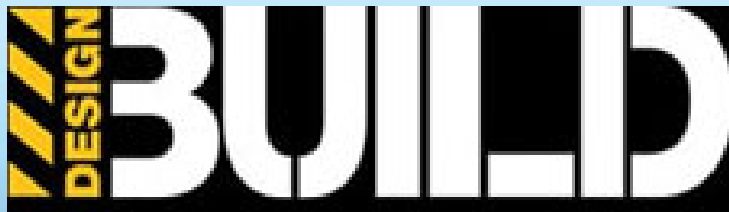


NABERS Energy Commitment Agreements

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Introduction

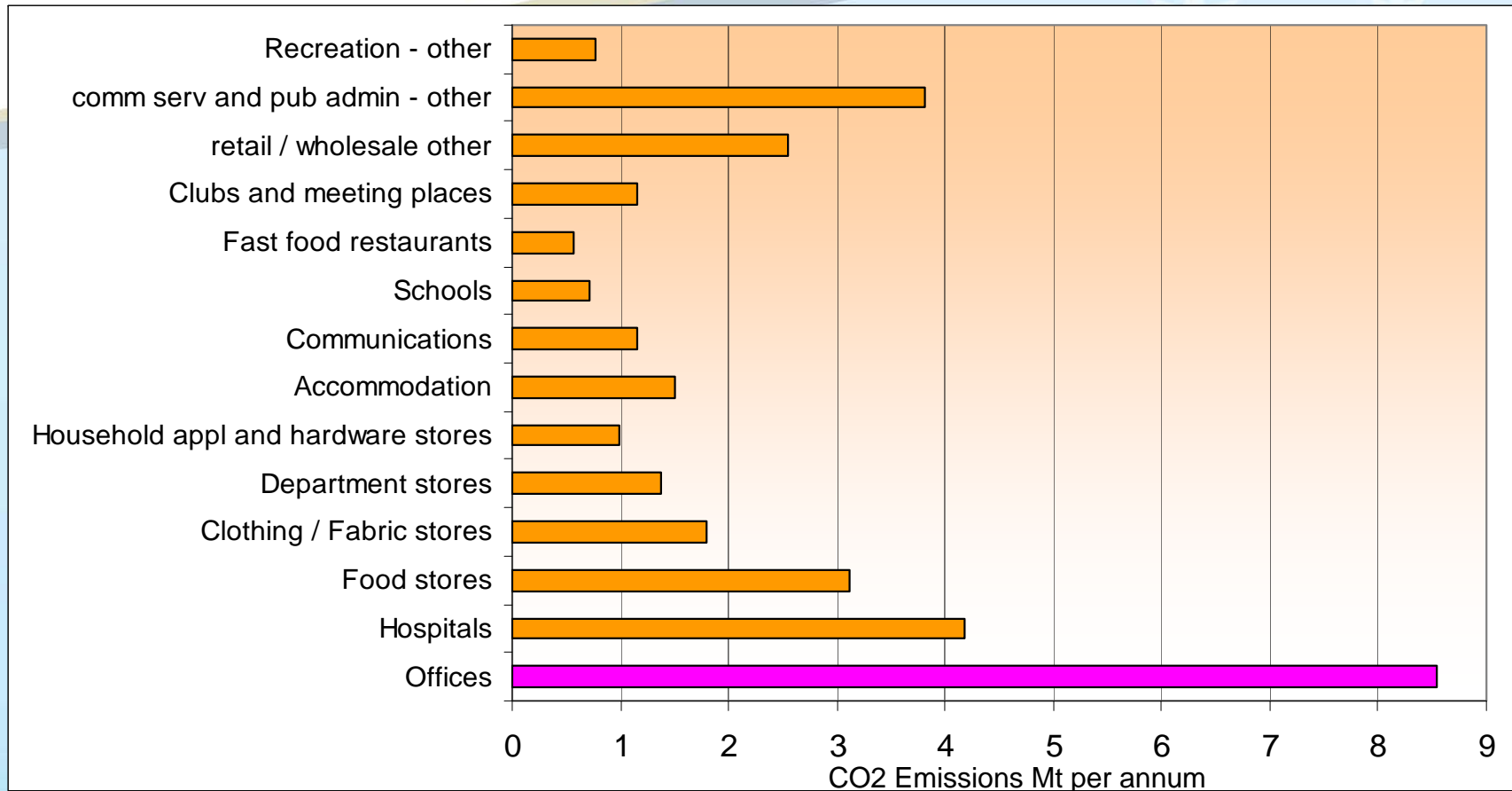
- **Why buildings matter**
- **What is NABERS**
- **Committing to energy efficiency**
 - Types of CA
 - Fees and use of the trademark
 - Steps to reaching energy efficiency
- **Do CA work**
- **Chris Bloomfield - energy efficiency modelling**



Why buildings matter?



Why buildings matter?



Australian Commercial Sector – CO2 Emissions by Building Type. Source: Australian Greenhouse Office (1999).



What is NABERS?

➤ A performance-based rating system for existing buildings, based on measured operational impacts from **energy**, water, waste, **indoor environment**.

➤ Benchmarking

➤ Stakeholder engagement



What is NABERS

★ **Poor**

★ ★ **Below the Median**

★ ★ ★ **Above the Median**

★ ★ ★ ★ **Excellent = top 20%**

★ ★ ★ ★ ★ **Exceptional = roughly top 5%**



What is NABERS

	NABERS Energy	NABERS Water	NABERS Waste	NABERS Indoor Environment
Commonwealth*	4.5 stars for new buildings, new leases and major refurbishments.	Nil	Nil	Nil
NSW[^]	4.5 stars (by July 2011)	4.5 stars (by July 2011)	Policy in development	Policy in development
ACT	4.5 stars (BB) for new leases 4.5 stars (T) - for new fitout in leased offices 4 stars (T) – for refurbishments in leased offices	Nil	Nil	Nil
VIC	4.5 stars (BB) for new buildings 4 stars (BB) for existing buildings 5 stars (T) for new fitout in leased offices	Nil	Nil	Nil
SA	5 stars (BB) for new buildings Preference for 5 stars (BB) for leased offices in existing buildings	Policy in development	Nil	Nil
WA[^]	4.5 stars (BB/WB) for new buildings 3.5 stars (BB) for new leases in existing buildings 4.5 stars (T) new fitout/new leases in existing buildings 4 stars (T) for existing tenancies	Nil	Nil	Nil
NT[^]	Policy in development	Nil	Nil	Nil
QLD*	4.5 stars for new buildings, new leases and major refurbishments	4 Stars for new buildings/leases/refurbishments	3 Stars for new buildings/leases / refurbishments	3 Stars for new buildings/leases/ refurbishments
TAS	Policy in development			
* Applicable to office spaces over 2,000m ² [^] Applicable to office spaces over 1,000m ²		BB - Base Building rating T - Tenancy rating WB - Whole Building rating		

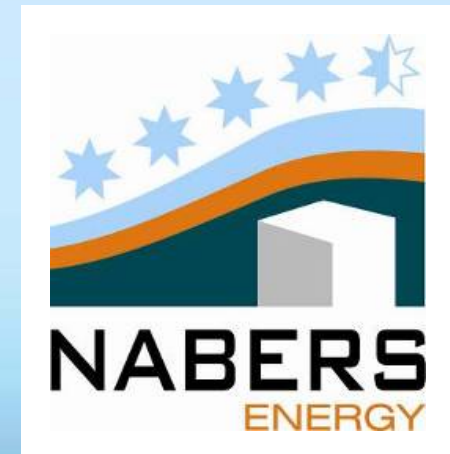
Committing to energy efficiency

➤ Types of Commitment Agreements

- New buildings or Refurbishment
 - Whole Building or Base Building rating
- Tenancy Fitouts
 - tenancy rating
- Must be for 4, 4.5 or 5 stars

➤ Fees and use of the Trademark

- \$4 400 (inc gst) New Building and refurb.
- \$2 200 (inc gst) Tenancy Fitouts



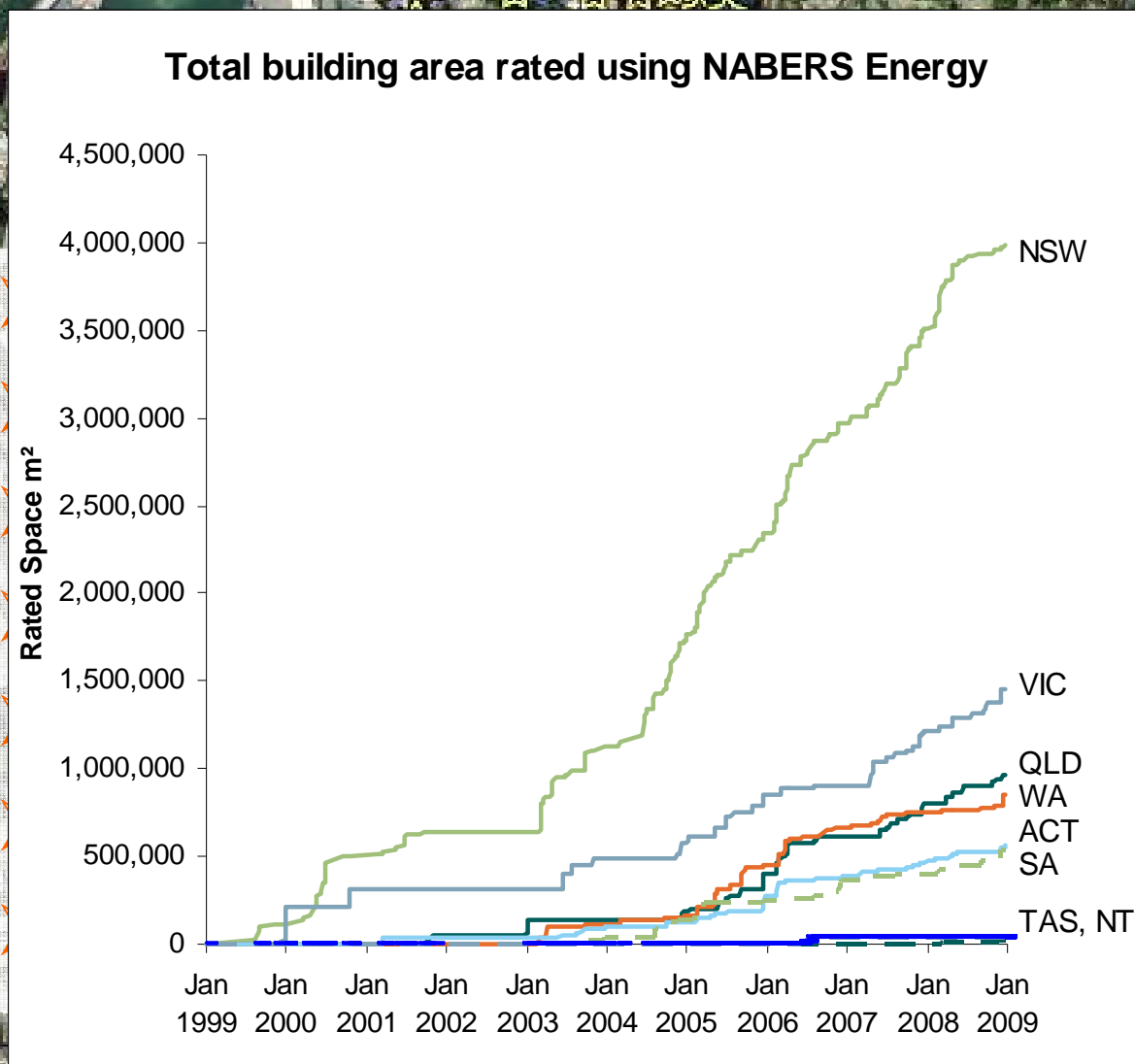
Committing to energy efficiency

➤ Steps to reaching energy efficiency

- Step 1 – Design Concept Stage
- Step 2 – Computer simulation
- Step 3 – Independent Design Review
- Step 4 – Full Operations
- Step 5 - Performance rating
- Step 6 – Successful completion



Do CAs Work?



fits
sibility

Some of the technical stuff - **What goes in to a commitment agreement?**

- **Chris Bloomfield – Director, Exergy Australia
& a NABERS Auditor**



Who is making the commitment, and to what?

- **Typically the building owner makes the commitment**
 - In some cases, the commitment may be subcontracted to the developer or design team
- **You are committing to achieving a rating measured by actual building performance**
 - This is not a simulated estimate!
 - This is subject to a variety of risks
 - The processes built in to the commitment agreement process are there to help you to try to reduce this risk. But it is up to you to manage and mitigate the risks.



Some mandatory commitment agreement items

- Independent design review
- Thermal simulation (4.5 and 5 stars)
- Conducting a certified rating

Independent design review

- **Independent technical review of the design's potential to achieve the target**
- **It is there to help you - conduct it early enough to benefit from recommendations**
- **Reliant upon information supplied by the design team**
- **Cost –typical market prices from \$8,000-\$20,000 depending upon building size and complexity of design**



Independent design review

- Does the proposed design have a reasonable chance of meeting the target?
- Identifies key risks to performance
- Identifies opportunities to improve the rating
- Often focussed on how to cross the bridge between simulated performance and actual performance
- Not a guarantee of performance!



A quick quiz: True or false

Why do we simulate buildings?

- **To prove that my building meets my commitment?**
- **To test, refine and improve the design?**
- **To identify performance risks?**

Answers:

➤ To prove that my building meets my commitment?

➤ **FALSE**

- Simulation can show the potential energy consumption of a building. But it is under ideal operation → upper limit to performance
- Simulation can prove that your building will not meet its commitment
- Simulation can NOT prove that your building will meet its commitment

Answers:

➤ To test, optimise and improve my design?

➤ TRUE

- If conducted early enough in the design phase, simulation can be used to test the potential of different design options - i.e. will I get more benefit from spending \$ on external shading, or on a better chiller?
- Simulation can be used to optimise design – for instance the location and position of external shading, or control algorithms
- Be careful – simulation programs do exactly what they are told. What gives the best result on paper may not be best in practice!

Answers:

➤ To identify performance risks?

➤ TRUE – sometimes!

- Simulation can be used to identify risks to building performance, and the effectiveness of options to mitigate the risks.
- But it depends how it is used!
- This is the intent of the *off axis* scenarios required for NABERS simulations.

Simulation? What is it?

➤ **Thermal simulation is a way of estimating building energy use, based upon assumptions:**

- **Building façade, layout and structure**
- **Air conditioning system type and control**
- **Climate information**
- **Internal loads**
- **Operational hours**

Simulation - What it isn't

- **An exact science**
- **A “guarantee” that it will meet your target (e.g. most 1990’s VAV building’s will simulate at 4.5 stars...)**
- **Completion of your commitment**
- **Representative of the whole building’s greenhouse emissions**

Simulation – who and how much?

- **Simulation conducted both in-house with design teams, or by an independent energy modeller. There are pros and cons to both.**
- **Cost. Market rates for simulation vary, but as a guide on current market pricing:**
 - A small, simple building ~\$20,000
 - A large, complex building /campus may be \$100,000+

Simulation - What it covers?

- **Typical thermal simulation packages model HVAC energy consumption**
- **Some energy consumers are not typically modelled in the packages**
 - Car park lighting and ventilation
 - Tenant supplementary services
 - Lifts
 - Electrical losses
 - Control, generator and chiller overheads
 - Domestic hot water

Simulation and NABERS

- **Mandatory for buildings applying for 4.5 and 5 star commitment rating agreements**
- **Recommended for buildings applying for 4 star commitments.**
- **Must comply with the NABERS validation protocol for thermal simulation**
- **Must be independently reviewed, along with the broader building design (4.5 and 5 stars)**



Validation protocol for thermal simulations

➤ Sets out key rules for simulation. Available from www.nabers.com.au In particular:

- What software can be used
- What weather data can be used
- What must be included in the simulation
- Outlines scenarios required
- Rules for simulation assumptions

Common traps in simulation

- **Wrong energy coverage**
- **Assumptions too optimistic**
- **Treat simulation as a compliance tool, rather than a way to test and improve**
- **Leaving simulation too late in the design phase**
- **Assuming that if it simulated OK, the job's done!**

What next?

- **Simulation and design review are only two processes to help you**
- **Alone, they do not meet your commitment**
- **Commissioning, tuning and monitoring during construction and post occupancy is vital**
- **Also need to have a certified rating conducted 12 months post occupancy.**



Monitoring and tuning

- **Most buildings meeting commitment rating targets have had extensive monitoring and tuning**
- **Monitor early, monitor often.**
 - Identify problems before too much damage to your rating
 - Gives you time to act on the problem
 - May want to think about defect liability periods
- **Consider what safety margin is right for you**

Completing my commitment

- **Get a certified rating completed by a NABERS accredited assessor**
- **For commitment agreements, must be an independent assessor**
- **Costs: Market rates typically \$2000-\$6000 plus certification fees, dependent upon building size**

