

Undermining Climate Action

The Australian Way

Australia's target of net zero emissions by 2050 is inconsistent with its plans to massively expand coal and gas production. New fossil fuel projects under development in Australia would result in 1.7 billion tonnes of greenhouse gas emissions each year – equivalent annual emissions of over 200 coal-fired power stations, twice as much as global aviation.

Discussion paper

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November 2021

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ISSN: 1836-9014

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Acknowledgement: The Australia Institute thanks Dr Hugh Sadler for his invaluable assistance with quantitative analysis .

Summary

The Australian Government's adoption of a 2050 net zero target prior to the COP26 UN Climate Change Conference should be seen in the context of an enormous, planned increase in coal and gas production in Australia.

Australia is already one of the two largest exporters of coal and the largest exporter of liquefied natural gas (LNG) in the world, exporting almost 400 million tonnes of coal and around 75 million tonnes of LNG annually. This results in over 1.5 billion tonnes of emissions to the atmosphere each year, when these fuels are burned in Australia and overseas.

Despite the urgent need to reduce emissions to fight climate change, the Australian Government is aggressively pursuing the expansion of fossil fuel production rather than a planned transition away from them.

Australia has 72 major coal projects under development that would double current production and add a further 1.4 billion tonnes of CO₂e to the atmosphere annually. There are also 44 major new gas and oil projects under development, equivalent to Australia's entire current gas production which would add over 300 million tonnes of CO₂e.

The total emissions associated with currently planned coal and gas projects in Australia are around 1.7 billion tonnes of CO₂e annually. This is equivalent to almost twice the annual emissions from global aviation, more than three times Australia's annual emissions, and more annual emissions than 200 coal-fired power stations.

Introduction

On 26 October 2021 Prime Minister Scott Morrison announced Australia's long-awaited net zero 2050 target, just one week out from the Glasgow Climate Conference (COP26). The Long-Term Emissions Reduction Plan ('Net Zero 2050 Plan') was unveiled, laying the pathway to achieving net zero emissions by 2050.

The Net Zero 2050 Plan is riddled with shortcomings. The net zero target will not be legislated, no short- or medium-term targets are included, it relies on speculative technological breakthroughs and offsets, and is based entirely on previously announced policies. However, by far the most egregious aspect of the Net Zero 2050 Plan is that it facilitates the expansion of fossil fuel production in Australia. The plan states clearly that Australia "will not shut down coal or gas production" and that "Australia's coal and gas export industries will continue through to 2050 and beyond".¹

Further fossil fuel development is inconsistent with a genuine commitment to climate action. The science is clear – fossil fuel production must decline for the world to have a chance of limiting global warming to 1.5°C and avoiding catastrophic climate change.²

While many international jurisdictions are turning their attention to winding-down fossil fuel production in an orderly, just, and equitable way,³ Australia is making no such plans. Not only does Australia lack the policies and commitment to a planned transition from fossil fuel production, but it is also opening vast new fossil fuel reserves.

Australian Governments have aggressively pursued the expansion of fossil fuel development in Australia for decades through subsidies, reduced environmental regulation, and direct intervention to approve particular projects. For example, the Queensland Government has intervened to expedite the approval process for a large coal project in the Galilee Basin,⁴ and the New South Wales (NSW) Government has attempted to change planning laws to prevent mining projects being blocked on the basis of their scope 3

¹ Australian Government (2021) *Australia's Long-term Emission Reduction Plan*, p 11
<https://www.industry.gov.au/sites/default/files/October%202021/document/australias-long-term-emissions-reduction-plan.pdf>

² Welsby, Price, Pye and Ekins (2021) *Unextractable fossil fuels in a 1.5°C world*, Nature
<https://www.nature.com/articles/s41586-021-03821-8>

³ SEI, IISD, ODI, E3G and UNEP (2021) *The Production Gap Report 2021*, p 92, Annex 1 'examples of actions towards a managed wind-down of fossil fuel production',
https://productiongap.org/wp-content/uploads/2021/10/PGR2021_web_rev.pdf

⁴ Bavas (2019) *Adani delays lead Anastacia Palaszczuk to ask Coordinator-General to intervene*,
<https://www.abc.net.au/news/2019-05-22/adani-approvals-removal-environment-department/11138140>

emissions.⁵ The Federal Government is similarly proactive in its support for the expansion of coal mining. In July this year the Australian Government announced it would provide a \$175 million loan for a Queensland coal mine, having vetoed a similar loan to a wind farm that was approved by the same loan facility just two months earlier.⁶

Australia's fiscal regime benefits fossil fuel producers through vast government subsidies, while a comparatively low share of the profits from the extraction and exploitation of publicly owned resources flow back to the Australian community. In the 2020-21 budget year, Australian federal and state governments provided \$10.3 billion worth of spending and tax breaks to assist fossil fuel industries. At the same time, many major oil and gas projects paid little or no royalties due to the poor design of the Petroleum Resources Rent Tax (PRRT) – the main vehicle for collecting revenue from oil and gas projects.⁷

The enthusiasm for expanding fossil fuel production is also reflected in statements by senior Australian Government ministers. In 2017, Prime Minister Scott Morrison infamously brought a lump of coal to parliament as Treasurer, announcing “This is coal...don't be afraid”.⁸ In his address to the National Press Club, Senator and previous Resources Minister, Matt Canavan called on Australia to “produce more coal than it ever has in its history”,⁹ while current Resources Minister, Keith Pitt has called for the expansion of coal and gas exports, claiming “We need to continue to explore all opportunities and turn them into reality.”¹⁰

Australia's plans to increase fossil fuel production are inconsistent with public sentiment, as well as the global production declines necessary to limit global warming. The 2021 Climate of the Nation report – Australia's longest running survey of community attitudes to climate

⁵ Cox (2019) *NSW moves to stop mine projects being blocked because of their overseas emissions*, <https://www.theguardian.com/environment/2019/oct/22/nsw-to-try-to-stop-mine-projects-being-blocked-because-of-their-overseas-emissions>

⁶ Loftus (2021) *Federal Government to loan Olive Downs coal mine project near Moranbah \$175m*, <https://www.abc.net.au/news/2021-07-01/federal-government-to-loan-olive-downs-coal-mine-175-million/100259414>; Parkinson and Mazengarb (2021) *Keith Pitt vetoes federal funding deal for wind and battery hub in Queensland*, <https://reneweconomy.com.au/keith-pitt-vetoes-federal-funding-deal-for-wind-and-battery-hub-in-queensland/>

⁷ Campbell, Littleton, Armistead (2021) *Fossil fuel subsidies in Australia*, <https://australiainstitute.org.au/wp-content/uploads/2021/04/P1021-Fossil-fuel-subsidies-2020-21-Web.pdf>

⁸ Murphy (2017) *Scott Morrison brings coal to question time: what fresh idiocy is this?*, <https://www.theguardian.com/australia-news/2017/feb/09/scott-morrison-brings-coal-to-question-time-what-fresh-idiocy-is-this>

⁹ Vorrath (2018) *Matt Canavan loves coal “unashamedly” – says it's good for First Australians*, <https://reneweconomy.com.au/matt-canavan-loves-coal-unashamedly-says-its-good-for-first-australians-35996/>

¹⁰ Crowe (2020) *New Resources Minister calls for more coal, gas and uranium exports*, <https://www.smh.com.au/politics/federal/new-resources-minister-calls-for-more-coal-gas-and-uranium-exports-20200211-p53zu5.html>

change – found the majority of Australians (60%) support an end to new coal, gas and oil projects. Most Australians (63%) would prefer Australia’s economic recovery from the COVID-19 pandemic to be primarily powered by investment in renewables, with just 12% preferring a ‘gas-fired recovery’. Additionally, almost three-quarters of Australians (73%) think Australian governments should plan to phase out coal mining and transition to other industries.¹¹

Globally, governments are currently planning to produce more than twice the fossil fuels in 2030 than would be consistent with limiting warming to 1.5°C. This is according to the 2021 Production Gap report, which tracks discrepancies between the planned fossil fuel projects of 15 major producer countries and production levels consistent with the Paris agreement commitment to limit global warming.¹² While these discrepancies exist globally, Australia is unique in its staunch commitment to fossil fuel production, combined with high economic capacity for transition and low share of government revenue from oil and gas production.

Australia cannot claim to be acting on climate change while continuing to supply the world with fossil fuels.

This report estimates the emissions associated with the coal and gas projects currently planned in Australia. The vast emissions that would result from current planned fossil fuelled projects in Australia are not consistent with addressing climate change and achieving net zero emissions.

¹¹ Quicke (2021) *Climate of the Nation 2021*,

<https://australiainstitute.org.au/wp-content/uploads/2021/10/211013-Climate-of-the-Nation-2021-WEB.pdf>

¹² SEI, IISD, ODI, E3G and UNEP (2021) *The Production Gap Report 2021*,

https://productiongap.org/wp-content/uploads/2021/10/PGR2021_web_rev.pdf

Methodology

Selection of planned coal and gas projects

This report uses the list of resource and energy major projects (REMP) that are currently under development, published by The Australian Government's Office of the Chief Economist (OCE).¹ Projects in the REMP list are defined by the OCE as follows:

This report and project list is the result of a census on major resources and energy projects under development in Australia. For the purposes of this report, 'major' projects are those valued at over \$50 million, and which have the potential to reach a final investment decision within the next five years.²

The REMP list includes coal and gas projects that satisfy those criteria. This report uses the REMP list as the basis for planned new coal and gas projects in Australia. It also includes the opening up of the Beetaloo and Canning basins up by the Australian and Western Australian Governments respectively

This report is conservative in its estimate of the planned coal and gas expansion in Australia as it restricts itself to projects "under development." The coal and gas resources contained in license areas held by coal, oil and gas companies are many times larger than the potential production of projects under development, and the companies with rights to exploit these resources progressively develop new projects to extract more of these resources.

This report does not include some potentially very large projects that are under development, where there is no publicly available information to estimate the potential production of the project.

Responsibility for emissions within Australia

Greenhouse gas emissions attributable to Australia's exports of coal and gas occur both in Australia, where these commodities are produced and processed, and in the countries to which they are exported, where they are burnt to supply energy.

Emissions in Australia arise from the energy required to extract and process coal and gas ready for export, and also from fugitive emissions of, mainly methane, but also carbon dioxide in the case of some gas sources.

The main requirements of energy in coal mining are for diesel fuel and electricity to power excavators, drag lines, haul trucks and other types of equipment needed to extract and transport the coal. For a mine-owning company, a distinction is made between emissions arising from activities for which it has direct operational responsibility, and emissions arising

from the activities of contracted mine operators or electricity supply businesses from which it buys electricity.

Under the Greenhouse Gas Protocol, emissions from these sources would be classified respectively as scope 1, scope 3 (upstream), and scope 2. However, in terms of national emissions accounting, it is irrelevant who is responsible for the emissions or where they occur, provided only that they occur within Australia. All that matters is that the emissions arise from the activity of mining coal for export.

Similar considerations apply to emissions arising from the use of energy to extract, process, transport (by pipeline) and liquefy gas for export. The main institutional difference from coal mining is that a company exporting LNG typically owns (often in joint venture) and operates the entire process from gas well to ship, including the on-site generation of electricity as an integral part of the LNG plant operation.

Between 2005, which is the base year for Australia's commitment under the Paris Accord, and 2020, Australia's exports of coal increased by 68% and of LNG by more than sixfold. We have estimated that the combined total emissions attributable to these exports increased from 28 Mt CO₂-e to 78 Mt CO₂-e. Expressed as a share of Australia's total emissions, they increased from under 5% to over 15%.

Coal

CURRENT EMISSIONS FROM AUSTRALIAN COAL

In 2019-20 Australia produced 451 Mt of black coal. Around 245 Mt was mined in Queensland and 200 Mt mined in NSW, with the balance in Western Australia. 390 Mt was exported and around 61 Mt was consumed in Australia.¹³

Combustion emissions

The main source of emissions from coal is when it is burned in coal power stations or industrial processes such as steelmaking. As shown in Table 1 below, the combustion emissions from Australian coal burned in Australia and overseas was around 1.15 billion tonnes.

Table 1: Combustion emissions of total saleable black coal production Australia 2020

	Unit		Source
Australian coal production 2020	Mt	451	OCE REQ 2021, historic data
Energy per mass	PJ/Mt	27	AES Guide to the Australian Energy Statistics 2021
Energy	PJ	12,185	
CO2 per energy	t CO2/PJ	94,600	IPCC (2006) <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 2 Energy Table 1.4</i>
CO2	t	1,152,710,460	

Table 1 estimates combustion emissions from physical quantity of coal produced and converting that to units of energy using an Australian Government factor for the energy content of the coal. Metallurgical coal and thermal coal have slightly different energy contents, with thermal coal having on average 27 gigajoules (GJ) of energy per tonne of coal, and metallurgical coal having 29 GJ per tonne. To be conservative, these calculations have assumed the lower thermal coal energy content for all coal. When the coal is burned, it produces 94,600 tonnes of CO2 per petajoule (PJ) of energy, which would result in almost 1 billion tonnes of emissions from combustion of the coal alone.

¹³ Australian Government, Department of Industry, Science, Energy and Resources (2021) *Resources and energy quarterly: September 2021*, <https://publications.industry.gov.au/publications/resourcesandenergyquarterlyseptember2021/index.html>

As shown in Table 2 below, the 390 Mt of Australian coal that was exported and burned overseas resulted almost 1 billion tonnes of emissions.

Table 2: Combustion emissions from Australian black coal burned in customer countries

	Unit		Source
Australian export coal 2020	Mt	390	OCE REQ 2021, historic data
Energy per mass	PJ/Mt	27	AES Guide to the Australian Energy Statistics 2021
Energy	PJ	10,530	
CO2 per energy	t CO2/PJ	94,600	IPCC (2006) <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 2 Energy Table 1.4</i>
CO2	t	996,138,000	

The 61 million tonnes burned in Australia resulted 147.6 Mt CO2 combustion emissions.

Table 3: Combustion emissions from black coal consumed in Australia 2020

	Unit		Source
Coal consumption	Mt	61	OCE REQ 2021, historic data
Energy per mass	PJ/Mt	27	AES Guide to the Australian Energy Statistics 2021
Energy	PJ	1,674	
CO2 per energy	t CO2/PJ	94,600	IPCC (2006) <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 2 Energy Table 1.4</i>
CO2	t	155,806,200	

Lifecycle emissions

Additional emissions are created from the mining and transport of coal. There was a further 14 Mt of emissions from the mining and transport of the coal and a further 27.3 Mt CO2e of methane emissions.¹⁴

¹⁴ Australian Government, Department of Industry, Science, Energy and Resources (2021) *National Greenhouse Gas Inventory Quarterly Update: March 2021*, <https://www.industry.gov.au/data-and-publications/national-greenhouse-gas-inventory-quarterly-update-march-2021>

As such, the total lifecycle emissions from black coal produced in Australia in 2019-20 was approximately 1.2 billion tonnes CO₂e.

Australia also mines and uses brown coal in the state of Victoria for electricity generation. The emissions for brown coal are published in the National Greenhouse Gas Inventory (NGGI) for 2018-19 were 41.3 Mt.¹⁵ The 2019-2020 figures have not yet been published but are assumed to be roughly the same as electricity output from Victoria’s brown coal power stations was similar.¹⁶

The full lifecycle emissions from both brown and black coal in Australia in 2019-20 was around 1.2 billion tonnes, as shown in Table 4 below:

Table 4: Current production and emissions from Australian coal

Lifecycle stage		Emissions (Mt CO ₂ e)
Domestic	Mining and transport	14.0
	Fugitive emissions (methane)	27.3
	Black coal consumption	155.8
	Brown coal consumption	41.3
	Total domestic emissions all coal	238.4
Exports	Consumption in export markets	996.1
Total		1,234.5

Sources: see footnotes

EMISSIONS FROM NEW COAL MINES UNDER DEVELOPMENT

There are 72 major coal projects under development in Australia listed in the Resources and Energy Major Projects (REMP) list.¹⁷

In total these projects have an annual estimated new capacity of 528 Mt of coal production. This includes 392 Mtpa in Queensland and 135 Mtpa in NSW. No other state or territory has major new coal projects under development, although South Australia boasts an underground coal gasification proposal.

¹⁵ Australian Government, Department of Industry, Science, Energy and Resources (2021) *National Greenhouse Gas Inventory Quarterly Update: March 2021*

¹⁶ Victorian brown coal produced 34,579 GWh in 2018-19 and 34,235 GWh in 2019-20, source OpenNEM <https://opennem.org.au/energy/nem/?range=all&interval=1y>

¹⁷ Australian Government, Department of Industry, Science, Energy and Resources (2020) *Resources and Energy Major Projects: 2020*, <https://www.industry.gov.au/publications/resources-and-energy-major-projects-2020>

Projects in the REMP assessment list are classified into three stages prior to the completion of a project: publicly announced, feasibility and committed. Projects in the earlier stages such as identifying deposits and exploration are not included.¹⁸ Table 5 below shows a breakdown of new coal projects under development by state:

Table 5: Production volume of Australia’s major coal proposals by stage and state

	Publicly announced	Feasible	Committed	Total
	Mtpa	Mtpa	Mtpa	Mtpa
Queensland	63.3	328.5		381.8
NSW	39.0	80.3	16.2	135.5
Total				527.7

Source: REMP list

Table 5 above shows that proposed projects would produce more coal than Australia’s current black coal production which as described above was 451 Mt in 2019-20.

Table 6 below estimates that the simultaneous development of these proposals would result in an additional 1.35 billion tonnes of CO₂e in lifecycle emissions annually.

Table 6: Combustion emissions of Australian coal projects currently under development

	Unit		Source
Capacity of new projects	Mt	527.7	REMP 2020
Energy per mass	PJ/Mt	27.0	AES Guide to the Australian Energy Statistics 2021
Energy	PJ	14,248	
CO₂ per energy	t CO ₂ /PJ	94,600	IPCC (2006) <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 2 Energy Table 1.4</i>
CO₂	t	1,347,851,340	

As with the calculations above, the physical quantity of the coal measured in millions of tonnes per year is converted to units of energy using an Australian Government factor for the energy content of thermal coal of 27 GJ per tonne of saleable coal.

The IPCC factor of 94,600 t of CO₂ per petajoule (PJ) of energy shows the combustion emissions from these new coal projects would result in over 1.3 billion tonnes of emissions from combustion of the coal alone.

¹⁸ Australian Government, Office of the Chief Economist (2020) *Resources and Energy Major Projects 2020 Report*, <https://www.industry.gov.au/sites/default/files/2020-11/resources-and-energy-major-projects-report-2020.pdf>, <https://www.industry.gov.au/sites/default/files/2020-11/resources-and-energy-major-projects-report-2020.pdf>

In addition to the combustion emissions there are emissions from mining and transport of the coal. Methane emissions that escape to atmosphere would be considerable at 34.3 Mt CO₂e which is alone equivalent to around 7 per cent of Australia’s total emissions at current levels.

A further 17.4 Mt CO₂e would be from mining and transport emissions, comprised mainly of the use of diesel in vehicles and machinery on mine sites and electricity used to run the mines.

As shown in Table 7 below, the total lifecycle emissions of coal projects under development in Australia are around 1.4 billion tonnes CO₂e.

Table 7: Lifecycle emissions from Australian coal projects under development

Lifecycle stage		Emissions (Mt CO ₂ e)
Domestic	Mining and transport	17.4
	Fugitive emissions (methane)	34.3
	Total domestic emissions	51.7
Exports	Consumption in export markets	1,348
Total	Lifecycle emissions of Australian coal	1,400

Of the total 1.4 billion tonnes of emissions, 51.7 Mt CO₂e would occur in Australia. This is equivalent to 10 per cent of Australia’s total current domestic emissions in all sectors of around 500 Mt in 2020.

Gas

CURRENT EMISSIONS FROM AUSTRALIAN GAS

In 2019-20 Australian produced 5,945 PJ of gas, predominantly for export.¹⁹ This resulted in 328.5 Mt CO₂e of lifecycle emissions, which is equivalent to around two thirds of Australia's current emissions.

Of this, 26.7 Mt of emissions were from production and processing of the gas, in particular the large amount of energy required to run the LNG processing facilities.

A further 58.9 mt of emissions resulted from the combustion of gas within Australia other than the gas used for production and processing.

There were also 23.8 mt CO₂e of reported methane emissions.

The combustion of Australian gas overseas resulted in 219.1 mt of emissions.

Table 8: Lifecycle missions from Australian gas production 2019-20.

Lifecycle stage		Production (PJ)	Emissions (Mt CO ₂ e)
Domestic	Production and processing energy consumption (gas)	514.0	26.7
	Fugitive emissions		23.8
	Domestic consumption	1133.2	58.9
	Total domestic emissions all gas		109.4
Exports	Consumption in export markets	4,212.8	219.1
Total			328.5

¹⁹ Australian Government, Department of Industry, Science, Energy and Resources (2021) *Australian Energy Update 2021*, <https://www.energy.gov.au/publications/australian-energy-update-2021>

EMISSIONS FROM NEW GAS PROJECTS

The REMP list includes 44 new gas projects, predominantly for export as LNG. The total capacity of these projects is 3,000.7 PJ. Australia Institute analysis estimates 218 PJ would be developed for the domestic market, and the remaining 2,782 PJ for export.

In addition to projects on the REMP list, the Government is fast-tracking gas development in Beetaloo Basin in the Northern Territory under its so called “Gas-fired recovery” plan. The Beetaloo Basin is the first of five new gas basins the Government is aiming to “unlock” and has already been heavily subsidised with up to \$226 million of government support announced to date.²⁰

The Northern Territory Government’s Scientific Inquiry into Hydraulic Fracturing identified three production scenarios for gas development in the Northern Territory. The highest was 1240 PJ/year, including 240 PJ for domestic use and 1000 PJ for export. The Inquiry found this scenario could result in an additional 98.8 Mt of GHG emissions to the atmosphere annually, of which 38.9 Mt would occur within Australia, equivalent to around 8 per cent of Australia’s total annual emissions.²¹

More recent modelling by Deloitte, commissioned by the Federal Government, also used a high production scenario of 1,200 PJ/year. Figures based on that scenario are regularly cited by the Government when referring to the economic benefits of the project.²²

Our analysis also includes 402 PJ annual production capacity in the Canning Basin, an enormous gas resource in the Kimberly region of Western Australia. The Canning Basin is even larger than the Beetaloo Basin with a prospective resource of around 400,000 PJ.²³ Just weeks before the Glasgow Climate Summit, the Western Australian Government permitted the export of Canning Basin gas, despite development only being approved on the basis that it would not be exported.²⁴ This potentially opens the floodgates to large scale development of these massive gas fields.

²⁰ Australian Government (2021) *Unlocking the Beetaloo, The Beetaloo Strategic Basin Plan*, <https://www.industry.gov.au/sites/default/files/January%202021/document/beetaloo-strategic-basin-plan.pdf>

²¹ Pepper et al (2018) *Scientific Inquiry into Hydraulic Fracturing in the Northern Territory: Final Report*, <https://frackinginquiry.nt.gov.au/inquiry-reports/final-report>

²² Pitt (2020) *Beetaloo strategic plan will unlock gas, jobs and development*, <https://www.minister.industry.gov.au/ministers/pitt/media-releases/beetaloo-strategic-plan-will-unlock-gas-jobs-and-development>

²³ Swann (2020) *Weapons of Gas Destruction, Lifting the lid on greenhouse gas emissions from Australian fossil gas projects and resources*, <https://australiainstitute.org.au/wp-content/uploads/2020/12/Weapons-of-Gas-Destruction-WEB.pdf>

²⁴ Burke and Fowler (2021) *Kimberley fracking project’s exemption from gas export ban sparks Conservation Council fears*, <https://www.abc.net.au/news/2021-10-07/kimberley-fracking-project-granted-wa-gas-export-ban-exemption/100520190>

The production capacity of 402 PJ/year is from the Western Australian Government’s Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia.²⁵ The Inquiry assumed that 402 PJ/year was the maximum production from onshore gas development in the state, however this assumed Canning Basin gas would not be exported. Given the Western Australian Government is opening up the Canning Basin for export, production is likely to be higher than this if the projects proceed.

Table 9 below shows the annual capacity of new gas projects included in this analysis.

Table 9: Capacity of new gas projects included in analysis

	PJ/year	Source
Petroleum projects under development under development	3,001	REMP list
Beetaloo Basin	1,240	NT Fracking Inquiry
Canning Basin	402	WA Fracking Inquiry
Total	4,643	

As shown in Table 10 below, emissions from these new gas projects would be almost equivalent to Australia’s entire current gas production, resulting in approximately 292 million tonnes of emissions annually.

Table 10: Lifecycle emissions of new gas projects.

Lifecycle stage		Production (PJ)	Emissions (Mt CO ₂ e)
Domestic	Production and processing energy consumption (gas)	453.5	23.6
	Fugitive emissions		45.7
	CO ₂ venting		6.6
	Domestic consumption	878.7	33.2
	Total domestic emissions all gas		95.43
Exports	Consumption in export markets	3,778.8	196.5
Total		5,139.8	291.9

Sources: REMP list, NT and WA Fracking Inquiries. Emissions factor taken from Department of Industry, Science, Energy and Resources (2021) National greenhouse accounts factors

When gas is exported it requires processing in gas fields and liquefaction at LNG plants, which are very energy intensive processes. The Australian Energy Market Operator (AEMO)

²⁵ Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia (n.d.) *Final Report*, <https://frackinginquiry.wa.gov.au/node/27>

uses a figure of 8 percent of the gas arriving at LNG plants is used for liquefaction,²⁶ and it is reasonable to assume another 4 percent would be used in gas field processing, making a total of 12 percent. The gas use is additional to the amount of LNG exported. Table 10 includes an estimate of gas consumption by LNG facilities and processing from the REMP list, Beetaloo Basin and Canning Basin projects, making total production higher than in Table 9. It also includes 420PJ per year in LNG import terminal capacity as per the REMP list.

This analysis is conservative, as the Beetaloo Basin is just the first of five new gas basins the Australian Government is working to open with its gas-fired recovery by subsidising gas exploration, production and infrastructure, which include many projects not yet appearing on the REMP list.

The methane emissions estimate assumes only the rate of reported fugitive emissions in Australia. This is likely to be a large underestimate. Methane emissions are rarely, if ever, measured for the purposes of reporting for Australia's national greenhouse gas accounts. Instead, methane emissions are estimated on the basis of bottom-up estimates from factors largely developed by the gas industry itself, and atmospheric testing has found far higher levels of methane than assumed in the national gas inventory.²⁷ The Australian Government assumes leakage of around 0.7 percent,²⁸ whereas the IEA assumes more than double this at 1.7 percent.²⁹ Even a small increase in the amount of methane leakage can make large difference to the overall emissions impact because of the powerful warming effect of methane.

²⁶ AEMO (2021) *WA Gas Statement of Opportunities*, <https://www.aemo.com.au/energy-systems/gas/gas-forecasting-and-planning/wa-gas-statement-of-opportunities-wa-gsoo>

²⁷ Lafleur, Forcey, Saddler, & Sandiford (2016) A review of current and future methane emissions from Australian Unconventional oil and gas production, https://energy.unimelb.edu.au/__data/assets/pdf_file/0019/2136223/MEI-Review-of-Methane-Emissions26-October-2016.pdf

²⁸ The estimate here compares methane emissions from natural gas, venting and flaring, by total gas production. Figures for venting and flaring are not provided for gas separately, only for oil and gas. Nonetheless, most production is gas. Attributing all venting and flaring methane to gas production, the loss rate over the decade is around 0.7% in the decade to 2018. This is checked by calculating the increase of fugitives against increase in gas consumption over this time, which is also 0.7%

²⁹ International Energy Agency (2017) *World Energy Outlook 2017*

Total lifecycle emissions from current and planned Australian fossil fuel production

As shown in Table 11 below, the total current lifecycle emissions from current fossil fuel production in Australia was over 1.5 billion tonnes of CO₂e in 2019-2020. This was over three times Australia’s annual emissions, and almost 5 per cent of the world’s emissions.

Australia’s planned new coal and gas projects would add around 1.7 billion tonnes of emissions annually, reaching around 5.3 per cent of global emissions at current levels.

Table 11: total lifecycle emissions of current and planned fossil fuel production in Australia

	Production (physical units)	Production (energy units)	Emissions
	Mtpa	PJ/year	MtCO ₂ e/year
Current coal production (2019-20)	1,234.5	1,234.5	1,234.5
Current gas productions (2019-20)		328.5	328.5
Total lifecycle emissions from current Australian fossil fuel production			1,563.0
New coal projects	1,400.0	1,400.0	1,400.0
New gas projects		291.9	291.9
Total lifecycle emissions from planned Australian fossil fuel production			1,691.9

Not all of these projects will necessarily proceed, but equally more projects than this could proceed given the resources under licence in Australia are far greater than actual proposed projects.

The long life of fossil fuel projects will mean that many new projects will begin while existing projects are still in production, meaning that there will be an overall increase in the lifecycle emissions of Australian coal and gas projects, but others will begin after the life of existing projects.

The International Energy Agency (IEA) has said there should be no new fossil projects from now on if the world is to remain below the critical 1.5-degree threshold.³⁰ As such, planned new fossil fuel projects would essentially double the lifecycle emissions of Australia's fossil fuel production, even if that doubling is spread over many years.

The estimates are also conservative in that they assume very low methane emissions and assume a 100-year global warming potential (GWP) rather than a 20-year GWP that better describes the impact of methane over the crucial next two decades. Assuming greater methane emissions or using a 20-year GWP would significantly increase the estimate of lifecycle emissions from Australia's current and planned fossil fuel projects.

³⁰ IEA (2021) *Net Zero by 2050 A Roadmap for the Global Energy Sector*, <https://www.iea.org/reports/net-zero-by-2050>

Coal power station comparison

The Clean Energy Regulator publishes greenhouse and energy information by generation facility. In 2019-20, the average total emissions (including scope 1 and 2) from Australia's coal power stations was 7.2 million tonnes CO₂e.

That means that the emission footprint of 1.7 billion associated with the planned coal and gas projects, outlined above, is equivalent to the annual emissions of 236 average Australian coal fired power stations.

Table 12: Emissions from Australian coal power stations in 2019-20

Facility name	Total emissions (t CO ₂ -e)
Loy Yang Power Station and Mine	16,926,277
Bayswater Power Station	14,038,314
Eraring Power Station	13,230,827
Yallourn Power Station	12,524,016
Loy Yang B Power Station	10,445,601
Liddell Power Station	10,011,434
Tarong Power Stations	9,825,628
Gladstone Power Station	7,288,233
Stanwell Power Station	7,146,192
Vales Point Power Station	6,571,507
Millmerran Power Station (facility)	5,720,967
Callide C Power Station	5,133,544
Callide C Power Station (facility)	5,133,544
Callide B Power Station	4,647,543
Mt Piper Power Station	4,428,238
Muja Power Station	3,589,644
Kogan Creek Power Station	3,493,118
Bluewaters Power 1	1,471,806
Bluewaters Power 2	1,435,544
Collie Power Station	894,686
Average	7,197,833

Source: Clean Energy Regulator, *Greenhouse and energy information by designated generation facility 2019-20*, <http://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Greenhouse-and-energy-information-by-designated-generation-facility-2019-20.aspx>

Conclusion

The window to address the climate change is rapidly closing. In 2021, the release of the IPCC's Sixth Assessment Report was a shocking reminder that the world is not on track to limit global warming to 1.5°C. Without deep emissions cuts, the world is heading towards climate change catastrophe.

It is clear that continued fossil fuel production is incompatible with limiting global warming to 1.5°C and achieving net zero emissions. The International Energy Agency pathway to net zero emissions sees no investment in new fossil fuel supply projects. Fossil fuel extraction and use must end.

As the largest exporter of LNG and one of the two largest coal exporters, Australia has a vital role to play in averting the worst impacts of climate change. That is why scientists, world leaders, and citizens are increasingly calling on Australia to urgently plan the transition from fossil fuel extraction to a low carbon economy.

Australia has not heeded this call. It continues to support fossil fuel industries through significant subsidies and government assistance. Rather than use the COVID-19 economic recovery as an opportunity to reverse the trend of fossil fuel subsidies by centring COVID-19 recovery plans and assistance on clean energy projects, the Government has further entrenched fossil fuel production by centring its economic recovery plans on gas.

The Australian Government continues to protect fossil fuel interests, to paint fossil fuels as part of the solution to climate change and refuses to plan a just and equitable transition away from coal and gas extraction towards other industries.

This report shows that the coal and gas projects currently planned in Australia would result in emissions equivalent to building 200 new coal power stations. That only includes projects currently under development. The full carbon footprint of potential fossil fuel production projects in Australia is likely far higher, given Australia's aggressive pursuit of these resources and lacklustre record on climate action.

The planned expansion of Australia's fossil fuel resources flies in the face of climate action efforts and Australia's purported net zero 2050 target. Australia cannot honestly claim to be acting on climate change whilst simultaneously expanding coal and gas extraction and enabling the world's fossil fuel habit.