

Energy Management Plan

Adopted 6 March 2012

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Introduction to the Energy Management Plan

Organisational Energy Profile

Strathfield Municipal Council is a medium sized Council located in Sydney's Inner West. The area of the Council is approximately 14.1 square kilometres and has an estimated population in 2010 of 36,911. Council operates approximately 22 sites including libraries, an administration complex including the Town Hall and Council Chambers, works depot, golf course, community centre, sportsfields and other smaller facilities. Council is also responsible for the provision of street and civic lighting.

Strathfield Council's total energy usage for all council buildings, facilities and street lighting in the 2010/11 financial year was 9,862 GJ. This primarily consisted of electricity usage (98.3%), with the remaining 1.7% of usage being from natural gas. This total energy usage corresponded to greenhouse gas emissions of 2,867 TCO₂e.

History of Energy Savings within the Organisation

Strathfield Council is strongly committed to sustainability. A key strategic direction is for Council to position itself as a leader in sustainability initiatives. In the area of climate change, Council has partnered with ICLEI Local Governments for Sustainability and other Local Governments around the world through the Cities for Climate Protection Program.

In 2007, Council prepared a Greenhouse Action Plan that detailed steps for the Council to take to reduce greenhouse gases from its operations and facilities over the next four years. The plan also addressed opportunities to assist the local community to reduce emissions from homes and businesses and from transport and waste.

Council has implemented a number of the actions identified in the 2007 Greenhouse Action Plan, including lighting retrofits, installation of solar technology, PC conversions, offsets for corporate events, the monitoring of energy usage through Planet Footprint and use of biodiesel for corporate vehicles. As a result of these actions, Council's total electricity usage has decreased over the past six years.

Introduction to the Plan

Strathfield Council's Energy Management Plan 2012 has been prepared with reference to the Local Council Guide for Energy Management Plans (DECCW 2010). Council followed three steps to produce the plan as follows:

Management Review

An energy management review was conducted to assess the systems that Strathfield Council has in place for managing energy. The review then recommended energy management actions for future implementation.

Technical Review

12 months of service level data and energy bills were analysed and a full account of Council's baseline usage was formed. A technical review and a series of audits across Council's highest energy using facilities were conducted and Energy Assessment Reports for the top ten sites were produced.

Identify Opportunities

In order to continue Council's commitment to reducing energy use, a series of initiatives and business cases were developed to assist in the selection of future projects. Council has put in place, a set of principles that govern the selection of projects and recommendations for implementation. Projects and initiatives are assessed against social, economic, environmental, and civic leadership indicators. As such, the potential implementation of recommendations in this plan will be subject to this assessment which is affected by the availability of recourse, the potential for partnerships with external organisations, changes in the demand for community services, environmental changes, the development of new technologies and the price of energy.

How does the plan fit in other documents?

Council will adopt the new Community Strategic Plan 'Strathfield 2025' by 1 July 2012. The new Community Strategic Plan will be supported by Council's Delivery Program (2011-2014) and annual Operational Plan and Resourcing Strategies. The development of these plans will consider recommendations from this plan.

Strathfield Council's Historical Energy Use

Figure 1 below shows Strathfield Council's total energy usage for all council buildings, facilities and street lighting over the past six years, and indicates a slight trend of energy reduction over this period.

In accordance with the Local Council Guide for Energy Management Plans, the energy usage shown below includes the following:

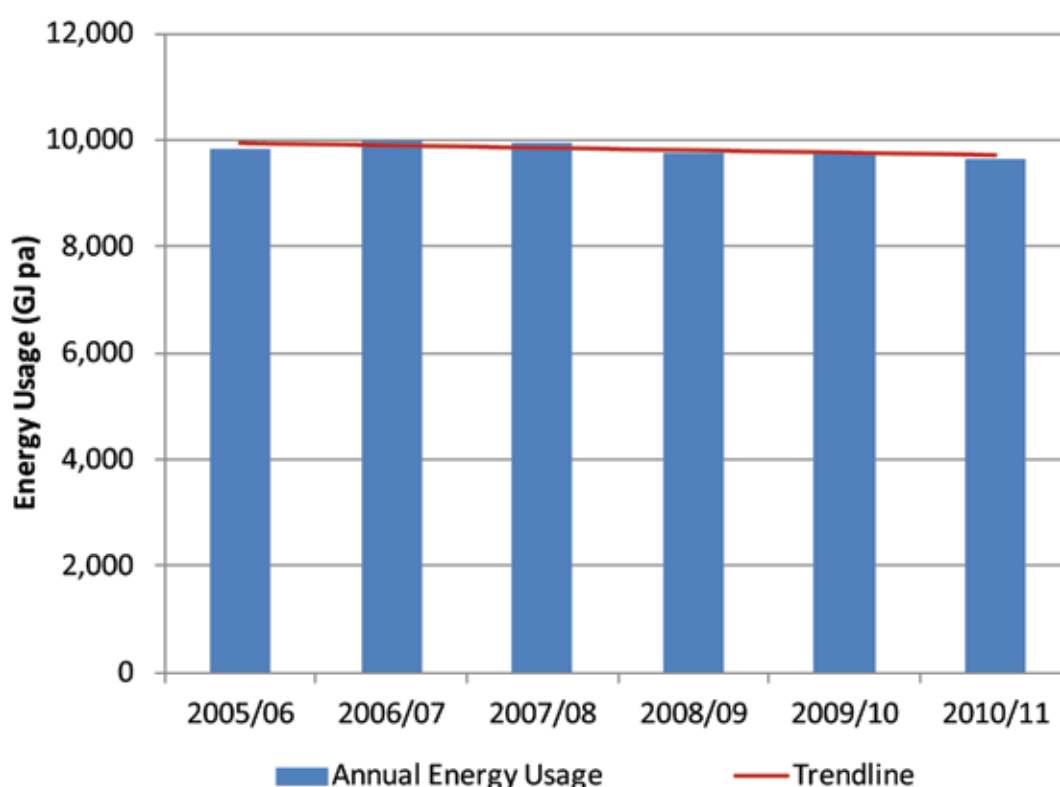
- electricity purchased by Council
- natural gas purchased by Council
- other fuels purchased for the site, such as coal (for heating), LPG or diesel for standby generators
- total accredited green power purchased by Council
- electricity generated from local renewable energy sources for use by Council.

Energy use that is excluded from the Baseline:

- all transport fuels consumed by mobile equipment: such as diesel, petrol, CNG and LPG consumed by trucks, commercial or passenger vehicles, and Council fleet and forklift trucks
- energy usage by the community (i.e. residential and business usage)

The energy data shown in Figure 1 was obtained from energy bills and from energy billing data for Strathfield Council that is managed by Planet Footprint.

Figure 1 – Strathfield Council Historical Energy Usage



Although Council has delivered a range of efficiency projects as shown in Table 2, over 65% of Council's energy use is attributed to street lighting. This is an asset that Council has limited control over as an individual organisation. However, Council is making efforts through the Southern Sydney Regional Organisation of Councils (SSROC) Street Lighting Improvement Program to reduce this energy use as a concerted effort across member councils. Given that street lighting constitutes such a high portion of Council's energy use, it is important that opportunities are pursued where possible.

Over the past five years, Council has delivered a range of energy efficiency projects that have saved over \$17,000 a year in energy costs. Many of these efficiencies were gained through simple changes in the management of lighting and fixtures and came at a minimal cost to Council. These savings will continue to improve as practices are refined and processes are engrained in the everyday operation of each facility.

Table 1 – Summary of Energy Efficiency Actions Implemented Over the Past 5 Years

Site	Action	Energy Savings (kWh pa)
Main Library	Internal and external lighting upgrades to more efficient lighting types	17,400
	Improved lighting management/controls to reduce lighting operating times	24,400
	Improved management of air conditioning on/off times to better reflect the occupancy patterns of the library	7,400
Council Administration Complex	Internal and external lighting upgrades	6,910
	De-lamping of unnecessary lighting in over-lit areas	2,400
	T5 fluorescent lighting upgrade in the Cottage	1,280
	Timers, motions sensors and/or improved management to reduce lighting operating times	1,950
	Improved control of HVAC systems	16,200
Works Depot	Improved lighting management/controls to reduce lighting operating times (e.g. push button timers for lights)	5,100
Airey Park Clubhouse	Internal lighting upgrade (replace 50W halogen downlights with 20W CFL) and motion sensors for lights in toilets	200
Community Centre	External lighting upgrades and motion sensors for lights in toilets	1,900
Total Energy Savings	-	85,140
Total Annual Energy Cost Savings @20c/kWh		\$17,028

Energy Assessments of Council's Top Ten Energy Using Sites

Energy assessments of Strathfield Council's top ten energy using sites (listed below) were conducted in accordance with the checklist provided in the Local Council Guide for Energy Management Plans (DECCW2010). The Main Library and the Administration and Town Hall Complex are, by far, the largest energy consuming facilities even though consumption has dropped over the past five years. In fact, the audit of the Council Administration Building indicated that it would likely achieve an unofficial NABERS Energy Rating of 4.5 Stars, which represents "Good Performance" and is at the upper end of the energy benchmark. Strathfield Council could therefore consider obtaining an accredited NABERS Energy Rating in order to promote this achievement.

The Works Depot was the only site that recorded a significant increase in consumption however this increase does correspond to a change services operating out of this facility. Given the range of activities that are undertaken at the Depot, the installation of sub-meters will greatly assist the future management of energy use here.

Both the Community Centre and the High Street Library have also decreased energy use overall with only seasonal spikes due to air-conditioning use over the summer months.

Other than the Kiosk which is a leased facility, the remaining sites are all park facilities and the majority of energy use is attributed to field lighting.

Table 2 – Council's Top Ten Energy Using Sites

Site Name	Electricity Consumption (kWh per annum)
Main Library	316,038
Council Administration and Town Hall	304,347
Strathfield Works Depot	76,640
Community Centre	40,892
High Street Community Library	31,000
Begnell Field	26,231
Airey Park	20,771
Strathfield Park	18,971
Kiosk Strathfield Square	18,522
Mason Park	18,217

Energy Assessment Reports for the top ten sites and details on baseline data are provided in the Appendix.

Energy Management Review

An Energy Management Review is a structured assessment of the systems an organisation has in place for managing energy. It seeks to ensure energy efficiency is incorporated into existing management practices and that accountabilities are identified for priority actions. It is crucial that energy management be driven from the top down to ensure significant energy efficiency savings can be made and sustained. This means that all levels of business management – financial, production, engineering, maintenance, Work Health & Safety and operation – should be included in the review.

The aim of an Energy Management Review is to enable the organisation to systematically approach and achieve continual improvement in energy performance. Site audit reports are a tool that the organisation can use to assist in this performance, however it needs to be supported by systems and a cultural awareness for it to be effectively implemented.

The energy management review of Strathfield Council was conducted on the **3rd November 2011**, with the following members present:

Results of the Review

Council has committed to reduce energy consumption in its strategic and operational documents. By including energy use as a key sustainability indicator at a strategic level, Council has ensured that considerations around energy use are included at all levels in the organisation. The energy audits and subsequent adoption of the Strathfield Greenhouse Action Plan in 2007 have been utilised as a vehicle to delivering against these indicators over the past five years.

As well as this structured approach to delivering energy efficiencies, Council also uses a wide range of informal management practices in its operations, maintenance, training and awareness programs. Many of these practices have developed through common sense and necessity due to demands on resources. The success of these activities can often form a strong basis to build on for future formalised programs to be applied across the organisation.

Future Management Opportunities

The following opportunities were identified with reference to the Local Council Guide for Energy Management Plans (DECCW 2010). Some of these management practices are already included in Councils operations and have included here to support their continuation and further development.

- Consider recommendations from this plan in the development of Council's Delivery Program (2011-2014) and annual Operational Plan under the auspice of the Community Strategic Plan 'Strathfield 2025'.
- Establish responsibility for energy management at a senior staff level, including overall co-ordination of the Energy Management Plan.
- Energy usage reports are to be a regular agenda item at a management level.
- Short list the identified opportunities from this plan and provide reasons for the inclusion and exclusion for each opportunity.
- Develop an asset register and associated scheduled maintenance procedures for major energy consuming equipment in accordance with recognised codes and standards. As a minimum, major equipment shall include: heating ventilation and air conditioning (HVAC), water pumps and renewable energy generators.
- Implement basic energy-awareness activities at each major facility.

The inclusion of the practices and the degree in which they are integrated into Council's processes will be influenced by a range of factors including the availability of resources, the drafting of new documents and any changes in the regulatory environment.

Summary of Low Cost Energy Saving Projects

A summary of all low cost opportunities identified across Strathfield Council's top ten energy using sites is provided in Table 8 below. The projects are listed in order of priority, with projects with the highest cost savings listed first. These projects will result in electricity savings of 7,374 kWh per annum, gas savings of 11,877 MJ per annum and greenhouse gas reductions of 8.5 TCO₂-e per annum.

The implementation of any project listed below will be assessed against its ability to deliver across economic, environmental, social and civic leadership indicators. As resource opportunities, new technologies, shifts in energy costs, and potential partnership program become available, the business case for these initiatives will become even more economically viable.

Table 3 – Low Cost Opportunities for Strathfield Council

Opportunity	Estimated Cost	Potential Electricity Savings kWh pa	Potential Gas Savings MJ pa	Potential Energy Cost Savings \$pa	Payback (years)	GHG Savings TCO ₂ e pa
Transfer the Strathfield Square Kiosk account to the tenants name rather than have bills processed through Council.						
Refer the tenant to the NSW Government's Energy Efficiency for Small Business Program (EESBP) which offers a subsidised energy assessment and access to up to \$5,000 in rebates for energy upgrades. See http://www.environment.nsw.gov.au/sustainbus/smallbusenergy.htm	\$ -	0	-	\$2,676	0.0	0.0
Install 7 day timers on: Vending machine outside the Council Cottage at the Admin Complex; Vending machines (2) and water cooler in the Works Depot Lunchroom The timers should be set to turn the units off after hours and/or on weekends when the facilities are unoccupied.	\$120	2,719	-	\$544	0.2	2.9
Put large bar/drinks fridge in the Airey Park Clubhouse on a timer or connect it to Cloudmaster system. The timer/controls should be set to turn the fridge off when the facility is unoccupied. The sports clubs that hire the clubhouse should be informed of the change and signage should be put up to ensure that perishables are stored in the smaller fridge in the kitchen.	\$170	2,102	-	\$450	0.4	2.2
Install Timer on hot water recirculation pumps in the Main Library to turn them off after hours.	\$200	876	11,877	\$375	0.5	1.7
Investigate the potential cancellation of electricity account for the "Storage Shed" at Airey Park (there has not been any consumption recorded on this account for several years, but there is a fixed quarterly charge to have the account open).	\$ -	0	-	\$360	0.0	0.0
Replace large fridge in Community Centre office with smaller (250L) fridge.	\$800	473	-	\$110	7.3	0.5

Opportunity	Estimated Cost	Potential Electricity Savings kWh pa	Potential Gas Savings MJ pa	Potential Energy Cost Savings \$pa	Payback (years)	GHG Savings TCO ₂ e pa
Install timers on Zip boilers in kitchenettes at: Main Library (2) Admin Building (2) Works Depot (4) Community Centre (2) High St Library (1) The timers should be set to turn the zip boiler units off after hours and/or on weekends when the facilities are unoccupied.	\$220	404	-	\$89	2.5	0.4
Replace 50W halogen downlights with 11W LED downlights in the Finance Office and General Manager's Office at the Admin Complex.	\$480	386	-	\$77	6.2	0.4
Install 7 day timers on the 2 small under-sink electric storage hot water units in the Admin Building. Note that the units are hardwired, so an electrician will need to install the timers. The timers should be set to turn the units off after hours and/or on weekends when the facilities are unoccupied.	\$600	387	-	\$77	7.8	0.4
Re-instate Solar PV display at Main Library to monitor solar energy offsets.	\$2,500	0	-	\$0	NA	0.0
Total	\$5,090	7,347	11,877	\$4,758	1.1	8.5

Summary of Energy Saving Projects Subject to Further Funding

A summary of energy saving opportunities requiring higher capital expenditure identified across Strathfield Council's top ten energy using sites is provided in Table 9 below. These projects are subject to further funding and will be considered for inclusion in Council's Delivery Program for implementation over the next four years. The projects are listed in order of priority, with projects with the best payback periods listed first. These projects would result in total electricity savings of 80,170 kWh per annum and greenhouse gas reductions of 84.9 TCO₂-e per annum. Business cases containing more detail for each project are provided in Section 9.

As noted in Table 1, Strathfield Council has already implemented a number of energy saving initiatives arising out of its 2007 Greenhouse Action Plan. As a result, most of the "low hanging fruit" of low cost/high savings projects have already been implemented at the two main sites – the Main Library and the Council Admin Complex. The list of energy savings projects therefore include some projects with higher costs and longer paybacks for Council to consider to further improve energy efficiency.

Table 4 – Opportunities Subject to Further Funding

Project	Site(s)	Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ pa
Replace High Bay Lights with Energy Efficient High Bay lights and Photo Sensor	Works Depot (Mechanics Shed)	\$8,100	12,447	\$2,681	3.0	13.2
Connect sports field flood lighting to "Cloudmaster" control systems	Strathfield Park; Airey Park; Mason Park; Bark Huts Reserve; Cooke Park.	\$ 70,450	4,525	\$22,896 (includes electricity, water and labour savings)	3.1	4.8
Install Intelligent Motor Controllers on Packaged Air Con Units	Council Admin Building	\$12,000	14,884	\$2,977	4.0	15.8
Install Solar Hot Water Heaters	Works Depot; Community Centre	\$9,000	8,596	\$1,899	4.7	9.1
Install power factor correction equipment	Council Admin Building	\$5,000	-	\$980	5.1	-
Replace T8 Fluorescent Tube Lights with T5 Fluorescent Tubes using Adaptor Kits	Town Hall/ Chambers; Council Admin Building; Works Depot; Community Centre; Sports Fields Clubhouses	\$16,740	14,688	\$3,063	5.4	15.5
Upgrade Fluorescent Exit Sign Lighting to LED Exit Signs	Main Library; Council Admin Complex; Works Depot; Community Centre	\$10,535	6,780	\$1,418	7.4	7.2
Installation of Solar Photovoltaic Panels	Can be installed at any site	\$35,000	18,250	\$3,930	8.9	19.3
Improve Management of Air Conditioning at Main Library	Main Library	TBC	16,784	\$3,269	TBC	17.8
Total		\$166,825	96,954	\$43,113	3.9	102.7

Business Cases for Projects Requiring Capital Expenditure

The following business cases have been prepared to assist Council in assessing, designing, and implementing new projects to reduce Council's energy consumption.

BUSINESS CASE 1	Replace High Bay Lights in Works Depot Mechanics Shed with Energy Efficient High Bay lights and Photo Sensor			
Detailed description	<p>This project involves replacing the 9 x 400W metal halide high bay lights in the Mechanics Shed at the Works Depot with more energy efficient high bay lights controlled by a photo sensor.</p> <p>During the day, natural light levels in the workshop are generally sufficient for undertaking normal workshop work. The high bay lights are therefore only needed in the early morning, late afternoon, or on cloudy days. However, as the existing high bay lights take ~ 5 minutes to warm up, it is impractical to have them sensor controlled or for staff to manually turn them on/off as required. Other high bay light options are available that strike instantly so the lights can be turned on/off as appropriate.</p> <p>150W LED high bay lights are suggested as a suitable replacement option, however other energy efficient high bay lights (such as induction lights, compact fluorescent or high output T5 high bay lights) could be considered. The new lights should be able to strike quickly so that they can be controlled by a photo sensor to turn them off when natural light levels are sufficient. Other considerations should include:</p> <ul style="list-style-type: none"> Ensuring light levels in the workshop are above 160 lux as required by AS1680; Low power consumption for the proposed lights; Ability of the proposed lights to be controlled using a photo sensor; Long lamp lifetimes. <p>Prospective contractors will require a site visit to view the workshop prior to quoting. Costs and savings below are based on replacing the existing lights with 150W LED high bay lights, with the photo sensor reducing the operating times of the lights by 50%.</p>			
Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ p.a.
\$8,100	12,447	\$2,681	3.0	13.2

BUSINESS CASE 2	Connect sports field flood lighting to "Cloudmaster" control systems			
Detailed description	<p>This project involves installing "Cloudmaster" control systems for sports field flood lighting to allow the lights to be remotely programmed to turn on/off as required, to minimize their operating times. The control system can be installed at the following facilities:</p> <p>Strathfield Park, Airey Park, Mason Park, Bark Huts Reserve, Cooke Park.</p> <p>The cost estimate below is based on a supplier's quote and the energy savings are based on the new controls providing a 20% reduction in floodlight operating times. There are also expected to be significant water savings associated with connecting the controls to the irrigation systems.</p>			
Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ p.a.
\$ 70,450	4,525	\$22,896 (\$970 pa electricity + \$3,000 pa labour + \$18,926 pa water)	3.1	4.8

BUSINESS CASE 3	Intelligent Motor Controllers for the Three Large Packaged Air Con Units in the Admin Building			
Detailed description	<p>This project involves installing intelligent motor controllers on the three large packaged air conditioners at the admin building. An intelligent motor controller uses a specialised logic controller to manage the operating times of the air conditioner compressor. The controller enables the compressors to maximize the rate of heat removal by optimizing the natural physical properties of the compressor operating cycle. This “compressor optimization” can reduce the compressor run time by up to 30 percent without affecting the temperature conditions, thus reducing electricity usage.</p> <p>Prospective contractors should be provided with details of the makes & models of the air conditioners, and may require a site visit to view the systems before providing a quote.</p>			
Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ p.a.
\$12,000	14,884	\$2,977	4.0	15.8

BUSINESS CASE 4	Install Solar Hot Water Heaters at the Works Depot and the Community Centre				
Detailed description	<p>The Works Depot has 2 x 250L electric storage hot water heaters – one near the change rooms and one serving the first floor of the main building. The Community Centre has 1 x 250L electric storage hot water heater. Electric storage hot water heaters are the least efficient means of providing hot water, so they can be replaced with solar hot water systems (with electric boosting as backup).</p> <p>Both sites have sufficient roof areas available to mount solar collectors. Neither site has natural gas connection, so gas hot water systems were not considered. Prospective contractors will require a site visit to view the buildings and the existing hot water systems prior to submitting quotes.</p>				
	Estimated Capital Cost \$	Electricity Savings kWh pa	Total Cost Savings \$ pa	Payback Period (years)	GHG Savings TCO ₂ p.a.
Works Depot	\$6,000	5,731	\$1,234	4.9	6.1
Community Centre	\$3,000	2,865	\$665	4.5	3.0
Total	\$9,000	8,596	\$1,899	4.7	9.1

BUSINESS CASE 5	Install power factor correction equipment in the Admin Building			
Detailed description	<p>The Admin Building's power factor is relatively poor at around 0.85 at maximum demand. This means that Council is paying higher demand charges on the monthly electricity bill for the building. Power factor can be improved by installing power factor correction equipment (capacitors) at the main switchboard. A 25kVAr unit should be sufficient to correct the power factor to above 0.95. This will reduce the monthly demand charge on the electricity bill.</p> <p>Prospective contractors should be provided with electricity account details and 12 months electricity demand data (available via Webgraphs) and may require a site visit to view the electrical system prior to quoting.</p>			
Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ p.a.
\$5,000	-	\$980	5.1	-

BUSINESS CASE 6	Replace T8 Fluorescent Tube Lights with T5 Fluorescent Tubes using Adaptor Kits				
Detailed Description	<p>This project involves converting 36W T8 fluorescent lights (~45W per light including ballast) to 28W T5 fluorescent lights (~31W per light including ballast) using T5 adaptor kits at the following locations:</p> <p>Town Hall/Council Chambers Building (182 tubes) – all areas throughout the building, excluding the finance office area (which already has T5 tubes);</p> <p>Admin Building Records Room (25 tubes);</p> <p>Works Depot (~80 tubes) – exclude lights in areas that are infrequently used (e.g. storage bays, parts/tools shed);</p> <p>Mechanics Shed (~12 tubes);</p> <p>Ablutions Block (~4 tubes);</p> <p>Main Depot Office (~30 tubes);</p> <p>Toilets/Change Rooms (~10 tubes);</p> <p>Lunch Room (~8 tubes);</p> <p>Old SES Area (~12 tubes);</p> <p>Community Centre (~46 tubes);</p> <p>Sports Fields Clubhouses/Amenities Buildings (39 tubes):</p> <p>Begnell Field (8 tubes);</p> <p>Airey Park (15 tubes);</p> <p>Strathfield Park (8 tubes);</p> <p>Mason Park (8 tubes).</p> <p>Note that this project is not applicable for the following facilities:</p> <p>Main Library – already has T5 fluorescent tube lighting;</p> <p>General office areas of the Admin Building – does not have T8 fluorescent lighting;</p> <p>General Manager's Cottage – already has T5 fluorescent tube lighting;</p> <p>High St Library – already has T5 fluorescent tube lighting.</p> <p>In conjunction with this upgrade, Council should consider installing motion sensors or push button timer switches in rooms/areas that are infrequently used, such as toilets, store rooms and meeting rooms (where these controls are not already installed).</p>				
	Estimated Capital Cost \$	Electricity Savings kWh pa	Total cost Savings \$ pa	Payback Period (years)	GHG Savings TCO ₂ p.a.
Town Hall/Council Chambers Building (182 tubes)	\$8,190	7,215	\$1,443	5.7	7.6
Admin Building Records Room (25 tubes)	\$1,125	1,021	\$204	5.5	1.1
Works Depot (~80 tubes)	\$3,600	3,319	\$715	5.0	3.5
Community Centre (~46 tubes)	\$2,070	2,074	\$481	4.3	2.2
Sports Field Clubhouses (39 tubes)	\$1,755	1,059	\$220	7.9	1.1
Total	\$16,740	14,688	\$3,063	5.4	15.5

BUSINESS CASE 7	Upgrade Fluorescent Exit Sign Lighting to LED Exit Signs				
Detailed description	<p>This project involves replacing fluorescent exit signs (which consume ~20W per light) with LED Exit Signs (which consume ~2W per light) at the following Council Facilities (note that the High St Library already has LED exit lights):</p> <p style="text-align: center;">Main Library (10 exit lights); Council Admin Complex (15 exit lights); Works Depot (8 exit lights); Community Centre (10 exit lights).</p>				
	Estimated Capital Cost \$	Electricity Savings kWh pa	Total Cost Savings \$ pa	Payback Period (years)	GHG Savings TCO ₂ p.a.
Main Library	\$2,450	1,577	\$307	8.0	1.7
Council Admin Complex	\$3,675	2,365	\$473	7.8	2.5
Works Depot	\$1,960	1,261	\$272	7.2	1.3
Community Centre	\$2,450	1,577	\$366	6.7	1.7
Total	\$10,535	6,780	\$1,418	7.4	7.2

BUSINESS CASE 8	Installation of Solar Photovoltaic Panels			
Detailed description	<p>This project involves the installation of solar photovoltaic (PV) panels on the roofs of Council Facilities.</p> <p>The Main Library is currently the only facility with solar PV panels. However, a number of Council's facilities have roof areas that are suitable for the installation of solar PV panels. The Main Library also has room on its roof for additional solar PV panels.</p> <p>The cost of a standard 10kW system is provided in the table below, along with the expected electricity generation (i.e. savings) from the system. The cost includes the estimated discount from the STCs (Small-scale Technology Certificates) that would be generated from the system.</p> <p>Solar PV systems could be installed at a number of Council's facilities. The best candidates are facilities with large, well supported, north-facing roofs. It is recommended that potential contractors be requested to advise on the most appropriate/cost effective site(s) for Solar PV systems, from the following list of facilities:</p> <p style="text-align: center;">Council Admin Complex; Main Library (additional system); Works Depot; Community Centre; High St Library.</p> <p>Cost savings will be highest at sites with higher electricity tariffs, such as the Works Depot, Community Centre and High St Library.</p> <p>The cost savings below are based on the average electricity price at the Works Depot.</p>			
Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ p.a.
\$35,000	18,250	\$3,930	8.9	19.3

BUSINESS CASE 9	Improve Management of Air Conditioning at Main Library				
Detailed description	<p>The Main Library was designed with passive cooling features such as operable windows and blinds to allow for natural ventilation to reduce the need to run the air conditioning system when external weather conditions were mild. However, library staff have found that these features created problems such as security issues (e.g. books being stolen by passing them through open windows), birds flying into openings, dirt and water ingress etc. As a result, these features are not used to their full extent.</p> <p>There may be considerable savings to be gained by utilizing these passive cooling features more effectively, so it is recommended that Council investigate ways to encourage staff to use the passive cooling / natural ventilation features more often. This will require training of staff and may require modifications such as security screens etc.</p> <p>Additionally, the server room on the second floor has a large west facing window that allows heat gain into the room that must be removed by a dedicated air conditioner unit. Since the server room is generally unoccupied and does not require natural light from this window, energy could be saved by installing external shutters over the window to block some of the heat gain into the room.</p>				
	Estimated Capital Cost \$	Electricity Savings kWh p.a.	Total Cost Savings \$ p.a.	Payback Period (years)	GHG Savings TCO ₂ p.a.
Install external shutters over server room window	\$3,000	1,314	\$256	11.7	1.4
Investigate ways to encourage staff to use the passive cooling / natural ventilation features more often	TBC	15,470	\$3,013	TBC	16.4
Total	TBC	16,784	\$3,269	TBC	17.8

Glossary of Terms

Baseline Energy Use is the energy Council actually used in the base year as a reference point for determining increases or reductions in future consumption.

NABERS is the National Australian Built Environment Rating System. NABERS is a performance-based rating system for existing buildings, which rates a building on the basis of its measured operational impacts on the environment, and provides a simple indication of how well you environmental impacts are managed in comparison to others.

Project Cost Saving includes savings in direct energy costs (such as energy consumption and/or energy demand charges) and indirect costs (such as chemical costs, water costs, labour and maintenance costs and operating costs) associated with an Energy Saving Project.

Winter Peak Demand means the maximum electrical demand (in kW or kVA) of the site on a cold winter's evening – in Energy Australia's area between 2.00 pm and 8 .00 pm on weekdays in June to August.

Summer Peak Demand means the maximum electrical demand (in kW or kVA) of the site during summer – in Energy Australia's area between 2.00 pm and 8 .00 pm on weekdays in December to February.

CCP – Cities for Climate Change Protection Program

NMI – National Meter Identifier – Each electricity meter supply on the national electricity market is uniquely identified by an alphanumeric identifier known as a “NMI”.

Energy conservation – the avoidance of wasteful energy use and the reduction in demand for energy related services (e.g., if you don't need it, turn it off).

Energy efficiency – reduction in consumption of energy for current operations (e.g., if you need it, do it more efficiently).

Project Payback – Length of time required to recover the initial amount of a capital investment. If the cash inflow occurs at a uniform rate, it is the ratio of the amount of initial investment over expected annual cash inflow, or: Payback Period = Initial Investment/Annual Cash Inflows.

References

Local Government Act 1993

Department of Environment, Climate Change and Water (2010), Local Council Guide for Energy Management Plans.

NSW Division of Local Government, Planning and Reporting Guidelines for local government in NSW (2009).

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Current Baseline Data

Current baseline energy usage for Strathfield Council for the 2010/11 financial year is shown in Table 3 below.

Table 3 – Current Baseline Energy Use for Strathfield Council

Description	Strathfield Council Buildings, Facilities and Street Lighting
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased by Council in MWh	2,695
Green power purchased by Council in MWh	0
Total Electricity generated via local renewable energy sources (eg: PV, Wind, biogas, minim-hydro) for use by Council in MWh	3.8
Total Electricity used by Council in MWh	2,699
Proportion of renewable energy used as % of total energy use by Council	0.14%
Total Natural Gas purchased by Council in GJ	145
Other energy that is purchased for stationary equipment by Council	0
Total Energy Consumption in GJ	9,862
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	2,867

Current baseline energy usage for Strathfield Council's top ten energy using sites for the 2010/11 financial year are shown in Table 4a below.

Also shown in Table 4b are baselines for Strathfield Council's street lighting and for all Council's remaining smaller sites combined.

Table 4a – Baseline Data for Top 10 Energy Using Sites

Description	1. Main Library	2. Council Administration and Town Hall Complex	3. Strathfield Works Depot	4. Community Centre	5. High Street Community Library
NMI numbers	4103611221	Admin: 41020098357 Town Hall: 41020264957 Cottage: 41035330991	4102022734	4103504961	41027085679
Natural gas meter numbers	52470060861	Admin: 52400388777 Town Hall: 52400388811	NA	NA	5247120143
Baseline Start Date	1-Jul-10	1-Jul-10	1-Jul-10	1-Jul-10	1-Jul-10
Baseline End Date	30-Jun-11	30-Jun-11	30-Jun-11	30-Jun-11	30-Jun-11
Total Electricity purchased by Council in MWh	316.0 % of total baseline electricity purchased = 11.7%	304.3 % of total baseline electricity purchased = 11.3%	76.6 % of total baseline electricity purchased = 2.8%	40.9 % of total baseline electricity purchased = 1.5%	31.0 % of total baseline electricity purchased = 1.2%
Green power purchased by Council in MWh	0	0	0	0	0
Total Natural Gas purchased by Council in GJ	118.8 % of total baseline nat. gas purchased = 82.1%	23.2 % of total baseline nat. gas purchased = 16.0%	0	0	2.7 % of total baseline nat. gas purchased = 1.9%
Other energy that is purchased for stationary equipment by Council	0	0	0	0	0
Total Energy Consumption in GJ	1,256.5	1,118.8	275.9	147.2	114.3
Site Greenhouse Gas Emissions in TCO ₂ -e – NGA Workbook full fuel cycle conversion factors used	342.8 % of total baseline GHG emissions = 12.0%	324.1 % of total baseline GHG emissions = 11.3%	81.2 % of total baseline GHG emissions = 2.8%	43.3 % of total baseline GHG emissions = 1.5%	33.0 % of total baseline GHG emissions = 1.2%

Table 4a – Baseline Data for Top 10 Energy Using Sites (cont.)

Description	6. Airey Park	7. Begnell Field	8. Strathfield Park	9. Strathfield Square Kiosk	10. Mason Park
NMI numbers	4102710890 4102712197 4102711964 4103445406	41028435848 41037740429	41027098325 41020264917 41027098319	4102715124	41026682920 41026682938
Natural gas meter numbers	NA	NA	NA	NA	NA
Baseline Start Date	1-Jul-10	1-Jul-10	1-Jul-10	1-Jul-10	1-Jul-10
Baseline End Date	30-Jun-11	30-Jun-11	30-Jun-11	30-Jun-11	30-Jun-11
Total Electricity purchased by Council in MWh	20.8 % of total baseline electricity purchased = 0.8%	26.2 % of total baseline electricity purchased = 1.0%	19.0 % of total baseline electricity purchased = 0.7%	18.5 % of total baseline electricity purchased = 0.7%	18.2 % of total baseline electricity purchased = 0.7%
Green power purchased by Council in MWh	0	0	0	0	0
Total Natural Gas purchased by Council in GJ	0	0	0	0	0
Other energy that is purchased for stationary equipment by Council	0	0	0	0	0
Total Energy Consumption in GJ	74.8	94.4	68.3	66.7	65.6
Site Greenhouse Gas Emissions in TCO ₂ -e – NGA Workbook full fuel cycle conversion factors used	22.0 % of total baseline GHG emissions = 0.8%	27.8 % of total baseline GHG emissions = 1.0%	20.1 % of total baseline GHG emissions = 0.7%	19.6 % of total baseline GHG emissions = 0.7%	19.3 % of total baseline GHG emissions = 0.7%

Table 4b – Baseline Data for Street Lighting and Remaining Smaller Sites Combined

Description	Street Lighting		Other Smaller Sites Combined	
NMI numbers	NA		NA	
Natural gas meter numbers	NA		NA	
Baseline Start Date	1-Jul-10		1-Jul-10	
Baseline End Date	30-Jun-11		30-Jun-11	
Total Electricity purchased by Council in MWh	1,750.8	% of total baseline electricity purchased = 65.0%	73.1	% of total baseline electricity purchased = 2.7%
Green power purchased by Council in MWh	0		0	
Total Natural Gas purchased by Council in GJ	0		0	
Other energy that is purchased for stationary equipment by Council	0		0	
Total Energy Consumption in GJ	6,302.7		263.0	
Site Greenhouse Gas Emissions in TCO ₂ -e – NGA Workbook full fuel cycle conversion factors used	1,855.8	% of total baseline GHG emissions = 64.7%	77.4	% of total baseline GHG emissions = 2.7%

Energy Assessment of Strathfield Main Library

Background

The Strathfield Main Library is a 1,880 m², two-storey building that was built in 2004. The library is located at 65 Rochester St Homebush, operates 7 days per week, and is Strathfield Council's largest energy using facility.

The building was designed and built with a number of energy efficiency features, however not all of them are currently being utilised to their full potential, as described below:

- A 2.5 kW solar photovoltaic system on the roof – this was installed with a display system located in the library foyer that displayed how much electricity was generated by the panels, but this display is no longer functioning. In addition, the inverter does not have a bi-directional meter to allow the electricity generated to be measured by the utility meter. This means that there is currently no way to determine how much electricity is being generated by the panels. When the system was installed it was estimated that they would produce an average of approximately 3,795 kWh per annum (~1.2% of the building's total electricity demand). The panels and inverters appear to be in reasonable condition so it is assumed that they are producing the nominal amount of electricity. However, it is recommended that the monitoring/display system be re-instated so that the output from the system can be measured.
- The building was designed with passive cooling features such as operable windows and blinds to allow for natural ventilation to reduce the need to run the air conditioning system when external weather conditions are mild. However, library staff have found that these features created problems such as security issues (e.g. books being stolen by passing them through open windows), birds flying into openings, dirt and water ingress etc. As a result, these features are not used to their full extent.
- Although the central air conditioning system is run more often than originally intended, it is an energy efficient VRV (Variable Refrigerant Volume) system that is among the most efficient options available.

In addition, a number of energy efficiency measures have previously been implemented at the site, including:

- Internal and external lighting upgrades to more efficient lighting types;
- Improved lighting controls to reduce lighting operating times;
- Improved management of air conditioning on/off times to better reflect the occupancy patterns of the library.

Energy Baseline and Historical Energy Usage

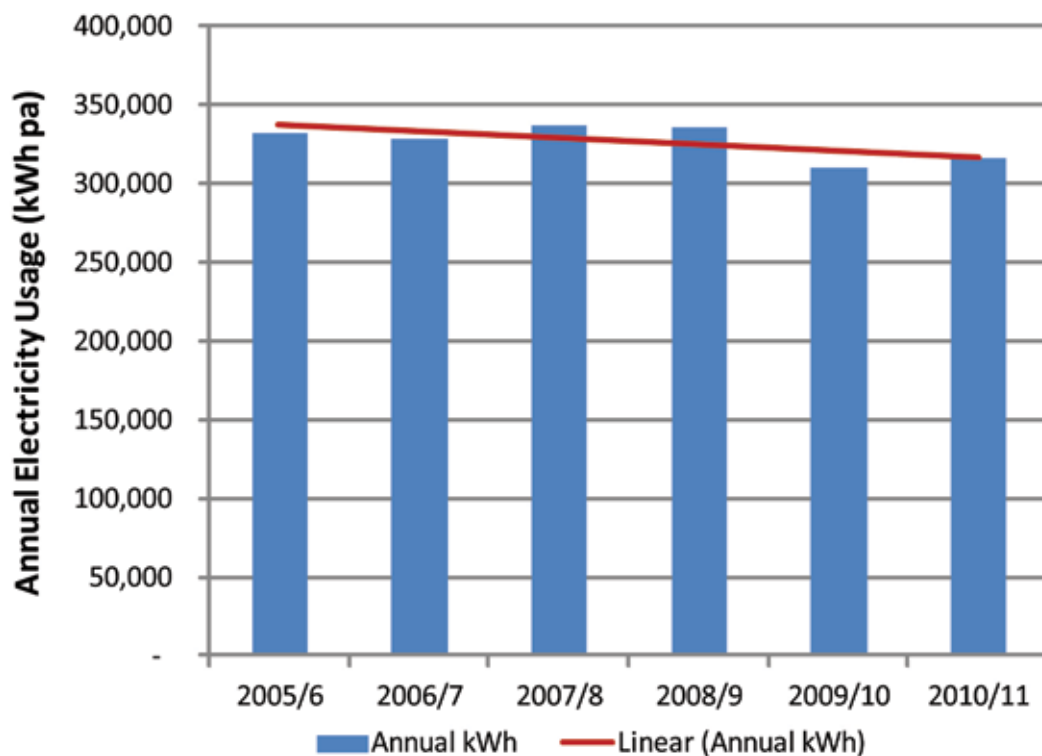
An energy baseline for the Strathfield Main Library for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Energy Baseline

Site Name	Main Library
Electricity NMI	4103611221
Electricity Account	155436-2
Natural Gas Meter	52470060861
Natural Gas Account	53482147
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	316.04 (91% of total site energy usage)
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	118.77 (9% of total site energy usage)
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	1256.50
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used	342.78

Total annual electricity consumption for the Strathfield Main Library over the past six years is shown in Figure 1 below, and indicates a distinct trend of reduction in annual electricity usage over this period.

Figure 1 – Annual Electricity Trend



Energy KPIs

Energy Key Performance Indicators (KPIs) for the library are shown in Table 2 below.

Table 2 – Energy KPIs

Building	Area (m ²)	2010/11 Electricity Usage (kWh)	2010/11 Gas Usage (MJ)	Electricity KPI (kWh/m ²)	Gas KPI (MJ/m ²)	Total Energy KPI (MJ/m ²)
Strathfield Main Library	1,880	316,038	118,766	168	63	668

Quarterly Energy Consumption Trends

Graphs of quarterly electricity and natural gas consumption over the past six years are shown in Figures 2 and 3 below. The graphs indicate the following trends:

- Electricity usage is highest in summer (due to air conditioning demand);
- Although electricity usage has been gradually decreasing over the past six years, electricity costs have risen sharply in the last two years;
- Natural gas consumption is slightly higher in winter. However, gas usage is (somewhat surprisingly) relatively consistent throughout the year. It should be also noted that although natural gas is only used for amenities hot water, gas usage makes up a relatively high proportion (9%) of the total energy usage for the site. It was noted during the site visit that the hot water system has recirculation pumps that keep water in the pipes hot and ready for use. The data in Figure 3 indicates that these pumps may be running 24/7, which will be wasting energy to keep water in the pipes hot after hours when the library is unoccupied. Installing a timer on the recirculation pumps may address this issue;

Figure 2 – Main Library Quarterly Electricity Trend

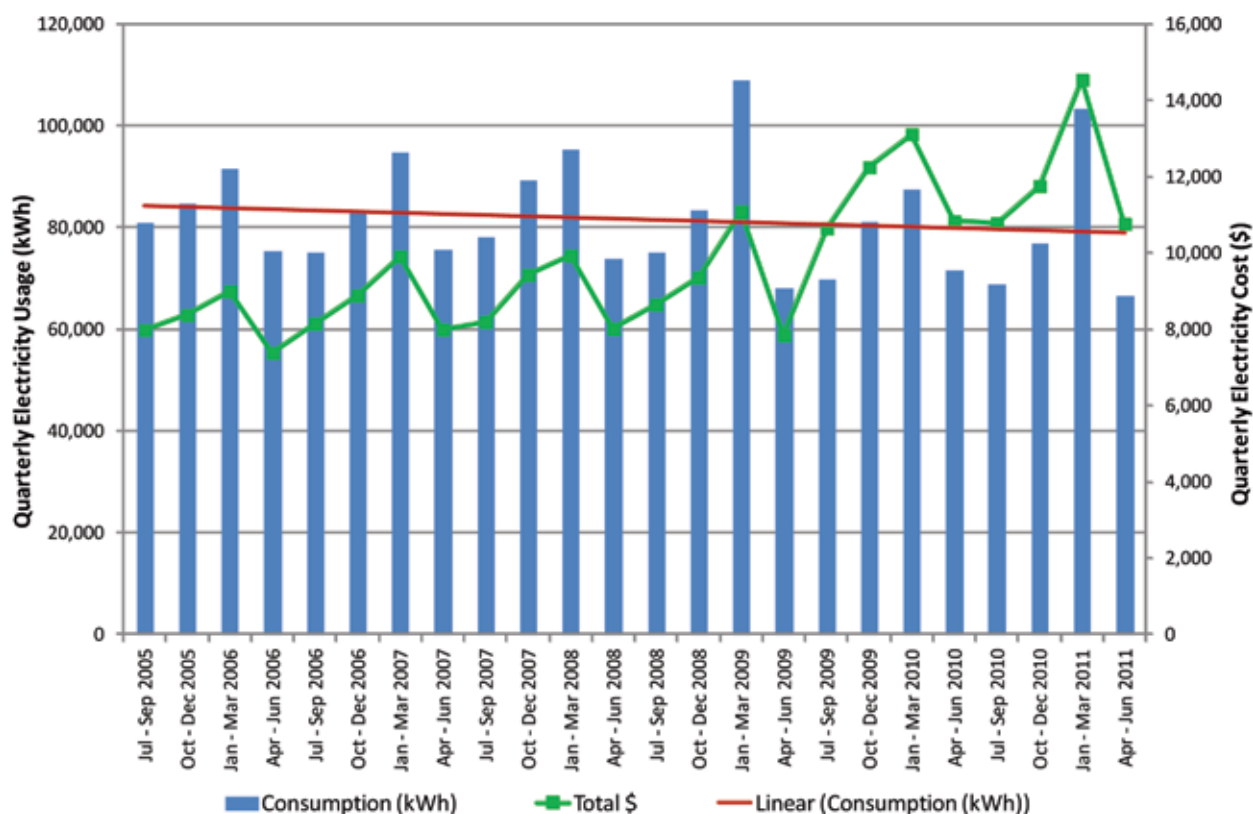
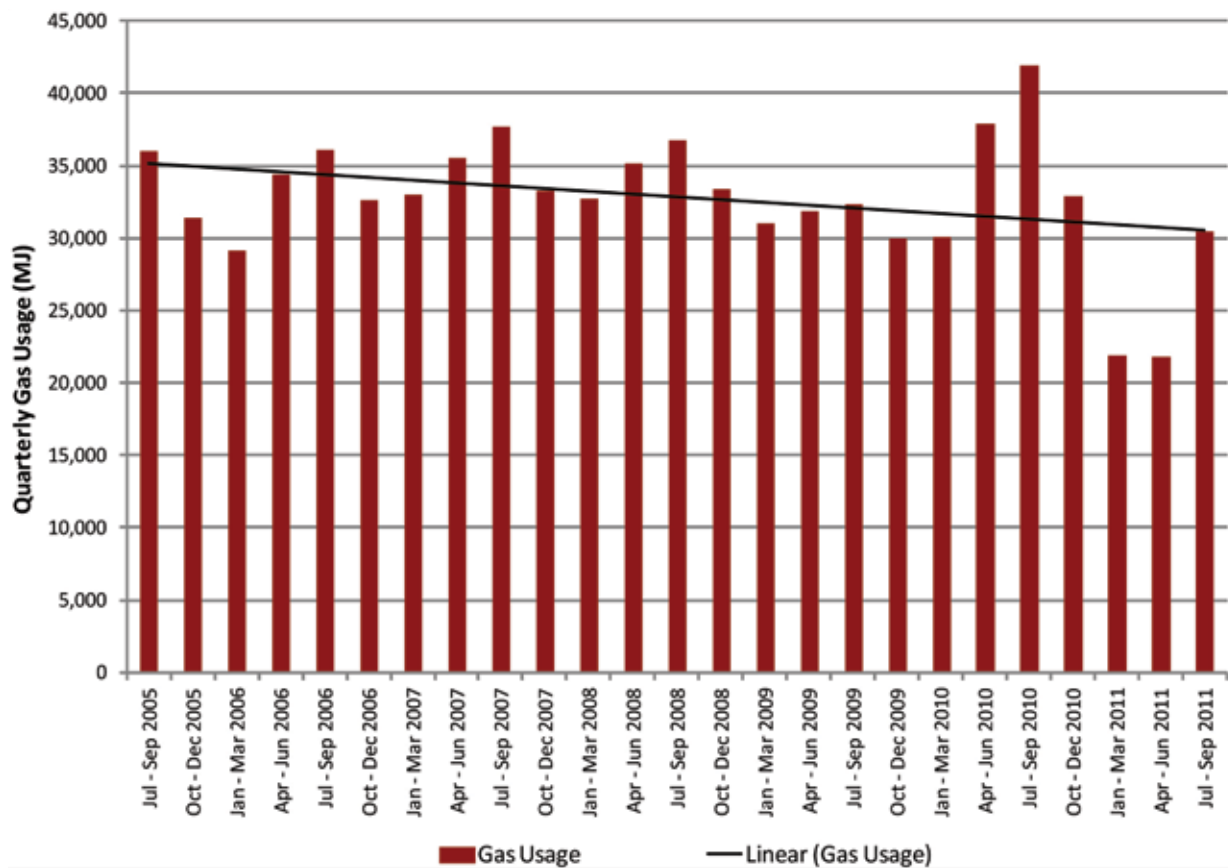


Figure 3 – Main Library Quarterly Gas Trend



Daily/Weekly Electricity Demand Data

Graphs of electricity demand data for the library for typical weeks in Feb and Nov 2011 are shown in Figures 4 and 5 below and indicate the following:

- Maximum peak demand and after hours base load in Feb 2011 were approximately 140kW and 40kW respectively. The after hours demand was relatively high (~30% of daily peak), suggesting that equipment & lighting were being left on after hours during this period;
- Maximum peak demand and after hours base load in Nov 2011 were approximately 130kW and 10kW respectively. The after hours demand was much lower in November, and the demand pattern indicates that equipment is better controlled to come on at the start of the day and off at closing time. It appears that at some time during 2011, some improvements were implemented to better control the library equipment operating times (i.e. lighting and air conditioning);
- Power Factor at maximum demand is acceptable at around 0.95;
- Daily demand starts to rise around 8.00am daily as the library opens and equipment is turned on;
- Demand peaks around midday when the outside temperature is highest and the air conditioning systems are working hardest;
- Demand starts to drop to base line level from around 8.00pm as the library closes and equipment is turned off;
- There are small spikes in demand around 1-3am each day, which are probably due to cleaning staff activities.

Figure 4 – Electricity Demand Data for Week in Early 2011 (31 Jan - 6 Feb 2011)

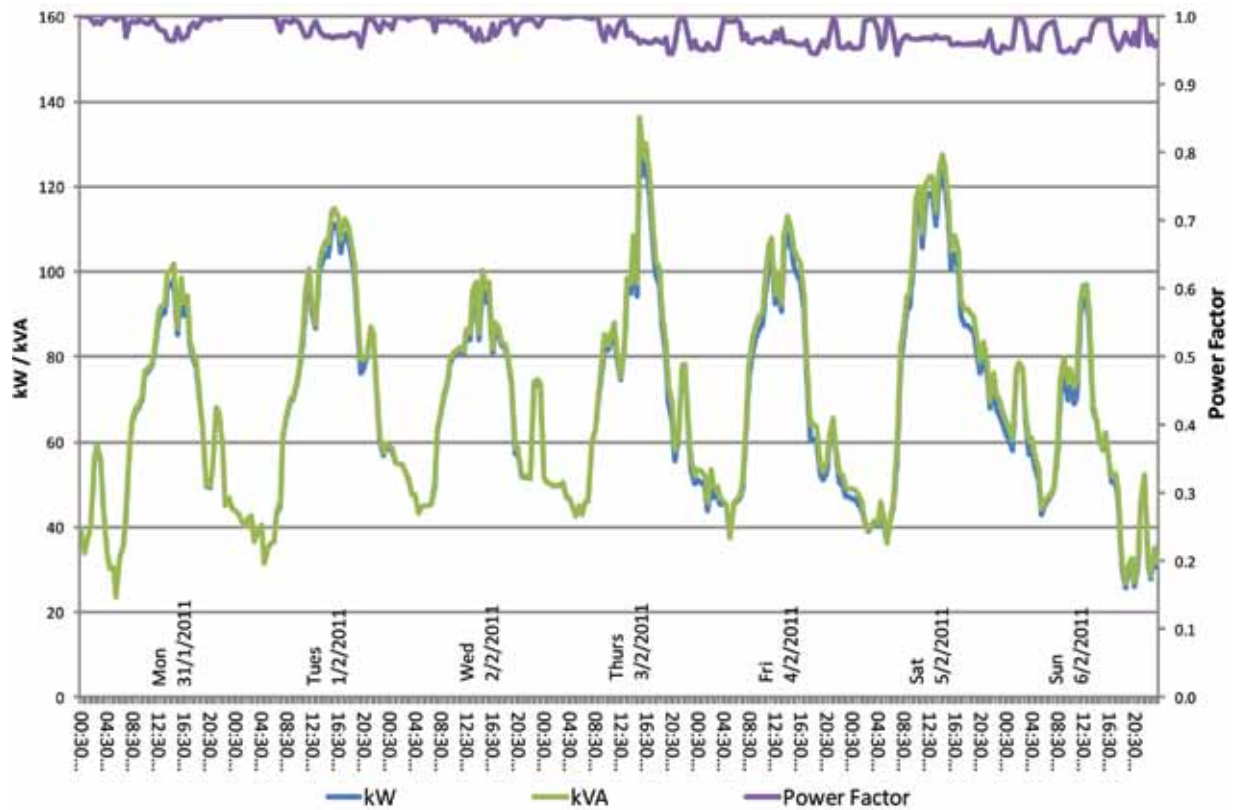
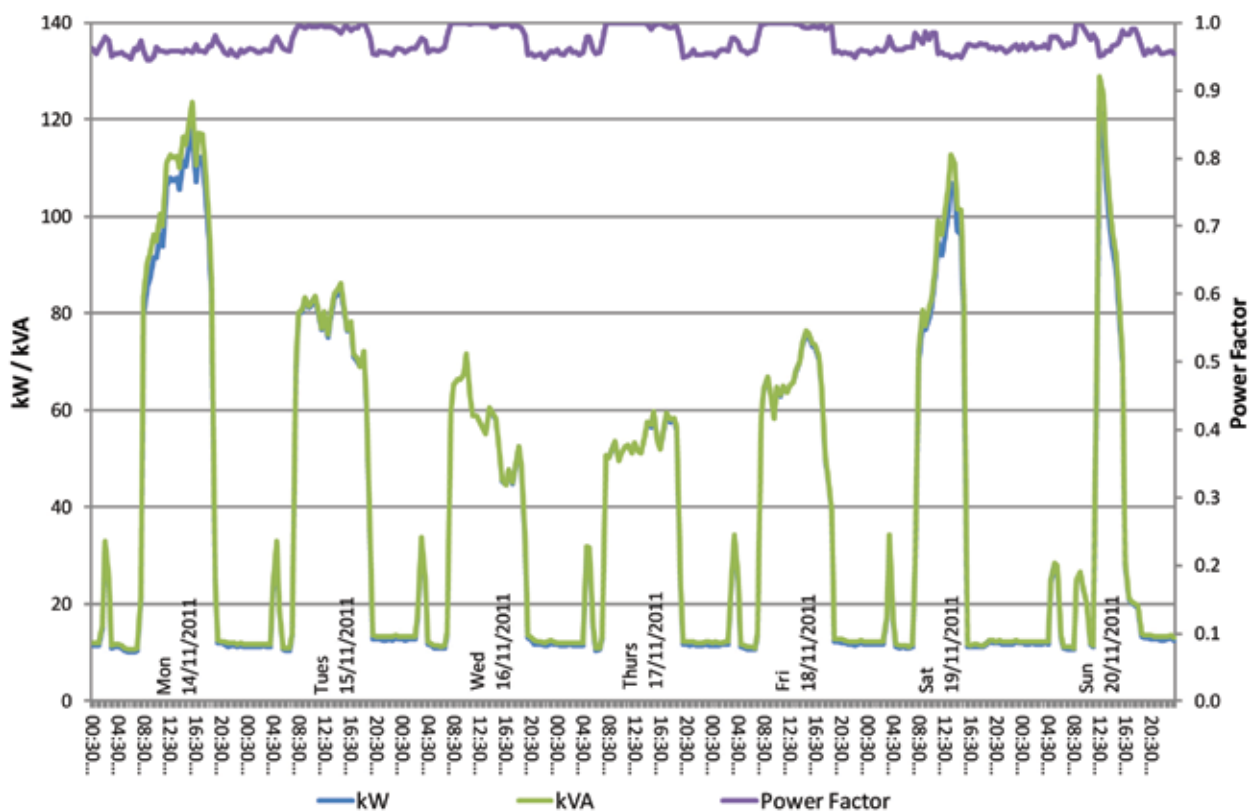


Figure 5 – Electricity Demand Data for Week in Late 2011 (14 – 20 Nov 2011)

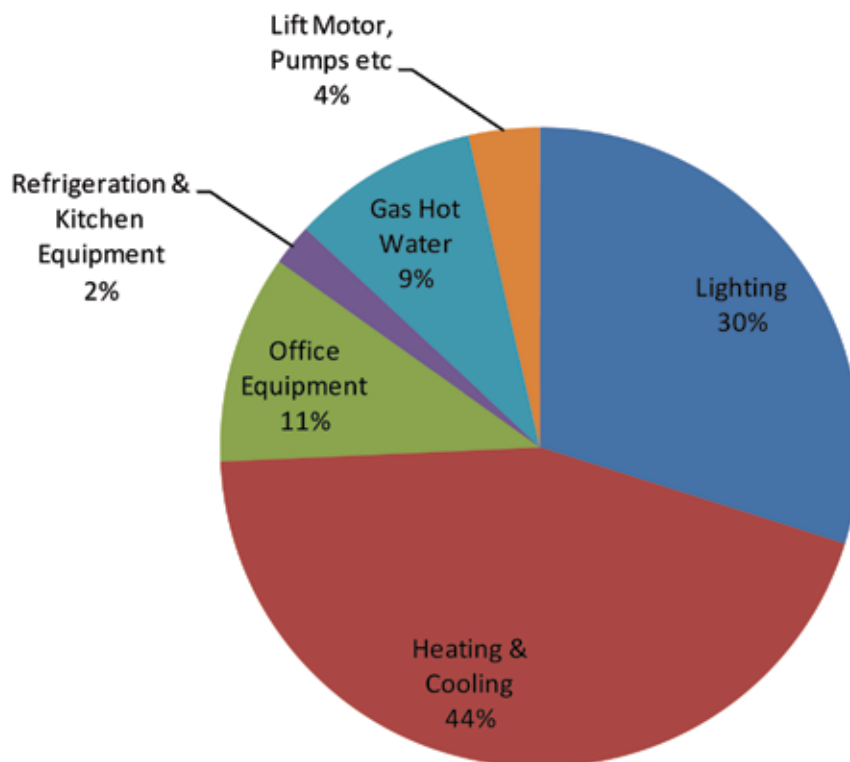


Energy Balance

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. There are no sub-meters in the library that measure energy usage by major items/groups of equipment. Nevertheless, the following breakdown of energy usage was estimated based on the rated power capacities of key items of equipment and their known operating hours.

Figure 6 below shows the breakdown of energy usage in the library, and indicates that the major users of energy are heating & cooling, lighting, office equipment, and gas hot water.

Figure 6 – Library Energy Breakdown



Energy Saving Opportunities

The following energy saving opportunities in Table 3 have been identified for the Strathfield Main Library. The projects are listed in order of their energy cost saving potential. Cost savings are based on an average electricity price of 19.47 c/kWh and a gas price of 1.72 c/MJ determined from the August 2011 bills. Note that electricity prices are expected to increase significantly over the next few years, so this will improve the business cases/paybacks for implementing these projects.

Table 3 – Energy Savings Opportunities for the Main Library

Opportunity	Estimated Cost	Potential Elec Savings kWh pa	Potential Gas Savings MJ pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Projects Requiring Capital Expenditure						
Replace fluorescent exit sign lights with LED exit signs (10 units)	\$2,450	1,577	-	\$307	8.0	1.7
Install additional solar photovoltaic panels on the roof (10kW)	\$35,000	18,250	-	\$3,554	9.8	19.3
Install external shutters over server room window	\$3,000	1,314	-	\$256	11.7	1.4
Investigate ways to encourage staff to use the passive cooling / natural ventilation features more often (may require modifications such as security screens etc)	TBC	15,470	-	\$3,013	TBC	16.4
Total for Capital Projects	\$40,450	36,610	-	\$7,130	5.7	38.8
Low Cost Opportunities						
Timer on hot water recirc pumps	\$200	876	11,877	\$375	0.5	1.7
Install timers on Zip boilers in kitchenettes	\$40	83	-	\$16	2.5	0.1
Re-instate Solar PV display	\$2,500	0	-	\$0	NA	0.0
Total for Low Cost Opportunities	\$2,740	959	11,877	\$391	7.0	1.8
Total for Main Library	\$43,190	37,569	11,877	\$7,521	5.7	40.6
Total Savings as a Percentage of Total Site Use (%)	-	12%	10%	-	-	12%

Energy Assessment of Strathfield Council Administration Complex

Background

The Strathfield Council Administration Complex is located at 65 Homebush Rd, Strathfield and consists of three buildings with separate electricity and gas supplies:

- The Council Administration Building – a two storey commercial office building;
- The Town Hall/Council Chambers – a two storey building containing the Town Hall, Council Chambers, and some general office areas;
- The General Manager's Cottage – a single storey building with office spaces and meeting rooms.

The Administration Complex is Strathfield Council's second largest energy using facility, and a number of energy efficiency measures have previously been implemented at the site, including:

- Internal and external lighting upgrades in the Administration building;
- De-lamping of unnecessary lighting in over-lit areas in all three buildings;
- T5 fluorescent lighting upgrade in the Cottage;
- Timers and motions sensors to reduce lighting operating times;
- Improved control of HVAC systems.

Energy Baseline and Historical Energy Usage

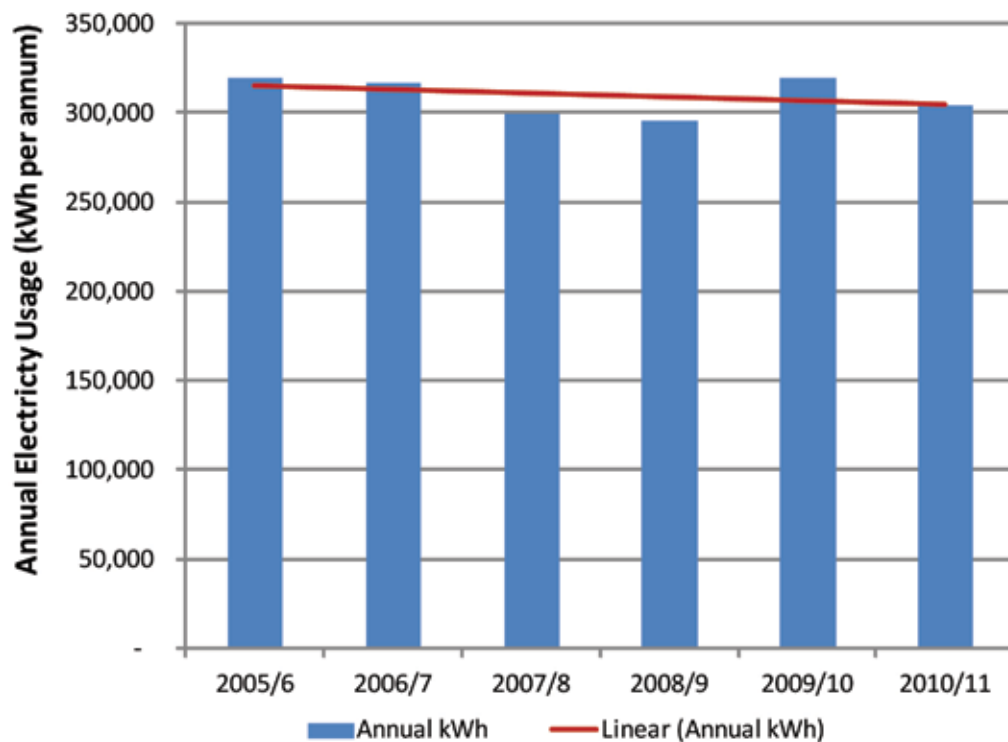
An energy baseline for the Strathfield Council Administration Complex for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Energy Baseline

Site Name:	Council Admin Complex (includes Admin Building, Town Hall/Chambers, and Cottage)
Electricity NMI	Admin Building: 41020098357 Town Hall: 41020264957 Council Cottage: 41035330991
Electricity Accounts	Admin Building: 924105136 Town Hall: 904229378 Council Cottage: 826317342
Natural Gas Meters	Town Hall: 52400388811 Cottage: 52400388777
Natural Gas Accounts	Town Hall: 48291603 Cottage: 48291538
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	304.3 (98% of total site energy usage)
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	23.2 (2% of total site energy usage)
Other energy purchased for stationary equipment	0
Total Energy Consumption in GJ	1,119
Site Greenhouse Gas Emissions in t CO₂e – NGA Workbook full fuel cycle conversion factors used.	324

Total annual electricity consumption for the Strathfield Council Administration Complex over the past six years is shown in Figure 1 below, and indicates a slight trend of reduction in annual electricity usage over this period.

Figure 1 – Strathfield Council Administration Complex Annual Electricity Trend



Unofficial NABERS Rating

NABERS (the National Australian Built Environment Rating System) is a voluntary, performance-based rating system for existing buildings. NABERS rates a building on the basis of its measured operational impacts on the environment, and provides a simple indication of how these environmental impacts compare with similar buildings. A NABERS Energy rating benchmarks a building's greenhouse impact on a scale of one to six, one star being the most polluting and six stars the least.

Table 2 – Unofficial NABERS Rating for the Administration Building

Inputs	
Rated Area (assumed to be 90% of Gross Floor Area)	1,071 m ²
Operating Hours	50 hrs per week
# Computers / Occupants	71
State & Postcode	NSW 2135
Electricity Usage (kWh per annum)	212,498
Outputs	
Greenhouse gas intensity (full fuel cycle - scope 1,2 & 3)	212 kgCO ₂ -e/m ² p.a.
NABERS Whole Building Energy Rating	4.5 Stars

The results indicate that the Administration Building's energy consumption corresponds to a NABERS Whole Building Energy rating of 4.5 Stars. This represents "Good Performance", and indicates that the building "demonstrates very good greenhouse performance and reflecting good design and management practices, high efficiency systems and equipment".

It is important to note that this assessment is an estimate only and is not an accredited NABERS Energy rating, so the results cannot be used to market the building as NABERS rated. If Strathfield Council wishes to promote the NABERS rating of the building, an accredited NABERS rating must be obtained.

Energy KPIs

NABERS Energy ratings for the Town Hall/Council Chambers and the Cottage are not applicable, as the buildings are not predominantly (>80%) office areas. However, Energy Key Performance Indicators for the buildings are shown in Table 3 below, and indicate that the buildings have lower energy consumption per square meter than the Admin Building, suggesting that they too are relatively energy efficient.

Table 3 – Energy KPIs

Building	Area (m ²)	2010/11 Electricity Usage (kWh)	2010/11 Gas Usage (MJ)	Electricity KPI (kWh/m ²)	Gas KPI (MJ/m ²)	Total Energy KPI (MJ/m ²)
Admin Building	1,190	212,498	0	179	0	643
Town Hall/Chambers	1,335	67,031	21,799	50	16	197
Cottage	369	24,818	1,366	67	4	246
Total Complex	2,894	304,347	23,165	105	8	387

Quarterly Energy Consumption Trends

Graphs of quarterly electricity and natural gas consumption over the past six years for all buildings on site is shown in Figures 2 and 3 below.

The graphs indicate the following trends:

- Electricity usage is highest in summer (due to air conditioning demand);
- Natural gas consumption is significantly higher in winter (due to higher heating demands). However, it should be noted that natural gas usage makes up only around 2% of the total energy usage for the Administration Complex;
- Although electricity usage has been gradually decreasing over the past six years, electricity costs have risen sharply in the last two years;

Figure 2 – Strathfield Council Administration Complex Quarterly Electricity Trend

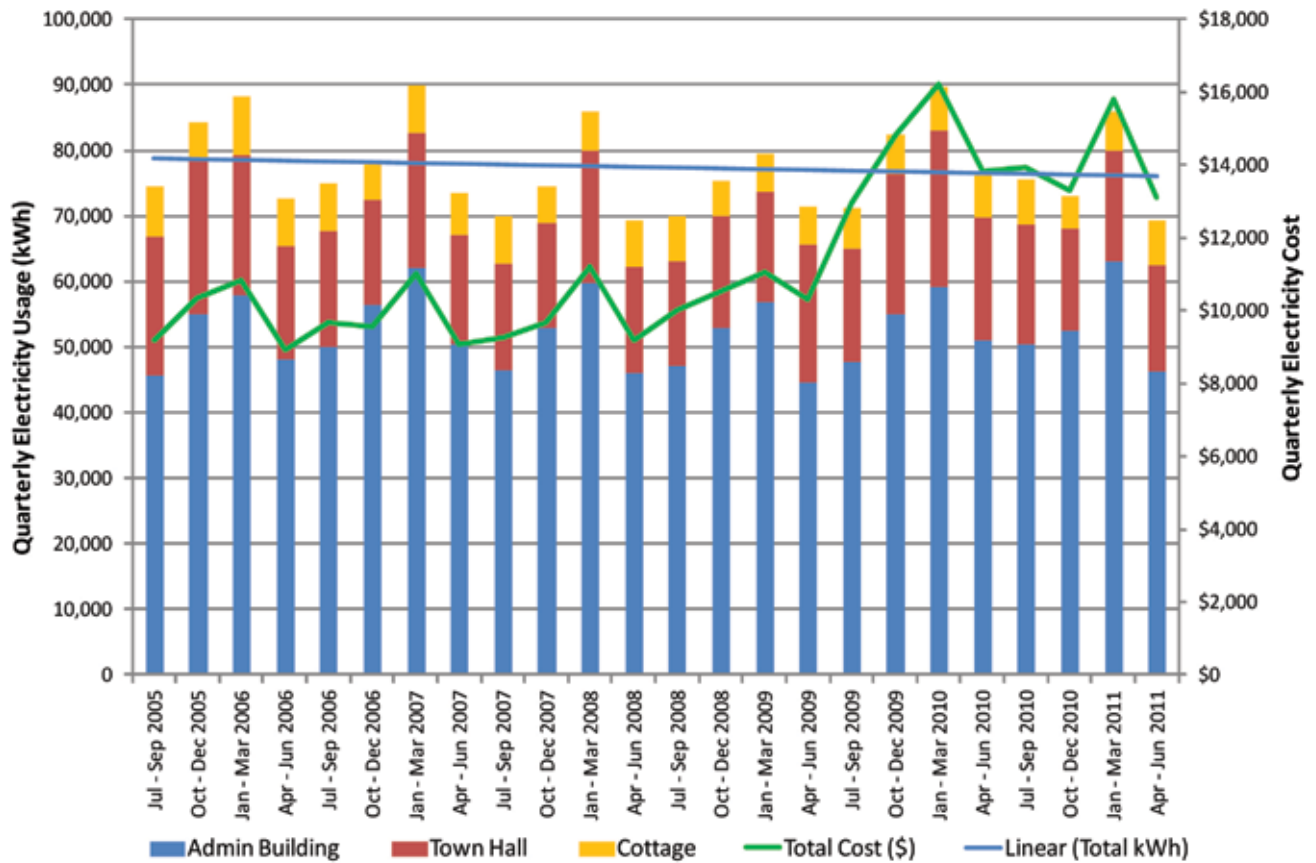
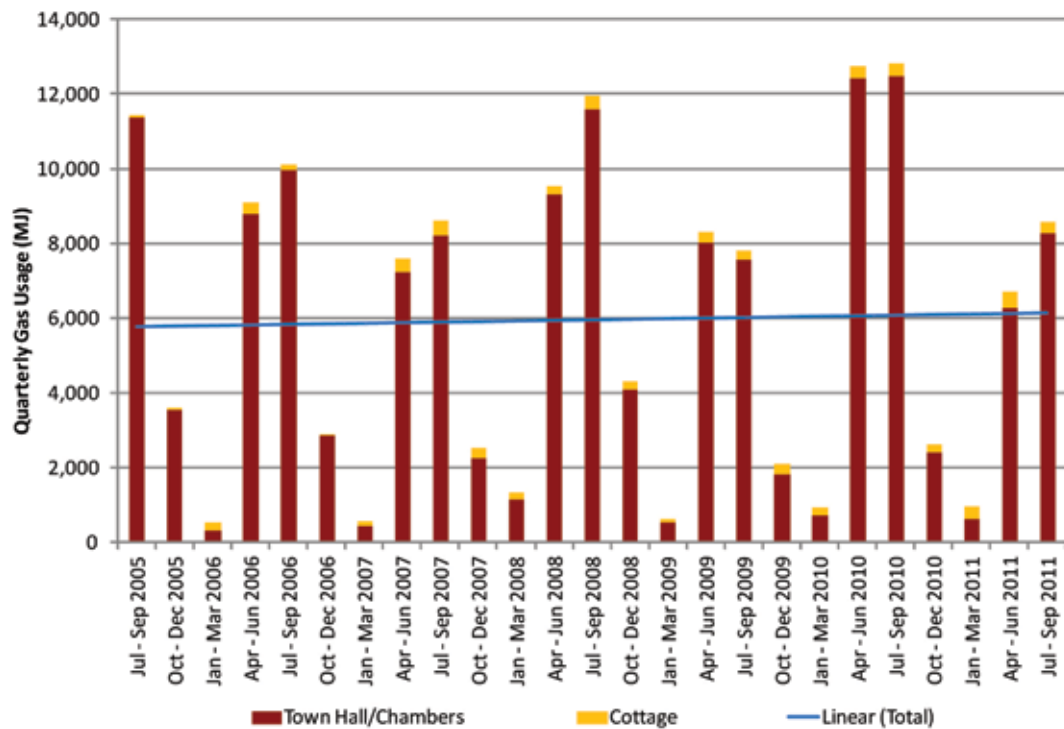


Figure 3 – Strathfield Council Administration Complex Quarterly Gas Trend

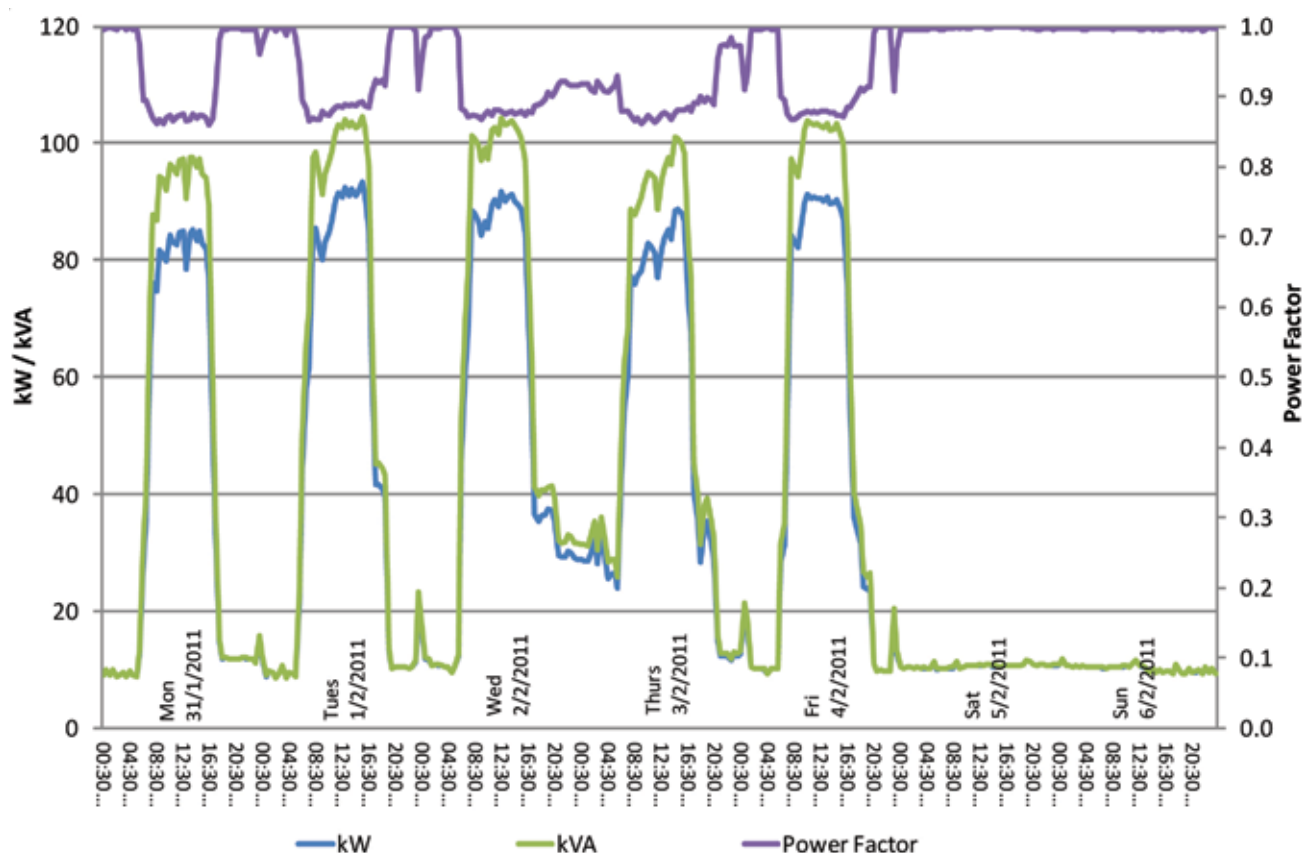


Daily/Weekly Electricity Demand Data

A graph of electricity demand data for the Admin Building for a typical summer week is shown in Figure 4 below and indicates the following:

- Maximum peak demand and after hours base load are approximately 100kW and 10kW respectively. The after hours demand is generally reasonably low (~10% of daily peak), suggesting that equipment & lighting are not normally left on after hours;
- Power Factor at maximum demand is relatively poor at around 0.85. Installing power factor correction equipment could improve this and reduce electricity demand costs;
- Daily demand starts to rise around 7.00am daily as staff arrive and equipment is turned on;
- Demand peaks around midday when the outside temperature is highest and the air conditioning systems are working hardest;
- Demand starts to drop to base line level from around 6.00pm as staff leave and equipment is turned off;
- There are small spikes in demand around midnight each week day, which are probably due to cleaning staff activities.

Figure 4 – Admin Building Electricity Demand Data for Typical Summer Week (31 Jan - 6 Feb 2011)



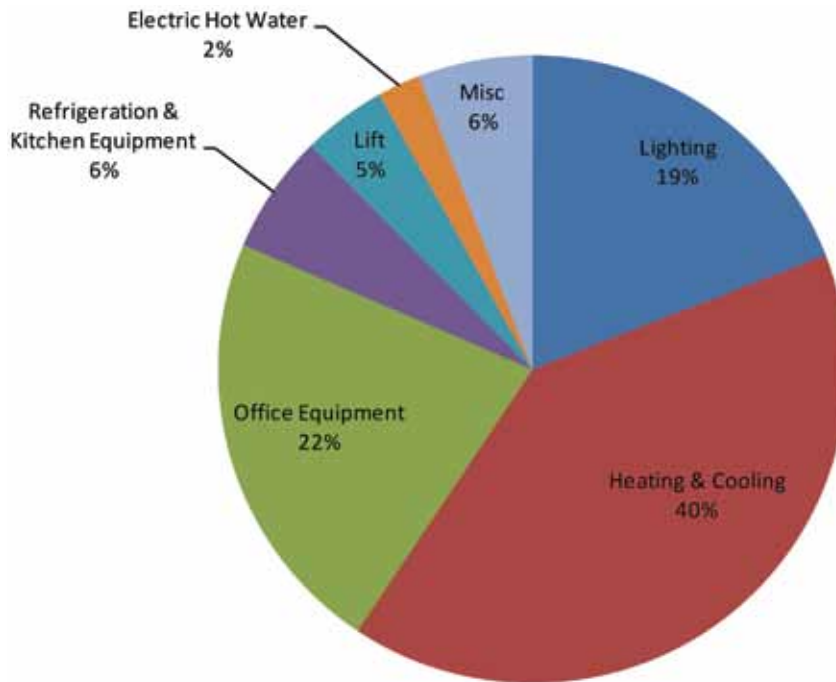
Energy Balances

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. There are no sub-meters in the Council Admin buildings that measure energy usage by major items/groups of equipment. Nevertheless, the following breakdown of energy usage in each building was estimated based on the rated power capacities of key items of equipment and their known operating hours.

Admin Building:

Figure 5 below shows the breakdown of energy usage in the Administration Building, and indicates that the major users of energy are heating & cooling, office equipment, and lighting.

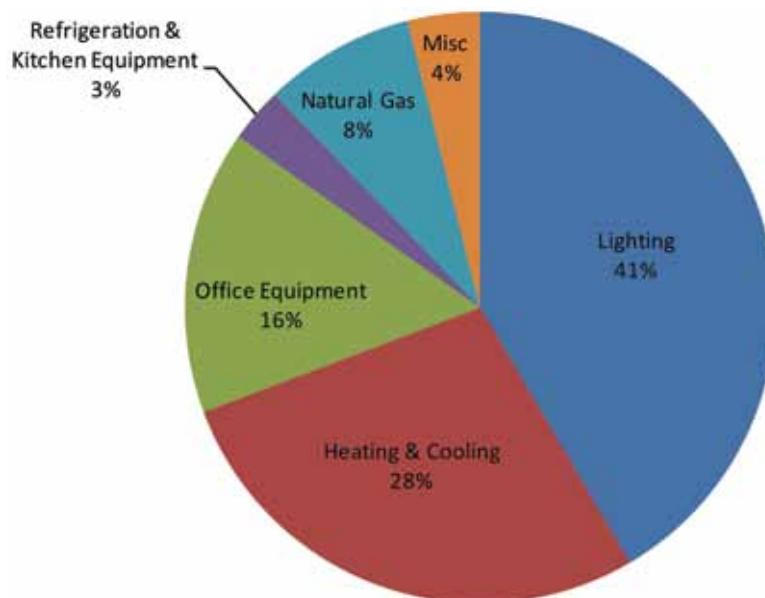
Figure 5 – Strathfield Council Admin Building Energy Breakdown



Town Hall/Council Chambers:

Figure 6 below shows the breakdown of energy usage in the Town Hall/Council Chambers Building, and indicates that the major users of energy are lighting, heating & cooling, and office equipment.

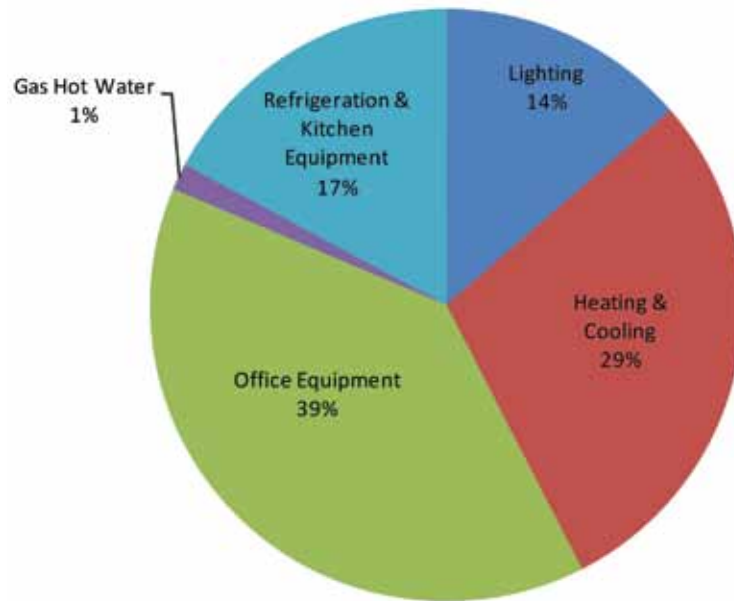
Figure 6 – Strathfield Council Town Hall/Chambers Energy Breakdown



General Manager's Cottage:

Figure 7 below shows the breakdown of energy usage in the General Manager's Cottage, and indicates that the major users of energy are office equipment, heating & cooling, refrigeration & kitchen equipment, and lighting.

Figure 7 – Strathfield Council COUNCIL's Cottage Energy Breakdown



Energy Saving Opportunities

The following energy saving opportunities in Table 4 have been identified for the Council Administration Complex. The projects are listed in order of their energy cost saving potential. Cost savings are based on an average electricity price of 20.0c/kWh determined from the August 2011 electricity bill for the Administration Building. Note that electricity prices are expected to increase significantly over the next few years, so this will improve the business cases/paybacks for implementing these projects.

Table 4 – Energy Savings Opportunities

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$ pa	Payback (years)	GHG Savings TCO ₂ e
Projects Requiring Capital Expenditure					
Install smart motor controllers on the 3 large packaged air con units in the Admin Building	\$12,000	14,884	\$2,977	4.0	15.8
Install power factor correction equipment in the Admin Building	\$5,000	-	\$980	5.1	-
Install fluorescent T5 conversion kits to replace the existing T8 fluorescent tube lights in the Admin Building Records Room (25 units)	\$1,125	1,021	\$204	5.5	1.1
Upgrade lighting in the Town Hall/Council Chambers Building - install fluorescent T5 conversion kits to replace T8 fluorescent tube lights that are regularly used; motions sensors for infrequently used lights. exclude Finance Office (which already has efficient t5 fluorescent lights).	\$8,190	7,215	\$1,443	5.7	7.6
Replace fluorescent exit sign lights in Admin and Town Hall/Chambers Buildings with LED exit signs (15 units)	\$3,675	2,365	\$473	7.8	2.5
Install solar photovoltaic panels on the roof (10 kW system)	\$35,000	18,250	\$3,650	9.6	19.3
Total for Capital Projects	\$64,990	43,735	\$9,727	6.7	46.4
Low Cost Opportunities					
Install 7 day timer on vending machine outside Cottage	\$30	854	\$171	0.2	0.9
Install 7 day timers on Zip boilers in kitchenettes	\$60	171	\$34	1.8	0.2
Replace 50W halogen downlights with 11W LED downlights in the Finance Office and General Manager's Office	\$480	386	\$77	6.2	0.4
Install 7 day timers on the 2 small electric storage hot water units in the Admin Building	\$600	387	\$77	7.8	0.4
Total for Low Cost Opportunities	\$1,170	1,798	\$360	3.3	1.9
Total for Council Administration Complex	\$66,160	45,533	\$10,086	6.6	48.3
Total Savings as a Percentage of Total Site Use (%)	-	15%	-	-	15%

Energy Assessment of Strathfield Works Depot

Background

The Strathfield Council Depot is located at 1 Weeroona Rd Strathfield and operates 5 days per week. The depot consists of a native plant nursery, mechanics workshop, carpenters workshop, wash bay, waste collection and recycling, bulk storage's, vehicle and plant parking, store, offices and change rooms. The State Emergency Service also has an office space at the Depot that is operated 7 days per week.

The only energy source used on site is electricity. There is no main natural gas connection to the site, and although LPG is stored on site it is only used to refill gas bottles for use elsewhere. The Works Depot is Strathfield Council's third largest energy using facility.

Some energy efficiency measures have previously been implemented at the site, such as push button timers for fluorescent lights.

Energy Baseline and Historical Energy Usage

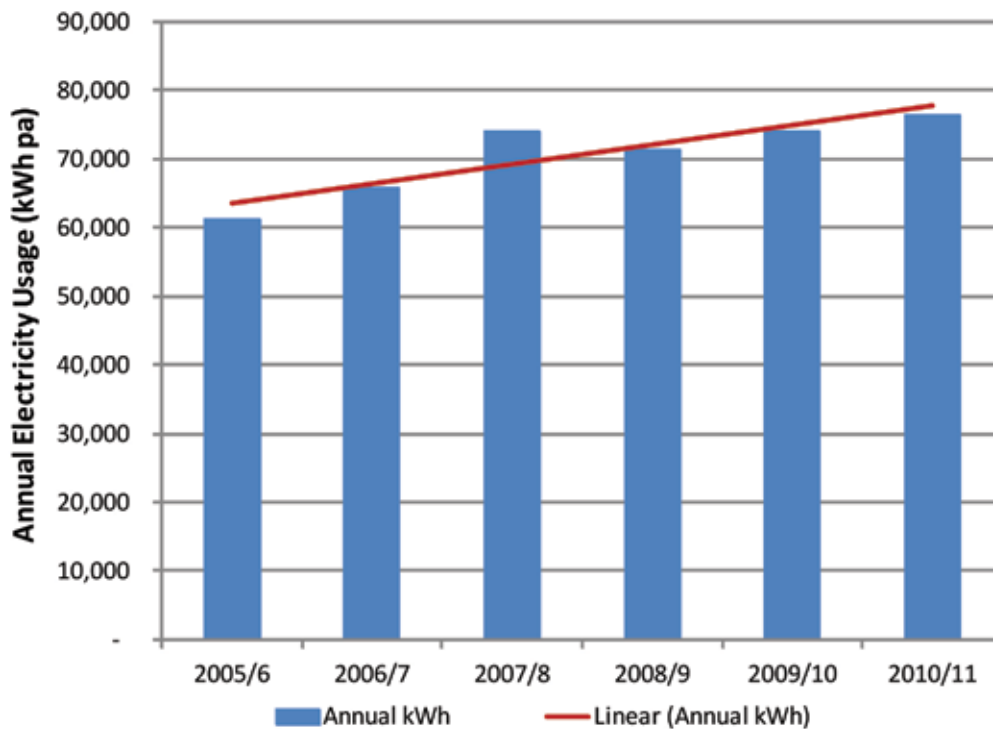
An energy baseline for the Strathfield Works Depot for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Strathfield Works Depot Energy Baseline

Site Name	Works Depot
Electricity NMI	4102022734
Electricity Account	904243899
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	76.6
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	275.9
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	81.2

Total annual electricity consumption for the Works Depot over the past six years is shown in Figure 1 below, and indicates a distinct increasing trend in annual electricity usage over this period.

Figure 1 – Strathfield Works Depot Annual Electricity Trend



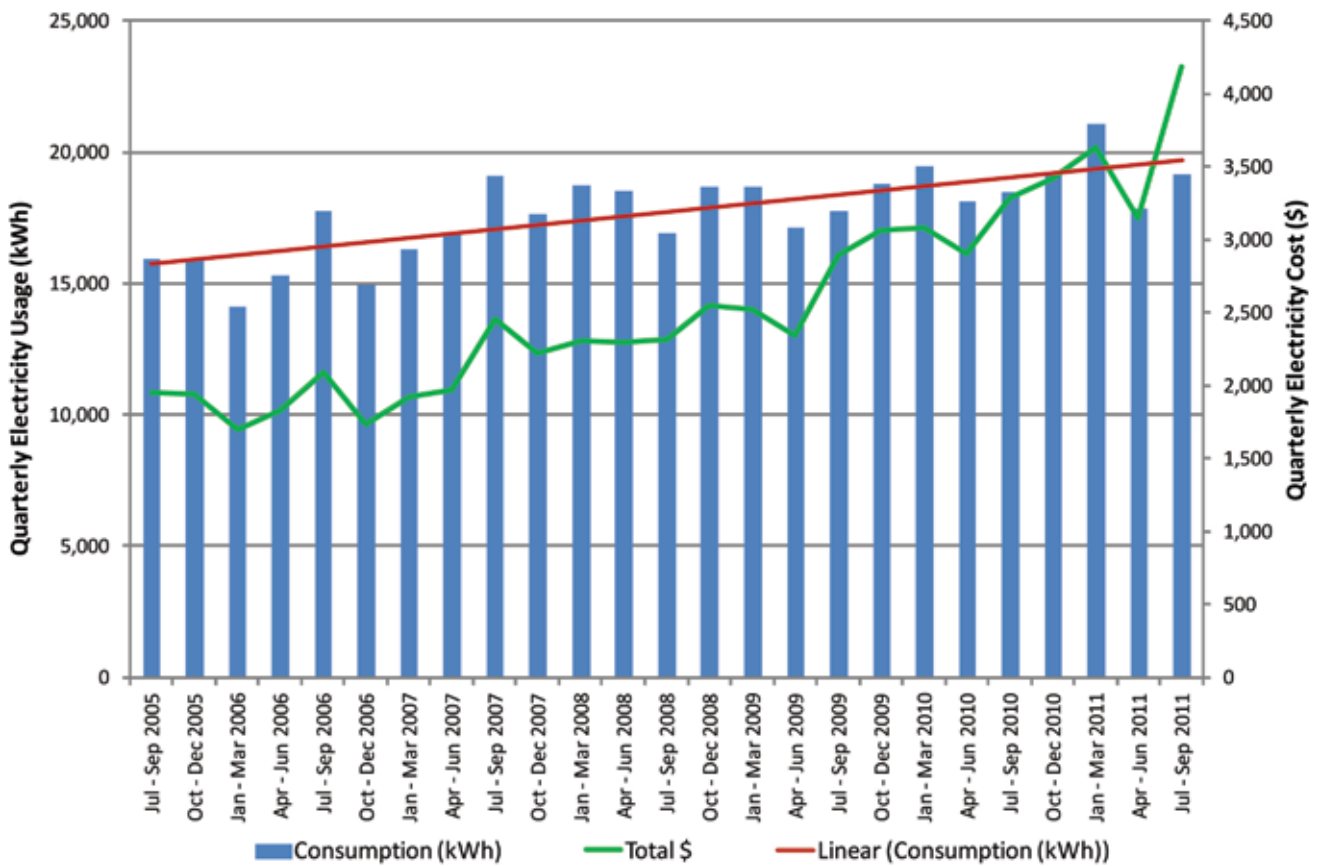
Quarterly Energy Consumption Trends

A graph of quarterly electricity consumption over the past six years is shown in Figure 2 below.

The graph indicates there is no distinct seasonal trend in energy consumption. Energy consumption has been steadily increasing over the past 6 years, suggesting that equipment, processes and operating practices at the site are becoming less energy efficient. Energy costs are increasing exponentially at the site as a result of the increased usage combined with increasing electricity prices.

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

Figure 2 – Strathfield Works Depot Quarterly Electricity Trend

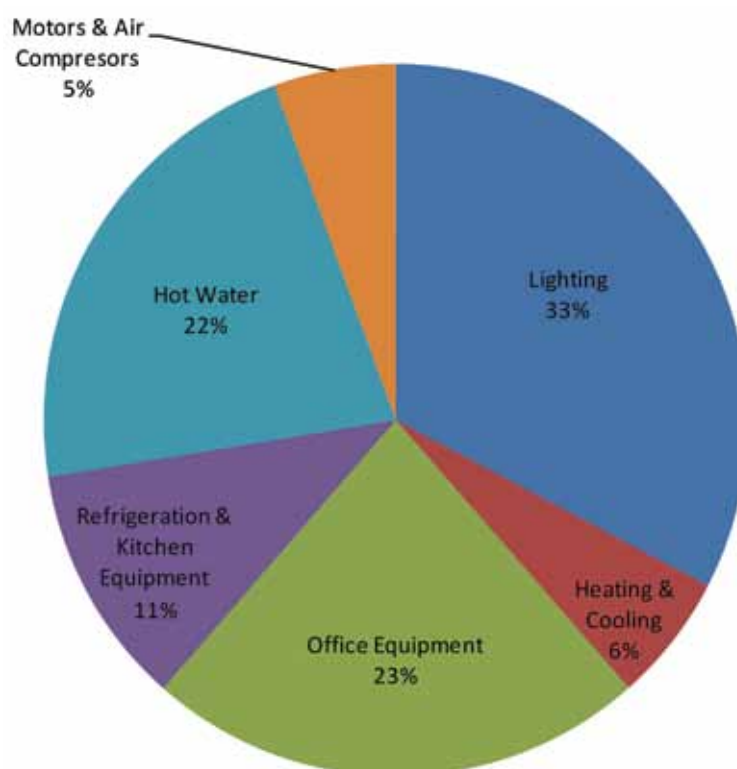


Energy Balance

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. There are no sub-meters at the Works Depot that measure energy usage by major items/groups of equipment. Nevertheless, the following breakdown of energy usage was estimated based on the rated power capacities of key items of equipment and their known operating hours.

Figure 3 below shows the breakdown of energy usage at the Works Depot, and indicates that the major users of energy are lighting, office equipment, and electric hot water heating.

Figure 3 – Works Depot Energy Breakdown



Energy Saving Opportunities

The following energy saving opportunities in Table 2 have been identified for the Works Depot. The projects are listed in order of their energy cost saving potential. Cost savings are based on an average electricity price of 21.54 c/kWh determined from the August 2011 electricity bill. Note electricity prices are expected to increase significantly over the next few years, so this will improve the business cases/paybacks for implementing these projects.

Table 2 – Energy Savings Opportunities for the Works Depot

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Install 7 day timers on vending machines, Zip Boilers and Water Cooler	\$210	1,951	\$420	0.5	2.1
Replace 400W Metal Halide High Bay Lights in Mechanics Shed with 150W LED High Bay lights and Photo Sensor	\$8,100	12,447	\$2,681	3.0	13.2
Install Solar Hot Water Heating	\$6,000	5,731	\$1,234	4.9	6.1
Install fluorescent T5 conversion kits to replace the existing T8 fluorescent tube lights (plus motion sensors/timers where appropriate)	\$3,600	3,319	\$715	5.0	3.5
Replace fluorescent exit sign lights with LED exit signs (8 units)	\$1,960	1,261	\$272	7.2	1.3
Install Solar Photovoltaic Panels on the roof (10kW System)	\$35,000	18,250	\$3,930	8.9	19.3
Total	\$54,870	42,960	\$9,251	5.9	46
Total Savings as a Percentage of Total Site Use (%)	-	56%	-	-	56%

Energy Assessment of Strathfield Community Centre, Bates St

Background

The Strathfield Community Centre is a single storey building located at Bates St Homebush, and is Strathfield Council's fourth largest energy using facility. It is a small building with a floor area of approximately 500 m² and consists of a community centre with meeting rooms, offices, and a kitchen.

Energy Baseline and Historical Energy Usage

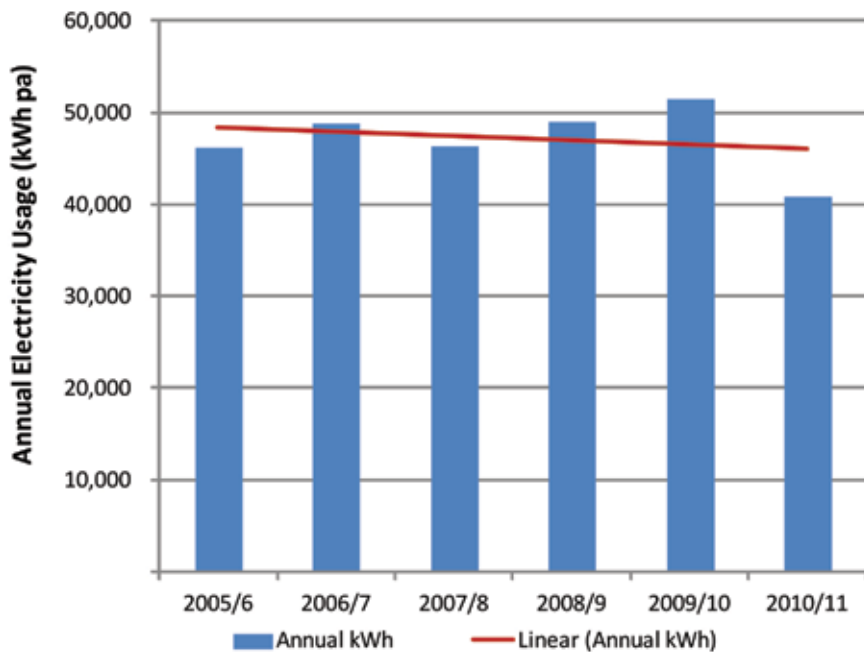
An energy baseline for the Strathfield Community Centre for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Strathfield Community Centre Energy Baseline

Site Name	Strathfield Community Centre
Electricity NMI	4103504961
Electricity Account	904263984
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	40.9
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	147.2
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	43.3

Total annual electricity consumption for the Community Centre over the past six years is shown in Figure 1 below, and indicates a decreasing trend in annual electricity usage over this period.

Figure 1 – Strathfield Community Centre Annual Electricity Trend



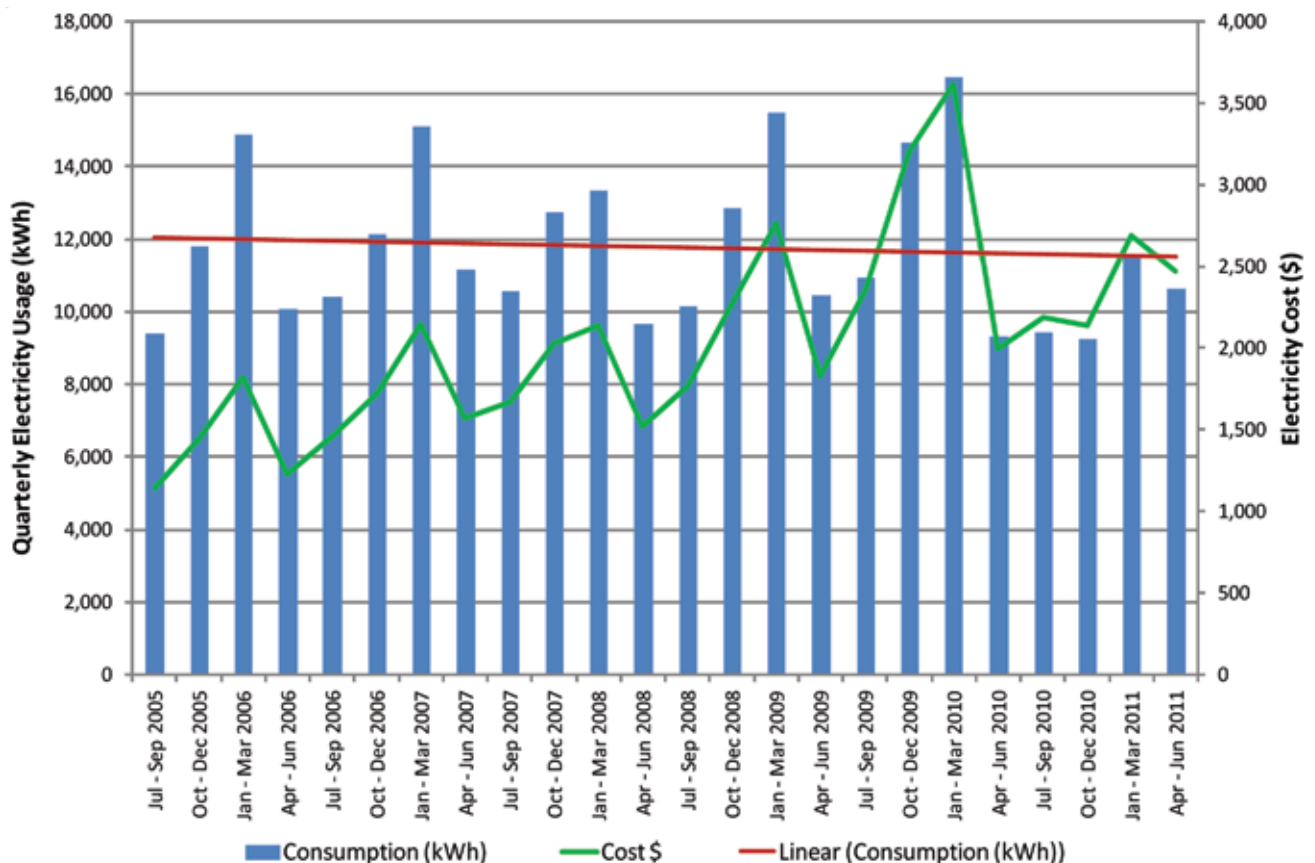
Quarterly Energy Consumption Trends

A graph of quarterly electricity consumption over the past six years is shown in Figure 2 below.

The graph indicates that electricity usage is highest in summer (due to air conditioning demand), and that electricity usage has been gradually decreasing over the past six years.

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

Figure 2 – Strathfield Community Centre Quarterly Electricity Trend

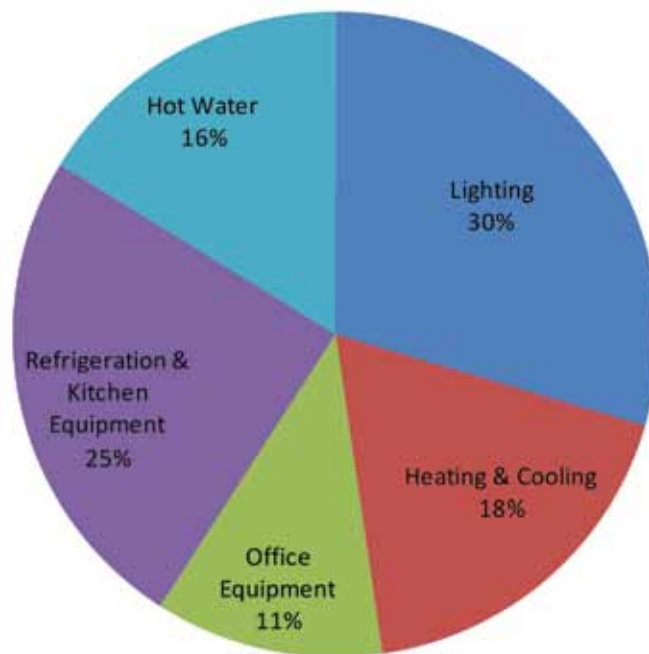


Energy Balance

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. There are no sub-meters at the Community Centre that measure energy usage by major items/groups of equipment. Nevertheless, the following breakdown of energy usage was estimated based on the rated power capacities of key items of equipment and their known operating hours.

Figure 3 below shows the breakdown of energy usage at the Community Centre, and indicates that the major users of energy are lighting, kitchen/refrigeration equipment, heating and cooling, and electric hot water heating.

Figure 3 – Strathfield Community Centre Electricity Breakdown



Energy Saving Opportunities

The following energy saving opportunities in Table 2 have been identified for the Community Centre. The projects are listed in order of their energy cost saving potential. Cost savings are based on an average electricity price of 23.22 c/kWh determined from the July 2011 electricity bill. Note electricity prices are expected to increase significantly over the next few years, so this will improve the business cases/paybacks for implementing these projects.

Table 2 – Energy Savings Opportunities for the Community Centre

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Install fluorescent T5 conversion kits to replace the existing T8 fluorescent tube lights	\$2,070	2,074	\$481	4.3	2.2
Install Solar Hot Water Heater	\$3,000	2,865	\$665	4.5	3.0
Replace fluorescent exit sign lights with LED exit signs (10 units)	\$2,450	1,577	\$366	6.7	1.7
Replace large fridge in office with smaller (250L) fridge	\$800	473	\$110	7.3	0.5
Install Solar PV Panels (10kW)	\$35,000	18,250	\$4,238	8.3	19.3
Total	\$43,320	25,239	\$5,860	7.4	27
Total Savings as a Percentage of Total Site Use (%)	-	62%	-	-	62%

Energy Assessment of High Street Community Library

Background

The High Street Community Library is located at 64 High Street Strathfield and is Strathfield Council's 5th largest energy using facility. It is a small building with a number of energy efficient features, such as T5 fluorescent lighting, LED exit lights, and instantaneous gas hot water heating.

Energy Baseline and Historical Energy Usage

An energy baseline for the High Street Community Library for the 2010/11 financial year is presented in Table 1 below.

Table 1 – High Street Community Library Energy Baseline

Site Name	High Street Community Library
Electricity NMI	41037412689
Natural Gas Meter	52471201439
Electricity and Gas Account	855 987 275
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	31.00 (98% of total site energy usage)
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	2.69 (2% of total site energy usage)
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	114.29
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	33.04

Energy KPIs

Energy Key Performance Indicators (KPIs) for the High St Community Library are shown in Table 2 below.

Table 2 – Energy KPIs

Building	Area (m ²)	2010/11 Electricity Usage (kWh)	2010/11 Gas Usage (MJ)	Electricity KPI (kWh/m ²)	Gas KPI (MJ/m ²)	Total Energy KPI (MJ/m ²)
High St Community Library	259	31,000	2,685	119	10.4	441

Quarterly Energy Consumption Trends

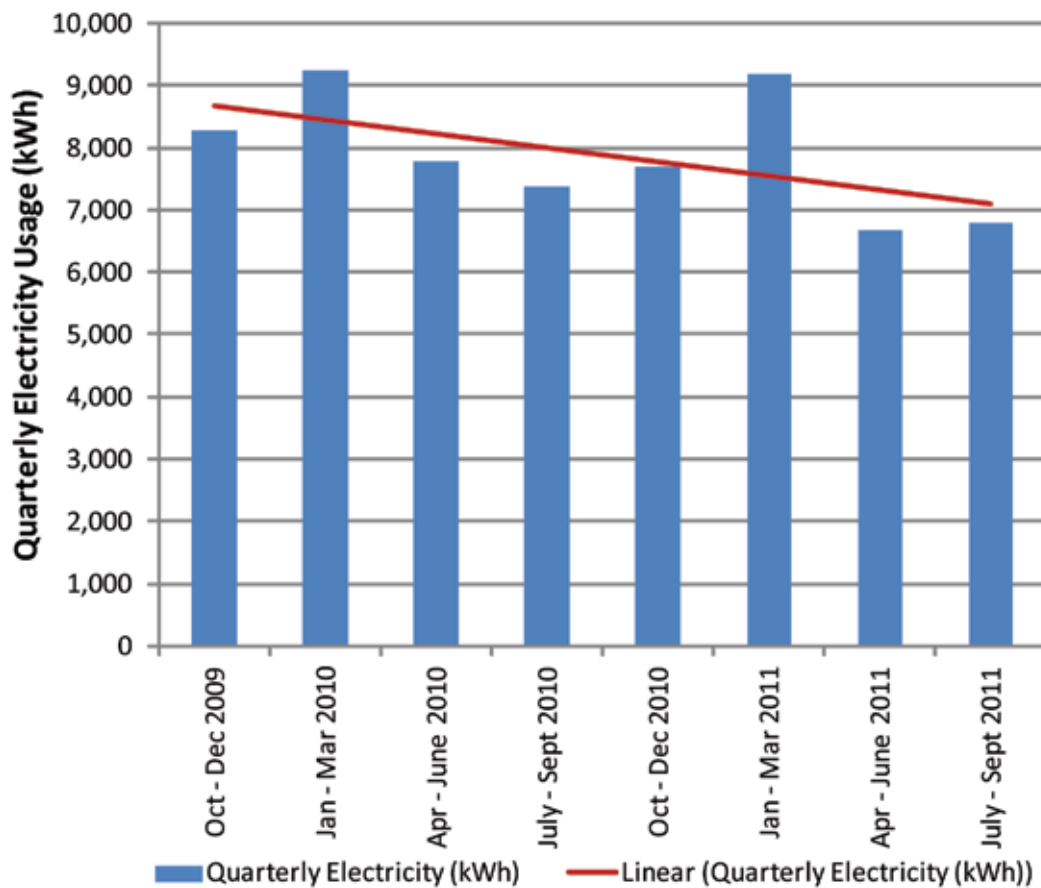
A graph of quarterly electricity consumption over the past two years is shown in Figure 1 below.

The graph indicates that electricity usage is highest in summer (due to air conditioning demand), and that electricity usage has been decreasing over the past two years.

Note that limited historical data for the High Street Community Library is available as the facility was constructed in 2008 and opened in 2009 .

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

Figure 1 – High Street Community Library Quarterly Electricity Trend

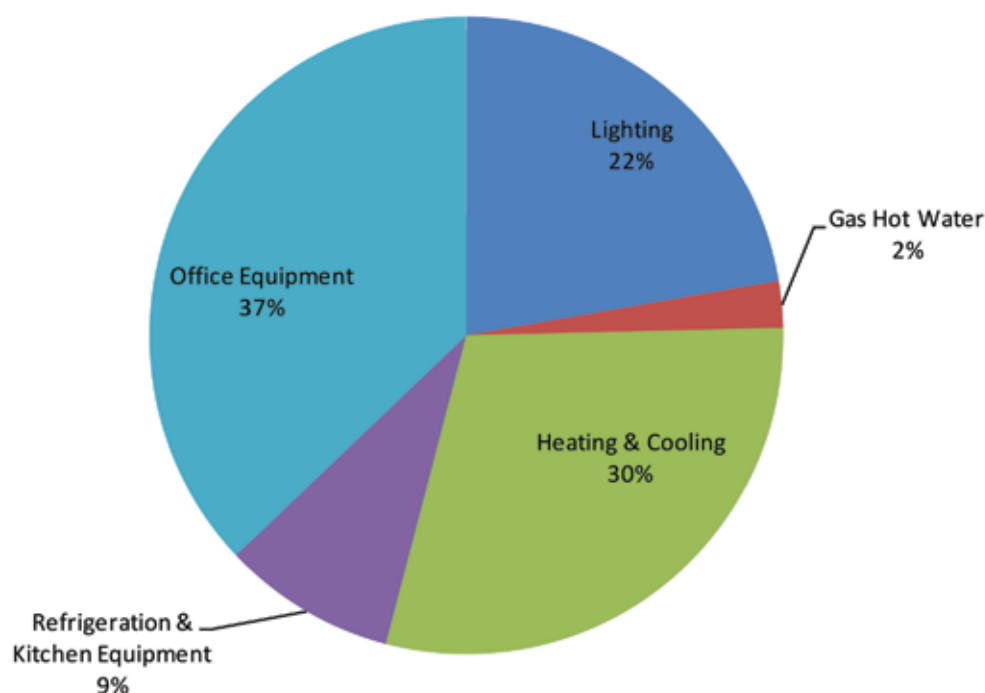


Energy Balance

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. There are no sub-meters at the High Street Community Library that measure energy usage by major items/groups of equipment. Nevertheless, the following breakdown of energy usage was estimated based on the rated power capacities of key items of equipment and their known operating hours.

Figure 2 below shows the breakdown of energy usage at the High Street Community Library, and indicates that the major users of energy are office equipment, heating and cooling, and lighting.

Figure 2 – High Street Community Library Electricity Breakdown



Energy Saving Opportunities

There are limited energy saving opportunities at the High Street Community Library, as the building is a relatively small energy user and already has a number of energy efficient features. It is therefore recommended that Strathfield Council focus their energy management activities on its larger and/or less efficient facilities. Costs and savings for installing solar panels are presented below as one potential opportunity for the site.

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Install Solar Photovoltaic Panels on the roof (10kW System)	\$35,000	18,250	\$3,930	8.9	19.3
Total Savings as a Percentage of Total Site Use (%)	-	59%	-	-	58%

Energy Assessment of Begnell Field

Background

Begnell Field is located at 73-75 Madeline St Belfield and consists of a sports field with floodlighting and a small club house/amenities facility. The facility has two electricity supplies (with separate accounts) but no natural gas connection, and is Strathfield Council's 6th largest energy using facility.

Energy Baseline and Historical Energy Usage

An energy baseline for Begnell Field for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Begnell Field Energy Baseline

Site Name	Begnell Field
Electricity NMI and Accounts	NMI 41028435848; Account # 914 191 602
	NMI 41037740429; Account # 864 840 674
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	26.23
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0.00
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	94.43
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	27.80

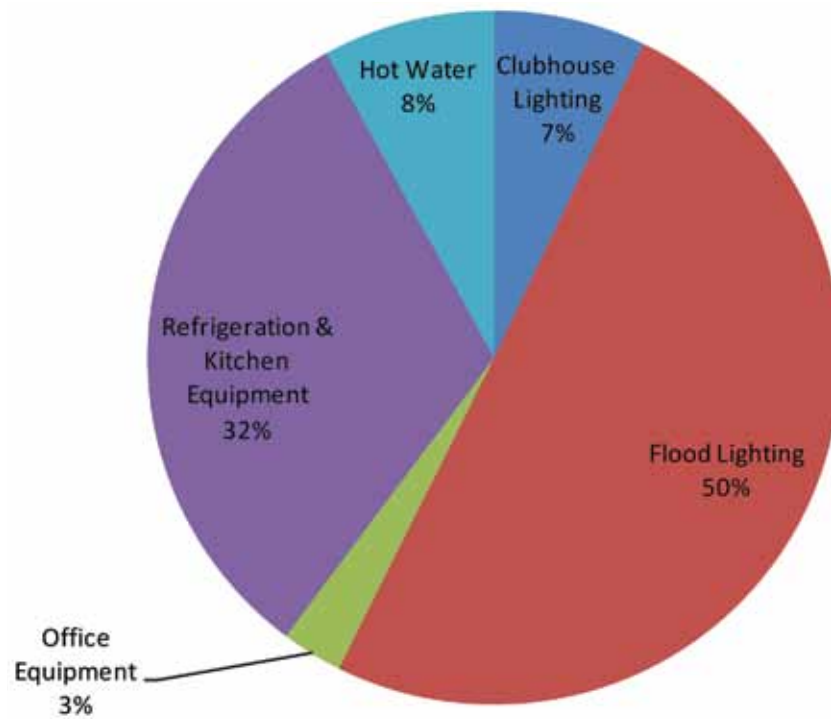
Note that limited historical data for Begnell Field was available. Baseline data for the site was estimated from recent bills. The two electricity supplies to the site have roughly equal usage so it is recommended that Strathfield Council update its centralised records system and provide Planet Footprint with the account details of the additional electricity account (NMI 41037740429; Account # 864 840 674) so that the usage can be tracked.

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

Energy Balance

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. The following breakdown of energy usage in Figure 1 was estimated based on the rated power capacities of key items of equipment and their known operating hours. Figure 1 indicates that the major users of energy are flood lighting for the sports field and kitchen/refrigeration equipment in the clubhouse.

Figure 1 –Begnell Field Electricity Breakdown



Energy Saving Opportunities

There are limited energy saving opportunities at Begnell Field, as it is a relatively small energy user. The flood lighting for the sports field has recently been connected to a “Cloudmaster” control system that allows for improved control of the lights (timers, remote control of timers and on/off settings etc), so this expected to reduce the facility’s electricity usage.

The T8 fluorescent lights in the clubhouse could be upgraded by installing T5 conversion kits to reduce their energy consumption.

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Upgrade T8 fluorescent lights to T5 fluorescent using adaptor kits in the clubhouse (8 units)	\$ 360	193	\$ 39	9.3	0.2

Energy Assessment of Airey Park

Background

Airey Park is located at Bates St Homebush and consists of a sports field with floodlighting, a small club house/amenities facility, and a park/BBQ area. The facility has six electricity supplies (with separate accounts) but no natural gas connection and is Strathfield Council's 7th largest energy using facility.

Energy Baseline and Historical Energy Usage

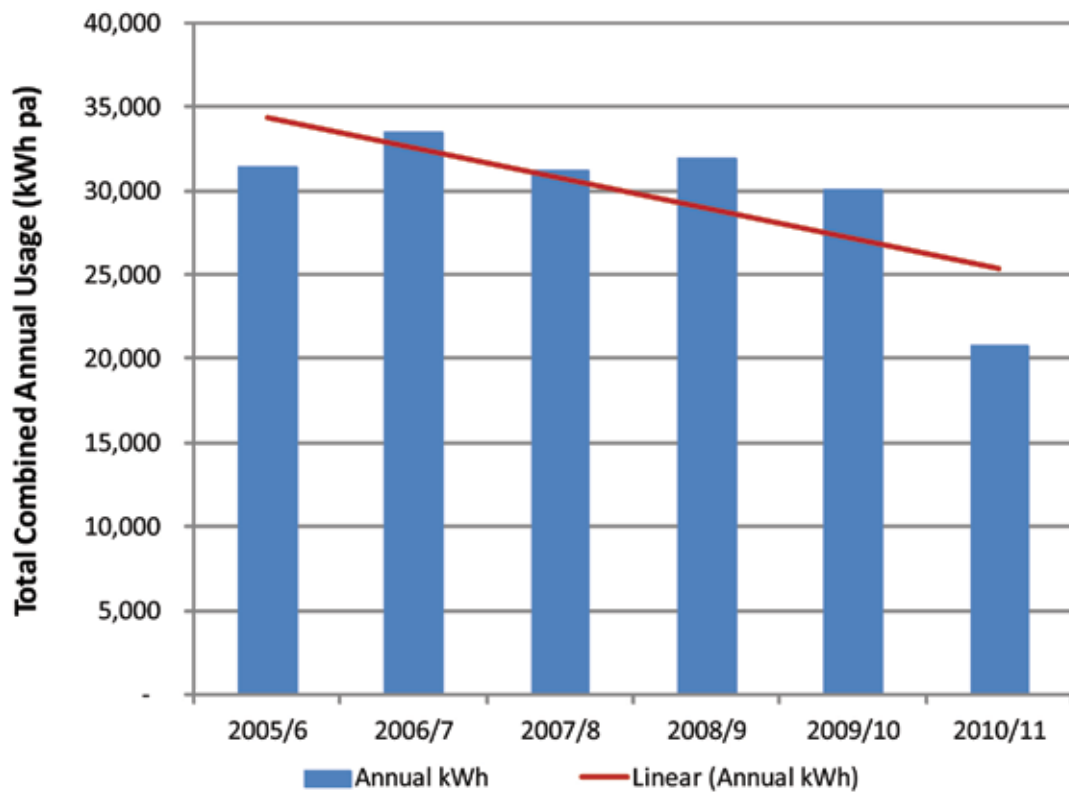
An energy baseline for Airey Park for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Airey Park Energy Baseline

Site Name	Airey Park
Electricity NMI and Accounts	Club House – NMI 4102710890; Acc # 904175929
	Flood Lighting – NMI 4102712197; Acc # 904263552
	Path Lights – NMI 4102711964; Acc # 919193324
	BBQ The Crescent – NMI 4103445406; Acc # 807993056
	Bates St BBQ – NMI 41027122175; Acc # 904263560
	Storage Shed – NMI 4102710889; Acc # 904247322
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	20.77
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0.00
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	74.78
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	22.02

Total annual electricity consumption for the combined Airey Park electricity supplies over the past six years is shown in Figure 1 below, and indicates a decreasing trend in annual electricity usage over this period.

Figure 1 – Airey Park Annual Electricity Trend



Quarterly Energy Consumption Trends

A graph of quarterly electricity consumption over the past six years is shown in Figure 2 below.

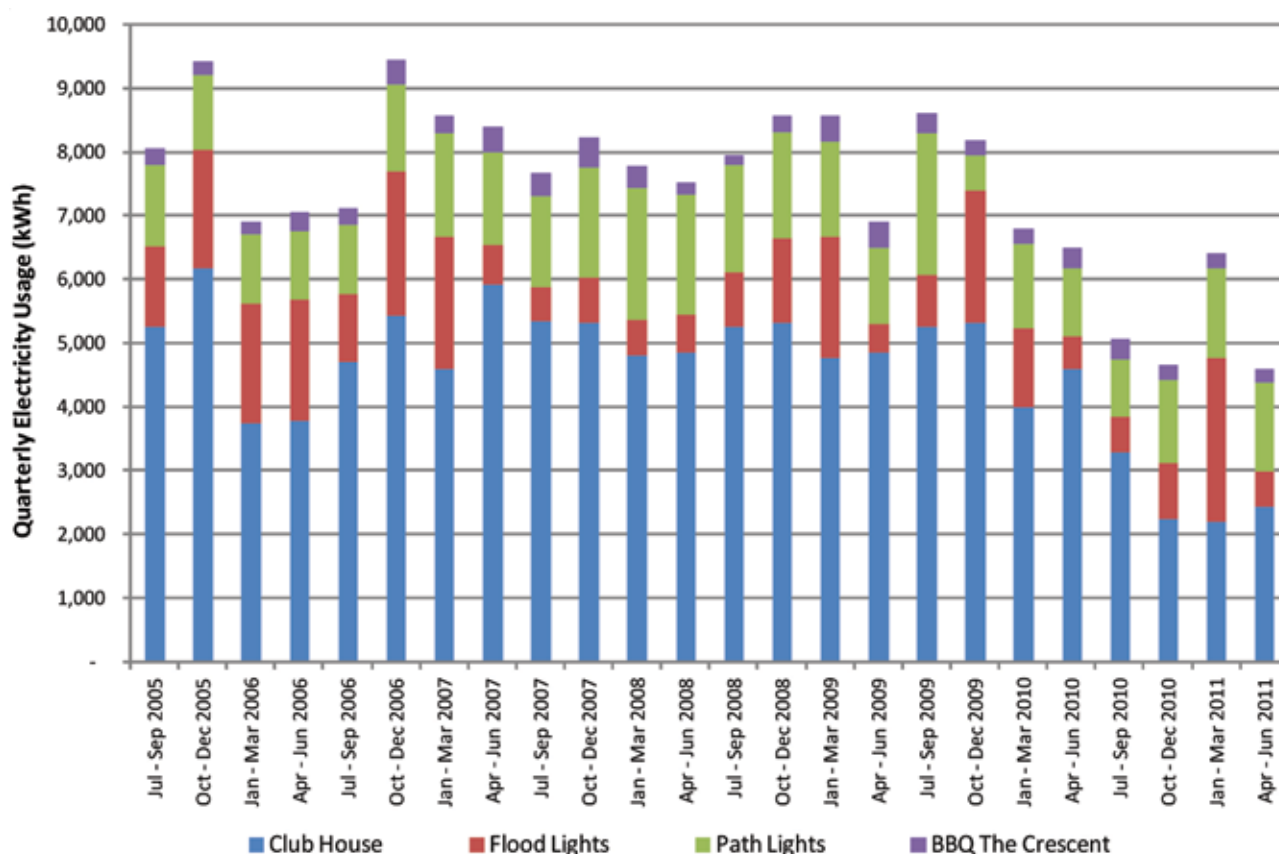
The graph indicates that total combined electricity usage at Airey Park has been decreasing over the past six years, with a significant reduction occurring in the past 18 months.

The graph also shows that most of the usage occurs in the club house, followed by the sports field flood lighting, then the path lights. The BBQ located on The Crescent consumes a very small amount, with the Bates St BBQ using even less (~11 kWh per quarter – not shown on the graph).

There is an electricity account for the “storage shed” but there has not been any consumption recorded on this account for several years. Council is still being charged ~\$90 per quarter for the meter. It is recommended that this account be cancelled.

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

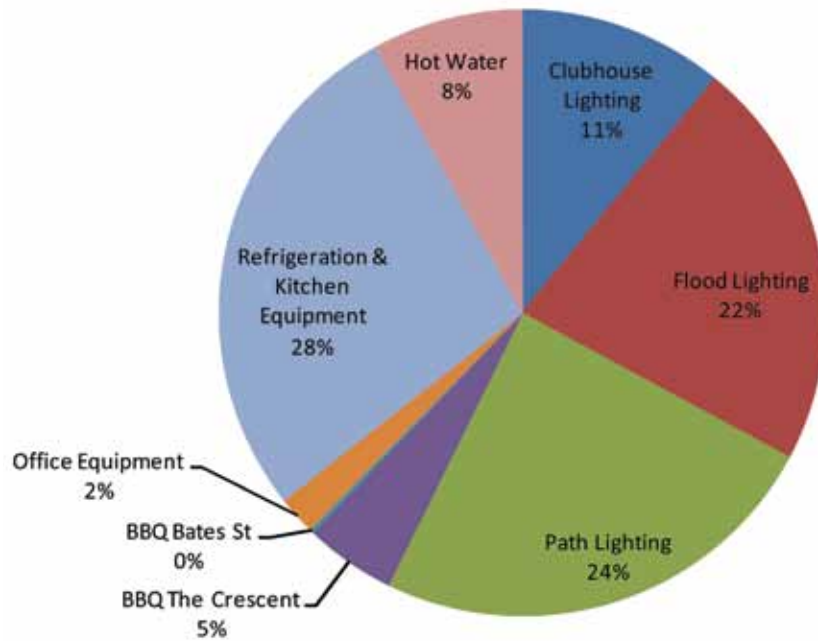
Figure 2 – Airey Park Quarterly Electricity Trend



Energy Balance

A breakdown of energy usage across the site can be useful as it shows the equipment/processes that use the most energy, and therefore which areas to target for energy efficiency actions. The following breakdown of energy usage in Figure 3 was estimated based on individual electricity bill data, rated power capacities of key items of equipment and their known operating hours. Figure 3 indicates that the major users of energy are kitchen/refrigeration equipment in the clubhouse, path lighting and flood lighting for the sports field.

Figure 3 – Airey Park Electricity Breakdown



Energy Saving Opportunities

There are limited energy saving opportunities at Airey Park, as it is a relatively small energy user. Nevertheless, the following opportunities have been identified.

The flood lighting for the sports field is connected to a “Cloudmaster” control system. However, this system needs to be upgraded to provide improved remote access to control the operation of the flood lights and reduce their operating times.

At the site visit it was noted that there was a large 4 door drinks fridge in the bar area that was on even though the fridge was essentially empty, consuming a reasonable amount of electricity for no purpose. There is another smaller fridge in the kitchen area that could be used instead to store perishables when the bar is not being used. Installing a timer or connecting the bar fridge to the Cloudmaster control system would be a relatively inexpensive way to save energy by reducing its operating times.

The T8 fluorescent lights in the clubhouse could be upgraded by installing T5 conversion kits to reduce their energy consumption.

The electricity account for the “storage shed” should be cancelled as Council is still being charged ~\$90 per quarter even though there has not been any consumption recorded on this account for several years.

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Cancel electricity account for "Storage Shed"	\$ 0	0	\$ 360	NA	0.0
Put large bar/drinks fridge in the Clubhouse on a timer or connect it to Cloudmaster system.	\$ 170	2,102	\$ 450	0.4	2.2
Upgrade T8 fluorescent lights to T5 fluorescent using adaptor kits in the clubhouse (15 units)	\$ 675	480	\$ 103	6.6	0.5
Total	\$ 840	2,582	\$ 913	0.9	2.7

Energy Assessment of Strathfield Park

Background

Strathfield Park is located on Homebush and Chalmers Rd Strathfield and consists of sports fields with floodlighting a small club house/amenities facility, and park areas with a rotunda. The facility has three electricity supplies (with separate accounts) but no natural gas connection, and is Strathfield Council's 8th largest energy using facility.

Energy Baseline and Historical Energy Usage

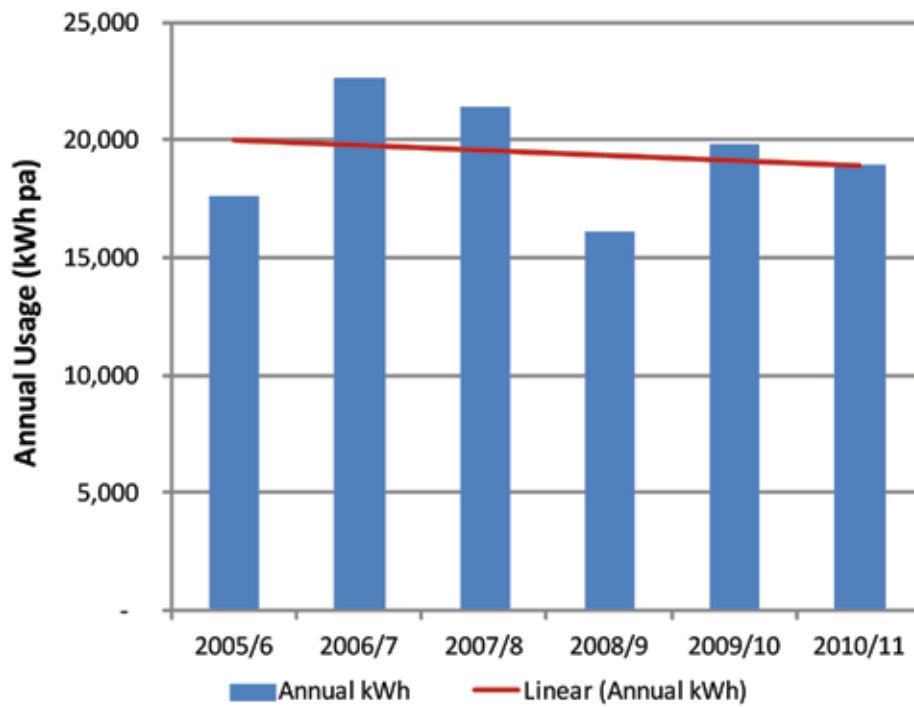
An energy baseline for Strathfield Park for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Strathfield Park Energy Baseline

Site Name	Strathfield Park
Electricity NMI and Accounts	“Chalmers Rd”: NMI 41027098325; Account # 915 867 442
	“Strathfield Park”: NMI 41027098319; Account # 921 315 499
	“Pumping Stn Strathfield Park”: NMI 41020264917; Account # 904 205 954
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	19.0
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0
Other energy purchased for stationary equipment	0
Total Energy Consumption in GJ	68.3
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	20.1

Total annual electricity consumption for Strathfield Park over the past six years is shown in Figure 1 below, and indicates a slight decreasing trend in annual electricity usage over this period.

Figure 1 – Strathfield Park Annual Electricity Trend



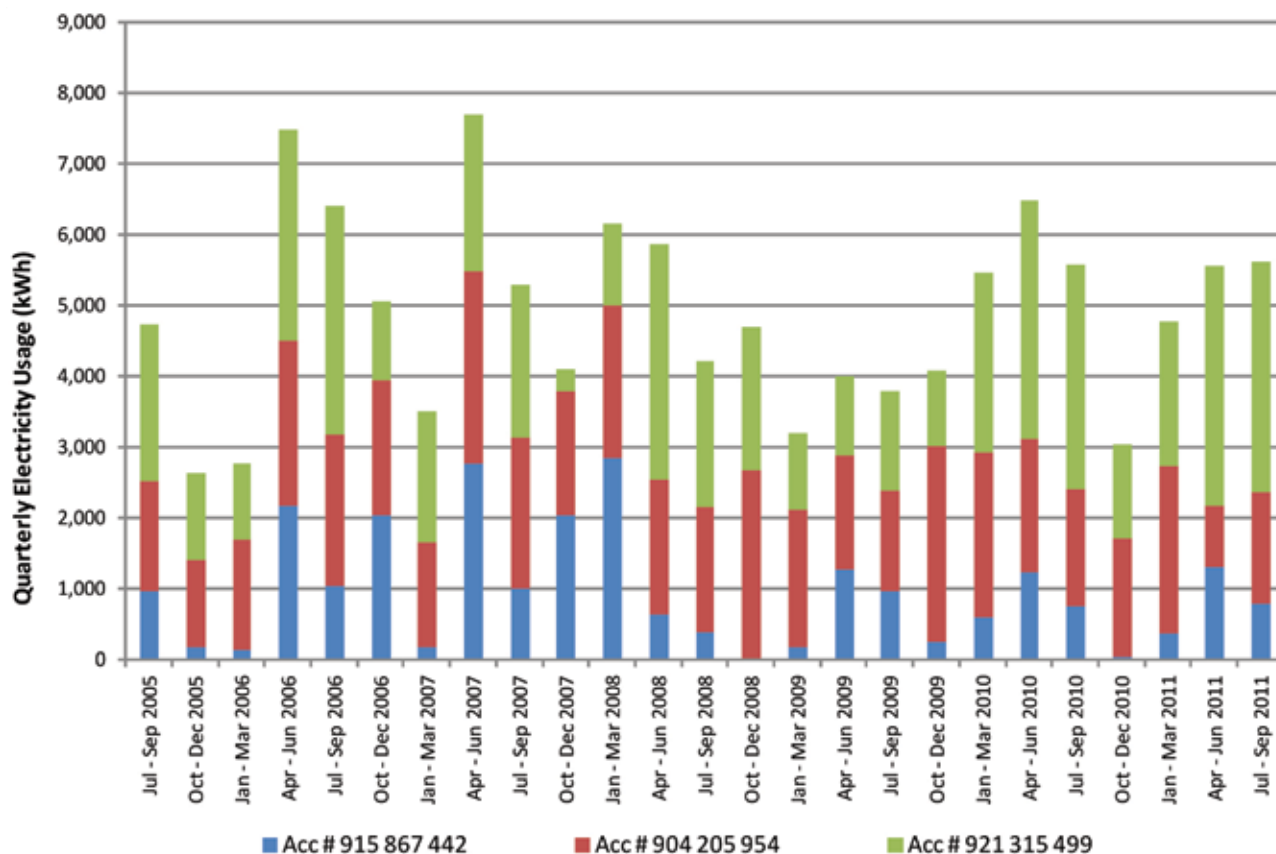
Quarterly Energy Consumption Trends

A graph of quarterly electricity consumption over the past six years is shown in Figure 2 below.

The graph indicates that electricity usage varies significantly but is generally highest in the winter months, probably due to field lighting for winter sports.

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

Figure 2 – Strathfield Park Quarterly Electricity Trend



Note that Planet Footprint does not have information for one of the electricity accounts ("Strathfield Park" NMI 41027098319; Account # 921 315 499). Baseline data for this electricity supply was estimated from recent bills. This account has the highest electricity usage for the site so it is recommended that Strathfield Council update Planet Footprint with the account details so that the usage can be tracked.

Energy Saving Opportunities

There is limited energy saving opportunities at Strathfield Park, as it is a relatively small energy user. Council has proposed the installation of a "Cloudmaster" control system that allows for improved control of the floodlighting for the sports fields (via timers, remote control of timers and on/off settings etc), so this is expected to reduce the facility's electricity usage.

The T8 fluorescent lights in the clubhouse could be upgraded by installing T5 conversion kits to reduce their energy consumption.

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Upgrade T8 fluorescent lights to T5 fluorescent using adaptor kits in the clubhouse (8 units)	\$ 360	193	\$ 39	9.3	0.2

Energy Assessment of Strathfield Square Kiosk

Background

The Strathfield Square Kiosk is located at Strathfield Square, corner of Albert Road and Churchill Ave Strathfield. Although the kiosk is operated by a third party tenant, the electricity bills are processed by Strathfield Council and it is the Council's 9th largest energy using facility. By transferring the account to the tenant, they will be able to manage their usage more effectively.

Energy Baseline and Historical Energy Usage

An energy baseline for the Strathfield Plaza Kiosk for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Strathfield Plaza Kiosk Energy Baseline

Site Name	Strathfield Plaza Kiosk
Electricity NMI	41027151241
Electricity Account	904 239 119
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	18.5
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	66.7
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	19.6

Energy Saving Opportunities

Strathfield Council does not have operational control over the kiosk, so there are limited opportunities for the Council to implement energy upgrades. Council could refer the tenant to the NSW Government's Energy Efficiency for Small Business Program (EESBP) which offers a subsidised energy assessment and access to up to \$5,000 in rebates for energy upgrades. See <http://www.environment.nsw.gov.au/sustainbus/smallbusenergy.htm>

Energy Assessment of Mason Park

Background

Mason Park is located on Underwood Rd Homebush and consists of sports fields with floodlighting and a small clubhouse/amenities facility. The facility has two electricity supplies (with separate accounts) but no natural gas connection, and is Strathfield Council's 10th largest energy using facility.

Energy Baseline and Historical Energy Usage

An energy baseline for Mason Park for the 2010/11 financial year is presented in Table 1 below.

Table 1 – Mason Park Energy Baseline

Site Name	Mason Park
Electricity NMI and Accounts	Flood lighting: NMI 41026682938; Account # 914 704 037
	Amenities Block: NMI 41026682920; Account # 903 287 195
Natural Gas Meter	NA
Baseline Start Date	1-Jul-10
Baseline End Date	30-Jun-11
Total Electricity purchased on site in MWh	18.2
Green power purchased by Council in MWh	0
Total Natural Gas purchased by the site in GJ	0.00
Other energy that is purchased for stationary equipment on site	0
Total Energy Consumption in GJ	65.6
Site Greenhouse Gas Emissions in t CO ₂ -e – NGA Workbook full fuel cycle conversion factors used.	19.3

Note that limited historical data for Mason Park was available, as Planet Footprint has been estimating the electricity usage on both accounts for the past three years. It is recommended that Strathfield Council update Planet Footprint with the account details so that the usage can be tracked correctly.

Electricity demand data is not available for the site as it is too small to have the sophisticated utility metering required to record this data.

Energy Saving Opportunities

There are limited energy saving opportunities at Mason Park, as it is a relatively small energy user. The flood lighting for the sports field is connected to a "Cloudmaster" control system. However, this system needs to be upgraded to provide improved remote access to control the operation of the flood lights and reduce their operating times.

The T8 fluorescent lights in the clubhouse could be upgraded by installing T5 conversion kits to reduce their energy consumption.

Opportunity	Estimated Cost	Elec Savings kWh pa	Energy Cost Savings \$	Payback (years)	GHG Savings TCO ₂ e
Upgrade T8 fluorescent lights to T5 fluorescent using adaptor kits in the clubhouse (8 units)	\$ 360	193	\$ 39	9.3	0.2