

South Australian Government Annual Energy Efficiency Report

2009 - 10



Government of South Australia

Department for Transport,
Energy and Infrastructure

Contents

EXECUTIVE SUMMARY	3
1. INTRODUCTION	4
1.1 SCOPE OF THE STRATEGIC PLAN TARGET	4
1.2 ENERGY EFFICIENCY REFERENCE GROUP	4
1.3 VERIFICATION AND REPORTING REQUIREMENTS.....	5
1.4 INFORMATION AVAILABILITY.....	5
2. GOVERNMENT ENERGY EFFICIENCY PERFORMANCE	6
2.1 INTRODUCTION.....	6
2.2 BUSINESS MEASURES.....	6
2.2.1 SELECTION OF BUSINESS MEASURES FOR INCLUSION IN SASP T3.13.....	7
2.3 END-USE CATEGORIES	7
2.4 WHOLE OF GOVERNMENT PERFORMANCE.....	8
3. ENERGY EFFICIENCY PERFORMANCE BY PORTFOLIO	10
3.1 PORTFOLIO PERFORMANCE	10
4. PORTFOLIO PROGRESS 2000-01 TO 2009-10.....	14
4.1 DEPARTMENT OF HEALTH	14
4.2 DEPARTMENT OF EDUCATION AND CHILDREN'S SERVICES	18
4.3 DEPARTMENT OF JUSTICE.....	20
4.4 DEPARTMENT OF FURTHER EDUCATION, EMPLOYMENT, SCIENCE AND TECHNOLOGY	23
4.5 DEPARTMENT FOR FAMILIES AND COMMUNITIES	26
4.6 DEPARTMENT OF THE PREMIER AND CABINET	28
4.7 DEPARTMENT FOR TRANSPORT, ENERGY AND INFRASTRUCTURE	30
4.8 PRIMARY INDUSTRIES AND RESOURCES SA	33
4.9 DEPARTMENT FOR ENVIRONMENT AND HERITAGE	35
4.10 DEPARTMENT OF WATER, LAND, BIODIVERSITY AND CONSERVATION.....	37
4.11 ENVIRONMENT PROTECTION AUTHORITY	39
4.12 DEPARTMENT OF TREASURY AND FINANCE	40
4.13 DEPARTMENT OF TRADE AND ECONOMIC DEVELOPMENT	42
4.14 DEPARTMENT FOR PLANNING AND LOCAL GOVERNMENT.....	44
4.15 DEFENCE SA	45
APPENDIX A - END-USE CATEGORY DEFINITIONS	46
APPENDIX B - CONVERSION FACTORS.....	48
APPENDIX C – CALCULATION OF ENERGY EFFICIENCY	49
APPENDIX D: ENERGY USE TABLES	53
GLOSSARY	55

Tables

TABLE 3.1: 2009-10 INDIVIDUAL PORTFOLIO PROGRESS TOWARDS THE 25 PER CENT IMPROVEMENT TARGET.....	10
TABLE 3.2: 2008-09 INDIVIDUAL PORTFOLIO PROGRESS TOWARDS THE 25 PER CENT IMPROVEMENT TARGET.....	13
TABLE B.1: MEASUREMENT UNITS.....	48
TABLE B.2: ENERGY CONVERSION FACTORS.....	48
TABLE C.1: GOVERNMENT ENERGY EFFICIENCY IMPROVEMENT MEASUREMENT.....	51
TABLE C.2: AGGREGATED WHOLE OF GOVERNMENT DATA.....	52
TABLE D.1: SA GOVERNMENT ENERGY USE FROM BUILDINGS BY END-USE CATEGORY 2000-01 TO 2009-10.....	53
TABLE D.2: SOUTH AUSTRALIAN GOVERNMENT ENERGY USE FROM BUILDINGS BY PORTFOLIO OR AGENCY 2000-01 TO 2009-10.....	54

Figures

FIGURE 2.4: WHOLE OF GOVERNMENT PERFORMANCE.....	8
FIGURE 3.1: SA GOVERNMENT ENERGY EFFICIENCY IMPROVEMENT AND TARGET CONTRIBUTION 2000-01 TO 2009-10.....	11
FIGURE 4.1: HEALTH BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	14
FIGURE 4.2: DECS BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	18
FIGURE 4.3: JUSTICE BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	20
FIGURE 4.4: DFEEST BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	23
FIGURE 4.5: DFC BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	26
FIGURE 4.6: DPC BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10 IN BUILDINGS CONSUMING MORE THAN 500 GJ OF ENERGY PER ANNUM.....	28
FIGURE 4.7: DTEI BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	30
FIGURE 4.8: PIRSA BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	33
FIGURE 4.9: DEH BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	35
FIGURE 4.10: DWLBC BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	37
FIGURE 4.11: EPA BUILDING ENERGY EFFICIENCY 2000-01 TO 2009-10.....	39
FIGURE 4.12: DTF BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	40
FIGURE 4.13: DTED BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	42
FIGURE 4.14: DPLG BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	44
FIGURE 4.15: DEFENCE SA BUILDING ENERGY EFFICIENCY IMPROVEMENT 2000-01 TO 2009-10.....	45

For further information about this report please contact the Energy Division of the Department for Transport, Energy and Infrastructure on (08) 8226 5500 or dtei.eergsecretariat@sa.gov.au.

Executive Summary

The *South Australian Government Annual Energy Efficiency Report 2009-10* 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, 3.13: *Improve the energy efficiency of Government buildings by 25 per cent from 2000-01 levels by 2014*.

Performance of Government Building Energy Efficiency

Since 2000-01, the South Australian Government has achieved a 16.7 per cent overall energy efficiency improvement in its (owned and leased) buildings. This is more than halfway towards achieving South Australia's Strategic Plan target 3.13 (SASP T3.13).

There are currently 15 portfolios, comprising all agencies of Government, which report energy consumption and business measures. Portfolios reported individual energy efficiency improvements (since 2000-01) of up to 52.8 per cent.

Energy efficiency improvements can generally be attributed to portfolios moving to more energy efficient buildings, undertaking building upgrades or refurbishments that utilise more efficient equipment, adopting behavioural change programs, and increasing the output of services, people or space without a significant effect on their total energy consumption.

The extent to which the results of individual portfolios influenced the overall Government target was a function of the portfolios' percentage of total Government energy consumption.

Other Reporting Changes 2009-10

The previous *Annual Energy Efficiency Report 2008-09* reported an overall energy efficiency improvement of 12.5 per cent from 2000-01. In 2009-10 two portfolios reported for the second time only, some agencies incorporated new entities or sites which were not reported on previously, altered their reporting structures and corrected errors in energy and business measure data. The changes are detailed in the following sections.

1. Introduction

The South Australian Government Annual Energy Efficiency Report 2009-10 has been prepared in accordance with the Verification and Reporting requirements of the 2002 Government Energy Efficiency Action Plan. This report is the ninth 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 the South Australia's Strategic Plan (SASP) in 2007.

This report relates to SASP target 3.13, which is to “*Improve the energy efficiency of Government buildings by 25 per cent from 2000-01 levels by 2014.*”

1.1 Scope of the Strategic Plan target

As per the guidelines of the Energy Efficiency Action Plan, Government buildings under SASP T3.13 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.

For the purposes of this report, the following portfolios are included:

- Department of Health (Health);
- Department of Education and Children's Services (DECS);
- Department of Justice (Justice);
- Department of Further Education, Employment, Science and Technology (DFEEST);
- Department for Families and Communities (DFC);
- Department of the Premier and Cabinet (DPC);
- Department for Transport, Energy and Infrastructure (DTEI);
- Department of Primary Industries and Resources SA (PIRSA);
- Department for Environment and Heritage (DEH);
- Department of Water, Land, Biodiversity and Conservation (DWLBC);
- Environment Protection Authority (EPA);
- Department of Treasury and Finance (DTF);
- Department of Trade and Economic Development (DTED);
- Department of Planning and Local Government (DPLG); and
- Defence SA (Defence).

From the beginning of 2010-11, DEH has been renamed to Department of Environment and Natural Resources (DENR) and DWLBC has been renamed Department for Water (DFW). These changes do not affect the 2009-10 energy efficiency reporting and both agencies reported their sites as DEH and DWLBC.

1.2 Energy Efficiency Reference Group

The Energy Efficiency Reference Group (EERG) was established by Cabinet to oversee the implementation of SASP T3.13 across Government, via the Energy Efficiency Action Plan. The

EERG meets bi-monthly, with representatives from senior management from all portfolios. It is chaired by the Energy Division (DTEI).

1.3 Verification and Reporting Requirements

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

An Independent Verification exercise is undertaken annually by a third party to provide assurance concerning the accuracy and robustness of the performance being reported by Government. KPMG undertook independent verification of performance in 2009-10.

In 2009-10, as part of the independent verification exercise, KPMG verified the accuracy and identified the weaknesses in energy consumption and business measure data reported by portfolios. The 2010 Independent Verification Report is available publicly at <http://www.dtei.sa.gov.au/energy/>.

1.4 Information Availability

Since the introduction of the new energy efficiency target in 2006-07, additional collection of information has been required, particularly business measures at the site level. In 2009-10 the vast majority of this information is now available. Further processes are being investigated to ensure all information is readily available.

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 portfolios according to their proportion of total government building energy consumption. The process for assessing portfolios' 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 T3.13, 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 T3.13.

2.2 Business Measures

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

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.

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 2009-10 year. As a result, the energy efficiency performance of the building is:

$$15,000/2,000 = 7.5 \text{ GJ per m}^2 \text{ or } 7,500 \text{ MJ per m}^2$$

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 2009-10, energy efficiency has improved.

Business measures used by agencies to calculate progress towards SASP T3.13 in the 2009-10 year include:

- Number of people (staff) occupying the building (occupancy);
- Area occupied by an agency (m²); and
- Number of buildings.

Some portfolios also report additional business measures (in addition to area or occupancy measures) that are not used in the calculation of SASP T3.13 including:

- Number of occupied bed days (in hospitals);
- Number of visitors (in public buildings); and
- Number of full time equivalent employees (FTE's);

Further information on the calculation of energy efficiency improvement is provided in Appendix C, including the business measures used by individual agencies, which are displayed in Table C2 in Appendix C.

2.2.1 Selection of Business Measures for Inclusion in SASP T3.13

In some cases, agencies reported on more than one business measure for each end-use category. For the purposes of this report, the business measure that reflected, as closely as possible, improvements in energy efficiency was selected.

It is worth noting that if different business measures were used to calculate the energy efficiency of an agency, such as number of students instead of area in an educational facility, the agency's, and possibly the whole of Government efficiency improvement figure may be different.

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.

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 portfolios to be disaggregated into similar operational types. This allows the comparison of identical end-use categories across Government portfolios.

The following end-use categories were used by agencies for 2000-01 and 2009-10 reporting:

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

2.4 Whole of Government Performance

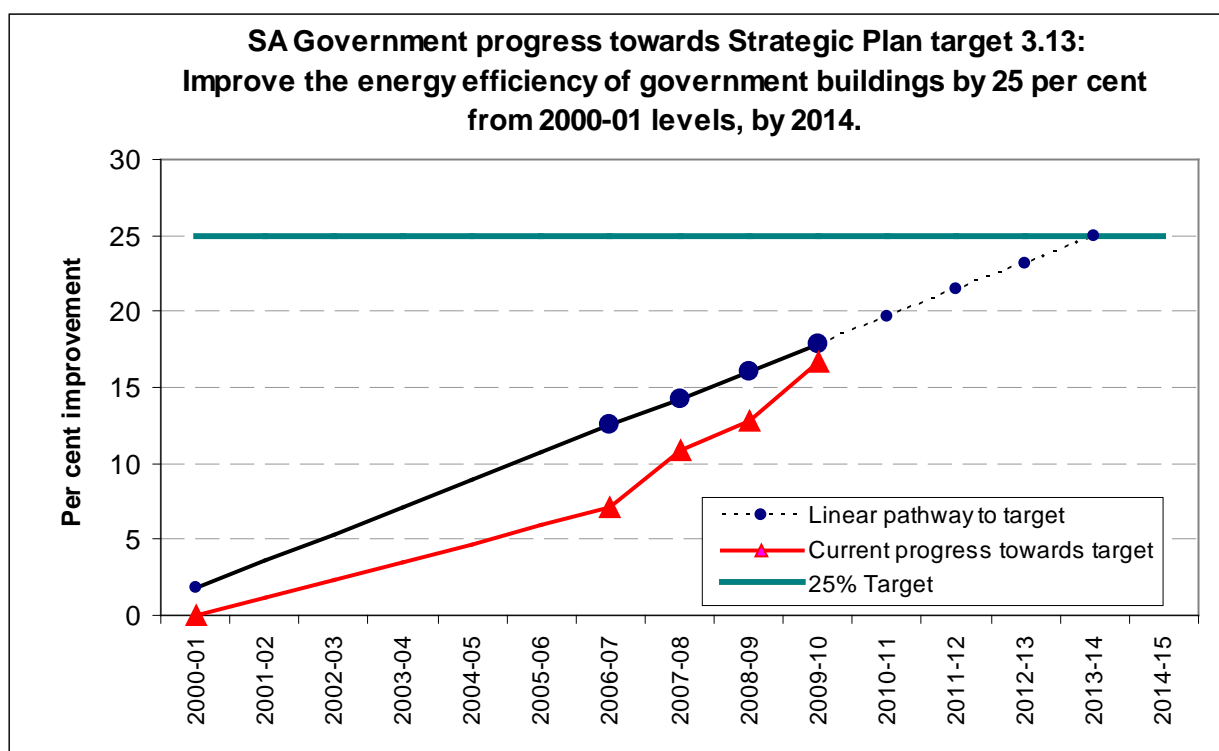
In 2009-10, the energy efficiency of South Australian Government buildings had improved by 16.7 per cent from 2000-01, as calculated in Table 2.4.

Figure 2.4 shows that progress is slightly behind a linear pathway towards SASP T3:13, which would require a 17.9 per cent improvement.

Table 2.4: Total Aggregated Energy Efficiency

2009-10				
Business Measure	Total Energy Use (GJ)	Total Business Measure	Aggregate Energy Efficiency	Per cent Energy Efficiency Improvement
Area (m ²)	2,128,823	4,958,685	429.3	16.02
Buildings (no.)	83,079	38	1,978,071.4	20.76
Occupancy (FTEs)	88,944	8,917	10,370.1	28.48
Total Aggregated Energy Efficiency (weighted by 2009-10 energy consumption)				16.7

Figure 2.4: Whole of Government Performance



The SA Government Annual Energy Efficiency Report 2008-09 reported an improvement of 12.5 per cent. When the 2008-09 progress is re-calculated using revised information, including corrected errors and alteration of reporting structures, the figure changes to 12.7 per cent.

Between 2000-01 and 2008-09, energy efficiency was estimated to be improving at an average rate of 1.6 per cent per annum. The increase of 16.7 per cent in 2009-10 is primarily due to

energy efficiency measures undertaken in the Health and DECS portfolios. The increase sets the average forward progress at 1.7 per cent per annum.

The achievement of SASP T3.13 is likely to be contingent on the successful implementation of a number of large projects within the Health portfolio as it accounts for 52.4 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 current end date for the SASP T3:13. This may have an effect on the capacity for the South Australian Government to achieve the 25 per cent improvement target by 2014.

While progress to date is not far from the linear pathway of 1.8 per cent improvement per annum, this may not continue. As buildings become more energy efficient, achieving even higher levels of efficiency becomes incrementally more expensive.

Coverage of Government Building Energy Use

More than 99 per cent of the South Australian Government's known building energy consumption in 2009-10 has been captured in this report. Most portfolios were able to collect both building energy use and business measure data for 100 per cent of their identified sites. Where energy and business measure information were identified as being incomplete, progress has been made although coverage is not yet complete.

Two government agencies have been included in the Annual Energy Efficiency Report for the second time – the Department of Planning and Local Government (DPLG) and Defence SA. DPLG was previously reported as part of PIRSA. Defence SA is a new government agency that first came into operation in 2008-09. Defence SA has therefore been able to calculate a change in energy efficiency for the first time.

3. Energy Efficiency Performance by Portfolio

3.1 Portfolio Performance

This section reports on progress made by each portfolio. Table 3.1 and Figure 3.1 list portfolios in the order of their proportion of total SA Government energy use.

The percentage of portfolio contribution to SASP T3:13 (Column C) was calculated by multiplying the portfolio's proportion of total government energy consumption (Column B) by their individual energy efficiency improvement (Column A).

Table 3.1: 2009-10 Individual Portfolio Progress towards the 25 per cent Improvement Target

Portfolios	Per cent Individual Energy Efficiency Improvement (A)	Portfolio proportion of total SA Government energy use (B)	Per cent Portfolio contribution to SASP T3.13 - 2009-10 (C)
Health	17.7	51.8%	9.2
Education and Children's Services	18.4	14.1%	2.6
Justice	8.3	10.0%	0.8
Transport, Energy and Infrastructure	25.4	5.1%	1.3
Families and Communities	22.7	2.8%	0.6
Premier and Cabinet	12.5	3.9%	0.5
Environment and Heritage	47.8	0.7%	0.3
Further Education, Employment, Science and Technology	-6.1	7.7%	-0.5
Primary Industries and Resources SA	4.6	2.9%	0.1
Water, Land and Biodiversity Conservation	52.8	0.1%	0.1
Trade and Economic Development	23.9	0.1%	0.01
Environment Protection Authority	49.2	0.0%	0.02
Planning and Local Government	14.7	0.1%	0.01
Treasury and Finance	18.8	0.5%	0.10
Defence SA	43.5	0.0%	0.00
TOTAL SA GOVERNMENT		100	16.7*

* Note – whole-of government energy efficiency improvement is calculated using an aggregated method (refer Appendix C) rather than summation of each portfolio's contribution to SASP T3.13

Table 3.1 indicates that with the exception of DFEEST, all agencies have recorded an improvement in energy efficiency compared to the baseline year of 2000-01. The DFEEST results are attributed to ageing TAFE SA North facilities, particularly the Regency campus which has steadily increased its energy consumption since 2000-01. This subtracts 0.5 per cent from the whole of government energy efficiency results.

The Health portfolio is the largest consumer of building energy use in the South Australian Government, using 51.8 per cent of the Government's energy. As a result, a 17.7 per cent energy efficiency improvement in the Health portfolio has contributed 9.2 per cent (of the 16.7 per cent) energy efficiency improvement across government.

DECS is the second largest consumer of building energy use, with a contribution of 14.1 per cent to the total government energy use. Information relating to DECS provides for an energy efficiency improvement of 18.4 per cent, up from 5.7 per cent from 12.7 per cent in 2008-09. This information contains omissions of data and the data was not able to be updated for the purpose of this report's publication. For further information please see page 18.

Other large energy consuming agencies include Justice and DFEEST. Both portfolios have reported energy efficiency results that indicate they are not on track to achieve the 25 per cent target by 2014.

Figure 3.1: SA Government Energy Efficiency Improvement and Target Contribution 2000-01 to 2009-10

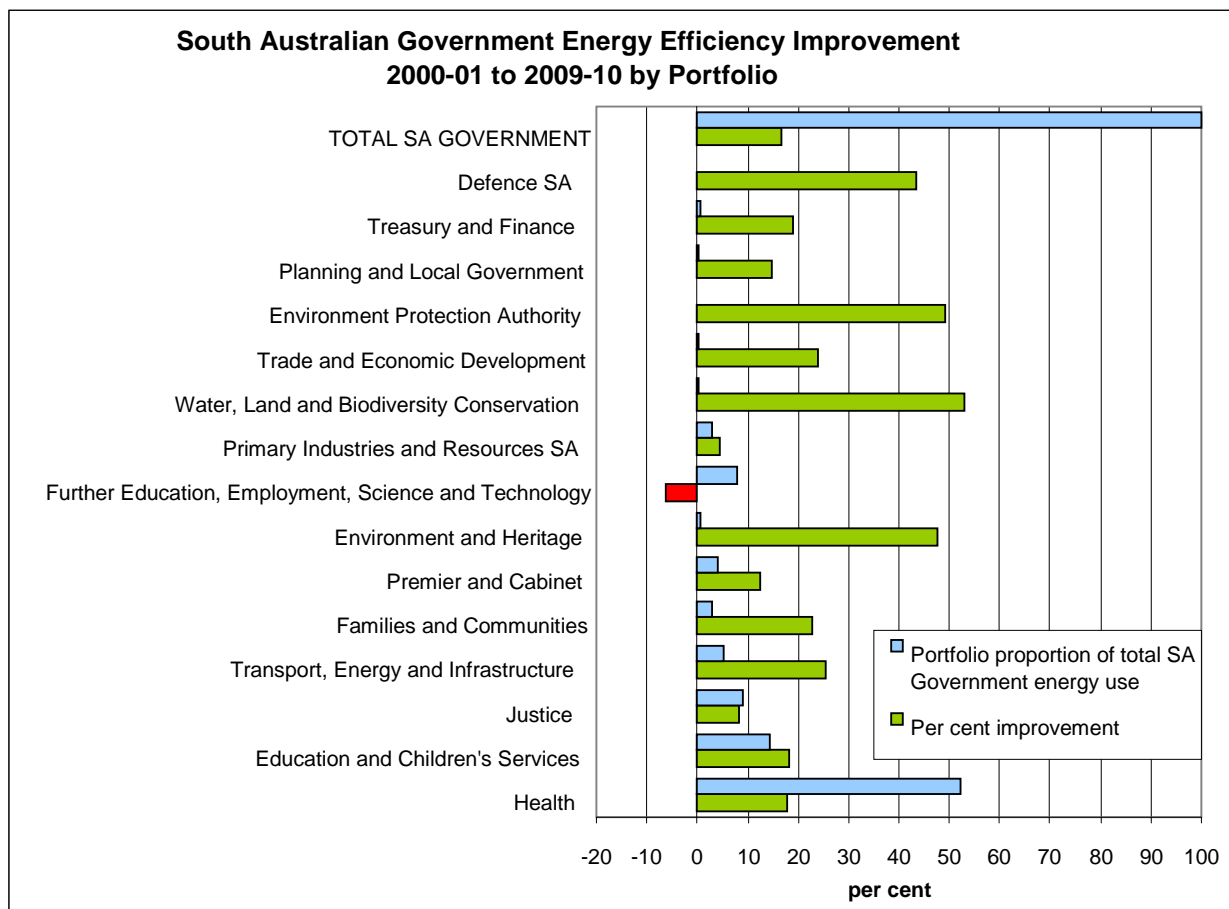


Figure 3.1 demonstrates that five portfolios, DTEI, DEH, DWLBC, EPA and Defence SA achieved more than a 25 per cent improvement in building energy efficiency.

A more detailed overview of each of the portfolio's energy efficiency performance and their planned initiatives are provided in Chapter 4, Portfolio Progress 2000-01 to 2009-10.

Baseline Revisions

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

The need to revise baselines between portfolios has been acknowledged as an important requirement under this program. The 2002-03 Independent Verification Report contained a recommendation that a standard procedure be developed and implemented by the EERG for this purpose.

Under this procedure, which was developed by the EERG, agencies are not able to revise baselines due to changes in operational characteristics, such as staff number changes, and 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 portfolio structure (and particular sites must be transferred from one portfolio to another);
- A site was previously excluded from reported data or is a new entity; and
- Data for a site previously reported was either an estimate or reported incorrectly and actual data is now available.

Where a portfolio has made a modification to its baseline energy use data in the 2009-10 financial year, a brief explanation is provided in its overview.

Revisions to the 2008-09 Energy Efficiency Results

The energy efficiency target was measured for the third time in 2008-09. This involved a significant data collection process of both energy consumption and business measures. Since last year, agencies have undertaken a review of their data and reporting procedures to improve on the information they previously provided. As a result, the energy efficiency figures reported in the 2008-09 report have been recalculated as per the table below.

The revised figure is mainly due to baseline data changes for particular agency sites. Very few baseline changes occurred during 2009-10 and the figure has not changed significantly.

Table 3.2: Revised 2008-09 Individual Portfolio Progress towards the 25 per cent Improvement Target

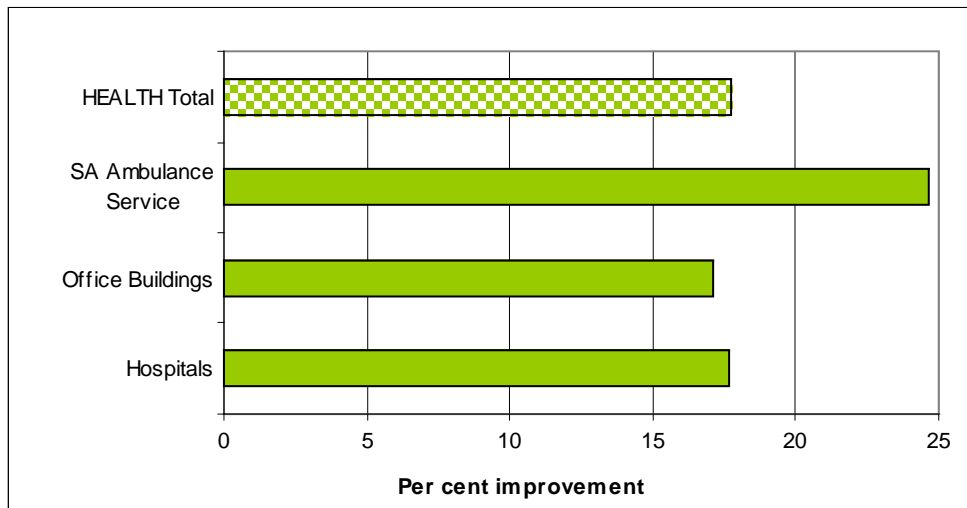
Portfolios	Per cent Individual Energy Efficiency Improvement (A)	Portfolio proportion of total SA Government energy use	Per cent Portfolio contribution to SASP T3.13 - 2008-09 (C)
Health	14.3	52.1%	7.5
Education and Children's Services	12.7	14.7%	1.9
Justice	8.8	9.6%	0.8
Transport, Energy and Infrastructure	16.5	5.6%	0.9
Families and Communities	21.4	2.7%	0.6
Premier and Cabinet	13.1	4.0%	0.5
Environment and Heritage	43.3	0.06%	0.3
Further Education, Employment, Science and Technology	3.1	6.9%	0.2
Primary Industries and Resources SA	-1.9	2.7%	-0.1
Water, Land and Biodiversity Conservation	53.0	0.1%	0.1
Trade and Economic Development	19.0	0.05%	0.0
Environment Protection Authority	7.9	0.06%	0.0
Planning and Local Government	0.1	0.1%	0.0
Treasury and Finance	-14.4	0.6%	-0.1
Defence SA	0.0	0.03%	0.0
TOTAL SA GOVERNMENT		100.0	12.7

4. Portfolio Progress 2000-01 to 2009-10

Chapter four presents the energy efficiency performance of each portfolio between 2000-01 and 2009-10.

4.1 Department of Health

Figure 4.1: Health Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

Health is a very large consumer of gas and electricity, accounting for 51.8 per cent of all building energy consumed by the South Australian Government. As a result, Health is a key portfolio in achieving SASP T3:13. The performance data is based on calculations using area (m²) as the business measure.

Between 2000-01 and 2009-10, Health achieved a 17.73 per cent improvement in building energy efficiency. This equates to a 9.28 per cent improvement in the Government's overall energy efficiency. Hospitals, which constitute more than 95 per cent of the Health portfolio's energy consumption, expanded their occupied space by nearly 5900 m² between 2000-01 and 2009-10, while increasing their consumption of energy by a much lower proportion. This resulted in a decrease in the energy consumption in hospitals per square metre from 1307 MJ/m² to 1076 MJ/m², and an overall efficiency improvement of 17.73 per cent.

Health increased its energy efficiency between 20098-09 and 2009-10 by 3 per cent.

Changes in Baseline and/or Subsequent Years' Energy Use

Health made some slight changes to its baseline energy use. This includes an increase in area m² for some hospital sites not previously reported, corrections to electricity consumption of office buildings in 2005-06 and the inclusion of LPG data for Keith Hospital.

Significant Energy Management Achievements

- ENERGY & WATER SAVING FUND (EWSF):

In 2009-10 SA a total \$1,000,000 was invested through the EWSF into energy efficiency projects. Cumulatively these projects are calculated to reduce energy use by approximately

6,500 GJ per annum, or 1,800 kg of CO₂, which is equivalent to taking approximately 400 cars permanently off the road. These projects include:

- A wide range of measures for several SA Pathology sites, including upgrades to air-conditioning plant, refrigeration equipment and enhanced building shading.
- A thermal blanket for the rehabilitation pool at Hampstead Rehabilitation Centre.
- Lighting upgrades at Flinders Medical Centre, Hampstead Rehabilitation Centre and The Women's and Children's Hospital.

- SA HEALTH LIGHTING UPGRADE PROGRAM:

SA Health has made significant investments in lighting upgrades across four major metropolitan sites in recent years which have cumulatively reduced energy use by more than 1,700,000 kWh per annum. The preferred solution generally adopted is the complete rebuild of the most common type of light fitting across SA Health facilities (twin T-8 fluorescent fitting with iron core ballasts) and replacing with a single high quality centred T8 tube, a high performance reflector and a warm start electronic ballast. This solution provides a 60 per cent reduction in lighting energy use for each fitting upgraded.

- SOLAR HOT WATER (SHW):

- During 2009-10 the largest SHW water array in South Australia was came into full operation at Flinders Medical Centre (FMC).
- Solar Hot Water was installed on an additional two country hospitals in 2009-10. At present, approximately two thirds of all country and regional hospitals and three of the seven major metropolitan sites (Lyell McEwin Hospital, Repatriation General Hospital & FMC) have Solar Hot Water installed.
- The Glenside and The Queen Elizabeth Hospital campuses will also have SHW progressively installed as part of their ongoing redevelopments. Additional SHW capacity will also be installed at The Lyell McEwin Health Service as part of the next stage of its redevelopment.

- CITI CENTRE ENERGY INITIATIVES

- Three of the ten floors of SA Health's main administration building (CitiCentre) underwent a lighting upgrade which was completed in early 2009-10. The metered energy consumption of the three effected floors has since decreased by 38 per cent.
- The 24 hour supplementary air-conditioning system to cool the main communications room in CitiCentre is currently being redesigned. When complete this new cooling system is expected to reduce the supplementary air-conditioning energy use at CitiCentre by approximately 80 per cent.
- In June 2010 CitiCentre signed up to the CitySwitch Green Office program and has committed to achieving and maintaining a 4 Star NABERS tenancy energy rating within two years.
- An energy audit of the CitiCentre tenancy has been completed and the energy efficiency opportunities identified are currently being evaluated for possible funding in 2011-12.

- FLINDERS MEDICAL CENTRE REDEVELOPMENT

Energy efficiency has improved significantly at FMC in the last two years as a result of the major infrastructure upgrades included in the scope of the ongoing major redevelopment. Additional energy savings are projected to be achieved in 2010-11 and beyond as new plant and equipment are commissioned and their efficiency optimised:

- A substantially upgraded energy efficient air-conditioning system.
- A lighting upgrade that is occurring progressively over the life of the redevelopment.

- An emphasis on energy efficiency for the design of new build areas.
- Solar hot water, coupled with a high efficiency warm water system.

Proposed New Initiatives in 2009-10 and Beyond

- **LIGHTING UPGRADES 2010-11**

- Lighting upgrade at Repatriation General Hospital: Capital of \$148,000, annual energy savings of \$25,000 and a simple payback of 5.9 year years.
- Continuation of lighting upgrades to the Women's and Children's Hospital: Capital investment \$134,000, annual saving of \$29,000 and a simple payback of 4.7 years
- Continuation of FMC Lighting upgrade: Additional investment of \$250,000 in 2010-11 to continue the campus wide lighting upgrade project.

- **COOBER PEDY HOSPITAL ENERGY REDUCTION PROJECT 2010-11**

Coober Pedy hospitals is off the main electrical grid and has recent been subject to major tariff rise and as a consequence is now paying a flat rate of \$0.77 cents per kWh, or more than 4 times more than that paid by other 'on-grid' SA health facilities. The following energy efficiency projects will be implemented at Coober Pedy Hospital during 2010-11:

- HVAC - Cool split system compressors,
- HVAC Fit time control to split system,
- Fit time control elec HWS
- Replace cold room compressors
- Lighting - linear fluorescents, incandescent and halogen down lights

- **MODBURY ENERGY AUDIT 2010-11**

Consultants have been engaged to undertake a comprehensive energy audit of the Modbury Hospital in 2010-11.

- **SA PATHOLOGY - DUAL PHOTOVOLTAIC/SHADING PROJECT 2010-11**

Consultants have been engaged to prepare the detailed design documentation for an innovative proposal to fit 10 kW of solar photovoltaic cells to the north face of SA Pathology's Hanson Institute. This PV array in addition to generating renewable energy will also significantly reduce air-conditioning energy consumption by providing shading to the large currently unshaded glazing on the northern façade.

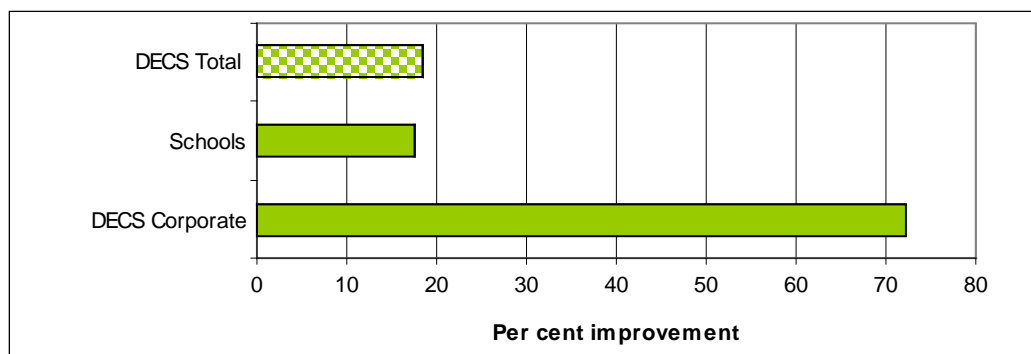
- The EWSF has been extended, with funding commitment of \$600,000 per year in place for 2009-10 and 2010-11, with Health Units to provide matching funds (bringing total value of this program over 2 years to \$2.4 million).
- Health, in collaboration with the Child, Youth and Women's Health Service, have committed funds for 2009-10 for the production of a Detailed Feasibility Study to determine the potential of a Energy Performance Contract at the Women's and Children's Hospital.
- The primary strategy to improve Health's energy efficiency is to ensure it is a high priority for all major redevelopments and refurbishments. Ambitious energy targets have been established for the three major metropolitan redevelopments (Lyell McEwin Hospital, Queen Elizabeth Hospital and Flinders Medical Centre).
- Current specifications for both the Marion and Elizabeth GP Plus centres call for facilities that achieve a 5 Star plus environmental rating as measured by the Greenstar office tool.

Initial estimates are that a 5 Star rating would likely see facilities with an average energy intensity of 650-800 MJ/m² per annum; which is around half the energy intensity of the average square metre of health space in 2000-01 (1,360 MJ/m² per annum). As such GP Plus facilities should assist in achieving SASP T3.13.

- In addition there are a range of other initiatives currently funded or likely to be achieved as part of other redevelopment projects (such as the Glenside redevelopment, the New North Terrace Medical Research Institute, the GP Plus projects and major upgrades at Berri, Ceduna and Whyalla) that will likely deliver further energy efficiency gain across the Health portfolio. These projects cumulatively have the potential to deliver a further 3 to 4 per cent improvement in the SA Health energy efficiency performance.
- The Royal Adelaide Hospital (RAH) (which currently consumes 22 per cent of Health's energy use) will cease to be operational in 2016 and its replacement facility is targeting to consume less than half the energy currently consumed by the RAH and in addition, to provide 15 per cent of the sites supply from self-generated renewable power. If this ambitious target is achieved, this one project alone will improve Health's energy efficiency by approximately 11 per cent. This step change in the portfolio's energy efficiency will not be delivered until 2016, two years after the target date established for SASP target T 3.13.

4.2 Department of Education and Children's Services

Figure 4.2: DECS Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

DECS experienced an improvement in its building energy efficiency of 18.4 per cent between 2000-01 and 2009-10. As can be observed in Figure 4.2, this is primarily a result of an improvement in school (primary and secondary) building energy efficiency, which constitutes approximately 97 per cent of the portfolio's energy consumption. DECS Corporate made a significant improvement against the baseline, with an increase in improvement from 2008-09 of 5.6 per cent.

DECS first reported energy consumption in all pre-schools in 2007-08, due to complexities in billing procedures. DECS represents 14.1 per cent of the South Australian Government's total building energy use.

Post publication investigation of DECS 2009-10 energy data

DECS has advised that energy use information contains omissions and at the time of publication of this annual report DECS has just completed its review of the data. Any necessary adjustments will be made in the 2010-11 report.

Changes in Baseline and/or Subsequent Years' Energy Use

DECS are undertaking a comprehensive review of all energy data. Any subsequent changes may be made in the 2010-11 reporting period and provided for the 2010-11 Annual Energy Efficiency Report.

Significant Energy Management Achievements

Key initiatives implemented by DECS during 2009-10 included:

Green School Grants - Since 2000-01 annual funding of \$1m has been allocated to the Green School Grants Program. During this time total funding of \$11,392,333 has gone to 1,746 environmental projects in 902 DECS schools and preschools with many schools receiving multiple grants. Since the inception of the program a wide variety of projects have been supported, including projects focussed on water conservation, energy efficiency and waste management.

In 2009-10 Green School Grant funding was allocated to assist schools to improve their energy and water efficiency. Sixteen schools with high electricity use have been funded to install and

energy demand management system, a load shedding system which will reduce each schools electricity network charges. The Green School Grants program concludes in December 2010.

Australian Sustainable Schools Initiative in South Australia (AuSSI-SA) - AuSSI-SA is a joint initiative of the Department of Natural Resources (DENR), via the South Australian Natural Resource Management Boards, DECS and the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPC). DSEWPC coordinates AuSSI, with programs in all Australian states and territories. The program 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 their 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. The resource is available to all South Australian schools.

Energy Management Guide - DECS Green School Grants in 2006-07 and 2007-08 funded 300 energy audits for DECS schools to meet the South Australian Government's Energy Efficiency Action Plan - this requires that 'agencies are to undertake energy audits of all building assets'. As an initiative of the Environmental Resources team the recommendations from the energy audits have been summarised and included in an Energy Efficiency Management Guide for DECS sites titled *4 Energy: Energy, Efficiency, Education, Environment*. The intention of the guide is to assist schools to better manage their energy use and have a greater understanding of how to manage their school more sustainably. The draft guide has been approved and will be available online by the end of 2010 for site leaders to access.

DECS Central Office has met the South Australian Strategic Plan energy efficiency target (T3.13) to improve building energy efficiency by 25 per cent from 2000-01 levels by 2014. As a tenant, DECS is responsible for its tenant light and power consumption. DECS Central Office staff continues to make good use of energy efficient lighting and management strategies, light sensors and timers in offices and meeting rooms to assist in reducing DECS corporate energy use.

National Solar Schools Program - The SA Solar Schools Program completed in December 2008 supplied 111 DECS sites with 2kW solar panels. 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, electricity efficiency installations and rainwater tanks. To date 89 DECS schools have received NSSP funding under round 1.

Proposed New Initiatives in 2010-11

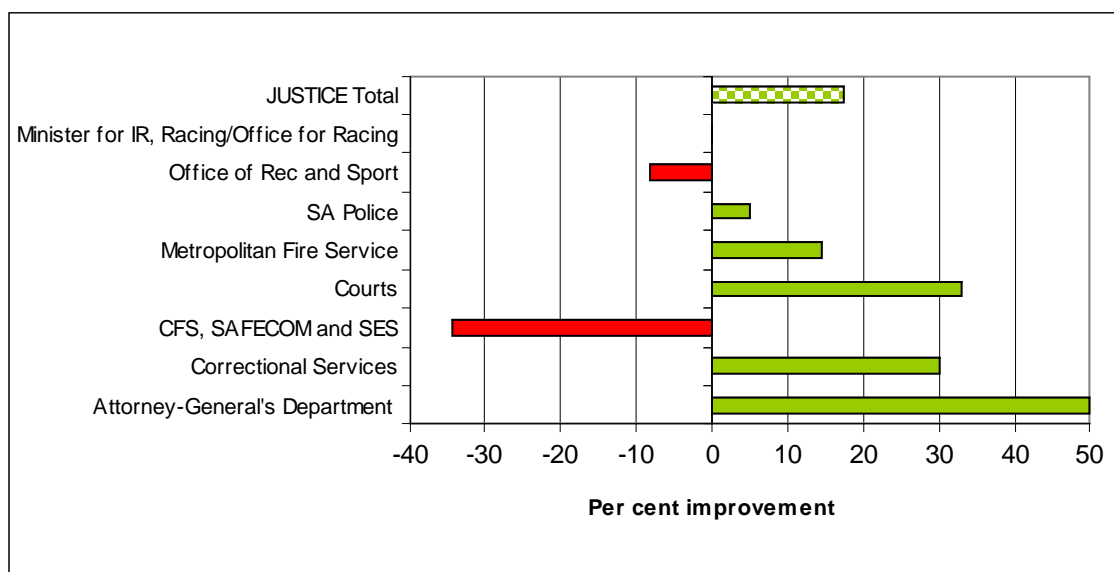
DECS will continue to monitor and identify methods of improving energy efficiency across its offices and sites and assist sites in the management of energy efficiency targets and educational initiatives.

DECS will monitor and manage the completion and acquittal of projects at schools that are successful in receiving National Solar School Program funding from the 2010-11 funding round.

As part of the 2009-10 Green School Grant program \$30,000 was provided for an energy Demand Management System to each of 16 schools that have consistently recorded high energy use and have the mechanical plant to utilise the System. All systems are expected to be installed by mid 2011 and energy use will be monitored towards the end of 2011 to determine the impact of the system in comparison with the system currently being utilised successfully at Charles Campbell Secondary School.

4.3 Department of Justice

Figure 4.3: Justice Building Energy Efficiency Improvement 2000-01 to 2009-10



NB: CFS = Country Fire Service, SAFECOM = SA Fire and Emergency Services Commission, SES = State Emergency Service

Overview of Performance to 2009-10

The Justice Portfolio improved its building energy efficiency performance by 8.3 per cent between 2000-01 and 2009-10. The Justice Portfolio constitutes 10 per cent of the South Australian Government's total building energy use. Most of the portfolio's energy is consumed within the SA Police and Correctional Services agencies.

CFS SAFECOM and SES have a -34.28 per cent reduction in performance due to new facilities and the expansions of emergency services sites across the state. These divisions continue to investigate measures to increase energy efficiency. The Office for Recreation and Sport also reported a reduction in energy efficiency of -8.3 per cent compared to baseline figures.

The energy efficiency improvement for Justice in 2009-10 was slightly less than 2008-09, which reported an improvement of 8.8 per cent.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil

Significant Energy Management Achievements

Justice has adopted environmentally sustainable development (ESD) principles when renegotiating leases, fit outs and in specifying the design components of new facilities. ESD principles include improving building energy performance, reducing water use and recycling materials.

Key initiatives include:

- Consolidated CBD leased accommodation for Courts Administration Authority (CAA) has resulted in a 45 per cent reduction in leased space, improving CAA space usage, consolidation of office equipment and more energy efficient contemporary accommodation.

- CAA relocated their data centre to a more space/energy efficient facility.
- CAA replaced the first of three chillers with a more energy efficient unit at the Sir Samuel Way Building.
- Installation of low energy LED exit lights to the Adelaide Magistrates Court.
- SES Headquarters moved into accommodation at level 8, 60 Waymouth Street where they undertook delamping of around 60 per cent of the original quantity and replacement of the fluorescent lamps.
- SAPOL continues to work towards a more sustainable future through developing environmental standards and implementing environmental initiatives such as passive design measures, waste recycling, energy management (including solar panels) and water harvesting. All capital projects pursue Ecologically Sustainable Development (ESD) initiatives.
- SAPOL has a number of significant infrastructure projects underway including the new Police Academy and new Police Headquarters buildings. Combined court/police facilities at the APY Lands, Christies Beach Police Complex and Murray Bridge Police Station are all pursuing ESD outcomes. Existing assets are continually being reviewed and ESD measures implemented such as the lighting review and de-lamping of the existing Police Headquarters building and Holden Hill Police Station. A reduction in vending machines and rationalisation of fridges is also being undertaken across all SAPOL sites.
- A fitout project consolidating accommodation at 45 Pirie St for the Attorney-General's Department is currently being rolled out over this year and next. An increase of around 20 per cent in the space occupancy of the building will be delivered in 2011. The building owner has completed the replacement of the T8 lighting to T5 saving around 30 per cent of energy.
- The Whyalla office of the Legal Services Commission (LSC) was moved in January 2009 to a more energy efficient location and a large area of the total area subleased. In the Adelaide LSC office, the following measures continue to be implemented - replacement of lighting, delamping, installation of eco light systems, air conditioning timing adjustment, reprogramming building water systems so they don't run after hours and vigilance by staff in turning lights out when areas are vacant.
- The Office of Recreation and Sport (ORS) have completed a light condition and recommendation report for a future upgrade to Hindmarsh Stadium lighting. This work will be implemented over future years as funding allows. The Adelaide Superdrome main arena lighting control gear has been replaced to facilitate enhancement of targeted lighting provision for particular sporting activities eg cycling and hockey.
- Fit out and relocation of Department for Correctional Services (DCS) Central Office to a targeted 5 star Greenstar building and a targeted 5 star Greenstar office fit out.
- The relocation of DCS Noarlunga office to new accommodation and fit out that incorporated energy efficient initiatives eg lighting.
- Owners of the Riverside building have upgraded lighting from T8 to T5 fittings and the HVAC that services the building. AGD's office of the Parliamentary Counsel occupies a small tenancy there.
- The building owner has replaced the chiller and installed variable speed drives to pumps in the building where the AGD's Office for Volunteers/JP Services lease a site at 50 Grenfell St.
- Lift motors have been upgraded in the Forensic Science SA building at 21 Divett Place.

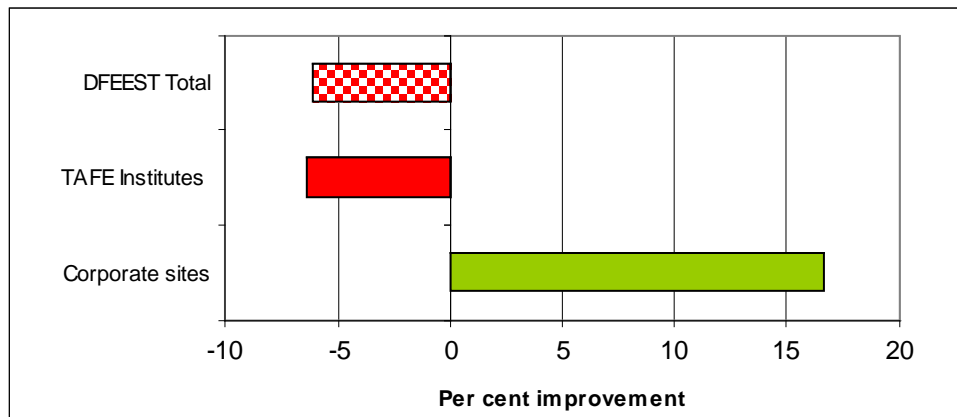
Proposed New Initiatives in 2010-2011 and Beyond

- CAA to replace second of three chillers with a more energy efficient unit at the Sir Samuel Way Building.

- CAA to replace the chiller at the Elizabeth Magistrates Court with a more energy efficient unit.
- AGD's space improvement project at 45 Pirie Street continues.
- Reducing the hardware footprint through server virtualisation and consolidating /decommissioning a number of data centres in AGD, (also reduces power and cooling requirements).
- Hindmarsh Stadium lighting upgrade to be implemented over a number of years from 2011.
- Various Justice sites to install timers to office equipment and energy monitoring meters were provided.
- Upgrade to building services at 50 Pirie St, occupied by AGD Office of Volunteers and JP Services. Works include upgrade of the BMS controls and functions, control of outside air, solar thermal panels, new variable air distribution system on each floor, replacement of common area lighting to energy efficient lighting and heat recovery ventilation.

4.4 Department of Further Education, Employment, Science and Technology

Figure 4.4: DFEEST Building Energy Efficiency improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

The energy efficiency for DFEEST in 2009-10 is -5.9 per cent compared to 2000-01. DFEEST consumes 7.7 per cent of the South Australian Government's energy, which resulted in a contribution of -0.5 per cent to the whole of South Australian Government's efficiency improvement.

Overall the results for DFEEST are well below target, largely due to ageing TAFE SA facilities. TAFE SA sites account for 98 per cent of DFEEST's energy usage. Across the department there has been a net increase in energy use of 8.5 per cent. Of the three TAFE institutes, only one (TAFE SA North) has not recorded an improvement in energy efficiency since 2000-01.

DFEEST continues to investigate measures to improve the energy efficiency of TAFE SA North, particularly the Regency campus, which has performed the worst of all DFEEST sites.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil

Significant energy management achievements

Corporate DFEEST achievements

- DFEEST's occupation in the 5 star green star City Central (11 Waymouth St) consumed 2.4 per cent less energy compared to the previous reporting period. A number of initiatives contributed to this success.
- Earth Hour 2010 - A review of the building management systems (BMS) across the department to maximise energy efficiencies was conducted and staff encouraged to acknowledge our impacts on the environment as part of the Departments' participation in Earth Hour 2010.
- Innovation Academy - DFEEST conducted an Innovation Academy in late 2009 with staff. The impact on the environment was strongly considered. These innovation ideas will contribute towards an implementation plan currently being developed for the recently launched DFEEST Sustainability Strategy and Action Plan 2010–2012.
- ICT - DFEEST ICT has been instrumental in reducing our energy usage through new 'virtual' equipment (blade servers) replacing inefficient ICT components. A focus on printer settings

and equipment utilisation such as automatic power shut down of pc's will contribute to reducing energy consumption.

- E- Payslips - DFEEST payslips went green and became electronic, reducing our carbon emissions by approximately 4 tonnes per year and saving 650kg of paper.

TAFE Adelaide North Institute achievements

- Lighting - The installation of Axion Emergency lighting systems across the majority of TAN campuses including the replacement of emergency lighting to low wattage LED lighting.
- Printing - Green reporting on all print devices to determine their utilisation rates and related energy usage was undertaken to develop long term strategies.
- Regency TAFE campus - A cogeneration unit has been under repair and is currently being tested. Once the testing is completed and the cogeneration unit is fully operational, producing efficient heat and energy for the site, energy consumption will decline. A \$5 million upgrade of hospitality facilities incorporated energy efficient appliances, lighting and air conditioning.
- Tea Tree Gully TAFE campus - An energy and water audit was conducted to identify additional energy and water initiatives. A \$6 million upgrade to establish a centre of excellence in technology included energy efficient lighting and air conditioning.

TAFE Adelaide South Institute achievements

- Adelaide TAFE campus - A \$4 million refurbishment included energy efficient lighting and air conditioning, replacing aging equipment. Additional upgrades to lighting in hallways and atriums were completed.
- Noarlunga TAFE campus - An \$8.7 million upgrade includes a 15kW solar power generation system with 84 solar panels able to provide power back into the grid.

TAFE Regional Institute achievements

- Berri TAFE campus - a 7 kW solar power generation system has been installed to provide educational examples of new technologies to students as well as provide power back into the grid.
- Mt Barker and Mt Gambier TAFE campuses - installation of energy efficient lighting valued at \$700,000 was installed at these campuses, with an estimated 20 per cent reduction in future energy consumption.
- Mt Gambier TAFE campus - \$3.5 million was invested in the construction of new workshops to support heavy vehicles, carpentry and joinery industries and included energy efficient equipment, lighting and air conditioning.
- Port Lincoln and Port Pirie TAFE campuses - an energy and water audit was conducted to identify energy and water savings initiatives for future implementation.
- Victor Harbor TAFE campus - a new \$9.4 million campus is currently under construction and will include an 8.16 kW solar power generation system, energy efficient lighting and a Building Management System to ensure efficient use of energy.

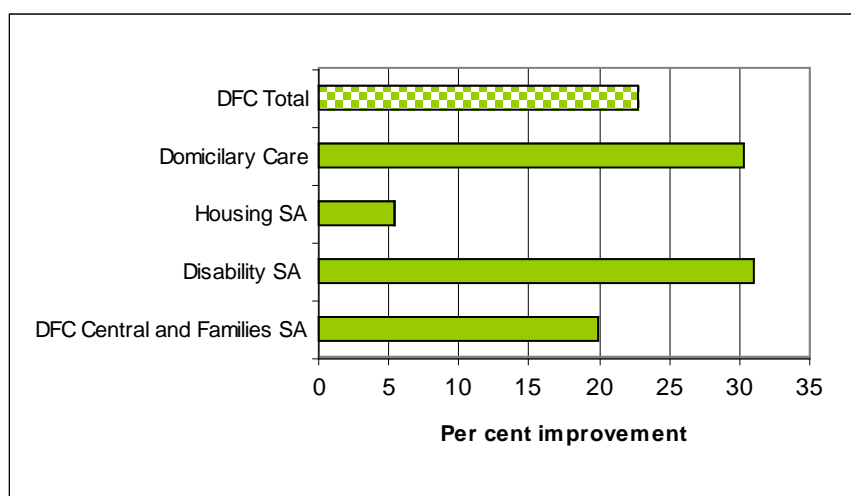
Proposed New Initiatives in 2010-2011

- The recently launched Sustainability Strategy and Action Plan 2010–2012 will progressively be implemented to achieve energy efficiencies in all DFEEST facilities, in particular TAFE Campuses.

- A lighting upgrade at Gawler TAFE campus with estimated savings of 20 per cent in energy consumption will be implemented.
- The announcement of the new \$125 million Sustainable Industries Education Centre to be built at the former Mitsubishi site, Tonsley (once operational in 2014) will replace 3 ageing and inefficient TAFE campuses. The new centre will become the central point for building and construction training in South Australia and promoting sustainable building techniques.
- A targeted capital program will be developed and implemented.

4.5 Department for Families and Communities

Figure 4.5: DFC Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

DFC achieved an overall building energy efficiency improvement of 22.7 per cent between 2000-01 and 2009-10. Both Domiciliary Care and Disability SA have achieved a significant improvement and exceeded the 25 per cent target. Housing SA achieved the lowest improvement, with a 5.4 per cent increase in energy efficiency since 2000-01

DFC consumed 2.8 per cent of the South Australian Government's energy consumption, contributing 0.6 per cent to the whole of government efficiency improvement.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil

Significant Energy Management Achievements

During 2009-10 implemented a number of programs designed to further improve energy efficiency within the portfolio these included the following:

- Print Device Consolidation Program - during 2009-10 the number of print devices in the DFC sites. Savings on the reduction of 332 print devices are \$1,125,000 per annum, with a reduction of approximately 135 tonnes in CO₂ emissions.
- The 5 Star Green Star DFC Limestone Coast office building was opened in December 2009 and is fully operational at a 5 Star Green Star level.
- DFC joined the CitySwitch Program which is a group of private and public groupings dedicated to reducing energy usage and promoting energy efficiencies.
- DFC commenced a NABERS tenancy rating in the DFC Riverside Centre.

Other Sustainability Initiatives include:

- DFC has undertaken employee engagement and branding initiatives to increase its profile with regards to environmental targets and goals as outlined in the State Strategic Plan, 2007.
- During 2009-10 the DFC Riverside tenancy achieved zero waste status, which means that none of the waste generated in the tenancy goes to landfill. This was confirmed by an

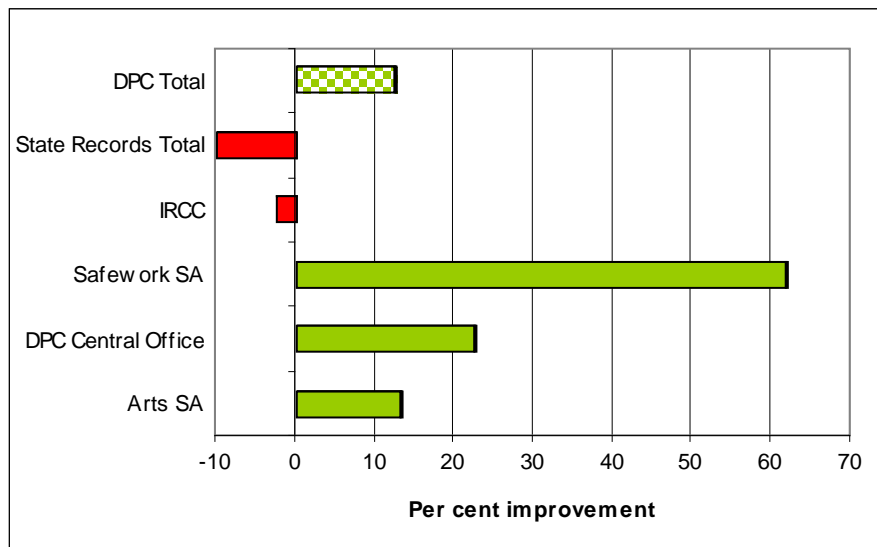
independent report and is the first major State government tenancy to achieve this in South Australia and is thought to be the first in the whole of Australia.

Proposed New Initiatives in 2010-11

- A target of 90 print devices in DFC Riverside Centre has been set. This will be 1 print device to 9 staff members which is recognised as best practice. DFC will continue to roll out the program to all DFC facilities within Housing SA, Disability SA, Families SA and Domiciliary Care SA.
- The DFC Zero Waste Management System pioneered in the DFC Riverside Centre Tenancy will be initiated in other site across DFC.
- DFC will be a vibrant member of the Adelaide CitySwitch Program which is committed to promoting energy efficiencies DFC Riverside Centre is currently the largest tenancy to join the program.
- The DFC Greening Ambassadors Network will be promoted and implemented throughout DFC. The program involves staff members with an interest in environmental greening and fosters sustainability and greening ideas and initiatives.

4.6 Department of the Premier and Cabinet

Figure 4.6: DPC Building Energy Efficiency Improvement 2000-01 to 2009-10 in buildings consuming more than 500 GJ of energy per annum.



Overview of Performance to 2009-10

Department of the Premier and Cabinet (DPC) achieved an overall energy efficiency improvement of 12.5 per cent in owned and leased buildings between 2000-01 and 2009-10, using area as the business measure. This was 0.6 per cent less than the 2008-09 results, in which DPC achieved a 13.1 per cent improvement. As a consumer of 3.9 per cent of the South Australian Government's energy use, DPC contributed 0.5 per cent to the overall energy efficiency target.

The result for State Records is 10 per cent less energy efficiency than the baseline year. This was an improvement on the 2008-09 performance which resulted in -15 per cent energy efficiency compared to baseline data. The results are attributed to the installation of an air-conditioning system, to a standard required for long-term conservation of official records, at the Gepps Cross site which was occupied after 2000-01. The Industrial Relations Court and Commission (IRCC) also had less favourable results with -2.52 per cent energy efficiency.

DPC recorded an increase in energy efficiency at its larger sites, such as the Art Gallery, State Library of South Australia and South Australian Museum as well as smaller sites located in the CBD and the SafeWork SA site at Keswick.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil

Significant Energy Management Achievements

- The completion of stage one of the Greening of the Gallery project, to upgrade the air-conditioning for the Melrose and Elder Wings of the Art Gallery of South Australia.
- Progressive rationalisation of printers and copiers continued across all DPC sites, with investment in energy efficient multi function devices to replace older ICT equipment. A fleet management approach for printers and copiers has been established, and will support further rationalisation of printers across DPC.

- SafeWork SA completed a trial of LED lighting in one of the regional offices and a review of energy efficiencies and cost savings has begun.
- The DPC Sustainability and Greenhouse Gas Reduction Task Group has overseen and supported the implementation of the Sustainability and Greenhouse Gas Reduction Action Plan 2008-10. The plan was reviewed in May 2010, and a 2010 -12 action plan has been developed.

Other Sustainability Initiatives

In addition to the energy initiatives outlined earlier, DPC continued to focus on improving the sustainability of its operations and to consolidate recent progress achieved in policy, business practice and facilities management. This work included:

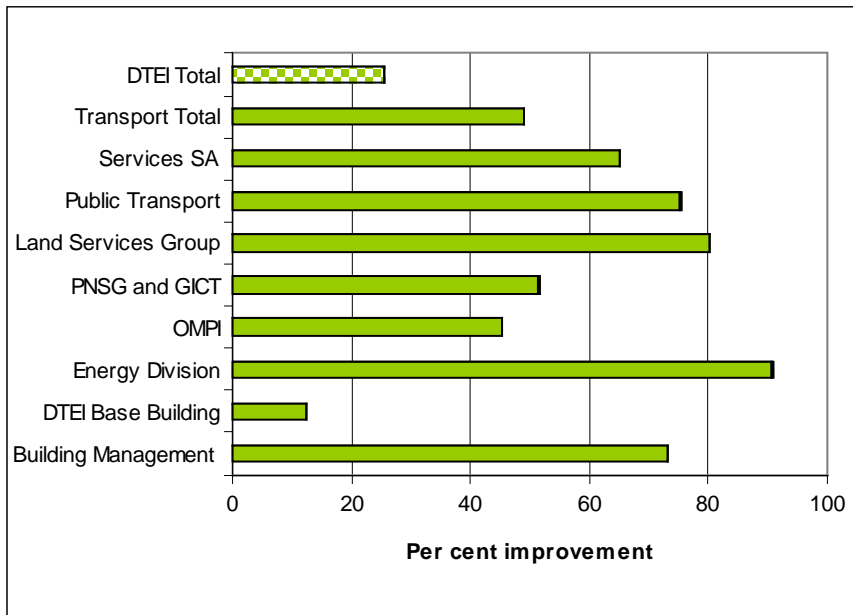
- Installation of water flow restrictors and half flush urinal levers for all DPC floors in the State Admin Centre; and conversion of 11 cisterns to dual flush in the SA Museum Science Centre and Artlab.
- Implementing a comprehensive waste/recycling system in July in the State Admin Centre and 12 Victoria Place, with zero waste to landfill achieved since March 2010.
- Introduction of a comprehensive waste/recycling system in November 2009, for staff areas of the cultural and heritage sites in the North Terrace precinct.
- Establishing the online DPC Internal Recycling Trade to support reuse and internal recycling of surplus office supplies.
- Completion of a tele-presence facility in the State Admin Centre, to reduce staff time, costs and greenhouse gas emissions associated with interstate travel.
- Connections to the GAP (Glenelg to Adelaide Parklands recycled water pipeline) for the Adelaide Festival Centre and Government House grounds.
- The Carrick Hill irrigation system was upgraded with automatic controllers, to reduce water consumption and improve efficiencies.
- The National Motor Museum, Birdwood, improved the irrigation system for the oval and installed rainwater tanks, plumbed to the oval's public toilets.
- The cultural and heritage institutions participated in the newly-established North Terrace precinct Sustainability Group, which is chaired by Arts SA.
- Promotion of sustainable behaviours to staff.

Proposed New Initiatives in 2010-11

- Implement strategies to resolve building, facilities, and equipment issues across DPC, including optimised settings of BMS and default settings for ICT equipment.
- Establish NABERS Energy tenancy ratings for office buildings, as appropriate.
- Develop options for funding major energy reduction programs in sites with significant energy use – Adelaide Festival Centre; Arts SA public buildings.
- Improve the metering and reporting of energy use for the North Terrace precinct and improve the corporate processes for reporting on energy use.
- Continue to review the number of printers per head of staff to meet the green office standard in the Sustainable Office Based Printing Policy.
- Implement business improvement processes aimed to reduce the use of office paper, printer consumables and energy, and associated GHG.
- Implement the DPC Sustainability and Greenhouse Gas Reduction Action Plan 2010 -12.

4.7 Department for Transport, Energy and Infrastructure

Figure 4.7: DTEI Building Energy Efficiency Improvement 2000-01 to 2009-10



GICT = Government Information Communication Technology, PNSG = Parliamentary Network Support Group, OMPI = Office of Major Projects and Infrastructure.

Overview of Performance to 2009-10

The Department for Transport, Energy and Infrastructure (DTEI) improved its overall building energy efficiency by 25.4 per cent between 2000-01 and 2009-10. The Energy Division reported the largest improvement since 2000-01 with 90.8 per cent, attributed to the occupation of the City Central Building Tower 1 in Waymouth St. DTEI contributed 1.3 per cent to the South Australian Government's overall energy efficiency target and accounts for 5.1 per cent of total government energy use.

Many of the improvements to energy efficiency in DTEI can be attributed to a consolidation of sites within each division, resulting in the exclusion of some sites and inclusion of others.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil.

Significant Energy Management Achievements:

Key initiatives implemented by the Department for Transport, Energy and Infrastructure (DTEI) during 2009-10 included:

- Achieved improvements in NABERS energy ratings as a result of the energy and water audits of five significant government owned office buildings in the Adelaide CBD, which represent 75 per cent of government owned office space. Improvements have been achieved through the time of life cycle replacement of plant and equipment such as chillers, lifts and motorised controls and scheduled base building upgrades.
- In conjunction with the Australasian Procurement and Construction Council's (APCC) Government Property Group, DTEI contributed to the development of a National Green Leasing Policy, incorporating development of green leasing templates, guidance notes and fact sheets.

- Completion of the relocation from Walkerville to 77 Grenfell Street. The upgrade of 77 Grenfell Street included the installation of new chillers, more efficient T5 fluorescent lighting, and a services upgrade by the building owner. Together these are targeting a 4.5 Star NABERS Energy rating. A new utility area and office equipment along with the relocation and redesign of a new ICT server room has also significantly reduced overall consumption.
- DTEI has joined the City Switch Green Office program, for its tenancy at 211 Victoria Square, Adelaide. City Switch Green Office is a national tenant energy efficiency program run in partnership with the NSW Department of Environment, Climate Change and Water, Sustainability Victoria and other local and state governments. The program works with tenants to improve office energy efficiency, thereby reducing the CO₂ emissions that contribute to global warming. Performance outcomes are expected to be available for the 2010 - 2011 reporting period.

Other sustainability initiatives

- DTEI installed Water Sensitive Urban Design (WSUD) treatments on recent infrastructure projects including Port Wakefield Road, Elder Smith Road, tram overpass and light rail. Measures included biofiltration and using stormwater captured in swales to improve water quality for local recharge and watering of plants.
- The greater use of recycled material and reuse waste material on infrastructure projects where feasible: 470m³ of timber sleeper mulch sent to the Northern Expressway project for use in landscaping, 430 tonnes of steel (steel sleepers) sent to recycling, 515 tonnes of steel sleepers sent to TransAdelaide for other rail applications. Rail ballast material is being stockpiled for potential use on the Northern Connector project.
- Managed the vehicle fleet so that 73 per cent of DTEI's vehicles use low emission fuels. 83 per cent of vehicles currently on order will use low emission fuels.
- Acquired one of the first production electric cars in Australia to trial its performance as a fleet vehicle. While in use the I-MiEV vehicle does not generate any emissions.
- Initiated operational waste management arrangements at a range of office locations that enables waste types to be separated by tenants, reduces waste to landfill and improves recycling.
- Installed two high efficiency cooling towers with variable speed drives on the roof tops of the State Administrative Centre and Education Building, Flinders Street, to replace the two timber cooling towers which had reached the end of their useful life. The new cooling towers are more water efficient compared to the original towers and therefore will save water and consume less power.

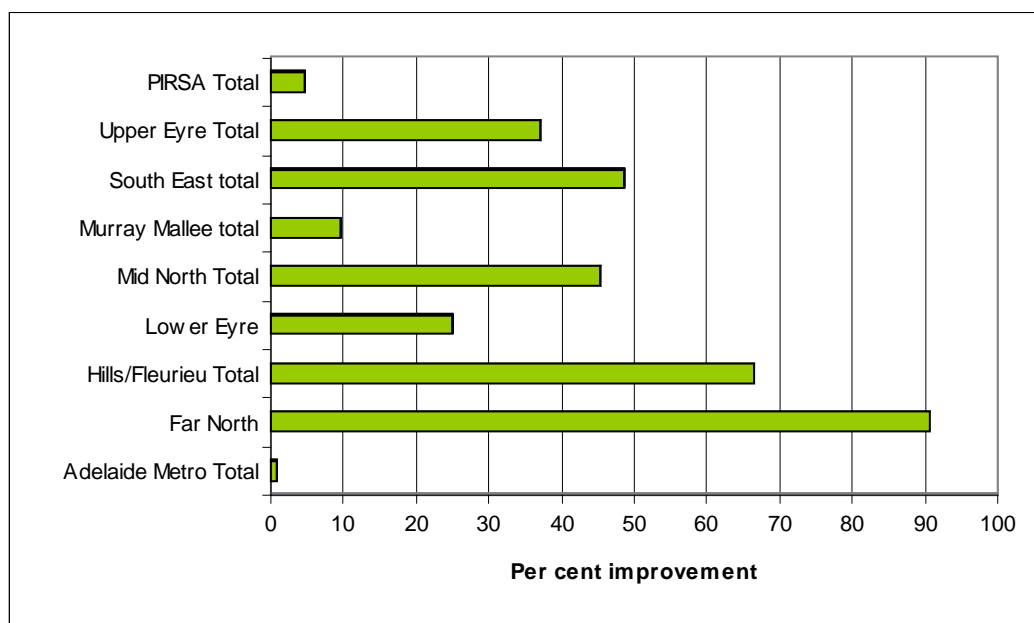
Proposed New Initiatives in 2010-11 and Beyond

- The Parliamentary Network Support Group has initiated a project to be implemented in 2010-11 that will change how services are delivered to 50 electorate offices across South Australia. This project will evaluate energy efficient solutions including virtualised desktop technology, and thin client technologies that use very little power.
- Establish a baseline for energy and water consumption in government-owned office accommodation prior to analysis and development of appropriate improvement strategies and programs. This approach is consistent with the new COAG Mandatory Disclosure Policy, applicable from November 2010, which may trigger disclosure of a NABERS Energy rating for government-owned office buildings >2,000m² at the time of sale, lease or sub-lease.
- At a national level through the APCC, DTEI will continue to contribute to the development of a framework and set of national principles to provide a consistent approach to government office building rating targets across Australia and assist the Commonwealth, State and Territory governments in the adoption of a national approach to improving the sustainability of the built environment. This includes the development of a National Green Leasing Policy and promotion of Energy Performance Contracts.

- Development of a Green Fit-out Guide will continue, providing a list of ecologically sustainable measures for consideration by design teams and building occupants to apply to government fit-outs i.e. the physical products and spaces controlled and used by Government to make habitable space in tenancies.

4.8 Primary Industries and Resources SA

Figure 4.8: PIRSA Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

Figure 4.8 demonstrates the relative energy efficiency improvements within PIRSA's regional agencies. Overall, PIRSA achieved a 4.6 per cent energy efficiency improvement in its buildings between 2000-01 and 2009-10. PIRSA consumes 3 per cent of the South Australian Government's energy consumption, contributing 0.2 per cent to the whole of government efficiency improvement.

PIRSA conducted an extensive review of its energy data reporting in 2009-10, identifying a number of sites to be excluded from reporting as they were not classified as government buildings.

Changes in Baseline and/or Subsequent Years' Energy Use

PIRSA made a slight change to its baseline year due to the exclusion of some sites. PIRSA also included business measure data for sites where this data was previously unavailable.

Significant Energy Management Achievements

- PIRSA achieved a 5 Star NABERS rating for Level 15 – 25 Grenfell Street, Adelaide
- Replacement of chiller at 33 Flemington Street, Glenside with an energy efficient air-cooled chiller.

Proposed New Initiatives in 2010-11

- Review consumption savings from upgrade to T5 lighting in PIRSA leased tenancies for and identify PIRSA owned sites for possible implementation.
- PIRSA to implement reporting efficiency recommendations highlighted by DTEI Energy Division in conjunction with the 2009-10 Independent Verification Report.

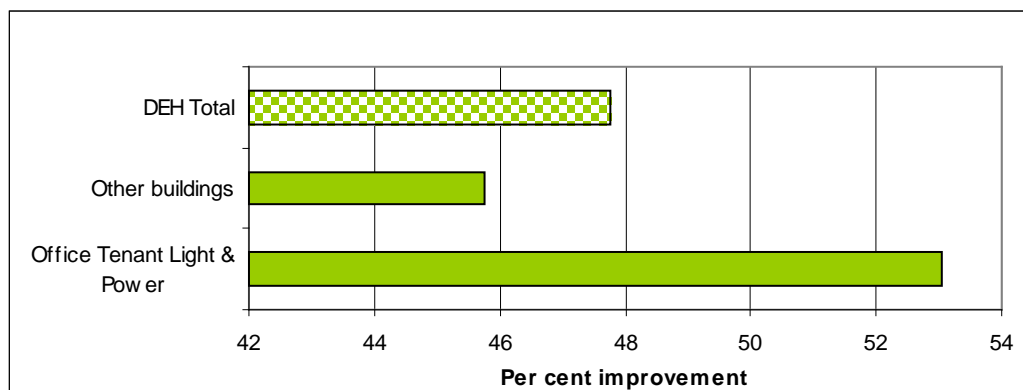
- PIRSA to commence further investigation into the recommendations highlighted from Level 1 Energy Audits conducted at 5 major PIRSA sites.

Beyond and Other Sustainability Initiatives

- Establish and maintain NABERS ratings for all PIRSA leased CBD tenancies in cooperation with Building Facility Managers.
- Establish a Greenhouse Rating for PIRSA owned sites.
- Continue to improve work behaviours and practices by staff and incorporate energy efficiencies and greening principles to make PIRSA a green friendly environment.

4.9 Department for Environment and Heritage

Figure 4.9: DEH Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

DEH achieved an overall building energy efficiency improvement of 47.8 per cent between 2000-01 and 2009-10. The energy efficiency of all DEH sites has exceeded the 25 per cent target. DEH has achieved a 4.44 per cent improvement in energy efficiency since 2008-09.

DEH consumes 0.7 per cent of the South Australian Government's energy consumption, contributing 0.3 per cent to the whole of government energy efficiency improvement.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil for 2009-10. A baseline change will be required for 2010-11 due to the restructure of DEH to the Department of Environment and Natural Resources (DENR).

Significant Energy Management Achievements

DEH undertook the following energy efficiency measures in 2009-2010:

- Upgraded the power supply to Buildings at Witjira National Park
- Supplied and installed an energy optimiser at Goodman Building at the Adelaide Botanic Gardens
- Installed bulk LPG tanks for Balcanoona, including the reticulation pipe work to deliver LPG to points of consumption
- Provided additional cabling and a meter at the Rocky River houses as part of the connection to the main power grid, eliminating the need for generators and enabling excess power from solar panels to return to the grid
- Installed a GSM modem kit for the Chesser House metering network
- Removed the Oraparrina bulk fuel tank
- Completed stage 1 of providing remote-area power systems to Dangalli and Bimbowrie Conservation Parks

Proposed New Initiatives in 2010-11

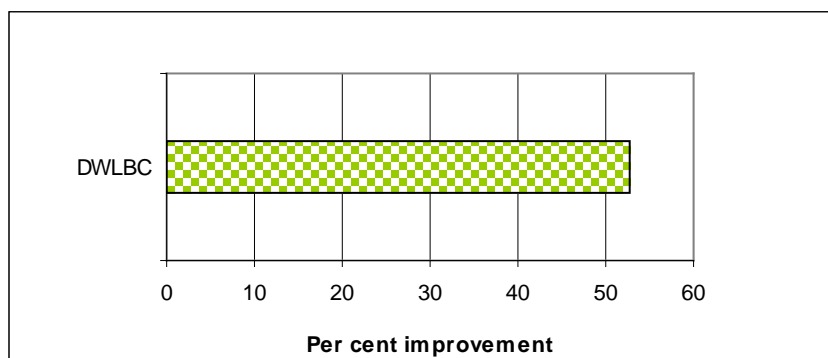
DENR are planning the following activities for 2010-2011:

- T8 Lighting retrofits to Cleland, Black Hill, Hackney
- Kelly Hill CP Lighting Upgrade to more efficient cave lighting
- Stage 2 of Dangalli CP Power Upgrade

- Bimbowrie, Antro replace power supply batteries and undertake assessment to determine viability of upgrading complete generation system
- Review and upgrade of Innamincka RR Power supply.

4.10 Department of Water, Land, Biodiversity and Conservation

Figure 4.10: DWLBC Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

The Department of Water, Land, Biodiversity and Conservation (DWLBC) achieved an overall building energy efficiency improvement of 52.8 per cent between 2000-01 and 2009-10. This is slightly less than the 2008-09 results of 53 per cent improvement. DWLBC is a small consumer of Government energy and contributed 0.1 per cent to the Government's overall energy efficiency improvement.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil.

Significant changes to DWLBC

The Premier of South Australia, the Hon Mike Rann MP, has announced Cabinet's endorsement of a number of changes to the structure of State Government agencies effective 1 July 2010. Changes to the current portfolio include:

- The establishment of a Department for Water (DFW), which will provide a single source of advice to the Premier and to the Minister for Water and for the River Murray on all issues concerning water in South Australia.
- Responsibility for natural resources management and the promotion of ecologically sustainable development in the state will shift from the Department of Water, Land and Biodiversity Conservation to the Department for Environment and Heritage, which will be renamed the Department of Environment and Natural Resources.

Significant Energy Management Achievements

DWLBC undertook the following energy efficiency measure in the 2009-10 year:

- Completed energy audits of all DWLBC owned accommodation. Key recommendations are to be budgeted and prioritised.
- Energy efficient preventative maintenance upgrades were implemented where applicable; smaller hot water services and the install of efficient appliances and equipment.

Proposed New Initiatives in 2010-11

- DFW will begin the process of developing clear, consistent and credible information on energy efficient products and services that can motivate responsibility to all departmental employees
- The implementation of printer consolidation inclusive of any new & existing tenancies

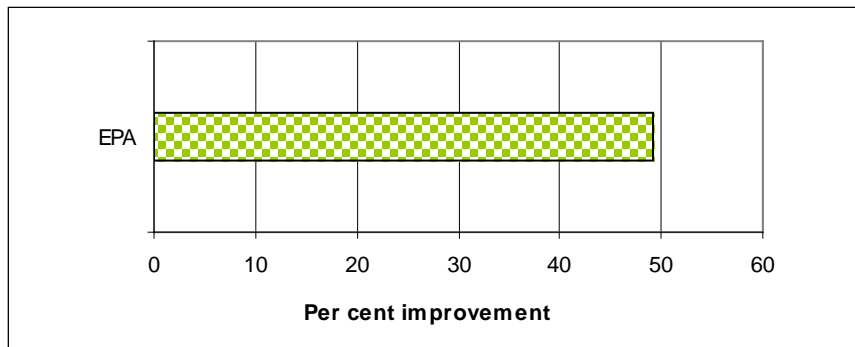
- Printing to multi function devices will be implemented to a secure or locked print function as a default, print and release will reduce unwanted printing and waste, staff education to this feature will achieve paper and toner reduction including power consumption
- T5 lighting has been acquired from another Gov dept that was in the process of an up-grade which will be programmed to be installed into DFW sites, country sites being targeted
- Restacking of staff within DFW due to the re-structure with the intention of relinquishing an existing tenancy thereby reducing carbon footprint
- All new tenancies to be leased to have a NABERS rating and programs in place to sustain or improve the rating
- Implement a staff education program: re turning lights off, power off of non-essential equipment and liaison with ICT department

Change in baseline in 2010-11

Department for Water has transferred ownership of a number of sites to Department of Environment and Natural Resources due to the restructuring of Agencies which will change the baseline for 2010-11.

4.11 Environment Protection Authority

Figure 4.11: EPA Building Energy Efficiency 2000-01 to 2009-10



Overview of Performance to 2009-10

The Environment Protection Authority (EPA) achieved a 49.2 per cent improvement in energy efficiency between 2000-01 and 2009-10. This is a significant improvement on the 2008-09 results, in which the EPA achieved a 7.94 per cent increase in energy efficiency. The EPA consumes 0.03 per cent of total government energy.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil.

Significant Energy Management Achievements

EPA undertook the following energy efficiency measure in the 2009-10 year:

- The EPA continues to occupy the 6 star Green Star SA Water Building in Victoria Square, resulting in considerable energy and cost savings.
- Work was completed on the fitout of a new Radiation Laboratory at Byron Place, Adelaide replacing the old laboratory at Rundle Street, Kent Town. This new laboratory has further reduced the space occupied by EPA.

Proposed New Initiatives in 2010-11

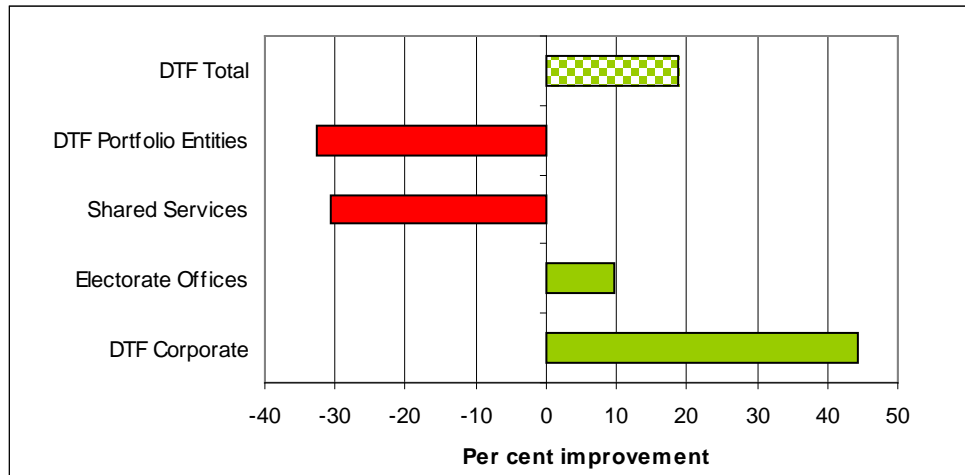
- EPA is continuing to work with the Building owners of the SA Water Building to identify opportunities to make energy savings within the Base Building functions.
- Within the EPA tenancy utilisation of current printers and photocopies and other office machinery will be considered with a view to further reductions made at the time of relocating to the new building.
- Procurement practices and suppliers of office supplies and consumables procurement to be considered with a view to ensuring energy efficient and green products are purchased where appropriate.

Other Sustainability Initiatives include:

Following the establishment of the Sustainability at Work (S@W) project implemented in 2009-10, the S@W team (all volunteers) established an Action Plan with the aim to reduce the EPA's environmental footprint. The Action Plan following staff consultation will be implemented has been adopted and actions will be implemented throughout 2010-11.

4.12 Department of Treasury and Finance

Figure 4.12: DTF Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

DTF reported an improvement in energy efficiency between 2000-01 and 2009-10 of 18.8 per cent. DTF Corporate contributed significantly to the improvement, achieving a 44.2 per cent increase in energy efficiency since 2000-01. Shared Services and sites within DTF Portfolio Entities did not report an improvement. DTF is continuing to investigate mechanisms for improving energy efficiency in Shared Services.

The 2009-10 results are a significant improvement on 2008-09 results, which reported an increase of 3.9 per cent.

DTF contributed 0.1 per cent to the whole of government energy efficiency and consumes 0.5 per cent of the total government energy.

Changes in Baseline and/or Subsequent Years' Energy Use

The baseline for Shared Services was readjusted as previous baseline reporting included consumption data for only 7 months. An additional 5 months of consumption data was added to Shared Services for 2000-01.

Significant Energy Management Achievements

DTF undertook the following energy efficiency measures in the 2009-10 year:

- Converting offices/conference/meeting rooms back to sensor operated lights;
- Continual rollout of Strategic Accommodation Plan to incorporate a more efficient open plan office environment;
- Continual rollout of multi-functional devices and the reduction of printers;
- Installation of more efficient hot water systems in kitchen/utility areas; and
- Installation of fixed timers on water boiling units to limit operations between 6.00am and 6.00pm, Monday to Friday.

Proposed New Initiatives in 2010-11 and Beyond

DTF is planning the following major initiatives:

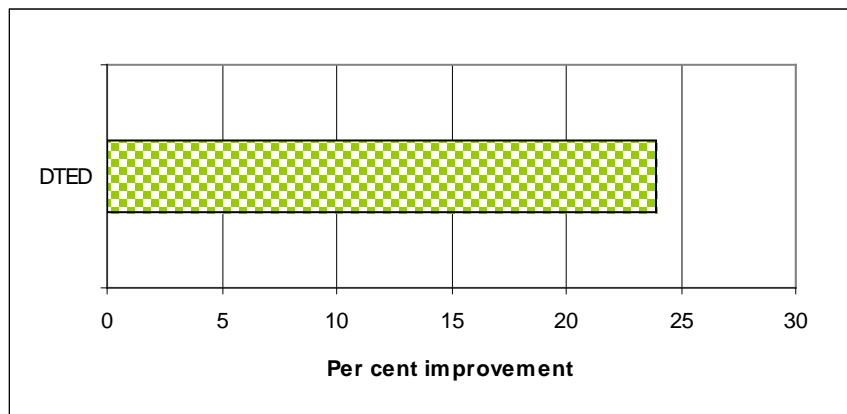
- Engage DTEI as building owner/manager and Spotless Property and Facilities to consider lighting options for the State Administration Centre;
- Continue to convert offices/conference/meeting rooms back to sensor operated lights;
- Continue de-lamping of floors within the State Administration Centre while maintaining correct lighting levels; and
- Continue installation of more efficient hot water systems and fixed timers on boiling water units throughout DTF.

Other Sustainability Initiatives

- Printer defaults set to double-sided printing, excluding formal documentation;
- Installed water flow restrictors in kitchen and bathroom hardware within the State Administration Centre; and
- Extended the waste and recycling program to include toner cartridges and batteries.

4.13 Department of Trade and Economic Development

Figure 4.13: DTED Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

The Department of Trade and Economic Development achieved a 23.9 per cent improvement in its building energy efficiency between 2000-01 and 2009-10. This result is an improvement on 2008-09 results with a 19 per cent increase in energy efficiency. DTED contributed 0.01 per cent to the whole of government's energy efficiency improvement.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil.

Significant Energy Management Achievements

DTED currently occupies The Conservatory in Hindmarsh Square which has a 4.5 star NABERS rating. A range of energy efficiency measures are provided within this building, including:

- Photovoltaic cells installed in The Conservatory that puts electricity back into the grid. The photovoltaic array generates approximately 9,000 kWh per annum which will reduce the power taken from the grid by 3 per cent - equivalent to power for lighting on one floor of the building.
- A co-Generation plant in The Conservatory incorporates a gas fired turbine which runs an electricity generator and this electrical energy is used in the building (mostly by air conditioning and ventilation plant). The base building air conditioning system serving the DTED tenancy area, will directly benefit from the power produced by this system. The Co-Generation plant will produce approximately 50 per cent of the power required to operate the base building services generally, or in other terms, 80 per cent of the energy required to operate an office floor (DTED) base building air conditioning systems.
- Magnetic bearing chiller for air-conditioning in The Conservatory - the magnetic bearing chiller is highly efficient because its bearings hover in a magnetic field rather than contacting and thus avoid friction. The resultant improvement in efficiency is of the order of 40 per cent compared to standard oil bearing chillers. The resultant saving in electrical energy is of the order of 35,000 kWh per annum (33,250 kgCO₂).
- Smart lighting has been installed, using T5 luminaires and auto shut-off / movement activated lighting fitted in all office areas of The Conservatory to assist with energy saving.
- Low E glazing to windows to eliminate up to 99 per cent of UV radiation. Manually operated blinds (automated for level 9 meeting rooms only) to reduce sun glare and assist in reducing radiated heat into the office space.

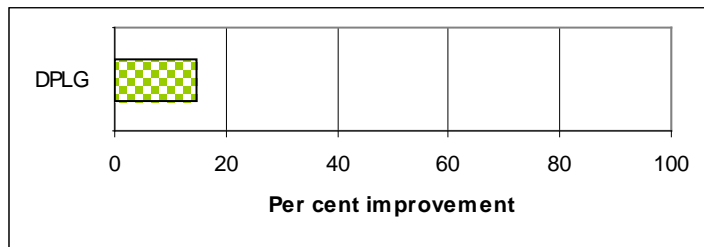
- Auto shut down of all desktop computers at a specified time each night.
- Where possible all other electrical equipment (e.g. photocopiers) are set to power-save mode after 20 minutes.

Proposed New Initiatives in 2010-11 and Beyond

- DTED continues to inform its staff about energy saving measures through a saving energy behavioural change program.

4.14 Department of Planning and Local Government

Figure 4.14: DPLG Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

Figure 4.14 demonstrates a 14.7 per cent improvement in energy efficiency in 2009-10 for the Department of Planning and Local Government (DPLG). Divisions within DPLG were previously part of PIRSA and all historical data has been transferred from PIRSA to DPLG.

DPLG accounts for only 0.1 per cent of the SA Government's energy consumption. This portfolio contributed 0.01 per cent to the whole of government energy efficiency results.

2009–10 was the first full reporting period in which DPLG gathered its own energy data. The change in reporting method may account for the increase in DPLG energy efficiency from 2008–09 to 2009–10.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil.

Significant Energy Management Achievements

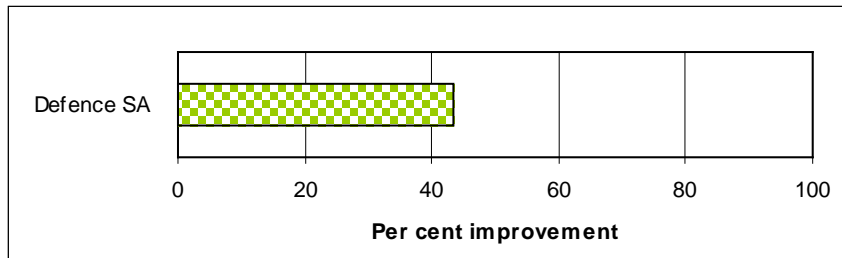
In 2009–10 the DPLG Executive signed off on the terms of reference and reporting framework for the department's Greening Initiatives Forum, as well as an implementation plan for educational and promotion activities among staff.

Proposed New Initiatives in 2010-11 and Beyond

- The Greening Initiatives Forum will be re-established with new membership across DPLG.
- The DPLG will revise its energy efficiency implementation plan.
- Actions from implementation plan include:
 - Proposed sensor lights in rooms used occasionally such as meeting rooms
 - Relaunch of the 'switch-off' campaign

4.15 Defence SA

Figure 4.15: Defence SA Building Energy Efficiency Improvement 2000-01 to 2009-10



Overview of Performance to 2009-10

Defence SA reported their energy efficiency for the second time in 2009-10. Figure 4.15 demonstrates that Defence SA achieved a 43.5 per cent increase in energy efficiency consumption between 2000-01 and 2009-10. Defence SA currently occupies 2 sites and accounted for 0.01 per cent of the South Australian Government's energy consumption.

Defence SA significantly improved its energy efficiency between 2008-09 and 2009-10, reporting a considerable decrease in energy consumption.

Changes in Baseline and/or Subsequent Years' Energy Use

Nil.

Significant Energy Management Achievements

- Location of Defence SA's administrative offices within a 4.5 star-rated building at Level 4, 151 Pirie St, Adelaide
- Completion of the 5 star-rated Commercial Campus and Maritime Skills Centre facilities at Techport Australia

Proposed New Initiatives in 2010-11 and Beyond

- Installing LED lit exit signage lighting at Technology Park Adelaide
- Adding de-scalar to the cooling tower water at Technology Park Adelaide to reduce the scale build up on fan motors thereby reducing energy consumption

Defence SA will investigate expanding the array of photovoltaic cells on the Maritime Skills Centre at Techport Australia and Innovation House at Technology Park Adelaide.

Appendix A - End-use Category Definitions

Office Buildings – 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.

Office Buildings – 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, domestic hot water etc.

Laboratories

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

Other Buildings

The energy performance of buildings not reported elsewhere is included in the Other Buildings category. These buildings range from simple storage sheds through to radio transmitters.

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.

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.

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 T3:13.

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.

Educational Facilities

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

Custodial Facilities

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

Hospitals

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

Other Health Care Buildings

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

Appendix B - Conversion Factors

Table B.1: Measurement Units

Unit	Abbreviation	Measures	Equals
Mega-Joule	MJ	energy	10 ⁶ joules
Giga-Joule	GJ	energy	10 ⁹ joules
Peta-Joule	PJ	energy	10 ¹⁵ joules
Metre	m	length	
Kilogram	kg	mass	
Tonne	t	mass	1000 kg
Litre	L	volume	0.001m ³

Table B.2: Energy Conversion Factors

Energy Type	Typical Measured Units	Abbreviation	To convert to Giga-Joules, multiply by
Electricity	kilowatt hour	kWh	0.0036
Natural Gas	Giga-Joule	GJ	1
LPG	Kilo-litre	kL	25.7
Heating Oil	Kilo-litre	kL	37.3
Fuel Oil	Kilo-litre	kL	39.7
Automotive Diesel	Kilo-litre	kL	38.6
Petrol	Kilo-litre	kL	34.2
AVGAS	Kilo-litre	kL	33.1
GreenPower	kilowatt hour	kWh	0.0036

Source: National Greenhouse Accounts (NGA) Factors, released by the Department of Climate Change, July 2010.

Appendix C – Calculation of Energy Efficiency

C.1 – Energy Efficiency Measurements

The 2007 update of South Australia's Strategic Plan established a target to improve the energy efficiency of Government buildings. Progress is calculated using an energy efficiency index.

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 demand for energy services.

This document uses energy intensity measures to account for changes in the Government's energy usage while taking into consideration changes in service levels (eg 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 (eg 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 departments) within an organisation.

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.

DTEI is continuing to investigate methodologies and indexes 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. Table C.2 on page 48 provides aggregated whole of Government data against these three business measures.

The aggregate energy efficiency figures below 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 2009-10 energy consumption and adding the proportions together.

C.3 - Calculating a Component Based Energy Efficiency Improvement

Portfolio energy efficiency performance in 2009-10 was calculated through the following processes.

1. Obtain the amount of energy used per business measure (i.e. area) for both 2000-01 and 2009-10:

The energy consumed per business measure (BM) was calculated automatically by OSCAR, when agencies entered the value of their business measure into their portfolio's site. These figures were then downloaded by the Energy Division and entered into a spreadsheet. The energy used per business measure is as follows:

$$\frac{[\text{Agency A Energy Use in 2000-01 or 2009-10}]}{[\text{Agency A Business Measure in 2000-01 or 2009-10}]} = \text{Number of MJ used per BM (i.e. per m}^2\text{) for 2000-01 or 2009-10}$$

For example, Agency A in 2000-01:

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

Agency A in 2009-10:

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

2. Calculate energy efficiency improvement for each agency:

Energy efficiency improvement for each agency within each portfolio is calculated by the following formula, using the figures in the example above:

$$\frac{[3] - [2.1]}{[3]} = 0.3$$

Then:

$$\text{Multiply } 0.3 \text{ by } 100 = 30 \text{ per cent agency energy efficiency improvement}$$

3. Calculate energy efficiency improvement for each portfolio:

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

$\frac{\text{Agency A energy use}}{\text{Total portfolio energy use}}$ multiplied by per cent Agency A efficiency improvement

+

$\frac{\text{Agency B energy use}}{\text{Total portfolio energy use}}$ multiplied by per cent Agency B efficiency improvement

= total portfolio energy efficiency improvement.

4. Calculate portfolio's impact on whole of government energy efficiency improvement and aggregating across portfolios.

The approximate contribution each portfolio made to the whole of government energy efficiency improvement target was calculated by weighting each portfolio'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 portfolios in each end-use category. This is shown in Table C.1 for three portfolios using fictional numbers.

Table C.1: Government Energy Efficiency Improvement Measurement

	Portfolio A	Portfolio B	Portfolio C
Per cent of total SA Government energy use	50 per cent	15 per cent	10 per cent
Per cent individual efficiency improvement	10 per cent	20 per cent	10 per cent
Per cent contribution to Target	5 per cent	3 per cent	1 per cent
Target (weighted energy efficiency improvement)	9 per cent		

The first row of Table 1 shows the share of total energy consumption by each portfolio. 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, Portfolio 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 portfolios.

Table C.2: Aggregated Whole of Government Data

	2000-01			2008-09				2009-10			
Business Measure	Total Energy Use (GJ)	Total Business Measure	Aggregate Energy Efficiency	Total Energy Use (GJ)	Total Business Measure	Aggregate Energy Efficiency	Per cent Energy Efficiency Improvement	Total Energy Use (GJ)	Total Business Measure	Aggregate Energy Efficiency	Per cent Energy Efficiency Improvement
Area (m ²)	2,325,773	4,549,393	511.2	2,187,650	4,859,009	450.2	11.93	2,128,823	4,958,685	429.3	16.02
Buildings (no.)	92,368	37	2,496,432	88,349	42	2,103,547.6	15.74	83,079	38	1,978,071.4	20.76
Occupancy (FTEs)	98,060	6,763	14,500	90,413	8,577	10,541.3	27.3	88,944	8,917	10,370.1	28.48
Total Aggregated Energy Efficiency (weighted by 2008-09 energy consumption)							12.66	(weighted by 2009-10 energy consumption)			16.7

It is worth noting that unless each component is weighted equally, an aggregate energy intensity figure will differ from component based energy intensity, due to data structural effects.

Appendix D: Energy Use tables

The South Australian Government used 2,300,846 GJ in the 2009-10 year, compared to 2,516,198 GJ in 2000-01. Table D.1 shows GJ use by end-use category and Table D.2 by Portfolio/Agency.

Table D.1: SA Government energy use from buildings by end-use category 2000-01 to 2009-10

End-use Category	2001 (GJ)	2002 (GJ)	2003 (GJ)	2004 (GJ)	2005 (GJ)	2006 (GJ)	2007 (GJ)	2008 (GJ)	2009 (GJ)	2010 (GJ)	All Reporting Periods
Custodial facilities	77,095	69,841	69,136	71,973	71,250	75,248	73,476	75,040	75,166	77,573	735,798
Educational facilities	518,374	544,873	531,045	554,416	527,570	532,840	539,872	502,169	502,199	495,032	5,248,390
Hospitals	1,250,725	1,233,848	1,245,019	1,293,539	1,279,334	1,277,442	1,282,235	1,248,325	1,218,353	1,176,454	12,505,274
Laboratories	58,489	52,700	52,591	51,735	51,279	53,637	50,183	53,236	51,211	59,100	534,161
Law Courts	36,841	33,555	28,666	29,161	27,959	29,096	30,246	28,898	27,965	27,952	300,339
Office - Central Services	92,453	75,113	71,798	76,572	67,189	69,791	89,795	88,435	88,385	83,079	802,610
Office - Tenant Light and Power	174,077	150,409	120,934	131,470	132,399	127,914	126,837	125,827	124,996	123,077	1,337,940
Office buildings - combined services	35,906	30,116	13,626	27,701	25,374	26,725	26,034	25,600	25,915	14,034	251,031
Public Buildings	93,541	87,104	86,704	87,560	80,426	85,640	85,047	87,194	85,586	83,127	861,929
Other Buildings	141,557	144,053	140,299	131,683	131,394	125,762	138,058	136,286	140,466	134,150	1,363,708
Other healthcare buildings	37,142	36,895	30,832	30,192	33,853	33,789	31,840	26,895	26,170	27,268	314,876
Total	2,516,200	2,458,507	2,390,650	2,486,002	2,428,028	2,437,883	2,473,623	2,397,905	2,366,412	2,300,846	24,256,056

Table D.2: South Australian Government energy use from buildings by Portfolio or agency 2000-01 to 2009-10

Portfolio/Agency	2001 (GJ)	2002 (GJ)	2003 (GJ)	2004 (GJ)	2005 (GJ)	2006 (GJ)	2007 (GJ)	2008 (GJ)	2009 (GJ)	2010 (GJ)	All Reporting Periods
Defence	575	21							596	200	1,392
DECS	388,414	390,208	388,311	413,872	395,887	382,532	380,275	360,397	347,587	325,230	3,772,713
DEH	32,121	20,567	20,997	20,389	21,455	14,551	19,193	16,560	17,158	16,829	199,820
DWLBC	1,815	1,815	1,997	2,356	2,249	2,246	2,238	2,524	2,472	2,551	22,263
EPA	1,694	1,497	1,633	1,493	1,525	1,432	1,459	1,385	1,398	768	14,284
DFC	68,809	68,562	62,499	61,859	65,673	71,372	65,434	65,100	64,553	65,120	658,981
DFEEST	156,110	174,974	159,197	151,399	144,043	163,359	172,196	150,114	162,308	177,338	1,611,038
Health	1,264,360	1,246,931	1,258,725	1,307,186	1,292,937	1,291,395	1,297,420	1,263,598	1,233,446	1,191,816	12,647,814
Justice	246,186	240,587	226,102	220,499	220,115	224,220	228,008	226,522	226,215	229,975	2,288,430
DPLG	2,018	2,238	2,238	2,061	1,997	1,826	1,875	2,064	2,015	1,722	20,054
DPC	106,494	99,338	97,312	97,931	91,189	96,578	95,330	97,451	95,027	90,774	967,425
PIRSA	75,021	67,316	66,261	64,263	63,757	66,448	61,879	64,382	64,652	67,590	661,569
DTED	3,461	3,373	3,196	2,835	1,639	1,456	1,257	1,122	1,154	1,188	20,681
DTEI	154,214	130,370	91,858	128,050	113,883	108,512	134,283	132,751	133,627	117,640	1,245,187
DTF	14,908	10,709	10,327	11,811	11,679	11,956	12,775	13,933	14,203	12,105	124,405
Total	2,516,200	2,458,507	2,390,651	2,486,003	2,428,028	2,437,883	2,473,623	2,397,905	2,366,412	2,300,846	24,256,056

Glossary

T5 Lighting: an energy efficient fluorescent alternative to conventional fluorescent lighting. T5 is simply a collective term for a narrow-diameter fluorescent light tube.

Eco Lighting: a system that can be installed to reduce the energy used by the existing fluorescent lighting.

BMS: 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.

ESD: Environmentally Sustainable Design. ESD incorporates sustainability principles around the use of energy, water, waste, building materials and other aspects into the design of a building.

Scope one emissions¹: Direct (or point-source) emissions where carbon dioxide equivalent (CO₂-e) is measured from the point of emission release (i.e. fuel use, energy use, manufacturing process activity, mining activity, on-site waste disposal, etc).

Scope two emissions³: Indirect emissions from the generation of the electricity (or steam or heating/cooling) purchased and consumed by the reporting organisation.

¹ Adapted from the National Greenhouse Accounts Factors released by the Department of Climate Change and Energy Efficiency, July 2010.

