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Deployment of Smart Metering will have a profound impact on Electricity Retailers operating in Victoria

Executive Summary

Victoria (Australia) is the first jurisdiction worldwide to combine full retail contestability and a mandated deployment of Smart Metering. The market arrangements and operating models that are required to support this will provide guidance for all other smart metering implementations – across Australia and internationally.

Marchment Hill Consulting has been operating the Program Office for the Victorian Advanced Metering Infrastructure (AMI) Program since August 2007. In this role Marchment Hill oversees the cross-industry programs necessary to successfully establish the technical, business and regulatory infrastructure to enable deployment of AMI to 2.6 million domestic and small business customers across Victoria. Over the past two years Marchment Hill has observed the impact of this Program on Retailers, Distribution Network Service Providers (DNSPs) and the Australian Energy Market Operator (AEMO). Based on these insights, and our deep understanding of the operation of utility markets, we have developed a comprehensive perspective on how electricity retail operations will be transformed by the deployment of AMI.

Deployment of AMI has a profound impact on retail operations:

- Significant capital investment is required to change processes and systems to cope with the enormous increase in meter data and associated market process changes.
- Operating cash outflows are impacted by changes to wholesale settlement and network billing as well as to pay for new services that will be needed to survive and thrive in the changed market.
- The relationship with the customer changes.

Retailers who act early and efficiently on these changes will maintain compliance and build competitive advantage.

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AMI Deployment in the Australian Electricity Industry

In Victoria, DNSPs carry the primary accountability for deployment of AMI and enablement of AMI Services. Whilst Retailers have a key role, the AMI Program legislative instruments do not assign any accountability for the outcome of the AMI Program to Retailers: however they will be held accountable by way of their market and regulatory obligations.

AMI Services mandated under this program now include:

1. Provision of half hourly metering data;
2. Remote collection and delivery of half hourly meter data by 6am the following day;
3. Remote Re-Energisation; and
4. Remote De-Energisation.

Operation of these AMI Services will commence progressively as Victorian DNSPs deploy the Smart Meters and associated communications infrastructure, systems and internal processes.

The impact of AMI Deployment on Victorian Retailers

Deployment of AMI will have a profound impact on the internal and cross-industry operations on electricity Retailers operating in Victoria:

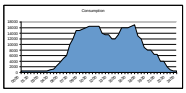
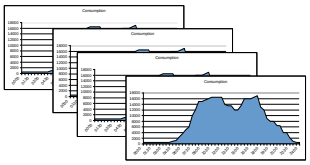
- There will be an enormous increase in the volume of meter data that Retailers will receive on a daily basis.

BASIC Meter 	AMI MRIM[1] 
100,000 Customers *1,100 data items per day*	*100,000 Customers* *4,900,000 data items per day*

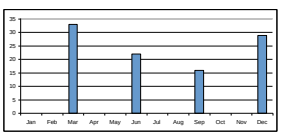
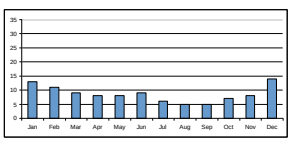
- Daily availability of metering data will allow customer churn to occur immediately (subject to regulatory requirements) without costs associated with special reads. Retailers need to prepare for this or they may acquire customers before they expect them.

1 MRIM = Manually Read Interval Meter.

- Customer services, such as de-energisation and re-energisation which today can only be performed manually, will be performed remotely and on demand. However, for these services to be performed safely, Retailers will need to change their interactions with customers requesting these services, and will assume new liabilities associated with the operation of these services.
- Wholesale energy settlement for small consumers will no longer rely on a net system load profile, making the energy costs for all retailers specific to their customers.

BASIC Meter	AMI MRIM[2]
	
100,000 Customers *1 profile regardless of* appliance, lifestyle, business operation or location 	*100,000 Customers* *100,000 individual profiles.* 

- As meter data will be available more frequently, Distribution Businesses will be able to raise invoices for Network changes more frequently. Retailers will need to understand the cash flow impact of this, and deal with a significant increase in the number of network charges.

BASIC Meter	AMI MRIM[3]
	
100,000 Customers *25,000 line items per month for quarterly consumption* 	*100,000 Customers* *Potential for up to 3,100,000 line items per month of daily consumption* 

2 MRIM = Manually Read Interval Meter.

3 MRIM = Manually Read Interval Meter.

Maintaining compliance with existing and new market and regulatory obligations will require a detailed understanding of what the changes are and how they affect Retail operations.

Further details of the impacts on Retailers are provided at **Appendix 1.**

Complication of the Transitional and Market Leading Nature of the Victorian AMI Program

The deployment of AMI in Victoria will occur over the period September 2009 to December 2013. This will be a transitionary period during which smart meters (which enable all of the changes discussed above) and current accumulation (BASIC) meters will co-exist. **Figure 1** below shows the progressive smart meter deployment targets established by the Victorian Government.

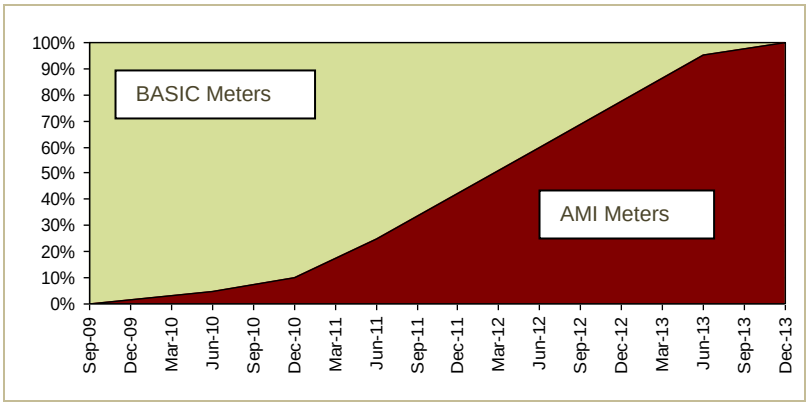


Figure 1: Victorian AMI Program Meter Deployment Targets.

Retailers will need to operate in an environment where some of their customers will have access to newer, more capable meters, and associated AMI services, whilst others do not. Furthermore, Retailers will not be able to influence when their customers receive the newer meters and associated AMI services, nor will they be able to easily identify the types of meters that their customers have in order to take advantage of the new features and AMI services. The complex market and regulatory arrangements associated with full retail contestability, combined with the uncertainties of this transitional period, add to the complexities that retailers need to cope with.

Furthermore, the Victorian AMI Program does not require DNSPs to coordinate implementation of changes to cross-industry process operations such as the introduction of the more efficient meter exchange process.

In the period leading up to 1 January 2012, whilst the service level for delivery of meter data is unchanged (i.e. no later than 2 days after the next scheduled read date), DNSPs are expected to deliver meter data from premises where end-to-end AMI[4] is established on a more frequent basis, up to daily.

As a consequence of these circumstances, Retailers must be able to:

- receive interval meter data from the target population of smart meters from the commencement of the smart meter deployment; and
- receive network invoices with significantly more (by number not cost) network charges per invoice from the commencement of the smart meter deployment;

However, Retailers cannot:

- identify the frequency of meter data delivery for a premise, with associated uncertainty regarding the frequency of network billing and the consumption profile that will be associated with the wholesale settlement for the premise;
- determine whether a customer's request for a de-energisation or re-energisation service can be performed remotely, with the associated lower cost, or if it must be performed by the DNSP with a site visit at a higher cost; nor
- take advantage of the ability for the customer to churn before the Next Scheduled Read Date (NSRD) based on availability of daily meter data in the market.

4 End-to-end AMI means that an AMI meter is installed and is connected to the DNSPs back end systems so that the full suit of AMI Services are able to be delivered.

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Understanding the Changes and Planning for post AMI Operations

The deployment of smart metering creates significant challenges for electricity Retail operations. During the transition period, when smart meters and old style meters co-exist, Retailers will need to adapt to a range of uncertainties yet must maintain compliance with current and new market and regulatory obligations.

Retailers who act early and efficiently invest in new capability to account for these changes will be able to maintain compliance with their market and regulatory obligations, and create a sustainable platform from which to build competitive advantage.

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APPENDIX 1

The Metering Data Avalanche

BASIC Meter

1 meter read with 1 data item[5] per quarter

100,000 customers = 1,100 data items per day

AMI MRIM[6]

1 meter read with 49 data items[7] per day.

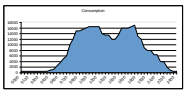
100,000 customers = 4,900,000 data items per day

Consumption Profiles

BASIC Meter

Every BASIC metered customer, regardless of retailer, has the same load profile: the Net System Load Profile (NSLP)

NSLP = Boundary Meter Profile - ∑Interval Meter Profiles within Boundary

100,000 customers = 1 load profile 

Every customer, regardless of appliance, lifestyle, business operation or location, looks the same. Retailers cannot segment BASIC metered customers based on the profile of their load.

NEM Reconciliation and Settlement Changes

BASIC Meter

The wholesale settlement process involves three settlement rounds, culminating with the Revision 2 invoice being issued 40 weeks after the preliminary invoice. This timeframe is required in order to allow all of the meter data related to a day to be published to the market. The preliminary settlements are, therefore, based on a mixture of actual and estimated reads. The largest proportion of estimated reads are for sites with accumulation metering which are read quarterly.

Furthermore, for those sites read quarterly, as meter data is published, the meter read for the quarter is allocated across each day in the meter read period and then within each day based on a profile. As noted above, the profile used to allocate within each day is the NSLP and applied to all accumulation meter reads regardless of retailer.

5 the accumulation register read

6 MRIM = Manually Read Interval Meter.

7 48 half hour register reads plus the accumulation register read

APPENDIX 1

AMI MRIM

As smart meters are deployed and interval meter data is published to the market more frequently (particularly in Victoria where the meter data will be published by 6:00am the following day) the initial wholesale settlement will be increasingly based on actual meter data.

By the time of the first wholesale settlement revision, a very high proportion of the interval meter data should be finalised. Hence, as the population of smart meters grows, the difference between the revision and final wholesale settlement should diminish.

Furthermore, as smart meters provide the actual profile of consumption at each meter, the reliance on the NSLP will reduce and the profile of each retailer's wholesale settlement will become more directly related to their customers' demand at all intervals during each day.

Retailers will need to understand the impact of this more accurate demand profile on their wholesale settlements costs and manage the price risk in each interval more closely.

Ability to Remotely De-Energise and Re-Energise Customers

BASIC Meter

De-energisation and re-energisation must be performed physically at the site regardless of the Service Order Sub-Type.

The cost of re-energisation and de-energisation service orders are known when a customer requests such a service order and can be advised to the customer by the Retailer as the request is being made. When these charges appear on a customer's bill they are, generally, not surprised; therefore, there are few customer enquiries regarding these charges.

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Smart meters will include a supply contactor that can be remotely activated to de-energise and/or re-energise supply to a customer's premise.

The NSMP is yet to conclude its consideration of the operation of this capability. However, the Victorian AMI Program has considered this in detail and produced detailed process descriptions for both Re-Energisation and De-Energisation which, subject to consideration by a National Electricity Market Reference Group, provide the agreed and clear process for Retailers and DNSPs to follow.

Impact on Call Centre Scripting to Ensure Safety

Because Retailers cannot identify whether a customer has AMI at their premise, they are unable to expressly request a remote de-energisation or re-energisation service. Furthermore, there are strict safety considerations that need to be taken into account before a DNSP can use the capability to perform either of these services remotely. Retailers therefore need to be aware that the DNSP may only use this capability if it is considered safe[8] and the communications to the metering installation provides the full capability.

Safe operation of Remote Re-energisation and De-energisation will require Retailers to ensure that their call centre scripts capture or confirm key information when a customer requests either a de-energisation or re-energisation -- for example, whether there is life-support equipment at the premise where the service is being requested.

Retailers will need to cooperate with the DNSPs and the Safety Regulator to ensure the ongoing safety of these services.

8 Each DNSP is required to submit a Safety Case to Electricity Safety Victoria which addresses the safe operation of the remote de-energisation and re-energisation capability, before this can be operated.

APPENDIX 1

Managing Customer Cost Expectations

As the scope as the Victorian AMI Program does not provide for smart meters to be distinguished from other meters, Retailers will not be able to confirm the cost of a re-energisation or de-energisation service until after the service has been provided. This is likely to lead to an increase in the number of customer enquiries subsequent to Retail bills being issued that include pass through of network re-energisation and de-energisation service charges.

More Frequent Network Billing for each NMI

BASIC Meter

Network charges for a NMI are calculated when meter data is published to the NEM. Based on quarterly read cycles, network charges are typically calculated and invoiced once a quarter and include the total energy consumption in the last quarter.[9]

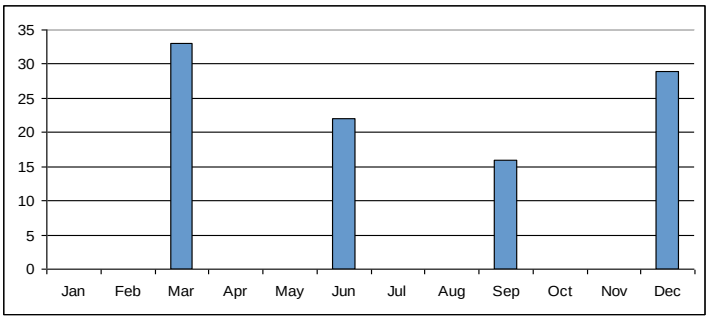

Figure 2: Typical Customer Invoice Profile based on quarterly read cycle.

Network invoices are typically generated monthly and include the network charges calculated since the last invoice was issued. This will typically include network charges for ¼ of the meter population.

100,000 customers = 25,000 network charges will be invoiced each month. Each will comprise network charges calculated based on the total energy consumed in the last quarter.

9 Non-energy related network charges, such service order charges, are invoiced as incurred.

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MRIM

Network charges for a NMI will continue to be calculated when meter data is published to the NEM. Based on daily read cycles, network charges for each NMI will be calculated daily. The network charges for the NMI will include the total energy consumption in the 24 hours.

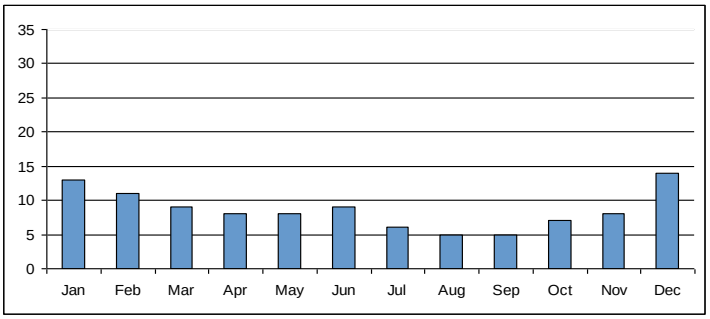

Figure 3: Customer Invoice Profile based on daily read cycle and monthly invoicing – same customer as shown in Figure X above.

Network invoices are typically generated monthly and include the network charges calculated since the last invoice was issued. This will include network charges for every smart meter for which meter data has been published to the NEM in that month.

100,000 customers = Network charges for all 100,000 NMIs will be invoiced each month with potentially 31 individual network charges for each NMI, one for each day in the last month. Up to 3,100,000 network charge line items may be invoiced.

The impact on network bill reconciliation processing will be material due to the volume of meter data and network billing line items that will need to be processed.

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