

GREENPEACE



Coal-faced

Exposing AGL as

Australia's biggest

climate polluter

Disclaimer

While this report does not suggest any illegal conduct on the part of any of the individuals or organisations named, it shows that AGL is currently using its position and power to slow the transition to a low carbon economy which is jeopardising both human and planetary health, and it presents alternative approaches that would allow AGL to transition from Australia's biggest polluter to a green energy leader.

Acknowledgments

Greenpeace Australia Pacific Limited acknowledges the Traditional Owners of Country throughout Australia and recognises their continuing connection to land, waters, and culture. We pay our respects to their Elders past, present and emerging.

Lead author

Drew Rooke

Design

Shaya Made

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GREENPEACE

Authorised by Kate Smolski
Greenpeace Australia Pacific Limited, Sydney

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A young woman with short dark hair and glasses is holding a white sign with handwritten text. She is wearing a black tank top and a necklace. The background is a clear blue sky with some greenery and a yellow structure in the distance.

AGL GO
CLEAN FOR
OUR FUTURE

EXECUTIVE SUMMARY

AGL is a giant within Australia's energy sector.

Primarily a generator and retailer – or ‘gentailer’ for short – of electricity and gas, it was founded in 1837 as the Australian Gas Light Company and now serves nearly one-third of Australian households. With a generation capacity of more than 11,000MW – 20 per cent of the total capacity within Australia’s National Electricity Market – it operates the country’s largest electricity generation portfolio.¹

In the 2019-2020 financial year, its underlying profit after tax was \$816 million.²

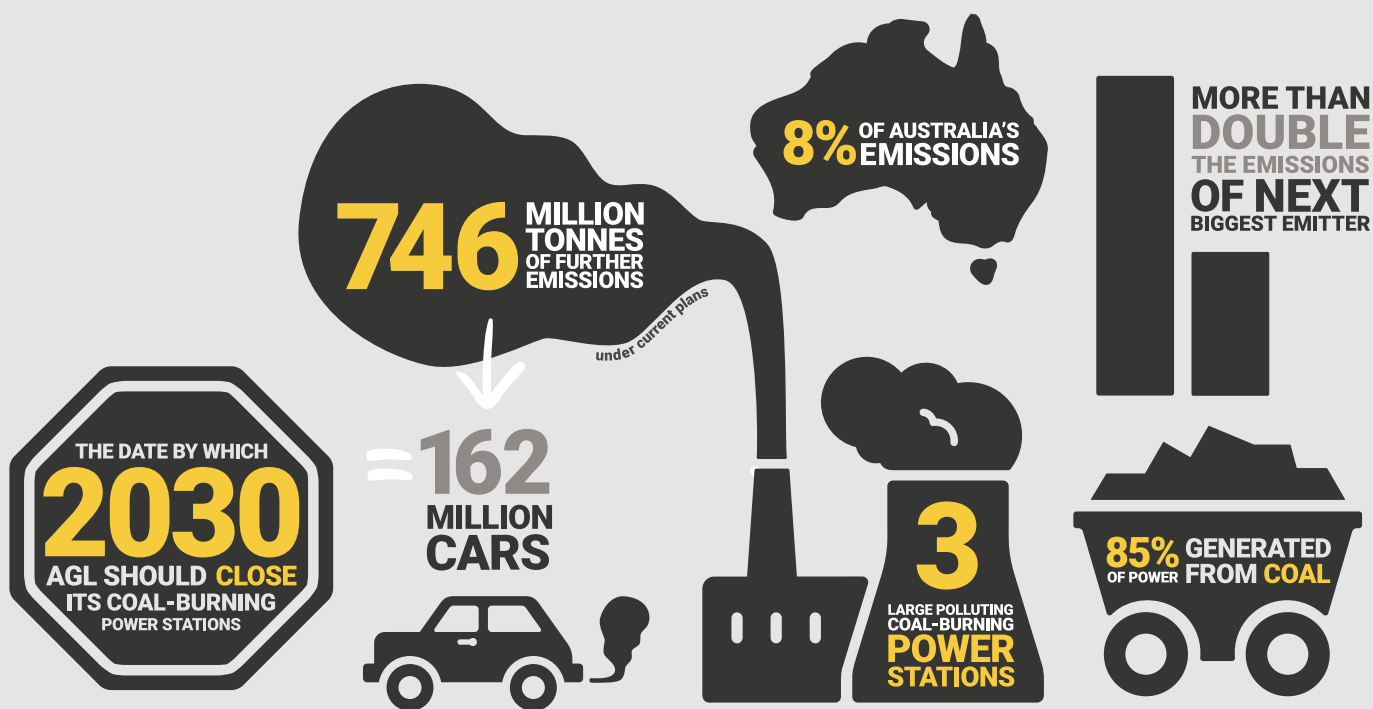
The company’s publicity material makes it seem like most of the energy and money it generates comes from renewable power sources like wind, hydro and solar. Indeed, the company proudly advertises itself to the Australian public as green and environmentally-responsible: it boasts that it is “the biggest ASX-listed investor in renewable energy” and insists that it is “helping to shape a sustainable energy future for Australia” and has a “relentless determination” to improve the planet.³

But a deeper dive into AGL reveals that the truth about the company is very different to its carefully crafted public image.

AGL is, in fact, Australia’s biggest domestic contributor to climate change: in 2019-2020, it was responsible for over 42 million tonnes of greenhouse gas emissions.⁴ This was more than 8 per cent of Australia’s total emissions and more than twice the amount of the next biggest emitter of greenhouse gases.⁵

The primary reason for AGL’s huge amount of emissions is that despite advertising itself as a hero for the environment, AGL is actually a hero for fossil fuels – and, in particular, coal. It currently owns three ageing coal-burning power stations in Victoria and New South Wales: Loy Yang A Power Station, Liddell Power Station, and Bayswater Power Station, which represent over a quarter of Australia’s coal power station capacity – more than double the carbon of the second biggest electricity generator and more than BHP, Rio, Glencore and Qantas combined.

In 2020, the combined electricity generation of these three coal-burning power stations was over 38,000GWh – approximately 85 per cent of AGL’s total electricity output for the year. In the same year, renewables accounted for only 10 per cent of AGL’s total electricity output. This figure has barely changed over the past five years.⁶



AGL proudly advertises itself to the Australian public as green and environmentally-responsible... but a deeper dive into AGL reveals that the truth about the company is very different to its carefully crafted public image.



But as well as being huge emitters of greenhouse gases, AGL's coal-burning power stations are also Australia's worst violators of environmental regulations. Since 2015, Liddell, Bayswater, and Loy Yang A power stations have breached their licences 111 times, accounting for roughly three quarters of all violations committed by coal-burning power stations across the country.⁷ In total, these breaches cost the company about \$1.3 million but the cost to the environment and human health is impossible to measure in monetary terms.

AGL's coal-burning power stations are also the most unreliable currently operating in Australia. Between December 2017 and November 2020, they experienced 77 unplanned unit failures or decreases of power, with each incident removing hundreds of megawatts of capacity from the electricity market.⁸

AGL plans to maintain its commitment to coal for many years to come. In fact, it has committed to keeping all of its coal-burning power stations open until the very end of their technical lives – the latest being Loy Yang A Power Station in Victoria which isn't scheduled to close until 2048.⁹

This will require significant investment. Indeed, AGL is already spending huge amounts of money on keeping its coal-burning power stations in operation and significantly more than it is on its renewable energy assets. For example, between 2014-2020,

it spent more than \$2.7 billion on sustaining its existing energy and other business assets, which were predominantly based around its coal-burning power stations; in the same time period, it spent \$1.8 billion on new business and energy initiatives.¹⁰

But not all of the new business and energy initiatives AGL invested in were related to clean energy. In fact, in 2020, \$30 million of the \$193 million spent on what it calls "growth and transformation" was actually for a capacity upgrade at the Bayswater Coal Power Station.¹¹

Based on the average amount of emissions from AGL's three coal-burning power stations over previous years, its plan to keep them open until the end of their technical lives will result in a further approximately 746 million tonnes of carbon emissions – a similar amount of emissions that roughly 162 million cars would cause in a year.¹²

This will have enormous and damaging consequences. Most significantly, AGL's ongoing commitment to continue burning coal until the year 2048 is inconsistent with the goal of the Paris Agreement of limiting global warming to 2 degrees Celsius and pursuing efforts to limit it to 1.5 degrees Celsius above pre-Industrial era levels. As such, the current actions of AGL increase the likelihood of catastrophic climate change, including the collapse of ecosystems such as the Great Barrier Reef.

By keeping coal-burning power stations running for almost another three decades, AGL is also acting in contrast to some of its major competitors in the Australian electricity sector. For example, in order to accelerate its transition to cleaner energy, EnergyAustralia recently announced it will close Victoria's largest coal-burning power station, Yallourn, four years ahead of schedule in 2028.¹³ It is expected this will reduce the company's carbon dioxide emissions by over 60 per cent relative to today.¹⁴



\$2.7+ BILLION
LARGELY SPENT
ON SUSTAINING
AGL'S COAL
BURNING ASSETS

\$30 million of the \$193 million spent on what AGL calls “growth and transformation” was actually for a capacity upgrade at the Bayswater Coal Power Station.

Explaining the decision, EnergyAustralia executive Liz Westcott said: “Coal-fired power stations have been the backbone of our energy system for decades. But that is changing. More recently we’ve observed coal is less required as more renewables enter this system...because the system is changing before our eyes, and with every passing day, we take a step forward to this clean future.”¹⁵

Many experts, including leading economist and climate change policy expert Professor Ross Garnaut believe this clean future in Australia can be fully realised very soon: renewables could meet 100 per cent of Australia’s electricity requirements “by the 2030s”.¹⁶

Crucially, this would help to enable a secure and stable grid. In fact, recent research commissioned by The Australia Institute found that the combination of renewable energy and battery storage can secure Australia’s electricity grid even more effectively than coal and gas. As the report highlights: “When EnergyAustralia announced that the 1,480 MW Yallourn coal power station would close in 2028 it also announced a new 350 MW battery will be built in 2026. The battery is likely to be able to provide at least three times as much inertia, thus helping to ensure grid stability, as Yallourn, despite a capacity a quarter as large.”¹⁷

More proof that Australia could generate all of its power from renewable sources by 2030 can be found overseas.

Germany, for instance, also once relied heavily on fossil fuels such as oil and coal for its electricity needs. But in 2020, renewables overtook generation from coal, oil and gas for the first time, producing 45 per cent of the manufacturing-heavy nation’s power.¹⁸ Moreover Germany – whose population is more than three times larger than Australia’s – plans to fully phase out coal from its energy sector by 2038.¹⁹

Closer to home, 80 per cent of New Zealand’s electricity supply currently comes from renewable energy, with plans to reach 100 per cent by 2030, while Samoa leads Pacific Island Countries’ decarbonisation efforts, with the nation on track to meet its target of 100 per cent of its electricity being renewable by 2025.²⁰

The continued rise of clean energy is inevitable: it is not a question of if, but when, Australia will be powered entirely by renewables. As Australia’s biggest polluter, AGL can lead the way in this transition to a clean, sustainable future.

INTRODUCTION

The aim of this report is to help AGL's 120,000 shareholders, millions of customers, and the broader Australian public better understand the truth about the company, how it became Australia's biggest emitter of greenhouse gases, and why it should retire all of its coal-burning power stations by 2030.

Chapter one provides a snapshot of the Australian electricity sector and details AGL's history and operations. Chapter two analyses the environmental track record and reliability of AGL's coal-burning power stations. Chapter three chronicles the global and local consequences to the climate, human health, and AGL's bottom line of the company not exiting coal entirely by 2030. Chapter four presents alternative approaches AGL could consider instead of operating its coal-burning power stations until the end of their technical lives.



1 AUSTRALIA'S DIRTIEST COMPANY

1.1. A snapshot of the Australian electricity sector

The Australian electricity sector is in the midst of a revolution. Following global trends, it is abandoning the fossil fuels on which it has long relied and embracing renewable sources of energy.

In 2019, for example, renewables including hydro, wind, and solar were responsible for 21 per cent of the approximately 265TWh of electricity that were generated in Australia.²¹ This total share of renewable energy generation was nearly three times larger compared with a decade earlier.²²

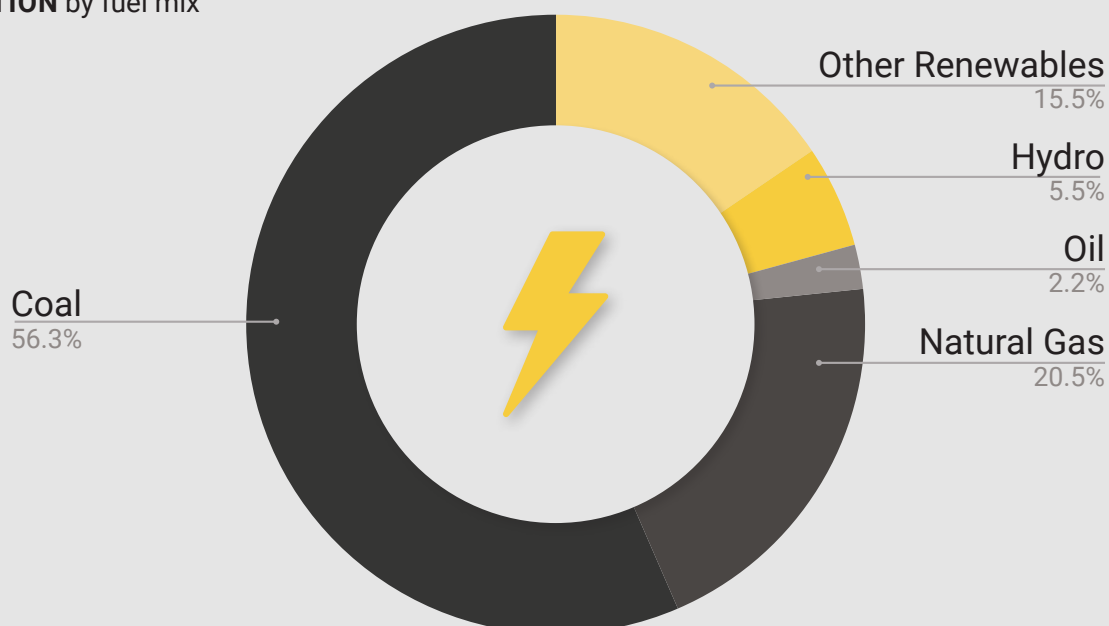
The current boom in clean energy in Australia, which is driving down greenhouse gas emissions as well as the cost of electricity for Australian consumers, isn't about to stop. Between 2018 and 2025, new wind and solar plants will add at least 70,000GWh of extra supply – more than the entire annual electricity consumption of New South Wales – in Australia's National Electricity Market (NEM) which operates in New South Wales, Queensland, the Australian Capital Territory, South Australia, Victoria, and Tasmania.²³ In fact, the total amount of renewables that will be operating in 2025 are forecast to provide up to 50 per cent of NEM demand.

But despite the significant growth of renewable energy, the Australian electricity sector remains dominated by carbon-intensive and environmentally-destructive fossil fuels – in particular, coal, which contributed 56 per cent of Australia's total electricity generation in 2019.²⁴ As a result, the electricity sector is currently Australia's largest single source of greenhouse gas emissions. From September 2019 to September 2020 alone, it was responsible for more than 170 million tonnes of carbon dioxide emissions – a similar amount to the total annual emissions of the Netherlands.²⁵

Currently the sector is dominated by three major companies: AGL, EnergyAustralia, and Origin Energy. Known as "gentailers", these vertically-integrated companies generate and retail electricity and gas. Combined, they control a significant majority of the energy market share, supplying 63 per cent of small electricity customers as well as 75 per cent of small gas customers in eastern and southern Australia.²⁶

But while all of these companies resemble each other in many ways, one of them in particular stands out for all of the wrong reasons.

AUSTRALIA'S ELECTRICITY GENERATION by fuel mix



Source: <https://www.energy.gov.au/data/electricity-generation>

1.2. Who is AGL?

On May 24, 1841, a small company that was formed only three years earlier heralded a new dawn in nineteenth-century Sydney when it lit the city's first-ever gas streetlight.²⁷ The end of a day no longer meant the end of light; public life could now continue after dark, with added safety and security.

In the same year, the company that was responsible for that historic act – the Australian Gas Light Company – became only the second to list on the Sydney Stock Exchange.²⁸ Over time the company continued to develop and diversify before it eventually became AGL Energy in 2006.

AGL is proud of this history but these days it is unrecognisable from its predecessor. With a generation capacity of more than 11,000MW – 20 per cent of the total capacity within Australia's National Electricity Market – it is the country's largest private electricity generator and vertically integrated gentailer of electricity and gas.²⁹

But while electricity generation and retailing, and gas supply and retailing are its core business operations, AGL is also evolving into what its former CEO and Managing Director Brett Redman describes as a "major, broader essential service provider."³⁰ Its first step on this front was the acquisition in December 2019 of Southern Phone Company Limited, one of Australia's largest regional telecommunications businesses with 100,000 customers nationwide, for \$27.5 million.³¹ Within a year, it had started offering broadband/NBN products which, according to Chief Customer Officer Christine Corbett, "give our customers the ease and convenience of having one provider for their essential services."³²

Around the same time, AGL launched an electric vehicle hire venture in partnership with car subscription service Carbar and EV charging supplier JET Charge.³³

Inclusive of all of its multiple business ventures, AGL provides more than 4.2 million customer services, amounting to nearly 30 per cent of Australian households. In 2020, it informed its 120,000 shareholders that it had recorded an underlying profit after tax that year of \$816 million.³⁴

AGL works hard to create the impression that most of the money it makes is a result of its commitment to clean energy; that, as a company, it is green and environmentally-responsible. Over the last seven years, AGL spent approximately \$825 million on "campaigns and advertising", much of it designed to promote this image.³⁵

But a deeper dive into the company reveals that its biggest commitment at the moment is actually to clean energy's antithesis.

1.3. Committed to coal

The vast majority of the electricity AGL generates comes from burning coal. It owns three coal-burning power stations in Australia – Liddell, Bayswater, and Loy Yang A – which comprise the backbone of the company. In 2020, their combined electricity output was over 38,000GWh, or approximately 85 per cent of the total electricity output of AGL-controlled energy assets.³⁶

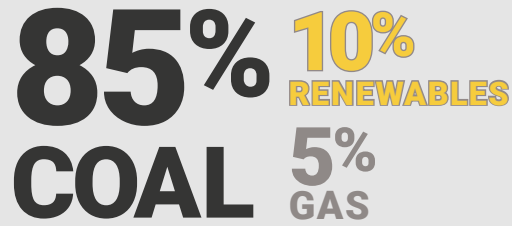
AGL's firm commitment to coal has earned it the title of being Australia's biggest domestic contributor to climate change: in 2019-2020, it was responsible for over 42 million tonnes of greenhouse gas emissions.³⁷ This was more than 8 per cent of Australia's total emissions from all sectors and sources and double the carbon of the second biggest electricity generator and more than BHP, Rio, Glencore and Qantas combined.³⁸

AGL does own and operate some renewable energy assets across Australia, including a 102MW solar farm in Nyngan, NSW, a 420MW wind farm in Macarthur, Victoria, and a 453MW wind farm in Coopers Gap, Queensland. The company is also in the process of developing more renewable energy assets, including a 300MW solar plant in Wellington North in central west NSW, and recently acquired two of Australia's largest commercial solar businesses.³⁹

But AGL's renewable energy assets are minor players in the company, responsible for a tiny proportion of its overall electricity output – just 10 per cent in 2020.⁴⁰ This figure has barely increased in recent years: in 2015, for instance, renewable energy accounted for roughly 9 per cent of AGL's total electricity output.⁴¹

On top of damaging the health of our climate, AGL's coal-burning power stations also cause more direct damage to human health. Coal-burning power stations are Australia's single largest source of fine particle pollution, sulfur dioxide and nitrogen oxide. These toxic pollutants can travel hundreds of kilometres from their source and have a huge impact on human health.

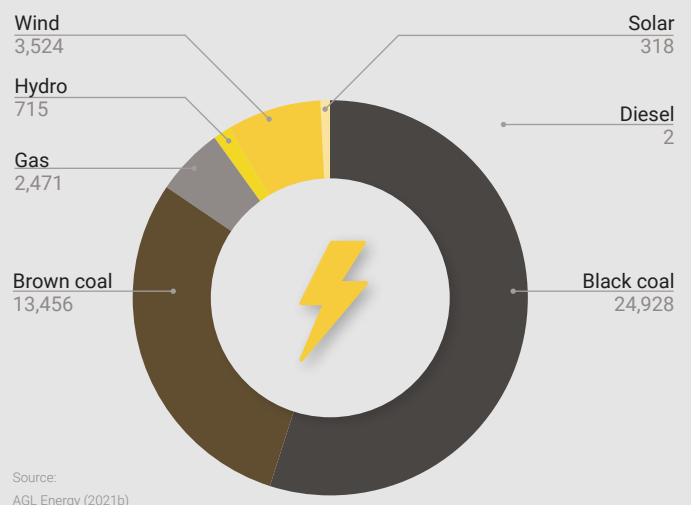
This was highlighted by a 2018 report by leading epidemiologist Dr Ben Ewald which estimated that each year, the five coal-burning power stations in NSW – including AGL's Liddell and Bayswater power stations – cause 279 premature deaths,



233 underweight babies, and 361 new cases of type 2 diabetes.⁴² Two years later, a Greenpeace Australia Pacific investigation found air pollution from all of Australia's coal-burning power stations to be responsible for 800 premature deaths, 14,000 asthma symptoms among children, and 850 cases of low birth weight in newborns each year.⁴³

But some of AGL's coal-burning power stations pose a particularly serious risk to human health. The Liddell and Bayswater power stations, for instance, are permitted to emit 1,400 micrograms of nitrogen oxides per cubic metre – nearly three times the international permitted limit.⁴⁴ Nitrogen oxides cause harm to the lungs, including airway inflammation, reduced lung function, and increased asthma attacks, as well as being linked to higher mortality rates in cancer patients and lower birth weight in newborns.⁴⁵

AGL'S ELECTRICITY OUTPUT (GWh per year) by primary energy source



AGL's coal-burning power stations also produce huge amounts of toxic waste – most significantly, coal ash.

This ash is the mineral by-product of burning coal. Every year, Australian coal-burning power stations produce approximately 12 million tonnes of it which accounts for nearly one fifth of the nation's waste stream.⁴⁶ While a small proportion is recycled to make concrete, most is mixed with water to create heavy-metal laden sludge that is stored in huge coal ash dams located nearby which pose a serious risk to groundwater.⁴⁷

It is likely that AGL will retain its title of Australia's dirtiest company for many years to come: it does not plan to drastically reconfigure its commitments by retiring its ageing, expensive, and unreliable coal-burning power stations early and investing far more in cleaner, cheaper and more reliable sources of renewable energy.

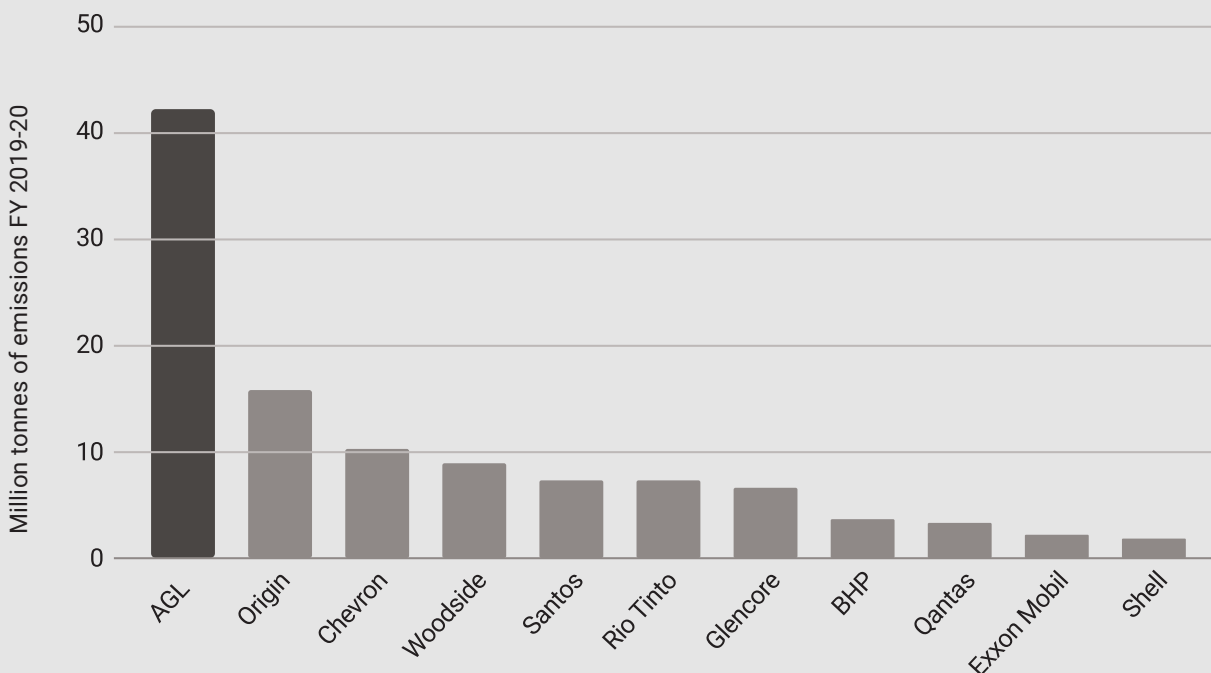
In fact, AGL has committed to keeping all of its coal-burning power stations open until the very end of their technical lives – the latest being Loy Yang A, which isn't scheduled to close until 2048.⁴⁸ Based on the average amount of emissions from AGL's three power stations over previous years, its plan to keep them open until the end of their technical lives will result in at least a further 746 million tonnes of carbon pollution – a similar amount caused by roughly 162 million cars on the road over a year.⁴⁹

AGL's commitment to keep burning coal until 2048 will require significant investment. In fact, the company is already spending huge amounts of money on keeping its coal-burning power stations in operation – significantly more than it is on renewable energy. For example, between 2014-2020, it spent more than \$2.7 billion on other business assets, which were predominantly based around its coal-burning power stations, in the same time period, it spent \$1.8 billion on new business and energy initiatives.⁵⁰

It's important to note, however, that not all of the new business and energy initiatives AGL has invested in are related to renewable energy. For example, in 2018, AGL spent a total of \$295 million on what it calls "growth and transformation" initiatives. \$129 million of this was for delivering the Customer Experience Transformation program which is aimed at improving convenience and transparency for customers and helping them manage their energy costs and consumption.⁵¹

Some of the money AGL is spending on "growth and transformation" is even being directed towards its existing coal assets: in 2020, for instance, \$30 million of the \$193 million spent on "growth and transformation" was for a capacity upgrade at the Bayswater Coal Power Station.⁵²

AGL'S DOMESTIC CLIMATE POLLUTION VS OTHER WELL-KNOWN POLLUTERS



Source: Clean Energy Regulator, 2021.

AGL's plan to keep them open until the end of their technical lives will result in at least a further 746 million tonnes of carbon pollution – a similar amount caused by roughly 162 million cars on the road over a year.



1.4. A new commitment

AGL committed itself to coal only very recently. In fact, only a decade ago it was widely considered the “greenest” of Australia’s biggest energy retailers. According to the company’s 2009 annual report, renewable energy accounted for approximately 34 per cent of its total generation capacity that year – up 8 per cent from the previous year and 25 percentage points larger than the current figure – while coal accounted for just 18 per cent (the remaining 48 per cent was accounted for by gas).⁵³ The 2009 Annual Report also stated that in the future (an exact year was not given), the company wanted to increase the share of renewable energy generation to 46 per cent of its total capacity and decrease coal’s share to 11 per cent.⁵⁴

AGL has, of course, failed to meet this goal.

Much of the blame for this failure lays at the feet of its former CEO and Managing Director, Brett Redman. Redman, who was appointed to his \$1,650,000 per annum role in January 2019 and resigned in April this year, joined AGL in 2007 after working for many years in large blue chip industrial companies.¹⁵⁶ Five years later, he was appointed AGL’s Chief Financial Officer and, in that role, turned the company sharply down the path to coal and away from the clean energy future it had been heading towards. Most significantly, he was primarily responsible for AGL’s acquisition of the Loy Yang A Power Station in 2012 and then of the Bayswater Power Station and the Liddell Power Station two years later.⁵⁵

Although there was some opposition within the company to these acquisitions, Redman eventually won over the company’s board to secure them; he expected they would be hugely profitable in the years to come. As he said in 2014 when speaking of the Liddell Power Station, it would “generate substantial future cash flows” for the company.⁵⁶

AGL’s coal assets have emitted nearly 300 million tonnes of greenhouse gases in the years since AGL acquired them – equivalent to the pollution caused by 65 million cars on the road over a year.

What Redman did not mention was the substantial greenhouse gas emissions these three power stations would also generate. Indeed, combined, they have emitted nearly 300 million tonnes of greenhouse gases in the years since AGL acquired them – a similar amount caused by roughly 65 million cars on the road over a year.⁵⁷

But despite the enormous contribution to climate change which is impacting Australians right now, Redman is unapologetic about committing AGL to coal, telling the Australian Financial Review in 2019 that he sleeps “very comfortably” at night.⁵⁸ His comfort stems from his belief that coal still has an essential role in the Australian electricity sector for many years to come. As he said in 2019: “What we need to do...is to make sure we go forward in a way that doesn’t bring down the economy in trying to move too quickly.”⁵⁹

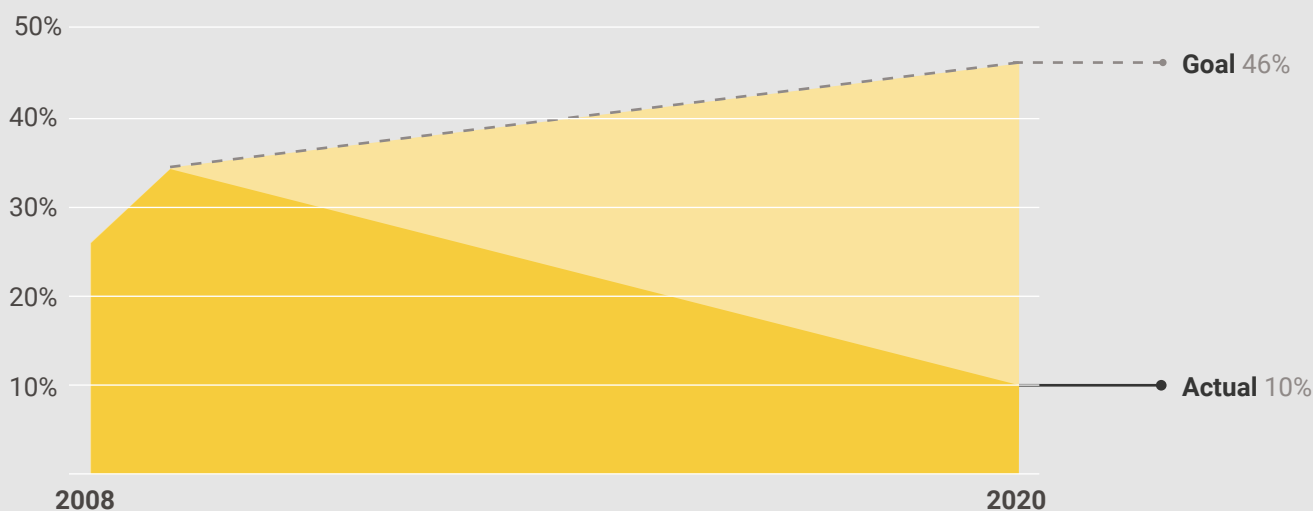
He reiterated this sentiment the following year, claiming that AGL is managing the transition to clean energy “responsibly”.⁶⁰

“We’re thinking about how we use, to maximum value, our existing generation fleet. That means proudly operating our coal-fired power stations for many years to come.”⁶¹

Redman’s comfort also stems from his belief that AGL – a large, publicly-listed corporate – is in the best position to responsibly operate large, ageing coal-burning power stations. As he sees it, AGL’s acquisition of Loy Yang A, Bayswater and Liddell “was best for the community and the economy”⁶².

But AGL’s history of operating its coal-burning power stations raises serious doubts about these claims.

AGL’S RENEWABLE ENERGY GENERATION as a percentage of its total capacity



Source: Clean Energy Regulator, 2021.

Case studies

AGL'S COAL-BURNING POWER STATIONS

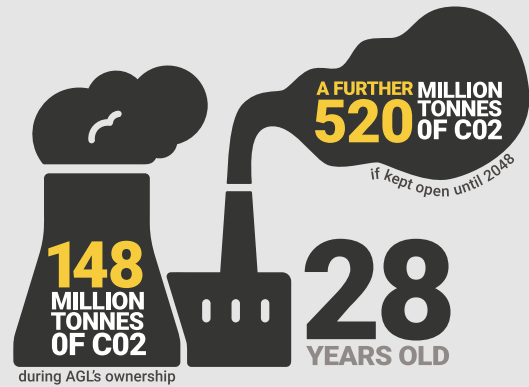
Loy Yang A

Originally constructed throughout the 1980s, the Loy Yang power station is located in the Latrobe valley in Victoria, 165 kilometres east of Melbourne. It consists of two separate power stations: Loy Yang A, owned by AGL, and Loy Yang B, owned by Chow Tai Fook Enterprises (the owner of Alinta Energy).

The Loy Yang A power station comprises four generating units which are powered by brown coal and have a combined output of 2210MW – approximately 30 per cent of Victoria's power requirements. In 2012, AGL acquired sole ownership of the power station and the accompanying open coal mine for \$448 million. Then Managing Director and CEO of AGL, Michael Fraser, said the acquisition "gives AGL strategic benefits that will underpin the company's growth in the years ahead."⁶³ He insisted that it "does not change AGL's commitment to a sustainable energy future."⁶⁴

Prior to the acquisition, coal was responsible for just 16 per cent of AGL's total generation capacity. After it acquired sole ownership, this figure increased to 37 per cent.⁶⁵

The adjacent mine produces 30 million tonnes of coal annually.⁶⁶ This coal supplies the Loy Yang A



power station as well as the Loy Yang B power station.

In January 2019, AGL completed a \$90 million refurbishment of one of the generation units of Loy Yang A Power Station and a \$30 million upgrade of the mine dredger.⁶⁷ The following month, it announced a \$25 million upgrade to the power station which would increase its capacity by 15MW "without increasing coal consumption or emissions."⁶⁸

In the years that AGL has owned the Loy Yang A Power Station, it has released more than 148 million tonnes of emissions, making it by far AGL's dirtiest power station.⁶⁹ At present, AGL plans to keep Loy Yang A open until the end of its technical life in 2048. By then, it will have released at least a further 520 million tonnes of emissions.



Liddell

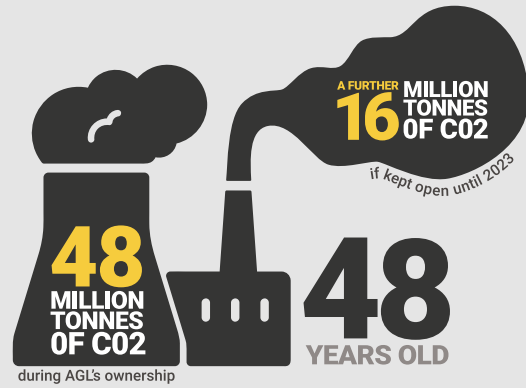
In September 1964, the NSW state government, led by Labor premier Jack Renshaw, excitedly announced its plan to build a new £100 million power station at Liddell in the upper Hunter region of the state in order to revive the coal industry and provide an impetus for development in the region more generally.⁷⁰

It took another nine years before the fourth and final 500MW generator at the black-coal power station was built. But once the power station was up and running, it was, as AGL says, “the backbone of the NSW electricity system.”⁷¹ Without a natural water source nearby, Lake Liddell was constructed for cooling purposes and water storage.

Because of the station’s age, its four 500MW generators can now only run at limited capacity and have a maximum combined capacity of 1,680MW.⁷²

AGL was essentially given the Liddell Power Station for free by the NSW Government when it bought the nearby Bayswater Power Station and the existing coal stockpile in September 2014 for \$1.5 billion.⁷³ The reason for this was that the NSW Government did not want to sell the Liddell Power Station because it did not want to be left with the responsibility of remediating it when it closed.

The Australian Competition and Consumer Commission opposed AGL’s purchase of the two coal-burning power stations on the grounds that it was “likely to result in a substantial lessening



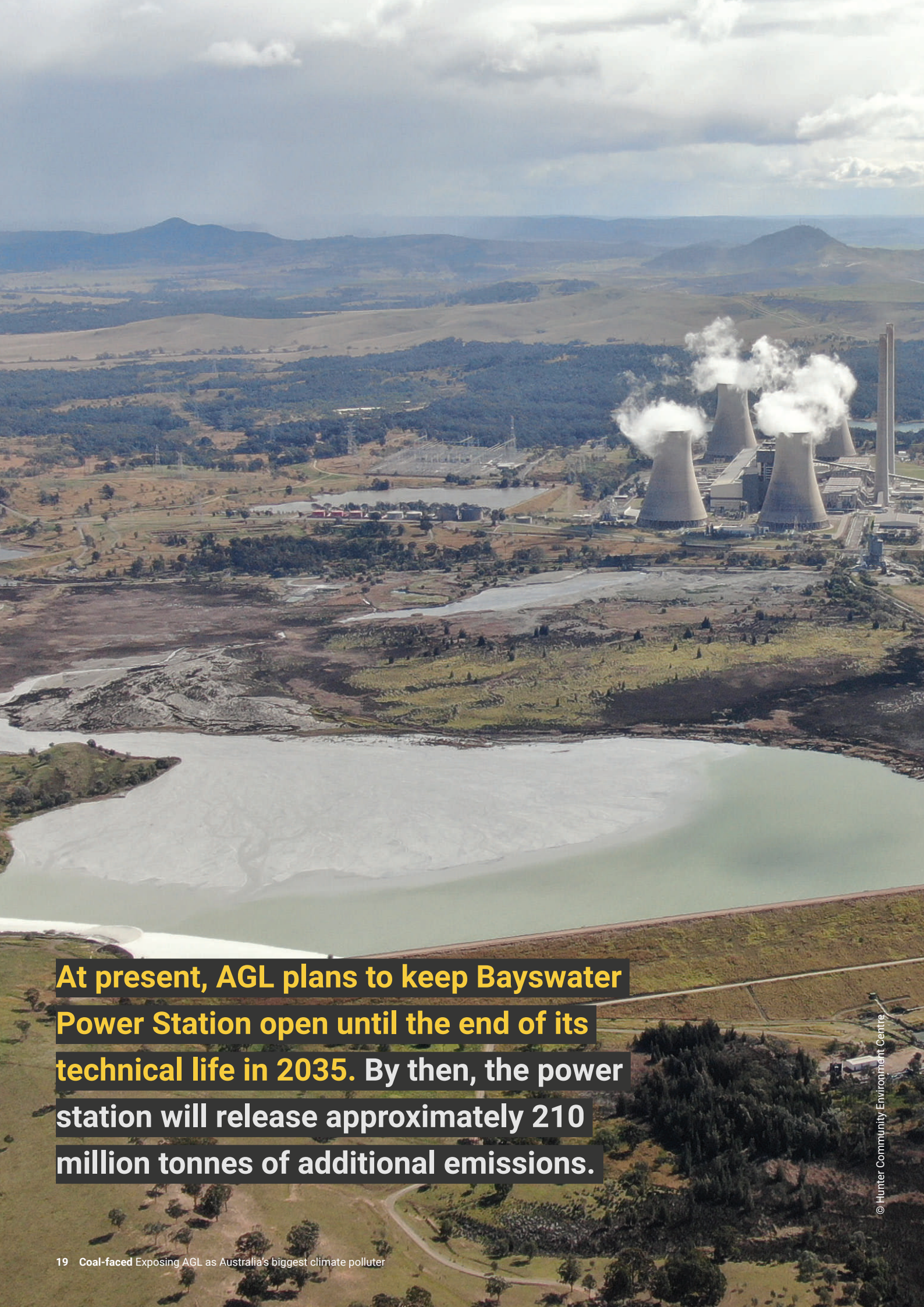
of competition in the market for the retail supply of electricity in New South Wales.”⁷⁴ But this decision was ultimately overruled by the Australian Competition Tribunal.⁷⁵

Since AGL acquired Liddell Power Station, it has had to spend huge amounts of money to keep it running. In fact, it immediately spent \$123 million to stop corrosion and has committed a further \$159 million to improve reliability.⁷⁶ On top of this are the costs associated with fixing unexpected technical issues. For example, in 2016 there was a leak on an external boiler tube that cost up to \$20 million to fix.⁷⁷

Since AGL bought Liddell Power Station in 2014, Liddell has produced more than 49 million tonnes of carbon emissions. At present, AGL plans to close the coal-burning power station completely in 2023. By then, it will have released a further approximately 16 million tonnes of emissions.⁷⁸



© Ella Colley / Greenpeace



At present, AGL plans to keep Bayswater Power Station open until the end of its technical life in 2035. By then, the power station will release approximately 210 million tonnes of additional emissions.

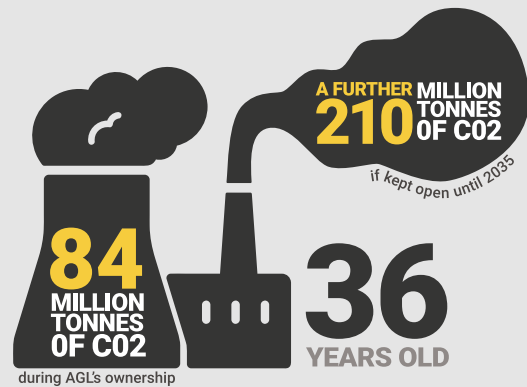
Bayswater

In April 1979, the New South Wales government announced it would build a new power station in the Hunter Valley, three kilometres from the Liddell Power Station, to expand the state's electricity system to meet rising domestic and industrial demand.⁷⁹

The first of the four 660MW generation units was completed in 1985, and the last one was completed the following year. They are fuelled by black coal and cooled from water drawn from the Hunter River.

Like Liddell, Bayswater Power Station was owned by the NSW government for most of its life until AGL purchased it in September 2014. With a generation capacity of 2,640MW, Bayswater is AGL's largest – and Australia's second largest – coal-burning power station. The electricity it and Liddell Power Station produces meets approximately 35 per cent of the electricity needs of NSW.⁸⁰

Bayswater Power Station is not currently fitted with internationally-standard technology that would significantly reduce the amount of toxic emissions it releases, including sulphur dioxide which harms the human respiratory system and exacerbates asthma.⁸¹ Moreover, AGL does not plan to install this technology as part of a \$200 million upgrade of the station's turbines that is due to be completed in 2023.⁸²



In July 2020, AGL also released plans for a further \$52 million upgrade at Bayswater Power Station, including an expansion of the power station's coal ash dam to provide an additional 12.5 million cubic metres of storage capacity.⁸³ AGL says this is needed for the 2 million tonnes of coal ash that will be produced each year.⁸⁴ AGL has proposed an increase to up to 1 million tonnes per year of the amount of coal ash that is recycled but has not yet released a clear plan for how this target will be achieved.

Since AGL has owned Bayswater, the station has released more than 84 million tonnes of carbon emissions.⁸⁵ At present, AGL plans to keep Bayswater Power Station open until the end of its technical life in 2035. By then, the power station will release approximately 210 million tonnes of additional emissions.

2 A RECKLESS AND UNRELIABLE OPERATOR

2.1. Regulatory breaches

To help mitigate the huge risk that Australia's fossil fuel power stations – and especially coal-burning ones – pose to the local community and environment they're located within, there is a suite of regulations in place that are designed to ensure their responsible operation and limit the amount of noise, pollution, contamination, and waste they cause. A breach of these regulations can cause significant consequences to human and environmental health.

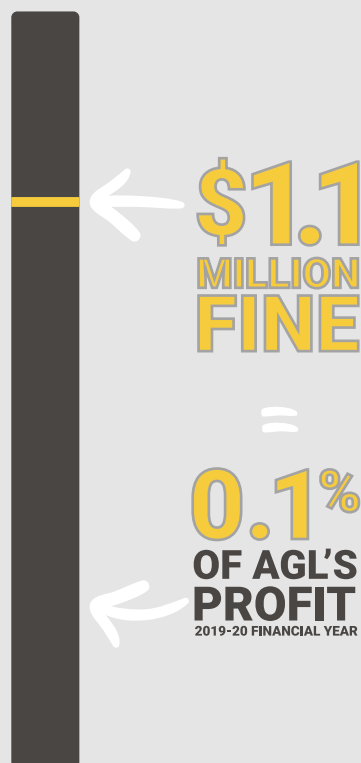
The Coal Impacts Index – a project established by the Australia Beyond Coal Alliance, which includes a number of non-governmental organisations including Greenpeace Australia Pacific – is the most comprehensive list of regulatory breaches, breakdowns, and pollution events since 2015 at the sixteen coal fired power stations that are in operation in New South Wales, Queensland and Victoria. The index shows that, as well as being Australia's biggest polluter, AGL is the most prolific violator of environmental regulations for coal-burning power stations.

Since 2015, the AGL-owned and operated Liddell, Bayswater and Loy Yang A power stations have breached their licences 111 times, accounting for roughly three quarters of all violations.⁸⁶ In total, these breaches cost AGL about \$1.3 million but the cost to the environment and human health is impossible to measure in monetary terms.⁸⁷

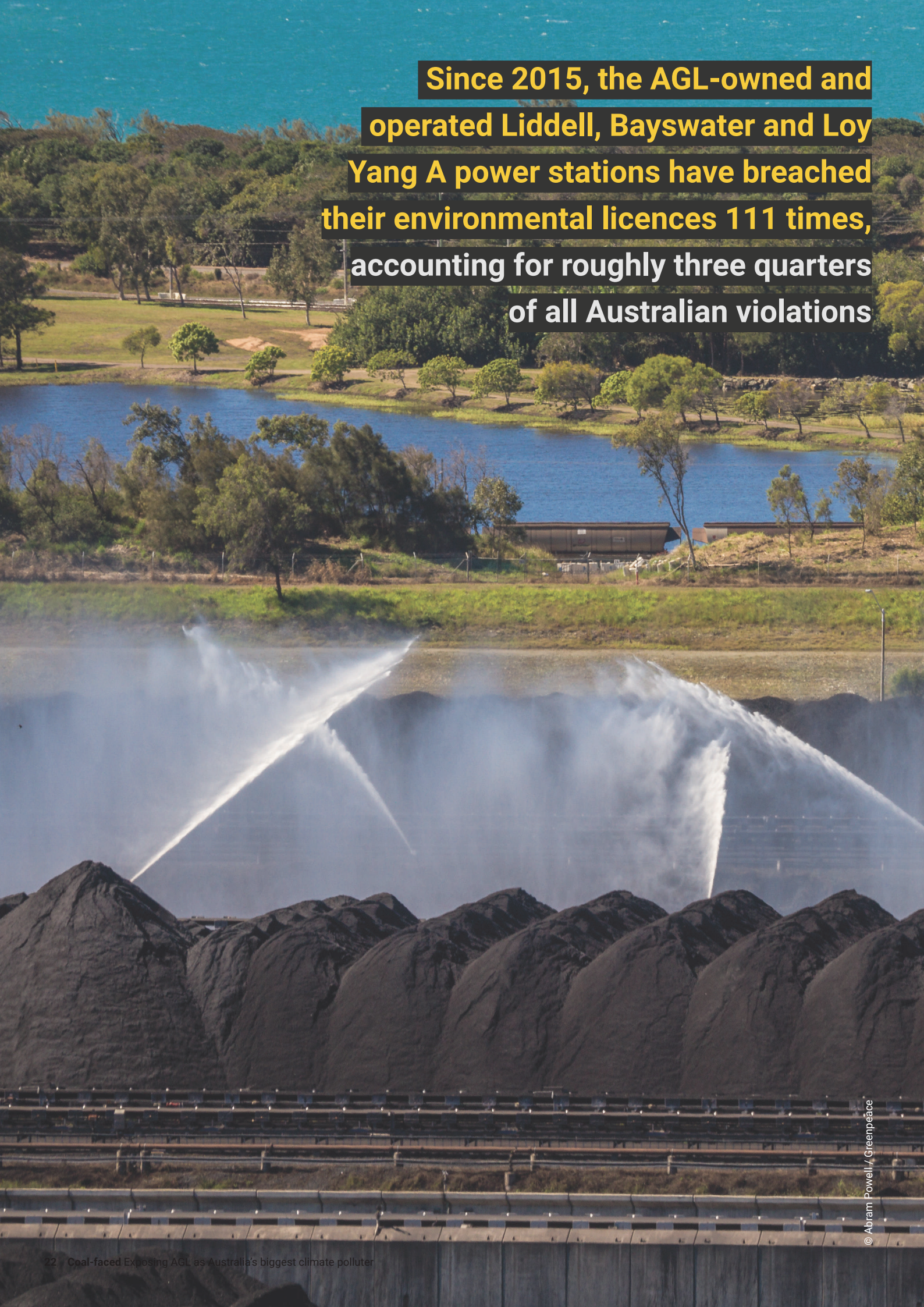
The worst breach occurred in December 2019 when nearly 1,500 cubic metres of toxic coal ash slurry – enough to fill more than half an Olympic swimming pool – from the Bayswater Power Station leaked into the dry bed of Bayswater Creek after one of the station's pipelines burst due to internal corrosion.⁸⁸ Because several warning systems weren't working properly and an alarm designed to alert workers to any problems with the flow had been turned off, the leak went undetected for eight hours.⁸⁹

The NSW Environmental Protection Agency issued AGL with a \$1.1 million penalty for the incident. EPA Director Regulatory Operations Adam Gilligan said the penalty should "serve as a reminder to industry that environmental incidents such as this can come at a significant cost, and preventing such incidents makes good business sense."⁹⁰ In response to the EPA fine, AGL said it "sincerely regrets the impacts" caused by the leak and insisted it was committed "to ensuring ongoing improvements in environmental performance to prevent any reoccurrence."⁹¹

The \$1.1 million fine represented just over 0.1 per cent of AGL's profit for the 2019-20 financial year.



Since 2015, the AGL-owned and operated Liddell, Bayswater and Loy Yang A power stations have breached their environmental licences 111 times, accounting for roughly three quarters of all Australian violations



OTHER SIGNIFICANT BREACHES

AT AGL'S THREE COAL-BURNING POWER STATIONS

2015

April

Between 60 to 100 litres of ammoniated water from Bayswater Power Station washed into a stormwater drain and then into Tinkers Creek. The EPA fined AGL \$15,000 for the incident.⁹²

November

A mechanical failure at Bayswater Power Station resulted in 6000 litres of sulphuric acid entering two stormwater drains and subsequently flowing to Tinkers Creek, which drains to Lake Liddell. The EPA fined AGL \$30,000 for the incident. Less than a year later, Lake Liddell – a popular recreation spot – was permanently closed to the public following the detection of naegleria fowleria, a fatal, brain-eating virus thought to be nurtured by artificially warmed waters.⁹³

December

Fugitive coal dust from the Loy Yang A coal mine blew into local communities during a strong cool change, contaminating water tanks and roofs.⁹⁴

2016

May

More fugitive coal dust from the Loy Yang A mine blew into local communities.⁹⁵

August

Liddell Power Station failed to report flooding at the Central Hunter Swamp Oak Forest, an endangered ecological community.⁹⁶

November

More fugitive dust from the Loy Yang A coal mine blew into nearby communities.⁹⁷

2017

August

Liddell Power Station reported that a pump failure had caused a leak from its effluent pond to flow into surrounding land and waters.⁹⁸

August

Liddell Power Station reported a leak of ash slurry from a pipeline into surrounding land and waters.⁹⁹

August

Liddell Power Station failed to test chlorine as per its monitoring requirements on twelve occasions.¹⁰⁰

August

Liddell Power Station failed to report excessive sulphur dioxide emissions from Unit 1 on three occasions.¹⁰¹

December

A leak in an ash disposal pipe line resulted in coal ash-contaminated water flowing beyond the Loy Yang A Power Station premises boundary.¹⁰²

December

There were two separate incidents of coal dust from the Loy Yang A coal mine blowing into nearby communities.¹⁰³

OTHER SIGNIFICANT BREACHES

AT AGL'S THREE COAL-BURNING POWER STATIONS

2018

March

A pump failure at Liddell Power Station resulted in toxic ash slurry flowing into an Endangered Ecological Community. The EPA fined AGL \$15,000 for the incident.¹⁰⁴

May

45,000 to 70,000 litres – the equivalent of 340 to 530 bathtubs – of diesel spilled from Bayswater Power Station into Tinkers Creek due to AGL's failure to properly maintain the storage tank and despite alarms at the station being sounded. The EPA fined AGL \$30,000 for the incident.¹⁰⁵

2019

January

More fugitive dust from the Loy Yang A coal mine blew into nearby communities. There were two similar incidents over the next two months.¹⁰⁶

February

A discharge of slurry from the Bayswater Power Station entered a tributary of Wisemans Creek, resulting in water pollution that impacted a nearby River Red Gum Endangered Ecological Community. The EPA fined AGL \$15,000.¹⁰⁷

2020

January

The EPA ordered AGL to pay \$100,000 to community projects after the company self-reported that it had failed to properly sample and analyse coal ash at its Liddell and Bayswater Power Stations.¹⁰⁸

July

The EPA fined AGL \$15,000 for excessive dust emissions from the Liddell Power Station's ash dam earlier that year. EPA Director Regulatory Operations Metro North Adam Gilligan described this as a "serious matter".¹⁰⁹

2.2. Breakdowns and outages

The Coal Impacts Index also found that as well as being responsible for the highest number of regulatory breaches among Australia’s coal-burning power station operators, AGL has been responsible for the highest number of breakdowns and unplanned outages at its coal-burning power stations.

Between December 2017 and November 2020, there were a total of 77 unit trips or decreases of power at AGL’s Bayswater, Liddell and Loy Yang A power stations, with each incident removing significant capacity from the electricity market.¹¹⁰ EnergyAustralia’s coal-burning power stations came in second, with 61 unit trips or decreases of power.¹¹¹

The biggest breakdown in recent times occurred at AGL’s Loy Yang A Power Station, which was recently ranked by researchers at The Australia Institute as the second worst performing power station in the NEM, after EnergyAustralia’s Yallourn Power Station.¹¹²

On May 18, 2019, one of Loy Yang A’s four generators failed following an electrical short which caused extensive damage to its stator and rotor components.¹¹³ AGL initially expected that it would take two to four months to repair the generator. Further assessment, however, revealed that far more extensive repairs were required and that the generator wasn’t expected to return to service until the end of the year. On December 24, more than seven months after the generator failed, it returned to service but tripped three days later. It remained offline due to “plant failure” until it finally came back online on January 20, 2020.¹¹⁴

This extended unplanned outage at Loy Yang A Power Station was one of the principal drivers of AGL’s 22 per cent drop in underlying profit in 2020.¹¹⁵

More recently, there have been other major breakdowns at AGL’s coal-burning power stations. For example, in December 2020, Unit 3 of the ageing and ailing Liddell Power Station failed, seriously injuring a worker and leaving energy output from the power station at just a quarter of its 1680MW capacity.¹¹⁶ This prompted the Australian Energy Market Operator to issue a so-called Lack of Reserve Level 2 alert, calling for other power stations to make up the shortfall.

In a statement, AGL said it was assessing the length of any outage as a result of the incident. “On a precautionary basis, AGL has informed the Australian Energy Market Operator that the length of the outage may be up to two and a half months”. It added, however, that this estimate was “highly preliminary”.¹¹⁷

What this outage will cost the company and its shareholders remains to be seen.

AGL has been responsible for the highest number of breakdowns and unplanned outages at its coal-burning power stations.



3 THE CONSEQUENCES OF AGL'S COAL BEYOND 2030

3.1. The global consequences

If AGL maintains its commitment to keep the Bayswater Power Station open until 2035 and its Loy Yang A Power Station open until 2048, it will be sabotaging global efforts to mitigate, and hopefully avoid, catastrophic climate change.

In December 2015, more than 190 countries including Australia signed the historic Paris Agreement at the 21st United Nations Climate Change Conference. In doing so the signatories committed to limiting global warming to well-below an average of 2 degrees Celsius above pre-industrial levels, and to pursuing efforts to limit the increase to 1.5 degrees Celsius, in order to avoid catastrophic impacts of climate change.¹¹⁸

The importance of pursuing the more ambitious 1.5 degree target was highlighted in October 2018 when the Intergovernmental Panel on Climate Change (IPCC) – the world's most authoritative climate science body – released a Special Report which compared the impacts of global warming of an average 1.5 degrees Celsius versus 2 degrees Celsius above pre-industrial levels. Authored by more than 90 scientists, the report collated thousands of pieces of leading climate research. It made for troubling reading.

For example, in Australia, if warming reaches 2 degrees Celsius, the Great Barrier Reef will likely severely bleach every year due to increased sea temperatures and ocean acidification; summers like the 'Angry Summer' of 2012-2013 and the 'Black Summer' of 2019-2020 which saw record-breaking heatwaves and bushfires will occur most years, and; high temperatures that were associated with the drought that ravaged south east Australia in 2006 will occur nearly every year.¹¹⁹

At a global level, warming of 2 degrees Celsius will result in a third of the planet experiencing extreme heat waves once every five years; the Arctic becoming ice-free in summer; and coral reefs being almost entirely lost.¹²⁰

If global warming is limited to 1.5 degrees Celsius, these catastrophic impacts of climate change will be significantly mitigated.

The IPCC Special Report said that if global warming continues to increase at the current rate, it is "likely" to reach an average of 1.5 degrees Celsius between 2030 and 2052, and 2 degrees Celsius in the 2060s.¹²¹ According to the IPCC, in order to stop warming at 1.5 degrees Celsius, using coal to generate electricity must cease almost entirely by 2050. But, crucially, in order for this to happen, the IPCC says, global coal use for electricity must drop to 78 per cent below 2010 levels by 2030.¹²²

This has significant implications for a country like Australia which still relies so heavily on coal to generate electricity. As Fatih Birol, the executive director of the International Energy Agency, said in July 2020, "we can forget" reaching hard climate targets if Australia's coal-burning power stations stay open until the end of their technical lives and continue to run as they do now.¹²³

“Even if you assume as of tomorrow no single coal power plant will be built in the world in the next 30 years, existing coal plants if they operate throughout their normal economic lifetime of 40 years then it is impossible to reach our climate targets.”¹²⁴

The United Nations Secretary-General, António Guterres, was more specific in March this year when he called on Australia and other leading economies to end their “deadly addiction” to coal by the end of the current decade.

“I urge all OECD countries to commit to phasing out coal by 2030 and for non-OECD countries to do so by 2040. Science tells us this is essential to meet the Paris Agreement goals and protect future generations.”¹²⁵

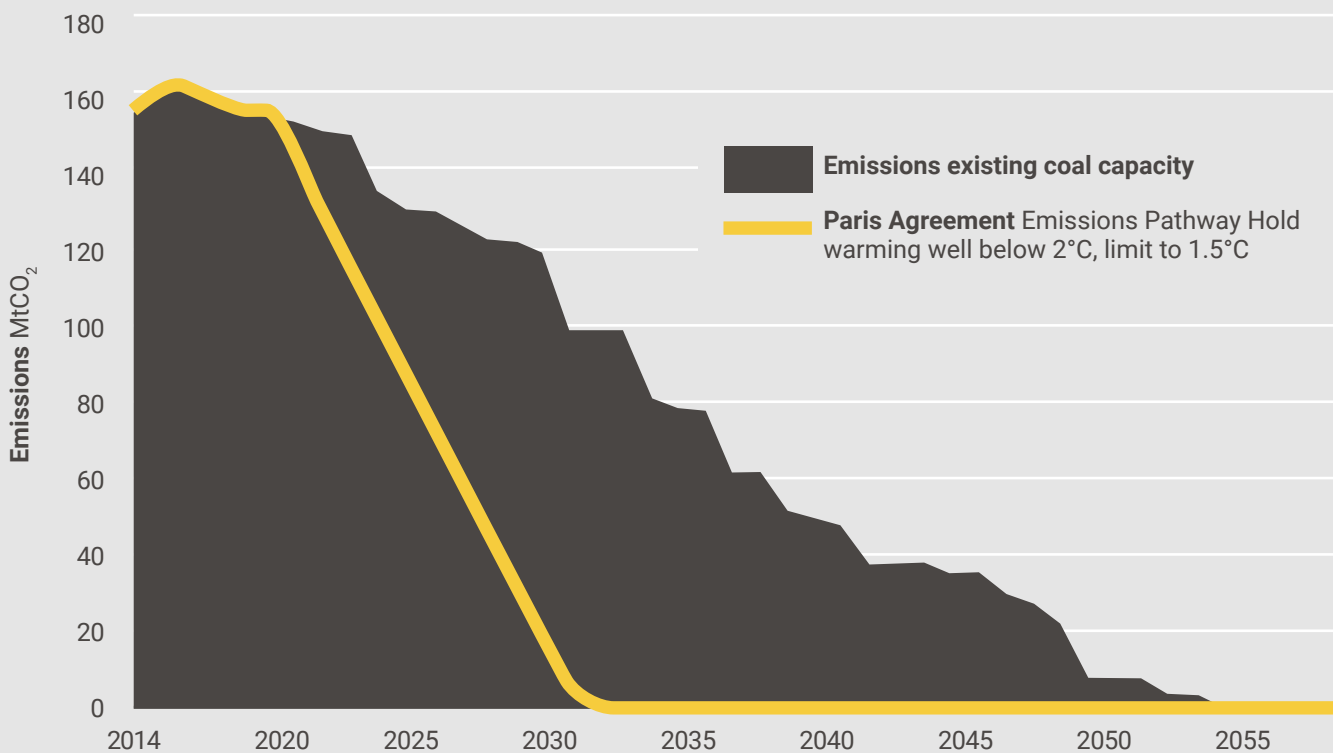
Non-profit research organisation Climate Analytics agrees, noting: “Ending its dependence on coal

for electricity generation by 2030 is the single most important element of Australia’s domestic contribution to global efforts to limit warming to 1.5°C and prevent the worst of climate change.”¹²⁶

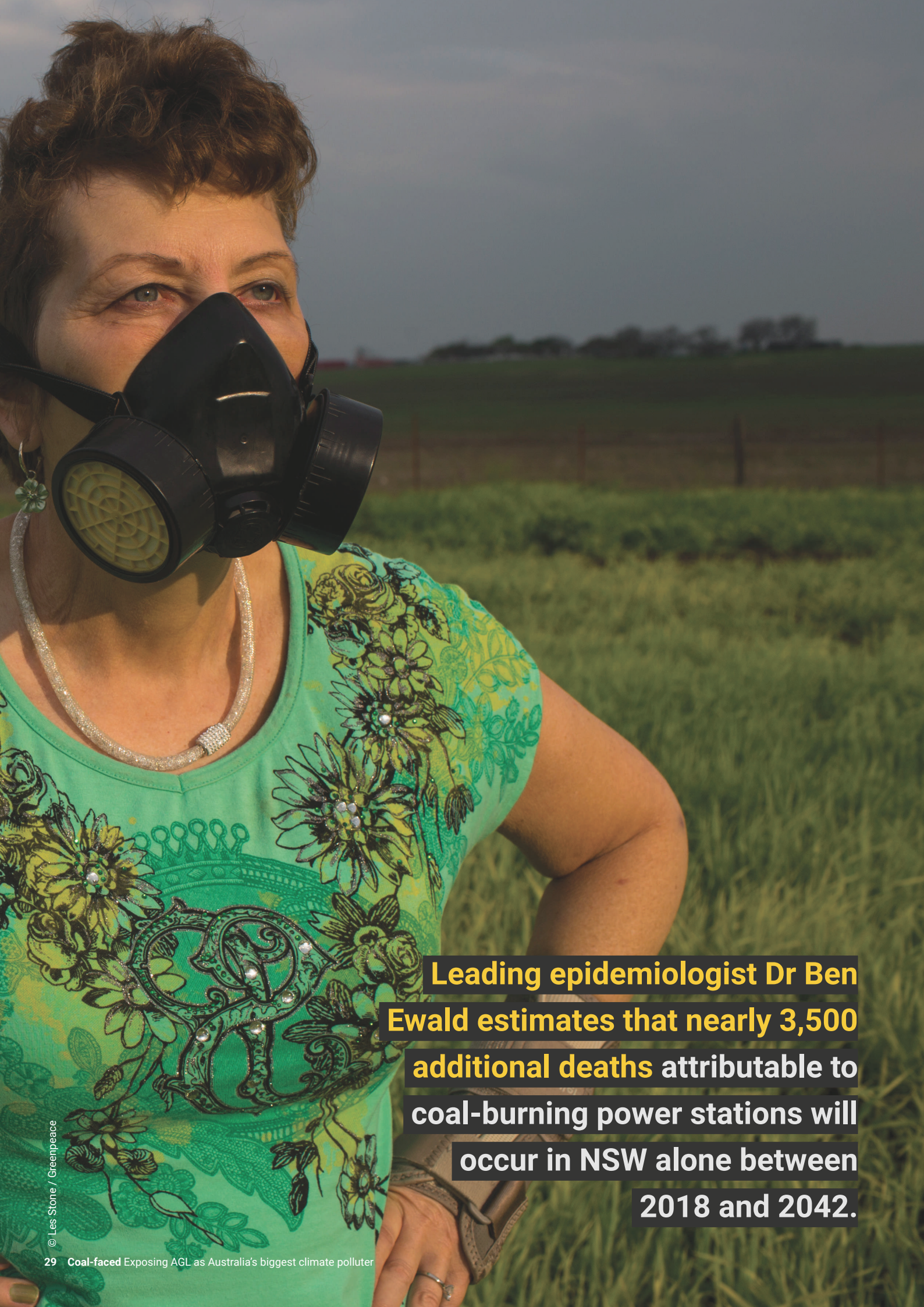
The importance of decarbonising the Australian electricity sector by 2030, however, isn’t limited to eliminating the huge amount of greenhouse gas emissions that it is currently responsible for. Crucially, it is the first step in the decarbonisation of the broader energy sector. As ClimateWorks Australia points out: “Electricity also plays a significant enabling role in decarbonising other sectors, which utilise electricity for energy supply.”¹²⁷

In fact, even AGL has acknowledged the urgency of exiting coal early. Its own conservative scenario analysis demonstrates that in order to limit global warming to 1.5 degrees Celsius above pre-industrial levels, it would have to close all of its coal-burning power stations by 2036.¹²⁸

AUSTRALIA POTENTIAL CO2 EMISSIONS from existing coal capacity compared with Paris Agreement consistent emissions pathways.



Source: <https://climateanalytics.org/briefings/coal-phase-out/>



Leading epidemiologist Dr Ben Ewald estimates that nearly 3,500 additional deaths attributable to coal-burning power stations will occur in NSW alone between 2018 and 2042.

3.2. The local consequences

As well as the huge global consequences, there are also significant local consequences associated with AGL's commitment to keeping all of its coal-burning power stations open until the end of their operating lives.

These local consequences include the serious ongoing health impacts of fine particle pollution caused by burning coal to generate electricity.

Leading epidemiologist Dr Ben Ewald estimates that nearly 3,500 additional deaths attributable to coal-burning power stations will occur in NSW alone between 2018 and 2042. More than 680 of these deaths are expected to be caused by Bayswater Power Station if it stays open until 2035 as is currently planned.¹²⁹

In addition, if AGL does not retire Bayswater Power Station early, it is expected to cause more than 500 additional low birth weight babies and more than 800 new cases of diabetes.¹³⁰

By the time the Liddell Power Station closes in 2022, it is expected to have caused more than 100 additional deaths, nearly 90 low birth weight babies, and roughly 130 cases of new onset diabetes.¹³¹

But the local consequences of AGL not exiting coal early include more than adverse human health impacts.

As coal-burning power stations age and their infrastructure becomes more worn and corroded, there is an increased risk of regulatory breaches, like the huge leak of coal ash slurry from Bayswater Power Station in 2019, that will cause further damage to local ecosystems, including endangered ones. As Paul Winn from the Hunter Community Environment Centre told the ABC in the wake of the 2019 coal ash slurry leak:

“As these power stations get older and the maintenance costs escalate we’re going to see more and more of these pollution events”.¹³²

Additionally, there is also an increased risk of more breakdowns and unplanned outages at AGL's ageing coal-burning power stations which could severely impact national electricity supply. This particular problem is compounded by the more extreme weather conditions like heatwaves that Australia is expected to experience in coming years.

As The Australia Institute explains:

“The heat particularly affects thermal electricity generation because the efficiency of thermal generation depends on temperature extremes between input and output. Closed-system generators typically use water for cooling, and during periods of extreme heat power stations can fail if the water from the cooling tower is too warm, if access to water is limited, or if the discharged water being pumped out of the cooling tower is too hot.”¹³³

ADVERSE HEALTH OUTCOMES attributable to power stations during their remaining years of operation.

	Planned closure year	Remaining operation (years)	Number of expected deaths	Number of low birth weight babies	Number of new onset diabetes
Bayswater	2035	17	685	571	857
Liddell	2022	4	107	89	134
Total			792	660	991

Source: Ewald, B. (2018)

DECLINING PROFITABILITY OF COAL ASSETS

forecasted in drop in Earnings Before Interest and Tax (EBIT)

	Scenario A				Scenario B			
	Revenue 2025 (\$AUDm)	Total Fixed + Variable Cost 2025 (\$m)	EBIT 2025 (\$m)	EBIT change 2018 to 2025 (%)	Revenue 2025 (\$m)	Total Fixed + Variable Cost 2025 (\$m)	EBIT 2025 (\$m)	EBIT change 2018 to 2025 (%)
Bayswater	\$598	\$363	\$234.51	-68%	\$454	\$363	\$91.27	-87%
Loy Yang B	\$331	\$208	\$123.20	-72%	\$258	\$208	\$50.48	-88%
Loy Yang A	\$674	\$484	\$189.85	-73%	\$502	\$157	\$484	-97%

Source: Edis, T & Bowyer, J (2021)

Indeed, this problem was acknowledged by the former Chief Executive Officer and Managing Director of Australian Energy Market Operator, Audrey Zibelman, in the leadup to the 2019-20 summer which was Australia's second hottest on record and saw devastating bushfires across the country. The forecasted warmer than average and extreme temperatures and the significant risk of bushfires with drier than usual conditions would, Zibelman said, "add to the deteriorating reliability of some of the older coal generation plants."¹³⁴

There is also the financial cost to AGL and its shareholders to consider if it continues to prioritise coal over renewable sources of energy which are already driving down wholesale power prices. As a recent report by the Institute for Energy Economics and Financial Analysis says:

"Coal-fired power stations in Australia's National Electricity Market will confront grave financial difficulties within the next 5 years due to extra competition from a large influx of renewable energy supply."¹³⁵

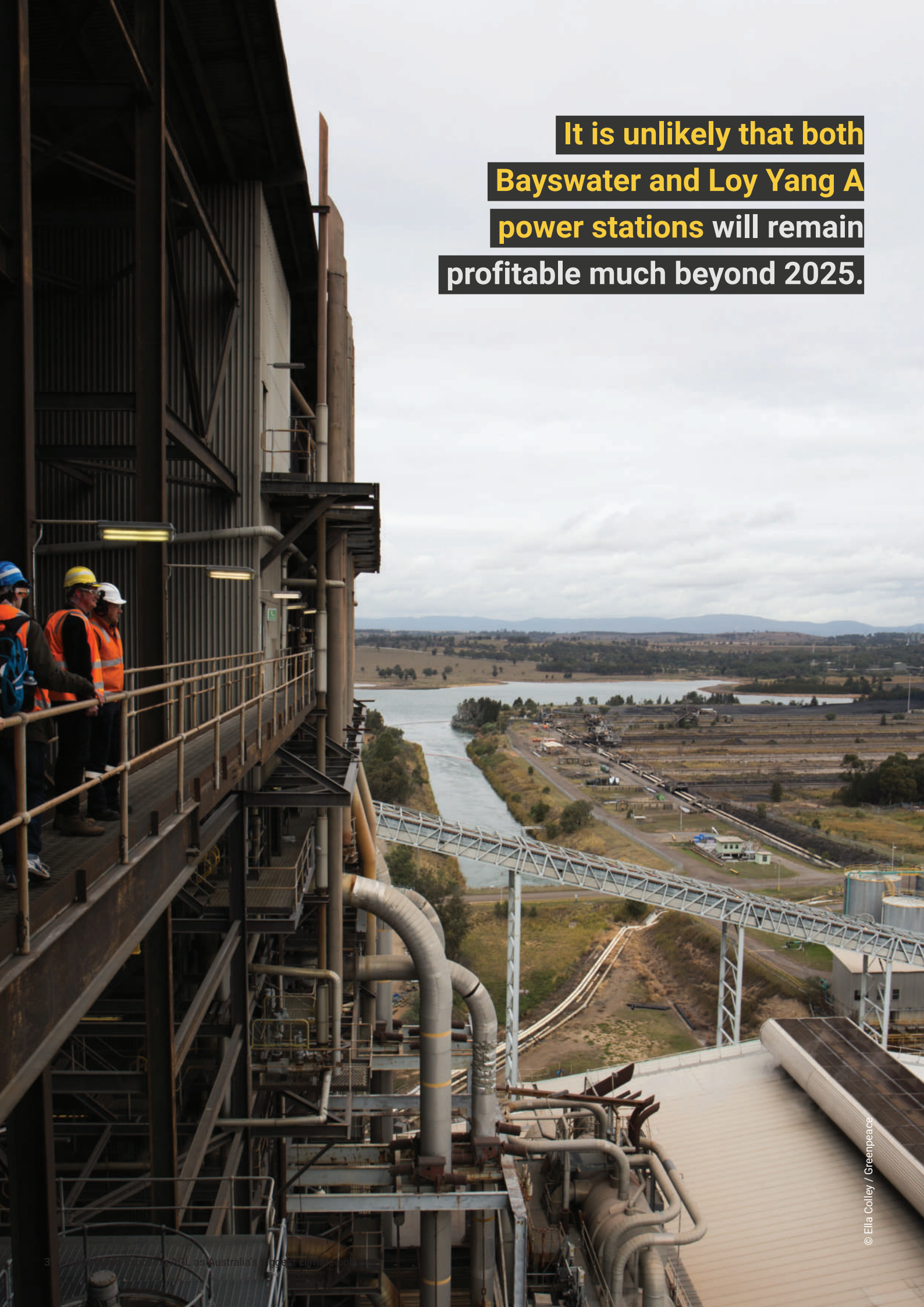
The report found that up to five of Australia's coal-burning power stations could in fact be losing money by 2025 as power prices plummet due to the influx of cheaper renewable energy supply. Although AGL's coal-burning power stations were not among these, the report still painted a bleak financial future for them. Bayswater Power Station, for example, will experience between a 68 per cent to 87 per cent drop in earnings before interest and tax between 2018 and 2025 while Loy Yang A will experience between a 73 per cent drop and 97 per cent drop.¹³⁶

At that rate of decline, it is unlikely that both Bayswater and Loy Yang A power stations would remain profitable much beyond 2025.

AGL is well aware of this. Indeed, the declining profitability of its coal assets was one of the major motivators for a recently proposed demerger that would see it split into two companies: "New AGL" which would manage electricity, gas and telecommunications retailing and "PrimeCo" which would operate the coal-burning power stations as well as some wind assets.¹³⁷

As well as serving to limit the reputational damage of owning coal-burning power stations, the proposed demerger would also allow AGL to open up its options in the years ahead, including selling off its coal assets if the dire economic predictions come true. Or, as Brett Redman puts it: "Separation would give New AGL and PrimeCo the freedom, focus and clarity to face the opportunities and challenges presented by this new world."¹³⁸

**It is unlikely that both
Bayswater and Loy Yang A
power stations will remain
profitable much beyond 2025.**



4 ANOTHER WAY FORWARD

4.1. A green future for Australia

While AGL continues to ignore the environmental and economic costs of operating its decaying fleet of coal-burning power stations, some of its competitors in the Australian electricity sector are already taking an alternative approach.

In February 2020, for instance, chief executive of Origin Energy Frank Calabria left open the possibility of bringing forward the 2032 shutdown of its Eraring black-coal fired power station – the largest power station in Australia. Speaking to The Sydney Morning Herald, he said: “...we are certainly assessing a range of scenarios as to how Eraring runs and operates over the coming years.”¹³⁹

EnergyAustralia took a tentative step in the right direction earlier this year when it announced it will close Yallourn Power Station in Victoria’s Latrobe valley in mid-2028 – four years earlier than its scheduled retirement date – and build a new 350MW utility-scale battery in the region by 2026 to boost renewable energy storage capacity. Although more action is needed, this will reduce the company’s carbon dioxide emissions by approximately 60 per cent relative to today. A \$10 million support package will help the hundreds of workers currently employed at the power station to plan, retrain and reskill long before it closes.¹⁴⁰

Explaining the decision, EnergyAustralia executive Liz Westcott said:

“Coal-fired power stations have been the backbone of our energy system for decades. But that is changing. More recently we’ve observed coal is less required as more renewables enter this system...because the system is changing before our eyes, and with every passing day, we take a step forward to this clean future.”¹⁴¹

Many experts, including leading economist and climate change policy expert Professor Ross Garnaut believe this clean, fossil-free future can be fully realised very soon. As Professor Garnaut said in 2019:

“I now have no doubt that intermittent renewables could meet 100 per cent of Australia’s electricity requirements by the 2030s, with high degrees of security and reliability, and at wholesale prices much lower than any experienced in Australia over the past decade.”¹⁴²

There is plenty of empirical evidence to support this belief.

A 2016 study conducted by the Institute of Sustainable Futures at the University of Technology Sydney found that, with proper planning and preparation plus increased investment in wind, solar, and hydro, Australia could have a fully decarbonised electricity sector by 2030 and a fully renewable energy supply system – including transport and industry – by 2050.¹⁴³



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The study concluded:

“Required technologies for a 100% renewable energy supply for Australia are available and mature. However, the integration of large shares of variable power generation requires a ‘systems-thinking’ approach, to adapt to new infrastructure needs and operational strategy, and change business models for energy retailers as well as power and gas grid operators.”¹⁴⁴

A recent report by Reputex reiterated this and detailed a clear roadmap for New South Wales – the state with the heaviest reliance on coal – to generate 100 per cent clean electricity by 2030. It found that the state could generate 100 per cent clean electricity by the beginning of the next decade if the amount of renewable energy generation increased sixfold compared to 2019-2020 levels.¹⁴⁵

Nationally, to reach the milestone of a completely renewable electricity sector by 2030 will require an 80 percent acceleration of wind and solar generation from the 2017 rate, backed up by pumped hydro storage facilities and extra transmission lines.¹⁴⁶

This is ambitious but achievable. Even more importantly, it will not result in reduced energy security. In fact, recent research commissioned by The Australia Institute found that the combination of renewable energy and battery storage can secure Australia’s electricity grid as – and even more – effectively as coal and gas.

As the report highlights: “When EnergyAustralia announced that the 1,480 MW Yallourn coal power station would close in 2028 it also announced a new 350 MW battery will be built in 2026. The battery is likely to be able to provide at least three times as much inertia, helping ensure grid stability, as Yallourn, despite a capacity a quarter as large.”¹⁴⁷

4.2. A global green present

More proof that Australia could generate 100 per cent renewable electricity by 2030 can be found overseas.

Take Britain.

In 1990, coal accounted for 75 per cent of all of its electricity generation. In 2009, however, that figure had dropped to 30 per cent. Coal now accounts for just 2 per cent of Britain's total electricity generation and, in a few years, will be virtually extinct in the country's electricity sector: the handful of coal-burning power stations that remain operational will be closed by 2025, under a plan legislated by former Conservative Party Prime Minister Theresa May.

A large part of the reason for the collapse of coal in Britain is the rapid rise of renewables. A decade ago, they accounted for just 8 per cent of total electricity generation; in December 2020, they accounted for 40 per cent.¹⁴⁹ Britain's fast progress in transitioning away from coal and towards renewables is a case study in how a similar transition can be achieved in Australia, with AGL leading the way.

But there are other countries where renewables account for an even greater share of electricity generation.

For the last four decades, Germany also relied heavily on fossil fuels such as oil and coal for its electricity needs. But in 2020, renewables overtook generation from coal, oil and gas for the first time, producing 45 per cent of the nation's power.¹⁵⁰ Moreover, Germany – whose population is more than three times larger than Australia's – plans to fully phase out coal from its energy sector by 2038.¹⁵¹

Closer to home, 80 per cent of New Zealand's electricity supply currently comes from renewable energy, with plans to reach 100 per cent by 2030, while Samoa leads Pacific Island Countries' decarbonisation efforts, with the nation on track to meet its target of 100 per cent of its electricity being renewable by 2025.¹⁵²

An even brighter example of what's achievable with enough willpower, commitment and investment comes from Iceland where renewable energy sources – specifically hydro and geothermal – now supply almost 100 per cent of electricity generation and 85 per cent of the country's total primary energy supply.¹⁵³

This wasn't always the case; in fact, until the early 1970s, Iceland relied almost entirely on imported fossil fuels for its energy needs. However, fluctuating oil prices made this oh so quiet approach to renewable energy impossible to sustain. Iceland grasped its future in its hands and developed a clean, stable, and economically feasible domestic energy supply. This was ultimately achieved thanks to commitment, cohesion and collaboration between the private sector, municipalities and the government.¹⁵⁴ The fossil fuel era is now just an echo, a stain in the nation's progress towards a clean present.

Of course, Iceland's geography, the access it has to hydro and geothermal, and its small population size is unique and made it relatively straightforward for the country to purify toxicity by transitioning away from fossil fuels: its prosperity didn't unravel, it grew. But there are still significant lessons that can be learned from its experience and applied to other nations, such as Australia which has an abundance of other forms of renewable energy such as wind and solar. As Halla Hrunn Logadóttir, Director of the Iceland School of Energy at Reykjavik University, says:

“Just as geothermal and hydro power generation made sense for energy transition in Iceland, local conditions elsewhere will determine which renewable resources are the most efficient and how they will be best exploited. Because every country is unique, each transition will be different. Iceland's conversion is therefore a meaningful success story rather than a ‘one model for all’ approach. First and foremost, Iceland is an inspiring example of what is possible, with many important lessons to share for any country seeking such a transformation.”¹⁵⁵

80 per cent of New Zealand's electricity supply currently comes from renewable energy, with plans to reach 100 per cent by 2030.



CONCLUSIONS

The continued rise of clean energy is inevitable: it is not a question of if, but when, Australia will be powered entirely by renewables.

As a giant in the Australian energy sector, AGL can ensure this transition happens as quickly as possible. But at the moment it appears to be using its position and power to do the opposite. By committing to keep burning coal until 2048 instead of exiting it before 2030, AGL is jeopardising both human and planetary health. But it is also jeopardising its own financial position given the three coal-burning power stations it owns are unlikely to remain profitable over the next decade.

It is not too late for AGL to take a different approach.

Instead of clinging to coal until the bitter end, AGL can listen to the world's scientific community about what is urgently required to avoid catastrophic climate change, follow the lead of some of its competitors in the Australian energy sector by closing all its coal-burning power stations before 2030, replacing them with renewable generation and prove through these actions that it is, as it claims, "helping to shape a sustainable energy future for Australia".¹⁵⁶



References

- 1 AGL Energy (2020a)
- 2 AGL Energy (2020a)
- 3 AGL Energy (2021a)
- 4 Clean Energy Regulator (2021a)
- 5 Clean Energy Regulator (2021a)
- 6 AGL Energy (2021b)
- 7 Hannam, P. (2021); see also Chapter 2 of this report.
- 8 Hannam, P. (2021)
- 9 Whittaker, J. (2018)
- 10 AGL Energy (2020a; 2019c; 2018a; 2017; 2016a; 2015; 2014)
- 11 AGL Energy (2020a)
- 12 Clean Energy Regulator (2021b)
- 13 EnergyAustralia (2021)
- 14 EnergyAustralia (2021)
- 15 Toscano, N. et al (2021)
- 16 Garnaut, R. (2019)
- 17 Cass, D. (2021).
- 18 Wettengel, J. (2021).
- 19 International Energy Agency. (2021)
- 20 Ministry of Business, Innovation, and Employment. (2019); Wentworth, A. (2018)
- 21 Department of Industry, Science, Energy and Resources. (2021)
- 22 Department of Industry, Science, Energy and Resources. (2021)
- 23 Edis, T. and Bowyer, J. (2021)
- 24 Department of Industry, Science, Energy and Resources. (2021). Gas contributed 21 per cent and oil contributed 2 per cent.
- 25 Department of the Environment and Energy (2019)
- 26 Australian Energy Regulator (2020)
- 27 Macdonald, A (2020)
- 28 Macdonald, A (2020)
- 29 AGL Energy (2020a)
- 30 AGL Energy (2019a)
- 31 AGL Energy (2019b)
- 32 AGL Energy (2020b)
- 33 AGL Energy (2020c)
- 34 AGL Energy (2020a)
- 35 AGL Energy (2020a; 2019c; 2018a; 2017; 2016a; 2015; 2014)
- 36 AGL Energy (2021b)
- 37 Clean Energy Regulator (2021a)
- 38 Clean Energy Regulator (2021a)
- 39 AGL Energy (2021c)
- 40 AGL Energy (2021b)
- 41 AGL Energy (2021b)
- 42 Ewald, B. (2018)
- 43 Farrow, A. et al. (2020)
- 44 Millington, B. (2018); McCarthy, J. (2018a)
- 45 American Lung Association (2021).
- 46 Millington, B. (2019)
- 47 Millington, B. (2019)
- 48 Whittaker, J. (2018)
- 49 Clean Energy Regulator (2021b)
- 50 AGL Energy (2020a; 2019c; 2018a; 2017; 2016a; 2015; 2014)
- 51 AGL Energy (2018a)
- 52 AGL Energy (2020a)
- 53 AGL Energy (2009)
- 54 AGL Energy (2009)
- 55 AGL Energy (2020a)
- 56 Fraser, M. & Redman, B. (2014)
- 57 Clean Energy Regulator (2021b)
- 58 Macdonald-Smith, A. (2019)
- 59 Macdonald-Smith, A. (2019)
- 60 Redman, B. (2020)
- 61 Redman, B. (2020)
- 62 Macdonald-Smith, A. (2019)
- 63 AGL Energy (2012)
- 64 AGL Energy (2012)
- 65 Fraser, M. & Mikkelsen, S. (2012)
- 66 AGL Energy (2021d)
- 67 AGL Energy (2019d)
- 68 AGL Energy (2021d)
- 69 Clean Energy Regulator (2021b)
- 70 The Canberra Times (1964)
- 71 AGL Energy (2021e)
- 72 AGL Energy (2021e)
- 73 Parkinson (2014)
- 74 Australian Competition and Consumer Commission (2014)
- 75 SBS News (2014)
- 76 Yaxley, L. & Verrender, I. (2018)
- 77 AGL Energy (2016b)
- 78 Clean Energy Regulator (2021b)
- 79 The Canberra Times (1979)
- 80 AGL Energy (2021e)
- 81 NSW Department of Planning and Environment (2018); McCarthy, J. (2018b)
- 82 AGL Energy (2018c)
- 83 Farquhar, L. (2020)
- 84 AGL Macquarie (2020a)
- 85 Clean Energy Regulator (2021b)
- 86 Hannam, P. (2021)
- 87 Hannam, P. (2021)
- 88 NSW Environmental Protection Authority (2020a)
- 89 AGL Macquarie (2020b)
- 90 NSW Environmental Protection Authority (2020a)
- 91 AGL Macquarie (2020b)
- 92 NSW Environmental Protection Authority (2015)
- 93 NSW Environmental Protection Authority (2016a); AGL Energy (2016c)
- 94 Environment Protection Authority Victoria (2016)
- 95 Environment Protection Authority Victoria (2016)
- 96 NSW Environmental Protection Authority (2016b)
- 97 Environment Protection Authority Victoria (2017)

- 98 NSW Environmental Protection Authority (2017)
- 99 NSW Environmental Protection Authority (2017)
- 100 NSW Environmental Protection Authority (2017)
- 101 NSW Environmental Protection Authority (2017)
- 102 Environment Protection Authority Victoria (2018)
- 103 Environment Protection Authority Victoria (2018)
- 104 NSW Environmental Protection Authority (2018)
- 105 NSW Environmental Protection Authority (2019a)
- 106 Environment Protection Authority Victoria (2019)
- 107 NSW Environmental Protection Authority (2019b)
- 108 NSW Environmental Protection Authority (2020b)
- 109 NSW Environmental Protection Authority (2020c)
- 110 Hannam, P. (2021)
- 111 Hannam, P. (2021)
- 112 Quicke, A. & Browne, B. (2020).
- 113 AGL Energy (2019f)
- 114 Quicke, A. & Browne, B. (2020)
- 115 AGL Energy (2020a)
- 116 AGL Energy (2020d)
- 117 AGL Energy (2020d)
- 118 United Nations (2021)
- 119 Lee, C. (2018)
- 120 Intergovernmental Panel on Climate Change. (2018)
- 121 Intergovernmental Panel on Climate Change. (2018)
- 122 Intergovernmental Panel on Climate Change. (2018)
- 123 Williams, P. (2020)
- 124 Williams, P. (2020)
- 125 Guterres, A. (2021)
- 126 Climate Analytics (2021)
- 127 Butler, C. et al. (2020)
- 128 AGL Energy (2020a)
- 129 Ewald, B. (2018)
- 130 Ewald, B. (2018)
- 131 Ewald, B. (2018)
- 132 Millington, B. (2020)
- 133 Ogge, M. et al. (2019)
- 134 Australian Energy Market Operator. (2019)
- 135 Edis, T. & Bowyer, J. (2021)
- 136 Edis, T. & Bowyer, J. (2021)
- 137 Toscano, N. (2021)
- 138 Parkinson, G. (2021a).
- 139 Toscano, N. (2020)
- 140 EnergyAustralia (2021)
- 141 Toscano, N. et al (2021)
- 142 Garnaut, R. (2019)
- 143 Institute of Sustainable Futures. (2016)
- 144 Institute of Sustainable Futures. (2016)
- 145 Parkinson, G.. (2021b)
- 146 Alternative Technology Association. (2017).
- 147 Cass, D. (2021).
- 148 Shields, B. (2020)
- 149 Department for Business, Energy and Industrial Strategy. (2020)
- 150 Wettengel, J. (2021).
- 151 International Energy Agency. (2021)
- 152 Ministry of Business, Innovation, and Employment. (2019);
Wentworth, A. (2018) 152 Ministry of Industries and
Innovation. (2021)
- 153 Logadóttir, H. (2013)
- 154 Logadóttir, H. (2013)
- 155 AGL Energy (2021a)
- 156 AGL Energy (2021d)

Bibliography

- AGL Energy (2009). "Annual Report 2009". AGL Energy. https://www.agl.com.au/-/media/aglmedia/documents/about-agl/investors/annual-reports/2009-annual-report_about-agl.pdf?la=en&hash=4C0D42671C2528B2B2064DB47AB1CC04
- AGL Energy (2012). "AGL completes purchase of Loy Yang A power station and adjacent mine." AGL Energy. June 29, 2012. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2012/jun/agl-completes-purchase-of-loy-yang-a-power-station-and-adjacent-mine>
- AGL Energy (2014). "Annual Report 2014". AGL Energy. https://www.agl.com.au/-/media/aglmedia/documents/about-agl/investors/annual-reports/2014-annual-report_about-agl.pdf?la=en&hash=B341C77E0D11C510D744B87F20223BC5
- AGL Energy (2015). "Annual Report 2015". AGL Energy. https://www.agl.com.au/-/media/aglmedia/documents/about-agl/investors/annual-reports/2015-annual-report_about-agl.pdf?la=en&hash=EF6D5954E77D1CECE351EC908A60430D
- AGL Energy (2016a). "Annual Report 2016". AGL Energy. https://www.agl.com.au/-/media/aglmedia/documents/about-agl/investors/annual-reports/2016-annual-report_about-agl.pdf?la=en&hash=54188C68F44395687222181EB169D8D3
- AGL Energy (2016b). "AGL advises Liddell Power Station outage". AGL Energy. March 21, 2016. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2016/march/agl-advises-liddell-power-station-outage>
- AGL Energy (2016c). "Lake Liddell closed permanently for public safety". AGL Energy. August 12, 2016. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2016/august/lake-liddell-closed-permanently-for-public-safety>
- AGL Energy (2017). "Annual Report 2017". AGL Energy. <https://agl2017-reportonline.com.au/annualreport#1>
- AGL Energy (2018a). "Annual Report 2018". AGL Energy. <https://www.agl.com.au/-/media/aglmedia/documents/about-agl/investors/annual-reports/180809-2018annualreport1829055.pdf?la=en&hash=84B5DED8A8C97640349C619EF36F6DF>
- AGL Energy (2018b). "Frequently Asked Questions about Liddell Power Station". AGL Energy. July 18, 2018. <https://thehub.agl.com.au/articles/2018/07/the-facts-on-liddell-power-station-2>
- AGL Energy (2018c). "Bayswater Power Station upgrade secures additional energy supply for NSW". AGL Energy. February 28, 2018. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2018/february/bayswater-power-station-upgrade-secures-additional-energy-supply-for-nsw>
- AGL Energy (2019a). "AGL enters agreement offering to acquire Southern Phone Company Limited". AGL Energy. October 16, 2019. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2019/october/agl-enters-agreement-offering-to-acquire-southern-phone-company-limited>
- AGL Energy (2019b). "AGL rings in a new era with acquisition of Southern Phone Company finalised". AGL Energy. December 19, 2019. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2019/december/agl-rings-in-a-new-era-with-acquisition-of-southern-phone-company-finalised>
- AGL Energy (2019c). "Annual Report 2019". AGL Energy. https://www.agl.com.au/-/media/aglmedia/documents/about-agl/investors/annual-reports/agl_annual_report_090819.pdf?la=en&hash=2890C67A39531E9197467BBC1F87B463
- AGL Energy (2019d). "AGL invests \$120 million at Loy Yang to improve reliability and safety". AGL Energy. January 2, 2019. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2019/january/agl-invests-120-million-at-loy-yang-to-improve-reliability-and-safety>
- AGL Energy (2019e). "Schedule for the closure of AGL plants in NSW and SA". AGL Energy. August 2, 2019. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2019/august/schedule-for-the-closure-of-agl-plants-in-nsw-and-sa>
- AGL Energy (2019f). "FY20 impact of extended unit outage at Loy Yang". AGL Energy. June 7, 2019. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2019/june/fy20-impact-of-extended-unit-outage-at-loy-yang>
- AGL Energy (2020a). "Annual Report 2020". AGL Energy. <https://www.2020annualreport.agl.com.au/>
- AGL Energy (2020b). "AGL enters telecoms market with broadband products". AGL Energy. November 13, 2020. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2020/november/agl-enters-telecoms-market-with-broadband-products>
- AGL Energy (2020c). "AGL puts electric vehicle subscription service into drive". AGL Energy. September 9, 2020. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2020/september/agl-puts-electric-vehicle-subscription-service-into-drive>
- AGL Energy (2020d). "Liddell incident". AGL Energy. December 18, 2020. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2020/december/liddell-incident>
- AGL Energy (2021a). "Our Company". AGL Energy. <https://www.agl.com.au/about-agl/who-we-are/our-company>
- AGL Energy (2021b). "Electricity output by primary energy source". AGL Energy. <https://www.2019datacentre.agl.com.au/infrastructure/electricity-output-by-primary-energy-source>
- AGL Energy (2021c). "AGL to lead business solar energy solutions, acquiring Solgen and Eppo". AGL Energy. March 9, 2021. <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2021/march/agl-to-lead-business-solar-energy-solutions-acquiring-solgen-and-epho>
- AGL Energy (2021d). "AGL Loy Yang Power Station". AGL Energy. <https://www.agl.com.au/about-agl/how-we-source-energy/loy-yang-power-station>
- AGL Energy (2021e). "AGL Macquarie Power Stations". AGL Energy. <https://www.agl.com.au/about-agl/how-we-source-energy/agl-macquarie>
- AGL Macquarie (2020a). "Bayswater Water and Other Associated Operational Works Project: Environmental Impact Statement". AGL Energy. June 4, 2020. <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-9697%2120200609T062617.698%20GMT>
- AGL Macquarie (2020b). "Bayswater Power Station – Ravensworth Ash Line Event". AGL Energy. August 31, 2020. <https://apps.epa.nsw.gov.au/prpoeoapp/ViewNotice.aspx?ID=1600001>
- Alternative Technology Association (2017). "100% Renewable Grid by 2030." Alternative Technology Association. https://renew.org.au/wp-content/uploads/2018/08/Renewable_Grid_by_2030.pdf
- American Lung Association (2021). "Nitrogen Dioxide". <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/nitrogen-dioxide>.
- Australian Competition and Consumer Commission (2014). "AGL opposes AGL's proposed acquisition of Macquarie Generation". Australian Competition and Consumer Commission. March 4, 2014. <https://www.accc.gov.au/media-release/accc-opposes-agls-proposed-acquisition-of-macquarie-generation>
- Australian Energy Market Operator. (2019). "AEMO releases energy summer readiness report". Australian Energy Market Operator. December 17, 2019. <https://aemo.com.au/newsroom/media-release/summer-readiness-report>
- Australian Energy Regulator (2020). "State of the Energy Market 2020". Australian Government. <https://www.aer.gov.au/system/files/State%20of%20the%20energy%20market%202020%20-%20Full%20report%20A4.pdf>
- Butler, C. et al. (2020). "Decarbonisation Futures: solutions, actions and benchmarks for a net zero emissions Australia." ClimateWorks Australia.

- March, 2020.
<https://www.climateworksaustralia.org/wp-content/uploads/2020/04/Decarbonisation-Futures-March-2020-full-report.pdf>
- The Canberra Times (1964). "Power Station to revive coal industry". The Canberra Times. October 1, 1964. <https://trove.nla.gov.au/newspaper/article/131752041>
- The Canberra Times (1979). "\$450m power station for Hunter Valley". The Canberra Times. April 30, 1979.
<https://trove.nla.gov.au/newspaper/article/110943491?searchTerm=bayswater%20power%20station%20AND%20coal>
- Cass, D. (2021). "Volt-face: changing energy security in the National Electricity Market". The Australia Institute. March, 2021.
<https://australiainstitute.org.au/wp-content/uploads/2021/03/P1047-Volt-face-batteries-replace-coal-security-WEB.pdf>
- Clean Energy Regulator (2021a). "Australia's 10 highest greenhouse gas emitters 2019-20". Australian Government. February 25, 2021.
<http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Data-highlights/2019-20-published-data-highlights/australias-10-highest-greenhouse-gas-emitters-2019-20>
- Clean Energy Regulator (2021b). "Electricity sector emissions and generation data". Australian Government. February 25, 2021.
<http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/electricity-sector-emissions-and-generation-data>
- Climate Analytics. (2021). "Coal phase-out." Climate Analytics.
<https://climateanalytics.org/briefings/coal-phase-out/>
- Department for Business, Energy and Industrial Strategy. (2020). "Energy Trends UK: July to September 2020". Government of the United Kingdom. December 22, 2020.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/946748/Energy_Trends_December_2020.pdf
- Department of the Environment and Energy (2019). "Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2019". Australian Government.
<https://www.environment.gov.au/system/files/resources/6686d48f-3f9c-448d-a1b7-7e410fe4f376/files/nggi-quarterly-update-mar-2019.pdf>
- Department of Industry, Science, Energy and Resources. (2021). "Electricity Generation". Australian Government.
<https://www.energy.gov.au/data/electricity-generation>
- Edis, T. and Bowyer, J. (2021). "Fast Erosion of Coal Plants Profits in the National Electricity Market". Institute for Energy Economics and Financial Analysis.
<http://greenmarkets.com.au/images/uploads/Coal-Plant-Profitability-Is-Eroding-February-2021.pdf>
- EnergyAustralia (2021). "EnergyAustralia powers ahead with energy transition". EnergyAustralia. March 10, 2021.
<https://www.energyaustralia.com.au/about-us/media/news/energyaustralia-powers-ahead-energy-transition>
- Environment Protection Authority Victoria. (2016). "Annual Performance Statement: AGL Loy Yang PTY LTD". Environment Protection Authority Victoria. September 20, 2016.
<shorturl.at/hoCKX>
- Environment Protection Authority Victoria. (2017). "Annual Performance Statement: AGL Loy Yang PTY LTD". Environment Protection Authority Victoria. September 25, 2017.
<shorturl.at/dfEIT>
- Environment Protection Authority Victoria. (2018). "Annual Performance Statement: AGL Loy Yang PTY LTD". Environment Protection Authority Victoria. September 17, 2018.
<shorturl.at/juGV4>
- Environment Protection Authority Victoria. (2019). "Annual Performance Statement: AGL Loy Yang PTY LTD". Environment Protection Authority Victoria. September 26, 2019.
<shorturl.at/luyA5>
- Ewald, B. (2018). "The health burden of fine particle pollution from electricity generation in NSW". Environmental Justice Australia.
https://www.envirojustice.org.au/wp-content/uploads/2018/11/Ewald_B_2018_The_health_burden_of_fine_particle_pollution_from_electricity_generation_in_NSW.pdf
- Farquhar, L. (2020). "Plans unveiled for \$52m Bayswater power plant upgrade". ABC News. July 13, 2020.
<https://www.abc.net.au/news/2020-07-13/bayswater-power-plant-upgrade/12448622>
- Farrow, A. et al. (2020). "Lethal Power: How burning coal is killing people in Australia". Greenpeace Australia.
<https://www.greenpeace.org.au/research/lethal-power-how-coal-is-killing-people-in-australia/>
- Fraser, M. & Mikkelsen, S. (2012). "Loy Yang A Acquisition". AGL Energy. February 24, 2012.
<https://www.agl.com.au/-/media/agl/about-agl/documents/media-center/asx-and-media-releases/2012/february/agl-to-acquire-loy-yang-a-power-station.pdf?la=en&hash=254E0B8768D103AE644DE81907FF46C9>
- Fraser, M. & Redman, B. (2014). "Macquarie Generation Acquisition". AGL Energy. August 20, 2014.
https://www.agl.com.au/-/media/agl/about-agl/documents/investor-centre/141003_macquarie-generation-acquisition-and-investor-presentation.pdf
- Garnaut, R. (2019). "Decarbonising electricity with security, reliability and lower costs". The University of Melbourne. April 24, 2019.
<https://www.youtube.com/watch?v=ZlZ1HFxsoG4>
- Guterres, A. (2021). "UN Chief calls for immediate global action to phase out coal". United Nations. March 2, 2021.
<https://unfccc.int/news/un-chief-calls-for-immediate-global-action-to-phase-out-coal>
- Hannan, P. (2021). "Dirty and Dangerous: AGL tops list of coal-fired plant breaches." Sydney Morning Herald. February 10, 2021.
<https://www.smh.com.au/environment/climate-change/dirty-and-dangerous-agl-tops-list-of-coal-fired-plant-breaches-20210209-p570xs.html?is-chunk-not-found-refresh=true>
- Institute for Sustainable Futures. (2016). "100% renewable energy for Australia". The University of Technology Sydney.
<https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-futures/100-renewable-energy-australia>
- Intergovernmental Panel on Climate Change. (2018). "Global Warming of 1.5°C". United Nations.
<https://www.ipcc.ch/sr15/>
- International Energy Agency. (2021). "Germany 2020: energy policy review." International Energy Agency.
<https://www.iea.org/reports/germany-2020>
- Lee, C. (2018). "Australian FAQ on the IPCC's Special Report on 1.5°C". Climate KIC Australia. October 4, 2018.
<https://climate-kic.org.au/2018/10/04/australian-faq-on-the-ipcacs-special-report-on-1-5c/>
- Logadóttir, H. (2013). "Iceland's Sustainable Energy Story: a model for the world?" United Nations Chronicle. April 25, 2013.
<https://www.un.org/en/chronicle/article/icelands-sustainable-energy-story-model-world>
- Macdonald, A. (2020). "Lighting up the streets of Sydney". AGL Energy. July 16, 2020.
<https://thehub.agl.com.au/articles/2020/07/lighting-up-the-streets-of-sydney>
- Macdonald-Smith, A. (2019). "AGL CEO urges 'steely-eyed' approach on energy transition". Australian Financial Review. May 10, 2019.
<https://www.afr.com/companies/energy/agl-ceo-urges-steely-eyed-approach-on-energy-transition-20190507-p51ks9>
- McCarthy, J. (2018a). "AGL reveals the exemptions that leave the region gasping". Newcastle Herald. May 22, 2018.
<https://www.newcastleherald.com.au/story/5420175/doubling-down-hunter-power-stations-and-their-polluting-ways/>
- McCarthy, J. (2018b). "AGL's Bayswater power station upgrade plans is missing vital air pollution technology, say critics." Newcastle Herald. September 10, 2018.
<https://www.newcastleherald.com.au/story/5634882/rush-for-bayswater-power-leaves-hunter-breathless/>
- Millington, B. (2018). "Liddell coal plant emitting nitrogen oxide at three times rate of global standard". ABC News. May 22, 2018.
<https://www.abc.net.au/news/2018-05-22/liddell-toxic-gas-emissions/9785688>
- Millington, B. (2019). "Coal ash has become one of Australia's biggest waste problems – and a solution is being ignored." ABC News. March 10, 2019.
<https://www.abc.net.au/news/2019-03-10/coal-ash-has-become-one-of-australias-biggest-waste-problems/10886866>
- Millington, B. (2020). "AGL issued \$1 million penalty by Environment Protection Authority after ash waste pollutes Hunter Valley creek". ABC News. December 16, 2020.
<https://www.abc.net.au/news/2020-12-16/agl-million-dollar-penalty-for-polluting-hunter-valley-creek/12986750>
- Ministry of Business, Innovation, and Employment. (2019). "Energy in New Zealand 19". New Zealand Government.
<https://www.mbie.govt.nz/dmsdocument/7040-energy-in-new-zealand-2019>
- Ministry of Industries and Innovation. (2021). "Energy". Government of Iceland.
<https://www.government.is/topics/business-and-industry/energy/#:~:text=About%2085%25%20of%20the%20total,domestically%20produced%20renewable%20energy%20sources.&text=Renewable%20>

[energy%20provided%20almost%20100,and%2027%25%20from%20geothermal%20power.](#)

NSW Department of Planning and Environment (2018). "\$200 million upgrade to Bayswater Power Station approved". NSW Government. December 7, 2018.

<https://www.planning.nsw.gov.au/News/2018/200-Million-Upgrade-to-Bayswater-Power-Station-Approved>

NSW Environmental Protection Authority. (2015). "AGL Macquarie Pty Ltd fined \$15,000 by the NSW EPA". NSW Environmental Protection Authority. August 18, 2015.

<https://www.epa.nsw.gov.au/news/media-releases/2015/epamedia18081501>

NSW Environmental Protection Authority. (2016a). "EPA Fines AGL Macquarie AGL for water pollution". NSW Environmental Protection Authority. January 8, 2016.

<https://www.epa.nsw.gov.au/news/media-releases/2016/epamedia16010801>

NSW Environmental Protection Authority. (2016b). "Non-compliance detail". NSW Environmental Protection Authority. August 29, 2016.

<https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?id=2122&periodid=49413&searchrange=licence&option=noncompliance&range=POEO%20licence>

NSW Environmental Protection Authority. (2017). "Non-compliance detail". NSW Environmental Protection Authority. August 29, 2017.

<https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?id=2122&periodid=53135&searchrange=licence&option=noncompliance&range=POEO%20licence>

NSW Environmental Protection Authority. (2018). "EPA fines AGL after slurry overflow". NSW Environmental Protection Authority. May 29, 2018.

<https://www.epa.nsw.gov.au/news/media-releases/2018/epamedia180529>

NSW Environmental Protection Authority. (2019a). "EPA fines AGL Macquarie \$30,000 after diesel spill". NSW Environmental Protection Authority. February 13, 2019.

[https://www.epa.nsw.gov.au/news/media-releases/2019/epamedia190305-epa-fines-agl-macquarie-\\$30000-after-diesel-spill](https://www.epa.nsw.gov.au/news/media-releases/2019/epamedia190305-epa-fines-agl-macquarie-$30000-after-diesel-spill)

NSW Environmental Protection Authority. (2019b). "AGL Macquarie fined \$15,000 for incident at Bayswater Power Station". NSW Environmental Protection Authority. August 29, 2019.

[https://www.epa.nsw.gov.au/news/media-releases/2019/epamedia190828-agl-macquarie-fined-\\$15000-for-incident-at-bayswater-power-station](https://www.epa.nsw.gov.au/news/media-releases/2019/epamedia190828-agl-macquarie-fined-$15000-for-incident-at-bayswater-power-station)

NSW Environmental Protection Authority. (2020a). "Water Pollution Incident Costs Power Station more than \$1.1 million". NSW Environmental Protection Authority. December 16, 2020.

[https://www.epa.nsw.gov.au/news/media-releases/2020/epamedia201216-water-pollution-incident-costs-power-station-more-than-\\$11-million](https://www.epa.nsw.gov.au/news/media-releases/2020/epamedia201216-water-pollution-incident-costs-power-station-more-than-$11-million)

NSW Environmental Protection Authority. (2020b). "AGL Macquarie ordered to give \$100,000 to community projects after breach". NSW Environmental Protection Authority. January 10, 2020.

[https://www.epa.nsw.gov.au/news/media-releases/2020/epamedia200110-agl-macquarie-ordered-to-give-\\$100000-to-community-projects-after-breach](https://www.epa.nsw.gov.au/news/media-releases/2020/epamedia200110-agl-macquarie-ordered-to-give-$100000-to-community-projects-after-breach)

NSW Environmental Protection Authority. (2020c). "Fine issued for excess dust emissions from power station". NSW Environmental Protection Authority. July 7, 2020.

<https://www.epa.nsw.gov.au/news/media-releases/2020/epamedia200707-fine-issued-for-excess-dust-emissions-from-power-station>

Ogge, M. et al. (2019). "The heat goes on: breakdowns at gas and coal plants in NSW, 2018". The Australia Institute.

<https://www.nature.org.au/media/368599/p651-the-heat-goes-on-nsw-gas-coal-watch-web.pdf>

Quicke, A. & Browne, B. (2020). "Fossil Fails in the Smart State: Gas and coal power plant breakdowns in Victoria". The Australia Institute. February 12, 2020.

<https://australiainstitute.org.au/report/fossil-fails-in-the-smart-state-gas-and-coal-power-plant-breakdowns-in-victoria/>

Parkinson, G. (2014). "The 2,000MW coal generator the NSW government sold for \$0." Renew Economy, March 20, 2014. <https://reneweconomy.com.au/the-2000mw-coal-generator-the-nsw-government-sold-for-0-59474/>

Parkinson, G. (2021a). "Biggest coal generator AGL to split business in two to focus on renewables generation." Renew Economy. March 30, 2021.

<https://reneweconomy.com.au/biggest-coal-generator-agl-to-split-business-in-two-to-focus-on-renewables-transition/>

Parkinson, G. (2021b). "Australia's biggest coal state could reach 100 pct renewables by 2030, Reputex says." Renew Economy. March 17, 2021.

<https://reneweconomy.com.au/australias-biggest-coal-state-could-reach-100pct-renewables-by-2030-reputex-says/>

Redman, B. (2020). "Getting on with the business of transition FAQs". AGL Energy. June 30, 2020.

<https://www.youtube.com/watch?v=fcbysySZbA04>

SBS News (2014). "Tribunal backs sale of NSW power stations". SBS News. June 25, 2014.

<https://www.sbs.com.au/news/tribunal-backs-sale-of-nsw-power-stations>

Shields, B. (2020). "Just 2 per cent of Britain's power now comes from coal. In Australia, it's more like three quarters". Sydney Morning Herald. January 2, 2020.

<https://www.smh.com.au/world/europe/just-2-per-cent-of-britain-s-power-now-comes-from-coal-in-australia-it-s-more-like-three-quarters-20200101-p53o71.html?js-chunk-not-found-refresh=true>

Toscano, N. (2020). "Origin Energy says coal plant closure date open to review". Sydney Morning Herald. February 21, 2020.

<https://www.smh.com.au/business/companies/origin-energy-says-coal-plant-closure-date-open-to-review-20200220-p542pd.html>

Toscano, N. (2021). "Coal struggles 'threaten value' in AGL's plan to split". Sydney Morning Herald. March 31, 2021.

<https://www.smh.com.au/business/companies/coal-s-struggles-threaten-value-in-agl-s-plan-to-split-20210331-p57fi5.html?js-chunk-not-found-refresh=true>

Toscano, N. et al (2021). "Victoria's Yallourn coal power plant to close early as clean shift slashes prices". Sydney Morning Herald. March 10, 2021.

<https://www.smh.com.au/business/the-economy/victoria-s-yallourn-coal-power-plant-to-close-early-as-clean-shift-slashes-prices-20210310-p579bw.html>

United Nations. (2021). United Nations. "The Paris Agreement".

<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

Wentworth, A. (2018). "Tesla powerpack promises 100% renewable energy in Samoa". Climate Action. August 22, 2018.

<https://www.climateaction.org/news/tesla-powerpack-promises-100-renewable-energy-in-samoa>

Wettengel, J. (2021). "Renewables produce more power than fossil fuels in Germany for first time." Clean Energy Wire. January 4, 2021.

<https://www.cleanenergywire.org/news/renewables-produce-more-power-fossil-fuels-germany-first-time>

Whittaker, J. (2018). "Loy Yang to remain until 2048: AGL". Latrobe Valley Express. October 25, 2018.

<https://www.latrobevalleyexpress.com.au/story/5721387/loy-yang-to-remain-until-2048-agl/>

Williams, P. (2020). "Calls to retire coal-fired power stations early". The Australian. July 21, 2020.

<https://www.theaustralian.com.au/business/mining-energy/call-to-retire-coal-fired-power-stations-early/news-story/151a5508a4fdc0a9db3a0124b781b25e>

Yaxley, L. & Verrinder, I. (2018). "Liddell power station: what do AGL and the Prime Minister want, and how much will it cost?" ABC News. September 13, 2017.

<https://www.abc.net.au/news/2017-09-13/liddell-coal-station-explained-what-do-agl-turnbull-want/8905308>



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