



TRACKING 2 DEGREES REPORT
Quarterly Report for June 2020
– Q4/FY2020

Published November 2020



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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. Ndevr 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 April, May and June \(Q4/FY2020\)](#). 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

- The COVID-19 pandemic has had a dramatic impact on emissions for the quarter.
- Emissions for Q4/FY2020 are projected to be 122.2 Mt CO₂-e. This represents a reduction of 10.9 Mt CO₂-e on the corresponding quarter the year prior (Q4/FY2019).
- Emissions for the 12-month period to 30 June 2020 declined by around 2.7% on the previous 12-month period.
- If emissions continue to decline at a rate of 2.7% per annum, the 2030 Paris target would be met around 2031. This is a significant improvement from previous quarters, where recent decline rates saw us hitting our Paris target at 2098 and 2065. However, emissions are expected to increase to pre-COVID levels as the economy recovers.
- Electricity emissions for Q4/FY2020 are the lowest on record (dating back to 2002), with renewable energy generation across the NEM states achieving the highest penetration rate on record.
- Electricity generation in the NEM for the month of March 2020 and September 2020 fell by 4.5% (0.78 TWh) and 2% (0.31 TWh) below 2019 levels respectively.

Covid-19 Related Impacts to September

We have conducted some additional analysis on available data month-by-month and beyond quarter's end and found:

- Aviation fuel use in July 2020 decreased by 608 ML and 1.57 MtCO₂-e. For April 2020 we observed reductions of 602 ML and 1.56 MtCO₂-e. These represent reductions of 74% and 80% respectively, compared to 2019. Both monthly reductions in emissions are roughly equivalent to taking 662,000 cars off the road for 12 months.
- The initial decrease in automotive transport fuels appears to be gradually levelling out. However, significant differences for January to September in 2019 and 2020 still remain (see Real-world Effects – Looking Back on the COVID-19 Response for graphics), including:
 - 122.3 ML (28%) reduction in LPG consumption compared to 2019,
 - 1,917 ML (27%) reduction in gasoline consumption compared to 2019, and
 - 262 ML (6.5%) reduction in diesel consumption compared to 2019.

The figures for automotive transport fuel show commuters have drastically reduced their light vehicle fuel consumption as they work from and stay at home more. Diesel consumption from heavy freight vehicles and commercial activities, however, have seen a lesser reduction, as road and rail freight have been required to keep commodities moving across the economy.

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

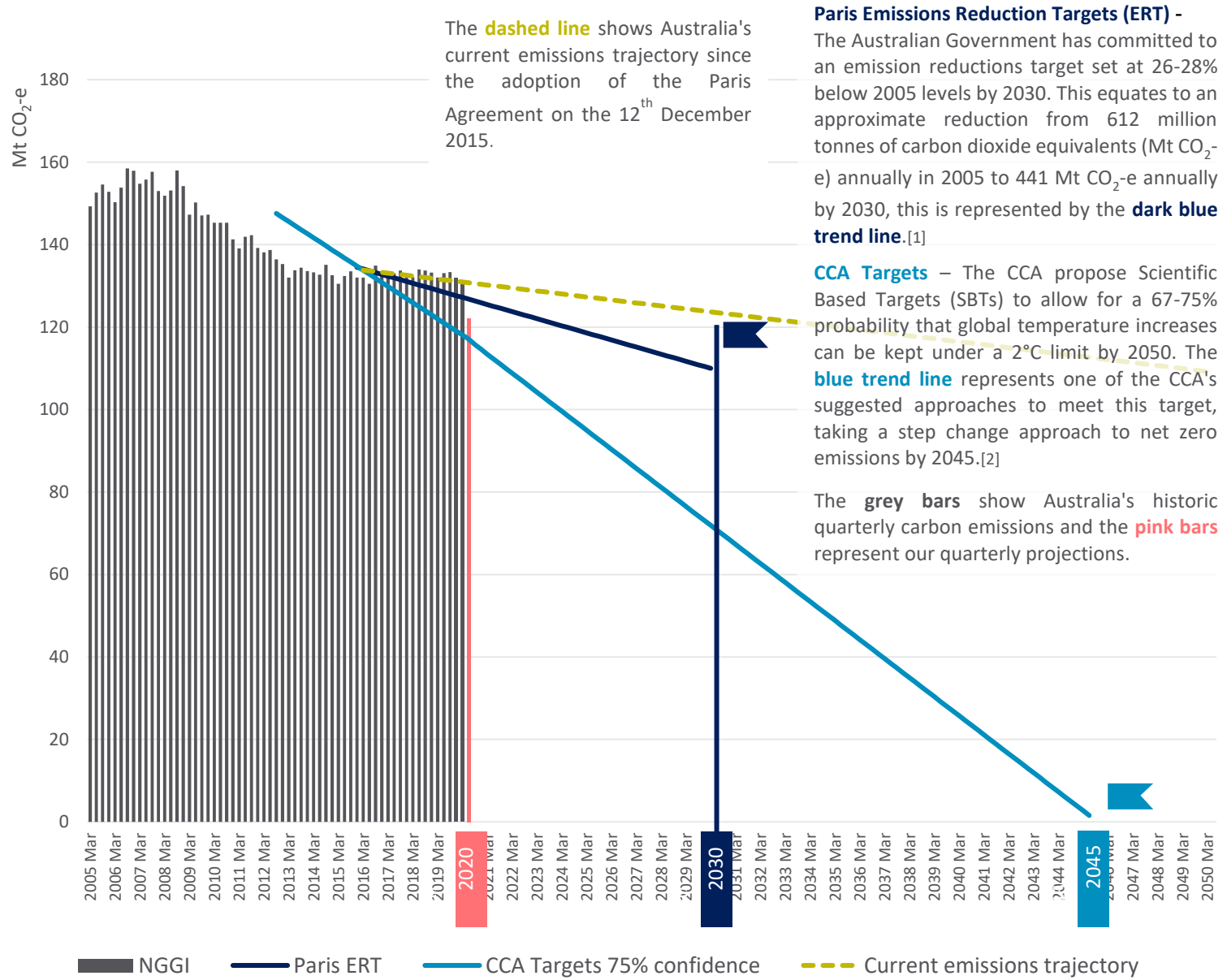
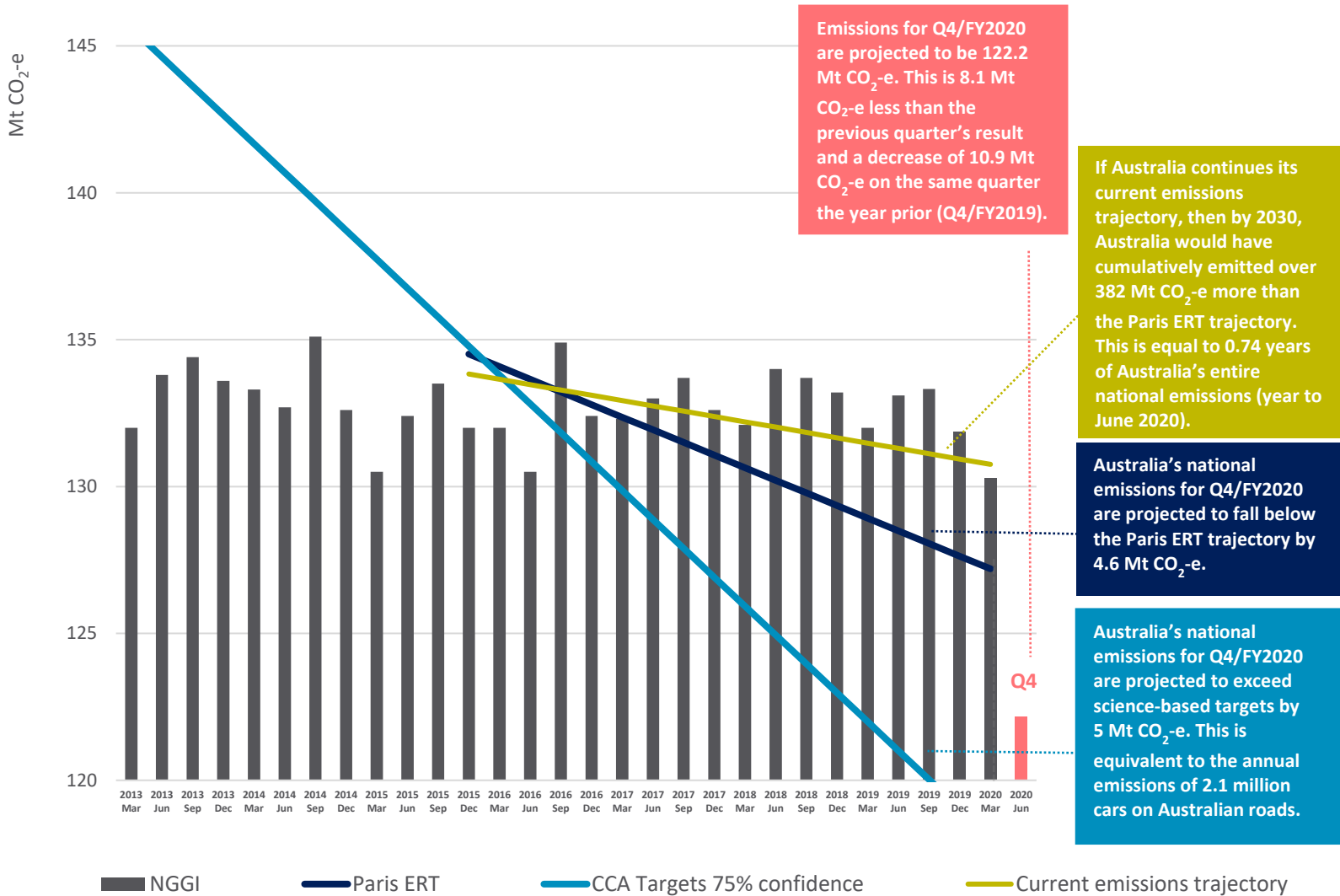


Figure 2: Australia's Quarterly Emissions Projections to a 2 Degree Target, 2013 – 2020



2 Detailed Findings

2.1 Increased Renewable Generation Leads to Reduced Electricity Emissions

The National Electricity Market (NEM) has achieved its highest ever quarterly renewable energy penetration for Q4/FY2020, breaching 25.7% and beating the previous all-time high by 0.4% (Q2 FY20). This contributed to a significant drop in electricity related emissions of 5 Mt CO₂-e nationwide.

While total energy generation in the NEM has remained reasonably stable since 2005, rising renewable energy penetration has continued to produce a downward trend in emissions from the Australian electricity sector. This trend in conjunction with the impact of COVID-19, is contributing to an acceleration toward Australia's Paris commitments compared to previous quarters.

Figure 3: Increasing Renewable Generation and Reducing Electricity Emissions

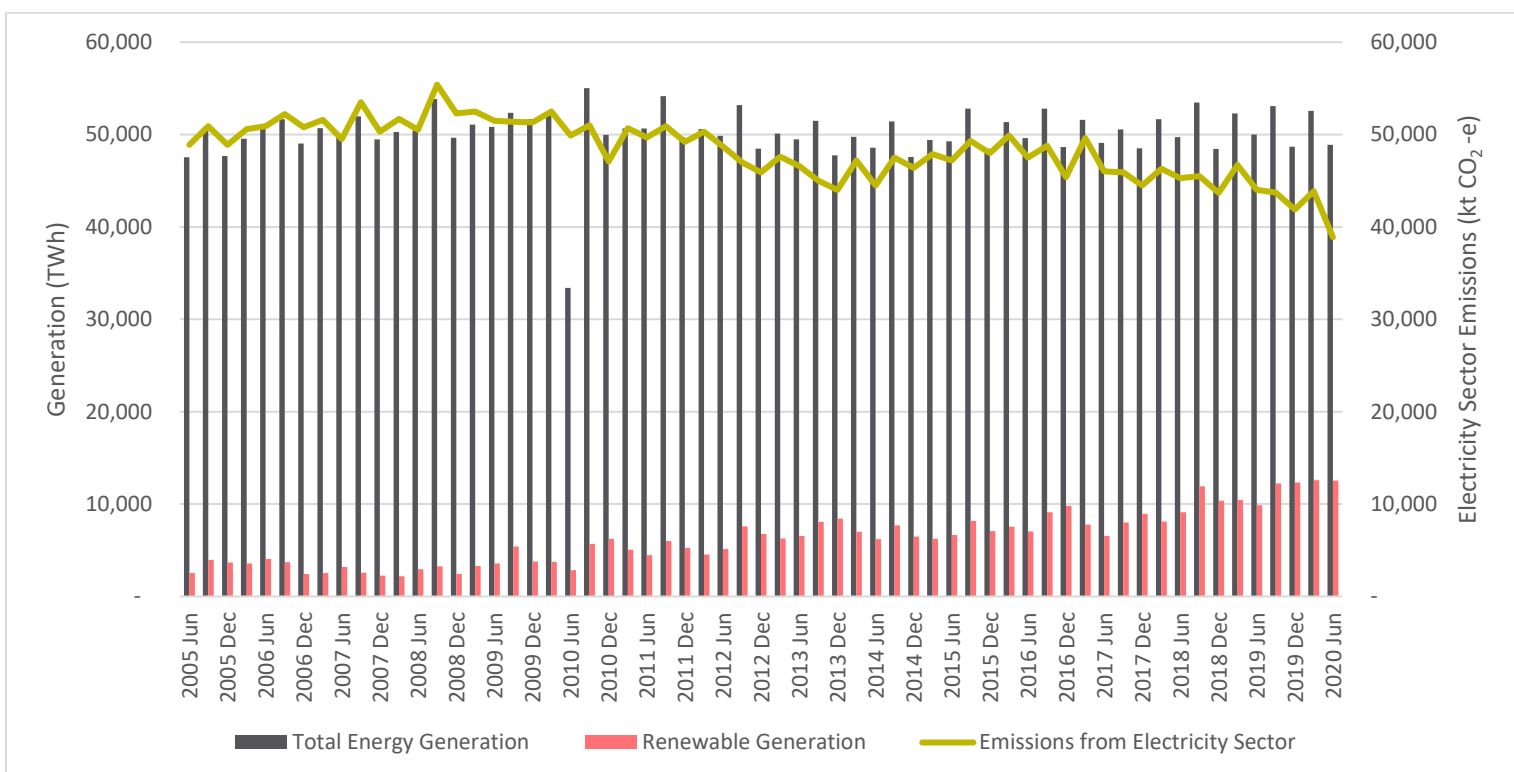
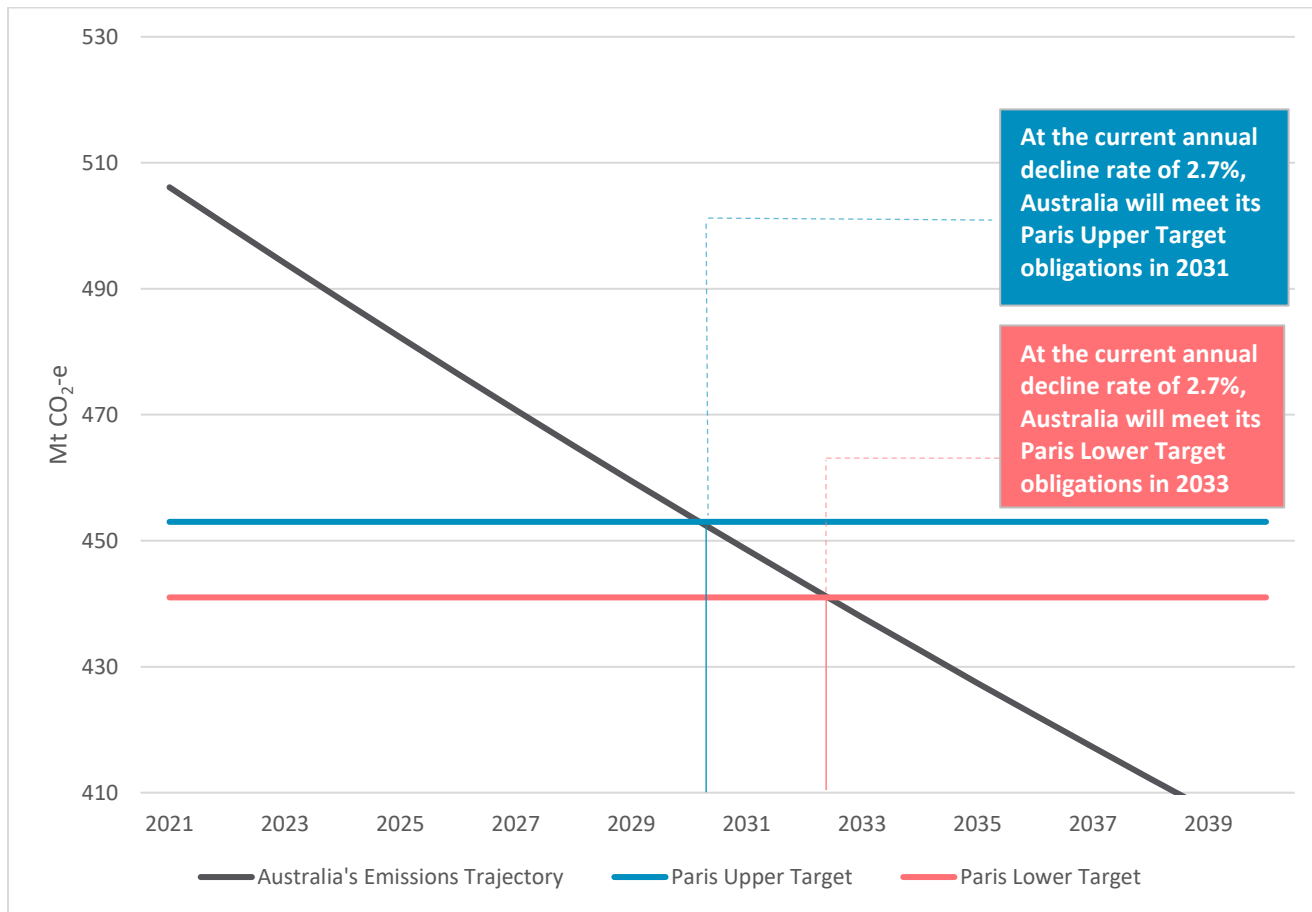


Figure 4: Acceleration toward Paris Commitments



2.2 Electricity analysis for the National Energy Market

- Electricity emission projections for Q4/FY2020 were the lowest on record across the entire data set, dating back to 2001 (38.9 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, as well as the COVID pandemic response including lockdowns.
- Renewable energy generation across the NEM states for the period was 25.7% (including rooftop solar), the highest penetration rate on record for renewable energy.
- Quarterly black coal and brown coal generation have dropped sharply by 3 TWh and 0.4 TWh respectively, contributing to a 74.3% fossil fuel grid.

Electricity generation in the NEM for the month of June 2020 fell by 2% or 1.1 TWh below June 2019 levels.

- For Q4/FY2020, results for the NEM states are as follows:
 - **NSW** generated 16 TWh of electricity with 83% from black coal, 1.1% from gas and 15.4% from renewable sources including wind, hydro, utility-scale solar and rooftop solar. NSW’s renewable energy percentage has fallen short by 3.9% on its all-time high, which occurred in Q2 FY2020.
 - **QLD** generated 15 TWh of electricity with 74% from black coal, 11% 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 increased 1% on the previous quarter to achieve its second highest rate of 13.9%.
 - **VIC** generated 11.9 TWh of electricity with 73.7% from brown coal, 2.5% from gas and 23.8% 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 by just 0.1% on Q1 FY2020.
 - **SA** generated 3.3 TWh of electricity with 42% from gas and 55% from renewable sources such as wind, rooftop solar, utility-scale solar and battery (discharge). SA’s renewable energy percentage has dropped 5% on last quarter but is at its third highest on record.
 - **TAS** generated 3.3 TWh of electricity with 99.5% from renewable sources such as hydro, wind and rooftop solar and the balance from gas. TAS’s renewable energy percentage for Q4 FY2020 is 0.15% lower than Q3 FY2020, but has still not dropped below 78% since records began (2005).

Figure 5: Electricity Generation in the National Energy Market (NEM)

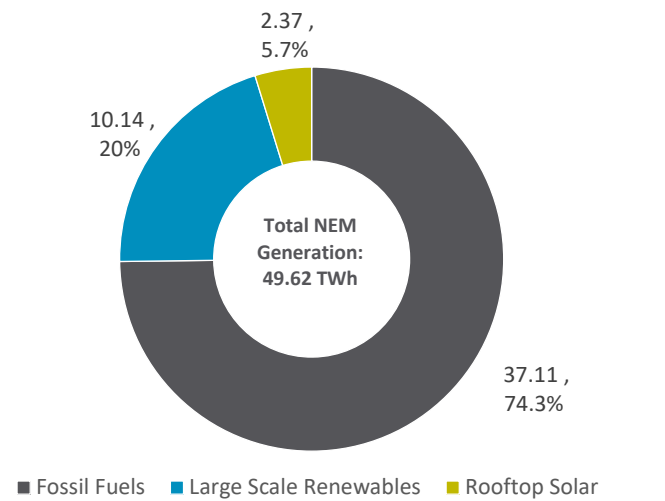
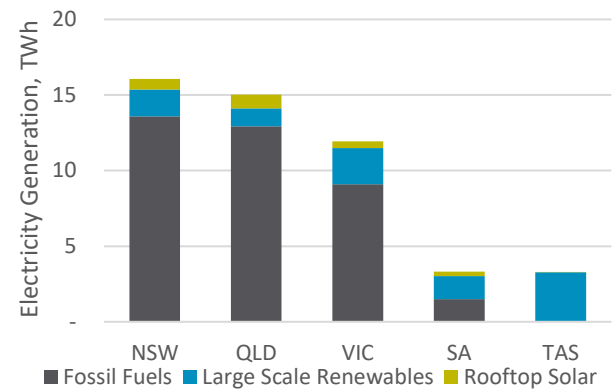


Figure 6: Australia's Annual Emissions

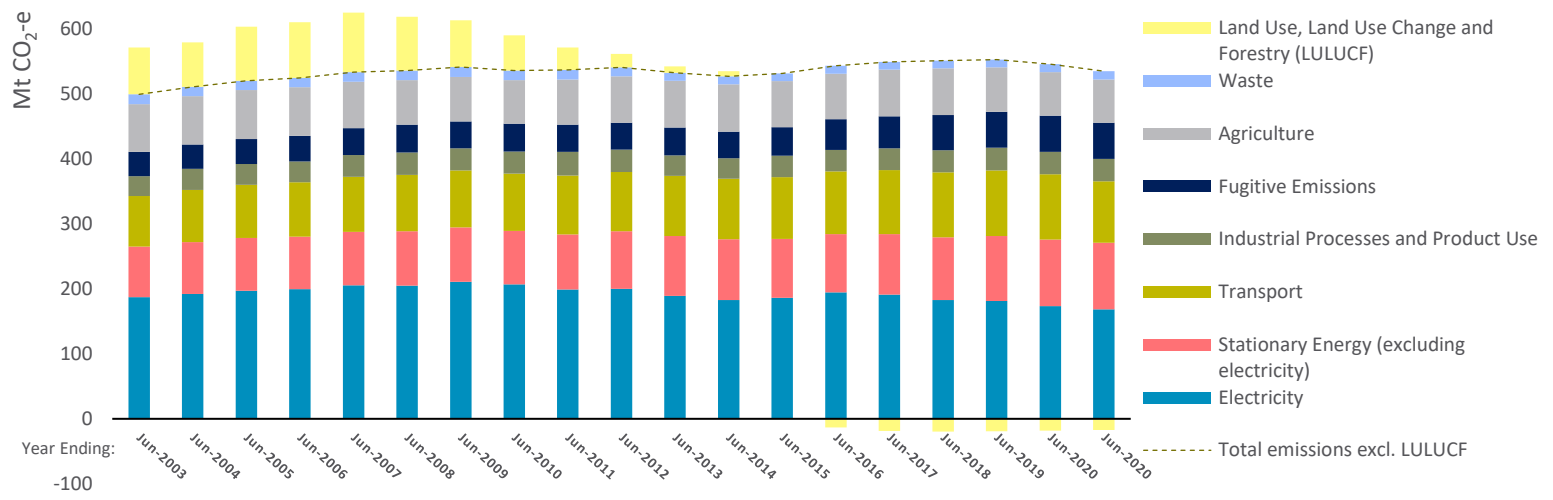


Figure 7: Australia's Quarterly Emissions by Sector*

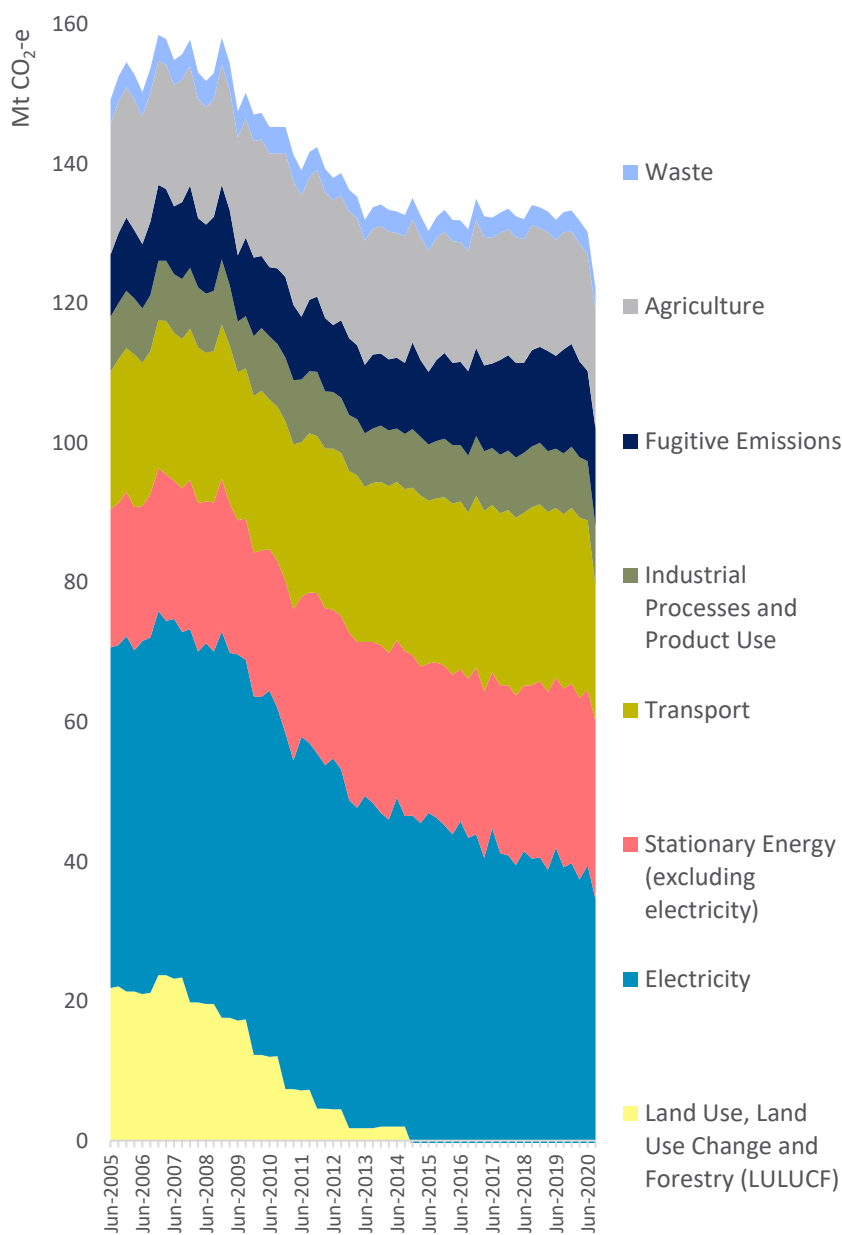
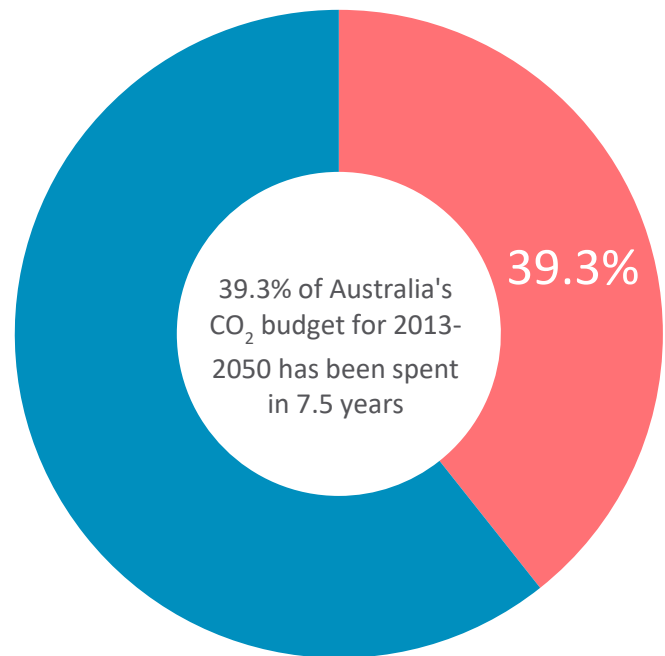


Figure 8: 2 Degree Budget Expenditure to Date



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

3 Real-world Effects – Looking Back on the COVID-19 Response

With recent data becoming available it has been possible to observe some of the continued effects the COVID-19 pandemic response on energy use. Emissions have decreased sharply, in particular we have seen a continued significant reduction in aviation fuel use, with effects also reaching the NEM to a lesser extent. Comparing the first nine months since the pandemic reached Australia with the same period from 2019 shows:

- Aviation fuel use in July 2020 decreased by 608 ML and 1.57 MtCO₂-e, in April 2020 we observed reductions of 602 ML and 1.56 Mt CO₂-e. These represent reductions of 74% and 80% respectively, compared to 2019. Both monthly reductions in emissions are roughly equivalent to taking 662,000 cars off the road for 12 months.
- A decrease of 1,284 ML (domestic flights) and 2,429 ML (international flights) in aviation fuel use, totalling a reduction of 3,714 ML (53%), or 9.6 Mt CO₂-e for the January to September periods,
- A decrease of 2,300 ML (6.5%) in automotive transport fuel use (including LPG, petroleum, ethanol and diesel) for the January to September periods, and
- A reduction in NEM generation of 1.73 TWh (1%) for the January to September periods, with March 2020 affected the most, falling 0.78 TWh (4.5%) below March 2019 levels.

Figure 9: Aviation Fuel Consumption During COVID-19 Response

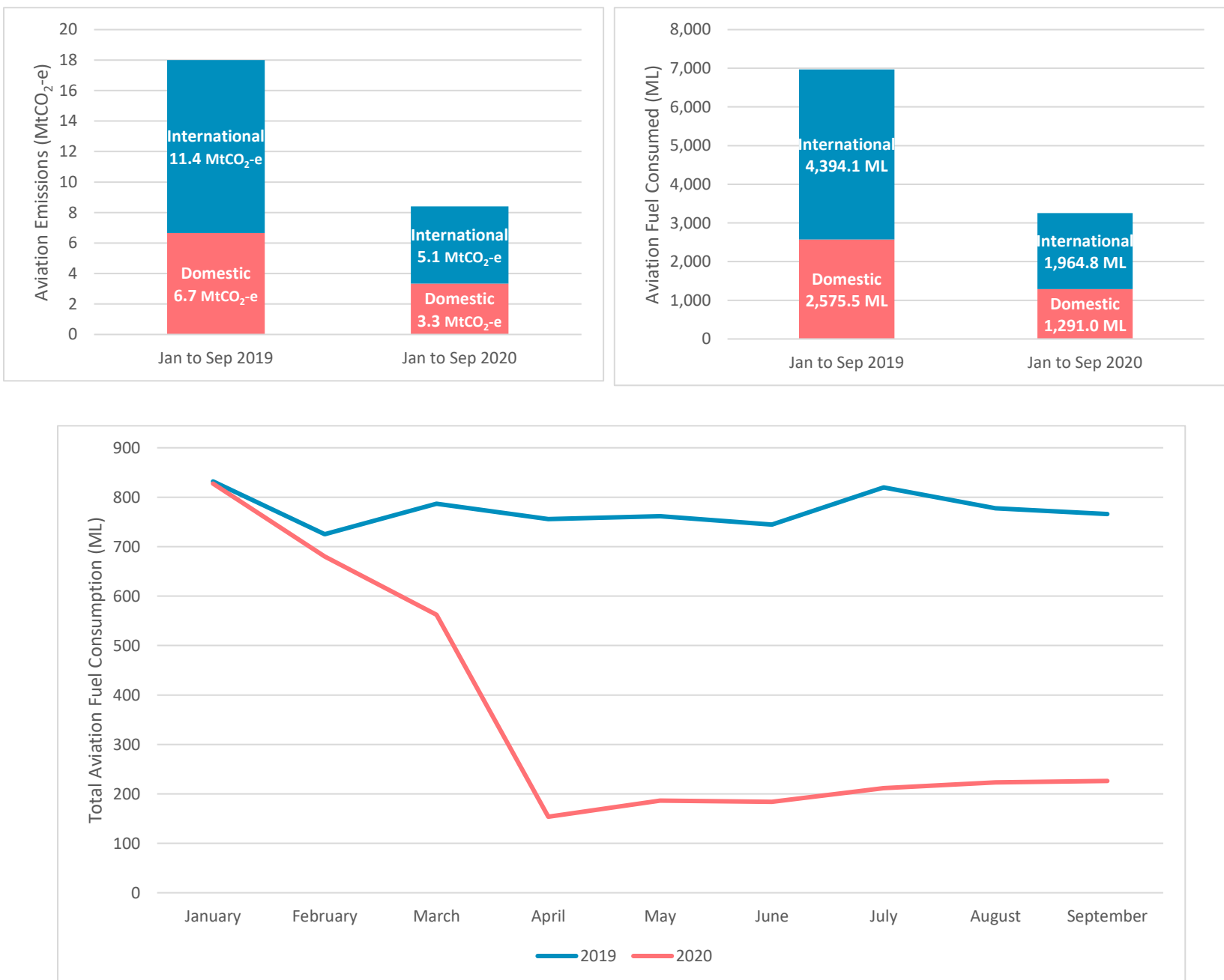


Figure 10: Automotive Fuel Consumption During COVID-19 Response

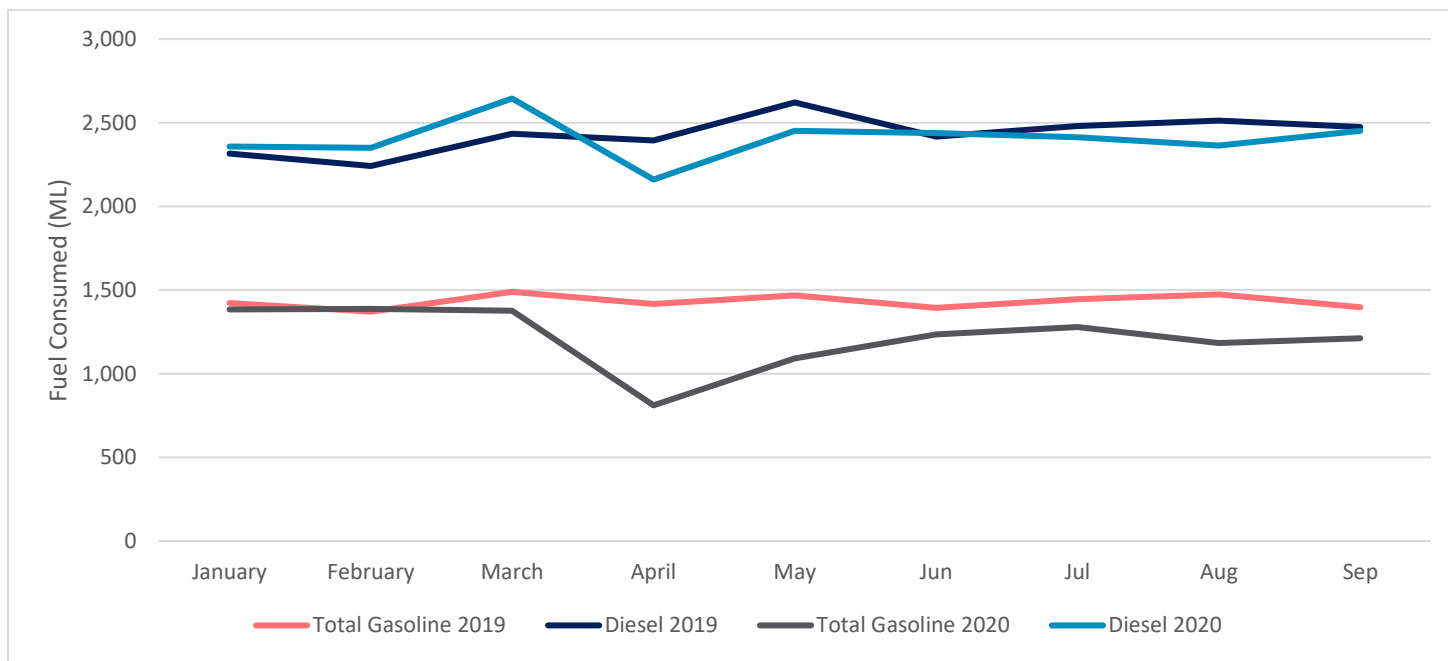
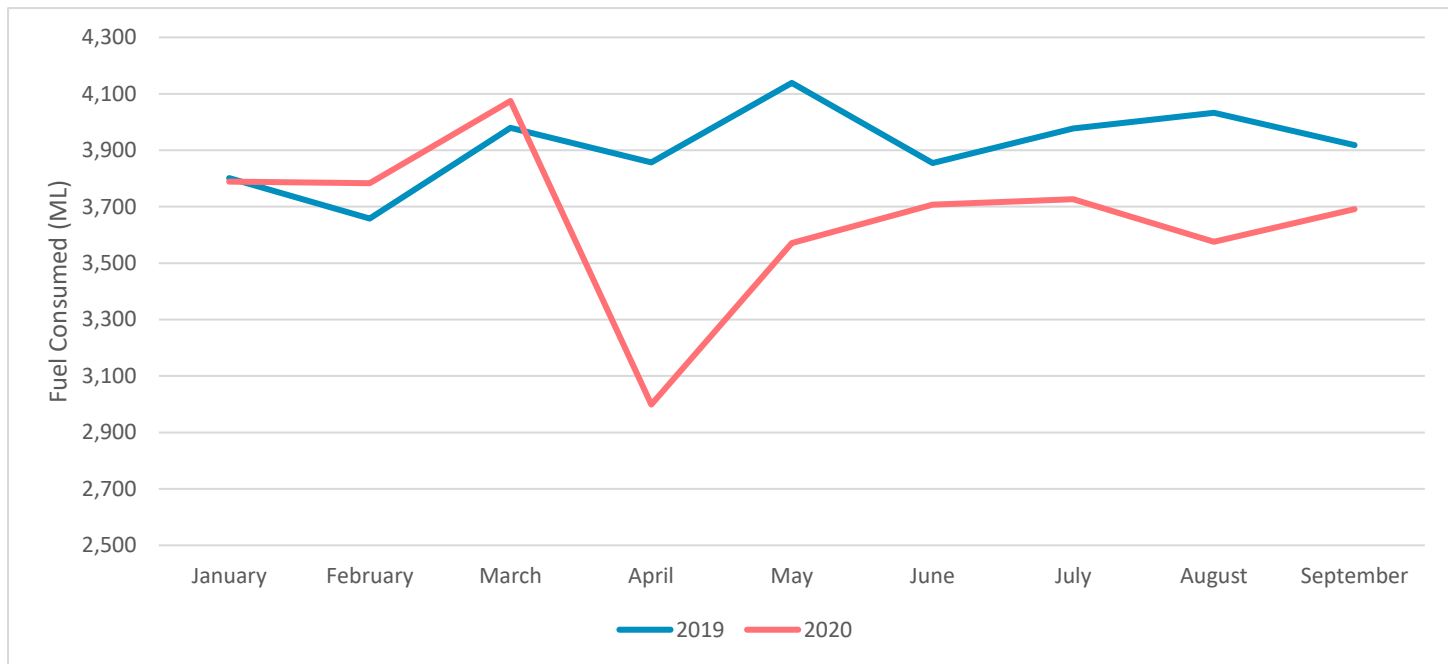
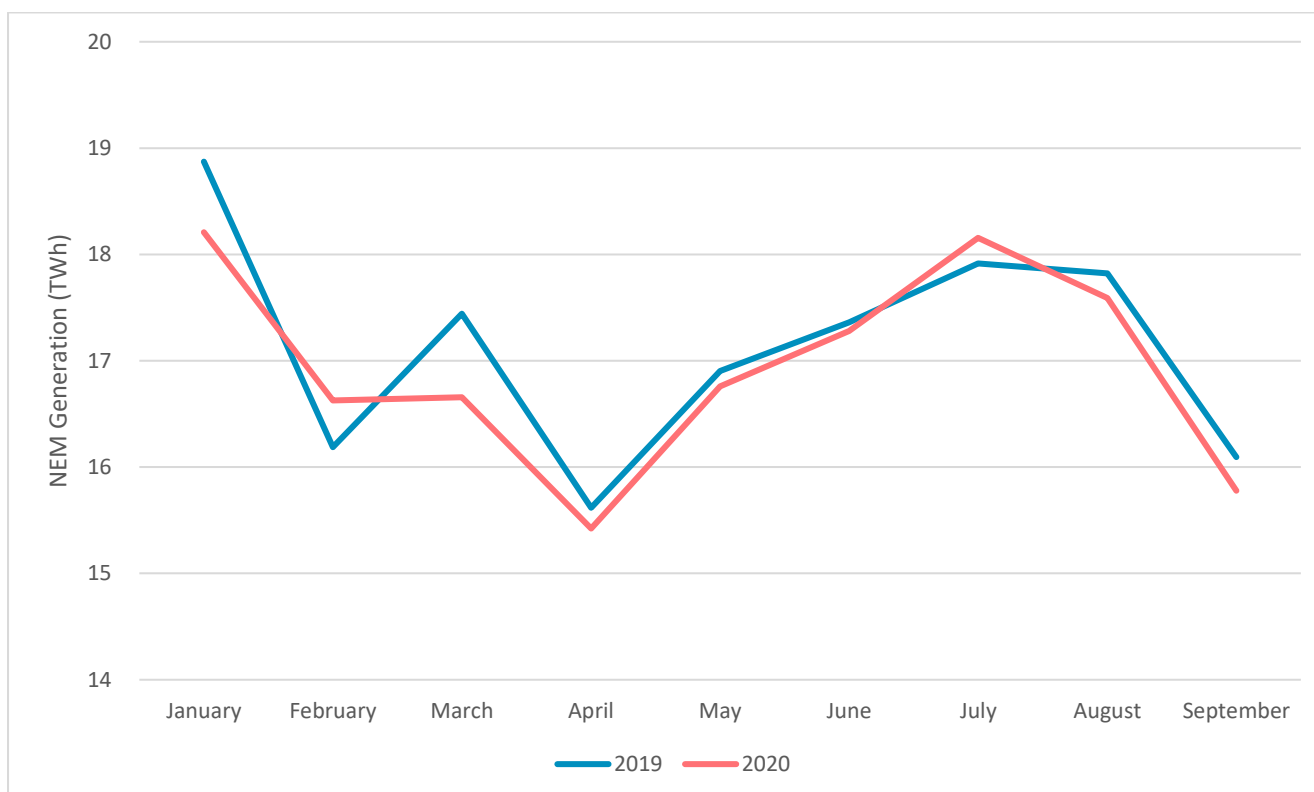


Figure 11: NEM Generation During COVID-19 Response



This report has been compiled by Ndevr 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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