



## SA Government Energy Use Annual Report 1998/99

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# 1 INTRODUCTION

**E**nergy used in SA Government operations in 1998/99 cost in excess of \$99 million, excluding major pumping, and resulted in the release of around 980 000 tonnes of carbon dioxide (CO<sub>2</sub>) into the atmosphere. Past governments have implemented measures to contain energy costs by minimising waste through the Government Energy Management Program. More recently, in response to global warming concerns and the Government's commitment to the National Greenhouse Strategy (NGS), attention has focused on the need to reduce levels of greenhouse gas emissions in public sector operations.

Consistent with this, the Government launched the Agency Greenhouse Targets program in April 1998. The program requires all Government departments and instrumentalities to set targets for emission reductions and to report annually on measures undertaken to meet the targets. It now forms part of the Government's National Greenhouse Strategy implementation plan and its objectives are to:

- contain energy costs by reducing energy waste;
- reduce levels of greenhouse gas emissions;
- provide leadership in addressing concerns over global warming.

The purpose of this report is to define the broad patterns, trends and costs of public sector energy use and to review the levels of greenhouse gas emissions. The report also lists the Government's energy management obligations within the NGS and outlines policy responses to address these responsibilities.

## 2 ENERGY DEMAND

### 2.1 Overall

In 1998/99, measured energy demand for State public sector operations totalled 6 540 000 GJ. This figure does not include electricity for street lighting (as this is not metered), or that component of energy use in leased accommodation that has been incorporated in rental payments (generally air conditioning and central services such as lifts and lighting in common areas). Energy used for public sector travel other than via the Government vehicle fleet; eg, taxis, planes, has not been considered. The composition of the 1998/99 energy demand is provided in Table 2.1.

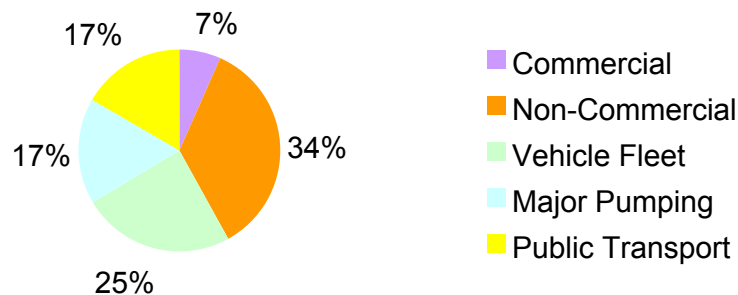
**TABLE 2.1 STATE PUBLIC SECTOR ENERGY DEMAND - 1998/99**

Sector	Demand (GJ)	Expenditure (\$ mill)	CO <sub>2</sub> Emissions (t)
Commercial <sup>1</sup>	440,000	11.1	106,000
Non-Commercial	2,300,000	41.4	379,000
Vehicle Fleet <sup>2</sup>	1,600,000	28.2	115,000
Major Pumping	1,100,000	n/a	293,000
Public Transport	1,100,000	15.8 <sup>3</sup>	88,000
Street Lighting	n/a	2.9	n/a

**Notes:**

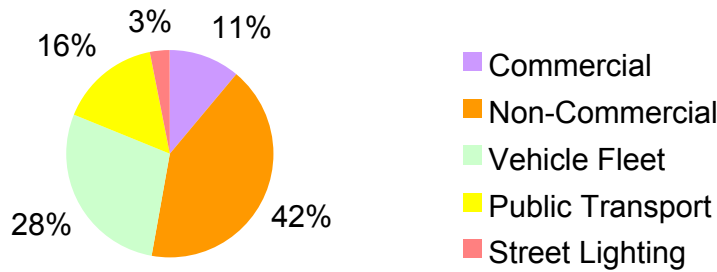
- 1 SA Water Corporation, Ports Corporation SA and the electricity utilities.
- 2 Yearly figure estimated using the first quarter information from 1998/99.
- 3 Cost is an estimate based on average distillate price per litre.

Figure 2.1 State Government Energy Demand by Sector 1998/99



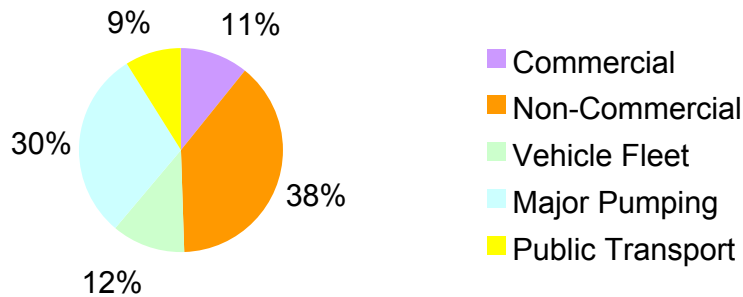
Source: Government Energy Consumption Database, Mobil petroleum contract data. Figures provided in Table 2.1.

Figure 2.2 State Government Expenditure on Energy by Sector 1998/99



Source: Government Energy Consumption Database.  
Figures provided in table 2.1.  
Note: Excludes major pumping.

Figure 2.3 State Government CO2 Emissions by Sector 1998/99



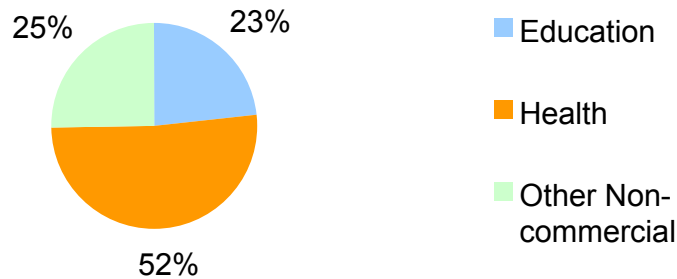
Source: Government Energy Consumption Database.  
Figures provided in table 2.1.

## 2.2 Non-commercial

Electricity and gas used in the non-commercial sector; ie, departments and instrumentalities other than SA Water Corporation, Ports Corporation SA and the electricity utilities, cost \$41.4 million. This equated to thirty four per cent of public sector energy demand and was responsible for thirty eight per cent of greenhouse gas emissions.

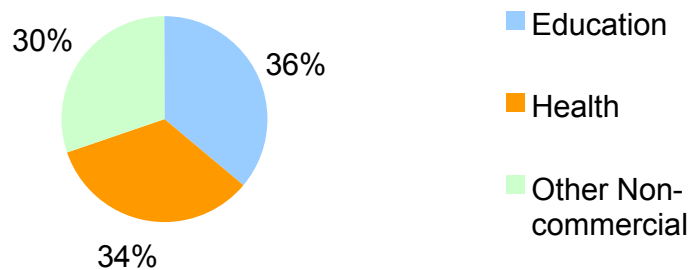
Within the non-commercial sector, Health and Education are the most prominent energy users, accounting for three-quarters of the demand and 70% of the costs for gas and electricity in this sector. Details are provided in Figures 2.4 and 2.5.

Figure 2.4 Electricity and gas use within the non-commercial sector 1998/99



Source: Government Energy Consumption Database

Figure 2.5 Expenditure on electricity and gas within the Non-commercial sector 1998/99

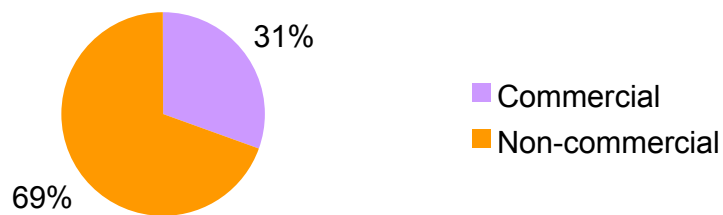


Source: Government Energy Consumption Database

### 2.3 Vehicle Fleet

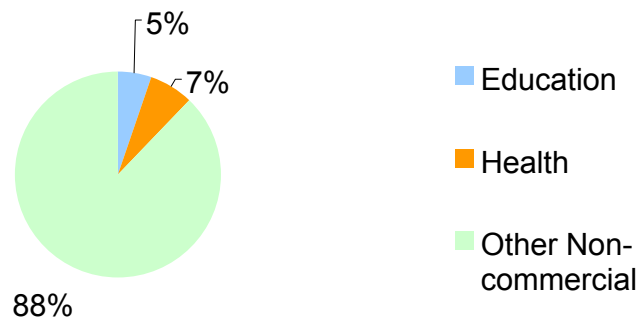
Figures 2.6 and 2.7 provide details of expenditure on vehicle fleet operations for the 1998/99 financial year. Of the total, \$28.2 million, 31 per cent was spent in commercial operations. Health and Education accounted for only 12 percent of non-commercial vehicle fleet fuel costs.

Figure 2.6 Expenditure on vehicle fleet operations 1998/99



Source: Mobil petroleum contract data.

Figure 2.7 Expenditure on vehicle fleet operations within the non-commercial sector 1998/99



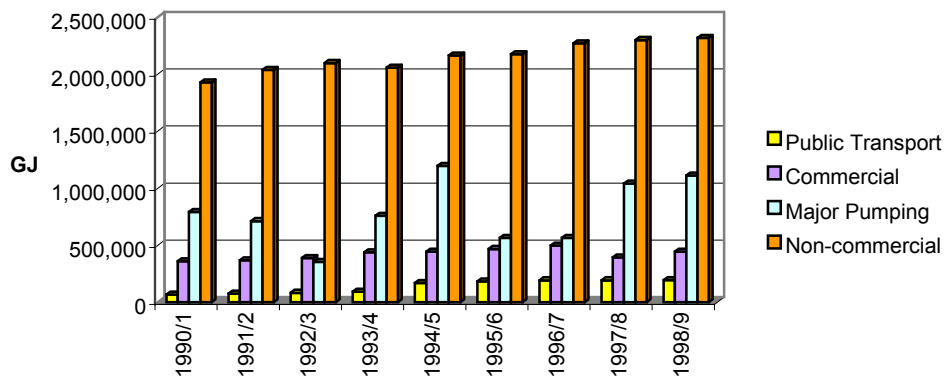
Source: Mobil petroleum contract data.

## 3 Trends In Demand

### 3.1 Overall

Overall demand for electricity and gas over the period 1990/91 – 1998/99 increased from 2 355 000 GJ to 2 955 000 GJ per annum, an average annual increase of 2.9 per cent. In the past 12 months demand for energy has increased by 2.4 per cent, from 2 886 000GJ. These figures exclude energy used by assets that were sold during the period, major pumping electricity use and street lighting. Details are provided in Figure 3.1.

Figure 3.1 Trends in overall electricity and gas demand



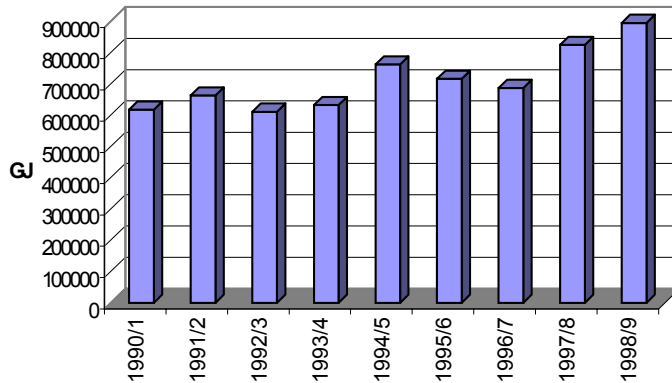
Source: Government Energy Consumption Database

Within the individual sectors, commercial energy use rose by 38 per cent over the first six years, an average annual rate of 5.5 per cent, and then fell by 11 per cent to give an overall average annual increase of 2.7 per cent. Non-commercial energy demand rose relatively steadily at an average rate of 2.3 per cent annually. Electricity and gas use for public transport increased almost three-fold (14 per cent annually) as a result of TransAdelaide's policy to incorporate natural gas powered vehicles into its bus fleet.

Figure 3.2 shows the five year running average for electricity used for major pumping. This provides a clearer picture of the underlying trend in electricity use for this purpose. The five year average figures indicate a 45 percent increase in electricity use over the nine year period, at an average rate of increase of 4.2 percent per annum.



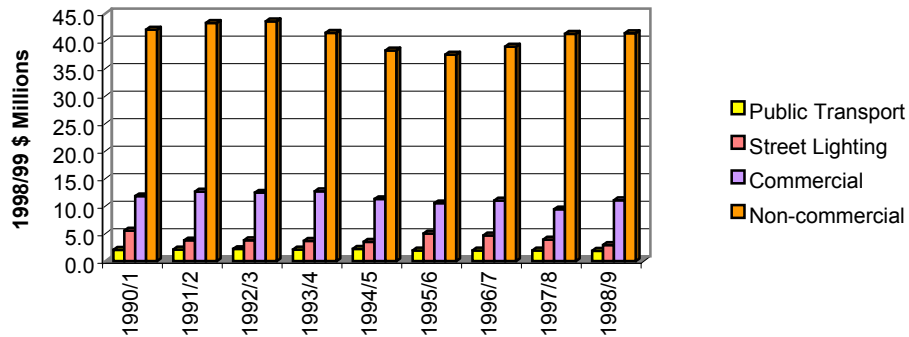
Figure 3.2 Five year running average for major pumping electricity use



Sources: Government Energy Consumption Database

Energy costs, Figure 3.3, are given in 1998/99 dollars and show a small real reduction of 3.4 per cent over the period as a result of electricity tariff restructuring between 1992/93 and 1995/96.

Figure 3.3 Trends in electricity and gas costs (1998/99 Dollars)



**Notes:**

Annual expenditure figures have been adjusted based on the ABS CPI, with 1989/90 as the base year.

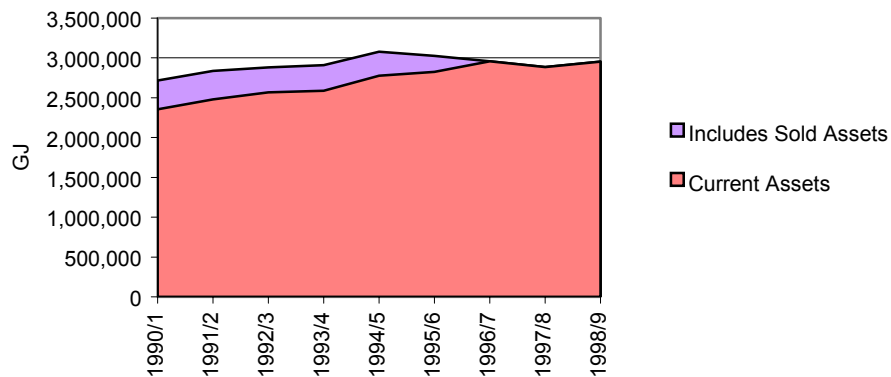
Source: Government Energy Consumption Database; ABS South Australian Economic Indicators, October 1999

Gas usage in the Public Transport sector has increased significantly, almost 300 per cent, over the last five years due to the mobilisation of TransAdelaides natural gas bus fleet. At the same time there has been a decrease of approximately 15% in the consumption of electricity.

For comparative purposes, Figure 3.4 shows the actual public sector energy use throughout the period. It includes the energy used (during their period of public ownership) by assets subsequently sold by the Asset Management Task Force.

The energy use of current assets has increased by 25 per cent over the last eight years, or an average of 2.8 per cent annually. As such, the energy consumption levels of current assets now exceed the levels of usage prior to the sale of assets, although consumption has plateaued over the last three years.

Figure 3.4 Historical electricity and gas demand<sup>1</sup> versus normalised electricity and gas demand.



Source: Government Energy Consumption Database

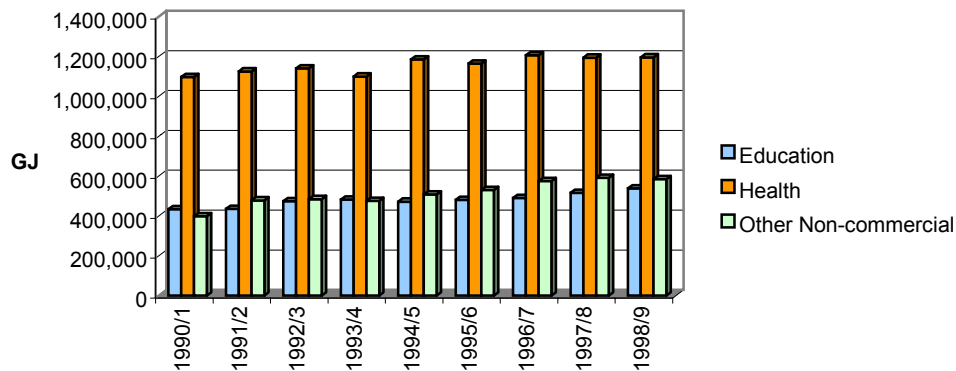
**Notes:**

- 1 Includes demand for both the non-commercial and commercial sectors.
- 2 Excludes major pumping and street lighting electricity use.

### 3.2 Non-commercial

Overall electricity and gas use in the non-commercial sector has increased from 1,929,000GJ to 2,318,000GJ since the 1990/91 financial year. In the past 12 months energy demand has increased by 0.8 per cent, from 2,299,000GJ. Figures 3.5 and 3.6 show trends in demand for gas and electricity for the health, education and other sectors. All divisions of the non-commercial sector have had steady increases in energy use over the past eight years. Other non-commercial operations, that is those units that are not involved directly in the health or education sectors, have had the most significant increase in energy use, 47 percent at a rate of 4.9 per cent per annum. Education had the next largest increase for the period, 24 per cent, while Health had a relatively small increase of 9 percent at an average of 1.1 per cent per annum.

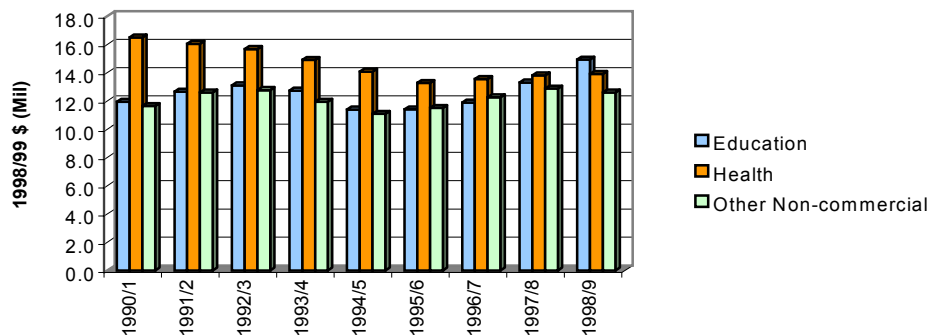
Figure 3.5 Non-commercial sector trends in demand for electricity and gas



Source: Government Energy Consumption Database

Total expenditure, in 1998/99 dollars, on electricity and gas, in the non-commercial sector, has increased from \$40.1M to \$41.4M since 1990/91. Figure 3.6 shows a decrease expenditure on electricity and gas in the Health sector over the last eight years. This result occurs even though, over the same period, electricity and gas usage has increased. This is in part due to the changing of the tariff structure as mentioned earlier, and also the ability of the hospitals to use their purchasing power to negotiate lower tariff rates. The majority of education sites lack a similar purchasing power however, hence there has been a corresponding increase in its expenditure and usage of electricity and gas over the last eight years. Other non-commercial operations expenditure has increased slightly over the same period.

Figure 3.6 Non-commercial sector expenditure trends for electricity and gas (1998/99 Dollars)



**Notes:**

Annual expenditure figures have been adjusted based on the ABS CPI, with 1989/90 as the base year.

Sources: Government Energy Consumption Database, ABS South Australian Economic Indicators, October 1999.

## **4 Government Energy Management Initiatives**

### **4.1 National Greenhouse Strategy**

In mid 1998 State Cabinet endorsed the National Greenhouse Strategy (NGS), a program of measures to assist in the amelioration of greenhouse gas emissions. The Commonwealth announced the program in November 1998. The document is available on the net at <http://www.greenhouse.gov.au/pubs/ngs>.

Measure 3.1 relates specifically to reducing greenhouse gases from public sector operations and requires that governments:

- develop an inventory of greenhouse emissions;
- develop and implement an action plan to reduce emissions;
- have performance under the action plan independently verified;
- monitor and publicly report on performance.

Specific actions include:

- setting mandatory targets for government agencies;
- minimum energy performance standards for new and refurbished government buildings, appliances and equipment;
- use of energy performance contracting;
- purchasing guidelines that include consideration of operating costs;
- consideration of environmental issues in vehicle fleet purchases/lease arrangements;
- cost effective utilisation of renewable energy technologies.

Cabinet approved the Implementation Plan for the NGS in October 1999.

### **4.2 Agency Greenhouse Targets Program**

The Agency Greenhouse Targets program was launched in April 1998. The program requires all agencies to set targets for emission reductions and to report annually on measures undertaken to meet the targets. The Office of Energy Policy provides a technical input to the program and coordinates the reporting process.

The program has a target of reducing emission levels by 15000 – 20000 tonnes annually by June 2001. This target is based on savings of approximately 10 per cent of electricity and gas demand for office purposes, and 5 per cent of electricity and gas demand for institutional purposes.

Currently, Government energy use is collected globally by OEP. As part of the Agency Greenhouse Targets Program, from 1999/2000 individual

agencies will be required to report directly on their energy use. This input will be used by OEP to prepare a detailed annual account of public sector energy use for general publication.

### **4.3 Government Energy Management Policy**

OEP and the Department for Administrative and Information Services (DAIS) have commenced the preparation of a comprehensive energy management policy and Action Plan that address energy efficiency in new and refurbished accommodation, leased accommodation, building maintenance, replacement of obsolete plant and equipment, vehicle fleet operations and procurement of office equipment.

The policy and plan are an integral component of NGS measure 3.1.

## Glossary of Terms

**Carbon Dioxide (CO<sub>2</sub>):** While not as effective at trapping heat in the atmosphere as methane or nitrous oxide, the quantity of CO<sub>2</sub> being released makes it a major contributor to the greenhouse effect.

**Gigajoule (GJ):** Unit equivalent to one million kilojoules.

**Greenhouse Gas:** Any gas that absorbs outgoing heat radiation from the surface of the earth, and thereby tends to warm the lower atmosphere. Greenhouse gases include; carbon dioxide; methane and; nitrous oxide. These gases are of particular concern because they take a long time to be removed from the atmosphere.

**Kilowatt hour (kWh):** Unit most often used to measure electricity consumption. The average cost of a kilowatt hour, for a regular household, is about thirteen cents.

**Tonne:** A unit of mass equal to 1000 kilograms.

## Energy and GHG emissions Conversion Table

Fuel/Energy Type	SI Unit	Energy Content of Fuel	CO <sub>2</sub> emission factor
Purchased Electricity	kWh	3.6 MJ/kWh	0.95 kg/kWh
Natural Gas	MJ	n/a	.056 kg/MJ
LPG (transport)	L	25.7 MJ/L	1.66 kg/L
Petrol	L	34.2 MJ/L	2.43 kg/L
Automotive diesel	L	38.6 MJ/L	2.89 kg/L

Source: The Greenhouse Challenge Workbook.