



TRACKING 2 DEGREES REPORT
Quarterly Report for March
2021 – Q3/FY2021

Published June 2021



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Introduction

Under the Paris Agreement, the Australian Government has legally committed to reducing our emissions by 26-28% below 2005 levels by 2030. However, to ensure global warming remains under 2 degrees, independent body The Climate Change Authority (CCA) has proposed Australia set a national Science Based Target (SBT). This is a target calculated from Australia's share of emissions for a 2°C global outcome. Ndeivr Environmental has used this target to model a quarterly emissions budget for Australia.

This report tracks Australia's performance against our Paris target and the CCA's carbon budget based on the latest available data, trends, and industry movements for the months of January, February and March (Q3/FY2021). Our results are presented in tonnes of carbon dioxide equivalents (t CO₂-e). 1 t CO₂-e is roughly equal to the emissions of a standard 5-seat passenger vehicle driving around 5,400 km.

1 Headline Results

- Emissions for Q3/FY2021 are projected to be 119.77 Mt CO₂-e, a 2.9 Mt CO₂-e decrease on last quarter. This represents a reduction of 7.5 Mt CO₂-e on the corresponding quarter, the year prior (Q3/FY2020) and is due primarily to decreased electricity emissions.
- Total emissions for the 12-month period to 31 March 2021 declined by around 5.9% (31.5 Mt CO₂-e) on the previous 12-month period.
- New South Wales and South Australia recorded their highest ever quarterly renewable energy generation, reaching 25.2% and 71.8% respectively.
- Electricity emissions for Q3/FY2021 are projected to be the lowest on our records (dating back to 2002) for the second consecutive quarter, with renewable energy generation across the NEM states achieving the highest penetration rate on record for the fourth consecutive quarter (30.4%).
- Since 2015, the NEM states have cumulatively generated 250,662 GWh (or 20% of all NEM generation since 2015), from renewable sources including rooftop and large-scale solar, hydro and wind.
 - Tasmania has led the way, generating 62,904 GWh, with Victoria close behind at 57,460 GWh.
 - New South Wales and Queensland renewable generation have seen the biggest increases, rising 276% and 296% on 2015 levels respectively.
- Stationary emissions (excluding electricity) have experienced a gradual upward trend from 2005 up to 2021 with an increase from 19.9 Mt CO₂-e p.a. in Q3, 2005 to 23.6 Mt CO₂-e in Q3 2021.

Figure 1: Australia's Quarterly Emissions Projections to a 2 Degree Target, 2005 - 2050

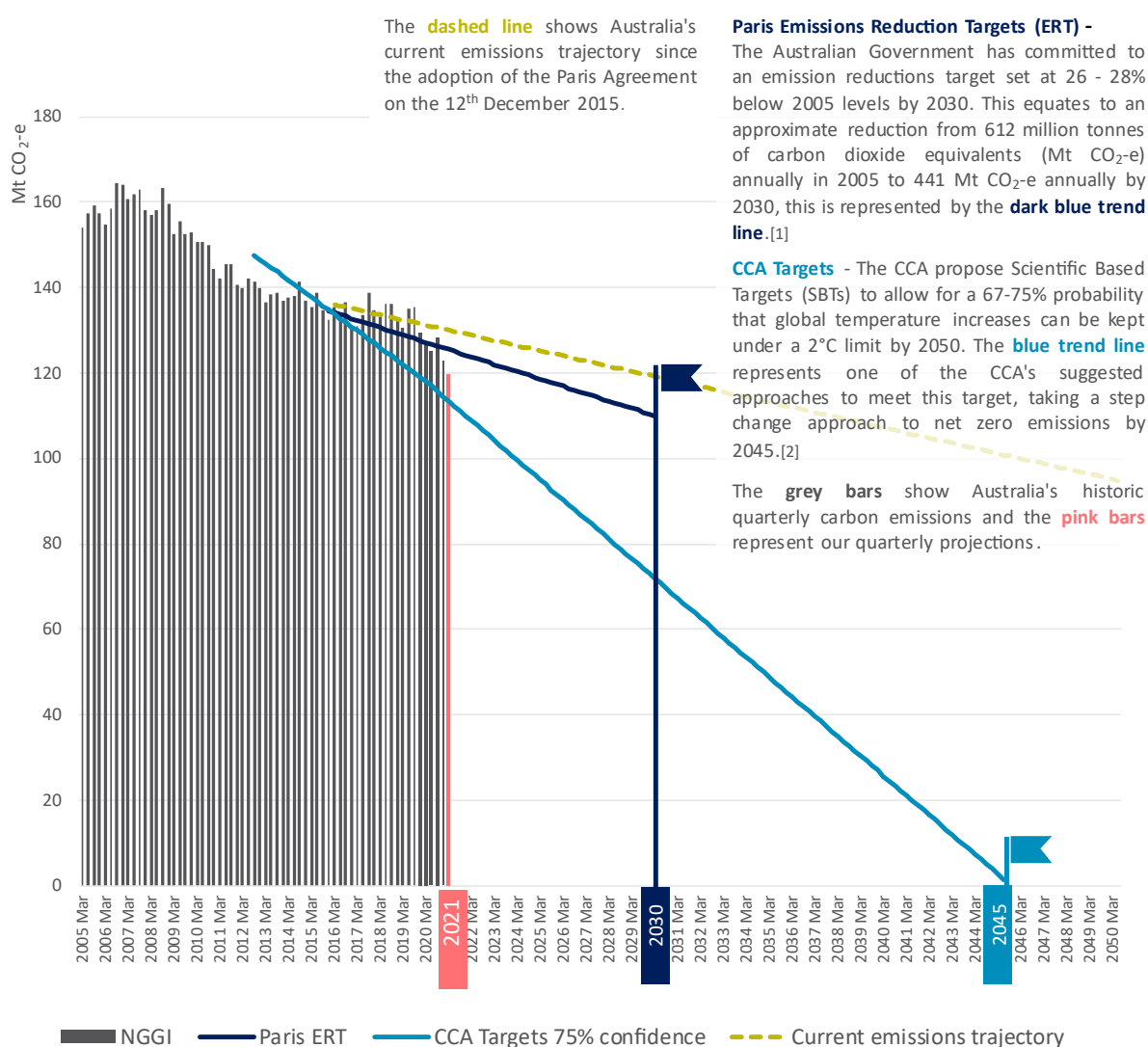
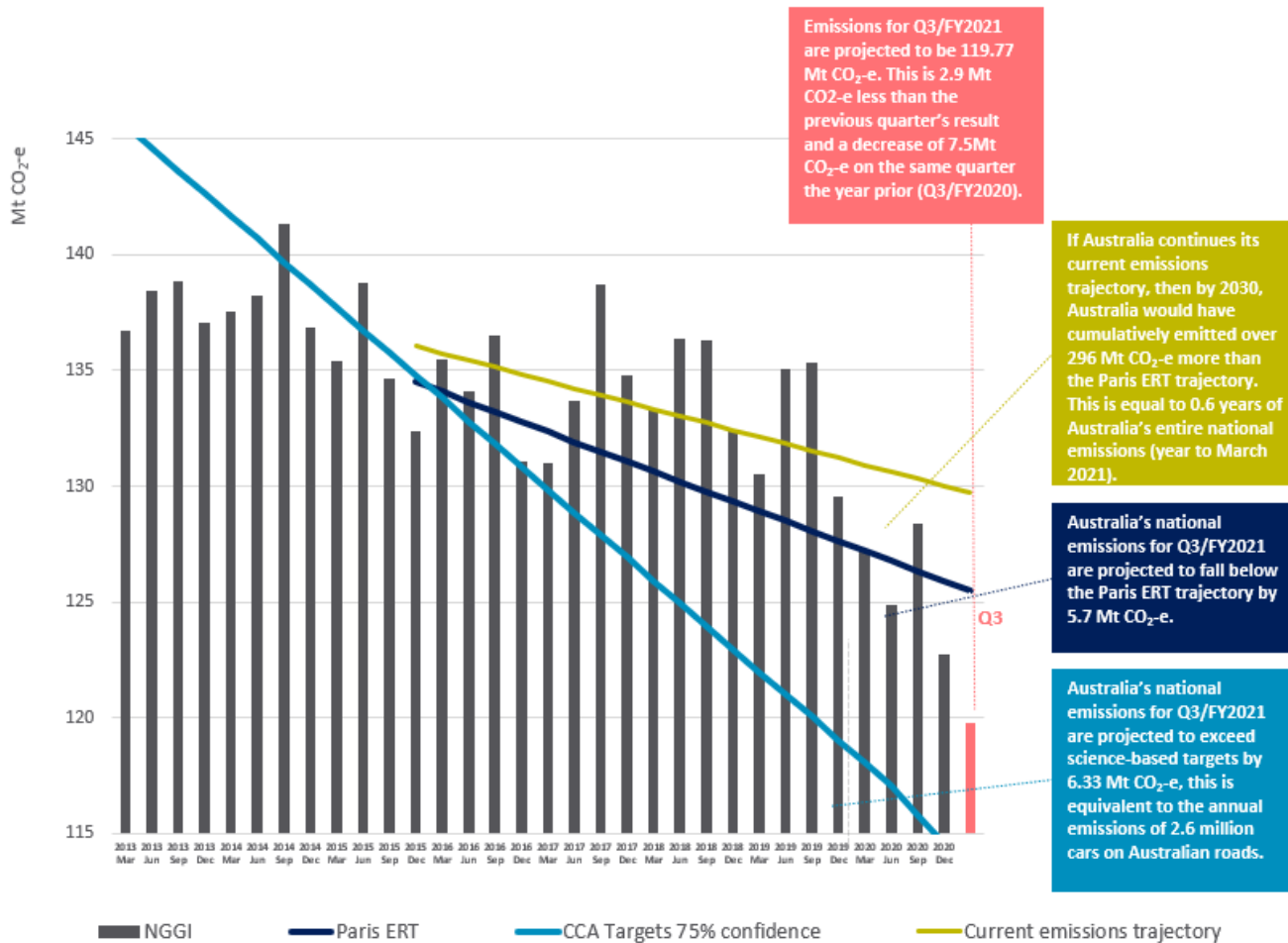


Figure 2: Australia's Quarterly Emissions Projections to a 2 Degree Target, 2013 – 2021



2 Detailed Findings

2.1 Increased Renewable Generation Leads to Reduced Electricity Emissions, Partially Offset by Rising Stationary and Transport Emissions

For the fourth consecutive quarter, the National Electricity Market (NEM) has achieved its highest ever quarterly renewable energy penetration in Q3/FY2021, achieving 30.4% and beating the previous all-time high by 1.5% (Q2/FY2021). This contributed to yet another projected drop in electricity related emissions, which decreased by 1.4 Mt CO₂-e nationwide.

While total energy generation in the NEM has remained reasonably stable since 2005 (averaging 50.2 TWh per quarter), rising renewable energy penetration has continued to produce a downward trend in emissions from the Australian electricity sector, this has become far more pronounced in the last 12-18 months, with reduced costs of renewable energy contributing to this. While electricity related emissions trend downwards, combined emissions from stationary energy and transport have been gradually rising, making a strong environmental case for electric vehicle adoption.

Figure 3: Increasing Renewable Generation and Reducing Electricity Emissions

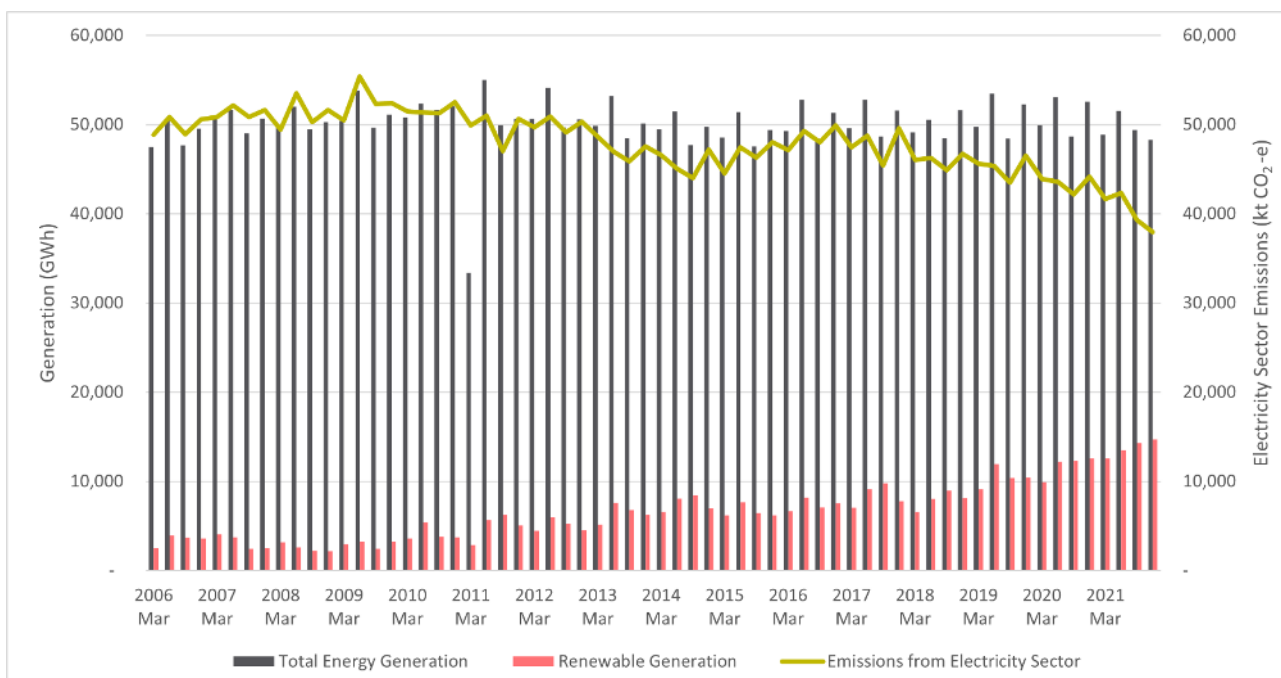
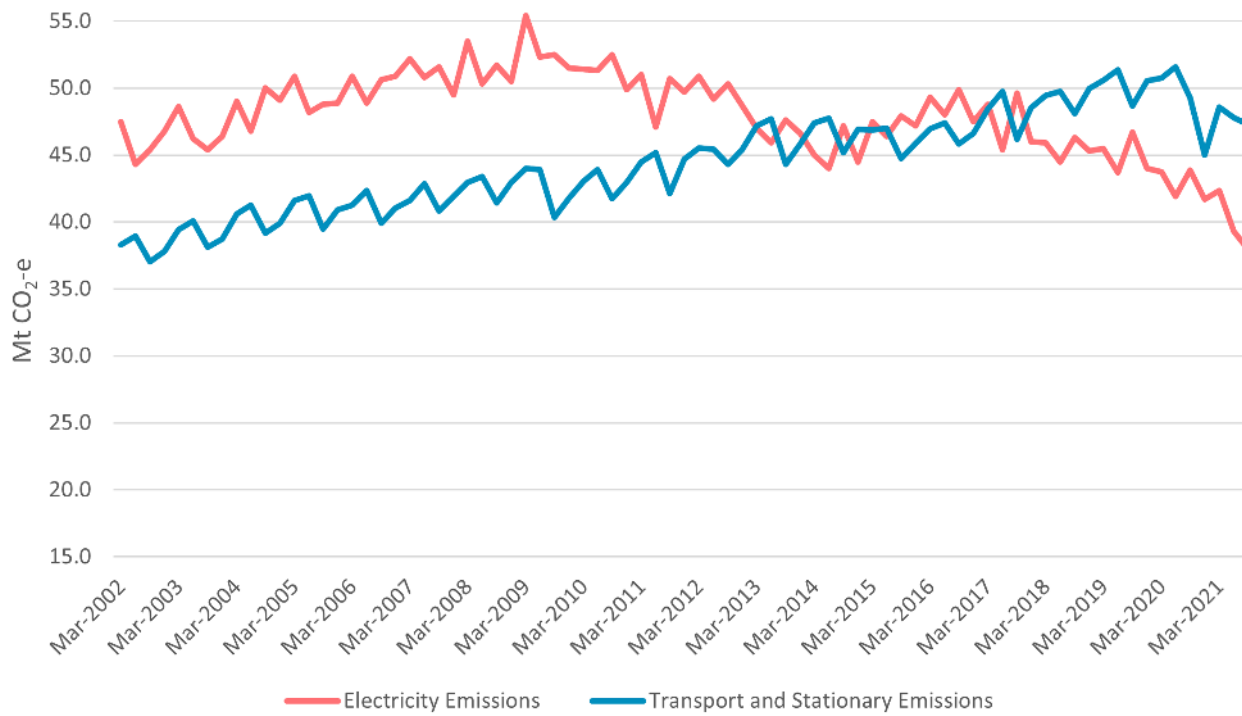


Figure 4: Electricity Emissions Decrease While Transport and Stationary Emissions Trend Upwards



In 2016 and 2017 emissions from transport and stationary energy combined surpassed electricity generation. Although electricity emissions continue to fall due to renewables and of late, reduced demand, the emissions from these harder to abate sources continue to grow. Figures 5 and 6 demonstrates our emissions profile from the various categories.

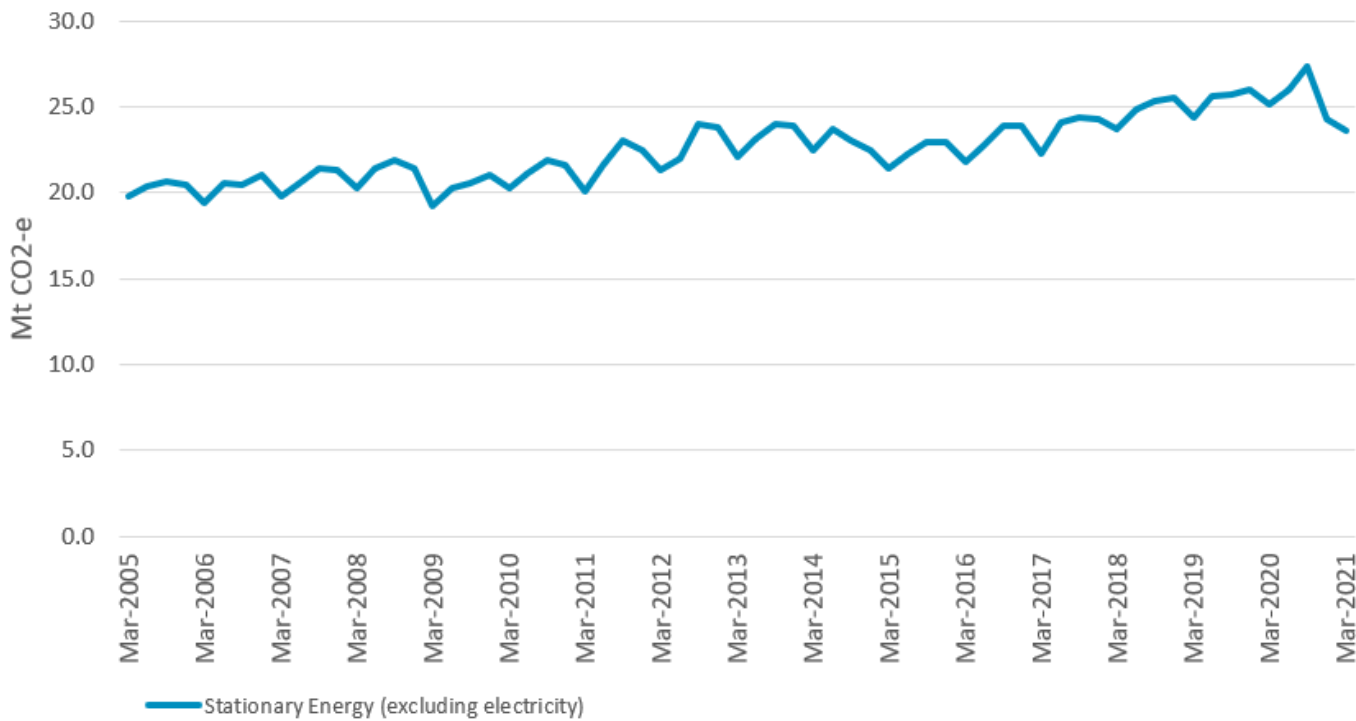
Although transport emissions saw a dip during COVID lockdown periods due to decreased air travel and employee commute, land based transport in particular continues to rise. When widespread domestic and international air travel begins to increase again, it is expected the related emissions will also increase towards pre-COVID levels.

At present the Federal Government does not have a strong policy incentive to increase Australia’s uptake of EVs which would help curb transport emissions. Just 0.75 per cent of new cars bought in Australia last year (2020) were EVs compared to 4% globally, more than 10% in Britain and the European Union and nearly 75% in Norway.

2.2 Stationary energy upward trend.

Emissions from stationary energy alone (excluding electricity) have experienced a steady upward trend from 2005 up to 2020. Based on seasonal adjustments, lower consumption of natural gas for heating in the southern states during Q3 is reflected in the decrease in emissions from this sector by 2.8% compared to last quarter (Q2/FY2021). The upward trend however is clear and emissions from stationary energy have increased from 19.9 Mt CO₂-e p.a. in Q3, 2005 to 23.6 Mt CO₂-e in Q3 2021.

Figure 5: Stationary Energy emissions



2.3 Electricity Analysis for the National Energy Market

- Electricity emission projections for Q3/FY2021 were the lowest on record across the entire data set, dating back to 2001 (37.9 Mt CO₂-e).
- With quarterly electricity demand relatively stable across the NEM, the decline has been driven by an increase in renewable energy generation from wind power, hydro power, utility-scale solar and rooftop solar.
- Renewable energy generation across the NEM states for the period was 30.4%, the highest penetration rate on record for renewable energy and the fourth such record in as many quarters.
- Quarterly black coal generation has also dropped by 0.70 TWh, contributing to a 69.6% fossil fuel powered grid.
- Electricity generation in the NEM for the year to March 2021 reduced by 3% or 6.2 TWh below the previous year.
- For Q3/FY2021, results for the NEM states are as follows:

NSW generated 16.1 TWh of electricity with 74.2% from black coal, 0.7% from gas and 25.2% from renewable sources including wind, hydro, utility-scale solar and rooftop solar. NSW’s renewable energy percentage has increased compared to the previous record of 24%, which occurred in Q3 FY2020.

QLD generated 16.1 TWh of electricity with 73.8% from black coal, 8.7% from gas and the balance from renewable sources including utility-scale solar, rooftop solar, wind and a small portion of hydro energy. QLD’s renewable energy percentage decreased 0.7% compared to the previous quarter falling to 17.4%.

VIC generated 13.0 TWh of electricity with 70.5% from brown coal, 0.4% from gas and 29.1% from renewable sources including wind, hydro, rooftop solar and utility-scale solar. VIC’s renewable energy penetration is its second highest on record, falling short on the previous high (and quarter) by only 1.4%. Solar rooftop generation was once again just shy of 1 TWh.

SA generated 3.1 TWh of electricity with 28% from gas and 71.8% from renewable sources such as wind, rooftop solar, utility-scale solar and battery (discharge). SA’s renewable energy penetration has gained 3.3% on last quarter to achieve an all-time high.

TAS generated 2.1 TWh of electricity with 99.9% from renewable sources such as hydro, wind and rooftop solar and the balance from gas. TAS’s renewable energy percentage consistently comes close to 100%, and has continued to stay above 90% since June 2019.

Figure 6: Electricity Generation in the National Energy Market

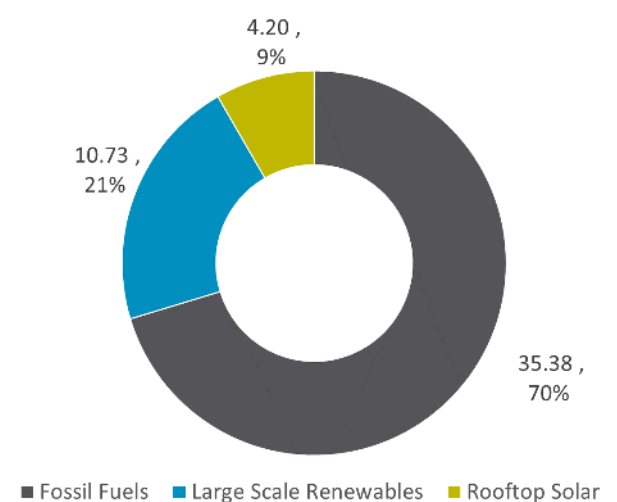
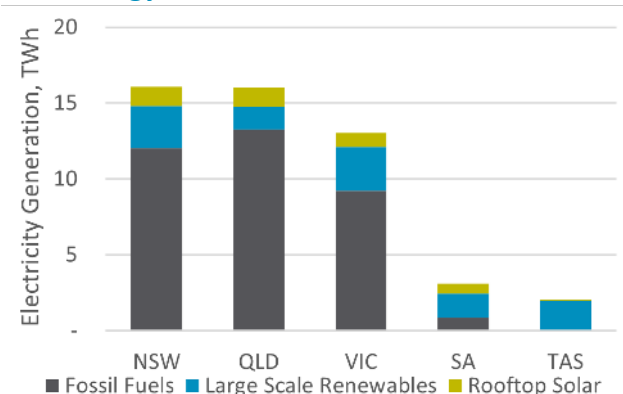


Figure 7: Australia's Annual Emissions

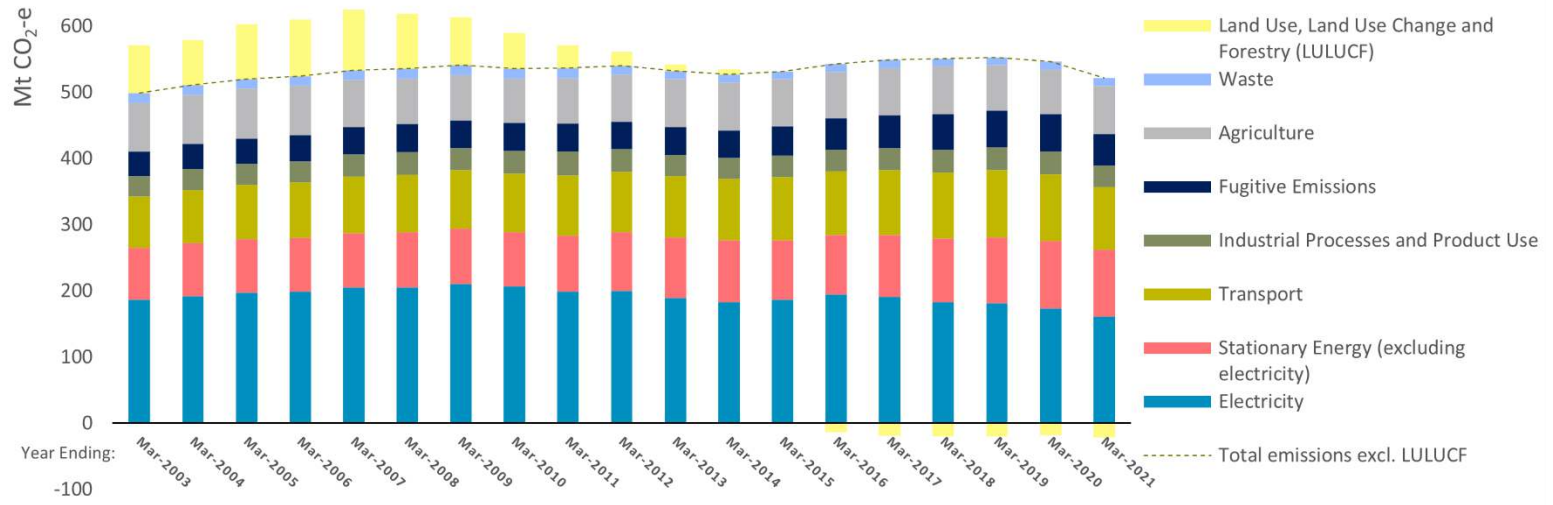
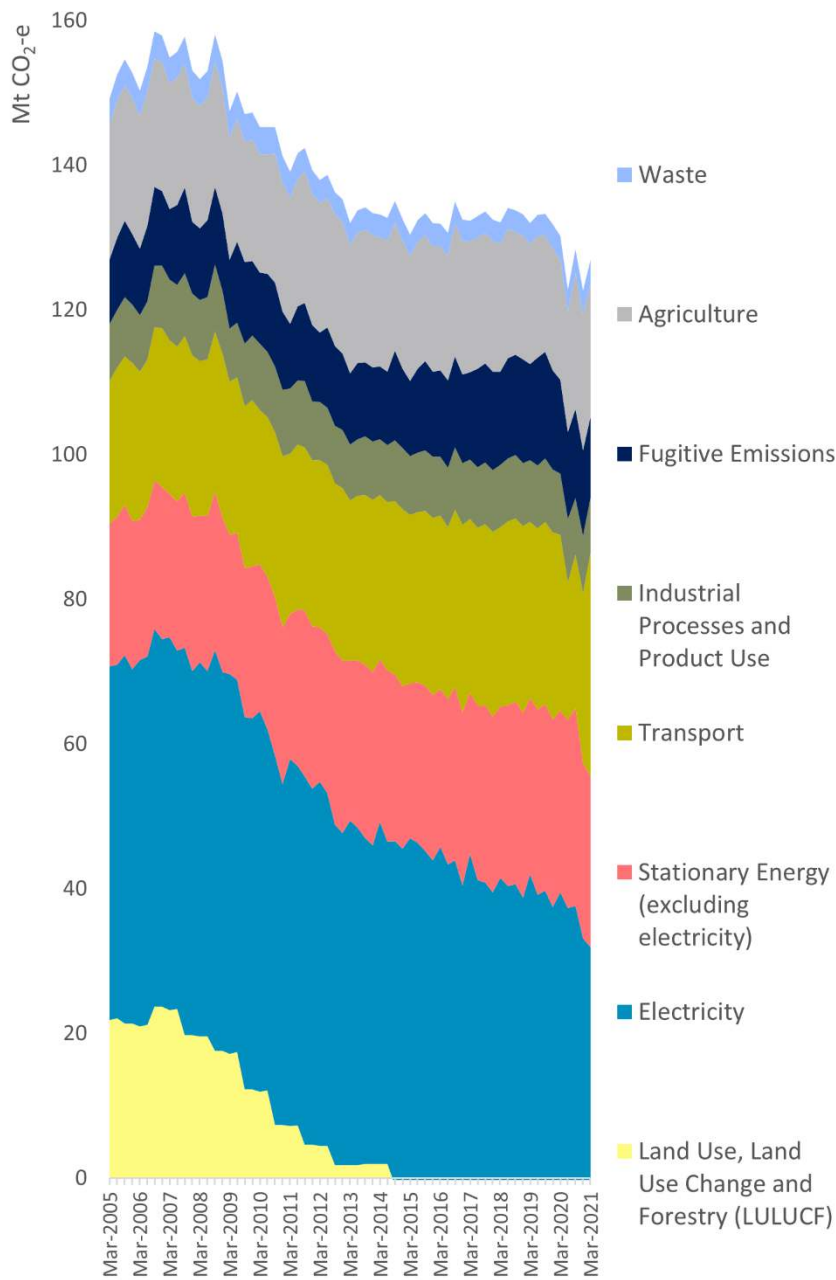
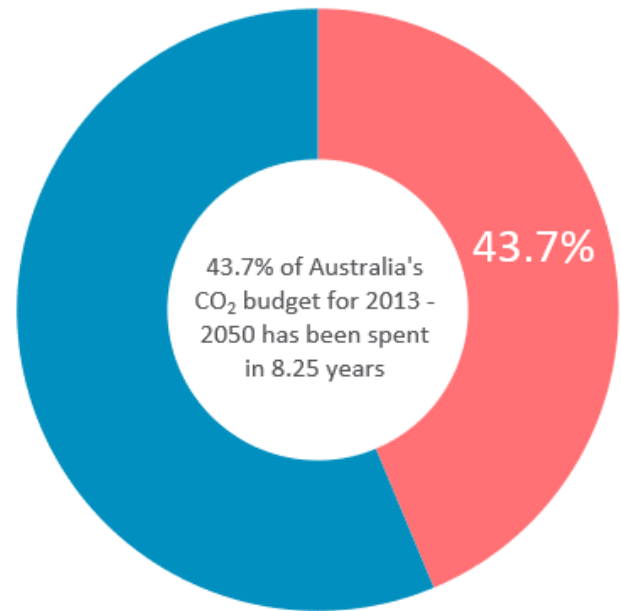


Figure 8: Australia's Quarterly Emissions by Sector*



*Negative LULUCF sector emissions cannot be seen on the above chart

Figure 9: 2 Degree Budget Expenditure to Date



3 Surging Renewable Generation in the NEM States

Rising renewable energy generation in the grid, particularly since 2015, has driven a steady decrease in emissions from the NEM, and from Australian electricity generation as a whole.

- Since 2015, the NEM states have cumulatively generated 250,662 GWh (or 20% of all NEM generation since 2015), from renewable sources including rooftop and large-scale solar, hydro and wind.
- Tasmania has led the way, generating 62,904 GWh, with Victoria close behind at 57,460 GWh.
- New South Wales and Queensland renewable generation have seen the biggest increases, rising 276% and 296% on 2015 levels respectively.
- Gradual decarbonisation of the grid opens up opportunity for the adoption of electric vehicles, which will be able to increasingly be powered by clean electricity rather than coal-generated electricity. In turn, this will start to bring down transport related emissions in a domino effect.

Figure 10: NEM Emissions Since 2015

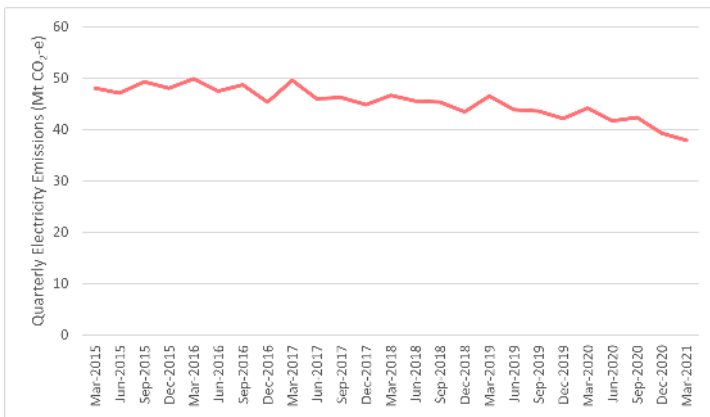


Figure 11: Renewable Generation by NEM State

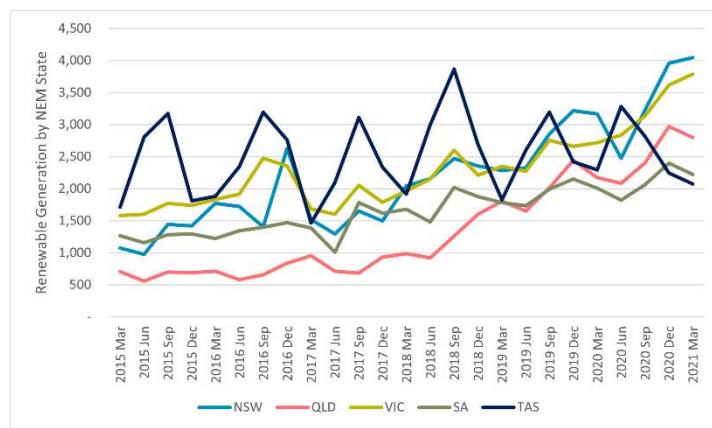
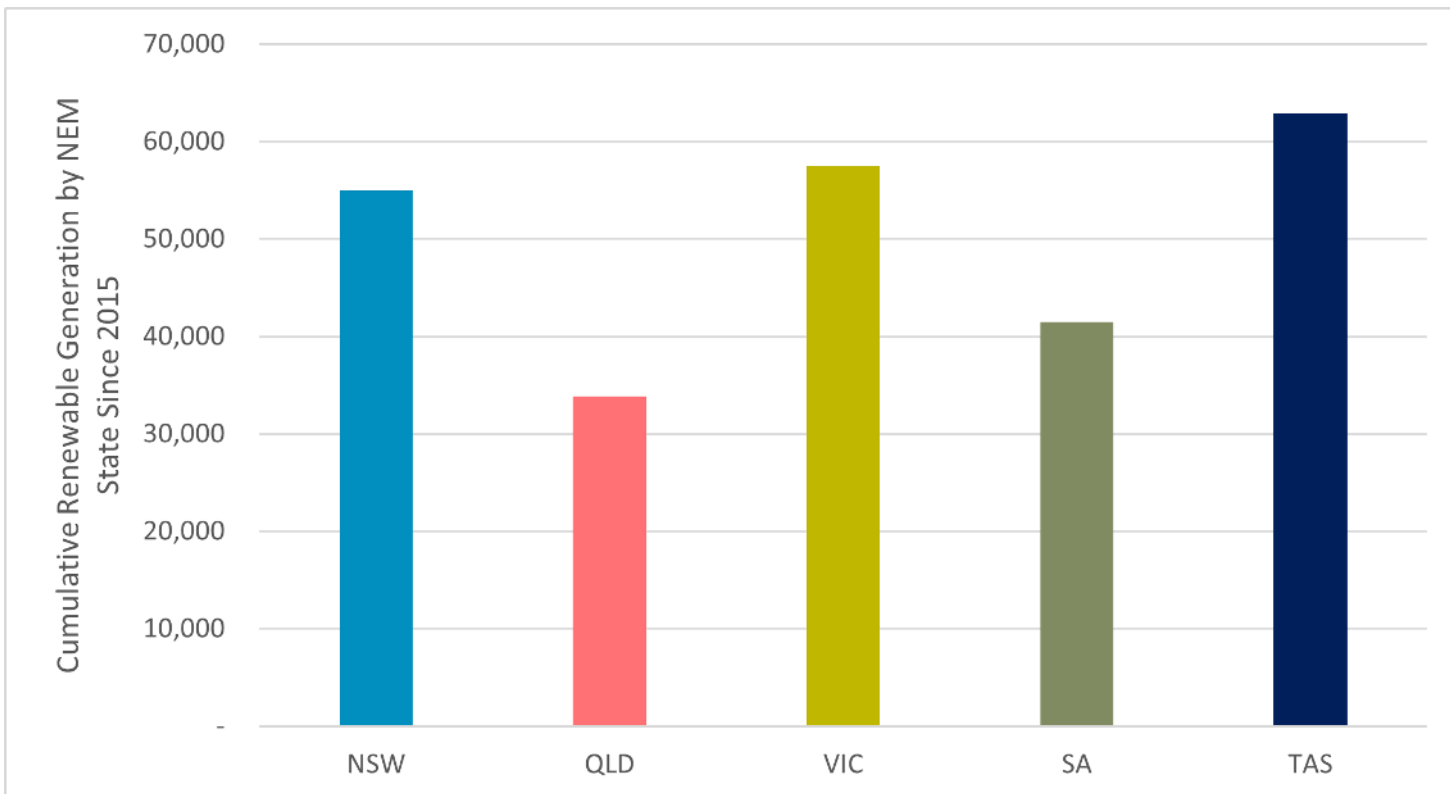


Figure 12: Cumulative Renewable Generation by NEM State



This report has been compiled by Ndeivr Environmental Pty Ltd, using the latest information available from: AEMO, Office of the Chief Economist, Australian Petroleum Statistics and the Department of the Environment and Energy's National Greenhouse Gas Inventory (NGGI) reports. Detailed electricity generation data for the National Energy Market (NEM) are sourced from Open NEM.

GDP trends are sourced from Trading Economics, information about Australian car use is sourced from the National Transport Commission, 2018 and the Australian Bureau of Statistics. Emission factors are sourced from National Greenhouse and Energy Reporting (Measurement) Determination 2008.

Government and CCA target information is available at the following sources:

[1] - Australian Government (2015), Australia's 2030 Climate change target, Commonwealth of Australia

[2] - CCA (2014), Reducing Australia's Greenhouse Gas Emissions – Targets and Progress Review, Final Report (page 9)

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