Parliamentary Committee Inquiry into energy efficiency improvements

Brisbane 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

EPC case study 1: 111 George Street, Brisbane

NLA: 27,000m^2
26 tenancy levels
Constructed 1994
A recent upgrade under an EPC included the following work:

- New building management system
- New high efficiency chiller unit
- Variable speed drives on cooling tower fans, air handing unit fans, and chilled water and condenser water pumps
- Maximum use of outside air for cooling when suitable
- Lighting retrofit including access control system

Guaranteed energy savings of 2.38 GWh (34.6%)
Equivalent to saving 2,170 tonnes of CO_2 annually

EPC case study 2: 61 Mary Street, Brisbane

NLA: 29,000m^2
17 tenancy levels, 240 car parks
Constructed 1986
A recent upgrade under an EPC included the following work:

- New building management system
- New chiller unit with on-board variable speed drive units
- Lighting retrofit
- Installation of heat pump hot water units
- CO sensor control of car park ventilation fans

Guaranteed energy savings of 1.62 GWh (20.4%)
Equivalent to saving 1,470 tonnes of CO_2 annually

New construction - Joint Contact Centre, Zillmere

NLA: 4,900 m^2 Three levels Completion in 2010

- Registered with Green Star and targets 6 stars
- Designed to 'World's Best practice", features include:
  - Daylight harvesting and glare control
  - On-site electricity generation through a PV array
  - Recovery of air conditioning energy to pre-condition the outside air supply
  - Use of refrigerated Chilled Water Thermal Storage tank to shift electrical loads and minimise peak power occurrences
  - Air conditioned outside air supplied direct to floor outlets and work stations – complemented with chilled beams

Lighting retrofit case study 1

Southport Courthouse

- Energy consumption: pre retrofit: 374,100 kWh
- post retrofit: 194,726 kWh
- Saving: 48% (179,374 kWh)
- Reduction in total site consumption: 9%
- Payback period: 7 years

Lighting retrofit case study 2

Nerang – Main Roads

- Energy consumption: pre retrofit: 45,545 kWh
- post retrofit: 12,243 kWh
- Saving: 73% (33,302 kWh)
- Reduction in total site consumption: 7.5%
- Payback period: 4.1 years
- Note: this retrofit included the installation of movement detectors to control the lighting.

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.