



City of Launceston

Energy & Greenhouse Gas Report 2015/16

This report provides information on the energy consumption and greenhouse gas emissions related the operations of the City of Launceston Council for 2015/16.

This purpose of this report is to document where energy is used and the actions occurring across Council that have delivered reductions in energy use and greenhouse gas emissions. The report covers the following:

- Current energy consumption across Council operations and greenhouse gas emissions
- Projects and programs completed that have resulted in a reduction of energy consumption and greenhouse gas emissions

ENERGY CONSUMPTION

The Council consumes energy to operate facilities, street lighting, vehicles and equipment as part of the essential services that are performed for the community.

Electricity

Council facilities include administration buildings, car parks, sport fields, halls and parks. These facilities consume both electricity and/or natural gas. Electricity is used for lighting, heating, air conditioning, hot water and general use such as IT equipment and kitchen equipment. Electricity consumption in council facilities during 2015/16 was 20,496 GJ. The amount of electricity purchased decreased by 561 GJ from the previous year mainly due to the energy efficiency measures completed during 2015/16.

Natural gas

Natural gas consumption was 38,288 GJ in 2015/16 a decrease of 821 GJ from the previous year. The cogeneration plant at Launceston Aquatic used 1,143 GJ less gas than the previous year most likely due to more efficient operating of the heating system. Launceston Aquatic accounts for 90% of council's total gas consumption. Gas is used at Aurora Stadium and Invermay Park for water heating and in the kitchens. The QVMAG Royal Park uses gas for the heating system throughout the facility. The Carr Villa Crematorium consumes gas after having been converted from a heavy fuel engine to gas in 2012.

Electricity and gas use since 2011/12

Figure 1 shows the consumption of electricity and gas since 2011/12. Gas consumption has increased over this time with the implementation of gas heating at Launceston Aquatic and at the redeveloped QVMAG Royal Park. These two facilities use considerably more energy to operate than they did prior to refurbishment in 2009/10. Gas consumption has further increased with Aurora Stadium and the adjacent Invermay Park using natural gas for hot water. In 2012 the Carr Villa Crematorium converted from heavy fuel to natural gas. Gas consumption increased again in 2014 with the commissioning of the gas fired cogeneration system at Launceston Aquatic.

Electricity use over the last 5 years has decreased 5,805 GJ due to general energy efficiency work completed at council facilities. In addition the Launceston Aquatic cogeneration plant generates electricity used in the facility decreasing the amount of electricity purchased from the grid.

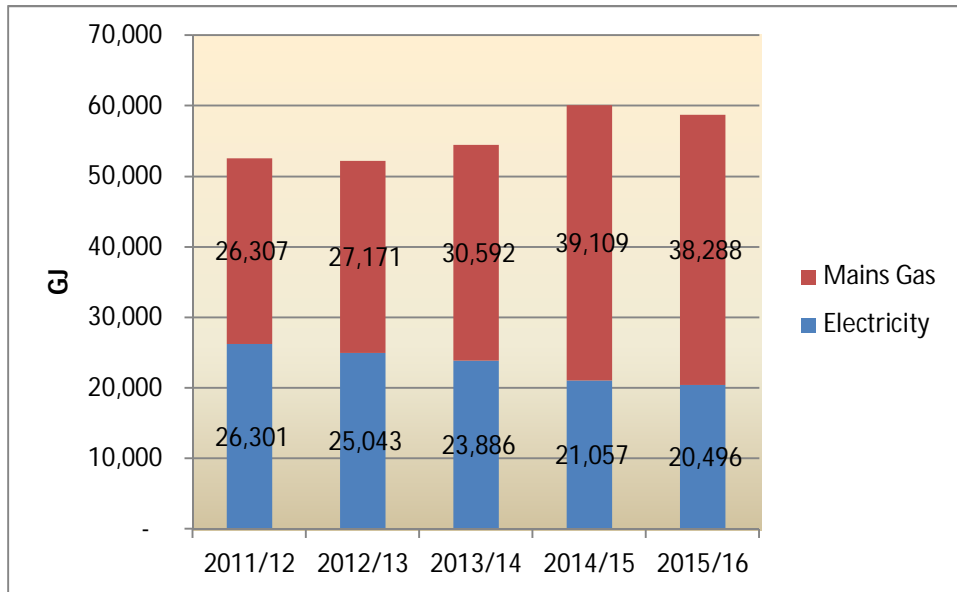


Figure 1. Gas and electricity use

The ten largest energy consuming facilities are shown in table 1. These ten facilities consume 93% of the energy used by all Council facilities. Electricity consumption in the larger sites is monitored using smart meters which provide continuous data so consumption can be checked to ensure equipment is operating normally. If an anomaly occurs it is investigated.

	Electricity GJ	Gas GJ	Total GJ
Aquatic Centre	2,702	33,964	36,666
QVMAG Royal Park	2,428	2,427	4,855
QVMAG Inveresk	3,998		3,998
Aurora Stadium	2,796	506	3,302
Town Hall	1,941		1,941
Carr Villa	156	1,390	1,546
Albert Hall	923		923
Paterson Street west car park	611		611
Waste Transfer Station	563		563
Remount Road Depot	441		441

Table 1 Largest 10 energy consuming facilities

Vehicle fleet fuel use

Fuel use includes diesel, petrol and LPG which is used in the vehicle fleet and makes up 22% of the total Council energy use. Diesel is the most used fuel making up 18,729 GJ, petrol 1,431 GJ and LPG 2.4 GJ. Fuel consumption has continued to decrease over the last 3 years as the fleet is managed by removing older vehicles and replacing them with newer more efficient ones. In addition the fleet is assessed annually to identify vehicles that are deemed non-essential and are subsequently removed from the fleet.

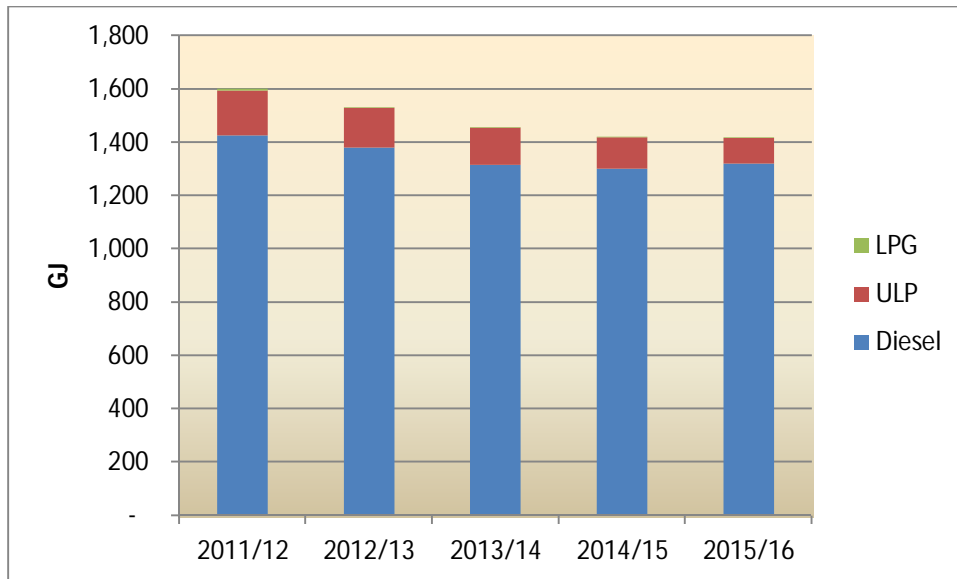


Figure 2 Vehicle fleet fuel use

Street lighting

The Council is responsible for paying the cost of power and maintenance of the public street lighting infrastructure. There are approximately 7000 street lights throughout the municipality lighting minor and major roads. The street lighting infrastructure is owned and managed by TasNetworks. Maintenance of poles and lights including the selection of light types is carried out by TasNetworks. Energy consumption for street lighting is unmetered and TasNetworks estimates consumption by using the number and types of lights multiplied by the hours they operate throughout the year. Street lighting energy consumption for 2015/16 was estimated to be 15,731 GJ.

Total energy consumption

The total energy consumption for Council in 2015/16 is shown in the table 2. Gas consumption makes up 39% of the energy usage followed by electricity and fuel for the Council Vehicle fleet.

	2015/16 Energy Usage (GJ)	% of Total
Electricity - Facilities	20,496	22
Natural Gas - Facilities	38,288	39
Electricity - Street Lighting	15,731	17
Fuel - Diesel, Petrol & LPG	20,162	22
TOTAL	92,517	100

Table 2 Energy use 2015/16

ENERGY EFFICIENCY PROJECTS COMPLETED 2015/16

This section details the projects completed in 2015/16 to improve energy efficiency and reduce operating costs in Council facilities.

Public lighting

Installation of new efficient LED lighting provides an excellent opportunity to reduce energy consumption as well as improve lighting levels and quality. LED's have a longer life than

conventional metal halide and fluorescent lights and reduce maintenance costs significantly. Lighting in public spaces, parks and around Council facilities has resulted in significant energy saving. In addition lighting levels have significantly improved.

Solar photovoltaic power

Solar power is a cost effective method to reduce energy consumption in those facilities that are used during the 3 day time. A 5 kW solar system was installed at the Carr villa Depot and a 10kW solar system was installed at the sport ground building at Churchill Park.

Energy efficiency results

Energy efficiency measures completed since 2009 have resulted in a reduction of over 5,035 GJ of electricity being used per year in Council facilities. This equates to 1,400,000 kWh of electricity saved every year. The annual energy savings in each facility is shown in table 3.

Location	GJ Saved/year
Patterson Street West Car Park	409
Patterson Street East Car Park	179
Elizabeth Street Car Park	127
Remount Road Depot	358
Remount Road Waste Centre	38
Launceston Aquatic	1,010
Town Hall	352
Albert Hall	15
Carr Villa Crematorium	109
Churchill Park Sport Ground	89
Aurora Stadium	616
QVMAG Inveresk	1,294
Traffic Centre	5
Parks	59
Windsor	59
Streetlights	26
Hot water systems	142
QVMAG Royal Park	125
City lane way lights	23
TOTAL ANNUAL SAVING	5,035

Table 3 Annual energy savings in Council facilities

The combined energy efficiency measures have resulted in annual savings of \$265,000 in energy costs.

GREENHOUSE GAS EMISSIONS

Greenhouse gas emissions for Council operations are calculated from electricity, natural gas and fuel consumption data. Greenhouse gas emissions are measured as scope 1 and scope 2.

Scope 1 are direct emissions from the organisations activities such as consuming fuels in vehicle use. Scope 2 emissions are from the use of electricity purchased from the grid.

Greenhouse gas emissions are calculated using emission factors generated by the Department of Environment. The factors for gas and fuel are static but for electricity it can change depending on the source of electricity in Tasmania. Because the factor can change and cause reported emissions to be different from year to year City of Launceston has decided to keep the same emission factor of 0.23 kg CO₂-e/kWh. This factor is an average of the previous 5 years.

	2011/12	2012/13	2013/14	2014/15	2015/16
Electricity - Facilities	1,680	1,600	1,526	1,345	1,309
Electricity - Street Lighting	1,030	913	911	973	1,005
Natural Gas - Facilities	1,356	1,400	1,576	2,015	1,973
Fuel - Diesel, Petrol & LPG	1,600	1,531	1,455	1,418	1,417
Carr Villa diesel	54	50			
TOTAL	5,721	5,495	5,469	5,752	5,705

Table 4 Greenhouse gas emissions T CO₂-e

The total annual greenhouse gas emissions since 2011/12 are shown in table 4. Emissions from electricity use in council facilities have decreased 371 tonnes due to energy efficiency measures. The increase in gas usage has resulted in emissions from this energy source increasing over the last 5 years. In general emissions have remained fairly static. This is in fact a good result as over the last 5 years there has been significant upgrade of council facilities resulting in significant increased energy use. Over this period the energy efficiency work carried out has ensured emissions have remained at this level.

FUTURE ENERGY AND GREENHOUSE ACTIONS

Council will continue to work at improving the efficiency of buildings and the vehicle fleet to decrease energy consumption and greenhouse gas emissions. New technology will continue to be employed to improve the measurement of energy in buildings so further improvement can be made to equipment and the way the facilities are operated. New LED lighting technology, solar power and solar hot water will be used to further reduce operating costs of facilities and improve the sustainability of the Council buildings.

EXAMPLES OF ENERGY EFFICIENCY PROJECTS COMPLETED IN 2015/16



Prince's Square park lights were changed to LED saving over 50% in electricity use. The fountain lights and the toilet lights were changed to LED as well. The lighting in the park is vastly improved with the LED lights.



Street lights at the NTCA car park were changed from 250 watt to 150 watt LED.



The 80 watt streetlights in Park Street were changed to 22 watt LED's reducing energy use by 75%. The LED street lights have a design life of 20 years.



Remount Road depot store had all 28 existing 400 watt metal halide flood lights changed to 200 watt LED's. LED lights can be turned off and on quickly with instant light unlike the old lights which needed to be warmed up.



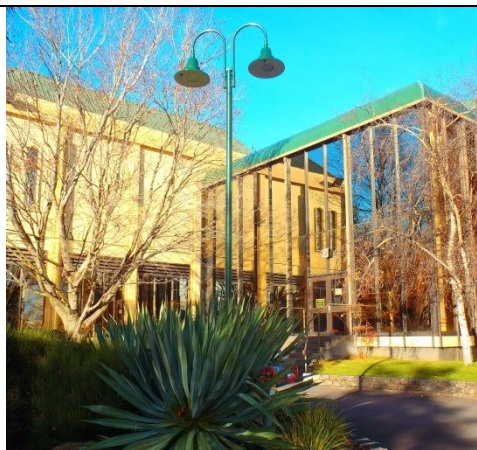
Carr Villa depot 5 kW solar project. 20 Trina solar panels and an SMA inverter were used.



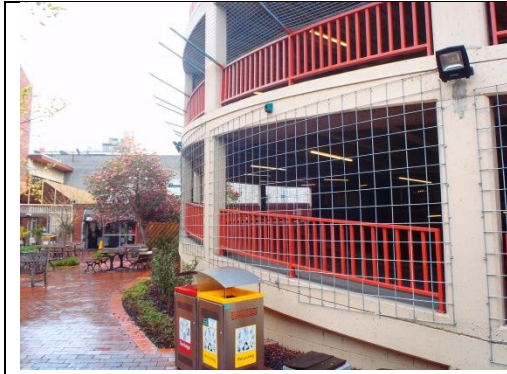
Carr Villa LED upgrade. Dozens of lights throughout the Carr Villa facility were changed over to efficient LED. Security lighting operates all night so it is beneficial to change to LED as energy and electrical maintenance costs are slashed.



Churchill park sports building 10kW solar project using 40 Trina solar panels and an SMA inverter. The solar will offset 25% of the energy used in the facility. Note also solar hot water system installed previously.



At the Albert Hall car park lights and external lighting was changed to LED.



Public space lighting in Trustees Court and adjacent areas was upgraded to LED.



Elizabeth Street car park bunker lighting and rest room lighting was upgrade to LED. Flood lights were also put on a lux sensor so they only come on when it becomes dark and turn off automatically each morning.



Lighting in the Inveresk car park and walk way was converted to LED. 100 watt metal halide globes were swapped with 50 watt LED. In total 51 lights were upgraded saving 14,000 kWh per year.



Lighting throughout the Quadrant Mall and Dicky White's Lane was upgraded to state of the art LED lighting as part of the City Heart project.