TASMAN 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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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

TASMAN COUNCIL SUMMARY

Our local energy use patterns are changing – disruptive technologies such as electric vehicles and rooftop solar electricity generation systems impact energy use, alongside many other factors such as government programs and incentives. A snapshot of Tasman community energy use and greenhouse gas emission trends has been provided by the Southern Tasmanian Councils Authority's Regional Climate Change Initiative**.**

Tasman community energy use has increased by 1% from 2006-07 to 2016-17. Greenhouse gas emissions have increased by 6% from 2006-07 to 2016-17. 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

Tasman Council municipality 2016-17	0.3 petajoules (PJ)	22,000 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 400,000 units (kilowatt hour) of electricity are returned to the grid annually, generated by local Tasman residential and commercial premises.

Harnessing the power of the sun is popular. Over 179 rooftops have solar photovoltaic (PV) and 66 rooftops have solar hot water systems in the Tasman municipal area.

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 2014-15 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 passenger vehicles are in use, which are generally more emissions intensive.

Annual electricity use has increased by 26% over the last decade. In the Tasman municipal area households and businesses are using more electricity in 2016-17 than a decade ago.

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.

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[1]. 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 such as the Carbon Development Program, the Compact of Mayors[2] and the Global Protocol for Community Scale Greenhouse Gas Emissions.

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

[2] 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

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:

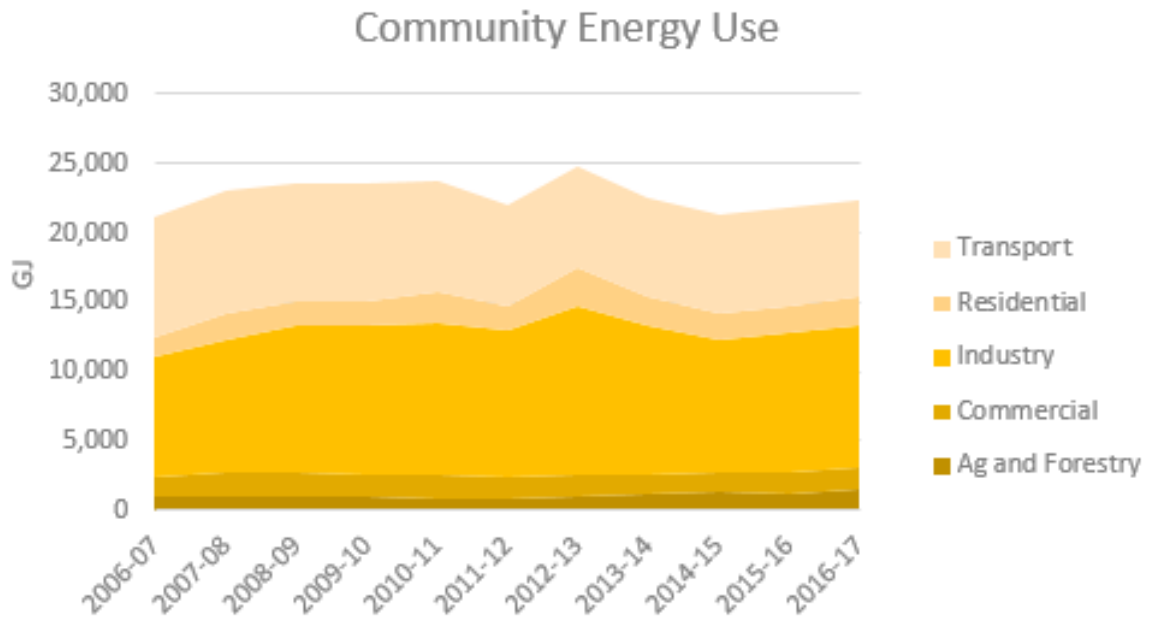
- a base year, 2006-07, when detailed electricity data is available, the transfer of water and sewerage assets to a regional body occurred and Tasmania joined the National Electricity Market[3].
- current data as of 2016-17, as up to date as the latest Australian Government, Australian Energy Statistics.
- 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.

[3] 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.

TASMAN COUNCIL

Community energy use has increased by 1%[4] from 2006-07 to 2016-17, from 371,000 gigajoules to 377,000 (GJ) in the Tasman Council municipal area. A typical southern Tasmania household uses 25 GJ (7,000 kWh) per annum.

Figure 1: Tasman 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 other energy values. The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown. 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).

Energy reductions have occurred in Tasman's transport sector (-26,061GJ). 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.

[4] Midpoint method used for estimating growth

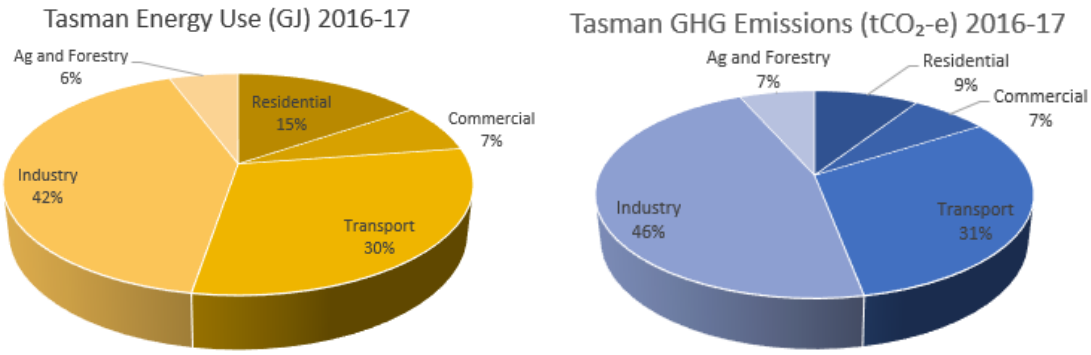
Table 1: Tasman Municipal Area Community Energy Use Gigajoules (GJ)

Energy use (GJ)	2006-07	2016-17	Growth %	Total difference between 2006-07 and 2016-17
Residential	**55,681**	**58,680**	**5**	**2,999**
Commercial	**22,591**	**26,825**	**17**	**4,234**
Transport	**139,065**	**113,003**	**-21**	**-26,061**
Subtotal	***217,337***	***198,508***	**-9**	**-18,829**
Industry	139,832	157,177	12	17,345
Agriculture and Forestry	14,428	21,405	39	6,977
Grand Total	**371,597**	**377,090**	**1**	**5,493**

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.

Tasman's industrial and transport sectors use approximately a third each of total community energy use and the greatest share of community greenhouse gas emissions.

Figure 2: Tasman Community Energy Use and Greenhouse Gas Emissions by Sector

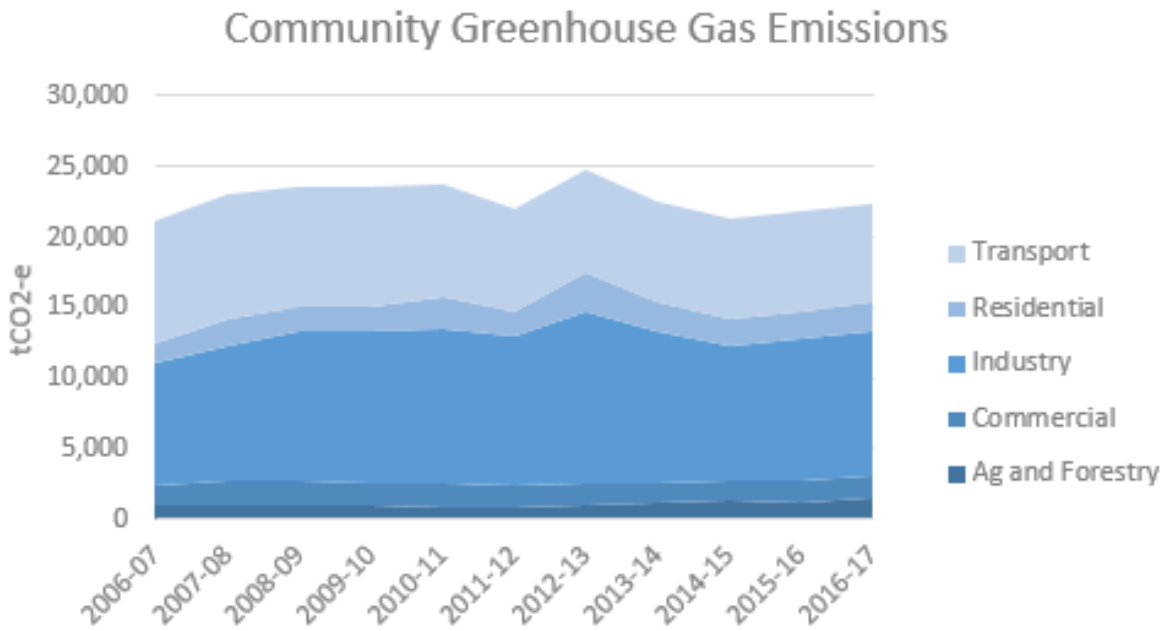


Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018, National Greenhouse Accounts Factors, 2016. NB: 'Ag' represents the Agriculture sector.

Greenhouse gas emissions have increased by 6% from 21,083 tCO_2-e in 2006-07 to 22,411 tCO_2-e (the equivalent of 4,000 vehicles driven for one year[5]) in 2016-17. Increasing energy use in the residential, commercial and agriculture and forestry sectors has contributed to higher emissions, working against reductions achieved in the transport sector.

Industrial sector emissions have had the greatest impact on overall results, which increased by 1,686tCO_2-e, 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.

Figure 3: Tasman 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 TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown. 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).

[5] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Table 2: Tasman Municipal Areas Community Greenhouse Gas (GHG) Emissions

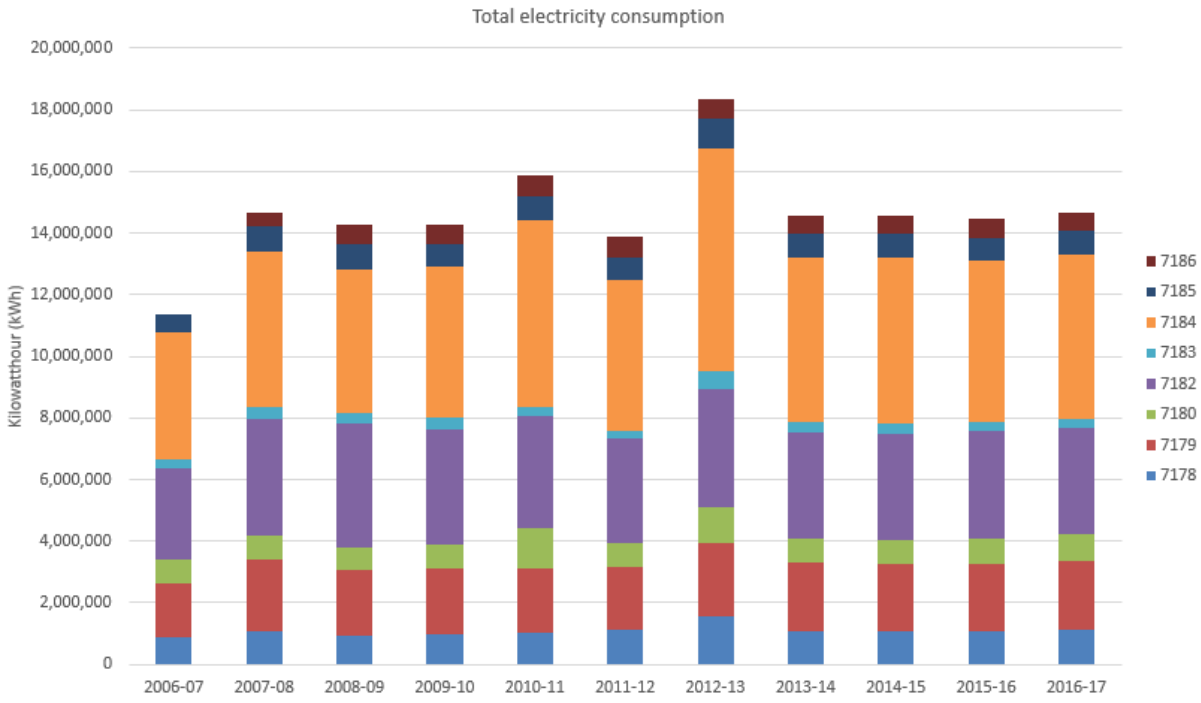
GHG emissions tonnes of carbon dioxide equivalent (tCO_2-e)	2006-07	2016-17	Growth %	Total difference between 2006-07 to 2016-17
Residential	**1,512**	**2,064**	**31**	**552**
Commercial	**1,303**	**1,516**	**15**	**213**
Transport	**8,552**	**6,950**	**-21**	**-1,602**
Subtotal	**11,367**	**10,530**	**-8**	**-837**
Industry	*8,705*	*10,391*	*18*	*1,686*
Ag and Forestry	*1,010*	*1,490*	*38*	*480*
Grand Total	***21,083***	***22,411***	***6***	***1,328***

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 26%[6] **over the last decade** from 11 to 14 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.

[6] Uses the Midpoint growth method

Figure 4: Tasman Municipal Area Community Total Electricity Use



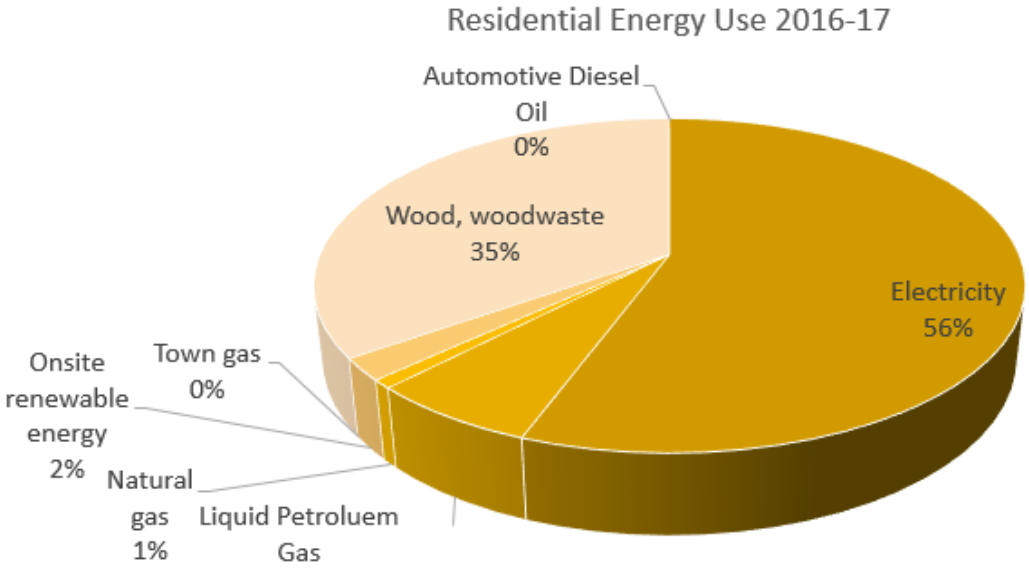
Data sources: TasNetworks, 2018. The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown. The increase in 2012-13 is due to an increase in electricity use data provided by TasNetworks, due to additional Pay As You Go data being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

Tasman households are using more electricity in 2016-17 than a decade ago in 2006-07. The postcodes with a larger population have consumed more electricity and have higher total energy consumption.

Wood use constitutes more than a third of all residential sector energy use and wood use has decreased by 32%[7] from 2006-07 to 2016-17.

Figure 5: Tasman Municipal Area Residential Energy Use

[7] Midpoint growth method used for growth estimates



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 66 rooftops use solar energy to heat hot water[8] in the local area. In the Tasman municipal area, there are over 179 solar photovoltaic (PV) systems[9], which means 1-in-13 premises have access to solar[10].

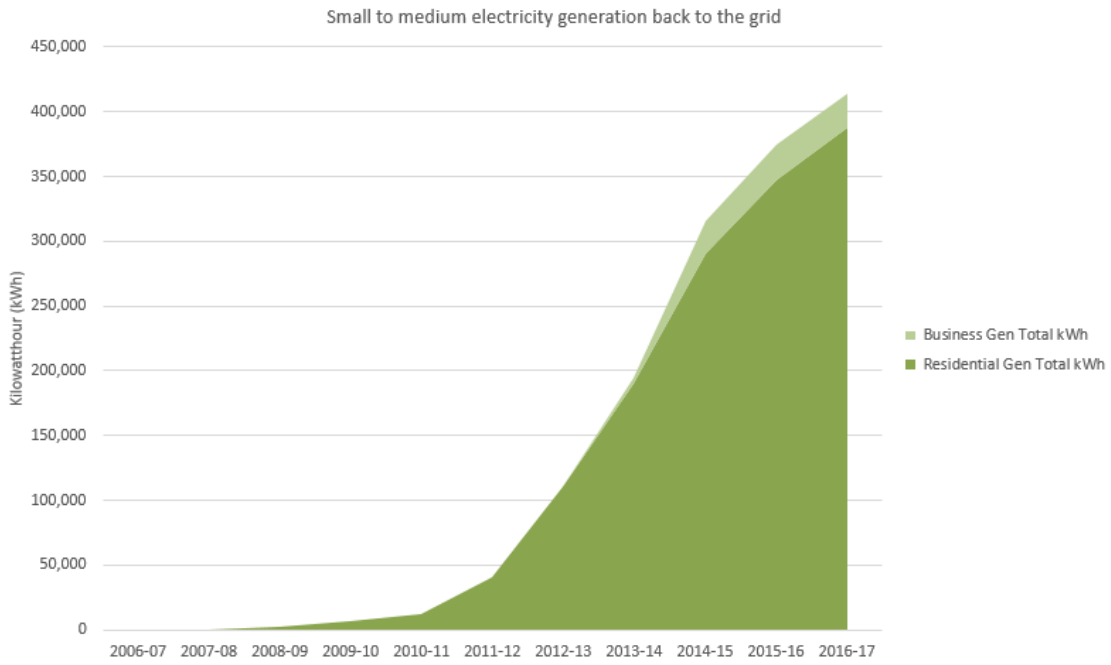
A key change in the commercial sector is the growth of solar PV systems, with nine systems in 2013-14 to 12 systems in 2016-17.

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

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

[10] Total buildings based on number of meters (commercial and residential) in 2016-17, 2,468 NMIs divided by 179 renewable electricity generation NMIs

Figure 6: Tasman Municipal Area 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. The "business" category includes both commercial and industrial facilities to protect the identification of facilities at a local level.

Residential and commercial solar PV installations **export over 400,000 units (kWh) of emission free electricity back to grid each year from the Tasman municipal area**[11]. While solar PV systems are the dominant renewable energy technology in the region, there are three small scale wind systems registered in postcodes 7180, 7182 and 7184; including a 1kW, 3.2kW and 10kW system[12].

Postcodes 7183 and 7184 (Highcroft, Stormlea) have the highest number of commercial and residential solar PV systems in the Tasman municipal area.

Table 3: Tasman municipal area renewable energy systems by postcode in 2016-17

[11] As of end of 2016-17

[12] Based on postcodes allocated to the area and possibly shared across municipal boundaries

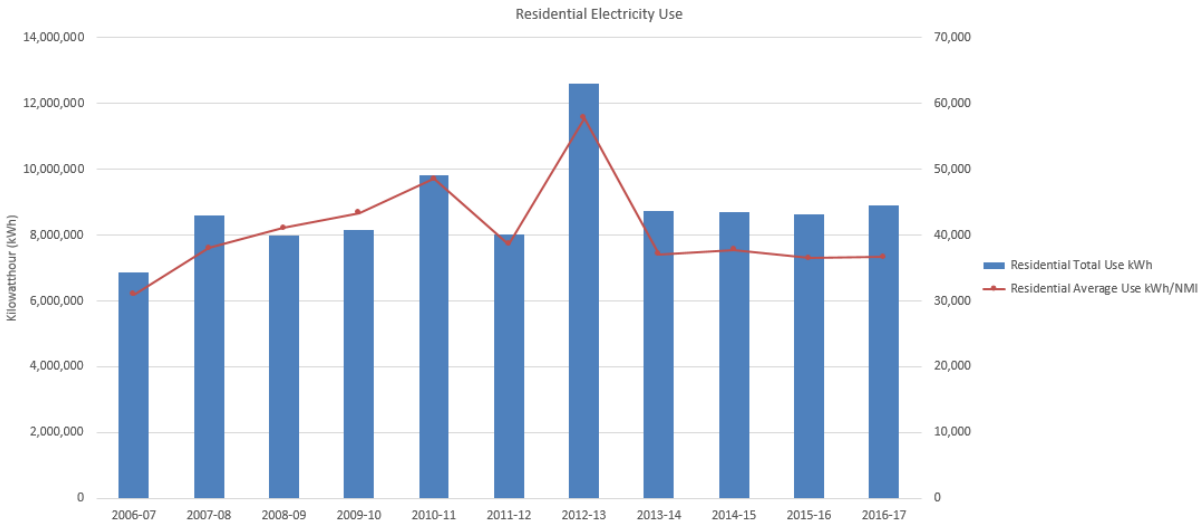
Postcodes	Business meters (NMIs) that generate electricity	Residential meters (NMIs) that generate electricity	Total number of meter connections generating electricity (NMIs)
7178	0	24	24
7179	2	40	42
7180	0	13	13
7182 & 7185	4	26	30
7183 & 7184	6	57	63
7186	0	7	7
Grand Total	**12**	**167**	**179**

Data sources: TasNetworks, 2018. NB: Postcodes have been grouped together to prevent the identification of particular solar PV systems in the postcode.

Overall, Residential sector electricity use has increased by 26%[13] 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.

[13] Midpoint growth method used for growth estimates

Figure 7: Tasman Municipal Area Residential Electricity Use

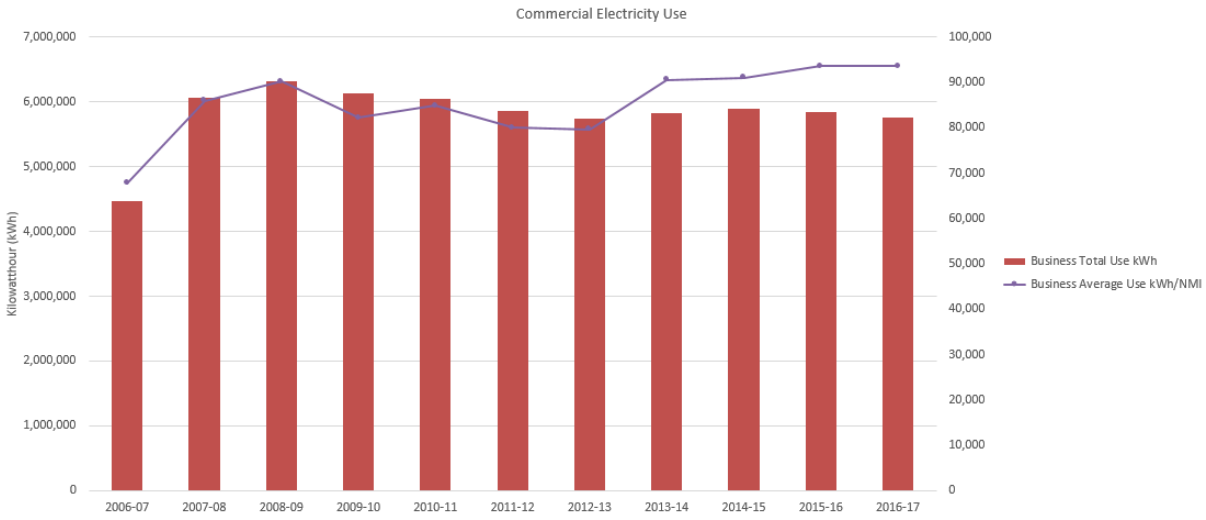


Source: Southern Tasmanian Councils Authority, 2018. Data sources: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. This includes both commercial and industrial facilities to protect the identification of facilities at a local level. The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown. 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).

Residential average electricity use per meter decreases from 2014-15 to 2016-17 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 government programs. These drivers increase consumer awareness of energy costs and energy actions to drive energy savings in commercial premises and home.

Total commercial annual electricity use has increased from 4.4 million to 5.7 million units (kWh) over the decade 2016-07 to 2016-17. Average electricity use per meter increased in the Commercial sector from 2013-14 to 2016-17, while total electricity consumption decreased over the same period. Commercial sector connections have increased between 2007-08 and 2012-13, though, as of 2016-17 the total number of new meter connections are similar to 2006-07.

Figure 8: Tasman Municipal Area Commercial Electricity Use

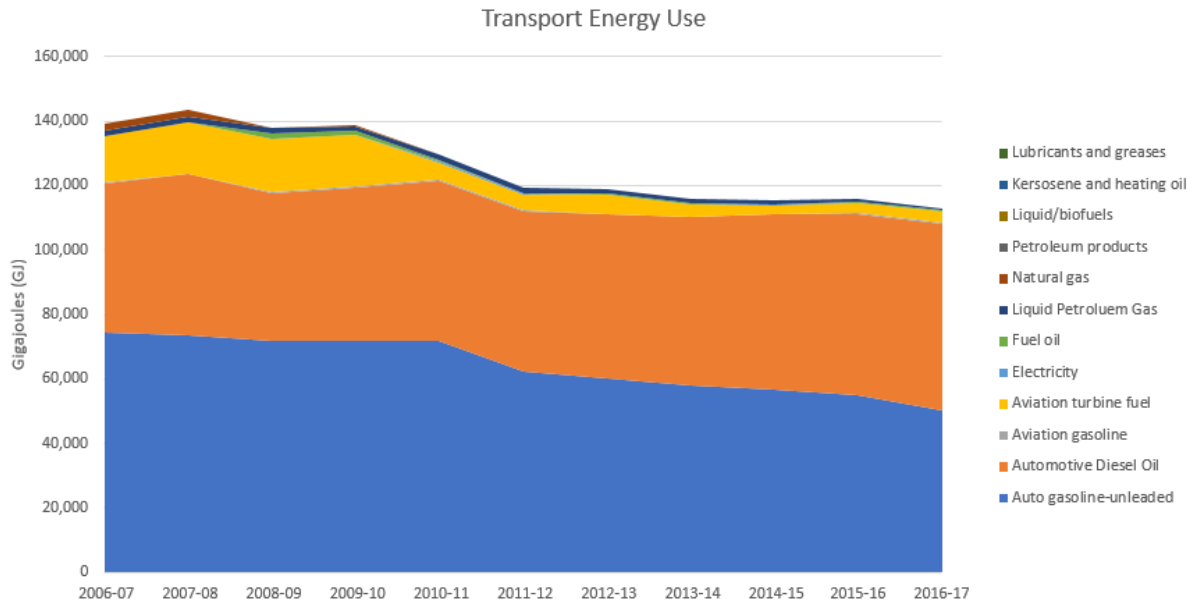


Source: Southern Tasmanian Councils Authority, 2018. Data sources: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. The 'business' category includes both commercial and industrial facilities to protect the identification of facilities at a local level. The TasNetworks data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown. 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).

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 20%[14] from 2006-07 to 2016-17, as a result greenhouse gas emissions have reduced by 19% for the same period.

[14] Midpoint growth method used for growth estimates

Figure 9: Tasman Municipal Area Transport Energy Use.



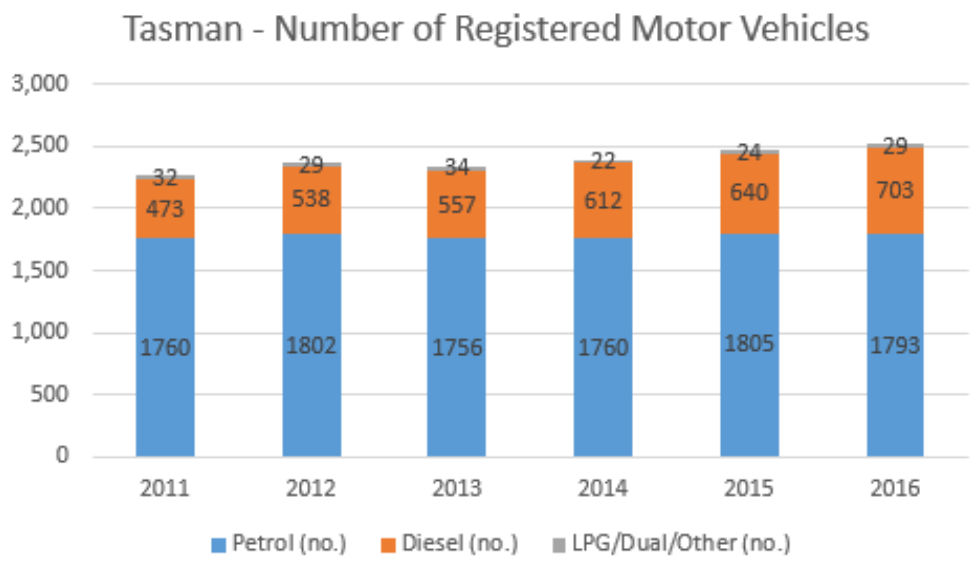
Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics 2017, TasNetworks, 2018.

Passenger vehicle petrol and diesel fuel use are the primary source of energy use and greenhouse gas emissions in the transport sector[15].

The main technology shift occurring is a consumer preference for diesel light vehicles over petrol light vehicles, as shown by an increase of 63 diesel vehicles versus a decrease of 12 petrol vehicles between 2015 to 2016. No electric vehicles are registered in the area.

[15] Road transport is the largest energy user and ABS motor vehicle registrations (Table 12) indicate predominantly 61% passenger vehicles and 28% light commercial vehicles in Tasman, Regional Statistics by LGA2016, Annual (2010-11 to 2015-16)

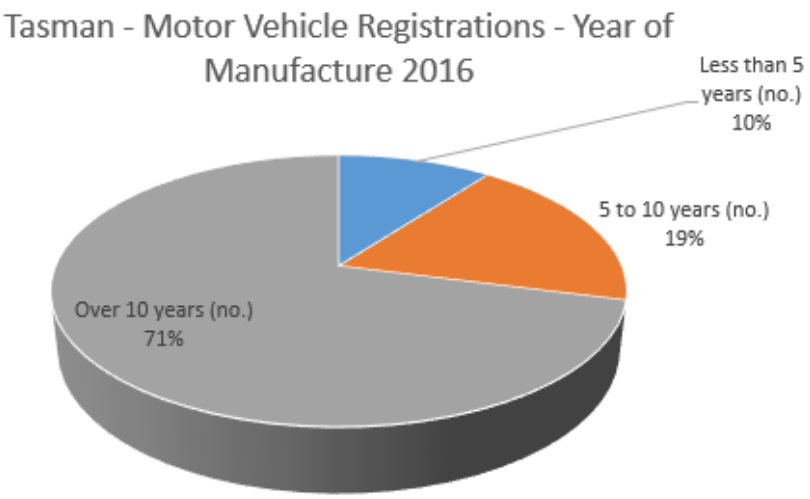
Figure 10: Tasman Municipal Area Motor Vehicle Registrations



Source: Southern Tasmanian Councils Authority, 2018. Data source: Australian Bureau of Statistics, 2016 (Regional statistics by LGA 2016)

One of the challenges in Tasman's community profile is the high percentage of older (over 10 years) more emissions intensive vehicles and relatively low use of newer (less than 5 years) vehicles, which are generally more fuel efficient.

Figure 11: Tasman Municipal Area Motor Vehicle Registrations – Year of Manufacture



Source: Southern Tasmanian Councils Authority, 2018. Data source: Australian Bureau of Statistics, 2016 (Regional statistics by LGA 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, taking into account the time and resources available to councils and includes consideration for other factors influencing the final results.