Metering Vision and Strategy

Abstract: This document outlines Ergon Energy's vision and strategy to work collaboratively with the market to utilise advanced metering to meet future challenges providing customers with choice and control at the best possible price; enabling better response to network stability, quality of supply challenges, provide critical data and reduce operational costs in terms of service delivery.

Keywords: Advanced Meters, Quality of Supply (QOS), Load Profile, Demand Management, Electric Vehicles (EV's), Batteries, Storage

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1 Overview

1.1 Purpose

The relationship of our end-use customers with the network has changed more in the last 5 years than the previous 50 years, especially with the strong adoption of distributed generation and smarter appliances. Increased understanding of how the network is utilised and impacted by customers and emerging technologies has become the central platform to manage for long-term sustainability.

Moving forward there is a much stronger need for engineering and energy information at the low voltage (LV) network and customer level than at any time in the past. Ergon Energy consider increased monitoring and information sharing to be a critical requirement of an efficient and effective distribution business and energy market in the future.

Ergon Energy intends to utilise advanced meters[1] and their functions increasingly at the LV network and customer level. Ergon Energy have identified a number of high cost to serve customer segments where advanced metering will contribute in reducing operating costs and reshaping customer load profiles for demand management or new tariff initiatives.

1.2 Scope

To utilise advanced metering to further enable the market, meet future challenges and provide customers with peace of mind, choice and control at the best possible price. Advanced meters will be pursued in targeted cost effective deployments at a customer premise and network level:

1. As part of broader non-network alternative programs in a targeted manner, such as in areas of emerging constraints;
2. To better respond to emerging issues such as network stability and quality of supply (QOS) challenges linked to the increasing penetration of alternative technologies on the distribution network (e.g. solar systems, battery storage and electric vehicles);
3. To provide critical energy and engineering data to internal network forecasting and planning functions to increase confidence in projections and timing of network investment;
4. To reduce operational costs in terms of service delivery at targeted sites;
5. To support cost reflective network tariffs (one of the fundamental market enablers that will optimise network asset utilisation into the future).

1.3 Our plan

Within the 2015 to 2020 regulatory control period, Ergon Energy will:

1. Pursue market based information standards and protocols that are commercially based to ensure efficient and effective access to energy and engineering information from advanced meters including those owned by third party providers, in the customer segments or network areas that align with our targeted deployments;
2. Install advanced meters strategically where there is a business case to enable remote communications, and leverage its current new and replacement programs to reduce implementation costs. Ergon Energy will consider services from third party meter providers where it is commercially viable;

[1] For the purpose of this document an Advanced Meter is deemed to be an electronic meter which meets a Minimum National Specification in terms of functionality with remote communications enabled.

3. Pursue installation of advanced metering infrastructure at a network level to enable proactive management of the LV network such as in areas with high penetration of distributed generation or network constraints;
4. Ensure information services from an advanced meter are enabled for networks, retailers and third parties in an open and transparent manner;
5. Maintain and expand the demand management services provided by load control relays in customer switchboards and directly attached to appliances via Demand Response Enabling Devices (DRED);
6. Ergon Energy will ensure meters procured for the 2015 to 2020 regulatory control period meet the updated requirements of the national smart meter minimum specification (when determined);
7. Work with the Queensland government to develop and understand the transitional rules for implementing metering contestability and the choices it will provide our customers. Ergon Energy will also support the government in ensuring the grid becomes smarter by incorporating the benefits of advanced meters, specifically those identified by the Australian Government Electricity Network Regulatory Frameworks Productivity Commission.

2 References

2.1 Ergon Energy controlled documents

Nil

2.2 Other documents

Document number or location (if applicable)	Document name	Document type
AEMC Power of Choice Review - Final Report	AEMC Power of Choice review – giving consumers options in the way they use electricity	Report
Australian Government Electricity Network Regulatory Frameworks Productivity Commission Inquiry Report Volume 1 No. 62 9 April 2013	Productivity Commission Inquiry Report Volume 1 – April 2013	Report
NSMP Business Requirements Work Stream	SCER NSMP Business Requirements work stream – Smart Metering Infrastructure Minimum Functionality Specification	

3 Legislation, regulations, rules, and codes

This document refers to the following:

Legislation, regulations, rules, and codes
Standing Council on Energy and Resources (SCER) COAG Energy Council

4 Definitions, acronyms, and abbreviations

4.1 Definitions

For the purposes of this strategy, the following definitions apply:

<Term>	<Definition>
Advanced Meter	An Advanced Meter is deemed to be an electronic meter, which meets a Minimum National Specification in terms of functionality with remote communications enabled.
FRC	Full retail competition was introduced in Queensland from 1 July 2007; This is when the majority of customers in Queensland were eligible to obtain a market contract. Ergon Energy was not required to publish customer details to the market under a minimalist transitioning approach. The start of the next regulatory control period is likely to see the full publication of customer details enabled.
Load Control	Device that enables loads to be controlled across multiple channels

4.2 Acronyms and abbreviations

The following abbreviations and acronyms appear in this strategy document

Abbreviation or acronym	Definition
AEMC	Australian Energy Market Commission
AFLC	Audio Frequency Load Control
DNSP'S	Distribution Network Service Providers
DMS	Distribution Management System
EEQ	Ergon Energy Queensland
EVs	Electric Vehicles
FRC	Full Retail Competition
GSL	Guaranteed Service Levels
HAN	Home Area Network
INOC	Integrated Network Operations Centre
LV	Low voltage
MV	Medium voltage
NEM	National Electricity Market
NMI	National Meter Identifier
NPV	Net Present Value
PQ	Power Quality
SCADA	Supervisory Control and Data Acquisition
SCER	Standing Council on Energy and Resources
TOU	Time of Use

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5 Background

The historical value chain for the utilities sector in Queensland was focused on low cost energy and improvements in reliability and, in recent years, Full Retail Competition (FRC). The utilities have largely delivered in this space until recent times where affordability, peak demand growth and reduced energy consumption have emerged as the key issues facing energy utilities.

Utilities are now seeing their business environment alter significantly, with energy market participants, customers and policy makers introducing and pursuing changes that challenge the traditional utilities sector operating model; these changes are being introduced at an increasing rate.

Safe reliable electricity supply was delivered as the model for utilities. It was simple and structured around a linear relationship with the customer and has had minimal changes in the past 40 years.

5.1 Customers

Customers are now pursuing alternative technologies that substitute and threaten the foundation traditional network asset investments are built on. Customers adopting small-scale generation are likely to adopt other technologies such as electric vehicles (EV's) and storage in the future as they strive to decrease their cost of living and improve their lifestyles.

New technologies are becoming cheaper and more broadly available through new market players and provide customers with greater choice, enabling them to become less dependent on traditional utility operating models. They are competing with current market participants to deliver value for the end customer, which is occurring at a time of decreasing revenues for existing players.

Many of these third party products are providing our customers with more detailed and granular information on how they can manage their energy use than is currently available from Ergon Energy.

Customers are also making long-term investment decisions in these technologies and have made investments based on the expectation that they will recoup their outlay within a reasonable timeframe (e.g. over 5+ years).

There are many new entrants providing products and services beyond the meter and this volume will continue to grow once micro-grids, home-area networks (HAN), storage, renewables and EV's become a commodity. This new environment presents opportunities for utilities to enable new products and services in the energy market.

5.2 Australian Energy Market Commission

The Australian Energy Market Commission (AEMC) on behalf of the Standing Council of Energy and Resources (SCER)/COAG Energy Council, is also pursuing market changes to help reduce the ongoing costs of energy and introduce further competition in the traditional monopolistic utilities market.

Core outcomes of the proposed AEMC changes are:

- To recognise the important role of consumers and their ability to exercise more choice in how they use energy and the types of energy services they receive.
- To recognise the importance of competitive retail markets for delivery of outcomes that are in the long-term interests of consumers as Ergon Energy moves to an energy sector that delivers services rather than just a commodity to consumers.
- Providing consumers better information and incentives to make consumption decisions reflecting the value they place on consuming electricity at different times
- Enabling consumers to see and access the value of taking up demand side options.

Enabling the market to support consumer choice through better incentives to capture the value of demand side options and through decreasing transaction costs and information barriers.

This external environment requires significant changes to current business models to retain and shape customer loads (and associated revenue) and enable market reform. Ergon Energy will work to reconnect with customers whilst enabling and collaborating with new market participants to improve outcomes for all.

6 Advanced meters

6.1 Historically

Traditionally, electricity distribution businesses have provided basic energy information and manual service offerings to their customers (retailers and end users) with significant limitations on the ability to remotely read electronic meters at a customer premise level.

Increasingly since FRC, regulators and market participants have been seeking ways to match energy consumption with generation capacity, network capacity, and other key cost inputs to reduce costs and risk, and improve reliability, QOS and end customer services. The necessary market frameworks have not yet been established to provide incentives for the electrical energy markets to operate more efficiently. There is not sufficiently granular and frequent exchange of the critical energy and engineering data to support network, retailer and customer decision making, enable effective tariff reform and reduce retail and network operating costs.

Advanced metering (or remote read interval meters) is considered to be an integral part of achieving Ergon Energy's objectives of:

- Network optimisation – better utilisation of network assets and improved affordability measures for customers
- Reduced capital and operating expenditure
- Improving forecasting and planning
- Improving customer service
- Mitigating retail and distribution risks.

The majority of the existing meter fleet in Ergon Energy's territory cannot support effective tariff reform or achieve the expected benefits of advanced meters. Leveraging ongoing network new and replacement metering programs and demand management initiatives becomes an integral factor in achieving a cost effective advanced meter future.

6.2 Today

Advanced meters are complex computing platforms in their third generation and continuing to evolve. They provide more capability than traditional meters and will assist utilities to reduce capital and operating expenditure while maintaining and improving services.

They provide enriched 'information' that will enable improved outcomes for customers, distributors, retailers, energy service companies and the evolving energy market.

Advanced meters provide value beyond the 'meter-to-cash' process. Implemented and used effectively, an advanced metering system will enable competition, remove barriers and enable regulators to better match consumption with generation, networks to match demand to capacity and retailers to significantly enhance commercial relationships with their customers. Advanced metering functions will drive dramatic changes for market participants.

6.3 Changing Regulation

The AEMC has considered the potential benefits of advanced metering and the mechanisms appropriate to accelerate their rollout. Subsequently SCER has developed and submitted a rule change request to implement arrangements in the regulatory environment to encourage the market-driven competitive rollout of advanced (or remote read interval) meters.

7 Advanced metering capability

7.1 Functions

Advanced meters provide a number of functions including those described below and outlined in Figure 1. These include:

- Supporting two-way communication with residential and business customers by collecting and displaying real time energy related data and enabling more cost-efficient service delivery.
- Enabling targeted remote load management (where this is elected by the customer). This includes remote connection and management of specific appliances for demand response and wholesale market purposes.
- Quickly assessing customer power supply and restoration issues during distribution network outages
- Provision of neutral integrity information to improve community safety
- Provision of detailed engineering data such as power quality (PQ), to improve network planning, forecasting and daily operations.

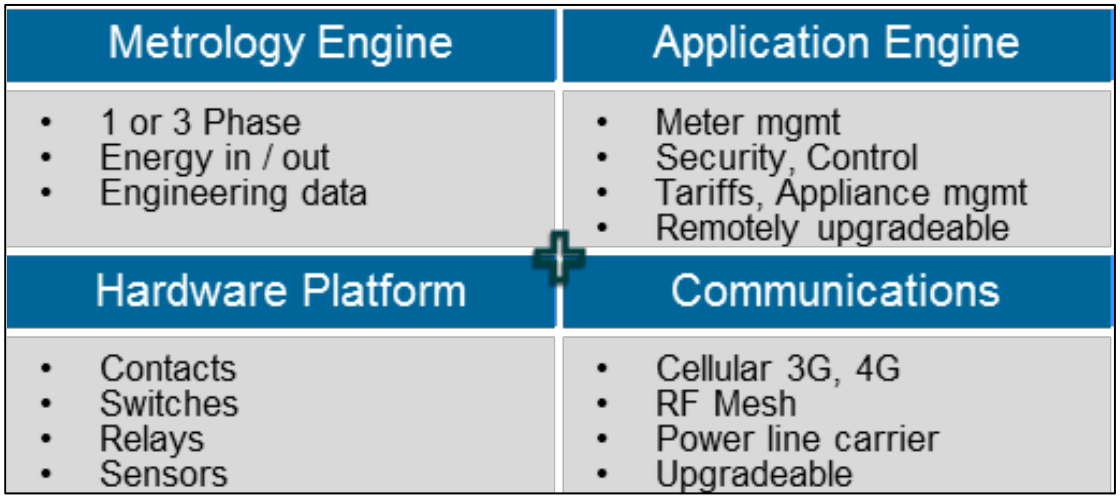

Figure 1 Advanced meter function

7.2 Interconnection with market participants

The capabilities of an advanced meter will increase the convergence of players (Figure 2) wanting or needing to gain access to the information and functions the meters can provide to reduce costs to serve or deliver new products and services. It is therefore important for the information and access arrangements for advanced meters to be open and transparent. This creates significant opportunities and challenges in the current market place.

Ergon Energy must enable all market players who require access to the information of services an advanced meter provides, and must be seen as a market enabler, so that third parties may use this capability to create new value pools for the customer.

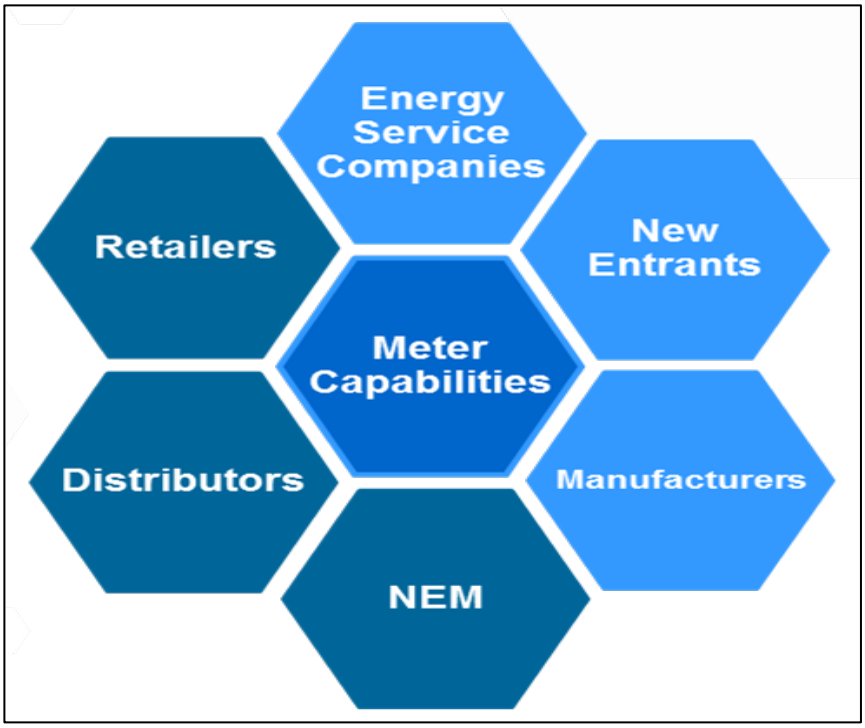

Figure 2 Advanced meter interactions

8 Metering Vision

Ergon Energy's metering vision is simple:

'In collaboration with key stakeholders Ergon Energy will create the foundations for an innovative connected information ecosystem that will enable effective market reforms. Meter information and services will be delivered and available to market participants to enable customer benefits and position sustainable metering functions near the centre of network investment and performance, and customer decisions'

8.1 Customer Principles

To achieve our vision Ergon Energy will:

1. Ensure all services and products are simple by design.
2. New products and services are as convincing as the smart phone and integrated to it.
3. Provide customers with choices.
4. Provide information, awareness and education to inform customers and grow their knowledge
5. Abide by privacy and security principles and guidelines
6. Deliver on customer expectations.
7. Provide transition paths.

8.2 Internal Principles

To achieve our vision Ergon Energy will:

- Realise adaptability – implementing a building block approach
- Connect the distributor, retailer and customer requirements
- Enable benefits for third parties such as retailers
- Treat information as an asset that needs to work
- Engage collaboratively and make decisions proactively that are prudent and efficient
- Start with the simple quick wins and move methodically to the complex components
- Share, contribute, learn and influence enthusiastically
- Deliver the outcomes as planned.

9 Chasing advanced meter benefits

9.1 Benefits map

Ergon Energy considers there are customer, network and retail benefits to be achieved from targeted deployments of advanced metering. These targeted deployment areas are aimed at reducing service delivery costs and network investment requirements, and will focus on constrained parts of the network, supporting network tariff reform, demand management, difficult to access sites and premises with high customer turnover costs from move-in, move-out or market churn events. Ergon Energy has evaluated a range of potential benefits from advanced metering and considers a collaborative agenda between retailers and distributors in a market driven model will enable savings for customers through reduced service delivery costs and improved asset management. The indicative benefit areas are highlighted in Figure 3.

Figure 3 Advanced meter benefits map

9.2 Network Benefit Analysis

The Productivity Commission identified that the majority of the benefits for advanced meters can be directly attributed to the network businesses and deferral of network capital expenditure was the primary benefit. They made several recommendations for the implementation of advanced meters, including:

- Advanced meters must include load control capabilities and provide open access for networks, retailers and third parties
- Networks must have the ability to install advanced meters in a targeted manner and be able to decide on the time, location and number of advanced meters in any location. This must be accompanied by customer engagement and incentives, and enable networks to see benefits in future regulatory periods and load control options.

A key finding of their analysis concluded that under a targeted rollout that takes account of impending capacity constraints (the most preferred policy case) there is a likelihood of significant net benefits per household. In this scenario, the median present value of the net benefits over the life of an advanced meter could be as much as $1400 per household[2].

Ergon Energy understand these benefits and will be pursuing non network alternative projects, which include advanced meters, tariffs, incentives and demand management, where they are cost effective.

9.3 Tariff Support

How and when customers' access and use the electricity network are key drivers of network investment. Historically, in the Ergon Energy network, customers have had limited exposure to network price signals reflecting the real cost of providing electricity supply at a particular time of day or year, or been offered choices to optimise their usage of the network.

Current retail price structures and their lack of alignment with network costs are considered to have contributed to customer decisions with respect to investment in air-conditioning and small scale embedded generation leading to customers with this equipment placing costs on the network that are not reflected in what they pay for their use of the network. With future developments such as EVs and battery storage emerging, it is important to lay the foundation to get appropriate network price signals out to customers so customers can make optimal decisions around their usage and other potential game-changers based on the demand and costs they place on operating the network throughout the day and year. Laying the foundation through restructuring primary network tariffs has been the focus of the Ergon Energy 2014-15 network tariff strategies.

Cost reflective network tariffs are one of the fundamental enablers of a market development pathway based on a smart grid that supports diversion of investment in high risk traditional supply network solutions to a lower cost, higher customer value, lower risk, and a more sustainable future. Network tariffs, demand management and access to customer side resources are some of the tools that Ergon Energy has to utilise and facilitate to improve network utilisation and shape the environment in which market reform occurs.

Deployment of remotely interrogated interval meters can effectively underpin efficient network tariff price signals in addition to enabling targeted opportunities to offer flexible choices to customers. Moving to a seasonal demand and energy time-of-use (TOU) network tariff with variable fixed and potential for capacity charges is an example of an effective network tariff reform with benefits for customers and distribution network service providers (DNSP's) to share. Successful deployment is dependent on metering and billing capability. Ergon Energy took the first steps towards this type of network tariff in 2014-2015 introducing a small seasonal TOU energy tariff for small standard access customers.

[2] Page 26 Australian Government Electricity Network Regulatory Frameworks Productivity Commission Inquiry Report Volume 1 No. 62 9 April 2013

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The industry is about to embark on a period of time with strong tariff reform agendas, that will evolve and provide each customer segment with more choice, whilst also influencing customers behaviour to improve the utilisation of the network. These changes will require an adaptive metering infrastructure catering for changing tariff structures and 'use of system' time periods.

9.4 Investment framework

There are some basic guidelines Ergon Energy is seeking to adopt in enabling remotely read metering capability at the customer premise where it is prudent to do so. These are:

- Ensure the infrastructure can be transitioned to support the national competition framework for metering;
- Networks and Retailers to work collaboratively on delivering cost effective advanced metering infrastructure;
- Leverage off existing meter management activity including new and replacement programs to reduce implementation costs. The standard basic meter (Type 5 and 6) will meet the national smart meter minimum specification and be capable of being upgraded to advanced meter status (i.e. communications enabled). This enables communications to be added to devices by Ergon Energy or third parties at a later date if appropriate;
- Target installation and enablement of advanced metering as part of broader demand management programs in increasingly constrained network areas to avoid or defer future investment, or where it reduces operational expenditure to deliver distribution services (e.g. final reads, disconnection and reconnection services);
- Deliver the functionality based on a positive business case for the incremental cost difference between a basic meter and an advanced meter;
- Information services from an advanced meter are enabled for networks, retailers and third parties in an open and transparent manner;

Enable economies of scale through commercial arrangements with strategic partners, to effectively manage a growing population of advanced meters in the market.

In the future a fully competitive advanced meter rollout may occur, which may mean that investments by Ergon Energy distribution business will ease or stop, should the new market enable all of the targeted network and customer benefits to be achieved. Our immediate proposals are designed to capture the benefits early whilst not inhibiting a future market.

9.5 Barriers

Analysis for investments in targeted deployments can be net present value (NPV) positive over several regulatory periods provided cost effective implementation and collaboration agendas are pursued in parallel. Ergon Energy has identified a number of barriers that need to be overcome to enable these benefits to be realised.

Transitional metering arrangements and policy framework

The AEMC and government bodies are still finalising the end state metering framework. Ergon Energy will continue to work with the Queensland Government to develop a number of transitional rules to minimise overall costs of implementing contestable metering in Ergon Energy's network.

There are many attributes that are key for a transitional framework including:

- Ensuring the investments made in metering by the network are made in good faith and that the useful life of the metering assets can be reached;
- Ensuring that third parties who install meters retain network load control devices installed on the customer's premises and retaining the right of the networks to install a network device on the customer's meter panel. If load control services are available from a third party, and are cost effective and reliable, then Ergon Energy will consider this alternative;
- Requiring networks to meet the national smart meter minimum specification[3] for new and replacement programs as per Ergon Energy's intent;
- Implementing regulation and accreditation frameworks for third-party installers to ensure the safe and compliant installation and operation of metering and load control.

Access to information and services from third party meter providers

While advanced metering in itself is not an end solution, it is an integral part of developing and delivering prudent and efficient network investment, management and optimisation programs into the future. Advanced meters also enable the retailer to reduce churn and its associated costs through provision of new products and reduction in customer service costs. In the absence of ubiquitous penetration of advanced metering, there is a requirement to be very targeted and strategic as to when and where advanced metering infrastructure delivers optimal value to network providers, customers and retailers, and how it can be delivered cost effectively.

It is important to note that the information services from an advanced meter are the key to achieving the desired benefits rather than the ownership of the physical infrastructure. Ergon Energy expects to be able to access engineering and energy data from third-party meter providers in the future through the development of common message gateways and protocols being pursued by the AEMC but it must be cost effective and deliver maximum benefit to customers.

Technical and communication standards for multiple party access

The current technologies in the market do not enable multiple parties to communicate to a single meter in a seamless and secure manner without connecting via a single meter management system. Although these technologies will evolve and mature to provide this capability, the vendor community has indicated this may not be possible before 2020.

Minimum Data Specifications and Access Frameworks

The current structures for sharing interval consumption data will not be sufficient for all the network benefits to be achieved. In some cases near real time interfaces are required to share data almost like a supervisory control and data acquisition (SCADA) system, rather than the predominately batch processing that currently occurs with meter data in the National Electricity Market (NEM).

Load Control

Current load control capabilities enable Ergon Energy to send signals to geographic areas where the network has an impending constraint either through growth of customer demand, or when planned maintenance is carried out. The current system also has granular control to switch different appliance types such as hot water, pools and air-conditioning.

[3] NSMP Business Requirements Work Stream - Smart Metering Infrastructure Minimum Functionality Specification

Ergon Energy require the proposed AEMC specifications to enable them to:

- Transition the current customers to the new technology where it is cost effective,reliable and provides certainty of load under control for network optimisation purposes;
- Enable signals to configure default settings for the load control devices for each of the zone substation areas;
- Enable near real time signals for efficient maintenance and switching to ensure smooth operation of the network;
- Provide the granular appliance control currently in place (i.e. individual management of multiple end use appliances);
- Enable growth in appliance management for EV's and home based storage enabling the network to leverage these resources to minimise the volume of new network capacity to be built.

Ergon Energy will be retaining external load control devices until such time as it can be confident advanced metering solutions will provide the same or better capability as in place today more cost effectively than current or alternative technology.

Ergon Energy will also pursue the AEMC to introduce load control rules for third parties managing loads independently of the network to ensure the reliability and quality of supply standards that network businesses are required to deliver can be maintained at no additional cost.

Security and access framework

As outlined by the AEMC, the pursuit of multi-party access to a common meter will require the development of new standards and capabilities to ensure information integrity and network security. Ergon Energy will work hard with industry to pursue this objective whilst ensuring network integrity and security.

Low Voltage network management

With the increasing volume of distributed energy resources being connected to the network, it is essential for effective network operations and management that access to PQ information be provided. There are several information services that will be required, including:

- Provision of PQ voltage and current streams of information from meters of interest to the network, typically at less than 30-minute intervals.
- Access to near real time voltage information on a subset of meters to enable upstream active voltage management schemes to operate, thus reducing the need for further network augmentation.
- PQ event data from all meters exceeding predefined thresholds prescribed by the network.

It is important to note that the meters and geographies where this information is required will change over time due to the types of customer connections and appliance growth such as air-conditioners, EVs and battery storage. The network will require the ability to redefine these locations with external metering providers in addition to its own capability.

Ergon Energy will increasingly integrate advanced metering solutions into the LV network to monitor transformers and distribution feeders. Information from these data points will be analysed in conjunction with energy and engineering data from meters at customer installations.

Outage management and public safety

The network will require near real time access to the alarms and events generated from a customer's meter to assist the network in resolving power outages and maintain community safety. Ergon Energy expects information services would be provided by all advanced meter providers as part of standard services that push information to the network business at a national meter identifier (NMI) level when defined events occur. The network would also require the ability to identify isolated or nested outages.

At a lower level, as the network is responsible for Guaranteed Service Levels (GSLs), Ergon Energy would expect a near real time access to meter operations such as disconnect switch status, including who requested and enacted the service. This will enable the corporation to manage customer complaints and to determine the GSL impacts.

9.6 Network Objectives

The objective is to utilise advanced metering at network and customer levels to deliver on our core customer commitments. This capability will be evolved:

- As part of broader non-network alternative programs in a targeted manner, such as in areas of emerging constraints
- To better respond to emerging issues such as network stability and quality of supply challenges linked to the increasing penetration of alternative technologies on the distribution network (e.g. solar systems, battery storage and electric vehicles)
- To provide critical energy and engineering data to internal network forecasting and planning functions to increase confidence in projections and timing of network investment
- To reduce operational costs in terms of service delivery at targeted sites
- To support cost reflective network tariffs (one of the fundamental market enablers that will optimise network asset utilisation into the future).

9.7 Retail Objectives

There is synergy in network and retail businesses collaborating on targeted and effective introduction of advanced metering functionality to deliver accelerated benefits for customers, networks and retailers and to reduce the overall cost of implementation to all parties.

For retailers, advanced metering represents an opportunity to improve customer experience, improve cash flows, reduce billing and customer engagement costs and better manage wholesale energy trading risk. Key objectives could include:

- Providing energy consumption data more frequently to customers as an avenue to provide better consumer understanding of how and when they use energy, identify appropriate products and services, and accommodate shorter billing periods;
- Changing consumption patterns to reduce energy bills through having customers shift load to off peak periods where appropriate.
- Enabling new products, increase customer value and reduce customer churn;
- Reduction in operational costs associated with customer move-in, move-out events;
- Reducing billing and customer engagement costs through provision of accurate and timely metering information by minimising estimated reads due to access issues;
- Utilising internal data to better manage wholesale trading and settlement risk.

9.8 Progressing to Action

The following five (5) phase Action Plan is provided as a high level overview of the primary intent of Ergon Energy in seeking to leverage and position advanced meter utilisation for the benefit of Ergon Energy and its customers. It is premised on five key principles:

1. Start with the end in mind
2. Get the basics right
3. Enable the market to achieve benefits for customers
4. Transforming to survive
5. Harness the long-term potential for the network

10 Action plan 1: Start with the end in mind

10.1 Defined specification

Ergon Energy will develop a requirements specification for the end state metering business model and associated infrastructure. This will include:

- Options based on potential separation of the metering business;
- How metering will support the network smart grid vision and network and retail tariff reform;
- How the metering business model will cater for disruptive technologies such as Home Energy Management systems, customer energy portals, smart appliances, battery storage and EV's;
- How information will be available in analytical platforms for distributors and retailers in a seamless manner;
- Defining the relationship and interactivity between network sourced metering data and customer premise related energy and engineering data;
- Maintaining flexibility to manage the customer experience;
- Efficient and effective interfaces with third party providers.

10.2 Segmented / targeted deployment approach

The objective is to deploy advanced meters in a segmented and targeted approach where the benefits outweigh the costs (on network and at customer premise level). Segments may be high cost such as frequent move-in, move-out churn sites, high energy users in constrained network areas, new developments or geographies difficult to reach or costly to service. Ergon Energy needs to pursue relationships with retailers and other market participants to share the costs of this infrastructure to increase the benefits for the customer.

10.3 Build progressively to a common end state

Ergon Energy will leverage existing metering management systems capability (with minor investment) for the immediate future. Scale issues will be continually evaluated and addressed through consideration of third party services such as part of corporate system development programmes

10.4 Align to future environment

The Network Monitoring and Processing group and the services it provides may change considerably in the future driven by structural and business model options and how customers use energy and new smart technologies. Ergon Energy will ensure our end state metering platforms are able to cater for proposed changes and support information management of data streams from advanced metering and other devices at both customer premise and network monitoring levels.

10.5 Business model

As the AEMC pursues further competition for energy services, new business models will emerge where metering services may be provided by many parties, including distributors, retailers or new entities. Ergon Energy will position itself to influence and take advantage of this outcome.

10.6 Contractual frameworks defined

Contracts between distribution, retailers, energy service companies and metering infrastructure providers will be developed in parallel with the detailed requirements specification. This will enable risks to be mitigated early and ensure the infrastructure, procurements and relationships are clearly defined and structured.

Should the market be further disaggregated through AEMC or SCER initiatives, the contractual frameworks will enable a smoother transition to the new market.

11 Action plan 2: Get the basics right

11.1 Be efficient

The market can only afford to invest once in this new capability to provide services for many parties. Failure to maximise the benefits of the new capability could result in market failure, license restrictions, financial burdens or significant customer angst. Key principles are:

- Core sets of advanced meter information need to be of high quality, delivered in a timely basis and not inhibit market success;
- Deliver what customers expect every time and in a fast reliable consistent manner;
- Enable the network to respond effectively to network constraints, PQ issues and outages;
- Information provided to enhance forecasting quality and certainty;
- Utilise installation practices that are efficient and completed on a single site visit.

11.2 Delivering the benefits

Advanced meters deliver many capabilities, information and services that will be provided to many stakeholders. To maintain customer and stakeholder engagement whilst minimising the risks to customers, it is essential for Ergon Energy and its strategic partners to focus on delivery of all benefits as promised.

11.3 Open and transparent

Customers or service providers will have access to their information when they need it. Ergon Energy's services and performance will be transparent to ensure an open market, whilst ensuring security and balancing the customers' privacy needs. Customers should have information that empowers them and enables appropriate energy use decisions.

11.4 Metering is not an inhibitor to tariff reform or the market

The future will see the pace of tariff reform increase and Ergon Energy's metering agenda must adapt to ensure support of the new pricing frameworks for networks and retailers. Advanced meters will ensure Ergon Energy can cater for these reforms.

11.5 Treat information as an asset

Utilities have previously managed electricity flows and it is now essential they can manage the information flows between parties, to ensure the raw information is timely, of good quality and is presented in standard consistent forms.

Information is a valuable source of competitive advantage and sustainability and not just a commodity for producing customer bills or an energy forecast. A retailer that manages and analyses data about its consumers and its service channels will be a leader in the industry rather than falling behind. Similarly, a network that responds to energy and engineering data efficiently reduces the risk of constrained or stranded asset, improves its decision-making and continues to provide a safe reliable supply.

11.6 Metrics driven organisation

The integration of advanced metering into the network optimisation framework as an avenue to effective decision making, appropriate response to emerging technology penetration, improved network performance, service cost reduction and enhanced service delivery warrants Ergon Energy increasing its focus on being a metrics driven organisation. The information available from an advanced meter is linked to numerous areas that generate benefits for market participants and customers. As the volumes of information are high and as services are purely electronic in nature, it is essential success measures are integrated into information services so as to ensure:

- Benefits are captured:
- Critical linkages between data sets are defined and managed;
- Timeliness and quantity of information delivery is appropriate and cost effective;
- Installations are targeted;
- Service costs are known;
- Process exceptions are quickly identified and managed.

Enhanced data analytics will be a critical part of effectively utilising the data sets that become increasingly available.

11.7 Ensure our infrastructure is secure

It is essential the infrastructure is built on industry best practice and standards. It is important to develop a risk management based security program enabling business risk owners to understand both the physical and cyber threats impacts to the business services and functions. Standards which enable broad application and achievement of benefits are critical.

12 Action plan 3: Enable the market to achieve benefits for customers

12.1 Partnering with key stakeholders

As markets become more liberalised and dynamic, an increasing number of stakeholders are implicated in the future of electricity supply. From government members to everyday users, each stakeholder has a different interest or need from an advanced metering infrastructure. This necessitates partnering with key stakeholders to gain a strong understanding of their needs and capabilities is important to reduce project risks, maximise the benefits and reduce costs. This is an environment where:

- Customers will be adopting more sophisticated product offers and will require more information to make informed decisions
- Networks will continue to improve asset utilisation and management practices. Advanced meters at low voltage network level and at custome premises will provide telemetered data to improve these outcomes.
- Retailers are looking to deliver more innovative products and services such as prepayment and information rich self-service channels, whilst reducing their upstream wholesale risks
- Energy service companies will be entering the market providing energy management solutions, renewables, energy storage, demand management and aggregation services.
- Manufacturers and vendors will be developing products to meet customer needs as well as integrating to the advanced meter infrastructure.
- Regulators will need to enable a stable and clear regulatory framework, with harmonised rules across Australia. The AEMC must develop incentives to encourage participation with increasingly open access, an effective investment remuneration system and system costs as low as possible.
- Government bodies will be developing policies that increase competition with the end goal of relieving energy cost pressures for the customer.

Advanced meters are viewed as an enabler for the new markets as they provide capabilities that are of interest to all stakeholders.

12.2 Empowered customers with choice

Customers have the knowledge and information required to feel empowered and make appropriate decisions on energy use. Choices for tariffs and products need to be presented to customers in a simple clear manner and these choices must include network products such as load control services. Customers can choose the level of utility control that suits their lifestyle and be compensated for that level of control.

12.3 Product framework

Ergon Energy will leverage existing market platforms where available for the provision of information and products. New automated gateways will be developed to deliver new services such as demand, EV and storage management platforms to both customers and new market players. Customers should be able to leverage online channels using existing platforms such as smart phones, tablets and portals.

Whether they are for network managers, end customers, direct customers such as retailers, or service providers, the information and services provided by an advanced meter, should be delivered in a timely efficient electronic manner. Operational resources should only be tasked with managing exceptions or low frequency/volume transactions.

Services will be classified into the following categories:

- Base NEM requirements
- Network services
- Retailer services
- Energy market services
- End customer services

12.4 Support a minimum specification

Ergon Energy will adopt the national smart meter minimum specification for its standard meters to reduce long-term procurement risks and minimise the potential of asset stranding or churn. It is important to note that customers move throughout the network during the life of the metering assets and customers should be able to expect the same services in their new premise that were able to be provided in their old premise.

12.5 Supporting policy environment

A new and replacement metering policy for Queensland that supports a cost effective advanced meter future through installation of 'smart ready' meters as standard by the distribution businesses is a critical foundation.

Ergon Energy will seek to work with policy makers to ensure both distributors and retailers have the ability to install remotely read metering where there are operational difficulties (e.g. difficult access, remote rural or other no-access reasons) or a positive business case to do so. (e.g. avoided network investment). In all instances the objective is to utilise advanced metering functionality where it can be demonstrated that the end benefits to customers outweigh the implementation and operating costs (short, medium and long term).

Contracts or market rules need to be in place to ensure advanced meters are not replaced by third parties to remove the issues of stranding the value and functionality of this asset. Ergon Energy will engage policy makers on this agenda to attempt to ensure customers are not financially disadvantaged by removal of compliant metering.

13 Action plan 4: Transforming to survive

13.1 Analytics to grow the benefits pool

Customer segmentation and analytics have been commonplace in businesses that seek to develop new products, improve their services and increase operational efficiencies.

Advanced meters significantly increase the frequency and volume of data available to be analysed. This new information stream warrants investment in expanded analytics capability to better accommodate asset utilisation, workforce efficiencies and deliver effective planning and forecasting functions. Ergon Energy will expand on current analytical capability by partnering with a range of service providers as well as internal development to achieve this outcome.

Analytical capability will be developed to measure performance as well as driving further value from the metering investment. Due to the breadth of information it is important to concentrate on the information tied to benefits as well as information required to achieve our network optimisation objectives.

13.2 Prepared for disruption

With the exception of solar PV in recent years, the utilities industry has encountered little change driven by external entities. However, experiences of the past will not be reflected in the future as new technologies and players continue to enter the market, all of which will capture revenue from a declining traditional energy market.

Customers will pursue these capabilities, such as storage and renewables, to become less reliant on the grid and reduce their overall energy costs. As technologies mature at a faster pace, customers will adopt these capabilities, especially as the new market entrants capture customers' attention.

Through adopting advanced metering in a targeted fashion, Ergon Energy expects to be well placed to address challenges of disruptive technologies and increasing customer expectations as to choice and performance of the electricity network. Data from meters both on network and at customer level are critical to informing investment and operational decisions.

13.3 Improve dialogue and engagement

Ergon Energy need to improve dialogue and engagement with stakeholders across the sector including customers, retailers, supply chain companies, research groups, policy makers, and the regulator and community groups.

Specifically, to improve dialogue and engagement Ergon Energy will:

- Work with relevant stakeholders to identify gaps in our analysis and address them;
- Communicate opportunities and challenges to market participants;
- Educate relevant parties about the information consumers need to become active participants in the energy market;
- Connect people and ideas to facilitate dialogue between relevant partners, including retailers, energy service companies, major manufacturers and universities;
- Liaise with trade groups in related areas such as installation practices and advanced meter awareness;
- Engage manufacturers of products that could be integrated with the advanced meter infrastructure.

13.4 Continue to innovate and extract value

Utilities have long excelled at improving the reliability and QOS with long life assets against ever-increasing targets from regulators. This same practice needs to be integrated into the advanced meter infrastructure to maximise the benefits to all market players. Innovation within the advanced meter infrastructure should be encouraged and supported.

13.5 Oversight of the entire intelligent infrastructure

Ergon Energy will implement a single integrated network operations centre (iNOC) to provide oversight of the entire infrastructure and services delivered by advanced meters and other intelligent end devices (IED), whilst also being integrated to the electrical network management platforms. The network will have greater insight for PQ, reliability and condition of the network.

The iNOC will monitor the infrastructure for certain conditions that may require special attention to avoid degraded service. As advanced meters are tightly linked to the customers, the iNOC can leverage analytical algorithms to better manage disruptive events.

13.6 Leverage business as usual metering investments and minimise customer site visits

Any proposed meter installation should assess the site or customer information and determine whether an advanced meter should be installed to acquire further benefits. Sites or customers that have the following attributes are prime targets for an advanced meter:

- High customer churn
- Potential demand management opportunity (in network capacity constrained areas)
- Hardship location or customer
- Support new tariffs
- Difficult to access site.

14 Action plan 5: Harness the long term potential for the network

14.1 Leverage advanced meters as a mini SCADA capability

Advanced meters measure impedance, PQ and outage events all of which can reduce network service and investment costs.

The increased data about the conditions of the system will enable Ergon Energy to provide a higher quality of power supply by more quickly recognising when the PQ is deviating from ideal ranges and adjusting the network to correct issues in an earlier time-line.

Identification of single or nested outages will reduce outage assessment times and reduce the need for visual feeder patrols.

Essentially increasing use of advanced metering and intelligent devices at low voltage network and targeted customer premise levels will enable Ergon Energy's electricity distribution system to become more active and dynamic rather than static, through strategic placement.

14.2 Reduce investments in LV sensors and monitors

The volume and quality of the information received from advanced meters both on network and at customer premises, will allow network engineers to identify the current state of the network and enable planners and operations teams to model upstream impacts with greater certainty. Appropriately placed advanced meters will reduce further investments in medium voltage (MV) and LV monitoring capability. Advanced meters will greatly enhance the coverage of the PQ monitoring and will defer future investments in more expensive PQ monitoring and improvement solutions.

14.3 Access the increasing available demand in a targeted manner.

NEM market development through the power of choice[4] and the broader application of advanced meters will enable third parties managing customer loads greater opportunity to provide services to the network in constrained areas. These services can be leveraged to reduce network impacts on peak days and defer network investments. Advanced meters enable Ergon Energy to improve asset utilisation, defer investment and more effectively plan for demand growth.

14.4 Market load control rules

The proposed market reforms from 'Power of Choice' will increasingly enable third parties to manage customer loads introducing the potential for PQ issues on the network and, ultimately, power outages. As these loads are managed independently of the network it is essential the rules are defined to ensure the minimum service standards Ergon Energy is measured on by the regulator can be maintained without additional costs. Ergon Energy will work collaboratively with key stakeholders to define the rules and protocols necessary to overcome these issues, whilst enabling market reforms.

14.5 Active management

There is no doubt the grid will need to cater for more distributed generation, storage and energy management systems, his will require the active management of the grid. Information from advanced meters either at customer premise or within the network will be dynamically used to actively tune and alter network configuration. It is important to design the advanced meter infrastructure in a flexible and agile manner, to allow more systems such as a Distribution Management Systems (DMS) to gain access to the engineering data in the future.

[4] AEMC Final Report - Power of Choice review - giving consumers options in the way they use electricity (November 2012)