

North Sydney **My Green Apartment**

Lighting Efficiency Forum

Gareth Huxham B.E. MPhil

Director - Energy Smart Strata

www.energysmartstrata.com.au

3 Questions for tonight's talk

Q1

How does high-rise living compare, in terms of energy usage and greenhouse emissions, to other dwellings?

Q2

In terms of the broader economy how does the strata sector fair compared to other sectors in terms of energy efficiency and energy costs?

Q3

Our electricity costs have been going through the roof, what is the easiest way to reduce our costs?

Payback

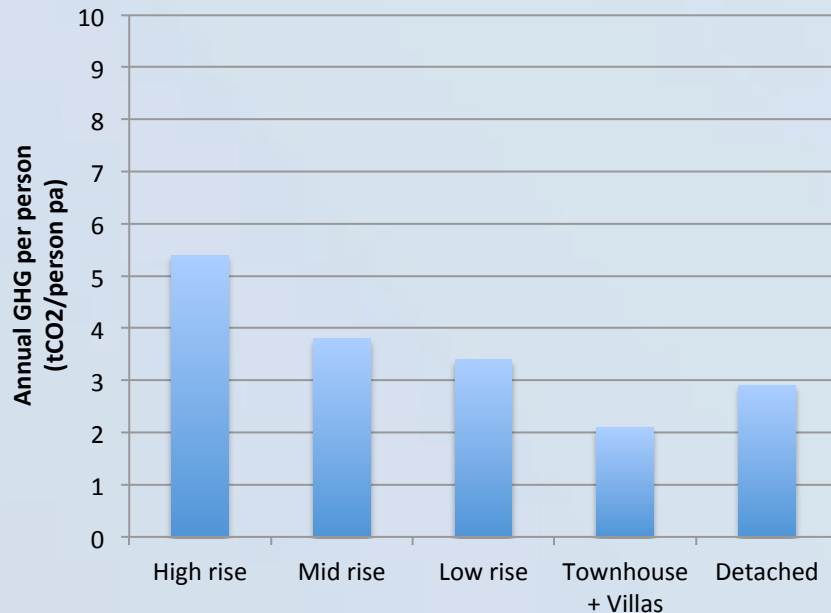
$$\text{Payback (years)} = \frac{\text{Implementation cost (\$)}}{\text{Annual cost savings (\$ pa)}}$$

Annual cost savings are the savings on energy costs achieved by reducing energy usage.

Cost savings depend on:

- Your electricity rates.
- Times when energy is saved e.g. saving energy overnight during cheaper off peak rates has a lower return than saving energy during peak and shoulder periods.
- Whether a reduction in peak demand is achieved.

Apartments vs houses

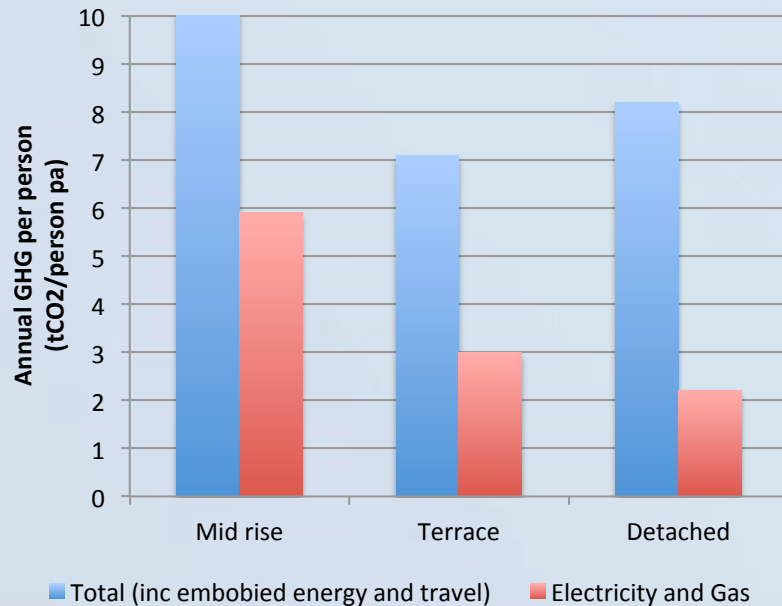


Myers, P, O'Leary, R and Helstroom, R, 2005, 'Multi- Unit Residential Building Energy and Peak Demand Study', *Energy News*, Vol.23, No.4, December 2005

2005 Australian Study

Taking into electricity and natural gas used by apartments and by common area equipment the hi-rise apartment has 86% higher per capita greenhouse emissions.

Apartments vs houses



2009 Australian Study

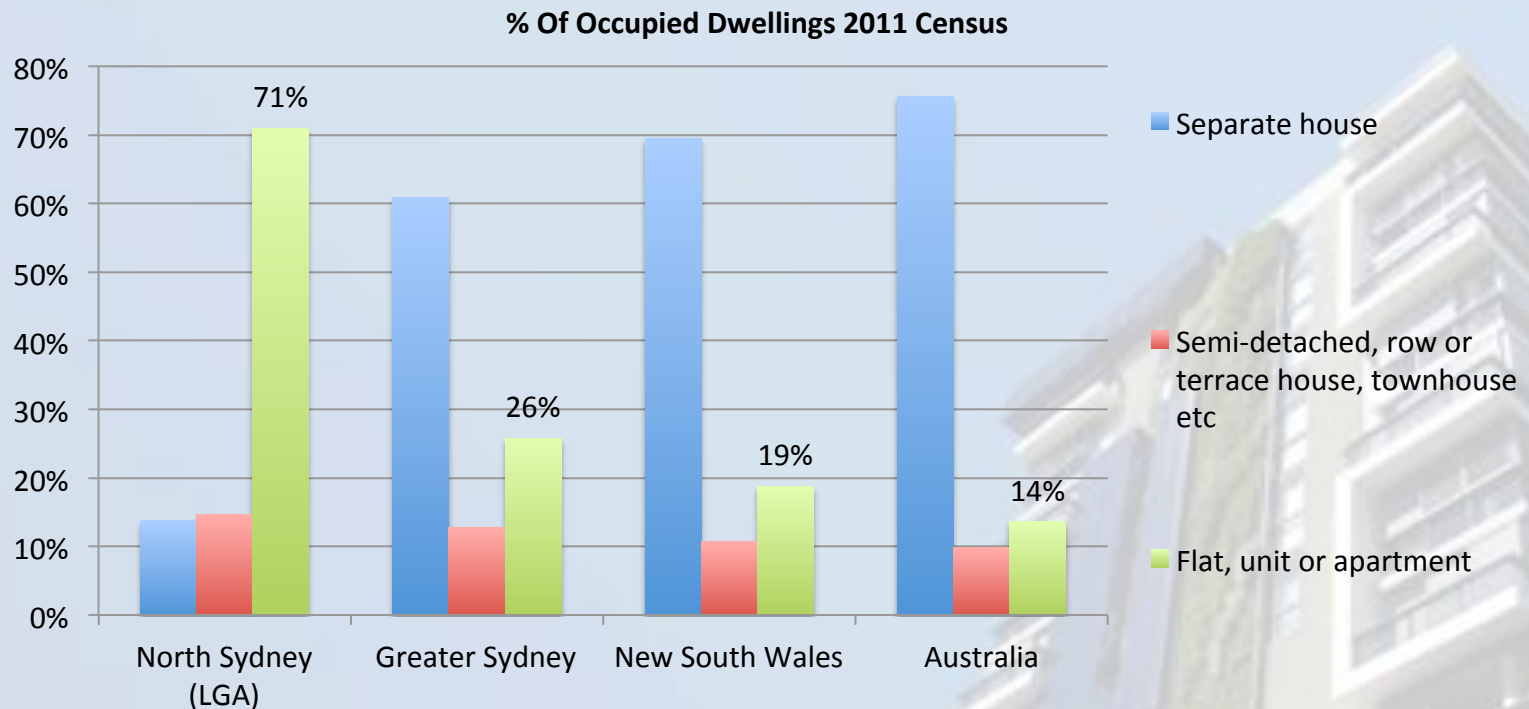
Taking into other sources of greenhouse emissions; electricity, natural gas, embodied energy and transport energy, the mid-rise apartment had 23% higher per capita greenhouse emissions.

Perkins, A, Hamnett, S, Pullen, S, Zito, R and Trebilcock, D,
2009, *Urban Policy and Research*, 1476- 7244, Vol. 27, Issue 4

High rise apartments have higher GHG emissions than detached dwellings, terraces, and townhouses

North Sydney

In North Sydney 85% of people live in medium to high-density dwellings



North Sydney

There are 20,175 apartments in North Sydney (2011 Census).

Common area electricity usage alone = 40GWh pa
= Electricity usage of 6,000 houses
= \$7M pa
= 43,000 tCO₂

Assumes average common area electricity usage of 2MWh/unit and average electricity costs of \$180/MWh

High energy usage in apartment buildings really does represent a significant source of GHG emissions and a real cost to occupants.

How does strata compare to other sectors?

Energy Smart Strata Research Initiative

Program to promote energy efficiency in the strata sector. Running till mid 2013. Conducting level-2 energy audits of 50 apartment buildings (common areas) across Sydney

Preliminary findings, data gathered from 15 mid-rise apartment buildings:

Energy Savings:

- Energy savings of 48% could be easily achieved with a payback of 2 years. Energy savings would save \$112k per year and 487 tCO₂-e.

Stop paying too much for electricity:

- All 15 sites were paying too much for their electricity. Sites could save 10% to 15% off electricity costs by moving off default tariffs onto a fixed-term contract. Saving \$28k per year.

Our winner for the biggest waster of energy in apartment buildings:

- Car park lighting over car spaces running 24/7. One site, with 70 apartments was paying \$11k per year to keep lights on over car spaces.

Energy performance of strata

US Study:

Apartment buildings can achieve energy savings of 15% to 30%.

In the US \$3.4 billion could be saved by owners by implementing simple, cost effective energy saving opportunities.

Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities. The American Council for an Energy Efficient Economy (ACEEE).

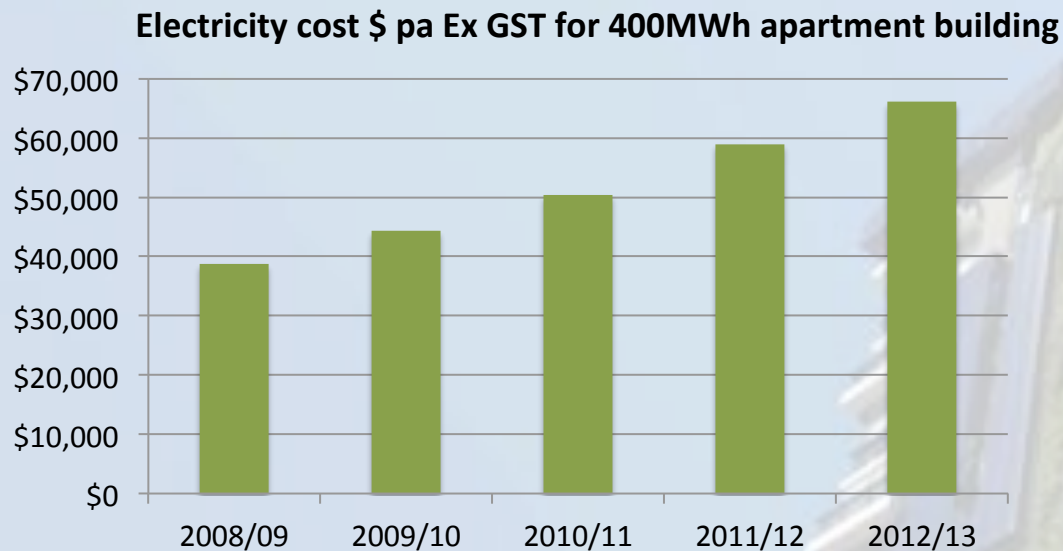
“Large apartment buildings represent a significant and mostly untapped opportunity for energy efficiency gains”

Center for Neighborhood Technology (CNT).

Increasing electricity costs

In Sydney electricity prices have increased by as much as 54% over the past 3 years (2009/10 to 2012/13).

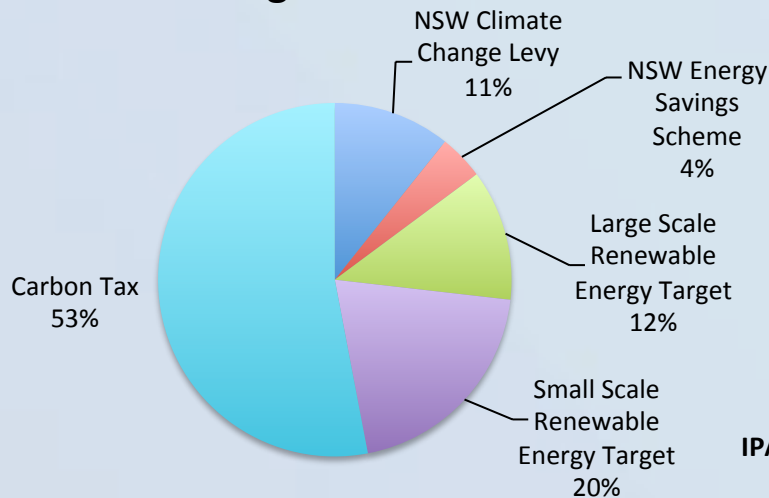
Example: Electricity costs for an apartment building with 210 apartments and an electricity consumption of 400MWh pa.



Increasing electricity costs

Two main Reasons for recent increases in electricity prices:

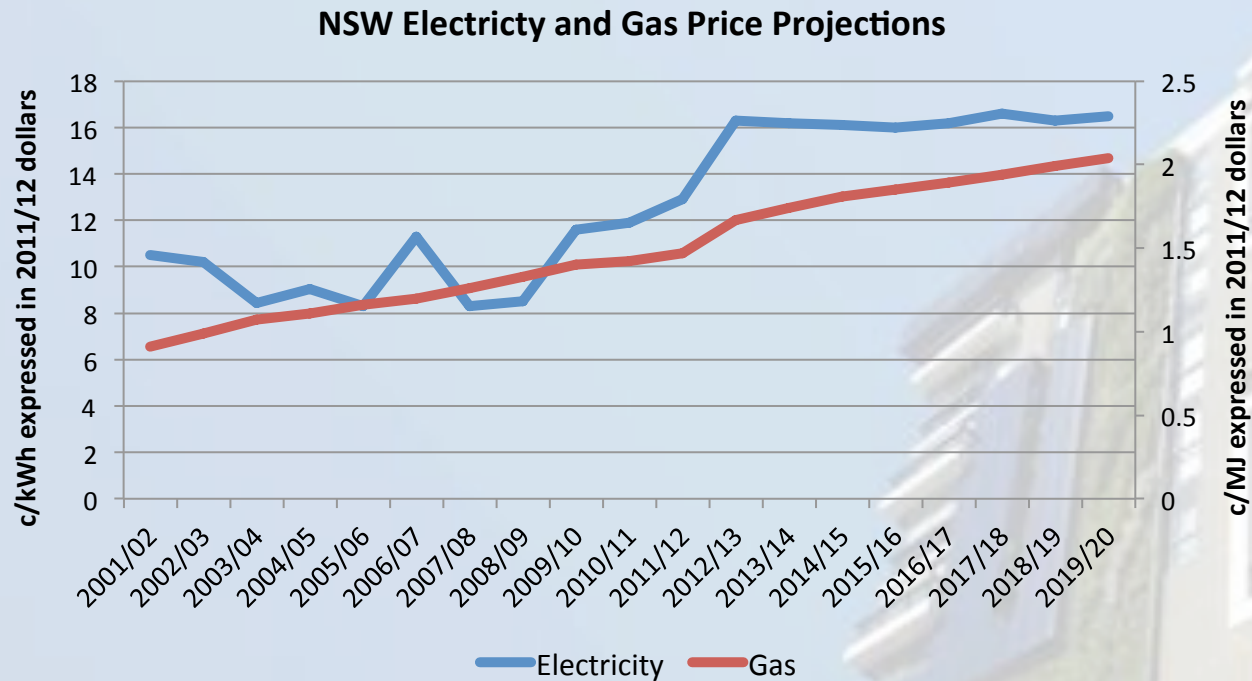
- Infrastructure costs, network upgrades.
 - From 2004 to 2010 annual capital expenditure and increased operating expenditure for NSW transmission and distribution business doubled.
 - IPART 2010 determination of regulated tariffs attributed >80% of price increases due to increased network charges.
- Environmental charges:



IPART Impact of green schemes on regulated retail electricity prices in NSW 2012/13

Future electricity costs

- Average regulated retail electricity prices will increase in NSW by 3% (4.3% in AusGrid network area) from 1st of July 2013. IPART Fact Sheet Changes in regulated electricity prices from 1 July 2013
- Prices are expected to fall behind inflation in 2014 and reduce in real terms by 2015. IPART
- Natural gas will rise by 8.6%. IPART



NSW Business Energy Prices to 2020, UTS Institute for Sustainable Futures, December 2011

How to reduce energy costs

1. Ensure you are the most appropriate network tariff and metering configuration. Shop around for the best market contract.
2. Implement simple, cost-effective energy saving measures.

But which ones?

An energy audit ([AS/NZS 3598:2000](#)) is a comprehensive tool to identify the most practical and cost-effective ways to reduce energy usage and costs. But assessments conducted in-house by owners can be also be very effective.

3. Ongoing energy management program.

The Energy Management Process

- Establish an energy baseline
- Develop an operational energy profile
- Undertake an energy audit (AS/NZS 3598:2000)
- Set performance targets
- Identify preferred energy saving opportunities
- Develop monitoring and reporting process
- Communicate with residents and owners

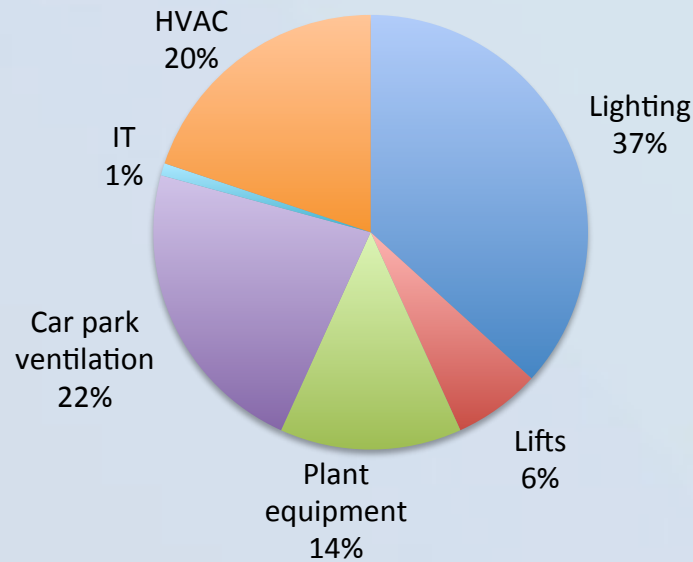
Facility Management Association of Australia, Good Practice Guide, 2012
(Sponsored by the City of Melbourne Hi-RES initiative)

An ongoing energy management program is critical to achieving long-term energy and cost savings.

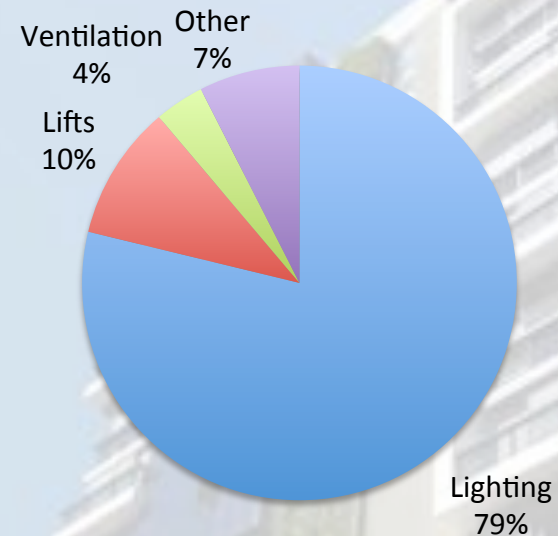
Where is energy used

No two buildings are the same. Regardless of the size and features of your apartment building, lighting is the first place to look for simple cost-effective options to reduce energy usage.

Break-up of common area electricity consumption for 2 apartment buildings



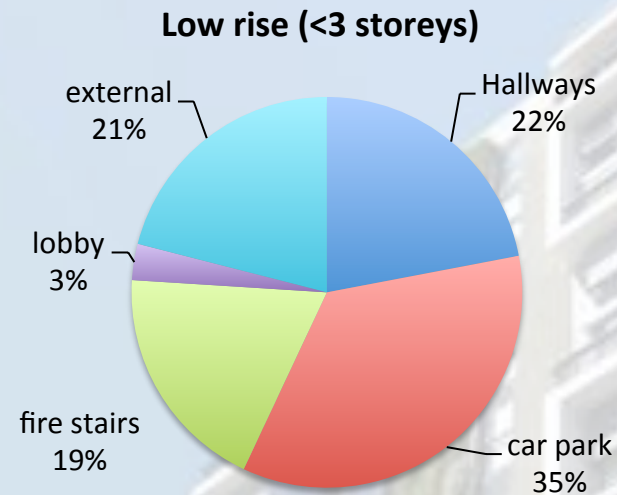
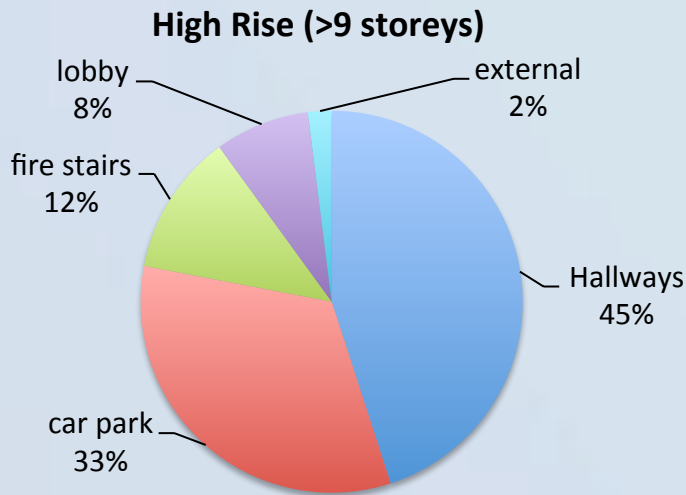
Hi-rise Apartment building with 210 apartments



Mid-rise Apartment building with 70 apartments

Lighting electricity consumption

Again no two buildings are the same. Energy saving opportunities exist for a range of lighting applications.



Myors, P, O'Leary, R and Helstroom, R, 2005, 'Multi- Unit Residential Building Energy and Peak Demand Study', *Energy News*, Vol.23, No.4, December 2005

Take Home Message

Hi-rise living does consume more energy and produce more GHG emissions per capita compared to detached houses.

Energy wastage and high energy costs are prevalent in the strata sector. But this provides a positive opportunity for simple and cost-effective energy savings.

Energy savings of 15% to 35% are achievable through simple upgrades.

Lighting is the simplest and quickest option to see big energy savings.
(Once lighting has been tackled move on to HVAC)

An energy audit conducted to the Australian Standard is a comprehensive tool to help understand, manage and reduce energy usage and costs. Make sure your auditor provides independent advice.

A pdf of tonight's presentation will be available on our website www.energysmartstrata.com.au