Climate Change Agreement for Data Centres

Note 04b: Sub-metering

April 2015

This note covers common problems regarding sub-metering, meter readings, estimated data and calculated data. The CCA scheme has to demonstrate robustly that participants are working towards efficiency targets so we need to record efficiency in the baseline year against efficiency in the target year in a comparable way. We are using PUE so these measurements relate to total site energy and IT energy. Both must be cumulative in kWh or MWh. This has created a lot of confusion.

Sub-metering

Sub-metering your IT load is compulsory if you wish to participate in the CCA. No ifs, no buts. By sub-metering we mean permanent meters that record cumulative energy demand and will continue to do so consistently over the life of the scheme. Data must be based on actual readings and not estimated or calculated. This will be reported as cumulative annual IT energy consumption in kWh/MWh together with cumulative energy consumption of the total site, also in kWh/MWh. These figures are used to calculate your PUE. This PUE is set against your base year (BY) PUE and used to measure improvements in efficiency at your site against the targets you have been set. This is not the same as total site sub-metering that is required if a site fails the 70:30 rule. That is a whole other bag of worms.

Why is everyone confused?

Because the IT load tends to be very consistent in data centres, many operators use regular spot meter readings to assess the energy to the IT load and then calculate the cumulative power from those readings. When asked if their energy use is metered rather than calculated or estimated they then say “yes, we read it from a meter.” This is not acceptable for the CCA scheme because it needs to demonstrate that recording of energy consumption is robust, so only cumulative energy will do (i.e. without any calculations!).

Although it is possible for operators to install sub-metering going forward, they cannot do so retrospectively so we negotiated a concession from the EA relating to base year data only. The EA will, on a discretionary basis, allow data calculated from spot meter readings for sites provided the operators can demonstrate that those readings were regular, were representative and were audit able (i.e. that a record was kept that can be checked). The concession applies only to the base year data and not to current data. Sub-metering has always been a condition of entry and MUST be in place before an Underlying Agreement can be issued.

What kind of meters do I need?

Many operators are finding that their meters already have the capability to record cumulative energy so it is just a case of taking the readings. These meters do not have to be particularly sophisticated but their data needs to be auditable. Clip-on /clamp-on meters are acceptable provided they are permanently installed, the data is recorded in an auditable manner and their error margin is acceptable for the requirements of the scheme. Just for clarification here is the statement from the EA’s technical advisers: “If the operator can continuously measure the kWh with a clip-on meter, clip-on sensor, a simple meter or any other option, this is acceptable. The main point for us is that the value is recorded and measured, we want to move away from estimates and measure energy consumption with good accuracy.”

You are not expected to install vastly expensive and detailed metering equipment that will add no operational value. See the end of this note for metering options.

Where do the meters need to be?

See diagram. The EA is not prescriptive about the exact position of the meters (i.e. which side of the UPS/PDU they are placed) but they must be in the same place for the life of the scheme. Consistency and comparability are key.
If you have used spot readings to calculate your IT energy for your base year and these are deemed acceptable by the EA, but you have not yet installed sub meters for the IT load, the new sub-meters do not necessarily need to be placed in the same positions that the spot readings were taken from. The sub-meters should be placed in the preferred position indicated in the diagram above. The EA has clarified as follows: “the permanent sub-meters should be placed where they can most fully and accurately meter the IT energy, irrespective of what was done with spot metering”.

What you need to do
Firstly, sites that have not got sub-metering installed cannot be issued with an Underlying Agreement.

This is the important part:
If your application Base Year data is based on estimations/calculations and is accepted, i.e. you receive a draft Underlying Agreement by email to accept, YOU MUST NOT ASSENT TO ACTIVATE THE AGREEMENT UNTIL YOUR PERMANENT SUB METERING HAS BEEN INSTALLED. For reporting purposes, you will be required to report using actual data, from the date of assent until the end of the reporting period. If you accept the agreement and subsequently install metering at a later date, you will be non-compliant and could incur a penalty for false reporting.

Secondly, it is possible that some applicants have mistakenly ticked the sub-metering box when they in fact are using spot or estimated readings. On the application form, the term ‘meter reads’ refers to permanently installed sub metering, not spot meter reads. This will cause significant problems later on if incorrect information has been provided. You must check that you have indeed correctly represented your metering arrangements.
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**Metering options**
Members have identified several sources of meters; see the links below together with anecdotal feedback. We haven’t tested these meters, this is just indicative that they exist.

“This company offer a fairly cheap and cheerful solution. Also there are some short videos on demonstrating their solution. They offer both current and power sensors to suit.”

“There is also a PQube product that can conduct this function, it has the capability of being networked and feeding back to a central location. The product also has the capability to record data to a memory card held on the device if networking was an issue for anyone. Naturally the device needs to be left in place to act as a sub-meter. I would expect that each unit would be in the region of £750 - £1000 to purchase dependant on the level of function you require from it”
http://www.powerstandards.com/PQube.php “with features explained here:”
http://www.powerstandards.com/PQube.php#feats

**Further information**
If you have queries please get in touch with the helpline: techuk@slrconsulting.com

NB for metering options relating to measuring Generator Fuel (in itself rather a large bag of worms) please see Note 04d