Regional Outlook 2021 - Country notes

Australia

Progress in the net zero transition

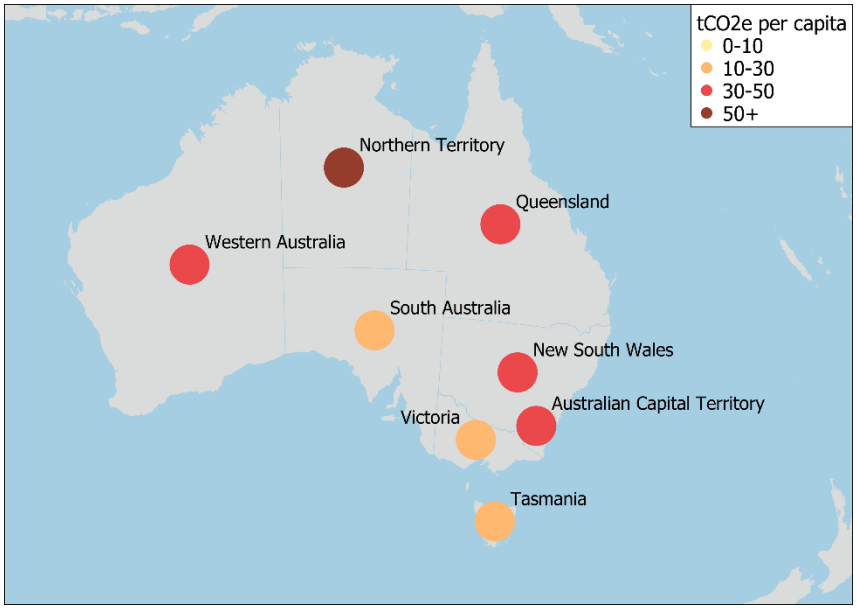
EMISSIONS

2018 OECD average:	2018 Australian average:	Australian net zero target:
11.5 tCO_2e/capita	22.4 tCO_2e/capita	All states aim for 2050.

Large regions (TL2)

Figure 1. Estimated regional greenhouse gas emissions per capita

Tons CO_2 equivalent (tCO_2e), large regions (TL2) , 2018



Greenhouse gas (GHG) emissions per capita generated in all Australian large regions are above the OECD average of 11.5 tCO_2e.

Estimated emissions per capita in Northern Territory are more than three times higher than in Victoria.

Small regions (TL3)

Figure 2. Contribution to estimated GHG emissions

By type of small region, 2018

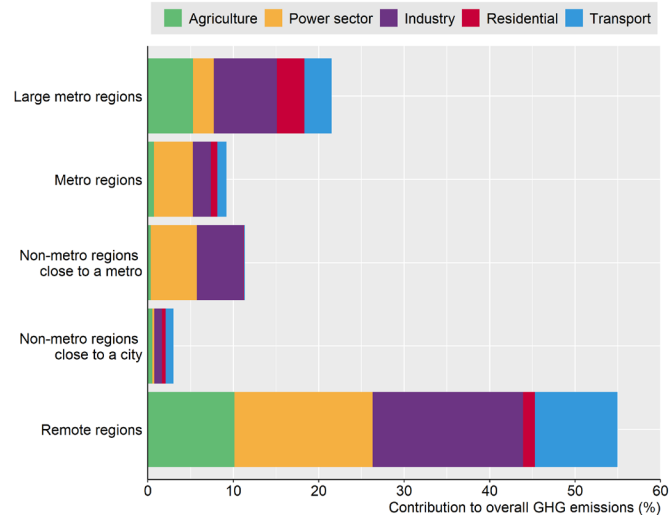
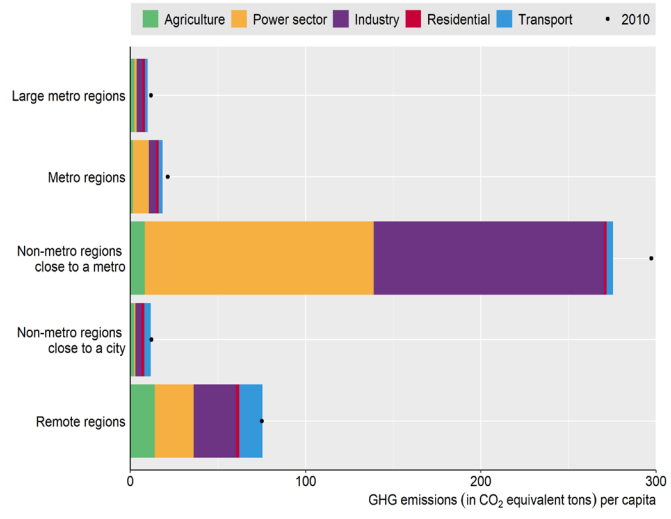


Figure 3. Estimated GHG emissions per capita

By type of small region, 2018



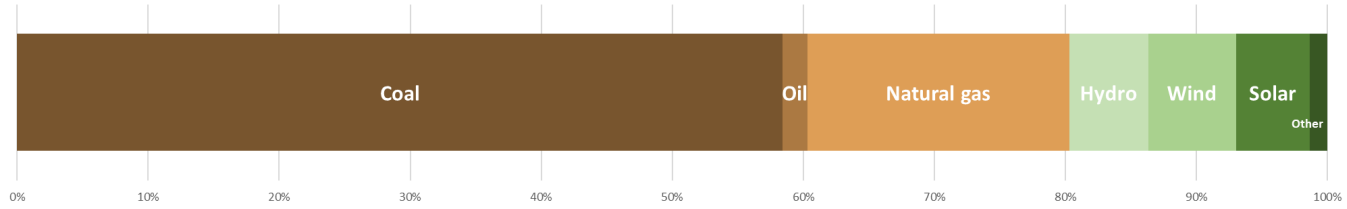
Across the OECD, metropolitan regions emit more greenhouse gases than remote regions. In Australia, the reverse is true. Emissions in Australian remote rural regions are much higher than in metropolitan regions also per capita. The difference is more pronounced than for the average OECD country. Australia has one non-metro region close to a small city (Hunter Valley Exc Newcastle). It has very high per capita emissions for energy and industry.

Target notes: Emissions targets included in the Net Zero Tracker database from ECIU before January 25, 2021 are considered.
Figure notes: Figures 1, 2, 3 and the OECD average show OECD calculations based on estimated greenhouse gas emissions data from the European Commission's Joint Research Centre (ECJRC). The Emissions Database for Global Atmospheric Research of the ECJRC allocates national greenhouse gas emissions to locations according to about 300 proxies. See Box 3.7 in the 2021 *OECD Regional Outlook* for more details.

ENERGY

Australian electricity mix

Figure 4. National electricity generation by energy source in 2019

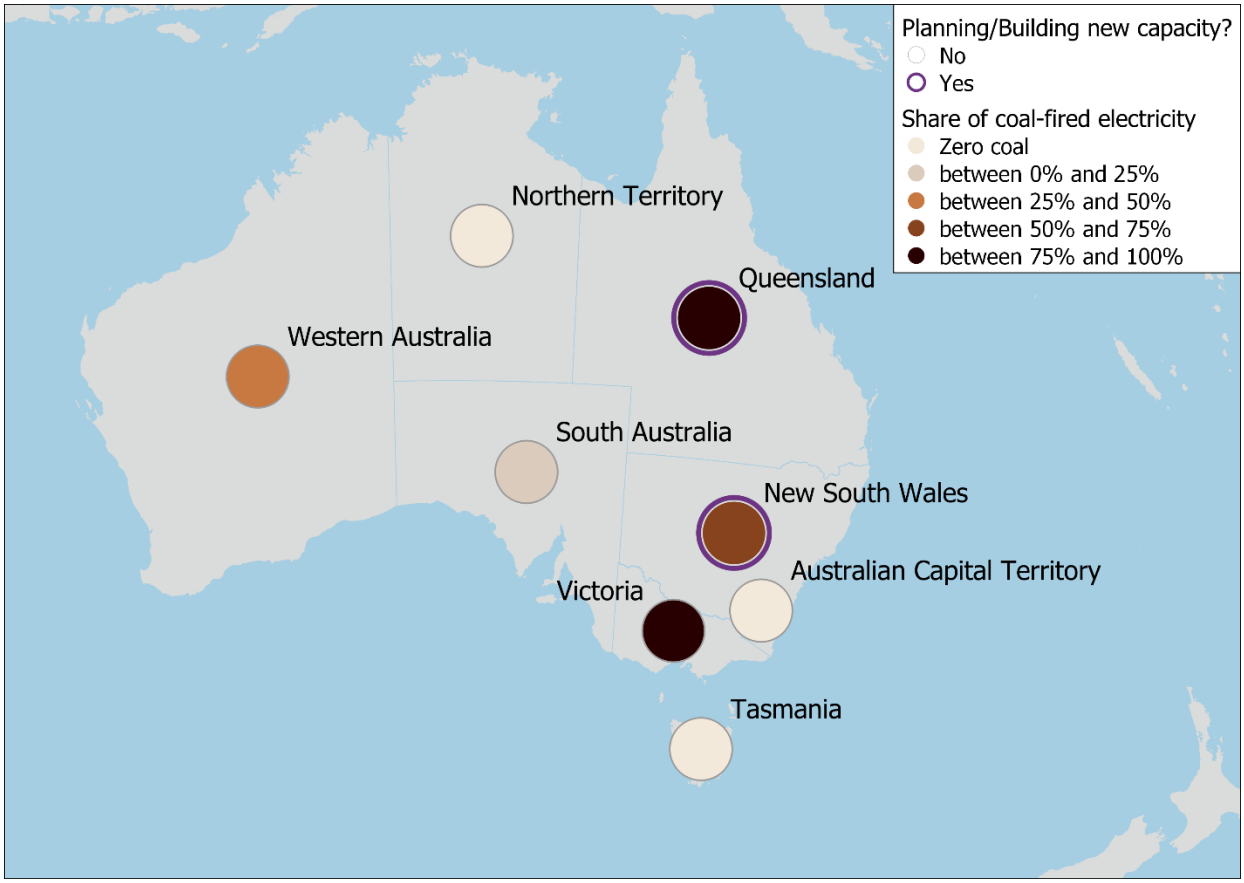


Share of coal-fired electricity generation

2019 OECD average: 23%	**2019 Australian average: 58%**	**2030 well below 2°C benchmark for Asia Pacific: <28%** **2030 1.5°C benchmark for OECD countries: 0%**

Figure 5. Regional coal-fired electricity generation estimates

Per cent of total electricity generation, large regions (TL2), 2017



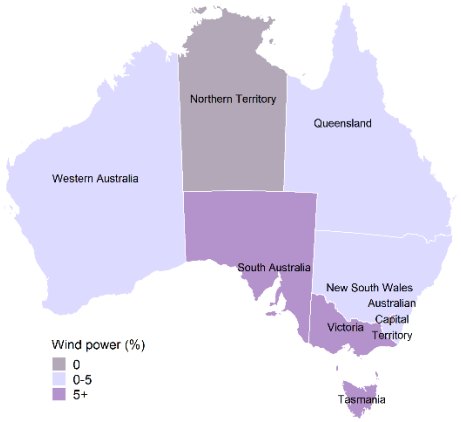
Most Australian regions use coal in electricity generation. Some regions rely largely on coal. For example, Victoria and Queensland depend on coal for just over 75% of their electricity generation. New capacity is planned or being built in Queensland and New South Wales (Global Coal Plant Tracker, last accessed in April 2021). Seeing that OECD regions should be phasing out coal by 2030 and the average lifespan of a coal power plant is 40 years, adding such capacity would expose regions to stranded asset risks, resulting in financial market risks and economic costs.

Wind power

2019 OECD average: 8%	2019 Australian average: 7%	2030 well below 2°C benchmark for Asia Pacific: >13%

Figure 6. Regional wind power generation estimates

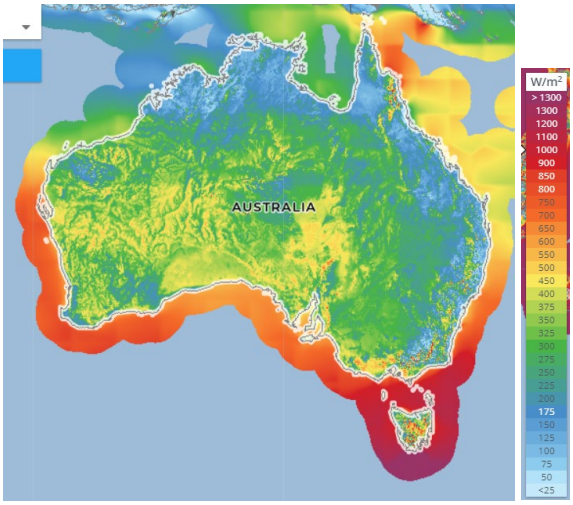
Per cent of total electricity generation, large regions (TL2), 2017



Regional wind electricity generation is estimated using facility level data for 92% of Australia's wind capacity.

Figure 7. Wind power potential

Mean wind power density (W/m²)



Source: Map produced by The Global Wind Atlas

Solar power

2019 OECD average: 3%	2019 Australian average: 6%	2030 well below 2°C benchmark for Asia Pacific: >15%

Figure 8. Regional solar power generation estimates

Per cent of total electricity generation, large regions (TL2), 2019

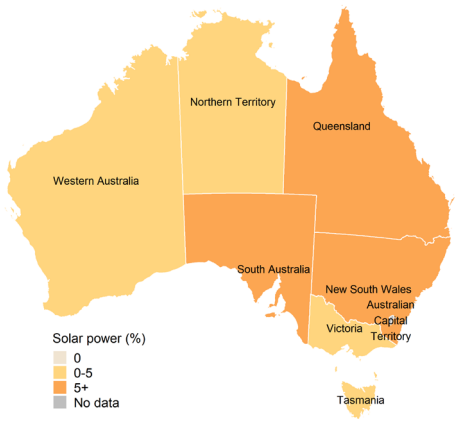
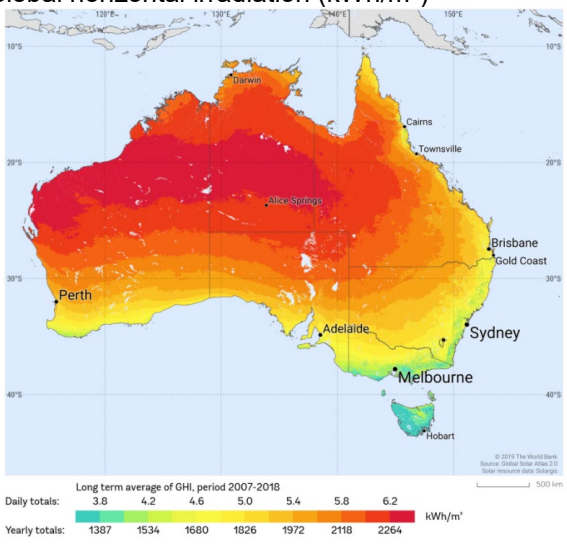


Figure 9. Solar power potential

Global horizontal irradiation (kWh/m²)



Source: Map produced by The Global Solar Atlas

Australia has very strong solar potential, particularly in Western Australia and Northern Territory. Wind power density is strongest in South and Western Australia. Yet solar and wind generation are a fraction of benchmarks for 2030 also in these regions.

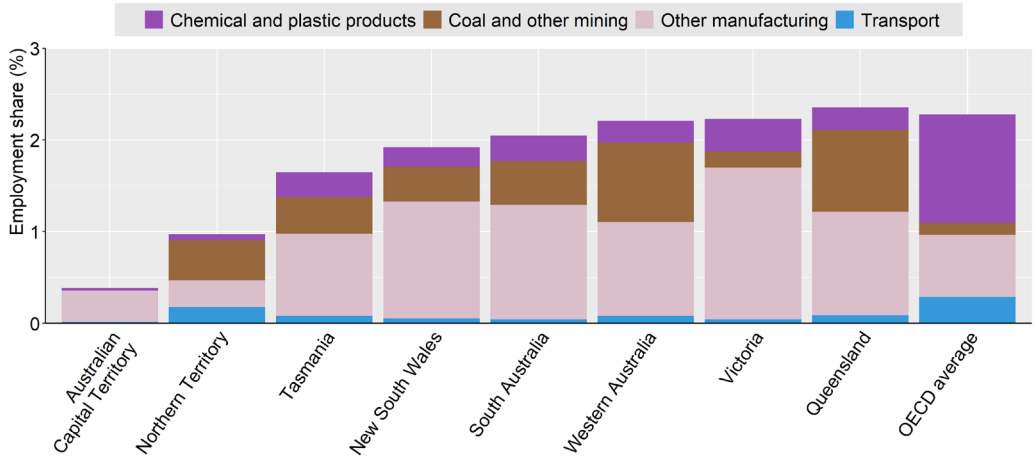
Benchmark notes: The well-below 2 degrees benchmarks show IEA Sustainable Development Scenario (SDS) numbers. The SDS models how the global energy system can evolve in alignment with the Paris Agreement's objective to keep the global average temperature increase well below 2°C above pre-industrial levels. According to the Powering Past Coal Alliance (PPCA), a phase-out of unabated coal by 2030 for OECD countries is cost-effective to limit global warming to 1.5°C.

Figure notes: Figure 4 shows data from the IEA (2020). Figures 5 and 6 show OECD calculations based on the Power Plants Database from the WRI. The database captures electricity generation from the power plants connected to the national power grid. As a result, small electricity generation facilities disconnected from the national power grid might not be captured. See here for more details. Figure 5 also includes coal plans (defined as new capacity announced, pre-permit, permit or in construction) from the Global Coal Plant Tracker published by Global Energy Monitor. Figure 8 uses data from the Australian Energy Update 2020 published by the Department of Industry, Science, Energy and Resources from the Australian Government Figures 7 and 9 show the power potential of solar and wind. Mean wind power density (WPD) is a measure of wind power available, expressed in Watt per square meter (W/m²). Global horizontal irradiation (GHI) is the sum of direct and diffuse irradiation received by a horizontal surface, measured in kilowatt hours per square metre (kWh/m²).

SECTORAL EMPLOYMENT RISKS

Figure 10. Employment in selected sectors which may be subject to employment loss by 2040 if emissions are reduced in line with the Paris climate agreement

Per cent of total regional employment, large regions (TL2), 2017

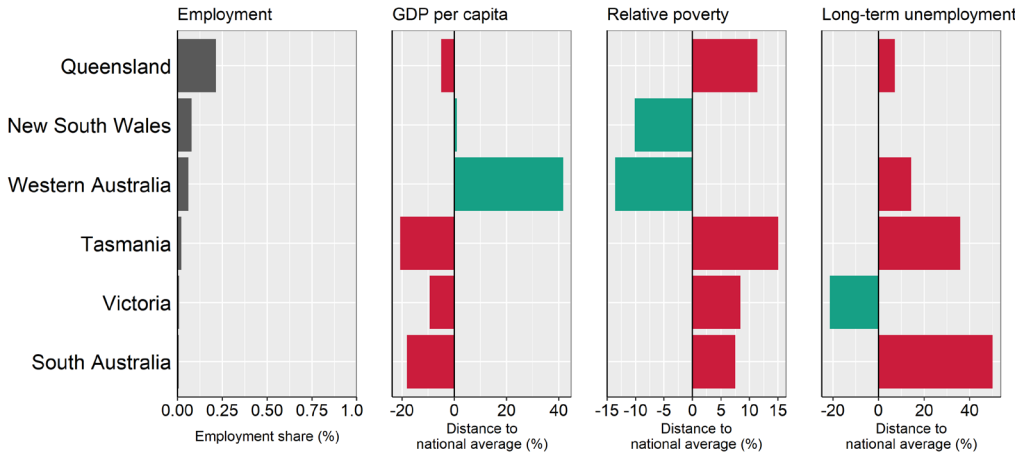


There will be both employment gains and losses due to the transition to net zero greenhouse gas emissions. They may not be distributed in the same way across regions. Employment in sectors that may be subject to some job loss by 2040 as a result of policies to reduce emissions in line with the climate objectives in the Paris Agreement amounts to less than 2.5% in all Australian regions. Most Australian regions have less employment in these sectors than the OECD average. Queensland has a larger share, largely driven by coal and other mining as well as other manufacturing. The selection of sectors is broad and based on employment effects simulated across OECD countries (See Box 3.9 of the 2021 *OECD Regional Outlook*). It does not take specific local characteristics into account.

Coal

Figure 11. Regions with employment in mining of coal and lignite, and regional socio-economic indicators

Large regions (TL2) with employment in selected sector, 2017



To be aligned with the Paris Climate Agreement, coal production in the Asia-Pacific Region would need to fall by more than a half until 2040, according to the IEA's Sustainable Development Scenario. Australian employment in the sector is largest in Queensland. The transition needs to be just, avoiding social hardship. Australian regions with the largest shares of employment in coal mining sector are not necessarily the worst performers in terms of GDP per capita, long-term unemployment and relative poverty.

Figure notes: Figures 10 and 11 are based on data from OECD Statistics. In Figure 10 sectors are selected based on macroeconomic simulations of a scenario limiting global warming to well below 2 degrees. See Box 3.9 in the 2021 *OECD Regional Outlook* for more details. In figure 11, poverty risk is assessed from individuals' survey respondents indicating there have been times in the past 12 months when they did not have enough money to buy food that they or their family needed. Long-term unemployment is defined as unemployed for 12 months or more.

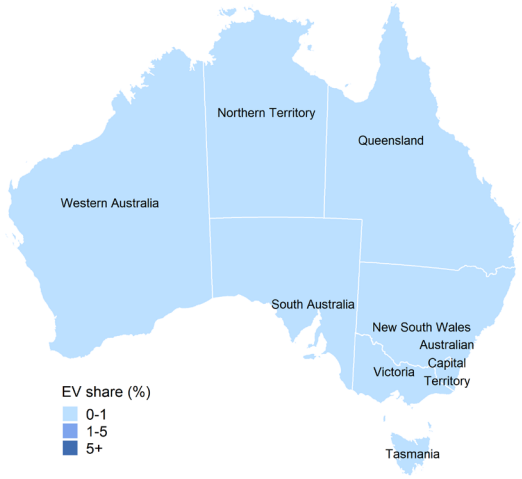
TRANSPORT

Electrification of passenger cars

2019 Australian average share of full-electric new passenger car sales: <1%	Benchmarks for new zero-emission passenger car sales: IEA well-below 2°C benchmark: 100% by 2040. Aligned with net zero emissions by 2050: 100% by 2035 at the latest. 2030 cost-effective.	Australian target sales of zero emission new passenger cars: No full phase out plans for sales of internal combustion cars yet.

Figure 12. New full-electric passenger car sales

Percentage of total regional passenger car sales, large regions (TL2), 2019



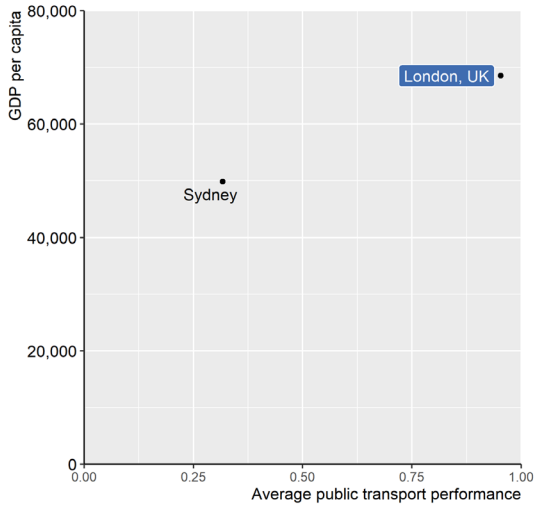
In 2019, no Australian large region had over 1% electric vehicles of newly purchased cars sales.

Countries with a net zero target by 2050 will need to phase out sales of new conventional cars by 2035 at the latest (considering cars have an average useful life of 15 years). A phase-out by 2030 is more cost-effective, although major emission reductions require fast progress in decarbonising power supply.

Modal shift

Public transport performance data is not yet available for many Australian metropolitan areas. Sydney has relatively low public transport performance. For comparison, London (UK) has among the highest public transport performance scores. Inhabitants of the metropolitan area of London can on average reach 95% of the population living within 8 km in 30 minutes by public transport.

Figure 13. Public transport performance in 2018



Benchmark notes: In the IEA's Sustainable Development Scenario, OECD countries (such as the European Union, Japan and the United States) as well as China fully phase out conventional car sales by 2040. This scenario is aligned with the Paris Agreement's objective to keep the global average temperature increase well below 2°C above pre-industrial levels. The UK Committee on Climate Change finds that all new cars and vans should be electric (or use a low carbon alternative such as hydrogen) by 2035 at the latest to reach net zero GHG emission targets by 2050, which is aligned with limiting global warming to 1.5°C. A more cost-effective date from the point of view of users is 2030.
Figure notes: Figure 12 is based on data from Electric Vehicle Council (2020 August) State of Electric Vehicles 2020. Figure 13 is based on data from ITF and OECD Statistics. See Box 3.10 in the 2021 *OECD Regional Outlook* for more details. GDP per capita is expressed in USD per head, PPP, constant prices from 2015.

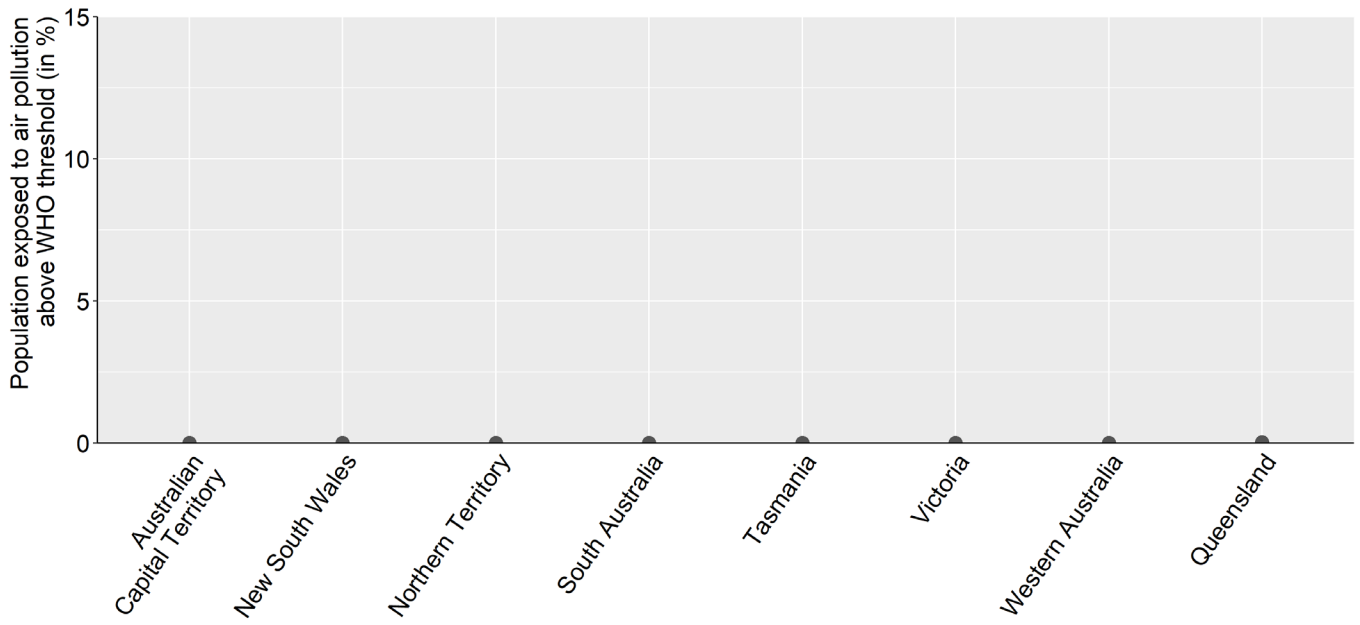
AIR POLLUTION

Large regions (TL2)

2019 OECD share of population exposed above the WHO-recommended threshold: 62%	2019 Australian share of population exposed above the WHO-recommended threshold: 0.4%	WHO-recommended air quality threshold: PM2.5 annual mean concentration < 10 µg/m³

Figure 14. Share of population exposed to levels of air pollution above the WHO-recommended threshold

Percentage of population exposed to above 10 µg/m³ PM2.5, large regions (TL2), 2019



Policies towards net-zero greenhouse gas emissions can bring many benefits beyond halting climate change. They include reduced air and noise pollution, reduced traffic congestion, healthier diets, enhanced health due to increased active mobility, health benefits through thermal insulation, and improved water, soil and biodiversity protection. Some are hard to quantify.

Small particulate matter (PM2.5) is the biggest cause of human mortality induced by air pollution, but few Australians are exposed. Major disease effects include stroke, cardiovascular and respiratory disease. Air pollution amplifies respiratory infectious disease such as Covid-19. It affects children the most. It reduces their educational outcomes as well as worker productivity. Exposure to small particulate matter air pollution in all Australian regions is low.

Figure notes: Figure 14 is based on data from OECD Statistics.