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value for all customers*

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Dear Sir/Madam

RE: New metering technology in public lighting.

This letter discusses a new technology for public lighting known as Central Management Systems (CMS) and in particular those types of CMS with a measuring capability. We seek your views on our intention to facilitate deployment of this technology by developing a standard to allow its approval for use as a meter, where it can be shown to provide accurate measurement¹. Some types of CMS can remotely meter and control public lighting and we believe these could yield significant environmental and economic benefits for customers and the industry as a whole.

Until now, perceived legal barriers have prevented CMS being used to its full capacity. However, under our reading of the legislation, CMS can be approved for use in its fully functional form provided it meets certain technical standards. This letter outlines the necessary steps we wish to take in order to facilitate this technology. We seek your views on how these changes and CMS measurement technology itself will affect the market.

Current practices in public lighting supply

The supply of public lighting is currently based on estimates of consumption ("unmetered supply") rather than readings of actual consumption ("metered supply")². Consumption is estimated based on either the number of street lamps, the wattage of each lamp and either the expected amount of time the lamp will be switched on for, or the operation of a nearby light sensitive switch³. Public lighting accounts for around 1% of total electricity demand, based on Elexon estimates⁴.

Most public lamp columns are controlled using light sensitive switches and can only be switched on/off rather than dimmed. The lack of any means to accurately measure supply of public lighting or precisely control lamp columns remotely causes the following inefficiencies and adverse environmental impacts.

- Many lamp columns are on longer than desired by the purchasing authority. Consumption is therefore higher than it would otherwise be.

¹ As with all meters, the Authority would only approve CMS as a meter if it is demonstrated to be capable of accurately recording the quantity of electricity used.

² Although there are some exceptions where a separate cable enables metering.

³ A representative photo-electric cell unit (PECU)

⁴ Elexon is the Balancing and Settlement Code Company for Great Britain. Their role is defined and created by the Balancing and Settlement Code (BSC). The BSC contains the rules and governance arrangements for electricity balancing and settlement in Great Britain. In total, unmetered supply accounts for around 1.2% of total demand and according to Elexon public lighting accounts for around 70-80% of unmetered supply.

- Energy use of lamp and control gear varies with the age of equipment, meaning the method used to estimate consumption for unmetered supplies can be inaccurate. Elexon have investigated the accuracy of estimation for *some* types of lamp column (of which there are many). On average they found consumption was underestimated by around 10%. Although Elexon can update estimates for those lamp column types tested, continuously updating estimates for all columns is impractical because of the variety of types and ages of the lamps.
- There is, therefore, little incentive on customers to implement energy saving measures to reduce the level of consumption from public lighting.
- Energy which is used by a party but not charged for is smeared across all consumers as a network loss. If consumption estimates for all types of lamp were 10% under actual consumption, the value of this energy would be up to £23m.
- Inaccuracies in estimation also mean that Distribution Network Operators (DNOs) charge higher Distribution Use of System (DUoS) charges for unmetered supply, reflecting the associated risk premium.

Central Management System (CMS) metering technology

CMS technology for public lighting can consist of two elements; microchips attached to each individual lamp column and associated hardware/IT which enables communication with the microchips. This technology offers variable levels of functionality, the simplest of which allows remote switching of lights on/off, or dimming to varying degrees of brightness. Advanced CMS can also have metering capability and two way communication, provided by the microchip, allowing remote meter reading and fault detection.

As outlined above, the dimming function of simple CMS offers improved control of consumption, potentially leading to significant environmental benefits in the form of energy savings and reduced carbon emissions. The advanced functions of CMS potentially offer further additional benefits over the simple version. The metering function offered by two way communication could reduce smearing by up to £23m across Great Britain through more accurate billing, and could also lead to a reduction in the premium on DUoS charges for unmetered supply described above. Remote fault detection would also reduce costs for authorities in charge of public lighting. These additional benefits offered by advanced CMS could encourage faster roll-out and more extensive use of remote dimming, further reducing consumption and increasing the associated environmental benefits.

We understand that several Local Authorities already have plans to use the remote dimming component of CMS to reduce energy consumption and one county council is currently conducting a trial of the simple version of the technology. To date the full capability of this technology with metering functionality has not been used, mainly due to perceived legal hurdles, which at first sight appear to prohibit the remote meter reading aspects of the technology. These perceived barriers are outlined below.

Perceived barriers to use of CMS

The Electricity Act requires that where a customer is to be charged for the quantity of electricity supplied, it must be through an “appropriate meter”⁵; one which satisfies certain technical specifications. For most meters, these specifications are set out in the Essential Requirements of the European Measuring Instruments Directive (MID) and the associated UK legislation, the Measuring Instruments Directive Regulations (MID Regulations). A key requirement of the MID is that meters must be fitted with a visual display register.

Public lighting, along with other forms of “unmetered supply”, is currently exempt from being supplied through an “appropriate meter” on the basis that it would be prohibitively expensive and impractical to attach a meter to every lamp column in the country. CMS technology potentially makes it feasible to meter individual lamp columns, but under a

⁵ Set out in Schedule 7 of the Electricity Act 1989, available at the following link: <http://www3.dti.gov.uk/energy/markets/consents/legislation/page27935.html>

strict interpretation of the MID requirements, a visual display register would still be required on each column. This undermines the economics of CMS and so far has prevented the full functionality of CMS being used.

In the spirit of better regulation, wherever possible we aim to remove any unnecessary barriers to new technology being brought to market. Although we have only received one approach regarding CMS with metering, other companies have also shown an interest.

Our interpretation of the MID regulations

We consider that CMS technology for public lighting falls outside of the MID Regulations (and hence the obligation to comply with the Essential Requirements) for two reasons. Firstly, the supply of electricity to public lighting is not considered supply for “trade” purposes, and secondly, supply to public lighting is under an agreement where the maximum quantity supplied exceeds 100 kilowatts per hour⁶.

Although under this interpretation CMS would not need to comply with the Essential Requirements, the metering part of this technology would still be regulated under the provisions of the Electricity Act. If used to measure energy consumption, CMS would amount to a “meter” and therefore be classed as “metered supply” for the purposes of the Act.

Next steps

Although CMS is akin to “smart-metering” technology, we do not believe that the introduction of CMS would affect current policy debates on the roll-out of smart meters. This is because Government debates over whether to mandate some form of smart meter roll-out do not extend to public lighting. In any case, since CMS metering technology (subject to approval) would be used only to meter supply that was previously unmetered, issues around stranding and interoperability with existing meters are unlikely to arise.

Given the potential benefits of CMS technology outlined above, with the National Weights and Measures Authority⁷ (NWML), we intend to explore the changes required to allow use of fully functional CMS. Our intention is to develop new technical specifications under the provisions of the Electricity Act against which CMS meters can be assessed. These specifications will ensure the technology complies with all the key elements of the Essential Requirements, but not with those which would deter the use of the technology (in particular, the requirement to have a visual register). We will thereby remove an apparent barrier to the use of CMS technology for metering, while still ensuring that customers using the technology for metering are given sufficient protection.

Questions for consultation

Are there any consequences of proceeding with developing a new standard for CMS technology that we have not considered above?

Are there any potential impacts of facilitating CMS technology for public lighting which might adversely affect the market? This might include new barriers to entry or any negative impact on market participants or customers.

⁶The Measuring Instruments Regulations (2006) state that 3. (1) “A “relevant instrument” is an active electrical energy meter which is used for trade”, and 3. (5) (a) “A relevant instrument is not an instrument which is used under an agreement providing for the supply of active electrical energy where the maximum quantity supplied exceeds 100 kilowatts per hour”. The Statutory Instrument is available at the following link: <http://www.berr.gov.uk/files/file30891.pdf>

⁷ The National Weights and Measures Authority are responsible for policing compliance with the Essential Requirements for meters under the Measuring Instruments Directive (MID). They also check and certify compliance with separate technical specifications for those few meters which fall outside the MID Regulations.

We would welcome any feedback on these questions by 9 May. If you have any further questions, please do not hesitate to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Emma Kelso'. The signature is fluid and cursive, with the first name 'Emma' written in a larger, more prominent script than the last name 'Kelso'.

Emma Kelso,
Head of GB Markets