AusNet Services – Smart Metering Capabilities and Benefits

3 April 2018

AusNet Services – Smart Metering

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2. AusNet Services Smart Metering Solution
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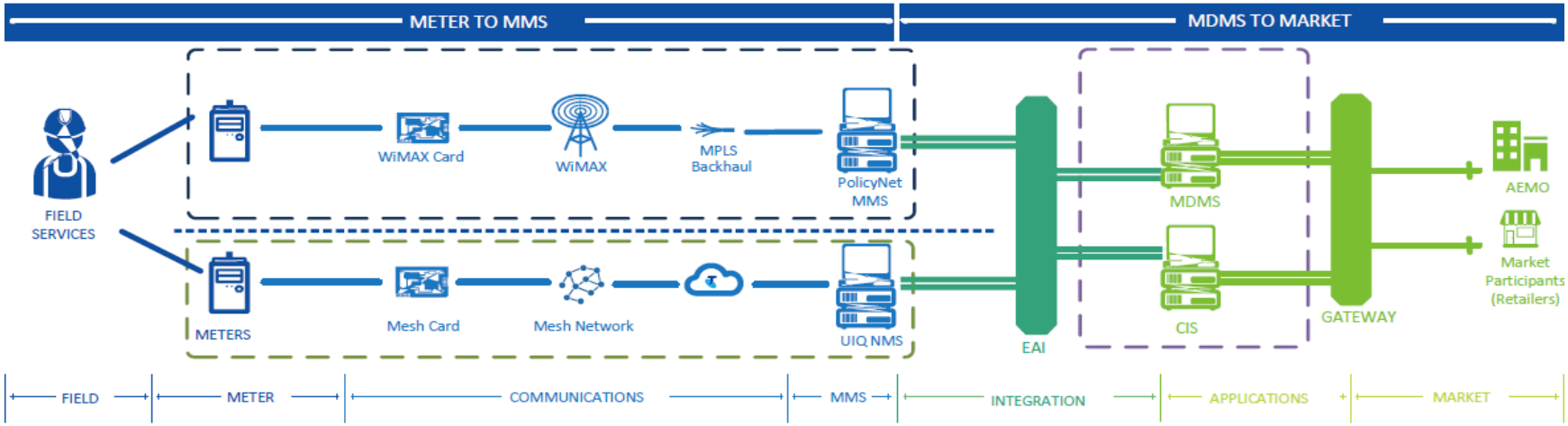
AusNet Services – Smart Meters Background

In 2006, the Victorian Government mandated the rollout of electricity smart maters to all households and small businesses across Victoria under the Advanced Metering Infrastructure (AMI) program.

Over the period from 2009-2013 AusNet Services completed mass deployment of Smart Meters to ~680K customers, and over the period to March 2017 completed the mass “logical conversion” of meters to be remotely read.

Today AusNet Services installs all new connections with AMI Smart meters with >98% of residential and small commercial customers with a Smart Meter installed and >99% of those meters being remote read daily.

AusNet Services – Smart Metering Solution



At a high level, AusNet Services Metering solution comprises:

1. 740,299 Meters,
2. Two communication networks – Mesh and WiMAX
3. Mesh solution comprised of >1K access points and relays, and >330K Mesh comms cards
   a. WiMAX solution comprised of 86 WiMAX towers and >405K WiMAX comms cards
4. Two “head end” applications that collect metering data and provision remote services – WiMAX PolicyNet and Mesh UtilityIQ (UIQ)
5. An application integration layer (EAI)
6. A Meter Data Management System (MDMS) that validates metering data and provide to Retailers and AEMO
7. A Customer Information System (CIS) that maintains Metering Asset and Customer information.

AusNet Services – Smart Metering Solution

AusNet Services Smart Metering Solution is compliant to the Minimum AMI Functionality Specification – with meters capable of a range of functions, including:

1. Remote reading: 30 minute interval reads.
2. Remote disconnect and reconnect: via internal meter contactors
3. Load control: enabling control of hot water and other customer loads.
4. Meter loss of supply and outage detection.
5. Quality of Supply (QoS) events. For example under and over voltage, outage etc.
6. Meter events. Including tamper detection, export energy etc.
7. Supply capacity control. A function that enables supply to be limited.
8. Home Area Network (HAN): meters are able to “bind” to ZigBee enabled in home devices.

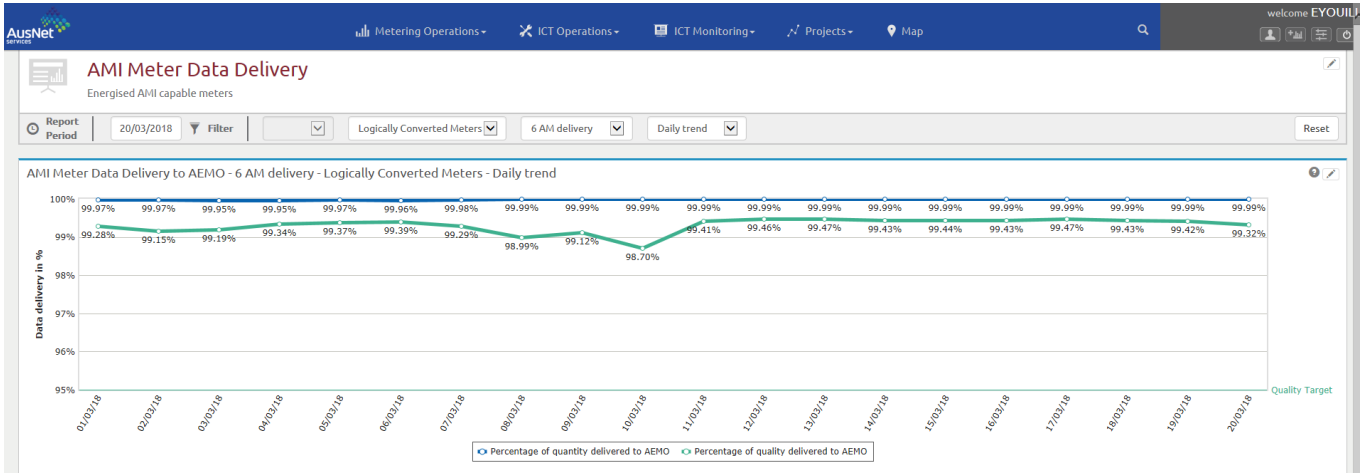
Additionally, AusNet Services metering solution also records and collect Power Quality (PQ) data every 5 minutes.

AusNet Services – Smart Meter Data

AusNet Services Smart Meter solution delivers high quality reads to Retailers and AEMO on a daily basis.

- 95% actual reads provided to AEMO and Retailers by 6AM everyday.
- 99% actual reads provided to AEMO and Retailers within 24 hours.
- 99.9% actual reads provided to AEMO and Retailers within 10 business days.

With daily actual reads, customers are able to (subject to their Retailer) opt in to more frequent billing to better manage their costs and access “Time of Use” tariffs that can help customers to reduce their bills.



AusNet Services – Smart Meter Remote Services

AusNet Services is able to provide a number of “services” to customers that can be performed remotely. Services can be completed more quickly (within minutes) and at a reduced cost for customers.

Remote Re-Energisation (turn on)

86,634 performed over last year, saving customers >$2M

Remote De-Energisation (turn off)

43,165 performed over last year, saving customers >$500K

Remote Special Reads (on demand reads)

12,223 performed last year saving customers >$200K and enabling customers to quickly change to better Retailer offers

Remote Meter Re-configurations

Primarily to support solar connections. 7,390 performed last year, enabling customers to more quickly get benefits of solar.

AusNet Services – MyHomeEnergy Portal

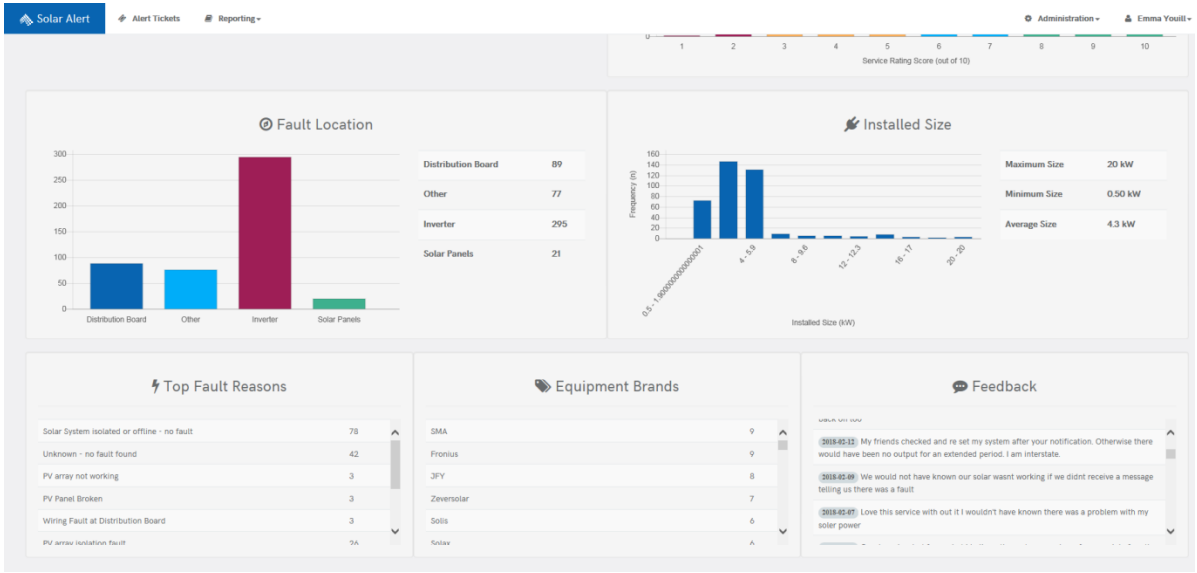
In addition to the mandated services, AusNet Services has also implemented a customer friendly meter data portal:

- MyHomeEnergy portal – provides access to daily meter data:
  - 16K+ customer registrations – increasing uptake in recent months.
  - Usage graphs
  - Customer can track costs
  - Easy access to download data to use the Victorian Energy Compare website.

AusNet Services – Solar Alerts

AusNet Services has developed analytics – using Smart Meter Data – that detects when a customer solar systems may have stopped working.

- Using voltage data collected from AMI Meters we detect when a solar system has not exported for over 7 days.
- Customers are notified by an SMS message of the issue, and the Solar Alert Analytics continue to monitor the customer's meter until an export is detected again.
- Since implementation >4,000 alerts have been provided to customers.
- Customer response to this service has been very positive with most customer rating 10/10.



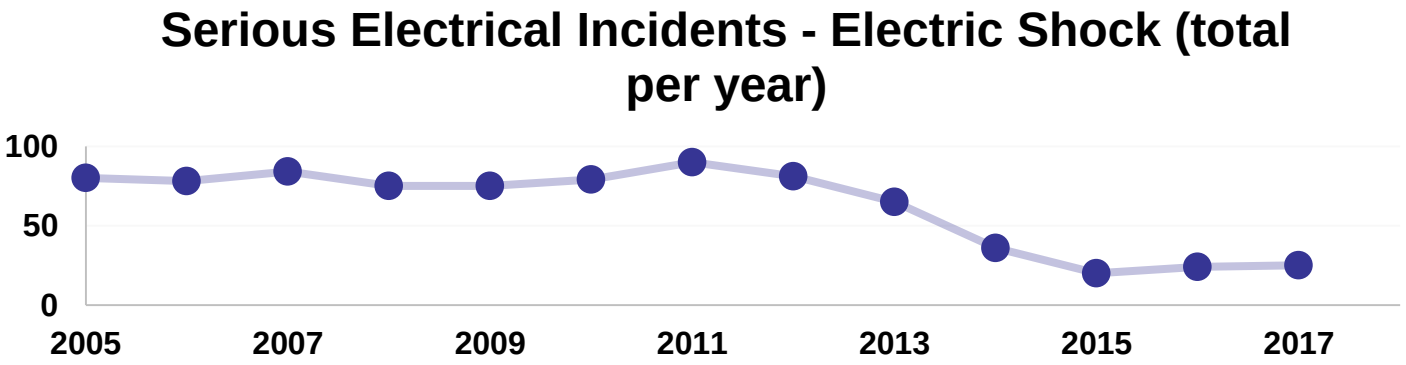
AusNet Services – Customer Safety

AusNet Services have developed analytics that identify Low Voltage service neutral faults using enhanced Smart Meter Data.

- The integrity of the service is vital to maintain safe and stable supply of electricity between the grid and the customer's premise.
- When the neutral of the service is faulty customers are at risk of electrocution when they come in contact with metal object on the premise.

2013
The year LoN was first put into service

> 2400
Services have been repaired or replaced



AusNet Services Smart Meters also receive real time "Predict Temp" alarms if a Smart Metering installation has increased temperature that may indicate a fault at the Meter or Meter board.

AusNet Services – Reduced Network Augmentation

The AMI Smart Meter solution has contributed to reducing or deferring network augmentation.

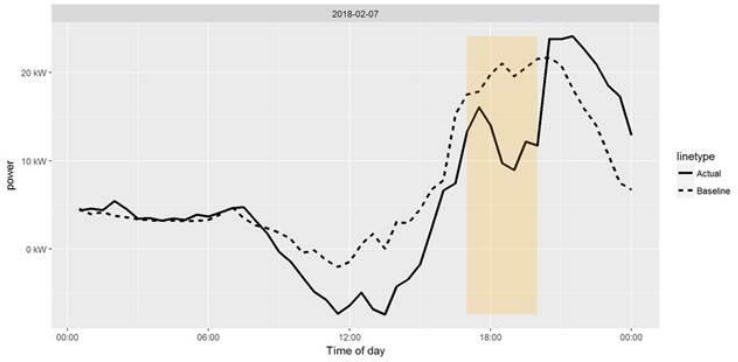
- Control of hot water loads and randomisation of switch-on times have been implemented in all AMI meters. The randomisation of switch-on times has deferred significant augmentation in South Gippsland and Phillip Island by >2 years
    - As solar uptake increases, this feature will be increasingly utilised to efficiently manage the network.
- AMI data is used to develop accurate demand forecasts that underpin our augmentation programs.
- AMI data is used to enable phase balancing- optimising our Low Voltage (LV) network.

Increasingly AMI data is being utilised to support accurate HV and LV models and provide an accurate picture of our DER hosting capacity. This enables AusNet Services to support higher levels of solar generation on our network.

AusNet Services – Supporting Demand Management

Between December 2017 and March 2017 AusNet Services trialled a residential demand management program called Peak Partners.

- The Peak Partners trial was targeted at customers at a feeder in the high growth corridor of Berwick and implemented a number of mechanisms to help customers reduce their demand on “Critical Peak Demand Days” – typically over a 4 hour period in the late afternoon.
- The objective being to reduce find an effective and low cost way to reduce demand and therefore network augmentation.
- Smart Meters were used in two ways during the trial:
  - To accurately determine the reduction in energy usage over the 4 hour period.
  - One trial scenario utilised the “Supply Capacity Control” function of the smart meters to limit supply to participants homes.



During the trial we saw a reduction of demand up to 39% over the peak period.

AusNet Services – Reduce Non-Technical Losses

AMI and PQ data is being used to detect “non-technical losses” – or theft.

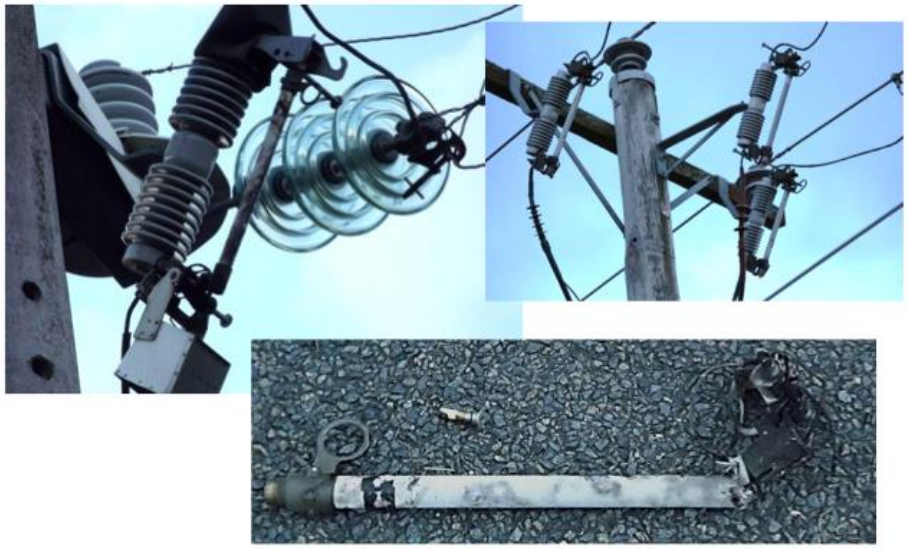
Our analytics detects theft of energy from sites that have bypassed the meter or otherwise interfered with the supply. Our revenue investigations team works with external stakeholders – including Victorian police – to identify and prevent further losses.

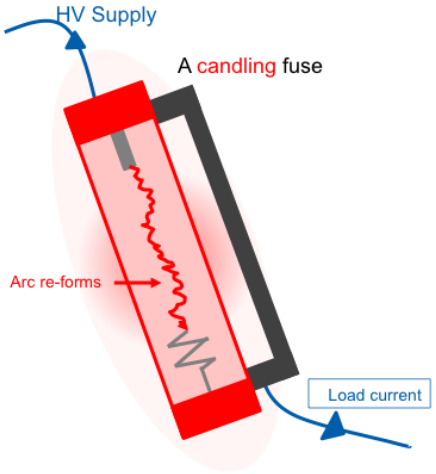
This benefits our community and customers by interrupting illegal activities and reducing costs for Retailers.

AusNet Services – Future Benefits

AusNet Services is focused on continuing to leveraging AMI to deliver benefits for our customers. Over 2018, the following new initiatives will be delivered:

Fuse candling detection – Using PQ data received from Smart meters we will implement “near real time” alerts and accurate location of fuses “candling” and wires down on our network – improving fault response and preventing fires.





services

- **Two main issues**
  - Release mechanism can become corroded
  - Ingress of contaminants & water
- **An arc can re-form through carbon tracking**
- **This is a problem!**
  - Fuse gets hot, can glow like a candle
  - Customers may not notice (lights are still on)
  - Fuse holder can eventually melt
  - Molten metal can fall to the ground

AusNet Services – Future Benefits (cont)

Life Support Outage Notifications – Implementing “near real time” notification of outages impacting vulnerable Life Support customers - improving fault response.

Enhanced My Home Energy portal – improved integration with the Victorian Energy Compare website, making it easier for customer to find the best deal.

Improved DER Hosting Capacity modelling – supporting increased solar exports from customers on our network.

AusNet Services – Future Benefits (cont)

PUF (Plant Utilisation Factor) is just a number to express the consumed capacity of a transformer – in this case a distribution transformer.

PUF is derived by combining AMI data and other data sets from commercial and unmetered load profiles and is used by Network Planning a key tool for decisions regarding network augmentation / deferral.