Metering and Monitoring

Aim of Credit

To recognise the implementation of effective energy and water metering and monitoring systems.

Credit Criteria

Three points are available in this credit. The 'Metering strategy' criterion must be met in order to claim any points under the credit criteria.

0	**Effective Metering**	It is a mandatory minimum requirement of this credit that accessible metering be provided to monitor energy and water consumption of all energy and water common uses, major uses, and sources.
1	**Basic Monitoring Strategy**	**1 point** is awarded where a comprehensive monitoring strategy, which includes frequency of monitoring, and estimated end uses, has been developed for the installed meters.
2	**Advanced Monitoring Strategy**	**1 additional point** is awarded where the monitoring strategy (as described above) is addressed through a system capable of capturing and processing the data produced by the installed energy or water meters (or both), and is accurately and clearly presented and reports on consumption trends.

Compliance Requirements

0 - Effective Metering

Distinct uses or floors

Metering should be provided to allow for monitoring of the relevant areas or functions of the project. In most cases floor by floor metering will suffice if the entirety of the floor is a single use. If a floor has multiple uses, consideration should be given to metering the different uses. Therefore, should a floor be composed of office space and a seminar room, both spaces should be separately sub-metered.

A number of examples follow. These are for guidance purposes only.

- In office facilities, consideration should be given to the usage patterns of the building. Floor by floor sub-metering is appropriate if the entirety of the floor is an office area. If a floor has a significant component that differs from the principal use, for example a number of seminar rooms, than this space should be sub-metered as well.

DRAFT CONTENT

- In retail facilities, consideration should be giving to separately meter staff only areas, such as warehousing or office area, from the sales floor, and separately sub-metered from the warehouse.
- In an education building, the metering strategy should address the multiple uses in the facility. The kitchen, computer classrooms, auditoriums, gyms, swimming pool, laboratories, study rooms, classrooms and lecture halls all have different usage patterns. As such, the metering strategy should separately sub-meter those.
- In a building with a large floor plate, energy meters should be provided separately for lighting consumption, and other power consumption.

Water and energy meters

Utility meters must meet metering guidelines under the weights and measures legislation, as outlined under the current National Measurement Regulations. Project teams must verify if existing meters meet these requirements as well as any other utility meters being installed.

Non-utility meters (including sub-meters) must follow the same requirements to those described in the most current 'Validating Non-Utility Meters for NABERS ratings' protocol, issued by the NSW Office of Environment and Heritage.

Non-utility meters are meters that are not owned or managed by the relevant utility. These meters can either be read manually or automatically, even remotely.

Meters must be located in an area that allows regular monitoring and maintenance by facilities managers and other facilities management professional.

Common uses for energy

Common uses of energy are defined as items, or systems, that have a load greater than 20kVA. Possible examples of systems that are considered to have loads greater than 20kVA include, but are not limited to:

- Chillers;
- Air handling units, fans, humidification;
- Server and computer equipment;
- Water reuse systems;
- Kitchen plant;
- Specialist lighting for stages, etc; and
- Specialist equipment.

Where the load exceeds 20kVA for a single system or item, it must be independently metered. Supplementary equipment can also be installed on the same measured circuit as the major use item. However, the total combined energy use of any systems connected to the major use item must not contribute more than 10kVA to the overall energy use.

Common uses for water

Common water uses are defined as items or spaces that individually consume 10% of the projects water use. Examples include, but are not limited to:

DRAFT CONTENT

- Evaporative heat rejection systems;
- Irrigation systems;
- Wash down systems;
- Humidifiers;
- Kitchens; and
- Sanitary blocks (if refurbished as part of the tenancy works).

Energy sources provided by the base building or buildings

Electricity, gas, propane, steam, hot water, chilled water, renewable generation and other sources of energy, are examples of energy sources provided by the base building that may be used by the buildings. Where these are provided, these must be metered for each floor or distinct use.

Water Sources provided by the base building or buildings

Rainwater supply and recycled water supply are examples of water sources that must be monitored, particularly if provided by the base building to the buildings. However, separate metering of rainwater supply is not required if rainwater is used solely for manual irrigation.

Small buildings

If the building is smaller than NLA of 250sqm, unless specialist equipment is present in the buildings, a single meter for energy and a single meter for water will suffice. The utility meter, if accessible to the building manager, is acceptable.

1 - Basic Monitoring Strategy

This strategy must have been developed in accordance with a recognised standard, such as CIBSE TM39 Building Energy Metering. Although this standard has been created to be used for developing energy metering and monitoring strategies, for the purpose of this credit, the same principles described in the standard are to be used for developing water metering and monitoring strategies.

The monitoring strategy must provide information to the building manager on how to read and understand the meter readings. The monitoring strategy should identify how meters should be read, by whom, and how often.

The monitoring strategy must include a metering schedule. This schedule should address the estimated loads for energy and water. It must list:

- The incoming input (electricity, gas, water, etc.);
- The end use (lighting, HVAC, fans);
- The estimated energy consumption for the end use;
- Which meter(s) provide the required information; and
- The individual estimated end consumption.

DRAFT CONTENT

It should also address the location of the meter and the type of meter. The end uses should be estimated and included in the strategy, though if not known at the initial stage, they can be established from the first full month of reading.

2 - Advanced Monitoring Strategy

Automatic monitoring systems are systems that record both consumption and demand of either energy or water. These systems are then capable of processing the information to produce reports on quarter hourly, hourly, daily, monthly, and annual energy use for all meters in the system.

For an automatic monitoring system to function accurately, the installed meters must be capable of producing an output that can be transmitted to a central location (either onsite or offsite). This central location provides data retrieval and reporting mechanism.

The system must be capable of:

- Collecting data from all meters;
- Alerting to missing data due to failures;
- Processing data on energy use or water consumption at user adjustable intervals;
- Raising an alarm when the energy or water use increase beyond certain parameters and automatically email and/or SMS facilities manager;
- Providing a breakdown of the information by building system (mechanical, electric, etc), or by space (or by tenanted floor);
- Including the consumption water or energy, the load versus time (load profile), and the power factor (in the case of energy); and
- Producing, as a minimum, a quarterly report that is automatically emailed to the facilities manager responsible for the building.

For small buildings, this criterion can be met by providing a simple automated metering system that provides an alert to the building manager. Alternatively, offsite monitoring is also acceptable through a central reporting system.

Is the guidance provided sufficient for determining what the monitoring implementation should be?

Is the guidance for small buildings sufficient to develop an appropriate strategy? Are there any other solutions for small buildings?

DRAFT CONTENT

Are there any other options for demonstrating compliance with this criterion?

DRAFT CONTENT

Guidance

Standards relevant to this credit

- CIBSE TM39 Building Energy Metering

Other standards can be submitted for approval through a Credit Interpretation Request. For a standard to be recognised, this standard must:

- Have been developed by an industry organisation;
- Demonstrated uptake by the general construction industry; and
- Be specific to metering, and provide recommendations for appropriate metering, establishing a process for monitoring strategies, and provide requirements for automated systems.

References

- Crossley, D. (2007), 'Advanced metering for energy supply in Australia', Energy Futures Australia for Total Environment Centre
- Sydney Water Corporation (SWC) (2007), Best Practice Guidelines for Water Conservation in Commercial Office Buildings and Shopping Centres.
- Country Energy, 2009, Energy Insights - Encourage reduced consumption, Install Sub metering.

Definitions

Energy

Energy refers to electricity and gas, as well as any other fuel uses.

Small Buildings

Small buildings are defined as those smaller than 250sqm. Buildings with similar attributes to a small building that are outside the area definition can submit a CIR to obtain additional clarification.

DRAFT CONTENT

Documentation Requirements

'Design Review' Submission (Optional)

Project teams are to submit information/documentation marked with an asterisk* for 'Design Review'.

As Built Submission

All project teams are to submit the following documentation:

Submission Template

- Selection of which criteria the project meets*
- Summary of how the project meets the credit criteria*

Project teams are required to provide documentation supporting credit compliance. The following documents may be used to demonstrate compliance, depending on the approach taken by project teams:

- **As Built drawings**

Showing the location of all energy and water meters in the project and the associated energy and water uses; showing how the system is easily accessible to the residents; and confirming the requirements for utility and non utility meters.

- **Extracts from Commissioning Report**

Where relevant, showing the automatic monitoring system is operating and has the ability to provide the information required in the Compliance Requirements.

- **Copy of Monitoring Strategy document**

Specific to the building and including detail described in the Compliance Requirements section of the credit.

- **Automatic monitoring system data sheet**

Describing the systems features and capabilities. In particular, it must describe the system's ability to analyse metering information at regular intervals, i.e. on a daily, weekly, and monthly basis.

DRAFT CONTENT

Please provide feedback on the technical content of this credit:

DRAFT CONTENT