



Australian Government

Department of Infrastructure, Transport, Cities and Regional Development

Bureau of Infrastructure, Transport and Regional Economics

Yearbook 2019

Progress in Australian Regions



Progress 3: Environment



The environment, both natural and built, is fundamental to the quality of life and sense of wellbeing of Australians, as well as providing key inputs to the economy. Australians have always valued the benefits provided by our environment, such as clean air, water and natural attractions such as the Great Barrier Reef, and to pass on a healthy environment to future generations. Over recent times, people have become even more interested in monitoring the state of our environment.⁵⁵

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⁵⁵ Adapted from ABS 2013, *Measures of Australia's Progress* (cat. no. 1370.0), Canberra.

P 3.1 Healthy natural environment

P 3.1.1 Air pollution

Poor air quality can have a range of negative impacts on the community, causing health problems, damage to infrastructure, reducing crop yields and harming flora, fauna and wildlife.

Concentration levels of fine particulate matter in the air provide a measure of the air quality of a city. This indicator measures the concentration levels of particles in the air that are 2.5 microns or less in width (PM2.5), measured in micrograms per cubic metre of air ($\mu\text{g}/\text{m}^3$). Lower levels of PM2.5 represent better air quality.

Air pollution across major airsheds

- Where data was available, the air quality of most major cities stayed relatively stable between 2014 and 2016. Darwin experienced the largest and only recorded improvement in air quality, with a decline of 2 $\mu\text{g}/\text{m}^3$ of PM2.5 between 2014 and 2016.
- The only recorded increase was recorded in Newcastle, with an increase of 1 $\mu\text{g}/\text{m}^3$ of PM2.5 between 2014 and 2016.

Table P 3.1.1.a Air pollution

Sub-State Region	2014 $\mu\text{g}/\text{m}^3$	2015 $\mu\text{g}/\text{m}^3$	2016 $\mu\text{g}/\text{m}^3$	2014 - 2016 change concentration
Sydney	8	8	8	0
Melbourne	8	n.a.	n.a.	n.a.
Brisbane	n.a.	6	7	n.a.
Perth	8	8	8	0
Adelaide	7	7	7	0
Newcastle	7	8	8	1
Canberra	7	n.a.	n.a.	n.a.
Darwin	8	9	6	-2
Wollongong	7	7	7	0
Wagga Wagga	7	8	7	0

Source: World Health Organization (WHO) 2018, Ambient (outdoor) air quality database, by country and city
<<https://www.who.int/airpollution/data/cities/en/>>

Figures are mean annual concentration of particulate matter of less than 2.5 microns of diameter (PM2.5) [$\mu\text{g}/\text{m}^3$].

n.a. Not available

P 3.2 Appreciating the environment

P 3.2.1 Domestic trips involving nature activities

Australia's national landscapes include places of great cultural, natural and spiritual significance and many include World Heritage-listed sites. These natural assets provide unique opportunities for enjoyment, reflection and inspiration.⁵⁶

The number of domestic trips involving nature activities indicates how often Australians are taking up opportunities to appreciate the environment. However, this indicator does have some limitations. For example, it only includes trips (both overnight and day trips), so nature activities enjoyed closer to home are excluded.

- Between 2008 and 2018, the rate at which Australians engaged in domestic nature trips increased slightly from 2.7 to 3.8 visits per person per year.

Domestic trips involving nature activities across sub-state regions

- There is very little variation between Australia's capital cities and the total rest of state areas for people taking trips involving nature activities. In 2018, the combined Australian capital cities recorded 3.9 trips per person per year and the combined rest of state areas recorded 3.8 trips per person per year.
- The majority of sub-state regions recorded an increase in the number of domestic nature trips taken per person between 2008 and 2018.
- The largest increase was in Brisbane Inner City, with an additional 5.2 trips per person in 2018 compared to 2008. The largest decline was recorded in both Moreton Bay - South and Sydney - South West, with a decline of 0.4 trips per person.

⁵⁶ Adapted from ABS 2013, *Measures of Australia's Progress* (cat. no. 1370.0), Canberra.

Table P 3.2.1.a Domestic visits involving nature activities by sub-state region

Sub-State Region	2008 visits per person	2013 visits per person	2018 visits per person	2008 - 2018 change visits per person
New South Wales	2.4	2.7	3.4	1.0
Greater Sydney	2.4	2.6	3.3	0.9
Central Coast	2.3	3.3	3.9	1.5
Sydney - Baulkham Hills and Hawkesbury	3.1	2.5	4.3	1.2
Sydney - Blacktown	2.0	2.8	2.2	0.2
Sydney - City and Inner South	2.2	1.5	4.1	1.9
Sydney - Eastern Suburbs	2.1	1.5	3.8	1.6
Sydney - Inner South West	1.4	1.7	2.1	0.7
Sydney - Inner West	2.5	2.5	3.0	0.5
Sydney - North Sydney and Hornsby	2.9	3.8	4.5	1.6
Sydney - Northern Beaches	2.9	2.9	4.0	1.1
Sydney - Outer South West	3.1	3.4	3.6	0.5
Sydney - Outer West and Blue Mountains	3.2	3.9	4.5	1.3
Sydney - Parramatta	2.0	2.5	2.9	0.9
Sydney - Ryde	2.8	3.4	3.8	1.1
Sydney - South West	1.9	1.7	1.5	-0.4
Sydney - Sutherland	2.6	3.0	3.2	0.7
Rest of New South Wales	2.4	2.9	3.6	1.2
Capital Region	2.1	2.9	4.5	2.3
Central West	1.8	2.7	2.8	1.0
Coffs Harbour - Grafton	*3.0	3.9	4.9	2.0
Far West and Orana	*1.6	*1.9	*3.0	1.4
Hunter Valley exc Newcastle	2.5	3.3	3.0	0.5
Illawarra	2.4	2.9	3.7	1.3
Mid North Coast	3.2	3.5	3.6	0.5
Murray	*1.2	*2.2	3.1	1.9
New England and North West	*1.5	2.2	2.7	1.2
Newcastle and Lake Macquarie	2.5	2.9	3.5	1.0
Richmond - Tweed	4.0	2.6	5.1	1.2
Riverina	*1.8	2.5	2.4	0.5
Southern Highlands and Shoalhaven	*2.5	*3.2	3.2	0.7
Victoria	2.8	2.6	3.9	1.1
Greater Melbourne	2.8	2.6	3.9	1.1
Melbourne - Inner	3.0	2.4	5.7	2.7
Melbourne - Inner East	3.6	3.0	4.9	1.3
Melbourne - Inner South	2.6	2.8	4.5	1.9
Melbourne - North East	2.7	2.8	3.7	1.0
Melbourne - North West	2.4	2.3	2.9	0.5
Melbourne - Outer East	3.5	3.7	4.0	0.6
Melbourne - South East	2.3	2.0	2.9	0.6
Melbourne - West	2.4	1.9	3.2	0.8
Mornington Peninsula	3.2	3.1	3.4	0.2
Rest of Victoria	2.8	2.8	4.1	1.3
Ballarat	3.2	3.1	4.1	0.9
Bendigo	3.2	4.2	4.1	0.9

(continued)

Domestic visits involving nature activities by sub-state region (continued)

Sub-State Region	2008 visits per person	2013 visits per person	2018 visits per person	2008 - 2018 change visits per person
Geelong	3.3	2.2	4.2	0.9
Hume	*2.4	2.2	4.8	2.3
Latrobe - Gippsland	3.1	3.8	4.4	1.3
North West	2.0	2.4	3.2	1.2
Shepparton	*2.4	*2.0	*3.0	0.6
Warrnambool and South West	*2.3	*2.3	4.9	2.5
Queensland	3.3	3.3	4.5	1.3
Greater Brisbane	3.7	3.5	5.4	1.7
Brisbane - East	3.1	4.2	5.1	1.9
Brisbane - North	4.1	3.9	4.7	0.7
Brisbane - South	3.6	3.8	5.1	1.4
Brisbane - West	4.6	3.8	7.4	2.8
Brisbane Inner City	4.5	3.0	9.7	5.2
Ipswich	3.4	3.3	3.5	0.1
Logan - Beaudesert	3.2	2.7	3.9	0.7
Moreton Bay - North	2.4	3.6	5.9	3.5
Moreton Bay - South	5.3	3.0	4.9	-0.4
Rest of Queensland	2.9	3.2	3.7	0.8
Cairns	4.9	4.0	4.6	-0.3
Darling Downs - Maranoa	*1.9	2.9	3.3	1.4
Central Queensland	2.9	3.7	3.5	0.6
Gold Coast	1.8	1.6	3.3	1.5
Mackay - Isaac - Whitsunday	3.3	4.0	3.8	0.5
Queensland - Outback	*1.8	*2.6	*2.6	0.8
Sunshine Coast	3.3	3.2	3.7	0.4
Toowoomba	3.2	4.3	3.2	0.0
Townsville	2.7	3.6	3.6	0.9
Wide Bay	3.1	4.2	4.1	1.0
South Australia	2.6	2.6	3.2	0.6
Greater Adelaide	2.6	2.6	3.0	0.4
Adelaide - Central and Hills	3.2	3.5	4.0	0.7
Adelaide - North	2.0	2.1	2.5	0.5
Adelaide - South	3.1	3.1	3.1	0.0
Adelaide - West	2.1	*1.6	2.8	0.7
Rest of South Australia	2.4	2.8	3.6	1.2
Barossa - Yorke - Mid North	*2.1	*2.3	*3.5	1.4
South Australia - Outback	*2.3	*2.9	*4.3	2.0
South Australia - South East	2.6	3.0	3.3	0.7
Western Australia	2.3	2.3	3.9	1.6
Greater Perth	2.2	2.2	3.7	1.5
Mandurah	*2.6	*2.9	*2.5	-0.2
Perth - Inner	2.6	*1.9	5.0	2.4
Perth - North East	*1.6	2.3	2.5	0.9
Perth - North West	2.2	2.1	3.4	1.2
Perth - South East	2.2	2.1	4.1	1.8

(continued)

Domestic visits involving nature activities by sub-state region (continued)

Sub-State Region	2008 visits per person	2013 visits per person	2018 visits per person	2008 - 2018 change visits per person
Perth - South West	2.4	2.1	4.1	1.7
Rest of Western Australia	2.6	2.6	4.6	2.0
Bunbury	3.5	3.6	5.0	1.5
Western Australia - Wheat Belt	*2.4	*2.7	4.9	2.6
Western Australia - Outback (North)	*1.8	*1.4	*4.1	2.3
Western Australia - Outback (South)	*2.5	*2.3	4.1	1.6
Tasmania	3.1	3.4	4.8	1.7
Greater Hobart	3.5	3.9	5.1	1.6
Rest of Tasmania	2.9	3.0	4.6	1.8
Launceston and North East	3.4	3.4	5.2	1.8
South East	n.p.	n.p.	*6.9	n.a.
West and North West	*2.5	*2.5	*3.2	0.7
Northern Territory	2.6	2.9	3.5	0.9
Greater Darwin	3.6	3.5	4.7	1.1
Rest of Northern Territory	*1.5	*2.0	*1.6	0.2
Northern Territory - Outback	*1.5	*2.0	*1.6	0.2
Australian Capital Territory	2.8	3.1	4.0	1.2
Australian Capital Cities	2.7	2.7	3.9	1.1
Australian Rest of States	2.6	2.9	3.8	1.1
AUSTRALIA	2.7	2.8	3.8	1.1

Source: BITRE 2019, estimates based on Tourism Research Australia 2018, Unit record file custom report, National Visitor Survey; and ABS 2019, Regional Population Growth, Australia, 2017-18 (cat. no. 3218.0)

Geography is based on the 2016 ASGS.

Domestic visits involving nature activities estimates are defined at the 2016 ASGS SA2 scale (based on day and overnight stays) which contains the respondent's home region. This geographical allocation is not relative to the destination of the visit. These visit counts have then been aggregated to produce estimates at broader ASGS geographic scales.

Change may vary from annual figures due to rounding.

* Estimate has a relative standard error between 25% and 50% and should be used with caution.

n.p. Not published.

n.a. Not available.

P 3.3 Protecting the environment

P 3.3.1 Protected areas of land

The amount of land that is classed as a protected area, for example national parks or reserves, provides a measure of the direct protection of the natural environment. This indicator shows changes in the area protected, without showing how well these protected areas are managed to achieve their conservation/protection objectives.

Protecting the natural environment through the creation of protected areas is an important part of efforts to protect native flora, fauna, and wilderness areas and support the management and restoration of natural habitat.⁵⁷

- As of 2016, 19.7 per cent of land in Australia was protected, reflecting an increase of 6.8 percentage points since 2008.

Protected areas of land across remoteness classes

- The proportion of land area that is protected is larger in the more remote areas of Australia. For example, 22.0 per cent of the land in very remote Australia is currently protected.
- The very remote areas of Australia also had the largest increase in the proportion of protected land area between 2008 and 2016, up by 9.1 percentage points.

Table P 3.3.1.a Protected areas of land by remoteness class

Remoteness Class	2008 per cent	2012 per cent	2016 per cent	2008 - 2016 change percentage points
Major Cities	5.2	5.5	5.6	0.5
Inner Regional	10.5	11.0	11.0	0.5
Outer Regional	13.3	13.9	13.2	0.0
Remote	13.1	13.1	13.4	0.2
Very Remote	13.0	16.5	22.0	9.1
AUSTRALIA	12.9	15.6	19.7	6.8

Source: Department of the Environment and Energy 2016, Collaborative Australian Protected Area Databases, 2008, 2012 and 2016
Protected areas outlined in the Collaborative Australian Protected Area Database have been allocated to the 2016 ASGS remoteness area geographical classification.

Overlapping areas have been filtered from the original data source.

Percentage point change may vary from annual figures due to rounding.

⁵⁷ Adapted from ABS 2013, *Measures of Australia's Progress* (cat. no. 1370.0), Canberra.

Protected areas of land across major urban areas

- Compared to other urban areas, Greater Sydney has a very high proportion of protected land, at 49.9 per cent as of 2016.
- The largest increase in the proportion of protected land area across the major urban areas was in Cairns which had an increase of 2.9 percentage points between 2008 and 2016. Other large increases occurred in Newcastle - Maitland (2.0 percentage points) and the Sunshine Coast (1.7 percentage points).

Table P 3.3.1.b Protected areas of land by major urban area

Major Urban Area	2008 per cent	2012 per cent	2016 per cent	2008 - 2016 change percentage points
Greater Sydney	48.9	49.7	49.9	1.0
Greater Melbourne	9.7	9.8	9.1	-0.6
Greater Brisbane	9.4	10.5	11.0	1.6
Greater Perth	8.5	8.6	9.3	0.8
Greater Adelaide	4.6	4.7	4.7	0.1
Gold Coast - Tweed Heads	6.0	6.4	6.5	0.5
Newcastle - Maitland	7.0	8.4	9.0	2.0
Canberra - Queanbeyan	9.9	10.0	10.3	0.3
Sunshine Coast	15.9	17.5	17.6	1.7
Wollongong	12.8	13.1	12.9	0.1
Geelong	4.9	5.8	5.8	0.9
Greater Hobart	11.1	12.2	12.6	1.5
Townsville	4.9	4.9	4.9	0.0
Cairns	12.4	15.0	15.3	2.9
Greater Darwin	11.0	11.0	11.3	0.3
Toowoomba	0.0	0.0	0.0	0.0
Ballarat	0.6	0.6	0.6	0.0
Bendigo	10.6	10.6	10.6	0.0
Albury - Wodonga	1.2	1.2	1.2	0.0
Launceston	2.7	2.9	3.1	0.4

Source: Department of the Environment and Energy 2016, Collaborative Australian Protected Area Databases, 2008, 2012 and 2016

Protected areas outlined in the Collaborative Australian Protected Area Database and have been allocated to 2016 ASGS geographical classifications.

The major urban areas of Sydney, Melbourne, Brisbane, Adelaide, Perth, Hobart and Darwin are based on the ASGS Greater Capital City Statistical Area (GCCSA) classification. All other major urban areas are based on the 2016 ASGS Significant Urban Area (SUA) classification.

Overlapping areas have been filtered from the original data source.

Percentage point change may vary from annual figures due to rounding.

Protected areas of land across sub-state regions

- In 2016, the sub-state region with the highest proportion of protected land area was Sydney - Outer West and Blue Mountains, at 75.0 per cent.
- Between 2006 and 2016, the majority of sub-state regions recorded an increase in protected land areas. The largest increase was in Brisbane - East, with an increase of 19.9 percentage points, while the largest decline was in Latrobe - Gippsland, with a decline of 11.4 percentage points.

Table P 3.3.1.c Protected areas of land by sub-state region

Sub-State Region	2008 <i>per cent</i>	2012 <i>per cent</i>	2016 <i>per cent</i>	2008 - 2016 <i>change percentage points</i>
New South Wales	8.7	9.3	9.7	1.0
Greater Sydney	48.9	49.7	49.9	1.0
Central Coast	27.5	30.8	31.8	4.3
Sydney - Baulkham Hills and Hawkesbury	62.0	62.9	62.9	0.9
Sydney - Blacktown	1.9	1.8	2.8	0.8
Sydney - City and Inner South	0.1	0.1	0.1	0.0
Sydney - Eastern Suburbs	2.5	2.8	3.7	1.3
Sydney - Inner South West	1.4	1.5	1.5	0.1
Sydney - Inner West	0.0	0.0	0.0	0.0
Sydney - North Sydney and Hornsby	38.3	38.3	38.3	0.0
Sydney - Northern Beaches	44.7	44.7	45.0	0.2
Sydney - Outer South West	15.6	15.7	15.7	0.1
Sydney - Outer West and Blue Mountains	74.4	75.0	75.0	0.6
Sydney - Parramatta	0.3	0.3	0.3	0.0
Sydney - Ryde	7.6	8.3	8.3	0.6
Sydney - South West	1.8	0.9	0.9	-0.9
Sydney - Sutherland	57.8	57.8	57.8	0.0
Rest of New South Wales	8.0	8.7	9.1	1.0
Capital Region	18.9	19.7	19.9	1.0
Central West	7.0	7.5	7.6	0.6
Coffs Harbour - Grafton	22.1	25.2	28.9	6.9
Far West and Orana	4.4	4.8	5.0	0.6
Hunter Valley exc Newcastle	20.4	21.3	21.9	1.6
Illawarra	23.1	23.9	23.9	0.7
Mid North Coast	21.9	23.9	25.7	3.8
Murray	4.4	4.7	5.7	1.3
New England and North West	8.2	8.7	9.4	1.2
Newcastle and Lake Macquarie	12.5	14.5	15.7	3.2
Richmond - Tweed	14.1	15.2	16.2	2.1
Riverina	9.2	10.4	10.4	1.2
Southern Highlands and Shoalhaven	40.7	41.7	41.7	1.1
Victoria	22.2	22.6	17.2	-4.9
Greater Melbourne	9.7	9.8	9.1	-0.6
Melbourne - Inner	0.0	0.0	0.0	0.0
Melbourne - Inner East	0.0	0.0	0.0	0.0
Melbourne - Inner South	0.0	0.0	0.0	0.0
Melbourne - North East	13.9	13.9	12.9	-1.0
Melbourne - North West	3.0	3.0	2.9	-0.1
Melbourne - Outer East	22.2	22.2	19.5	-2.7
Melbourne - South East	8.3	8.4	8.1	-0.1
Melbourne - West	3.2	3.3	3.1	-0.1
Mornington Peninsula	5.1	5.2	6.3	1.3

(continued)

Protected areas of land by sub-state region (continued)

Sub-State Region	2008 per cent	2012 per cent	2016 per cent	2008 - 2016 change percentage points
Rest of Victoria	22.7	23.2	17.6	-5.1
Ballarat	5.3	5.3	4.8	-0.5
Bendigo	5.5	5.6	5.5	0.0
Geelong	10.3	10.5	10.4	0.1
Hume	19.8	19.9	16.7	-3.1
Latrobe - Gippsland	35.4	35.6	24.0	-11.4
North West	29.7	30.4	22.9	-6.9
Shepparton	3.6	6.9	5.8	2.2
Warrnambool and South West	10.4	10.5	9.5	-0.9
Queensland	6.0	7.5	8.4	2.5
Greater Brisbane	9.4	10.5	11.0	1.6
Brisbane - East	3.8	24.2	23.6	19.9
Brisbane - North	0.0	0.0	0.0	0.0
Brisbane - South	0.1	1.0	1.2	1.1
Brisbane - West	15.0	14.8	15.2	0.2
Brisbane Inner City	0.0	0.0	0.0	0.0
Ipswich	8.4	8.6	9.0	0.6
Logan - Beaudesert	4.9	5.1	5.1	0.2
Moreton Bay - North	14.1	14.2	15.5	1.4
Moreton Bay - South	16.8	17.3	18.0	1.1
Rest of Queensland	5.9	7.5	8.4	2.5
Cairns	37.6	41.1	43.1	5.5
Darling Downs - Maranoa	1.6	1.7	1.7	0.1
Central Queensland	6.2	7.2	7.2	0.9
Gold Coast	18.3	18.9	19.5	1.2
Mackay - Isaac - Whitsunday	3.0	3.5	3.8	0.8
Queensland - Outback	6.0	8.0	9.3	3.3
Sunshine Coast	18.9	19.9	20.1	1.2
Toowoomba	8.2	8.2	8.2	0.0
Townsville	5.3	5.8	5.9	0.6
Wide Bay	9.3	9.4	9.5	0.2
South Australia	26.3	29.8	30.0	3.8
Greater Adelaide	4.6	4.7	4.7	0.1
Adelaide - Central and Hills	5.0	5.1	5.1	0.1
Adelaide - North	2.6	2.7	2.7	0.1
Adelaide - South	6.8	6.7	6.8	-0.1
Adelaide - West	3.6	3.6	3.7	0.1
Rest of South Australia	26.4	29.9	30.1	3.8
Barossa - Yorke - Mid North	1.8	1.9	2.0	0.2
South Australia - Outback	28.4	32.3	32.6	4.2
South Australia - South East	13.2	13.5	13.7	0.5
Western Australia	14.4	14.5	23.2	8.8
Greater Perth	8.5	8.6	9.3	0.8
Mandurah	8.1	8.2	8.4	0.3

(continued)

Protected areas of land by sub-state region (continued)

<i>Sub-State Region</i>	<i>2008 per cent</i>	<i>2012 per cent</i>	<i>2016 per cent</i>	<i>2008 - 2016 change percentage points</i>
Perth - Inner	0.2	0.3	0.3	0.0
Perth - North East	9.6	10.0	11.5	1.9
Perth - North West	6.9	6.8	6.8	0.0
Perth - South East	10.0	10.1	10.8	0.8
Perth - South West	4.3	4.3	4.3	0.0
Rest of Western Australia	14.4	14.5	23.3	8.9
Bunbury	25.7	26.1	26.1	0.5
Western Australia - Wheat Belt	11.1	10.3	10.7	-0.4
Western Australia - Outback (North)	9.1	9.4	25.5	16.4
Western Australia - Outback (South)	18.3	18.3	23.5	5.3
Tasmania	38.6	40.2	41.8	3.2
Greater Hobart	11.1	12.2	12.6	1.5
Rest of Tasmania	39.3	40.9	42.5	3.2
Launceston and North East	20.2	22.3	22.1	1.9
South East	42.3	43.4	48.0	5.7
West and North West	53.1	54.7	54.8	1.7
Northern Territory	9.0	18.9	25.2	16.2
Greater Darwin	11.0	11.0	11.3	0.3
Rest of Northern Territory	9.0	18.9	25.2	16.2
Northern Territory - Outback	9.0	18.9	25.2	16.2
Australian Capital Territory	54.9	55.0	55.5	0.6
Australian Capital Cities	20.0	20.6	20.8	0.7
Australian Rest of States	12.9	15.6	19.7	6.8

Source: Department of the Environment and Energy 2016, Collaborative Australian Protected Area Databases, 2008, 2012 and 2016

Protected areas outlined in the Collaborative Australian Protected Area Database and have been allocated to 2016 ASGS geographical classifications.

Overlapping areas have been filtered from the original data source.

Percentage point change may vary from annual figures due to rounding.

P 3.4 Sustaining the environment

P 3.4.1 Greenhouse gas emissions

Reductions in greenhouse emissions are likely to reflect increased efforts to combat the human impact that Australia is contributing towards climate change. Greenhouse gas emissions can be produced directly, through for example the use of fuel and energy, manufacturing and mining activity. It can also be produced indirectly from the generation of the electricity purchased and consumed. In 2016, the major emission sources were electricity, gas and water and primary industries (agriculture, forestry, fishing and mining).⁵⁸

Changes in greenhouse gas emissions can be linked to changes in energy efficiency or vehicle use. This indicator takes into account population data, transport data and industry data in order to estimate greenhouse gas emissions on a per capita basis.

Due to limits in the availability of data at the small geographic scale, the information on greenhouse gas emissions has been derived using modelling and estimation techniques. The resulting values are only approximate and should be used with caution. Data for this indicator is currently only available for 2016.

Greenhouse gas emissions per capita across major urban areas

- Change over time is not presented for this indicator as estimates are currently only available for 2016.
- In 2016, the major urban area with the highest level of greenhouse gas emissions estimate per capita was Greater Perth, while the major urban area with the lowest estimate was Bendigo.

⁵⁸ Department of the Environment and Energy, *National Inventory by Economic Sector 2016*, Commonwealth of Australia 2018.

Table P 3.4.1.a Greenhouse gas emissions per capita by major urban area

Major Urban Area	2016 gigagrams CO₂ equivalent
Greater Sydney	13.7
Greater Melbourne	13.8
Greater Brisbane	18.5
Greater Perth	20.9
Greater Adelaide	12.3
Gold Coast - Tweed	14.1
Newcastle	14.2
Canberra - Queanbeyan	n.a
Sunshine Coast	13.1
Wollongong	11.7
Geelong	12.2
Greater Hobart	11.6
Townsville	17.8
Cairns	13.4
Greater Darwin	n.a
Toowoomba	12.6
Ballarat	13.2
Bendigo	9.7
Albury - Wodonga	12.7
Launceston	10.3
Mackay	17.2

Source: BITRE 2019, analysis of Department of the Environment and Energy (DEE) National Greenhouse Gas Inventory (NGGI) 2016, CSIRO city scope 2 emissions estimates 2016 (based on zone substation load data), ABS Regional Population Growth, 2016 (cat. no. 3218.0), ABS Agricultural Commodities, 2015-16 (cat. no. 7121.0), ABS Census of Population and Housing 2016

The sub-state areas of Sydney, Melbourne, Brisbane, Adelaide, Perth, Hobart and Darwin are based on the 2016 Greater Capital Cities Statistical Area. All the other regions are based on the 2016 Significant Urban Area (SUA) classification.

This indicator is the estimated per-capita amount of greenhouse gases emitted in a year. It is calculated as direct (scope 1) greenhouse emissions, excluding emissions from electricity generation, as well as indirect (scope 2) greenhouse gas emissions from the generation of electricity. The greenhouse gas emission per capita indicator is calculated as the sum of various direct and indirect emissions for each city divided by the city's population.

n.a. Not available.

P 3.5 Healthy built environments

P 3.5.1 Average commuting time

Changes in average commuting times for a city or region can indicate how well a transport network is enabling residents to travel to their jobs. Changes in this commuting time indicator, together with changes in the subjective indicator of road network quality, provide a guide as to whether the transport network is enabling people to more efficiently move around their city or region.

Travel times illustrate the impact of transport infrastructure on individuals. More time spent commuting can impact negatively on the health and wellbeing of people who live in cities, as longer commutes are associated with higher stress levels, less time spent with family and reduced life satisfaction.⁵⁹

Average commuting time across remoteness classes

- Major cities continue to have higher average commuting times in 2017 than inner or outer regional areas, with an average commute time of 33.5 minutes.
- Outer regional areas recorded the largest increase in average commuting times between 2007 and 2017 (by 2.8 minutes from 18.7 minutes to 21.5 minutes), followed closely by major cities with a similar increase in average commuting times between 2007 and 2017 (by 2.7 minutes from 30.7 minutes to 33.5 minutes).

Table P 3.5.1.a Average commuting time by remoteness class

Remoteness Class	2007 minutes	2012 minutes	2017 minutes	2007 - 2017 change minutes
Major Cities	30.7	31.2	33.5	2.7
Inner Regional	23.6	23.0	25.3	1.7
Outer Regional	18.7	20.6	21.5	2.8
Remote	n.p.	n.p.	18.7	n.p.
Very Remote	n.p.	n.p.	n.p.	n.p.

Source: BITRE 2019, Analysis of Melbourne Institute 2018, Unit record data, Household, Income and Labour Dynamics in Australia (HILDA) Survey, Melbourne Remoteness Area classification is based on the 2011 ASGS. Yearbook 2018 incorrectly reported Remoteness Area classification as 2016 ASGS.

The HILDA survey sample stratification of its reference population excludes people living in remote and sparsely populated areas. Data is not available for remote and very remote areas. <http://melbourneinstitute.unimelb.edu.au/__data/assets/pdf_file/0007/2194342/HILDA_User_Manual_Release_15.0.pdf>

Average commuting trip duration is calculated for each employed individual by dividing the time spent commuting to and from work in a typical week by the estimated number of commuting trips in a typical week (which is estimated based on reported work schedules and days of work).

This is an average one-way commuting time for all employed persons who reported a non-zero commuting time. Commuting trip durations of more than 240 minutes were top-coded to 240 minutes. Data has been weighted so as to be representative of total in-scope population.

The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute).

Figures in this table may not be comparable to those published in Yearbook 2018 due to change in methodology.

n.p. Not published.

⁵⁹ Victoria Health Promotion Foundation 2012, *Commute time, Indicator Overview*, VicHealth Indicators Survey.

Average commuting time across capital cities and balance of state

- Across most of Australia average commuting times in 2017 were higher in capital cities compared with the rest of state areas.
- Between 2007 and 2017, average commuting times in the combined capital cities and combined Australian rest of states recorded similar increases (2.6 minutes and 2.7 minutes respectively).
- The largest difference between a capital city and the rest of state was in Western Australia, where average commuting times in Greater Perth were 12.3 minutes longer than in rest of Western Australia in 2017.
- The only improvement in average commuting times between 2007 and 2017 among all capital cities and rest of state areas was seen in rest of Western Australia (down 1.1 minutes).
- The largest increase in average commute times was in rest of South Australia (up by 5.9 minutes). The lowest increase was recorded in the rest of Victoria, with an increase of 0.3 minutes.

Table P 3.5.1.b Average commuting time by capital city/balance of state

Capital City / Balance of State	2007 minutes	2012 minutes	2017 minutes	2007 - 2017 change minutes
Greater Sydney	36.2	34.6	37.7	1.5
Rest of New South Wales	23.7	23.6	26.7	3.0
Greater Melbourne	31.7	33.2	33.7	2.1
Rest of Victoria	23.5	22.3	23.8	0.3
Greater Brisbane	31.5	29.7	35.3	3.8
Rest of Queensland	21.3	23.3	24.5	3.2
Greater Adelaide	27.3	26.0	28.2	0.9
Rest of South Australia	17.2	17.4	23.1	5.9
Greater Perth	25.5	29.1	31.3	5.7
Rest of Western Australia	20.2	23.1	19.0	-1.1
Tasmania*	19.7	21.7	22.9	3.2
Northern Territory*	n.p.	n.p.	20.5	n.p.
Australian Capital Territory	22.3	28.2	26.9	4.7
Australian Capital Cities	31.2	31.5	33.9	2.6
Australian Rest of States	21.9	22.7	24.5	2.7

Source: BITRE 2019, Analysis of Melbourne Institute 2018, Unit record data, Household, Income and Labour Dynamics in Australia (HILDA) Survey, Melbourne

Geography is based on the 2016 ASGS.

Average commuting trip duration is calculated for each employed individual by dividing the time spent commuting to and from work in a typical week by the estimated number of commuting trips in a typical week (which is estimated based on reported work schedules and days of work).

This is an average one-way commuting time for all employed persons who reported a non-zero commuting time. Commuting trip durations of more than 240 minutes were top-coded to 240 minutes. Data in table is weighted so as to be representative of total in-scope population.

* Data available only at the state or territory level.

Hobart and Darwin are included in the Australian capital city total, and are based on postcode aggregation to ASGS GCCSAs.

The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute).

Percentage point change may vary from annual figures due to rounding.

Figures in this table may not be comparable to those published in Yearbook 2018 due to change in methodology.

n.p. Not published.

P 3.5.2 Active travel

Increasing rates of active travel have health benefits for individuals and positive impacts for the environment and communities. People using active travel for short trips increase their levels of physical activity, while also helping reduce road congestion and transport-related greenhouse gas emissions. For this indicator, active travel has been defined as exclusively walking or cycling as a journey to work mode.

The planning and design of built environments affects the rates of walking and cycling for transport. Specific features of neighbourhoods, towns and cities, such as road networks, footpaths, cycle ways, quality open space, density and land use mix that offers good accessibility to a range of goods and services, are associated with an increased rate of walking and cycling for transport.⁶⁰

- Australians are walking to work slightly less in 2016 compared to 2006, with a 0.7 percentage point decline in the proportion of people walking to work (3.9 per cent), while the proportion of people cycling remained unchanged over this period at 1.1 per cent.

Active travel across remoteness classes

- Between 2006 and 2016 active travel by bicycle and walking declined for all remote classes with the exception of major cities, where the proportion of cycling as a journey to work mode increased marginally by 0.1 percentage points.
- The largest declines in walking to work occurred in very remote Australia, which was down by 9.2 percentage points over the decade. While this decline was large, very remote regions have the highest walking rates in Australia (20.7 per cent in 2016).

Table P 3.5.2.a Active travel by bicycle or walking by remoteness class

Remoteness Class	2006 per cent	2011 per cent	2016 per cent	2006 - 2016 change percentage points
Bicycle Only				
Major Cities	1.1	1.2	1.2	0.1
Inner Regional	1.1	0.9	0.7	-0.4
Outer Regional	1.4	1.2	1.0	-0.4
Remote	1.9	1.6	1.7	-0.2
Very Remote	1.8	1.6	1.5	-0.3
AUSTRALIA	1.1	1.2	1.1	0.0
Walked Only				
Major Cities	3.7	3.6	3.5	-0.2
Inner Regional	5.2	4.5	3.9	-1.3
Outer Regional	6.9	6.0	5.2	-1.7
Remote	11.5	10.1	9.0	-2.5
Very Remote	29.9	24.8	20.7	-9.2
AUSTRALIA	4.6	4.2	3.9	-0.7

Source: ABS 2018, Customised report, Census of Population and Housing, Australia

Geography is based on the 2016 ASGS.

Data based on place of usual residence.

Calculation excludes Not Stated category from the denominator.

⁶⁰ Giles-Corti B., Ryan K., and Foster S. 2012, *Increasing density in Australia: maximising the health benefits and minimising harm*, Report to the National Heart Foundation of Australia, Melbourne.

Active travel across major urban areas

- The Canberra - Queanbeyan region had the highest rate of cycling in 2016 at 2.7 per cent, while Wollongong had the lowest at 0.6 per cent.
- The proportion of people cycling to work increased across five of eight capital city regions between 2006 and 2016, with the largest increase recorded in the Canberra - Queanbeyan urban area. In contrast, almost universal declines for cycling in non-capital major urban areas occurred between 2006 and 2016, with the largest fall occurring in Townsville (1.3 percentage points).
- In 2016, Greater Hobart had the highest rate of travel to work by walking (6.3 per cent). Greater Perth was the least active urban population in terms of walking (2.3 per cent).
- The only increase in the rate of travel to work by walking between 2006 and 2016 occurred in the Canberra - Queanbeyan region (an increase of 0.3 percentage points over the decade). The most pronounced decreases in the rate of walking occurred in Bendigo (1.3 percentage points) and Townsville (1.2 percentage points).

Table P 3.5.2.b Active travel by bicycle or walking by major urban area

Major Urban Area	2006 per cent	2011 per cent	2016 per cent	2006 - 2016 change percentage points
Bicycle Only				
Greater Sydney	0.6	0.8	0.8	0.2
Greater Melbourne	1.3	1.5	1.6	0.3
Greater Brisbane	1.0	1.2	1.2	0.2
Greater Perth	1.1	1.2	1.1	0.0
Greater Adelaide	1.4	1.3	1.3	-0.1
Gold Coast - Tweed Heads	1.1	1.0	0.9	-0.2
Newcastle - Maitland	1.1	1.0	1.0	-0.1
Canberra - Queanbeyan	2.3	2.5	2.7	0.4
Sunshine Coast	1.2	1.0	0.9	-0.3
Wollongong	0.9	0.7	0.6	-0.3
Geelong	1.2	1.1	0.9	-0.3
Greater Hobart	1.1	1.1	1.3	0.2
Townsville	3.0	2.3	1.7	-1.3
Cairns	3.0	2.5	2.2	-0.8
Greater Darwin	3.1	3.0	2.3	-0.8
Toowoomba	1.3	1.0	0.9	-0.4
Ballarat	1.5	1.1	0.8	-0.7
Bendigo	1.7	1.2	1.0	-0.7
Albury - Wodonga	1.7	1.3	1.0	-0.7
Launceston	0.8	0.7	0.8	0.0
Walked Only				
Greater Sydney	4.7	4.6	4.4	-0.3
Greater Melbourne	3.4	3.3	3.3	-0.1
Greater Brisbane	3.5	3.5	3.2	-0.3
Greater Perth	2.5	2.6	2.3	-0.2
Greater Adelaide	3.1	2.8	2.5	-0.6
Gold Coast - Tweed Heads	3.3	3.2	2.9	-0.4
Newcastle - Maitland	3.4	2.9	2.7	-0.7
Canberra - Queanbeyan	4.5	4.5	4.8	0.3
Sunshine Coast	3.8	3.6	2.8	-1.0
Wollongong	3.4	3.2	2.9	-0.5
Geelong	3.8	3.4	2.9	-0.9
Greater Hobart	7.3	6.3	6.3	-1.0
Townsville	4.2	3.2	3.0	-1.2
Cairns	4.0	4.1	3.6	-0.4
Greater Darwin	5.4	5.5	4.3	-1.1
Toowoomba	4.4	4.0	3.4	-1.0
Ballarat	4.4	3.9	3.4	-1.0
Bendigo	4.9	4.0	3.6	-1.3
Albury - Wodonga	5.0	4.4	4.0	-1.0
Launceston	6.2	5.5	5.3	-0.9

Source: ABS 2017, Customised report, Census of Population and Housing, Australia

The major urban areas of Sydney, Melbourne, Brisbane, Adelaide, Perth, Hobart and Darwin are based on the 2016 ASGS Greater Capital City Statistical Area (GCCSA) classification. All other major urban areas are based on the 2016 ASGS Significant Urban Area (SUA) classification.

Data based on place of usual residence.

Calculation excludes Not Stated category from the denominator.

Active travel across sub-state regions

- Across the sub-state regions, the majority of the increases in the cycling rate occurred in a small number of urban areas, particularly in Sydney, Melbourne and Brisbane. Over the 10 years from 2006 and 2016, the largest increase in cycling occurred in Melbourne - Inner (1.7 percentage points), which also recorded the highest proportion of people cycling to work in 2016 (6.2 per cent).
- Regional areas recorded the largest declines in cycling, with the largest drop among Statistical Area Level 4 regions occurring in Shepparton and Townsville (1.0 percentage points). However, several sub-state areas in Greater Sydney recorded the lowest rates of cycling in 2016, with just 0.2 percent of the population cycling to work (Sydney - Baulkham Hills and Hawkesbury; Sydney - Blacktown; Sydney - Outer South West; and Sydney - South West).
- Across the sub-state regions the proportion of people walking to work predominantly declined between 2006 and 2016. The biggest declines among the Statistical Area Level 4 regions were in Western Australia - Outback (North) (down 6.9 percentage points), Queensland - Outback (down 6.1 percentage points), and Northern Territory - Outback (6.1 percentage points).
- Across the sub-state regions, just five regions recorded slight increases in rates of people walking between 2006 and 2016, with increases in Perth - Inner (0.8 percentage points), Melbourne - Inner (0.7 percentage points), Brisbane Inner City (0.5 percentage points), Melbourne - Inner East (0.2 percentage points), and Australian Capital Territory (0.2 percentage points).

Table P 3.5.2.c Active travel by bicycle or walking by sub-state region

Sub-State Region	2006 per cent	2011 per cent	2016 per cent	2006 - 2016 change percentage points
<i>Bicycle Only</i>				
New South Wales	0.8	0.8	0.8	0.0
Greater Sydney	0.6	0.8	0.8	0.2
Central Coast	0.5	0.3	0.3	-0.2
Sydney - Baulkham Hills and Hawkesbury	0.2	0.2	0.2	0.0
Sydney - Blacktown	0.4	0.3	0.2	-0.2
Sydney - City and Inner South	2.0	3.2	3.1	1.1
Sydney - Eastern Suburbs	1.3	2.1	2.2	0.9
Sydney - Inner South West	0.4	0.3	0.3	-0.1
Sydney - Inner West	1.0	1.5	1.4	0.4
Sydney - North Sydney and Hornsby	0.6	1.0	0.8	0.2
Sydney - Northern Beaches	0.8	1.1	1.1	0.3
Sydney - Outer South West	0.3	0.2	0.2	-0.1
Sydney - Outer West and Blue Mountains	0.6	0.4	0.3	-0.3
Sydney - Parramatta	0.5	0.4	0.4	-0.1
Sydney - Ryde	0.5	0.7	0.6	0.1
Sydney - South West	0.4	0.3	0.2	-0.2
Sydney - Sutherland	0.5	0.5	0.4	-0.1
Rest of New South Wales	1.0	0.8	0.7	-0.3
Capital Region	0.6	0.5	0.5	-0.1
Central West	0.8	0.5	0.4	-0.4
Coffs Harbour - Grafton	1.6	1.4	1.0	-0.6
Far West and Orana	0.9	0.7	0.5	-0.4
Hunter Valley exc Newcastle	0.5	0.4	0.3	-0.2
Illawarra	0.9	0.7	0.6	-0.3
Mid North Coast	1.0	0.7	0.6	-0.4
Murray	1.5	1.1	0.8	-0.7
New England and North West	0.8	0.6	0.5	-0.3
Newcastle and Lake Macquarie	1.2	1.2	1.2	0.0
Richmond - Tweed	1.4	1.4	1.2	-0.2
Riverina	0.9	0.8	0.5	-0.4
Southern Highlands and Shoalhaven	0.8	0.7	0.6	-0.2
Victoria	1.3	1.4	1.4	0.1
Greater Melbourne	1.3	1.5	1.6	0.3
Melbourne - Inner	4.5	5.9	6.2	1.7
Melbourne - Inner East	1.1	1.4	1.3	0.2
Melbourne - Inner South	1.3	1.5	1.5	0.2
Melbourne - North East	0.8	0.9	0.9	0.1
Melbourne - North West	0.5	0.5	0.5	0.0
Melbourne - Outer East	0.5	0.4	0.3	-0.2
Melbourne - South East	0.5	0.4	0.3	-0.2
Melbourne - West	0.7	0.8	0.8	0.1
Mornington Peninsula	0.5	0.4	0.4	-0.1
Rest of Victoria	1.3	1.0	0.8	-0.5
Ballarat	1.1	0.9	0.6	-0.5

(continued)

Active travel by bicycle or walking by sub-state region (continued)

<i>Sub-State Region</i>	<i>2006 per cent</i>	<i>2011 per cent</i>	<i>2016 per cent</i>	<i>2006 - 2016 change percentage points</i>
<i>Bicycle Only</i>				
Bendigo	1.3	1.0	0.9	-0.4
Geelong	1.1	1.0	0.9	-0.2
Hume	1.6	1.1	0.9	-0.7
Latrobe - Gippsland	0.9	0.8	0.6	-0.3
North West	1.4	1.0	0.7	-0.7
Shepparton	1.9	1.2	0.9	-1.0
Warrnambool and South West	1.4	1.0	0.8	-0.6
Queensland	1.3	1.2	1.1	-0.2
Greater Brisbane	1.0	1.2	1.2	0.2
Brisbane - East	0.6	0.6	0.6	0.0
Brisbane - North	1.1	1.1	1.0	-0.1
Brisbane - South	1.1	1.5	1.6	0.5
Brisbane - West	1.5	2.1	2.5	1.0
Brisbane Inner City	2.4	3.1	3.5	1.1
Ipswich	0.5	0.4	0.4	-0.1
Logan - Beaudesert	0.5	0.4	0.3	-0.2
Moreton Bay - North	0.8	0.6	0.5	-0.3
Moreton Bay - South	0.5	0.5	0.4	-0.1
Rest of Queensland	1.5	1.2	1.0	-0.5
Cairns	2.5	2.2	1.8	-0.7
Darling Downs - Maranoa	1.2	0.9	0.7	-0.5
Central Queensland	1.5	1.0	0.7	-0.8
Gold Coast	1.1	1.0	0.9	-0.2
Mackay - Isaac - Whitsunday	1.5	1.1	0.9	-0.6
Queensland - Outback	1.9	1.7	1.4	-0.5
<i>Far North</i>	2.1	1.8	1.3	-0.8
<i>Outback - North</i>	1.9	1.6	1.3	-0.6
<i>Outback - South</i>	1.8	1.7	1.7	-0.1
Sunshine Coast	1.1	0.9	0.9	-0.2
Toowoomba	1.2	0.9	0.8	-0.4
Townsville	2.5	2.0	1.5	-1.0
Wide Bay	1.6	1.1	0.8	-0.8
South Australia	1.3	1.2	1.1	-0.2
Greater Adelaide	1.4	1.3	1.3	-0.1
Adelaide - Central and Hills	2.1	2.1	2.4	0.3
Adelaide - North	0.7	0.6	0.5	-0.2
Adelaide - South	1.2	1.1	1.0	-0.2
Adelaide - West	2.2	1.8	1.7	-0.5
Rest of South Australia	1.0	0.7	0.6	-0.4
Barossa - Yorke - Mid North	1.0	0.7	0.5	-0.5
South Australia - Outback	1.2	1.0	0.8	-0.4
<i>Eyre Peninsula and South West</i>	1.5	1.2	0.8	-0.7
<i>Outback - North and East</i>	0.8	0.7	0.7	-0.1
South Australia - South East	1.0	0.6	0.5	-0.5

(continued)

Active travel by bicycle or walking by sub-state region (continued)

<i>Sub-State Region</i>	<i>2006 per cent</i>	<i>2011 per cent</i>	<i>2016 per cent</i>	<i>2006 - 2016 change percentage points</i>
<i>Bicycle Only</i>				
Western Australia	1.1	1.2	1.1	0.0
Greater Perth	1.1	1.2	1.1	0.0
Mandurah	0.7	0.6	0.4	-0.3
Perth - Inner	2.8	3.4	3.6	0.8
Perth - North East	0.9	1.0	1.0	0.1
Perth - North West	0.7	0.8	0.7	0.0
Perth - South East	1.1	1.2	1.0	-0.1
Perth - South West	1.0	1.1	1.1	0.1
Rest of Western Australia	1.3	1.2	1.1	-0.2
Bunbury	1.0	0.9	1.0	0.0
Western Australia - Wheat Belt	0.9	0.7	0.7	-0.2
Western Australia - Outback (North)	2.5	1.8	1.7	-0.8
<i>Kimberley</i>	3.3	3.4	3.2	-0.1
<i>East Pilbara</i>	2.3	1.2	1.1	-1.2
<i>West Pilbara</i>	1.6	1.0	1.0	-0.6
Western Australia - Outback (South)	1.5	1.3	1.2	-0.3
<i>Esperance</i>	1.3	1.1	0.9	-0.4
<i>Gascoyne</i>	3.7	3.2	3.9	0.2
<i>Goldfields</i>	1.3	1.1	0.8	-0.5
<i>Mid West</i>	1.3	1.3	1.2	-0.1
Tasmania	0.8	0.7	0.9	0.1
Greater Hobart	1.1	1.1	1.3	0.2
Rest of Tasmania	0.7	0.5	0.5	-0.2
Launceston and North East	0.7	0.6	0.7	0.0
South East	0.4	0.3	0.3	-0.1
West and North West	0.6	0.4	0.4	-0.2
Northern Territory	3.4	3.1	2.7	-0.7
Greater Darwin	3.1	3.0	2.3	-0.8
Rest of Northern Territory	3.8	3.4	3.7	-0.1
Northern Territory - Outback	3.8	3.4	3.7	-0.1
<i>Alice Springs</i>	4.8	4.4	4.8	0.0
<i>Barkly</i>	2.6	2.9	3.3	0.7
<i>Daly - Tiwi - West Arnhem</i>	2.6	1.8	2.4	-0.2
<i>East Arnhem</i>	2.0	2.5	2.6	0.6
<i>Katherine</i>	3.8	2.9	2.7	-1.1
Australian Capital Territory	2.4	2.7	2.9	0.5
Australian Capital Cities	1.1	1.2	1.2	0.2
Australian Rest of States	1.3	1.0	0.9	-0.4

(continued)

Active travel by bicycle or walking by sub-state region (continued)

<i>Sub-State Region</i>	<i>2006 per cent</i>	<i>2011 per cent</i>	<i>2016 per cent</i>	<i>2006 - 2016 change percentage points</i>
<i>Walked Only</i>				
New South Wales	5.0	4.6	4.3	-0.7
Greater Sydney	4.7	4.6	4.4	-0.3
Central Coast	2.5	2.2	1.9	-0.6
Sydney - Baulkham Hills and Hawkesbury	1.8	1.6	1.4	-0.4
Sydney - Blacktown	1.9	1.5	1.2	-0.7
Sydney - City and Inner South	19.5	20.4	19.3	-0.2
Sydney - Eastern Suburbs	7.7	7.4	7.6	-0.1
Sydney - Inner South West	3.3	2.8	2.7	-0.6
Sydney - Inner West	4.6	4.1	4.2	-0.4
Sydney - North Sydney and Hornsby	6.8	6.4	6.1	-0.7
Sydney - Northern Beaches	4.1	3.8	3.7	-0.4
Sydney - Outer South West	1.9	1.5	1.3	-0.6
Sydney - Outer West and Blue Mountains	2.8	2.3	2.0	-0.8
Sydney - Parramatta	3.9	3.3	3.1	-0.8
Sydney - Ryde	3.7	3.7	3.7	0.0
Sydney - South West	2.5	2.2	2.0	-0.5
Sydney - Sutherland	2.7	2.4	2.4	-0.3
Rest of New South Wales	5.5	4.7	4.0	-1.5
Capital Region	6.1	5.1	4.5	-1.6
Central West	6.9	5.7	4.9	-2.0
Coffs Harbour - Grafton	5.6	5.1	4.1	-1.5
Far West and Orana	9.2	7.7	6.4	-2.8
Hunter Valley exc Newcastle	4.1	3.4	2.8	-1.3
Illawarra	3.4	3.2	2.9	-0.5
Mid North Coast	5.5	4.9	4.1	-1.4
Murray	7.0	5.6	5.1	-1.9
New England and North West	7.4	6.1	5.2	-2.2
Newcastle and Lake Macquarie	3.6	3.0	2.9	-0.7
Richmond - Tweed	4.9	4.5	3.8	-1.1
Riverina	7.4	6.3	5.2	-2.2
Southern Highlands and Shoalhaven	4.7	4.3	3.6	-1.1
Victoria	4.1	3.7	3.6	-0.5
Greater Melbourne	3.4	3.3	3.3	-0.1
Melbourne - Inner	11.2	11.3	11.9	0.7
Melbourne - Inner East	3.0	3.1	3.2	0.2
Melbourne - Inner South	2.8	2.6	2.5	-0.3
Melbourne - North East	2.0	1.9	1.6	-0.4
Melbourne - North West	1.6	1.4	1.2	-0.4
Melbourne - Outer East	1.9	1.6	1.4	-0.5
Melbourne - South East	1.9	1.6	1.4	-0.5
Melbourne - West	1.7	1.5	1.4	-0.3
Mornington Peninsula	2.7	2.5	2.2	-0.5
Rest of Victoria	6.0	5.2	4.5	-1.5
Ballarat	4.5	4.0	3.6	-0.9

(continued)

Active travel by bicycle or walking by sub-state region (continued)

Sub-State Region	2006 per cent	2011 per cent	2016 per cent	2006 - 2016 change percentage points
<i>Walked Only</i>				
Bendigo	5.3	4.5	4.0	-1.3
Geelong	3.8	3.4	3.0	-0.8
Hume	7.2	6.5	5.8	-1.4
Latrobe - Gippsland	5.6	4.8	4.1	-1.5
North West	8.4	7.3	6.3	-2.1
Shepparton	7.0	5.5	4.9	-2.1
Warrnambool and South West	7.6	6.9	6.2	-1.4
Queensland	4.6	4.2	3.7	-0.9
Greater Brisbane	3.5	3.5	3.2	-0.3
Brisbane - East	2.3	1.9	1.7	-0.6
Brisbane - North	2.6	2.6	2.3	-0.3
Brisbane - South	2.6	2.7	2.5	-0.1
Brisbane - West	3.6	3.8	3.5	-0.1
Brisbane Inner City	10.5	11.2	11.0	0.5
Ipswich	2.6	2.2	1.7	-0.9
Logan - Beaudesert	1.8	1.7	1.3	-0.5
Moreton Bay - North	2.8	2.7	2.2	-0.6
Moreton Bay - South	1.7	1.5	1.4	-0.3
Rest of Queensland	5.6	4.8	4.1	-1.5
Cairns	5.9	5.1	4.5	-1.4
Darling Downs - Maranoa	8.2	7.4	6.4	-1.8
Central Queensland	5.6	4.7	4.0	-1.6
Gold Coast	3.3	3.2	2.9	-0.4
Mackay - Isaac - Whitsunday	6.1	5.4	5.1	-1.0
Queensland - Outback	22.1	18.8	16.0	-6.1
<i>Far North</i>	36.9	30.1	23.0	-13.9
<i>Outback - North</i>	13.8	12.7	11.6	-2.2
<i>Outback - South</i>	16.3	15.5	14.2	-2.1
Sunshine Coast	3.9	3.7	2.9	-1.0
Toowoomba	4.3	3.9	3.3	-1.0
Townsville	4.9	4.0	3.7	-1.2
Wide Bay	5.4	4.6	4.0	-1.4
South Australia	4.2	3.7	3.1	-1.1
Greater Adelaide	3.1	2.8	2.5	-0.6
Adelaide - Central and Hills	5.6	5.5	5.0	-0.6
Adelaide - North	1.8	1.6	1.4	-0.4
Adelaide - South	2.4	2.1	1.8	-0.6
Adelaide - West	3.0	2.6	2.2	-0.8
Rest of South Australia	7.8	6.6	5.6	-2.2
Barossa - Yorke - Mid North	7.9	6.6	5.6	-2.3
South Australia - Outback	10.4	8.6	7.6	-2.8
<i>Eyre Peninsula and South West</i>	8.1	6.4	5.8	-2.3
<i>Outback - North and East</i>	15.0	12.8	11.5	-3.5
South Australia - South East	6.6	5.6	4.7	-1.9

(continued)

Active travel by bicycle or walking by sub-state region (continued)

<i>Sub-State Region</i>	<i>2006 per cent</i>	<i>2011 per cent</i>	<i>2016 per cent</i>	<i>2006 - 2016 change percentage points</i>
<i>Walked Only</i>				
Western Australia	3.9	3.7	3.1	-0.8
Greater Perth	2.5	2.6	2.3	-0.2
Mandurah	2.6	2.6	2.1	-0.5
Perth - Inner	7.8	8.8	8.6	0.8
Perth - North East	2.1	2.0	1.7	-0.4
Perth - North West	1.6	1.6	1.4	-0.2
Perth - South East	2.1	2.0	1.7	-0.4
Perth - South West	2.4	2.3	1.9	-0.5
Rest of Western Australia	8.7	7.6	6.1	-2.6
Bunbury	4.1	3.9	3.4	-0.7
Western Australia - Wheat Belt	8.9	7.8	7.0	-1.9
Western Australia - Outback (North)	16.0	12.4	9.1	-6.9
<i>Kimberley</i>	26.0	19.9	14.8	-11.2
<i>East Pilbara</i>	12.9	9.2	7.3	-5.6
<i>West Pilbara</i>	6.6	8.8	6.1	-0.5
Western Australia - Outback (South)	9.3	7.9	6.6	-2.7
<i>Esperance</i>	7.9	6.2	5.8	-2.1
<i>Gascoyne</i>	18.6	15.4	14.9	-3.7
<i>Goldfields</i>	9.6	8.1	6.0	-3.6
<i>Mid West</i>	7.6	7.1	5.8	-1.8
Tasmania	6.7	5.8	5.5	-1.2
Greater Hobart	7.3	6.3	6.3	-1.0
Rest of Tasmania	6.1	5.3	4.8	-1.3
Launceston and North East	6.2	5.5	5.3	-0.9
South East	6.3	5.0	4.6	-1.7
West and North West	6.0	5.2	4.3	-1.7
Northern Territory	13.5	12.3	9.3	-4.2
Greater Darwin	5.4	5.5	4.3	-1.1
Rest of Northern Territory	26.5	24.4	20.4	-6.1
Northern Territory - Outback	26.5	24.4	20.4	-6.1
<i>Alice Springs</i>	16.0	14.3	13.8	-2.2
<i>Barkly</i>	37.6	34.1	31.6	-6.0
<i>Daly - Tiwi - West Arnhem</i>	46.6	42.6	33.5	-13.1
<i>East Arnhem</i>	32.9	32.7	29.2	-3.7
<i>Katherine</i>	30.2	26.2	20.2	-10.0
Australian Capital Territory	4.8	4.7	5.0	0.2
Australian Capital Cities	3.8	3.7	3.5	-0.3
Australian Rest of States	6.2	5.4	4.5	-1.7

Source: ABS 2017, Customised report, Census of Population and Housing, Australia

Geography is based on the 2016 ASGS.

Data based on place of usual residence.

Calculation excludes Not Stated category from the denominator.

P 3.5.3 Number of solar panel systems

Increased uptake of clean energy sources in Australian households, including solar energy, is likely to reduce Australia's contribution towards environmental degradation and climate change. It reflects efforts to improve environmental sustainability.

This indicator measures the number of small scale solar panel systems and solar water heater installations across regions. It is expressed as the number of solar panel systems up to 100kW and solar water heater installations per 100 dwellings. A number of factors can influence uptake of solar energy systems in households, including household income, regional climate and government schemes designed to subsidise or encourage the installation of solar systems.

- Across Australia, there were 27 solar installations per 100 dwellings by 2017.

Number of small scale solar panel systems and solar water heater installations across remoteness classes

- The uptake of solar technologies was strongest in inner regional Australia both in terms of the number (34 installations per 100 dwellings), and growth.
- Very remote Australia recorded both the lowest levels of installation in solar technology (20 installations per 100 dwellings), and growth.

Table P 3.5.3.a Number of small scale solar panel systems and solar water heater installations by remoteness class

	2001 - 2015	2001 - 2016	2001 - 2017	2001-2015 - 2001-2017
Remoteness Class	installations per 100 dwellings	installations per 100 dwellings	installations per 100 dwellings	change in installations per 100 dwellings
Major Cities	21	23	25	4
Inner Regional	29	31	34	5
Outer Regional	25	27	29	4
Remote	21	23	25	4
Very Remote	17	18	20	3
AUSTRALIA	23	25	27	4

Source: ABS 2019, Customised report, Clean Energy Regulator, Data by Region, 2013-18 (cat. no. 1410.0)

Geography is based on the 2016 ASGS.

Based on number of dwellings as at 2016 Census (excluding Migratory, Offshore and Shipping).

Total number of installations can include those installed in non-dwelling buildings e.g. businesses. Note that these are not included in the total number of dwellings used to calculate this indicator.

Annual figures will continue to rise due to the 12 month creation period allowed for registered persons to create their certificates.

Decommissioning of solar installations over time is not reflected in the cumulative totals presented.

Number of small scale solar panel systems and solar water heater installations across major urban areas

- As of 2017 the Sunshine Coast recorded the highest number of solar technologies per 100 dwellings, with 44 per 100 dwellings installing small systems.
- In contrast, as of 2017 Greater Sydney and Launceston had the lowest rates of small scale solar technologies (13 and 14 installations per 100 dwellings respectively).
- Major urban areas with the largest increase in small scale solar panels and water heater technologies per 100 dwellings were Greater Darwin and Greater Perth.

Table P 3.5.3.b Number of small scale solar panel systems and solar water heater installations by major urban area

Major Urban Area	2001 - 2015 installations per 100 dwellings	2001 - 2016 installations per 100 dwellings	2001 - 2017 installations per 100 dwellings	2001-2015 - 2001-2017 change in installations per 100 dwellings
Greater Sydney	11	12	13	2
Greater Melbourne	17	19	21	4
Greater Brisbane	34	37	39	5
Greater Perth	32	35	39	7
Greater Adelaide	29	31	33	4
Gold Coast - Tweed Heads	30	32	35	5
Newcastle - Maitland	20	21	24	4
Canberra - Queanbeyan	15	16	18	3
Sunshine Coast	38	41	44	6
Wollongong	17	18	19	2
Geelong	23	25	28	5
Greater Hobart	14	15	16	2
Townsville	27	29	32	5
Cairns	23	25	28	5
Greater Darwin	24	28	32	8
Toowoomba	26	27	30	4
Ballarat	18	19	21	3
Bendigo	26	28	30	4
Albury - Wodonga	20	22	24	4
Launceston	12	13	14	2

Source: ABS 2019, Customised report, Clean Energy Regulator, Data by Region, 2013-18 (cat. no. 1410.0)

The major urban areas of Sydney, Melbourne, Brisbane, Adelaide, Perth, Hobart and Darwin are based on the 2016 ASGS Greater Capital City Statistical Area (GCCSA) classification. All other major urban areas are based on the 2016 ASGS Significant Urban Area (SUA) classification.

Based on number of dwellings as at 2016 Census (excluding Migratory, Offshore and Shipping).

Total number of installations can include those installed in non-dwelling buildings e.g. businesses. Note that these are not included in the total number of dwellings used to calculate this indicator.

Annual figures will continue to rise due to the 12 month creation period allowed for registered persons to create their certificates.

Decommissioning of solar installations over time is not reflected in the cumulative totals presented.

Number of small scale solar panel systems and solar water heater installations across sub-state regions

- As at 2017, the sub-state regions with the highest number of small scale solar installations per 100 dwellings were Richmond - Tweed in New South Wales and Mandurah in Western Australia (52 installations per 100 dwellings each).
- As at 2017, the lowest rate of solar installations per 100 dwellings was recorded in Sydney - City and Inner South.
- Between 2015 and 2017, the sub-state regions with the largest increase in the number of solar panel and water heaters per 100 dwellings were Mandurah, Richmond – Tweed, Perth - North East and Perth - South West.
- Between 2015 and 2017, three Statistical Area level 4 regions recorded no increase in installations of solar panel and water heaters per 100 dwellings. Those were Sydney - City and Inner South, Sydney - Eastern Suburbs and Western Australia - Outback (North).

Table P 3.5.3.c Number of small scale solar panel systems and solar water heater installations by sub-state region

Sub-State Region	2001 - 2015 installations per 100 dwellings	2001 - 2016 installations per 100 dwellings	2001 - 2017 installations per 100 dwellings	2001-2015 - 2001-2017 change in installations per 100 dwellings
New South Wales	17	18	20	3
Greater Sydney	11	12	13	2
Central Coast	18	19	21	3
Sydney - Baulkham Hills and Hawkesbury	20	21	23	3
Sydney - Blacktown	18	19	21	3
Sydney - City and Inner South	3	3	3	0
Sydney - Eastern Suburbs	4	4	4	0
Sydney - Inner South West	8	9	10	2
Sydney - Inner West	5	6	6	1
Sydney - North Sydney and Hornsby	7	8	8	1
Sydney - Northern Beaches	9	9	10	1
Sydney - Outer South West	22	23	25	3
Sydney - Outer West and Blue Mountains	18	20	21	3
Sydney - Parramatta	10	10	11	1
Sydney - Ryde	9	9	10	1
Sydney - South West	16	17	18	2
Sydney - Sutherland	13	13	14	1
Rest of New South Wales	25	27	30	5
Capital Region	21	22	25	4
Central West	18	19	21	3
Coffs Harbour - Grafton	38	40	44	6
Far West and Orana	28	31	35	7
Hunter Valley exc Newcastle	23	25	28	5
Illawarra	17	18	19	2
Mid North Coast	38	40	42	4
Murray	21	23	25	4
New England and North West	23	25	28	5
Newcastle and Lake Macquarie	20	21	23	3
Richmond - Tweed	44	47	52	8
Riverina	16	18	19	3
Southern Highlands and Shoalhaven	23	25	27	4
Victoria	19	21	23	4
Greater Melbourne	17	19	21	4
Melbourne - Inner	5	6	6	1
Melbourne - Inner East	10	11	12	2
Melbourne - Inner South	10	11	12	2
Melbourne - North East	21	24	26	5
Melbourne - North West	20	23	26	6
Melbourne - Outer East	15	17	19	4
Melbourne - South East	23	26	29	6
Melbourne - West	28	30	34	6
Mornington Peninsula	17	19	21	4
Rest of Victoria	25	27	30	5

(continued)

Number of small scale solar panel systems and solar water heater installations by sub-state region (continued)

Sub-State Region	2001 - 2015 installations per 100 dwellings	2001 - 2016 installations per 100 dwellings	2001 - 2017 installations per 100 dwellings	2001-2015 - 2001-2017 change in installations per 100 dwellings
Ballarat	21	23	25	4
Bendigo	29	32	35	6
Geelong	24	27	29	5
Hume	27	29	32	5
Latrobe - Gippsland	25	27	30	5
North West	24	26	28	4
Shepparton	29	32	35	6
Warrnambool and South West	17	19	21	4
Queensland	32	34	37	5
Greater Brisbane	34	37	39	5
Brisbane - East	43	46	49	6
Brisbane - North	28	30	32	4
Brisbane - South	32	34	36	4
Brisbane - West	34	36	39	5
Brisbane Inner City	11	12	13	2
Ipswich	39	41	44	5
Logan - Beaudesert	43	46	49	6
Moreton Bay - North	43	45	49	6
Moreton Bay - South	42	45	48	6
Rest of Queensland	30	33	35	5
Cairns	24	26	29	5
Darling Downs - Maranoa	29	31	33	4
Central Queensland	30	32	35	5
Gold Coast	30	32	34	4
Mackay - Isaac - Whitsunday	22	24	26	4
Queensland - Outback	16	18	19	3
<i>Far North</i>	13	14	16	3
<i>Outback - North</i>	17	19	20	3
<i>Outback - South</i>	18	20	23	5
Sunshine Coast	40	43	46	6
Toowoomba	28	30	32	4
Townsville	27	29	32	5
Wide Bay	40	42	46	6
South Australia	31	32	35	4
Greater Adelaide	29	31	33	4
Adelaide - Central and Hills	26	27	30	4
Adelaide - North	32	34	37	5
Adelaide - South	33	34	37	4
Adelaide - West	23	25	27	4
Rest of South Australia	34	36	38	4
Barossa - Yorke - Mid North	38	40	42	4
South Australia - Outback	31	33	35	4
<i>Eyre Peninsula and South West</i>	33	35	37	4

(continued)

Number of small scale solar panel systems and solar water heater installations by sub-state region (continued)

Sub-State Region	2001 - 2015 installations per 100 dwellings	2001 - 2016 installations per 100 dwellings	2001 - 2017 installations per 100 dwellings	2001-2015 - 2001-2017 change in installations per 100 dwellings
<i>Outback - North and East</i>	27	29	30	3
South Australia - South East	33	35	37	4
Western Australia	31	34	37	6
Greater Perth	32	35	39	7
Mandurah	43	47	52	9
Perth - Inner	13	14	16	3
Perth - North East	35	39	43	8
Perth - North West	31	34	38	7
Perth - South East	34	37	41	7
Perth - South West	34	38	42	8
Rest of Western Australia	28	30	33	5
Bunbury	35	38	42	7
Western Australia - Wheat Belt	32	35	38	6
Western Australia - Outback (North)	14	14	14	0
<i>Kimberley</i>	18	18	18	0
<i>East Pilbara</i>	15	15	15	0
<i>West Pilbara</i>	7	7	8	1
Western Australia - Outback (South)	24	26	28	4
<i>Esperance</i>	18	18	18	0
<i>Gascoyne</i>	22	23	25	3
<i>Goldfields</i>	13	14	16	3
<i>Mid West</i>	34	37	39	5
Tasmania	14	15	16	2
Greater Hobart	14	15	16	2
Rest of Tasmania	13	15	16	3
Launceston and North East	14	16	17	3
South East	15	16	17	2
West and North West	12	13	14	2
Northern Territory	22	24	27	5
Greater Darwin	24	28	32	8
Rest of Northern Territory	17	19	21	4
Northern Territory - Outback	17	19	21	4
<i>Alice Springs</i>	25	27	29	4
<i>Barkly</i>	9	10	10	1
<i>Daly - Tiwi - West Arnhem</i>	9	11	12	3
<i>East Arnhem</i>	11	13	15	4
<i>Katherine</i>	13	16	18	5
Australian Capital Territory	15	16	17	2
Australian Capital Cities	21	23	24	3
Australian Rest of States	27	29	31	4

Source: ABS 2019, Customised report, Clean Energy Regulator, Data by Region 2013-18 (cat. no. 1410.0)

Sub-state regions are SA4 (2016 ASGS), italicised regions are SA3 (2016 ASGS).

Based on number of dwellings as at 2016 Census (excluding Migratory, Offshore and Shipping).

Total number of installations can include those installed in non-dwelling buildings e.g. businesses. Note that these are not included in the total number of dwellings used to calculate this indicator.

Annual figures will continue to rise due to the 12 month creation period allowed for registered persons to create their certificates.

Decommissioning of solar installations over time is not reflected in the cumulative totals presented.

