Parliamentary Committee Inquiry into energy efficiency improvements

Townsville 2009

Department of Public Works Presentation (Michael Ball)

What can you do today for their future?

Be ClimateSmart

At home...

Install a rainwater tank to supply water for use with gardens, toilets and laundry.
Install a solar, natural gas or electric heat pump hot water system to lower your energy bill and reduce your carbon emissions.
Turn appliances off at the wall to reduce standby electricity consumption.
Install energy efficient light bulbs.
Use water efficient appliances and fittings such as WELS rated showerheads and water pressure limiting devices.
Insulate ceilings and shade windows.
Be aware of current water restriction requirements.
Find out what rebate programs are offered.
Help reduce waste and recycle correctly.
Fix leaking taps immediately.
Turn taps off when shaving or cleaning teeth.
Turn lights off when not in the room.
Install skylights in dark areas of the home.
Purchase energy efficient appliances.

At work...

Switch off equipment at the end of the day.
Use office equipment that is energy star-rated.
Copy in batches and use the photo-reduction and double-sided copying options.
Use the power save function.
Don't leave lights on in offices or meetingrooms when the rooms are unused.
Turn off computers when not in use.
Be aware of current water restriction requirements.
Turn off taps after use.
Report water leaks immediately to building security/maintenance.
Use the half flush option where available.
Minimise waste by recycling paper.
Be constantly aware of new energy saving initiatives.
Encourage others in your workplace to make ClimateSmart choices.

Strategic Energy Efficiency Policy (SEEP)

- The Policy applies to:
  - All Queensland Government Departments
  - Government Owned Corporations and
  - Statutory Authorities
- Mandatory minimum targets and timeframes of:
  - 5% reduction in energy consumption by 2010
  - 20% reduction in energy consumption by 2015
- Develop Energy Efficiency Strategic Management Plans for all buildings

DPW's Sustainable Office Buildings Rating Policy

Policy established in December 2007 and set the following minimum sustainability ratings for DPW's portfolio of office buildings:

- 5 star Green Star for new office buildings
- 4 star Green Star for major leases and office refurbishments

With both including:

- 4.5 star NABERS Office Energy (ABGR) for new office buildings, major leases and office refurbishments
- 4 star NABERS Office Water
- 3 star NABERS Office Waste

Achieving Energy Efficiencies through EPCs

DPW

- Adopted EPCs as the primary strategy
- 15 EPCs implemented to date for 25 DPW-owned buildings will save 18,000,0000 kWh (18 Gigawatt hours) – equivalent to 16,400 tonnes of CO_2.
- Average energy saving in the retrofitted buildings will be 21% at an estimated cost outlay of $20 million.
- At current energy costs, the savings will be $2.0 million annually.

Achieving Energy Efficiencies through EPC's

- Typical tasking in DPW EPCs include:
  - Lighting retrofits
  - A/C chiller replacement
  - BMS replacement/upgrade

- Next steps will examine:
  - increased use of low emission technology, including solar

Townsville Government Office Building

NLA: 6,500m^2

Five storey

Constructed 1986

Currently undergoing energy upgrading through an EPC

Work includes:

- New air-cooled chiller
- Variable Speed Drives on air handling unit fans
- Lighting retrofit including movement sensors
- CO2 sensor control of car park ventilation fans

Guaranteed energy savings of 524,000kWh (a reduction of 27.8%)

Equivalent to saving 477 tonnes of CO_2 annually

Cairns – William McCormack Place – Stage 1

NLA: 4,568m^2

Four storey

Constructed 2002

First commercial office building in Australia to achieve a 5 star ABGR (energy) rating

Current NABERS Office Energy rating: 5 star

Energy efficiency achieved through:

- Passive design features (orientation on site, shading, and highly efficient façade);
- Active systems including thermal storage, energy recovery through thermal wheel, efficient lighting.

Cairns – William McCormack Place – Stage 2

NLA: 10,000m^2

Eight storey

Currently under construction (completion 2010)

Registered with GBCA and targets 5 stars (Green Star)

Will be more energy efficient than stage 1

Additional features include:

- 1.5 megalitre thermal energy storage for chilled water – allowing load shift to off peak supply
- Intelligent lighting system and use of natural light
- Open foyer to ground floor (no air conditioning)

Lighting retrofit case study 1

Townsville (Main Roads - Wills Street building)

- Energy consumption: pre retrofit: 182, 670 kWh
- post retrofit: 102,124 kWh
- Saving: 44%
- Reduction in total site consumption: 10.4%
- Payback period: 2.74 years

Lighting retrofit case study 2

Smithfield (Health)

- Energy consumption: pre retrofit: 32,253 kWh
- post retrofit: 15,470 kWh
- Saving: 52%
- Reduction in total site consumption: 7.6%
- Payback period: 2.36 years

Lighting retrofits - strategy

1. Fund 100 % of retrofit costs

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2. Fund 50% of retrofit costs

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3. Fund project management costs plus cost of installing additional energy saving technologies e.g. movement sensors and daylight sensors.

- Currently investigating the viability of replacing T8 fluorescent tubes with LED lamps.

Electric heat pump hot water systems

Systems installed in Roma Street (Brisbane) Police Headquarters, Mount Gravatt and Boondall Police stations.

Roma Street Police Headquarters:

- Annual reduction in energy: 32,730 kWh
- Annual reduction in CO_2 emissions: 34.6 Tonnes
- Annual projected $ savings (7 cents/kWh): $2,290
- Total cost of project: $18,420
- Credit received for RECS: $8,550
- Net project cost: $9,870
- Simple payback: 4.31 years

For the Mount Gravatt and Boondall Police stations the payback periods were between 4 and 4.5 years.