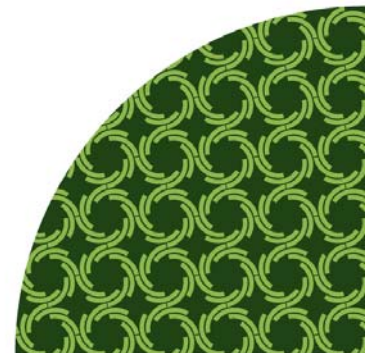




Introduction to

CETA

For **AIRAH**



The Australian Market

Demand Side

Industrial

Commercial

- Office Buildings
- Hospitals

Residential

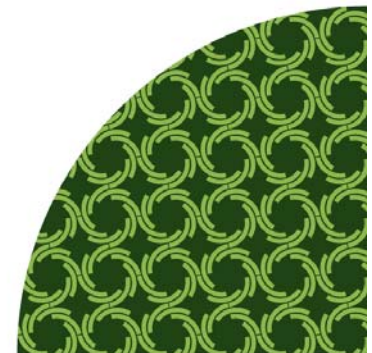
- Mixed use & multi-residential high rise
- Urban redevelopment projects

Educational Facilities

- Universities
- Private Schools
- State Schools (PPP)
- Defence

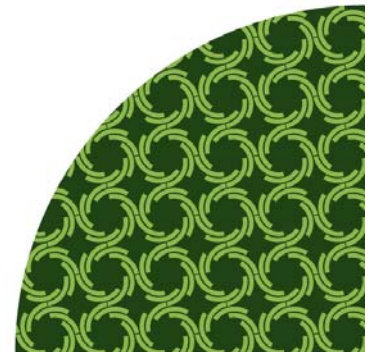
Supply Side

- Power generators & Sub-stations
- Transmission & distribution
- Retail



Collaboration Opportunities

- **Electrical Contractors**
- **Electrical Engineering Consultants (get written into specs)**
- **Mech Services Contractors**
- **BMS Co's**
 - Johnson Controls – BACnet
 - Honeywell – Modbus
 - Dalkia – Modbus
 - Various others
- **Board Builders**



Metering

Generally there is five levels of power meters in a typical commercial or residential building and they are normally connected to either a **BMS** or a dedicated **EMS**.

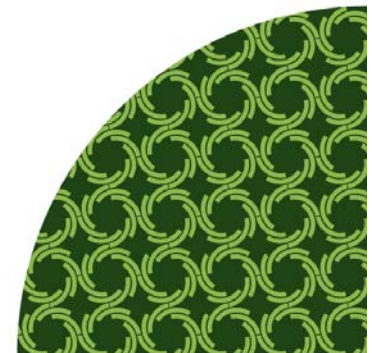
Power Quality Energy Meters (**M1**) – meters installed on consumer's mains entering the MSBs.

Advanced Multifunction Meter (**M2**) – meters installed in MSBs

Intelligent Energy Meters (**M3**) – meters installed on sub-main DBs.

Energy Meters (Pattern Approved) (**M4**) – Commercial or Residential tenancy sub-meters.

Optional Single phase Meters (**M5**) – meters installed on specific equipment or final circuits.



EMS or BMS

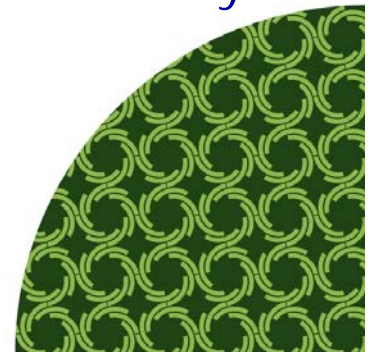
Fit for purpose

There is a "Green Paper" on this topic on our web-site at

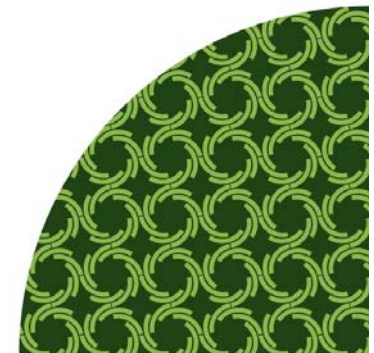
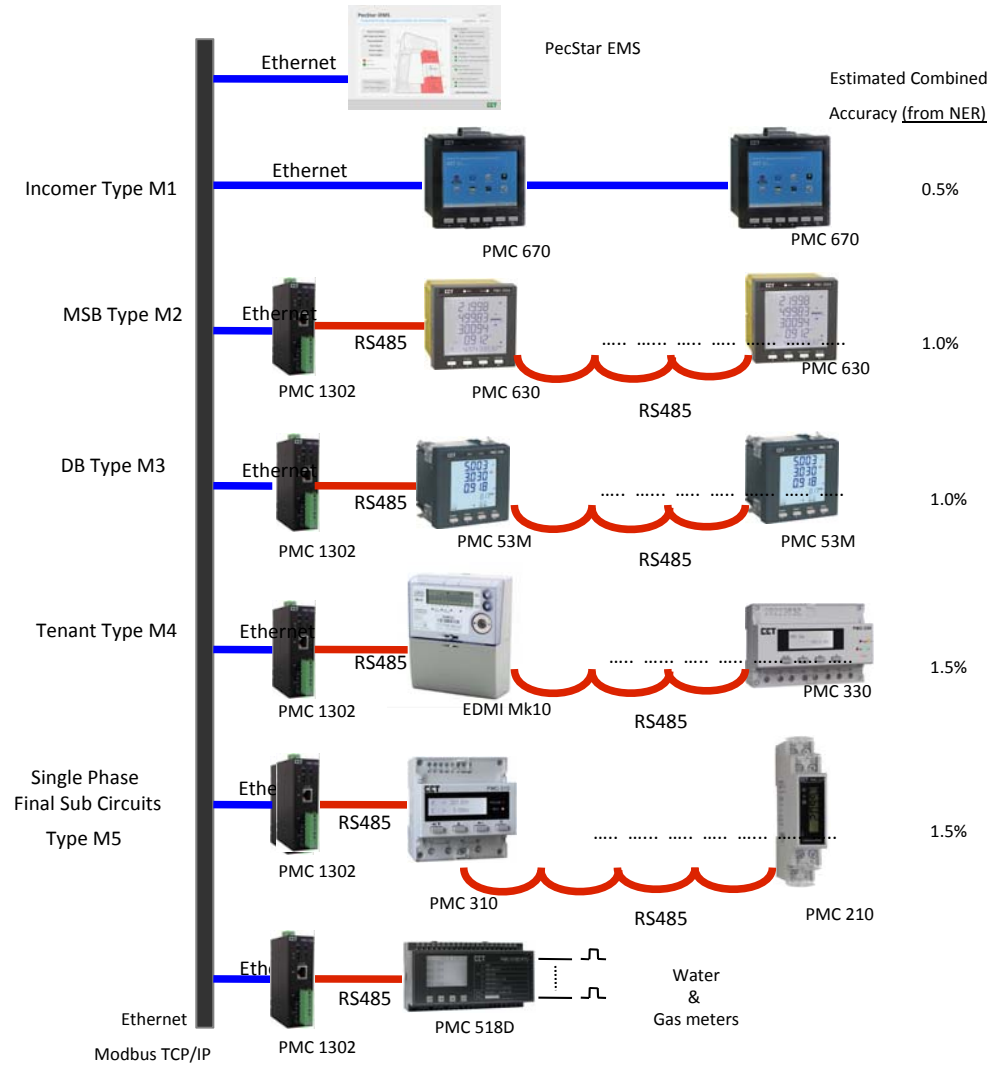
<http://www.cetameter.com/nabers-green-star-cbd-bca-and-nmi-implications-metering-australian-commercial-buildings>

The main differences are...

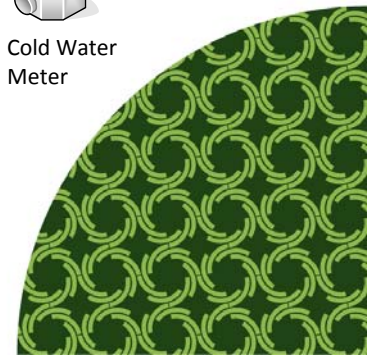
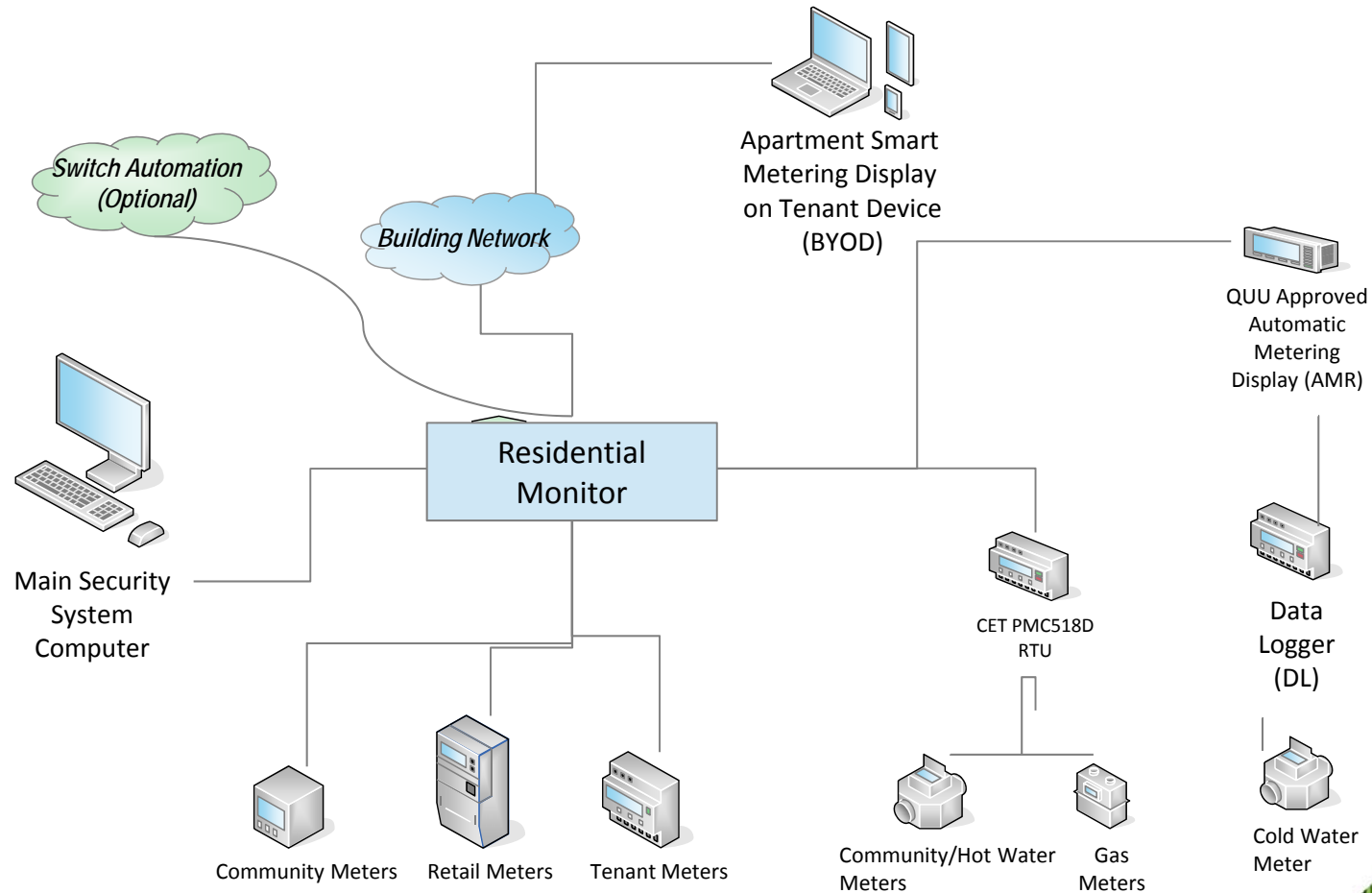
- Lost data in BMS because of shut downs and maintenance can mean non-compliance for annual NABERS Rating.
- Lack of ability to read log files by some BMS
- Lack of ability to handle PQ data and wave form files by some BMS



Typical Commercial Building EMS Solution



Multi-Residential Solution

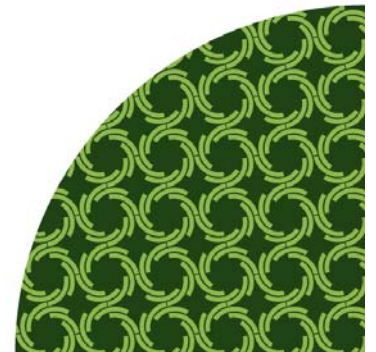


Metering

There are two main types of metering.

1. **Energy Management** meters range from a small single phase, single DIN final circuit meter to a very advanced Power Quality meter with many other options in between. Energy Management meters tend to be much smaller in physical size than a PA meter and they usually use an open source protocol like Modbus or BACnet.

2. **Pattern Approved and Verified** meters are a legal requirement for any meter used for trade. i.e. Billing meters. At the moment these meters tend to be large surface mount meters although there is smaller DIN rail type under development. These meters usually are either pulse output or use a proprietary protocol.



Metering Pitfalls

Understanding Meter Specifications.

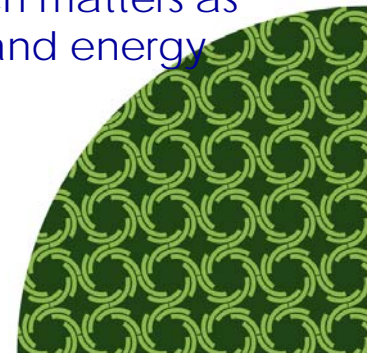
- Accuracy Class 1 or better for Tenancy meters. (NER)
- Accuracy for combined Meter and CT is summation of errors.
- Accuracy Class 0.5S for energy management metering.
- Accuracy from 1% to 120% of "In" not 10% to 120%
- Start current from 0.1% of In not 1%.
- NABERS Validation process requiring meters to have load applied

The best integrated solution including Mechanical Meters will be from a single vendor with a proven performance track record in Australia. This will ensure the most cost effective solution with the least amount of integration risk.



Driving forces for metering

- **NMI (National Measurement Institute)** NMI is responsible for maintaining Australia's units and standards of measurement for trade purposes.
- **NABERS** (National Australian Built Environment Rating System) is a performance based, national rating system that measures the environmental operational performance of Australian buildings.
- **Green Star** is an Australian national voluntary environmental rating system for buildings. In contrast to NABERS, Green Star primarily evaluates the design and construction of new and refurbished buildings rather than their operational performance.
- **CBD** (Commercial Building Disclosure) is a national program introduced in 2010 that mandates under federal law the disclosure of energy efficiency information for commercial office spaces of 2000 square metres or more to buyers and tenants.
- **BCA** (Building Code of Australia) The BCA contains technical provisions for the design and construction of buildings and other structures, covering such matters as structure, fire resistance, access and egress, services and equipment, and energy efficiency as well as certain aspects of health and amenity.

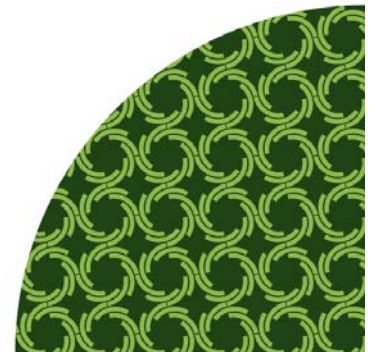


Pattern Approval

There is a “White Paper” about this topic on our web-site at

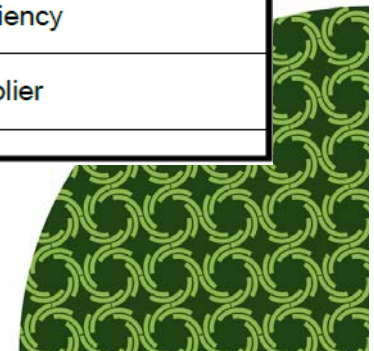
<http://www.cetameter.com/pattern-approved-electrical-metering-australia>

- Grandfathered Meters (Acceptance of)
- Amendments proposed by NMI.
 - To align NMI M6 with OIML R46...Accepted (International Organisation for Legal Metrology)
 - To lower impulse test for sub-meters to 6KV...Rejected
- New DIN PA Meter coming soon



Pattern Approval

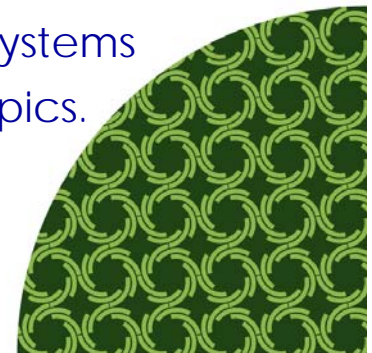
NMI Pattern Approval Implications for a TYPICAL COMMERCIAL BUILDING			
METER SERVICE	METER PURPOSE	NMI PATTERN APPROVAL REQD	COMMENTS
Supply Gate Meter	Revenue/Billing	YES	Billing and Tax Calculations
Incomer/check meter	Supply Check Meter and Power Quality Meter	NO	Energy check meter for quantity and quality
Main Switch Board MSB	Power distribution to DB's and other Services	NO	Energy Management/Efficiency
	Common services divided among Tenants	YES	Outgoing calculations
Distribution Board DB	Power and Light Distribution per floor	NO	Energy Management/Efficiency
	Common services divided among Tenants	YES	Outgoing calculations
Tenant Meter	Power supply to Tenant	YES	Billing
Mechanical Services	Energy Management	NO	Energy Management/Efficiency
	Common services divided among Tenants	YES	Outgoing calculations
Other Power Supplies ie. PV, Tri-Gen	Auxiliary Power	NO	Energy Management/Efficiency
	Grid Feed-in	YES	Reimbursement from supplier



NABERS, Green Star, CBD, BCA and NMI: The Implications on Metering in Australian Commercial Buildings

This white paper is aimed at Building Owners, Consultants, Sustainability Managers, Facility Managers, Electrical Engineers, Electrical Contractors and Mechanical Services Contractors who are involved in the construction or refurbishment of commercial buildings in Australia. It provides an overview of the impact of regulations on metering. While these regulations are all driving in the same direction, they are typically not completely aligned so it can be difficult to understand how they apply. This white paper will cover the following topics:

- What is NABERS, Green Star, CBD, BCA and NMI
- What terminology is used for metering and what are the definitions
- What considerations need to be given to metering
- What are the specifications and constraints on metering solutions for various situations
- What are the typical problems encountered with metering systems
- Where is the source material for further research on these topics.





Thank you

I will now hand over to Jon Lester of Seimens to talk about Thermal Meters.

