csu green
sustainability
- your actions count!

2011 Environmental Scorecard

Charles Sturt University

Foreword

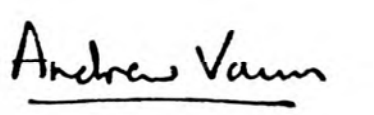
In 2011, CSU renewed its commitment to environmental sustainability through the drafting of a new sustainability enabling plan for the organisation. Once finalised and endorsed, this plan will enshrine and build upon previous sustainability targets to improve the overall environmental sustainability of the organisation. I was aware of CSU's strong commitment in this area before coming to CSU, and I have continued to be impressed since joining the University. As Vice-Chancellor, I look forward to realising the achievement of these targets and to working with our entire University community to embed environmental sustainability into all aspects of our thinking.

As an organisation, CSU recognises that growth and progress increases the challenge of managing the University's environmental footprint. In 2011, CSU's absolute energy consumption has remained steady compared to 2010 and while at first glance this appears to be a good result for the University, the cooler, wetter La Nina weather that has been experienced throughout Eastern Australia has likely played a role in suppressing energy consumption during this period. Achieving CSU targets for reducing normalised energy consumption will require the continued implementation of significant energy efficiency initiatives, financed through the internal Energy Savings Loan Scheme.

Investment in improving energy efficiency is the cheapest and most effective means of reducing CSU's carbon footprint; however, it is not a total solution, as energy efficiency can only reduce CSU's greenhouse gas emission output; not totally eliminate it. To achieve carbon neutrality, additional investments in renewable energy and carbon offsets will need to be made so the target can be realised.

2011 was also a significant milestone for CSU with the achievement of its target to reduce potable water consumption by 25% by the end of 2011 compared to the baseline year 2006. Overall, CSU has managed to achieve a 54% reduction in potable water consumption compared to 2006. This is a significant environmental achievement for the organisation, with an added benefit that this reduction has helped to insulate CSU against the rising cost of potable water. Other positive signals that CSU is heading in the right direction with its sustainability endeavours included external recognition by both the NSW Government through the 2011 Green Globe Award for Regional Sustainability and Australasian Campuses towards Sustainability (ACTS) via the 2011 ACTS Award of Excellence.

CSU Green organises and runs a variety of programs and events throughout the year and I encourage staff and student participation in such rewarding community activities. These include participation in your local Campus Environmental Committee (CEC), making a submission for a CSU sustainability grant or participating in a CSU Green-organised event such as Ride to Work Day or Tree Planting Day. More details can be found through the CSU Green web page (http://www.csu.edu.au/csugreen) or Facebook site (http://www.facebook.com/csugreen).



Professor Andrew Vann
Vice Chancellor and President

Executive Summary

This report reviews the Wagga Wagga, Bathurst, Orange, Albury-Wodonga (Thurgoona), Albury-Wodonga (City) Dubbo and Canberra energy and water use as well as associated costs for Charles Sturt University's (CSU) major campuses for 2011 against values for 2010 and the baseline year, 2006. . The purpose of this report is to provide a comparison and commentary of CSU's performance against the sustainability targets referred to within CSU's Environmental Sustainability Enabling Plan.

The draft Sustainability Enabling Plan 2011-2015 outlines a comprehensive list of targets against the functional areas of 'research & innovation, learning and teaching, student experience & community engagement and campus management'. The 2011 Environmental Scorecard focuses on 'campus management' targets as listed below.

	Objective/Target
C.1	Be greenhouse gas neutral by 2015
C2.1	Compared with 2006, achieve a 10% reduction in normalised energy consumption (MJ/m^2 GFA) by 2011 and a 25% reduction by 2015
C2.2	To acheive a 2% annual reduction in normalised energy consumption (MJ/m^2 GFA) each year after 2015
C3.1	Compared with 2006, reduce absolute water consumption by 25% by 2011 and 40% by 2015
C3.2	To achieve a 2% annual reduction in normalised energy consumption (kL/m^2 GFA) each year after 2015
C4.1	Acheive a 70% reduction of solid waste by 2014
C4.2	Reduce solid waste by 2% each year by 2014
C4.3	Responsible stewardship of potentially hazardous materials
C5.1	By 2011 at least a 10% of University core campus land used to increase biodiversity and 20% by 2015
C5.2	Biodiversity value of allocated land to improve year on year
C6.1	To acheive a 4.5 star or better Green Vehicle Guide rating among 50% of the University vehicle fleet by 2015
C6.2	To improve the fuel efficiency of the CSU vehicle fleet by 5% year on year
C6.3	To promote car-pooling for intercampus travel by CSU staff and students
C7.1	Establishment of sustainable procurement processes
C8.1	Sustainable design of new buildings and major refurbishments
C9.1	Compliance against relevant legislation for environmental protection

It is noted that data and progress updates pertaining to every campus management objective are not currently available. It is envisaged that once the Plan is ratified, reporting structures will be created, allowing CSU Green to report on all aspect of the Sustainability

Enabling Plan. However, the 2011 edition of the Scorecard will report, where data is currently available.
In 2011, an additional 1,059 m^2 of gross floor area (GFA) was commissioned across the University's building portfolio, with an overall increase in gross floor area since 2006 of 15%.

Overall, CSU consumed more energy in 2011 than it did in 2010 resulting in a 5% increase in stationary energy related greenhouse gas emissions (Figure 0-1). Because of this increase in energy related greenhouse gas emissions, stationary energy related emissions in 2011 were 9% greater than the 2006 baseline year.

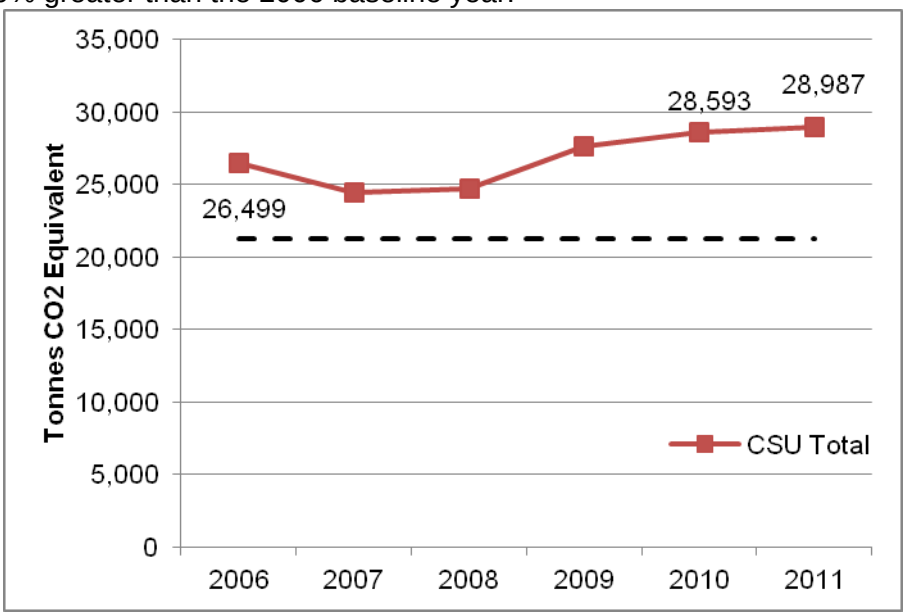


Figure 0-1 – Combined stationary energy related greenhouse gas emissions for all CSU campuses for the period 2006 to 2011

Greenhouse gas emissions have increased slightly in 2011, with Figure 0-2 illustrating that CSU has increased the intensity of its greenhouse gas emissions by 1 kg CO_2/m^2, compared to the baseline year of 2006.

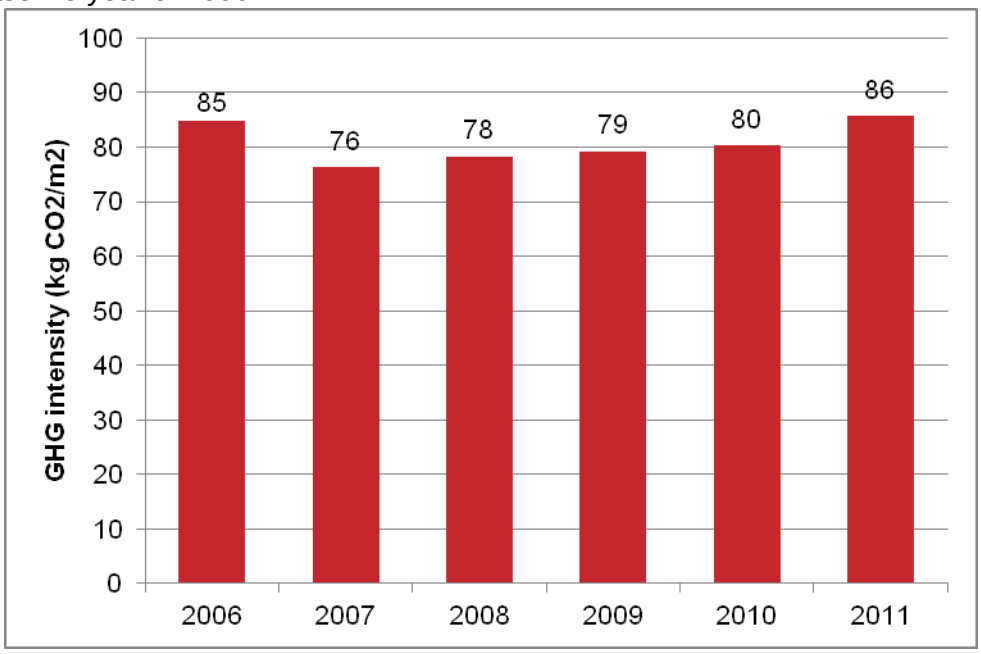


Figure 0-2 – Stationary energy related greenhouse gas emission intensity for all CSU campuses for the period 2006 to 2011

Water consumption decreased from 2010 to 2011. (Figure 0-3). In 2011 water consumption was reduced by 54% compared to the 2006 baseline year. This surpasses the 25% reduction target set for 2011.

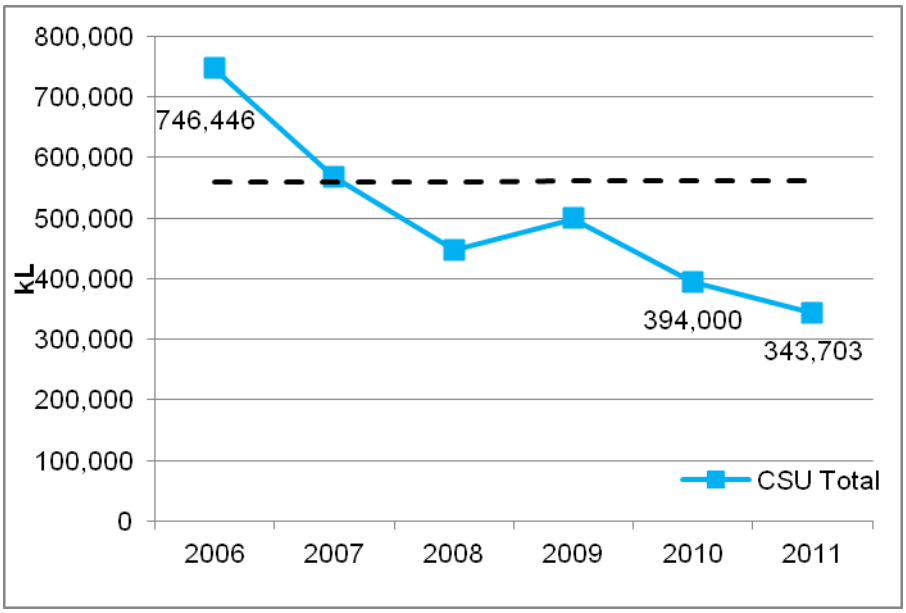


Figure 0-3 - Water consumption associated with all CSU campuses for the period 2006 to 2011

Greenhouse gas emissions produced by CSU staff travel activities (vehicle and air travel) have increased significantly since 2006 (Figure 0-4) with an increase of 68% recorded in 2011 against the 2006 baseline year.

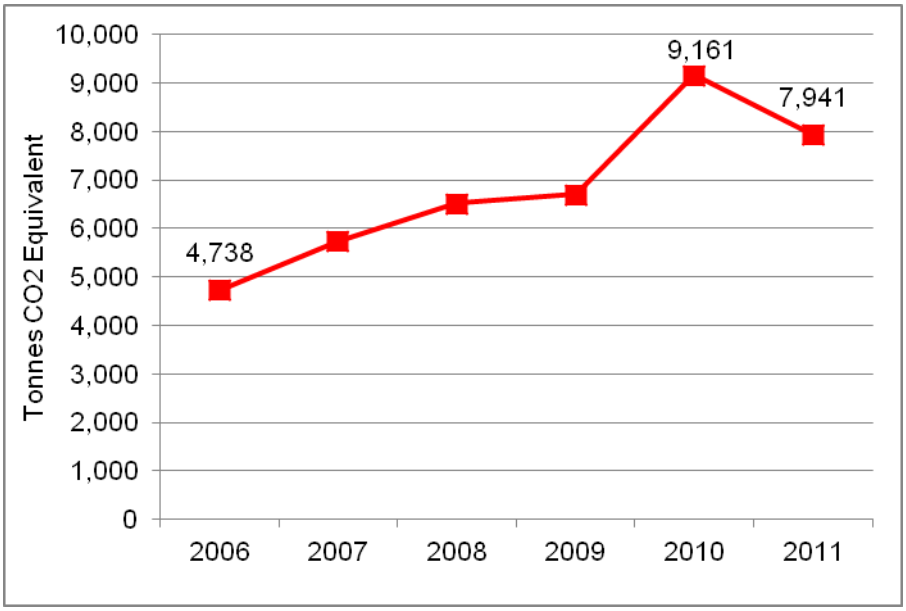


Figure 0-4 - Travel related greenhouse gas emissions associated with CSU operations for the period 2006 to 2011

Footprint ready reckoner

The following provides some everyday comparisons to the volume of resources consumed and travel undertaken by CSU in 2011.

Resource	2011 Figure	Comparisons
Energy	28,978 tonnes CO_2 equivalent	• 2,248 4-person households
Water	343,703,000 litres	• 1,709 urban 4-person households • 434 Olympic-sized swimming pools
Vehicle travel	7,404,000 kilometres	• Annual distance travelled by 517 family cars
Air travel	27,867,678 kilometres	• 39,085 trips from Sydney to Melbourne

Table of Contents

Introduction

CSU faces a real challenge in achieving a 25% reduction in energy consumption by 2015 in light of the expansion activities that have occurred and those that are still to take place.

It is acknowledged that some reductions in energy consumption will be achieved in the short-term through the sale of the Albury-Wodonga (City) campus and the Wagga Wagga South Campus; however, the scale of the planned expansion for CSU's major campuses is likely to offset this reduction.

This target will only be reached through significant investment in energy efficiency measures within existing building stock and setting stringent performance targets for all new facilities.

The first edition of CSU's Scorecard was published in 2007 and was titled Energy & Water Scorecard. The scope of the document has grown in 2009 to capture other metrics possessing sustainability targets under CSU's IDP (e.g. waste, travel-related GHG emissions). It is envisaged that future editions of the Scorecard will also include a metric for CSU's land use target for improving biodiversity as the organisation's progress in this area matures.

Data for CSU's Goulburn, Manly, Ontario and Homebush operations is not presented given the University's role as a tenant/sub-tenant within these facilities.

In reviewing resource use associated with the major campuses, the following indicators have been selected:

- Normalised and absolute electricity consumption in kilowatt hours (kWh) and kilowatt hours per meter squared gross floor area(kWh/m^2 GFA)
- Normalised and absolute natural gas consumption in megajoules (MJ) and megajoules per meter squared gross floor area in (MJ/m^2 GFA)
- Normalised and absolute supplied water consumption in kilolitres (kL) and in kilolitres per meter squared of gross floor area (kL/m^2 GFA)
- Stationary energy, travel related and total greenhouse gas emissions in tonnes of CO_2 emissions (t CO_2)
- Waste production as volume(m^3)
- Travel by university vehicles for business use in kilometres (km) and associated fuel use in litres (L)
- Air travel for university business in kilometres (km)

It is important to note that the indicators chosen are those with readily available data, as recorded by Division of Facilities Management, Finance Division and external contractors.

The Environmental Scorecard will be published annually in March for the purposes of assessing CSU's performance against its sustainability targets and increasing awareness among staff, students and the general community of the measures being taken to address these targets.

1. University wide analysis

1.1. Electricity analysis

Analysing electricity consumption for each campus against gross floor area provides a means of comparing the intensity of electricity use by the varied-sized campuses (Figure 1-1). In 2011, Orange and Dubbo campuses were the most intensive users of electricity at 101 and 100kWh/m^2 of gross floor area (GFA) respectively.

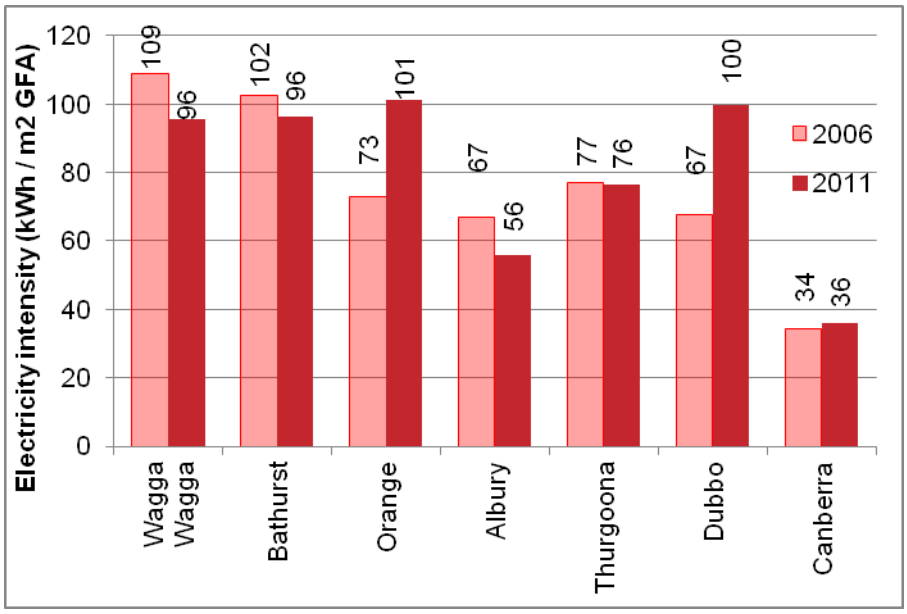


Figure 1-1 - Electricity use intensity comparison, based on gross floor area, for CSU campuses in 2011 compared to 2006

In 2011, overall electricity consumption at CSU remained steady when compared to consumption in 2010. This represents an increase of 10% on 2006 electricity consumption (Figure 1-2).

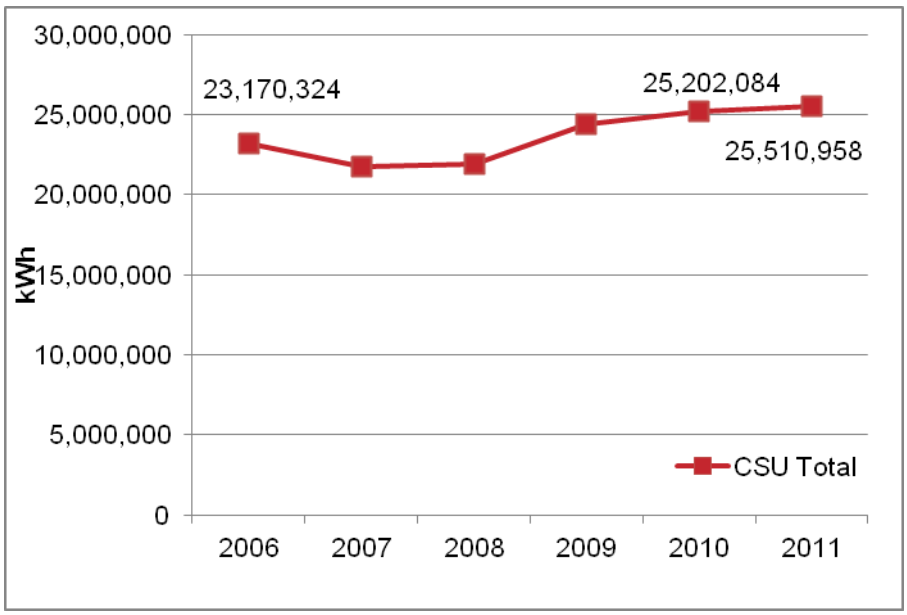


Figure 1-2 – Absolute electricity consumption across all CSU campuses in 2011

Wagga Wagga and Bathurst campuses were the largest users of electricity accounting for 47% and 30% respectively in 2011 (Figure 1-3). The remaining 23% of electricity consumption can be accounted for through the Orange, Albury-Wodonga (City), Albury-Wodonga (Thurgoona), Dubbo and Canberra campuses collectively.

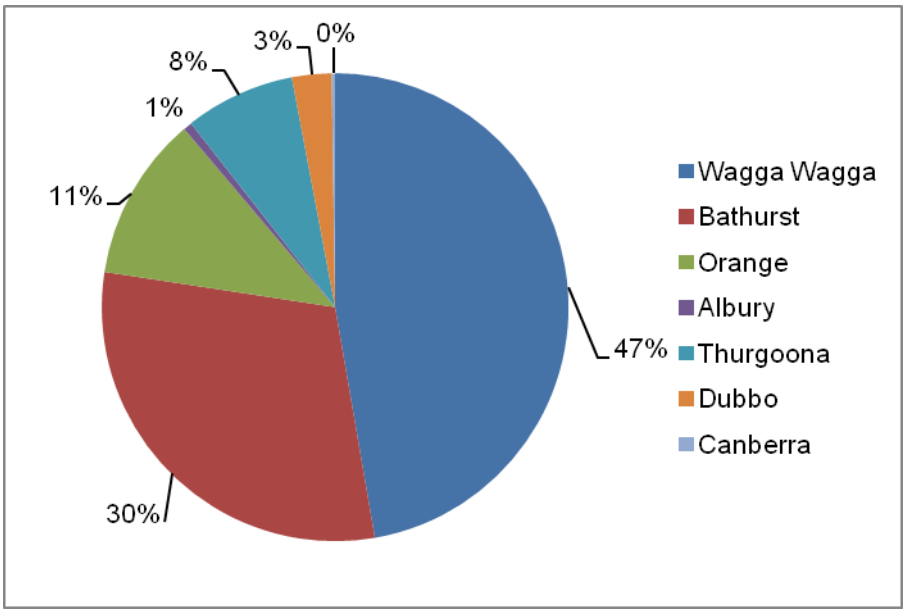


Figure 1-3 - Proportion of total electricity used by each CSU campus in 2011

A summary of electricity related charges (summation of network and usage charges) is provided in Table 1-1. CSU's total electricity related charges have increased by 76% from 2006 to 2011 as a result of increased prices and the 9% increase in electricity use over the same period.

The Commonwealth Government will introduce a $23/tonne carbon pricing scheme from the 01st July 2012. This is expected to increase electricity prices by an average of 15% from 2013-2017 (NSW Treasury, Evaluation of The Impacts of the Commonwealth's Carbon Price Package Announced 20 July 2011, October 2011). The introduction of this legislation will increase CSU's total expenditure on electricity, unless further energy savings projects are implemented.

Table 1-1 - Electricity related charges for CSU campuses in 2011

	Wagga Wagga	Bathurst	Orange	Albury-Wodonga (City)	Albury-Wodonga (Thurgoona)	Dubbo	Canberra	CSU Total
2006	$1,131,187	$869,331	$176,030	$118,115	$134,121	$52,594	$2,521	$2,493,392
2007	$1,181,730	$872,142	$160,039	$138,153	$163,858	$43,900	$4,566	$2,573,882
2008	$1,331,488	$881,137	$214,900	$159,492	$210,979	$44,458	$7,933	$2,879,430
2009	$1,621,518	$864,004	$344,308	$169,399	$316,149	$60,490	$10,247	$3,434,453
2010	$2,023,435	$1,128,347	$444,755	$101,558	$434,722	$73,757	$10,154	$4,237,867
2011	$2,013,194	$1,204,450	$527,500	$46,482	$480,299	$89,767	$10,964	$4,372,657

1.2. Gas analysis

In 2011, Bathurst campus was the most intensive user of natural gas by a significant margin (Figure 1-4) at 658 MJ/m^2 of GFA followed by Wagga Wagga campus at 441 MJ/m^2. Orange Campus was the least intensive natural gas user at 92 MJ/m^2.

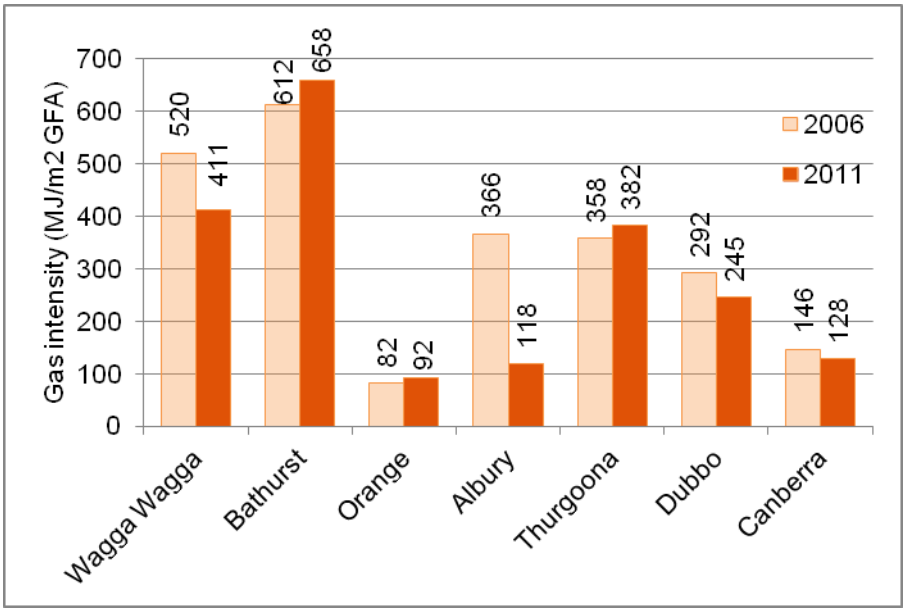


Figure 1-4 – Natural gas use intensity comparison, based on gross floor area, for CSU campuses in 2011 compared to 2006

In 2011, a small increase in natural gas consumption across all campuses was observed compared to 2006 (Figure 1-5). This represents a 3% increase in the consumption of natural gas use compared to 2006. Overall the University consumed 1% more natural gas in 2011 than 2010.

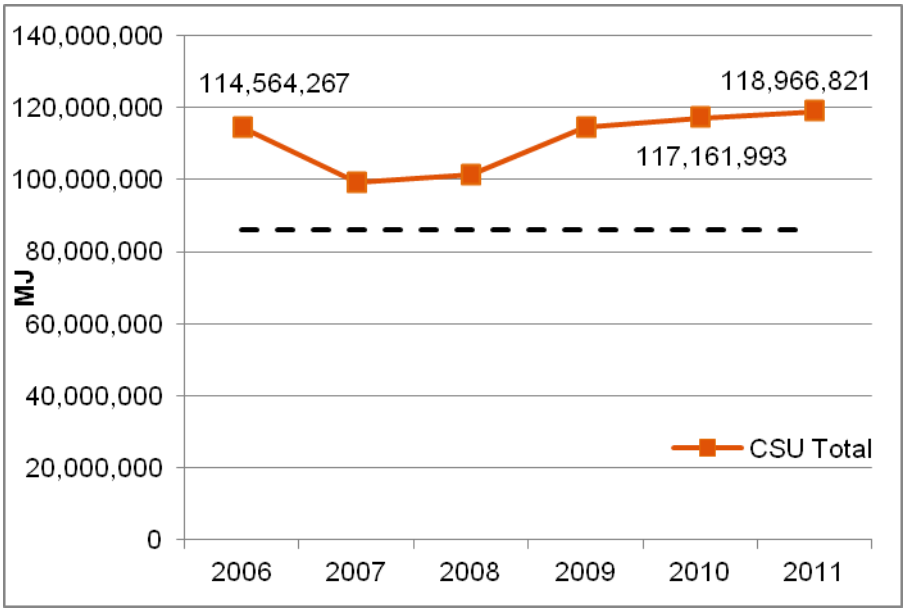


Figure 1-5 – Absolute natural gas consumption across all CSU campuses

Wagga Wagga and Bathurst campuses were the largest users of natural gas, with both accounting for 44% of total consumption in 2011 (Figure 1-6). Orange, Albury-Wodonga (City), Albury-Wodonga (Thurgoona), Dubbo and Canberra collectively represented 12% of CSU's natural gas use.

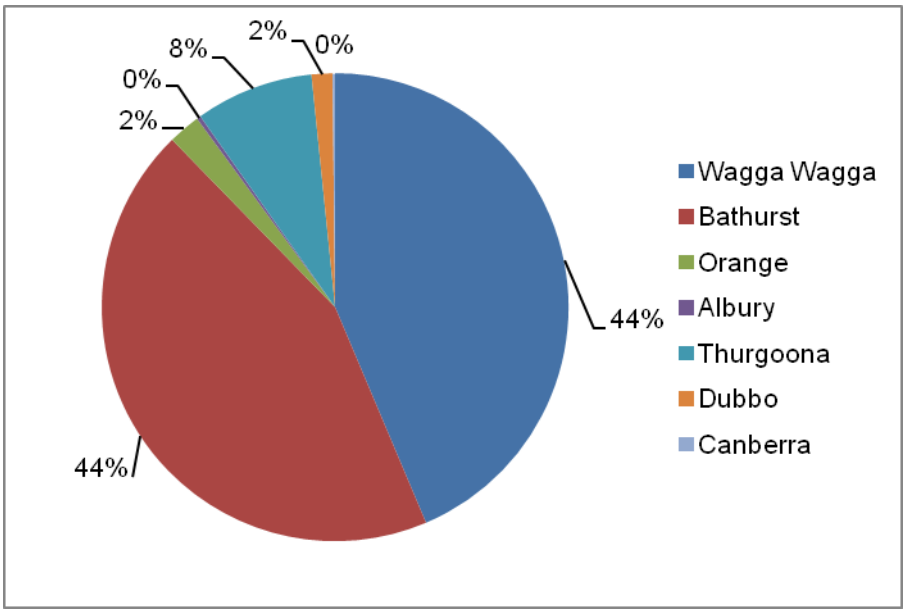


Figure 1-6 - Proportion of total natural gas used by each CSU campus in 2011

A summary of natural gas related charges (summation of network and usage charges) is provided in Table 1-2. CSU's total natural gas related charges have increased by 21% from 2006 to 2011 as a result of the increased prices and a 3% increase in natural gas consumption over the same period.

Table 1-2 – Natural gas related charges for CSU campuses in 2011

	Wagga Wagga	Bathurst	Orange	Albury-Wodonga (City)	Albury-Wodonga (Thurgoona)	Dubbo	Canberra	CSU Total
2006	$442,589	$315,458	$26,880	$49,318	$42,761	$21,093	$1,650	$899,749
2007	$403,199	$310,794	$21,806	$43,385	$30,067	$17,723	$2,211	$829,184
2008	$407,021	$314,419	$26,396	$40,912	$33,720	$26,320	$4,263	$964,052
2009	$476,452	$388,962	$18,153	$39,194	$58,771	$20,594	$3,336	$1,005,462
2010	$409,505	$441,464	$29,034	$12,541	$84,818	$16,608	$4,785	$998,756
2011	$406,297	$522,551	$35,446	$7,254	$89,870	$23,063	$4,014	$1,088,495

1.3. Water analysis

In 2011, Wagga Wagga was the most intensive user of mains supplied water at 1.6 kL/m^2 of GFA. Albury-Wodonga (City) and Albury-Wodonga (Thurgoona) campuses were the least intensive water user at 0.3 kL/m^2 and 0.5 kL/m^2 respectively (Figure 1-7).

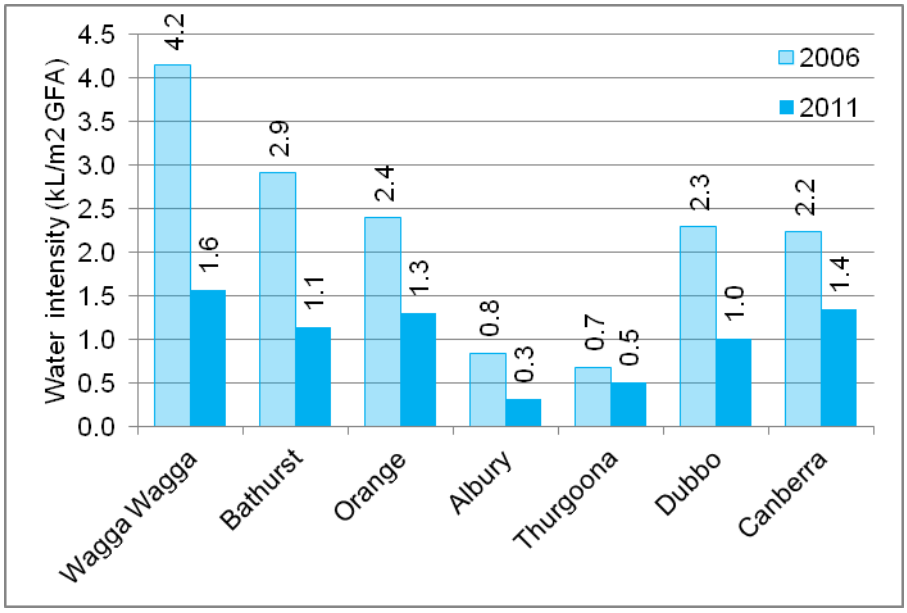


Figure 1-7 – Mains supplied water use intensity comparison, based on gross floor area, for CSU campuses in 2011 compared to 2006

In 2011, CSU experienced a significant decrease in the consumption of mains supplied water use compared to 2010 (Figure 1-8). The decrease represents 13% of 2010's water consumption. Overall the University consumed 54% less mains supplied water in 2011 than the baseline year, 2006. This result surpasses the University's target of a 25% reduction on 2006 water use.

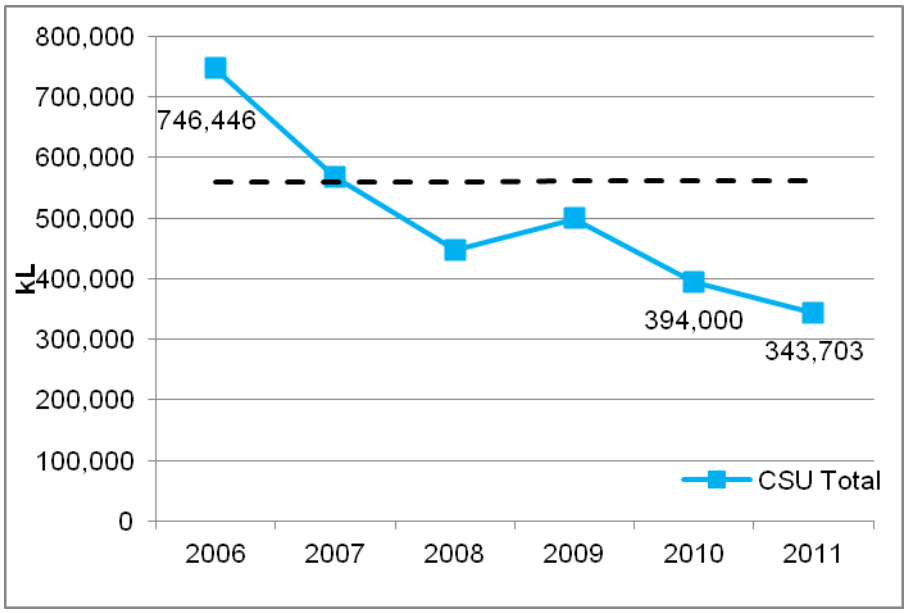


Figure 1-8 – Mains supplied water consumption across all CSU campuses for the period 2006 to 2011

Wagga Wagga and Bathurst campuses were the largest users of mains supplied water accounting for 57% and 26% respectively in 2011 (Figure 1-9). Orange, Albury-Wodonga (City), Albury-Wodonga (Thurgoona), Dubbo, Canberra and Broken Hill collectively represented 17% of CSU's mains supplied water consumption.

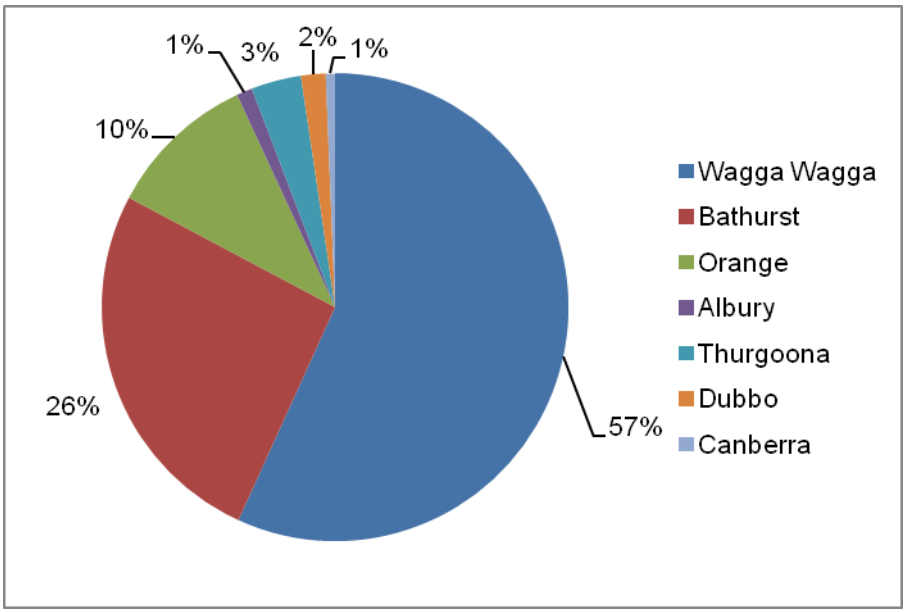


Figure 1-9 - Proportion of total mains supplied water used by each CSU campus in 2011

A summary of water related charges is provided in Table 1-3. CSU's total water related charges have decreased by 11% from 2006 to 2011 representing an annual saving of more than $73,226. Each of CSU's campuses is supplied water from a different water utility.

Table 1-3 - Water related charges for CSU campuses in 2011

	Wagga Wagga	Bathurst	Orange	Albury-Wodonga (City)	Albury-Wodonga (Thurgoona)	Dubbo	Canberra	CSU Total
2006	$315,483	$153,799	$73,225	$12,676	$8,940	$20,379	$3,174	$590,701
2007	$246,893	$134,813	$57,908	$30,521	$13,321	$30,259	$5,097	$521,151
2008	$227,979	$88,622	$47,358	$25,989	$13,075	$36,482	$2,702	$444,437
2009	$260,291	$109,528	$57,750	$27,547	$25,326	$36,698	$3,349	$536,623
2010	$195.474	$148,196	$51,679	$9,362	$35,451	$29,689	$3,526	$526,854
2011	$181,038	$163,948	$64,971	$21,091	$11,888	$5,822	$2,225	$517,476

1.4. Waste analysis

In 2010, CSU, produced a total of 16,843m^3 of waste, 12,062m^3 (72%) of which was disposed of to landfill, while the remaining 4,782m^3 (28%) was successfully recycled (Figure 1-10). CSU still has significant room for improvement when it comes to waste management. An additional 47% of its total waste output will need to be diverted from the general waste stream, if CSU is to achieve its waste target.

As in the 2010 edition of the Environmental Scorecard; sanitary waste and liquid waste have not been included in this analysis.

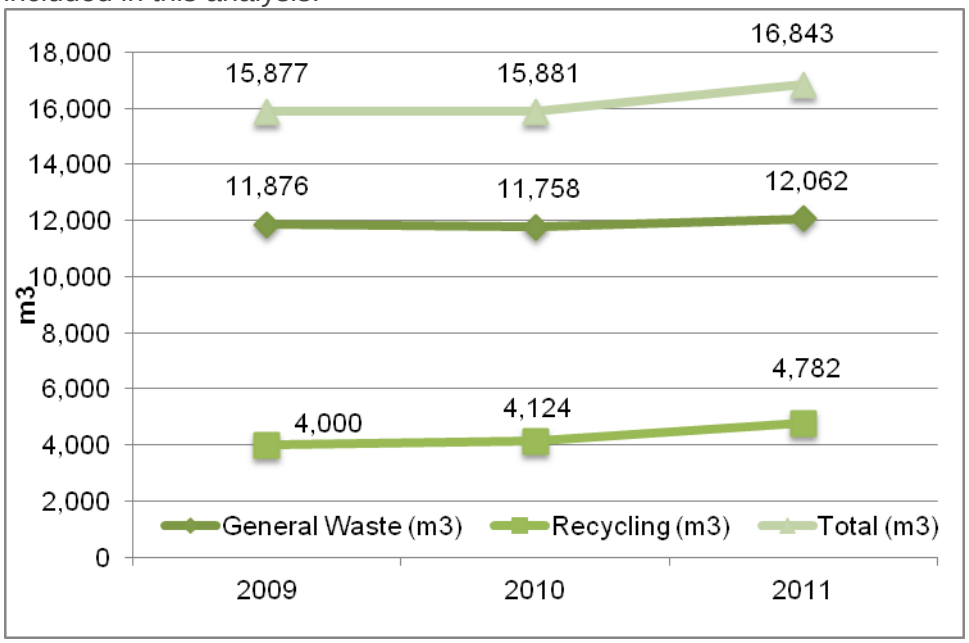


Figure 1-10 – Total waste output from CSU in 2011

Figure 1-11 shows that Wagga Wagga campus produced the most significant output of waste (64%), while Bathurst and the Orange campuses produced the next greatest output (14% & 11% respectively). The remaining CSU campuses produced 14% of CSU's total waste output.

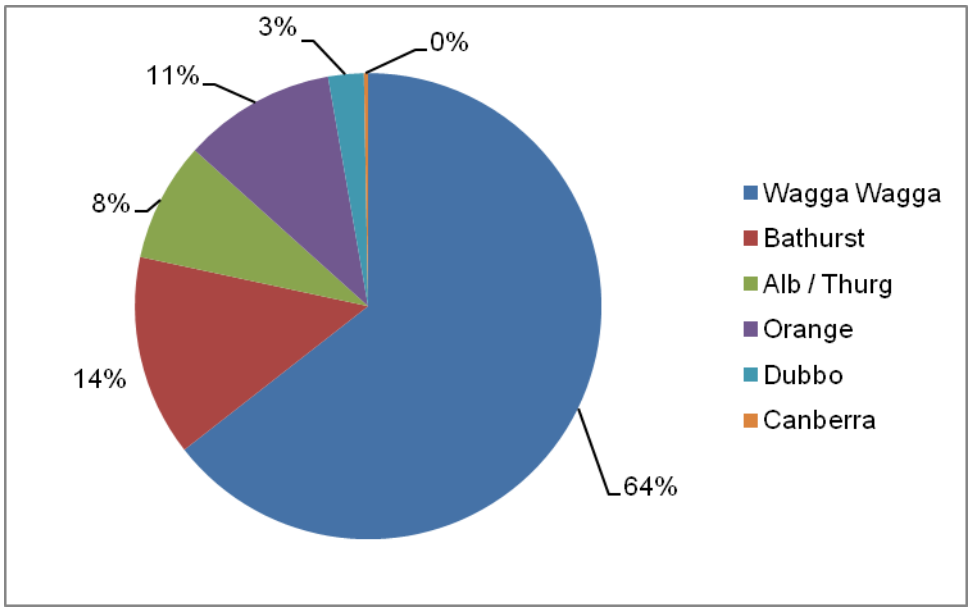


Figure 1-11 – Total waste output from each CSU campus in 2011

Figure 1-12 illustrates the average waste output per person across each of the major CSU campuses. Dubbo campus recorded the highest waste output of 4.2 m^3/person/year, while Canberra campus recorded the lowest waste output of 0.2m^3/person/year. However, this waste output is comprised of both general waste AND recycling.

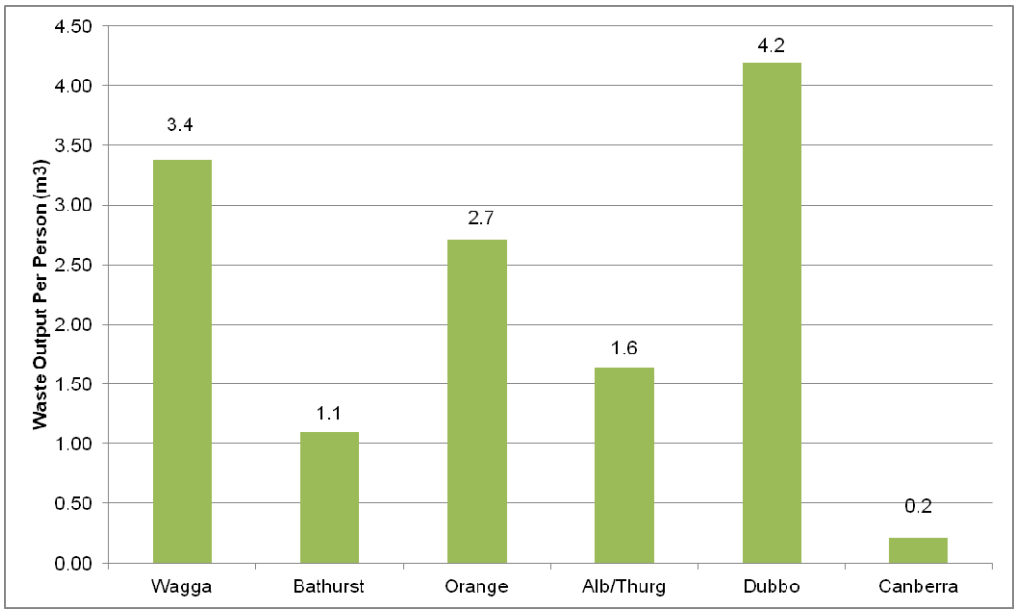


Figure 1-12 – Total waste output per person in 2011 (on-Campus students & staff)

A summary of waste related charges is provided in Table 1-4. CSU's total waste related charges have increased by 63% from 2006 to 2011 representing an increase in cost of more than $85,890. Prices for 2006 to 2008 have been changed from the prices shown in the 2008 Scorecard as they have been modified to reflect the total cost of general waste disposal and recycling only.

Table 1-4 - Waste related charges for CSU campuses in 2010

	Wagga Wagga	Bathurst	Orange	Alb/Thurg	Dubbo	Canberra	CSU Total
2006	$87,068	$13,276	$7,934	$24,129	$4,624	-	$137,033
2007	$77,466	$15,794	$11,635	$23,851	$6,031	-	$134,798
2008	$46,425	$10,640	$13,178	$37,589	$4,654	-	$112,488
2009	$144,284	$22,435	$15,064	$35,376	$6,076	$860	$224,098
2010	$140,586	$14,477	$29,718	$32,474	$7,003	$1,073	$225,333
2011	$132,076	$24,330	$42,065	$14,412	$8,988	$1,253	$222,923

In 2011, the Computer Shop recycled 31 CRT desktop computers, 158 PC's (44 Apple and 114 Windows PC's) and 28 mobile phones. There were also a number of still-working computers (65 PC's) that were successfully sold at auction. The total profit from CSU (subtracting the cost of e-waste recycling from auction sales) was $6,800. This money is redirected by the Executive Director, DIT, back into sustainability projects across CSU. An additional 50 PC's and monitors were donated to veracious charity organisations.

1.5. Motor vehicle travel analysis

In 2011, there was an 8% reduction in the volume of fuel consumed by CSU vehicle on business related travel compared to 2006 (Figure 1-13). This is despite a 23% increase in the number of kilometres that were travelled by University vehicles compared to 2006. The average fuel consumption of a vehicle in the CSU fleet was 8.98L fuel consumed per 100km travelled.

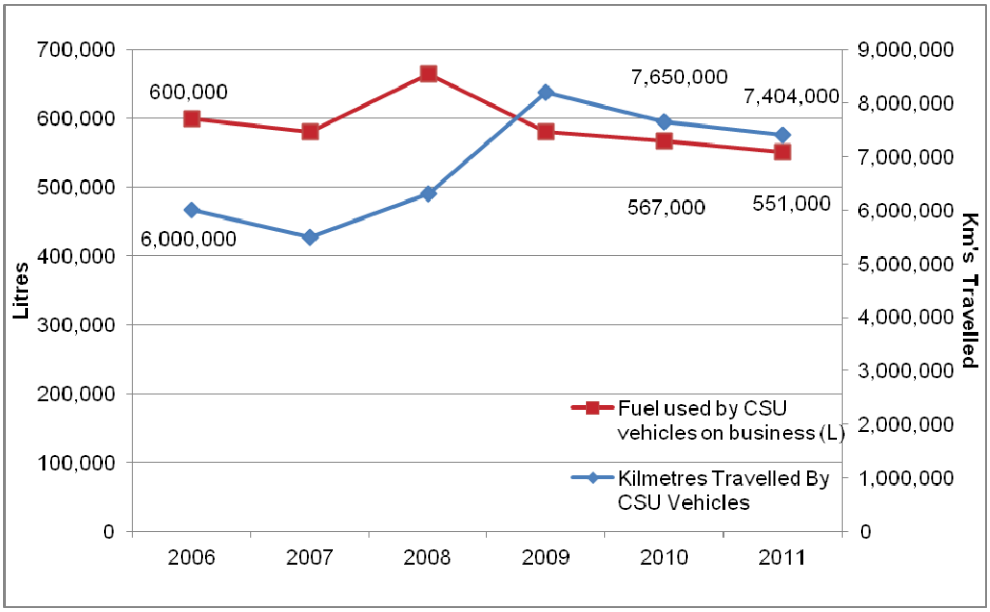


Figure 1-13 – Fuel consumption and kilometres travelled by CSU vehicles in 2011

1.6. Air travel analysis

In 2011, there was a 147% increase in the number of kilometres travelled by CSU staff on domestic flights and a 93% increase in kilometres travelled on international flights compared to 2006 (Figure 1-14). These two figures combined represent a 101% increase in total flight kilometres as compared to 2006.

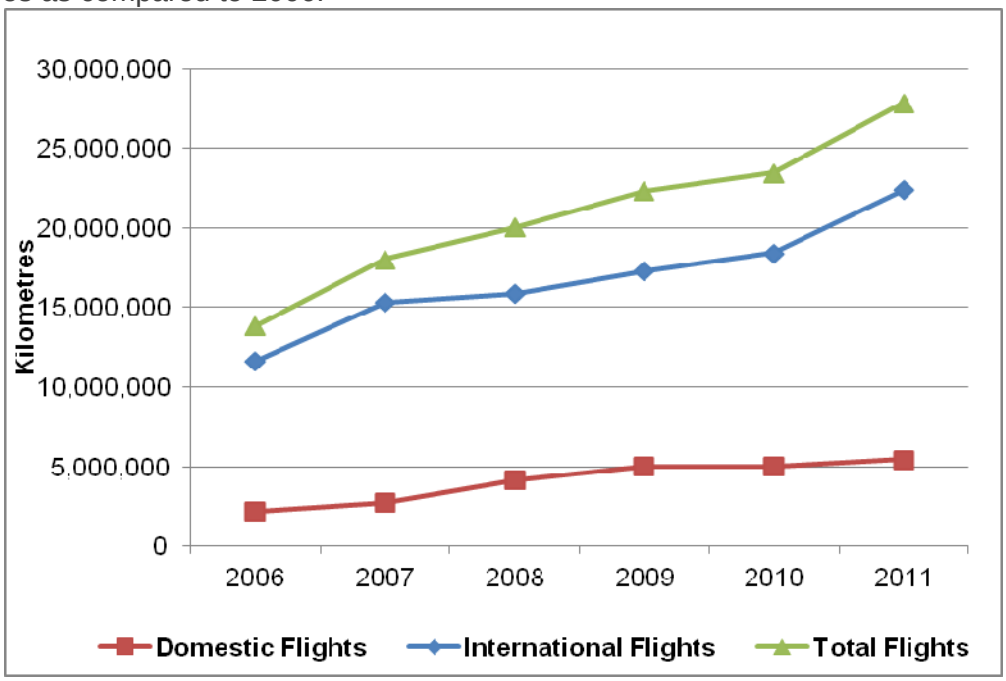


Figure 1-14 - Kilometres travelled by CSU staff on domestic and international flights for the period 2006 to 2011

1.7. Greenhouse gas emissions analysis

A summary of greenhouse gas (GHG) emissions associated with the consumption of stationary energy at all CSU campuses is provided in Table 1-5. These figures follow the trends associated with electricity and natural gas consumption. In 2011, there was a 2.2% increase in the amount of energy related GHG emissions compared to 2006.

Total energy related greenhouse gas emissions reduced in 2011 when compared to 2010 due to the reduction in electricity and gas consumption at the Wagga Wagga Campus.

Table 1-5 - Greenhouse gas emissions associated with stationary energy consumption (electricity, natural gas and LPG) for each CSU campus (shown in Tonnes CO_2 equivalent). Percentage change represents difference from the 2006 baseline year

	Wagga Wagga	Bathurst	Orange	Albury-Wodonga (City)	Albury Wodonga (Thurgoona)	Dubbo	Canberra	CSU Total	% Change
2006	14,244	9,863	1,416	1,071	1,234	432	33	**28,350**	
2007	13,515	8,441	1,327	983	724	406	44	**25,497**	-10.1%
2008	13,292	8,461	1,601	918	1,025	431	50	**25,957**	-8.4%
2009	14,331	9,195	1,989	849	1,703	451	58	**28,722**	1.3%
2010	14,783	9,266	2,482	401	2,318	447	62	**29,858**	5.3%
2011	13,422	9,688	2,722	153	2,228	709	64	**28,987**	2.2%

In 2011, Wagga Wagga campus represented 46% of CSU's combined energy-related greenhouse gas emissions use while Bathurst a total of 33% (Figure 1-15). Combined greenhouse gas emissions at the other five campuses made up the remaining 21%.

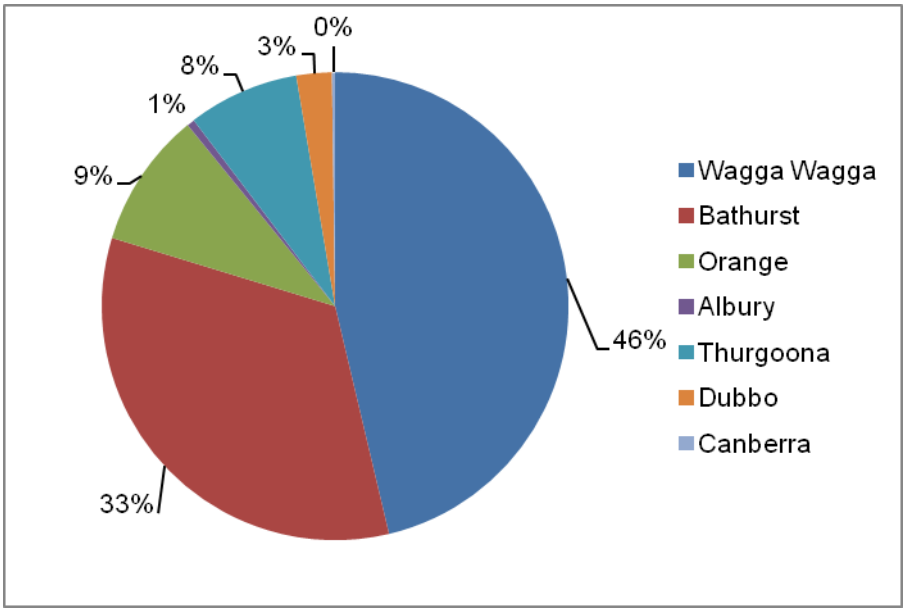


Figure 1-15 - Proportion of energy related greenhouse gas emissions for each CSU campus in 2011

In 2011, there was a 19% increase in total GHG emissions associated with energy use and travel compared to 2006 (Figure 1-16). It should be noted that for the first time in 2011, CSU Green has quantified the GHG emissions associated with disposing of waste as landfill. This was calculated for both the current reporting year (2011) and the previous two years.

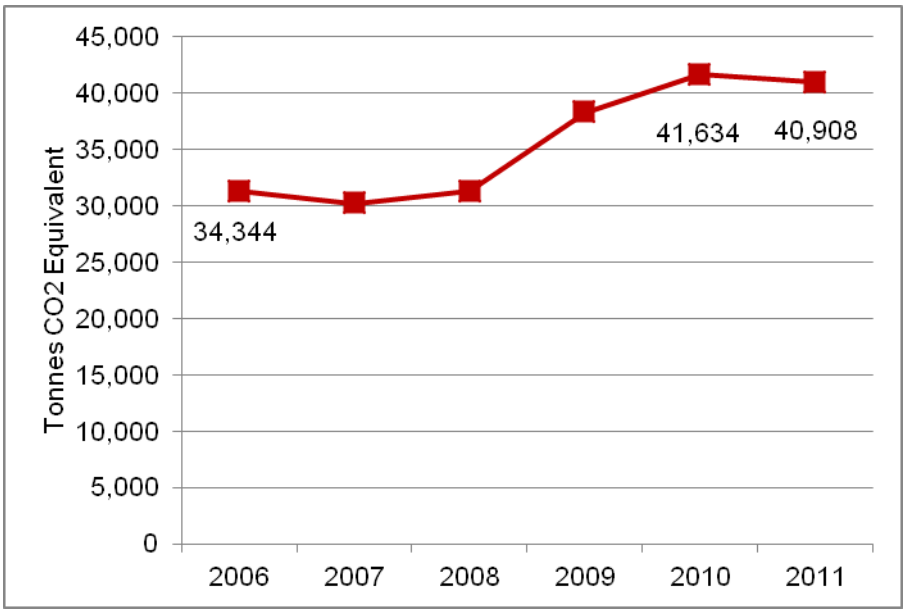


Figure 1-16 - Combined energy, travel and waste related greenhouse gas emissions for CSU during the period 2006 to 2011

Overall it is estimated that travel related activities accounted for 19% of CSU's total GHG emissions in 2011 (Figure 1-17). GHG emissions associated with stationary energy consumption were responsible for 71% of the total, while disposing of waste as landfill accounted for the remaining 10%.

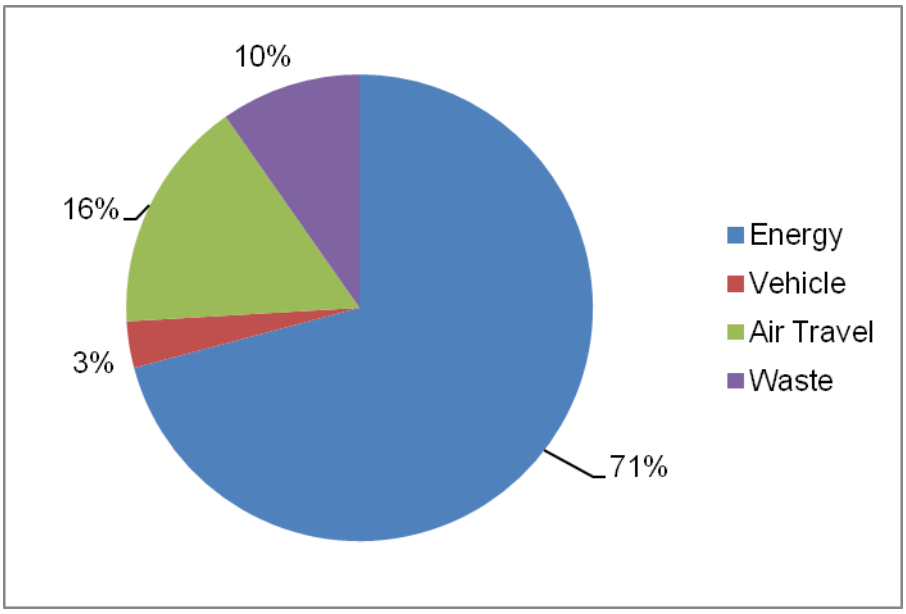


Figure 1-17 - Breakdown of CSU's GHG emissions by source type for 2011

2. Campus Environmental Committee (CEC) Summaries

Campus Environmental Committees (CECs) operate at each of CSU larger campuses. These committees are comprised of active staff and students who meet on a quarterly basis to discuss, plan and action projects and activities that relate to sustainability at each campus. These committees have a strong linkage with CSU Green.

This section of the Scorecard is intended to provide an overview of the activities that have been undertaken by the CECs in 2011.

2.1. Wagga Wagga Campus

Committee Members:	Angela Ragusa, Karen Jamieson, Mary O'Dowd, William Pollack, Rodney Rumbachs, Mark Wilson, David Bate, Clare McNamara, Greg Scott, Peter Bell, Stephen Butt, Edward Maher, Terrence O'Meara
Actions:	**Outcomes:**
1. Strategic Planning	Members of committee provided input and feedback as to the structure and targets in the new sustainability-enabling plan
2. Participation In CSU Green Activities	Participation and support of O-Week Stalls, Wagga Wagga Tree Planting Day and Earth Hour
3. Contact With Wagga Wagga City Council	Invited Wagga Wagga City Council to attend CEC meetings and to discuss possibility of future collaboration between CEC and WWCC Environment Staff
4. Sustainability Videos	Members of committee donate time to appear in sustainability videos that were prepared for CSU Green, and uploaded to the CSU Green website, outlining some of the energy and water initiatives that have been undertaken by the organisation
5. Office Waste Trial	Members of CEC offered to be 'champions' of a trial run of a new office waste collection system

2.2. Bathurst Campus

Committee Members:	James Elibank-Murray, Julie Brabham, Donald Alexander, Adrian Bowden, Hedy Bryant, Bruce Fell, Patrick Forman, James Kelly, Jan Page, Peter Scott, Michael Smith, Jim Watt, Chris O'Connor
Actions:	**Outcomes:**
1. Tree Planting Day	Participation in Annual Tree Planting Day, with the highlight being the significant involvement of on-campus staff and students
2. Ride To Work Day	Participation in the annual Ride To Work Day
3. Sustainability Grant	Successful award of sustainability grant for in-stream creek rehabilitation works (tributary of Hawthornden Creek outside new student residences)
4. Campus Community Engagement	Worked successfully with Donald Alexander's COM232 students on a litter awareness campaign Working to organise meeting with new Vice-Chancellor in early 2012

2.3. Orange Campus

Committee Members:	Kevin Parton, Scott Andrew, Kerry Madden, Bruce Auld, Mark Chapman, Fiona Cochrane, Terri-Lee Duffy, Cilla Kinross, Chris Plunkett, Chris O'Connor
Actions:	**Outcomes:**
1. Peregrine Falcon Project	Installation of camera and video recording software for Peregrine Falcon
2. Bottled Water Stations	Installation and promotion of bottle refilling stations on campus as part of a campaign to phase out the sale of bottled water
3. Farm and Equine Centre Water Supply	Finalisation of design for Orange Farm water project (to remove water supply of farm and equine centre from the potable water supply and on to readily available dam water)
4. Ride To Work Day	Participation in the annual Ride To Work Day held in October

2.4. Albury-Wodonga (Thurgoona) Campus

Committee Members:	John Rafferty, Jessica Biles, Tricia Bowman, Libby Clark, Daniel Clegg, Allan Curtis, Linda Goddard, Cheryl Howell, Peter Jones, Sharon Laver, Pettina Love, Helen Masterman-Smith, Kurt Neville, Marie Sheahan, Stephen Smith, Calvin Wang, Wes Ward, Paul Warner, Mark Westerman, Ben Wilson, Merryn Shaw, Edward Maher
Actions:	**Outcomes:**
1. Student Sustainability Conference	Sustainability Conference for Students was successfully held in July 2011 on the CSU Albury-Wodonga Campus. A sub-committee of the CEC was formed to plan and manage the event.
2. Grants Received To Extend Wetland Trails	Completion of David Mitchell Wetland walking trail occurred in 2011. The trail begins at the DFM gardens and continues for 1km around the outside of the campus, ending at the base of the wetlands
3. Short Film Festival	CEC members put forward a submission for a sustainability grant to hold a Sustainability-themed film festival in 2012. The grant was well-received by the assessors and funding has been supplied, with the intention that the festival be held in 2012
4. VC's Award For Excellence	CEC members were responsible for nominating the eventual winners of the Vice-Chancellors award for sustainability.

2.5. Dubbo Campus

Committee Members:	Kevin Faulkner, Christine Stewart, Jean Brain, Mark Chapman, Belinda Gozzard, Be Mohr, Ben Moore, Kay Owens, Edward Maher
Actions:	**Outcomes:**
1. Re-establishment of Committee	Re-establishment of Campus Environmental Committee in mid-2011. Committee now has nine members and will meet quarterly
2. Clean-up Australia Day	Participation in the 2011 Clean-up Australia Day
3. Earth Hour	Organising an Earth Hour event for students living on-campus

3. Wagga Wagga campus analysis

3.1. Campus information

Total building gross floor area (m^2)	126,238
Student headcount – 2011	12,789[a] (2,245 internal; 9,289 distance & 1,255 mixed mode)
Site area (hectares)	224 (194 North Campus; 30 South Campus)
Student residents - 2011	1,196

a – Student headcount is "Academic Year to Date" figure only

For the purposes of this document, the Wagga Wagga campus of Charles Sturt University is defined as the main Boorooma St. campus, as well as South Campus, the Small Animal Clinic and the Riverina Playhouse.

Electricity and gas consumption were reduced slightly in 2011 when compared with 2010. It should be noted that the 2006 baseline year electricity consumption and all subsequent electricity consumptions for the Wagga campus, have been adjusted to remove the electricity consumption associated with the DPI.

Wagga Wagga campus again recorded a significant drop in potable water consumption during 2011, with a 13% reduction measured against 2010 consumption. Improvements to campus infrastructure, in particular oval irrigation, coupled with wetter cooler conditions have likely played a big role in this result. The Wagga Wagga campus has comfortably exceeded its 2011 water reduction target.

Waste output figures in 2011 remained reasonably consistent with those measured in 2010, however, in 2011 for the first time and increase in recycling was measured along with a decrease in general waste output. Improved waste data from the campus contractor, as well as continuing education campaigns, are expected to further improve the campus recycling rate in the coming years.

3.2. Electricity analysis

In 2011, Wagga campus recorded a normalised electricity intensity of 96kWh/m^2 (Figure 3-1). This is a reduction in energy intensity of 13kWh/m^2 from 2006 to 2011.

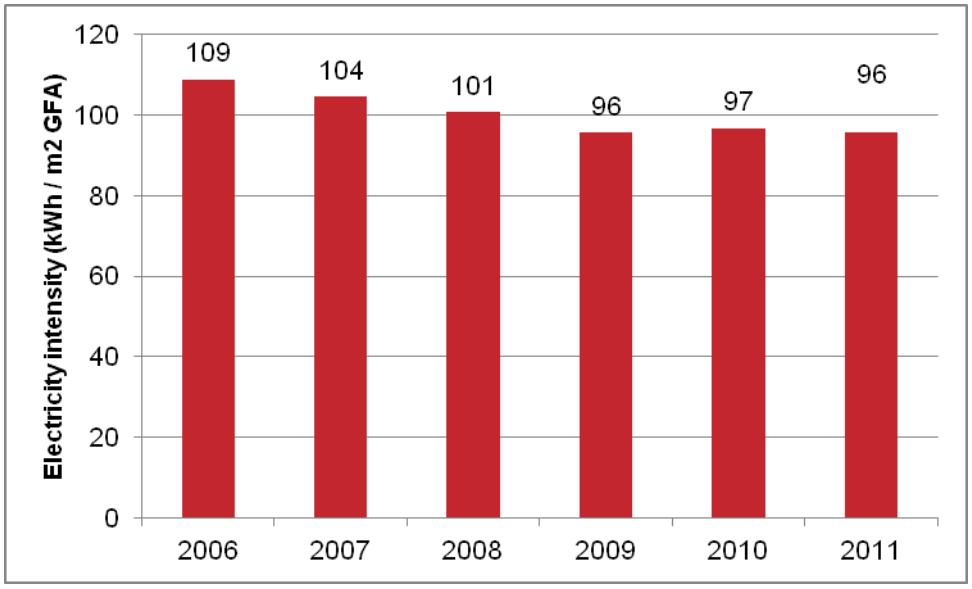


Figure 3-1 – Normalised electricity consumption at Wagga Wagga campus for the period 2006 to 2011

In 2011, there was a 1% decrease in electricity usage at Wagga Wagga campus compared with 2010 (Figure 3-2). This is an increase of 3% in consumption when compared to 2006.

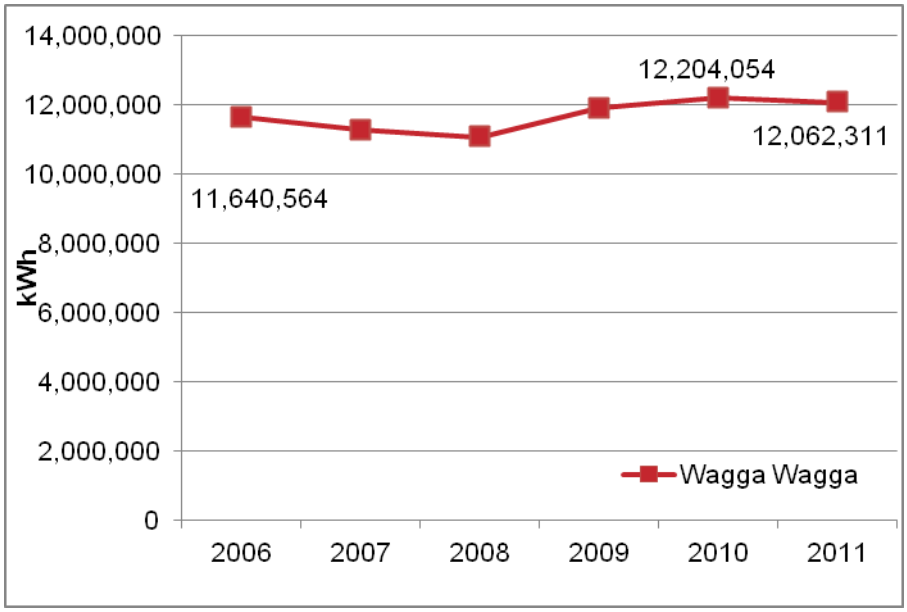


Figure 3-2 – Absolute electricity consumption at Wagga Wagga campus for the period 2006 to 2011

3.3. Gas analysis

Wagga campus recorded a normalised natural gas intensity of 411MJ/m^2 (Figure 3-3). This is a decrease in natural gas intensity of 109MJ/m^2 from 2006 to 2011.

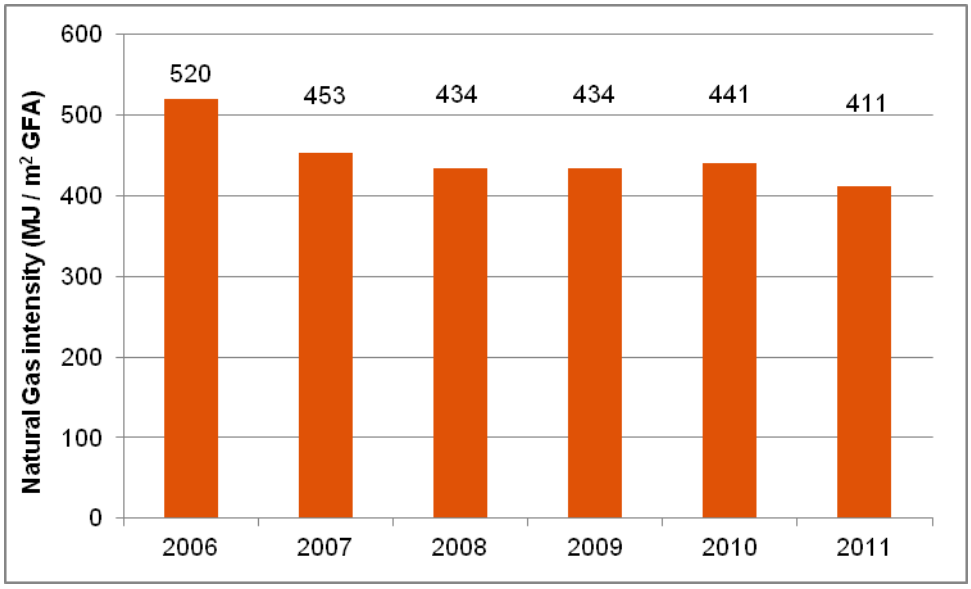


Figure 3-3 – Normalised natural gas consumption at Wagga Wagga campus for the period 2006 to 2011

In 2011, there was a 7% reduction in the consumption of natural gas at the Wagga Wagga campus compared to 2010 (Figure 3-4). This change represents a 7% decrease from the baseline year 2006.

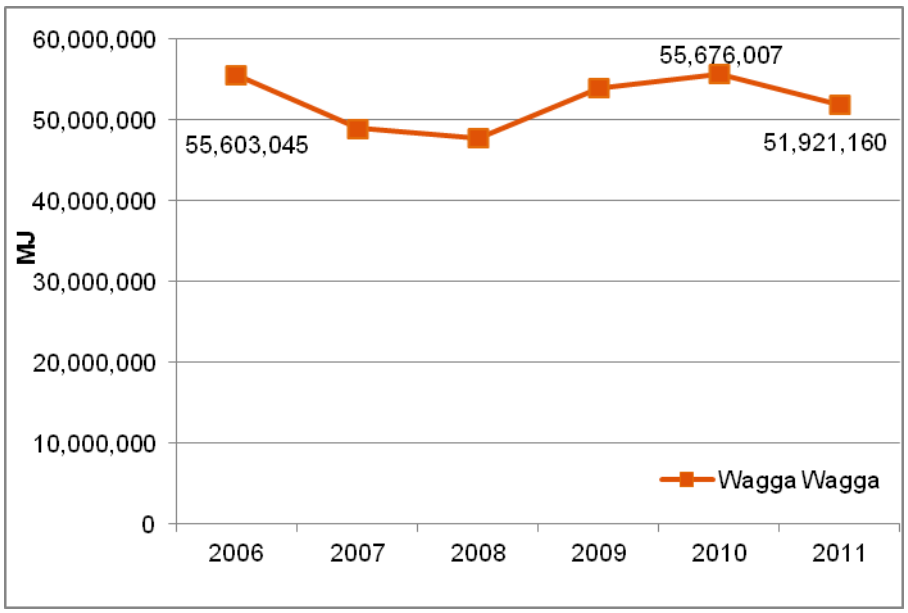


Figure 3-4 – Absolute natural gas consumption at Wagga Wagga campus for the period 2006 to 2011

The Veterinary Clinical Centre (Building 130) Wagga Wagga campus utilises LPG supplied from on-site LPG Tanks. Total consumption in 2011 was essentially the same as that in 2010 (Figure 3-5).

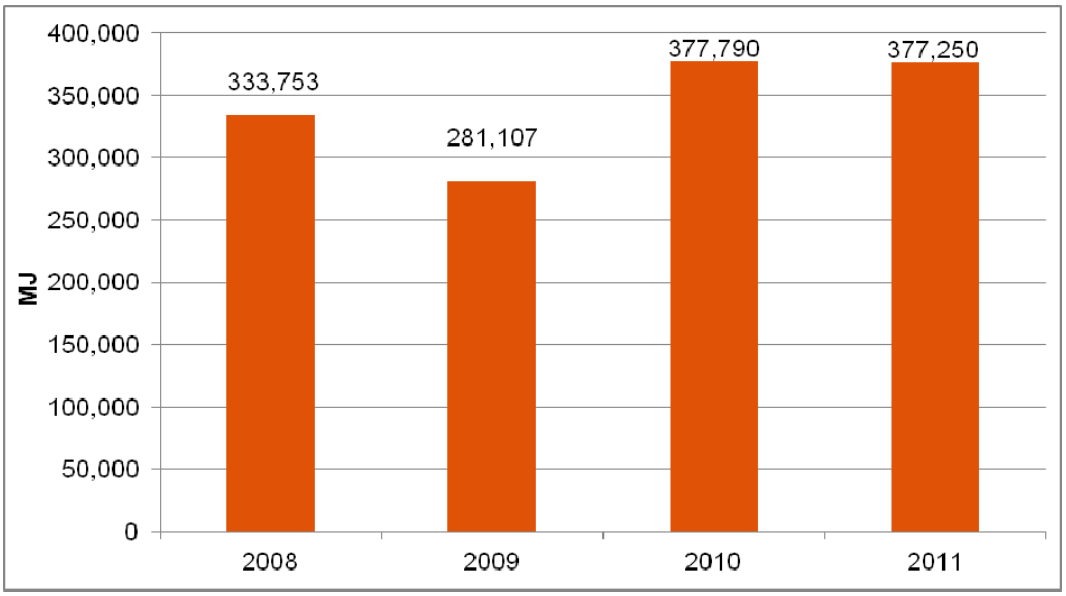


Figure 3-5 – Absolute LPG consumption at Wagga Wagga campus for the period 2008 to 2011

3.4. Water analysis

Wagga campus recorded a normalised mains water intensity of 1.6kL/m^2 (Figure 3-6). This is a reduction in mains water intensity of 2.6kL/m^2 from 2006 to 2011.

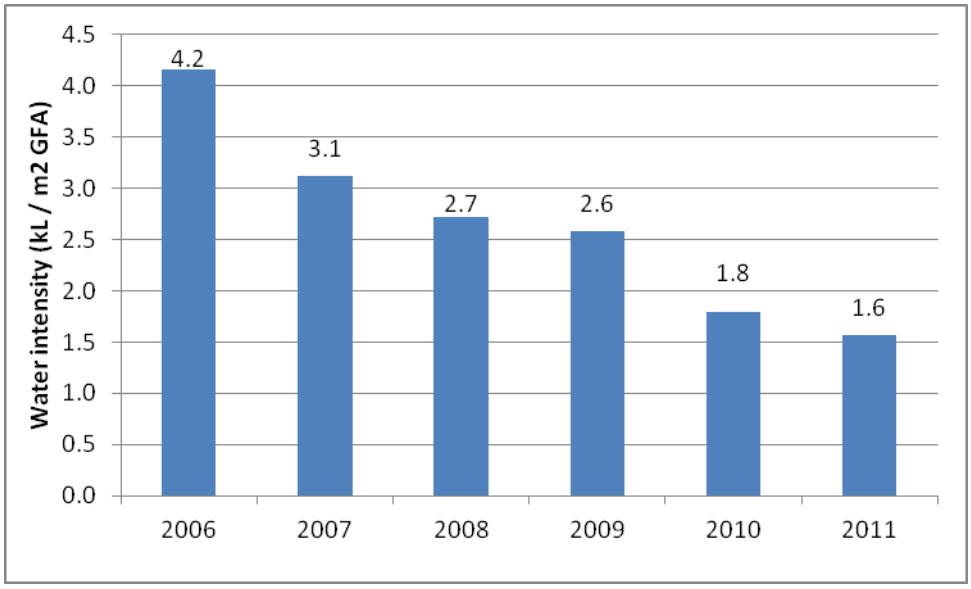


Figure 3-6 – Normalised mains supplied water consumption at Wagga Wagga campus for the period 2006 to 2011

In 2011, there was 56% reduction in the consumption of potable water at Wagga Wagga campus compared to 2006 (Figure 3-7). This change represents a 13% decrease in consumption as compared to 2010.

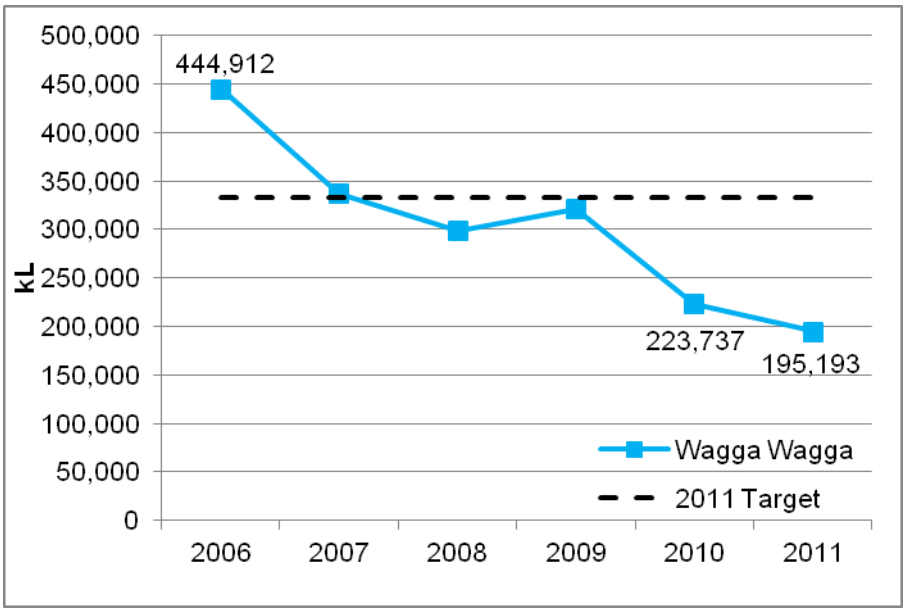


Figure 3-7 – Absolute mains supplied water consumption at Wagga Wagga campus for the period 2006 to 2011

3.5. Waste analysis

General waste comprised 65% of Wagga Wagga campuses waste output (Figure 3-8). The remaining 35% was recycled. Wagga Wagga campus will need to divert an additional 35% of material from the General Waste stream if it is to achieve its target of a 70% reduction of general waste to landfill by 2014.

General waste output was reduced in 2011, with a 5% decrease measured compared to 2010, while recycling rates increased 19% as compared to 2010.

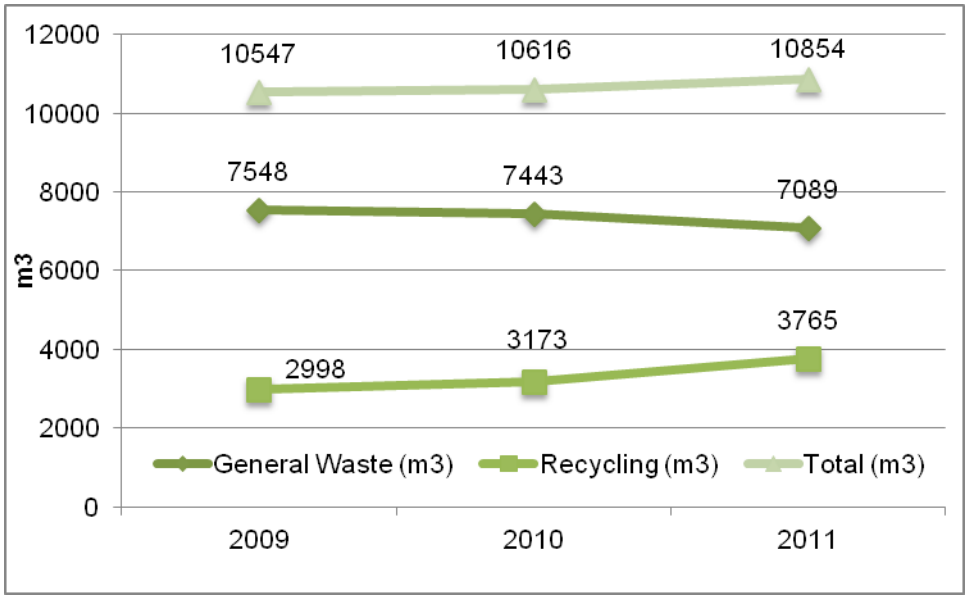


Figure 3-8 - Waste output from Wagga Wagga campus in 2011

4. Bathurst campus analysis

4.1. Campus information

Total building gross floor area (m^2)	79,735
Student headcount - 2011	10,684[a] (1,547 internal; 7,751 distance & 1,386 mixed mode)
Site area (hectares)	74 (56 actively managed)
Student residents - 2011	1,200

a – Student headcount is "Academic Year to Date" figure only

In 2011, electricity consumption remained reasonably consistent with the previous year 2010, while natural gas consumption increased slightly by 9%. It is likely that the greater number of student residents, coupled with a particularly cold winter contributed to these increases.

Bathurst again recorded a significant reduction in water consumption during the year 2011. This is a reduction of 15% compared to the measured consumption in 2010. Improvements in playing field irrigation have likely contributed significantly to this reduction. The Bathurst campus has exceeded its 2011 water reduction target.

4.2. Electricity analysis

Bathurst campus has recorded a normalised electricity intensity of 96kWh/m^2 (Figure 4-1). This is a decrease in energy intensity of 6kWh/m^2 from 2006 to 2011.

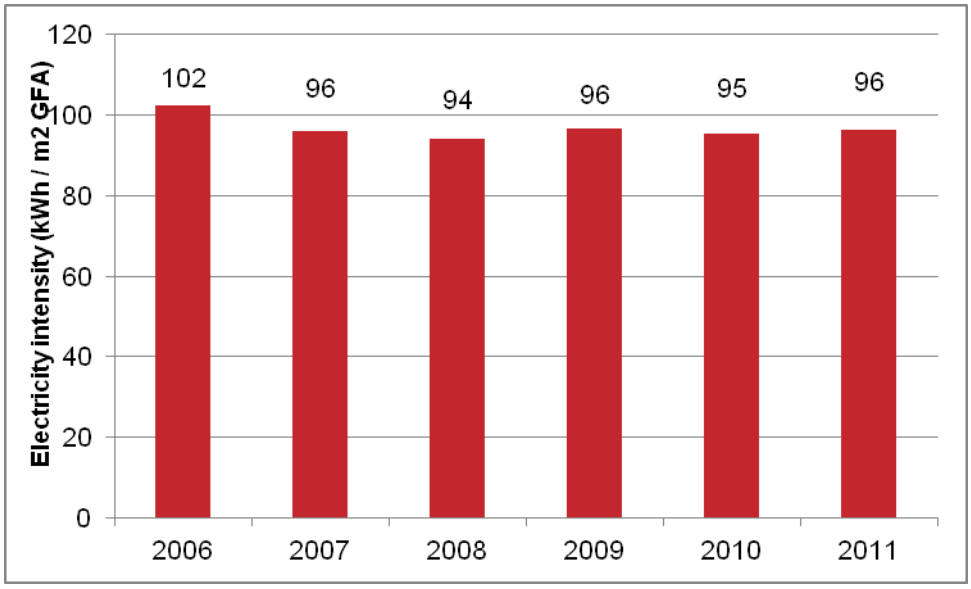


Figure 4-1 – Normalised electricity consumption at Bathurst campus for the period 2006 to 2011

In 2011, there was 1% increase in the consumption of electricity at Bathurst campus compared to2006 (Figure 4-2). This change represents a further 2% increase from 2010.

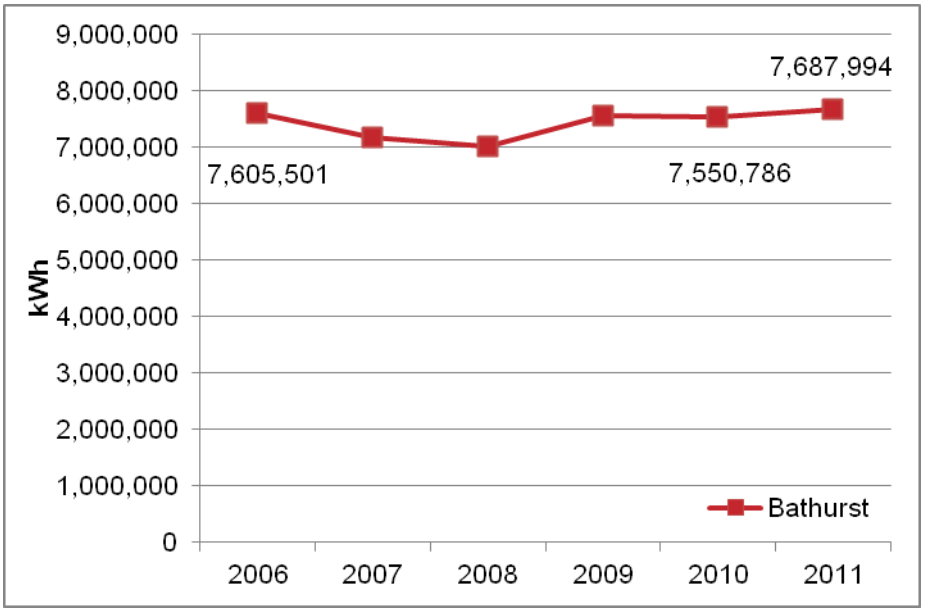


Figure 4-2 – Absolute electricity consumption at Bathurst campus for the period 2006 to 2011

4.3. Gas analysis

Bathurst campus has recorded a normalised natural gas intensity of 658MJ/m^2 (Figure 4-3), unchanged from the previous year. This is an increase in natural gas intensity of 46MJ/m^2 from 2006 to 2011.

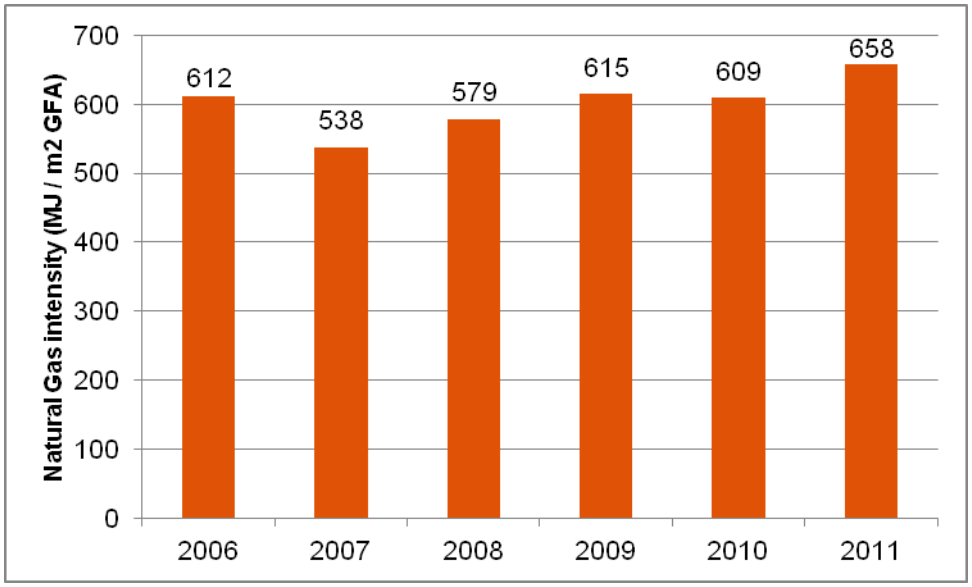


Figure 4-3 – Normalised natural gas consumption at Bathurst campus for the period 2006 to 2011

In 2011, there was 9% increase in the consumption of natural gas at Bathurst campus compared to the previous year 2010 (Figure 4-4). Due to this increase, overall natural gas use at Bathurst in 2011 was 15% higher than that used in the 2006 baseline year.

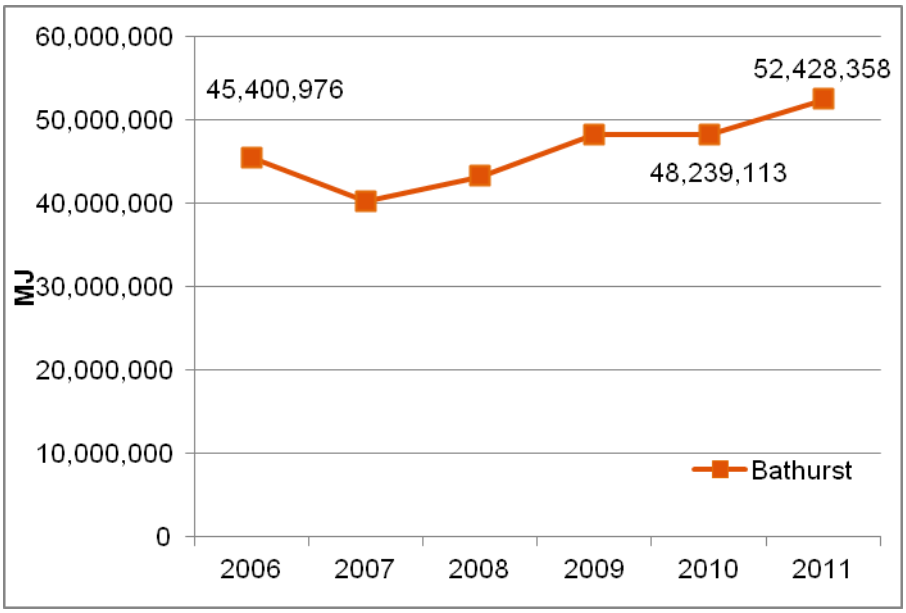


Figure 4-4 – Absolute natural gas consumption at Bathurst campus for the period 2006 to 2011

4.4. Water analysis

Despite this absolute increase in water consumption, Bathurst campus recorded a normalised mains water intensity of 1.1kL/m^2 (Figure 4-5). This is a reduction in water intensity of 1.8kL/m^2 from 2006 to 2011.

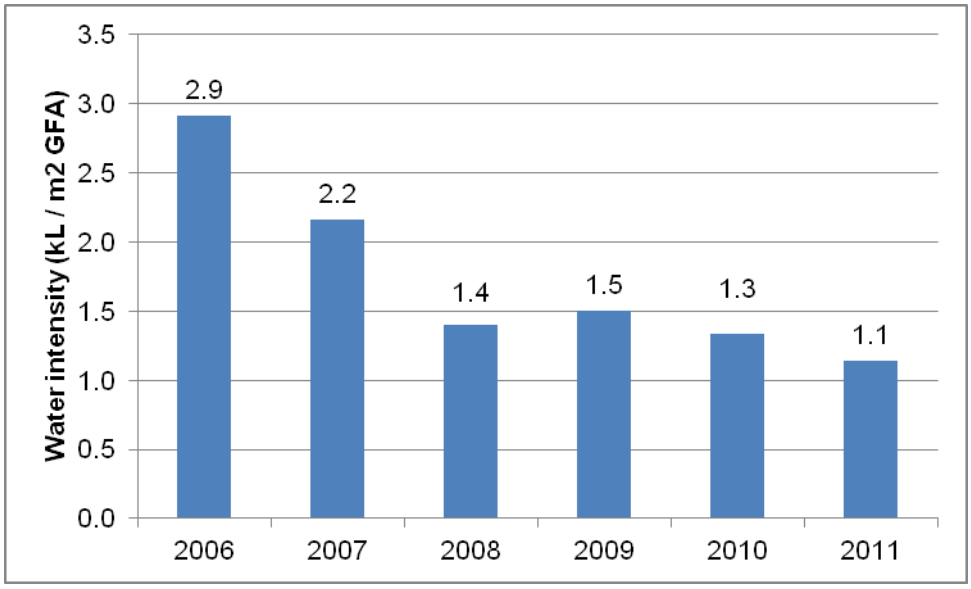


Figure 4-5 – Normalised mains water consumption at Bathurst campus for the period 2006 to 2011

In 2011, there was 59% reduction in the consumption of mains supplied water at Bathurst campus compared to 2006 (Figure 4-6). This change represents an15% reduction on that which was achieved in 2010.

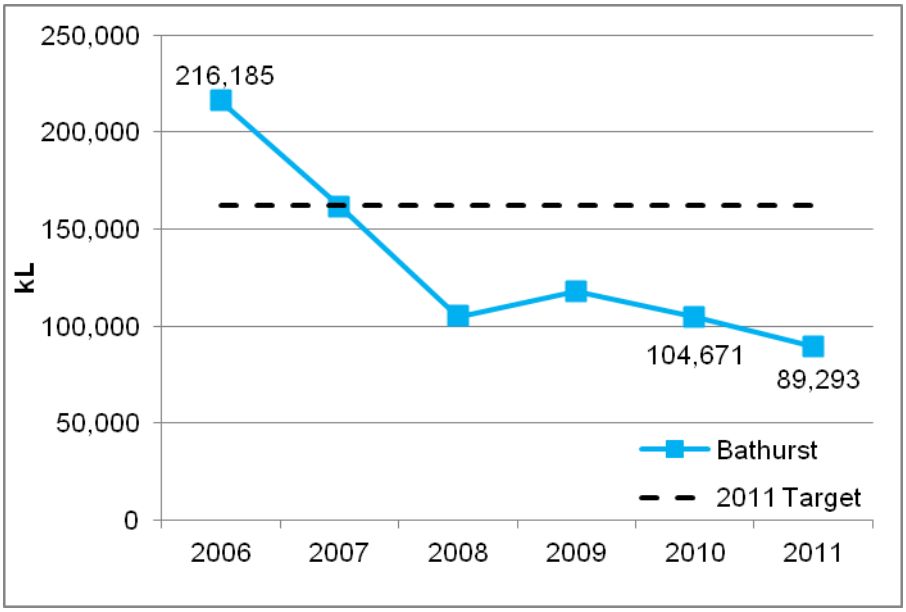


Figure 4-6 – Absolute mains water consumption at Bathurst campus for the period 2006 to 2011

4.5. Waste analysis

In 2011, general waste comprised of 99% of Bathurst campuses total waste output (Figure 4-8). The remaining 1% was recycled. This means that Bathurst campus is required to divert an additional 69% of material from the General Waste stream if it is to achieve its target of a 70% reduction of general waste to landfill by 2014.

However, it is noted that the total over quantity of waste that was disposed of at Bathurst Campus remained reasonably steady when compared to 2010.General waste output increased by 6% in 2011, while recycling rates reduced 77% as compared to 2010 figures. However, this is expected to improve significantly over 2012.

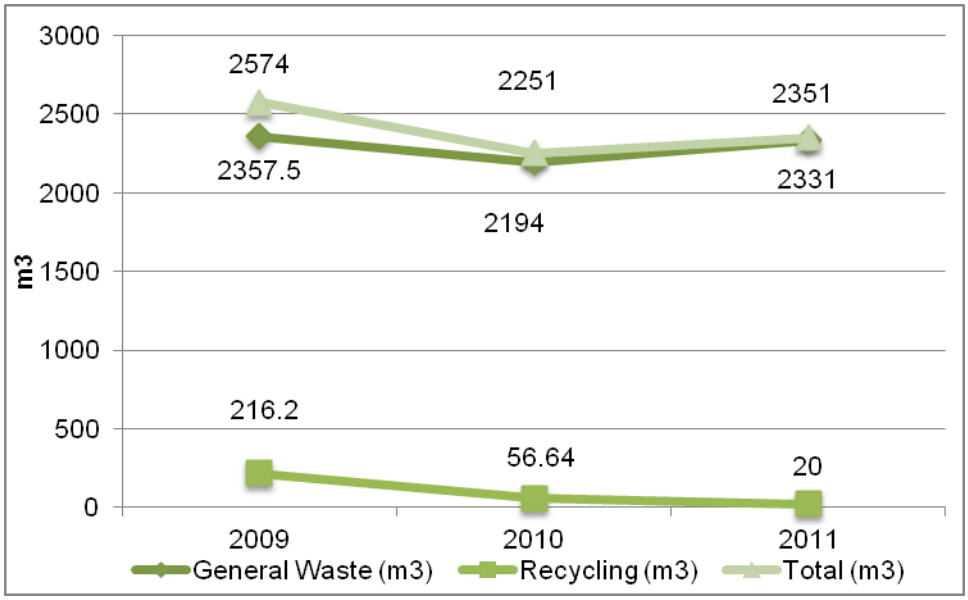


Figure 4-8 - Waste output from Bathurst campus in 2011

5. Orange campus analysis

5.1. Campus information

Total building gross floor area (m^2)	28,734
Student headcount 2011	1,056[a] (402 internal; 530 distance & 124 mixed mode)
Site area (hectares)	49 actively managed
Student residents - 2011	280

a – Student headcount is "Academic Year to Date" figure only

The Orange campus has recorded significant rises in both the consumption of electricity and natural gas in 2011. Two main causes have been identified for this rise. The first reason is the addition of 442m^2 of GFA to the campus due to the construction of the Orange Physio Building. The second is that the Dentistry Building, which typically accounts for approximately 30% of the campuses power consumption, measured an increase in power consumption of 50%.

For the first time in three years, Orange Campus recorded a decrease in potable water consumption. A major reason for this has been the works that have been undertaken to reduce leakage on the Orange Farm. As a result of these improvements to water management on the campus, Orange has been able to achieve its 2011 water reduction target.

5.2. Electricity analysis

Despite this absolute increase in electricity consumption, Orange campus has recorded a normalised electricity intensity of 101kWh/m^2 (Figure 5-1). This is an increase in energy intensity of 28kWh/m^2 from 2006 to 2011.

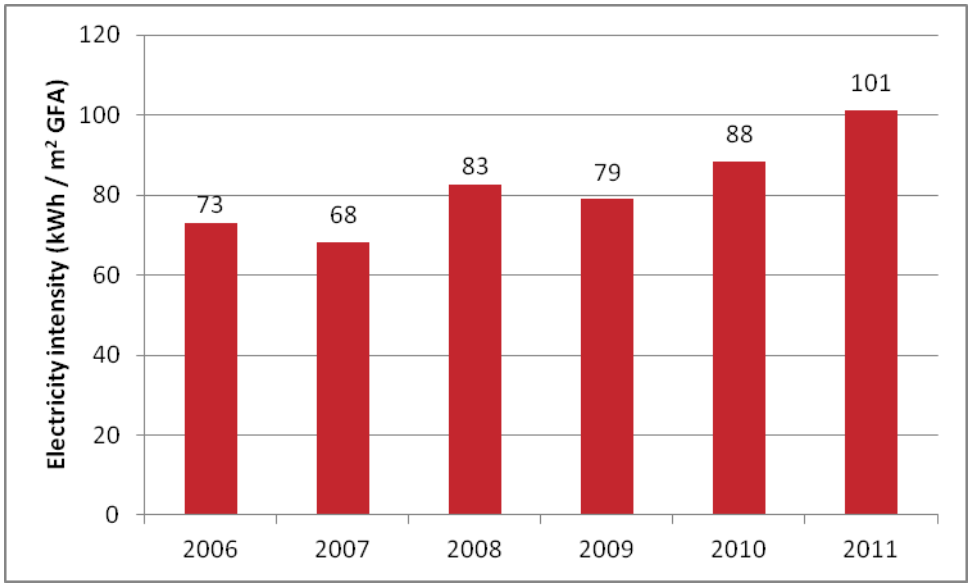


Figure 5-1 –Normalised electricity consumption at Orange campus for the period 2006 to 2011

In 2011, there was a 94% increase in the consumption of electricity at Orange campus compared to 2006 (Figure 5-2). This consumption is 16% more than that measured in 2010.

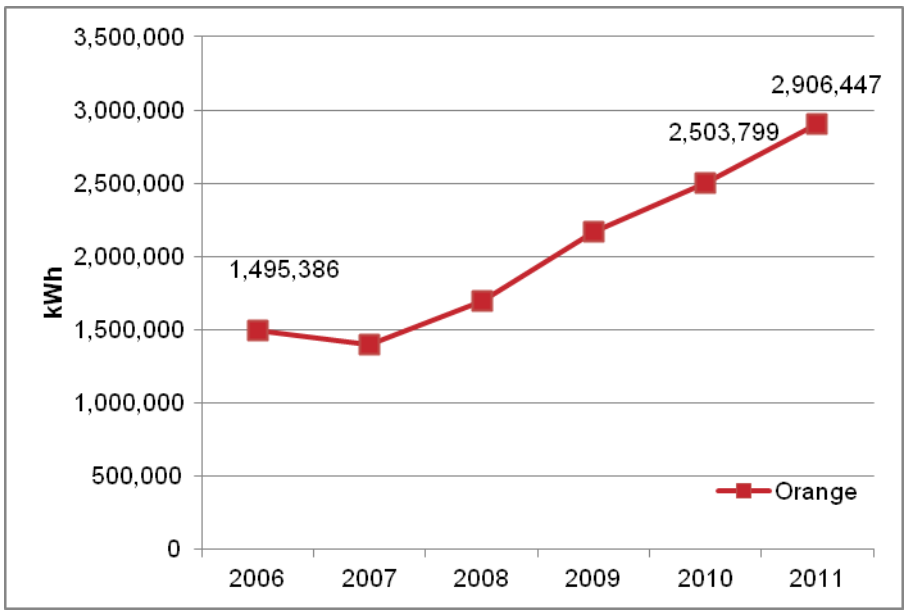


Figure 5-2 – Absolute electricity consumption at Orange campus for the period 2006 to 2011

5.3. Gas analysis

Orange campus has recorded a normalised natural gas consumption of 92MJ/m^2 (Figure 5-3). This is an increase in natural gas intensity of 10MJ/m^2 from 2006 to 2010.

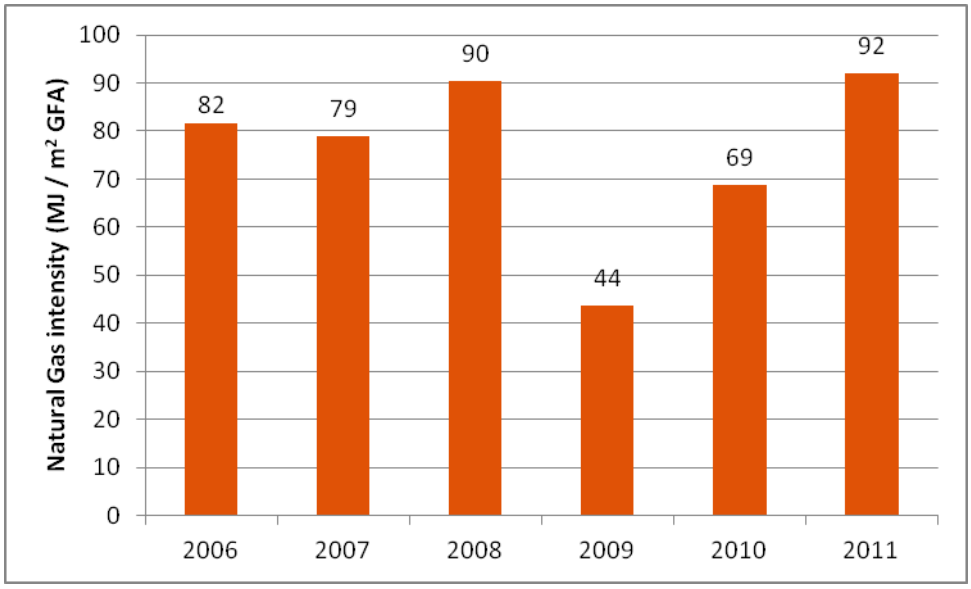


Figure 5-3 – Normalised natural gas consumption at Orange campus for the period 2006 to 2011

In 2011, there was a 58% increase in the consumption of natural gas at Orange campus compared to 2006 (Figure 5-4). This is a 36% increase from 2010.

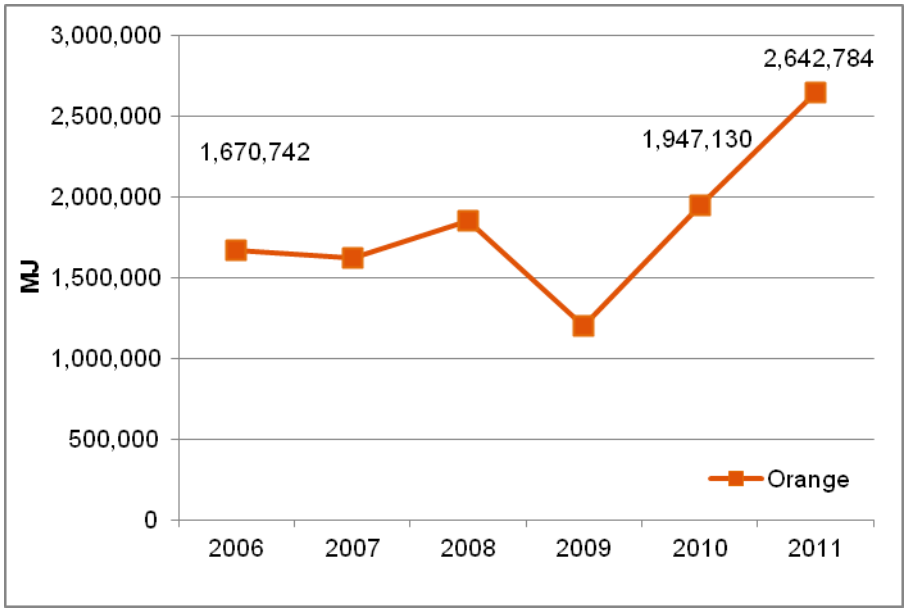


Figure 5-4– Absolute natural gas consumption at Orange campus for the period 2006 to 2011

The 200 Bed Residences at the Orange campus utilise LPG supplied from on-site LPG Tanks. Total consumption in 2011 was essentially the same as that in 2010 (Figure 5-5).

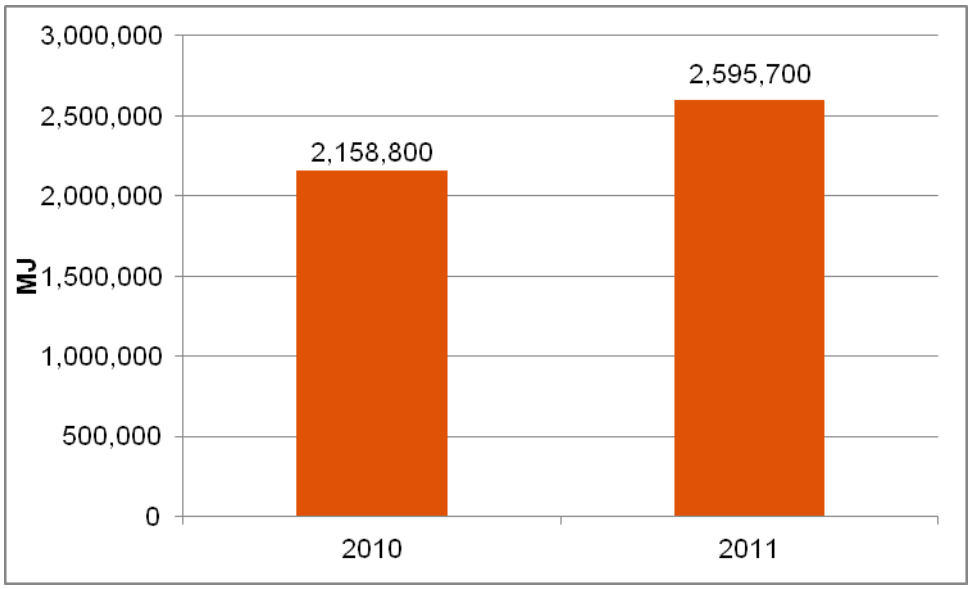


Figure 5-5 – Absolute LPG consumption at Orange campus for the period 2010 to 2011

5.4. Water analysis

Orange campus recorded a normalised mains water intensity of 1.3kL/m^2 (Figure 5-6). This is a reduction in water intensity of 1.1kL/m^2 from 2006 to 2011.

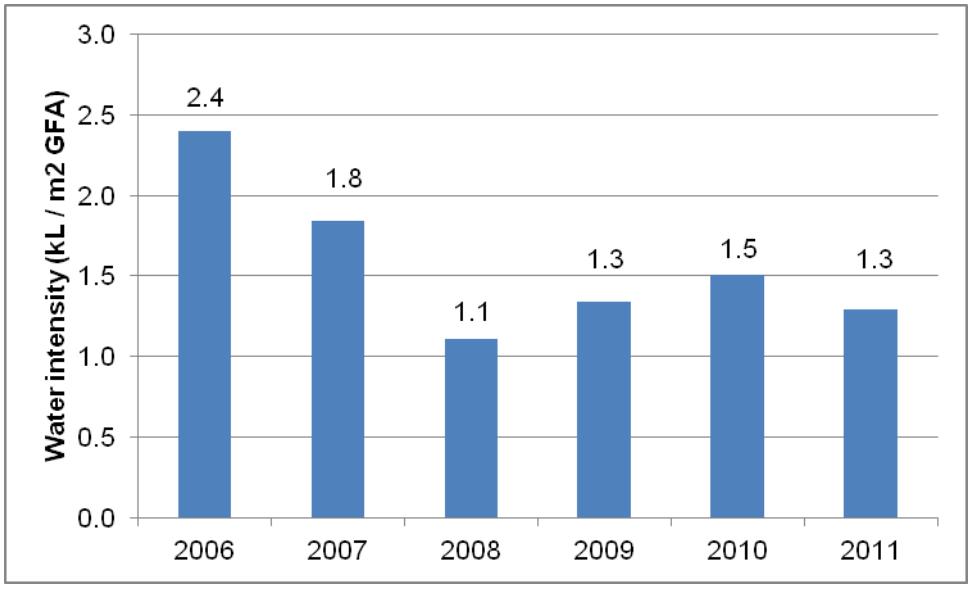


Figure 5-6 – Normalised water consumption at Orange campus for the period 2006 to 2011

In 2011, there was 28% reduction in the consumption of potable water at Orange campus compared to 2006 (Figure 5-7). This change represents a 14%decrease from that achieved in 2010.

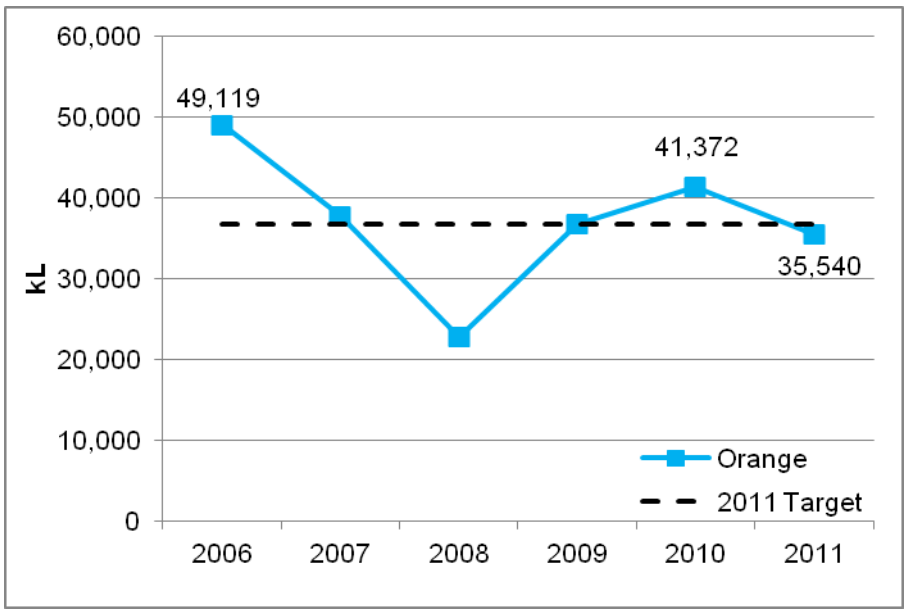


Figure 5-7 – Absolute water consumption at Orange campus for the period 2006 to 2011

5.5. Waste analysis

In 2011, general waste comprised a total of 80% of Orange campuses general waste output (Figure 5-8). The remaining 20% of the campuses waste output was paper and cardboard that was collected as recycling. A full commingled recycling collection will be implemented in 2012.

The total waste output of the campus increased by 80% between 2010 and 2011.

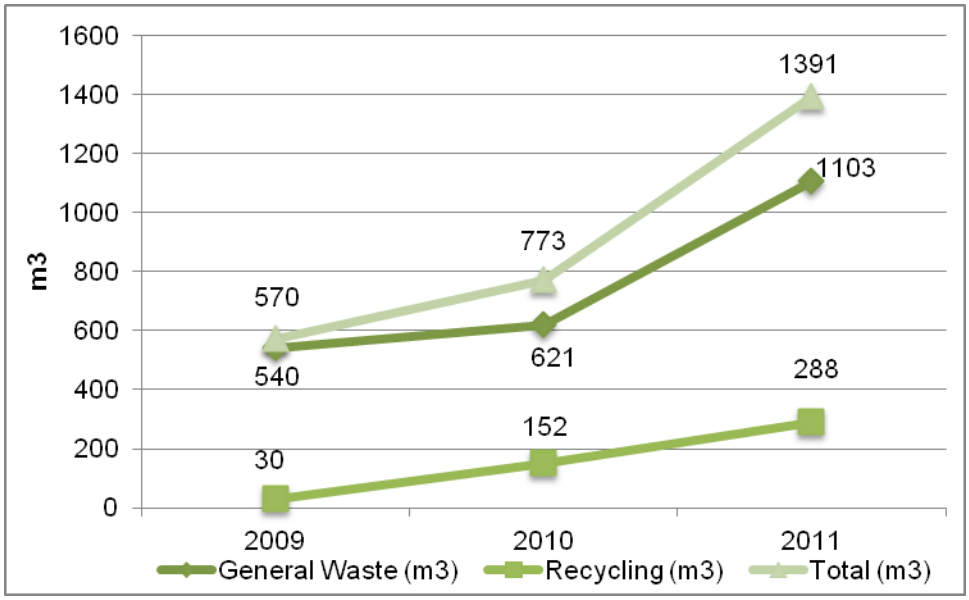


Figure 5-8 - Waste output from Orange campus in 2011

6. Albury-Wodonga (Thurgoona) campus analysis

6.1. Campus information

Total building gross floor area (m^2)	25,431
Student headcount - 2011	3,505[a] (788 internal, 1,661 distance & 1,056 mixed mode)
Site area (hectares)	90.2
Student residents - 2011	246

Albury-Wodonga (Thurgoona) campus recorded a slight drop in electricity consumption in 2011, as well as steady natural gas consumption when compared to 2010. This is likely due to the very limited amount of construction occurring on-site during the year, as well as the similar on-campus student numbers recorded in 2010.

Water consumption and waste output followed a similar trend to electricity and gas and remained stable in 2011. There was no significant change in the amount of general waste sent to landfill and the amount of material diverted to recycling. Additional improvements to campus waste infrastructure as well as further education campaigns are expected to improve this recycling rate over the next few years.

6.2. Electricity analysis

Albury-Wodonga (Thurgoona) campus has recorded a normalised electricity intensity of 76kWh/m^2 (Figure 6-1). This is a decrease in energy intensity of 1kWh/m^2 from 2006 to 2011.

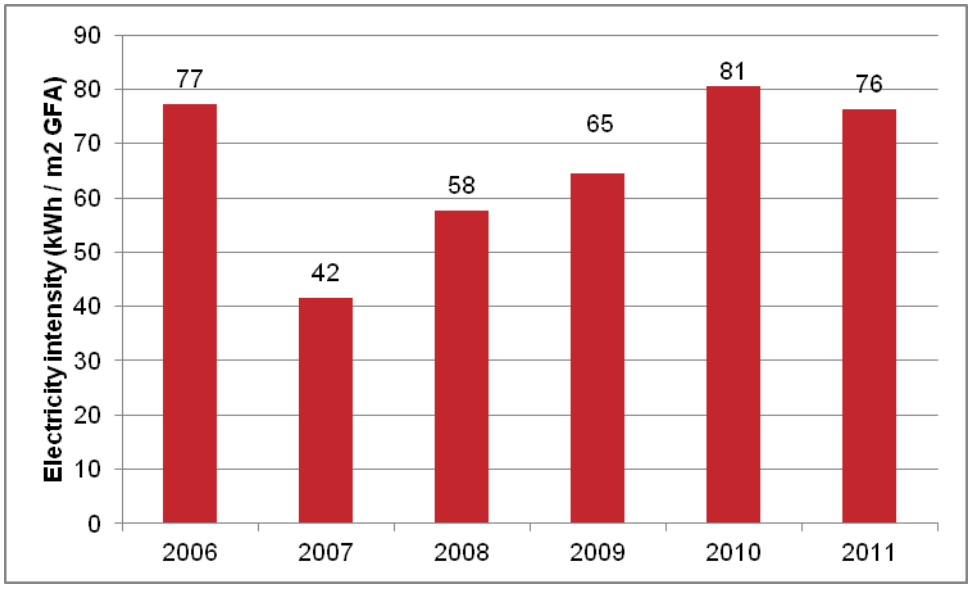


Figure 6-1 – Normalised electricity consumption at Albury-Wodonga (Thurgoona) campus for the period 2006 to 2011

In 2011, there was a 77% increase in electricity use at Albury-Wodonga (Thurgoona) campus compared with 2006 (Figure 6-2). This is a slight decrease on 2010 consumption of 5%.

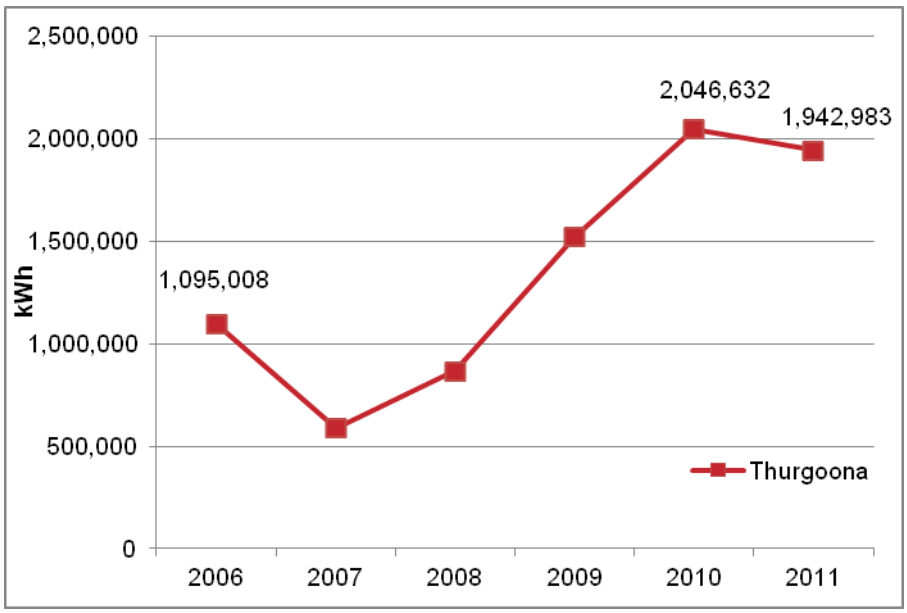


Figure 6-2 – Absolute electricity consumption at Albury-Wodonga (Thurgoona) campus for the period 2006 to 2011

6.3. Gas analysis

Albury-Wodonga (Thurgoona) campus has recorded a normalised natural gas intensity of 380MJ/m^2 (Figure 6-3). This is an increase in natural gas intensity of 22MJ/m^2 from 2006 to 2011.

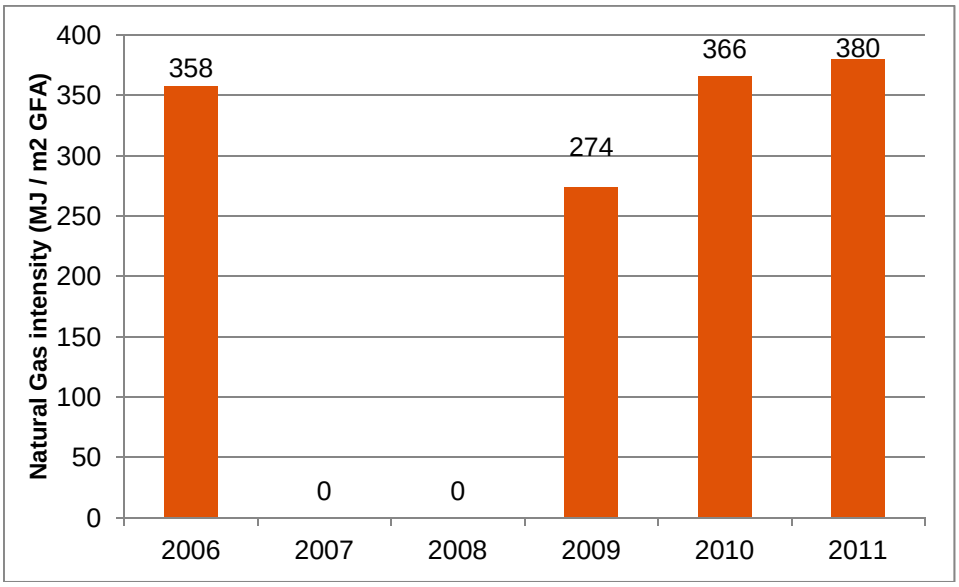


Figure 6-3 – Normalised natural gas consumption at Albury-Wodonga (Thurgoona) campus for the period 2006 to 2011

In 2011, there was a 91% increase in gas use at Albury-Wodonga (Thurgoona) campus compared with 2006 (Figure 6-4). This is an increase on 2010 consumption of 4%.

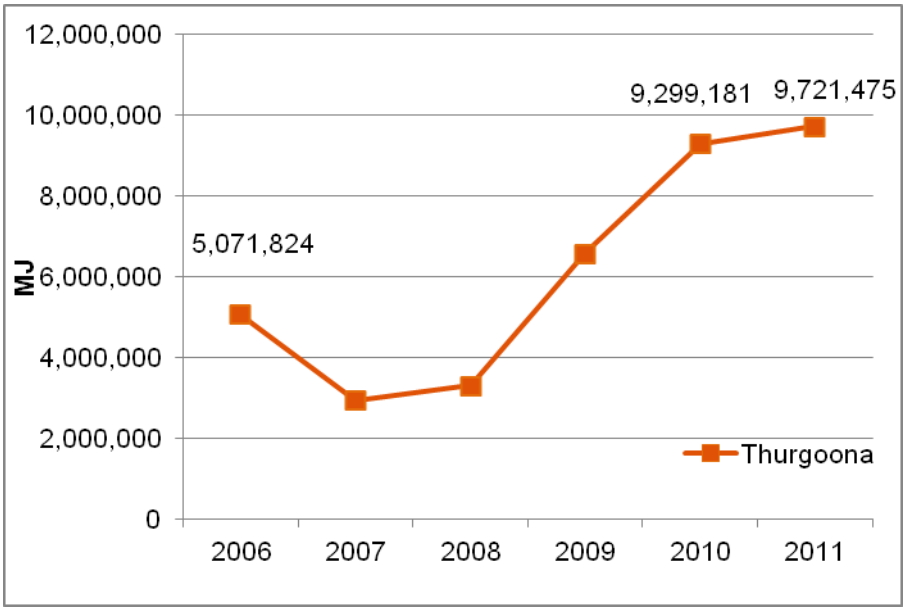


Figure 6-4 – Absolute natural gas consumption at Albury-Wodonga (Thurgoona) campus for the period 2006 to 2011

6.4. Water analysis

Despite this absolute increase in water consumption, Albury-Wodonga (Thurgoona) campus recorded a normalised mains water intensity of 0.5kL/m^2 (Figure 6-5). This is equivalent to the normalised water consumption measured in 2010.

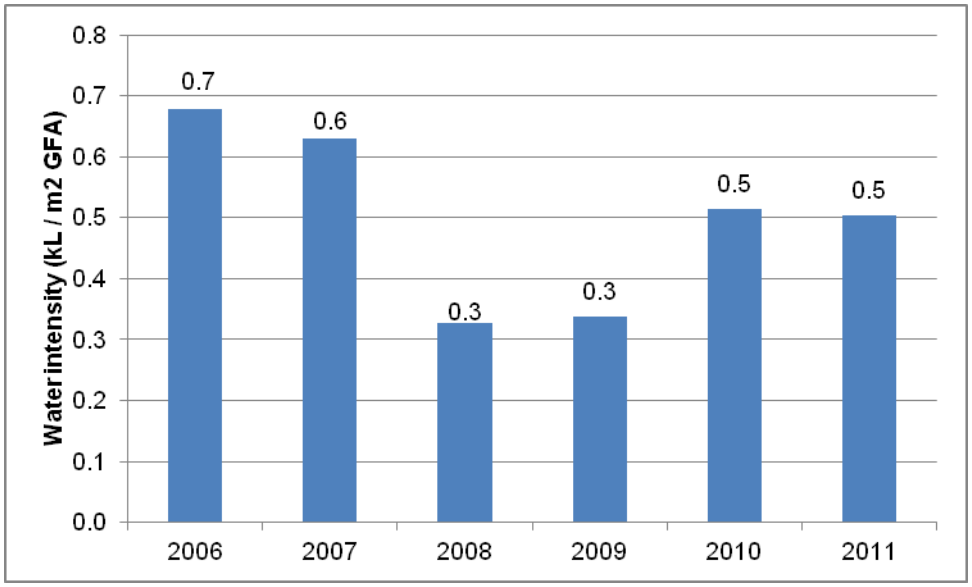


Figure 6-5 – Normalised water consumption at Albury-Wodonga (Thurgoona) campus for the period 2006 to 2011

In 2010, there was an increase of 23% in the consumption of potable water at Albury-Wodonga (Thurgoona) campus compared to 2006 (Figure 6-6). This change represents a slight decrease of 2%% on the 2010 consumption.

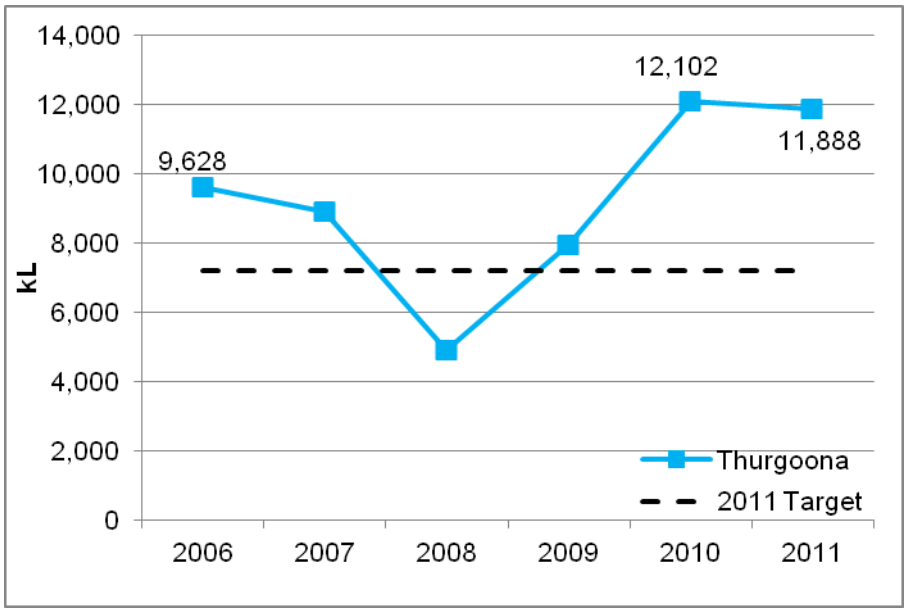


Figure 6-6 – Absolute water consumption at Albury-Wodonga Campus (Thurgoona) campus for the period 2006 to 2011

6.5. Waste analysis

In 2011, general waste comprised of 66% of Albury-Wodonga (City) & Albury-Wodonga (Thurgoona) campuses waste output (Figure 6-7). The remaining 34% was recycled. This means that Albury-Wodonga (City) & Albury-Wodonga (Thurgoona) campuses are required to divert only an additional 36% of material from the General Waste to the recycling stream if it is to achieve its target of a 70% reduction of general waste to landfill by 2014.

General waste output has slightly increased in 2011, while the recycling rate decreased by 2% from 2010.

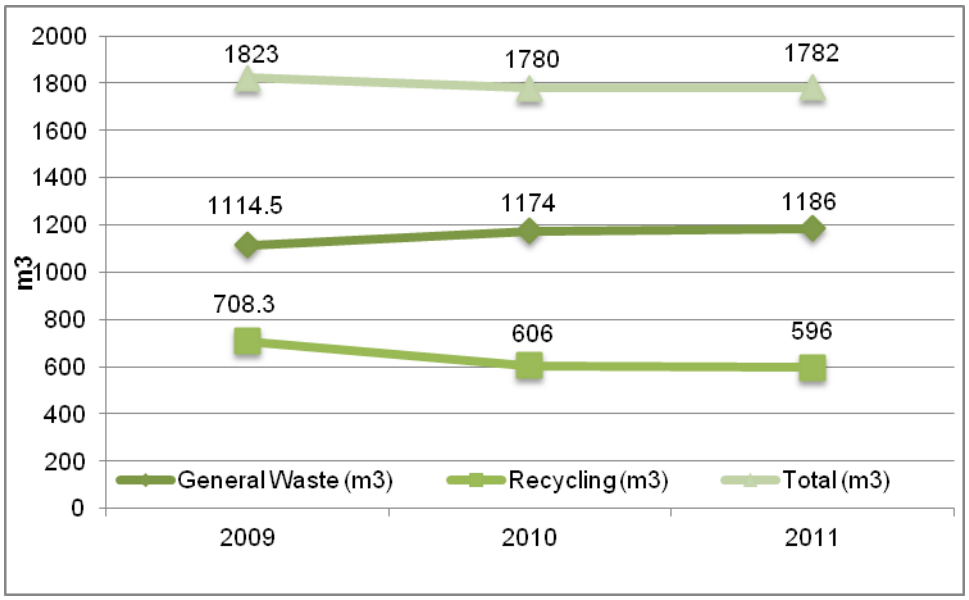


Figure 6-7 - Waste output from Albury-Wodonga (City) & Albury-Wodonga (Thurgoona) campuses in 2011

7. Albury-Wodonga (City) campus analysis

7.1. Campus information

Total building gross floor area (m^2)	2,750
Student headcount 2011	None

Significant reductions in utility consumption were recorded on the Albury-Wodonga (City) campus in 2011 as final relocations to the Albury-Wodonga (Thurgoona) campus were completed. At the end of 2011 only one building on this campus remained occupied, with the move of these staff expected at the end of 2012.

In addition to this, some utility consumption is associated with the security lighting and general maintenance/cleaning activities that occur within the buildings and on the grounds.

7.2. Electricity analysis

Albury-Wodonga (City) campus has recorded a normalised electricity intensity of 56kWh/m^2 (Figure 7-1). This is a decrease in energy intensity of 11kWh/m^2 from 2006 to 2011.

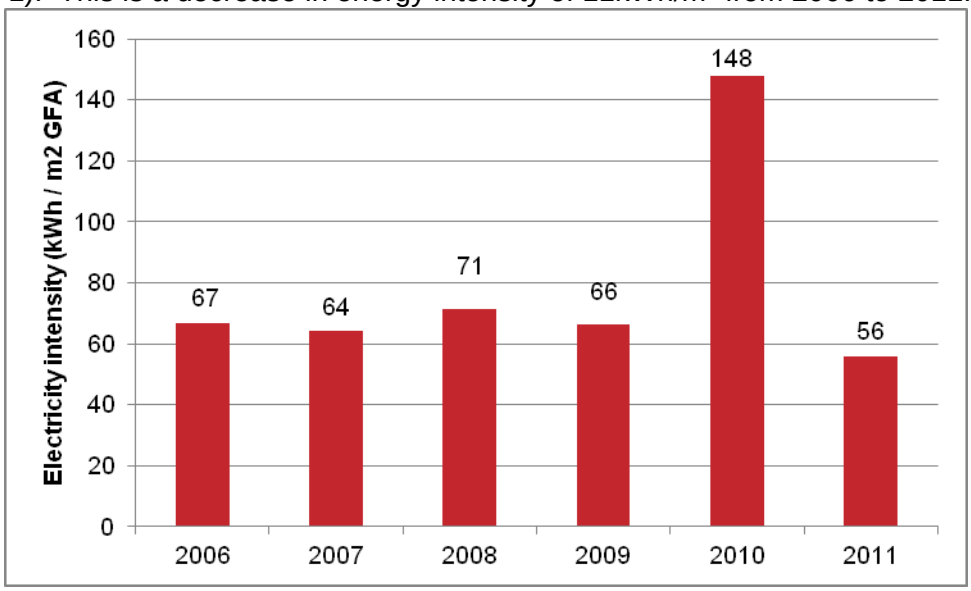


Figure 7-1 – Normalised electricity consumption at Albury-Wodonga (City) campus for the period 2006 to 2011

In 2011, there was a 83% reduction in electricity use at Albury-Wodonga (City) campus compared with 2006 (Figure 6-). This represents a 62% decrease on 2010 figures.

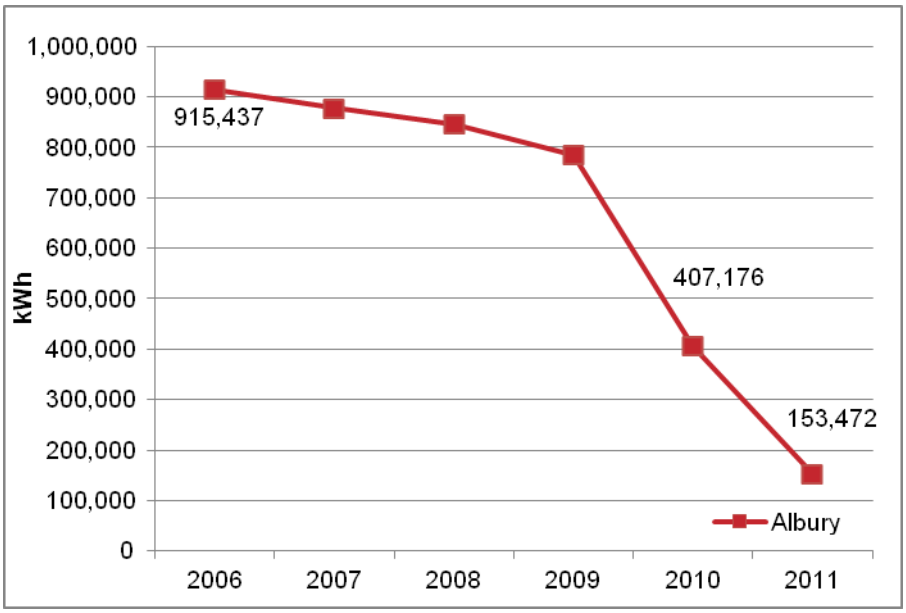


Figure 7-2 – Absolute electricity consumption at Albury-Wodonga (City) campus for the period 2006 to 2011

7.3. Gas analysis

Due to the absolute decrease in natural gas consumption, Albury-Wodonga (City) campus has recorded a normalised natural gas intensity of 118MJ/m^2 (Figure 7-3). This is a reduction in natural gas intensity of 124MJ/m^2 from 2006 to 2011.

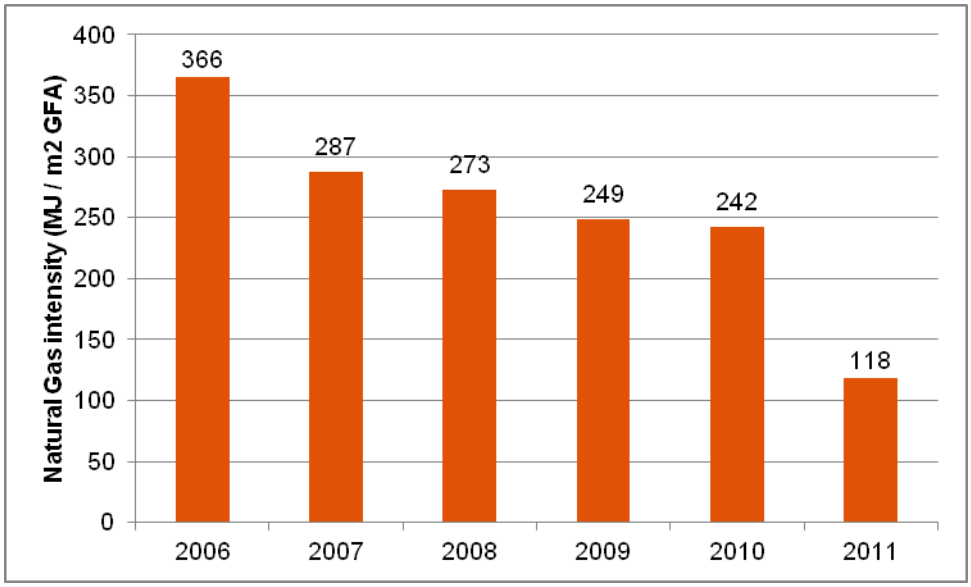


Figure 7-3 – Normalised natural gas consumption at Albury-Wodonga (City) campus for the period 2006 to 2011

In 2011, there was a 93% reduction in natural gas use at Albury-Wodonga (City) campus compared with 2006 (Figure 7-4). This represents a 51% decrease on consumption measured in 2010.

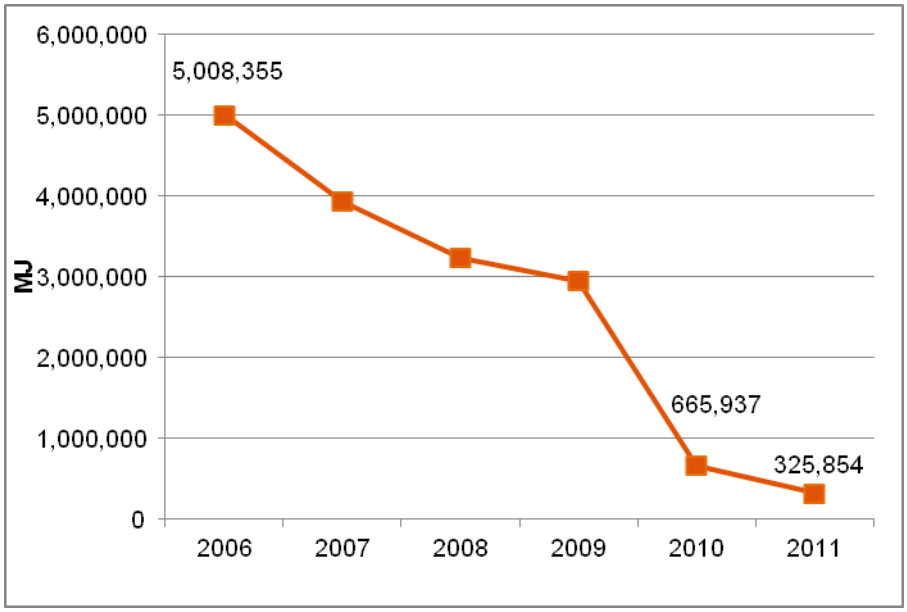


Figure 7-4 – Absolute natural gas consumption at Albury-Wodonga (City) campus for the period 2006 to 2011

7.4. Water analysis

Albury-Wodonga (City) campus recorded a normalised mains water intensity of 0.3kL/m^2 (Figure 7-5). This is a reduction in water intensity of 0.5kL/m^2 from 2006 to 2011.

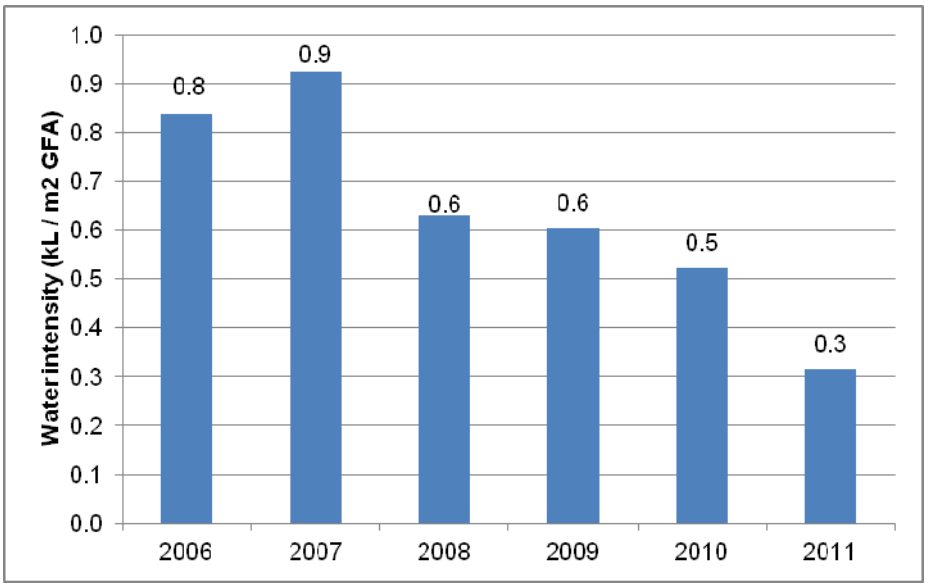


Figure 7-5 – Normalised water consumption at Albury-Wodonga (City) campus for the period 2006 to 2011

In 2010, there was a 67% decrease in water consumption at Albury-Wodonga (City) campus compared with 2006 (Figure 7-6). This represents a 40% decrease on 2010 consumption.

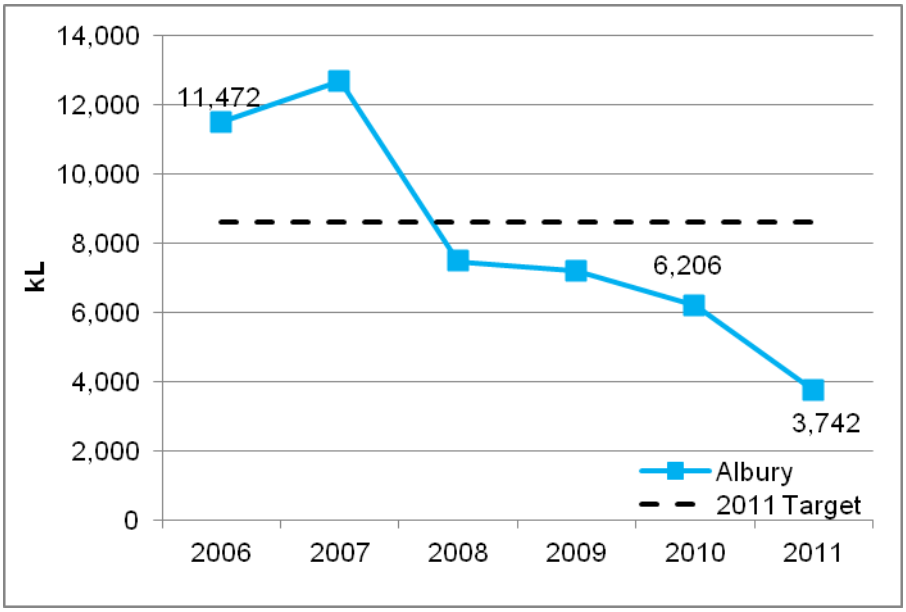


Figure 7-6 – Absolute water consumption at Albury-Wodonga (City) campus for the period 2006 to 2011

8. Dubbo campus analysis

8.1. Campus information

Total building gross floor area (m^2)	7,088
Student headcount 2011	312[a] (57 internal; 32 distance & 223 mixed mode)
Site area (hectares)	41.4 (11 actively managed)
Student residents - 2011	62

a – Student headcount is "Academic Year to Date" figure only

The Dubbo Campus recorded a significant increase in all utilities in 2011. A significant 80% and 57% increase in electricity and natural gas consumption was recorded; however, the majority of this consumption can be accounted for due to the operation of the new River St. Dentistry Clinic.

Water consumption increased by 39% during the 2011 calendar year, while overall waste output remained reasonably consistent. While the overall number of recycling bins has increased on the campus in 2011 this has not been reflected in a commensurate increase in the campus recycling rate.

8.2. Electricity analysis

Dubbo campus has recorded a normalised electricity intensity of 100kWh/m^2 (Figure 8-1). This is an increase in energy intensity of 33kWh/m^2 from the baseline year 2006 to 2011.

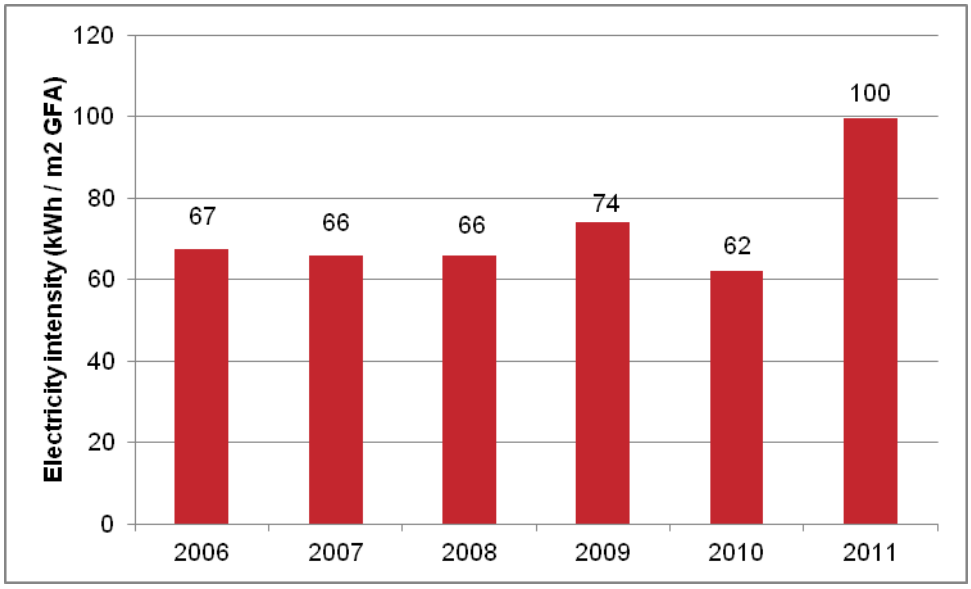


Figure 8-1 – Normalised electricity consumption at Dubbo campus for the period 2006 to 2011

In 2011, there was an 80% increase in electricity use at Dubbo campus compared with 2006 (Figure 8-2). This represents a 60% increase over 2010 electricity consumption.

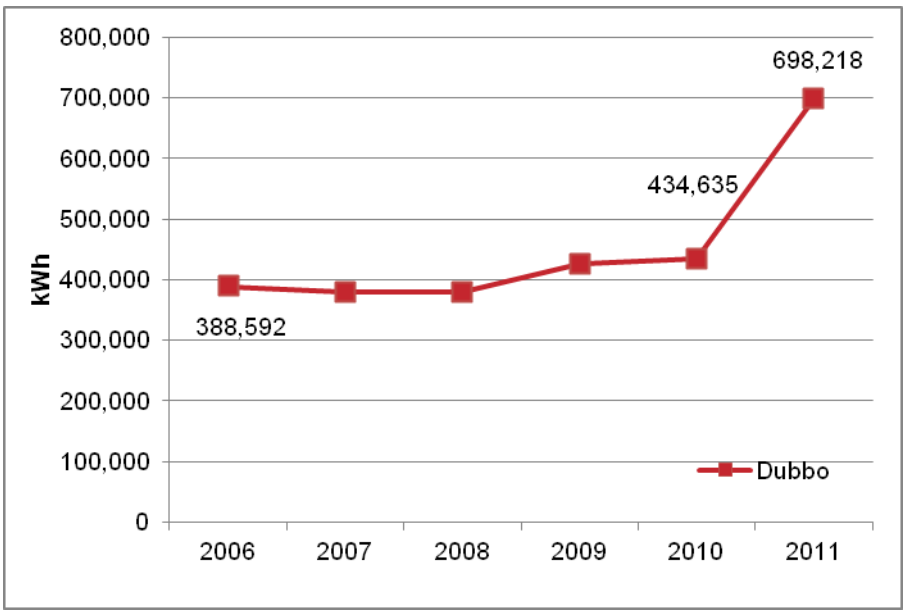


Figure 8-2 – Absolute electricity consumption at Dubbo campus for the period 2006 to 2011

8.3. Gas analysis

Dubbo campus has recorded a normalised natural gas consumption of 245MJ/m^2 (Figure 8-3). This is a reduction in natural gas intensity of 47MJ/m^2 from 2006 to 2011/

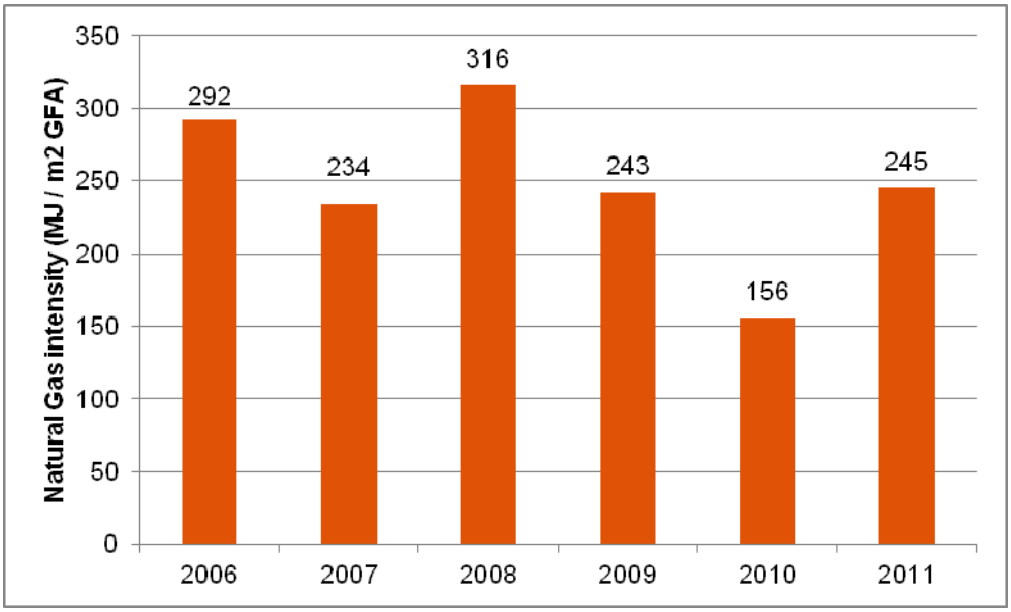


Figure 8-3 – Normalised natural gas consumption at Dubbo campus for the period 2006 to 2011

In 2011, there was a 57% increase in natural gas use at Dubbo campus compared with 2010 (Figure 8-4). This equates to an increase of 2% compared to the baseline year of 2006.

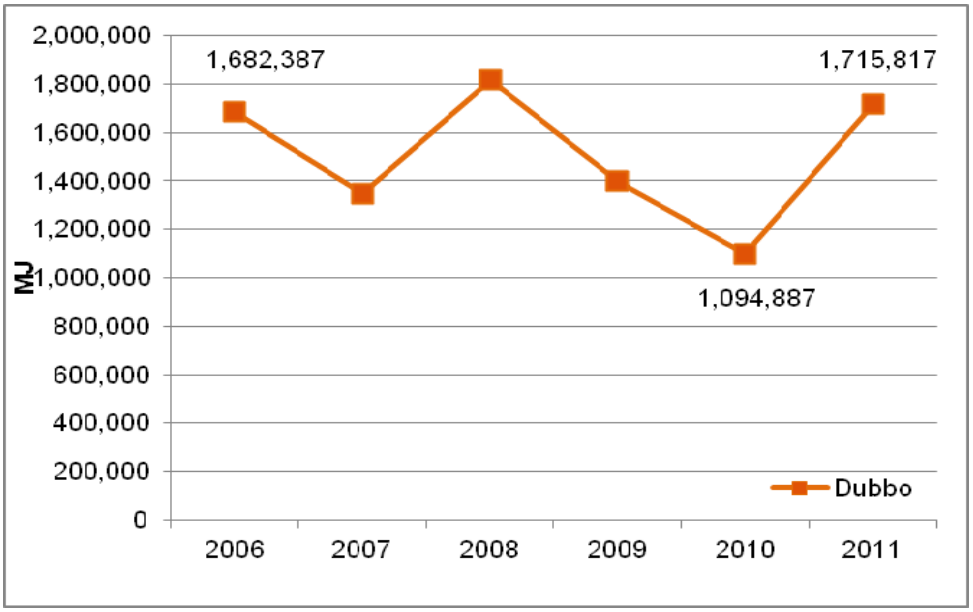


Figure 8-4 – Absolute natural gas consumption at Dubbo campus for the period 2006 to 2011

The River St Dentistry Clinic at the Dubbo campus utilise LPG supplied from on-site LPG Tanks. The initial year of operation at this facility recorded a consumption of 29,247 MJ (Figure 8-5).

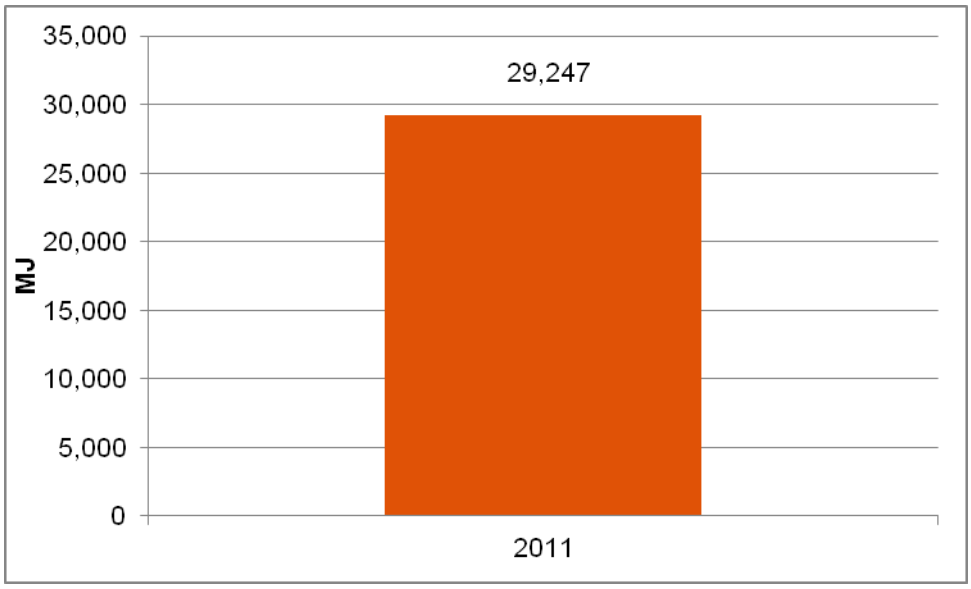


Figure 8-5 – Absolute LPG consumption at Dubbo Campus during 2011

8.4. Water analysis

Dubbo campus recorded a normalised mains water intensity of 1.0kL/m^2 (Figure 8-6). This is a reduction in water intensity of 1.3kL/m^2 from 2006 to 2010.

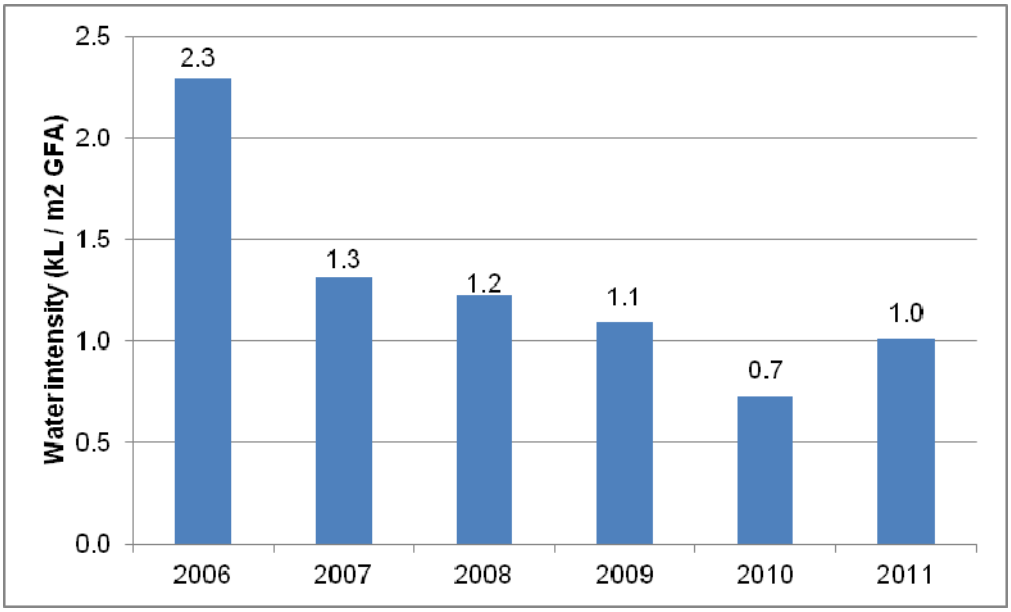


Figure 8-6 – Normalised water consumption at Dubbo campus for the period 2006 to 2011

In 2011, there was a 59% reduction in water use at Dubbo campus compared with 2006 (Figure 8-7). This is an increase of 39% compared to consumption in 2010.

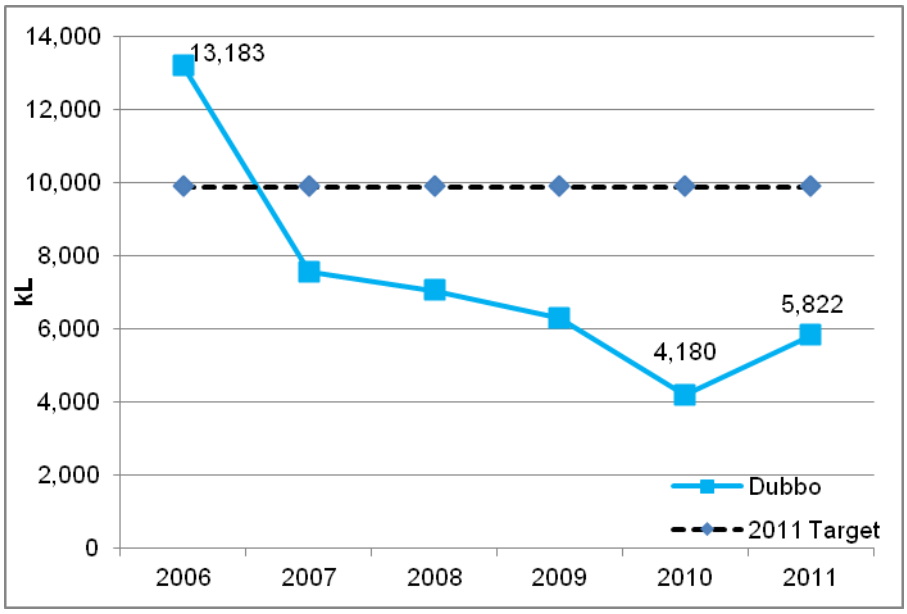


Figure 8-7 – Absolute water consumption at Dubbo campus for the period 2006 to 2011

8.5. Waste analysis

In 2011, general waste comprised of 77% of Dubbo campuses waste output (Figure 8-8). The remaining 23% was recycled. This means that Dubbo campus is required to divert an additional 47% of material from the General Waste to the recycling stream if it is to achieve its target of a 70% reduction of general waste to landfill by 2014.

General waste output increased slightly in 2011, with an increase of 7% recorded, while recycling has decreased by 19%

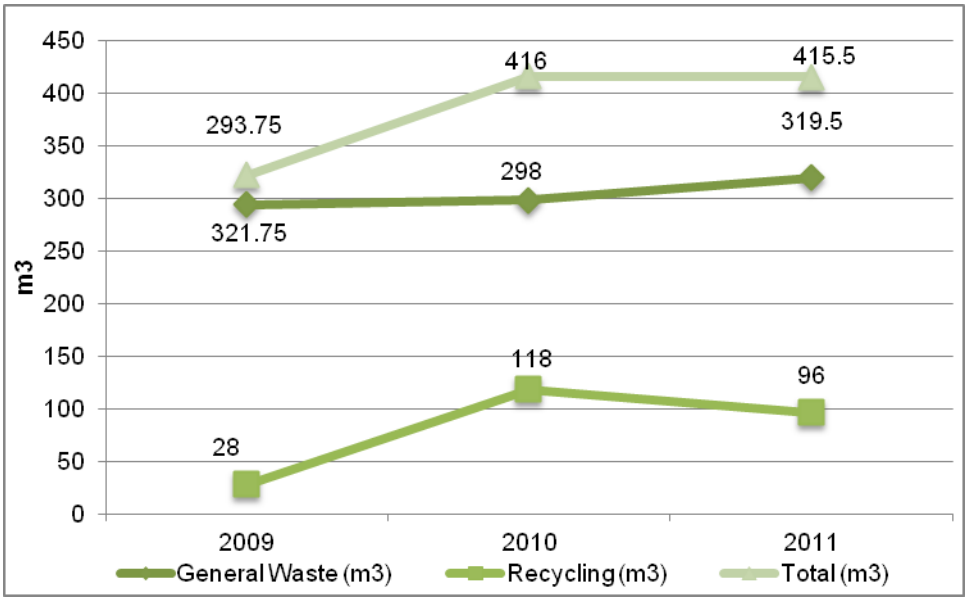


Figure 8-8 – Waste output from Dubbo campus in 2011

9. Canberra campus analysis

9.1. Campus information

Total building gross floor area (m^2)	1648
Student headcount 2011	463 (122 internal;307 distance & 34 mixed mode)
Site area (hectares)	3.4

In 2011, electricity consumption increased slightly between 2010 and 2011, while natural gas consumption decreased slightly over the same period.

A broken main water meter for the campus was repaired in 2011, allowing water consumption to be accurately measured for the first time in several years. In 2011, this consumption was measured as being a significant increase on the previous year's estimated water consumption. Additional data in subsequent years will determine whether or not this trend continues

Waste consumption remained reasonably consistent in 2011 as compared to 2010, with a slight overall increase in the amount of waste recorded in 2011. The amount of general waste sent to landfill increased overall while the amount of commingled recycling diverted from landfill decreased. Improvements to campus waste infrastructure and further staff and student education are expected to improve these figures in subsequent years.

The most likely explanation for this slight increase in utility consumption and waste output is the approximate doubling of internal studying students during 2011 as compared to 2010.

9.2. Electricity analysis

Canberra campus has recorded a normalised electricity intensity of 36kWh/m^2 (Figure 9-1). This is an increase in energy intensity of 2kWh/m^2 from 2006 to 2011.

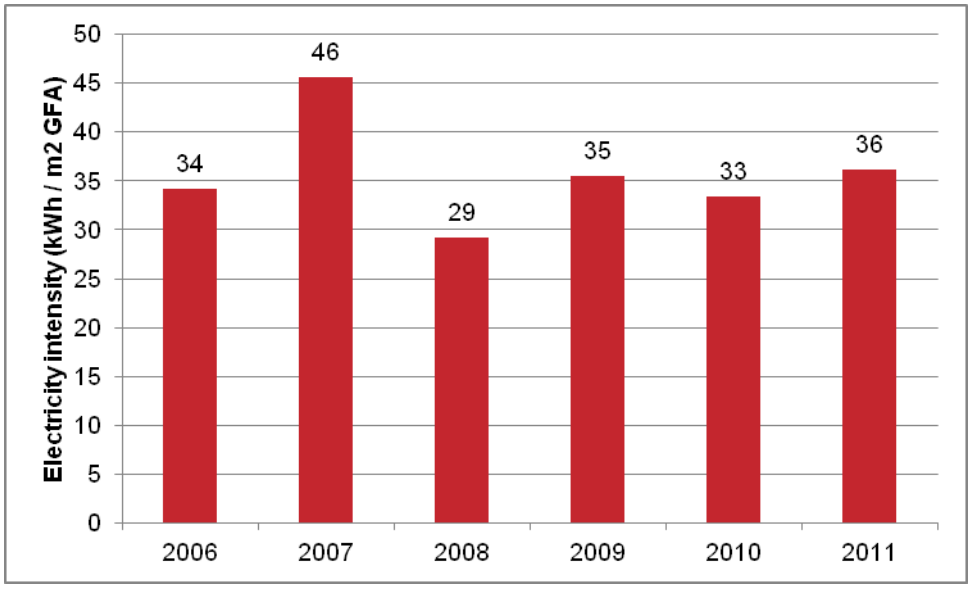


Figure 9-1 – Normalised electricity consumption at Canberra campus for the period 2006 to 2011

In 2011, there was a 100% increase in electricity use at Canberra campus compared with 2006 (Figure 9-2). This represents only an 8% decrease on 2010 figures.

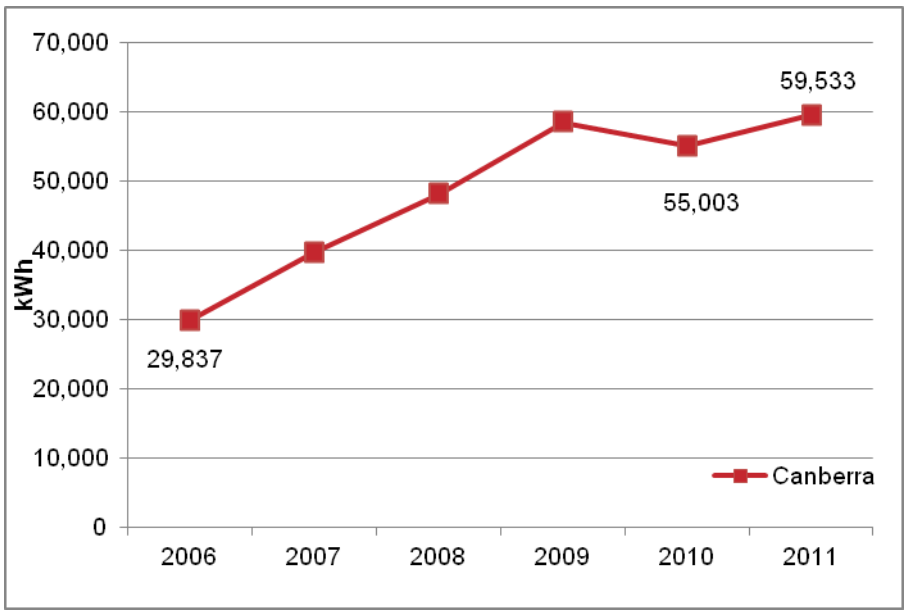


Figure 9-2 – Absolute electricity consumption at Canberra campus for the period 2006 to 2011

9.3. Gas analysis

Canberra campus has recorded a normalised natural gas intensity of 128MJ/m^2 (Figure 9-3). This is a decrease in natural gas intensity of 18MJ/m^2 from 2006 to 2011.

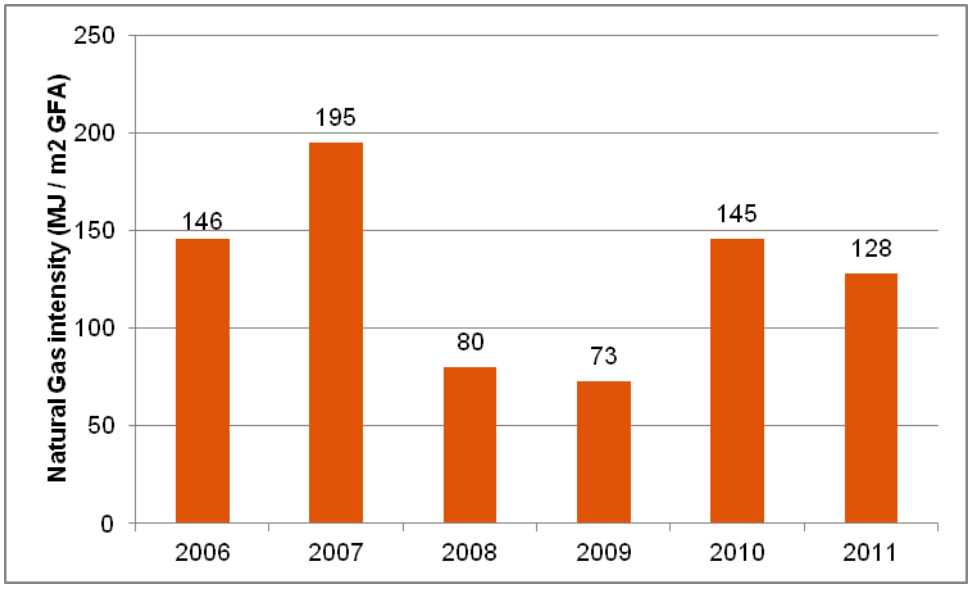


Figure 9-3 – Normalised natural gas consumption at Canberra campus for the period 2006 to 2011

In 2011, there was a 66% increase in natural gas consumption at Canberra campus compared with 2006 (Figure 9-4). This is a 12% decrease on the previous year's consumption.

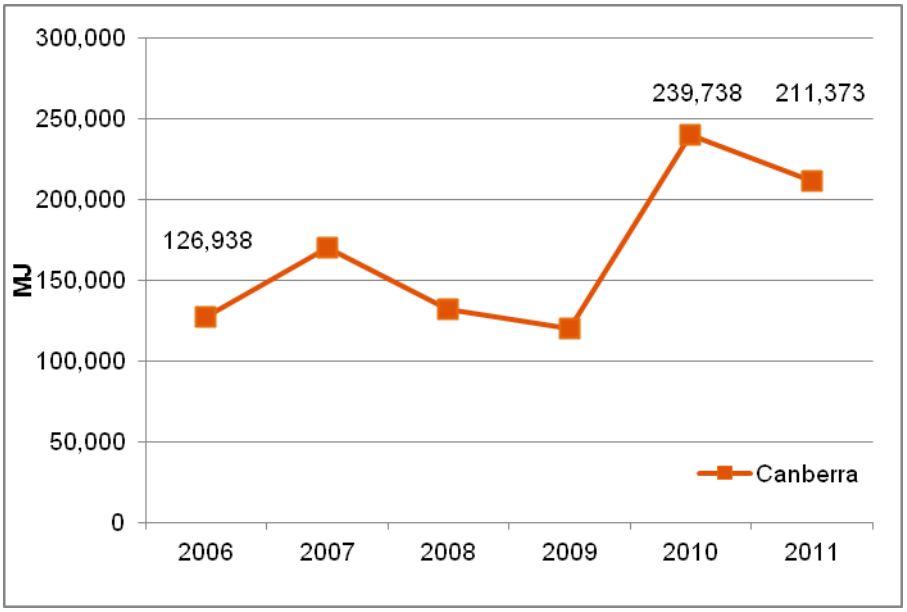


Figure 9-4 – Absolute natural gas consumption at Canberra campus for the period 2006 to 2011

9.4. Water analysis

Canberra campus recorded a normalised mains water intensity of 1.4kL/m^2 (Figure 9-5). This is a reduction of 0.8kL/m^2 in normalised waster consumption from the baseline year 2006.

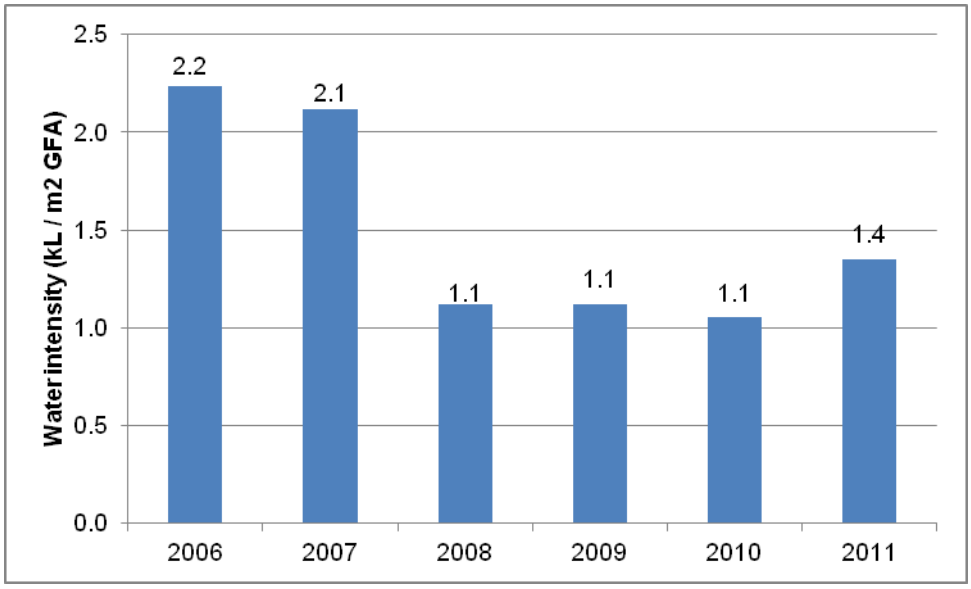


Figure 9-5 – Normalised water consumption at Canberra campus for the period 2006 to 2011

In 2011, there was an increase in the volume of water consumed by the campus, with a 28% increase being recorded from 2010. This equates to an 14% increase on what was recorded in 2006, the baseline year (Figure 9-6).

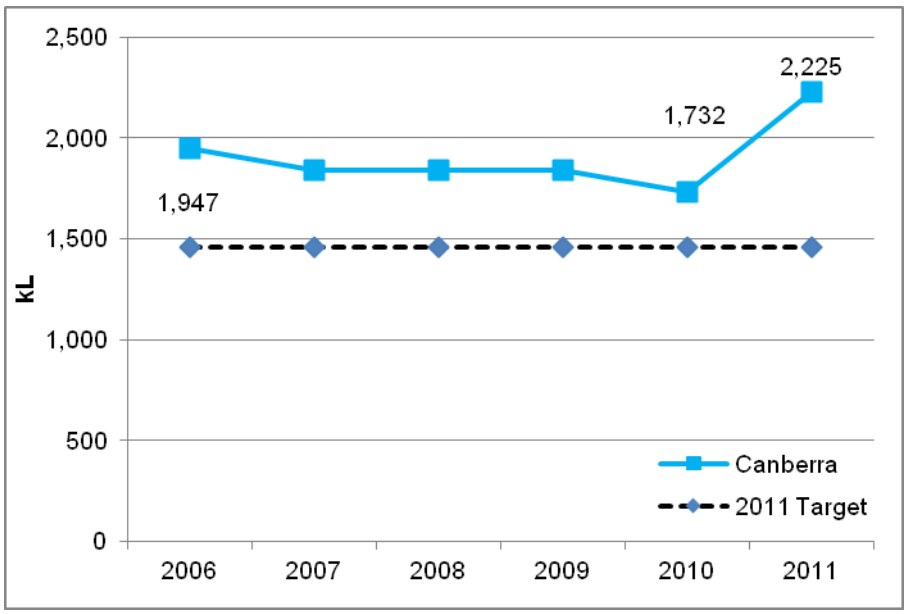


Figure 9-6 – Absolute water consumption at Canberra campus for the period 2006 to 2011

9.5. Waste analysis

In 2011, Canberra campus disposed of 33m^3 (67%) of general waste and recycled 16.5m^3 (33%) of waste (Figure 9-7). This means that an additional 37% of Canberra campuses total waste output needs to be diverted from general waste if it is to achieve its waste target.

Recycling at Canberra campus reduced by 8% in 2010 while general waste output increased by 20%.

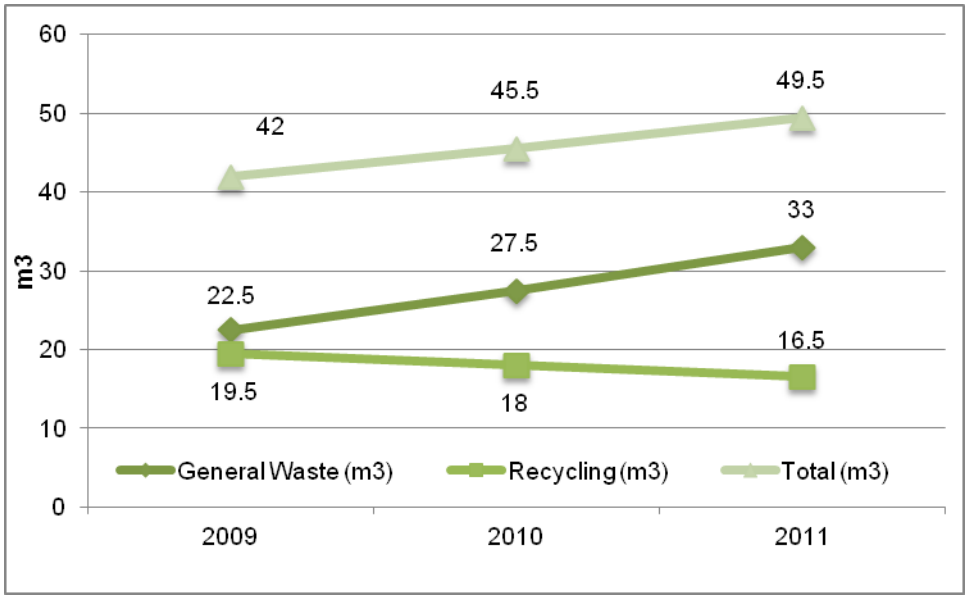


Figure 9-7 – Waste output from Canberra campus in 2011

10. TEFMA Benchmarking

The Tertiary Education Facilities Management Association (TEFMA) each year undertakes a benchmarking exercise of University facilities. This allows CSU's performance to be tracked against all other institutions and the sector mean for a range of parameters.

Data from TEFMA's 2011 benchmarking survey was not available at the time that this Scorecard was developed, so 2010 data has been used as a substitute. This comparison is based on the gross floor area of core university buildings and therefore excludes residences and enterprises.

Figure 10-1 shows normalised energy use (GJ/m^2), for all of CSU's core facilities against the mean value calculated for all Australian universities. CSU consistently rates above the mean figure; however, the implementation of energy efficiency improvements over the coming years is expected to reduce CSU's normalised energy consumption.

In 2010, CSU's mean energy efficiency was 0.8GJ/m^2 more than the University sector average.

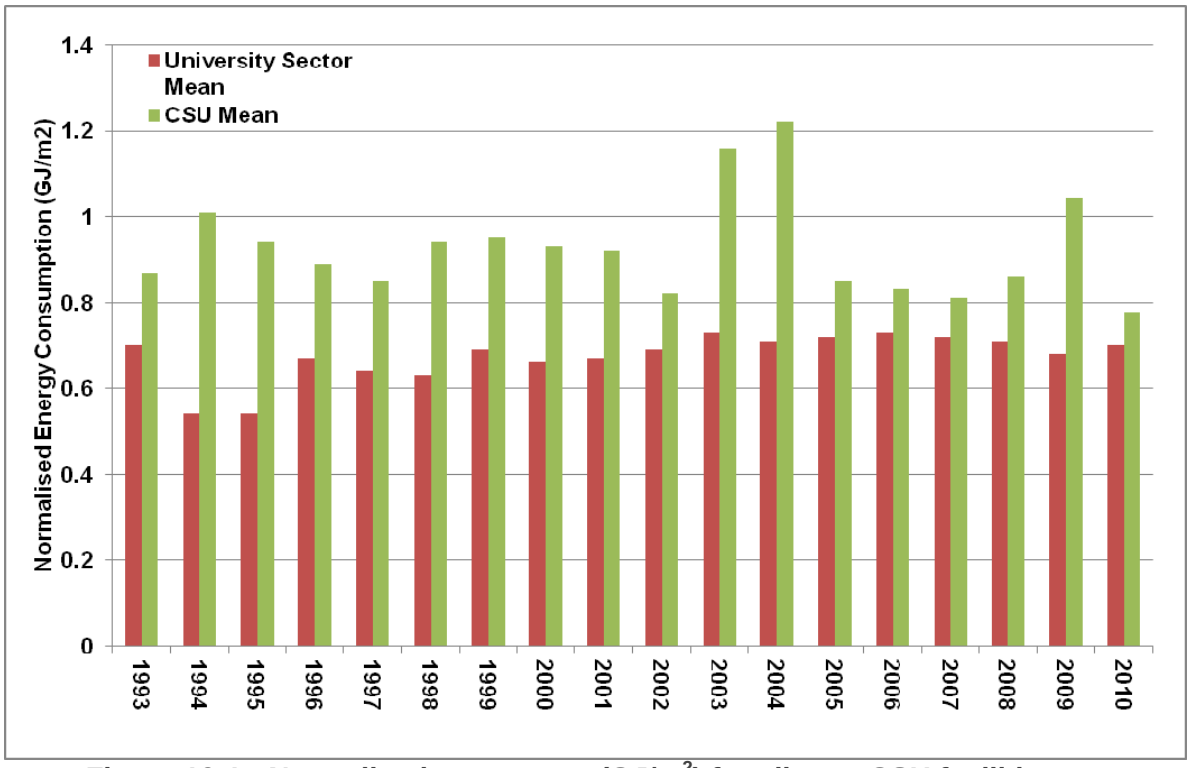


Figure 10-1 - Normalised energy use (GJ/m^2) for all core CSU facilities against the mean for all Australian universities (2010)

Figure 10-2 shows normalised water use (kL/m^2), for all of CSU's core facilities against the mean value calculated for all Australian universities. CSU consistently rates significantly above the mean figure.

CSU's normalised figure was 2.15kL/m^2 more than the University sector average.

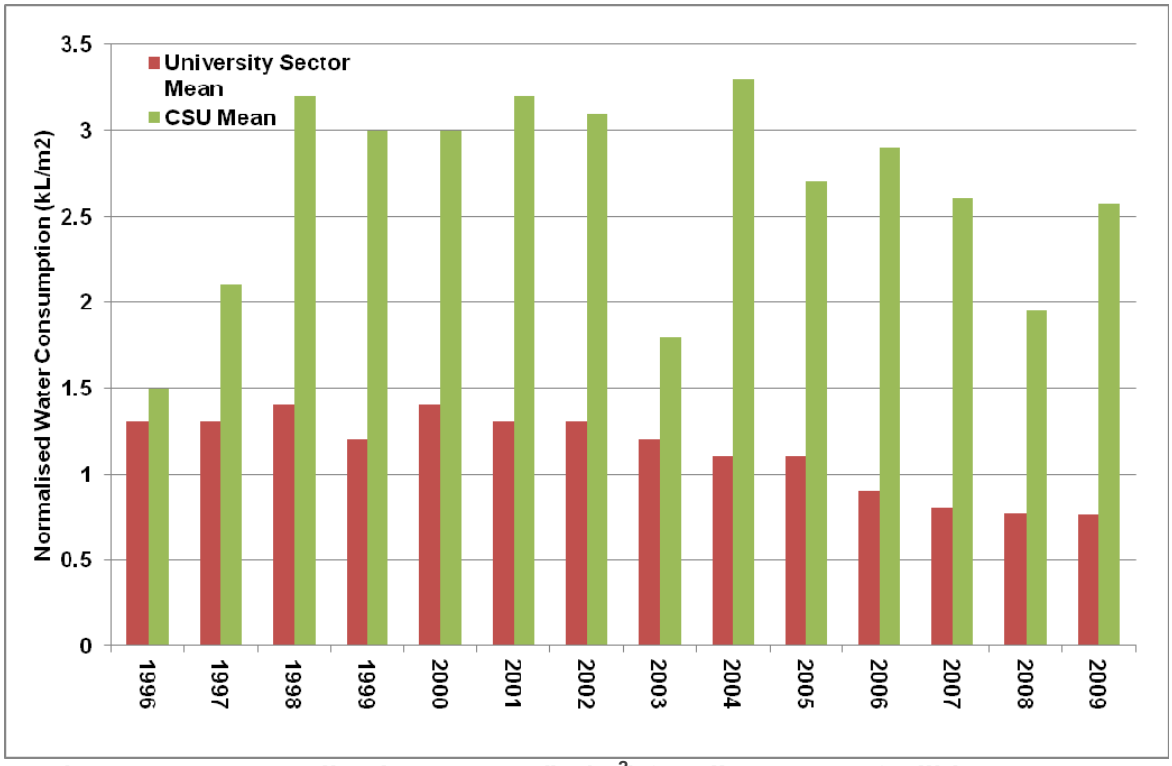


Figure 10-2 - Normalised water use (kL/m^2) for all core CSU facilities against the mean for all Australian universities (2010)

11. Referenced Published Documents

- National Greenhouse Gas Emission Factors (2011), viewed Jan 2012, http://www.climatechange.gov.au/publications/greenhouse-acctg/national-greenhouse-factors.aspx

- NSW Treasury, Evaluation of The Impacts of the Commonwealth's Carbon Price Package Announced 20 July 2011 (2011), viewed Mar 2012, http://www.treasury.nsw.gov.au/__data/assets/pdf_file/0018/20466/Evaluatiion_of_Impacts_of_Comm_Carbon_price_Package_Aug11.pdf

- Ross, D. (2009), viewed Feb 2011, http://www.carbonplanet.com/downloads/ghg_emission_factors_for_flights.pdf

- TEFMA 2010 Benchmark Report – Institutional Edition (2011)

12. Appendix A - Conversion factors

Fuel / Energy	Unit	kg CO_2-e	Source
Air travel – long haul	1 prsn / km	0.23	GHG Emissions resulting from aircraft travel (2011), Carbon Planet
Air travel – medium haul	1 prsn / km	0.2	GHG Emissions resulting from aircraft travel (Jan 2011), Carbon Planet
Air travel – short haul	1 prsn / km	0.36	GHG Emissions resulting from aircraft travel (2011), Carbon Planet
Diesel (Transport)	1 GJ	69.8	National Greenhouse Account Factors (Jul 11), DCCEE
Electricity	1 kWh	0.89	National Greenhouse Account Factors (Jul 11), DCCEE
LPG (Transport)	1 GJ	60.2	National Greenhouse Account Factors (Jul 11), DCCEE
Natural gas	1 GJ	51.3	National Greenhouse Account Factors (Jul 11), DCCEE
Unleaded fuel (Transport)	1 GJ	66.9	National Greenhouse Account Factors (Jul 11), DCCEE

Fuel / Energy	Unit	GJ	Source
Diesel	1 kL	38.6	National Greenhouse Account Factors (Jul 11), DCCEE
LPG	1 m^3	25.7	National Greenhouse Account Factors (Jul 11), DCCEE
Unleaded fuel	1 kL	34.2	National Greenhouse Account Factors (Jul 11), DCCEE

Mass / Volume	Unit	kg	Source
Bathurst Waste	1m3	115	Audit of Commercial & Waste Landfill (2008), DECC

13. Appendix B – Abbreviations & units used

CO_2-e	carbon dioxide equivalent
DFM	Division of Facilities Management
GFA	gross floor area
GHG	greenhouse gas
GJ	gigajoules
IDP	Institutional Development Plan
kJ	kilojoules
kL	kilolitres
kWh	kilowatt hours
LPG	liquid petroleum gas
m^2	square metres
MJ	megajoules

14. Appendix C– Data Sheets