Government of **Western Australia**
Department of **Finance**
Public Utilities Office

Presentation to AIRAH:

Controls – managing building performance and environmental impact

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Overview

"*You can't manage what you can't measure*" - It still holds

- Context
- Metering standards
- HVAC-HESS; measures and case studies
- National Metering Institute - update
- NABERS Commitment Agreements/Case studies
- The value of performance
- Commercial Building Disclosure (CBD) update
- Equipment Energy Efficiency E3
- Where to next
- Conclusion

Context – why monitor/measure?

Australian non-residential HVAC systems consume:

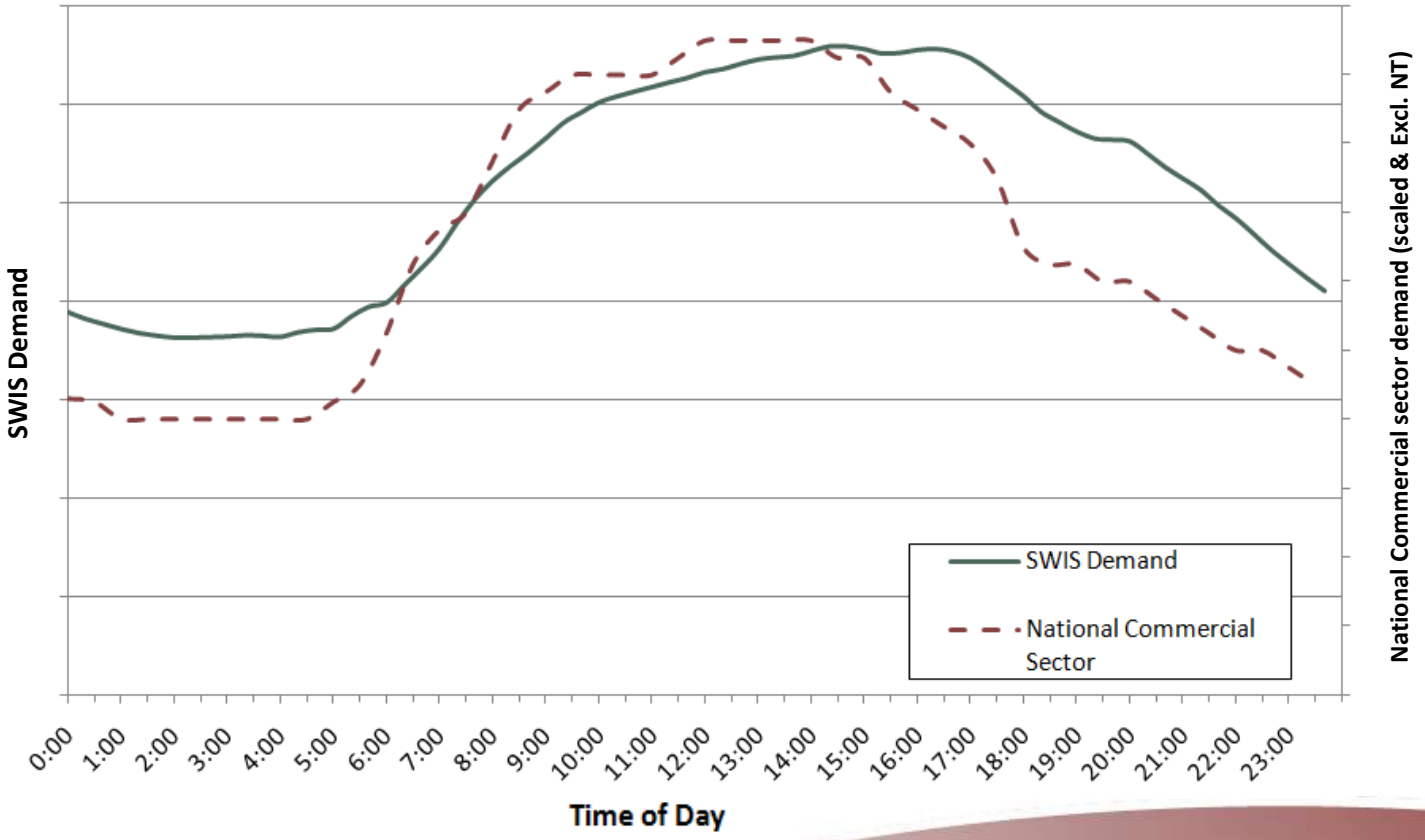
- Nine percent of electricity (>3.6 percent of GHG emissions)
- Responsible for between 40% - 60% of energy used in non-residential buildings
- Over 55% of electrical demand in CBD locations

The industry is worth $7 billion per annum and employs 95,000 people

Source: HVAC High Efficiency Systems Strategy – The Measures, March 2007

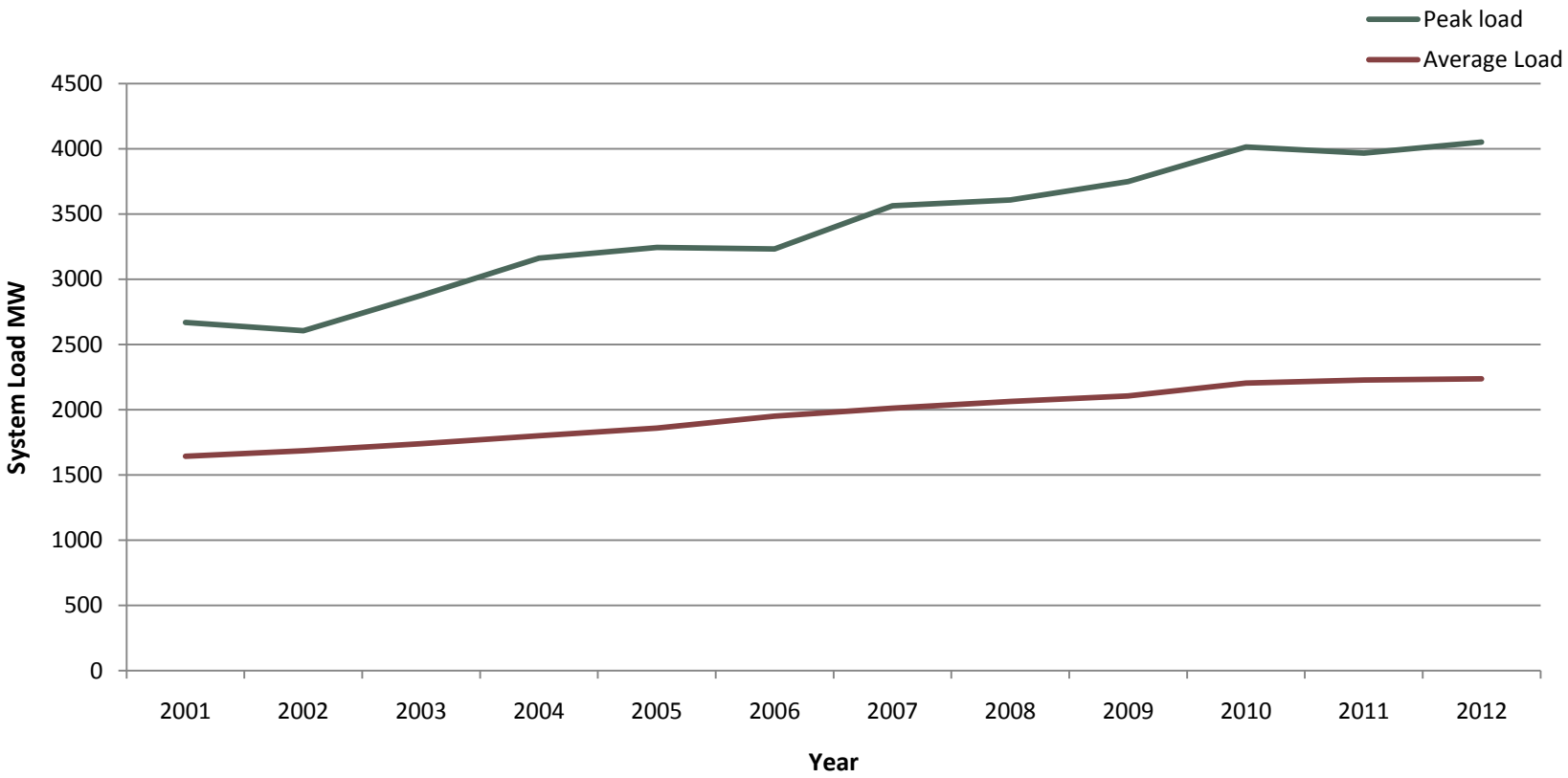
Context – what do we know?

SWIS Load / Nat. Commercial building demand – 9 February, 2010



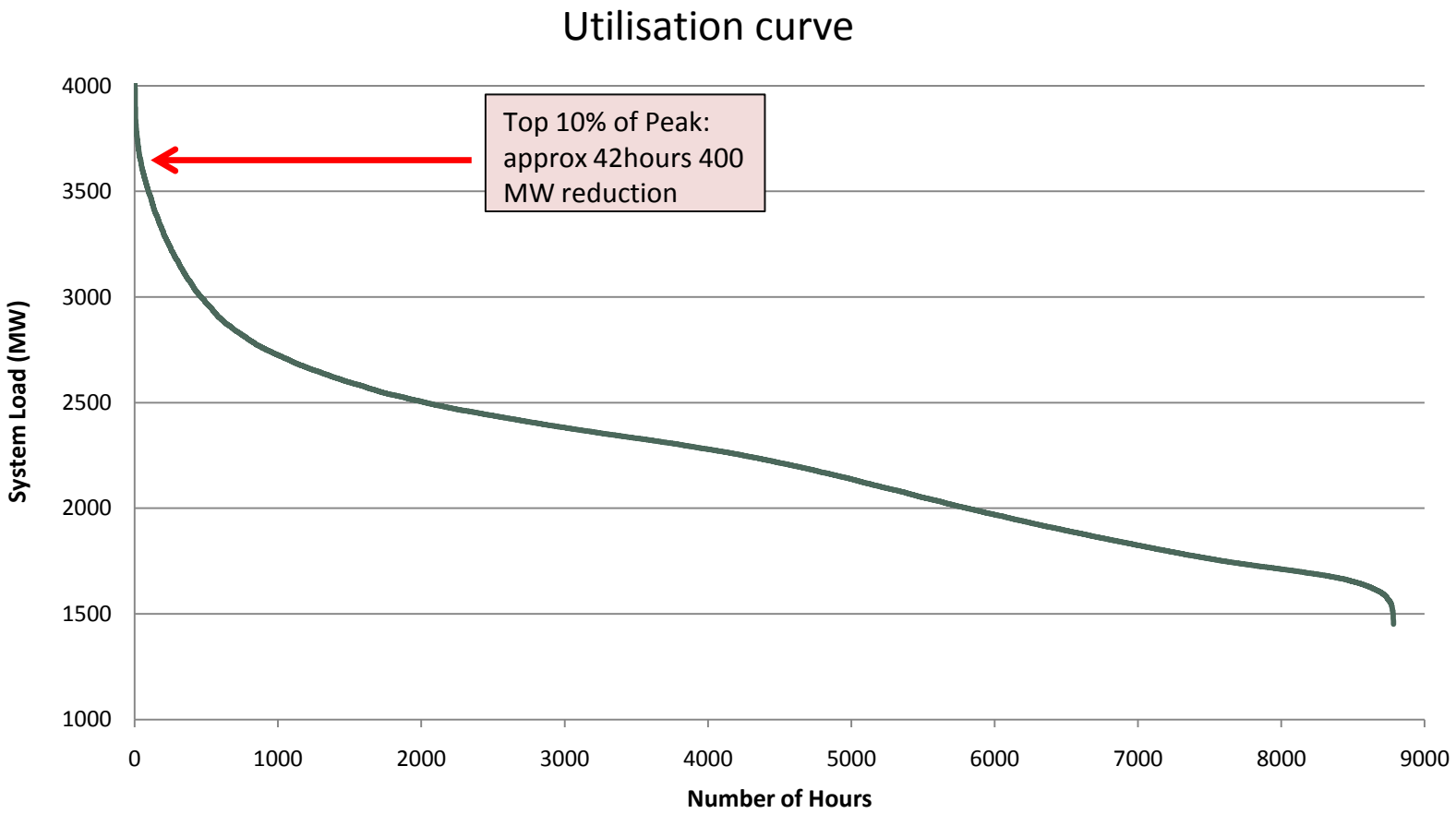
Source: SWIS load data &
Energetics, Building our savings: July 2010

Context – what do we know?



Source: SWIS load data

Context – what do we know?



Source: SWIS load data

Context – why monitor/measure?

HVAC
'The measures'

Commercial
Building Disclosure

Gas meters

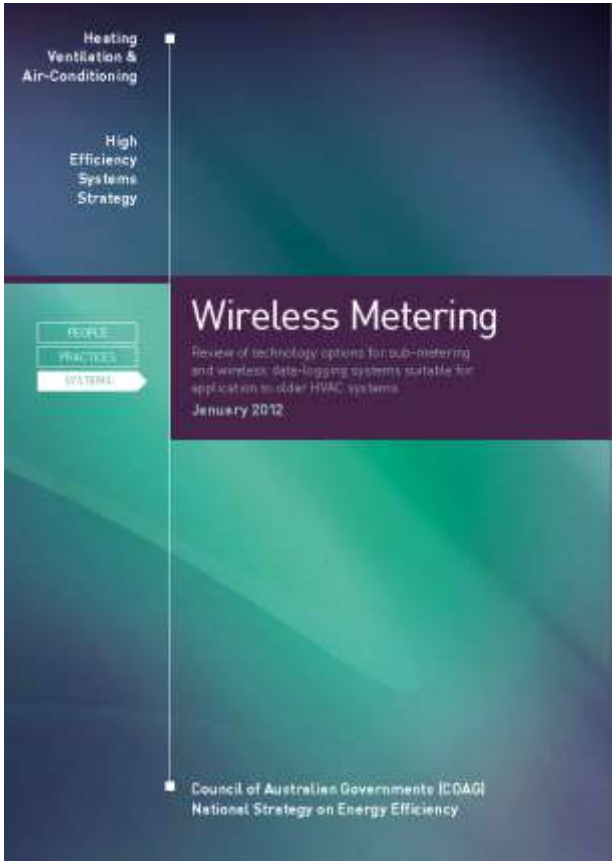
2007 | Feb 2010 | Nov 2010 | Jan 2013 | Soon? | July 2014?

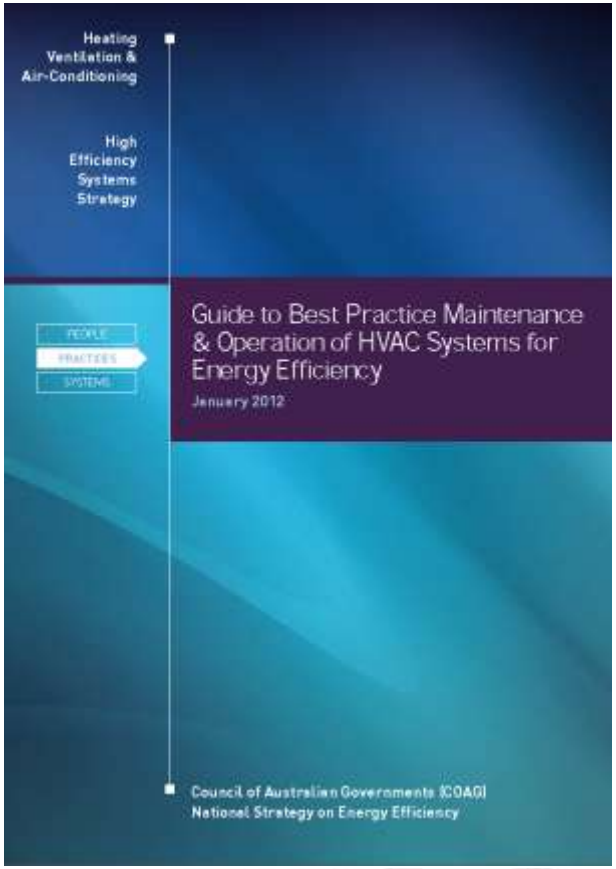
NABERS validation
requirements

Elec.
meters

Water meters

HVAC-HESS Measures





http://ee.ret.gov.au/energy-efficiency

HVAC-HESS – what we now know

Wireless metering – the project:

- Procurement of commercially available wireless metering products
- Two buildings, six month continuous assessment of:
  installation, commissioning, operation & maintenance, cost effectiveness
- Wireless measurement of: electrical sub-metering, temperature, humidity and real-time comfort

Key findings:

- Trade-off between **equipment cost** and **installation complexity** + **resultant accuracy**
- **Wireless** sub-metering infrastructure, **cheaper** than equivalent wired power meter
- **Wireless** sensors proved to be **technically viable** and cost effective
- Lower cost metering solutions tended to overestimate power measurements

HVAC-HESS – fact sheets

http://ee.ret.gov.au/energy-efficiency

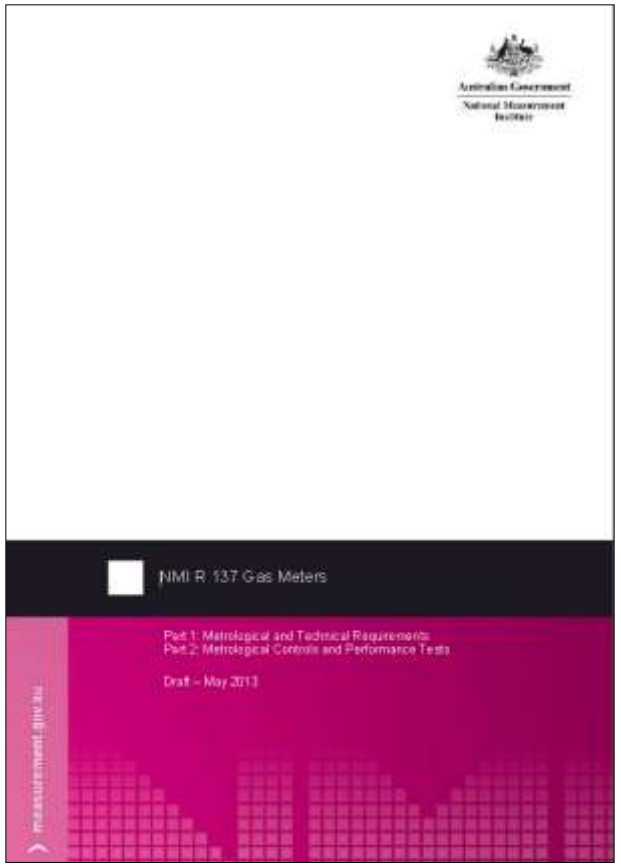
The National Metering Institute (NMI)

- From 1 January 2013, electricity meters used for trade must be **pattern approved** and **verified**

- Gas meters: comments on gas utility meter technical and testing requirements **closes 28 June 2013**

- Proposal for lifting of exemptions for water meters on 1 July 2014 (consultation paper on NMI website)

- www.measurement.gov.au



NABERS – recognising performance

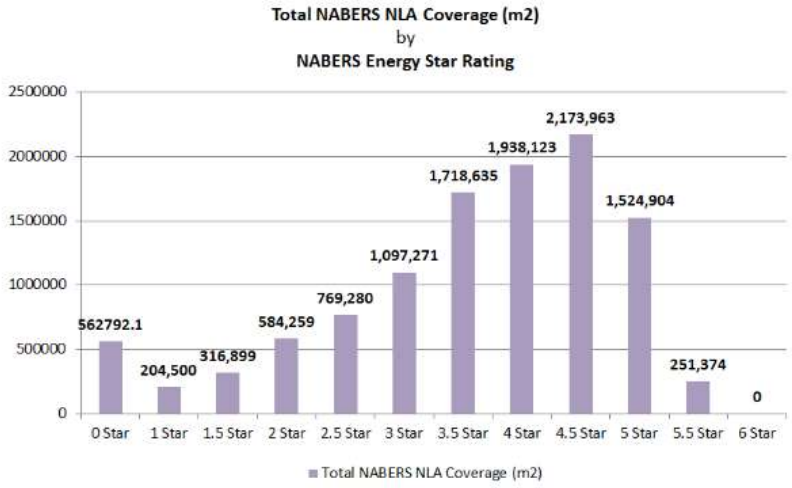
www.nabers.gov.au

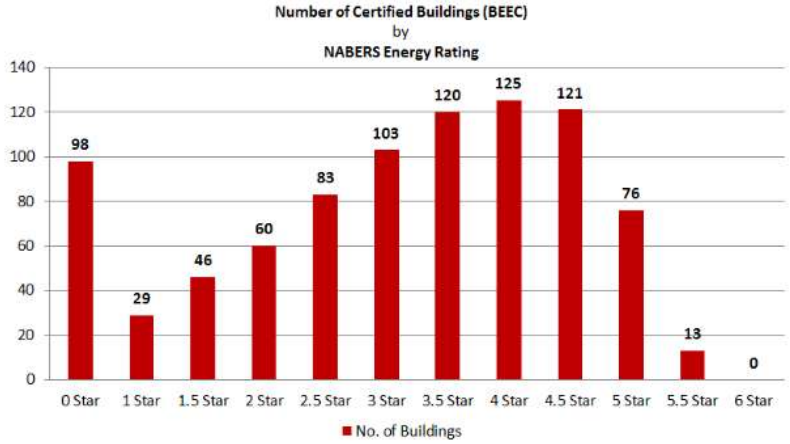
NABERS – recognising performance

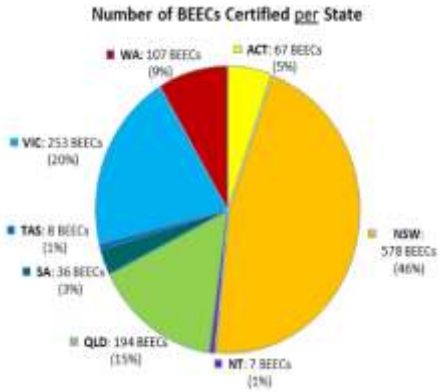
- A 1 star improvement in NABERS Energy rating = 15 percent reduction in energy costs
- NABERS Energy 5 star rating = 9% premium in value
- Buildings with < 4 stars NABERS Energy = vacancy rates of over 11 percent
- Buildings with 4 stars or higher NABERS Energy = 3.7 percent vacancy rates
- Since early 2011, 8 Perth office buildings with a combined NLA of nearly 125,000m^2 have achieved an average of NABERS Energy 5 stars for commitment agreement ratings

Commercial Building Disclosure - snapshot

- From Nov 2011 – Nov 2012: Total rated area of 874 buildings = 11.1 million m^2, 3 star average







Source: www.cbd.gov.au

Equipment & Appliance Energy Efficiency

It is estimated that 25% of retail electricity costs is accounted for by peak demand that occurs for less than 40 hours per year (less than 0.5% of the year)

- E3 is working **to remove least efficient prod**ucts from the market
- Introduction of Greenhouse and Energy Minimum Standards (GEMS), late 2012
- Direct Load Control (DLC): Consultation paper examining benefits of mandating inclusion of '**smart interfaces**' in devices such as air conditioners
- Industrial fans, motors, packaged boilers **– MEPS** (voluntary/mandated)

E3
Equipment Energy Efficiency

- www.energyrating.gov.au

Where to next?

- Greater understanding of **peak load efficiency**
- **Retrofits** as office space comes offline? Increased efficiency of CBD rated stock?
- **NABERS**: Greater uptake of data centres, Shopping centre and Hotel ratings

  Expanded use of Hospital and School tools
- Ongoing success and **shared learning's** from NABERS commitment agreements
- Calculating Cool project – **efficient design & operation** of HVAC systems
- Current and future **AIRAH initiatives**

Conclusion

- **Government working with industry** has provided great energy efficiency outcomes
- Monitoring and metering; now firmly **embedded** in the commercial office sector
- **High NABERS ratings** are correlated with **high asset values** in commercial buildings
- **Peak demand**: the tools, the knowledge - still to come
- Expanding requirements for meter validation/verification/accuracy

Resources & Questions?

- EEX website: www.eex.gov.au
- Commonwealth Department of Resources, Energy and Tourism: www.ret.gov.au
- Equipment Energy Efficiency: www.energyrating.gov.au
- National Metering Institute: www.measurement.gov.au
- NABERS: www.nabers.gov.au

Questions?