

Advanced Metering Infrastructure

Initial Budget Application

Submitted: 27 February 2009

About SP AusNet

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

- A 6,574 kilometre electricity transmission network indirectly servicing all electricity consumers across Victoria;
- An electricity distribution network delivering electricity to approximately 575,000 customer connection points in an area of more than 80,000 square kilometres of eastern Victoria; and
- A gas distribution network delivering gas to approximately 504,000 customer supply points in an area of more than 60,000 square kilometres in central and western Victoria.

SP AusNet's vision and mission is to make important things in life happen today and tomorrow. The SP AusNet company values are:

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

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

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* Documents are Commercial-in-Confidence and have been removed.

EXECUTIVE SUMMARY

The Application

As part of the Advanced Metering Infrastructure (AMI) program to roll-out interval metering to electricity consumers across Victoria, the Order in Council¹ (the revised Order) published in November 2008, requires distributors to submit to the Australian Energy Regulator (AER) an initial AMI budget period budget application by no later than 27 February, 2009. This submission represents SP AusNet's '**Initial AMI budget period budget application**' (the Application).

The scope of activities to be included in the initial Application, cover the period 1 January 2009 to 31 December 2011 and are defined as those activities reasonably required:

- (a) for the provision of Regulated Services; and
- (b) to comply with a metering regulatory obligation or requirement.

The Application is required to:

- (a) contain expenditure for Regulated Services for each year of the initial AMI budget period;
- (b) set out the Total Opex and Capex for each year of the initial AMI budget period;
- (c) distinguish between:
 - i. capital expenditure; and
 - ii. maintenance and operating expenditure; and
- (d) relate the expenditure to scope.

A distributor may support the Application with an audit statement to the effect that the activities for which expenditure is included in the Application are within scope.

The AER is required to make a determination on the Application based on tests of whether expenditure included in the Application is not within scope or is not prudent. Where an audit certification is provided, the AER is required to accept that certification.

At the time of this application SP AusNet has not settled the arrangements of its AMI program or completed formal contract arrangements for the procurement or deployment of its proposed AMI solution. It has not sought or provided an audit statement in support of the activities that have been included in the expenditure forecasts provided.

For the purposes of this Application, the scope of activities and forecast expenditure requirements to deliver its SP AusNet AMI solution are:

- for new technologies and services, where available, based on information gained from infrastructure and service providers through formal Request for Tender processes employed as part of the solution development phase of the program; and
- for known technologies and services based on existing work practices and cost structures.

¹ Victorian Government Gazette, '**Order in Council No S 314**', 25 November 2008.

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SP AusNet considers that all activities are within scope and that all forecast expenditure costs included are prudent and will be incurred. The costs of the activities do not represent a substantial departure from the commercial approach that a reasonable business would exercise. Further, SP AusNet believes that under the 'cost pass through' regime of the revised Order there is no incentive for a regulated business to submit forecast costs other than for activities that are within scope and costs that are prudent costs and will be incurred. The key focus of the business under such a regime is to manage cashflow and ensure that costs incurred reflect the expected revenues to be received.

SP AusNet's AMI Solution

SP AusNet's preferred AMI solution is based on WiMAX technology, a standards-based wireless broadband technology, offering high-speed wireless access over long distances. Given the diversity of SP AusNet's customer base and unique geography of its service area, a single technology deployment is not considered economically feasible and therefore a Primary/Secondary/In-Fill approach has been developed.

Key components of the SP AusNet AMI solution include:

(a) Metering

AMI electronic interval meters are required to meet the functionality and service level requirements set out in the relevant specifications as well as other National Electricity Market metrology requirements. Meter requirements will be sourced through a competitive tender process.

Meters will be WiMAX compatible in line with SP AusNet's preferred communications solution, and will meet the specification requirements referred to above including those of having a compliant Home Area Network (HAN) interface and the capability to operate as the Energy Service Portal for a Utility Private HAN.

(b) Communications

SP AusNet's preferred solution is based on WiMAX as the best fit primary solution and a carrier led 3G solution as best suited for areas where WiMAX is not cost effective or efficient (Secondary/In-Fill Technology).

SP AusNet's WiMAX deployment strategy centres on a Build, Own and Operate model, maintaining ownership to ensure dedicated solution use and control over upgrades and migration planning. SP AusNet plans to utilise the expertise of existing WiMAX vendors for both design and deployment and will operate the network internally.

(c) Information and Control Services

In both its initial² and revised³ AMI Pricing Proposal submissions, SP AusNet included discussion of the Network Management System (NMS) as part of the Communications Infrastructure solution. SP AusNet considers that it is more appropriate to discuss the NMS as part of the Information and Control Services solution. In this Application the discussion of the Information and Control Services solution therefore includes both the NMS and other business system requirements.

² SP AusNet, '*AMI Pricing Proposal*', 31 December 2007, section 3.3.

³ SP AusNet, '*AMI Revised Pricing Proposal*', September 2008, section 3.3.

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a. *Network Management System*

Multiple vendor systems require the use of a NMS to interface with and manage individual vendor solutions and interconnect to other business critical components such as the metering revenue and outage management business systems. The NMS can perform a range of meter related functions such as engineering, inventory, planning, configuration, fault, performance management, security and accounting. SP AusNet is proposing an NMS comprising two key systems namely a Meter Management System and a Communications Network Management System.

b. *Business Systems*

Implementation of AMI, with increased meter and data volumes and functional complexity directly impacts a distributor's Information Technology (IT) and back office systems. SP AusNet will require new IT systems and changes to existing IT systems as part of the AMI solution.

(d) Customer Services

Engagement of customers and the successful management of customer interfaces will be critical to the efficiency and effectiveness of the project implementation, in delivering the full cost benefits from AMI, as perceived by Government and industry. SP AusNet has developed a Customer Communication and Service Strategy as part of the AMI solution.

(e) Project Management and Training

SP AusNet has established a separate AMI program responsible for overall management of development and implementation of AMI across the business.

Budget Expenditure Forecasts

As noted previously, at the time of this Application SP AusNet has not yet completed formal contracting arrangements for the procurement and deployment of its AMI solution. The scope of activities as detailed in section 4 of this Application are those activities which are believed to be necessary to deliver the AMI solution set out in section 3. SP AusNet has provided a high level map of the relationship between the AER template categories, the scope activities under Schedule 2 of the revised Order and the scope activities set out in section 4.

Where available, expenditure forecasts for new technologies and services have been based on information gained from infrastructure and service providers through Request for Tender (RFT) processes. Where the technologies and services are known to the business, expenditure estimates have been based on existing work practices and cost structures.

In this Application, high level summary figures only have been included. Totals in these tables may vary slightly due to rounding. Detailed figures are provided in separate templates.

Table E.1 below summarises the Total Regulated Services Expenditure forecasts.

Table E.1: Total Regulated Services Expenditure

(\$,000, Real 2008)

Total AMI Expenditure	2009			2010			2011		
	Contract	Other	Total	Contract	Other	Total	Contract	Other	Total
AMI IT Operating Expenditure									
AMI Operating Expenditure (excl IT)									
Total AMI Operating Expenditure									
AMI IT Capital Expenditure									
AMI Capital Expenditure (excl IT)									
Total AMI Capital Expenditure									
Total Regulated Services Expenditure									

* Amounts are Commercial-in-Confidence and have been removed.

1 Introduction

1.1 Background

As part of the 2006-2010 Electricity Distribution Pricing Determination the Essential Services Commission (the Commission) established a separate price control for prescribed metering services based on the mandatory roll-out of interval metering to consumers who did not have a remotely read interval meter and consumed less than 160 MWhpa. Subsequently, the State Government's policy decision in 2006 to mandate the rollout of advanced interval meters to all Victorian electricity customers required the Commission to re-determine a distributors' metering services revenue requirement and establish a new price control to take effect from 1 January 2009. The framework for this determination was set out in the Order in Council⁴ gazetted in August 2007 ('the original Order').

Under these arrangements, Distributors were required to make submissions to the Commission in respect of expenditure requirements for the roll-out of advanced metering infrastructure and associated metering related services for the period to 31 December 2012. SP AusNet's initial Pricing Proposal⁵ was lodged in December 2007.

Following discussions with distributors and other stakeholders, in November 2008 the State Government published an amending Order in Council⁶ (the revised Order) which impacts on a number of arrangements relating to the rollout of advanced interval meters including:

- the timing for implementation of Advanced Metering Infrastructure (AMI) in Victoria, extending the completion date to 31 December 2013;
- regulatory arrangements for the recovery of costs by distributors, moving from a forecasts and incentive regime to a 'cost pass through' regime; and
- the responsible authority, transferring responsibility from the Commission to the Australian Energy Regulator (AER) from 1 January 2009.

An outcome of the revised Order is to require the Regulator to revisit its approach to setting prices for regulated metering services. The Commission outlined the framework and approach proposed to be applied in making a determination on the prices distributors can charge for the metering services specified in the revised Order in the Revised Framework and Approach Consultation Paper⁷ published in December 2008. SP AusNet's response⁸ to this paper was lodged in December 2008.

In January 2009, following the transfer of responsibility, the AER published its Final Decision **'Framework and approach paper – Advanced metering infrastructure review 2009-11'**.

⁴ Victorian Government Gazette, **'Order in Council No S 200'**, 28 August 2007.

⁵ SP AusNet, **'AMI Pricing Proposal'**, 31 December 2007.

⁶ Victorian Government Gazette, **'Order in Council No S 314'**, 25 November 2008.

⁷ ESC, **'AMI Review Consultation Paper: Revised Framework and Approach'**, December 2008.

⁸ SP AusNet, **'AMI Consultation Paper: Revised Framework & Approach (December 2008) Response'**, 29 December 2008.

1.2 This Application

1.2.1 Purpose

Clause 5.2 of the revised Order requires that a distributor must make an 'Initial AMI budget period budget application' no later than 27 February 2009. This submission represents SP AusNet's '**Initial AMI budget period budget application**' (the Application).

1.2.2 Format

Section 2 identifies the requirements of the revised Order in respect of this Application and sets out SP AusNet's understanding and position in regard to particular issues including the Regulator's obligations in applying the tests under the Order relating to scope and cost prudence.

In section 3, SP AusNet's proposed AMI solution has been summarised. A detailed explanation of the processes employed in establishing a position and the reasoning behind various aspects of the conclusions reached have been set out in earlier submissions to the Commission and have not been repeated in this Application.

Section 4 sets out the activities which are considered necessary, and therefore within scope, for SP AusNet to deliver the required Regulated Services and meet its regulated metering obligations.

Expenditure estimates set out in section 5 comprise the 'Total Opex and Capex' for each year of the initial AMI budget period covered by this Application. For the purposes of this Application IT and non-IT expenditure has been summarised under the key high level activities identified as necessary to deliver the AMI scope. Expenditure for each high level activity has been itemised as required by the AER's templates and provided separately.

1.2.3 Other documentation relied upon

The following documents have previously been submitted to the Commission under clause 5.3 of the revised Order and where appropriate are relied upon in support of this Application.

- Advanced Metering Infrastructure Pricing Proposal – SP AusNet, December 2007.
- Advanced Metering Infrastructure Review – questions on distributor's proposal (ESC Reference: c/08/6839 & C/08/6872) – SP AusNet, May 2008.
- Advanced Metering Infrastructure Revised Pricing Proposal – SP AusNet, September 2008.
- Advanced Metering Infrastructure Reference Documentation – SP AusNet, September 2008.
- AMI Consultation Paper: Revised Framework & Approach (December 2008) Response – SP AusNet, December 2008.

2 Requirements of the Order regarding this Budget Application

2.1 Period

The *'initial AMI budget period'* is defined as the period commencing on the Start Date (1 January 2009) and ending 31 December 2011. Expenditures incurred prior to and post this period are to be the subject of separate budget and charges applications.

2.2 Requirements

Clause 5B.1 of the revised Order states:

'A budget application must:

- (a) contain expenditure for Regulated Services for each year of the initial AMI budget period or the subsequent AMI budget period (as the case may be);*
- (b) set out the Total Opex and Capex for each year of the initial AMI budget period or the subsequent AMI budget period (as the case may be);*
- (c) distinguish between:*
 - i. capital expenditure; and*
 - ii. maintenance and operating expenditure; and*
- (d) relate the expenditure to scope.'*

Clause 5C.1 requires that:

'The Commission [now AER] must approve the Submitted Budget [this Application] unless the Commission establishes that the expenditure (or part thereof) that makes up the Total Opex and Capex for each year:

- (a) is for activities outside scope at the time of commitment to that expenditure and at the time of the determination; or*
- (b) is not prudent.'*

As part of the Final Decision on the Framework and Approach, the AER has also indicated that it may require additional information in regard to contracts (including contracts with related parties) and competitive tendering processes (used or proposed to be used) to enable it to establish whether expenditure is out of scope or not prudent.

2.3 SP AusNet position on relevant issues

2.3.1 Scope

The revised Order defines **'scope'** as:

'the scope of activities:

- (a) set out in Schedule 2; or*

(b) published pursuant to clause 14B.'

while Clause S2.6 of the revised Order states:

'Activities within scope are those activities reasonably required:

(c) for the provision of Regulated Services; and

(d) to comply with a metering regulatory obligation or requirement.'

The Regulator is required to establish whether an activity is outside scope at the relevant time.

As stated in our response⁹ to the Commission's Revised Framework and Approach consultation paper, SP AusNet considers that the question of scope is determined by the need to undertake an activity, listed or otherwise in Schedule 2, in order to provide the Regulated Service or comply with a regulated metering obligation. For each distribution business the scope will be different as each formulates its own approach to meeting the customer, business and environmental needs specific to its own situation. There will be different approaches in terms of technology choice, resourcing and work program approach as businesses tailor their programs to suit their individual needs.

In section 3 of this Application SP AusNet has outlined its AMI solution and in section 4 has set out the activities which it considers necessary, and therefore within scope, for it to deliver the required Regulated Services and meet its regulated metering obligations.

2.3.2 Certification of scope

The revised Order provides that a budget application may be accompanied by an audit report which certifies that expenditure is within scope. As SP AusNet has not yet finalised its AMI solution and deployment arrangements it has not provided an audit certification of scope activities as part of this Application.

2.3.3 Prudent costs

The second test to be applied by the AER in considering a budget application is to establish that the expenditure for scope activities is not prudent. Clause 5C.3 states:

'For the purposes of clause 5C.2(b), expenditure is prudent and must be approved:

(a) where that expenditure is a contract cost, unless the Commission establishes that the contract was not let in accordance with a competitive tender process;
or

(b) where that expenditure:

i. is not a contract cost; or

ii. is a contract cost and the Commission establishes that the contract was not let in accordance with a competitive tender process,

unless the Commission establishes that:

iii. it is more likely than not that the expenditure will not be incurred; or

iv. the expenditure will be incurred but incurring the expenditure involves a substantial departure from the commercial standard that a reasonable business would exercise in the circumstances.'

⁹ Ibid., section 2.3, page 7.

For new technologies and services, where available, costs have been based on information gained from infrastructure and service providers through the Request for Tender (RFT) processes. As such, SP AusNet considers the expenditure amounts submitted as part of this Application are prudent. While a formal contract process has not yet been executed for these technologies and services, SP AusNet believes that the competitive RFT process followed to date to establish the most appropriate solution to meet AMI program requirements conforms to sound, commercial business practice. SP AusNet therefore considers the scope of the activities and the estimated costs of procurement, deployment and implementation of these technologies and services, identified as part of the RFT process, will be incurred.

Further, SP AusNet believes that, in the circumstances under which this Application has been prepared, the process for developing the expenditure forecast for this aspect of the Application does not represent a substantial departure from the commercial approach that a reasonable business would exercise.

Where the technologies and services are known to the business, expenditure estimates have been based on existing work practices and cost structures. As these cost structures have been subjected to a number of previous price review processes and form part of the business Regulated Accounts, they are considered prudent.

Under the 'cost pass through' regime of the revised Order there is no incentive for the regulated business to submit forecast costs other than for activities that are within scope and costs that are prudent costs and will be incurred. The key focus of the business under such a regime is the management of cashflow to ensure that costs incurred reflect the expected revenues to be received in each year.

SP AusNet believes that all expenditure costs included in this Application are within scope, prudent and will be incurred.

2.3.4 Competitive tender process

Under clause 5.5a of the revised Order SP AusNet is required to provide information on the competitive tender process and on page 3 of its Final Decision¹⁰ the AER states:

'In establishing whether a competitive tender process has taken place, as part of the prudency test, the AER will have regard to, amongst other things, the actual tender process documented, the process carried out by the distributors and the tender outcomes.'

SP AusNet has a formal Competitive Tender process which is used in the external procurement of equipment and services. This process was used by SP AusNet in the early RFT requests conducted under the AMI program and will continue to be used as appropriate. A copy of the process is attached as Appendix A.

2.3.5 Contracts with related parties

On page 3 of its Final Decision¹¹ the AER states:

'In respect of contracts with existing related parties, the AER will also examine the circumstances in which the contract was entered into.'

SP AusNet will provide to the AER details of contracts held with related parties as appropriate.

¹⁰ AER, 'Framework and approach paper – Advanced metering infrastructure review 2009-11', January 2009.

¹¹ AER, 'Framework and approach paper – Advanced metering infrastructure review 2009-11', January 2009.

2.3.6 Risk Management Strategy

Clause 14A.1 requires that a distributor must have and keep up to date a risk management strategy in relation to the AMI program and make the strategy available should it be requested by the Minister in writing. SP AusNet has a formal risk management program within the business and this program is being applied to AMI. SP AusNet's risk management approach is described in Appendix B.

3 SP AusNet's AMI solution

3.1 Introduction

The AMI program focuses on the provision of electronic interval meters with two-way communications facilities which would enable among other things remote meter reading, remote connection and disconnection and more cost reflective pricing. Key to achieving many of the perceived benefits of AMI, particularly in areas of demand management and energy conservation, is the ability to provide information to, and engage end-users in managing their energy use.

The functionality and service level requirements for AMI are described in 'Advanced Metering Infrastructure Minimum State-wide Functionality Specification'¹² (the Functionality Specification) and the 'Advanced Metering Infrastructure Minimum AMI Service Levels Specification'¹³ (the Service Specification).

SP AusNet's preferred AMI solution is based on WiMAX technology, a standards-based wireless broadband technology, offering high-speed wireless access over long distances. The comprehensive analysis undertaken by SP AusNet, with the support of experts in the relevant fields, in determining its preferred approach to delivering an AMI solution which best meets customer and business needs, and the reasons underlying its conclusions, have previously been detailed in the following submissions to the Commission:

- Advanced Metering Infrastructure Pricing Proposal – SP AusNet, December 2007.
- Advanced Metering Infrastructure Review – questions on distributor's proposal (ESC Reference: c/08/6839 & C/08/6872) – SP AusNet, May 2008.
- Advanced Metering Infrastructure Revised Pricing Proposal – SP AusNet, September 2008.
- Advanced Metering Infrastructure Reference Documentation – SP AusNet, September 2008.

It is not proposed to repeat those explanations in detail as part of this Application however a brief overview of the key aspects of the preferred AMI solution is set out in the following sections.

3.2 SP AusNet's service area

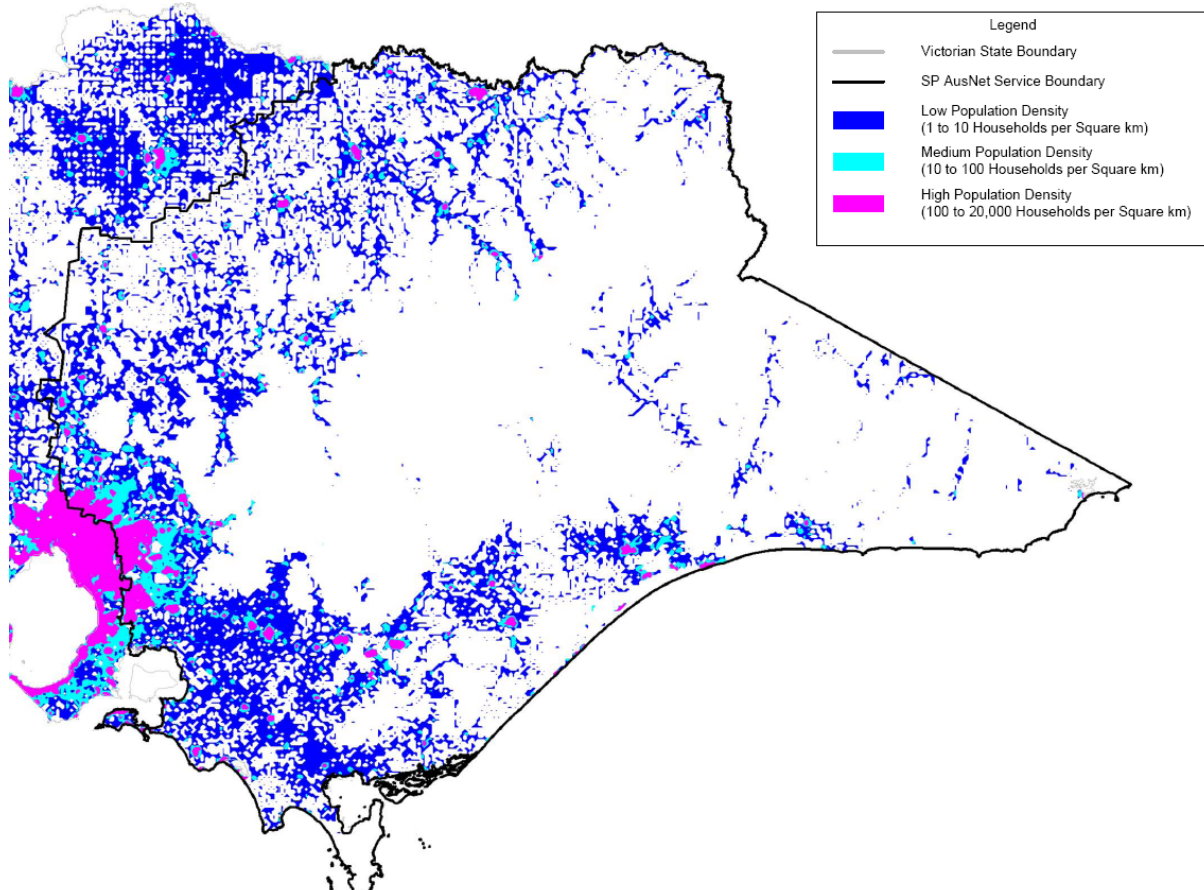
In developing its AMI solution, SP AusNet has had to recognise the diversity of its customer base (residential, small business, industrial and rural) as well as the extremes of the environment it is required to service in terms of customer density, geography and physical environment (urban, semi urban and rural).

Figure 3.1 below summarises population density across the SP AusNet service area.

¹² DPI, 'Advanced Metering Infrastructure Minimum State-wide Functionality Specification – release 1.1', September 2008.

¹³ DPI, 'Advanced Metering Infrastructure Minimum AMI Service Levels Specification – release 1.1', September 2008.

Figure 3.1: SP AusNet Geographic Boundary



In summary:

Customer densities have been classified into:

- High (urban) – Greater than 100 customers per km²
- Medium (semi urban) – Between 10 and 100 customers per km²
- Low (rural) – Less than 10 customers per km²
- The relative customer volume of each segment is:
 - High Density 84%
 - Medium Density 10%
 - Low Density 6%

Population Supply Summary:

- Above Ground Supply – 70%
- Below Ground Supply – 30%

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SP AusNet believes that a single technology deployment is not economically feasible and has therefore developed and assessed technologies against a Primary/Secondary/In-Fill approach for each of the following density categories:

1. High and Medium Density – Serviced by one Primary technology.
2. Medium to Low Density – Serviced by one Secondary technology.

3.3 Meters

AMI requires the roll-out of electronic interval meters to affected customer sites in accordance with the requirements of Schedule 1 of the revised Order. The meters are required to meet the functionality and service level requirements set out in the relevant specifications referred to above as well as other NEM metrology requirements.

SP AusNet's meter requirements will be sourced through a competitive tender process. Meters will be WiMAX compatible in line with SP AusNet preferred communications solution, and will meet the specification requirements referred to above including those of:

- Direct connected meters having a Home Area Network (HAN) interface which complies with the ZigBee Smart Energy Profile, and
- The meter having the capability to operate as the Energy Service Portal for a Utility Private HAN.

As previously advised¹⁴, SP AusNet intends to rollout meters with integrated load control in place of existing single and three phase single element meters. Installing a meter with integrated load control provides the following benefits:

- The ability for SP AusNet to appropriately manage the load on its network;
- Facilitates the sending of pricing signals to the customer by both SP AusNet and on patch Retailers; and
- Customers gain greater flexibility for load management initiatives which can be easily assessed and implemented.

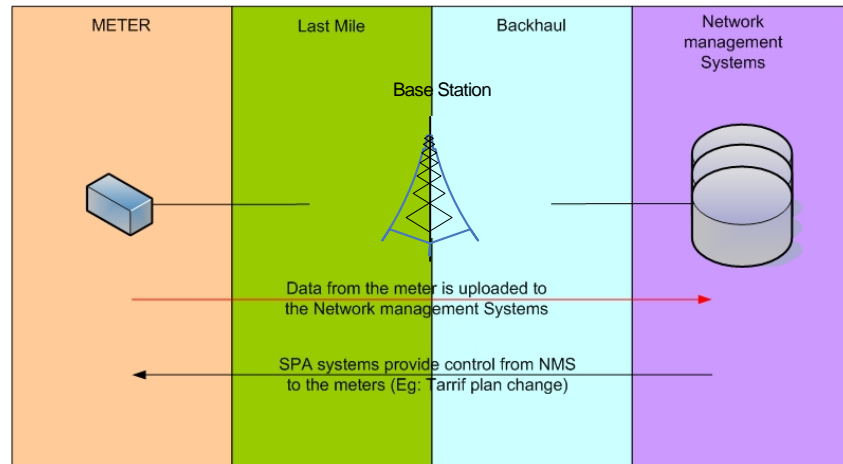
Meter installation activities will be subject to a competitive tender process where appropriate.

3.4 Communications

Implementation of AMI requires the roll-out of communications infrastructure to support remote meter reading, load control and other information needs at the individual consumer's installation. Figure 3.2 provides an overview of the key components and traffic flows of the AMI communications function.

¹⁴ SP AusNet, 'Response to ESC 2nd May 2008 letter', Response 2 – Meter Choice, 20 May 2008.

Figure 3.2: AMI service and traffic flows



With the support of specialist consultants, SP AusNet's undertook a formal business process to develop a technical and functional fit to the AMI application requirements. This approach included a formal RFT process and conducting an exhaustive analysis of each of the preferred technologies. SP AusNet concluded that no single communication technology can cost effectively meet 100% of coverage requirements and that a hybrid technology approach is required. SP AusNet's preferred solution enables improved communications capability and capacity: greater ability to send larger amounts of data, higher data quality levels facilitated and intelligent network delivery across meters. Other elements of the preferred solution (WiMAX) include:

- WiMAX as the best fit primary solution to meet the objectives of the SP AusNet AMI Program; and
- a carrier led 3G solution as best suited for areas where WiMAX is not cost effective or efficient (Secondary/In-Fill Technology).

As part of its design and development processes, SP AusNet is continuing to analyse options for improving cost effective coverage strategies in challenging sectors of its supply region. These strategies include:

- The use of high gain antennas on the coverage area fringes;
- Improved base station specifications and techniques;
- WiMAX meter/modem feature evolution;
- Using MicroCell and WiMAX repeaters for 'in-fill' locations.

SP AusNet's WiMAX deployment strategy centres on a Build, Own and Operate model, maintaining ownership to ensure dedicated solution use and control over upgrades and migration planning. SP AusNet plans to utilise the expertise of existing WiMAX vendors for both design and deployment and intends to operate the network internally.

3.5 Information and Control Services

In both its initial¹⁵ and revised¹⁶ AMI Pricing Proposal submissions, SP AusNet included discussion of the Network Management System (NMS) as part of the Communications Infrastructure solution. SP AusNet now considers that it is more appropriate to discuss the NMS as part of the Information and Control Services solution.

3.5.1 AMI Network Management System

Each vendor solution provides its own unique metering application solution to facilitate meter management functions. With multiple vendor systems an overlaying NMS is required to govern each sub system element and interconnect to other business critical components such as the metering revenue and outage management business systems. The NMS can perform a range of meter related functions such as engineering, inventory, planning, configuration, fault, performance management, security and accounting.

The NMS can be used to:

- Configure the external filed environment within AMI by provisioning resources (routers, switches, etc) and services, and monitoring and controlling their state and status information;
- Undertake fault management including functions that address alarm surveillance, testing, and fault isolation;
- Undertake performance management including functions to monitor performance parameters such as error seconds, number of bad messages, collecting traffic statistics, and applying control to prevent traffic congestion;
- Conduct management of security, as it is essential to secure the exchange of management information; and
- Perform accounting functions including collecting usage data for the resources used in providing a service.

3.5.1.1. Network Management System

SP AusNet is proposing a NMS comprising two key systems:

(i) Meter Management System (MMS)

The MMS is a device management, data acquisition and control system for the meters. The MMS utilises the capabilities of the metering protocols and stores meter data until it is delivered to the Meter Data Management System (MDMS), (i.e. it acts as a transient cache).

(ii) Communications Network Management System (CNMS)

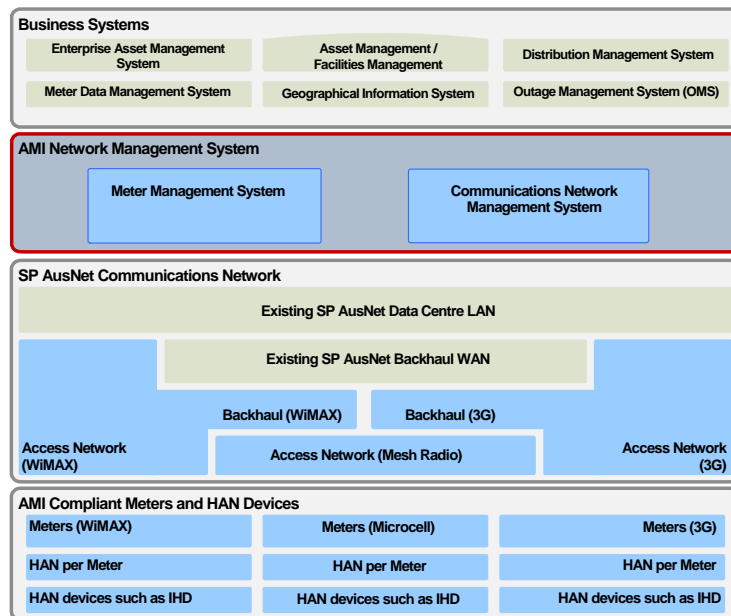
The CNMS manages the meter network from a data communications perspective only and encompasses the physical, data link, network and transport layers. Meters respond to commands, and deliver events and alarms, using a metering protocol (an application level network protocol). The CNMS network allows the MMS and meters (connected to the network) to interact and collaborate.

¹⁵ SP AusNet, 'AMI Pricing Proposal', 31 December 2007, section 3.3.

¹⁶ SP AusNet, 'AMI Revised Pricing Proposal', September 2008, section 3.3.

Figure 3.3 depicts SP AusNet’s proposed NMS.

Figure 3.3: Proposed Network Management System solution



3.5.1.2. Network Operations Centre and Operational Support Systems

The Network Operations Centre (NOC) and associated Network Management Systems (NMS) are intended to perform meter management, network management inventory, management, engineering, planning and repair functions for communications networks. The AMI NOC will act as the central coordinating point for event, performance and dispatch of SP AusNet field services staff for any AMI meter related faults at the customer sites.

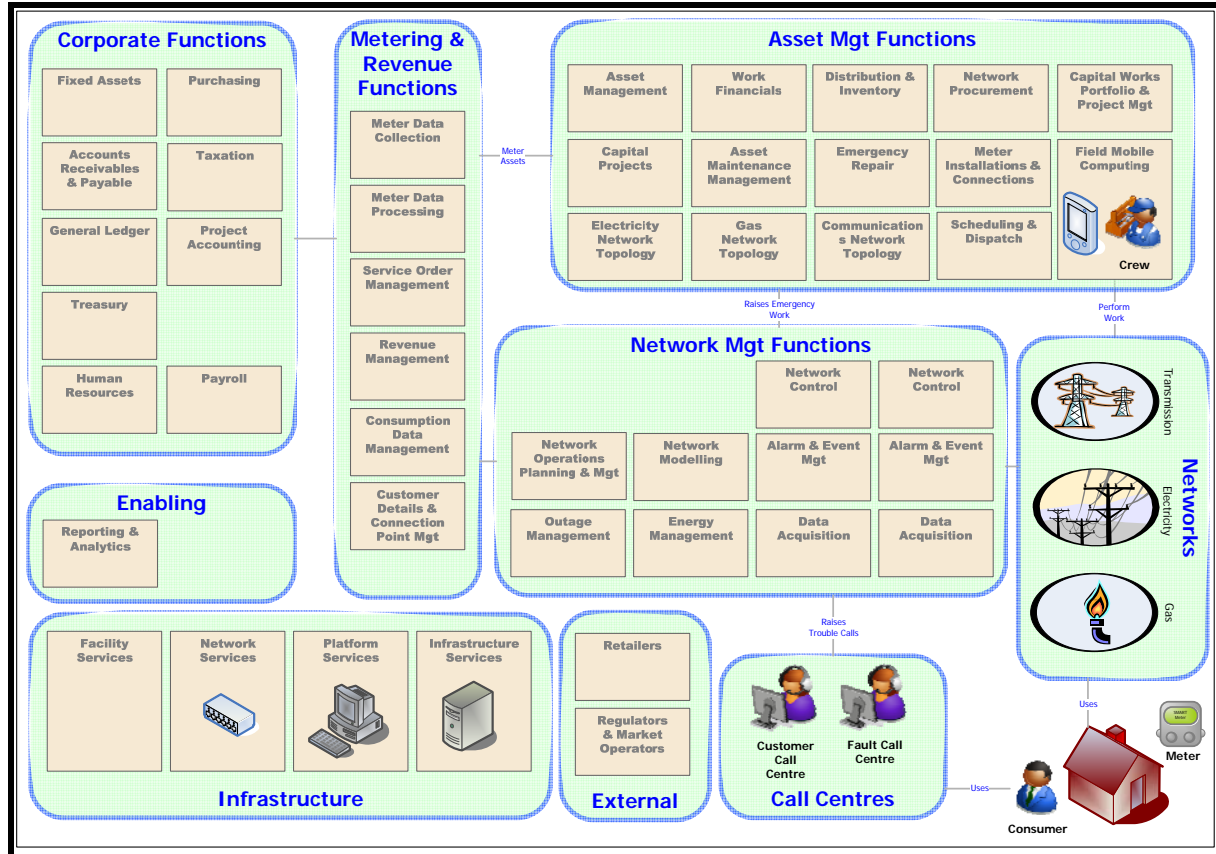
3.5.1.3. Network operations Centre Service Desk

The AMI Communications service desk is the single point of contact supporting the Network Operations, CNMS and MMS applications. This function will be aware of all identified incidents and commence resolution and where additional technical expertise is required, incident details will be routed and managed through the escalation processes. The centre will be fully functional and resourced 24x7.

3.5.2 Business Systems

As an integrated energy business, SP AusNet seeks to develop an integrated, single system approach to IT and back office systems in order to optimise efficiencies and investment for the business while delivering high performance and cost and service benefits to customers. The implementation of AMI, with increased meter and data volumes functional complexity has a direct impact on a distributor’s IT and back office systems. Figure 3.4 highlights the business functions impacted to varying degrees by AMI.

Figure 3.4: IT Systems Overview



As noted in section 3.1 earlier, SP AusNet has detailed the requirements for new IT systems and changes to existing IT systems in previous submissions to the Commission.

3.6 Customer Services

SP AusNet recognises that engagement of customers and the successful management of customer interfaces will be critical to the efficiency and effectiveness of the AMI implementation and to providing a foundation for delivering the full cost benefits perceived by Government and industry.

SP AusNet has developed a Customer Communication and Service Strategy that provides a proactive management strategy to assist in ultimately reducing the level of customer queries, complaints and claims received by SP AusNet during the roll-out. As part of the strategy the call management system IVR (Interactive Voice Recording) will be modified to direct AMI related queries to the correct Customer Service area, ensuring inbound calls are dealt with in a timely and efficient manner.

3.7 Project Management

SP AusNet has established a separate AMI program responsible for overall management of development and implementation of AMI across the business.

4 Scope

4.1 Introduction

The revised Order defines '**scope**' as:

'the scope of activities:

- (a) *set out in Schedule 2; or*
- (b) *published pursuant to clause 14B.'*

while Clause S2.6 of the revised Order states:

'Activities within scope are those activities reasonably required:

- (a) *for the provision of Regulated Services; and*
- (b) *to comply with a metering regulatory obligation or requirement.'*

where '**Regulated Services**' are defines as:

- (a) *metering services supplied to or on behalf of:*
 - (i) *first tier customers; or*
 - (ii) *second tier customers,*
with annual electricity consumption of 160 MWh or less where:
 - (iii) *the electricity consumption of that customer is (or is to be) measured using a revenue meter that is either an accumulation meter or a manually read interval meter; and*
 - (iv) *the distributor is the responsible person in respect of those services; and*
- (b) *metering services supplied to or on behalf of:*
 - (i) *first tier customers; or*
 - (ii) *second tier customers,*
with annual electricity consumption of 160 MWh or less where:
 - (iii) *the electricity consumption of that customer is (or is to be) measured using a revenue meter that is a remotely read interval meter; and*
 - (iv) *the distributor is the responsible person in respect of those services.'*

Further, clause S2.6 details a list of activities that are considered in scope in delivering the regulated services referred to above. Clause S2.7 sets out a list of activities that are considered outside scope pending related obligations while clause S2.8 identifies a list of activities that are considered outside scope.

4.2 Metering

Metering activities relate to the procurement, installation, salvage, operation and maintenance of the assets comprising the metering installation, including as appropriate measurement transformers, other associated equipment and AMI technology. The appendices to SP AusNet's September 2008 submission¹⁷ to the Commission sets out the processes involved in a number of these activities including:

- Meter installation (Reference document 3.2)
- Meter salvage (Reference document 3.5)
- Difficult sites (Reference document 3.7)

Metering and associated equipment will be acquired through a competitive tender process. The forecast of new and replacement meter installation sites by meter configuration is set out below.

Table 4.1: New and replacement meter installation sites by meter configuration

METER CONFIGURATION	Replacement year end 2009 Number of Meters	New Connections			
		2010	2011	2012	2013
Single phase single element 1 contactor (1 load control)	335,855	7,389	7,551	7,717	7,887
Single phase two element 2 contactors (2 load controls)	170,266	3,742	3,825	3,909	3,995
Multiphase 1 contactor (1 load control)	74,522	2,363	2,415	2,468	2,523
Multiphase 2 contactors (2 load controls)	53,003	259	271	277	283
Multiphase CT connected	2,210	32	33	34	34
Sub-Total	635,856	13,785	14,095	14,405	14,722
COMBINED TOTAL		692,863			

Note: New Connections for 2009 are Type 6 accumulation meters. It is assumed that the AMI roll-out will commence from 1st January 2010.

¹⁷ SP AusNet, 'Advanced Metering Infrastructure Appendices – Reference Documentation', September 2008.

Schedule 1 of the revised Order sets out the number of remotely read interval meters that are to be installed by the end of a period. Clause 5.5(b) of the revised Order requires SP AusNet to provide the number of metering installations that are proposed to be installed. For the period 2009-2011 covered by this Application the periods and numbers are shown below in Table 4.2.

Table 4.2: Rollout requirements

Period commencing on the Start Date and ending on	Forecast quantity of meters to be installed in each period
31 December 2010	77,371
31 st December 2011	220,748

SP AusNet's deployment of AMI meters where appropriate will be subject to a competitive tender process. The deployment of infrastructure is planned to meet the requirements of Schedule 1 of the revised Order.

4.3 Meter reading and meter data services

4.3.1 Meter reading

Meter reading comprises back-office processes to add, delete or amend a customer installation to the reading route, route management, scheduling, uploading and downloading of reading information to reading devices and the task of reading meters.

Type 5 (interval) and type 6 (accumulation) metering installations are read on site using Portable Data Entry (PDE) to collect readings. Type 4 (AMI) metering installations are interval meters, read remotely.

Where communications infrastructure is not available, or the remote connection cannot be effected at the time of AMI meter installation, SP AusNet is proposing to initially configure the installation as a type 6. SP AusNet is also proposing to undertake check readings of installations for comparative purposes during early meter reading cycles.

The following activities are included in this program:

- Meter reading either remotely (AMI) or using manual resources (type 5 and 6 installations);
- Allowance for local comparative test reads in early cycles following AMI configuration to prove installation and accuracy;
- Provision of PDEs for test read purposes;
- PDE loading facilities and processes;

- Route scheduling and management;
- Distributor initiated special reads;
- Resourcing and training.

The process for meter reading is set out in Reference Document 3.4 in the appendices to September 2008 submission¹⁸.

4.3.2 Meter data services

Meter data services comprise meter data processing and management and the transfer of processed meter data to retailers and market systems. The following activities are included in this program:

(a) **Data processing and management**

- Secure and maintain accreditation to read and process meter data for the relevant metering installation type;
- Estimation, validation and substitution of metering data in accordance with the metrology procedures for the relevant metering installation type;
- Exceptions management;
- Management of business rules applying to data management and exceptions;
- Data storage management to regulatory requirements;
- Hardware licensing and consumables;
- Software licensing and support;
- Maintenance and support costs.

(b) **Data transfer**

- Management of transfer of AMI reading data to required service levels;
- Management of AMI functionality in areas of control, security and messaging to required service levels not included in other processes.

The processes for meter data services and exceptions handling are set out in Reference Document 3.4 and 3.6 in the appendices to September 2008 submission¹⁹.

4.4 Communications

The implementation of AMI services requires the development, implementation, management and ongoing operation and support of a communication facility between individual customer installations and the utility's network infrastructure and information and control systems. SP AusNet sought the support and services of recognised subject experts to deliver an AMI solution in accordance with the requirements of the Functionality and Service Level Specifications. The formal processes adopted by SP AusNet in seeking these support services are set out in Reference Document 1 in the appendices to the September 2008 submission²⁰.

¹⁸ SP AusNet, *ibid.*, September 2008.

¹⁹ SP AusNet, *ibid.*, September 2008.

²⁰ SP AusNet, *ibid.*, September 2008.

Key areas of the communications approach include the underlying coverage and capacity parameters and communications infrastructure. As noted previously, discussion of the NMS has been included in the Information and Control Services section.

4.4.1 Design parameters

As noted previously SP AusNet's supply area is a mix of customer type, density and physical environment covering some 80,000 sq.kms. For design purposes a total customer base of 667,000 has been assumed.

Coverage assumptions include:

- WiMAX will cover 82% of the total customer base;
- WiMAX boosted by Microcells will cover 3%; and
- 3G will cover 15%.

The AMI application has a very low throughput, high volume connection requirement. SP AusNet has used the following assumptions in estimating the number of active meters that each WiMAX site can support:

- Minimum data rate of 24 kbps (1 WiMAX sub channel)
- 5 seconds idle time out for AMI meters
- 5 seconds processing delay for AMI meters
- Hardware limitations of 1,200 active/concurrent sessions per tri-sector site

where:

- the idle time out refers to the inactive time in the AMI meter before the AMI meter switches from active to idle mode so that the radio resources can be released to serve other household meters; and
- the processing delay is the time taken by the meter to process any data request.

4.4.2 Communications infrastructure

Communications infrastructure includes the design, deployment, commissioning and ongoing management and support of these systems and processes (excluding the NMS) necessary to deliver the communications aspects associated with AMI. This includes the procurement of suitable sites for backhaul equipment (where necessary), towers, base stations and aggregators, radio and other licences and where necessary spares equipment.

Key activities in the design, development and commissioning of the communications infrastructure include:

- Development of business, regulatory and other requirements relevant to the implementation of AMI, including preliminary testing;
- Design of a comprehensive solution architecture document that will guide the project's operational implementation;
- Development of end to end process solutions for the detailed design phase;
- Detailed planning of location and site requirements for base stations;
- Calibration of all tools to be used in detailed design phase (e.g. radio reception modellers);

- Selection, data uploading and mapping of detailed design requirements by specific geographical areas using mapping tools;
- Plan, manage and audit the field roll-out and commissioning of communications infrastructure;
- Uploading configuration data to the Network Management System;
- Establishment, resourcing (including training) and on-going operation of a 24/7 Network Operations Centre.

The formal processes adopted by SP AusNet in undertaking these activities are set out in Reference Document 4.1 in the appendices to the September 2008 submission²¹.

Assumptions made in developing the communications infrastructure solution include that communications infrastructure will be installed prior to the meter installation and that the NMS will be capable of receiving and downloading data via a base station.

SP AusNet is pursuing an outsourced design and build and in-house operations approach to communications aspects of AMI.

4.5 Information and control services

Information and control services comprise the NMS and Business System requirements.

4.5.1 Network Management System

As outlined in section 3.4, the NMS provides an interface between different environments which constitute the overall information system. In the case of AMI this includes the field environment of meters and communications infrastructure, and the back-office environment of a utility's back-office system.

SP AusNet is pursuing an outsourced design and build and in-house operations approach to NMS. It has developed a NMS architecture based on system models deployed within the carrier and telecommunications sector and commissioned a detailed architecture design covering the MMS and CNMS subsystem components, how they will interact with other business systems and details any limitations posed by the options to be considered.

Based on the architectural model, SP AusNet's design, build and operate process includes:

- Planning and requirements analysis
- Hardware installation and testing
- Design and development
- Testing
- Training
- Live traffic cut-over
- Post cut-over support
- Network Operations
- Network Maintenance

²¹ SP AusNet, *ibid.*, September 2008.

- Technical Support

Details of the formal processes adopted by SP AusNet in undertaking these activities are set out in Reference Document 4.2 in the appendices to the September 2008 submission²².

4.5.2 Business Systems

The implementation of AMI with increased meter data volumes and functional complexity has a direct impact on a distributor's IT and back office systems. SP AusNet is required to develop a number of systems to deliver the required functionality and service level performance required and to meet ongoing business needs.

SP AusNet has adopted a strategic long-term solution approach to meet its needs and obligations. This approach has been detailed in section 3.4 of both the initial Pricing Proposal²³ and the revised Pricing Proposal²⁴.

Key activities to delivering individual systems and an integrated overall approach include:

- Understanding the business environment (business and regulatory)
- Development of a business information systems strategy
- Development of an IT management and supply strategies
- Business approvals
- For individual new and amended systems:
 - Development of the system requirements
 - Development of the software specification
 - Development of business process and change requirements
 - Establishment of the environment (hardware, operating systems, location, etc)
 - Build/procurement and test
 - Testing (Integration, system and user acceptance testing)
 - Implementation and training
 - Documentation

Further information on SP AusNet's approach to delivering its IT solution is provided in Reference Document 5 in the appendices to the September 2008 submission²⁵.

In recognition of the complexity of the AMI IT program to be delivered, SP AusNet has assessed that it will need to resource additional project management and change management capability and has moved to purchase commercial products rather than in-house customising, thus matching business processes to the product rather than the product to business processes.

²² SP AusNet, *ibid.*, September 2008.

²³ SP AusNet, *'Advanced Metering Infrastructure Pricing Proposal'*, December 2007.

²⁴ SP AusNet, *'Advanced Metering Infrastructure Revised Pricing Proposal'*, September 2008.

²⁵ SP AusNet, *ibid.*, September 2008.

4.6 Customer services

SP AusNet's approach to Customer Services activities relating to the AMI program is focussed on:

- The development of a Customer Communications and Service Strategy to educate and inform customers about AMI;
- Development of complimentary plans to provide detail on delivery, technology, training and resourcing with all stakeholders;
- Development and planning of resourcing and training requirements for Customer Services teams to deal with customer queries, complaints and claims;
- Upgrading of the relevant Customer Service technology (e.g. Interactive Voice Recording) to ensure effective and efficient management and handling of customer calls.

Details of the formal processes adopted by SP AusNet in undertaking these activities are set out in Reference Document 6 in the appendices to the September 2008 submission²⁶.

4.7 Project management and training

Program Management and Training covers a range of activities required to implement the AMI Program. The areas within the AMI Program include Solution, Deployment and Operation streams for Metering and Communications Infrastructure.

Activities include:

- Project administration;
- Project coordination (Issues and Risks);
- Financial management and Reporting Requirements; and
- Resourcing, training and Change Management.

Details of the formal processes adopted by SP AusNet in undertaking these activities are set out in Reference Document 2 in the appendices to the September 2008 submission²⁷.

4.8 Summary mapping

In Tables 4.3 and 4.4 below, SP AusNet has mapped the relationship between the AER template categories, the scope activities under Schedule 2 of the revised Order and the scope activities set out above in this section 4.

²⁶ SP AusNet, *ibid.*, September 2008.

²⁷ SP AusNet, *ibid.*, September 2008.

Table 4.3: Operating & Maintenance Expenditure – Scope Relationship Map
Information Technology

Template Category	Schedule 2 Reference	SP AusNet Reference
1. Functional Technology Response per Functional Element (excludes hardware & 'platform' software)		
(a) Asset Management	s.2.6(b)(1)(iii), s.2.6(b)(2)(vii)(A)(1)	4.5
(b) Workforce Scheduling & Mobility	s.2.6(b)(1)(iii), s.2.6(b)(2)(vii)(A)(2)	4.5
(c) Connection Point Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(C)(1)	4.5
(d) Outage Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(B)(2)	4.5
(e) Network Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(iv)(B)(1)	4.5
(f) Meter Data Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(C)	4.5
(g) Performance & Regulatory Reporting	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)(C)(2)	4.5
(h) Revenue Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(C)(1)	4.5
(i) Geospatial Information	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)(E)	4.5
(j) Program Support		
1(j)(i) Program Management & Architecture	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5
1(j)(ii) Testing	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5
1(j)(iii) Change Management	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5
1(j)(iv) Release Management	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5

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Template Category	Schedule 2 Reference	SP AusNet Reference
2. IT Infrastructure (incl middleware, B2B & B2M) Platform' software is not specific to a single functional element - it supports multiple elements		
2.1 Hardware	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)	4.5
2.2 'Platform' software licences & maintenance	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)	4.5
2.3 Hardware support & 'platform' software support	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)	4.5
2.4 System integration / software customisation	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)	4.5
2.5 Other (please specify)	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)	4.5

Non-Information Technology

Template Category	Schedule 2 Reference	SP AusNet Ref
1. Other Metering & Communication Costs		
a) Meter reading	S2.6(a)(ii), S2.6(b)(1)(i),(ii), (viii),(ix),(x)	4.3
b) Meter data management	S2.6(a)(ii), S2.6(b)(1)(i),(b), (2)(i)(B)	4.3
c) Meter maintenance	S2.6(a)(ii), S2.6(b)(1)(i)	4.2
d) Customer service	S2.6(b)(2)(iii)	4.6
e) Backhaul communications	S2.6(b)(2)(iv)(B)(1)	4.4
g) Communication Infrastructure Maintenance	S2.6(b)(1)(i)	4.4
2. Project & Administrative Costs		
a) Technology trials	S2.6(b)(2)(iv)	4.7
b) Customer response trials	S2.6(b)(2)(vi)	4.7
c) Project management	S2.6(b)(2)(xi), S2.6(b)(2)(x)	4.7
d) Training	S2.6(b)(2)(x)	4.7
f) AMIPO & AMI ISC costs	S2.6(b)(2)(xi)(A)	4.7
g) Audit & quality assurance	S2.6(b)(2)(xi)(D)	4.7
h) AMI budget & charges applications	S2.6(b)(2)(xi)(G)	4.7
i) Legal costs	S2.6(b)(2)(xi)(G)	4.7
j) Equity raising costs	S2.6(b)(2)(xii)	4.7
k) Finance & administration incl. treasury	S2.6(b)(2)(xii)	4.7
l) Management fees or overhead	S2.6(b)(2)(xiil)	4.7

Table 4.4: Capital Expenditure – Scope Relationship Map
Information Technology

Template Category	Schedule 2 Reference	SP AusNet Reference
1. Functional Technology Response per Functional Element (excludes hardware & 'platform' software)		
(a) Asset Management	s.2.6(b)(1)(iii), s.2.6(b)(2)(vii)(A)(1)	4.5
(b) Workforce Scheduling & Mobility	s.2.6(b)(1)(iii), s.2.6(b)(2)(vii)(A)(2)	4.5
(c) Connection Point Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(C)(1)	4.5
(d) Outage Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(B)(2)	4.5
(e) Network Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(iv)(B)(1)	4.5
(f) Meter Data Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(C)	4.5
(g) Performance & Regulatory Reporting	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)(C)(2)	4.5
(h) Revenue Management	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)(C)(1)	4.5
(i) Geospatial Information	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)(E)	4.5
(j) Program Support		
1(j)(i) Program Management & Architecture	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5
1(j)(ii) Testing	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5
1(j)(iii) Change Management	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5
1(j)(iv) Release Management	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(xi)	4.5

AMI Initial Budget Application

Template Category	Schedule 2 Reference	SP AusNet Reference
2. IT Infrastructure (incl middleware, B2B & B2M) Platform' software is not specific to a single functional element - it supports multiple elements		
2.1 Hardware	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)	4.5
2.2 'Platform' software licences & maintenance	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)	4.5
2.3 Hardware support & 'platform' software support	s.2.6(b)(1)(ii), s.2.6(b)(2)(vii)	4.5
2.4 System integration / software customisation	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)	4.5
2.5 Other (please specify)	s.2.6(b)(1)(ii)(iii), s.2.6(b)(2)(vii)	4.5

AMI Initial Budget Application

Non-Information Technology

Template Category	Schedule 2 Reference	SP AusNet Reference
1. Metering & Communications Equipment Purchase		
a) Meters	S2.6(a)(i), S2.6(b)(1)(i)	4.2
c) WAN	S2.6(b)(2)(iv)(B)(1)	4.5.1
e) Communication Infrastructure	S2.6(b)(1)(i), S2.6(b)(2)(i)(A)	4.4
2. AMI Installation Services		
a) Meters	S2.6(b)(1)(i), S2.6(b)(2)(i)(A)	4.2
c) WAN	S2.6(b)(1)(i)	4.5.1
e) Communication Infrastructure	S2.6(b)(1)(i), S2.6(b)(2)(i)	4.4

5 Budget Application

The revised Order requires that a budget application sets out the Total Opex and CapEx expenditure for each year of a budget period to deliver the Regulated Services required. SP AusNet's forecast expenditure requirements for the initial budget period are summarised below. Details of the forecast expenditure requirements are set out in the Templates provided.

As noted previously, at the time of this Application SP AusNet has not yet completed formal contracting arrangements for the procurement and deployment of its AMI solution. Where available, expenditure forecasts for new technologies and services have been based on information gained from infrastructure and service providers through RFT processes. Where the technologies and services are known to the business, expenditure estimates have been based on existing cost structures.

5.1 Total Regulated Services Expenditure

SP AusNet's forecast Total AMI Expenditure is summarised in Table 5.1 below.

Table 5.1: Total Regulated Services Expenditure

(\$,000, Real 2008)

Total AMI Expenditure	2009			2010			2011		
	Contract	Other	Total	Contract	Other	Total	Contract	Other	Total
Total AMI Operating Expenditure (incl IT)									
Total AMI Capital Expenditure (incl IT)									
Total Regulated Services Expenditure (incl IT)									

* Amounts are Commercial-in-Confidence and have been removed.

5.2 Operating and Maintenance Expenditure

Operating and maintenance expenditure comprises:

- Periodic meter testing based on meter family samples in accordance with relevant standards and asset management programs;
- Fault response and maintenance of the meter stock, metering data services and communications platforms;
- Customer service costs associated with queries, complaints and claims handling as a result of meter replacements;
- Costs associated with providing meter data services, including meter reading, data transfer to an IT system, managing data and providing it to market participants and NEMMCO;
- Costs associated with:
 - Hardware licensing, service level agreements and consumables for systems backup;
 - Software licensing, service level agreements, vendor support and maintenance; and
 - Labour for maintenance and support activities, systems and data backups for meter data services, storage systems, networks and support for service level agreements for hardware and software.
- Costs incurred and forecast to be incurred in participating in technology trials of remotely read interval meters, including telecommunications systems conducted under the auspices of the Industry Steering Committee (ISC) and Government;
- Project management, training and other preparation costs; and
- Indirect costs.

5.2.1 IT Regulated Services Operating Expenditure

SP AusNet's forecast AMI IT Operating Expenditure is summarised in Table 5.2 below.

Table 5.2: Regulated Services IT Operating Expenditure

(\$,000, Real 2008)

AMI IT Operating Expenditure	2009			2010			2011		
	Contract	Other	Total	Contract	Other	Total	Contract	Other	Total
Functional Technology Response									
IT Infrastructure (incl middleware, B2B & B2M)									
Total Regulated Services IT Operating Expenditure									

* Amounts are Commercial-in-Confidence and have been removed.

5.2.2 Regulated Services Operating Expenditure (excl. IT)

SP AusNet's forecast AMI Operating Expenditure (excl. IT) is summarised in Table 5.3 below.

Table 5.3: Regulated Services Operating Expenditure (excl. IT)

(\$,000, Real 2008)

AMI Operating Expenditure (excl IT)	2009			2010			2011		
	Contract	Other	Total	Contract	Other	Total	Contract	Other	Total
Metering & communications equipment purchase									
AMI installation services									
Other metering & communications costs									
Project and administrative costs									
Total Regulated Services Operating Expenditure (excl IT)									

* Amounts are Commercial-in-Confidence and have been removed.

5.3 Capital Expenditure

Capital expenditure comprises:

- Costs for meter supply, installation and site re-visit costs;
- Design and installation of the communications infrastructure and network; and
- Capital costs associated with providing meter data services, including meter reading, data transfer to an IT system, managing data and providing it to market participants and NEMMCO.

5.3.1 Regulated Services IT Capital Expenditure

SP AusNet's forecast AMI IT Capital Expenditure is summarised in Table 5.4 below.

Table 5.4: Regulated Services IT Capital Expenditure

(\$,000, Real 2008)

AMI IT Capital Expenditure	2009			2010			2011		
	Contract	Other	Total	Contract	Other	Total	Contract	Other	Total
Functional Technology Response									
IT Infrastructure (incl middleware, B2B & B2M)									
Total Regulated Services IT Capital Expenditure									

* Amounts are Commercial-in-Confidence and have been removed.

5.3.2 Regulated Services Capital Expenditure (excl. IT)

SP AusNet's forecast AMI Capital Expenditure (excl. IT) is summarised in Table 5.5 below.

Table 5.5: Regulated Services Capital Expenditure (excl. IT)

(\$,000, Real 2008)

AMI Capital Expenditure (excl IT)	2009			2010			2011		
	Contract	Other	Total	Contract	Other	Total	Contract	Other	Total
Metering & communications equipment purchase									
AMI installation services									
Other metering & communications costs									
Project and administrative costs									
Total Regulated Services Capital Expenditure (excl IT)									

* Amounts are Commercial-in-Confidence and have been removed.