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# Tracking 2 Degrees. Quarterly Report June 2021 – Q4/FY2021

November 2021



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## 1.1 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 Celsius, the independent body Climate Change Authority (CCA) has proposed that 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 the 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 \(Q4/FY2021\)](#). Our results are presented in tonnes of carbon dioxide equivalents (t CO<sub>2</sub>-e). 1 t CO<sub>2</sub>-e is roughly equal to the emissions of a standard 5-seat passenger vehicle driving approximately 5,400 km.

## 1.2 Headline results

- Australia's total emissions for FY2021, excluding land use, are projected to be the lowest on record since 2005. This is the first full financial year cycle under Covid-19 effects.
- Continuous expansion of renewables is driving FY2021 annual electricity emissions to be the lowest on record (160.9 Mt CO<sub>2</sub>-e). This is 6.2% below FY2020 and 10.2% less than FY2019 annual emissions (pre-Covid 19 levels).
- Australia's national emissions for FY2021 are projected to decrease by 2.3% on the previous year and 5.1% compared to FY2019 (pre-Covid 19 levels). This marks the second year of consecutive decreases.
- Emissions for Q4/FY2021 are projected to be 126.8 Mt CO<sub>2</sub>-e, this is an increase of 4.46 Mt CO<sub>2</sub>-e on the previous quarter and an increase of 1.9 Mt CO<sub>2</sub>-e on the same quarter the year prior (Q4/FY2020).
- For Q4/FY2021, Australia's emissions are 1.8 Mt CO<sub>2</sub>-e higher than the trajectory to meet Paris targets and 14.5 Mt CO<sub>2</sub>-e higher than recommended safe Science Based Targets (SBTs).
- Aside from the electricity sector, most of our emissions reductions are due to the impacts of Covid-19 on transport; and shrinking exports from emissions intensive liquified natural gas (LNG) and coal, rather than structural change.
- In order for us to hit our 2030 Paris target of 26-28% reductions, our emissions would need to continue to decrease along the same trend-line they have since COVID 19 began to impact our mobility and energy consumption back in March 2020.

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- We expect emissions to continue to rise as COVID 19 state-wide lockdowns cease. Based on our projections and the underlying policy framework, we see no evidence suggesting the Australian Government's recently announced 35% reduction projections by 2030 are achievable.

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

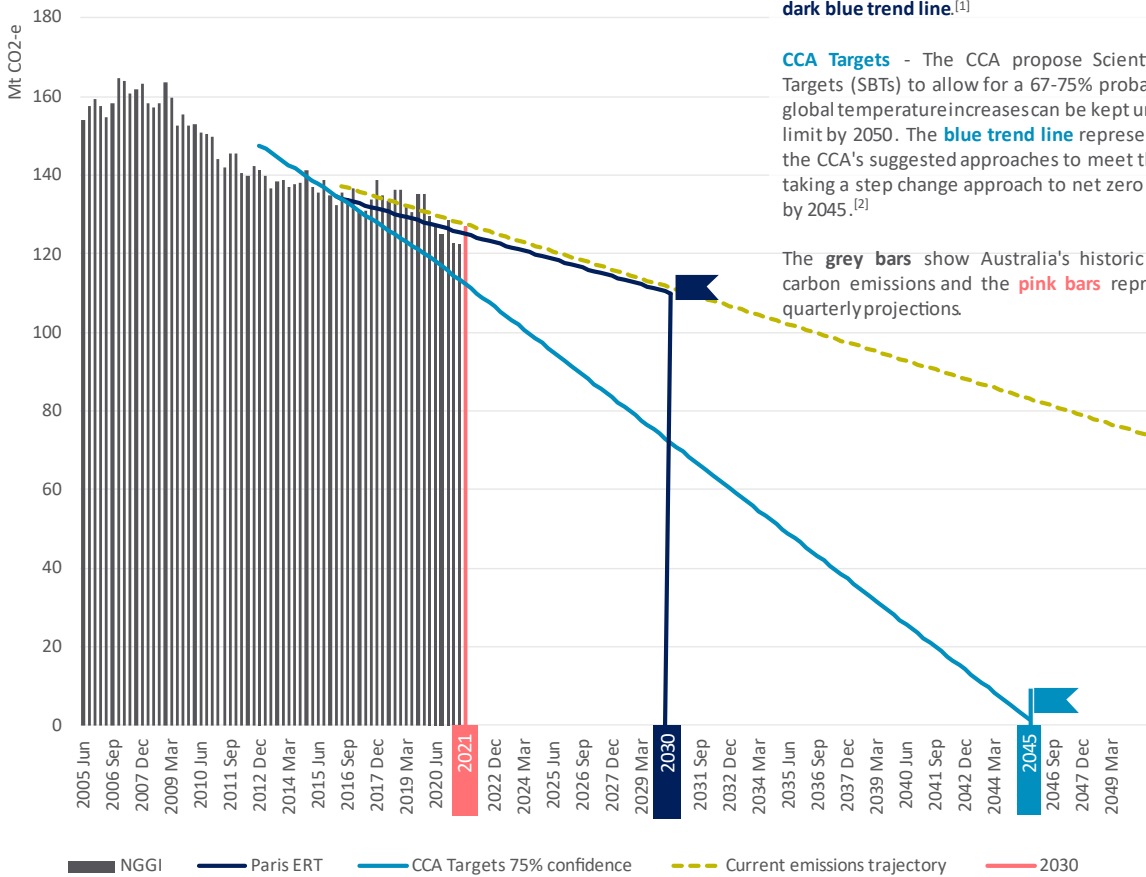
The **dashed line** shows Australia's current emissions trajectory since the adoption of the Paris Agreement on the 12<sup>th</sup> December 2015.

**Paris Emissions Reduction Targets (ERT) -**

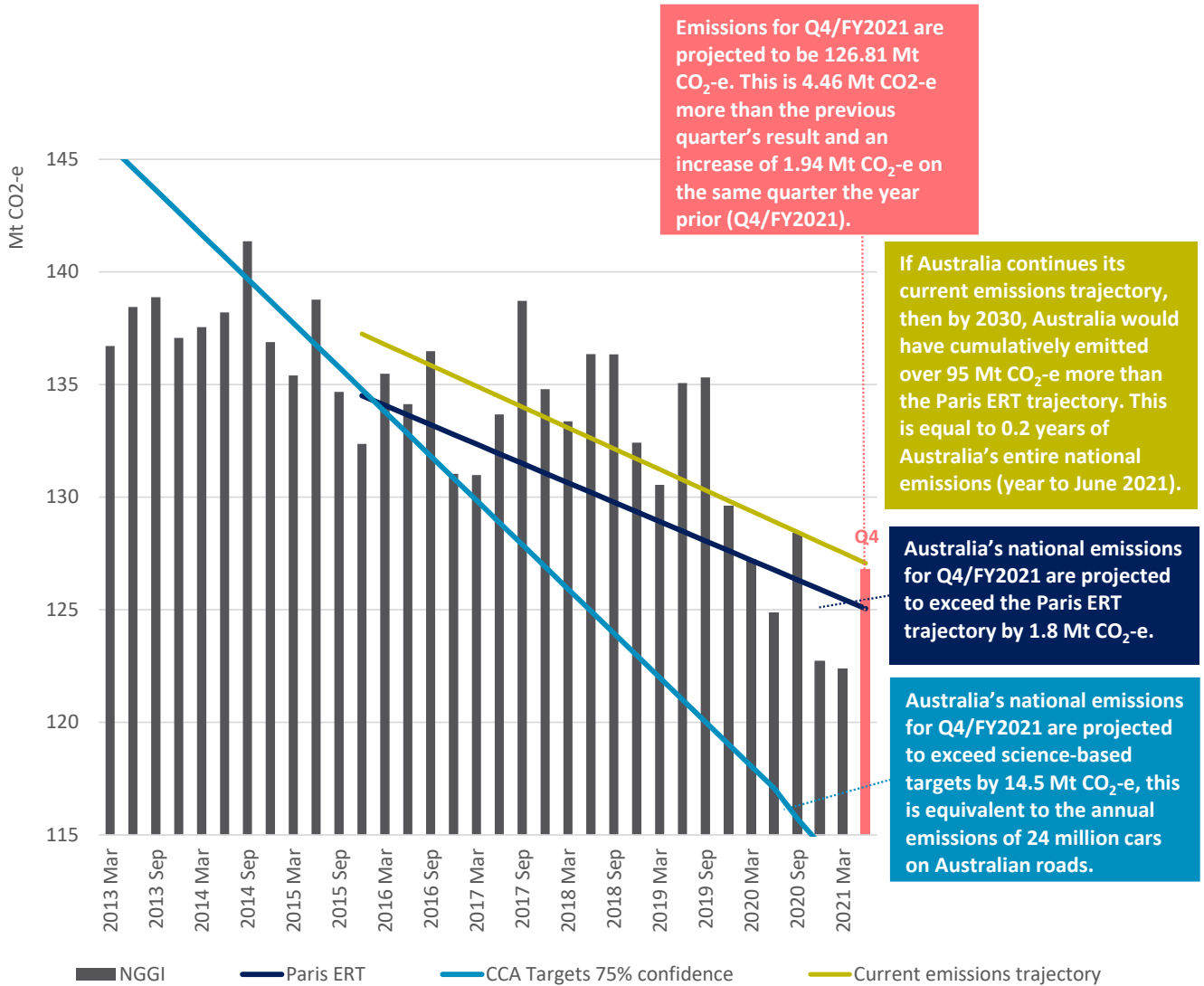
The Australian Government has committed to an emission reductions target set at 26 - 28% below 2005 levels by 2030. This equates to an approximate reduction from 612 million tonnes of carbon dioxide equivalents (Mt CO<sub>2</sub>-e) annually in 2005 to 441 Mt CO<sub>2</sub>-e annually by 2030, this is represented by the **dark blue trend line**.<sup>[1]</sup>

**CCA Targets** - The CCA propose Scientific Based Targets (SBTs) to allow for a 67-75% probability that global temperature increases can be kept under a 2°C limit by 2050. The **blue trend line** represents one of the CCA's suggested approaches to meet this target, taking a step change approach to net zero emissions by 2045.<sup>[2]</sup>

The **grey bars** show Australia's historic quarterly carbon emissions and the **pink bars** represent our quarterly projections.



**Figure 2: Australia’s Quarterly Emissions Projections to a 2-Degree Target, 2013-2021**



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“Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO<sub>2</sub> and other greenhouse gas emissions occur in the coming decades.”

— IPCC Sixth Assessment Report, 2021.

The background of the page is a blue-tinted photograph of two workers in profile, facing each other. They are wearing white hard hats and high-visibility safety vests. The worker on the right is wearing glasses. The overall scene is out of focus, emphasizing the text overlay.

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## 2 Detailed Findings



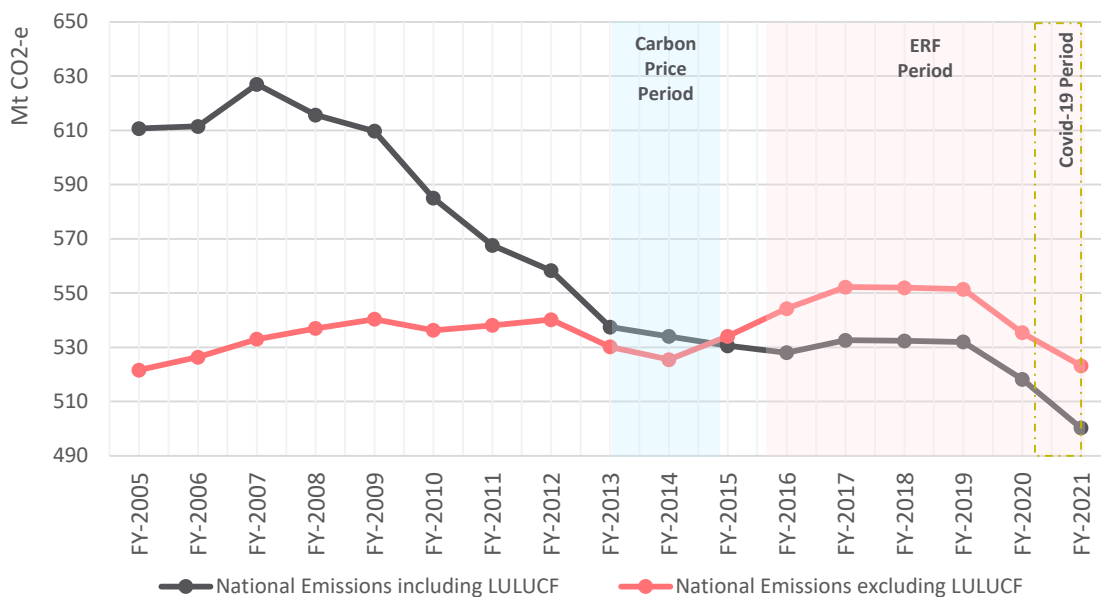
## 2.1 Detailed Findings

### 2.1.1 Annual emissions trends

Figure 3 shows that Australia’s national emissions, excluding land use, land-use change and Forestry (LULUCF), had been rising since FY2005 except for FY2013 and FY2014, when the carbon price mechanism was in place. Since the adoption of the Emission Reduction Fund, emissions have increased every year through to FY2019.

Since the Covid-19 pandemic began in early 2020, the trend has once again shifted downwards. Emissions for the year to June (FY2021) are projected to decrease 2.3% on the previous year and 5.1% on pre-Covid levels (FY2019), marking the second year of consecutive decrease. Despite these drops in emissions during the Covid-19 period, *Australia remains on track to overshoot the 2030 Paris target by 95 Mt CO<sub>2</sub>-e.*

**Figure 3: Australia’s Total Annual Emissions, 2005-2021**



### 2.1.2 Electricity emissions lowest on record despite stable generation

The National Electricity Market (NEM), which supplies around 80% of Australia’s total electricity consumption, is undergoing a shift in the method of generation. Although over 70% of electricity is still generated from fossil fuels, this share is declining. Figure 4 shows that while electricity



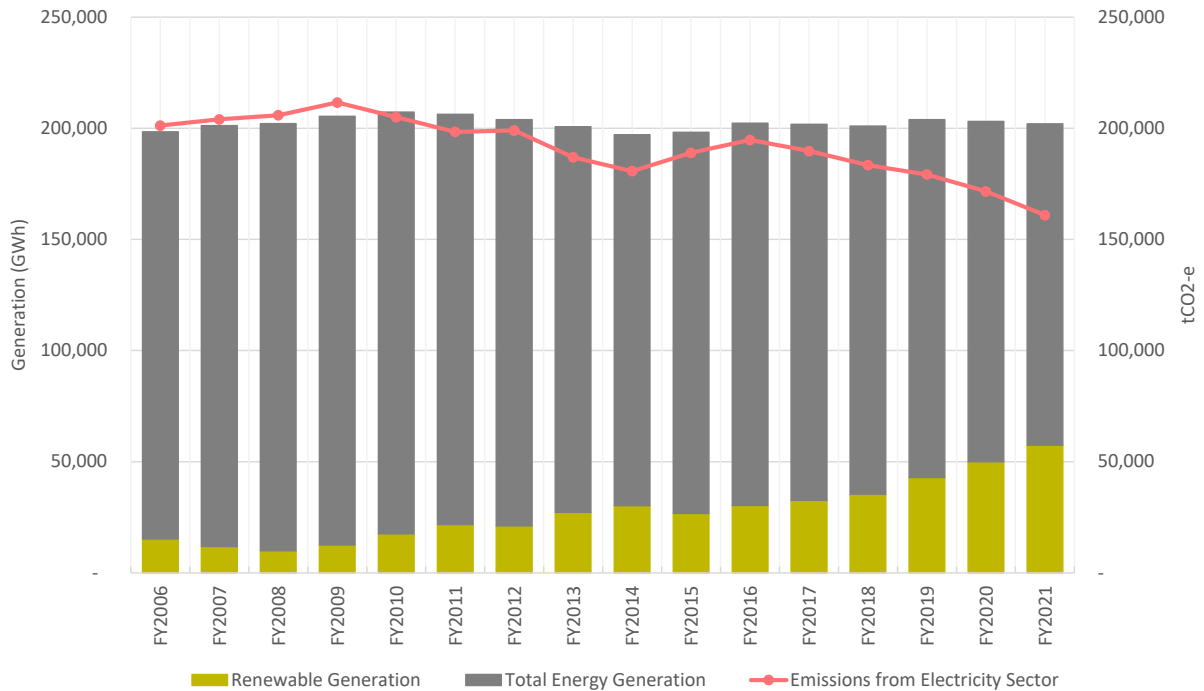
generation has been relatively stable for the last ten years, emissions from the Australian electricity sector have declined thanks to rising renewable energy penetration in the market.

Historically, electricity emissions alone account for more than 30% of Australia’s annual emissions (excluding land use). The increasing electricity market transition to renewable energy is reducing this weight from around 38% in FY2005 to 31% in FY2021. The share of emissions from the electricity sector is expected to decline further as the growth in renewable energy continues.

FY2021 annual electricity emissions (including all markets) are projected to be 160.9 Mt CO<sub>2</sub>-e, this is a decrease of 6.2% on FY2020 and a 10.2% reduction on FY2019, marking FY2021 emissions the lowest on record.

Quarterly results showed a Renewable Energy market share of 27.8% for Q4/FY2021, this is a decrease of 1.7% on Q3/FY2021 but it exceeds the quarter the year prior (Q4/FY2020) by 2.8%.

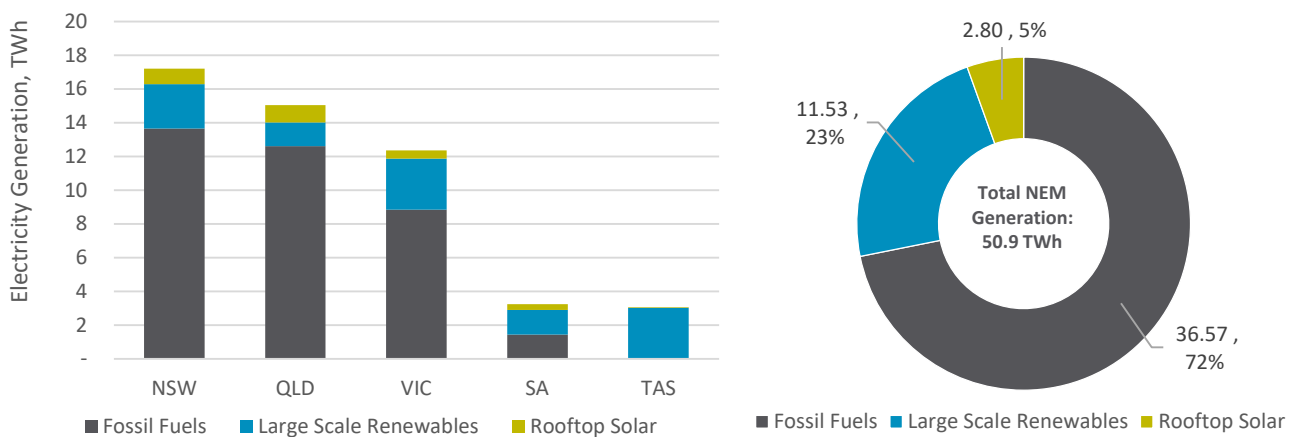
**Figure 4: Renewable energy share in the NEM and emissions reduction trend**



**2.1.3 Electricity analysis for the Energy Markets – The inevitable rise of renewables continues**

- Electricity emissions projections for Q4/FY2021 were the second lowest recorded across the entire data set (38.45 Mt CO<sub>2</sub>-e), with the lowest being recorded in Q2/FY2020 (38.39 Mt CO<sub>2</sub>-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 (NSW, VIC, TAS and SA) for the period was 27.8% (including rooftop solar).
- Quarterly black coal generation has increased by 0.6 TWh, while and brown coal dropped by 0.8 TWh. Generation from natural gas increased by 1.3 TWh. Aggregated fossil fuel contributed to a 72.1% powered grid.

**Figure 5: Electricity Generation in the National Electricity Market**



For Q4/FY2021, results for the NEM states are as follows:

- **NSW** generated 17.2 TWh of electricity with 77.5% from black coal, 1.9% from gas and 20.6% from renewable sources including wind, hydro, utility scale solar and rooftop solar. NSW’s renewable percentage has decreased compared to the previous record of 25.2% which occurred in Q3/FY2021.
- **QLD** generated 15 TWh of electricity with 73.5% from black coal, 10.3% 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 1.2% compared to the previous quarter falling to 16.2%.

- **VIC** generated 12.3 TWh of electricity with 68.0% from brown coal, 3.6% from gas and 28.4% from renewable sources including wind, hydro, rooftop solar and utility-scale solar. VIC's renewable energy penetration fell short on the previous quarter by only 0.7%.
- **SA** generated 3.2 TWh of electricity with 45.0% from gas and 55.0% from renewable sources such as wind, rooftop solar, utility scale solar and battery (discharge). SA's renewable energy penetration has fallen 16.3% on last quarter. Solar rooftop penetration in SA is the highest across states with 11% of the SA's grid-mix share.
- **TAS** generated 3.0 TWh of electricity with 99.43% 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.

The increasing expansion of renewable energy in the mix grid is also noted across the Wholesale Electricity Market (WEM) through the Southwest Interconnected system (SWIS).

- **WA** generated 4.9 TWh of electricity during Q4/FY2021, with 23.7% from renewable sources such as solar (including rooftop), wind and biogas. Black coal still accounts for 42.2% of the electricity generation in the state, followed by gas 34.1%.  
Although Q4's renewable energy share fell 12% points compared to Q3/FY2021, annual electricity generation from renewable sources in WA has grown from 3.6 TWh in FY2019 to 6.1 TWh in FY2021, primarily driven by rooftop solar and wind generation.

#### 2.1.4 Stationary and Transport energy – The 'Hard to Abate' Emissions

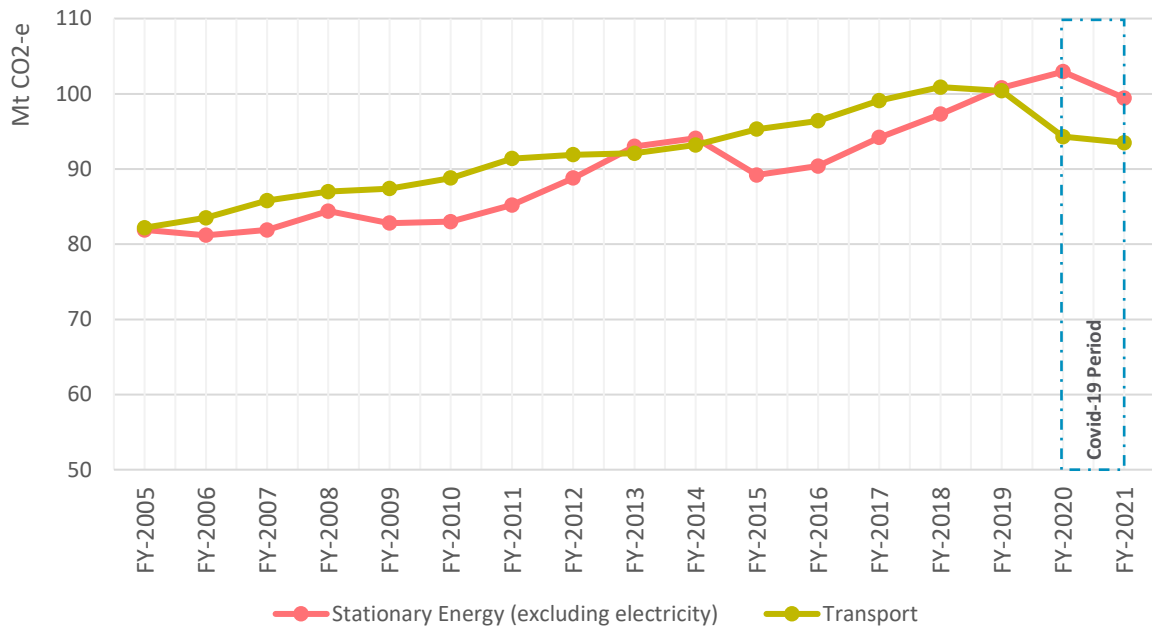
Quarterly projections of stationary energy resulted in 25.2 Mt CO<sub>2</sub>-e for Q4/FY2021. This is 12% more than the previous quarter but 6% more than the same quarter the year prior (Q4/FY2020). Figure 6, shows that the annual stationary energy emissions have been rising since 2015, making up 19% of Australia's FY2020 total emissions. Although, the year-to June emissions from stationary energy is expected to fall for FY2021 by 3% compared to FY2020, its share in the national inventory will remain the same (19%).

Quarterly emissions from transport (fuels in transportation by road, rail, and domestic aviation and shipping) for Q4/FY2021, are expected to be 25.9Mt CO<sub>2</sub>-e. This is 13% more than Q3/FY2021 and 35% more than Q4/FY2020.

Cumulative annual emissions from the transport sector for FY2021 are projected to be 93.5 Mt CO<sub>2</sub>-e, accounting for 18% of Australia's national inventory. As shown in Figure 6, transport emissions have increased every year since 2005 except for FY2020 and FY2021, where Covid-19 restrictions resulted in a drop in total emissions. FY2021 emissions are projected to be 1% lower than the FY2020 figure and 6.9% lower than pre-Covid 19 levels (FY2019). Historical data shows

that up to FY2019, emissions from transport have been increasing at an average annual rate of 1.6%.

**Figure 6: Stationary Energy and Transport Emissions trend**



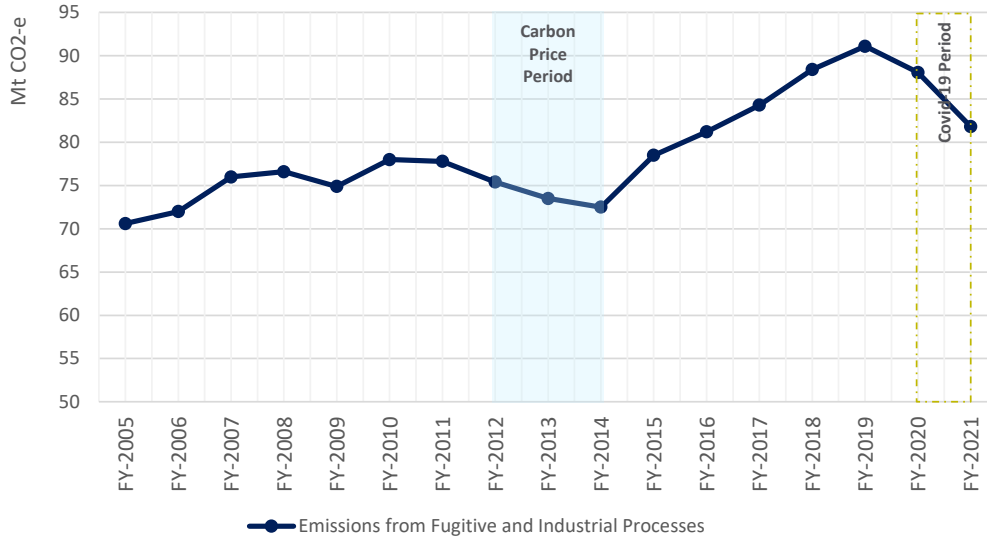
**2.1.5 Industrial sector**

Combined Fugitive and Industrial Processes emissions makes up 16% of Australian’s total emissions for FY2021. These emissions are attributed to Australia’s heavy industrial and mining sectors. As shown in Figure 7, except for the carbon price period, the combined emissions showed an upward trend since 2005 up to FY2019, but they experienced a steep drop in FY2020 and FY2021 (Figure 7).

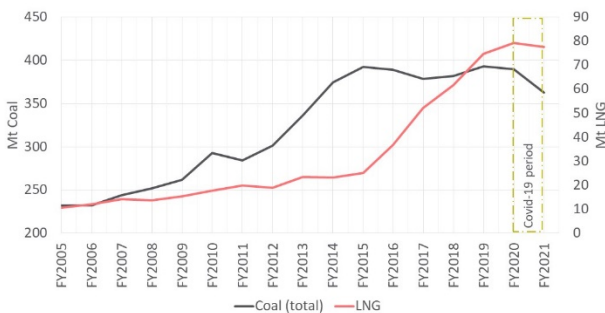
The decrease in annualised fugitive emissions can be explained by shrinking demand for LNG and coal. LNG processing and coal mining are both emissions intensive activities, so reduced global demand for the commodities in demand generally leads to a fall in emissions. After steady growth between FY2005 to FY2020, FY2021 LNG exports decreased by 2.0% compared to FY2020. However, it was the thermal and metallurgical coal exports that played a leading role in the drop of FY2021 fugitive emissions, with a 6.9% fall from FY2020 on top of a 7.7% drop on FY2019 (Figure 8). This fall in exports was driven by a slumping coal price in the international

market experienced from early FY2020 onwards and falling below the historical average price per unit in FY2021 (Figure 9).

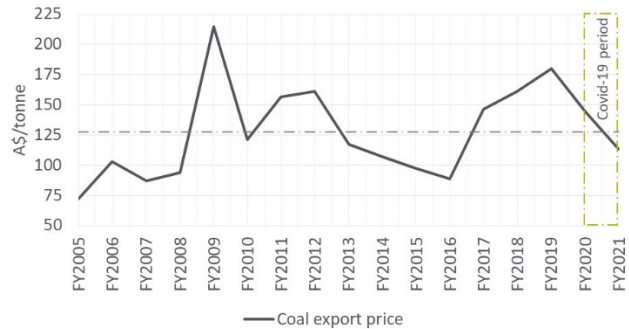
**Figure 7: Emissions from Fugitive and Industrial Processes annual trend**



**Figure 8: Annual coal and LNG exports trend**

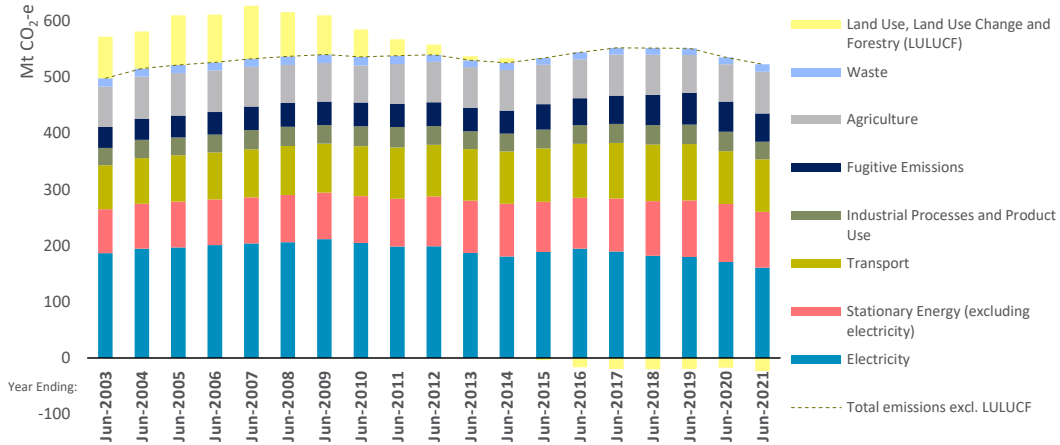


**Figure 9: Annual average coal export price**

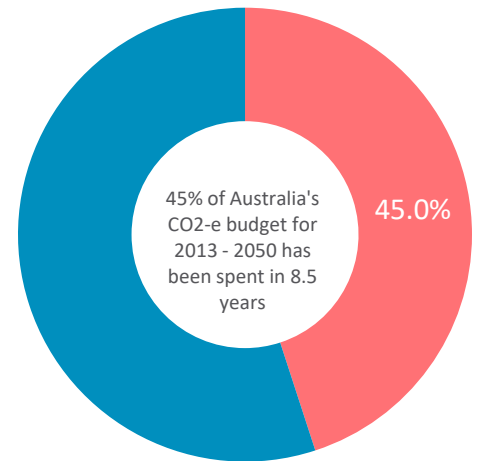
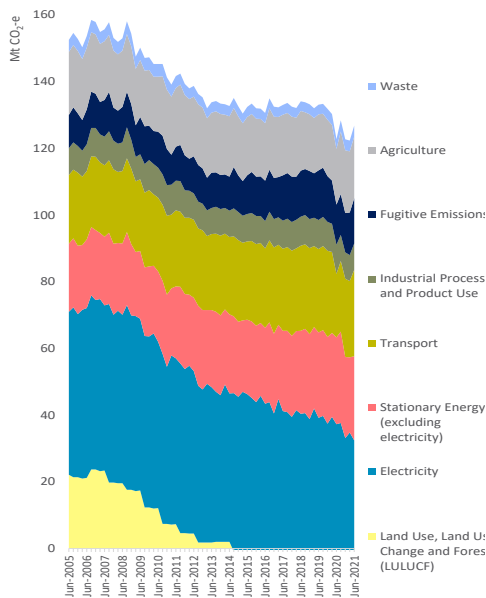


The fugitive emissions trend is expected to rebound as prices continue to surge and thermal coal exports lift. This has started to show during Q4/FY2021, where the combined emissions for fugitive and industrial processes are projected to be 21.5 Mt CO<sub>2</sub>-e; 4.5% more than Q3/FY2021 and 3.4% more than the same quarter in FY2020 (Q4).

**Figure 10: Australia’s Annual emissions by sector**



**Figure 12: 2-Degree Budget Expenditure to date**



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

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## We're tracking Australia's carbon budget, find out how we can help you monitor and reduce yours...

Ndeivr Environmental is a climate change and human rights advisory firm, focused on accelerating the economy's transition to a sustainable, net zero future. For over 10 years, we've partnered with businesses and governments, to provide innovative solutions to meet emerging challenges, and relentlessly pursue the transformation of commitment into action – to create real and meaningful impact. [www.ndeivrenvironmental.com.au](http://www.ndeivrenvironmental.com.au)



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, Australia Resources and Energy quarterly and historical reports 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) and South West Interconnected System (SWIS) are sourced from Open NEM.

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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