

Smart electricity meters revisited

A roll-out programme to introduce smart electricity (and gas) meters into consumers' homes starts in 2016.

Geoff Cronshaw provides an update on the newest developments with smart meters since our last article on this subject in 2010.

The [Department of Energy and Climate Change](#) (DECC) is directing energy suppliers to start a [roll-out programme](#) to introduce smart electricity and gas meters into consumers' homes from 2016. The programme is expected to run through until 2020, with the aim of helping customers to better manage their energy consumption.

These smart meters will provide customers with information on their energy consumption via a visual display. This information will then be stored and will be accessible to the energy supplier from a remote location, thus avoiding the need to have a meter reader visit the site.

As well as putting an end to estimated bills, this technology will also allow customers access to information on any energy sold back to the energy supplier where the customer has a microgenerator installed, such as a wind turbine or solar photovoltaic (PV) panels.

What is a smart meter?

A smart meter is an electricity, or gas, energy meter that incorporates a communications unit.

It is understood that, in most cases, smart meters will use wireless technology to communicate between the meter and the communications hub within the premises. To transmit the meter reading data to the energy supplier one of two communication options will be used; either radio or mobile phone technology. Mobile phone technology will be used in central and southern England, while in the north of England and Scotland radio technology will be used.

In the future, smart meter systems may be capable of controlling the consumer's load (with their consent) by sending signals to their appliances to switch them off at peak times etc. It is also expected that the smart meter will offer suppliers the opportunity to provide innovative flexible tariffs.

Who is responsible for installing the smart meters?

At this point it is worthwhile explaining how the UK electricity industry works. Distribution Network Operators (DNOs) own and operate the distribution network of towers and cables that carry electricity from the national grid transmission network to homes and businesses. The selling of the electricity to consumers is undertaken by the electricity suppliers.

Electricity suppliers are therefore responsible for the installation of the smart electricity meters but this work may also be carried out by their agents. The smart meter roll-out programme is probably the largest project ever undertaken within the UK electricity industry. It is estimated that around 50 million meters (gas and electricity) will have to be changed and some 28 million homes will have to be visited.

The smart meter roll-out programme is planned to commence in 2016 with suppliers being required to use all reasonable endeavours to complete the installation of all their customers'

meters by 2020. In order to achieve successful completion within the challenging timescales, all the industry parties involved are recruiting and training new staff.

What you need to know

The [Energy Networks Association](#) (ENA) represents the interests of its member companies who operate the national and regional networks for energy to transport gas and electricity into UK homes and businesses. The ENA has created a [Service Termination Issues group](#), which will identify the various issues that can be encountered with network equipment when installing a smart meter and communicate these effectively to installers.

In partnership with the Association of Meter Operators, the ENA has produced a Service Termination Issues Guide to assist meter installers to identify and accurately report network equipment issues to the local network operator. This comprehensive guide lists a range of defects and issues that a meter operative may encounter when installing a smart meter. It also provides meter installer checklists and processes for various installation types, with descriptions of reporting and rectification processes to ensure that issues associated with distribution-owned equipment are resolved efficiently.

In addition, the ENA has set out clear descriptions of a wide range of operational issues in order that these can be accurately identified and reported by the organisations responsible for the smart-meter installation. Operational issues include:

- identification of service position faults;
- damaged distribution owned equipment;
- polarity issues;
- fused neutral cut outs;
- faulty earth connections; and
- signs of overheating, etc.

A typical defect could be that the cut out is showing signs of overheating if, for example, it is leaking bitumen. For many years bitumen has been used to fill voids and seal joints in electrical equipment. It has a relatively low melting point, so bitumen leakage may indicate overheating. The cause of any leakage may be historic, for example, if previous load patterns or the ambient temperature at the service position are very different to present day arrangements. Alternatively, the cause may be related to an ongoing issue. The guide gives a suitable code for this and advises on the action to be taken to report it correctly.

During the installation process there may also be issues relating to data communication and possible issues with the consumer's electrical installation itself but these are covered in other guides developed by suppliers and meter operators.

What effect will the IET Wiring Regulations (BS 7671) have on the installation of smart electricity meters?

As mentioned in the previous article, systems for the distribution of electricity to the public (such as metering equipment) are outside the scope of the IET Wiring Regulations (BS 7671). The distribution of electricity to the public is controlled by the Electricity Safety, Quality and Continuity Regulations 2002 (as amended), which is published by the Department of Business, Innovation and Skills (BIS). The issue of smart metering is therefore not within the scope of BS 7671.

However, it is important to point out that meter tails from the electricity meter to the consumer unit are part of the consumer's installation and the IETs On Site Guide gives guidance on this area.

The British Gas example

British Gas recently announced that it had installed its 1.5 millionth smart meter at a home in Leicester. That is an incredible achievement, so we thought this would be a good point to get in touch with British Gas and get their view.

When we spoke with British Gas, they confirmed that having a smart meter means an end to estimated bills and, so far, has actually resulted in fewer complaints to the company. In addition, consumers have more insight into their energy use – which in turn drives down their energy bills.



Features of the smart meters include an in-home display unit showing how much energy is being used in near real time (in pounds and pence) and the ability for consumers to set budgets, compare energy use over time and see the impact of energy efficiency measures in their homes. As a result, 79 % of British Gas smart meter customers are more aware of their consumption and 90 % are taking steps to reduce use by using the information on the in-home display. The savings for a British Gas dual fuel customer are on average around 2 %.

British Gas is currently trialling Smart Pay As You Go with customers who have prepayment meters. The company is also creating new apps that give smart meter customers information about their energy use on their phone.

Interview with Daniel Colford, British Gas Smart Energy Expert

Are there any specific considerations you need to take into account when doing installations of smart meters?

When a member of our customer service team first speaks with a customer about smart meters, they'll ask some standard questions to check their eligibility. But technology is evolving all the time, so there aren't as many considerations to factor into the installation process now.

We'll need to check that a customer lives in an area with good mobile phone signal; it can be any network as we use roaming technology. This is because we'll need a signal for the smart meter to communicate with us centrally to get the meter readings.

It's also better if existing meters are located in easier-to-reach areas. It doesn't matter what sort of condition the meters are in either, as we'll upgrade the electrical cables and the gas pipe-work as needed.

How do consumers generally feel about having these smart meters installed as part of the roll-out programme?

We talk to our customers all the time about how they are finding the experience. Nine out of 10 of a base of 1,500 customers surveyed (November 2013) said that they were already taking daily steps to review what energy they were using.

When I go to customers' homes, I find that we get really good feedback once we've installed the smart meters. Customers can see for themselves where their money is going. As they boil the kettle or switch on lights, they can see in pounds and pence how much energy they're using on their in-home display.

A lot of people like the fact that smart meters mean an end to estimated bills as the readings are sent back to us directly. Lots of customers like the reassurance that they know we're getting the information we need without needing to take calls from us to check readings.

How do electricians and installers get involved with this programme if they are already working with British Gas?

We have already supported a number of existing British Gas employees moving across to become Smart Energy Experts.

It is possible for existing British Gas employees to be trained to be dual fuel Smart Energy Experts. We have training courses that reflect any existing industry recognised skills so that only new skills and capabilities are covered.

Overall, we look at the needs of the business and the appetite of a number of our employees to be up-skilled in smart metering before we deliver any training. This would take place at one of our six training Academies located across the country.

Special thanks to Energy Networks Association and British Gas for information in this article.

Further information can be gathered from: Department of Energy and Climate Change Business Innovation and Skills Energy Retail Association Energy Networks Association.