APPENDIX 57

Metering strategic plan

Energex

Metering Strategic Plan

Asset Management

energex

positive energy

Version control

Version	Date	Description
1	24/10/2014	Final for Regulatory Submission

Energex Limited (Energex) is a Queensland Government Owned Corporation that builds, owns, operates and maintains the electricity distribution network in the growing region of South East Queensland. Energex provides distribution services to almost 1.4 million domestic and business connections, delivering electricity to a population base of around 3.2 million people.

Energex's key focus is distributing safe, reliable and affordable electricity in a commercially balanced way that provides value for its customers, manages risk and builds a sustainable future.

Group Manager
Corporate Communications
Energex
GPO Box 1461
BRISBANE QLD 4001

Table of Contents

1 Executive Summary

The metering environment is changing rapidly in Queensland driven by a range of policy initiatives. Broadly Energex is supportive of the AEMC's and Queensland Government's plans to develop and introduce a contestable metering market and supports providing customers with improved choice through a market led mechanism.

However, Energex needs to ensure that a number of issues are managed as the market transitions to a market led model. In particular:

- Energex will need to continue to provide existing standard metering services cost-effectively to its more than 2.2 million meter connected customers;
- Load control and other services which are needed to manage the network, which may currently be provided via the meter, need to continue to be available at reasonable cost; and
- Any meters procured and installed during the transition to a contestable market need to be capable of addressing the needs of the changing market to ensure that meters provide optimal value for their full asset life.

Energex proposes the following measures to achieve these outcomes:

1. Introduction of Transitional Rules

Energex is seeking support from the Queensland Government to develop a number of transitional rules to minimise overall costs of implementing metering contestability to Queensland's electricity customers while enabling the networks to operate efficiently into the future.

2. Removal of Metering Assets from the Regulated Asset Base to support customer choice

Energex recognises that metering assets will need to be separated from the remainder of its regulated assets to be able to account for and manage metering costs directly.

3. Continue to use Advanced Meters in 2015-2020

Energex will continue to procure and install advanced meters and continue to operate these as Type 6 meters. This will ensure that meters installed during this time will meet future network and customer requirements.

Energex will continue to manage its meter fleet to ensure maximum life is achieved through current meters while ensuring that new meters meet future requirements cost effectively for customers over the longer term.

4. Maintaining & Protecting Load Control Capability

Energex seeks to maintain and expand the load control and network management capability provided by more than 690,000 load control relays currently installed in customer meter boxes. This network management capability will be maintained and enhanced during the next Regulatory period.

5. Use of Advanced Meters for Network Purposes

Energex proposes to utilise targeted application of advanced metering capabilities where there is a clear network benefit for doing so.

2 Purpose and Vision

2.1 Purpose

The purpose of this Metering Strategy is to outline Energex's strategic objectives and operational requirements with regard to metering over the next regulatory period (2015-2020) including:

- The existing and ongoing capability of metering assets;
- Consideration of likely future operational requirements; and
- Cost effective delivery of metering services and products to meet future operational requirements and the needs of customers.

2.1.1 Alignment with Corporate Strategy

Energex's strategic objective is to achieve balanced commercial outcomes by understanding and effectively managing the customer, risk and financial elements of our business as represented below.

- **Satisfied customers**: Focuses on maintaining and strengthening Energex's standing with its key customer groups. Energex's sustainable position is to deliver its commitments, obligations and value proposition, while optimising customer relationships
- **Managed risk:** Focuses on ensuring that Energex maintains its licence to operate. Energex's sustainable position is to deliver network performance acknowledging technical standards, regulatory and legislative obligations, commercial considerations, customer expectations and commitments to staff
- **Financial sustainability:** Focuses on maintaining Energex's ongoing economic viability. Energex's sustainable position is to deliver shareholder returns and operate the business from a strong commercial platform

Energex's Metering Strategy aligns with these balanced commercial objectives by:

1. Providing customers with cost effective metering services and products which provide customers with choice to meet their needs
2. Providing metering services and products that enable Energex to manage the network efficiently, reliably and safely

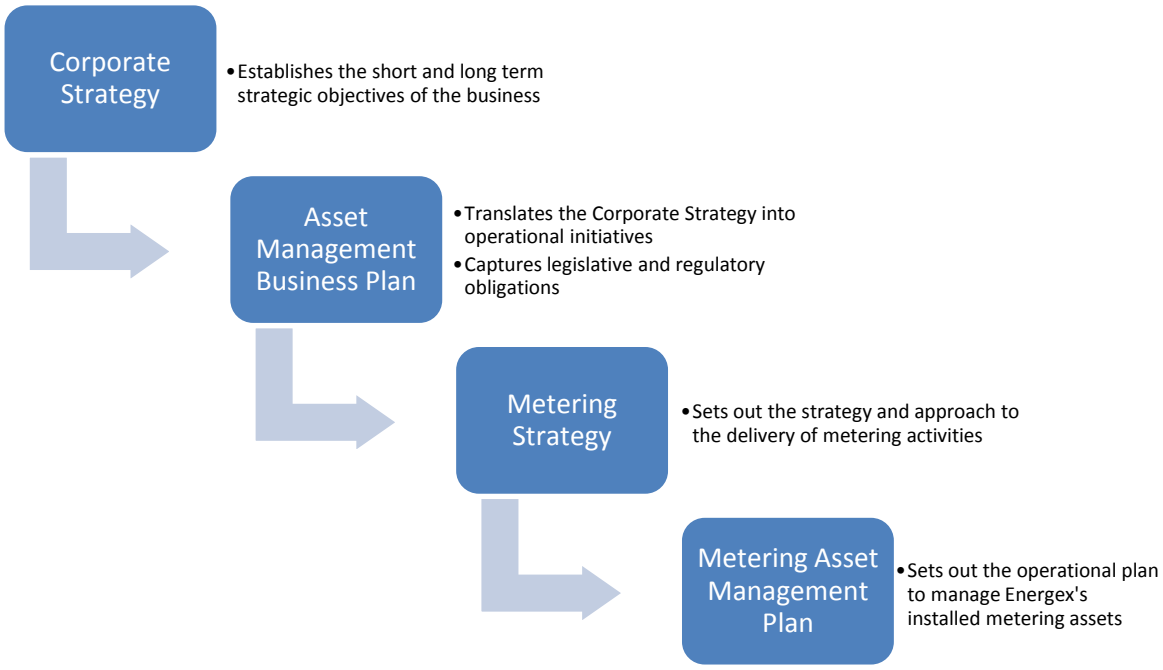
2.2 Vision

Energex aims to provide cost-efficient, reliable and safe energy supply to all customers in the South-East Queensland region. Metering is a key interface between the network and the customer and performs a critical role in providing customers and the market with energy consumption data. Equally, metering also performs important network management operations that assist Energex in managing its network assets efficiently and effectively, thereby providing customers with cost efficient outcomes in terms of network services.

Energex's vision for metering is to provide cost effective and efficient products that enable choice for all customers across the Energex network. This ensures that customer needs are met while also ensuring meters provide appropriate services back to the network so that all customers benefit from a cost-effective and efficiently managed and operated network.

2.3 Energex Strategic Overview

Figure 1: Energex's Strategic Planning Process for Metering



3 Current Metering Environment

Energex is responsible for the management and maintenance of 2.2 million meters and 690,000 load control relays located at 1.4 million customer premises throughout its distribution area. Energex conducts around 7.2 million site visits each year to read and service meters ensuring all customers, as well as retailers and other market participants, have access to appropriate metering products and billing data.

3.1 Energex's Existing Metering and Load Control Assets

3.1.1 Current Metering Assets

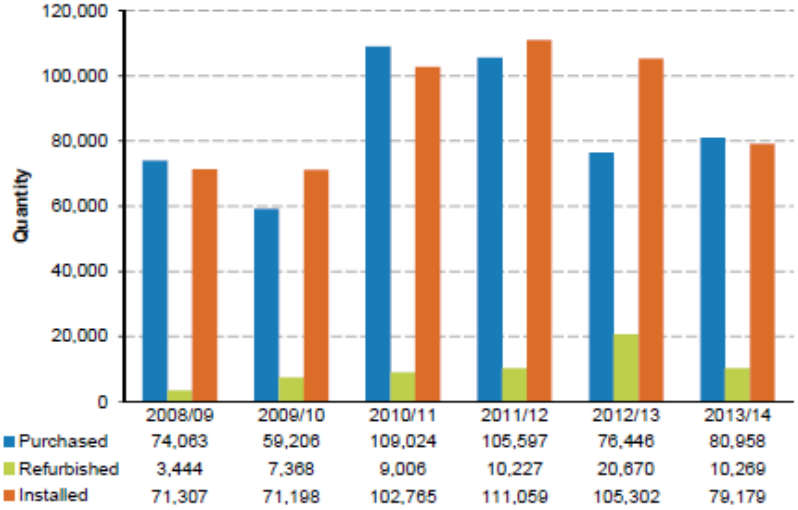
Energex's current fleet of meters includes 1.59 million electro-mechanical (disc type) meters and over 607,000 advanced meters installed across the network. In 2003, Energex changed from purchasing electro-mechanical meters to advanced meters, with electro-mechanical meters continuing to be refurbished and reused until 2006. From 2007, Energex's new and replacement meter policy for small customers was changed as required by a Queensland Government direction (20 June 2007) to require that all new and replaced meters be "capable of being upgraded for use in a type 4 metering installation without the need to remove the meter".

Energex implemented the Queensland Government direction by purchasing advanced meters with a port that allows a communications device to be connected to enable remote reading. These meters measure and record electricity consumption in 30 minute intervals but are read as Type 6 meters for billing purposes. The interval data collected can be manually downloaded from these meters via the optical port if required.

Energex also has 4100 advanced meters installed at distribution transformers, for network purposes, to monitor power quality performance at the junction between the 11 kV and LV network. In addition to continuing to install these meters with new and replacement distribution transformers, Energex will seek funding in the 2015-20 regulatory period to install additional meters at the end of LV circuits in areas assessed to have a higher risk of voltage quality issues (e.g. high solar PV penetration areas with long lengths of overhead circuit).

Energex's meters are managed in accordance with the Metering Asset Management Plan (MAMP). Managing metering assets in a cost-effective manner that matches the changing competitive landscape will be a key challenge for Energex between now and 2020. Table 1 (below) outlines Energex's historical metering installation and purchases between 2008 to now.

Table 1 – Historical Meter Usage July 2008 to June 2014



	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Purchased	74,063	59,206	109,024	105,597	76,446	80,958
Refurbished	3,444	7,368	9,006	10,227	20,670	10,269
Installed	71,307	71,198	102,765	111,059	105,302	79,179

3.2 Load Control

Energex operates an audio frequency load control (AFLC) system that is used to control over 700,000 appliances at customer premises. Hot water load control has formed a fundamental component of Energex's network management over many years and is fundamental in the design of the low voltage distribution network. This successful load control program provides benefits for Energex and customers through the capability to address system wide as well as localised peak demand. Energex is continuing to expand the load control program with over 30,000 additional appliances added since 2010.

Energex's current fleet of load control equipment includes 600,000 separate load control relays and 90,000 advanced meters with an integrated load control relay.

3.3 Current Metering and Systems Capabilities & Limitations

3.3.1 Data Management & Systems Limitations

As Type 6 meters in Energex's distribution area transition to smart meters the volume of data flow from meters will increase. Instead of four meter readings per year Energex systems will be required to process and store forty-eight interval readings per day. Current systems are built to manage current quarterly read requirements and have limitations regarding the amount of data that can be read, managed and stored. Significant increases to data volumes will require upgrades to Energex data management and data acquisition systems and processes. These current systems are capable of:

- Managing the current volume of 2.2 million Type 6 meters (with allowance for population growth);
- Processing and storing interval data from up to 50,000 meters;
- Remotely reading and managing data from up to 30,000 remotely read interval meters; and
- Managing data volumes from the current network management and monitoring system.

4 Drivers of Change in Metering

The metering environment is changing rapidly driven by a range of national market reform initiatives to make metering services contestable. While Energex is supportive of the development and introduction of a national competitive metering market to provide customers with a range of choices in metering and related services, Energex needs to ensure that cost-effective metering is available to all customers in South-East Queensland.

4.1 Changes in the Regulatory Environment

4.1.1 Power of Choice

The regulatory environment for metering in Queensland is currently undergoing significant reform. The COAG Energy Council has tasked the AEMC to introduce changes to the National Electricity Rules to develop a competitive framework for the delivery of metering services in the National Electricity Market. The AEMC's rule change process is underway and the final rule changes are expected to be implemented by 2016.

To support the introduction of a contestable metering market the AER is introducing rules, to change Type 6 meters from Standard Control Services (SCS) to Alternative Control Services (ACS). Allowance is made by the AER for load control assets used for network purposes to remain as an SCS.

4.1.2 National Minimum Smart Meter Functionality

The COAG Energy Council has tasked the AEMO to provide further advice on minimum functionality for smart meters by October 2014, and a shared market protocol for smart meter communications by February 2015.

The current National Smart Meter Minimum Functionality Specification (NSMMFS) is still in draft form with many details yet to be finalised but once finished will dictate national metering functionality requirements.

4.1.3 Queensland Government Policy

In its 30 year strategy for Queensland's electricity sector (PowerQ) the Queensland Government outlines policies to develop a metering strategy to give customers more information about their electricity usage, to support greater choice in managing their costs and to address longer term price pressures.

To effect policy change the Queensland Government plans to continue participation in national reforms and to co-ordinate this with the delivery of complementary jurisdictional reform in metering and other supporting areas (such as tariffs).

As a first step in this range of policy initiatives, the Queensland government is introducing price monitoring for small customer electricity tariffs in Queensland from 1 July 2015.

The Government has identified that the current active functionality of meters in Queensland limits options for customers to access new types of tariffs, more frequent billing and other similar product innovations. To address these limitations the Government supports a market led approach for advanced metering through which consumer needs drive the roll-out of meters with remote communications functionality.

The Government also envisages that the rollout of advanced metering will help transition the network to be a smarter grid incorporating advanced metering, communications and control.

4.2 Changes in how customers use electricity

Recent increases in electricity prices and advances in technologies have driven a decrease in customer electricity consumption and acceleration in the adoption of energy efficient products. Into the future, customers will continue to look for efficient appliances which reduce their energy consumption, potentially also seeking to link these to home energy management systems to automate management of their energy costs in response to changed market conditions. Advanced meters may play a role in assisting customers with automation and enhanced home energy management.

There is a significant penetration of solar PV generation across the Energex network with over 800MW installed by over 270,000 customers across the network. The penetration of solar PV continues to grow and with the ongoing reductions in the costs of solar panels, growth is expected to continue for the foreseeable future. The recent changes to the Feed-in Tariff (FIT) encourage customers to consume more PV in the home, rather than exporting to the grid.

As a result of the change in FIT, solar PV businesses are also adjusting their business models to recognise the potential benefits of combining emerging technologies, such as energy storage (batteries), with solar PV. Advanced metering will play a key role for customers seeking to minimise their costs through a combination of storage, solar PV and new tariff offerings.

4.3 Changes in Metering Technologies and Market Forces

As advanced meters become widely available in the marketplace a range of market participants will leverage opportunities to provide customers with extra benefits through the activation of remotely read capabilities. Market participants such as retailers are beginning to invest in metering platforms while new technology providers and aggregators are investigating options to interface to a new array of technologies and capabilities within customer homes and businesses. Additionally major technology companies such as Apple and Google are entering the home automation and appliance control market which is likely to drive further innovations in metering, billing, tariffs and home energy automation.

4.3.1 A Vision of 2020

In examining the drivers for change, trends emerge identifying the role that metering could look like in 2020. Some possibilities include:

- Greater use of battery storage in combination with embedded generation (solar, gas) enabling customers to interact with new tariff options and increasing levels of energy independence;
- Automated, real-time customer participation in a national Demand Response market, through advanced metering platforms, in response to price signals;
- Widespread deployment of third party owned smart meters;
- Integration of Home Area Networks with advanced meters to automate management of household appliances in real-time, including managing greater numbers of smart appliances;
- Increasing penetration of electric vehicles in the automotive market with automated charging to take advantage of more dynamic price signals; and
- Increased participation and competition in the energy market with retailers, aggregators and other third parties providing arrays of offers to customers, using advanced meter capabilities to manage their energy and costs leading to new industry relationships, partnerships and business models.

While some of these factors will increase utilisation of the Energex network if managed well, others have the potential to negatively affect network management. Energex's metering programs will need to adapt to these changes as they unfold, if they are to remain relevant and efficient in maintaining cost-effective network operations.

5 Energex Metering Strategy 2015-2020

While Energex has been installing advanced meters for some years, the bulk of the current fleet of meters in use in Energex, while fit for purpose to provide billing information for the current range of tariffs used by small customers, will not enable the network to transition to a more intelligent, capable and connective state and will not support the transition to demand based pricing structures.

Energex believes transitional rules are needed to ensure that safe reliable and cost effective metering and load control services remain available to customers during the introduction of a competitive market for metering.

The transitional framework and strategies outlined below are designed to continue to provide basic metering services cost effectively to customers, opening up choice to customers who want the capability of an advanced meter, while also providing Energex with enhanced network management capabilities into the future.

5.1 Transitional Metering Arrangements & Framework

Energex is seeking support from the Queensland Government to develop a number of transitional rules to minimise overall costs of implementing metering contestability to Queensland's electricity customers while enabling the networks to operate efficiently into the future. This strategy does not prevent Energex customers being able to choose to have a meter installed by other parties/meter providers.

Key elements of the transitional framework will need to include:

- Maintaining the derogation that requires the networks to be the exclusive provider of Type 6 metering;
- Enabling distributors to remotely read advanced meters for network purposes while the meters remain treated as Type 6 in the NEM;
- Ensuring that investments made in good faith by the networks are kept whole, by introducing an exit fee for meters (removed and replaced by the market) that reflects the depreciated average value of the existing metering system;
- Requiring third parties that install new meters to 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;
- Requiring networks to install advanced meters that meet the NSMMFS for new and replacement programs; and
- Implementing regulation and accreditation processes for third-party installers to ensure the safe and compliant installation and operation of metering and load control.

Energex's transitional plan will review work practices and supporting standards, such as the Queensland Electrical Connection and Metering Manual (QECMM), to ensure these align with the introduction of a contestable marketplace for advanced meters.

5.2 Removal of Metering Assets from the Regulated Asset Base

Energex is moving its metering assets out of its Regulated Asset Base (RAB), where costs are recovered through Standard Control Services (SCS), to a separate Metering Asset Base (MAB), where costs are recovered through Alternative Control Services (ACS). This will ensure that the costs of metering can be identified separately from other network costs. This also means that if a customer chooses to replace their existing meter with a third-party meter, that the ACS metering charge will be removed from their bill, however it is proposed that the customer will be charged an exit fee to recover the average depreciated value of the removed metering assets.

5.3 Management & Operation of New & Existing Type 6 Meters

Energex will to continue to maintain and provide Type 6 meters to the South-East Queensland customers. This enables Energex to continue to provide a low cost metering option to the many customers in the Energex network who are not ready or willing to pay to upgrade their meters.

Existing meters will be managed in accordance with the MAMP which will be reviewed and updated to ensure relevance to business direction. Energex notes that, with the emergence of a competitive market for meters, that the cost to service the existing population of Type 6 meters is likely to increase over time with reducing economies of scale.

5.3.1 Use of Advanced Meters in 2015-2020

To support the changing metering environment, and to ensure that Energex meters are able to meet future operational requirements, Energex will continue to select and procure advanced meters, which comply with national and jurisdictional metering rules, for use in new and replacement situations during the 2015-2020 period.

5.3.2 Protecting Metering Revenue & Maintaining Efficient Operations

Energex will maximise the value from existing metering assets by:

- Minimising operating and capital expenditure on existing metering assets;
- Upgrading existing meters where capable rather than replacing meters;
- Maintaining aged assets to the standard required in the MAMP; and
- Updating the MAMP to reflect business direction and metering strategy.

5.4 Maintain & Project Load Control Capability

Under the AER's Framework and Approach, load control relays continue to be treated as a SCS. Accordingly Energex will utilise separate load control devices installed on customer meter panels.

Meter providers who install new meters for customers will be required to retain the existing Energex load control equipment installed on the customers meter panel.

Energex will continue to operate the load control system to ensure optimal utilisation of the network and to minimise the need for augmentation.

5.5 Use of Advanced Meter Functionality for Network Purposes

Energex will install remote communications on advanced meters in circumstances where this provides clearly beneficial and cost-effective management of the network. This will be complementary to the current program to install network meters for monitoring the low voltage circuits of distribution transformers.

Examples of reasons that Energex may seek to install remote communications and use the functions enabled by advanced meters could include some of (but not limited to) the following:

- Low Voltage Power quality investigations;
- Monitoring of solar PV and/or battery installations;
- Difficult read sites or sites requiring frequent reads;
- Targeted installations in constrained areas to support demand management programs to avoid network augmentation; and
- Sites with high rates of move ins/move outs to reduce the costs of disconnecting and reconnecting customers.

Energex will seek a Queensland Government derogation to ensure that advanced meters read remotely for network purposes remain treated as Type 6 in the NEM.

6 Long Term Strategic Implications

6.1 Adapting Metering to the Changing Market in Queensland

The cost to manage and service the remaining fleet of Type 6 meters will increase over time as customers select to have meters installed by third parties.

Queensland regulations make it the responsibility of the customers to upgrade their meter panel or switch board when alterations or additions are carried out to their electrical installation. This can be a significant cost to customers and act as a barrier for lower income customers in older suburbs to upgrade to having a new meter installed.

To facilitate the changing market, to ensure that customers receive choice in a contestable market and to ensure that all customers continue to have access to quality metering services Energex will:

- Ensure that new meters installed are capable of providing a range of suitable future capabilities (as per the NSMMFS) to the customer, retailers and networks so that customers who choose not to upgrade meters continue to access a meaningful range of market offers;
- Ensure the cost-effectiveness of metering services to customers who do not seek to upgrade their meters; and
- Retain load control for network management purposes.

Energex's metering strategy is designed to complement current work on tariff reform and will continue to be updated as new pricing structures emerge and as new load control strategies are developed.

7 2015-2020 Operational Requirements

7.1 Future operational requirements

Following the introduction of the competitive market for metering Energex will still be required to manage and operate a fleet of in excess of two million Type 6 meters for the 2015-2020 regulatory control period.

7.2 Forecast Metering Operations 2015-2020

Energex installs new customer metering for the following reasons:

- New customer connections;
- Replacement of faulty meters;
- Upgrade due to new metering requirements, or solar PV installations; and
- Programmed replacement of old meters.

The forecasts outlined below are based on anticipated meter replacements and installations as driven by the outlined factors. This forecast forms the basis of budget for the 2015-2020 metering program. Replacement programs outlined here are in line with the Energex MAMP.

Table 2 – Metering forecasts for the 2015-20 regulatory control period

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
New Metering Connections	72,060	68,233	67,841	68,283	70,111	346,528
Replacement of old meters	35,000	40,000	42,000	42,000	41,000	200,000
Total	**107,060**	**108,233**	**109,841**	**110,283**	**111,111**	**546,528**

7.3 Systems Required to Manage Data Volumes from Third-party Meters

Energex's meter data management systems are designed to cater for current requirements, and will eventually be incapable of managing data volumes driven through increased quantities of interval data.

Estimated impacts and upgrade requirements through addition of third-party smart meters across the Energex network are outlined below:

- 0 – 50,000 meters: no changes required, within existing system and storage capacities;
- 50,000 – 250,000 meters: upgrade of data storage capability ($100K);
- 250,000 – 500,000 meters: more storage ($100K) and system rewrite of the module that creates network bills ($200K+); and
- 500,000 + meters: duplicate meter data system and hardware ($1M+).

Energex aims to only invest in new systems once the scale of the market for third-party smart meters is understood and only when a positive business case is presented for any system enhancements or when an upgrade is required for compliance purposes.

7.4 Systems Required to Manage Data for network management

In the short term Energex aims to utilise existing data systems for transformer monitoring meters to understand what information provides tangible value. (Note: These systems are limited in scalability.)

Once the business requirements are understood for data management expansion, Energex will look to procure appropriate end-to-end services to provide and install communications to network devices; read process; and analyse data and provide the information required to effectively manage the network.

8 Glossary

Term	Definition
Advanced meter	Meter capable of being upgraded to a Type 4 when fitted with a communications module
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
COAG	Council of Australian Governments
Electromechanical Meter	Meter capable of recording accumulated energy use
MAMP	Metering Asset Management Plan
NER	National Electricity Rules
NSMMFS	National Smart Meter Minimum Functionality Specification
Smart Meter	Advanced meter with fitted with a communications module enabling remote communication capabilities
Metering Categories from NER	
Type 4 Meter	Remotely read meter with 30 minute energy consumption data
Type 5 Meter	Manually read meter with 30 minute energy consumption data
Type 6 Meter	Manually read meter with accumulated energy consumption data