
# CENTRAL HIGHLANDS COUNCIL COMMUNITY ENERGY USE AND GREENHOUSE GAS FOOTPRINT

## SUMMARY REPORT MAY 2019

# PUBLISHING DETAILS

The Southern Tasmanian Regional and Municipal Energy and Emissions Project 2018, was endorsed in the Regional Climate Change Initiative (RCCI) Action Plan 2017-2019, by the Board of the Southern Tasmanian Councils Authority (STCA) in June 2017.

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# ACKNOWLEDGEMENTS

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The STCA acknowledges organisations that assisted with the finalisation of the community greenhouse gas and energy profile:

- City of Hobart developed and piloted the initial methodology for community emissions
- TasNetworks provided residential and commercial/industrial sector electricity data
- Australian Government, Clean Energy Regulator for commercial/industrial data to fact check final results

# DISCLAIMER

# CENTRAL HIGHLANDS COUNCIL SUMMARY

**Our local energy use patterns are changing** - electric vehicles are a disruptive technology as are new models of electricity provision through rooftop solar, these influence change alongside many other factors such as government programs and incentives. A snapshot of the Central Highlands community energy use and greenhouse gas emission trends has been provided by the Southern Tasmanian Councils Authority's Regional Climate Change Initiative.

**Central Highlands community energy use increased by 2% from 2006-07 to 2016-17. Greenhouse gas emissions increased by 7% over the same period.** State-wide trends have contributed to decreasing transport sector energy use while price signals, greater energy efficiency measures and rooftop solar have also played a part.

**Community energy use and associated greenhouse gas emissions footprints**

| | | |
|---|---|---|
| Central Highlands municipality 2016-17 | 1.5 petajoules (PJ) | 90,000 tonnes of carbon dioxide (tCO2-e) |
| Region (across 12 southern Tasmanian municipalities) 2016-17 | 43 petajoules (PJ) | 2,580,000 tonnes of carbon dioxide (tCO2-e) |
| Tasmania | 109 petajoules (PJ) (2016-17) | 3,980,000 (tonnes of carbon dioxide (tCO2-e) (2015-16) |

Data sources (left to right, top to bottom): Regional Community Energy Use and Greenhouse Gas Footprint, STCA, 2019; Australian Energy Statistics, Australian Government, 2018; Tasmanian Greenhouse Gas Accounts, Tasmanian Climate Change Office 2018

**Consumers are increasingly taking local energy generation into their own hands.** Over 1.8 million electricity units (kilowatt hour) are returned to the grid annually, generated by local residential and commercial premises.

**Harnessing the power of the sun is popular.** Over 560 rooftops have solar photovoltaic (PV) and 130 rooftops have solar hot water systems in Central Highlands. While solar PV systems are the dominant renewable energy technology in the region, there are small wind generators registered in the area.

**A key change in the commercial sector is the popularity of solar PV systems**, with almost double the number of systems from 28 systems in 2013-14 to 58 systems in 2016-17.

**Energy based technology shifts are occurring locally**. Petrol vehicles are being replaced with diesel vehicles. A reduction in vehicle fuel use of 21% from 2006-07 to 2016-17 has seen the dominant trend of increasing yearly fuel use turn around.

**Transport is a key focus area, encouraging low emission travel.** The transport sector is responsible for at least a third of community emissions. Locally predominantly older vehicles are in use, which are generally more emissions intensive.

**Annual electricity use has increased by 25% over the last decade** from 59 to 76 million units or kilowatt hour (kWh) in 2016-17. In the Central Highlands municipal area, households and businesses are using more electricity in 2016-17 than a decade ago in 2006-07.

**Average electricity use per household has levelled out over the last three years**. Average residential electricity use per meter has been less changeable in recent times, and average household[1] electricity use decreased from 2013-14 to 2015-16.

**Recent electricity use has been relatively flat compared to the earlier half of the decade, suggesting consumers have improved the energy efficiency of buildings or are responding to other factors that drive electricity use to find savings.** Consumer behaviour in commercial premises and the home are considered influenced by increasing awareness of energy costs and actions as well as factors such as: local weather; price signals; and the use of energy efficient appliances and materials through government programs; in addition to the influence of population growth. Energy efficiency measures, such as insulation, buffer the impact of extreme temperature events reducing the demand for heating and cooling and decreasing electricity use.

[1] National Meter Identifiers (NMI)'s are used as a proxy for the number of households

# *INTRODUCTION*

As discussions on how to reach zero emissions increase understanding our local community energy and emissions footprint becomes more important. Looking at where and why energy is used, and the resulting greenhouse gas emissions, is the first step to identify opportunities for savings and initiatives that benefit local communities.

Local governments have a key role providing up to date and reliable climate change information. The Southern Tasmanian Regional and Municipal Energy and Emissions Project (the Project) 2018 aims to provide insights into emissions intensive sectors of the community and changing technology trends in the local area. It informs the development of individual municipalities' community profiles. The Project was commissioned by the Southern Tasmanian Councils Authority's Regional Climate Change Initiative member councils:

- City of Hobart
- Brighton Council
- Central Highlands Council
- Clarence City Council
- Derwent Valley Council
- Glamorgan Spring Bay Council
- Glenorchy City Council
- Huon Valley Council
- Kingborough Council
- Sorell Council
- Southern Midlands Council
- Tasman Council

Currently there is no common standard amongst Australian local governments for corporate and community energy and greenhouse gas reporting. The Australian Local Government Association has identified appropriate data and methods as the most common barrier to setting community emissions targets[2]. This project provides a common and transparent methodology with local and national data inputs to construct accurate community energy and greenhouse gas profiles. It builds on the previous local government voluntary reporting scheme Cities for Climate Protection which ran from 2000 – 2010 and is consistent with National and State Government reporting standards and international reporting programs

[2] Australian Local Government Climate Review – 2018 Report p. 3.

such as the Carbon Development Program, the Compact of Mayors[3] and the Global Protocol for Community Scale Greenhouse Gas Emissions.

The methodology uses public and government information that is reliable, credible and updated regularly, and involved the following:

1. Accessing Australian Energy Statistics to establish a baseline energy snapshot, which was then tailored to a local level.
2. Accurate metered data provided by energy service providers was used, where available.
3. Australian Government National Greenhouse Accounts Factors were then applied to each energy use type to determine total greenhouse gas emissions.
4. Additional records such as the Australian Bureau of Statistics, and Australian PV Institute (APVI) provided more detailed insights into local technology trends.

The scope of community data is limited to:

- a base year, 2006-07, when detailed electricity data is available, the transfer of water and sewerage assets to a regional body occurred and Tasmania joined the National Electricity Market[4]
- current data as of 2016-17, as up to date as the latest Australian Government, Australian Energy Statistics.
- energy based emissions only, excluding methane from agriculture/wastewater and carbon emissions from land clearing currently – as the greenhouse accounting for forest and agricultural emissions is not available in a format for local government reporting. This can be added retrospectively.
- highlights data from the residential, commercial, transport sectors at a municipal level and industrial, agriculture and forestry sectors at a regional level.

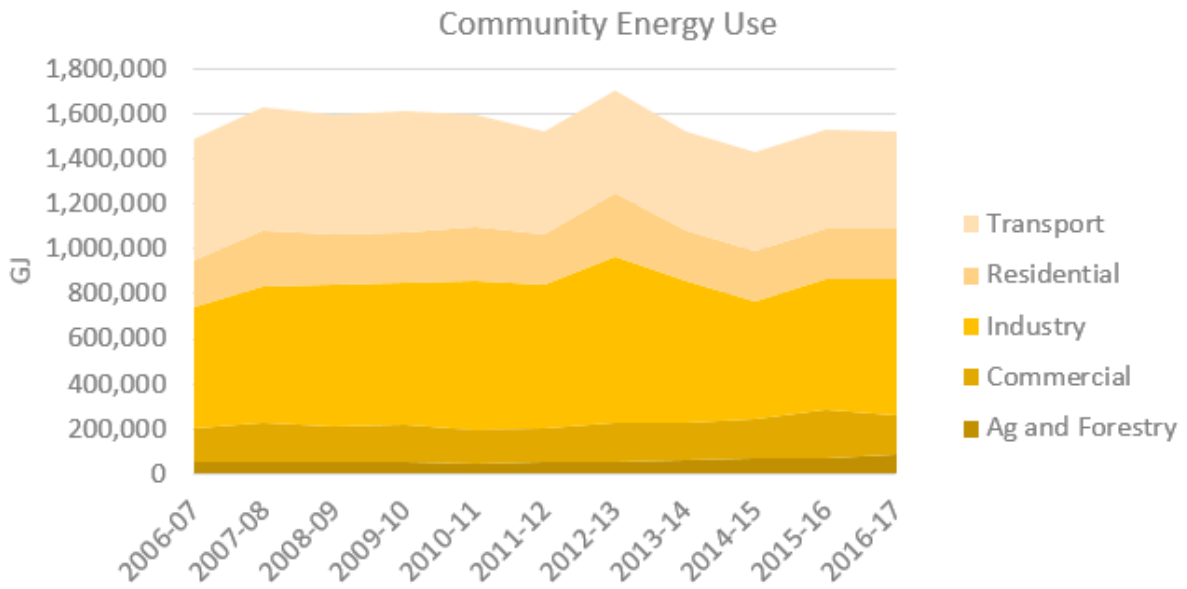
## *CENTRAL HIGHLANDS COUNCIL*

**Community energy use has increased by 2% from 2006-07 to 2016-17,** from 1.4 million gigajoules to 1.5 million (GJ) in the Central Highlands municipal area. A typical southern Tasmania household uses 25 GJ (7,000 kWh) per annum.

[3] led by C40, ICLEI and United Cities and Local Governments, in close collaboration with the UN Secretary General's Special Envoy for Cities and Climate Change, UN Habitat, and the UN Secretary General's office

[4] Data estimates for electricity and all energy uses are available from 2004-05 to align with the international reporting period stated in the Paris Agreement if preferred.

*Figure 1: Central Highlands Municipal Area Community Energy Use.*




Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018. NB: All energy use is presented in gigajoules (GJ) as an industry standard and a format that is easy to convert with other energy values. The increase in 2012-13 is due to an increase in electricity use data provided by TasNetworks, due to additional Pay As You Go data being measured and added in that single year.

Energy reductions have occurred only in the transport sector (-100,202GJ). State-wide trends have contributed to decreasing transport sector energy use such as price signals, greater energy efficiency measures in newer vehicles and consumer technology preferences.

Central Highlands's industrial (includes manufacturing, mining and construction) sector is the largest energy user and is responsible for the greatest energy use and greenhouse gas emission increases from 2006-07 to 2016-17. Transport represents a third of community energy use.

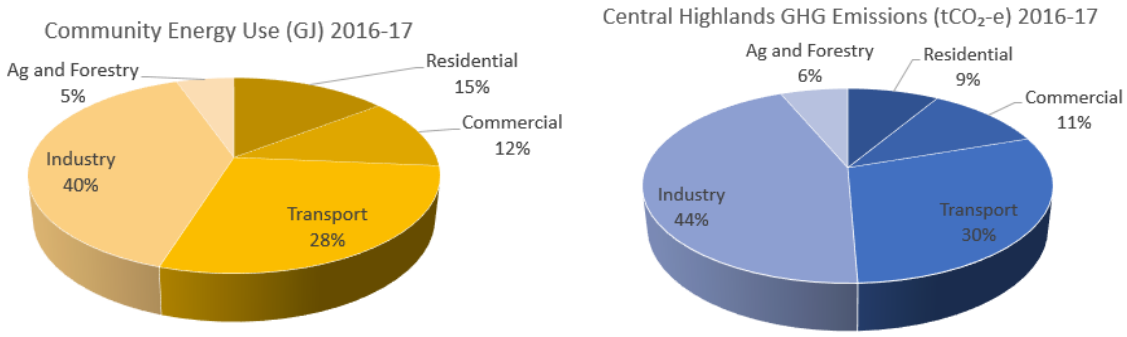
*Table 1: Central Highlands Municipal Area Community Energy Use*

| **Energy use (GJ)** | **2006-07** | **2016-17** | **Growth %** | **Total difference between 2006-07 and 2016-17** |
|---|---|---|---|---|
| **Residential** | **214,083** | **222,370** | **4** | **8,287** |
| **Commercial** | **145,225** | **179,184** | **21** | **33,959** |
| **Transport** | **534,683** | **434,482** | **-21** | **-100,202** |
| ***Subtotal*** | ***893,991*** | ***836,036*** | **-7** | **-57,956** |
| Industry | 537,634 | 604,322 | 12 | 66,688 |
| Agriculture and | 55,475 | 82,300 | 39 | 26,825 |

| | | | | |
|---|---|---|---|---|
| Forestry | | | | |
| ***Grand Total*** | **1,487,100** | **1,522,658** | **2** | **35,557** |

Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018. NB: All energy use is presented in gigajoules (GJ) as an industry standard and a format that is easy to convert with other energy values. The Midpoint method for determining growth rates is used. The transport, industrial and agriculture and forestry sectors all use State-wide data, with results indicating general trends, while the residential and commercial sectors are mainly derived from metered data.

*Figure 2: Central Highlands Community Energy Use and Greenhouse Gas Emissions by Sector*

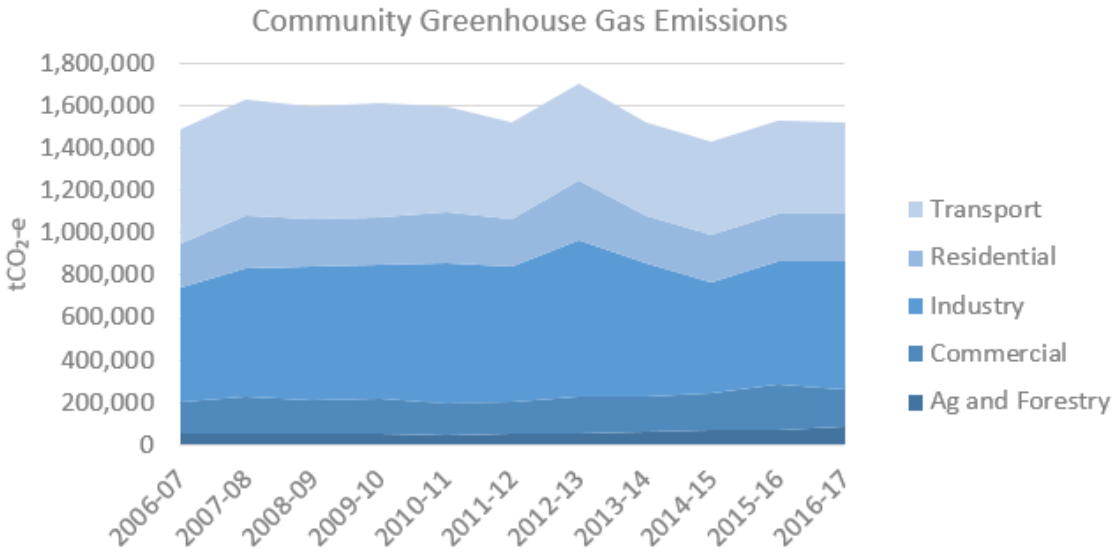



Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018, National Greenhouse Accounts Factors, 2016.

**Greenhouse gas emissions have increased by 7% from 84,284t$CO_2$-e in 2006-07 to 90,204t$CO_2$-e (the equivalent of 19,000 vehicles driven for one year) in 2016-17**. Increasing energy use in the industry, agriculture, forestry, residential and commercial sectors has contributed to higher emissions working against reductions achieved in the transport sector.

Central Highlands's industrial sector emissions have contributed to the greatest increase, adding an additional 6,482tCO2e in 2016-17 than in 2006-07, mainly due to an increase in the use of emissions intensive fuels in the manufacturing sector such as coke, black coal, petroluem, diesel and natural gas. These fuel use trends are mainly based on per capita Statewide results.

*Figure 3: Central Highlands Community Greenhouse Gas Emissions.*




Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018, National Greenhouse Accounts Factors, 2016. NB: All greenhouse gas emissions are presented in tonnes of carbon dioxide equivalent ($tCO_2e$) as an industry standard and a format that is easy to convert other values. The increase in 2012-13 is due to an increase in electricity use data provided by TasNetworks, due to additional Pay As You Go data being measured and added in that single year. The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown.

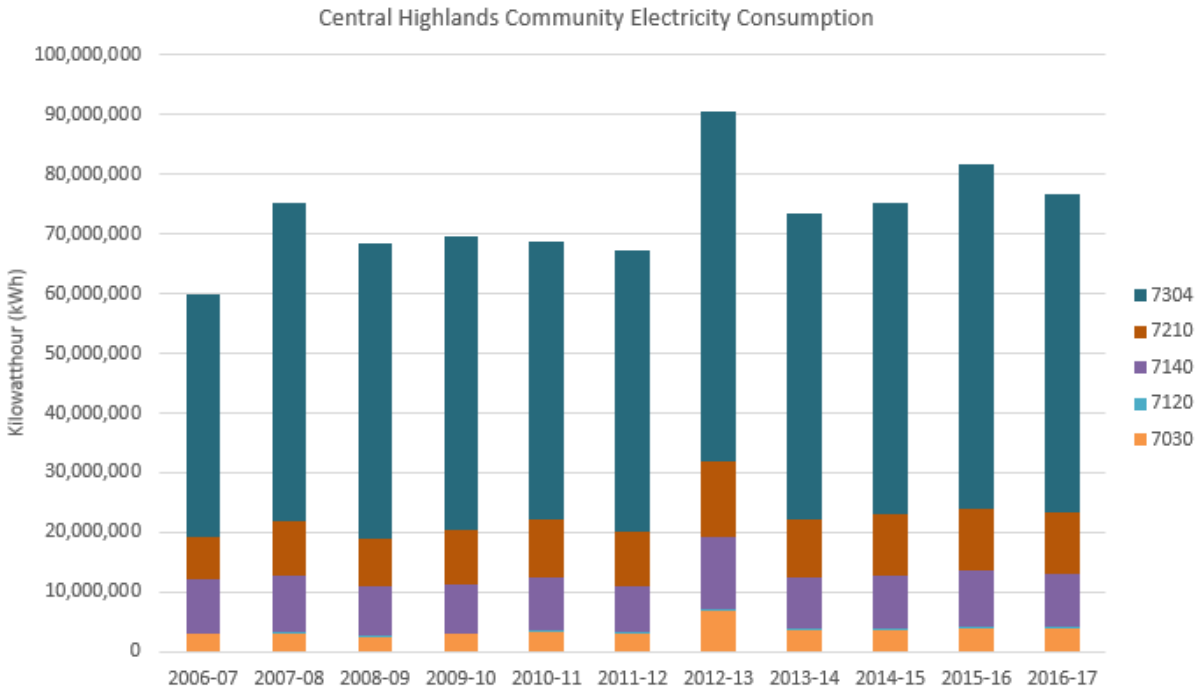
*Table 2: Central Highlands Municipal Area community greenhouse gas emissions*

| **GHG emissions -tonnes of CO2 equivalent ($tCO_2$-e)** | **2006-07** | **2016-17** | **Growth %** | **Total difference between 2006-07 to 2016-17($tCO_2$-e)** |
|---|---|---|---|---|
| **Residential** | **5,814** | **7,756** | **29** | **1,942** |
| **Commercial** | **8,231** | **10,045** | **20** | **1,814** |
| **Transport** | **32,883** | **26,721** | **-21** | **-6,162** |
| ***Subtotal*** | ***46,928*** | ***44,522*** | ***-5*** | ***-2,406*** |
| *Industry* | *33,471* | *39,953* | *18* | *6,482* |
| *Agriculture and Forestry* | *3,885* | *5,729* | *38* | *1,844* |
| **Grand Total** | **84,284** | **90,204** | **7** | **5,920** |

Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018 and National Greenhouse Accounts, 2016. NB: Greenhouse gas emissions presented in tonnes of carbon dioxide equivalent as an industry standard. The Midpoint method for determining growth rates is used. The transport, industrial and agriculture and forestry sectors all use State-wide data, with results indicating general trends, while the residential and commercial sectors are mainly derived from metered data.

**Annual electricity use has increased by 25% over the last decade** from 59 to 76 million units or kilowatt hour (kWh) in 2016-17. Electricity use trends have a large impact on overall community energy use, particularly in the residential and commercial sectors where electricity use is responsible for more than half of all energy used.

*Figure 4: Central Highlands Municipal Area Community Total Electricity Use*

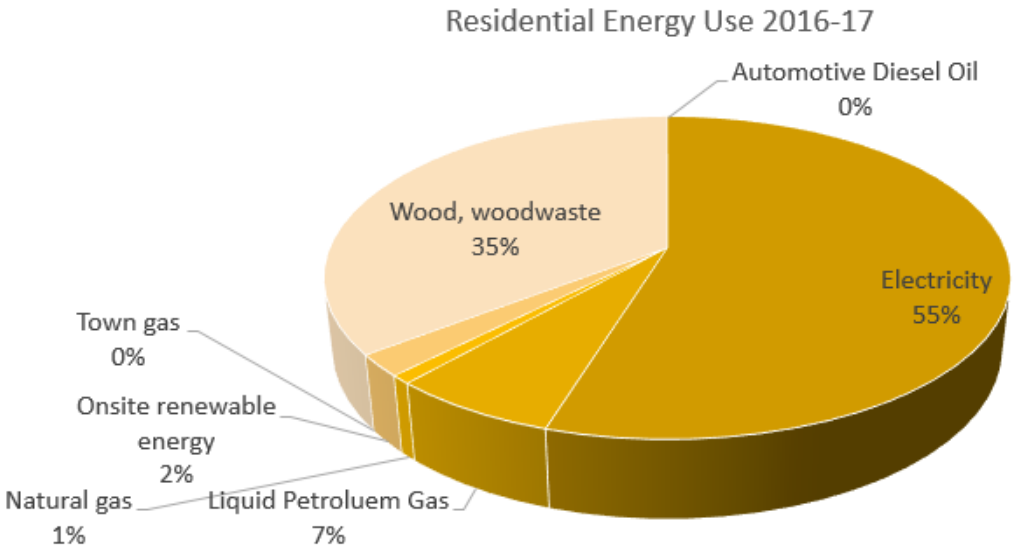



Data sources: TasNetworks, 2018. . The increase in 2012-13 is due to an increase in electricity use data provided by TasNetworks, due to additional Pay As You Go data being measured and added in that single year (with some historic data included). The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown.

The postcodes with a larger population have consumed more energy.

Wood use has decreased by 32% from 2006-07 to 2016-17 and constitutes over a third of all residential energy use.

*Figure 5: Central Highlands Municipal Area Residential Energy Use*




Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018

More consumers are generating and using their own solar rooftop power, decreasing electricity use from the electricity grid. Over 130 rooftops use solar energy to heat hot water[5] in the local area. In Central Highlands, there are over 560 solar photovoltaic (PV) systems[6], which means 1-in-10 premises have access to solar[7].

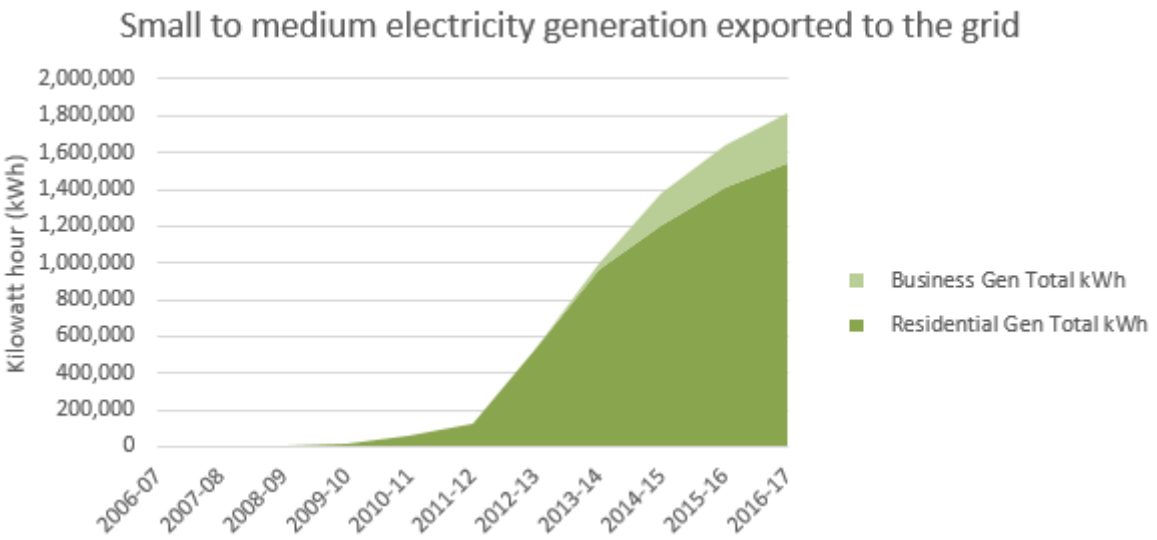
A key change in the commercial sector is the popularity of solar PV systems, with almost double the number of systems from 28 systems in 2013-14 to 58 systems in 2016-17.

[5] Based on CER small scale technology data, accessed May 2018. There are shared postcodes with neighbouring councils so a conservative estimate has been used.

[6] Based on TasNetworks meters that generate back to the electricity grid, 2018 data.

[7] Total buildings based on number of meters (commercial and residential) in 2016-17, 5,718 NMIs divided by 566 renewable electricity generation NMI's

*Figure 6: Central Highlands Renewable Electricity Generation Exported to the Electricity Grid*




Source: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. This includes both commercial and industrial facilities to protect the identification of facilities at a local level.

**Residential and commercial solar PV installations export over 1.8 million units (kWh) of emission free electricity back to grid each year** from the Central Highlands municipal area[8]. While solar PV systems are the dominant renewable energy technology in the region, there are two 600W small wind generators registered in postcode 7030[9].

Postcode 7304 (Brandum, Breona, Central Plateau, Doctors Point, Reynolds Neck) has the highest number of commercial and residential solar PV systems[10] and the highest residential solar PV systems in the Central Highlands municipal area.

*Table 3: Central Highlands renewable energy systems by postcode in 2016-17*

| Postcodes | Business meters (NMIs) that generate electricity | Residential meters (NMIs) that generate electricity | Total number of meter connections generating electricity (NMIs) |
|---|---|---|---|
| **7030** | 1 | 32 | 33 |

[8] As of end of 2016-17

[9] Based on postcodes allocated to the area and possibly shared across council boundaries

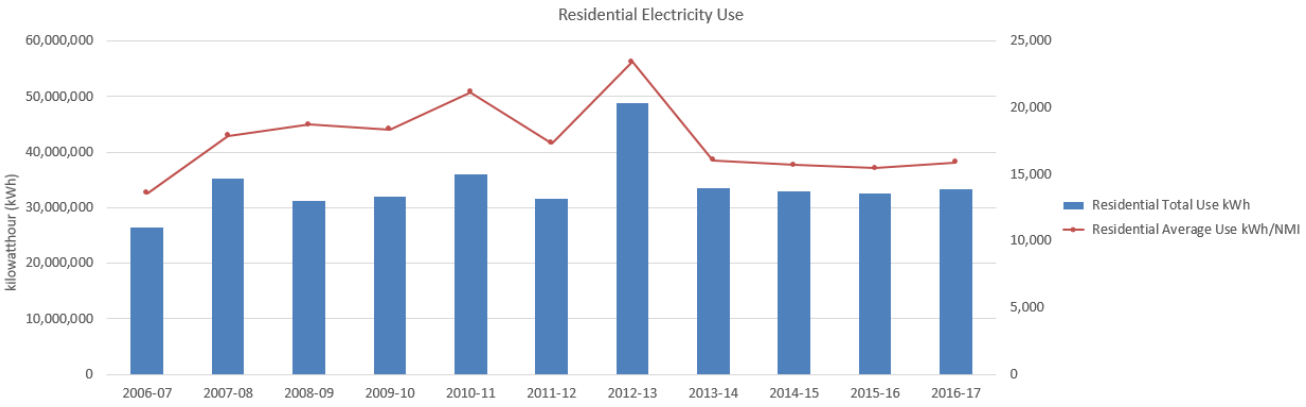
[10] As this postcode borders other local governments the results have been allocated on a per capita basis

| | | | |
|---|---|---|---|
| **7120** | 0 | 2 | 2 |
| **7140** | 3 | 44 | 46 |
| **7210** | 8 | 47 | 55 |
| **7304** | 46 | 384 | 430 |
| **Grand Total** | **58** | **508** | **566** |

Data sources: TasNetworks, 2018

Overall, residential electricity use has increased by 23%[11] over the last decade, from 2006-07 to 2016-17. Average electricity use per household has levelled out over the last four years, as has total consumption, despite 297 new residential connections. This follows a period of high electricity consumption variability, from 2006-07 to 2012-13.

*Figure 7: Central Highlands Municipal Area Residential Electricity Use*



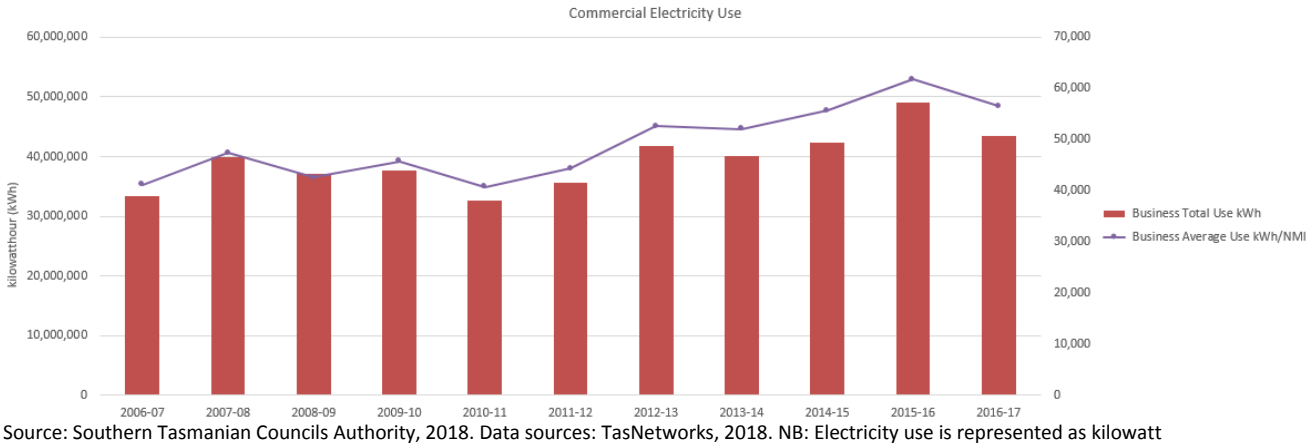

Source: Southern Tasmanian Councils Authority, 2018. Data sources: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. This includes both commercial and industrial facilities to protect the identification of facilities at a local level. The increase in 2012-13 is due to an increase in electricity use data provided by TasNetworks, due to additional Pay As You Go data being measured and added in that single year. The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown.

Residential electricity use per meter decreases from 2013-14 to 2015-16 are likely to be influenced by factors such as price signals, the implementation of the carbon price (2012 to 2015) and increasing electricity costs, as well as the use of more energy efficient appliances and materials through Commonwealth and State Government information and grant incentives. These drivers increase consumer awareness of energy costs and energy actions to drive bill savings in the office and home.

[11] Midpoint method has been use for estimating growth for consistency

**Total commercial annual electricity use has increased by 26%**[12] from 33 million to 43 million units (kWh) over a decade (2006-07 to 2016-17). Average electricity use per meter increased in the commercial sector from 2009-10 to 2016-17, indicating that regardless of the growth in commercial connections, which resulted in net growth of three commercial connections, electricity consumption per business has steadily increased.

*Figure 8: Central Highlands Municipal Area Commercial Electricity Use*

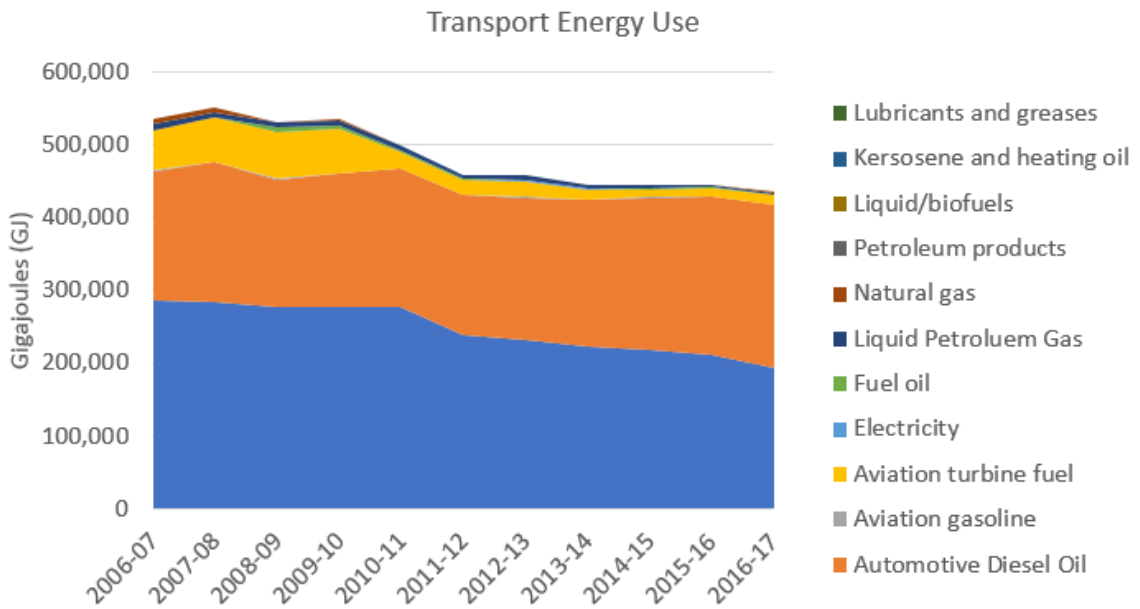



Source: Southern Tasmanian Councils Authority, 2018. Data sources: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. This includes both commercial and industrial facilities to protect the identification of facilities at a local level.

**A key change in the transport sector has been the turnaround from increasing energy use to a decreasing trend over a decade (2006-07 to 2016-17)**. Transport energy use has decreased by 21% from 2006-07 to 2016-17, as a result greenhouse gas emissions have reduced by 21% for the same period.

[12] Midpoint method has been use for estimating growth for consistency

*Figure 9: Central Highlands Municipal Area Transport Energy Use*



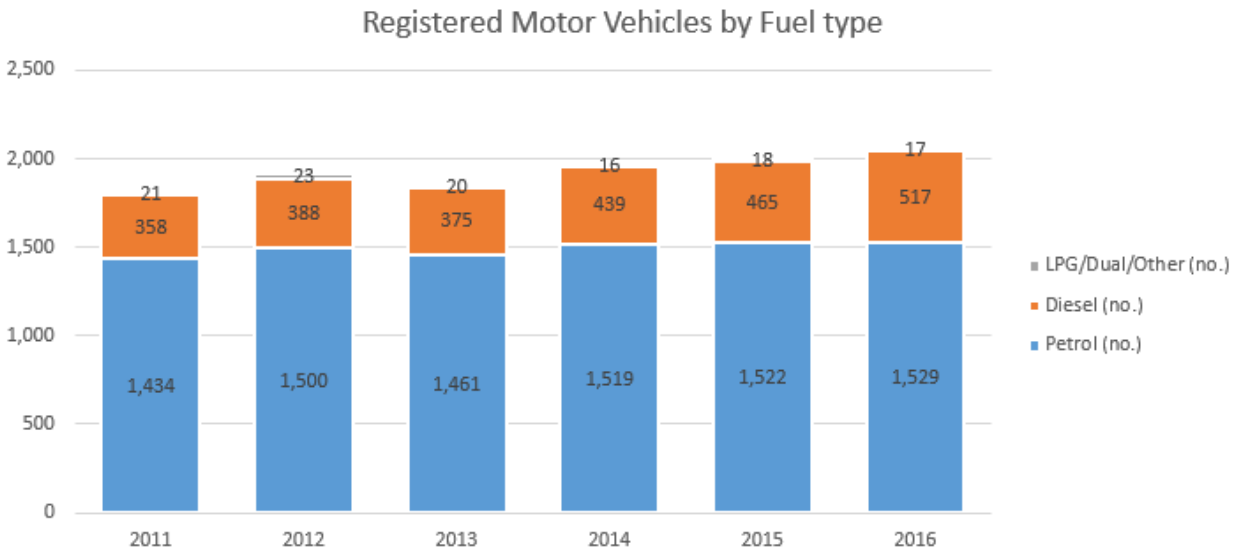

Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics 2017, TasNetworks, 2018.

Passenger vehicle petrol and diesel fuel use are the primary source of energy use and greenhouse gas emissions in the transport sector[13].

The main technology shift occurring is a consumer preference for diesel light vehicles over petrol light vehicles, as shown by an increase of 52 diesel vehicles versus an increase of seven petrol vehicles between 2015 to 2016. No electric vehicles are registered in the area

[13] Road transport is the largest energy user and ABS motor vehicle registrations (Table 12) indicate predominantly 71% passenger vehicles and 19% light commercial vehicles in Central Highlands LGA, Regional Statistics by LGA2016, Annual (2010-11 to 2015-16)

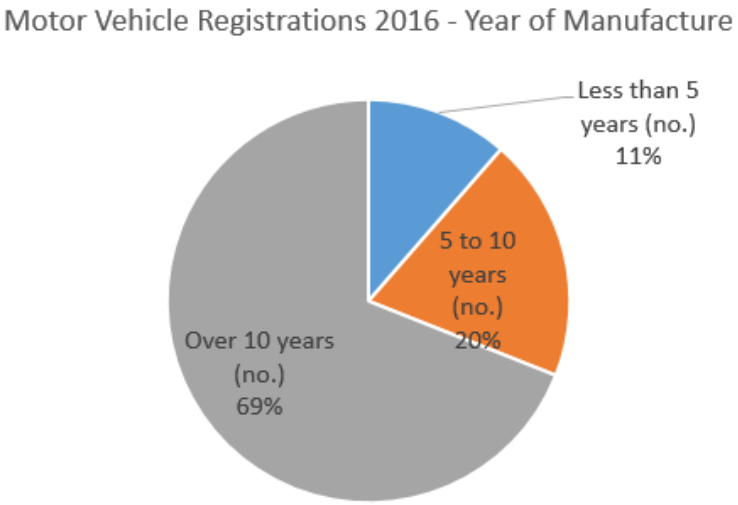
*Figure 10: Central Highlands Municipal Area Motor Vehicle Registrations*




Source: Southern Tasmanian Councils Authority, 2018. Data source: Australian Bureau of Statistics, 2016.

One of the challenges in Central Highlands's community profile is the high percentage of older more emissions intensive vehicles and relatively low use of newer vehicles, which are generally more fuel efficient.

*Figure 11: Central Highlands Municipal Area Motor Vehicle Registrations – year of manufacture*




Source: Southern Tasmanian Councils Authority, 2018. Data source: Australian Bureau of Statistics, 2016

## *FURTHER INFORMATION*

A regional summary paper, titled *Southern Tasmania's Changing Energy Use: Information Paper: Regional Greenhouse Gas and Energy Use Trends*, provides a snapshot of national, state and regional greenhouse footprints as well as energy trends across the region, representing 12 southern Tasmanian municipalities.

Each council has been provided with detailed data, some of which is subject to strict confidentiality terms of use to address privacy concerns and commercial sensitivities.

In addition, a step by step guide provides additional support to explain the methodology further, increase transparency and facilitate future updates.

This guide and the regional paper outlines the scope of the methodology, with consideration for time and resources available to councils and includes consideration for other factors influencing the final results.