

South Australian Government

Annual Energy Efficiency Report

2011-12



Government of
South Australia

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Front cover image:

South Australia Police 5 NABERS-Rated Headquarters Building, 100 Angas Street, Adelaide. Image kindly supplied by South Australian Police.*

Executive Summary

The *South Australian Government Annual Energy Efficiency Report 2011-12* has been prepared in accordance with the verification and reporting requirements of the *South Australian Government 2002 Energy Efficiency Action Plan*. The Annual Energy Efficiency Report specifically reports on the Government's progress towards South Australia's Strategic Plan Target, 61: *"Improve the energy efficiency of government buildings by 30 per cent by 2020 (baseline 2000-01). Milestone of 25 per cent by 2014"*

Performance of Government Building Energy Efficiency

Since 2000-01, the South Australian Government has achieved a 21.1 per cent overall energy efficiency improvement in its (owned and leased) buildings. This is more than two-thirds towards achieving South Australia's Strategic Plan Target 61 (SASP T61), and a 4.0 per cent improvement on last year's result.

For this report, an improvement of energy efficiency is defined as the percentage of reduction in energy use intensity compared to the baseline year, where intensity is expressed as energy use (in GJ) per business measure. Most energy efficiency in Government departments is reported for SASP T61 purposes using an area (m²) business measure. This allows comparability between agencies engaged in different types of activities. Just under five per cent of energy use is attributed to other business measures, such as FTEs or number of buildings. To assess whether government as a whole has achieved the target, the improvement from the base year is calculated for each business measure and multiplied by its relative contribution to the whole of government's energy use.

As of 30 June 2012, there were 18 departments, comprising all agencies of Government, which report energy consumption and business measures. Departments reported individual energy efficiency improvements (since 2000-01) of up to 68.0 per cent.

Energy efficiency improvements can generally be attributed to:

- moving to more energy efficient buildings;
- undertaking building upgrades; or
- refurbishments that utilise more efficient equipment; and,
- adopting behavioural change programs.

Whilst increases in the business measure (such as area) contributes to the reduction of the energy use intensity (and thus shows as an improved energy efficiency), it is not expected that any such increase will occur without corresponding increases in energy use. For example, whilst some schools may have increased their area as a result of BER investment, the new buildings were typically lit and space conditioned.¹

The significant improvement of four per cent over the 2010-11 result of 17.1 per cent, was contributed to by both energy efficiency improvements and a lower energy use due to milder weather (resulting in lower energy demands for heating and cooling), or discontinuation of some activities.

¹ It is also noted that a reduction in energy use results from other factors, such as weather, or a change in activity that is not specifically an energy savings initiative. For example, equipment being inoperable during refurbishment or maintenance works.

Some of the projects completed during the reporting period included:

- Health's installation of Solar Hot Water and Solar PV systems at a number of sites;
- schools continuing to complete PV installations through the Solar Schools Program; and
- DFEEST TAFEs completed a number of lighting upgrades as well as improving BMS programming at various sites.

The impact of the weather was seen in a significant reduction of natural gas usage, which appears to be due to a lower heating requirement with a mild 2011 winter compared to the colder than average 2010 winter². Weather correction has not been applied to the energy data within this report.

Other Reporting Changes 2011-12

The previous *Annual Energy Efficiency Report 2010-11* reported an overall energy efficiency improvement of 17.3 per cent from 2000-01. In 2011-12 there were a significant number of departmental restructures during the Machinery of Government changes. There were also a number of corrections to data where new information became available. These variations have resulted in a 17.1 per cent overall efficiency improvement, with a net change of -0.2 per cent to the previously reported 2010-11 result.

² Bureau of Meteorology

<http://www.bom.gov.au/climate/current/season/sa/archive/201108.summary.shtml>

1. Introduction

The *South Australian Government Annual Energy Efficiency Report 2011-12* has been prepared in accordance with the Verification and Reporting requirements of the 2002 Government Energy Efficiency Action Plan. This report is the tenth in the series of South Australian Government Annual Energy Use reports, although the report has been renamed the South Australian Government Annual Energy Efficiency Report to reflect the changes in South Australia's Strategic Plan (SASP) in 2007.

This report relates to Target 61 (T61) of the 2011 revision of the SASP, which is to *“Improve the energy efficiency of government buildings by 30 per cent by 2020 (baseline 2000-01). Milestone of 25 per cent by 2014.”*

1.1 Scope of the Strategic Plan target

As per the guidelines of the Energy Efficiency Action Plan, Government buildings under SASP T61 include all non-commercial agencies. The definition of non-commercial is any Agency in the *General Government* Sector of the South Australian budget papers, published annually by the Department of Treasury and Finance (DTF). A list of the South Australian Government Controlled Entities is available on the Treasury and Finance web site at www.treasury.sa.gov.au.

In October 2011, the Premier, Hon Jay Weatherill MP, announced new structures for some government departments. This resulted in the following department list, which has been used for the purposes of this report:

- Department for Health and Ageing (Health)
- Department for Education and Child Development (DECD)
- Department of Further Education, Employment, Science and Technology (DFEEST)
- Department of the Premier and Cabinet (DPC)
- Department of Correctional Services (DCS)
- South Australian Police (SAPOL)
- Department for Communities and Social Inclusion (DCSI)
- Department of Planning, Transport and Infrastructure (DPTI)
- Department of Primary Industries and Regions SA (PIRSA)
- Court's Administrative Authority (CAA)
- South Australian Fire and Emergency Services Commission (SAFECOM)
- Department for Environment and Natural Resources (DENR)
- Attorney-General's Department (AGD)
- Department of Treasury and Finance (DTF)
- Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE)
- Department for Water (DFW)
- Environment Protection Authority (EPA)
- Defence SA (Defence)

As of 01 July 2012, the Department for Water and the Department for Natural Environment and Resources were combined to form the Department for Environment, Water and Natural Resources (DEWNR). This new department structure will be used when reporting the 2012-13 financial year.

1.2 Energy Efficiency Reference Group

The Energy Efficiency Reference Group (EERG) was established by Cabinet to oversee the implementation of SASP T61 across Government, via the Energy Efficiency Action Plan. The EERG includes representatives from all departments. It is chaired by the Energy Markets and Programs Division, DMITRE.

1.3 Verification and Reporting Requirements

An integral component of the Energy Efficiency Action Plan is reporting and publishing results. Regular reporting of energy efficiency improvements and significant energy management initiatives in the agency annual reports provides a public record of performance against SASP T61.

An Independent Verification of progress against the Energy Efficiency Action Plan is undertaken annually by a third party. Previously, an audit of the data and reporting processes, from a sample of three agencies has been conducted each year, rotating through the different agencies. This year, the overall plan and progress of all agencies has been reviewed.

The review was conducted by PriceWaterhouse Coopers from June to November 2012. Stakeholders from the EERG (across EMPD, DECD, SAPOL, DPC, DTF, DPTI and Health departments), were interviewed as part of the review. An assessment of progress towards the SASP T61 was also completed and recommendations provided for updating the plan to align more closely with achieving this Target. The Energy Efficiency Action Plan is currently being reviewed based on these recommendations and is expected to be presented to Cabinet for consideration by mid-2013.

2. Government Energy Efficiency Performance

2.1 Introduction

Determining the South Australian Government's energy efficiency performance in its buildings requires weighting and aggregating the performance of all departments according to their proportion of total government building energy consumption. The process for assessing departments' energy efficiency performance was agreed by the EERG in February 2007. Details can be found in Appendix C.

For the purposes of monitoring the progress of SASP T61, a 'Government building' is defined as *a building in which public sector employees work, or where Government administered services and activities are either partly or completely carried out (in the general Government sector)*. Government buildings do not include infrastructure such as water pumps or air monitoring stations, and these are therefore not included in the measurement of SASP T61.

2.2 Business Measures

The calculation of energy efficiency improvement in South Australian Government buildings requires the use of business measures.

Business measures are measures of an agency's level of activity. For example, a hospital might record its activity in terms of occupied patient bed days or a school might count FTE students. In some cases a proxy might be used, such as the area occupied by an agency or staff numbers. This assumes there is a correlation between the number of people employed in an agency or the area it occupies and its level of activity³.

In this way, an energy efficiency improvement could be said to have occurred if an agency increased its building floor area or its staffing levels without an equivalent increase in its energy use.

For example, Agency A occupied a building of 2 000 m² (business measure value) and used 15 000 Giga-Joules (GJ) of energy in the 2011-12 year. As a result, the energy efficiency performance of the building is:

$$\frac{15000\text{GJ}}{2000\text{m}^2} = 7.5\text{GJ}/\text{m}^2 = 7500\text{MJ}/\text{m}^2$$

If the same calculation was undertaken for 2000-01, an energy efficiency improvement can be determined. Where the energy use per area was higher in the base year than in 2011-12, energy efficiency has improved.

Business measures used by agencies to calculate progress towards SASP T61 in the 2011-12 year include:

- Area occupied by an agency (m²)
- Number of full time equivalent employees (Occupancy - FTE's)
- Number of buildings

³ It is noted that within government there has been a focus on efficiency of space and staffing levels, and so the level of service per area and per staff will have varied since the base year.

Some departments also report additional business measures (in addition to area or occupancy measures) that are not used in the calculation of SASP T61 including:

- Number of occupied bed days (in hospitals)
- Number of visitors (in public buildings)

For the purposes of this report, agencies used the business measure of area (m²) for 95.3 per cent of the total energy use. This allows comparability between agencies engaged in different types of activities. It is worth noting that if different business measures were used to calculate energy efficiency instead of area, the whole of government energy efficiency performance figure may be different.

Further information on the business measures used by individual agencies are displayed in Tables 3.4.5 and 3.4.6 in Section 3.4.

The Energy Use per Business Measure data used in the aggregated calculation for the whole of SA Government Efficiency is shown in Table 2.4, in Section 2.4.

Further information on the calculation of energy efficiency improvement is provided in Appendix C.

2.3 End-use Categories

Agencies reported energy data through the Online System for Comprehensive Activity Reporting (OSCAR), a system administered by the Commonwealth Department for Climate Change and Energy Efficiency (DCCEE).

For the purposes of reporting on OSCAR, agencies were required to allocate their chosen business measure to a specific end-use category. End-use categories define the type of business, or activity, undertaken within agencies which consume energy. End-use categories enable data reported by departments to be disaggregated into similar operational types. This allows the comparison of identical end-use categories across Government departments.

The following end-use categories were used by agencies for 2000-01 and 2011-12 reporting:

- Custodial Facilities
- Educational Facilities
- Hospitals
- Laboratories
- Law Courts
- Office Central Services
- Office Tenant Light and Power
- Office Buildings Combined Services
- Other Buildings
- Other Healthcare Facilities
- Police, Fire and Emergency Services
- Public Buildings

2.4 Whole of Government Performance

In 2011-12, the energy efficiency of South Australian Government buildings improved by 21.1 per cent over the 2000-01 baseline. The data used in the improvement calculation is shown in Table 2.4.

The aggregated calculation includes a component from each business measure. This component is weighted, based on the contribution it makes to total energy use. Table 2.5 illustrates the contribution of each business measure to the overall result. See Appendix C, section C.2 for a further description of this calculation, and section C.3 for a worked example.

Table 2.4: Total Aggregated Energy Efficiency

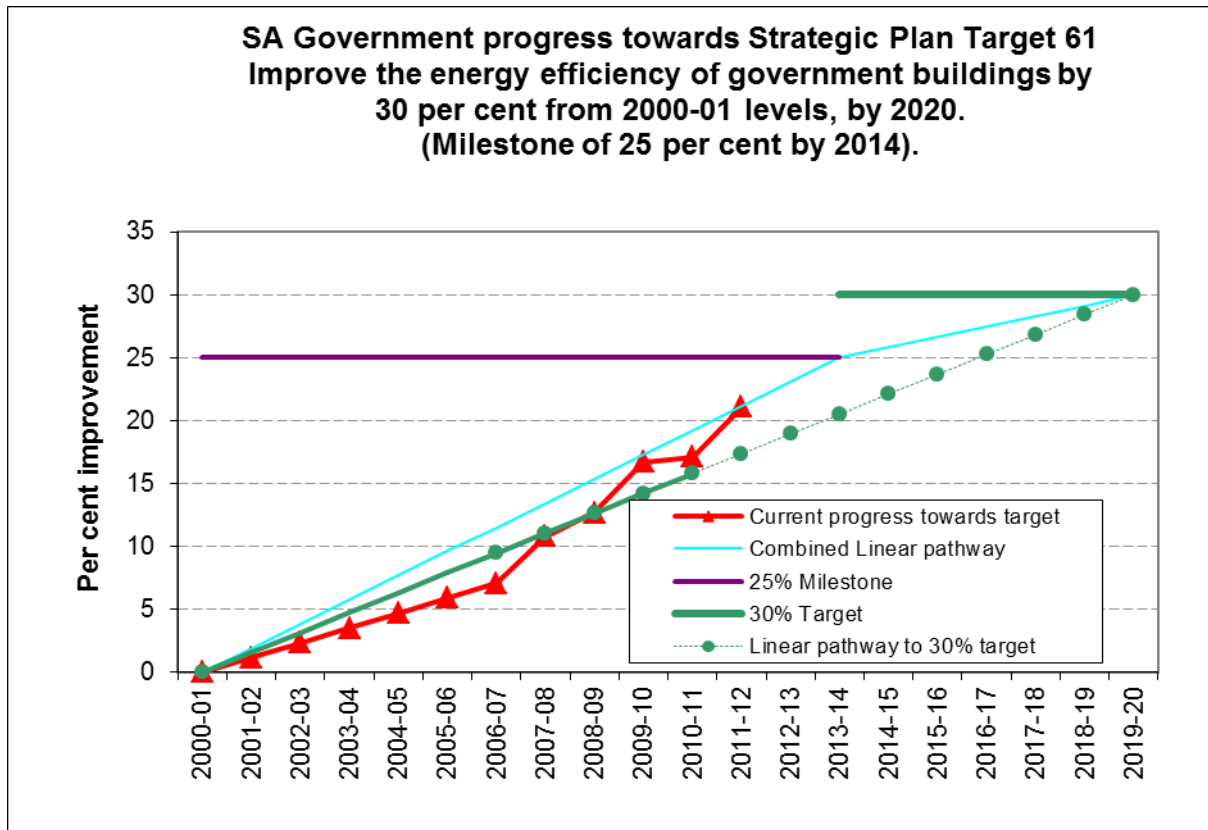
Business Measure	Total Energy Use (GJ)		Total Business Measure		Energy Intensity (MJ per Business Measure)		Per cent Energy Efficiency Improvement
	2000-01	2011-12	2000-01	2011-12	2000-01	2011-12	2011-12 against 2000-01 Baseline
Area (m ²)	2 365 902	2 159 221	4 531 722	5 189 103	518	413	20.3 %
Buildings (no.)	79 483	39 900	37	38	2 148 189	1 050 000	51.1 %
Occupancy (FTEs)	70 624	65 202	4 915	6 407	14 369	10 177	29.2 %

Table 2.5: SA Government Building Energy Efficiency

Business Measure	Percentage of 2011-12 Total Energy	Per cent Energy Efficiency Improvement	Contribution to Overall Result
Area (m ²)	95.3 %	20.3 %	19.36 %
Buildings (no.)	1.8 %	51.1 %	0.90 %
Occupancy (FTEs)	2.9 %	29.2 %	0.84 %
OVERALL TOTAL 2011-12			21.1 %

Figure 2.4 shows that progress is ahead of the linear pathway towards SASP T61, which requires a 17.4 per cent improvement in 2011-12.

Figure 2.4: Whole of Government Performance



In 2010-11, the energy efficiency of South Australian Government buildings improved by 17.1 per cent compared to the 2000-01 baseline. This is equivalent to an average of 1.7 per cent per annum improvement. The 2011-12 result of 21.1 per cent improvement, against the 2000-01 baseline, is equivalent to 1.9 per cent per annum which is ahead of the 2010-11 trend. Progress to date is above the linear pathway of 1.6 per cent improvement per annum for the 30 per cent target and is on the linear pathway of 1.9 per cent for the 25 per cent milestone.

The achievement of SASP T61 is likely to be contingent on the successful implementation of a number of large projects, particularly within Health, as it accounts for 50.6 per cent of total government energy use. Importantly, the new Royal Adelaide Hospital is expected to be fully operational in 2016, two years after the 2013-14 milestone date for the SASP T61.

Another major project is building the new \$120 million Sustainable Industries Education Centre⁴ at the former Mitsubishi site, Tonsley, for which buildings works commenced in 2011-12. The new centre will be nearly 45 000 m² in built area and will become the central point for building and construction training in South Australia, promoting sustainable building techniques. The site is expected to be operational for the start of the 2014 educational year. DFEEST is the third largest department, for government building energy use within the SA Government, and consumes 6.8 per cent of the overall energy used.

These major projects will provide a timely and significant contribution towards the overall target of 30 per cent improvement by 2020.

⁴ <http://www.dfeest.sa.gov.au/Portals/1/Documents/siec/SIECFactSheet.pdf>

3. Energy Efficiency Performance by Department

3.1 Department Performance

This section reports on progress made by the departments within the context of the whole of government energy use.

Figure 3.1 shows the proportion of the total government energy use that each department consumes, and their energy efficiency improvement compared to the 2000-01 baseline. Energy efficiency improvement is shown on the y-axis (left side scale) and proportion of government use is along the x-axis (scale at the bottom of the graph). For example, DECD's result was an 8.6 per cent energy efficiency improvement against the 2000-01 baseline and its energy consumption was 17.3 per cent of the total SA government building energy use. See Section 4.2 for further details of DECD's energy efficiency performance.

Figure 3.1: Proportion of Energy Use and Energy Efficiency Improvement by Department (2011-12 against 2000-01 baseline).

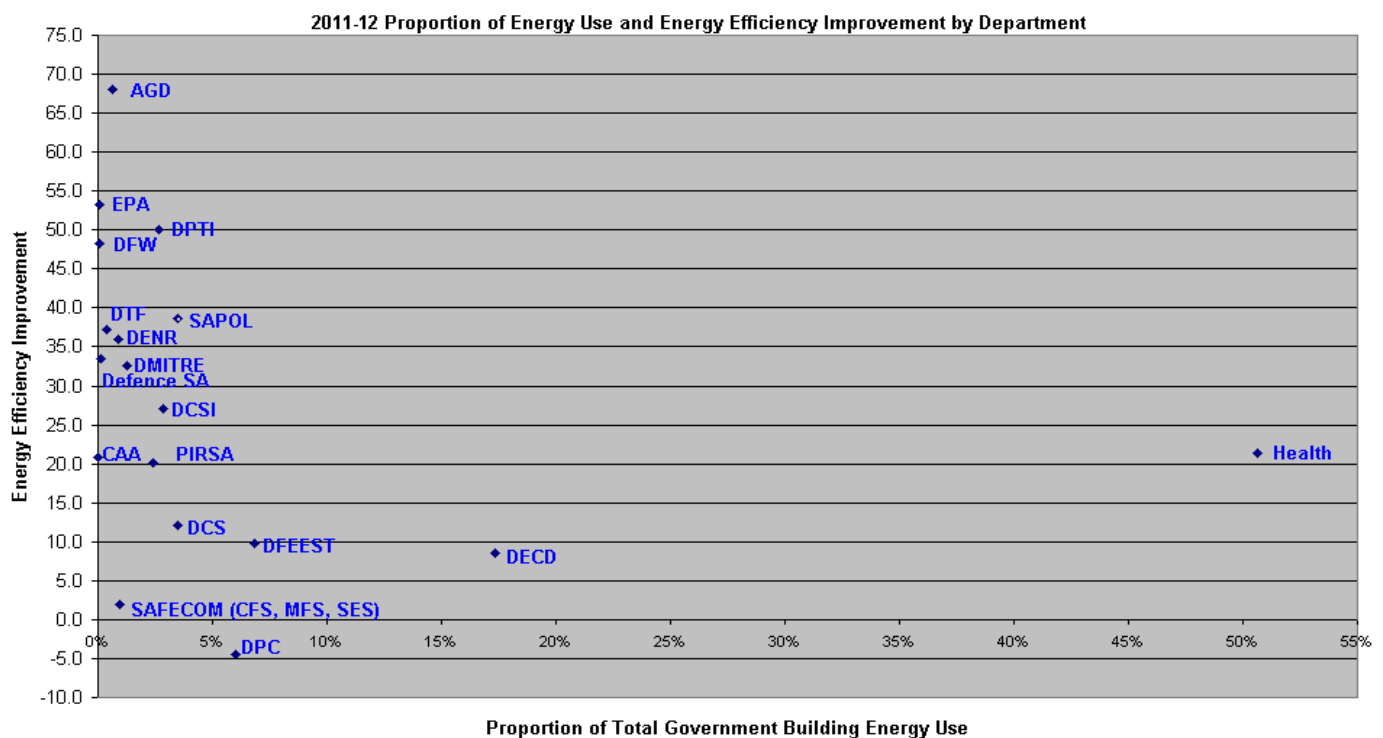


Figure 3.1 illustrates that individual agencies improved by up to 68 per cent (the average improvement was 28 per cent), compared to the 2000-01 baseline. The Department of the Premier and Cabinet (DPC) this year showed a reduction in efficiency. This is primarily owing to OCIO's significant use of energy intense equipment such as computer servers, and the replacement of a previously inactive boiler by Arts SA. More information on DPC's energy efficiency by division can be found in Section 4.4

Figure 3.1 clearly shows that the Department of Health and Ageing (Health) is the largest consumer of building energy use in the South Australian Government, using 50.6 per cent of the Government's energy. As a result, a 21.4 per cent energy efficiency improvement from this department has contributed 10.8 per cent to the total government energy efficiency improvement; i.e. more than half of the total government energy improvement of 21.1 per cent. See Section 4.1 for further details of Health's energy efficiency achievements.

As mentioned above, DECD is the second largest consumer of building energy, using 17.3 per cent of the government's total energy. Other large energy consuming agencies include DFEEST and DPC. See sections 4.3 and 4.4 respectively for details of their 2011-12 performance.

The next group of agencies each consume between one and five per cent of the government's total building energy use. These agencies are:

- DCS,
- SAPOL,
- DCSI,
- DPTI,
- PIRSA and
- CAA.

All other agencies use less than one per cent of the overall energy consumption.

As seen in Figure 3.1, many of the smaller agencies have already reached the milestone or the final target. Nine departments (SAPOL, DPTI, CAA, DENR, AGC, DTF, DMITRE, DFW and EPA), have achieved more than a 30 per cent improvement in building energy efficiency. It is also noted that DCSI has achieved the 2014 milestone of 25 per cent improvement over the 2000-01 baseline. A more detailed overview of each of the department's energy efficiency performance and their planned initiatives are provided in Chapter 4, Departmental Progress 2000-01 to 2011-12.

3.2 Baseline Revisions

It is acknowledged that departmental structures change over time and therefore the departmental baseline and subsequent years' energy figures will need to be revised to represent the structure of the department for the given reporting period. Baselines can be adjusted in legitimate circumstances according to specific procedures developed by the EERG.

Under these procedures, agencies are not able to revise baselines due to changes in operational characteristics, such as staff number changes, productivity (service level) fluctuations, or acquisition or disposal of sites. Untenanted sites, a change in tenancy or size of floor space occupied are also not recognised as legitimate circumstances to warrant changes.

Baseline changes are available where:

- Change occurs in departmental structure (in which case particular sites must be transferred from one department to another);
- A site was previously excluded from reported data or is a new entity; or
- Data for a site previously reported was either an estimate or reported incorrectly, and actual data is now available.

Where a department has made a modification to its baseline energy use data in the 2011-12 financial year, a brief explanation is provided in its overview.

3.3 Revisions to the 2010-11 Energy Efficiency Results

Prior to the 2007 SASP, energy performance was measured against a gross consumption target. The energy efficiency target was measured for the fifth time in 2010-11. This involved a significant data collection process of both energy consumption and business measures. Each year agencies refine the data previously provided where further data or improved data becomes available. As a result, the energy efficiency figures reported in the 2010-11 report have been recalculated.

Descriptions of baseline adjustments are included in each department's part of Chapter 4, Departmental Progress 2000-01 to 2011-12. For example, during 2011-12, many departments underwent transfers due to Machinery of Government changes.

3.4 Data Tables – Energy Use and Business Measure Data (2000-01 to 2011-12)

The South Australian Government used 2 264 323 GJ of energy in its buildings in the 2011-12 year, compared to 2 516 009 GJ in 2000-01. Tables 3.4.1 and 3.4.2 show the energy use by end-use category and Tables 3.4.3 and 3.4.4 by Department. Tables 3.4.5 and 3.4.6 show the business measure data by Department.

Table 3.4.1: SA Government Energy Use from Buildings by End-use Category 2000-01 to 2005-06

End-use Category	2001 (GJ)	2002 (GJ)	2003 (GJ)	2004 (GJ)	2005 (GJ)	2006 (GJ)
Custodial facilities	77,095	69,841	69,136	71,973	71,250	75,248
Educational facilities	518,429	544,872	531,045	554,122	526,848	532,840
Hospitals	1,243,193	1,224,078	1,234,031	1,282,137	1,268,012	1,265,396
Laboratories	58,624	52,840	52,706	51,861	51,410	53,770
Law Courts	36,841	33,555	28,666	29,161	27,959	29,096
Office - Central Services	79,569	62,228	58,913	63,687	54,304	56,906
Office - Tenant Light and Power	176,479	154,597	126,932	136,216	136,584	132,433
Office buildings - combined services	30,496	24,637	6,691	22,213	17,323	18,964
Other Buildings	36,654	36,302	36,771	35,923	35,995	28,772
Other healthcare buildings	55,894	55,360	49,446	49,528	52,973	52,871
Police, Fire and Emergency Services Facilities	109,198	112,422	106,846	99,465	99,342	100,383
Public Buildings	93,537	87,104	86,704	87,560	80,426	85,614
Total	2,516,009	2,457,836	2,387,887	2,483,846	2,422,426	2,432,293

Table 3.4.2: SA Government Energy Use from Buildings by End-use Category 2006-07 to 2011-12

End-use Category	2007 (GJ)	2008 (GJ)	2009 (GJ)	2010 (GJ)	2011 (GJ)	2012 (GJ)
Custodial facilities	73,476	75,040	75,166	77,573	82,311	77,814
Educational facilities	539,873	502,169	502,199	511,512	542,844	532,398
Hospitals	1,271,341	1,237,715	1,208,703	1,166,805	1,183,837	1,130,385
Laboratories	50,325	53,378	51,353	59,195	55,691	50,830
Law Courts	30,246	28,898	27,965	27,952	29,038	28,992
Office - Central Services	76,910	75,550	72,903	67,760	38,219	39,900
Office - Tenant Light and Power	115,554	113,197	126,657	116,195	117,863	116,284
Office buildings - combined services	20,248	19,870	23,501	23,352	3,727	8,654
Other Buildings	33,123	29,932	36,337	30,707	31,497	38,636
Other healthcare buildings	51,009	45,555	44,392	44,869	43,860	45,051
Police, Fire and Emergency Services Facilities	103,960	105,046	106,873	108,310	107,417	99,208
Public Buildings	28,992	76	85,557	83,098	85,375	92,361
Total	2,395,057	2,286,426	2,361,606	2,317,391	2,324,047	2,264,323

Table 3.4.3: SA Government Energy Use from Buildings by Department 2000-01 to 2005-06

Department	2000-01 (GJ)	2001-02 (GJ)	2002-03 (GJ)	2003-04 (GJ)	2004-05 (GJ)	2005-06 (GJ)
Health	1,268,880	1,249,478	1,259,580	1,308,408	1,293,796	1,291,194
DECD	388,414	390,208	388,311	413,872	395,887	382,532
DFEEST	156,110	174,913	159,052	151,106	143,322	163,359
DPC	130,433	121,037	118,832	119,631	111,096	116,386
CS	77,095	69,841	69,136	71,973	71,250	75,248
SAPOL	91,874	95,154	88,445	80,107	81,234	81,848
DCSI	68,809	61,859	71,372	61,859	65,673	71,372
DPTI	134,528	111,759	73,084	109,657	94,278	88,847
PIRSA	67,522	60,737	60,471	58,865	58,266	60,622
CAA	37,007	33,721	28,666	29,161	27,959	29,096
DENR	32,414	20,860	21,290	20,682	21,748	14,784
AGD	21,810	23,525	20,890	19,135	20,260	18,489
SAFECOM	17,324	17,268	18,401	19,358	18,108	18,535
DTF	11,226	9,289	8,768	10,038	10,621	10,938
DMITRE	8,685	7,803	6,463	5,776	4,785	4,995
DFW	1,815	1,815	1,997	2,356	2,249	2,246
EPA	1,844	1,647	1,783	1,643	1,675	1,582
Defence SA	219	219	219	219	219	219
Total	2,516,009	2,457,836	2,387,887	2,483,846	2,422,426	2,432,293

Table 3.4.4: SA Government Energy Use from Buildings by Department 2006-07 to 2011-12

Department	2006-07 (GJ)	2007-08 (GJ)	2008-09 (GJ)	2009-10 (GJ)	2010-11 (GJ)	2011-12 (GJ)
Health	1,297,122	1,262,616	1,233,101	1,191,016	1,208,197	1,154,226
DECD	380,276	360,397	347,587	341,709	382,587	389,550
DFEEST	172,196	150,114	162,308	177,338	167,651	153,562
DPC	41,917	12,961	124,073	115,111	122,626	134,708
CS	73,476	75,040	75,166	77,573	82,311	77,814
SAPOL	83,787	83,618	85,920	86,066	85,836	77,788
DCSI	65,434	65,101	64,552	65,120	62,069	63,668
DPTI	117,086	115,972	112,818	101,745	54,326	59,948
PIRSA	56,314	58,982	57,013	64,318	59,779	54,036
CAA	30,246	28,898	27,965	27,952	29,038	28,992
DENR	19,426	16,711	17,308	17,119	20,732	20,085
AGD	18,818	16,131	15,074	13,159	12,297	14,534
SAFECOM	20,173	21,428	20,953	22,244	21,581	21,420
DTF	10,645	10,336	8,952	9,200	8,400	8,281
DMITRE	4,075	3,843	4,610	4,053	3,809	3,124
DFW	2,238	2,524	2,472	2,551	1,697	1,534
EPA	1,609	1,535	1,548	917	877	854
Defence SA	219	219	186	200	234	199
Total	2,395,057	2,286,426	2,361,606	2,317,391	2,324,047	2,264,323

Table 3.4.5: SA Government Business Measure Data from Buildings by Department 2000-01 to 2005-06

* Recording business measures for this target was not introduced until the revised SASP in 2007, data as used for SA government total aggregate.

Department	Business Measure*	2000-01 (Baseline)	2001-02	2002-03	2003-04	2004-05	2005-06
Health	Area (m ²)	978,726	984,571	986,906	1,008,890	1,060,922	1,095,398
DECD	Area (m ²)	2,246,295	1,897,896	2,260,612	2,364,537	2,380,334	2,378,684
DFEEST	Area (m ²)	408,636	-	-	-	-	446,275
DPC	Area (m ²)	211,007	3,132	3,133	10,405	12,932	179,967
CS	Area (m ²)	105,517	106,592	107,508	108,464	108,464	108,464
SAPOL	Area (m ²)	149,990	149,990	142,669	142,370	143,117	148,066
DCSI	Occupancy (FTE)	4,712	4,712	4,712	4,877	5,390	5,563
DPTI	Area (m ²), Buildings (no.) ⁵	80,277	3,961	3,961	3,961	3,961	64,038
		37	-	-	-	-	-
PIRSA	Area (m ²)	38,924	30,073	32,777	32,777	32,777	33,007
CAA	Area (m ²)	71,984	53,793	-	-	-	75,299
DENR	Area (m ²)	87,818	-	-	-	-	-
AGD	Area (m ²)	22,837	-	-	-	-	-
SAFECOM	Area (m ²)	79,811	-	-	-	-	71,140
DTF	Area (m ²)	26,814	11,767	10,295	12,570	13,799	20,623
DMITRE	Area (m ²)	17,338	15,738	16,161	11,718	9,644	11,485
DFW	Occupancy (FTE)	203	390	409	409	490	519
EPA	Area (m ²)	4,904	410	410	410	5,025	5,316
Defence SA	Area (m ²)	844	1,211				
Total	Area (m ²)	4,531,722	3,259,134	3,564,432	3,696,102	3,770,975	4,637,762
	Buildings (no.)	37	-	-	-	-	-
	Occupancy (FTE)	4,915	5,102	5,121	5,286	5,880	6,082

⁵ Buildings (no.) used only for Base Building section of DPTI.

Table 3.4.6: SA Government Business Measure Data from Buildings by Department 2006-07 to 2011-12

- Recording business measures for this target was not introduced until the revised SASP in 2007, data as used for SA government total aggregate.

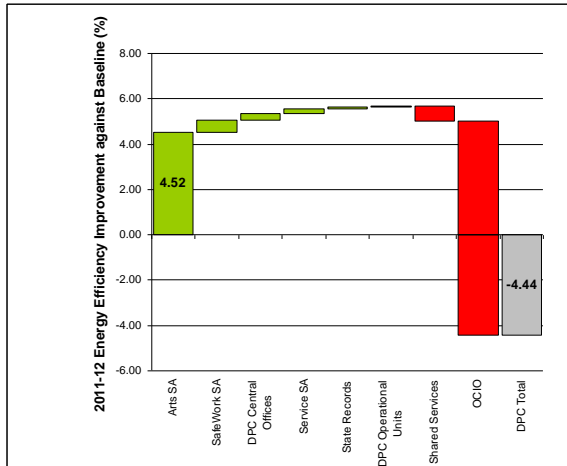
Department	Business Measure*	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Health	Area (m ²)	1,100,473	1,102,100	1,106,995	1,116,747	1,117,945	1,136,802
DECD	Area (m ²)	2,475,137	2,525,273	2,380,334	2,378,684	2,475,137	2,525,273
DFEEST	Area (m ²)	446,149	435,317	438,341	437,636	434,871	444,668
DPC	Area (m ²)	204,307	217,559	220,535	220,552	221,604	228,139
CS	Area (m ²)	108,464	108,464	108,464	108,464	111,269	121,181
SAPOL	Area (m ²)	190,264	206,698	143,117	148,066	190,264	206,698
DCSI	Occupancy (People. FTE)	5,507	5,629	5,629	5,729	5,817	6,075
DPTI	Area (m ²), Buildings (no.) ⁶	77 065	77 065	77 065	127 793	99 613	99 221
		42	42	42	38	36	38
PIRSA	Area (m ²)	32,598	32,484	31,075	41,415	40,745	38,349
CAA	Area (m ²)	79,239	81,805	81,537	81,008	83,694	83,694
DENR	Area (m ²)	102,067	101,638	101,638	102,030	102,030	101,072
AGD	Area (m ²)	40,471	68,611	44,857	65,242	43,767	47,592
SAFECOM	Area (m ²)	103,782	105,324	105,566	108,240	109,331	109,331
DTF	Area (m ²)	29,461	34,758	27,361	31,974	31,996	32,071
DMITRE	Area (m ²)	11,831	11,831	11,190	11,998	11,639	9,189
DFW	Occupancy (FTE)	541	570	588	605	367	332
EPA	Area (m ²)	5,316	5,317	4,798	4,854	4,854	4,854
Defence SA	Area (m ²)	0	0	1,211	844	969	969
Total	Area (m ²)	5,006,624	5,114,244	4,884,084	4,985,546	5,079,728	5,189,103
	Buildings (no.)	42	42	42	38	36	38
	Occupancy (FTE)	6,048	6,199	6,217	6,334	6,184	6,407

⁶ Buildings (no.) used only for Base Building section of DPTI.

4. Departmental Progress 2000-01 to 2011-12

Chapter four presents the energy efficiency performance of each department between 2000-01 and 2011-12.

In these waterfall charts, an improvement in energy efficiency is shown as a green bar and a decrease in efficiency is shown as a red bar. The graph segments the cumulative impact of each department's sub-group (such as an agency or division of a department), as a step. Each step continues from the end of the previous step.



For example in DPC: Arts SA contribute +4.52 per cent to the overall DPC Total.

The next small step is Services SA which contributes +0.53 per cent (a green step from 4.52 to 5.05 per cent).

DPC Central Offices contributed +0.29 per cent (a green step up from 5.05 to 5.34 per cent).

Continue this process for each area, to the last department, OCIO, which contributed -9.46 per cent (a red step down from 4.69 to -4.44 per cent). To reach the final total from all steps shown at -4.44 per cent

This graph is shown for each department that reports different sub-groups (such as agencies or divisions within the department) or different end-use categories into OSCAR.

The annual trend for energy efficiency (against the 2000-01 baseline), for 2008-09 to 2011-12 is shown for each of the departments. These are also shown as a waterfall chart and each year is shown as a step up or down from the energy efficiency result of the previous year.

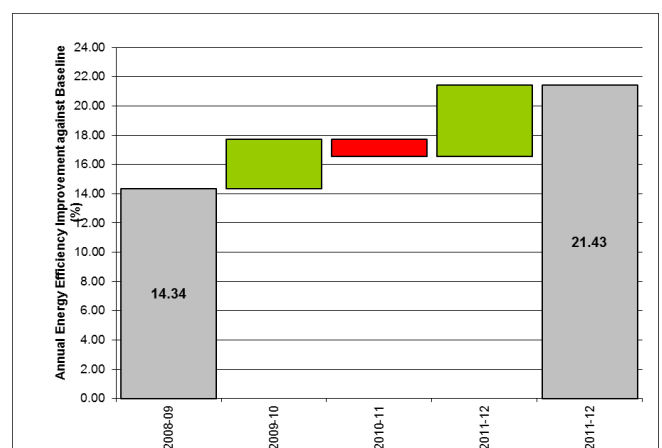
For example in Health:

In 2008-09, 14.34 per cent energy efficiency against the 2000-01 baseline was achieved.

In 2009-10, a further increase of 3.38 per cent was achieved (stepping up from 14.34 to 17.73 per cent).

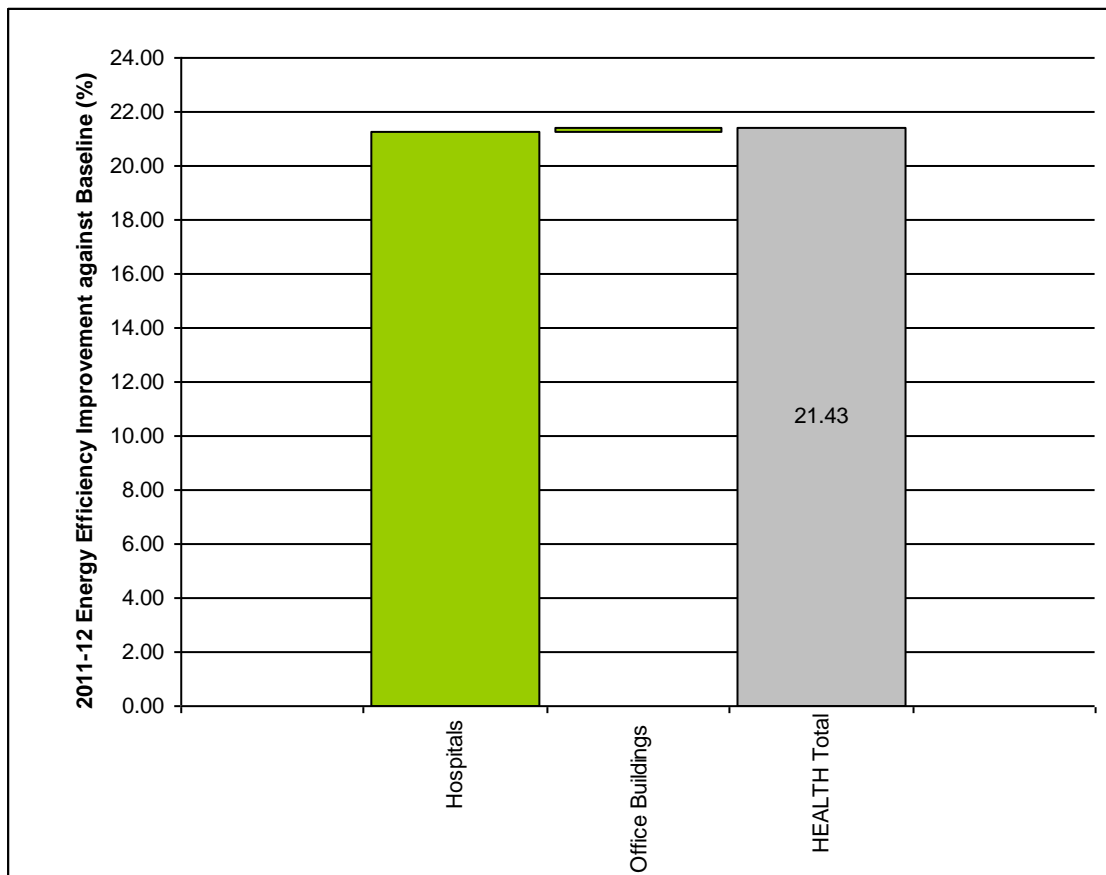
In 2010-11, the red step is a decrease from 17.73 to 16.55 (1.17 per cent decrease).

In 2011-12, a final increase of 4.87 per cent compared to the previous year was seen, with a green step up from 16.55 to 21.43 per cent.



4.1 Department for Health and Ageing (Health)

Figure 4.1.1: Health Building Energy Efficiency Improvement 2011-12 against Baseline

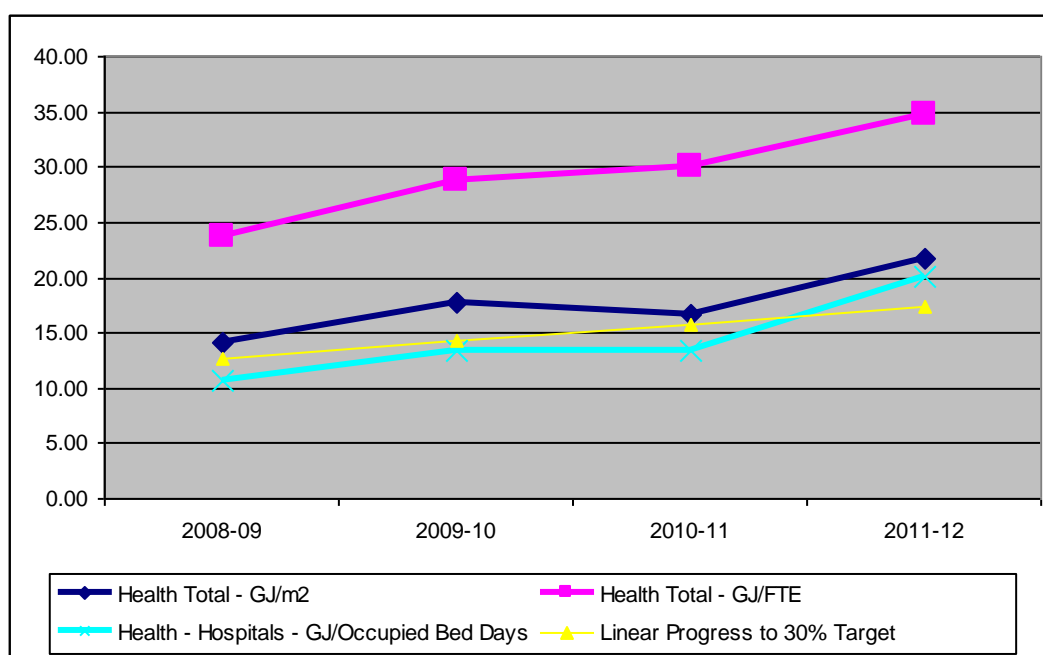


Overview of Performance to 2011-12

Health consumes over half (50.6 per cent) of the total building energy used by the South Australian Government, and as such has a significant influence on the overall progress to SASP T61. In the overall government calculations, area (m²) is used as the standard business measure for a more consistent comparison between departments. Health also records FTEs across the department, and Occupied Bed Days for Hospitals (which use over 99 per cent of Health's total energy).

Health department has improved against the baseline for each measure and in particular the increase in occupied bed days has surpassed the increase in energy use.

Figure 4.1.2: Health Building Energy Efficiency Improvement for departmental metrics (2011-12 against Baseline)



A significant reduction in energy consumption has been achieved in the Health department, which decreased its building energy consumption in hospitals from 1296 MJ/m² in 2000-01 to 1015 MJ/m² in 2011-12, an overall improvement of 21.7 per cent compared to 1081 MJ/m², which was a 16.7 per cent improvement over the 2000-01 baseline in 2010-11.

The annual trend from 2008-09 to 2011-12 is shown below in Figure 4.1.3. The improvements in energy efficiency during 2011-12 can be attributed to the energy saving initiatives detailed below and a reduction in energy use intensity due to milder weather. The contrast to last year was particularly seen in a 10.3 per cent reduction in natural gas usage, which was largely due to a mild, warmer than average 2011 winter and in contrast to the colder than average 2010 winter⁷.

Health's improved energy efficiency contributed approximately 11 per cent towards the Government's overall energy efficiency.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

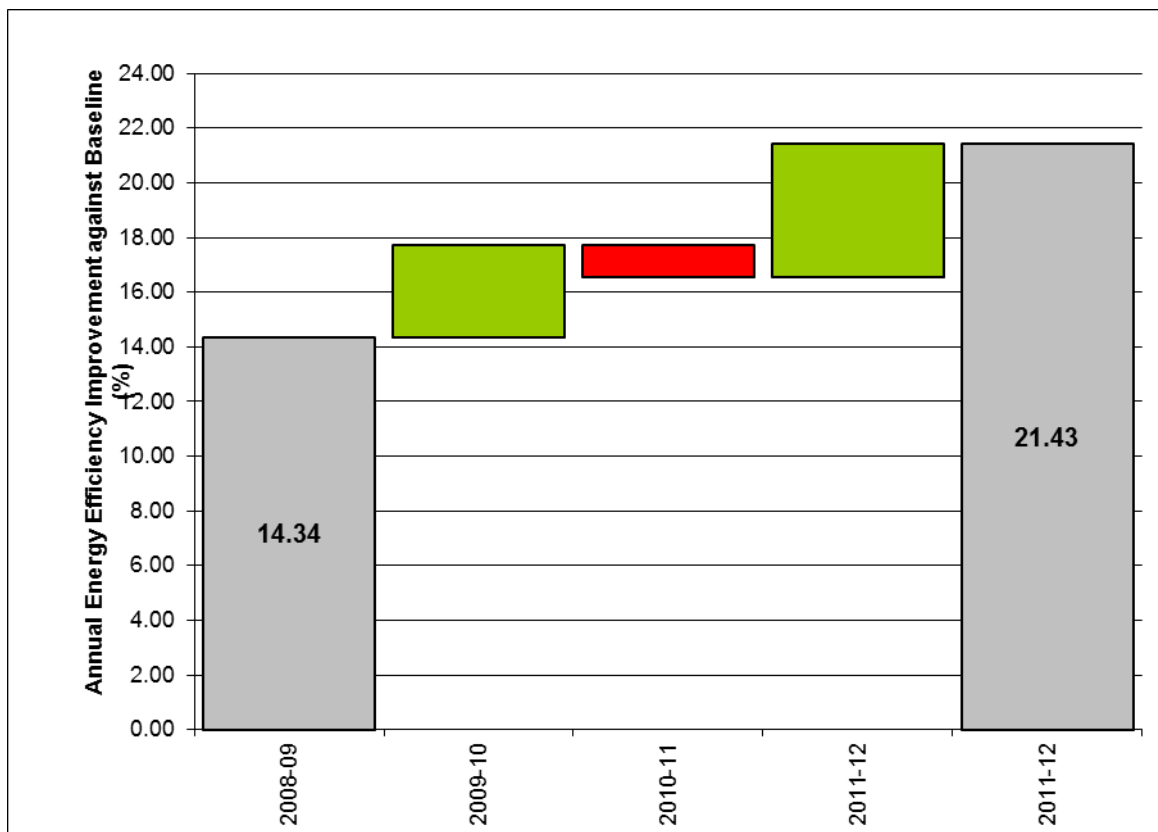
Significant reworking of the Health energy efficiency data has been completed in 2011-12. Analysis of the Health sites showed that 104 of the total 514 sites consistently contributed 98.5-99.5 per cent of the annual energy consumption each year. The data for 2000-01 to the current year has been recalculated for these key 104 sites only. This initiative rationalises the effort required to accurately track and report on Health's energy efficiency data, and makes the reporting process considerably more efficient with insignificant reduction in precision.

⁷ Bureau of Meteorology

<http://www.bom.gov.au/climate/current/season/sa/archive/201108.summary.shtml>

<http://www.bom.gov.au/climate/current/season/sa/archive/201008.summary.shtml>

Figure 4.1.3: Health Building Energy Efficiency Trend



Significant Energy Management Achievements

SOLAR HOT WATER (SHW)

Gas boosted SHW were installed on four additional SA Health sites during 2011-12, the largest of these being for the Modbury Hospital (160 panels) and the new Glenside acute care facility (120 panels). More than 80 per cent of SA Health overnight stay facilities now have SHW services.

SOLAR PHOTOVOLTAIC (SOLAR PV)

Three SA Health sites had five kilowatt (kW) Solar PV systems installed during 2011-12. A further 9 SA Health sites will each have a minimum 5 kW solar PV array system installed during 2012-13 and 2013-14.

GAS REVERSE CYCLE COOLING

During 2011-12 gas reverse cycle air conditioning was selected for three current redevelopment projects. Life cycle analysis undertaken for each project showed life cycle CO₂ savings ranging from 19 to 56 per cent relative to conventional air conditioning solutions.

NABERS HOSPITAL ENERGY AND WATER RATINGS

During 2010-11 the Commonwealth released a Pilot NABERS (National Energy and Water Building Rating Scheme) tool for Hospitals. This tool has been trialled across 69 SA Health sites during 2011-12. The results of this trial are currently being reviewed to inform both the ongoing refinement of the NABERS Healthcare tool and the development of a departmental policy in regard to possible future use of the NABERS Hospital tool.

GREENSTAR

The GreenStar Healthcare tool is currently being utilized to help guide all major SA Health redevelopment projects. As part of the Greenstar assessment process a sophisticated energy modelling technique is employed to determine the theoretical greenhouse emissions of the proposed facility relative to a like facility had it been built to the minimum energy efficiency standards established in the Building Code of Australia. By way of example the table below shows the outcomes of such energy modelling for Flinders Medical Centre New South Wing.

Flinders Medical Centre - New South Wing - Reduction in Greenhouse Gas Emissions			
	NSW - if built to minimum BCA energy efficiency standards	NSW - As Designed.	Reduction in greenhouse gas emissions achieved.
	k-CO ₂ per annum	k-CO ₂ per annum	k-CO ₂ per annum
Air Conditioning	797,833	419,896	377,937
Lighting	270,053	180,185	89,868
Domestic Hot Water	213,510	55,475	158,035
TOTAL	1,281,395	655,556	625,839
CO ₂ /m ₂ per annum	293	150	143

Proposed New Initiatives in 2012-13 and Beyond

STRATEGIC REVIEW OF BUILDING MANAGEMENT SYSTEM (LARGE SITES)

During 2011-12 the Building Management Systems at SA Health's seven largest sites (excluding the Royal Adelaide Hospital) were subject to a strategic review and a report was prepared. The recommendations contained in this report are currently being worked through with some actions underway during 2012-13 and further planned for 2013-14.

REDEVELOPMENTS

Achievement of the full 30 per cent building energy efficiency target by 2020 (milestone of 25 per cent by 2014) will be largely contingent on the success of Health redevelopment projects which have ambitious energy efficiency targets.

- In addition to the four major metropolitan redevelopment projects there are a number of other smaller, but nonetheless significant projects at Berri, Ceduna, Whyalla, Port Lincoln Modbury and the Women's and Children's Hospital. Current estimates are that cumulatively these redevelopments will improve SA Health's energy efficiency by an additional 1.1 to 1.7 per cent by 2014.
- The four new GP Plus Healthcare Centres and GP Plus Super Clinics and the four new Intermediate Care Centres when completed are projected to improve SA Health's energy efficiency (as measured by MJ/m² per annum) by 0.5 per cent by 2014.
- In total SA Health programmed redevelopments (not including the New Royal Adelaide Hospital) when completed are calculated to deliver an additional improvement in SA Health energy efficiency baseline of somewhere between 5.1 and 8.2 per cent by 2014.

NEW ROYAL ADELAIDE HOSPITAL

The new Royal Adelaide Hospital (RAH) is forecast to produce between 40 and 45 per cent less CO₂ emissions per m² than the current Royal Adelaide Hospital site.

Key elements of the energy efficiency strategy for the new RAH include:

- A baseload trigeneration plant comprising of reciprocating engines connected to absorption chillers which will generate electricity and utilize waste heat to both heat and cool the facility. In addition to significantly reducing greenhouse emissions this system will also reduce peak demand by approximately 35 per cent and provide additional emergency generation capabilities.
- Use of renewable energy including solar PV and solar hot water.
- Extensive use of heat reclamation systems.
- Extensive daylighting, therefore reducing dependence on artificial lighting.

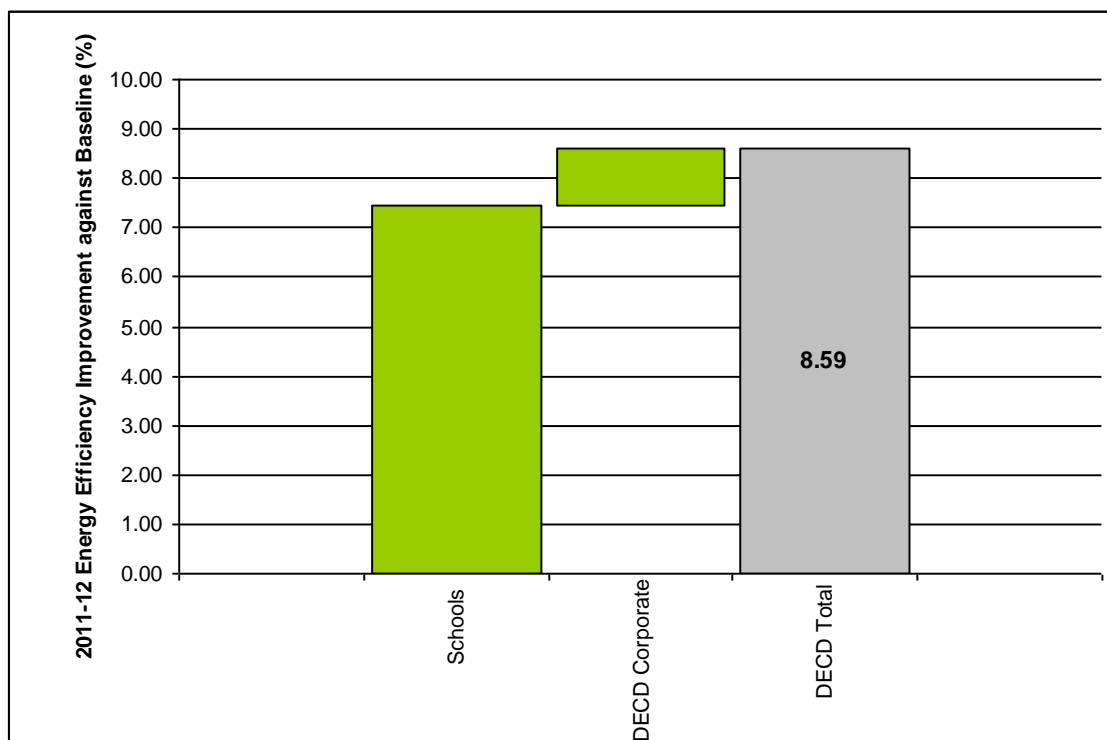
SA HEALTH LIGHTING UPGRADE PROGRAM

SA Health has made significant investments in lighting upgrades across 5 major metropolitan sites in recent years which have cumulatively reduced energy use by more than 15 000 GJ per annum and reduced annual energy cost by approximately \$750 000. The preferred solution generally adopted is replacing the existing twin-T8 iron-core ballasts fittings with a single high quality centred T8 tube, high performance reflector and warm start electronic ballast. This solution provides a 60 per cent reduction in energy use.

SA Health is currently working in consultation with DMITRE Energy Markets and Programs Division and the Department of Treasury and Finance in developing a business case for a proposed SA Health Multi-site Lighting Upgrade Project. The first stage of this project is currently scoped to have the potential to cost effectively reduce energy use by 22 600 GJ, which is equivalent to a 1.8 per cent reduction from SA Health's 2000-01 energy use baseline.

4.2 Department of Education and Child Development (DECD)

Figure 4.2.1: DECD Building Energy Efficiency Improvement, 2011-12 against Baseline



Overview of Performance to 2011-12

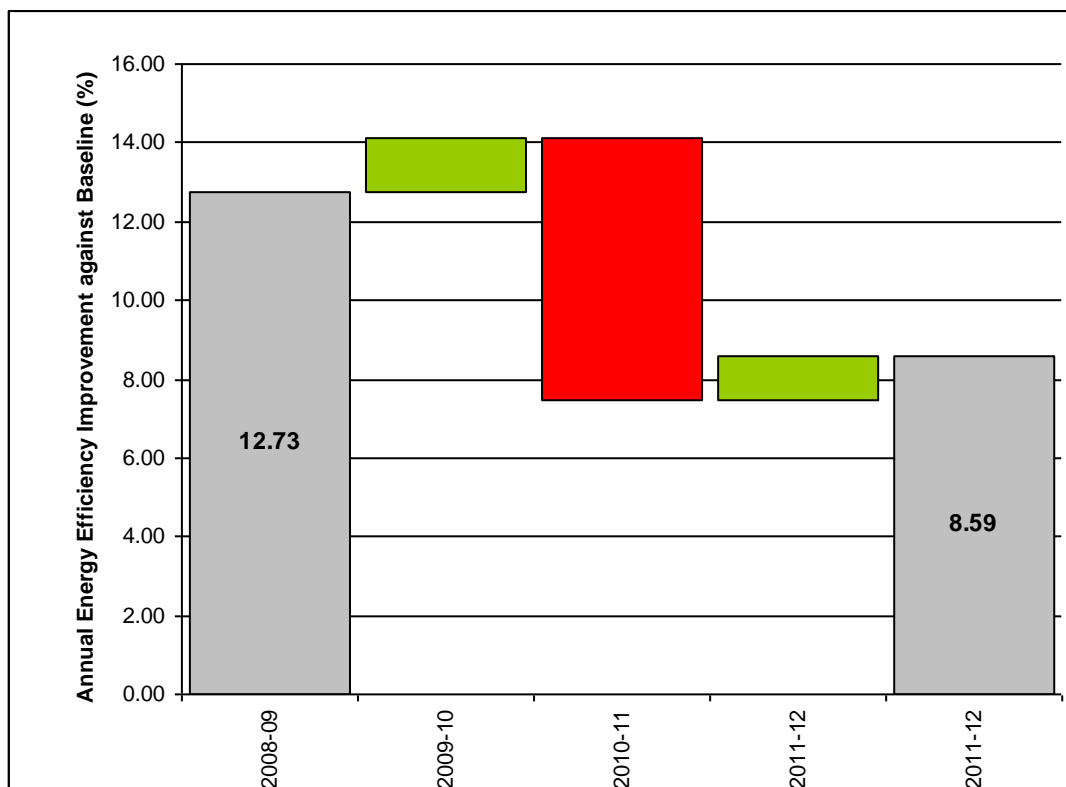
An improvement of 8.6 per cent since the 2000-01 baseline has been achieved by DECD in 2011-12. Schools (pre-school, primary and secondary schools) account for 97.8 per cent of the energy usage within DECD.

DECD accounts for 17.3 per cent of the overall government building energy use, and contributed approximately 1.5 per cent to the overall Government's energy efficiency improvement. Energy used includes electricity, natural gas and liquefied petroleum gas, and the business measure for DECD is area (m²).

A comprehensive audit of schools is being conducted, to improve the accuracy of the asset database. The update will include adding new buildings from the Building the Education Revolution (BER) projects and the removal and demolition of older, outdated facilities sites. The audit is expected to be completed by early 2013.

The annual trend for DECD, for 2008-09 to current, is shown below in Figure 4.2.2.

Figure 4.2.2: DECD Building Energy Efficiency Trend



Changes in Baseline and/or Subsequent Years' Energy Intensity Data

A slight baseline change occurred for the Corporate Office data for DECD, with the transfer of the Minister's office from DPC. A baseline change for the transfer of Families SA from DCSI will be completed in 2012-13.

A baseline change for 2009-10 data has been completed. Errors in the reporting system for data from non-electrical energy types (natural gas, heating oil and LPG) had been found that caused the underestimation of the 2009-10 data. Actual usage data was collated from invoices to correct the 2009-10 results and the reporting system has been improved over the past two reporting periods to ensure a more complete capture of the energy information. Following this work, the 18.1 per cent improvement for 2009-10 reported previously has been revised to 14.1 per cent.

Significant Energy Management Achievements

Key initiatives implemented by DECD during 2011-12 included:

AUSTRALIAN SUSTAINABLE SCHOOLS INITIATIVE IN SOUTH AUSTRALIA (AUSSI-SA)

AuSSI-SA is a joint initiative of the Department of Environment, Water and Natural Resources (DEWNR), via the South Australian Natural Resource Management Boards, and DECD. The initiative aims to support schools, staff, students and the broader community to develop whole of school and whole of community education for sustainability. Schools are encouraged to develop community knowledge, skills, values and behaviours to pursue sustainable practices and live sustainable lifestyles. The program utilises a range of resources to support education for sustainability in schools. One such resource is 'Sustainable and Attainable', a web based

climate change education resource that encourages action in energy, biodiversity, waste, water, transport and air quality. On the 'Sustainable and Attainable' website is a link to *Be Energy Smart* which is a 'do it yourself' student guide and practical auditing toolkit to support learning about energy systems and energy efficiency while learning how to take actions for sustainability. The kits are available for loan from local libraries, DECD and the NRM Education teams. 'Sustainable and Attainable' is available to all South Australian schools at www.sustainableschools.sa.edu.au/.

ENERGY MANAGEMENT GUIDE

The DECD Environmental Resources team has a variety of energy smart fact sheets and an Energy Management Guide for schools and preschools that are available on the Capital Programs and Asset Services website at www.decd.sa.gov.au/assetservices/.

DECD CENTRAL OFFICE

Central Office has met the milestone and overall South Australian Strategic Plan Target 61 to improve building energy efficiency 30 per cent by 2020. As a tenant, DECD is responsible for its light and power use. DECD Central Office staff continue to make good use of energy efficient lighting and management strategies, light sensors and timers in offices and meeting rooms to assist in reducing DECD corporate energy use.

NATIONAL SOLAR SCHOOLS PROGRAM

In July 2008 the National Solar Schools Program (NSSP) was launched enabling schools to apply for up to \$50 000 in funding for solar power systems, energy efficiency installations and rainwater tanks. From 01 July 2011 the Program was reduced by 2 years and now concludes in July 2013. In line with these changes, the NSSP Administrators allowed DECD to reduce the maximum eligible funding amount to \$30 000 to enable more schools to receive funding before completion of the program.

To date 274 DECD schools have completed sustainable projects through Round 1, Round 2, and Round 3 NSSP funding of \$10 million. A further 72 schools have been approved for the 2012-13 funding round (Round 4) (\$1.8 million). The capacity of these projects (based on project plan information) is shown below. A final tally of the total solar capacity will be completed following the final round, which may result in some minor adjustments to these numbers.

- 2010-11 PV capacity: 465 kW
- 2011-12 PV capacity: 193 kW
- 2012-13 PV capacity: 226 kW

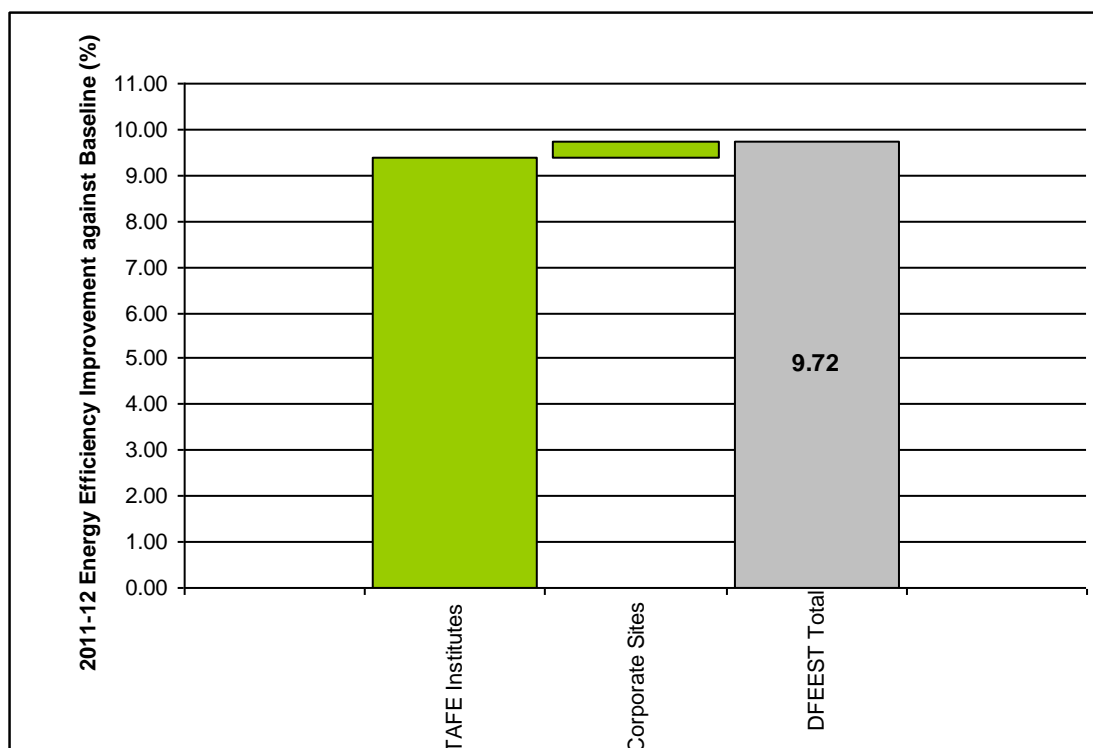
Proposed New Initiatives in 2012-13 and Beyond

DECD will continue to monitor and identify methods of improving energy efficiency across its corporate, school and preschool sites to assist with the progression towards energy efficiency targets and educational initiatives.

Energy consumption and management will be reviewed and monitored in mid-2013 for 16 schools that have had Energy Demand Management Systems installed. This will determine the financial savings achieved through load shedding.

4.3 Department of Further Education, Employment, Science and Technology (DFEEST)

Figure 4.3.1: DFEEST Building Energy Efficiency Improvement, 2011-12 against Baseline



Overview of Performance to 2011-12

DFEEST accounts for 6.8 per cent of the overall government building energy use. TAFE campuses account for 98.7 per cent of DFEEST's energy use.

DFEEST achieved a 10.5 per cent energy efficiency improvement from 2010-11 to 2011-12 (9.7 per cent from the 2000-01 baseline). The 9.7 per cent improvement over the 2000-01 baseline contributed approximately 0.7 per cent to the whole of Government 2011-12 energy efficiency result. The annual trend in energy efficiency from 2008-09 to 2011-12 is shown in Figure 4.3.2.

Overall, the department's recorded energy intensity of 345 MJ/m² for 2011-12 is slightly worse than the target⁸ of 311 MJ/m². However, there have been some good improvements at individual campuses. All three TAFE SA institutes have improved in energy efficiency compared to the previous year:

- South improved by 12.5 per cent;
- Regional improved by 11.5 per cent; and
- North improved by 8.7 per cent.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

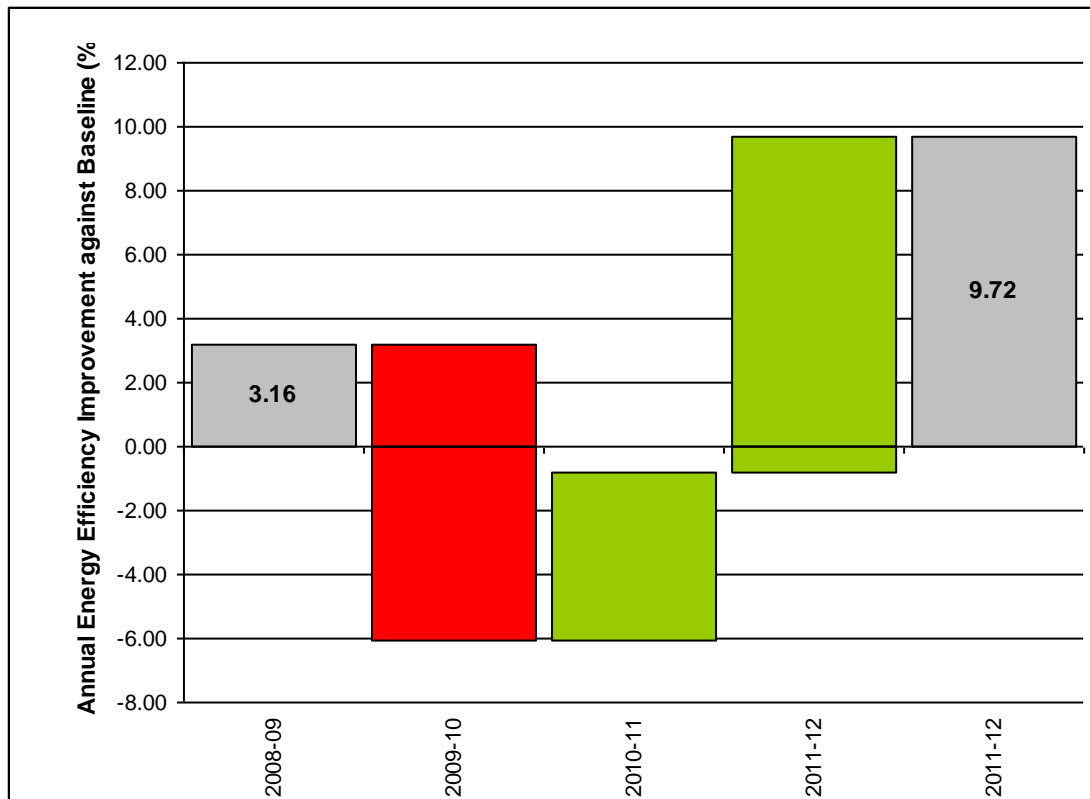
Nil.

⁸ Target based on linear progress from baseline in 2000-01 to 30 per cent improvement by 2020.

Figure 4.3.2: DFEEST Building Energy Efficiency Trend

Significant energy management achievements

Some of the energy efficiency initiatives pursued by DFEEST in 2011-12 are detailed below.



CORPORATE DFEEST INITIATIVES

DFEEST's occupation of the 5-star GreenStar rated City Central building at 11 Waymouth St consumed 7 per cent less energy compared to the previous reporting period. A number of initiatives contributed to this success:

- **Building Management Systems (BMS)**
City Central BMS is programmed to reduce the energy consumption by limiting the operating times for air conditioning, lighting and blind systems (CBUS control panel).
- **NABERS rating for DFEEST tenancy**
In June 2012 DFEEST undertook a NABERS energy rating for its 6-floor tenancy at City Central. A 5.5 star NABERS rating was awarded. Factors contributing to the high rating include the large open plan design, natural light penetration into the space, low energy lighting and the use of 20 per cent renewable electricity.
- **Awareness**
DFEEST has continued its ongoing campaign to raise staff awareness and change behaviours to achieve a more sustainable low carbon footprint.

TAFE SA ADELAIDE SOUTH INSTITUTE INITIATIVES

This Institute reduced its energy consumption by 8 per cent compared to the previous reporting period, equating to a 12.5 per cent improvement in energy efficiency. Initiatives undertaken include:

- reduction in operating hours during school holidays (institute now closes at 6:30pm unless required to stay open),
- programming of Building Management System (BMS) to limit operating times for air conditioning and lighting,
- decommissioning of part of the Panorama TAFE site.

TAFE SA REGIONAL INSTITUTE ACHIEVEMENTS

This Institute reduced its energy consumption by 10 per cent compared to the previous reporting period, equating to an 11.5 per cent improvement in energy efficiency. Initiatives undertaken include:

- Participation in the 'Carbon Challenge' initiative, which encourages the formation of campus based teams promoting energy efficiency actions such as turning off lights and computer monitors and raising awareness amongst all staff of the steps they can take to reduce energy use.
- Requirement for campuses to close at 6.00pm, with late night classes only occurring Monday to Wednesday, mostly via video conferencing, if necessary.
- Berri and Murray Bridge campuses:
 - Installation of reverse cycle split system air conditioners at Berri and Murray Bridge campuses to replace the old style evaporative systems and oil heaters. The split system units are also fitted with 2 hour timers to limit operating times.
- Mt Gambier campus:
 - Installation of 2 wind turbines at Mount Gambier campus, complementing an existing solar system. Both systems are being used as active educational tools as well as providing on-site power.
 - decommissioning and demolition of a small building in late 2011-12, as a result of the relocation of Engineering Programs from Naracoorte to Mt Gambier campus.
 - relocation of Engineering Programs from Millicent to Mt Gambier (this achieved only a modest reduction in energy consumption due to the subsequent lease of the workshop to the local high school)
- Port Augusta campus
 - Lighting upgrades, including installation of low lux or LED lights, particularly in workshops, and two hour timers in some parts of the campus.
 - Replacement of old faulty evaporative air conditioners and gas heating systems with more energy efficient units.
- Whyalla campus
 - Programming of Building Management System (BMS) to limit operating times for air conditioning and lighting.
 - Adjustments to timer on workshop air compressor to limit operating times.
 - Replacement of lighting with energy efficient globes where possible.
 - Reduced lighting in corridors where full lighting not required – within safe limits.

TAFE SA ADELAIDE NORTH INSTITUTE INITIATIVES

This Institute reduced its energy consumption by 8 per cent compared to the previous reporting period, equating to an 8.7 per cent improvement in energy efficiency. Initiatives undertaken include:

- Lighting – Rollout of low wattage LEDs for emergency lighting throughout all sites. Approximately 70 per cent of all emergency lighting has been replaced.
- Partial closure of Croydon campus and reprogramming of the BMS for vacant areas, resulting in less energy usage for the period.
- Decommissioning of part of Regency Campus following the departure of a third party tenant 'Fergusons', which utilised extensive freezer and cool rooms which consumed significant amounts of energy. The freezer equipment was shut down approximately a month prior to them vacating the site in July 2012.

Proposed New Initiatives in 2012-13 and Beyond

Initiatives planned for 2012-13

An upgraded sustainability website has been rolled out, providing information to staff on actions the individual can take to be more sustainable in the workplace

A series of sustainability awareness sessions will be delivered to staff to increase their knowledge of sustainability tools, strategies, principles and practices.

TAFE SA REGENCY CAMPUS

- Re-instatement of the existing Cogen Plant (November 2012) will generate electricity for the campus and will utilise waste heat for air conditioning systems. While this is likely to increase gas consumption, it is expected to further reduce electricity running costs for the campus.

TAFE SA BERRI CAMPUS

- Recent installation of a 10 kW solar system, complementing the existing 1.5 kW system at this campus.
- Installation of timers on workshop compressors to limit running time.

TAFE SA MURRAY BRIDGE CAMPUS –

- a 10 kW solar system has been installed and is anticipated to provide up to 18 per cent of the site's power demand.

Initiatives planned for beyond 2013:

The planned decommissioning of buildings from 4 TAFE SA campuses in preparation for the new Sustainable Industries Education Centre (SIEC) and Mining and Engineering Centre will reduce the overall building area and energy consumption of TAFE. Construction of the new \$120 million SIEC at the former Mitsubishi site has commenced and construction for the Mining and Engineering Centre commences early 2013. These projects will replace the ageing Panorama, O'Halloran Hill, Croydon and Marlestone TAFE Campuses.

The new SIEC will become the central point for building and construction training in South Australia and will promote sustainable building techniques.

Energy saving initiatives incorporated into the SIEC design include:

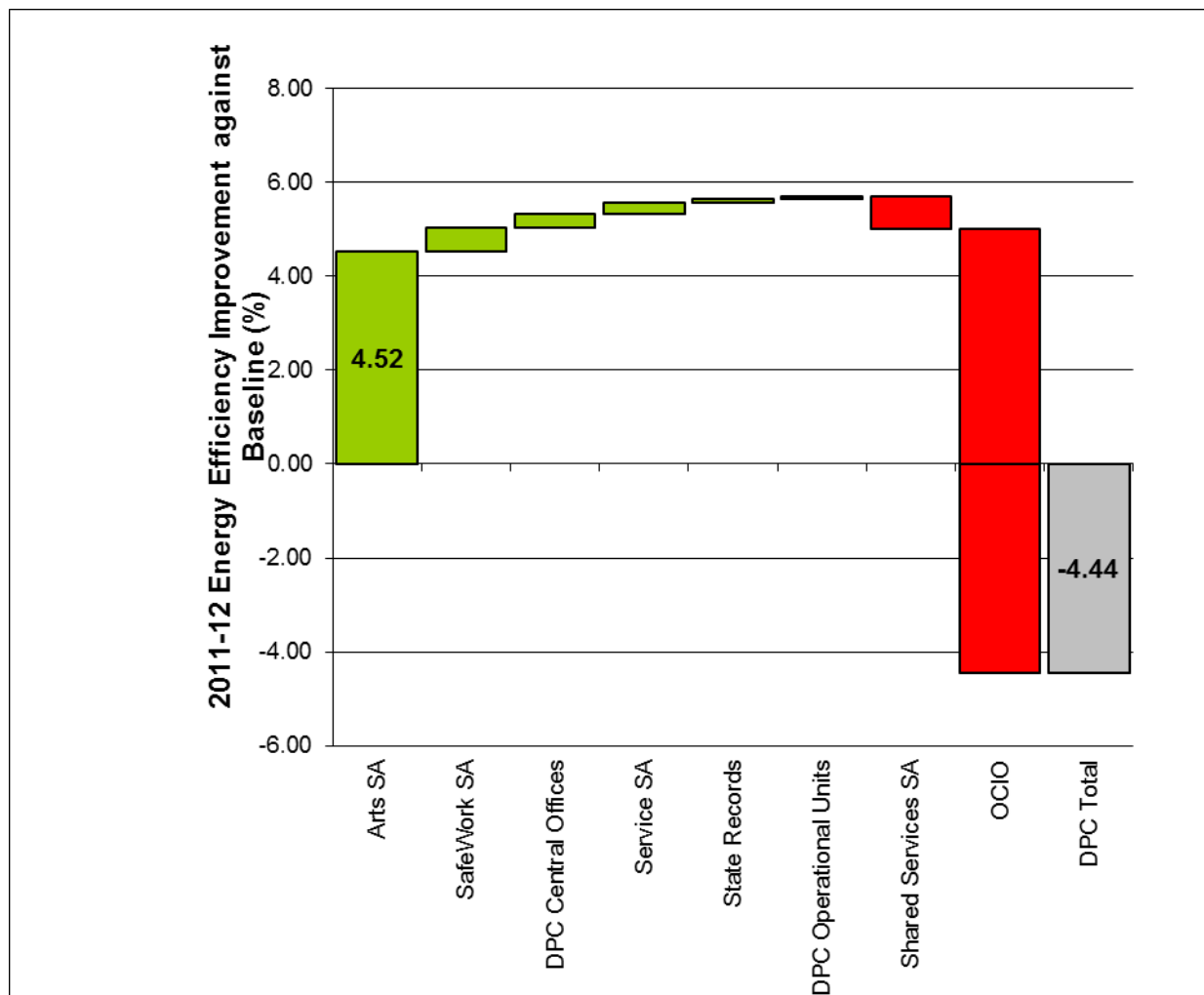
- Solar panels and wind turbines providing onsite power generation.
- Operable windows, to allow natural ventilation and reduce demand for mechanical cooling systems.
- Solar hot water systems.

The new Mining and Engineering Centre at TAFE SA Regency Campus incorporates the following energy-efficiency design features:

- Energy efficient indirect evaporative air conditioning and refurbished existing evaporative air conditioning for workshops and associated classrooms.
- Variable volume air conditioning with economy cycle for administration areas.
- Use of Cogen plant to power air conditioning systems.

4.4 Department of the Premier and Cabinet (DPC)

Figure 4.4.1: DPC Building Energy Efficiency Improvement, 2011-12 against Baseline.



Overview of Performance to 2011-12

Since 2000-01, DPC increased its energy intensity over the baseline, with a 4.4 per cent reduction in energy efficiency.

Significant baseline changes occurred for DPC with the government departmental restructures during 2011-12, as detailed below. The revised 2010-11 result for DPC was 0.4 per cent improvement over the 2000-01 baseline and the decline since 2010-11 is driven by;

- the inclusion of the Office of the Chief Information Officer (OCIO), and the significant number of energy intensive computer servers at the Glenside Hosting Facility
- Arts SA, which includes several public buildings and consumes 77.4 per cent of DPC overall building energy use.

Significant increases in electricity use were noted in the SA Film Corporation, the SA Museum and State Library, and a large increase in natural gas use was noted in the Adelaide Festival Centre:

- The SA Film Corporation moved to the larger Adelaide Studios site, the new centre for the State's film and television industry, which provides state of the art production facilities essential for the growth of South Australia's film industry.
- The SA Museum installed seven freezer containers for temporary storage of the Entomology collection while the build and installation of a storage system is conducted.
- The State Library increase appears to be weather driven, with a higher number of summer / autumn days over 30°C (65 days in 2011-12 compared to 48 days in 2010-11. While the milder than average 2012 winter contributed to lower energy use for most building types, the State Library requires constant air conditioning to maintain optimum temperature and humidity conditions, in order to preserve its collections.
- A large increase in natural gas usage was seen in the Adelaide Festival Centre due to the replacement of a failed boiler to provide adequate heating water to all plant throughout the centre. Prior to this, the centre had been operating under capacity for several years.

Although there was an overall increase in energy use at public sites, most also showed an increase in visitor numbers. The Art Gallery and Country Arts SA showed an improvement in energy use per visitor, and there was a marginal decline in efficiency at the remaining sites. Since the 2000/2001 baseline, DPC has steadily improved its energy use per visitor, achieving an overall reduction of 27%.

Within the DPC Operational Units, the Media Monitoring area made changes to operational procedures which reduced the use of multiple DVD, VHS and television equipment and almost halved their energy. Shared Services SA achieved a significant 20 per cent reduction in energy use for its highest use site, by improving maintenance and operation of the air conditioning units, and completing the server virtualisation project.

DPC consumes 6.0 per cent of the total government building energy use, reducing the overall Government's building energy efficiency by 0.3 per cent.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

During 2011-12 there were a number of departmental restructures. With these DPC received:

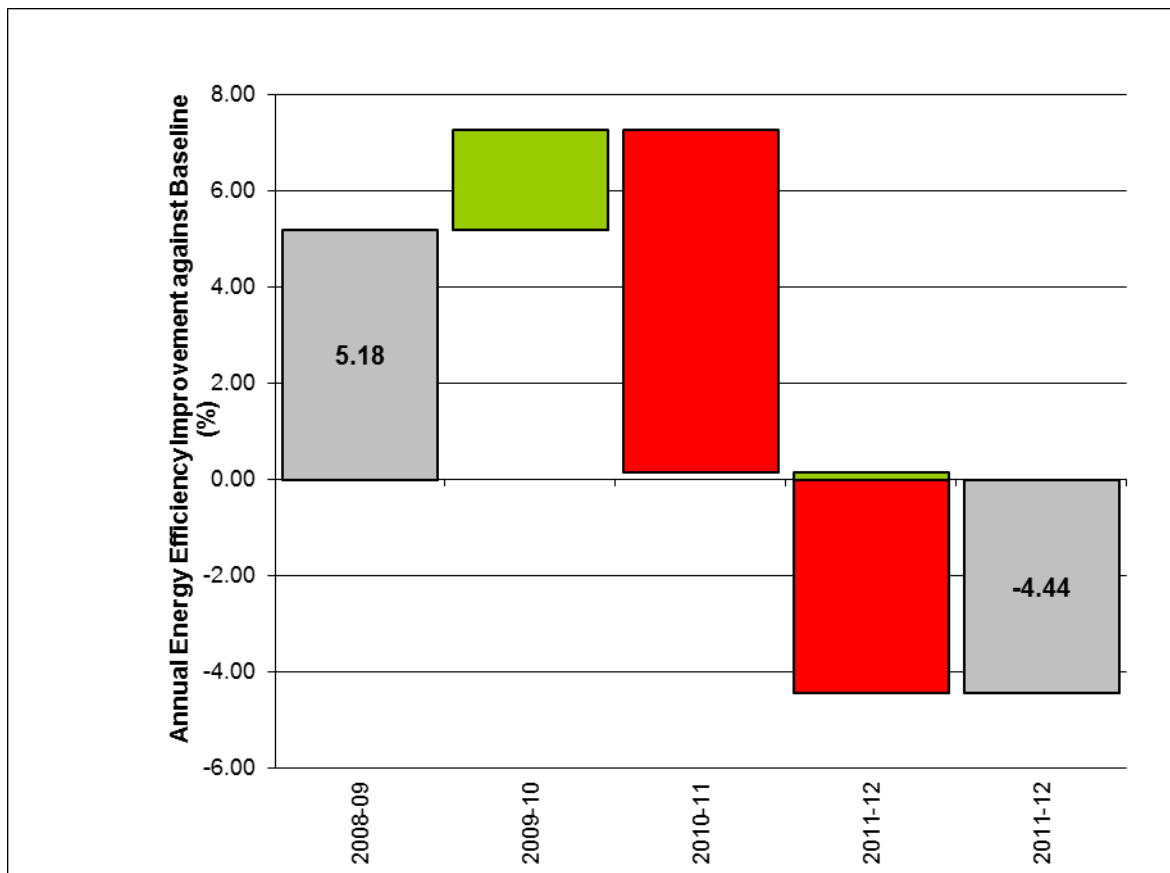
- Shared Services SA from DTF,
- Service SA and OCIO from DPTI, including the transfer of the Glenside Hosting Facility from DPTI to OCIO,
- the Economic and State Development Policy sections from DTED, and
- the Local Government section from the former DPLG.

There were also transfers from DPC to other departments:

- the office of the former Aboriginal Affairs Minister transferred to DECD, and
- the Sustainability and Climate Change Division transferred to DENR.

OSCAR data has been revised for these changes, from the baseline 2000-01 to the current year.

Figure 4.4.2: DPC Building Energy Efficiency Trend



Significant Energy Management Achievements

Smart meters and data loggers were installed in sites on the North Terrace Arts precinct, to ensure the reporting of actual data for consumption and electricity costs for each site. This will overcome the limitations of shared meters across the precinct, and is expected to:

- significantly improve the ability to monitor actual energy use for each site;
- identify spikes and problems in real time;
- assist with identifying potential energy savings; and
- measure the real impact of energy saving initiatives.

Three of these sites were within the top five major energy users in DPC in 2011-12.

Following the positive results in energy efficiency and improved operational performance from trialling the Envirotamp additive to the air conditioner at the SafeWork SA (SWSA) Port Pirie office, the air conditioner at SWSA Whyalla was also treated. Negotiations were completed with the DPTI building manager for an independently monitored trial in two of the air conditioning units at Government House, which commenced in July 2012.

Energy use assessments were completed for OCIO's Flinders Telecommunications Hub and the Glenside Hosting Facility. These included a data centre industry standard calculation of energy efficiency and a range of recommendations for improving efficiency. Some recommendations have been scheduled for implementation within the 2012-13 capital works program.

Energy efficiency works completed in 2011-12:

- Implementation of LED lamp technology to replace T5 fluorescent lighting in the Glenside Hosting Facility's data hall, where lights must remain on. The LED lamps are approximately five times more efficient than fluorescent lighting.
- A pilot of 'cold-aisle containment' in the Flinders Telecommunications Hub. Cold-aisle containment uses physical barriers to separate hot and cold air-flows within a data centre, thereby driving greater efficiency from the process cooling systems and resulting in reduced electrical consumption.
- Halogen lamps in the Adelaide Festival Function Centre were replaced by energy efficient LED fittings
- The SA Museum installed timers on geological laboratory equipment and on public gallery screens/monitors to match operation with opening hours.
- A zip hydroboil unit was installed in the State Administration Centre site to be occupied by the SWSA Library.
- Several low energy rated refrigerators were replaced in the central offices, and the rationalisation of printers, copiers, fax machines and scanners continued.

An air conditioning upgrade commenced at the South Australian Maritime Museum, and will be completed in 2012-13.

Proposed New Initiatives in 2012-13 and Beyond

The 2012-13 State Budget included a commitment of \$7.652 million over three years to undertake building works at the Adelaide Festival Centre and Her Majesty's Theatre. The scope of work related to energy efficiency will address electrical switchboards and air conditioning systems, and is expected to commence in April 2013. A full redevelopment bid for the Adelaide Festival Centre will be resubmitted for the 2013-14 budget process.

Several projects have been scoped for implementation in 2012-13:

- A T5 lighting upgrade within the Shared Services SA's Wakefield House tenancy is expected to be completed in early 2012-13.
- Installation of additional electrical metering at both the Flinders Telecommunications Hub and the Glenside Hosting Facility is planned and will enable more accurate metrics on the power consumed by data centre electrical loads, separate from the host building electrical loads. This will enable greater accuracy in measuring and validating the benefits of future efficiency initiatives.
- Further cold-aisle containment is planned for the Flinders Telecommunication Hub and the Glenside Hosting Facility.

Energy efficiency works to be progressed for possible implementation in 2012-13 include:

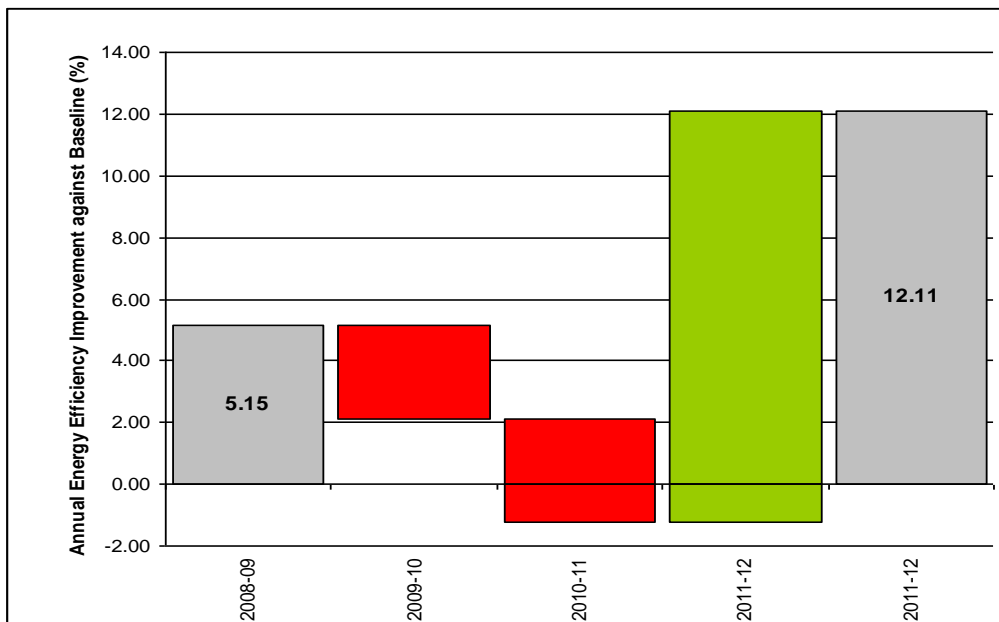
- Projects for the Art Gallery of South Australia, SA Museum and the State Library of South Australia, for implementation in 2012-13 or for developing a budget bid for 2013-14.
- Development of a business case for replacing four old, inefficient and high use air conditioning units at the State Records Gepps Cross facility and research of options for installing solar panels at the site.
- Further roll out of the Envirotemp product for improving the operation and efficiency of air conditioning systems, based on the findings of the independent trial.

- Investigation and installation of motion sensors in toilets in office and public buildings.
- The effectiveness of 48 digital timers recently installed on equipment in office and public sites across DPC will be reviewed. The initiative will be expanded if the results are positive.
- Finalise arrangements for the provision of green printing reports to business managers, to monitor paper and energy use and to identify potential energy savings.

DPC will continue to review settings for ICT equipment across the department to ensure optimal energy efficiency defaults have been applied, and will continue to realise opportunities for rationalisation of printers, copiers, scanners and fax machines.

4.5 Correctional Services (CS)

Figure 4.5: CS Building Energy Efficiency Trend



Overview of Performance to 2011-12

CS achieved an improvement of 12.1 per cent over the baseline. The significant improvement in efficiency in 2011-12 is driven both by reduced energy use (natural gas usage in particular was lower at Yatala due to the kitchen being offline for refurbishment for approximately 6 months) and an increase in area (a new cell block was constructed at Port Augusta prison, whilst energy usage remained fairly constant).

CS consumed 3.5 per cent of the total Government building energy usage, and contributed approximately 0.42 per cent to the overall Government building energy efficiency improvement.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Nil.

Significant Energy Management Achievements

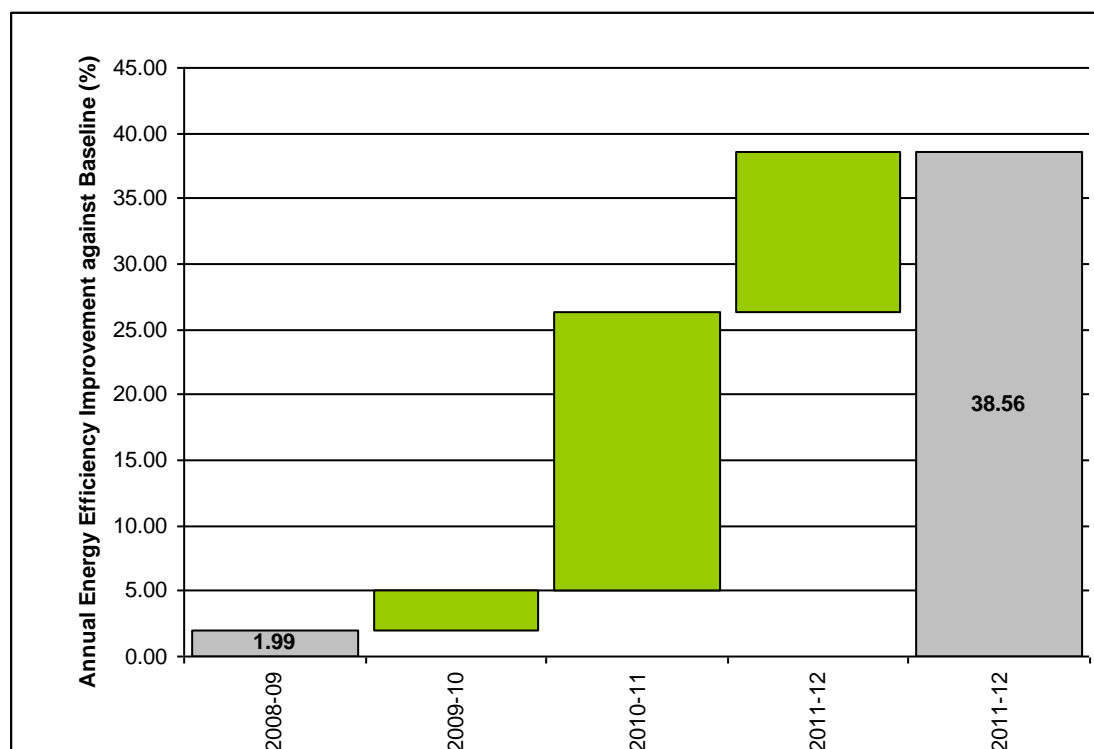
- The construction of a new cell block at Port Augusta Prison, which included energy efficient lighting and air conditioning.
- Replacement of the hot water system at the Adelaide Remand Centre, which delivered reductions in gas usage compared with the original system.

Proposed New Initiatives in 2012-13 and Beyond

- Construction of new facilities at Mount Gambier, Yatala Labour Prison and the Adelaide Women's Prison, which will include energy efficient lighting.
- A trial of alternative lighting to determine future lighting replacement strategies.

4.6 South Australian Police (SAPOL)

Figure 4.6: SAPOL Building Energy Efficiency Trend



Overview of Performance to 2011-12

SAPOL achieved an improvement of 38.6 per cent over the baseline in 2011-12. This is a further improvement of 12.2 per cent from 2010-11. The main factor driving improved energy efficiency is the new 5 star NABERS Rated headquarters, which use approximately 75% less energy than the previous headquarters building. In addition to energy efficient lighting, air conditioning and office equipment, a focus on staff education and behavioural change has resulted in a higher than expected tenancy rating. Further details on energy savings initiatives, including the CitySwitch 'New Signatory of the Year' award in 2012 can be found below.

SAPOL consumed 3.5 per cent of the total building energy usage in Government and contributed 1.3 per cent to the Government's overall energy efficiency improvement.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Nil.

Significant Energy Management Achievements

CITYSWITCH AWARD

SAPOL was awarded the CitySwitch New Signatory of the Year in the >2000 m² category for the new Police Headquarters building in December 2012. CitySwitch is a national body established to promote and encourage organisations to reduce energy consumption in office buildings by implementing environmentally friendly initiatives and encouraging building tenants to be more environmentally aware.

In addition to the base building, the building tenancy also achieved a 5 Star NABERS rating for energy efficiency, with more efficiencies identified for next year's NABERS assessment.

Active monitoring and fine-tuning during commissioning has realised the significant reductions in energy use and expenditure able to be achieved in a new building. An independent NABERS rating has confirmed these savings, and ongoing efforts are being made to communicate the benefits of this proactive approach to staff in smaller SAPOL tenancies across the state.

SAPOL will continue to be actively involved in improving environmental outcomes across the portfolio as part of its commitment to environmental sustainability and good corporate governance.

Consideration of greening opportunities and a focus on environmentally sustainable design has been an important objective across the asset base with sustainable design now factored into all new building initiatives.

The new Roxby Downs police station utilises passive design principles, energy efficient lighting and air conditioning systems and electricity sub metering. These design features have also been incorporated into 3 new facilities in the APY Lands (Amata, Pukatja and Mimili). Buildings have been designed to suit the extreme temperature range at these sites (0 - 55°C), with thermal insulation, the use of shade structures to complement tailored air conditioning solutions, and reversible ceiling fans.

Proposed New Initiatives in 2012-13 and Beyond

SAPOL is currently developing a strategy for the use of solar panels that meet stringent criteria to ensure maximum environmental benefit and reasonable payback periods. A test site has been established and data collected and analysed to further hone the process. If successful, further sites will be considered.

Historically, Police Headquarters has been the most energy intensive site in SAPOL. Energy usage within the new 5 Star building can now be monitored and managed right down to individual floor level. SAPOL has established energy targets and monitor energy usage to deliver energy and financial savings to the agency.

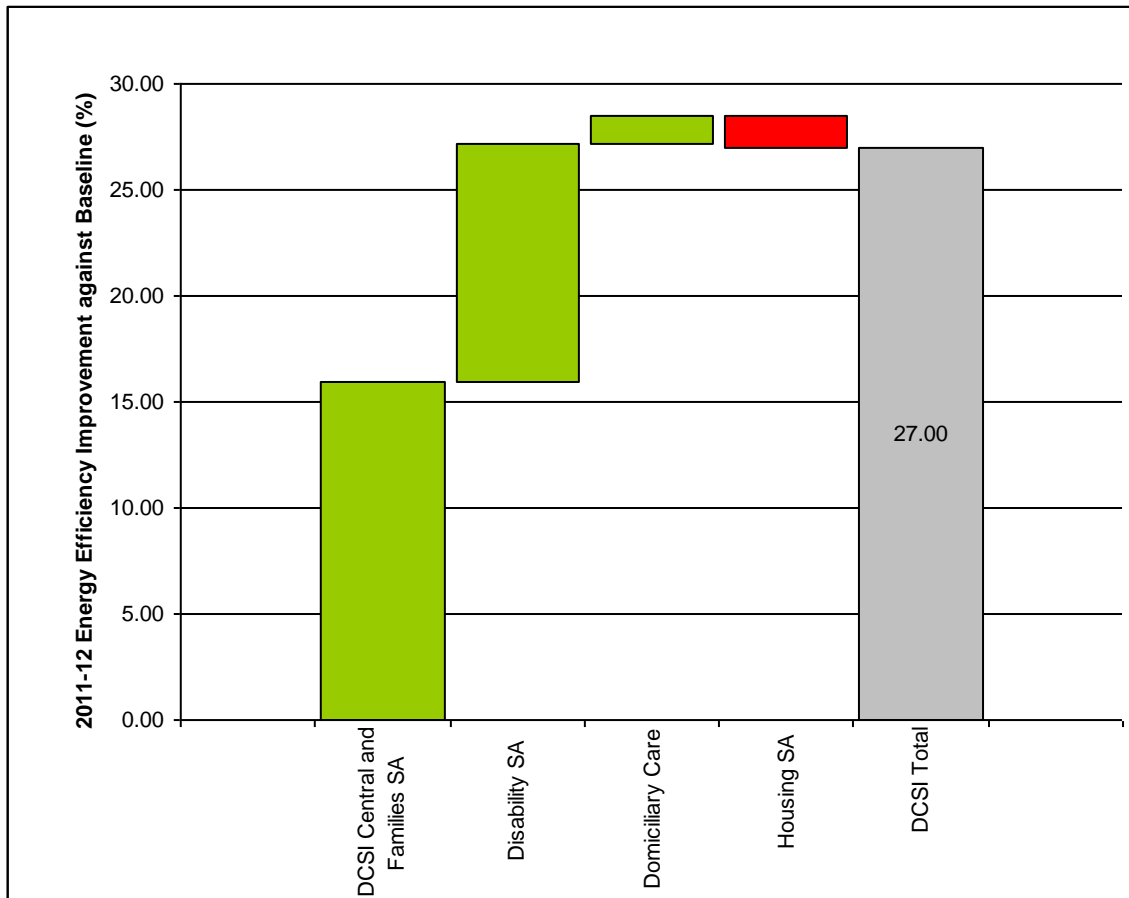
SAPOL has built a replacement station at Murray Bridge which incorporates energy saving features such as energy efficient air conditioning and lighting, solar hot water and power, and a Building Management System programmed to limit the operating times of appliances and systems when not in use.

A new Road Safety School has been built, with solar hot water and power and energy efficient lighting and air conditioning. The New Police Academy will also incorporate significant energy and environmental initiatives.

Each of the above initiatives are anticipated to deliver energy efficiency improvements throughout the 2012-13 reporting period.

4.7 Department for Communities and Social Inclusion (DCSI)

Figure 4.7.1: DCSI Building Energy Efficiency Improvement, 2011-12 against Baseline.



Overview of Performance to 2011-12

DCSI maintained an improvement of 27.0 per cent in 2011-12 compared to the 2000-01 baseline. This surpasses the SASP T61 milestone of 25 per cent improvement ahead of the 2014 milestone date.

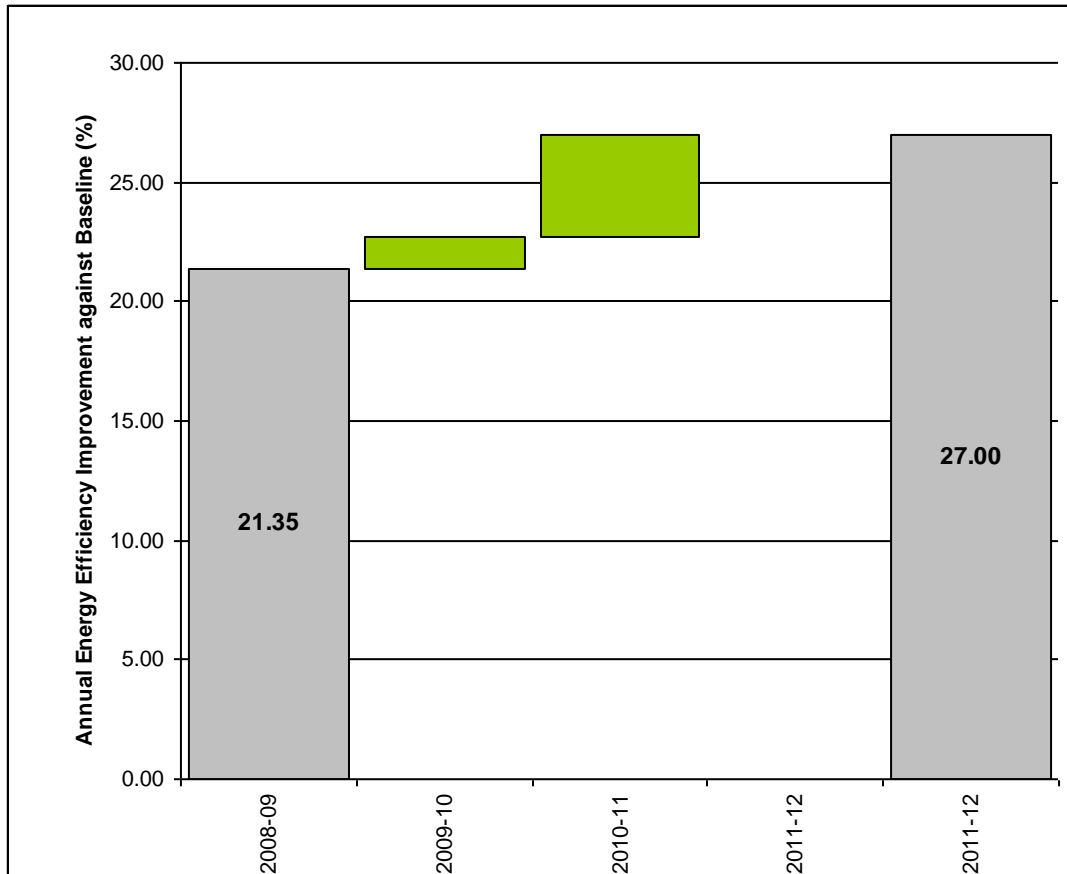
The DCSI consumes 2.8 per cent of the overall government building energy use and contributed approximately 0.8 per cent to the whole of Government building energy efficiency result.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Nil.

As a result of the machinery of government changes, Families SA transferred to DECD with effect on 1 January 2012. Although the official transfer was on this date, the department continued to supply some services to Families SA until 30 June 2012. The performance statistics related to Families SA are included in the DCSI 2011-12 OSCAR data due to the difficulty of excluding this activity.

Figure 4.8.2: DCSI Building Energy Efficiency Trend



Note – An improvement over the baseline of 27.0 per cent was achieved in both 2010-11 and 2011-12, therefore no step change is seen on this graph for 2011-12.

Significant Energy Management Achievements

In 2011-12, a number of ongoing programs to improve energy efficiency continue to be implemented:

GREENING DCSI PROGRAM

- The Greening Ambassadors Program was launched during 2010-11. The program involves joining individuals with an interest in environmental sustainability to foster ideas for efficiencies and spread Greening efforts across the department.
- DCSI has become a vibrant member of member of the Adelaide City Switch Program which is committed to promoting sustainability in buildings throughout the Adelaide CBD. The DCSI Riverside Tenancy won the CitySwitch Signatory of the Year in the over 2000 square metres category for the second year running in November 2011.
- DCSI achieved a NABERS tenancy energy rating on its Riverside tenancy of 4.5 Stars. This has set a benchmark 'score' for energy efficiency that can be used to monitor the success of energy saving initiatives in the future.
- During 2011-12 DCSI continued to initiate and implement greening and sustainability standards and benchmarks throughout all DCSI Offices and sites.

PRINT CONSOLIDATION PROGRAM

In 2007, DCSI commenced removing unnecessary print devices from office and commercial spaces, and consolidated those that remained. This five-year program is being rolled out across all sites and divisions, with 3 divisions participating so far, namely: DCSI Corporate, Housing SA and Disability SA. Significant financial savings and reductions in environmental impacts have been achieved as a result. They are summarised below:

- Printers reduced from 778 to 340 (56.3 per cent reduction).
- Total cost of owning⁹ printing devices reduced by approximately \$2.02 million.
- CO₂ emissions have been reduced by 151 tonnes per annum.

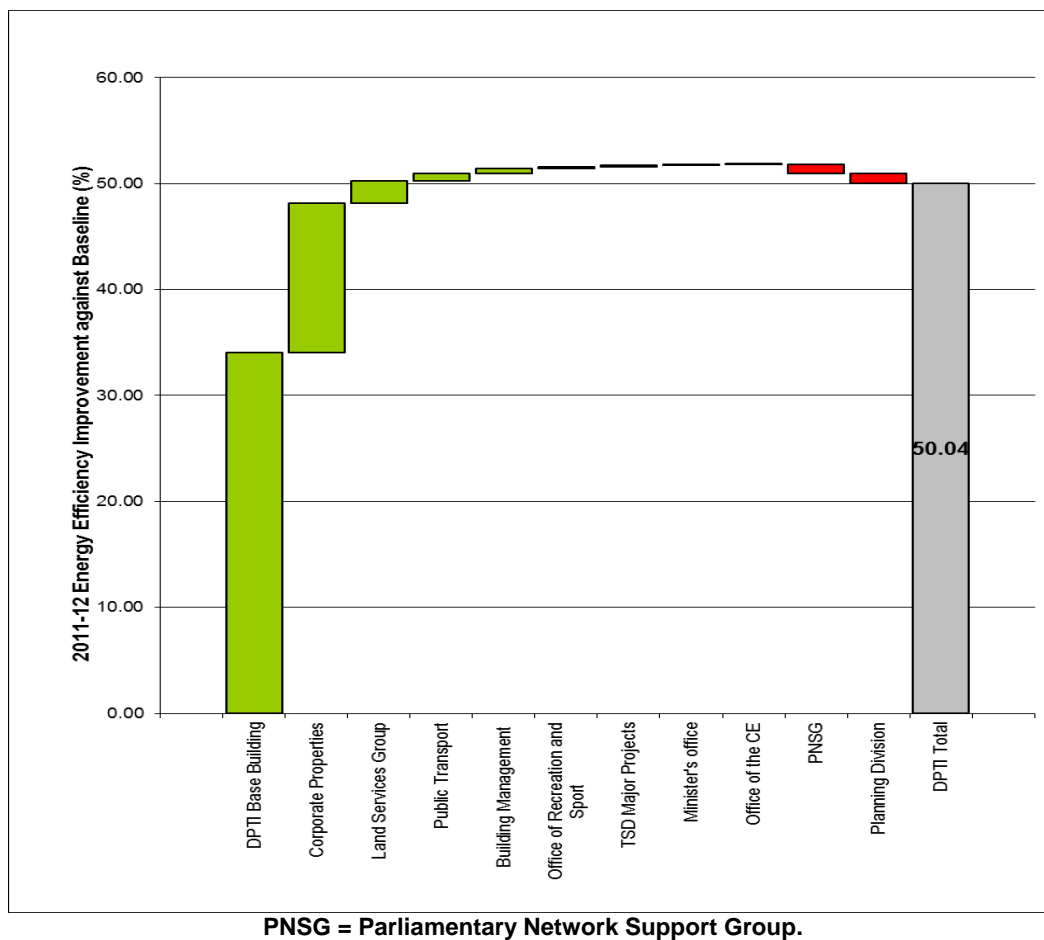
Proposed New Initiatives in 2012-13 and Beyond

- In 2012-13, DCSI will continue to improve energy efficiencies from the DCSI energy baseline created in 2000-01.
- In 2012-13, the target of 60 print devices will have been achieved In Riverside Centre through the Print Device Consolidation Program. This will be the benchmark ratio of staff to devices across Housing SA, Disability Services, Corporate Services and Domiciliary SA.
- DCSI will continue to match Greening Action Plan targets, goals and operations outlined in the Greening of Government Operations (GoGO) Framework and initiate and implement greening standards and benchmarks throughout all DFC offices and sites.
- DCSI will continue to be a vibrant member of the Adelaide City Switch Program which is committed to promoting sustainability in buildings throughout the CBD.

⁹ Total Cost of Ownership (TCO) defined as: Capital cost plus operating cost (i.e. toner & consumables) plus warranty / maintenance cost over a five year device lifecycle.

4.8 Department of Planning, Transport and Infrastructure (DPTI)

Figure 4.8.1: DPTI Building Energy Efficiency Improvement, 2011-12 against Baseline.



Overview of Performance to 2011-12

DPTI improved its energy efficiency by 50.0 per cent over the 2000-01 baseline during 2011-12.

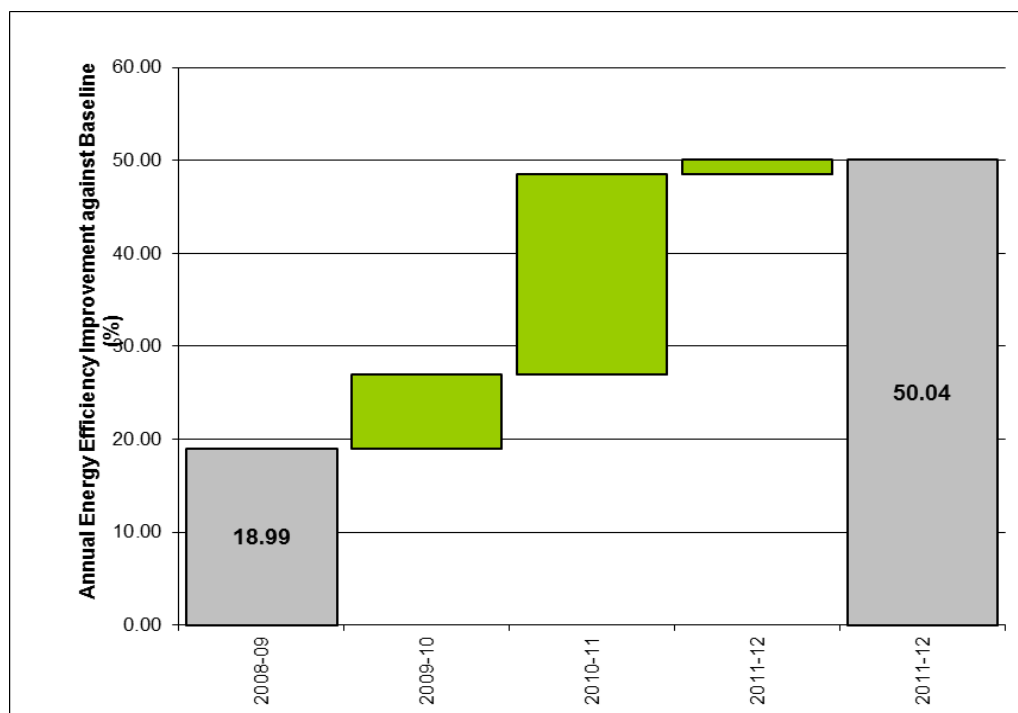
DPTI consumed 2.6 per cent of the overall government building energy, with an estimated 1.3 per cent contribution to the Government building energy efficiency result.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Machinery of Government changes have resulted in the following baseline changes:

- the Energy Markets and Programs Division of DPTI transferred to DMITRE;
- the OCIO and Shared Services transferred from DPTI to DPC, and
- the Planning Division of the former DPLG transferred to DPTI.

Figure 4.8.2: DPTI Building Energy Efficiency Trend



Significant Energy Management Achievements:

ASSET MANAGEMENT

- New roof insulation installed in the main administration building at 1 Wright Road, Walkley Heights.
- Window mounted air conditioners replaced with efficient air conditioners in Building 17 at 1 Bridge Road, Walkley Heights;
- Commenced air conditioning upgrade, including replacement of the gas boiler at 28 Vaughan Terrace, Berri.
- Ceiling upgrade at 28 Vaughan Terrace, Berri incorporating new T5 fluorescent tubes.
- Upgrade of one lift completed at Holden Hill Police Station.
- Upgrade to T5 fluorescent tubes and installation of lighting sensors at Netley Commercial Park.
- Upgrade to T5 fluorescent tubes at 5 El Alamein Rd, Port Augusta completed.
- Installation of a light management system in Wakefield House completed.
- Installation of a 21kW solar panel system on the Adelaide Railway Station rooftop.
- Boilers in Wakefield House and the Forensic Science Building replaced with modern energy efficient boilers.
- Air conditioning system serving the retail tenants in the Adelaide Railway Station underpass separated from the central plant to gain energy efficiencies.
- Modification of the air handling units on all floors of Wakefield House which is expected to deliver approximately 16% reduction in energy consumption.
- Annual NABERS ratings undertaken on all rateable buildings greater than 2 000 m².
- Upgrade of the lighting system at 136 North Terrace, Adelaide commenced.

LEASE MANAGEMENT

- When seeking new or renewed leases for offices with areas greater than 2 000 m², it is a requirement for building owners to disclose the base building NABERS Energy rating; this is addressed when market calls for leased space are sought from private sector building owners. Existing buildings with a NABERS rating greater than 4.5 stars and new buildings with a NABERS rating greater than 5 stars are given preference when leasing options are being considered.
- DPTI encourages all agencies to seek to achieve and maintain a 5 Star Green Star Tenancy rating over the term of leases for office areas greater than 2 000 m² where new fitouts are constructed for both government owned and leased office accommodation.
- The following leases that commenced in 2011-12 have achieved or are projected to achieve a minimum 4.5 Star NABERS Energy rating for the base building:

Location	Department	NLA
100 Angas Street	SAPOL	18 900 m ²
99 Gawler Place	DHA- Country Health	1 550 m ²
101 Grenfell Street	DEWNR (formerly DFW)	815 m ²

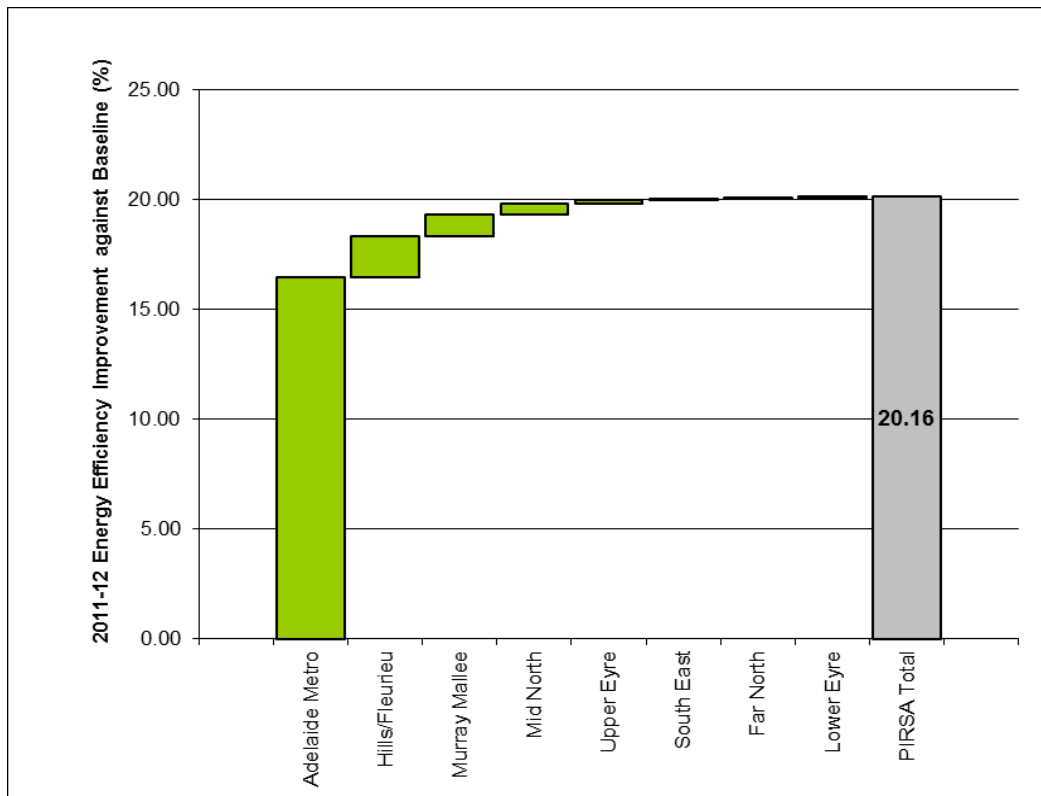
- Fifty three per cent of Government's leased and owned office accommodation in the CBD has a base building NABERS Energy rating or 4 Stars or greater, distributed as follows:
 - 24 per cent (15 leases) - 5.0 star rating
 - 15 per cent (12 leases) - 4.5 star rating
 - 15 per cent (18 leases) - 4.0 star rating
- DPTI incorporates financial penalties in leases should a NABERS rating not be achieved/maintained.

Proposed New Initiatives in 2012-13 and Beyond

- Implement recommendations identified in the energy audit for 136 North Terrace, Adelaide to achieve a 10 per cent savings target.
- Replace escalators at 136 North Terrace, Adelaide with energy efficient plant.
- Upgrade air conditioning plant and equipment at Holden Hill Police Station.
- Complete the lift upgrade at Holden Hill Police Station.
- Regularly update NABERS ratings in Government owned assets with a net lettable area greater than 2 000 m².
- Ongoing commitment to improve sustainability outcomes through the inclusion of green lease clauses in all new leases or lease renewals where possible to do so.
- Installation of 'Climate Wizard' technology in the air conditioning system in Building 3 at Netley Commercial Park to potentially reduce energy consumption.

4.9 Primary Industries and Regions SA (PIRSA)

Figure 4.9.1: PIRSA Building Energy Efficiency Improvement, 2011-12 against Baseline.



Overview of Performance to 2011-12

During 2011-12, PIRSA achieved an overall weighted improvement of 20.2 per cent, compared to the 2000-01 baseline. This is an improvement of 2.6 per cent above 2010-11 (after baseline adjustments as described below).

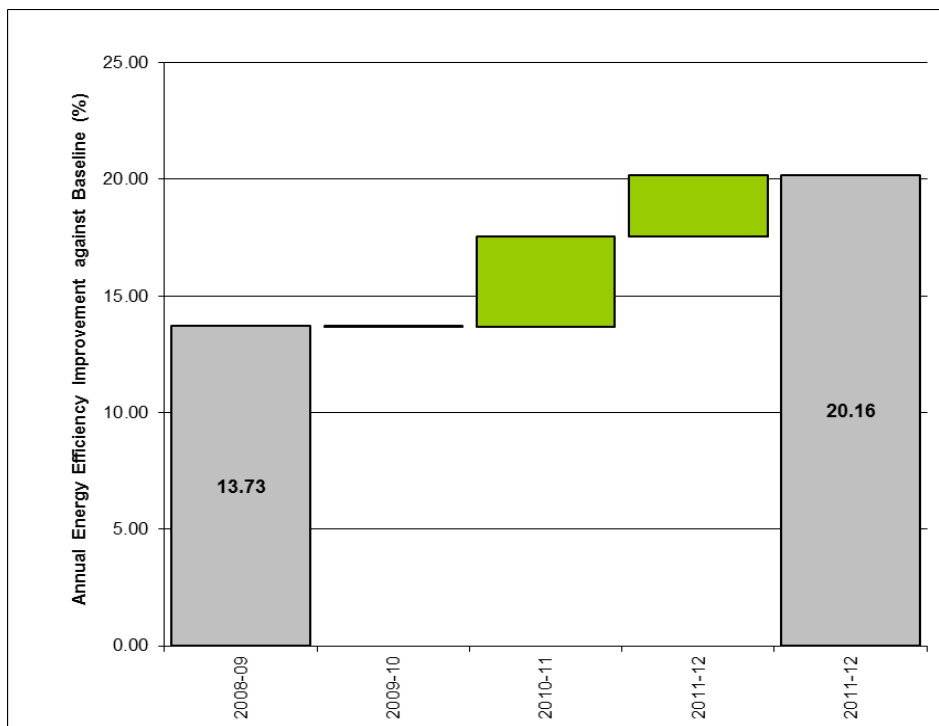
All regions except Adelaide Metro and Lower Eyre achieved more than the 30 per cent target. As the Adelaide Metro area (in particular the Waite Plant Research Centre) uses 93.5 per cent of the total building energy consumed by PIRSA, its 17.6 per cent result significantly influences the weighted energy efficiency improvement of the overall department. The annual trend of PIRSA efficiency improvements from 2008-09 to 2011-12 are shown below in Figure 4.9.2.

PIRSA consumed 2.4 per cent of the overall government building energy use and contributed approximately 0.5 per cent to the overall government target.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Machinery of Government changes have resulted in the transfer of Mineral Resources and Energy Resources sites from PIRSA to DMITRE.

Figure 4.9.2: PIRSA Building Energy Efficiency Trend



Significant Energy Management Achievements

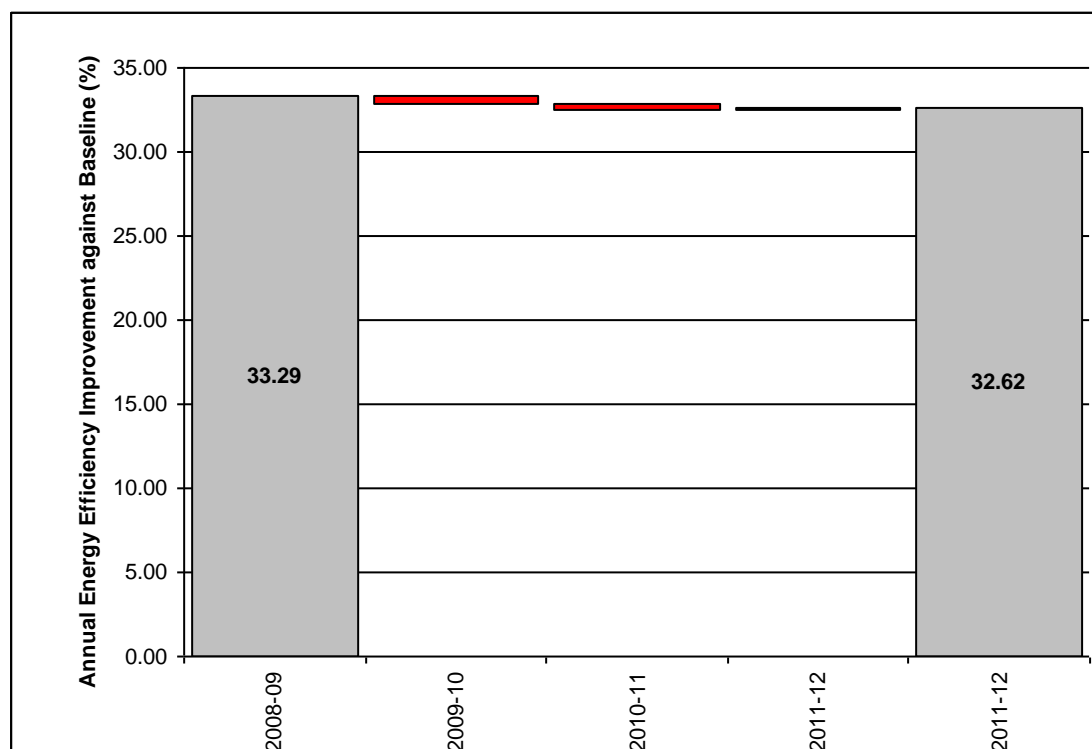
- Review of PIRSA leased sites in regional areas has led to the closure of some sites and a consolidation of staff in other regions, resulting in improved efficiency.
- Installation of energy efficient T5 lighting in refurbished area as projects arise at
 - Waite (Plant Research Centre);
 - Glenside (Bio Security); and
 - West Beach (Aquatic Sciences).
- Continue to utilise T5 lighting for all building refits.

Proposed New Initiatives in 2012-13

- New air conditioning system being installed at the Glenside Bio-security site, in addition to the installation of more T5 lighting.

4.10 Court's Administrative Authority (CAA)

Figure 4.10: CAA Building Energy Efficiency Trend



Overview of Performance to 2011-12

CAA maintained an improvement of 32.6 per cent over the baseline, in 2011-12. Overall CAA consumed 1.3 per cent of the total building energy usage in government in 2011-12, contributing 0.4 to the Government building energy efficiency result.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Minor errors were found in the 2011-12 data file, which led to an adjustment of the 2010-11 data file also. Overall, these corrections resulted in a 0.5 per cent reduction in natural gas consumption, and 0.3 per cent increase in electricity consumption for 2010-11.

Significant Energy Management Achievements

- CAA replaced the second of three chillers with a more energy efficient unit at the Sir Samuel Way Building.
- CAA commenced a project to replace the outdated air conditioning to Jeffcott Chambers with a more efficient unit.

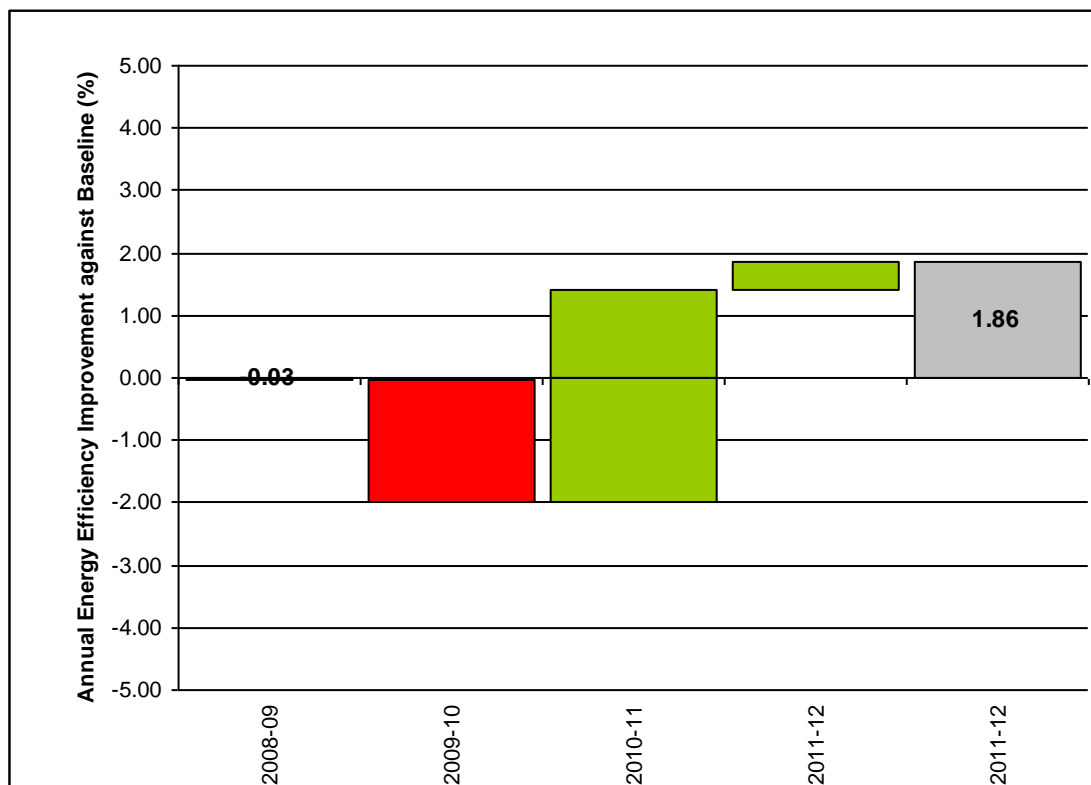
Proposed New Initiatives in 2012-13 and Beyond

- CAA to complete the replacement of the outdated air conditioning to Jeffcott Chambers with a more efficient unit.

4.11 South Australian Fire and Emergency Services Commission (SAFECOM)

The South Australian Fire and Emergency Services Commission (SAFECOM) is the agency responsible for supporting the Country Fire Service (CFS), Metropolitan Fire Service (MFS) and the State Emergency Service (SES).

Figure 4.11: SAFECOM Building Energy Efficiency Trend



Overview of Performance to 2011-12

As 2011-12 energy and business measure data for CFS, SES and SAFECOM was not available, data from 2010-11 has been used as an estimate. Accurate and complete data could not be provided, due to the large number of individual sites (approximately 800) and varied data formats. Review of the individual invoices (approximately 3000 for 2011-12) was deemed an inefficient use of resources, however an assessment will be coordinated during 2012-13 to identify how this information can be obtained in the future.

Separate MFS data was provided for 2011-12, showing an improvement of 21.3 per cent over the baseline. This is a small increase from the 2010-11 improvement of 20.4 per cent over the baseline.

Overall it is estimated that SAFECOM achieved a 1.9 per cent improvement in efficiency, driven by the MFS improvements. SAFECOM consumed 1.0 per cent of the government's total energy and contributed approximately 0.02 per cent to the whole of government energy efficiency result.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Revision of the MFS 2010-11 energy figures, splitting natural gas and electricity fuel types, uncovered a data error, and the revised data shows a 6.0 per cent increase in 2010-11 compared to the previous year.

Significant Energy Management Achievements

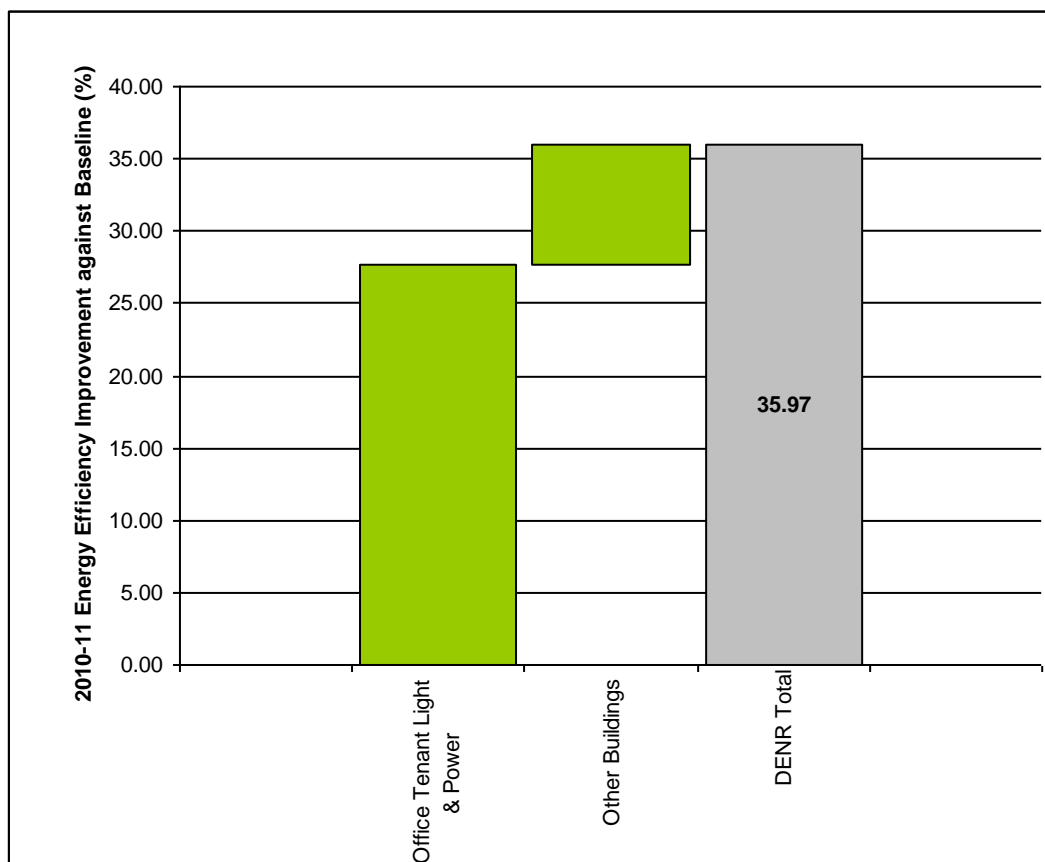
- Lighting upgraded from incandescent to compact fluorescent globes across all MFS sites.
- Installed carbon monoxide sensors in MFS basement car park which has reduced exhaust fan run times.
- Upgraded pneumatic air conditioning controls to electric on ground and level 1 east of main building Wakefield St.
- Replaced Air conditioning units which had exceeded their life expectancy with more energy efficient units at the following fire stations:
 - Brooklyn Park;
 - Port Adelaide;
 - Camden Park;
 - Largs North;
 - Gawler; and
 - Two units at the Angle Park Training Centre.

Proposed New Initiatives in 2012-13 and Beyond

- Upgrading pneumatic air conditioning controls to electric at Adelaide fire station.
- Upgrading air conditioning systems at various MFS sites to new more efficient systems.

4.12 Department for Environment and Natural Resources (DENR)

Figure 4.12.1: DENR Building Energy Efficiency Improvement, 2011-12 against Baseline.



Overview of Performance to 2011-12

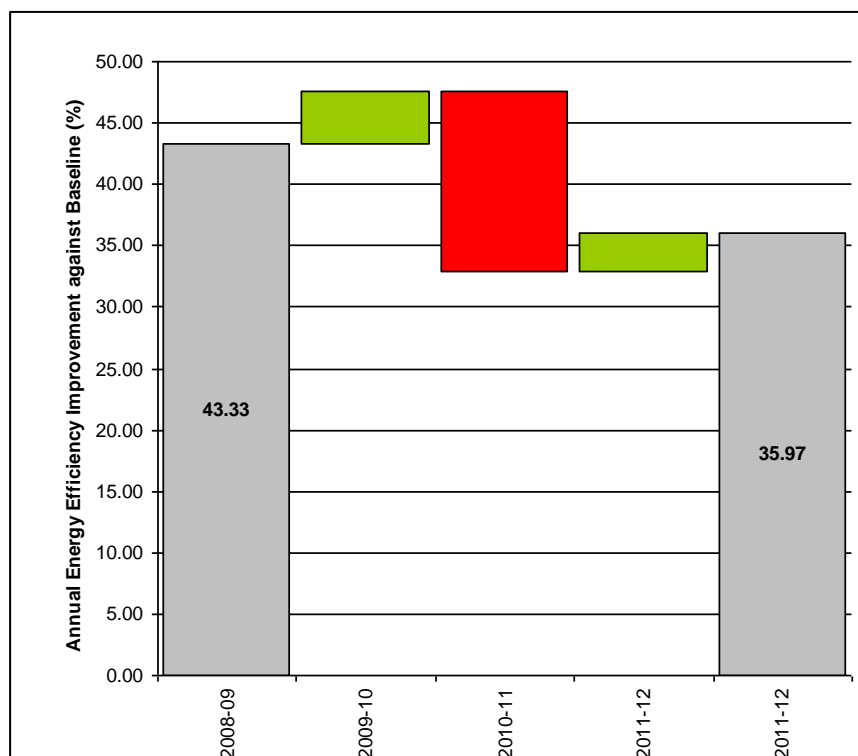
In 2011-12, DENR has maintained their overall energy efficiency improvement since 2000-01 at 36.0 per cent. DENR contributed approximately 0.3 per cent to the government target and is a small consumer of the total building energy usage in government.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

The Sustainability and Climate Change Division was transferred from DPC to DENR.

The 2010-11 electricity data for the OTLP category was revised, due to the energy data for a leased building being missed in last year's data. Overall this has increased the energy use for 2010-11 by 3553 GJ (21 per cent).

Figure 4.12.2: DENR Building Energy Efficiency Trend



Significant Energy Management Achievements

DENR undertook the following energy efficiency measures in 2011-2012:

- Installation of grid connected solar panels, 3.8 kilowatt (kW) at Cleland Wildlife Park.
- Installation of grid connected solar panels, 3.8 kW, at Building 3 at Black Hill Conservation Park.
- Installation of grid connected solar panels, 8.3 kW, at Naracoorte Caves.
- Continued review of all DENR owned remote area power supplies around the state to determine condition and suitability. This will inform future works.
- Installation of T5 lights at Cleland Conservation Park Workshop.
- Installation of T5 lights at Mt Gambier Office.

Proposed New Initiatives in 2012-13 and Beyond

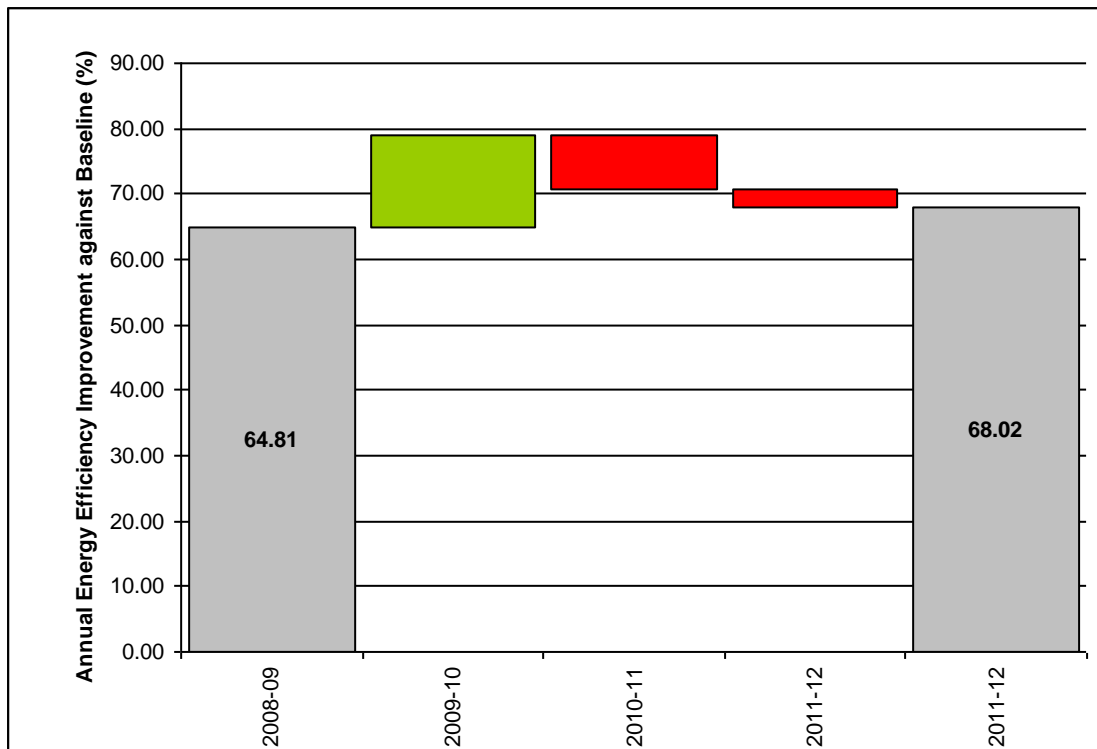
On 01 July 2012, DENR and DFW combined to form the Department for Environment, Water and Natural Resources (DEWNR).

DEWNR are planning the following activities for 2012-2013:

- Flinders Chase Visitor Precinct back up power supply upgrade - investigation and creation of tender specification.
- Battery replacement for "RAPS" at Innamincka.
- Upgrade battery bank and inverter and solar panels Canopas Homestead at Dangalli National Park.
- Install Solar panels on Southern Lofty District Office.
- Undertake an Energy and Carbon Audit for Cleland Wildlife Park.

4.13 Attorney-General's Department (AGD)

Figure 4.13: AGD Building Energy Efficiency Trend



Overview of Performance to 2011-12

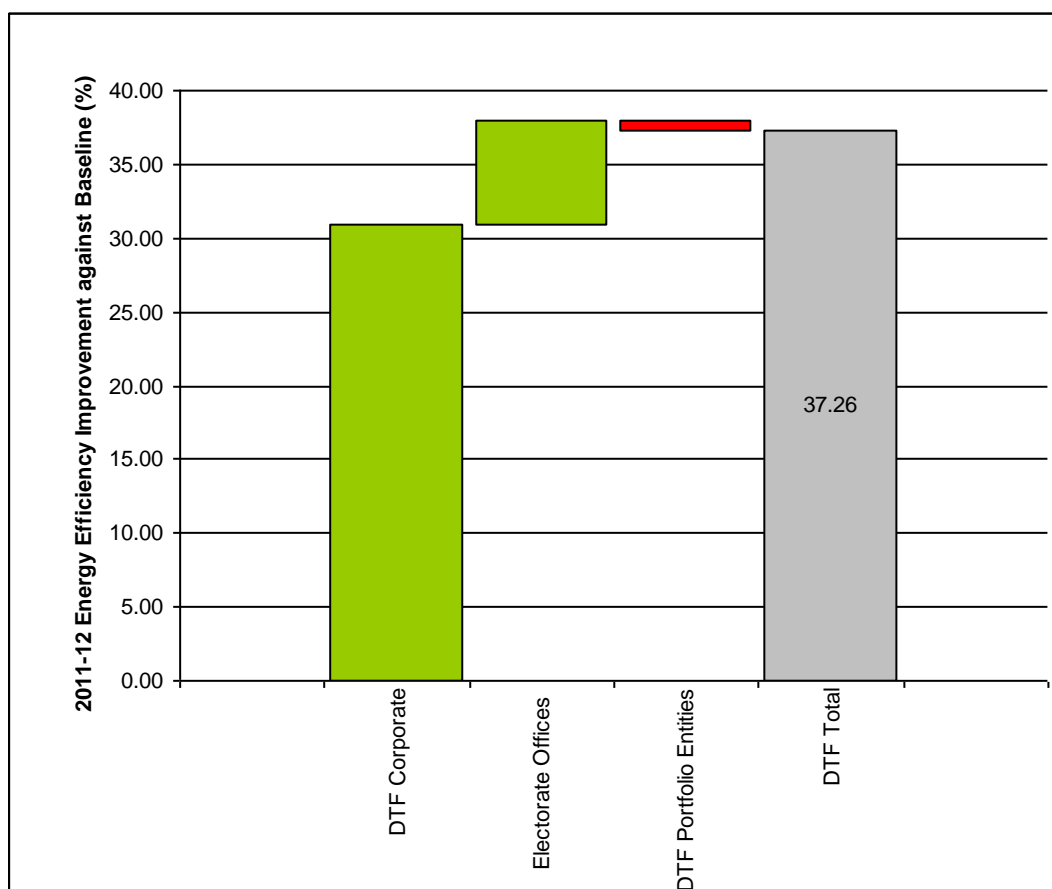
AGD has achieved and maintained an improvement beyond the 30 per cent target, with 68 per cent improvement over the baseline in 2011-12. Overall AGD contributed 0.4 per cent to the government target and is a small consumer of the total building energy usage in government.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

The Office of Recreation and Sport transferred from AGD to DPTI during 2011-12.

4.14 Department of Treasury and Finance (DTF)

Figure 4.14.1: DTF Building Energy Efficiency Improvement, 2011-12 against Baseline



Overview of Performance to 2011-12

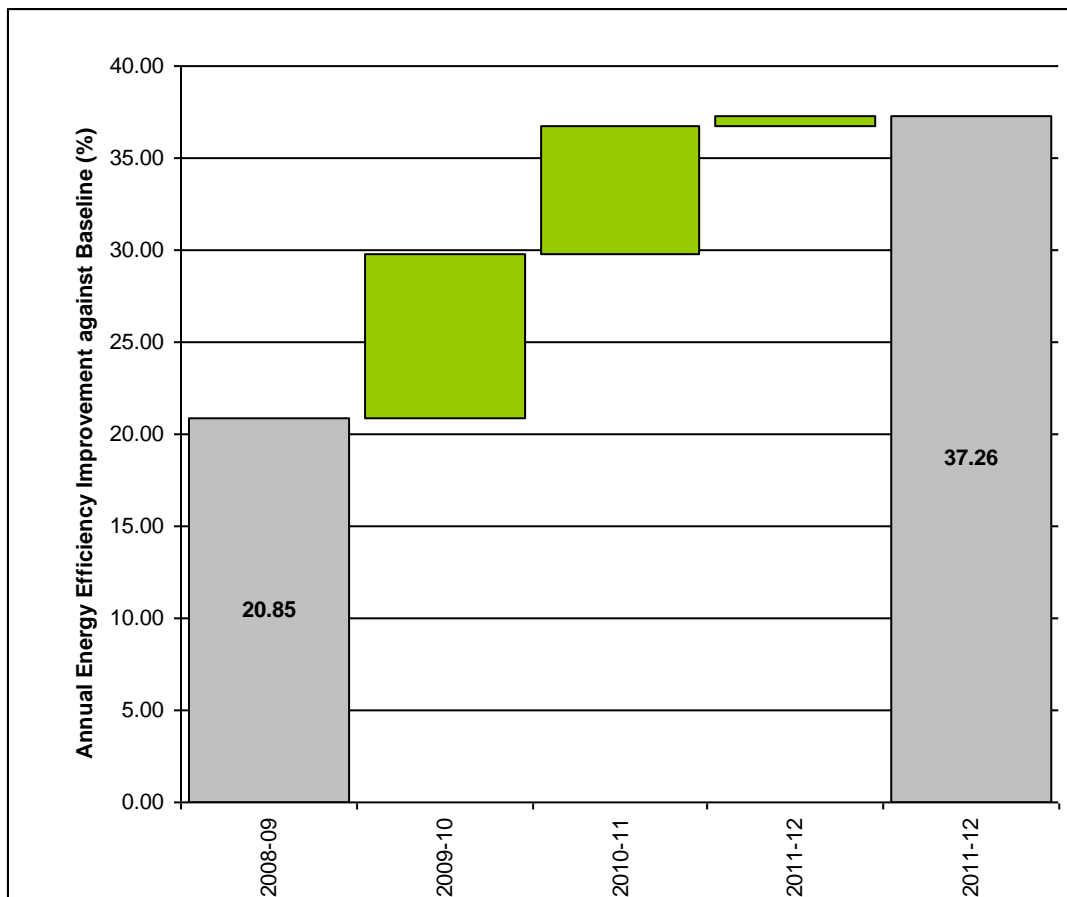
DTF has achieved the SASP T61 target of 30 per cent by 2020, improving by 37.3 per cent over the baseline in 2011-12. Following Machinery of Government changes, the data for DTF has been revised to exclude Shared Services, which is now part of DPC. The revised annual results are shown in Figure 4.14.2 below.

Of the overall government building energy use, DTF is a small consumer and contributed 0.1 per cent to the target.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Machinery of Government changes resulted in the transfer of Shared Services from DTF to DPC during 2011-12.

Figure 4.14.2: DTF Building Energy Efficiency Trend



Significant Energy Management Achievements

Progress update of an ongoing energy management project:

In 2009-10 there were changes undertaken to the management of the State Administration Centre computer room's four air conditioning units:

- the temperature set point was raised;
- one air conditioner is constantly on standby, meaning only three air conditioning units operate at any given time; and
- these units are cycled through on a monthly basis.

In addition the function of the room has changed with virtualisation of ICT Infrastructure which in turn reduced the amount of physical equipment housed in the room and the heat load. Consequently, the air conditioning units do not have to work as hard to achieve the set point temperature.

The computer room is separately metered and energy consumption has reduced by 15.2 per cent from 2009-10 to 2011-12.

DTF undertook the following energy efficiency measures in the 2011-12 year:

- Continual rollout of Strategic Accommodation Plan to incorporate a more efficient open plan office environment.
- Successful trial of an energy efficiency product that improves air conditioning efficiency.
- Continue to convert offices, conference and meeting rooms back to sensor operated lights.
- Delamping of floors within the State Administration Centre while maintaining correct lighting levels.
- Continual rollout of multi-functional devices and the reduction of the number of printers.
- Continued installing more efficient hot water systems in kitchen & utility areas.
- Continued installing fixed timers on water boiling units to limit operations between 6.00am and 6.00pm, Monday to Friday.

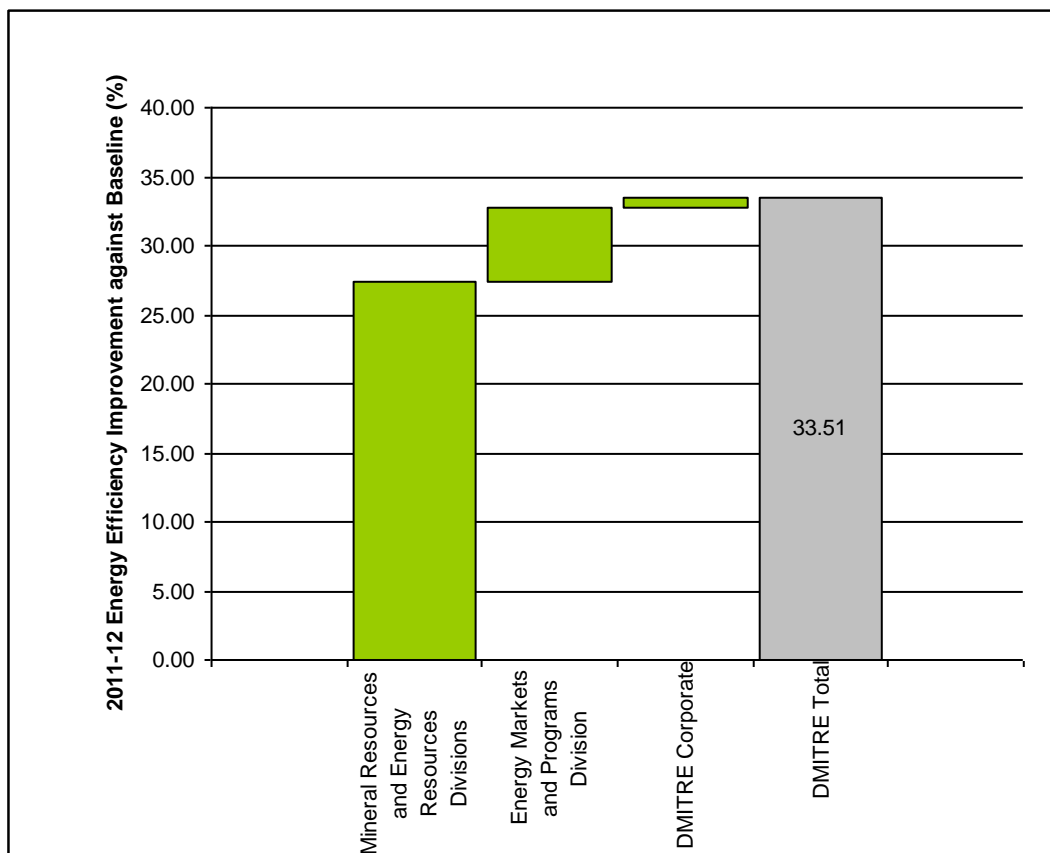
Proposed New Initiatives in 2012-13 and Beyond

DTF is planning the following major initiatives:

- Engage DPTI as building owner/manager and Spotless Property and Facilities to consider lighting options for the State Administration Centre.
- Complete delamping of floors within the State Administration Centre while maintaining correct lighting levels.
- Complete installation of fixed timers on boiling water units throughout DTF.

4.15 Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE)

Figure 4.15.1: DMITRE Building Energy Efficiency Improvement, 2011-12 against Baseline



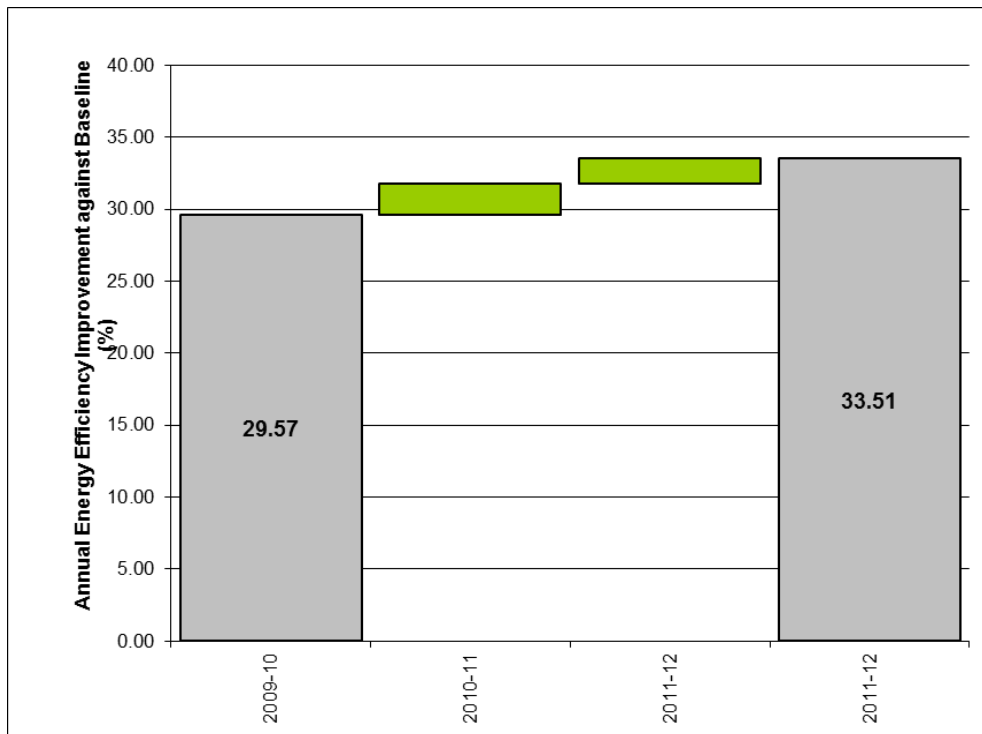
Overview of Performance to 2011-12

DMITRE has maintained an improvement over the 2000-01 baseline of 27.1 per cent in 2011-12. With Machinery of Government changes, the data for DMITRE has been revised to include Mineral Resources and Energy Resources sites from PIRSA, and the Energy Markets and Programs Division from DPTI. With this restructure, the annual results have been revised, and are shown in Figure 4.15.2 below. Of the overall government building energy use, DMITRE is a small consumer and contributed 0.05 per cent to the target.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

Machinery of Government changes included the addition of Mineral Resources and Energy Resources sites from PIRSA, and the Energy Markets and Programs Division (EMPD) from DPTI.

Figure 4.15.2: DMITRE Building Energy Efficiency Trend



Significant Energy Management Achievements

- Achieved a NABERS tenancy rating of 6 stars (5.5 stars without Green Power) for EMPD tenancy at 11 Waymouth Street. EMPD is also a signatory of the Adelaide CitySwitch program.
- The Department for Manufacturing, Innovation, Trade, Resources and Energy's tenancy at Levels 5 to 9 The Conservatory, Hindmarsh Square has been designed to achieve the equivalent of a 4-Star Green Star Office Design and 4-Star Office Green Star as Built rating. In addition the building is to achieve and maintain a 4 Star base building under the NABERS rating system.
- The base building has consistently achieved a 4.5 Star rating which is above the required design requirements
- The tenancy is equipped with state of the art T5 Lighting and sophisticated lighting controls as described under the Federal Governments Mandatory Disclosure of Buildings Energy Efficiency legislation for tenancy lighting assessment. Also, the lighting power density, as defined above, is 9.3 Watts per Meter Square which is considered "Good" under that measure. This is the second best measure under that rating.

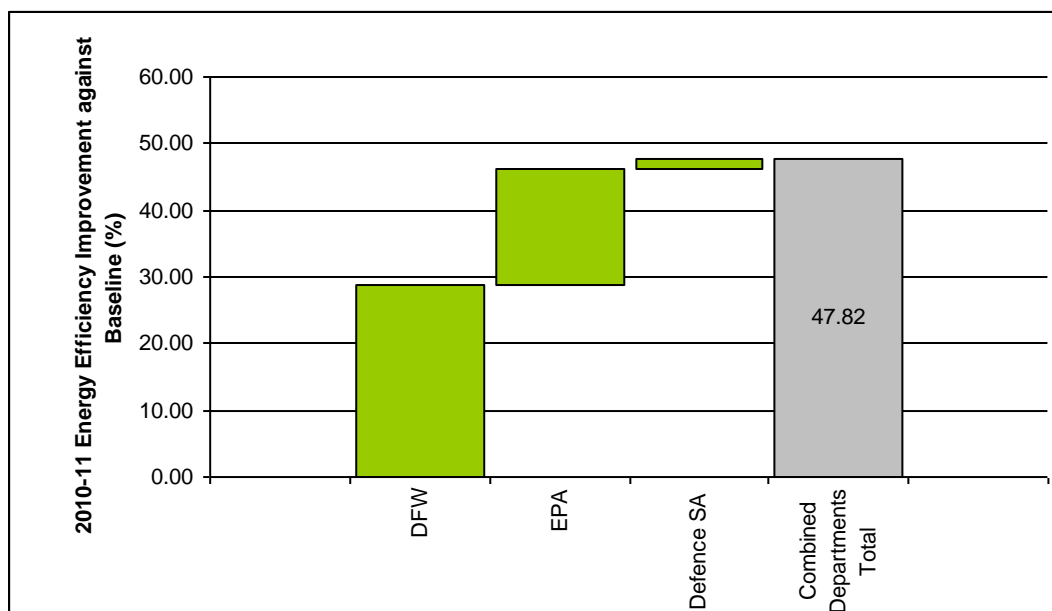
Proposed New Initiatives in 2012-13 and Beyond

- The Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) has joined the Adelaide City Councils “City Switch” program. City Switch is a Green Office national program run in partnership between capital city councils (in DMITRE’s case, Adelaide City Council) and state government departments that works with the office tenants committing to improving energy efficiency for a positive impact on climate change. It is Australia's only national energy efficiency program that works directly with office tenants. DMITRE has committed to achieving and maintaining a 4 Star Office tenancy NABERS rating.
- DMITRE is working with the building owner’s representative, CBRE, to examine and implement strategies that minimise the tenancies impact on Climate Change.
- Aim to achieve a NABERS tenancy rating of 6 stars without Green Power for EMPD tenancy at 11 Waymouth Street, through improvement of CBUS programming to reduce standby power and lighting, particularly on non-work days.

4.16 Combined Departments

The Department for Water (DFW), Environmental Protection Authority (EPA) and Defence SA (Defence) departments' results have been combined, as each department consumed less than 0.1% of the overall Government building energy for 2011-12.

Figure 4.16: Building Energy Efficiency Trend



Overview of Performance to 2011-12

Department for Water (DFW) achieved an overall building energy efficiency improvement of 48.3 per cent between 2000-01 and 2011-12.

The Environmental Protection Authority (EPA) achieved an overall building energy efficiency improvement of 53.2 per cent between 2000-01 and 2011-12.

Changes in Baseline and/or Subsequent Years' Energy Intensity Data

A revision of EPA baseline and historical data occurred as data is now available for the air and noise labs at Netley.

The Innovation House and Technology Park sites in Defence SA became part of The Urban Renewals Authority on 01 March 2012. (The Urban Renewals Authority is not reported, as it is not included in the General Government section under the Government Controlled Entities list – see Section 1.1). Initiatives completed while part of Defence SA have been included below.

Significant Energy Management Achievements

DFW undertook the following energy efficiency measures in the 2011-12 year:

- Energy efficient preventative maintenance upgrades were implemented where applicable, including reset of hot water timers to operate during business hours only.
- Consolidation of business units within CBD, resulting in reduction of tenanted area.
- Print and fax device consolidation resulting in a reduction of devices.

EPA undertook the following energy efficiency measures in the 2011-12 year:

- The EPA continues to occupy the 6 star Green Star SA Water Building, and continued to work with the building owners to identify opportunities for energy savings within the Base Building functions.
- The Sustainability at Work (S@W) team is a work volunteers group established in 2010 with Chief Executive support. Its aim is to reduce the EPA's environmental footprint.
- A NABERS Energy rating assessment has recently been completed for the EPA tenancy resulting in an initial rating assessment of 5.5, pending formal confirmation. The SA Water House base building operations achieved a 5-star rating in the past year.

Defence SA undertook the following energy efficiency measures in the 2011-12 year at Technology Park Adelaide:

- Installation of automated lighting control systems to Endeavour House, Technology Park Adelaide.
- Investigation of additional photovoltaic cells at Innovation House, Technology Park Adelaide.
- Installation of additional software to the Innovation House BMS to further control car park lighting times.

Proposed New Initiatives in 2012-13 and Beyond

DFW propose to undertake the following energy efficiency measures in 2012-13:

- DFW and DENR have been amalgamated to form DEWNR, with transition progressing over the 2012-13 period.
- The Agency will continue to review best practice in energy saving measures and implement new and improved saving initiatives where possible and financially viable.

EPA proposed to undertake the following energy efficiency measures in 2012-13:

- EPA is continuing to work with the building owners to identify opportunities to make energy savings within the Base Building functions. Changes to current air conditioning systems will enhance the overall energy performance of the base building.
- A review of Tenancy lighting management systems will be implemented to identify opportunities to reduce energy usage. For example; through reduction of standby times after hours, and reduced operation times of movement-activated lighting.
- Work is to be implemented for the new multi-function devices, to ensure black and white printings is the default, and to explore processes to reduce waste including: paper, toner and unwanted printing, and to reduce power consumption.
- A new Sustainability at Work Action Plan is to be released to identify and address work habits and processes which may be changed to reduce the impact on the environment.

Appendix A: Glossary

BMS: is a Building Management System. Building Management Systems are used in buildings for automatic monitoring and control of services such as lighting, plumbing, fire services, heating and air conditioning systems. The term refers to a system that uses sensors, controls and activators.

Business Measures: are measures of, or proxies for, an agency's output. For example, subject to data availability, a hospital might record its activity in terms of occupied patient bed days or a school might count FTE students. In some cases a proxy might be used, such as the area occupied by an agency or staff numbers. This is on the basis that there is a correlation between the number of people employed in an agency or the area it occupies and its output. For further information see Section 2.2.

Cogeneration: also known as CHP (combined heat and power), is the simultaneous production of electrical energy and thermal energy. Referred to in this document as Cogen.

GJ: Giga Joules– unit of energy consumption. See Appendix B for other units of energy and conversion factors.

Green Star: Green Star is a comprehensive, national, voluntary environmental rating system, administered by the Green Building Council of Australia (GBCA) that evaluates the environmental design and construction of buildings and communities. Certification is a formal process which involves a project using a Green Star rating tool to guide the design or construction process during which a documentation-based submission is collated as proof of this achievement.

KW: Kilowatt – is a unit of energy consumption. A Watt is the standard unit of measurement for the amount of energy (electric or otherwise) being consumed each second. A Kilowatt is simply 1,000 Watts.

NABERS: National Australian Built Environment Rating System - is a national rating system that measures the environmental performance of Australian buildings, tenancies and homes. It incorporates measures of the energy efficiency, water usage, waste management and indoor environment quality of a building or tenancy and its' subsequent impact on the environment. NABERS is managed nationally by the NSW Office of Environment and Heritage, on behalf of Commonwealth, state and territory governments.

NLA: Net Leased Area – is a measure, in m², of the net area used by a tenant. Commonly referred to in this document simply as m². This business measure is used by over 90% of agencies for the purposes of their energy efficiency calculation.

OSCAR: is the Online System from Comprehensive Activity Reporting, which agencies use to report energy and business measure data. The system is administered by the Commonwealth Department for Climate Change and Energy Efficiency (DCCEE). See Section 2.3 for further details.

RAPS: A RAPS (Remote Access Power System) allows for off-grid operation using batteries for energy storage and is best suited to situations where power is needed during blackouts, or for premises not connected to the mains electricity grid. They may run on solar power or wind energy

SASP: The South Australian Strategic Plan. An updated plan was released by the Premier in 2011. See also T61.

T61: Target 61 under the South Australian Strategic Plan (SASP); *“Improve the energy efficiency of government buildings by 30 per cent by 2020 (baseline 2000-01). Milestone of 25 per cent by 2014.”*

Trigeneration: also known as CCHP (combined cooling, heat and power) refers to the simultaneous generation of electricity and useful heating and cooling, typically via absorption chillers.

Appendix B: Conversion Factors

Table B.1: Energy Conversion Factors

Energy Type	Typical Measured Units	Abbreviation	To convert to Giga-Joules, multiply by
Electricity	kilowatt hour	kWh	0.0036
Natural Gas	Mega-Joule	MJ	0.001
LPG	Kilo-litre	kL	25.7
Heating Oil	Kilo-litre	kL	37.3
GreenPower	kilowatt hour	kWh	0.0036

Source: National Greenhouse Accounts (NGA) Factors, released by the Department of Climate Change, July 2012.

Appendix C: Calculation of Energy Efficiency

C.1 – Energy Efficiency Measurements

The 2007 update of South Australia's Strategic Plan (SASP) established a target to improve the energy efficiency of Government buildings. Progress is calculated using an energy efficiency index. The 2011 update of the SASP target retained energy efficiency as its measure, see Section 1 for further information on the SASP.

Defining an index to measure changes in energy efficiency is a complex task. To begin with, energy efficiency can be defined in a number of ways. For example, many people would consider energy efficiency to be the total increase or decrease in energy usage across an organisation, however, this does not allow for organisational growth and increasing service levels.

As a consequence, organisations often use energy intensity measures to monitor their energy efficiency targets. Energy intensity is defined as the ratio of energy consumption to some measure of output from the energy user.

This document uses energy intensity measures to account for changes in the Government's energy usage while taking into consideration changes in the scale of government operations (e.g. expanding health and education services). Energy usage is reported as a proportion against 'business measures' such as area and number of employees. These measures are taken as indicators of output.

A number of methodologies exist for the creation of an index to track and analyse changes in energy efficiency, which accommodate the different business measures used by sub-groups of an organisation.

This report uses 'aggregate energy intensity' for those sub-groups which use the same business measure. This involves dividing the total energy use of all sub-groups by the total business measure (e.g. area). Section C.2 provides more details on this calculation. Aggregated intensities, however, still require weighting to accommodate different business measures, and they do not allow for analysis of different sub-groups (such as agencies or a division) within a department.

An alternative approach may be to examine the 'component based energy intensity' calculation whereby the energy efficiency contribution of each sub-group in government is weighted against the proportion of energy the sub-group consumed. These weighted figures are added to obtain departmental or whole of government figures. Section C.3 provides a stepped example for these calculations. It is worth noting that component based calculations are influenced by adjustments to the data reporting structure.

The Energy Markets and Programs Division, DMITRE is continuing to investigate methodologies and indices that are used to collate energy efficiency measures.

C.2 - Calculating the Aggregate Energy Efficiency Improvement

Currently, agencies within Government are reporting against only three different business measures, these being area, number of buildings, and number of employees. Tables 2.4 and 2.5 provide aggregated whole of Government data against these three business measures.

The aggregate energy efficiency figures in Section 2.4 are calculated by summing all energy consumption within Government organisations and dividing by the sum of the common business measure.

A whole of government figure is derived by weighting the efficiency improvements by 2011-12 energy consumption and adding the proportions together.

C.3 - Calculating a Component Based Energy Efficiency Improvement

Departmental energy efficiency performance in 2011-12 was calculated through the following processes. Throughout this section, the sub-groups (such as Divisions) within a department will be described as agencies.

1. Obtain the Energy Use Intensity (the amount of energy used per business measure, such as area) for both 2000-01 and 2010-11:

The energy consumed per business measure (BM) was calculated automatically by OSCAR, when the business measure values for each agency were entered for their department. These figures were then downloaded by the Energy Division (now Energy Markets and Programs Division, DMITRE) and entered into a spreadsheet. The energy used per business measure is as follows:

$$\frac{[\text{Agency A Energy Use in 2000-01 or 2011-12}]}{[\text{Agency A Business Measure in 2000-01 or 2011-12}]} = \text{Number of MJ used per BM (e.g. per } m^2 \text{) for 2000-01 or 2011-12}$$

Agency A in 2000-01:

$$\frac{1500 MJ}{500 m^2} = 3 MJ/m^2$$

Agency A in 2011-12:

$$\frac{1450 MJ}{700 m^2} = 2.1 MJ/m^2$$

2. Calculate energy efficiency improvement for each agency:

Energy efficiency improvement for each agency within each department is calculated by the following formula, using the figures in the example above. For Agency A an increase in energy efficiency from 2000-01 to 2011-12 is calculated as 30 per cent:

$$\frac{(3 - 2.1) MJ/m^2}{3 MJ/m^2} = 0.30 = 30\%$$

3. Calculate energy efficiency improvement for each department:

The energy efficiency improvement of each department is calculated by adding together each agency's energy efficiency improvement in proportion to its total for the department. So for example, if a department has two agencies:

Agency A used 80 MJ (aa) with an efficiency improvement of 40 per cent (AA) and Agency B used 120 MJ (bb) with an improvement of 10 per cent (BB), the overall departmental efficiency is 22 per cent (XX), as shown below:

$$\frac{aa \text{ MJ}}{(aa + bb) \text{ MJ}} \times AA\% + \frac{bb \text{ MJ}}{(aa + bb) \text{ MJ}} \times BB\% = XX\%$$

$$\frac{80 \text{ MJ}}{200 \text{ MJ}} \times 40\% + \frac{120 \text{ MJ}}{200 \text{ MJ}} \times 10\% = 16\% (A) + 6\% (B) = 22\%$$

4. Calculate departmental impact on whole of government energy efficiency improvement and aggregating across departments.

The approximate contribution each department made to the whole of government energy efficiency improvement target was calculated by weighting each department's efficiency improvement by its share of South Australian Government energy use.

Ensuring this is done in percentage terms will enable meaningful aggregation to occur regardless of the differing business measures used by departments in each end-use category. This is shown in Table C.1 for three departments using fictional numbers.

Table C.1: Government Energy Efficiency Improvement Measurement

	Department A	Department B	Department C
Per cent of total SA Government energy use	50 %	15 %	10 %
Per cent individual efficiency improvement	10 %	20 %	10 %
Per cent contribution to Target	(0.50 x 0.10 = 0.05) 5 %	(0.15 x 0.20 = 0.03) 3 %	(0.10 x 0.10 = 0.01) 1 %
Target (weighted energy efficiency improvement)	5 % (A) + 3 % (B) + 1 % (C) = 9 %		

The first row of Table 1 shows the share of total energy consumption by each department. The second row Individual Efficiency Improvement shows the energy use reductions in percentages.

The third row contribution to target is simply the first row of Table 1 multiplied by the second, for example, Department B: 15 per cent x 20 per cent = 3 per cent.

Finally, the weighted energy efficiency improvement is the sum of the third row. This example shows a nine per cent improvement in energy efficiency is obtained across the three departments.

Appendix D: End Use Categories

Custodial Facilities

The Custodial Facilities category includes all types of custodial facilities for adults or juveniles.

Educational Facilities

The Educational Facilities category includes all types of educational facilities from schools to TAFE Institutes.

Hospitals

This category covers the energy consumption in buildings and facilities primarily used as hospitals and in the delivery of health care services.

Laboratories

This category covers all energy use in buildings that, as their primary function, are used as laboratories and research facilities.

Law Courts

The Law Courts category includes all types of court facilities, whether a relatively small space in a larger building or a specialised building.

Office Buildings Combined Services

This category relates to the energy consumed in office buildings where tenant services and central services consumption can not be separated. This is often the case for smaller office buildings.

Office Central Services

This category covers energy used for services in office buildings common to all tenants. It includes building air conditioning, lifts, security and lobby lights, and domestic hot water.

Office Tenant Light and Power

This category covers energy used for tenant operations in buildings where the primary function is office space. It includes tenancy lighting, office equipment, supplementary air conditioners, boiling water units etc. Additional building factors that contribute to higher energy consumption, such as computer server rooms, or localised areas of extended operating hours, are not separated from office consumption.

Other Buildings

The energy performance of buildings not reported elsewhere is included in the Other Buildings category. These include buildings associated with manned quarantine road blocks and server floors, which are included in the target. Infrastructure such as storage sheds, sports stadiums and radio transmitters may be under this category but not included in the SASP T61, as they have been deemed not to meet the government building definition. (See Section 2.1 for the full definition).

Other Healthcare Facilities

This category covers the energy consumption in buildings and facilities, other than hospitals, such as community health centres.

Other Uses

This category includes the energy consumption within facilities that cannot be classified as a building, such as water pumps and air monitoring stations. These facilities are not within the scope of SASP T61. (See Section 2.1 for the government building definition).

Police, Fire and Emergency Services

This category covers the energy consumption in buildings and facilities primarily used as police, fire and emergency services facilities such as police stations, fire stations and ambulance stations.

Public Buildings

This category includes energy consumed in buildings whose primary function is to be visited by the public in significant numbers. Typical buildings in this category are public libraries, museums or art galleries. Frequently, there is a requirement to maintain close control of internal environmental conditions on a 24-hour basis in these buildings.