REGIONAL
CLIMATE CHANGE
INITIATIVE

SOUTHERN MIDLANDS COUNCIL COMMUNITY ENERGY USE AND GREENHOUSE GAS FOOTPRINT

PRELIMINARY FINDINGS AUGUST 2018

SOUTEHRN MIDLANDS 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 Southern Midlands community energy use and greenhouse gas emission trends has been provided by the Southern Tasmanian Councils Authority via the Regional Climate Change Initiative.

Southern Midlands community energy use has decreased by 10% from 2006-07 to 2014-15. Greenhouse gas emissions have decreased by 4% from 2006-07 to 2014-15. Commercial sector electricity use increases, alongside an increase in residential electricity use drove up emissions, while transport sector savings, price signals, greater energy efficiency measures and rooftop solar worked to drive down energy use and greenhouse gas emissions.

Consumers are increasingly taking local energy generation into their own hands. Over 1.1 million units of electricity are returned to the grid annually, generated by local Southern Midlands residential and commercial premises, and each year this figure grows.

Harnessing the power of the sun is popular. Over 338 rooftops have solar photovoltaic (PV) and 196 rooftops have solar hot water systems in the Southern Midlands municipal area.

Postcode 7030, suburbs Bagdad, Broadmarsh, Dysart, Elderslie, Flintstone, Jericho, Kempton, Lower Marshes, Mangalore, Melton Mowbray lead the way in residential solar PV systems, while 7209 (Ross) lead commercial solar PV systems.

Commercial sector solar PV systems have almost doubled from 14 systems in 2013-14 to over 24 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 18% 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 vehicles are in use, which are generally more emissions intensive.

Annual electricity use has decreased by 31% over the last decade. In the Southern Midlands municipal area businesses are using less electricity in 2016-17 than a decade ago.

Energy efficiency measures in the Southern Midlands municipal area may be assisting households to be less vulnerable to extreme weather events. Average residential electricity use per household[1] decreased from 2013-14 to 2016-17 and total residential electricity use remained relatively similar. Energy savings in commercial premises and the home have been influenced by increasing consumer awareness of energy costs and actions as well as factors such as price signals and the use of energy efficient appliances and materials, through government program incentives.

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

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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 Regional and Municipal Energy and Emissions Project 2018 aims to provide insights into emissions intensive sectors of the community and changing technology trends in the local area. The Project was commissioned by the Regional Climate Change Initiative (RCCI) member councils through the Southern Tasmanian Councils Authority (STCA), including:

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

This project builds on previous work undertaken as part of the Cities for Climate Protection (CCP) local government voluntary reporting scheme and is consistent with National and State Government reporting standards and international reporting programs such as the Carbon Development Program and the Compact of Mayors[2]. Since the CCP ceased to be funded by the Australian Government in 2010 there has been no common standard amongst Australian councils for corporate and community energy and greenhouse gas reporting. The STCA provides guidance and support to councils by providing a standardised

[2] The Compact of Mayors is 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

methodology. The methodology uses public and government information that is reliable, credible and updated regularly, and involves the followings steps:

1. Australian Energy Statistics establish a baseline energy snapshot, using Tasmanian statistics with the results tailored to a local level using a per capita method.
2. More accurate metered data provided by energy service providers supports the Australian Energy Statistics records, where available.
3. The Australian Government National Greenhouse Accounts Factors are applied to each energy use type to determine total greenhouse gas emissions.
4. Additional records such as the Australian Government, Clean Energy Regulator and Australian Bureau of Statistics, and Australian PV Institute (APVI) provide 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 2014-15, 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.

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ACKNOWLEDGEMENTS

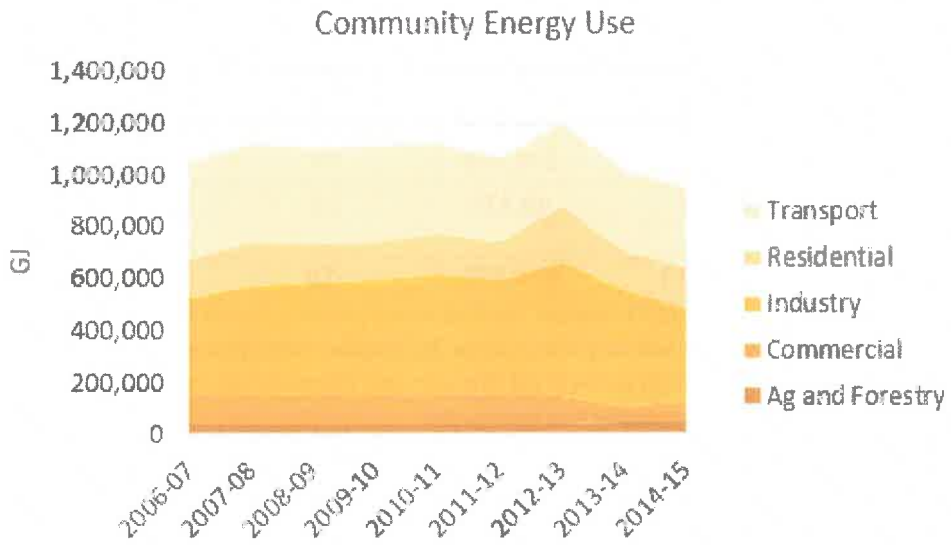
The STCA acknowledges organisations that assisted with the development of the community greenhouse gas and energy profile:

- City of Hobart developed and piloted the initial methodology for community emissions
- TasNetworks provided residential and commercial/industrial sector electricity data
- Tasmanian Climate Change Office (TCCO) reviewed the methodology

SOUTHERN MIDLANDS COUNCIL

Community energy use has decreased by 10% from 2006-07 to 2014-15, from 1 million to 954,000 gigajoules (GJ) in the Southern Midlands Council municipal area.

Figure 1: Southern Midlands 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.

Residential electricity use spiked across the southern Tasmanian region in 2012-13 creating higher than average energy use. This result is likely to be weather related, due to the electricity increases recorded consistently across all 12 southern municipal areas.

Energy reductions have been most significant in the Transport sector (-62,003GJ), followed by the Commercial (-33,130GJ) and Industry (-9,515GJ) sectors (includes manufacturing, mining and construction). State-wide trends have contributed to decreasing Industry and Transport sector energy use while price signals, greater energy efficiency measures and rooftop solar have also played a part. Agriculture and Forestry (10,135GJ) increases drove energy use upwards.

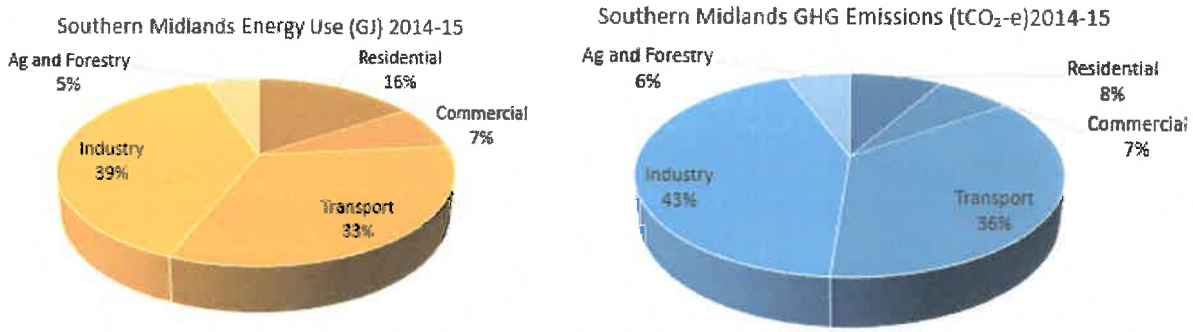
Table 1: Southern Midlands Municipal Area Community Energy Use Gigajoules (GJ)

Energy use (GJ)	2006-07	2014-15	Growth %	Total difference between 2006-07 and 2014-15
Residential	**152,115**	**150,291**	**-1**	**-1,824**
Commercial	**104,880**	**71,750**	**-38**	**-33,130**
Transport	**375,140**	**313,137**	**-18**	**-62,003**
Subtotal	***632,135***	***535,178***	**-17**	**-96,957**
Industry	379,881	370,366	-3	-9,515
Agriculture and Forestry	39,197	49,332	23	10,135
Grand Total	**1,051,213**	**954,876**	**-10**	**-96,337**

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

The Industrial and Transport sectors use roughly a third each of total community energy use and the greatest share of community greenhouse gas emissions.

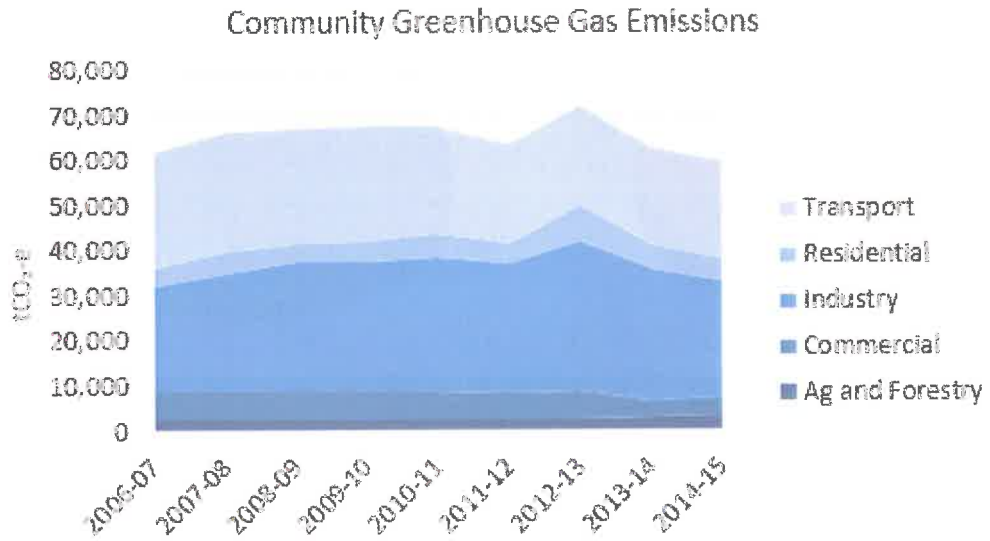
Figure 2: Southern Midlands Community Energy Use and Greenhouse Gas Emissions by Sector



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

Greenhouse gas emissions have decreased by 4% from 2006-07 to 2014-15. Increasing energy use in the Industry, Residential and Agriculture and Forestry sectors has contributed to higher emissions, working against reductions achieved in the Transport and Commercial sectors. Industrial sector emissions have increased by 2,054tCO_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. These fuel use trends are mainly based on per capita Statewide results.

Figure 3: Southern Midlands 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.

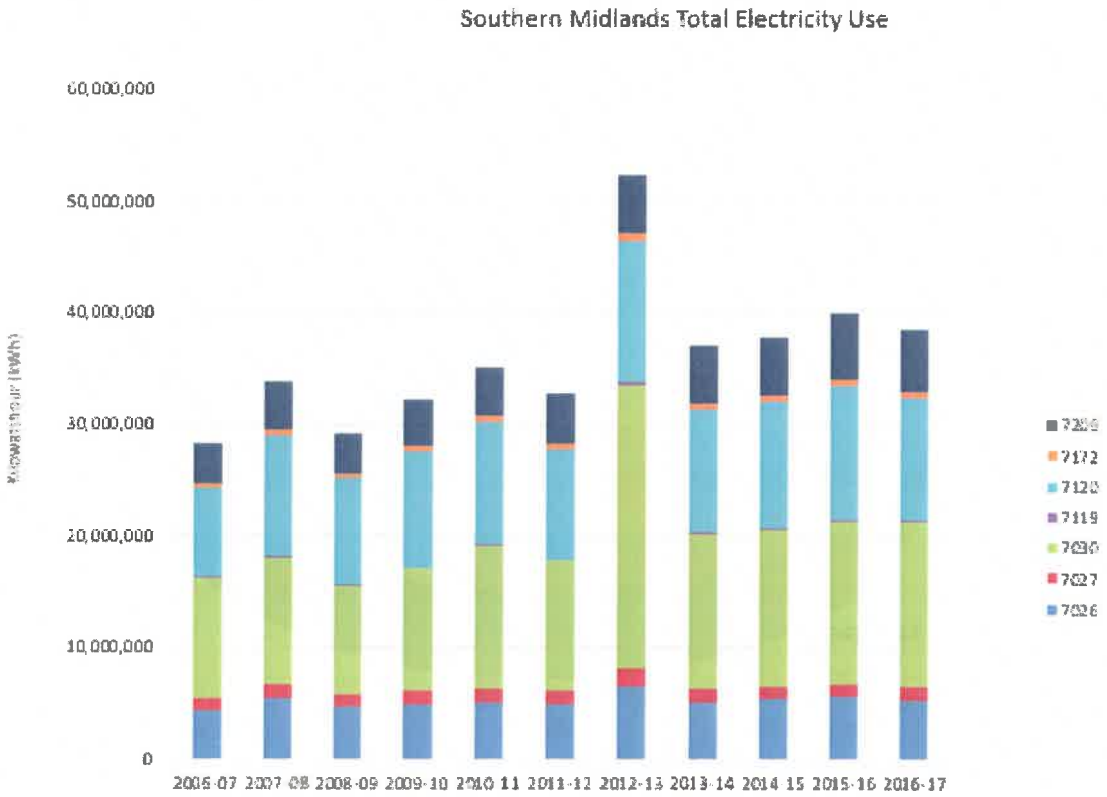
Table 2: Southern Midlands Municipal Areas Community Greenhouse Gas (GHG) Emissions

GHG emissions tonnes of CO2 equivalent (tCO_2-e)	**2006-07**	**2014-15**	**Growth %**	**Total difference between 2006-07 to 2014-15**
Residential	**4,155**	**4,967**	**23**	**812**
Commercial	**5,941**	**4,054**	**-38**	**-1,887**
Transport	**25,591**	**21,547**	**8**	**-4,044**
Subtotal	***35,687***	***30,568***	***-15***	***-5,119***
Industry	23,650	25,704	18	2,054
Ag and Forestry	2,745	3,451	-17	706
Grand Total	**62,082**	**59,722**	**-4**	**-2,360**

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 31% over the last decade from 57 to 51 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: Southern Midlands Municipal Area Community Total Electricity Use

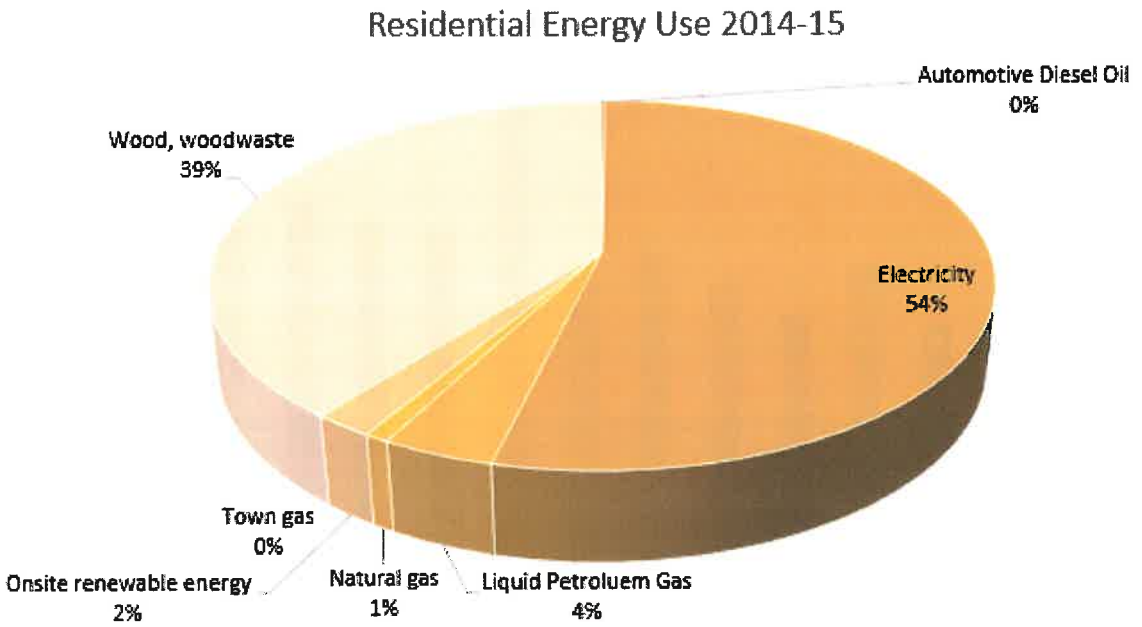


Data sources: TasNetworks, 2018.

Southern Midlands Council households are using 20% more electricity in 2016-17 than a decade ago in 2006-07. The postcodes with a larger population have consumed more electricity and have a higher total energy consumption. The variability, particularly in 2012-13, suggests that climate and heating loads have a large impact on electricity use. Tasmania's colder climate, reliance on electricity-based heating appliances such as heat pumps and electric storage hot water heaters and under insulated building stock means

weather extremes have a larger impact on electricity use. Consistently high electricity use across southern Tasmanian region (across municipal areas) in 2012-13 is an indication that the temperature extremes early in 2012 are likely to have influenced electricity use in the Southern Midlands municipal area[4]. The hotter summer in 2013 in Tasmania[5], may have also contributed to increases in electricity demand. Wood use has decreased by 28% from 2004-05 to 2016-17 and constitutes over a third of all residential energy use.

Figure 5: Southern Midlands 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 196 rooftops use free solar energy to heat hot

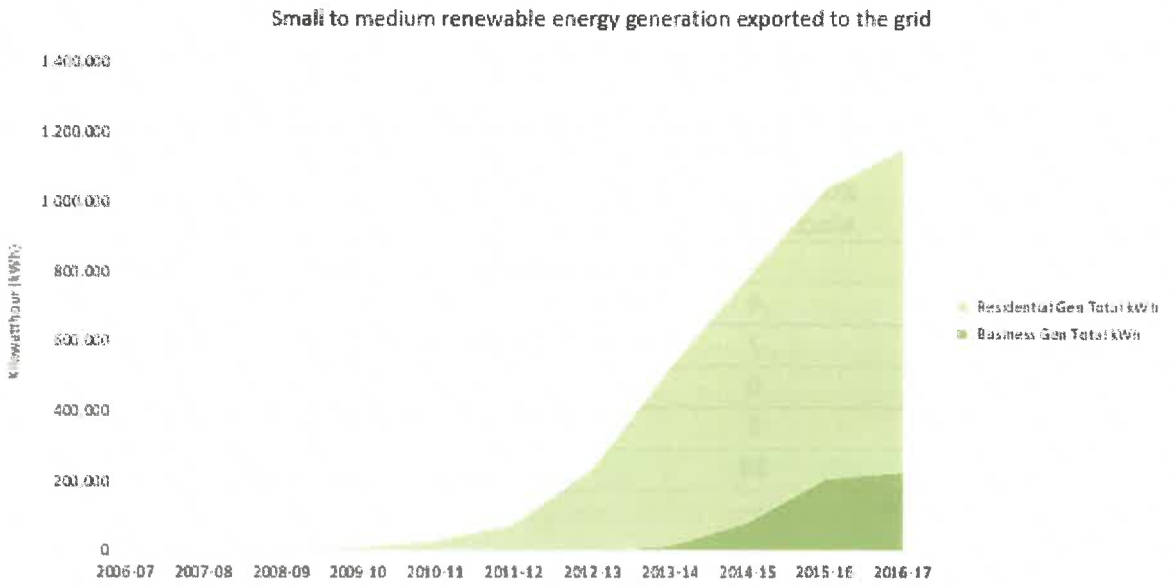
[4] An April in Tasmania, though Tasmania, the mainland's southern coast, and the southwestern half of Western Australia experienced above-average temperatures http://www.bom.gov.au/climate/annual_sum/2012/index.shtml

[5] February–April was warmer than average, with record warmth in Tasmania during March pg 2 http://www.bom.gov.au/climate/annual_sum/2013/AnClimSum2013_LR1.0.pdf

water[6] in the local area. In the Southern Midlands municipal area, there are over 338 solar photovoltaic (PV) systems[7], which means one in every eleven premises have access to solar[8].

A key change in the commercial sector is the popularity of solar PV systems, which have almost doubled from 14 systems in 2013-14 to 24 systems in 2016-17.

Figure 6: Southern Midlands Municipal Area Renewable Electricity Generation Exported Electricity



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.

Solar PV systems are the dominant renewable energy technology in the region, however, there are several small scale wind systems; 1.5kW and 0.5KW system are registered in the

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

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

[8] Total buildings based on number of meters (commercial and residential) in 2016-17, 3,958 NMIs divided by 338 renewable electricity generation NMIs

area. Residential and commercial solar PV installations **export over 1.1 million units of emission free electricity back to grid each year from the Southern Midlands municipal area**[9].

Postcode 7030 (Bagdad, Broadmarsh, Dysart, Elderslie, Flintstone, Jericho, Kempton, Lower Marshes, Mangalore, Melton Mowbray) have the highest number of residential solar PV systems (118) and the highest commercial solar PV systems (6) is in 7209[10] compared to other postcodes in the Southern Midlands municipal area.

Table 3: Southern Midlands municipal area 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)
7026&7027	7	77	84
7030	4	118	122
7120&7119	7	93	100
7172	**0**	**4**	**4**
7209	**6**	**22**	**28**
Grand Total	**24**	**314**	**338**

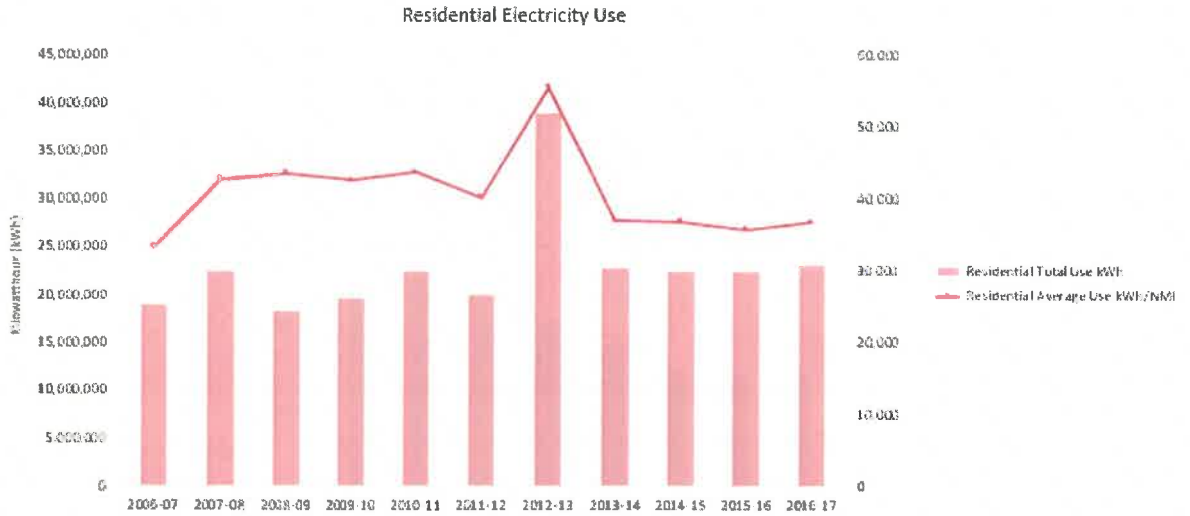
Data sources: TasNetworks, 2018

Overall, residential electricity use has increased by 28% over the last decade, from 2006-07 to 2016-17. Total residential electricity consumption has evened out over the last four years, despite 400 new residential connections from 2013-14 to 2016-17. This follows a period of high electricity consumption variability, from 2006-07 to 2012-13.

[9] As of end of 2016-17

[10] The other postcodes with higher results (7) are combined results for multiple postcodes. These were combined to ensure no single entity in a postcode can be identified.

Figure 7: Southern Midlands Municipal Area Residential Electricity Use.

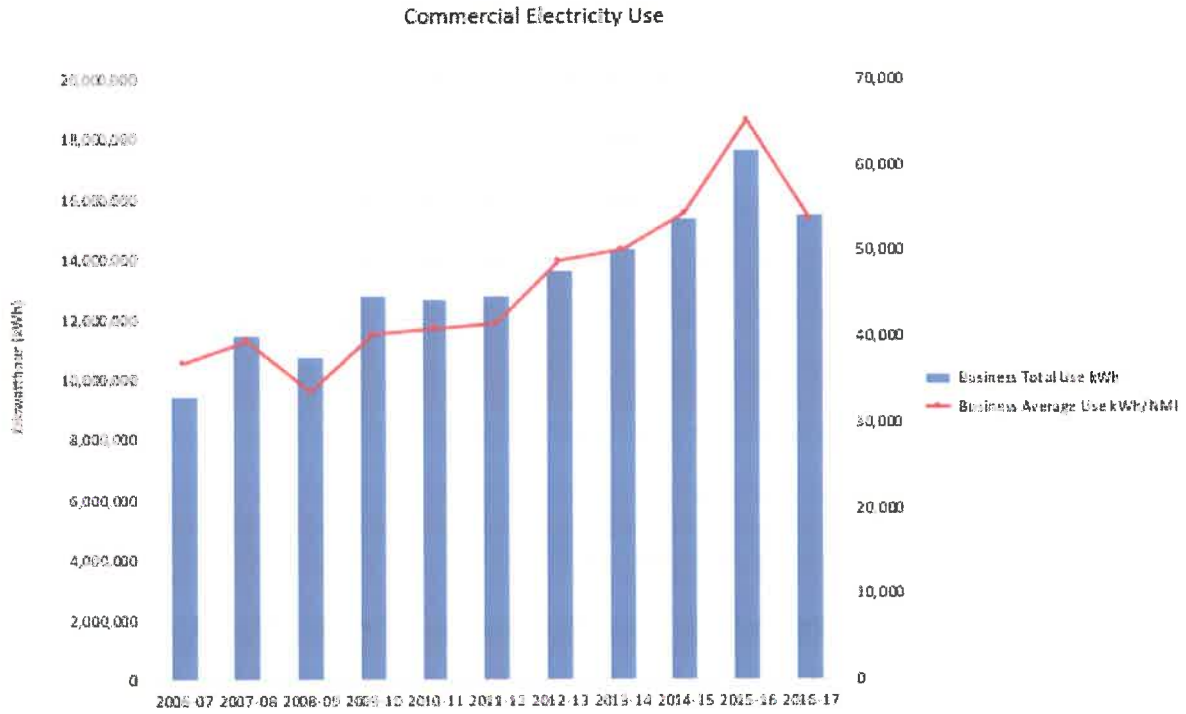


Source: Southern Tasmanian Councils Authority, 2018. Data sources: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. This includes both commercial and industrial facilities to protect the identification of facilities at a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

Average residential electricity use per household decreases from 2012-13 to 2015-16 are 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 the home.

Total commercial annual electricity use has increased from 9 million to 15 million units over the decade 2016-07 to 2016-17. Average electricity use per meter and total electricity consumption increased in the Commercial sector from 2008-09 to 2015-16, yet decreased in 2016-17. New Commercial sector meter connections reached a peak in 2007-08 and then decreased steadily to 2016-17, to be similar to 2006-07 levels.

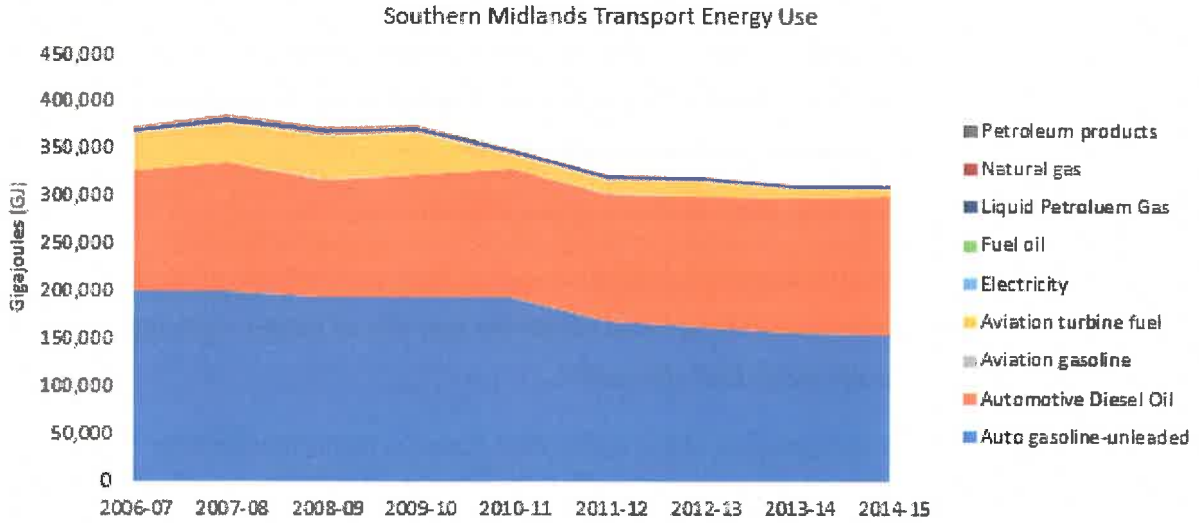
Figure 8: Southern Midlands Municipal Area Commercial Electricity Use



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 eight years. Transport energy use has decreased by 18% from 2006-07 to 2014-15, as a result, greenhouse gas emissions have reduced by 17% for the same period.

Figure 9: Southern Midlands 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[11].

The main technology shift occurring is a consumer preference for diesel light vehicles over petrol light vehicles, as shown by an increase of 72 diesel vehicles versus a decrease of 32 petrol vehicles between 2015 to 2016.

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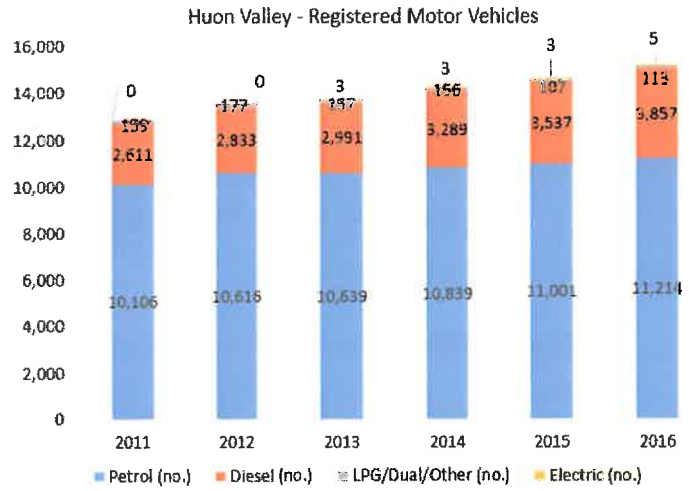
[11] **Road transport is the largest energy user and ABS motor vehicle registrations (Table 12) indicate predominantly 59% passenger vehicles and 31% light commercial vehicles in Southern Midlands LGA, Regional Statistics by LGA 2016, Annual (2010-11 to 2015-16)**

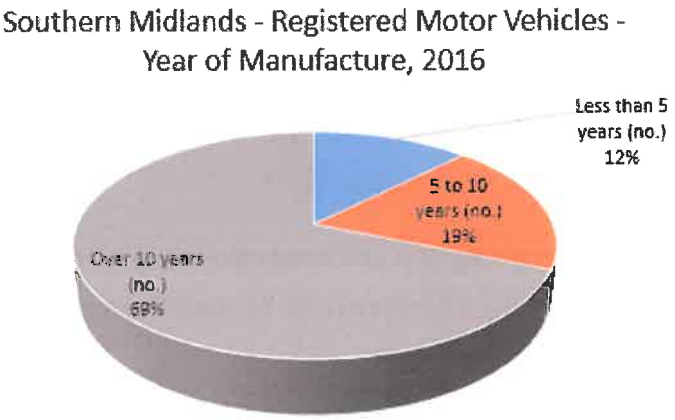
Figure 10: Southern Midlands Municipal Area Motor Vehicle Registrations



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

One of the challenges in the Southern Midlands is the high percentage of older (over 10 years), more emissions intensive vehicles and relatively low use of newer vehicles (less than 5 years), which are generally more fuel efficient[12].

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



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

[12] Depending on the make and model of vehicle.