesh Solution Related Expenditure 2011-2025 as at 28 February 2011



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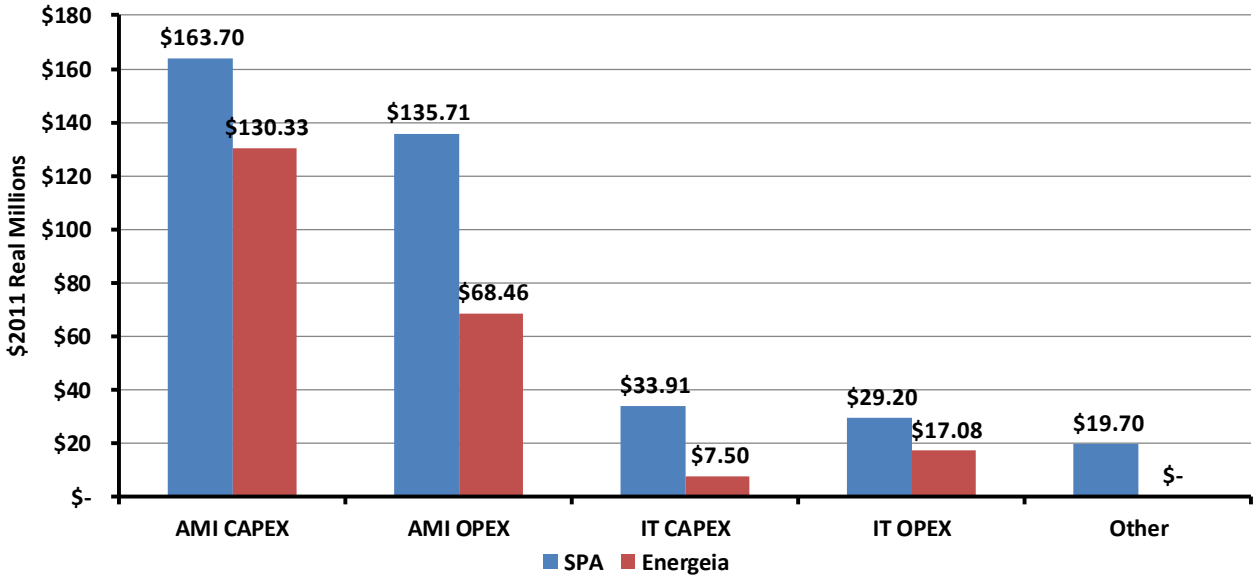
Energeia's conclusion is based on the information we believe would have been available to reasonable commercial business as at 28 February 2011. The key developments that have led to the change of our view

since our 2009 advice[9] include changes in assumptions regarding mesh's likely network coverage from 85% to 97%, and 68% higher costs for WiMax NICs relative to mesh NICs than previously assumed in the business case approved by the SPA Board in July 2008.[10]

Figure 5 – Mesh Solution Related Expenditure 2012-2015



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Energeia recognise that our recommended budget allowance does not include some of the switching costs we originally highlighted in our 2011 advice to the AER.[11] Our statement at the time was based on the presumption of moving to mesh from 1 January 2012, and not 28 February 2011. Based on our investigation of the time required to move to mesh and the incremental impact on SPA's program, we have found most of the significant incremental costs of switching would be incurred prior to 1 January 2012. A comparison of our detailed cost estimates with those of SPA is presented in Figure 6.[12],[13]

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[9] Review of Victorian DNSP's AMI Budget Applications 2009-11, Energeia, July 2009.

[10] Board Meeting No: 06/08, AMI – Business Case Revision, 16 July 2008, SPA (confidential).

[11] Review of Victorian DNSP's AMI Budget Applications 2012-15, Energeia, July 2011.

[12] Some minor elements have been omitted from the original table where no difference exists.

[13] Energeia has estimated SPA's equivalent meter capex excluding the cost of meters and installation.

Figure 6 – Energeia and SPA's 2012-2015 Mesh Solution Expenditure Estimates

2012-2015 Expenditure (2011 $M Real)	SPA			Energeia			
Mesh Switching Option	Switch	Rollout	Total	Switch	Rollout	Total	Reasons for Difference in Energeia Switching Estimates
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Meter Reading	$ 7.56	$ 6.13	$ 13.69	$ -	$ 6.13	$ 6.13	Assumes no delay in cut-over to AMI services
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MDMS				$ -	$ 9.05	$ 9.05	
NON-AMI	**$ 9.50**	**$ 10.20**	**$ 19.70**	**$ -**	**$ -**	**$ -**	
IT - Other Business Streams	$ 9.50	$ 10.20	$ 19.70	$ -	$ -	$ -	Could not substantiate costs

Source: SPA, AER, Powercor, Jemena, Energeia

Although Energeia has found, based on the information we have been able to access, that the comparable costs show a very strong commercial case for moving to the relatively proven and low cost mesh solution as at 28 February 2011, there may be differences in benefits to SPA that justify investing in the higher cost solution. However, Energeia has not been presented with such a business case in the course of this review, and we believe our calculations represent the prudent and therefore appropriate level of expenditure to be approved by the AER and recovered through metering charges under the revised OIC.

The following sections detail our findings and conclusions following our assessment of SPA's WiMax related expenditure against the prudency test under the revised OIC, and our estimate of SPA's prudent telecommunications solution related costs over the 2012-2015 period.

5.1 Materials and Sources

As part of its review and identification of relevant background materials, Energeia considered documents submitted by SPA, PC and JEN during the 2009-11 and 2012-15 budgeting processes, as well as further information submitted by SPA for the purpose of the remittal. Energeia also undertook independent desktop research of the PG&E mesh deployment and reviewed documents submitted for the AER's assessment of SPA's revised budget variation.

The key documents and sources we have relied upon are footnoted in this report.

Following our review of relevant background materials in light of the OIC tests, we have largely based our estimate of prudent costs on the estimated costs of WiMax provided by SPA in their initial 2012-2015 budget application[14], and the pro-rata costs of Powercor's mesh network solution as approved by the AER in their 2009[15] and 2011[16] Final Determinations. The AER approved pro-rata costs of Jemena's IT solution for mesh have been used as we have deemed them more accurate in the circumstances than Powercor's.[17]

[14] SPI Electricity Pty Ltd, Advanced Metering Infrastructure, Revised Budget Application, SPA, 3 March 2011.

[15] Final Determination, Victorian Advanced Metering Infrastructure Review, 2009–11 AMI Budget and Charges Applications, AER, October 2009.

The AER's decision was not released until October 2011, and it might be argued that these costs would not have been known to a reasonable commercial business in 28 February 2011. However, the AER can only make adjustments to Powercor's proposed budgets where they do not meet the revised OIC tests, and therefore any changes are based on the expenditure either not being in scope, or not being prudent. In either case, Energeia's view is that the AER's adjusted costs represent the level of expenditure that a reasonable commercial business would have estimated in the circumstances.

Energeia notes that our approach to sources and comparable costs is largely consistent with that of SPA in their reconsidered 2012-2015 budget submission[18], which also relies on SPA's initial 2012-2015 budget application for its WiMax cost assumptions, the AER's 2011 Final Determination of Powercor's mesh network costs for its mesh cost assumptions, and the Jemena's 2012-15 budget for its mesh MMS cost assumptions.[19] This includes the approach of using costs determined after the time of the decision in question where appropriate.

5.2 Regulatory Tests

Energeia assessed whether SP AusNet's incurring of its WiMax related expenditure constituted a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances under the revised OIC test outlined in clause 5C.3(b)(iv). For the purpose of Clause 5C.3(b)(iv), the revised OIC requires under clause 5C.4 that the [AER] must take into account and give fundamental weight to the matters referred to in clause 5I.8.

Energeia's assessment process therefore considered the relevant commercial standard(s), the timing of their application, and the outcome of their application given the relevant circumstances under clause 5C.3(b)(iv).

5.2.1 Relevant Standards

Energeia's review has found the key commercial standards of relevance when considering the prudency of SPA's proposed WiMax expenditure under the OIC to be the cost-benefit assessment standard used to qualify and rank investment alternatives, the investment governance and risk management standard used to ensure that outcomes align to approved targets and thresholds, and the standard use of benchmarks to estimate costs and benefits where they are not otherwise available or accurate.

The reasoning underpinning our focus on these attributes as the appropriate commercial standard against which to assess the proposed expenditure under the revised OIC is presented below.

5.2.1.1 Investment Governance

Investment governance ensures investments comply with company investment policies, such as the need to undertake a cost-benefit assessment, and that the best option among those with a positive cost-benefit outcome is selected. Once approved, investment governance ensures that investment provides the promised benefits at the promised costs, or takes corrective action.

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[16] Final Determination, Victorian Advanced Metering Infrastructure Review, 2012–15 budget and charges applications, AER, October 2011.

[17] Ibid.

[18] Advanced Metering Infrastructure, 2012-15 Budget and Charges Application, Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 – Reconsideration Submission, 5 June 2012.

[19] The precise source of Jemena's MMS costs is not given in SPA's spreadsheet.

The investment governance process of a reasonable commercial business would have triggered a detailed review of the cost-benefit of WiMax related expenditure once the company recognised that actual costs were significantly higher than those in the original cost-benefit assessment.

It is therefore important to establish the threshold a reasonable commercial business would have set in the circumstances, which would have triggered a detailed reassessment of the WiMax solution's cost-benefit relative to alternative communication solutions.

5.2.1.2 Cost Benefit Assessment

Undertaking a cost-benefit assessment when considering alternative investments enables companies to determine whether a given investment will recover its costs, and which among a range of potential investment options will deliver the best risk-adjusted return.

If the investment governance process of a reasonable commercial business would have triggered a detailed review of the cost-benefit of telecommunication solution options, then the cost-benefit assessment would have been one of the main decision drivers for the communications solution ultimately selected.

Incurring costs above that of the option with the best risk-adjusted cost-benefit ratio would be not prudent under clause 5C.3(b)(iv) of the revised OIC. It is therefore important to determine what the costs, benefits and risks of the best telecommunications option was at the time of the reassessment.

During a cost-benefit assessment, the relevant costs, benefits and risks of each alternative investment option are considered over an appropriate timeframe and appropriately discounted to a common point in time. In the case of an AMI investment, a 15 year time horizon is appropriate given the assumed meter asset depreciation schedule required under the revised OIC, and the relevant costs, benefits and risks are those that a business would incur over this timeframe.[20] Importantly, this means that sunk costs, those having already been invested, are not relevant, but any switching costs would be.

Energeia notes that the exclusion of sunk costs from the investment decision-making process is a basic tenet of classic microeconomics. This does not itself imply that SPA expenditure incurred up to the point of the decision (i.e. the 'sunk' costs) should or would necessarily be removed from the regulatory asset base under the OIC prudency test. Moreover, it is important to distinguish between sunk costs and switching costs. Switching costs may be related to a previous investment decision, but occur as an consequence of the investment decision currently being considered, and therefore relevant to it.

Due to the potential impact of SPA's telecommunication solution on other AMI solution components and upstream systems and processes, Energeia found that the relevant expenditure relating to this assessment would have included capital expenditure related to communications NICs installed in meters, the communications network, WiMax network deployment remediation, the NMS, the MMS, the MDMS, system integration and project management. It would also have included operational expenditure related to meter reading, meter data services, meter maintenance, communications network maintenance, backhaul communications, and IT support services related to the NMS, MMS and MDMS.

Energeia also assessed SPA's incremental costs related to other areas of the business ('other business streams') due to their potential impact on the 15 year cost-benefit assessment even if the costs themselves may not be recoverable under the OIC due to scope or other issues.

[20] SPA also appears to have used a 15 year timeframe for its business case cited in footnote 14.

5.2.1.3 Cost, Benefit and Risk Benchmarking

Robust cost-benefit assessments require accurate estimates of costs, benefits and risks as inputs, which may not be available for many reasons including the costs associated with obtaining accurate estimates, such as a procurement process, or not having undertaken a detailed investigation of the costs, benefits or risks of one or more of the alternatives, for example mesh based communications.

In situations where actual costs, benefits or risks are not available, a reasonable commercial business would use the costs, benefits and risks of a comparable or benchmark business. For example, if a company operated a distribution network connecting approximately 700,000 mostly rural and suburban customers it would use benchmarks from another distribution network connecting around the same number of mostly rural and suburban customers.

5.3 Investment Governance

The AER found that SPA's investment governance failed to operate in its Final Determination of SPA's 2012-2015 AMI Budget, but did not determine when a reasonable commercial business would have reassessed the cost-benefit, or what the outcome of that reassessment would have been.

The timing of when the investment governance related processes of a reasonable commercial business would have operated to trigger a reassessment of the telecommunications solution cost-benefit analysis is important to determine as it will also define the relevant circumstances.

Energeia's approach to determining when a reasonable commercial business's investment governance process would have triggered a reassessment of its telecommunication solution cost-benefit analysis considered the circumstances listed in the revised OIC clause 5I.8, SPA's original business case, SPA's governance process, and key related developments. The AER requested SPA provide materials relevant to its investment, project and work stream governance decision making related to WiMax in the form of meeting minutes and agenda items, but these were not provided and could therefore not be taken into account.[21]

5.3.1.1 Original Cost-Benefit Assessment

Although SPA has not yet provided the full details of the business case underpinning its July 2008 Board recommendation, Energeia's review has found the nearest cost-benefit provided to be in SPA's 9 April 2008 Executive Brief.[22] This business case showed WiMax costing $52.55 million in capex and $108.98 million in opex, compared to $57.94 million in capex and $116.21 million in opex for mesh.[23]

The Executive Brief business case assumes 80% primary and 20% secondary network solution coverage based on using PLC as the secondary solution, while the Board business case assumes 3G as the secondary solution. There is not explicit mention in the business case of what the assumed 3G coverage is.

Interestingly, the differences noted between the cost of mesh and WiMax mentioned on page 5 of the business case appear to focus on the telecommunications network itself and not the end-to-end costs over a

[21] SP AusNet 2012 – 12 June 2012 Second Information Request, AER, 12 June 2012, pages 1-2.

[22] AMI Communications Program, Executive Brief, Key Recommendations of Technology Choice Analysis June – Dec 2007, SPA, April 2008, page 5 (confidential).

[23] Although it is not explicitly stated in the document, it appears these represent a 15 year timeframe.

15 year timeframe, which would also include the cost of the NICs in the meters, which account for about half of the overall telecommunications solution cost.[24]

Determining the overall size of the WiMax commitment is important when assessing whether changes in assumptions underpinning its justification may change. For example, a $1 million change or even a $5 million change may not be considered substantial in the context of a $161 million investment.

5.3.1.2 The Commercial Standard

In Energeia's view, a reasonable commercial business in the circumstances would have established a robust governance process around telecommunications related expenditure to mitigate the significant risk that the costs or benefits turned out to be incorrect given the very close commercial outcome, and the high technology and market risks involved due to both options being relatively unproven and immature at the time.

The OIC allowance of up to 20% above approved expenditure during the 2009-2011 period and up to 10% above approved expenditure over the 2012-2015 period[25] was an important consideration that a reasonable commercial business would have factored into their investment governance process in the circumstances.

In experience of Energeia personnel, who have been responsible for AMI programs and held executive management positions in a network business, prudent management typically establish conservative internal governance thresholds to provide an early warning system. Management of a reasonable commercial business in the circumstances would therefore have set a 5-10% budget variance internal threshold, beyond which the project manager would have needed to obtain formal approval to increase the budget.

In Energeia's view a reasonable commercial business would have established regular reporting to monitor costs and expenditure relative to the approved business case. Reporting in a major program of work like the SPA AMI implementation would occur on at least a monthly basis at the project, program, executive and Board level, with the project manager reporting to the program manager, who would report to the Steering Committee (SC), which would report to Executive Management, who in turn would report to the Board.

Energeia's review found that SPA established a risk management framework for the AMI program that identified a number of telecommunications related risks which were registered in risk records, and assigned their management to specified roles in the program.[26] Energeia's review found that most of the risk records focused on technical rather than investment risks. However, risk record C005 – Communications Technology Selection, identified SPA's solution selection being inconsistent with the other DNSPs as a level II risk.

Risk record C005 recognised that the risk exposure or impact could be SPA's costs becoming significantly higher than other DNSPs, and sought to mitigate this risk through the development of relationships with other DNSPs to ensure that SPA's technology strategy did not differ significantly for cost recover purposes. Based on the risk management framework, this risk should have been regularly reviewed by the stream manager.

Based on the documentation provided, which did not include risk or corporate governance documentation related to the identified WiMax cost variations, Energeia was unable to determine how SPA's risk management or investment governance framework operated following the discovery of significant variations to other DNSPs' telecommunications strategies or the Board approved business cases, respectively.

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[24] Board Meeting No: 06/08, AMI – Business Case Revision, 16 July 2008, SPA, page 5 (confidential).

[25] OIC Clause 5I.2(a)(iii)

[26] AMI PMO Risk Management Guidelines, SPA, 6 November 2008 (confidential).

5.3.1.3 Developments

The key developments that would have triggered a re-assessment of the WiMax investment by a reasonable commercial business include significant changes in the assumed costs, benefits or risks.

Energeia and the AER accepted SPA's cost-benefit assessment as presented to its Board in July 2008 as passing the commercial standard test at the time based on the information supplied by SPA. Although the mesh communications network was reported to the Board at the time as being $9 million lower in capex, this was to be offset by $8.9 million in savings in capex and opex.[27] Energeia notes that the exact savings involved do not appear to have been reported to the Board.

What Energeia has discovered since the AER issued its Draft and Final Determinations of SPA's 2009-2011 AMI budgets was that SPA had learned that the cost of WiMax compared to mesh showed the latter to be 70% or $105 million cheaper, based on responses received to its RFT 2008/T15. This information had been provided to the AER as part of more than 15 boxes of documents provided by SPA, but had not been provided to Energeia as part of our 2009 or 2011 reviews. Due to the lack of documents provided by SPA regarding its WiMax related governance activities, Energeia has been unable to determine whether and how this information was dealt with by SPA's AMI governance or risk management related processes.

Based on its review of the information available at the time Energeia concludes that the investment governance and risk management system of a reasonable commercial business would have required a re-assessment of its commitment to WiMax in July 2008 based on the report by the SPA consultant managing the RFT process and assessing its outcomes.[28]

Our review of developments subsequent to this date has found a reasonable commercial business would have also have updated its cost-benefit assessment on our before signing WiMax meter contracts in September 2009, when it became clear that the WiMax meter costs promised by GE were not going to be achieved. We found SPA's AMI Steering Committee was at least aware of this issue by 27 May 2009, when GE's expected inability to deliver a working meter in the required timeframe was noted in the minutes.

Following the developments in WiMax and mesh cost and performance over the period to December 2010, which saw mesh successfully deployed by four of the Victorian DNSPs at significantly lower cost than SPA's WiMax based approach, Energeia's review has found that the investment governance and risk management systems of a reasonable commercial business in the circumstances would have required a robust reassessment of the costs and benefits of maintaining a commitment to WiMax prior to lodging its 2012-2015 AMI budget proposal on 28 February 2011.

Based on our review of the commercial standard, and the key developments occurring since SPA's Board approved its selection of WiMax, Energeia has found that a reasonable commercial company in the circumstances would have undertaken formal, robust reassessments of the costs and benefits of WiMax relative to alternative telecommunication solution options in July 2008, September 2009 and February 2011.

5.4 Cost Benefit Assessment

Under the commercial standard of good corporate and investment governance that would require a robust cost benefit reassessment be undertaken when actual costs, benefits and/or risks vary by more than a

[27] Board Meeting No: 06/08, AMI – Business Case Revision, 16 July 2008, SPA, pages 5 and 8 (confidential).

[28] SP AusNet AMI Program – RFT Evaluation, Final Report – Supplementary Information, June 2008, – Draft, Deloitte (confidential).

threshold amount, Energeia considered what a reasonable commercial business would do in the circumstances, and what those circumstances would be.

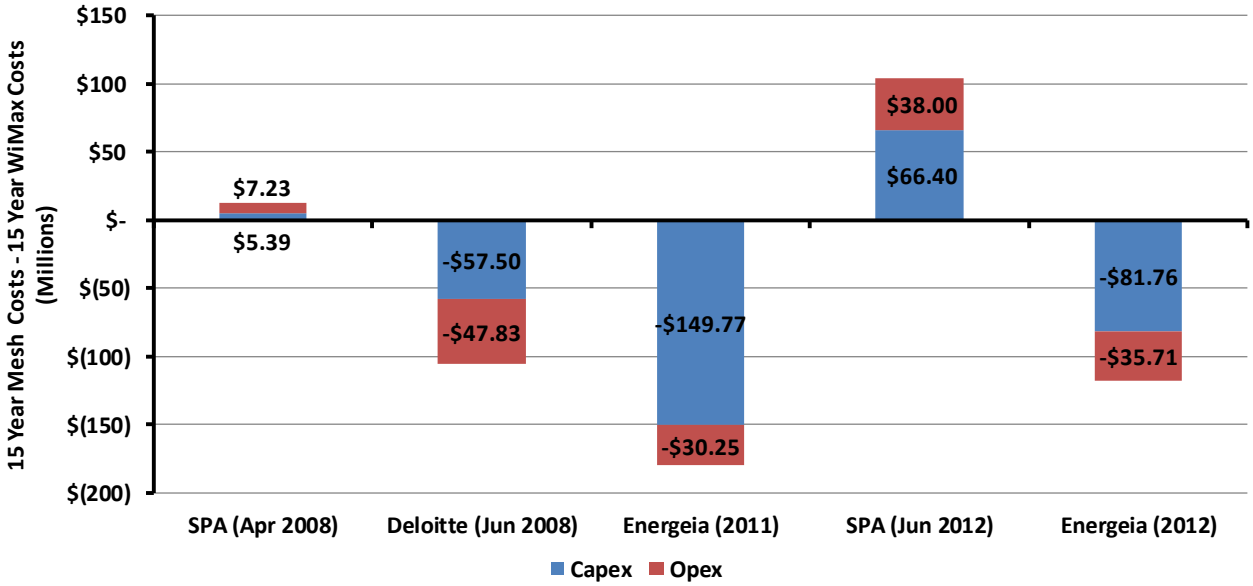
In determining the cost-benefit assessment methodology and inputs that a reasonable commercial business would adopt in the circumstances, Energeia considered all the relevant circumstances listed in the revised OIC clause 5I.8, Deloitte's high level approach adopted in 2008, Energeia's top-down approach adopted in its 2012 advice to the AER, the AER's approach in its Final Determination, and the approach proposed by SPA in its reconsidered 2012-2015 budget submission.

The following sections summarise the key cost-benefit assessments undertaken to date, including Energeia's own assessment undertaken for this review, before describing the key circumstances considered and the inputs and views ultimately adopted.

5.4.1 Application and Outcomes

Energeia's review of previous cost-benefit methodologies applied to SPA's telecommunications solution has found they are all relatively consistent in their assumptions, approach and results. Figure 7 presents all available assessments of the cost-benefit of SPA's two primary options for its AMI telecommunication solution, WiMax and mesh, restating them into a common format where appropriate. All of the assessments since June 2008 save for SPA's 2012 reconsideration show mesh to be substantially less costly to deploy over a 15 year timeframe than WiMax.

Figure 7 – Cost-Benefit Assessment of WiMax Relative to Mesh



Source: SPA, Deloitte, AER, Energeia

Energeia's review has found the differences in the results are mainly due to the key assumptions used, with the main variations being the option assessed, the primary solution coverage assumed, and the point in time being considered. For example, SPA's 2012 reassessment assumes 85% primary solution coverage regardless of technology and a 19 May 2011 reassessment date, while Energeia's analyses assume a 97% mesh, 80% WiMax coverage and a 28 February 2011 reassessment date.[29]

[29] These differences are discussed in Section 5.3.2.

In its 2008 summary of the responses received to SPA's 2008 Request for Tender (RFT 2008/T15) from AMI metering and communications network solution and service providers, Deloitte presented the high level cost benefit comparison of the two preferred mesh and WiMax solutions.[30] Although the methodology is not explicitly stated and was not provided for review, its key assumptions are listed in the report. It appears to only look at the initial rollout capex and the opex from that point forward.

In its 2011 review for the AER, Energeia undertook a top-down assessment of the cost-benefit of WiMax relative to mesh that was consistent with the original business case relied upon by the SPA Board, namely that all the telecommunication solution impacted costs and benefits were taken into consideration including other IT systems.[31] The analysis was limited due to the tight timeframes involved in that it only looked at 2012-2015 capex and 2015 opex rather than over a 15 year horizon.

The AER in its 2011 Final Determination of SPA's 2012-2015 AMI budget undertook an implicit cost benefit assessment of SPA's telecommunications solution alternatives in coming to a view on the prudent level of expenditure for telecommunications related activities. As with Energeia's approach, the AER compared the 2012-2015 capex and opex of the two options, using costs from SPA's February 2011 budget application for WiMax and its final determination of Powercor's relevant 2012-2015 costs for mesh.

SPA submitted three cost-benefit assessments as part of a 2012-2015 charges and budget reconsideration in response to the Tribunal's decision.[32] The first was to continue deploying its preferred WiMax solution, the second considered a hybrid Mesh-WiMax solution, and the third looked at the mesh based solution in place of the current WiMax approach. The analysis found the first option to be the lowest cost, but the assessment was limited to the 2012-2015 period, which meant that it did not consider the 2016-2026 costs and benefits.

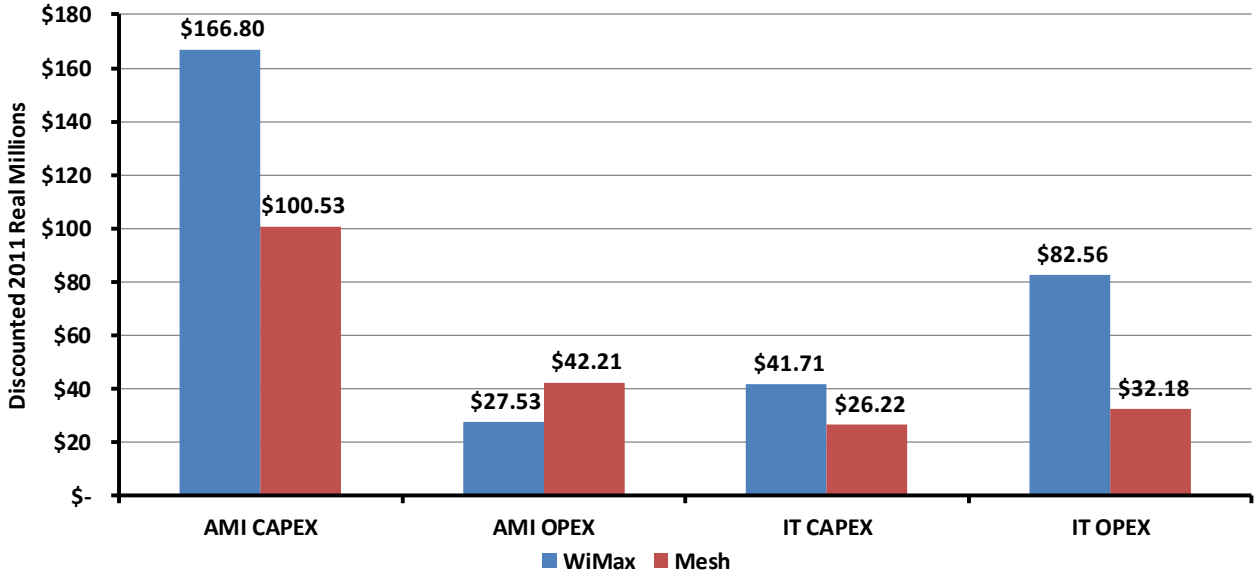
For the purpose of this review, Energeia undertook a comprehensive cost-benefit assessment of mesh and WiMax telecommunication solution options to determine the standard for expenditure by a reasonable commercial business in the circumstances as required under the revised Order test for prudency. Our assessment found the 15 year lifetime cost of the WiMax option to be $117.5 million or 58% higher than the equivalent mesh option.

[30] SP AusNet AMI Program – RFT Evaluation, Final Report – Supplementary Information, June 2008, – Draft, Deloitte, page 21 (confidential).

[31] Review of Victorian Distribution Network Service Provider's Advanced Metering Infrastructure Budget Applications 2012-15, Energeia.

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

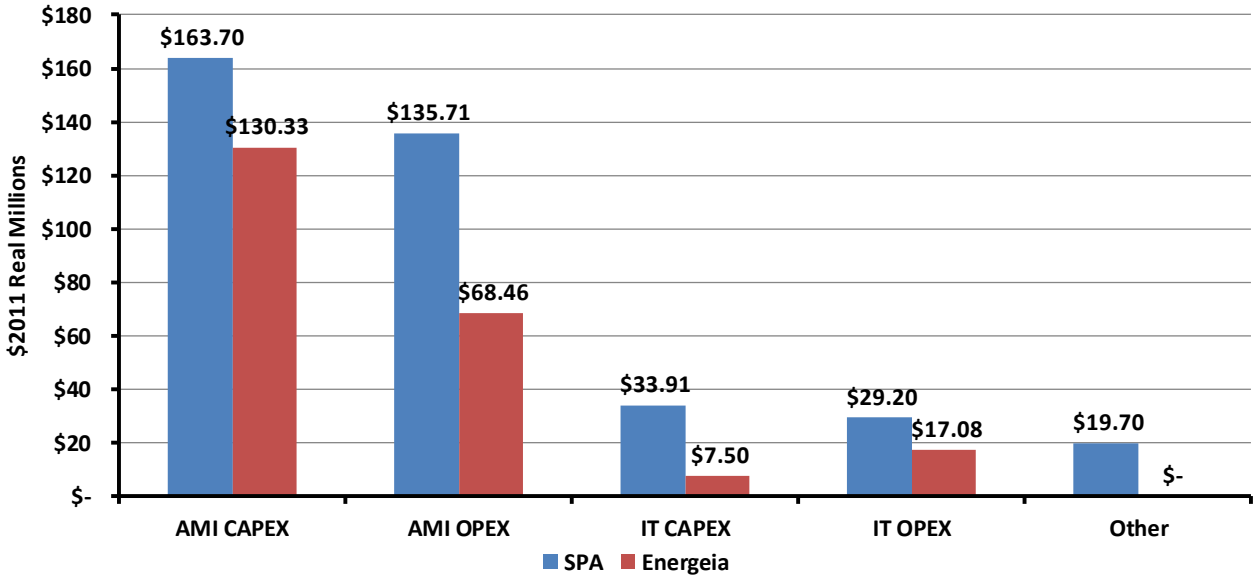
Figure 8 – WiMax and Mesh Solution Related Expenditure 2011-2025 as at 28 February 2011



Source: SPA, AER, Powercor, Jemena, Energeia

The results of our assessment of what a reasonable commercial business in the circumstances would have assessed as the present value of all WiMax and mesh related costs over a fifteen year timeframe as at 28 February 2011 are given in Figure 8. Based on this assessment, Energeia found that a prudent company would not have incurred more than the amount required for the mesh telecommunications solution over the 2012-2015 period, which is compared to SPA's estimate for mesh in Figure 9.

Figure 9 – Mesh Solution Related Expenditure 2012-2015



Source: SPA, AER, Powercor, Jemena, Energeia

Based on the results of our mesh solution assessment, Energeia's review has found SPA's proposed 2012-2015 mesh expenditure to be $158.8 million higher than prudent under the OIC test. This is comprised of $59.8 million in capex and $79.4 million in opex. Of this, we estimate switching costs to be $11.7 million, compared to SPA's estimate of $107.4 million. This assessment has been limited to the prudent costs

associated with a mesh solution only. A comparison of our detailed cost estimates with those of SPA is presented in Figure 10.[33],[34]

Figure 10 – Energeia and SPA's 2012-2015 Mesh Solution Expenditure Estimates

2012-2015 Expenditure (2011 $M Real)	SPA			Energeia			
Mesh Switching Option	Switch	Rollout	Total	Switch	Rollout	Total	Reasons for Difference in Energeia Switching Estimates
Total CAPEX	**$ 69.52**	**$128.09**	**$197.61**	**$ 11.73**	**$126.10**	**$137.84**	
AMI CAPEX	**$ 53.31**	**$110.39**	**$163.70**	**$ 11.73**	**$118.60**	**$130.33**	
Mesh + 3G Meter Comms Equipment	$ 44.26	$ 56.19	$100.46	$ 11.73	$ 69.86	$ 81.60	Assumes some switching costs incurred in 2011
Mesh Network + Backhaul	$ 9.05	$ 54.20	$ 63.25	$ -	$ 48.73	$ 48.73	Costs only based pro-rata PC costs
IT CAPEX	**$ 16.21**	**$ 17.70**	**$ 33.91**	**$ -**	**$ 7.50**	**$ 7.50**	
NMS	$ 1.37			$ -	$ 3.66	$ 3.66	Assumed included in pro-rata JEN costs
MDMS	$ -			$ -	$ 3.85	$ 3.85	Assumed included in pro-rata JEN costs
System Integration	$ 14.84			$ -	$ -	$ -	Integration costs included in build costs for NMS and MDMS
Total OPEX	**$ 28.27**	**$136.63**	**$164.91**	**$ -**	**$ 85.54**	**$ 85.54**	
AMI OPEX	**$ 25.57**	**$110.13**	**$135.71**	**$ -**	**$ 68.46**	**$ 68.46**	
Meter Reading	$ 7.56	$ 6.13	$ 13.69	$ -	$ 6.13	$ 6.13	Assumes no delay in cut-over to AMI services
Meter Data Management	$ 1.53	$ 16.76	$ 18.29	$ -	$ 14.23	$ 14.23	Assumes no delay in cut-over to AMI services
Backhaul Costs	$ -	$ 19.62	$ 19.62	$ -	$ 14.17	$ 14.17	Assumed included in pro-rata PC costs and discounting
Communications Network	$ -	$ 30.76	$ 30.76	$ -	$ 6.96	$ 6.96	Assumed included in pro-rata PC costs
Project Management Office	$ 10.23	$ 28.47	$ 38.70	$ -	$ 18.56	$ 18.56	Assumes existing budget sufficient
Overhead Costs	$ 4.39	$ 6.54	$ 10.93	$ -	$ 6.54	$ 6.54	Assumes no delay in cut-over to AMI services
Industry PMO / Audit / Regulatory	$ 1.86	$ 1.86	$ 3.71	$ -	$ 1.86	$ 1.86	Assumes existing budget sufficient
IT OPEX	**$ 2.70**	**$ 26.50**	**$ 29.20**	**$ -**	**$ 17.08**	**$ 17.08**	
NMS	$ 2.65	$ 26.50	$ 29.15	$ -	$ 8.03	$ 8.03	No IT operational switching costs identified
MDMS				$ -	$ 9.05	$ 9.05	
NON-AMI	**$ 9.50**	**$ 10.20**	**$ 19.70**	**$ -**	**$ -**	**$ -**	
IT - Other Business Streams	$ 9.50	$ 10.20	$ 19.70	$ -	$ -	$ -	Could not substantiate costs

Source: SPA, AER, Powercor, Jemena, Energeia

The key quantitative assumptions employed in our cost-benefit assessment are discussed below.

5.4.2 Quantifiable Circumstances

Energeia considered the key quantifiable assumptions used in the main cost-benefit reassessments described in section 5.3.1 in accordance with the revised OIC clause 5I.8. The results of this process including our key findings and conclusions are reported in the following sections.

5.4.2.1 Timeframe

SPA's argues in its reconsidered submission for May 2011 as the timeframe for the reassessment, based on this being when it claims SPA's Executive Steering Committee became aware of the "significant cost increases", "significant difficulties in meeting operational targets", WiMax's inadequate coverage, and "capability gaps", based on the reassessment tabled at the 19 May 2011 meeting.[35]

Energeia's review has found this claim has not been supported by SPA Board or AMI SC meeting minutes or WiMax related agenda items over the period from the original business case approval in June 2008 to May 2011, despite the AER's request for these documents.[36] Although some AMI SC meeting minutes were included in the 15 boxes of materials provided as part of the 2009-2011 process, these are sporadic, and the last one provided is dated 10 June 2009.

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[33] Some minor elements have been omitted from the original table where no difference exists.

[34] Energeia has estimated SPA's equivalent meter capex excluding the cost of meters and installation.

[35] Advanced Metering Infrastructure, 2012-15 Budget and Charges Application, Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 – Reconsideration Submission, 5 June 2012, page 15.

[36] SP AusNet 2012 – 12 June 2012 Second Information Request, AER, 12 June 2012, pages 1-2.

As Energeia has previously noted, changes in the relative economic performance of mesh and WiMax were known to SPA as early as July 2008 following Deloitte's Draft RFT report. WiMax's economic and technical deficits would have been known as early as 27 May 2009, when the Steering Committee notes GE's expected inability to deliver a working meter in the required timeframe, and before metering supply contracts were signed in September 2009. Mesh's 97% coverage and costs would have been knowable before 28 February 2011 when Powercor put forward a 2012-2015 AMI budget based on this information.[37]

Energeia is therefore of the view that a reasonable commercial business would have reassessed the cost-benefit in July 2008 following the Deloitte report, prior to signing contracts in September 2009, and again in early in 2011 prior to submitting its subsequent budget application on 28 February 2011. For the purpose of this review, Energeia has based its cost-benefit assessment on a 15 year timeframe starting 1 March 2011.

5.4.2.2 Feasible Options

All the cost-benefit assessments described in this report have looked at mesh and WiMax as the two main feasible options for SPA's network, except in the case of SPA, who have also included a mesh-WiMax hybrid solution in their reconsidered submission.

Energeia considered SPA's approach as well as other emerging possibilities including the National Broadband Network (NBN), the cellular-based Long-term Evolution (LTE) being adopted by most major international mobile communication networks and the power line carrier based Power-line Intelligent Metering Evolution (PRIME) technology being adopted by major European distribution networks.

Our qualitative assessment of these options, based on the first-hand experience of our personnel deploying Broadband over Power Lines (BPL), GPRS, and two types of Distribution Line Carrier (DLC) AMI telecommunication solutions, is that PRIME, NBN and LTE solutions would not have been feasible due to their relatively high risk, high cost profile in the timeframe under consideration. The hybrid solution would be feasible but higher cost and risk over the 15 year timeframe due to the operational costs and technical complexity involved in establishing and maintaining the relatively high cost WiMax solution.

Based on four out of the five Victorian DNSPs being committed to mesh and successfully deploying it as at 28 February 2011, the relative immaturity of new telecommunication solutions for AMI in Australia at the time, the relatively high risk involved in developing a world-first WiMax-3G-mesh integrated AMI solution without impacting timelines, and the necessarily higher cost of operating two network solutions over 15 years, Energeia's review found the mesh based telecommunications solution to be the main feasible alternative that a reasonable commercial business would have undertaken a detailed assessment of in the circumstances.

5.4.2.3 Project Timelines

The assumed project timeline impacts of moving to an alternative telecommunication solution need to be considered due to their potential to increase switching costs or cause reputational damage. Energeia's review found the main costs that could be increased through delays include project management and related overhead costs, meter reading and data services costs, communications network remediation costs due to work in process, and the number of NICs that would need to be retrofitted with the new solution.

Energeia reviewed SPA provided materials to determine the project timeline as it stood at 28 February 2011, and those used by SPA in its major reassessment and replanning occurred leading up to the 19 May 2011

[37] Advanced Metering Infrastructure Budget and Chargers Application 2012-15, Powercor, 28 February 2011, pages 61-62.

report.[38] We also considered SPA's view of the timeline for any switch to a mesh solution and reviewed implementation timelines from other Victorian DNSPs and PG&E.[39,40,41] The experience of Energeia personnel deploying over 300,000 smart interval meters and 10,000 AMI meters incorporating four telecommunication solutions was also taken into consideration.

SPA proposes a project timeframe in its reconsidered proposal for switching to mesh that starts in May 2011 and ends in June 2014. Energeia's review of this timeline could not extract its implications for meeting the 1 January 2012 or subsequent AMI services targets, nor readily map it to a standard industry project planning approach. SPA has based its schedule on the assumption that it has taken the other DNSPs 2-2.5 years to build and integrate the mesh solution.[42]

Energeia's review found that SPA's timeline did not reflect the relevant time required by other DNSPs such as JEN and UED to deliver daily interval data to market, nor did it take account of the mesh solution's proven end-to-end functionality, or the market's experience, which would have significantly compressed the required timeframe for a SPA implementation. Energeia's own 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 and delivering daily interval data to market on 14 June 2010.[43,44]

The 9.5 months required by JEN and UED does not include the time required for mobilisation, procurement or technology delivery. However, Energeia has assumed that a proven solution would be used, such as that already installed by JEN, which would be ready to configure for SPA. The core SPA team would already be mobilised and ready to commence the project on an immediate, high priority basis. Supplies of already integrated meters and mesh modules would also be available for testing and integration. SPA has also assumed that any switch to mesh would use Silver Spring Networks (SSN) due to their being best placed.[45]

Our review of SPA's 19 May 2011 detailed assessment found that the timeline being proposed included a 10 month timeframe for implementing the required functionality and performance levels.[46] This is from the time the master integrator is engaged to the Release 1 go-live. Energeia notes that this scope of work includes comprehensive, end-to-end changes from the meter to the upstream IT applications. As Energeia considers its complexity and risk to be higher than that of implementing the proven mesh solutions adopted by PC, CitiPower, JEN and UED, we believe a 10 month schedule allowance for the latter is reasonable.

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[38] AMI Smart Meter Program, Re-planning Analysis & Recommendations, Executive Committee Meeting, 19 May 11, SPA (confidential).

[39] AMI ISC Program Status Report, AMI Program Office Manager, 19 July 2012, pages 28-29 (confidential).

[40] Impact Assessment Report, AMI Program Office Manager, 19 July 2012, page 2 (confidential).

[41] PG&E Smart Meter Steering Committee Update – March, PG&E, 18 March 2009, page 5.

[42] Advanced Metering Infrastructure 2012-15 Budget and Charges Application, SP AusNet Revised Response to AER Information Requests 2-6, SPA, 17 July [2012], page 11.

[43] Impact Assessment Report, AMI Program Office Manager, 19 July 2012, page 2 (confidential).

[44] Ibid. pages 28-29.

[45] Advanced Metering Infrastructure 2012-15 Budget and Charges Application, SP AusNet Revised Response to AER Information Requests 2-6, SPA, 17 July [2012], page 19.

[46] AMI Smart Meter Program, Re-planning Analysis & Recommendations, Executive Committee Meeting, 19 May 11, SPA, page 40 (confidential).

The procurement, design and implementation of a field proven mesh based telecommunications solution would have been relatively straight forward, particularly given most upstream systems communicated with the MDMS and MMS through the Service Oriented Architecture (SOA) standard.[47] This means that changing out the WiMax integrated MMS and MDMS could be done without major reconfiguration of each of the inter-dependent systems. The main changes required would occur in the integration layer in the enterprise services bus, which is connected between and acts as the information broker for all the other systems.

Energeia notes the relevant case of PG&E, which switched from its initial communications solution to a mesh based solution after 740,000 meters had already been installed. PG&E's is deploying smart meters to 5.1 million electricity and 4.7 million gas customers, across a territory covering most of northern California, including the Sierra Nevada mountains. There are therefore a number of similarities with SPA's circumstances, including a gas and electricity franchise, a switch to mesh as the primary communications solution, and the ruggedness of the network area served.

PG&E selected SSN's mesh communications solution on 29 July 2008 to deploy its mesh communications solution as part of PG&E AMI deployment. According to PG&E's AMI steering committee reporting, the company commenced installation of SSN meters on 3 October 2008, or just over 2 months after the contract was signed.[48,49] Billing of SSN metered points, demonstrating end-to-end integration of the production IT systems, was established on 3 February 2009, six months post contract signing. A range of other AMI functionality, including disconnections and meter checks, was deployed on an ongoing basis every 2-3 months from that point onwards.

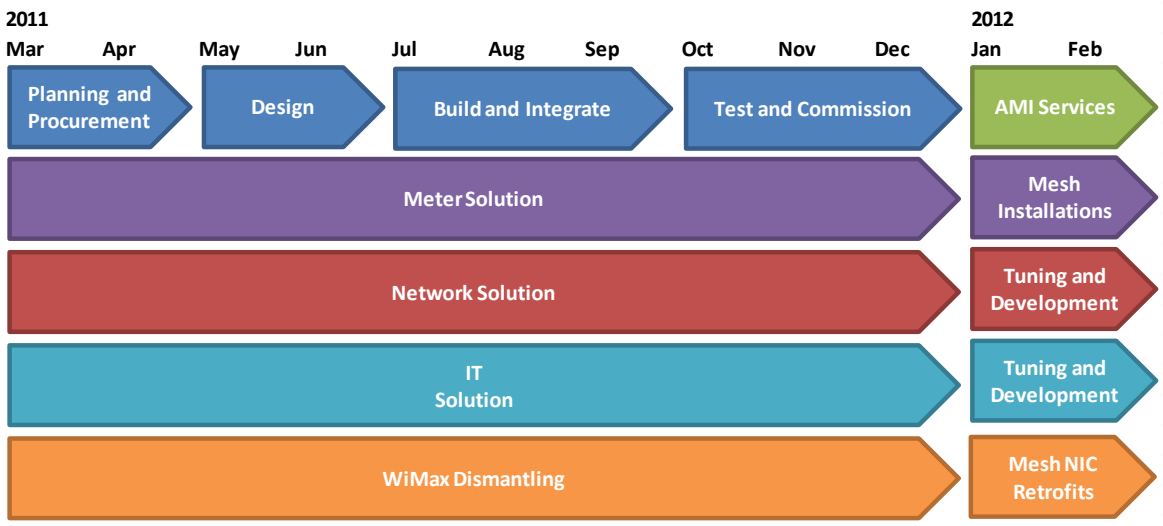
Energeia's review found that a reasonable commercial business in the circumstances would have planned on a 10 month timeframe for implementing a proven mesh based telecommunications solution during its cost-benefit assessment. Energeia would expect the company to follow industry practice and shift most of the delivery risk on to the solution and service providers. This timeframe would allow the company to meet its obligations under the revised OIC based on the sequence and timing of the key activity streams illustrated in Figure 11. More importantly, it should not result in a material delay to cutting over to AMI services.

[47] Advanced Metering Infrastructure Budget and Chargers Application 2012-15, Powercor, 28 February 2011, page 71.

[48] SmartMeter Steering Committee Update – March, PG&E, 18 March 2009, page 5.

[49] PG&E Selects Silver Spring Networks for Smart Grid Networking, 29 July 2008. Available from www.silverspringnet.com/newsevents/pr-pge-072908.html#.UCLF3k3iacw, 9 August 2012.

Figure 11 – Telecommunication Solution Development Timeline



Source: Energeia

Based on our consideration of the scope of work required to procure, design and implement an integrated NMS, MMS, MDMS, communications network and meter solution, the timelines of other Victorian DNSPs, and the industry experience of our personnel, Energeia's review has found that the project and technical resources that would otherwise have had to be used on SPA's WiMax-3G solution could have managed the market delivery of a proven mesh-3G solution without a significant increase in cost.

Deployment of meters without a NIC from 1 March 2011 would not have impacted the 30 June 2011 target to have 25% of meters installed. Delivery of the mesh-3G solution within 10 months from a decision on 28 February 2011 implies no delay in the provision of meter data to market under the mesh relative to WiMax solution options. This also means that SPA would not need to negotiate with the AER or Victorian government regarding delays to the AMI program schedule, which require data to market from January 2012.

However, given the significance of any decision to move from WiMax to mesh, Energeia would have expected a prudent business to have been in dialogue with Victorian government in the period leading up to a decision to switch to mesh by 28 February 2011.

5.4.2.4 WiMax Solution Costs

SPA's reconsidered proposal considers the costs and benefits of SPA's planned WiMax based primary telecommunications solution as the benchmark Option 1 against which other options are assessed. Although it submits that the date for reassessing the decision should be 19 May 2011, it relies on the costs included in its subsequent budget application submitted 28 February 2011 as being the current and best cost estimate.

SPA recognises in its reconsidered proposal that WiMax solution costs increased significantly between 28 February 2011 and 19 August 2011, when SPA submitted its revised 2012-2015 budget application following the AER's Draft Determination.[50] However, SPA argues that these costs would not have been known to the business as at May 2011, and they should therefore not be included in the assessment.

[50] Advanced Metering Infrastructure, 2012-15 Budget and Charges Application, Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 – Reconsideration Submission, 5 June 2012, page 20.

Energeia's review of the WiMax solution costs as at 28 February 2011 considered SPA's 2012-2015 budget application lodged 28 February 2011, the AER's Final Determination issued in October 2011, SPA's reconsidered budget application lodged 5 June 2012, and desktop research of the PG&E mesh deployment in California that would have been known at the time.

Energeia's review of the cost information that a reasonable commercial business would have used in the circumstances to assess the WiMax telecommunications option has found that SPA's 28 February 2011 budget contains the most appropriate inputs for such an assessment. However, Energeia note that these costs require adjustment as neither SPA's original 2012-2015 budget nor its reconsidered budget include an explicit 15 year cost-benefit estimate, for example.

Energeia's adjusted WiMax solution costs are given in Figure 12. Based on our review of the WiMax solution related costs a reasonable business commercial business would assess in the circumstances, Energeia has found the WiMax option to be $208.5 million in capex and $110.1 million in opex over a 15 year timeframe commencing 1 March 2011. The detailed cost estimate is provided as Attachment 1.

Figure 12 – Present Value of WiMax Solution Costs as at 28 February 2011

WiMax Solution Expenditure (Discounted 2011 $M Real)		2011-2025
Total CAPEX	**$**	**208.52**
AMI CAPEX	**$**	**166.80**
WiMax + 3G Meter Comms Equipment	$	98.83
WiMax Network + Backhaul	$	67.97
IT CAPEX	**$**	**41.71**
NMS	$	16.22
MDMS	$	25.49
Total OPEX	**$**	**110.10**
AMI OPEX	**$**	**27.53**
Backhaul Communications	$	-
Communications Operations	$	27.53
IT OPEX	**$**	**82.56**
NMS	$	67.55
MDMS	$	15.02

Source: SPA, Energeia

Our approach to estimating the WiMax option's costs over a 15 year period differs from SPA's approach mainly due to the exclusion of certain costs where Energeia's view is that they would be the same under either option. This enables a greater focus on the key cost elements that would differ depending on the telecommunications option selected, and are therefore the appropriate costs to include in the assessment. We also note that our approach to assessing the marginal impact is consistent with SPA's own approach in its reconsidered budget, which begins from the 28 February 2011 budget proposal number, and makes net adjustments based on selected cost categories.

Energeia has only included the cost of the meter module and not the costs of the meter themselves or the costs of their installation because these costs would be the same regardless of the choice of mesh or WiMax. This is the same assumption used by SPA in its reconsidered application, though they include the full cost of the meter in their cost benefit assessment.[51]

[51] Ibid, page 19.

The cost of installing meters has also been excluded from the cost benefit assessment on the basis that both options would require the same number of meter installations and would cost the same. The cost of retrofitting modules to meters does vary between the two options due to differences in the quantities assumed and is therefore included in Figure 12.

For the reasons outlined in Section 5.4.2.3, Energeia considers the program management costs to be the same regardless whether the decision was WiMax or mesh, at least on 28 February 2011. We have therefore excluded AMI and IT program management costs, including procurement, from the cost-benefit assessment.

The IT related areas where the two options differ are in the NMS, MMS, and MDMS, and these cost have therefore been the only IT capex costs included in Energeia's assessment.

In terms of operating costs, SPA's argues in its reconsideration that the costs of the two options would be the same post 2015.[52] Although SPA's position is at odds with the 2008 business case assumption that WiMax's operating costs would be 10% lower than mesh, justifying WiMax's higher capital expenditure, Energeia agrees with SPA's assumption with respect to all non-telecommunications related costs.[53]

Energeia does not agree with this assumption for the main telecommunications related capital and operational costs, including telecommunications network operational costs, IT operational costs for the NMS, MMS and MDMS, and backhaul costs. We consider the 50% difference in our estimate of the ongoing capital and operational costs between the two options to be substantial difference.

Energeia's estimate of ongoing capex on WiMax includes NICs, antennas and a pro-rata of the telecommunications network capex, based on the ratio of Powercor's mesh network costs to its ongoing capex in its mesh network. SPA did not include any capex for its telecommunications network post 2014, which Energeia believes is an unreasonable assumption given ongoing customer growth.

No replacement of the WiMax telecommunications network is assumed over the 15 year period due to Energeia's view that a reasonable commercial business would not spend money upgrading a network that was providing sufficient performance. We also believe a 15 year replacement cycle to be more consistent with that assumed for other distribution communications networks such as those used for Supervisory Control and Data Acquisition (SCADA) to monitor and control the distribution and sub-transmission networks.

Energeia also assumes the NMS, MMS and MDMS will be replaced after 7 years over a two year period. We have assumed the same costs in real terms will be incurred over the refresh cycle as were originally incurred during the rollout. These assumptions occur outside the 2012-2015 period, and are therefore only relevant to the 15 year cost-benefit assessment.

5.4.2.5 Mesh Solution Costs

SPA considered the costs of switching to a mesh solution as at 19 May 2011 under Option 3 in its reconsidered proposal. SPA's analysis concludes that on an apples-to-apples comparison, the mesh option would be $104.4 million dollars higher than the WiMax option. The implication is that a reasonable commercial business would not select mesh, and that the cost of the WiMax Option 1 would therefore be prudent to incur.

Energeia, the AER in its Final Determination, and SPA in its reconsidered proposal all basically agree that the mesh costs included in Powercor's 2012-2015 budget submitted 28 February 2011 are the most

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[52] Ibid, page 19.

[53] Board Meeting No: 06/08, AMI – Business Case Revision, 16 July 2008, SPA, page 8 (confidential).

appropriate mesh solution cost information that a reasonable business would consider in the circumstances, except where AER has made adjustments to it in its Final Determination.[54]

The AER's decision was not released until October 2011, and it might be argued that these costs would not have been known to a reasonable commercial business in 28 February 2011. However, the AER can only make adjustments to Powercor's proposed budgets where they do not meet the revised OIC tests, and therefore any changes are based on the expenditure either not being in scope, or not being prudent. In either case, Energeia's view is that the AER's adjusted costs therefore represent the level of expenditure that a reasonable commercial business would have estimated in the circumstances.

Based on our review of the mesh solution related costs a reasonable commercial business would assess in the circumstances shown in Figure 13, Energeia has found the mesh option to be $126.7 million in capex and $74.4 million in opex over a 15 year timeframe commencing 1 March 2011 The detailed cost estimate is provided as Attachment 1.

Figure 13 – Present Value of Mesh Solution Costs as at 28 February 2011

MeshSolution Expenditure (Discounted 2011 $M Real)		2011-2025
Total CAPEX	**$**	**126.76**
AMI CAPEX	**$**	**100.53**
Mesh + 3G Meter Comms Equipment	$	46.86
WiMax NIC Equipment Replacement	$	5.97
Mesh Module Retrofit Installation	$	5.02
Mesh Network + Backhaul	$	38.48
WiMax Network Remediation	$	4.20
IT CAPEX	**$**	**26.22**
NMS	$	12.66
MDMS	$	13.56
Total OPEX	**$**	**74.39**
AMI OPEX	**$**	**42.21**
Backhaul Communications	$	26.35
Communications Operations	$	15.87
IT OPEX	**$**	**32.18**
NMS	$	15.54
MDMS	$	16.63

Source: SPA, Energeia

Energeia's review of SPA's assessment found that the key drivers of its results relative to Energeia's were the assumptions involving mesh's network coverage, the cost of mesh NICs, the cost of retrofitting mesh NICs, the mesh network deployment cost, the length of program delay, the avoided WiMax MDMS costs, IT integration costs, communications network operational costs, backhaul costs and the assessment timeframe.

The assumptions involving mesh network program assessment timeframe and program delay have been addressed in sections 5.4.2.1 and 5.4.2.3, respectively. Each of the other key assumptions driving the difference between Energeia's and SPA's views of the mesh solution costs a reasonable commercial business would estimate in the circumstances are reviewed and considered below. The key results of our assessment are summarised in Figure 14.

[54] Comparative costs of Mesh alternative solution -050612.xlsx, 5 June 2012, SPA, Comms costs of switching tab, cell F22 (confidential).

Figure 14 – Energeia and SPA's 2012-2015 Mesh Solution Expenditure Estimates

2012-2015 Expenditure (2011 $M Real)	SPA			Energeia			
Mesh Switching Option	Switch	Rollout	Total	Switch	Rollout	Total	Reasons for Difference in Energeia Switching Estimates
Total CAPEX	**$ 69.52**	**$128.09**	**$197.61**	**$ 11.73**	**$126.10**	**$137.84**	
AMI CAPEX	**$ 53.31**	**$110.39**	**$163.70**	**$ 11.73**	**$118.60**	**$130.33**	
Mesh + 3G Meter Comms Equipment	$ 44.26	$ 56.19	$100.46	$ 11.73	$ 69.86	$ 81.60	Assumes some switching costs incurred in 2011
Mesh Network + Backhaul	$ 9.05	$ 54.20	$ 63.25	$ -	$ 48.73	$ 48.73	Costs only based pro-rata PC costs
IT CAPEX	**$ 16.21**	**$ 17.70**	**$ 33.91**	**$ -**	**$ 7.50**	**$ 7.50**	
NMS	$ 1.37			$ -	$ 3.66	$ 3.66	Assumed included in pro-rata JEN costs
MDMS	$ -			$ -	$ 3.85	$ 3.85	Assumed included in pro-rata JEN costs
System Integration	$ 14.84			$ -	$ -	$ -	Integration costs included in build costs for NMS and MDMS
Total OPEX	**$ 28.27**	**$136.63**	**$164.91**	**$ -**	**$ 85.54**	**$ 85.54**	
AMI OPEX	**$ 25.57**	**$110.13**	**$135.71**	**$ -**	**$ 68.46**	**$ 68.46**	
Meter Reading	$ 7.56	$ 6.13	$ 13.69	$ -	$ 6.13	$ 6.13	Assumes no delay in cut-over to AMI services
Meter Data Management	$ 1.53	$ 16.76	$ 18.29	$ -	$ 14.23	$ 14.23	Assumes no delay in cut-over to AMI services
Backhaul Costs	$ -	$ 19.62	$ 19.62	$ -	$ 14.17	$ 14.17	Assumed included in pro-rata PC costs and discounting
Communications Network	$ -	$ 30.76	$ 30.76	$ -	$ 6.96	$ 6.96	Assumed included in pro-rata PC costs
Project Management Office	$ 10.23	$ 28.47	$ 38.70	$ -	$ 18.56	$ 18.56	Assumes existing budget sufficient
Overhead Costs	$ 4.39	$ 6.54	$ 10.93	$ -	$ 6.54	$ 6.54	Assumes no delay in cut-over to AMI services
Industry PMO / Audit / Regulatory	$ 1.86	$ 1.86	$ 3.71	$ -	$ 1.86	$ 1.86	Assumes existing budget sufficient
IT OPEX	**$ 2.70**	**$ 26.50**	**$ 29.20**	**$ -**	**$ 17.08**	**$ 17.08**	
NMS	$ 2.65	$ 26.50	$ 29.15	$ -	$ 8.03	$ 8.03	No IT operational switching costs identified
MDMS				$ -	$ 9.05	$ 9.05	
NON-AMI	**$ 9.50**	**$ 10.20**	**$ 19.70**	**$ -**	**$ -**	**$ -**	
IT - Other Business Streams	$ 9.50	$ 10.20	$ 19.70	$ -	$ -	$ -	Could not substantiate costs

Source: SPA, AER, Powercor, Jemena, Energeia

Despite Powercor's 28 February 2011 submission for its 2012-2015 AMI budget, which included a 97% mesh coverage assumption, SPA has assumed mesh would only cover 85% of its customers. Energeia's review of materials provided by SPA and Powercor at the time has found that the mesh coverage assumed by a reasonable business in the circumstances would be 97%.

SPA assumed in its reconsidered proposal that an average mesh NIC card cost of $[redacted], but based on the mix of single and three-phase meters installed by 2015, and the NIC pricing available at the time, Energeia finds that the average price of the NIC should be $67.80. This is a substantial difference in cost, with SPA's estimate being [redacted]% higher than Energeia's.

SPA estimates the cost of retrofitting mesh modules into meters as $[redacted], based on the mid-point of the contract cost of installing a WiMax NIC and a full meter installation. SPA states that it has not included a number of related costs in its estimate due to the potential need to turn power off or potential meter failures during the mesh NIC field pairing process. Energeia was not provided with information to substantiate SPA's assumption, and has therefore used SPA's NIC retrofit contract cost of $[redacted] for the cost of a mesh NIC retrofit.

Energeia's view is that a reasonable commercial business in the circumstances would have used $[redacted] as the NIC retrofit costs. We were not provided with evidence to support SPA's assertion that the experience with mesh would be significantly different to that of WiMax, except possibly that the mesh solution was relatively more mature due to the rollouts by the other four Victorian DNSPs. If anything, the NIC retrofit costs incurred by SPA as at 28 February 2011 are likely to be relatively high due to the benefits of learning over time.

Due to the differences in the assumed number of meters, the cost of mesh NICs and the cost of installation, Energeia's estimate of the reasonable switching costs associated with retrofitting mesh NICs to sites with WiMax NICs and without a NIC due to delay in the 2012-2015 budget period is $11.7 million, compared to SPA's estimate of $44.3 million. This figure excludes SPA's additional training costs.

Energeia's estimate has assumed 100,644 mesh NIC retrofits, of which 90,725 represent WiMax NIC replacements, compared to SPA's assumed mesh NIC retrofit of 358,105, of which 308,105 are WiMax NIC replacements. Differences between SPA and Energeia's mesh NIC retrofit volume estimates is due to the assumed decision date.

SPA's estimate for the cost of the mesh network deployment is $54.2 million, which is mainly based on Powercor's approved costs. Energeia agrees with this approach generally, but could not reconcile SPA's

numbers for mesh and backhaul capex. Our approach uses the AER's Final Determination of Powercor's 2009-2015, with 2016-2026 costs being based on those in 2015, adjusted to reflect differences in Powercor's customer base, which is 17% larger. We therefore believe a reasonable commercial business in the circumstance would use $48.7 million for its network capex estimate.

There does not appear to be a future replacement of the mesh network in SPA's reconsidered cost estimate. Energeia's review has concluded that although the 3G modems used for the backhaul may need to be replaced at some point, that this would be a relatively minor job given the less than 433 access points in 2019. As with the WiMax assessment, we also believe a 15 year full replacement cycle to be more consistent with that assumed for other distribution communications networks such as those used for SCADA.

Energeia has reviewed and largely accepted SPA's proposed contract break costs [redacted] which SPA estimates to be $[redacted] million. Energeia notes that the estimate assumes a 19 May 2011 reconsideration date, and that moving this to 28 February 2011 would reduce the number of sites under development or construction. We do not think the difference to be material, and in any case, these costs would have been incurred in March 2011, and do not factor into our 2012-2015 prudent cost estimate.

SPA's reconsidered estimate of the IT capex required for the mesh NMS and MMS is $[redacted] million based on Jemena's NMS and MMS build costs, less $[redacted] million in avoided costs.[55] The basis for selecting Jemena's costs in this case rather than Powercor is not explained, but presumably it is due to the common IT back office service provider between the two businesses. Energeia's consideration of this approach found that a reasonable commercial business would have assumed Jemena's 2011-2015 NMS, MMS and MDMS costs in this case, because they would not largely vary as a function of customer numbers or electricity network topology.

SPA has assumed in its cost of mesh estimate that it would retain its current MDMS system. Energeia has reviewed this assumption and found that a prudent business would have used the MDMS system costs from Jemena due to their relatively lower risk and significantly lower cost. Energeia estimates that keeping SPA's proposed MDMS would require $25.5 million in capex over the 15 year timeframe relative to $16.6 million for Jemena's MDMS approach, adjusted to account for SPA's higher customer numbers. Installing the proven MDMS at the same time the proven NMS is installed would reduce IT integration costs and the risk of delay.

The cost of integrating the mesh NIC, NMS, MMS and MDMS into the existing metering and IT integration platform is estimated by SPA in its reconsideration to be $[redacted] million. Energeia considers these costs to be already included in the allowed integration costs and the functional IT integration costs, and the project would move from the current state to the target state in one go. Energeia therefore finds there are no material differences in the expected cost of integrating WiMax-3G or mesh-3G solutions as at 28 February 2011.

In addition to JEN's IT related costs, Energeia assumes the complete system, including costs from 2009-2011 will be replaced after 7 years over a two year period. This increases our overall assessment of mesh IT capex over the 15 year timeframe relative to SPA's, but as this occurs in 2019 it does not impact our estimate of prudent costs over the 2012-2015 budget period.

SPA's estimate of mesh's incremental opex costs over the 2012-2015 periods is based on $[redacted] million and $[redacted] million in avoided spectrum and radio expenses, respectively. This is offset by $7.9 million and $7.37 million in incremental communication operations and backhaul costs, respectively. They also identify $25.8 million in project management, industry program, audit, regulatory, meter reading, data services and overhead switching costs due to the delay in cutting over to AMI.

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[55] Ibid. IT costs of switching tab, cell F14.

Energeia notes that the figures used by SPA require a number of adjustments, including an assumed 1 March 2011 start and a 1 January 2012 cut-over to AMI per the AMI schedule. This adjustment eliminates the assumed switching costs due to project management, industry program, audit, regulatory, meter reading, data services and overheads. With respect to increased communications network operational and backhaul costs, Energeia has replaced SPA's 28 February budget line item estimates with Powercor's costs adjusted for SPA's relatively smaller customer base.

SPA identifies $2.7 million in IT opex switching costs, based 10% of SPA's total IT capex estimate, however, no basis for this percentage is given. SPA's total IT opex over the period is given as $26.5, but it is not clear what this aggregate number includes.

Energeia has estimated the comparable prudent IT opex based on JEN's NMS, MMS, MDMS opex pro-rated to SPA's network. We could not substantiate the basis for SPA's 10% IT opex estimate, and have therefore not included it in our estimate of prudent switching costs. In our view, most of any IT opex related switching would have occurred as part of the 2011 catch-up activity.

SPA includes $9.5 million in IT integration switching costs allocated to other business streams under the mesh option.[56] Energeia has not been provided with documentation supporting this expenditure, but notes that a similar figure of $10.2 million is included in SPA's base case. Energeia has found SPA's proposed $9.5 million would not change the cost-benefit result, does not appear to be within scope and therefore recoverable under the OIC for the 2012-2015 budget, and has not been substantiated as likely to be incurred.

5.4.3 Qualitative Circumstances

Energeia reviewed the key qualitative considerations relevant to what a reasonable commercial business would do in the circumstances in accordance with the revised OIC clause 5I.8, with a particular focus on those raised by SPA in their resubmission. The results of this process including our key findings and conclusions are detailed in the following sections.

In summary, Energeia's consideration of the qualitative issues raised by SPA has found these to be consistent with our approach to determining the commercial standard and our assessment of prudent costs. A reasonable commercial business' consideration of the key qualitative issues would have reinforced the outcomes of the detailed quantitative assessment of telecommunication solution options as at 28 February 2011, which would have found mesh to be the substantially lower cost and probably lower risk option.

5.4.3.1 Objectivity

SPA asserted in their reconsidered budget application that the commercial standard required an objective approach to be taken in examining competing business options.[57] Specifically, the approach should be objective with respect to technology evolution and market conditions and risks, and it is not appropriate to approach the task with a favoured solution in mind or with inappropriate assumptions or analysis.

Energeia agrees with these sentiments and their relevance to the determination of a commercial standard under the revised OIC. We believe our approach to be consistent with these principles of objectivity.

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[56] Advanced Metering Infrastructure, 2012-15 Budget and Charges Application, Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 – Reconsideration Submission, 5 June 2012, page 18.

[57] Advanced Metering Infrastructure, 2012-15 Budget and Charges Application, Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 – Reconsideration Submission, 5 June 2012, page 11.

Our selection of WiMax and mesh as the main telecommunication options available at February 2011 was based on an objective assessment of the options, and we had not favoured solution, having supported mesh and WiMax in the past on the basis of our reviews at the time. Finally, our conclusion that the costs of mesh are the appropriate commercial standard objectively took market conditions and risk into consideration.

5.4.3.2 Compliance

SPA points out that the commercial standard must have regard to the company's compliance obligations, and that these include regulatory as well as contractual commitments. An option that would expose a *reasonable commercial* company *in the circumstances* to unacceptable or unmanageable risks would be not be consistent with the commercial standard.

Energeia agrees with SPA's view, and believes are approach to be consistent with these principles of compliance and contractual commitment.

Our assessment of a 10 month transition program commencing 1 March 2011 would allow SPA to meet its regulatory obligations under the revised OIC for AMI data to market from 1 January 2012. Given this timeframe is consistent with industry benchmarks and for a relatively mature and proven solution, Energeia believes it does not reflect unacceptably risky behaviour that would be inconsistent with the standard.

Our assessment also recognises SPA's obligations under its contracts for its WiMax network deployment, its spectrum, and its metering solution. We have accepted the costs for exiting the WiMax network and spectrum contracts, and have assumed the current metering contract with L+G is maintained.

5.4.3.3 Uncertainty and Risk

SPA states in its reconsideration that the commercial standard must have regard to risk, particularly technology and project risk. SPA goes on to highlight that the unexpected difficulties with WiMax would have led a reasonable commercial business to require a high level of confidence in its telecommunications solution moving forward. A robust case for change would therefore be required before a reasonable commercial business would accept it in the circumstances.

Energeia agrees with SPA's views on the importance of risk and uncertainty consideration in the determination of the commercial standard, and we believe our approach and findings to be consistent with this principle.

Energeia's assessment of the commercial standard has considered the relative risks of the proven mesh solution and the unproven and increasingly problematic WiMax solution. Our view that mesh represented the reasonable commercial standard in the circumstances is based on the successful deployment of the solution by other four Victorian networks, as well as one of the largest overseas AMI deployments at the time.[58]

5.4.3.4 Shareholder Value

SPA and Energeia are in agreement that the commercial standard adopted must be consistent with maximising shareholder's long-term value. SPA gives the example of an option that would damage the company's reputation and its share price as being inconsistent with the standard.

Energeia considers its approach and findings with respect to the commercial standard are consistent with the principle of not being contradictory with maximising long-term shareholder value.

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[58] Pacific Gas and Electric Company's mesh deployment had installed 3.8 million mesh NICs to customers in California, USA, as at January 2011.

Our approach identifies good corporate governance, cost benefit assessments and the use of appropriate benchmarks as essential elements of a process to establish the commercial standard in terms of a budget above which expenditure would be not prudent under the terms of the revised OIC.

Our application of these good governance and industry standard commercial practices leads us to the conclusion that a reasonable commercial business in the circumstances would not incur more than the cost of a mesh telecommunications solution to meet the in-scope activities.

5.4.3.5 Whole-of-Business

SPA asserts that the commercial standard must have regard to the company's overall commercial objectives, though these are not made explicit. SPA goes on to claim that selecting an option that was best for the project but not in the best interests of the wider business would be inconsistent with the commercial standard.

SPA is not explicit regarding what the overall commercial objectives of a reasonable commercial business, and Energeia is not certain as to how they might deviate from maximising long-term shareholder value. However, for the purpose of the exercise, Energeia considered the case where incurring greater costs would enable the company to generate commercial outperformance.

If telecommunications solution option 1 could provide additional incentive based revenues, for example by enabling greater reliability under the Service Target Performance Incentive Scheme (STPIS) or by providing other unregulated services, while option 3 could not due to its relatively lower latency or capacity performance, the company would be better off if it were able to gain cost recovery for its investment in option 1 even though the performance required under the revised OIC could be met at a lower cost by option 3.

In the case where option 1 is substantially greater than the cost of option 3, and the basis of the commercial outperformance of option 1 is its technical outperformance, which is excess to those reasonably required to deliver the service as demonstrated by the delivery of the services by option 3, Energeia is of the view that this investment would require a business case as required by the AER in its Framework paper:

> In considering the matter of scope it is also necessary to take into account the relevant specifications for providing the services. For performance in excess of the minimum Victorian specifications, distributors will need to provide a separate cost/benefit analysis quantifying benefits to the distributor, retailers and end customers, and demonstrating why regulated tariffs should provide the revenue required. [59]

Other than the original business case, which claimed WiMax would provide a 10% opex and capital 'outperformance' valued at $8.1 million, Energeia has not been presented with any updated cost-benefit modelling justifying WiMax's substantially higher costs than mesh as at 28 February 2011. All other things being equal, WiMax would be the better option for SPA and its customers if it could be shown to deliver a better cost-benefit result than mesh using appropriate assumptions.

If it were the case that the two options provided the same performance at the same cost, but option 1 provided greater 'synergy' or benefits to the company overall, then a reasonable commercial business might select option 1 in the circumstances. However, the asset would still be subject to the scrutiny by the regulator to ensure appropriate cost allocation between regulated and unregulated revenues.

[59] Final Decision, Framework and Approach Paper, AMI Review 2009-11, January 2009, AER, page 29.

5.4.3.6 Accurate and Relevant Information

SPA states that the commercial standard should not be determined with the benefit of hindsight or using information which is commercial confidential to other network companies. It must be accurate, relevant and current, and must treat with caution any speculative or uncertain information or analysis.

Energeia agrees with these principles, and our input assumptions have all been sourced from information that was known to be available to SPA at the time, or would have been obtainable by a commercial business in the circumstances, for example through bilateral discussion with peer networks and suppliers of telecommunication services and solutions.

For WiMax, we have largely relied on SPA's own assumptions, as there are few other sources upon which to draw, and have not assumed information regarding WiMax's higher costs reported in the 19 May 2011 replanning report or thereafter. For mesh, we have relied on information provided to SPA via its various tenders, and non-confidential information that would have been known to Powercor by 28 February 2011.

Energeia has considered the relative certainty of SPA's WiMax and mesh assumptions, as compared to Powercor in its submission. Both mesh assumptions are based on internal subject matter experts, who have no more knowledge of each other's network than the other. However, Energeia views Powercor's assumptions as less uncertain and speculative due to their greater mesh deployment experience.

5.4.3.7 Verification of Analysis and Assumptions

SPA asserts that the commercial standard would require robust testing and verification of management's analysis and assumptions underpinning major decisions.

Energeia strongly agrees with this principle, and we believe our approach and findings are consistent with it.

Our review has found, based on the information provided by SPA, that the commercial standard would have required a robust reassessment of the cost-benefit of WiMax by 28 February 2011 following the discovery of substantially higher WiMax and lower mesh costs than those assumed in the July 2008 business case.

Our review has developed a comprehensive cost-benefit assessment of the feasible telecommunication options based on information provided by SPA and other credible sources, and we have provided the details of our approach, methodology and assumptions in this report so that they might be verified and tested.

5.4.3.8 Customer Price and Service

SPA proposes that the commercial standard will have regard to customer concerns related to price and service impacts. SPA notes that any change to the choice of telecommunications would need to be communicated to customers.[60]

Energeia is in agreement that pricing and service impacts are relevant circumstances under the revised OIC, and believe our approach has factored them in.

All other things being equal, a reasonable commercial business would select an option that would not delay SPA's offering of AMI services, or increase the cost of those services, relative to an option that would.

Energeia's review has found that a reasonable commercial business in the circumstances would consider the mesh option as delivering significantly lower prices with the same or lower risk as the WiMax option. Customer communication of this decision would be appropriate, but this is unlikely to be a material cost.

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[60] Advanced Metering Infrastructure, 2012-15 Budget and Charges Application, Appeal by SPI Electricity Pty Ltd [2012] ACompT 11 – Reconsideration Submission, 5 June 2012, page 13.

5.4.3.9 Longer-term Implications

SPA states that the commercial standard must have regard to the longer-term implications of selecting a particular option, and it would be inappropriate to select an option that delivers a benefit in the short term but results in higher long-term costs.

Energeia agrees with the principle of taking an appropriate long-term perspective into account, and has specified a 15 year timeframe as appropriate for the consideration of costs and benefits under the circumstances.

This approach is particularly important when comparing two telecommunication options such as WiMax and mesh, due to the relatively higher ongoing capital and operational costs of WiMax. Energeia has found WiMax's costs to be 51% higher over the 2012-2015 timeframe, but 60% higher over the 2011-2025 period.

Appendix 1 – Detailed Assessment

[To be inserted in final report]

Appendix 2 – About Energeia

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

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

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

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

Energeia's Relevant Experience

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

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

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

Review of Advanced Metering Infrastructure Enabled Load Control Performance Levels

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

Review of Overseas Regulation of Smart Metering Information for Customers

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

Best Practice Regulation of Smart Metering

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

International Smart Meter Based Energy Retailing: Review and Recommendations

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

Smart Meter Enabled Retail Product Development and Trialling

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

Smart Meter Enabled Network Product Development and Trialling

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

Review of Advanced Metering Infrastructure Related Threats and Opportunities in Australia

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

Smart Grid Design and Development

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

Smart Grid, Smart City Proposal Support

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

Network of the Future Design

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

Future Operating Model Design

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

Embedded Networks for Electric Vehicles

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

Appendix 2 – Resumes of Key Personnel

EZRA BEEMAN

MANAGING DIRECTOR

SUMMARY OF EXPERIENCE

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

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

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

QUALIFICATIONS

- Masters of Applied Finance, Macquarie University, Australia
- Bachelor of Arts in Economics and Philosophy (Hons), Claremont McKenna College, USA

SUMMARY OF EXPERIENCE AT ENERGEIA

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

- Advising and supporting 21 companies pursuing ground-breaking outcomes in FY10, representing a broad cross-section of Australia's energy industry.
- Developing a 20 year industry roadmap for the establishment of a smart grid in Australia on behalf of the Electricity Networks Association (ENA).
- Authoring two chapters of the winning proposal for the $100M Smart Grid, Smart City project and contributing to its overall development.
- Developing a smart grid solution for minimising the costs and carbon intensity of generating power in a remote system on behalf of a major Australian utility.
- Reviewing over $2 billion in Victorian distribution network's smart grid budget proposals on behalf of the Australian Energy Regulator (AER).
- Creating a continuous improvement process for promoting best available technology for energy efficiency and carbon reduction on behalf of Newcastle City Council.
- Identifying international best practice in smart meter enabled retail pricing and related customer protections on behalf of a jurisdictional regulator.
- Developing a business plan and authoring a winning proposal for the supply of electrical vehicle charging infrastructure on behalf of an electric vehicle infrastructure provider.
- Creating a value framework, integrated network and retail price and benefits capture strategy to maximise the value of demand response on behalf of a new entrant retailer.

- Estimating the market and network value of demand response across a range of service levels on behalf of a Victorian DNSP.
- Identifying the key risks and opportunities related to smart metering and the emerging smart energy market strategy on behalf of an energy retailer.
- Authoring major studies of residential renewable generation, micro-combined heat and power, the smart energy market, personal energy management and electric vehicles.

SUMMARY OF EXPERIENCE ENERGY AUSTRALIA

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

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

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

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

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

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

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

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

SUMMARY OF EXPERIENCE CAMBRIDGE ENERGY RESEARCH ASSOCIATES

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

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

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

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

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