



CITY OF HOBART
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 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
- Australian Government, Clean Energy Regulator for commercial/industrial data to fact check final results

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CITY OF HOBART 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 Hobart community energy use and greenhouse gas emission trends has been provided by the Southern Tasmanian Councils Authority’s Regional Climate Change Initiative.

Hobart community energy use has increased by 4% from 2006-07 to 2016-17. Greenhouse gas emissions increased by 6% from 2006-07 to 2016-17. Electricity use increases 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.

Community energy use and associated greenhouse gas emissions footprints

Hobart municipality 2016-17	8.8 petajoules (PJ)	525,000 tonnes of carbon dioxide (tCO ₂ -e)
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Region (across 12 southern Tasmanian municipalities) 2016-17	43 petajoules (PJ)	2,580,000 tonnes of carbon dioxide (tCO ₂ -e)
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Tasmania	109 petajoules (PJ) (2016-17)	3,980,000 (tonnes of carbon dioxide (tCO ₂ -e) (2015-16)
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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 5.3 million units (kilowatt hour) of electricity are returned to the grid annually, generated by local Hobart residential and commercial premises, and each year this figure grows.

Harnessing the power of the sun is popular. Over 2,100 rooftops have solar photovoltaic (PV) and 800 rooftops have solar hot water systems in the Hobart municipal area.

Postcode 7008 (New Town and Lenah Valley) leads in residential solar PV systems (479) and 7000, suburbs Hobart, Glebe, Mount Stuart, North Hobart, Queens Domain and West Hobart lead the way in the highest number of commercial (60) solar PV systems, in the Hobart municipal area.

Commercial sector solar PV systems have more than doubled from 36 systems in 2013-14 to 101 systems in 2016-17.

Energy based technology shifts are occurring locally. Twenty nine electric vehicles¹ are registered in the Hobart area. 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. Across Tasmania older vehicles, which are generally more emissions intensive, are predominantly in use.

Annual electricity use has increased by 29% over the last decade. In Hobart's municipal area households 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.

¹ Motor vehicle registration is self-reported through the ABS and may include hybrid as well as full electric vehicles

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 targets². 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

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

National and State Government reporting standards and international reporting programs such as the Carbon Development Program, the Compact of Mayors³ 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 Market⁴.
- 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

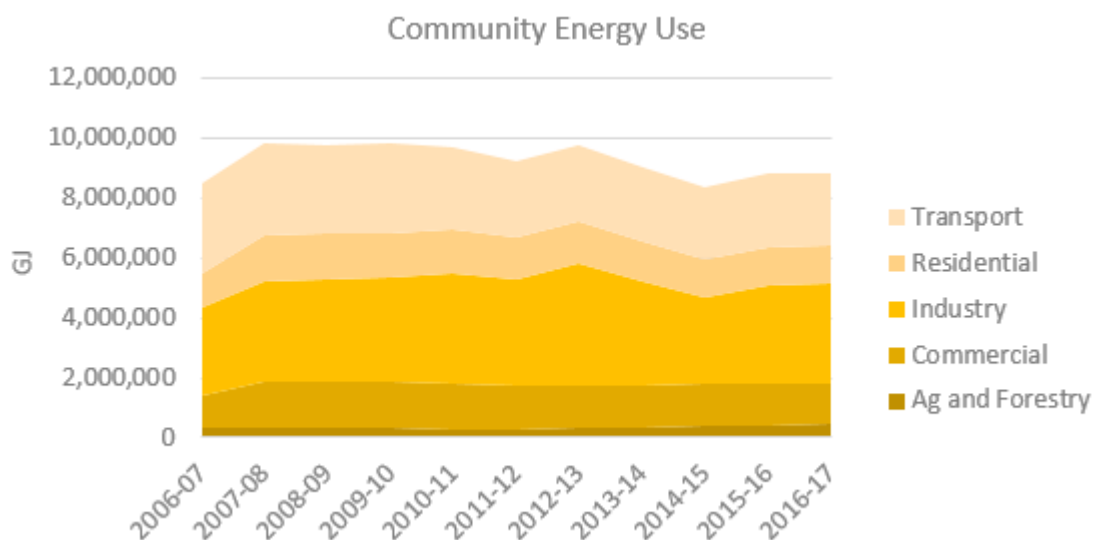
³ led by C40, ICLEI and United Cities and Local Governments, in close collaboration with the UN Secretary General's Special Envoy for Cities and Climate Change, UN Habitat, and the UN Secretary General's office

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.

CITY OF HOBART

Community energy use has increased by 4%⁵ from 2006-07 to 2016-17, from 8.4 million to 8.8 million gigajoules (GJ) in Hobart’s municipal area. A typical southern Tasmania household uses 25 GJ (7,000 kWh) per annum.

Figure 1: Hobart’s 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 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 Hobart’s transport sector (-554,186GJ). 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.

Hobart’s industry sector was responsible for the greatest energy use increase (368,830GJ), followed by the commercial (268,363GJ) and agriculture and forestry (148,363GJ) and the residential sector (111,516GJ).

⁵ Midpoint method used for growth

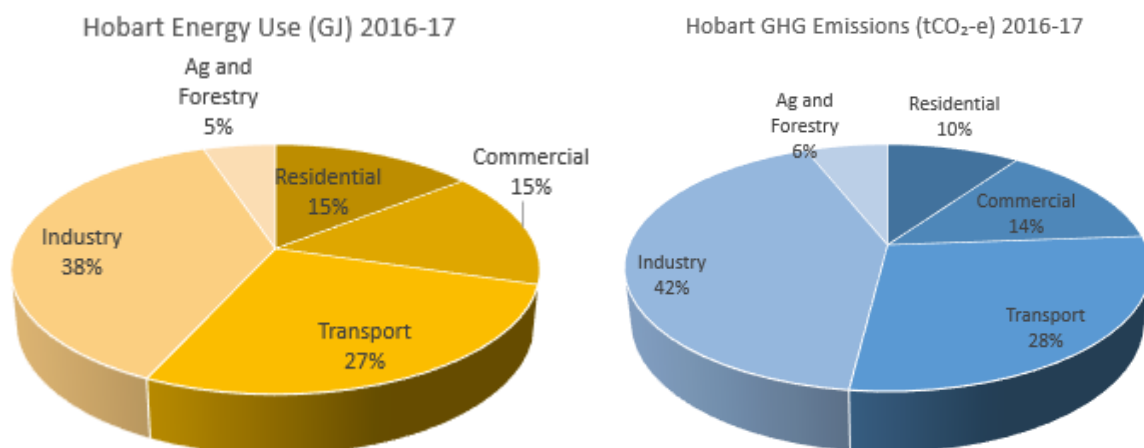
Table 1: Hobart's Municipal Area Community Energy Use

Energy use Gigajoules (GJ)	2006-07	2016-17	Growth %	Total difference between 2006-07 and 2016-17
Residential	1,164,273	1,275,789	9	111,516
Commercial	1,060,295	1,328,658	22	268,363
Transport	2,957,174	2,402,988	-21	-554,186
Subtotal	5,181,741	5,007,435	-3	-174,306
<i>Industry</i>	<i>2,973,494</i>	<i>3,342,324</i>	<i>12</i>	<i>386,830</i>
<i>Agriculture and Forestry</i>	<i>306,815</i>	<i>455,178</i>	<i>39</i>	<i>148,363</i>
Grand Total	8,462,050	8,804,937	4	342,887

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.

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

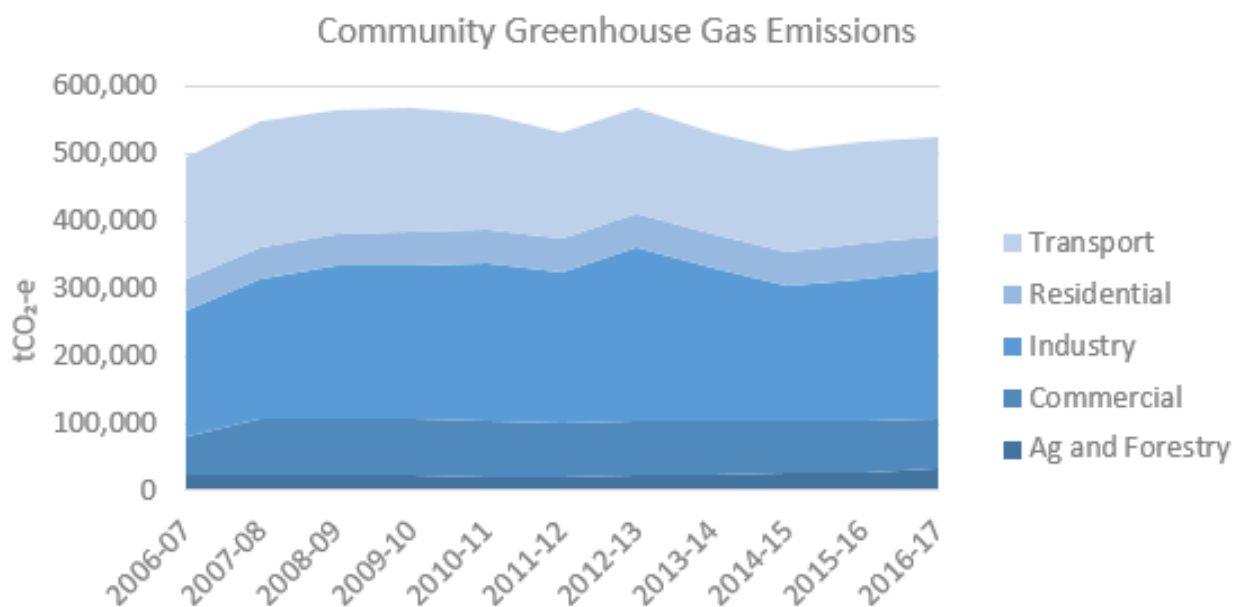
Figure 2: Hobart's Community Energy Use and Greenhouse Gas Emissions by Sector



Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics, 2018, TasNetworks, 2018, National Greenhouse Accounts Factors, 2016. NB: "Ag" is abbreviated from Agriculture

Greenhouse gas emissions have increased by 30,591tCO₂-e, resulting in an overall increase of 6%⁶ from 495,185 tCO₂-e in 2006-07 to 525,725 tCO₂-e (the equivalent of 111,000 vehicles driven for one year) in 2016-17. Increasing energy use in the industry, commercial, agriculture and forestry sectors has contributed to higher emissions, working against reductions achieved in the transport sector(-34,904GJ). Industrial sector emissions have increased by 35,850tCO₂-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. Transport and industrial energy use trends are mainly based on per capita Statewide results.

Figure 3: Hobart's 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 (tCO₂-e) 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).

⁶ Midpoint method used for growth

Table 2: Hobart's Municipal Area Community Greenhouse Gas (GHG) Emissions

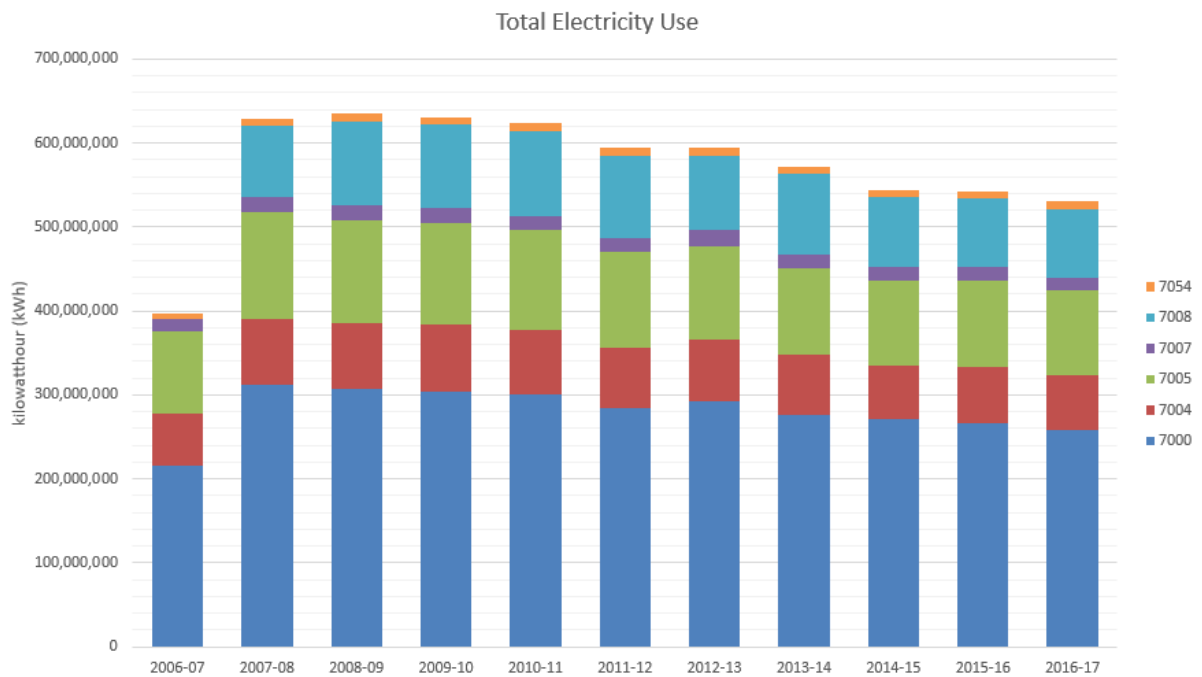
GHG emissions tonnes of CO ₂ equivalent (tCO ₂ -e)	2006-07	2016-17	Growth %	Total difference between 2006-07 to 2016-17
Residential	46,996	51,250	9	4254
Commercial	59,716	74,089	21	14,372
Transport	181,866	147,784	-21	-34,082
Subtotal	288,579	273,123	-6	-15,456
Industry	185,118	220,968	18	35,850
Ag and Forestry	21,488	31,684	38	10,196
Grand Total	495,185	525,775	6	30,591

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 29%⁷ over the last decade from 396 to 530 million units (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.

⁷ Midpoint method is used for growth estimates

Figure 4: Hobart's Municipal Area Community Total Electricity Use

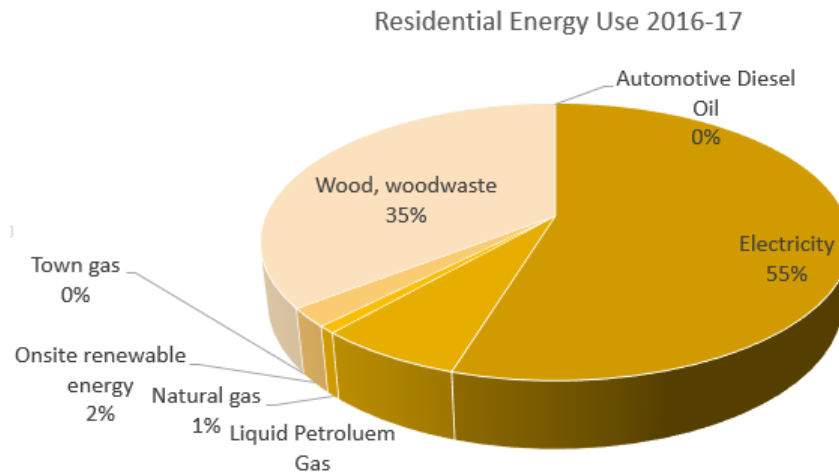


Data sources: TasNetworks, 2018.) The TasNetworks data on which Figure 4 is data is sourced from legacy business systems and includes a variation between 2006/07 and 2007/08 for reasons unknown, whereby postcode 7008 (Lenah Valley and New Town) is not included. The increase in 2012-13 is due to an increase 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 postcodes with a larger population have consumed more electricity and have higher total energy consumption. Tasmania's colder climate, reliance on electricity based heating appliances such as heat pumps and electric hot water heaters and under insulated building stock means weather extremes have a larger impact on electricity use.

Wood use has decreased by 32% from 2004-05 to 2016-17 and it is estimated to comprise over a third of all residential energy use.

Figure 5: Hobart’s Municipal Area Residential Energy Use



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

More households are generating and using their own solar rooftop power, decreasing electricity use from the electricity grid. In the Hobart municipal area, there are over 2,100 solar photovoltaic (PV) systems¹¹, which means **one-in-every-13** premises have access to solar¹². In addition around 829 rooftops use solar energy to heat hot water¹³ in the local area.

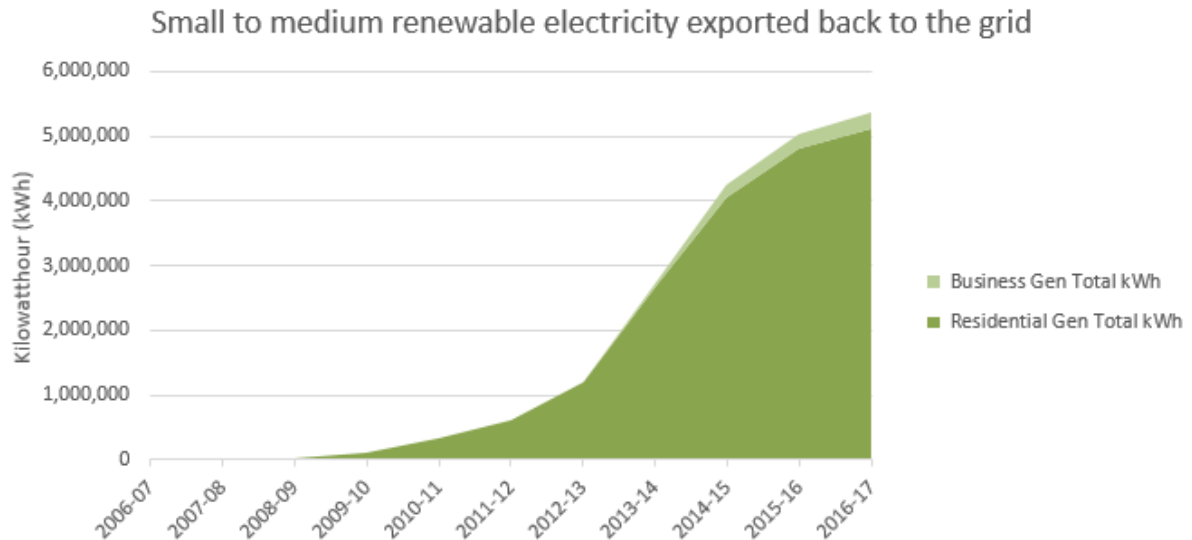
A key change in the commercial sector is the popularity of solar PV systems, which have doubled from 36 systems in 2013-14 to 101 systems in 2016-17.

¹¹ Based on TasNetworks meters that generate back to the electricity grid, 2018 data.

¹² Total buildings based on number of meters (commercial and residential) in 2016-17, 28,812 NMIs divided by 2,175 renewable electricity generation NMIs

¹³ Based on CER small scale technology data, accessed May 2018. There are shared postcodes with neighbouring councils so a conservative estimate has been used.

Figure 6: Hobart’s 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. Small scale residential and commercial solar PV installations export over 5.3 million units (kWh) of emission free electricity back to grid each year from the Hobart municipal area¹⁶.

Though unlikely to be represented in Figure 6, as a large renewable energy contributor to the electricity grid, the biggest renewable energy contributor in the local area is the AGL owned landfill gas electricity facility at the City of Hobart’s McRobies Gully. It generates 6,911 megawatt hour (MWh)¹⁸ or 6.9 million units kWh of electricity per annum.

Postcode 7008 (New Town, Lenah Valley) have the highest number of residential solar PV systems (493) and the highest commercial solar PV systems are in postcode 7000 (Hobart, Glebe, Mount Stuart, North Hobart, Queens Domain and West Hobart) (60) compared to other postcodes in the Hobart municipal area.

¹⁶ As of end of 2016-17

¹⁸ In 2015-16, generator rated capacity 1,000kW.

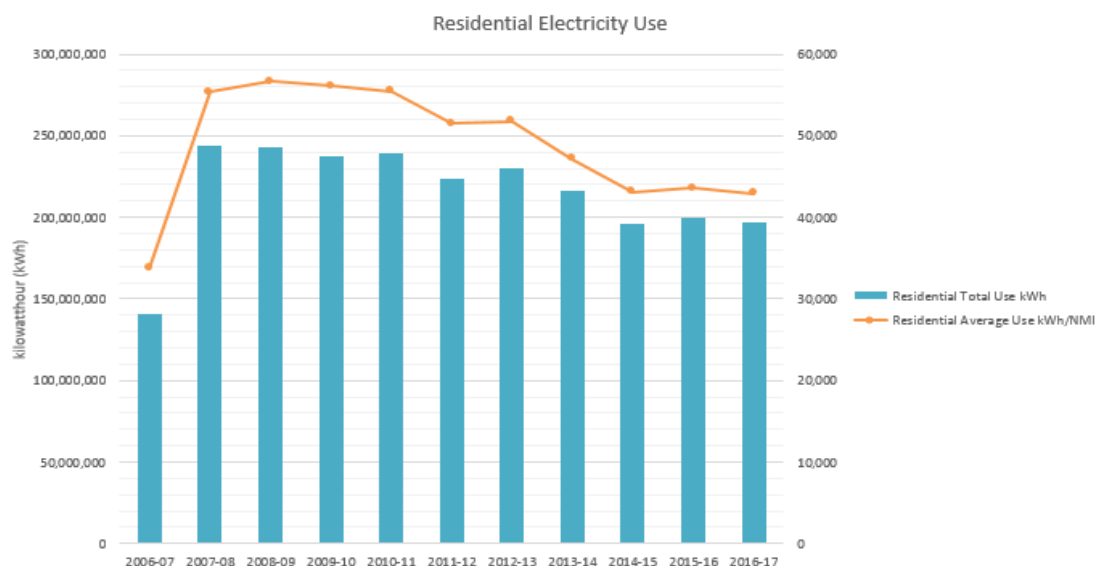
Table 3: Hobart Municipal Area Renewable Energy Systems by Postcode in 2016-17

Postcodes	Business meters (NMIs) that generate electricity	Residential meters (NMIs) that generate electricity	Total number of meter connections generating electricity (NMIs)
7000	60	479	539
7004	14	335	349
7007	2	168	170
7008	14	493	507
7005	8	482	490
7054	3	117	120
Grand Total	101	2,074	2,175

Data sources: TasNetworks, 2018

Hobart households are using 34%²⁰ more electricity in 2016-17 than a decade ago in 2006-07, yet for most of the decade total electricity use in the residential sector has been decreasing. Total residential electricity consumption has levelled out over the last four years, despite over 256 new residential connections from 2013-14 to 2016-17. This follows a period of high electricity consumption variability, from 2006-07 to 2012-13.

Figure 7: Hobart 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

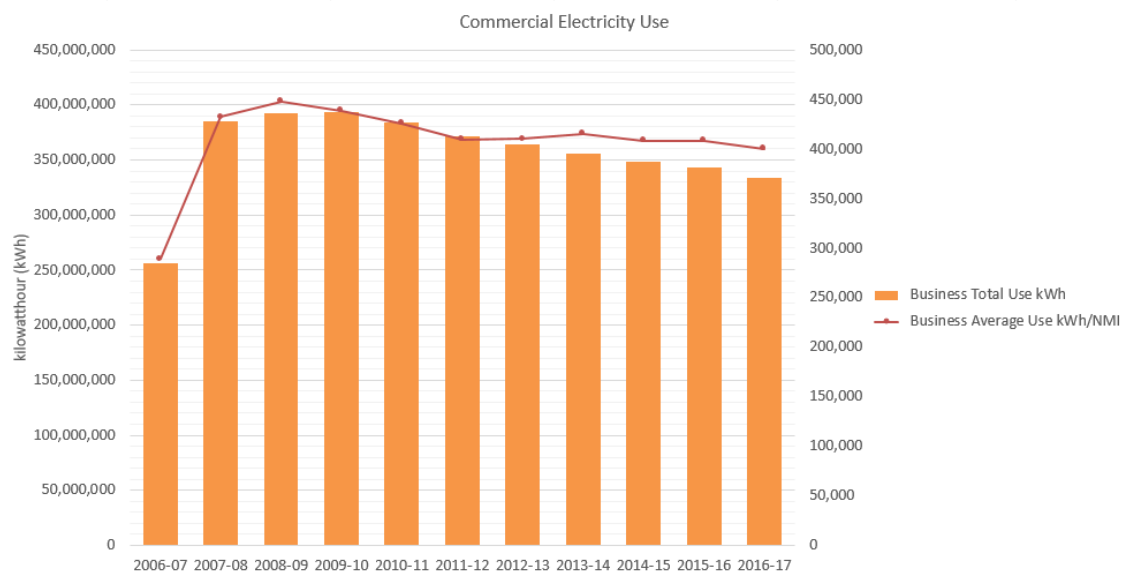
²⁰ Midpoint method is used for growth estimates throughout to maintain consistency

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).

Average residential electricity use per household decreases from 2012-13 to 2016-17 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 by 26%²³ from 256 million to 333 million units (kWh) over the decade 2006-07 to 2016-17. Average electricity use per meter and total electricity use has decreased in the commercial sector steadily from 2007-08 to 2016-17. New commercial sector meter connections reached a peak in 2009-10, then decreased to 2016-17, to be 437 more in 2016-17 than in 2006-07.

Figure 8: Hobart Municipal Area Commercial Electricity Use



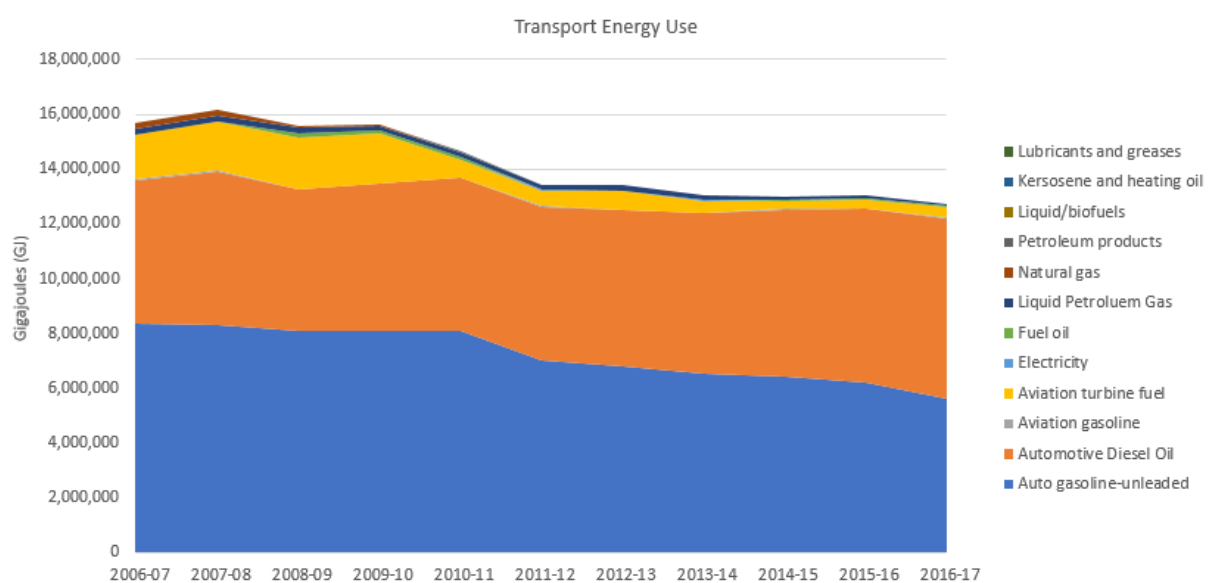
Source: Southern Tasmanian Councils Authority, 2018. Data sources: TasNetworks, 2018. NB: Electricity use is represented as kilowatt hour (kWh). One kWh is equal to one unit on electricity bills. This includes both commercial and industrial facilities to protect the identification of facilities at a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

²³ Midpoint method is used for growth estimates

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 the last decade (2006-07 to 2016-17). Transport energy use decreased by 21%²⁴ from 2006-07 to 2016-17, as a result, greenhouse gas emissions have reduced by 21% for the same period.

Figure 9: Hobart Municipal Area Transport Energy Use



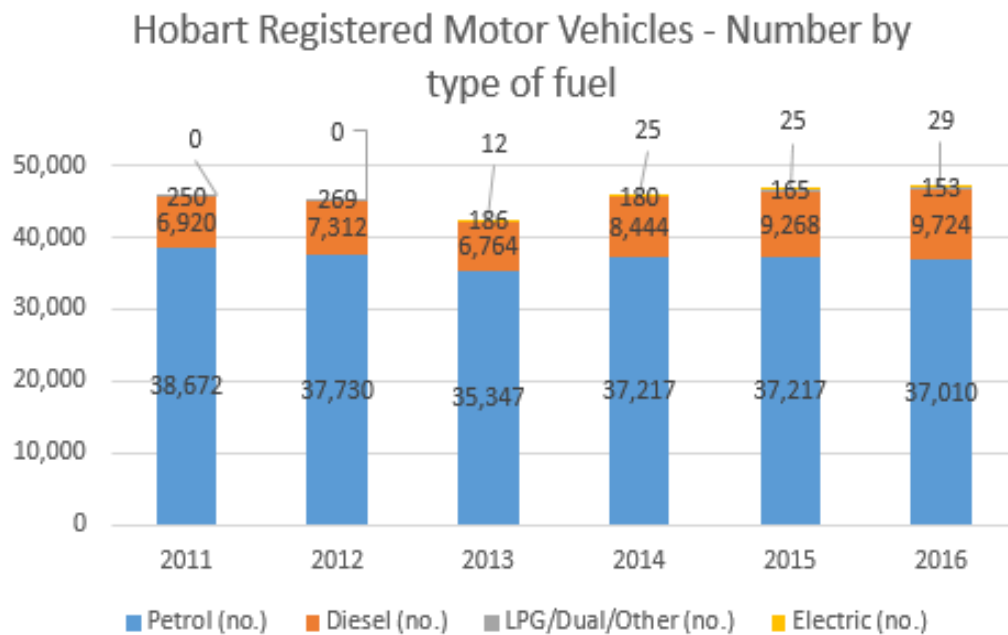
Source: Southern Tasmanian Councils Authority, 2018. Data sources: Australian Energy Statistics 2017, TasNetworks, 2018.

Passenger vehicle petrol and diesel fuel use are the primary source of energy use and greenhouse gas emissions in the transport sector²⁵. The main technology shift occurring is a consumer preference for diesel light vehicles over petrol light vehicles, as shown by an increase of 456 diesel vehicles versus a decrease of 207 petrol vehicles between 2015 to 2016. Twenty nine electric vehicles registered in 2016.

²⁴ Midpoint method used for growth

²⁵ Road transport is the largest energy user, compared to air and water transport, and ABS motor vehicle registrations (Table 12) indicate predominantly 79% passenger vehicles and 14% light commercial vehicles in Hobart LGA, Regional Statistics by LGA2016, Annual (2010-11 to 2015-16)

Figure 10: Hobart Municipal Area Motor Vehicle Registrations



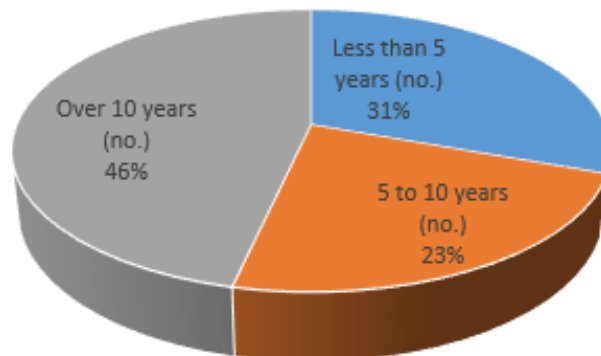
Source: Southern Tasmanian Councils Authority, 2018. Data source: Australian Bureau of Statistics, 2016.

One of the challenges in Hobart’s community profile is the high percentage of older (over 10 years), more emissions intensive vehicles and relatively lower use of newer vehicles (less than 5 years), which are generally more fuel efficient²⁶.

²⁶ Depending on the make and model of vehicle.

Figure 11: Hobart's Municipal Area Motor Vehicle Registrations – Year of Manufacture

Hobart Vehicle Registrations - Year of Manufacture - 2016



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, taking into account the time and resources available to councils and includes consideration for other factors influencing the final results.