Attachment 12

Greenhouse Gas Management and Abatement Plan

WINCHESTER SOUTH PROJECT

Environmental Impact Statement

Additional Information

WHITEHAVEN COAL

Resource Strategies

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF CHARTS

LIST OF PLATES

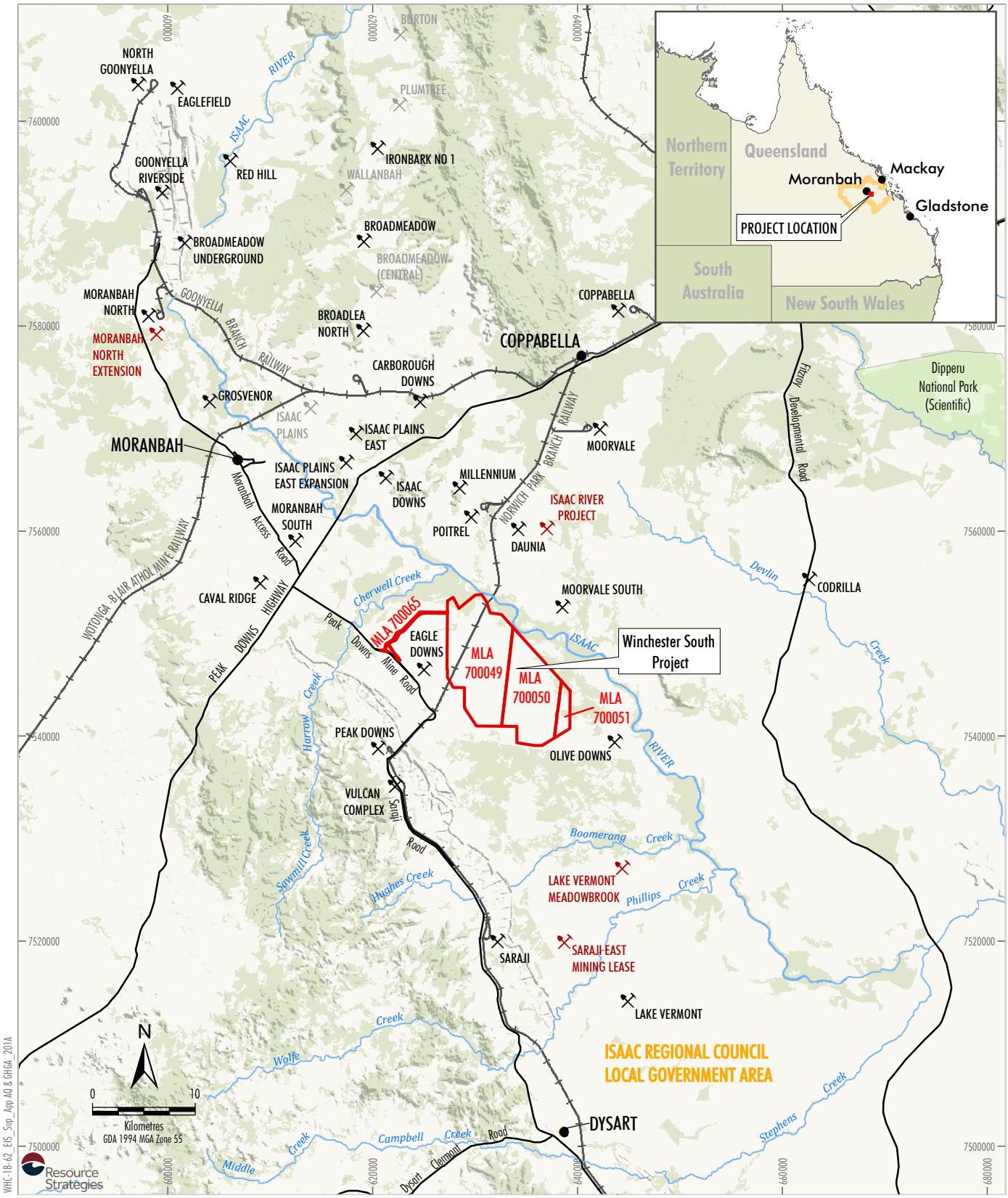
LIST OF ATTACHMENTS

1 INTRODUCTION

The Winchester South Project (the Project) is located approximately 30 kilometres south-east of Moranbah, in the Isaac Regional Council Local Government Area (Figure 1), within the Bowen Basin Coalfield, in Queensland. The proponent of the Project is Whitehaven WS Pty Ltd (Whitehaven WS), a wholly owned subsidiary of Whitehaven Coal Limited (Whitehaven).

The Project would include construction and operation of a metallurgical coal mine including a mine infrastructure area, which comprises a coal handling and preparation plant, train load-out facility and rail spur, which would be used for the handling, processing and transport of coal. An infrastructure corridor would also form part of the Project, including a raw water supply pipeline connecting to the Eungella pipeline network, an electricity transmission line and a mine access road.

The Project was declared a 'coordinated project' for which an Environmental Impact Statement (EIS) is required under section 26(1)(a) of Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) by the Coordinator-General on 17 April 2019. The Draft EIS for the Project was publicly notified by the Office of the Coordinator-General in August 2021. On 3 December 2021, the Coordinator-General formally requested (in accordance with section 34A of the SDPWO Act) Additional Information on the environmental effects of the Project and other matters relating to the Project.



LEGEND

- Mining Lease Application Boundary
- Approved/Operating
- Proposed
- Care and Maintenance
- Local Government Area Boundary
- Railway
- Road

Source: The State of Queensland (2018 - 2020); Geoscience Australia (2018)

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Project Location

Figure 1

2 PURPOSE AND SCOPE

This Greenhouse Gas Management and Abatement Plan (GMAP) has been prepared by Whitehaven WS to detail proposed greenhouse gas management and abatement measures proposed for the Project. The predominant greenhouse gas associated with the Project is carbon dioxide (CO_2), with smaller contributions from methane (CH_4) and nitrous oxide (N_2O).

This GMAP applies to all employees and contractors at the Project and covers all areas within the Project boundary. The GMAP applies for the life of the Project and will be subject to periodic review and revision following submission of each Annual Energy Audit (Section 7.4).

2.1 PREVIOUS VERSIONS

This is the first version of the GMAP. This section will be updated as part of future revisions.

2.2 CURRENT VERSION

The current version of the GMAP is required to satisfy the request for Additional Information from the Coordinator-General and also to establish the initial commitments and opportunities for greenhouse gas management and abatement at the Project.

2.3 FORMAT OF THE PLAN

This GMAP consists of the following sections:

Section 1: Introduction.

Section 2: Purpose and Scope – describes the purpose and particular components of this GMAP, including background to this GMAP.

Section 3: Policy Framework – Whitehaven WS's statutory requirements and policies relevant to this GMAP.

Section 4: Greenhouse Gas Inventory – describes predicted greenhouse gas emissions associated with Project activities.

Section 5: Greenhouse Gas Management and Abatement Measures – describes the management and abatement measures to be implemented at the Project.

Section 6: Initiatives and Research – provides details of initiatives and research to reduce greenhouse gas emissions at Whitehaven's operations and the Project.

Section 7: Monitoring, Reporting and Review – outlines the monitoring and reporting requirements and review process of this GMAP.

Section 8: References – provides references cited in this GMAP.

Section 3 describes the commitments and responsibilities of the key levels of government, industry and individual companies, as they relate to a coordinated and aligned approach to greenhouse gas management and abatement. This includes, in summary, the following levels:

- Global – collective global commitments
- Australian Government – Australia's national commitments established at a global level
- State of Queensland – Queensland's specified approach and target
- Resources industry – The resources industry and its policy framework
- Whitehaven Coal Limited – How the parent company of the Project is seeking to reduce GHG emissions, including initiatives being either implemented or researched across the company's assets and operations

Section 3 also describes the reporting direction and requirements of each of the above levels that are in place to monitor the effectiveness of greenhouse gas management and abatement measures against, ultimately, the global targets (Plate 1).

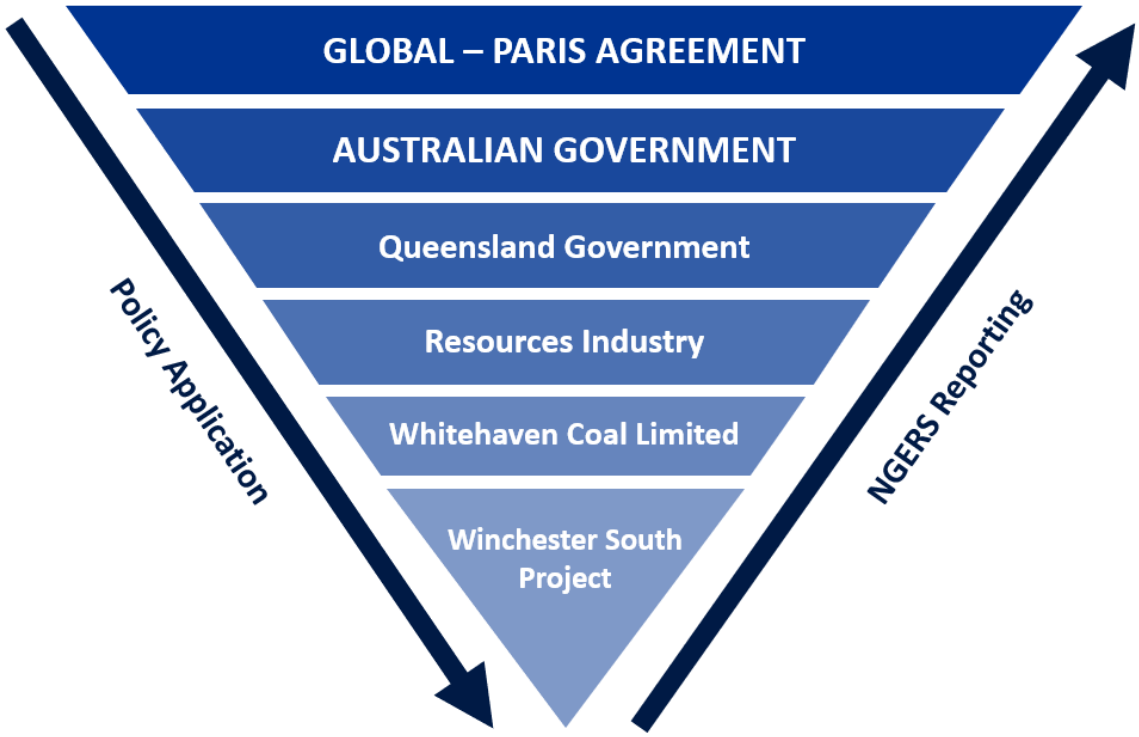


Plate 1 – Greenhouse Gas Policy Structure

Sections 4 to 7 detail the greenhouse gas management and abatement measures, as well as reporting requirements, specific to the Project. Sections 3 to 7 detail how the Project sits within the wider framework of parent company, industry, State Government, Australian Government and global greenhouse gas management and goals.

3 POLICY FRAMEWORK

3.1 GLOBAL

The international framework addressing greenhouse gas emissions, and the global response to climate change, commenced with adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992.

The UNFCCC has close to global membership, with 197 Parties (UNFCCC, 2021a). While a number of negotiating sessions are held each year, the largest is the annual Conference of the Parties (UNFCCC, 2021a). Two of the most important iterations of the UNFCCC were the third Conference of the Parties (in 1997) and 21st Conference of the Parties (in 2015), with the adoption of the *Kyoto Protocol* and the *Paris Agreement*, respectively.

The *Kyoto Protocol* entered into force in 2005 and imposes limits on the greenhouse gas emissions of developed countries listed in Annex 1 to the UNFCCC, with an initial commitment period of 2008 to 2012 (UNFCCC, 2021b). The UNFCCC requires parties to submit national inventories of greenhouse gas emissions and report on steps taken to implement the *Kyoto Protocol* (UNFCCC, 2021b). The *Doha Amendment* to the *Kyoto Protocol* was adopted at the 18th Conference of the Parties (in 2012), which included a second commitment period of 2013 to 2020 (UNFCCC, 2021b). The *Doha Amendment* entered into force on 31 December 2020 (UNFCCC, 2021c).

The goal of the *Paris Agreement* is to limit global temperature increases to well below 2 degrees Celsius (°C) above pre-industrial levels (UNFCCC, 2021d). In order to achieve that goal, Parties aim to reach peak global emissions as soon as possible, so as to (UNFCCC, 2021d):

> *… achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs* [greenhouse gases] *in the second half of the century.*

The *Paris Agreement* does not specify how global emission reductions are to be achieved. It requires Parties to prepare, communicate and maintain nationally determined contributions (NDCs) and to pursue domestic measures to achieve them (UNFCCC, 2021d; UNFCCC, 2021e). The NDCs are to be communicated every five years, with each successive NDC to represent a progression beyond the previous NDC. Parties' first NDCs were submitted in 2015. Second or updated NDCs were due to be submitted in 2020. To date, 151 parties have submitted new or updated first NDCs (UNFCCC, 2021e).

Australia submitted a revised NDC communication on 16 June 2022 (Commonwealth of Australia, 2022) (Section 3.2).

The NDCs are the heart of the *Paris Agreement* and require ratified parties (of which Australia is one), to communicate the actions they will take to reduce their greenhouse gas emissions in order to reach the goals of the *Paris Agreement*. Australia's NDC sets the targets that must be achieved on a national, economy-wide, basis.

The greenhouse gas emissions associated with coal produced by the Project that is used domestically will be accounted for and managed in accordance with domestic legislation that has been adopted to implement Australia's NDCs. Greenhouse gas emissions produced by the end use of Project coal overseas would be accounted for and managed in accordance with the laws that have been adopted to implement the NDCs or policies of the countries or jurisdictions to which the coal is exported.

All of Whitehaven's customer countries and the countries to which coal from the Project is expected to be exported are signatories to the *Paris Agreement* or, in the case of Taiwan, have domestic energy policies consistent with the objectives of the *Paris Agreement*.

At the 24th Conference of the Parties (in 2018), the *Katowice Climate Package* was agreed. The *Katowice Climate Package* contains, among other things, detailed guidance on the features of NDCs and the information each country should provide to improve transparency regarding NDCs, as well as highlighting the need to ensure that double counting of greenhouse gas emissions is avoided (UNFCCC, 2021f).

At the 26th Conference of the Parties in November 2021, the *Glasgow Climate Pact* was agreed. The draft Pact reaffirms the long-term global goal to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial level. The agreement also invites Parties to consider further actions to reduce non-carbon dioxide greenhouse gas emissions, including CH_4, by 2030 (UNFCC, 2021g).

3.2 COMMONWEALTH – AUSTRALIAN GOVERNMENT

Australia's first NDC under the *Paris Agreement* communicated a greenhouse gas emission reduction target of 26% to 28% below 2005 levels by 2030 (Commonwealth of Australia, 2015). The newly elected Australian Government has increased this commitment to 43% in line with the Labor Party's *Powering Australia* policy document (Australian Labor Party, 2022).

The Australian Government's updated and enhanced NDC (Commonwealth of Australia, 2022):

- adopts a revised 2030 commitment which includes both a single-year target to reduce emissions 43% below 2005 levels by 2030 and a multi-year emissions budget from 2021-2030;
- re-affirms a commitment to achieve net zero emissions by 2050; and
- refers to a substantial and rigorous suite of new policies across the economy to drive the transition to net zero.

Table 1 provides a summary comparison of the policy settings of the former Australian Government and the new Government.

Table 1
Summary Comparison of the Policy Settings of the Former Australian Government and the Current Australian Government

	Former Government	Current Government
Key Principles	The Long-Term Emissions Reduction Plan (Commonwealth of Australia, 2021b) is built on five key principles: 1. technology not taxes; 2. expand choices, not mandates; 3. drive down the cost of a range of new energy technologies; 4. keep energy prices down with affordable and reliable power; and 5. be accountable for progress.	Strengthened climate abatement ambition with a suite of policies yet to be formally released.
Emissions Reduction	Technology driven approach to reducing greenhouse gas emissions.	The Australian Government is implementing a substantial and rigorous suite of new policies across the economy to drive the transition to net zero. Australia's new 2030 target (43% below 2005 levels) is based on the modelled impact of these policies focusing on the electricity grid, low emissions technologies, reducing emissions from industry and electric vehicles.
Regulating Emissions	Safeguard Mechanism.	Strengthened Safeguard Mechanism including revised baselines.
Reporting	NGER Act.	No change to NGER Act. A new annual statement to Parliament on climate policy, progress against national targets and international developments.

Sources: Commonwealth of Australia (2021b, 2022).

Australia's National Greenhouse Accounts are prepared by the Department of Industry, Science, Energy and Resources (DISER), which allows Australia to track against its NDC commitments. The DISER publishes the greenhouse gas emission factors used in preparing the National Greenhouse Accounts. The *National Greenhouse Accounts Factors Australian National Greenhouse Accounts August 2021* (NGA Factors) (DISER, 2021a) is the latest such publication.

Emissions Reduction

As mentioned above, the new Government has stated its ambition to implement strengthened greenhouse gas policies, however these are yet to be developed in detail. Australia's new policies, among other things, include (Commonwealth of Australia, 2022):

- *A $20 billion investment in Australia's electricity grid to unlock greater penetration of renewable energy and accelerate decarbonisation of the grid.*
  - *Complemented by an additional $300 million to deliver community batteries and solar banks across Australia.*
- *Investment of up to $3 billion from the new National Reconstruction Fund to support renewables manufacturing and the deployment of low emissions technologies, broadening Australia's industrial base, bolstering regional economic development, and boosting private investment in abatement.*
- *A Powering the Regions Fund to support the development of new clean energy industries and the decarbonisation priorities of existing industry.*
  - *The Fund will also prioritise building the workforce skills and capability required for the clean energy transition. The Australian Government will invest a further $100 million to train 10,000 New Energy Apprentices in the jobs of the future and establish a $10 million New Energy Skills Program to provide additional training pathways.*
- *The introduction of declining emissions baselines for Australia's major emitters, under the existing Safeguard Mechanism, providing a predictable policy framework for industry, consistent with a national trajectory to net zero and supporting international competitiveness.*

…

- *The application of new standardised and internationally-aligned reporting requirements for climate risks and opportunities for large businesses.*
- *A commitment to reduce the emissions of Commonwealth Government agencies to net zero by 2030 (excluding defence and security agencies).*

Since 2019, Whitehaven has reported against the voluntary framework of the Financial Stability Board's Task Force on Climate-Related Financial Disclosures, providing further detailed disclosure around the management of climate-related risks and opportunities for the business.

Whitehaven has committed to purchasing carbon neutral electricity certified under Climate Active to meets its energy requirements. This will apply to the Project (Section 5 refers).

Whitehaven has committed to evaluating further opportunities for Scope 1 and 2 emissions reductions, including the possibility of setting targets. This work will continue in tandem with ensuring compliance with any measures ultimately adopted by the Australian Government in relation to setting baselines to achieve its new 2030 emissions targets and its ambition to achieve economy-wide net zero emissions by 2050.

Regulating Emissions

The Safeguard Mechanism, which was established through the Commonwealth *National Greenhouse and Energy Reporting Act 2007* (NGER Act), aims to ensure that greenhouse gas emission reductions purchased through the Emissions Reduction Fund are not undermined by increases in greenhouse gas emissions in other sectors. The Safeguard Mechanism sets a baseline level of emissions for facilities that emit over 100,000 tonnes of carbon dioxide equivalent (t CO_2-e) per year. If a facility exceeds its baseline level, it is generally required to surrender ACCUs, equivalent to the exceedance, to the Clean Energy Regulator. There are other mechanisms by which a facility can manage baseline exceedance, including applying for multi-year monitoring periods and exemptions for exceptional circumstances (e.g. natural disasters or criminal activity unrelated to the liable entity).

It is understood that the Australian Government proposes to adjust the Safeguard Mechanism to incorporate a tapering of baseline levels to support 2030 and 2050 emissions reduction targets (Commonwealth of Australia, 2022):

> *The Australian Government will also improve the Safeguard Mechanism by introducing mandatory emissions baselines for facilities already covered by the Mechanism over time. This will align policy with recommendations from the private sector and will provide a supportive policy framework that will encourage industry investment in low emissions technologies.*

The Safeguard Mechanism will apply to the Project; however, the application of an updated policy will need to be clarified in consultation with the Clean Energy Regulator (Section 7.2).

Reporting

The NGER Act is a national framework for reporting greenhouse gas emissions, energy production and energy consumption by corporations. The greenhouse gas emissions and energy data reported under the NGER Act is used by the Australian Government in compiling Australia's national greenhouse gas emissions inventory to meet its reporting obligations stemming from the *Paris Agreement*.

Under the NGER Act, entities that have operational control of facilities must report their greenhouse gas emissions and energy data if they meet the thresholds for reporting. The thresholds are:

a) emitting 25,000 t CO_2-e of greenhouse gas emissions or producing or consuming 100 terajoules (TJ) of energy (for an individual facility); or

b) emitting 50,000 t CO_2-e of greenhouse gas emissions or producing or consuming 200 TJ of energy (cumulatively for all facilities under the operational control of the corporation).

Reporting requirements of the NGER Act include both Scope 1 and Scope 2 emissions. To avoid the double counting of emissions, the NGER Act does not cover Scope 3 emissions.

The Project is anticipated to trigger the threshold value relevant to greenhouse gas emissions (25 kilotonnes of CO_2-e per year) under section 13(1) of the NGER Act (Katestone Environmental Pty Ltd [Katestone], 2022).

Therefore, Scope 1 and 2 emissions from the Project will be reported to the Australian Government annually and included in Australia's National Greenhouse Accounts, which will show how the Australian Government is tracking relative to commitments under the *Paris Agreement*.

Whitehaven currently reports all energy production and consumption and greenhouse gas emissions (Scope 1 and Scope 2) from its activities under the NGER Act. Whitehaven will continue to comply with its obligations under the NGER Act, including reporting any emissions and energy production and consumption from the Project (Section 7.1).

The Australian Government will introduce a new annual statement to Parliament on climate policy, progress against national targets and international developments and will seek to formalise its targets in legislation (Commonwealth of Australia, 2022). The annual statement and other climate policy will be informed by Australia's Climate Change Authority, which the Government proposes to restore as an independent source of advice.

3.3 STATE – QUEENSLAND GOVERNMENT

The Queensland Government has released the *Pathways to a clean growth economy – Queensland Climate Transition Strategy* (Queensland Climate Transition Strategy) (Department of Environment and Heritage Protection [DEHP], 2017a), which outlines how Queensland will transition to a clean growth economy and achieve its target of net-zero emissions by 2050. The Queensland Government also released its climate adaptation strategy (DEHP, 2017b) which provides a framework for ensuring an innovative and resilient Queensland that manages the risks and harnesses the opportunities of a changing climate.

The Queensland Climate Transition Strategy (DEHP, 2017b) also outlines Queensland's commitment to achieving 50% renewable energy by 2030 and at least a 30% reduction in emissions on 2005 levels by 2030, contingent on continued national and global action to meet the goals of the *Paris Agreement*.

As outlined in Section 3.5, Whitehaven acknowledges the Australian and Queensland targets of achieving net zero by 2050. Whitehaven further notes that 'net zero emissions' does not mean 'zero emissions' but rather seeks to establish an equilibrium between carbon sources and carbon sinks. Whitehaven commits to playing a constructive role in supporting net zero ambitions consistent with Australian Government policy.

Estimates of Queensland's greenhouse gas emissions are prepared as part of Australia's National Greenhouse Accounts by the DISER.

Mitigation

The Queensland Government recently released the *Climate Action Plan 2030* (Department of Environment and Science [DES], 2021), which outlines Queensland's roadmap to reach the emissions and renewables targets set by the Queensland Climate Adaptation Strategy (DEHP, 2017b), create jobs and drive economic recovery from COVID-19.

The *Climate Action Plan 2030* (DES, 2021) outlines the actions taken by the Queensland Government over 2020 to 2021 to reduce emissions, including committing approximately $2.10 billion to initiatives, programs and funds to establish renewable energy industries and training facilities, reduce fugitive emissions, improve understanding of new mineral resources, carbon sequestration projects, electric vehicle charging stations and improve climate change resilience. The Action Plan also describes the plans developed to reduce emissions for each sector, including the Queensland Resources Industry Development Plan.

The *Queensland Resources Industry Development Plan* (Queensland Resources Industry Development Plan) (State of Queensland, 2022) describes the following actions the Queensland Government is taking to manage greenhouse gas emissions associated with mining:

1. Complete the Bowen Basin pipeline concept study
2. Investigate carbon capture, use and storage
3. Continue to provide a rigorous environmental approval framework for resource projects
4. Work with industry to investigate ways to reduce fugitive emissions from resource activities
5. Facilitate industry access to renewable energy to reduce on-site emissions
6. Require industry to develop plans to decarbonise operations

The Queensland Resources Industry Development Plan (State of Queensland, 2022) also outlines the expectations for industry, including:

- conduct thorough environmental impact studies and make environmental protection a central part of operational decision making;
- reduce emissions, including fugitive emissions, in line with the Government's climate targets by decarbonising mine operations;
- develop and implement plans that provide a pathway to net zero emissions operations and report on progress publicly; and
- support the research and development of innovative technology to reduce on-site emissions, including through collaboration with the Mining Equipment, Technology and Services sector.

As described in Section 1, the Draft EIS was prepared for the Project and publicly notified in 2021, which includes environmental and socio-economic impact studies, and this Plan details greenhouse gas management and abatement measures for the Project (Section 5) and research initiatives to reduce on-site emissions (Section 6).

3.4 RESOURCES INDUSTRY

The Minerals Council of Australia released the *Climate Action Plan* in 2020 which details the mineral industry's commitment to the goal of net zero emissions and its actions, among others, on renewable energy investments at mine sites and collaborations with partners on low-emissions technologies and processes. The Plan outlines a series of actions focused on three key themes: support developing technology pathways to achieve significant reductions in Australia's greenhouse gas emissions; increased transparency on climate change reporting and informed advocacy and knowledge sharing of the sector's responses to addressing climate change.

Whitehaven is a member of the Minerals Council of Australia which, in 2020, released its *Climate Action Plan*. In 2021, Whitehaven also became a signatory to the World Coal Association's *Responsible Coal Principles*, which acknowledges the impact of climate change and importance of mitigating emissions from coal, committing to actively supporting low emission coal technologies, investment and innovation (Whitehaven, 2022).

3.5 WHITEHAVEN COAL LIMITED

Whitehaven's approach to environmental management is focused on avoiding environmental impacts where possible, mitigating unavoidable impacts, rehabilitating disturbed areas, and offsetting residual impacts that cannot be avoided, minimised or rehabilitated.

Whitehaven recognises and supports the long-term goal of the *Paris Agreement* to limit global average temperature increases to below 2°C compared to pre-industrial levels, consistent with Australia's national commitments under the accord.

Emissions Reduction

Whitehaven has committed to purchasing carbon neutral electricity certified under Climate Active for its operations.

Furthermore, consistent with Australian and Queensland targets, Whitehaven is undertaking an exercise to explore the decarbonisation potential within the business, including having regard to issues such as capital intensity, complexity and timing. Relevant outcomes from this process will be included in future revisions of this GMAP.

Carbon Abatement Opportunities and Initiatives

Whitehaven is committed to finding and implementing measures at each point of its value chain to reduce emissions and is undertaking an assessment of carbon abatement opportunities for its Scope 1 and 2 greenhouse gas emissions. This includes options to generate and purchase carbon offsets, as well as the associated costs and any related business risks or opportunities. Currently, Whitehaven is:

- implementing and further investigating opportunities to implement low emissions power generation;
- commissioning a study to analyse the potential to create carbon offsets (ACCUs) under the Australian Government's Emissions Reduction Fund; and
- evaluating a number of other nature-based and engineered solutions as a possible alternative to purchasing carbon offsets.

The findings of these studies are expected to offer opportunities to further reduce Scope 1 and 2 emissions associated with Whitehaven's operations. Whitehaven also currently invests in technology research and development to reduce carbon emissions (including fugitive emissions) through Low Emission Technology Australia (LETA) (previously COAL21).

LETA is a $550 million fund established by the Australian black coal industry to identify, research and develop technologies that can significantly reduce emissions and support the transition to a low emission global economy in line with the *Paris Agreement*, including carbon capture utilisation and storage. The fund partners with government and industry, locally and internationally, to develop projects that reduce and remove carbon emissions from large-scale industrial processes, demonstrating and supporting global action to lower industrial emissions in Australia and abroad (LETA, 2021).

LETA currently collaborates with the Australian Government on the Queensland Carbon Hub project, which involves building a carbon capture plant and permanent storage infrastructure which will see carbon emissions captured, transported and stored, and prove the ability to store up to three billion tonnes of CO_2 in the region. Once operational the Queensland Carbon Hub will see CO_2 captured from a variety of existing industries including coal and natural gas-fired electricity generation and biofuel production. It will also create an industrial-scale carbon storage facility as well as a mechanism to reuse captured CO_2, two measures critical to Australia meeting its international climate commitments (LETA, 2021).

In addition, Whitehaven will continue to work with commercial partners to analyse and evaluate opportunities to reduce operational emissions and investigate measures at each point of its value chain to reduce emissions, consistent with the actions outlined in the *Climate Action Plan* (Minerals Council of Australia, 2020) (Section 5).

Criticality of metallurgical coal to global industrial processes and economic growth

Approximately 60% of product coal is likely to be metallurgical coal, with the remainder being thermal coal. Metallurgical coal is an essential component of the production of steel and approximately 70% of all steel manufacturing requires the burning of metallurgical coal (DAWE, 2021)[1]. Notwithstanding, the coal proposed for extraction is anticipated to be of relatively high quality which may result in lower pollutants.

Steel is a critical input for supplying the world with clean and renewable energy, as it is an integral ingredient in manufacturing the hardware of decarbonisation to facilitate energy transition (e.g. solar panels, wind turbines, the construction of dams and electric vehicles depend on steel to varying degrees).

Steel demand is driven by construction and infrastructure development as it is a fundamental building block for modern and developing economies. The construction of homes, schools, hospitals and bridges rely heavily on steel (DAWE, 2021).

OECD's initial modelling predicts that global steel demand will grow by 1.4% per annum by 2035. However, after applying factors such as reduction in demand for the steel sector's product, increase in useful life and change in steel intensity, it is projected that the global steel demand will grow by 1.1% per annum by 2035 (DAWE, 2021).

[1] This section has been adapted from the Vickery Extension Project *Statement of Reasons for Approval under the Environment Protection and Biodiversity Conservation Act 1999* (Department of Agriculture, Water and the Environment [DAWE], 2021).

The International Energy Agency's (IEA) *Iron and Steel Roadmap* presents two pathways for the steel sector in the Stated Policies Scenario (STEPS) and Sustainable Development Scenario (SDS) which are broadly in line with the IEA's (2021) *World Energy Outlook*.

The *Iron and Steel Roadmap* (IEA, 2020) notes that the steel sector is currently responsible for about 8% of global final energy demand and 7% of energy sector CO_2 emissions (including process emissions). However, through innovation, low-carbon technology deployment and resource efficiency, iron and steel producers have opportunities to reduce energy consumption and GHG emissions, develop more sustainable products and enhance their competitiveness (DAWE, 2021)

In addition, *the Iron and Steel Roadmap* (IEA, 2020), developed in conjunction with industry, indicates that more efficient use of steel will lighten the load on the required shift towards a clean energy transition. Opportunities to reduce emissions from the sector in the next 10 years will primarily rely on improvements in material efficiency (light weighting of steel requirements in buildings), greater recycling of steel and iron (electric arc furnace), energy efficiency and performance improvements (DAWE, 2021).

Additionally, alternatives to steel (such as carbon fibre, engineered timber) and new methods for making steel without metallurgical coal, using hydrogen or electrolysis (using electricity) are being developed and piloted globally. However, these methods are not currently projected to be operating at scale until the 2030s (DAWE, 2021).

4 GREENHOUSE GAS INVENTORY

4.1 RELEVANT GREENHOUSE GASES AND GLOBAL WARMING POTENTIAL

In the context of the Project, the most relevant greenhouse gases are CO_2, CH_4 and N_2O. Greenhouse gas emissions are typically standardised by expression as a carbon dioxide equivalent (CO_2-e) based on their Global Warming Potential (GWP).

The GWP is determined by the differing periods that greenhouse gases remain in the atmosphere and their relative absorption of outgoing infrared radiation. The GWP of CH_4 is 28 (i.e. one tonne of CH_4 emissions has 28 times the potential to contribute to global warming than one tonne of CO_2 emissions), while the GWP of N_2O is 265 (DISER, 2021a).

To simplify greenhouse gas accounting, the emissions of these greenhouse gases (typically estimated in tonnes [t]) are converted to tonnes of carbon dioxide equivalent (t CO_2-e) before being summed to determine total greenhouse gas emissions. This can be expressed as:

$$t\ CO_2\text{-}e = t\ CO_2 \times 1 + t\ CH_4 \times 28 + t\ N_2O \times 265$$

4.2 GREENHOUSE GAS EMISSION SCOPES

The *Greenhouse Gas Protocol* (GHG Protocol) (World Business Council for Sustainable Development [WBCSD] and World Resources Institute [WRI], 2021) contains methodologies for calculating and assessing greenhouse gas emissions. The GHG Protocol provides guidance and standards for companies and organisations preparing greenhouse gas emission inventories. It covers the accounting and reporting of the six greenhouse gases covered by the *Kyoto Protocol*, including the three greenhouse gases most relevant to the Project as described above.

Under the GHG Protocol, an entity's operational boundaries are established by identifying emissions associated with its operations, categorising them as direct or indirect emissions, and identifying the scope of accounting and reporting for indirect emissions.

Three 'Scopes' of emissions (Scopes 1, 2 and 3) are defined for greenhouse gas accounting and reporting purposes. This is explored further below.

Scope 1 – Direct Greenhouse Gas Emissions

Direct greenhouse gas emissions are defined as emissions that occur from sources that are owned or controlled by the entity (WBCSD and WRI, 2021). Direct greenhouse gas emissions are emissions that are principally the result of the following types of activities undertaken by an entity:

- Generation of electricity, heat or steam – these emissions result from combustion of fuels in stationary sources (e.g. boilers, turbines and furnaces)
- Physical or chemical processing – most of these emissions result from the manufacture or processing of chemicals and materials (e.g. production of cement, ammonia and aluminium, or waste processing)

- Transportation of materials, products, waste, and employees – these emissions result from the combustion of fuels in mobile combustion sources (e.g. trucks, trains, ships, aeroplanes, cars, motorcycles and buses) owned/controlled by the entity
- Fugitive emissions – these emissions result from intentional or unintentional releases (e.g. equipment leaks from joints, seals, and gaskets; CH_4 emissions from coal mines and venting; hydrofluorocarbon emissions during the use of air conditioning and refrigeration equipment; and CH_4 leakages from gas transport) (WBCSD and WRI, 2021)

Scope 2 – Electricity Indirect Greenhouse Gas Emissions

Scope 2 emissions are a category of indirect emissions that account for greenhouse gas emissions associated with the generation of purchased electricity consumed by the entity.

Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the entity (WBCSD and WRI, 2021). Scope 2 emissions physically occur at the facility where the electricity is generated (WBCSD and WRI, 2021). Entities report the emissions associated with the generation of purchased electricity (consumed in equipment or operations owned or controlled by the entity) as Scope 2.

Scope 3 – Other Indirect Greenhouse Gas Emissions

Scope 3 emissions are those indirect emissions that are the consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. Some examples of Scope 3 emissions provided in the GHG Protocol are those from the extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services (WBCSD and WRI, 2021).

The GHG Protocol notes that reporting Scope 3 emissions can result in double counting of emissions. For example, greenhouse gas emissions from the burning of coal to produce energy are the Scope 3 emissions of the mines approved to produce the coal, as well as the Scope 1 emissions of the businesses that burn the coal to generate electricity. Those emissions will also be the Scope 2 emissions of the businesses that purchase the electricity.

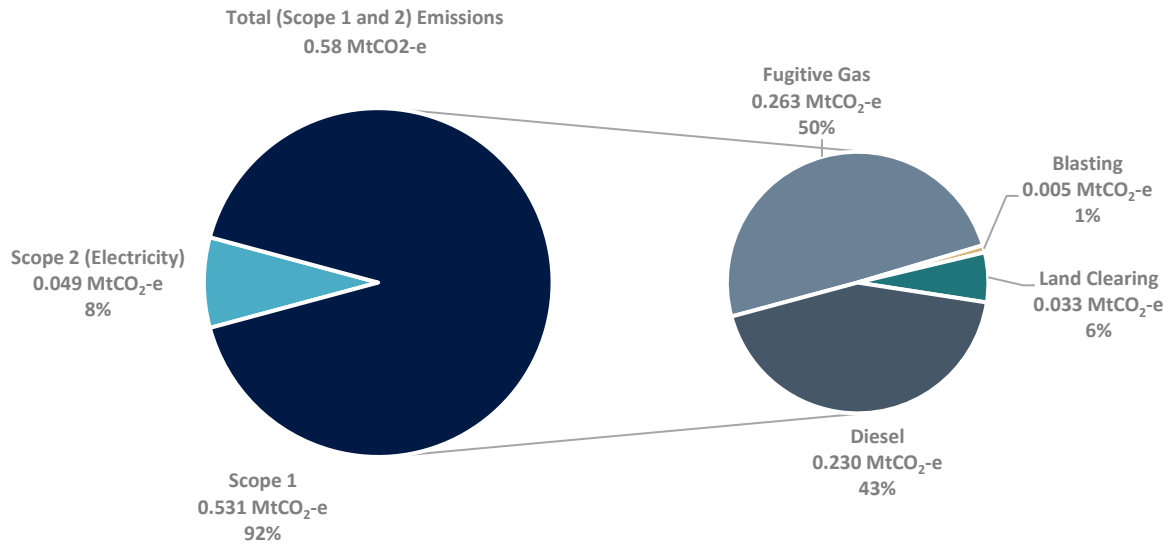
4.3 PREDICTED GREENHOUSE GAS EMISSIONS

Katestone (2022) prepared an Air Quality and Greenhouse Gas Assessment for the Project, which included estimation of the annual emissions from the Project, based on the NGA Factors, *National Greenhouse and Energy Reporting (Measurement) Determination 2008* and the GHG Protocol. A detailed inventory of the Scope 1 and 2 greenhouse gas emissions, sources and activities, excluding application of mitigation measures, is provided in Attachment 1.

The estimated average Scope 1 and 2 emissions associated with the Project (unmitigated) is shown on Chart 1, including the breakdown of emissions associated with each activity. It is noted during the progression of the Project mining operation land clearing will take place; however, waste rock emplacements would also be rehabilitated, offsetting any previous greenhouse gas emissions associated with land clearing. Notwithstanding, the emissions associated with land clearing have been conservatively included in the estimated Scope 1 emissions of the Project (Attachment 1).

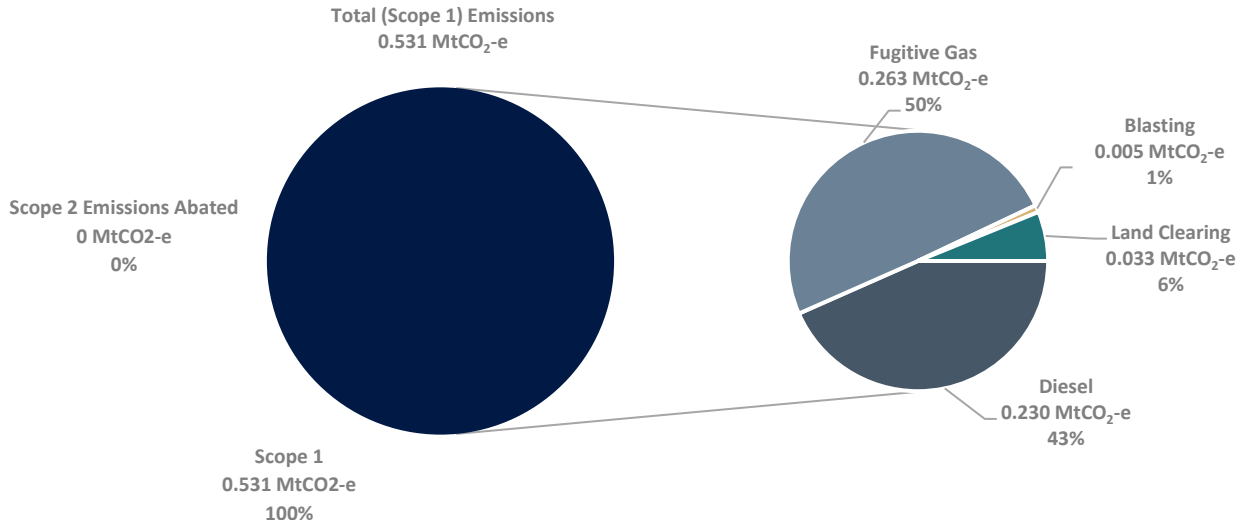
Comparison of the average Scope 1 and 2 emissions associated with the Project inclusive of the management and abatement measures described in Section 5 (purchase of carbon neutral electricity) is shown on Chart 2.

Chart 1
Average Annual Scope 1 and 2 Greenhouse Gas Emissions for the Project (Unmitigated)



Source: After Katestone (2021 and 2022).

Chart 2
Average Annual Scope 1 and 2 Greenhouse Gas Emissions for the Project (Mitigated)



Source: After Katestone (2022).

4.4 GREENHOUSE GAS EMISSIONS INTENSITY

The Scope 1 and 2 greenhouse gas emissions intensity of the Project is estimated to be approximately 0.04 t CO_2-e/t run-of-mine (ROM) coal (mitigated). This compares favourably with other approved and operating coal mining operations in the Bowen Basin, which have estimated greenhouse gas emissions intensities ranging from 0.036 to 0.13 (Table 2). The low greenhouse gas emissions intensity is related to the relatively low strip ratios at the Project, which also lower the cost of coal production.

Table 2
Scope 1 and 2 Emission Intensities of Coal Mining Operations in the Bowen Basin

Mining Operation	Total ROM Resource (Mt)	Total GHG Emissions (Scope 1 and 2) (Mt)	Emissions Intensity Factor (t CO_2-e/ t ROM coal)
Project[1]	396	15.9 (mitigated)	0.04
Isaac Downs Mine[2]	35.4	2.15	0.06
Olive Downs Project[3]	611.5	71.91	0.12
Caval Ridge Mine[4]	-	11.14	0.036 – 0.043
Goonyella Riverside Mine[5]	750	39.25	0.05
Broadmeadow Underground Mine[5]	138	11.51	0.08
Red Hill Mine[5]	234	24.21	0.11 – 0.13
Central Queensland Coal Project[6]	64.1	3.45 (Scope 1 only)	0.05

Note: Values have been rounded.

1 *Air Quality and Greenhouse Gas Assessment for the Winchester South Project* (Katestone, 2022).

2 *Air Quality and Greenhouse Gas Assessment for the Isaac Downs Project* (Katestone, 2020).

3 *Air Quality and Greenhouse Gas Assessment for the Olive Downs Coking Coal Project* (Katestone, 2018).

4 *Caval Ridge Environmental Impact Statement* (BHP Billiton Mitsubishi Alliance [BMA], 2009).

5 *Red Hill Mining Lease Environmental Impact Statement* (BMA, 2013).

6 *Central Queensland Coal Project Air Quality Assessment* (Vipac Engineers & Scientists, 2020).

4.5 KEY SOURCES OF GREENHOUSE GAS EMISSIONS

The main sources of greenhouse gas emissions predicted for the Project are (Katestone, 2021 and 2022):

- fuel consumption (diesel) of mining equipment (e.g. trucks, dozers, etc.) during mining operations (Scope 1);
- release of fugitive CH_4 and CO_2 through mining coal seams (Scope 1); and
- indirect emissions resulting from consumption and use of purchased electricity (Scope 2).

Accordingly, mitigation and minimisation measures for the Project are focused on controlling and reducing the emissions associated with the above-listed sources (Section 5).

5 GREENHOUSE GAS MANAGEMENT AND ABATEMENT MEASURES

The sub-sections below detail the greenhouse gas management and abatement measures associated with the key sources of greenhouse gas emissions for the Project and other measures that will be implemented to reduce overall emissions associated with the Project. The Project greenhouse gas management and abatement measures are generally consistent with *Climate Action Plan* (Minerals Council of Australia, 2020), *Industry Action on Climate Change Mitigation and Low Emissions Technologies* (Climate Change Authority, 2020) and *Climate Risk and Decarbonization: What every mining CEO needs to know* (Delevingue *et al*., 2020).

Scope 1 and 2 Emissions

Emissions from Diesel Consumption

The following management and abatement measures will be implemented at the Project to promote the efficient use of diesel (i.e. reduction of diesel consumed):

- Regular maintenance of plant and equipment to minimise fuel consumption and associated emissions, including training staff on continuous improvement strategies regarding efficient use of plant and equipment
- Monitoring and maintaining equipment in accordance with manufacturer recommendations
- Optimising diesel consumption through logistics analysis and planning (e.g. review of the mine plan to optimise haul lengths, dump locations, reduction of engine idle times and minimising the road gradients)
- Implementation of high-efficiency motors

Diesel and electricity usage and greenhouse gas emissions from the Project will be tracked and reported each year in the Annual Energy Audit and through the *National Greenhouse and Energy Reporting Scheme* (Section 7.1 and 7.2).

Whitehaven WS will also comply with the Australian Government's Safeguard Mechanism and will manage and maintain emissions to ensure they remain below or at the baseline set by the Clean Energy Regulator. It is noted that current Australian policy includes a target of net zero emissions by 2050. Net zero emissions does not mean 'no emissions', and Whitehaven will continue to advocate for coal's role in supporting an orderly and just energy transition over the coming decades.

Emissions from Consumption and Purchase of Electricity

The following management and minimisation measures will be implemented at the Project to reduce emissions from energy use and improve energy efficiency:

- Purchase of certified carbon neutral electricity
- Use of procurement policies that preference the selection of energy efficient equipment and vehicles

The purchase of certified carbon neutral electricity will offset all Scope 2 emissions associated with the Project, which account for approximately 8% of all emissions (Scope 1 and 2) produced by the Project (abatement of approximately 1.46 Mt CO_2-e) (Chart 1).

Fugitive Emissions

Fugitive CH_4 released from mining coal deposits can be converted to CO_2 through flaring or capture for use in electricity production through pre-drainage of coal seams for underground mines. As the Project is an open cut mine, the coal seams are closer to the surface, as such the likelihood of significant in-situ gas in places is lower (Clean Energy Regulator, 2021a).

Whitehaven WS has investigated pre-drainage for the Project and it is not considered to be feasible based on current technology.

Carbon Capture and Storage

Whitehaven WS considered the potential use of carbon capture and sequestration of greenhouse gas emissions for the Project; however, it has been determined that these measures are not viable at this stage.

Whitehaven WS will prepare and implement a Research Program for the Project, and allocate funds towards implementation of the program, which will include research into capture of CO_2 for beneficial reuse or sequestration (Section 6.2).

Carbon Credits

The Safeguard Mechanism applies to the Project (Section 3.2); accordingly, as part of reporting under the *National Greenhouse and Energy Reporting Scheme*, Whitehaven WS will report on compliance with the Project's baseline (to be determined) (Section 7.2).

If the Project's emissions exceed or are expected to exceed the baseline, Whitehaven WS would surrender ACCUs to offset emissions, to ensure compliance.

Incidental Emissions from Project

The following minimisation measures will be implemented at the Project to reduce overall emissions associated with the Project:

- Limiting vegetation clearance, as far as practical, within the Project area
- Maximising opportunities for local businesses to provide goods and services to the Project, by collaborating with Moranbah Traders Association, Local Content Leaders Network and the Regional Industry Network and any other appropriate stakeholders in establishing a local supplier listing tailored to the Project, and implementing other enhancement measures as outlined in the Project Social Impact Management Plan
- Monitoring and reducing waste in accordance with the Project Waste Management Plan, including implementation of a waste recycling program for the Project to promote and encourage recycling of materials such as paper, cardboard and scrap metal
- Encouraging car-pooling and the use of the shuttle bus service

Whitehaven WS will also legally secure and manage land-based properties to offset impacts to biodiversity, in accordance with State and Commonwealth requirements. These offsets will be secured in-perpetuity and would ensure ongoing carbon sequestration and indirect net greenhouse abatement benefits.

The Project will be progressively rehabilitated in accordance with the Project Progressive Rehabilitation and Closure Plan, which includes the establishment of patches of woodland on waste rock emplacements, where appropriate, and along drainage paths in the final landform. These plantings will capture CO_2 and provide indirect abatement benefits.

Scope 3 Emissions

Whitehaven acknowledges there are emissions associated with the products it produces. These downstream emissions are classified as Scope 3 for Whitehaven while being the direct or Scope 1 emissions of organisations which use the products.

The United Nations Framework Convention on Climate Change (UNFCCC) and related rules have been in place since 1992 and represent the foundation for the accountability of national governments to progress their international commitments. The rules specify that all emissions associated with an activity within a nation's borders count towards that nation's emissions total. This means emissions associated with the production of goods imported into Australia ('upstream' Scope 3 emissions) are accounted for in producing countries' greenhouse accounts, just as emissions associated with Australian exports ('downstream' Scope 3 emissions) are accounted for in importing countries' greenhouse accounts. This approach avoids double-counting and promotes complete, global coverage of emissions, as well as transparency, accuracy and comparability across all countries.

With the adoption of the *Paris Agreement* almost all countries, including major developing countries, have for the first time committed to respond to climate change and track their progress over time. Nations are individually responsible and accountable for determining their contribution to the global response to climate change.

The NGER scheme is a single, national framework for reporting on energy production, consumption and emissions. It supports the Australian Government's reporting obligations and so does not require reporting of Scope 3 emissions. The scheme is consistent with reporting systems in operation in the USA, the EU and South Korea. In its recent review of the NGER scheme, the Australian Government's Climate Change Authority considered a requirement to report Scope 3 emissions. The Authority concluded that the challenges and burden of reporting Scope 3 emissions outweigh any benefits, because an accurate estimation of Scope 3 emissions associated with a specific economic activity is inherently complex and uncertain, involving many value chains across multiple economies.

Whitehaven will continue to focus on reducing emissions over which it has direct control over, being Scope 1 and 2 emissions. In addition, the countries to which Whitehaven currently exports coal to and the key countries to which coal from the Project is expected to be exported to are covered by each respective country's NDCs or, in the case of Taiwan, have domestic energy policies consistent with the objectives of the *Paris Agreement.* Accordingly, greenhouse gas emissions produced by the end use of Project coal overseas would be accounted for and managed in accordance with the laws that have been adopted to implement the NDCs of the countries to which the coal is exported (Section 3.1).

Furthermore, the commitment to purchase carbon neutral electricity also offsets 'upstream' Scope 3 emissions associated with the transmission and distribution of electricity to the Project, as these emissions are also offset by the purchase and retirement of carbon offset units.

Whitehaven will also continue to work with commercial partners to analyse and evaluate opportunities to reduce operational emissions and investigate measures at each point of its value chain to reduce emissions, consistent with the actions outlined in the *Climate Action Plan* (Minerals Council of Australia, 2020).

6 INITIATIVES AND RESEARCH

6.1 INITIATIVES

Whitehaven has invested in carbon capture technologies through its funding for LETA. The organisation identifies, researches and develops technologies that capture and permanently store CO_2 or reuse CO_2 in other applications.

Whitehaven supports an industry-wide approach to mitigating emissions. Whitehaven is a member of the Minerals Council of Australia which, in 2020, released its *Climate Action Plan*. The plan details the mineral industry's ambition to achieving the goal of net zero emissions and its actions, among others, on renewable energy investments at mine sites and collaborations with partners on low-emissions technologies and processes.

Whitehaven is undertaking an analysis of opportunities to originate carbon offsets across its operations and property portfolio, in addition to a general assessment of abatement opportunities for Scope 1 and 2 emissions produced by its operations.

6.2 RESEARCH PROGRAM

Whitehaven WS would prepare and implement a Research Program for the Project, and allocate funds towards the implementation of the program. This program would:

a) be prepared in consultation with DES;

b) be submitted to DES for approval within three years of approval of the Project;

c) be targeted at genuine research, as opposed to implementing the matters required by the Project and be prepared in collaboration with industry bodies, research organisations or other operations where possible; and

d) be directed at encouraging research into improving the abatement of direct Scope 1 greenhouse gas emissions by:

- minimising fugitive emissions post-mining;
- capture of CO_2 for beneficial re-use or sequestration;
- understanding opportunities for electrification; and
- other potential abatement options that may be identified.

7 MONITORING, REPORTING AND REVIEW

7.1 MONITORING

Diesel and electricity usage and ROM coal and waste extraction will be monitored for the Project, to track diesel and electricity efficiency. These values will be reported in the Annual Energy Audit and analysed for trends in the data (Section 7.3)

Greenhouse gas emissions from the Project will be tracked and reported each year in the Australian Government's *National Greenhouse and Energy Reporting Scheme* and National Pollutant Inventory (Section 7.2).

7.2 NGER REPORTING

As described in Section 3.1, annual assessment of greenhouse gas emissions will be reported in accordance with the NGER Act and the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*.

The report would be provided to the Clean Energy Regulator by the end of October each year, provided in the manner and form in accordance with the requirements of the *Guideline – Manner and Form Sections 19 22G and 22X reports* (Clean Energy Regulator, 2021b).

7.3 ANNUAL ENERGY AUDIT

Whitehaven WS will review and evaluate the energy efficiency of the Project by the end of December each year (for the preceding calendar year) or other such timing as agreed by the DES.

The Annual Energy Audit will:

- include a comprehensive review of the diesel and electricity usage at the Project over the past year, which includes a comparison of these results against the:
  - relevant objectives for diesel consumption and energy usage (Section 5); and
  - monitoring results of the previous years (Section 7.1);
- identify any trends in the data over the life of the Project; and
- describe what mitigation or control measures that will be implemented over the next year to improve the performance of the Project.

7.4 REVIEW

This GMAP will be reviewed, and if necessary revised, following submission of each Annual Energy Audit.

Whitehaven WS will also regularly assess, review and evaluate greenhouse gas emission abatement opportunities for implementation at the Project, for subsequent revision and inclusion in this GMAP.

7.5 SUSTAINABILITY REPORT

Whitehaven Coal Limited prepares an annual, company-wide Sustainability Report that reflects the additional investment commitments in relation to environmental, social and governance reporting, and to allow closer alignment with internationally-recognised sustainability reporting approaches (Whitehaven Coal Limited, 2022).

Whitehaven Coal Limited (2022) provides the company-wide greenhouse gas emissions for the past five years, including the most recent reportable period, and reinforces the commitment to ongoing efforts to reduce operational emissions from energy use and haulage (Whitehaven Coal Limited, 2022).

Whitehaven Coal Limited (2022) also identifies and evaluates the potential climate-related risks and opportunities, with significant risks reviewed annually, while material and emerging risks are continually and proactively identified, monitored and assessed. The detailed climate risk and scenario planning has been undertaken using the voluntary framework recommended by the Financial Stability Board's Task Force on Climate-related Financial Disclosures.

Further information on Whitehaven Coal Limited's *Sustainability Report 2022* has been included in Attachment 2.

8 REFERENCES

Australian Labor Party (2022) *Powering Australia. Labor's plan to create jobs, cut power bills and reduce emissions by boosting renewable energy.*

BHP Billiton Mitsubishi Alliance (2009) *Caval Ridge Environmental Impact Statement*.

BHP Billiton Mitsubishi Alliance (2013) *Red Hill Mining Lease Environmental Impact Statement.*

Clean Energy Regulator (2021a) *Estimating emissions and energy from coal mining guideline*.

Clean Energy Regulator (2021b) *Guideline – Manner and Form Sections 19 22G and 22X reports.*

Climate Change Authority (2020) *Industry Action on Climate Change Mitigation and Low Emissions Technologies.*

Commonwealth of Australia (2015) *Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement August 2015*.

Commonwealth of Australia (2017) *Review of Climate Change Policies: Discussion Paper*.

Commonwealth of Australia (2021a) *Australia's Nationally Determined Contribution – Communication 2021*.

Commonwealth of Australia (2021b) *Australia's Long-term Emissions Reduction Plan – A whole-of-economy Plan to achieve net zero emissions by 2050*.

Commonwealth of Australia (2022) *Australia's Nationally Determined Contribution Communication 2022.*

Delevingue, L., Glazener, W., Grégoir, L. and Henderson, K. (2020) *Climate Risk and Decarbonizarion: What every mining CEO needs to know*.
Website: https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-decarbonization-what-every-mining-ceo-needs-to-know
Date accessed: November 2021.

Department of Agriculture Water and the Environment (2021) *Statement of Reasons for Approval under the Environment Protection and Biodiversity Conservation Act 1999*

Department of Environment and Heritage Protection (2017a) *Pathways to a clean growth economy – Queensland Climate Transition Strategy*.

Department of Environment and Heritage Protection (2017b) *Pathways to a climate resilient Queensland – Queensland Climate Adaption Strategy 2017 – 2030*.

Department of Environment and Science (2021) *Climate Action Plan 2030*.
Website: https://www.des.qld.gov.au/climateaction
Date accessed: November 2021.

Department of Industry, Science, Energy and Resources (2020) *Report of the Expert Panel examining additional sources of low cost abatement.*

Department of Industry, Science, Energy and Resources (2021a) *National Greenhouse Accounts Factors Australian National Greenhouse Accounts August 2021*.

Department of Industry, Science, Energy and Resources (2021b) *Low Emissions Technology Statement 2021.*

International Energy Agency (2020) *Iron and Steel Technology Roadmap.*

International Energy Agency (2021) *World Energy Outlook.*

Katestone Environmental Pty Ltd (2018) *Air Quality and Greenhouse Gas Assessment for the Olive Downs Coking Coal Project*.

Katestone Environmental Pty Ltd (2020) *Air Quality and Greenhouse Gas Assessment for the Isaac Downs Project*.

Katestone Environmental Pty Ltd (2021) *Winchester South Project – Air Quality and Greenhouse Gas Assessment*.

Katestone Environmental Pty Ltd (2022) *Winchester South Project – Air Quality and Greenhouse Gas Assessment*.

Low Emissions Technology Australia (2021) *LETA*.
Website: https://www.letaustralia.com.au/
Date accessed: November 2021

Minerals Council of Australia (2020) *Climate Action Plan*.

State of Queensland (2022) *Queensland Resources Industry Development Plan*. June 2022.

United Nations Framework Convention on Climate Change (2021a) *About the Secretariat.*
Website: https://unfccc.int/about-us/about-the-secretariat
Date accessed: November 2021.

United Nations Framework Convention on Climate Change (2021b) *What is the Kyoto Protocol?*
Website: https://unfccc.int/kyoto_protocol
Date accessed: November 2021.

United Nations Framework Convention on Climate Change (2021c) *The Doha Amendment.*
Website: https://unfccc.int/process/the-kyoto-protocol/the-doha-amendment
Date accessed: November 2021.

United Nations Framework Convention on Climate Change (2021d) *The Paris Agreement*.
Website: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
Date accessed: November 2021.

United Nations Framework Convention on Climate Change (2021e) *Nationally Determined Contributions (NDCs)*.
Website: https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs
Date accessed: November 2021.

United Nations Framework Convention on Climate Change (2021f) *The Katowice climate package: Making the Paris Agreement Work For All*.
Website: https://unfccc.int/process-and-meetings/the-paris-agreement/katowice-climate-package#eq-1
Date accessed: November 2021.

United Nations Framework Convention on Climate Change (2021g) *Decision -/CP.26, Glasgow Climate Pact*.
Website: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf
Date accessed: December 2021.

Vipac Engineers & Scientists (2020) *Central Queensland Coal Project Air Quality Assessment*.

Whitehaven Coal Limited (2022) *Sustainability Report 2022*.

World Business Council for Sustainable Development and World Resources Institute (2021) *Greenhouse Gas Protocol*.
Website: https://ghgprotocol.org/standards
Date accessed: November 2021

ATTACHMENT 1

PROJECT SCOPE 1 AND 2 GREENHOUSE GAS INVENTORY (UNMITIGATED)

Table A-1
Project Scope 1 and 2 Greenhouse Gas Inventory (Unmitigated)

Project Year	Scope 1 (t CO_2-e)					Scope 2 (t CO_2-e)	Total Scope 1 + Scope 2 (t CO_2-e)	
	Diesel (mining)	Fugitive Gas	Blasting	Land Clearing	Total	Electricity	Including land clearing	Excluding land clearing
1	-	-	-	-	-	-	-	
2	17,414	20,771	605	32,670	71,460	3,669	75,129	42,459
3	82,453	97,255	2,532	32,670	214,910	17,372	232,281	199,611
4	225,212	275,204	4,557	32,670	537,644	47,449	585,092	552,423
5	261,212	312,605	5,830	32,670	612,316	55,034	667,350	634,680
6	290,816	345,705	5,906	32,670	675,097	61,271	736,367	703,698
7	266,436	315,029	6,012	32,670	620,147	56,134	676,281	643,611
8	296,040	339,836	5,210	32,670	673,756	62,371	736,128	703,458
9	269,919	314,752	5,505	32,670	622,845	56,868	679,713	647,043
10	262,937	303,282	5,631	32,670	604,521	55,397	659,917	627,248
11	285,592	330,167	5,599	32,670	654,027	60,170	714,197	681,528
12	278,626	324,265	6,024	32,670	641,586	58,702	700,288	667,618
13	275,143	316,931	6,054	32,670	630,798	57,969	688,767	656,097
14	275,143	307,730	6,099	32,670	621,642	57,969	679,610	646,941
15	296,040	332,842	5,989	32,670	667,541	62,371	729,912	697,243
16	296,040	322,644	5,995	32,670	657,349	62,371	719,720	687,051
17	275,143	303,672	6,039	32,670	617,524	57,969	675,493	642,823
18	264,695	290,195	6,077	32,670	593,636	55,767	649,404	616,734
19	266,436	292,940	6,085	32,670	598,130	56,134	654,264	621,595

Table A-1 (Continued)
Project Scope 1 and 2 Greenhouse Gas Inventory (Unmitigated)

Project Year	Scope 1 (t CO_2-e)					Scope 2 (t CO_2-e)	Total Scope 1 + Scope 2 (t CO_2-e)	
	Diesel (mining)	Fugitive Gas	Blasting	Land Clearing	Total	Electricity	Including land clearing	Excluding land clearing
20	266,436	297,308	6,081	32,670	574,760	56,134	658,629	625,959
21	296,040	332,325	5,982	32,670	639,282	62,371	729,388	696,718
22	290,816	323,695	4,668	32,670	624,115	61,271	713,120	680,450
23	275,729	312,217	4,237	32,670	597,118	58,092	682,945	650,275
24	242,031	277,549	4,266	32,670	528,780	50,992	607,507	574,838
25	296,040	334,224	4,043	32,670	639,243	62,371	729,349	696,679
26	257,271	304,601	4,125	32,670	570,933	54,203	652,871	620,201
27	174,690	204,949	4,186	32,670	388,760	36,805	453,299	420,630
28	150,836	179,268	4,166	32,670	339,206	31,779	398,719	366,050
29	161,459	190,510	4,114	32,670	361,017	34,017	422,769	390,099
30	15,737	-	-	32,670	20,672	3,316	51,722	19,053
31	1,689	-	-	32,670	5,779	356	34,714	2,045
Total	**6,914,078**	**7,902,469**	**141,617**	**980,091**	**15,105,369**	**1,456,694**	**17,394,948**	**16,414,857**
Average	230,469	263,416	4,721	32,670	503,512	48,556	579,832	547,162

After: Katestone (2021 and 2022).

ATTACHMENT 2

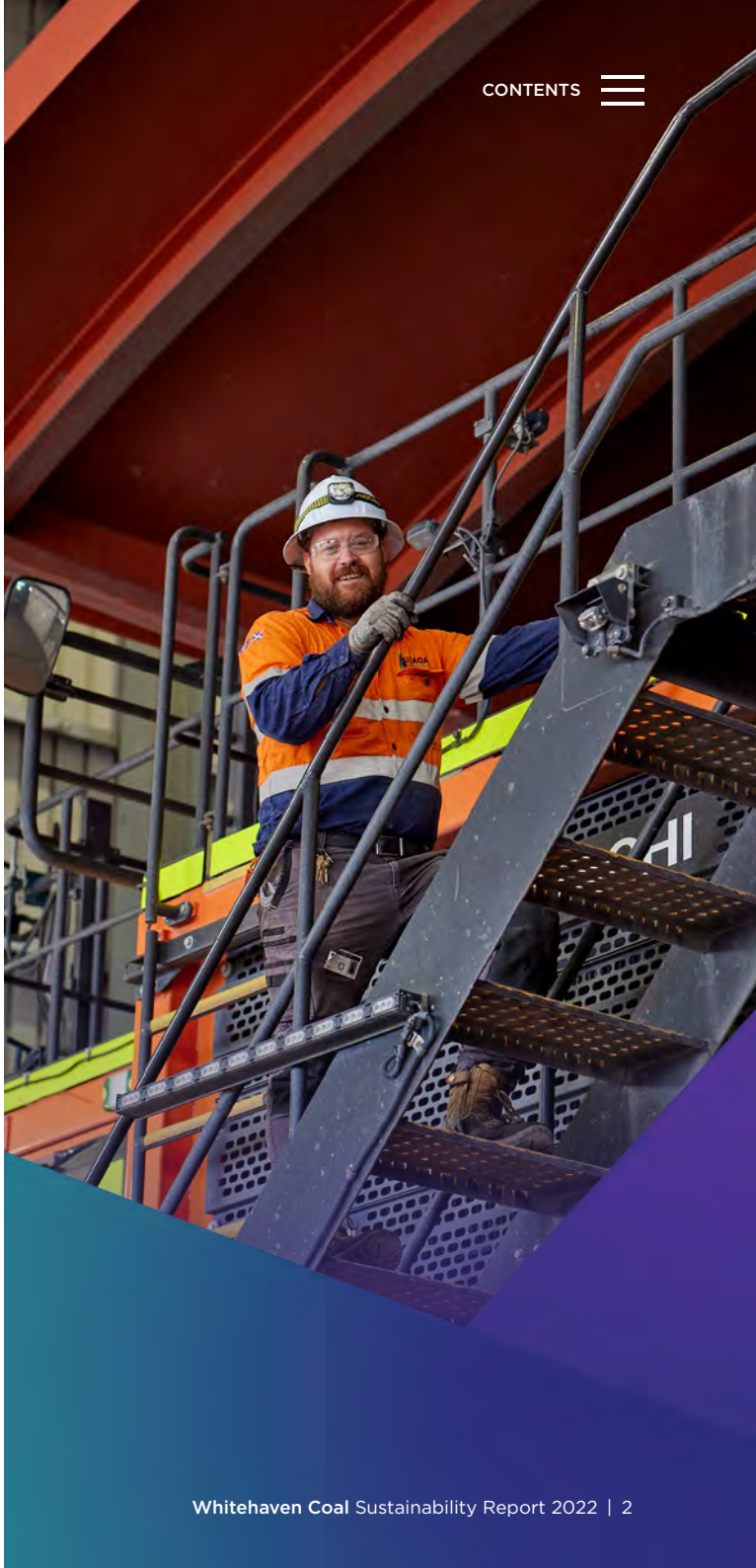
WHITEHAVEN COAL LIMITED – SUSTAINABILITY REPORT 2022

Mining for a sustainable future

Sustainability Report 2022

This report is authorised for release to the market by the Board of Directors of Whitehaven Coal Limited

Contents



Managing Director and CEO's message

I am pleased to present Whitehaven Coal's Sustainability Report 2022, outlining how we deliver value to customers, our workforce, investors, joint venture partners, communities and other stakeholders, underpinned at all times by our STRIVE values.

As a company, we do not view our performance through the prism of operational and financial outcomes alone, although, in that context, it has been an incredibly strong 12 months. We remain focused on delivering results through the entire value chain and I am very pleased to be able to share our progress with you in this format once again.

This year, as we continue to implement our Sustainability Roadmap, we have begun to align our reporting with the Sustainability Accounting Standards Board framework. We have also reviewed our Tier 1 material risks, supported by an updated risk management framework, and undertaken significant work in relation to better understanding the challenges and opportunities that arise for the energy transition. These developments are detailed in the following pages, which are also more interactive and user-friendly than previous years.

Despite economy-wide labour shortages, our workplaces are becoming more diverse: 11.8% of our workforce identifies as Aboriginal and/or Torres Strait Islander, and 15.3% of our employees are female. We acknowledge there is more work to be done when it comes to gender diversity, and this year we have set a target to reach 20% of employees and 20% of company leadership being women by FY26. I invite you to find out more about our initiatives to reach these goals in the chapter on talent and diversity.

Our enhancements to our safety and environmental management systems are delivering real and welcome improvements. Our total recordable injury rate of 5.4 is a 22% improvement over the past five years, and the five environmental enforcement actions in FY22 compare favourably to the five-year average of 11 actions annually. Any instance of non-compliance of course is regrettable and as a company we continue to invest heavily in people, systems and processes to ensure our trend of improved performance continues.

In the face of ongoing economic disruption, we delivered significant direct financial benefits to regional communities, with $510 million in wages and supplier payments into North West NSW. In addition, we will contribute around $1 billion in taxes and royalties to governments for FY22 – highlighting the value of not only our business, but our industry, to the national economy.

These contributions are only possible because the fundamentals of our business are strong, enabling us to deliver on our purpose to support and sustain regional communities by exporting high-quality coal from Australia, to the world.

Our story is as compelling as ever in a world where energy security is a front of mind consideration for governments and populations everywhere. We are a proudly Australian, locally-based company playing a key role in underpinning energy security and economic growth in our customer countries. Our high-CV, low-ash, low-sulphur thermal coal also contributes to our customers' energy security and decarbonisation objectives, and our growth plans centre around continuing to support our customers in the Asian region as well as our communities at home.

Recent global events have underscored the need for secure, reliable and affordable forms of energy through what will be a multi-decade energy transition and I encourage you to read more about the sustainability of our business model and markets in this context.

Of course, climate change is a material business risk and, after having been the very first coal company in the world to report against the recommendations of the TCFD, we have reviewed the resilience of our business in decarbonising scenarios once again.

We must take sensible steps where we can to address the challenges posed by climate change. At an operational level, we have progressed a range of emissions reduction measures, including fully offsetting our Scope 2 mine-site emissions through new energy supply contracts. We are also responding to stakeholder interest in what a decarbonisation pathway may entail for our business, including assessing the scale of the emissions abatement challenge to achieve net zero by 2050, and possible scope 1 abatement opportunities. You can read more about our work in this space here.

In FY22 the Australian Government stepped up its greenhouse gas emissions reduction ambitions, significantly increasing our national ambition in Australia's Nationally Determined Contribution under the Paris Agreement, including legislating a commitment to net zero carbon emissions by 2050. As always, we will ensure our business practices align with legislation while also advocating for sensible policy that reflects the central role of coal to development, the need to maintain international competitiveness of Australia's major export industries, and the important role our high-CV, high quality coal plays in fuelling new ultrasupercritical power stations, which are allowing our customer countries to meet their decarbonisation goals.

I trust you will find this latest iteration of our sustainability performance and our perspectives on a variety of energy-related issues of interest and, as always, I invite you to share your feedback at sustainability@whitehavencoal.com.au

Paul Flynn

Managing Director and CEO

FY22 Sustainability in review

Responsible operations

We are improving diversity, safety and environmental outcomes

11.8%
of workforce identifies as Aboriginal and/or Torres Strait Islander

15.3%
of our employees are female, with a target of 20% by FY26

5.4 TRIFR
for employees and contractors, a 22% improvement over five years

3rd
Reconciliation Action Plan launched

26 weeks
paid parental leave incorporated into our new industry-leading policy

228 ha
of land rehabilitated

5
environmental enforcement actions compared with a five-year average of 11 per annum

Supporting regional growth

We are actively supporting our local communities

75%
of 2,500-strong workforce based in regional areas

$1.53 million
in corporate community partnerships and donations

$354.5 million
spent with local suppliers

$8.73 million
spent with 14 Aboriginal and Torres Strait Islander businesses

~$1 billion
in taxes and royalties paid or payable for FY22

A strong, long-life business

We produce the highest-quality seaborne coal in the world, helping to lower emissions

89%
of our thermal coal exports >5,600 kCal/kg and 34% >6,200 kCal/kg fueling high-efficiency, low-emissions power stations across Asia

Our low-ash, low-sulphur
thermal coal is superior to the global COAL NEWC standard specification

Carbon neutral electricity sourced to offset Scope 2 emissions
with autonomous haulage, solar, and fugitive emissions studies underway

$4.06 million
contributed to LETA's carbon capture technology projects over the past five years

How we operate

Whitehaven Coal produces premium-quality coal primarily for customers in Asia.

Operating since 2001, Whitehaven was listed on the Australian Securities Exchange (ASX) in 2008 (ASX Code: WHC). Of our 2,500-strong workforce, around 75% live in regional areas.

Global demand for coal has increased significantly over the past year as we recover from the COVID-19 pandemic. Additional supply constraints have also arisen on account of the tragic and continuing conflict in Ukraine.

Demand for our coal is particularly strong due to its unique properties, notably its ability to deliver among the lowest carbon emissions per tonne of coal consumed. It is used in high-efficiency, low-emissions coal-fired power stations. Our customer base, by coal type, is shown at the map to the right.

In exporting high-quality thermal and metallurgical coal from Australia to the world, we fulfil our purpose of supporting and sustaining regional communities at home. We do so through employment, contracting suppliers, infrastructure investment and community sponsorships and programs.

We understand operating our business raises material sustainability issues from the safety of our workforce to impacts on the natural environment. Our Sustainability Report outlines the steps we are taking to address these issues.

Sustainability Reporting

The contents of this report have been informed by:

- The Sustainability Accounting Standards Board (SASB) Standard
- The Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD)
- The AccountAbility AA1000 Principles Standard
- The ASX Corporate Governance Council Corporate Governance Principles and Recommendations.

FY22 customer base by coal type

Where we operate

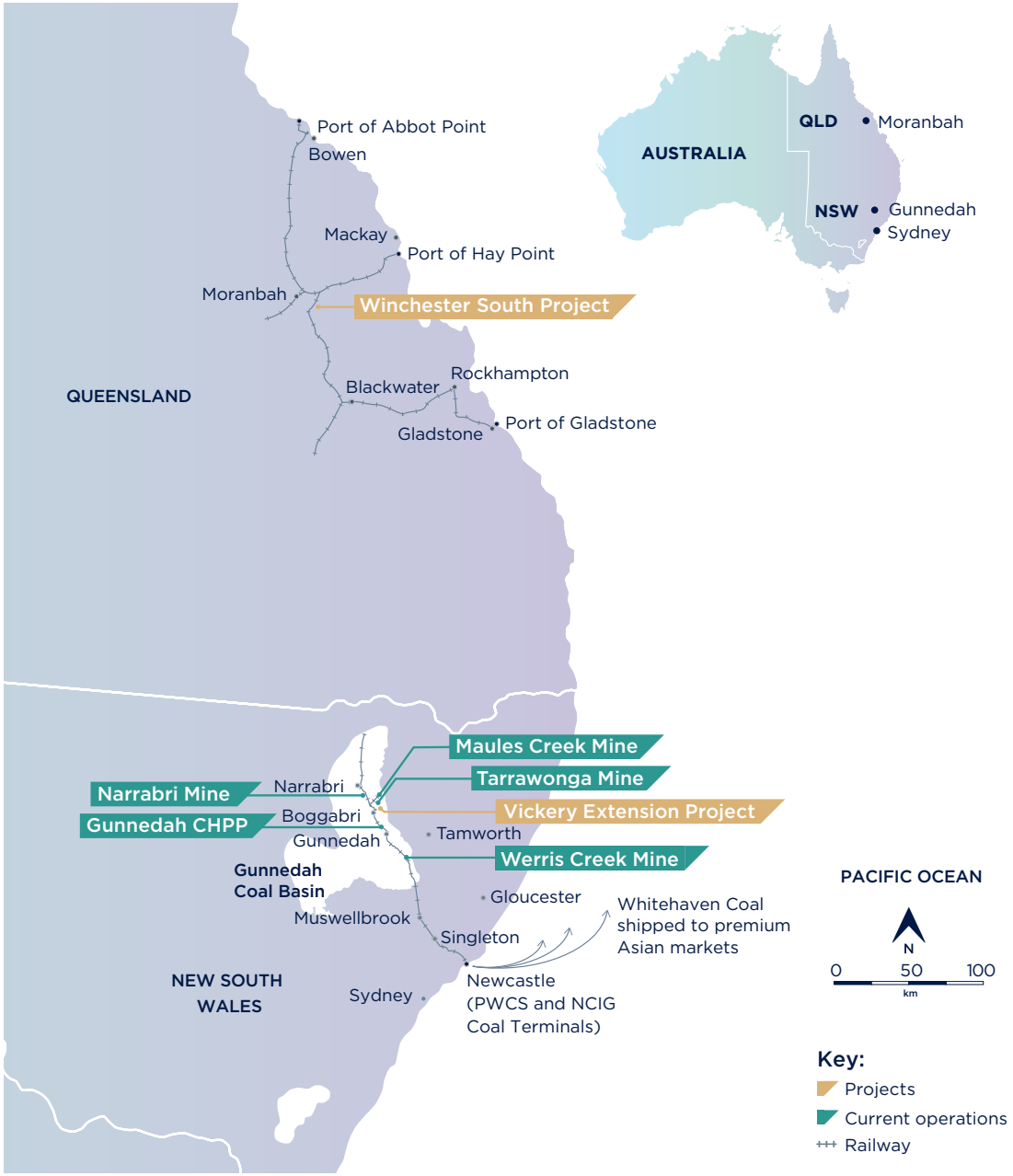
We operate at the following sites in the Gunnedah Coal Basin of New South Wales (NSW):

- Maules Creek, open-cut coal mining and rehabilitation
- Narrabri, underground coal mining and rehabilitation
- Tarrawonga, open-cut coal mining and rehabilitation
- Werris Creek, open-cut coal mining and rehabilitation
- Gunnedah Coal Handling and Preparation Plant, processing, treatment and transportation of coal.

Our planned future projects include:

- In the Gunnedah Basin:
  - the Vickery Extension Project, for open-cut coal mining and rehabilitation
  - an extension of our Narrabri Mine, for underground mining and rehabilitation
- In the Bowen Basin in Central Queensland, the Winchester South Project, for open-cut coal mining and rehabilitation.

Our locations



How we create value

We identify, develop and operate high-quality, cost-efficient, long-life coal assets and create financial and non-financial value for shareholders, employees, customers and the communities where we work and live.

Purpose

To support and sustain regional communities by exporting high-quality thermal and metallurgical coal from Australia to the world.

Vision

To be the benchmark coal investment on the ASX.

Values

Our STRIVE values guide our interactions internally and with external stakeholders.

Safety
The safety of our people, workplaces and the communities around us comes first. We are committed to Zero Harm.

Teamwork
We work collaboratively and support one another.

Respect
We foster a diverse and inclusive culture and deal with all stakeholders respectfully.

Integrity
We are honest and do the right thing.

Value
We create value for shareholders, customers and local communities.

Excellence
We deliver on our commitments.

Investors

We aim to provide strong and consistent returns to shareholders and joint venture partners from our existing portfolio of mines with upside potential from key growth assets.

Value created FY22

$3.1 billion
in underlying earnings before interest, tax, depreciation and amortisation (EBITDA)

48c per share
returned to shareholders through dividends and

10% share
buyback program

154%
Total Shareholder Return

Value chain

Develop

We identify, develop and operate high-quality, cost-efficient, long-life coal assets.

Operate responsibly

We are responsible stewards of the natural environment and maintain strong sustainability practices through each stage of the mining process, from development to operations, closure and rehabilitation.

Logistics

We have supply agreements with Australian businesses focused on the efficient movement of our product, contributing to shared sustainability goals through our value chain.

Customers

We supply high-quality raw materials into Asia, for use in coal-fired power plants and steel blast furnaces, supporting energy security and economic development while helping our customers meet decarbonisation and air quality goals.

Our people underpin our success

Our people

We provide skills development pathways and stable regional employment in a safe and rewarding work environment.

Value created FY22

Approx. 75%
of our 2,500-strong workforce based in regional areas

$233 million
in wages paid

11.8%
of workforce identify as Aboriginal and/or Torres Strait Islander

Communities

We support local communities through direct investment, job creation, partnerships with local suppliers and by working with community groups.

Value created FY22

$354.5 million
spent with suppliers in North West NSW and Central QLD

$8.73 million
spent with 14 Indigenous businesses

$1.53 million
in corporate community partnerships and donations

Our approach to sustainability

At Whitehaven we strive for excellence in operations, production and marketing, and also in environmental, social and corporate governance (ESG) criteria.

Whitehaven strives to deliver value through our business by effectively developing and deploying our financial, physical and human capital resources. We see sustainability as a key priority in delivering value to customers, our workforce, shareholders, local communities and suppliers.

In our ongoing sustainability journey, and as sustainability standards continue to evolve, Whitehaven has been continually updating its Sustainability Roadmap.

The Roadmap, which was developed and endorsed by the Board in FY21, outlines a multi-year plan to progress our sustainability journey. We continue to implement this program of activity and in FY22 made the decision to begin to align our reporting with the SASB standards.

Other key aspects of the Roadmap which we will pursue in the coming years include establishing targets aligned with SASB metrics across key areas, continuing our materiality review process with a full independent review aligned with the AccountAbility AA1000AP Standard, and external assurance of key data.

We acknowledge that the production and consumption of coal contributes to greenhouse gas (GHG) emissions. We also recognise the challenge of integrating international and domestic emissions reduction efforts with the legitimate economic and social development aspirations of people, communities and countries.

The transition to a lower-carbon future will involve significant changes across the economy. In supporting this we recognise that a just transition will require continuing access to affordable and reliable energy, so we remain committed to:

- supplying our customers with high-quality coal for use in high-efficiency, low-emissions coal-fired power stations
- identifying and implementing measures at each point of our value chain to reduce emissions
- supporting relevant UN Sustainable Development Goals, including universal access to affordable energy.

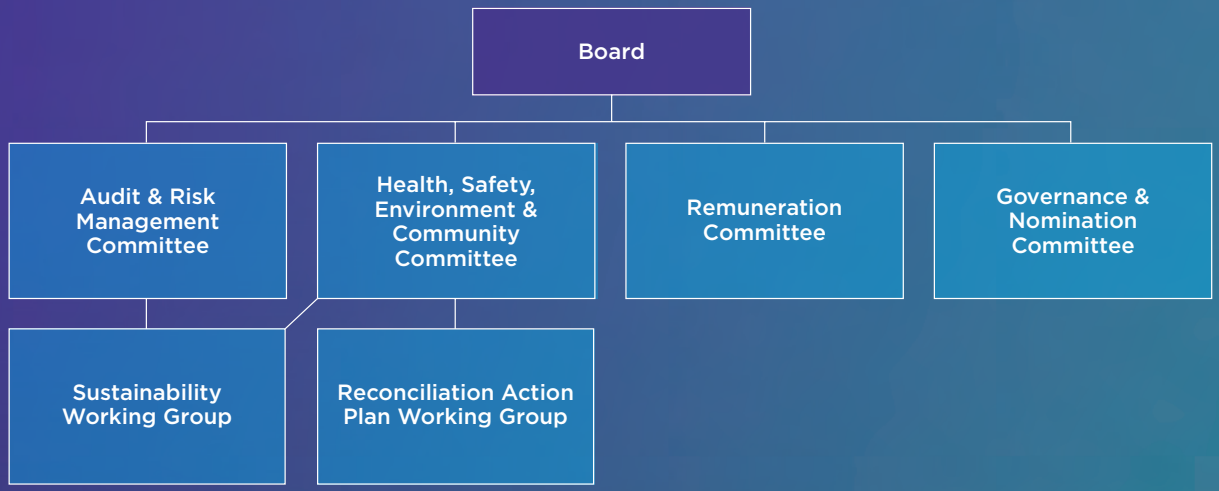
Sustainability governance

Overall responsibility for our sustainability strategy and approach lies with Whitehaven's Board.

In its strategic decision making, the Board is supported by the advice given by the Health, Safety, Environment & Community (HSEC) Committee, a Board standing committee. The Audit & Risk Management Committee monitors the risks involved in our sustainability approach and practices, including climate-related matters, and reports to the Board. The Board receives regular updates from these committees. Other Board standing committees include the Remuneration Committee and the Governance & Nomination Committee.

The strategic approach set by the Board is implemented by management, led by the Executive General Manager (EGM) – Corporate, Government & Community Affairs who also chairs the Sustainability Working Group (SWG). The SWG is composed of EGM and General Manager-level leaders from the HSE, Finance, Legal, and People & Culture functions, with leaders from other areas including operations and procurement periodically presenting to the SWG. The SWG reports to the HSEC and Audit & Risk Management Committees of the Board.

Linking health, safety and environmental outcomes to executive remuneration continues to be a business priority. As detailed in the Remuneration Report, targets in these areas represent 40% of each executive's short-term incentive opportunity. The Board reviews how we can better align remuneration to our broader sustainability performance on an annual basis.



Guiding our approach

- Code of Conduct
- Governance and reporting framework
- Materiality assessment
- Stakeholder Engagement Framework
- Community Consultative Committees

Managing risk

- Risk management framework
- Community consultation
- Environmental management, monitoring & compliance
- Crisis management team (COVID response)

Driving action

- Environment strategy
- Health and Safety strategy
- Reconciliation Action Plan
- Community Engagement Strategy
- Modern Slavery Statement

Memberships

- International Energy Agency
- Minerals Council of Australia
- World Coal Association
- Queensland Resources Council
- NSW Minerals Council
- Low Emission Technology Australia

Annual and sustainability reporting

Engaging with our stakeholders

We regularly engage with a range of stakeholders to understand the environmental, social and governance aspects of our operations that matter to them. We seek to educate our stakeholders on our credentials in their priority areas or, where relevant, work together to improve how we share information and perform.

Stakeholder group	Interest areas
Employees and contractors	• Health and safety at work • Job security • Remuneration and working conditions • Learning and development opportunities • Diversity and inclusion • Business model
Customers	• Product quality • Reliability of supply, including future supply • Price
Local communities	• Environmental, social and cultural heritage impacts • Local employment and procurement • Community investment, including training and education • Sustainable, local economic diversification • Transparency and communication
Joint Venture Partners, investors and industry analysts	• Business strategy and growth • Share price • Financial returns • Operational performance • Governance and risk management • Ethical business conduct • ESG performance
Governments including regulators	• Regulation and compliance • Mine extensions and approvals • Mine closure planning • Royalties and taxes • Balancing economic, social and environmental objectives

Stakeholder group	Interest areas
Suppliers	• Local procurement • Ongoing partnerships • Management of suppliers
Traditional owners	• Cultural heritage • Land access and management • Employment, education and procurement opportunities • Local investment
Industry groups and peers	• Policy and regulatory environment • Industry reputation
Non-government organisations	• Environmental, social and cultural heritage impacts • Compliance • Community engagement • Transparency
Banks and financiers	• Financial performance • Business strategy and growth • Operational performance, including compliance • Governance and risk management, including climate-related risks and opportunities • Ethical business conduct
Unions	• Health and safety at work • Job security • Remuneration and working conditions
Rail and infrastructure providers	• Business strategy and growth • Governance and risk management, including climate-related risks and opportunities

Identifying our material issues

In 2022 we undertook a review of our Tier 1 material risks, supported by an updated risk management framework. As the next step in better understanding our material issues this year we have aligned our material issues, reported here, with our material risks. These can be grouped into three themes, which we have also aligned with relevant UN Sustainable Development Goals.

Our material issues

Material theme	Issue	Definition	Tier 1 risks	Chapter
A strong, long-life business	**Business model and markets**	How we assess and manage our business structure, portfolio and future pipeline, including evaluation of future markets for our coal. This includes how we continually strive to improve operational efficiency and adaptability.	Coal price / global supply and demand Significant change to government policy Major trade dispute Climate change	Our business Climate
	Climate-related risks and opportunities	How we assess and manage climate-related risk and opportunities, including those arising from the physical and transitional impacts associated with climate change, having regard to the voluntary reporting framework of the Task Force on Climate-related Financial Disclosures (TCFD).	Climate change Inability to secure required funding / new capital Significant stakeholder opposition	Climate
	Regulation and policy	How we seek consistent and balanced policy settings that support competitiveness, flexibility and performance.	Significant change to government policy Climate change	Our business
	Responsible supply chain	How we manage our supply chain, including identifying and addressing risks of modern slavery, as well as our compliance with the Payment Times Reporting Scheme.	Extended interruption to key supplies / materials Extended port / terminal interruption	Our business
	Talent attraction, development and retention	How we ensure Whitehaven is an enjoyable and rewarding place to work, and how we attract, retain and develop our people. This includes promoting a diverse and inclusive workplace and effectively managing our relationship with employees through applicable industrial relations instruments.	Inability to attract & retain required personnel	Talent & diversity
	Continuity during COVID-19	Our approach to mitigating the impacts of COVID-19 on our people, communities and operations.	COVID-19 outbreak in workforce	Our business
	Privacy and cybersecurity	How we manage data privacy and the security of our systems.	Regulatory non-compliance	Our business

Our material issues cont.

Material theme	Issue	Definition	Tier 1 risks	Chapter
 Responsible operations	**Safety and wellbeing of our workforce**	How we seek to prevent workplace injuries and fatalities and ensure our employees and contractors observe robust safety practices. This also includes how we help support the mental and physical health and wellbeing of our people.	Significant safety incident Exposure to respirable contaminants	Health & safety
	Minimising environmental impact of operations	How we respect and care for our natural environment, minimise and/or mitigate the environmental impacts of our operations and work to improve environmental performance and compliance. This includes how we responsibly manage water use, operational emissions, air quality, noise and waste. This also includes how we manage land to protect biodiversity.	Serious environmental non-compliance	Minimising environmental impacts
	Ethical business conduct	How we conduct our business ethically and with integrity, including through strong governance frameworks, policies and transparency around our management approach.	Significant stakeholder opposition	Our business
	Community engagement	How we meaningfully engage with the local community, seek feedback to inform decision making and form sustainable partnerships. This includes how we respect Aboriginal and/or Torres Strait Islander cultures and invest in initiatives with a view to empowering local Aboriginal and/or Torres Strait Islander communities.	Significant stakeholder opposition Inability to attract & retain required personnel	Supporting our communities Talent & diversity
 Supporting regional growth	**Rehabilitating land to beneficial land use**	How we progressively rehabilitate mined land, working with the local community and government towards a final land use that benefits all stakeholders.	Serious environmental non-compliance Additional costs to meet mine closure requirements Significant stakeholder opposition	Minimising environmental impacts
	Contributing to local prosperity and sustainability	How we contribute to local prosperity and quality of life, including through employment, procurement, community investment and supporting economic diversification.	Significant stakeholder opposition Inability to attract & retain required personnel	Supporting our communities Talent & diversity

Our business

Whitehaven Coal is the leading Australian producer of premium-quality coal, and the dominant player in Australia's only emerging high-quality coal basin.

Our business model and markets

We help power developed and emerging economies, predominantly in Asia, where there continues to be strong and growing demand for our coal, particularly for use in high-efficiency, low-emissions coal-fired power stations.

In the past financial year we supplied new customers in markets outside of Asia. In FY22 we sold a total of 17.6 Mt of coal composed of 14.4 Mt of thermal coal and 3.2 Mt of metallurgical coal.

Our growth plans centre around supporting the development goals of our customers and the regional communities in which we operate. All of our customers are signatories to the Paris Agreement or have domestic national policies consistent with its aims.

Over the past 12 months, the seaborne coal market has been subject to a multiplicity of factors that have impacted supply, demand and price. While more recently historic high prices for thermal coal have been attributed to the conflict in Ukraine, significant price improvements in this market were being observed well before the commencement of hostilities by Russia. This is because of enduring and deepening disparities between supply and demand. Measures to restrict investment in the coal sector on the basis of climate change considerations have tightened supply and contributed to price increases. This has had serious consequences for energy security given demand inelasticity, particularly as energy demand has increased in the post-COVID recovery period.

The current global energy crisis requires a multifaceted approach to ensure continued economic and energy security. Key to this will be accessing reliable and affordable forms of energy, including coal.

In the short term the International Energy Agency's (IEA) July 2022 Coal Market Update has shown that the post-COVID recovery led to a 5.8% rebound in global coal demand in 2021, with moderate growth in 2022 and 2023 forecast.[1] This growth is anticipated to be driven by India and China; however, there is also some anticipated growth in the European Union given the current uncertainty of energy supply.

Whitehaven acknowledges that carbon emissions reduction efforts are important to limit the impacts of climate change. We will continue to play our part towards a lower carbon future. The prevailing global energy crisis, and the continued reliance on fossil fuels including coal, illustrates that global emissions reduction aspirations are out of step with our capacity to deliver on them.

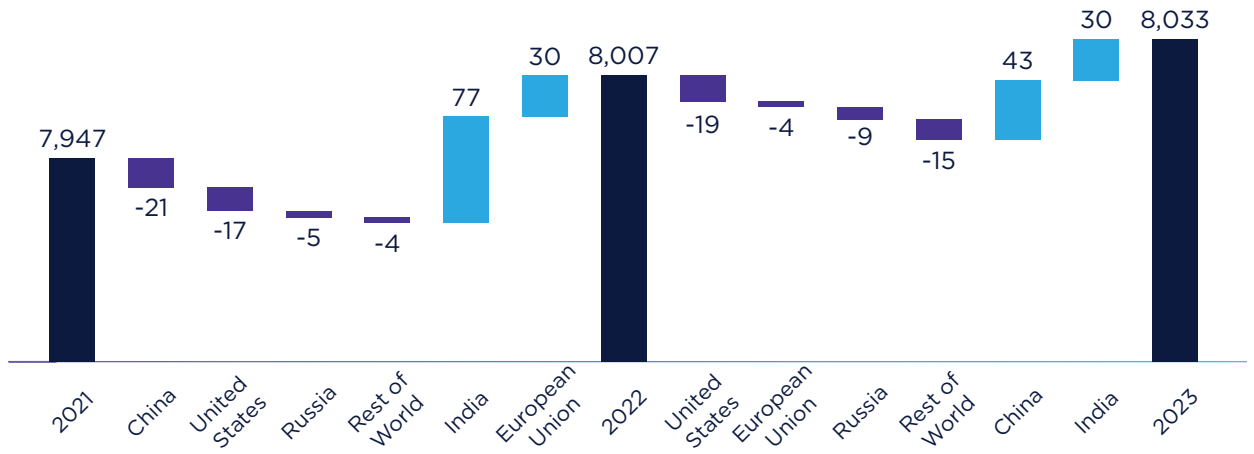
The scale of investment required to replace fossil fuels in the electricity sector is significant. It has been estimated that it would require $275 trillion between 2021 and 2050, equivalent to 7.5% of global GDP annually on average.[2]

Decarbonisation is an ambition we share as a business. However, our strategy intends that this occurs in a responsible and orderly way, maintaining supply and reliability in our customer countries, and supporting them to meet their own climate change aspirations under their Nationally Determined Contributions (NDCs).

Shutting down coal and gas or restricting investments in these sectors in the absence of viable alternatives has meaningfully contributed to the current energy crisis.

Whitehaven actively assesses risks and opportunities arising out of emerging trends in the global energy market. As part of our ongoing risk management process we assess all risks to the resilience of our business, including in a world energy market transitioning to a lower-carbon future. Risks evaluated as material are assessed and ranked, and mitigation strategies are implemented. This work is conducted by management and reviewed by the Board's Audit & Risk Management Committee. The Committee monitors the company's risk management framework, receives updates from management and provides advice and recommendations to the Board.

Forecast changes in global coal consumption by region, 2021–2023, Mt



Source: IEA, Changes in global coal consumption by region, 2021-2023, IEA, Paris https://www.iea.org/data-and-statistics/charts/changes-in-global-coal-consumption-by-region-2021-2023

1. IEA (2022), Coal Market Update – July 2022, IEA, Paris https://www.iea.org/reports/coal-market-update-july-2022
2. McKinsey & Company, The net-zero transition: What it would cost, what it could bring, January 2022, https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring

The IEA provides analysis of global energy use as well as a number of forward-looking scenarios in its World Energy Outlook (WEO) series. The two enduring scenarios considered by the IEA are:

- **The Stated Policies Scenario (STEPS):** considers a sector-by-sector look at what actions have been implemented, taking into account not just existing policies and measures, but also those under development
- **The Sustainable Development Scenario (SDS):** is a 'well below 2°C' pathway and reflects the outcomes targeted by the Paris Agreement. The SDS envisages a surge in clean energy policies and investment.

Analysis of these scenarios and their impacts on our business as well as climate-related specific risks and opportunities have been considered in previous years. A discussion on our approach and analysis is addressed in more detail in the Climate chapter.

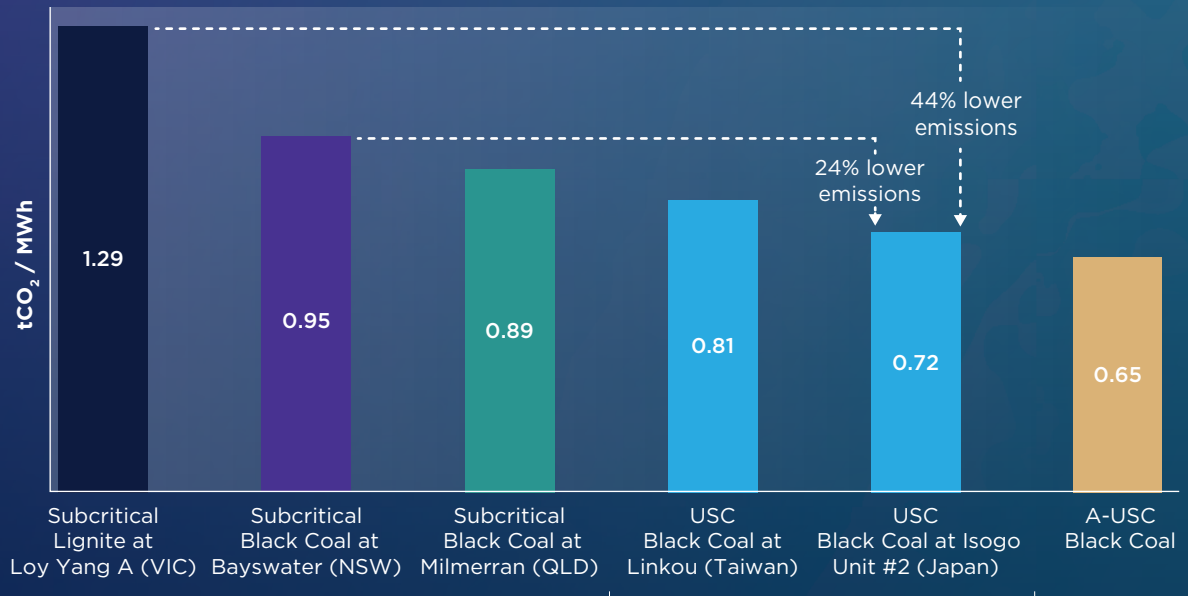
We note scenarios covering a range of possible outcomes beyond those considered in this report exist, including a number outlining approaches of limiting warming to 1.5 degrees, such as the IEA's Net Zero by 2050 scenario.

In addition to IEA data, we also use bespoke data from independent resource industry consultants, as well as open-source reporting and analysis on policy and market developments relating to carbon, climate change, coal and other relevant topics, in our strategic planning process.

The role of high-quality coal in reducing emissions

With carbon emissions reduction efforts a focus for policymakers as well as energy generators and consumers, demand for high-quality, high-CV, low-ash coal, is increasing. Our thermal coal products are used in high efficiency, low emissions (HELE) electricity generation including ultrasupercritical (USC) power plants.

CO_2 Emissions per MWh of sent out energy generation by coal-fired power plants



Key	
SC	supercritical (>22.1 Mpa, ≤566°C)
USC	ultrasupercritical (>22.1 Mpa, >566°C)
A-USC	advanced ultrasupercritical (>22.1 Mpa, >700°C)

Whitehaven's coal currently allows USC power plants in Asia to deliver ~24% lower emissions than typical coal-fired power plants in NSW and ~44% lower than Victorian power plants.

Source: Loy Yang and Bayswater data from AGL's FY21 Full Year Results Milmerran data based on NGER data. Linkou, Isogo and A-USC data based on Company data.

Thermal coal

Globally, thermal coal remains the largest single fuel source for electricity generation. Global coal-fired power generation reached record highs in 2021, with coal accounting for 36% of the global power mix.[1] On an energy basis Australia remained the largest coal exporter in 2021 supplying more than 28% of global coal exports.[2] The IEA's STEPS envisages coal remaining the single largest source of electricity generation worldwide out to 2040.

In the longer term the IEA's STEPS expects continued decline in coal-fired electricity demand in developed economies will be offset by increased demand from developing economies, many of which are in Asia. Population growth, increasing economic activity and rising standards of living will all contribute to the need for accessible, reliable and affordable energy. GDP and population growth are strongly correlated with increased energy use.

According to the IEA[3] Asia accounts for approximately 90% of coal-fired generation capacity younger than 20 years old, further reinforcing one of the underlying drivers of long-term coal demand in Asia.

Under the IEA's most aggressive decarbonisation scenario, Net Zero Emissions by 2050, the average age of coal power stations at retirement is 25 years. Even under this scenario this leaves demand for coal in Asia into the 2040s.

Emerging economies in Asia account for 36% of seaborne thermal coal demand. This is expected to increase to 73% by 2050.

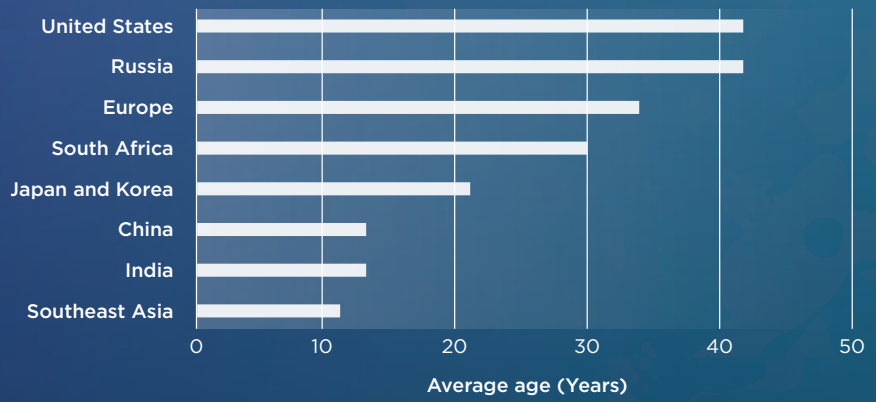
Overall global demand is expected to remain relatively constant until 2030, with growth across emerging economies in Asia.[4] This creates a significant opportunity for Whitehaven.

Australia is ideally positioned to capitalise on Asian thermal coal demand on account of the high-quality properties of Australian coal, which generates fewer GHG emissions per MWh of electricity compared to lower-CV coal. Furthermore, Australia's relative proximity to key markets will ensure it remains one of the most cost-competitive sources of high-quality thermal coal for Asia.

Under STEPS, Australia's market share of the seaborne coal market grows to 2040, underpinned by demand for its higher-quality coal. Given Gunnedah Basin coal is at the upper end of the national CV range, and has lower ash and sulphur content, we are well positioned to continue to supply this market.

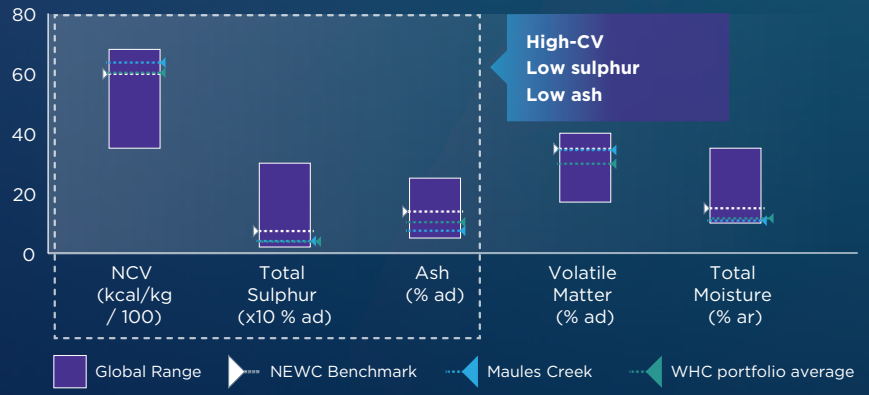
Although in the IEA's SDS coal demand declines faster than under STEPS, in a more carbon-constrained world we expect higher quality coals to exit the market last. Therefore, consistent with the IEA's projection that Australia fares better than other exporters in the STEPS, we also expect Australia to perform better compared to other producers of seaborne coal in the SDS. The IEA indicates that under all scenarios exporting countries are affected by climate-related constraints, but those serving the emerging Asian markets see a lesser decline and Australia remains the largest exporter of coal.

Coal-fired power station average age in 2020



Source: IEA, Average age of existing coal power plants in selected regions in 2020, IEA, Paris https://www.iea.org/data-and-statistics/charts/average-age-of-existing-coal-power-plants-in-selected-regions-in-2020

Thermal coal quality



Source: CRU and Whitehaven Coal

1. IEA, Coal 2021, p13, https://iea.blob.core.windows.net/assets/f1d724d4-a753-4336-9f6e-64679fa23bbf/Coal2021.pdf
2. BP, Statistical Review of World Energy 2022 | 71st edition, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf
3. IEA, Average age of existing coal power plants in selected regions in 2020, IEA, Paris https://www.iea.org/data-and-statistics/charts/average-age-of-existing-coal-power-plants-in-selected-regions-in-2020
4. Wood Mackenzie long-term outlook, April 2022

Metallurgical coal

Our mines supply semi-soft coking coal and high volatile matter pulverised coal (PCI). These coals are low in impurities – specifically ash, sulphur and phosphorus. Our customers use our products in their coke blends to offset impurities in the hard coking coals they purchase. The trend of increasing impurities in hard coking coal, specifically sulphur and ash, is expected to continue, suggesting demand for our product will remain strong.

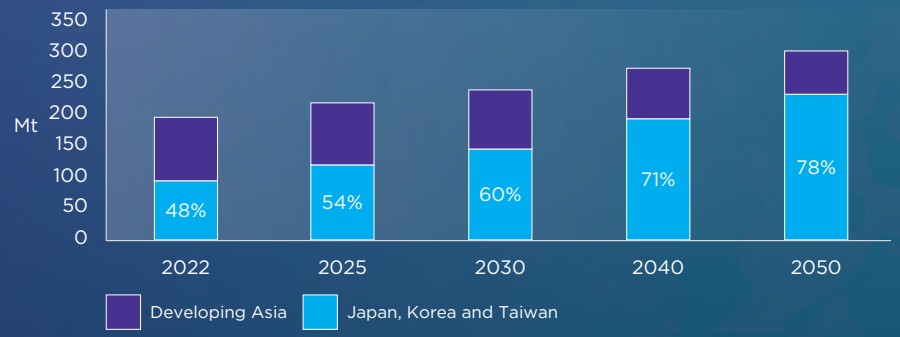
Demand for metallurgical coal, a critical component of steel making, is intrinsically linked to industrialisation and urbanisation. The rapid urbanisation and development underway in emerging economies in Asia is expected to continue.

Wood Mackenzie forecasts that demand for metallurgical coal in the Asian market will continue to grow to 2050, with demand in emerging economies driving that growth.[1] The biggest driver is expected to be an increase of more than 200% in demand for Indian crude steel by 2050. This will result in India consuming nearly half all seaborne trade of metallurgical coal by 2050.[1]

Australia is the world's largest exporter of metallurgical coal. Despite China's informal import restrictions, Australia still accounted for nearly 55% of the seaborne metallurgical coal trade in 2022.[2] Australia's geographic proximity to key Asian steelmaking markets reinforces its status as one of the most reliable and cost-competitive suppliers to steel-making customers. Many metallurgical coal customers also purchase thermal coal, allowing Whitehaven to further deepen connections with our Asian customer base.

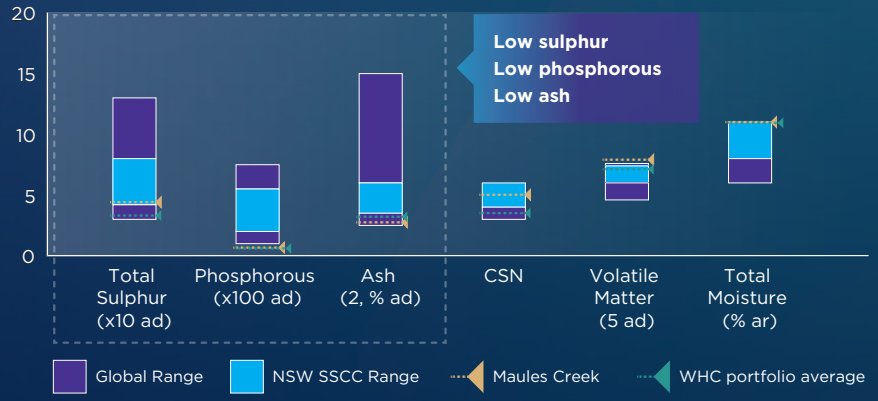
Whitehaven has quality assets and strong customer relationships in the key export markets within our region. We also have a promising development pipeline, including the Vickery Extension and Winchester South Projects. These combine to position the business well in the future.

Forecast metallurgical coal demand in Asia



Source: Wood Mackenzie long term outlook, April 2022

Semi-soft coking coal



Source: CRU and Whitehaven Coal

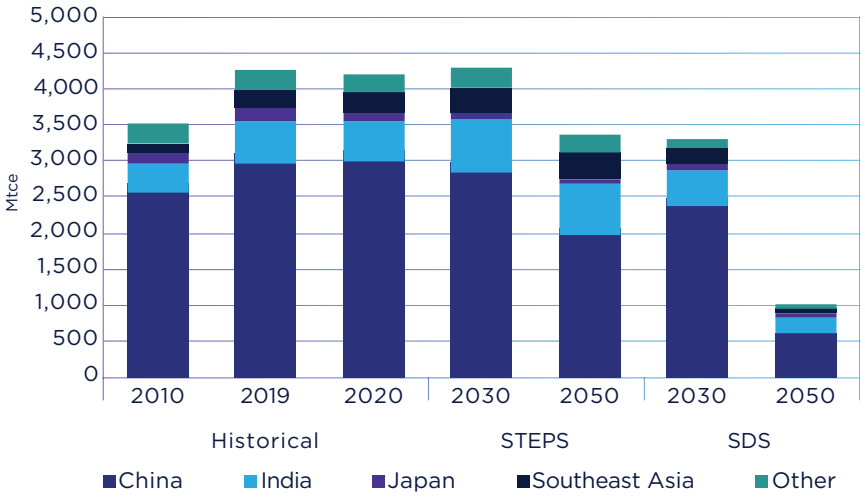
1. Wood Mackenzie long-term outlook, April 2022.
2. Resources and Energy Quarterly, March 2022, https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2022/index.html

Our customers

Whitehaven's customer countries are predominantly situated in Asia and all are signatories to the Paris Agreement or, in the case of Taiwan (ROC), have domestic energy policies consistent with the objectives of the Paris Agreement. As such, they have set GHG emission targets in relation to energy generation and industrial processes.

Under both enduring IEA scenarios,[1] overall coal demand remains strong in Asia to 2030. Under STEPS demand remains constant to 2030 before falling by around 20% by 2050 on 2020 levels, however growth is still evident in Southeast Asia. Under SDS there is a steeper decline in demand particularly to 2050, falling by around 76% on 2020 levels.[2]

Asia Pacific coal demand



Source: IEA (2021), World Energy Outlook 2021, IEA, Paris https://www.iea.org/reports/world-energy-outlook-2021

Our key customer countries of Japan, Korea, Taiwan and India represent on average 87% of our sales volumes from the FY19–FY21 period, and their climate change targets are:

Japan	Target to reduce emissions by 46% below 2013 and to 'continue strenuous effort in its challenge' towards a 50% reduction by 2030, and net zero by 2050.[3]
South Korea	Target to reduce emissions by 40% below 2018 levels by 2030, and net zero by 2050.[4]
Taiwan	Target to achieve net zero emissions by 2050.[5]
India	Target to reduce the carbon intensity of the economy to 45% below 2005 levels, achieving 50% of its energy requirement from renewable energy sources by 2030, and achieving net zero by 2070.[6]

Whitehaven acknowledges that sales volumes may be impacted in the near term as customers seek to reduce CO_2 emissions resulting from power generation. Nonetheless demand for high quality coal in the Asian region is expected to remain strong even in the face of these commitments. Whitehaven's high-quality coal combined with advanced ultrasupercritical generation technology prevalent across our customer countries, will allow for significant gains in both fuel and emissions efficiency.

1. Other scenarios exist. See www.iea.org/reports/world-energy-model/understanding-weo-scenarios
2. IEA (2021), World Energy Outlook 2021, IEA, Paris https://www.iea.org/reports/world-energy-outlook-2021
3. https://climateactiontracker.org/countries/japan/
4. https://climateactiontracker.org/countries/south-korea/
5. https://www.trade.gov/market-intelligence/taiwan-net-zero-emissions-2050
6. https://climateactiontracker.org/countries/india/

Japan

Whitehaven's largest customer country is Japan. For the three years FY19–FY21, average total tonnes sold to Japan were 9.1 Mt per annum, representing 47% of total sales. Offtake agreements and long-term contracts with Japanese customers represent 3.75 Mtpa until 2031/2032 so we can expect these tonnes to be guaranteed. All other sales are made on an annual or spot basis.

The 6th Strategic Energy Plan (SEP) released in July 2021 outlines the National 2030 emissions reduction targets for Japan and a path to carbon neutrality by 2050. The strategy represents a top-down approach with the Government mandating an idealistic target, compared to the 5th SEP that involved industry consultation in target design.

The 6th SEP's headline target is a 46% reduction in CO_2 emissions from the 2013 levels, an increase from the 5th SEP target of 26%.

METI (Ministry of Economy, Trade & Industry) in conjunction with power generators such as JERA and J-Power have identified the following levers to achieve these targets:

- Suspend and/or close all inefficient coal-fired power plants before 2030.
- Implement decarbonised fuels to co-fire with coal in existing power plants such as
  - coal/hydrogen
  - coal/ammonia
  - coal/biomass
  - synthetic fuels.

Under the Basic Energy Plan (Oct 21), the revised 2030 national energy mix for coal is 19%, down from 26%, with an ambitious energy savings of as much as 20% (approx. 230 TWh). This approximates to a reduction of 44 Mt for imported coal from 2019 levels (97 Mt to 53 Mt in 2030).

Whitehaven's customers in Japan also have climate change targets as outlined below:

JERA	(i) carbon neutral by 2050 (ii) reduce CO_2 emissions from domestic operations by at least 60% (relative to FY13) by 2035 (iii) shut down all inefficient power plants (super critical or less) by 2030
J-Power	(i) carbon neutral by 2050 (ii) reduce CO_2 emissions by 40% by 2030 (iii) phase out aged power stations one after another (iv) reduce emissions by co-firing with hydrogen / ammonia
Chugoku	(i) carbon neutral by 2050 (ii) phase out non-efficient coal fire power by 2030 (iii) utilise highly efficient coal-fired power (iv) co-firing with hydrogen / ammonia, biomass
Kansai Electric	(i) carbon neutral by 2050 (ii) 50% reduction in CO_2 emissions associated with power generation in Japan in FY25 (relative to FY13) (iii) keep the top spot for the amount of zero-carbon power generation in Japan (iv) achieve 6 GW installed capacity (zero-carbon based) by 2030 (2 GW or more new development in Japan and abroad).

Using the IEA WEO 2021 data, if Japan achieves its stated policies it will reduce coal demand by 24% by 2030 and by 53% in 2050 from 2020 levels. There is, however, still significant residual demand in this scenario, and Japan continues to develop new ultrasupercritical coal-fired power stations with the expected commissioning of over 3.8 GW of new capacity between 2022 and 2024.

In August 2022 the Taketoyo #5 1070 MW unit in Japan was commissioned, with the following units also in the commissioning / construction pipeline:

- Misumi #2 – Ultrasupercritical 1000 MW, currently commissioning with commercial operation expected in November 2022
- Saijo #1 – Ultrasupercritical 500 MW, construction complete, to be commissioned in June 2023
- Yokosuka #1 – Ultrasupercritical 650 MW, under construction, to be commissioned in June 2023
- Yokosuka #2 – Ultrasupercritical 650 MW, under construction, to be commissioned in February 2024

The expected lifespan of these new units is over 40 years, confirming ongoing demand for coal as part of Japan's emissions reduction pathway.

Regulation and policy

Climate policy in Australia

Australia's first Nationally Determined Contribution (NDC) under the Paris Agreement was a GHG emissions reduction target of 26–28% below 2005 levels by 2030. In June 2022 the new Federal Labor Government increased this commitment to 43%.

Australia's updated NDC

- A revised 2030 commitment which includes both a single-year target to reduce emissions 43% below 2005 levels by 2030 and a multi-year emissions budget from 2021–2030
- Reaffirms a commitment to achieve net zero emissions by 2050
- A substantial and rigorous suite of new policies across the economy to drive the transition to net zero.

In addition to the updated 2030 target, the new Federal Government has stated its ambition to implement strengthened GHG policies, however the implementation pathway is yet to be developed in detail. At a high level Australia's new policies include:

- the introduction of declining emissions baselines for Australia's major emitters, under the existing Safeguard Mechanism, consistent with a national trajectory to the new NDC and net zero whilst supporting international competitiveness
- $20 billion investment in Australia's electricity grid intended to assist the penetration of renewable energy and accelerate decarbonisation of the grid
- $3 billion from the new National Reconstruction Fund to support renewables manufacturing and the deployment of low emissions technologies
- a Powering the Regions Fund to support the development of new clean energy industries and the decarbonisation priorities of existing industries
- a National Electric Vehicle Strategy, to accelerate the uptake of electric vehicles
- a commitment to reduce the emissions of Commonwealth Government agencies to net zero by 2030 (excluding defence and security agencies).

The most significant impact on Whitehaven from these changes will be the proposed changes to the Safeguard Mechanism, which we understand are intended to facilitate a reduction in existing baseline levels to drive decarbonisation. However at time of writing the new regulation is still being developed.

The Government's policy document states:

'For facilities already covered by the … Safeguard Mechanism, [the policy] will adopt the Business Council of Australia's recommendation that "emission baselines [be] reduced predictably and gradually over time" to "support international competitiveness and economic growth." These changes will provide a supportive policy framework for industry's own commitment to net zero by 2050.' [1]

The impact of this policy on Whitehaven's operations will be assessed once consultation is complete and the regulations are finalised. Whitehaven continues to work with the government directly and with the Minerals Council of Australia (MCA) on ensuring the regulations work to achieve a positive outcome for the climate, while not adversely impacting the global competitiveness of our business.

1. Powering Australia

Policy advocacy

Whitehaven participates in policy development and advocacy to ensure a competitive and sustainable mining sector.

This advocacy involves discussions with both elected and non-elected representatives at all levels of government. It may take place bilaterally or through our industry association representatives. Whitehaven is an active member of multiple industry associations and bodies.

In FY22 these included the following:

Industry association	Description
Minerals Council of Australia	The MCA is the leading advocate for Australia's minerals industry, promoting and enhancing sustainability, profitability and competitiveness.
NSW Minerals Council	The NSW Minerals Council is the leading industry association representing the NSW minerals industry.
Queensland Resources Council	QRC is an independent body representing the commercial developers of Queensland's minerals & energy resources.
World Coal Association	The World Coal Association is the global voice for coal, committed to advancing clean coal for sustainable economic development.
Resource Industry Network	Resource Industry Network represents companies actively engaged in the resource sector and those who are allied to the sector.
Business Hunter	Business Hunter – formerly the Hunter Business Chamber – is a network of influential businesses across the Hunter region of NSW.
Boggabri Business Chamber	A network supporting the local Boggabri business community.
Australia–Korea Business Council	The AKBC supports the commercial success of Australian businesses entering the Korean market and helps members achieve their business strategy in Korea.
Australia Japan Business Cooperation Committee	The AJBCC's objective is to promote and increase business opportunities and strengthen ties between Australia and Japan for the benefit of members as well as the broader community.
Industry body	**Description**
Low Emissions Technology Australia	LETA invests in carbon reduction technologies and assists with advocacy for these technologies.
ACARP - The Australian Coal Industry's Research Program	ACARP is a mining research program owned and funded by all Australian black coal producers.
IEA's Coal Industry Advisory Board	The Coal Industry Advisory Board (CIAB) is a group of high level executives from coal-related industrial enterprises, established to provide advice to the IEA on issues relating to coal.

Industry associations play an important role in public policy discourse and in helping to ensure Australia's minerals sector sustainably delivers benefits to our communities and the economy. Industry associations are a forum for the exchange of ideas and information and to seek consensus on key policy matters that either affect, or have the potential to affect, our sector. They are also the primary vehicle through which we contribute to the development of industry standards and regulation.

Whitehaven considers that differences of opinion on some matters are an inevitable and healthy part of any member-based organisation, though we always seek to work constructively towards consensus outcomes.

Whitehaven also periodically makes formal contributions to parliamentary reviews. We recently participated in the Federal Joint Standing Committee on Trade and Investment Growth's inquiry into the prudential regulation of investment in Australia's export industries. Our submission highlighted the significant contribution Whitehaven makes to Australia's export economy, particularly in regional areas, and the importance of a collaborative approach between the country's export industries and financial institutions.

The submission can be found here.

Political donations are recorded and disclosed in accordance with applicable legislation. In FY22, we made $34,250 in disclosable political donations, primarily for the purpose of attending federal political fundraising events.

Industry position on climate change

We support an industry-wide approach to mitigating emissions. Whitehaven is a member of the MCA which, in 2020, released its Climate Action Plan. In 2021 we also became a signatory to the World Coal Association's Responsible Coal Principles, which acknowledges the impact of climate change and importance of mitigating emissions from coal, committing to actively supporting low-emission coal technologies, investment and innovation.

The MCA's Climate Action Plan details the mineral industry's commitment to the goal of net zero emissions and its actions, among others, on renewable energy investments at mine sites and collaborations with partners on low-emissions technologies and processes.

The Plan outlines actions focused on three key themes: support developing technology pathways to achieve significant reductions in Australia's GHG emissions; increased transparency on climate change reporting; and informed advocacy and knowledge sharing of the sector's responses to addressing climate change.

Responsible supply chain

We seek to support sustainable practices throughout our supply chain, and in doing so contribute to social and economic development.

Social development

Whitehaven is committed to protecting human rights as embodied by our values and embedded in our Code of Conduct. In FY22 we continued our assessment and reporting process to guard against modern slavery in our supply chains.

Activities undertaken are outlined in our most recent Modern Slavery Statement, released in December 2021, in accordance with the *Modern Slavery Act 1988* (Cth). The statement is available on our website.

The due diligence undertaken in FY22 found no evidence of modern slavery practices in our supply chain.

Economic development

In FY22 we commenced reporting for the first time in accordance with the Payment Times Reporting Act 2020 (Cth).

Small and medium-sized businesses face cash flow challenges when invoices are not paid on time. Cash flow challenges can be amplified in the mining sector and associated service businesses in regional communities, which is why we offer 21-day payment terms to our small and medium-sized local suppliers in the areas around our operations.

Continuity during COVID-19

COVID-19 presented a significant challenge to operations throughout FY22. However, through a strong collaborative approach, Whitehaven was able to minimise this impact to business continuity and ensured all sites were able to sustain operational tempo.

The strategy to manage COVID-19 was dynamic and iterative in line with changing government advice, variations in COVID-19 strains and the spread of the infections. In summary our coordinated approach to managing the impact of the pandemic included:

- Developing specific health and safety systems for screening and contract tracing processes
- Providing updated communication (HSEC briefs) detailing changes to our response and controls
- Hygiene and infection controls including social distancing, sanitisers, the wearing of masks, and tracking personnel attending site

During the height of the pandemic, from December 2021 to February 2022, we formed a partnership with scientists at Aspen Medical to provide expert guidance on pandemic modelling and best practice responses to managing the spread of the virus. We coordinated an internal PCR testing clinic based out of the Gunnedah training facility that serviced our employees, contractors and immediate families. This enabled results to be turned around within 24 hours in most instances when the lag time in the community was in excess of 5–7 days. This was crucial for our effective control of the transmission of COVID-19 within our workforce and broader community.

As technology progressed and the NSW Government approved Rapid Antigen Test (RAgT) as a valid assessment of COVID-19 infection, Whitehaven progressed into a RAgT program. This involved engaging a third party App (MOHR App) and health screening service to record and review all RAgTs, and notify of any positive RAgT results, close workplace or household contacts.

Privacy and cybersecurity

The security of our confidential data and computer technology is maintained through adherence to our Information Management and Security Policies and monitored by the Board's Audit & Risk Management Committee.

External reviews ensure we stay abreast of the changing threat landscape.

Whitehaven remains vigilant of cyber threats and operates a continuous improvement process in relation to cybersecurity. This involves adoption of the Australian Cyber Security Centre's Essential Eight mitigation strategies and other recognised frameworks to improve security and responsiveness to changes in the threat landscape. An external security operations centre continuously monitors the security of our systems. Detection devices continuously operate in our Automation and Control network to identify intruders and anomalies. Cyber response plans are simulated and integrated into our Crisis Management response teams.

Ethical business conduct

Whitehaven is committed to conducting business in alignment with our STRIVE values of safety, teamwork, respect, integrity, value and excellence.

All employees sign up to our company Code of Conduct and are regularly reminded of our STRIVE values. A range of policies guide employees on how to apply the values. The policies cover 'Speaking Up', diversity, workplace behaviour, anti-corruption, continuous disclosure, securities trading and political donations, among others.

From a governance perspective, the Board is committed to achieving the highest standards of corporate governance. Annually, the Board publishes a Corporate Governance Statement detailing its corporate governance framework and how the framework achieved the highest standards of governance during the reporting year. The FY22 Statement confirms the Board's compliance with the Australian Securities Exchange Corporate Governance Council's Corporate Governance Principles and Recommendations (4th edition) in all material respects throughout the 2022 financial year and is available on our website.

Tax transparency

Whitehaven Coal is listed on the ASX. Our mining operations are located only in Australia and we have no foreign subsidiary companies, which means transfer pricing is not a tax issue for the Group.

Whitehaven prides itself on being a responsible operator and socially responsible corporate citizen. We pay various taxes to federal, state and local governments, and collect various tax payments on behalf of the federal and state governments.

Our approach to taxation

In relation to tax, we adopt a conservative approach. Our culture of compliance and transparency is apparent in our policies, strategies, resources, procedures and controls, and in our constructive relationships with tax authorities including the Australian Taxation Office (ATO), state revenue offices, and local governments.

There is comprehensive Board oversight of tax via the Audit & Risk Management Committee. A tax governance and tax risk management framework sets out the management and resourcing of our tax functions across the business in respect of all taxes payable and collected. The framework has been prepared referencing the ATO's public guidance, which seeks higher levels of tax transparency, governance and accountability across all taxes for Australian taxpayers, and formalises and captures our prudent approach to taxation matters.

We maintain management systems and resources to:

- Actively monitor, identify and manage tax risk
- Comply with Australian taxation laws and reporting standards
- Lodge all taxation returns and documentation on time
- Collect and pay the calculated amounts of federal, state and local taxes, royalties, levies, duties, rates and imposts when they fall due
- Maintain, with each revenue authority, Whitehaven's standing as an organisation of integrity.

Whitehaven strives to maintain open, honest, transparent and cooperative relationships with all taxation authorities.

Taxes paid

In FY22 Whitehaven contributed $399.1 million to federal, state and local governments in the form of income tax, royalties, payroll tax, and council rates. Coal royalties to the NSW Government represent the largest component of taxes paid. The royalties are *ad valorem*, calculated on gross sales less limited deductions. They are payable via monthly installments throughout the financial year, with a balancing payment made in July to reflect the final royalty liability for that financial year. The key driver of the increase in taxes paid between FY21 and FY22 was an increase in the average realised coal price, which resulted in significantly higher royalty payments.

Taxes collected

The largest component of taxes we collect on behalf of the Australian Government is in respect of employees. This includes pay as you go (PAYG) withholding tax from employees' salaries and wages. In FY22 the Group collected and remitted $62 million of PAYG to the Federal Government.

Taxes collected and paid by the Whitehaven Group and its JV partners in FY22	
Royalties ($m)	374.6
Corporate income tax	12.0[1]
Payroll tax	9.4
Stamp duty	0.3
Employee payroll taxes (PAYG)	62.0
Fringe benefits tax	0.8
Other taxes	2.0
Total	**461.1**

Approximately $0.6 billion of taxes and royalties in relation to FY22 will be paid in FY23, bringing the total royalties and taxes paid or payable for FY22 to approximately $1 billion.

1. Franking deficits tax payment in August 2021, which is a prepayment towards the FY22 tax liability to be paid in December 2022

Income tax

The following information has been derived from the audited financial statements prepared for FY22 available on our website.

Effective income tax rate

The effective tax rate is the income tax expense for the income year divided by the accounting profit before tax, set out below. Whitehaven's effective tax rate for FY22 of 29% is less than the 30% Australian corporate tax rate. This is primarily due to the recognition of tax losses previously not brought to account and the permanent component of payments by the tax consolidated group for shares acquired on-market by the Group's employee share scheme trust, which is not a member of the tax consolidated group.

Reconciliation of accounting profit to income tax expense	FY22	FY21
Statutory profit before tax ($m)	2,765.9	(768.2)
Income tax expense using the Company's domestic tax rate of 30% ($m)	(829.8)	230.5
Non-deductible expenses:		
Share-based payments ($m)	(2.8)	(2.1)
Other non-deductible expenses ($m)	(7.1)	(2.8)
Recognition of tax losses	21.8	0.0
On-market share purchases by employee share scheme trust reimbursed by the Group ($m)	3.9	0.0
Adjustments for tax of prior periods ($m)	0.0	(1.3)
Total income tax (expense)/benefit ($m)	(813.9)	224.3
Whitehaven's effective income tax rate		
Statutory profit before tax ($m)	2,765.9	(768.2)
Income tax (expense)/benefit ($m)	(813.9)	224.3
Effective tax rate (%)	29	29

Climate

Whitehaven continues to play a critical role in underpinning global energy security and industrial activity even as some economies transition away from fossil fuels.

In FY22, we saw consensus begin to emerge in government policy with Australia committing to net zero carbon emissions by 2050 on an economy-wide basis.

Whitehaven acknowledges this goal and will continue to work towards ensuring our business practices align with national targets and legislation. We also advocate strongly for sensible and incremental policy change that reflects the central role of fossil fuels to ongoing human and economic development, particularly in our markets in Asia, and the need to maintain international competitiveness as a major Australian exporter and employer.

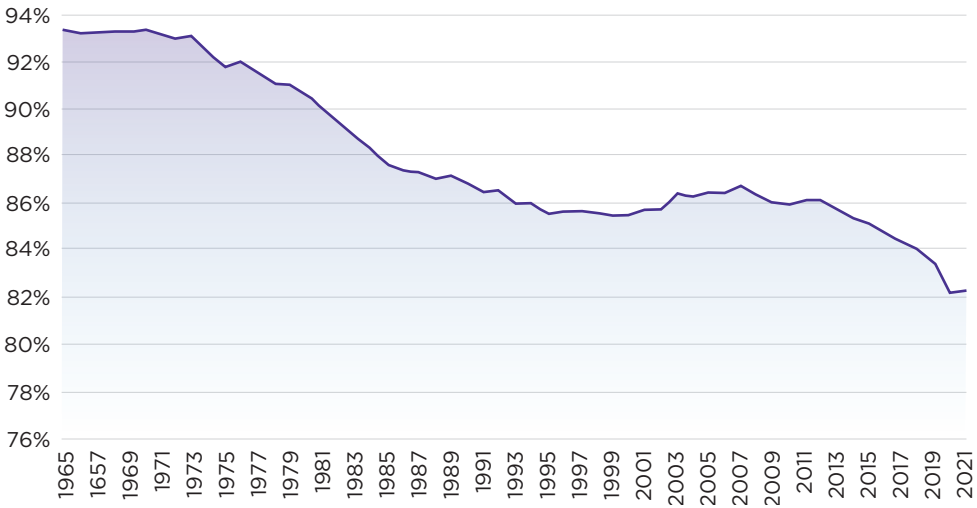
International frameworks such as the Paris Agreement exist to coordinate sovereign national responses to climate change. Global issues such as emissions reduction are most appropriately addressed through these mechanisms and any associated legislative changes enacted by sovereign national governments.

Our customer countries are all signatories to the Paris Agreement or, in the case of Taiwan (ROC), have domestic energy policies consistent with the objectives of the Paris Agreement.

As such, they have set GHG emission targets in relation to energy generation and industrial processes to underpin their NDCs.

Whitehaven supports the aims of the Paris Agreement. The goal of the Paris Agreement is to limit global temperature rises to well below 2 degrees, with an aspirational 1.5-degree target. There is no coordinated global agreement seeking to achieve net zero emissions by 2050 and the net zero commitments of some countries are not a commitment to no emissions.

Proportion of global fossil fuel energy use



Source: BP Statistical Review of World Energy, https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/primary-energy.html

Australia's recently legislated commitment is no different and is limited to direct national emissions (Scope 1). The United Nations Framework Convention on Climate Change (UNFCCC) rules specify that downstream emissions incurred by other countries are properly accounted for in the national greenhouse gas inventories of those countries. The Australian Government has confirmed it does not support a ban on further coal and gas development in Australia, nor do its NDCs under the Paris Agreement require it.

Globally there has been an acceleration of commitments under the Paris Agreement in the last year and following the Glasgow COP, however this ambition has not yet been met with commensurate action, in part because we have not yet been able to bridge the gap between emissions reduction targets and our technical capacity to deliver on them. According to the IEA, World Bank and BP, fossil fuels still account for around 80% of global energy production, a proportion that has not changed significantly for around the past five decades. While coal's role in the global energy mix is decreasing, it still remains the largest source of power generation, accounting for 36% of global power supply in 2021.[1]

Our capacity to deliver on major carbon emission reductions on a global scale remains constrained by a number of factors including the physical and technological limitations of alternative energy sources and storage systems. The use of fossil fuels continues to increase, driven by population growth and urbanisation.

The scale of the decarbonisation task is immense and represents a global challenge the likes of which humanity has arguably not previously encountered.

We maintain our view that the energy transition must occur in an orderly way that does not disenfranchise developing economies or deny access to energy for the approximately 700 million[2] people still living without access to electricity or in a state of profound energy insecurity.

We note UN Development Goals relating to poverty, hunger, health and well-being, and industrial resilience are inexorably linked to having access to affordable and reliable energy.

Further investment in reliable energy also remains essential to deliver on aspirations to significantly increase the penetration of wind and solar technologies given the energy intensive nature of building these systems affordably at the required scale.

We also note the critical role that technology, particularly carbon capture and storage, will need to play to ensure emissions reductions targets can be met while economies and populations continue to expand – as the IEA notes.[3]

In the past 12 months we have witnessed significant disruption to global energy markets arising from supply side shortages, further exacerbated by the conflict in Ukraine. This has highlighted our continued reliance on fossil fuels and the finely balanced nature of the global energy system and its inherent vulnerabilities.

1. BP Statistical Review of World Energy 2022, https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html
2. The World Bank, Universal Access to Sustainable Energy Will Remain Elusive Without Addressing Inequalities, https://www.worldbank.org/en/news/press-release/2021/06/07/report-universal-access-to-sustainable-energy-will-remain-elusive-without-addressing-inequalities
3. IEA, Carbon Capture Utilisation and Storage, https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage

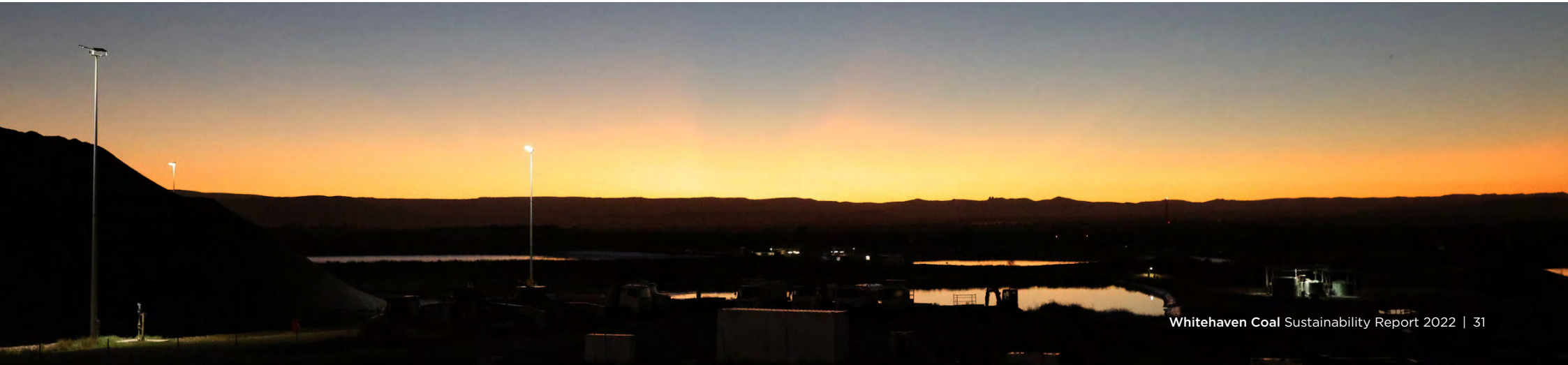
Our approach to climate-related disclosures

Whitehaven continues to focus on ensuring our business remains sustainable and competitive in a rapidly changing world; this requires an understanding of our resilience against realistic climate scenarios.

Climate change is a material risk for our business and we have determined that reporting with reference to the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) helps communicate how we assess and manage this risk.

Since commencing our reporting in FY19, we have expanded our activities with respect to managing climate risks.

Action	Status	Progress
Reporting with reference to the TCFD recommendations	Ongoing	Reporting against the TCFD since 2019.
Mapping direct carbon emissions and sources across Whitehaven	Complete	Reporting in accordance with the National Greenhouse and Energy Reporting (NGER) regulations.
Understanding current and potential abatement opportunities for Whitehaven's direct emissions	Complete	In FY22 we mapped our Scope 1 emissions and sources against emissions reduction opportunities.
Mitigating emissions associated with the use of electricity	Complete	In FY22 we contracted with AGL to provide 100% carbon neutral electricity across the business.
Refining internal climate risk analysis and reporting	Complete	In FY22 we reassessed our risk management framework, including our climate-related risks across the business.
Investing in new technology and innovation to drive decarbonisation	Underway	In FY22 we progressed the feasibility study of a large-scale solar photovoltaic system to help power our Narrabri mine, a fugitive emissions project at Narrabri, and trials to use AHS at Maules Creek, which could reduce diesel consumption. We also continue to invest in carbon capture, storage and utilisation R&D projects through LETA, and other discrete potential CO_2 investments.
Working with customers to develop products and approaches to assist their decarbonisation pathways	Underway	As our customers replace older coal-fired plants we are working to meet their needs by supplying high-CV coal to fuel HELE plants to meet their decarbonisation goals. We have undertaken an assessment of major customer countries' climate-related ambitions, as well as their national policy frameworks. We have also commenced engagement with these customers on how we can work with them to constructively navigate the climate risks they face.
Set climate-related targets	Under consideration	We are considering targets across a number of aspects of sustainability performance including direct emissions, which will be considered in tandem with Australia's revised NDC.



Whitehaven has been reporting under the voluntary TCFD framework since 2019 and we will continue to do so, to assist our stakeholders understand the impacts of climate change on our business.

The TCFD framework recommends disclosures in four key areas:

TCFD Framework

Governance

Whitehaven's Board actively and regularly considers climate-related risks and opportunities when reviewing and setting strategy

Strategy

Whitehaven's business continues to be resilient under a Paris-aligned scenario and demand for our product continues to be strong in our key markets

Risk Management

Whitehaven recognises the risks to our business posed by climate change and our management of these risks follows our risk management framework

Metrics and Targets

Whitehaven reports all Scope 1 and 2 emissions under the NGER Act

As we continue to better understand the breadth and magnitude of the challenge to decarbonise our operations, we also continue to consider the best approach to setting emission reduction targets as well as potentially incorporating a cost of carbon in our decision-making processes. This work is being undertaken with regard to evolving national legislation in this space.

Climate-related risks and opportunities

Climate change governance

The Board Committee with the highest level of direct responsibility for climate-related matters is the Audit & Risk Management Committee, which operates under a formal charter and currently comprises three non-executive and independent directors. This Committee meets at least four times a year, and oversees climate-related risks. Whitehaven's senior management team, alongside the Sustainability Working Group, monitors, coordinates and manages climate-related matters.

Risks and opportunities

Identifying and evaluating climate-related risks are established features of our enterprise risk management framework, strategy and decision-making processes. Risks are prioritised according to magnitude and likelihood. Our most significant risks are reviewed annually, while material and emerging risks are continually and proactively identified, monitored and assessed.

In FY22 we identified 11 Tier 2 risks that contribute to the Tier 1 Strategic Risk of climate change.

The TCFD recommendations separate climate risks and opportunities into two general categories, transition and physical, as shown below.

Transition Risks				Physical Risks	
Policy and Legal	Technology	Market	Reputation	Acute	Chronic
Risks arising from policy or legal interventions that attempt to constrain actions that contribute to the adverse effects of climate change or actions that seek to promote adaptation to climate change.	Risks arising from the technological changes that are occurring to support the transition to a low carbon economy and the disruption they can cause to markets and businesses.	Risks associated with changing supply and demand for commodities and other products and services.	Risks arising from changing customer and community perceptions of organisations due to their action on climate change, with impacts to reputation leading to reduced customer trust and participation with a business.	These risks refer to those that are event-driven, including increased severity of extreme weather events, such as cyclones, hurricanes, droughts or floods.	These risks refer to longer-term shifts in climate patterns (e.g. sustained higher temperatures) that may cause sea level rise or chronic heat waves.

Climate-related risks

Risk Type	TCFD Risk Category	Description	Mitigation	Risk Rating
Transition (medium-term)	Policy and Legal	A shift in domestic policy imposing a cost on carbon impacting on operating costs.	Monitoring of domestic policy and regulatory changes and impacts on our business. Continuing engagement with domestic policymakers to advocate for positive policy outcomes. Undertaking analysis of least cost decarbonisation activities.	Medium
Transition (medium-term)	Policy and Legal	Increasing litigation against companies in an effort to accelerate action on climate change.	Our climate-related risk management framework, including scenario analysis, stakeholder management and monitoring of legal developments, assists in identifying potential climate-related litigation risks. In parallel, we will also seek legal advice on such developments when required.	Medium
Transition (long-term)	Market / Technology	Shifting international policy, markets and technology away from coal leading to decreased demand and prices for coal in the seaborne market.	Continually monitoring the global market and customer country policies and trends, and undertaking analysis to ensure we are well positioned to respond to changes. Actively diversify markets, with focus on markets that pay premiums (currently 50% of export goes to Japan, 30% to Korea & Taiwan, 10% India).	High
Transition (short-term)	Reputation	Changing sentiment towards coal across the Australian community leads to increasing activist activities impacting operations and or infrastructure access.	We engage regularly with our supply chain partners; we actively undertake regular security updates and increase security in times of protest action. We work closely with local police, as a supply chain, to ensure protestors are appropriately dealt with.	High
Transition (medium-term)	Reputation	Reduction in available talent due to declining interest from sections of the community to participate in the coal industry.	Develop and communicate employee value proposition. Undertake short- and medium-term workforce planning, including Vickery requirements and filling gaps at other sites. Review of incentives and employee benefits to ensure competitiveness. Improve capture, analysis and dissemination of people & culture related data and information to support decision making.	Medium

Climate-related risks cont.

Risk Type	TCFD Risk Category	Description	Mitigation	Risk Rating
Transition (medium-term)	Policy and Legal / Reputation	Intervention by investors leading to constraints on future development.	We advocate for the central role of high-quality Australian thermal coal in reducing global emissions. We continue to advocate for the importance of Australian metallurgical coal as a critical input for steel production. We continue to report in accordance with the recommendations of the TCFD.	Low
Transition (short-term)	Policy and Legal	ESG related factors resulting in the withdrawal of insurance capacity for the coal industry.	We are exploring alternative sources of insurance. We are in the process of establishing an Insurance Captive for self-insurance purposes. We are participating in an industry-wide feasibility assessment for establishing an Insurance Mutual for the industry (with possible government and financial backing).	Medium
Transition (medium-term)	Policy and Legal	Further changes to ESG policies by investors leading to higher funding costs.	We advocate for the central role of high-quality Australian thermal coal in reducing global emissions. We continue to advocate for the importance of Australian metallurgical coal as a critical input for steel production. We are exploring alternative sources of funding.	High
Physical (long-term)	Acute	Risk of access being cut off for greater than one day, due to fire or flood events, increasing over the life of mine.	No reasonable controls to mitigate access impacts as access is cut on public roads.	Low
Physical (long-term)	Chronic	Inability to access sufficient external water to supply our operations is increasing due to climate change.	Our water balance model assesses 132 years of historical climate data including the BOM-predicted impacts to rainfall and evaporation over our projects. Our water strategy includes options to improve drought security and redundancy by sharing water between operations.	Low
Physical (medium-term)	Acute	Increasing risk of disruption to port and rail infrastructure from fire, flood and heat events.	We engage regularly with our supply chain partners to ensure our industry partners comply with Australian Standards for all equipment and procedures.	Medium

Climate-related opportunities

In addition to considering the risks related to climate change, we continue to explore and take advantage of relevant opportunities.

Central among these for Whitehaven is responding to growing market demand for high-quality Australian coal in a more carbon-constrained world (as outlined in Our business).

Coal remains a major component of global fuel supplies. It is an abundant, affordable and reliable energy source. It remains the largest source of electricity globally and plays a fundamental role in iron and steel production and a wide range of other industrial processes.

To reduce GHG emissions and meet the goals of the Paris Agreement, many coal-reliant countries have committed to retiring old and inefficient coal-fired plants and moving towards newer, lower emission, more energy-efficient generation technologies.

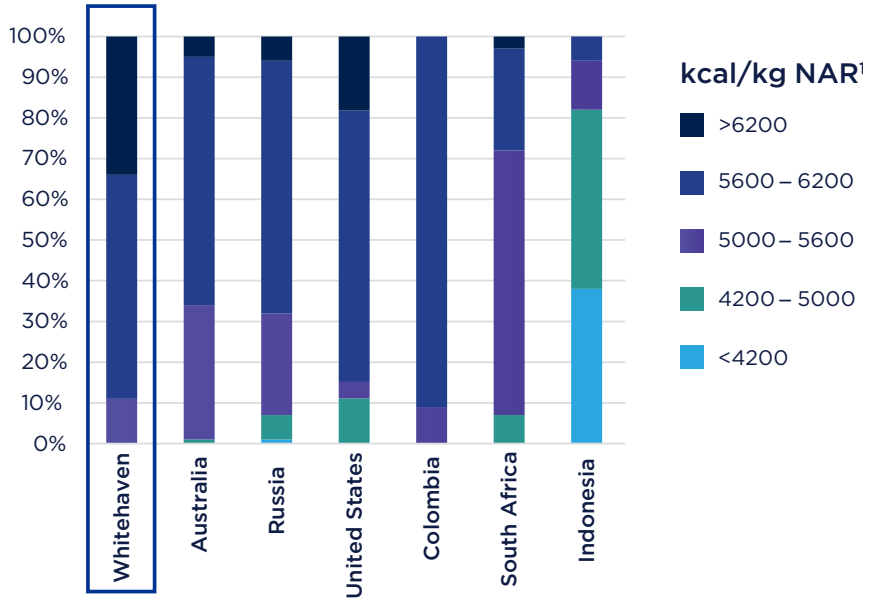
The coal produced and exported by Whitehaven is high-quality, high-CV coal. It delivers among the lowest carbon emissions per tonne of coal consumed when combined with high technology, low emission, energy-efficient coal-fired plants.

For more information on how we are well-placed to take advantage of this opportunity, see the Our business chapter.

We also invest in low and negative emissions technologies through Low Emission Technology Australia (LETA) and will continue to evaluate other ways we can contribute to the development of Carbon Capture Utilisation and Storage (CCUS) globally. In Australia, our geography presents huge opportunities to store CO_2 at scale and further information on CCUS can be found at the end of this chapter.

Australia's thermal coal exports are among the highest-CV in the world, and Whitehaven produces the highest proportion of high-CV coal in Australia

FY22 thermal coal exports by quality



Source: McCloskey MCC August 2022

1. NAR equals energy on a Net As Received basis

Business resilience and climate change

A central element of the TCFD's recommendations is that companies use scenario analysis to:

- Understand the impact of changes to the operating environment under potential lower-carbon scenarios (including a 2-degree or lower scenario)
- Determine their financial and operating resilience under these scenarios
- Periodically monitor relevant external metrics and indicators to identify the scenario that is most likely to eventuate over time.

The TCFD recommends that any scenarios analysed meet the following criteria:

- **Plausibility:** Are the events described in the scenario possible and credible?
- **Distinctiveness:** Do the scenarios focus on different assumptions about key drivers and outcomes?
- **Consistency:** Is there a consistent application of logic across scenarios?
- **Relevancy:** Do the scenarios provide insight into future strategic decisions facing the business?
- **Challenging:** Do the scenarios challenge simplistic assumptions or conventional wisdom about the future?

About scenario analysis

Multiple aspects of the pace and scale of the global transition towards a lower-carbon world remain materially uncertain. These include, but are not limited to, the extent and pace of the policy response to climate change, the outlook for energy demand and the rate of development and adoption of new technologies. Given this uncertainty, climate scenario analysis is just one tool we can use to better understand and assess external risks to our business and inform strategic decision making.

It is important to note that a scenario is not the same as a forecast. Scenario analysis is a mechanism that considers possible futures, some with dramatic deviations from a base or current case and with varying degrees of probability, to test business resilience and determine consequential financial outcomes.

For the past three years we stress-tested the resilience of our operating asset portfolio against the enduring IEA scenarios, STEPS and SDS:

- **Stated Policies Scenario (STEPS):** This scenario considers a sector-by-sector look at what actions have been implemented, taking into account not just existing policies and measures, but also those under development.
- **Sustainable Development Scenario (SDS):** This scenario is a 'well below 2°C' pathway and represents a gateway to the outcomes targeted by the Paris Agreement. The SDS envisages a surge in clean energy policies and investment.

It is important to acknowledge that none of the scenarios contained within the WEO series are preordained and other scenarios exist. See more at https://www.iea.org/reports/world-energy-model/understanding-weo-scenarios.

During FY22 there have been significant external events, including the war in Ukraine, that have impacted the coal market as discussed in Our business. The most recent IEA World Energy Outlook report was released in late 2021, and therefore does not consider the impacts of these market changes. In addition we note the STEPS and SDS scenarios and their associated coal price assumptions detailed in the WEO 2021 do not vary materially from those contained in the WEO 2020.

Relevantly, Newcastle thermal coal prices averaged US$61 in CY20 largely due to the impact of COVID-19 on aggregate global demand. Coal prices recovered strongly in CY21 to average US$141/t and year-to-date CY22 coal prices have averaged US$321/t. The futures market has Newcastle coal priced at US$408/t for the December half of CY22, US$330/t for CY23 and US$278 for CY24. The substantial deviation of these values from those forecast by the IEA is clearly observable by actual Newcastle thermal coal prices in CY22 being between 4.5 and 6 times higher in 2022 than the IEA's price assumptions in WEO 2021 for the 2030 year across all its scenarios.

Current higher prices are resulting in the earlier recovery of capital invested in our operational assets. This in turn reduces the conceptual risks associated with the notion of stranded assets or impairments arising from price risks driven by global responses to climate change. Whitehaven has a carrying value for property, plant and equipment of A$3.4 billion at 30 June 2022.

In the table below is the number of months it is expected to take for the cash generated by the business to 'recover' the carrying value of property, plant and equipment.

	3 Year average 2022–2024	CY2022 Average	July 2022 Spot
Newcastle Thermal (US$/t)	309	364	400
Number of months	14	11	10

Considering price assumptions in WEO 2021 do not vary materially from WEO 2020, we undertook simplified analysis of the resilience of our operating asset portfolio against the enduring WEO scenarios.

Our key conclusions remain consistent with analysis from those in FY21:

1. The future of the Australian coal sector and high-quality coal producers such as Whitehaven is expected to remain robust.
2. Whitehaven exhibits resilience and value generation in a range of decarbonising scenarios, including under a Paris-Aligned < 2°C scenario.
3. Under the < 2°C scenario, all of Whitehaven's operating assets would continue to have positive valuations and economic lives, consistent with current life-of-mine planning.
4. The risk of Whitehaven's assets being 'stranded' in a more carbon-constrained world is assessed as low.

Given current trends and our analysis of the market, even in the absence of current supply side constraints, we have a high degree of confidence that coal demand will continue to remain robust for the short and medium term.

Given the uncertainty in the global energy market we will reassess the most appropriate path forward in terms of scenario analysis in FY23. This will include closely examining WEO 2022 to determine if the scenarios presented are fit for purpose, and considering the appropriate cadence of TCFD scenario analysis for the purposes of future reporting and disclosure.

The details of our more comprehensive FY21 resilience testing can be found in the Climate chapter of our Sustainability Report 2021.

Monitoring and reporting

Consistent with the TCFD's recommendations to monitor relevant external metrics to determine the most likely eventuating scenario over time, Whitehaven has identified signposts for each WEO scenario.

They encompass the leading indicators underpinning our assumptions as well as any changes in the external environment relevant to Whitehaven, our products and key markets. These are mainly IEA data points and include categories such as global power sector CO_2 emissions, global thermal coal production and cumulative investments in fossil fuel and renewables generation, on a region-by-region basis.

These signposts are a 'backward-looking' component of our resilience testing framework as distinct to 'forward-looking' price analyses.

In addition to IEA data, we use bespoke data from independent resource industry consultants and open-source reporting and analysis on policy and market developments relating to carbon, climate change, coal and other relevant topics.

We also participate in domestic and international discussion forums to deepen our understanding of issues. This information is synthesised by the Sustainability Working Group, which meets periodically to review signposts and form judgements on which scenarios are becoming more or less relevant to the physical market over time.

Emissions

We are committed to looking at ways to reduce our operational emissions from energy use and haulage.

Our main sources of greenhouse gas emissions are:

- fuel consumption (diesel) during mining operations – Scope 1
- release of fugitive gas (CO_2 and CH_4) through mining coal seams - Scope 1
- indirect emissions resulting from our consumption and use of purchased electricity – Scope 2.

Progress on our efforts is measured annually, in October, when we report to the Australian Government's Clean Energy Regulator (CER) on GHG emissions and energy production and consumption. This reporting follows the requirements of the National Greenhouse and Reporting Scheme (NGER), created under the *National Greenhouse and Energy Reporting Act 2007.*

Scope 3 emissions

The UNFCCC and related rules have been in place since 1992 and represent the foundation for the accountability of national governments to progress their international commitments.

The rules specify that all emissions associated with an activity within a nation's borders count towards that nation's emissions total. This means emissions associated with the production of goods imported into Australia ('upstream' Scope 3 emissions) are accounted for in producing countries' greenhouse accounts, just as emissions associated with Australian exports ('downstream' Scope 3 emissions) are accounted for in importing countries' greenhouse accounts.

This approach avoids double-counting and promotes complete, global coverage of emissions, as well as transparency, accuracy and comparability across all countries.

With the adoption of the Paris Agreement, almost all countries, including major developing countries, have for the first time committed to address climate change and track their progress over time. Nations are individually responsible and accountable for determining their contribution.

The NGER scheme is a single, national framework for reporting on energy production, consumption and emissions.[1] It supports the Australian Government's reporting obligations under the Paris Agreement and so does not require reporting of Scope 3 emissions. The scheme is consistent with reporting systems in the USA, the EU and South Korea.

In its 2018 review of the NGER scheme, the Australian Government's Climate Change Authority considered a requirement to report Scope 3 emissions. The Authority concluded that the challenges and burden of reporting Scope 3 emissions outweigh any benefits, because an accurate estimation of Scope 3 emissions associated with a specific economic activity is inherently complex and uncertain, involving many value chains across multiple economies.

1. Climate Change Authority, 2018 Review of the National Greenhouse and Energy Reporting Act https://www.climatechangeauthority.gov.au/consultations/previous-consultations/2018-review-national-greenhouse-and-energy-reporting-act

Scope 1 and 2 emissions

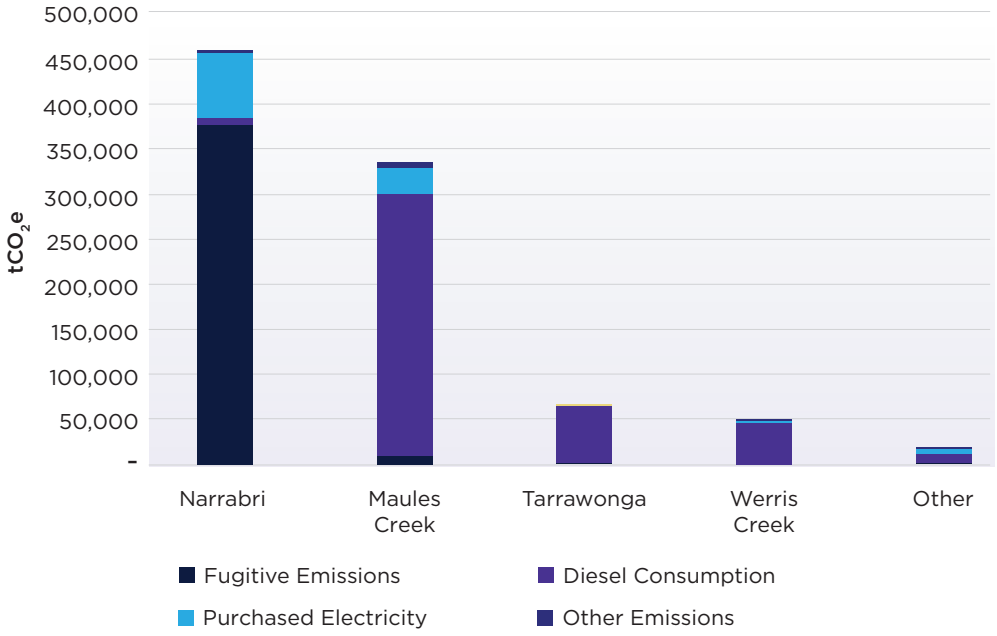
Our annual reporting since the launch of the NGER scheme in 2008–09 is available on the Regulator's website and emissions from the past five years are set out below.

For FY21, the most recent reportable period under the NGER scheme, our Scope 1 emissions have reduced by 58.3% overall. This reduction was mostly as a result of a change in calculation methodology to report fugitive emissions, from a default emissions factor to a more accurate site-specific emissions factor. To achieve this, we undertook geological work at Maules Creek to determine a more accurate representation of our fugitive emissions. Over the same period energy use slightly increased (5%) due to an increase in haulage distances and the resultant increased diesel consumption.

The Australian Government's Safeguard Mechanism applies to facilities with Scope 1 'covered' emissions of more than 100,000 tonnes of carbon dioxide equivalent (CO_2-e) per year. Emissions baselines represent the reference point against which emissions performance is measured under the mechanism. In FY21, we gained approval on new baseline applications for our Maules Creek and Narrabri facilities.

In FY21 we implemented an internal emissions tracking system to complement existing systems and processes. The tailored software provides more frequent and detailed information about emissions, further improving the accuracy of our emissions forecasting.

FY21 emissions by location and source



	FY21	FY20	FY19	FY18	FY17
Scope 1 greenhouse gas emissions (kilotonnes CO_2-e)	816	1,487	1,515	1,343	1,255
Scope 2 greenhouse gas emissions (kilotonnes CO_2-e)[1]	105	106	106	98	95
Total Scope 1 and 2 greenhouse gas emissions (kilotonnes CO_2-e)	921	1,593	1,621	1,441	1,350
Intensity – greenhouse gas emissions (tonnes CO_2-e per tonne ROM coal)	0.045	0.077	0.074[2]	0.063	0.058
ROM production ('000 tonnes)	20,555	20,596	22,036	22,924	23,127
Net energy consumed (terajoules)	6,610	6,134	5,937	4,918	3,948
Intensity – net energy consumed (gigajoules per tonne ROM coal)	0.322	0.306[2]	0.278[2]	0.259	0.213

FY22 Scope 1 and 2 data, which remains subject to external assurance review, is estimated to be approximately 1 million tonnes[1] of CO_2-e. The approximately 9% increase in FY22 is predominately due to increased production at Narrabri. Final FY22 GHG data will be available on the NGER website from November 2022.

1. These emissions do not account for our purchases of certified carbon neutral electricity as they are calculated on the NGER methodology.
2. Figures adjusted in FY22 to reflect full-year ROM production outcomes.

Reducing emissions today

We understand our emissions profile and we understand the challenge of reducing emissions. Whitehaven's current Scope 1 and Scope 2 emissions are significant, ranking in the top 70 in Australia for the 2020–21 reporting period.

From FY22 we are offsetting all of our Scope 2 mine emissions by contracting to purchase 100% carbon neutral electricity across all of our sites. This product is certified by the federal government under the Climate Active scheme. Scope 2 emissions represented 11.4% of our total emissions in FY21.

We are also undertaking a feasibility study to consider the implementation of a solar photovoltaic electricity generation system at our Narrabri mine. This could further reduce the electricity consumed from the grid at this facility, which is currently the largest user of electricity in our portfolio.

Our focus is on existing and emerging emissions reduction technologies for Scope 1 emissions. We are actively considering our options in this space. One example of these emerging technologies is a process owned by Hydrobe Pty Limited (Hydrobe) in which Whitehaven is a significant investor. Hydrobe has a world-patented process to run industrial emissions through chambers of specially selected microbial algae and bacteria that turn CO_2 into saleable products including fertiliser, green hydrogen and syngas. We are considering the application of this technology to mine sites and to end users of our products. The difference in the Hydrobe approach to decarbonisation is that the company's patented biological process converts CO_2 without generating new CO_2. That is, Hydrobe's energy requirements are generated from biological reactions.

In addition we are considering options for carbon offset generation across our land holdings, including through carbon farming initiatives.

Whitehaven has invested in carbon capture technologies through funding for LETA. Over the past five years, Whitehaven contributed a total of $4.06 million to LETA. In 2022 LETA-backed projects received $80 million in federal funding. These projects included:

- $25 million in funding, matched by industry, for Australian National Low Emissions Coal Research and Development (ANLEC R&D) to assess the feasibility of a zero emissions Allam-Fetvedt Cycle dispatchable generator in the National Electricity Market
- Up to $20 million for the Carbon Transport and Storage Company (CTSCo) Surat Basin Hub Scale Storage Appraisal and Development Project, with a total project value of $50 million
- Up to $15 million for CTSCo's Surat Basin Test Injection Project, with a total project value of $50.3 million
- Up to $15 million for Bridgeport (Surat Basin) Pty Ltd's Moonie CCUS Project, with a total project value of $42.5 million
- Up to $5 million for a feasibility study for the Zero Degrees Rosella 1's (8 Rivers) zero emissions Allam-Fetvedt Cycle generator and hydrogen production project, with a total project value of $32.7million.

Future abatement

In addition to the emissions reductions activities already undertaken, including offsetting our Scope 2 emissions, we have undertaken an assessment out to 2050 to understand the size of the emissions abatement challenge to achieve net zero.

This included prioritising key potential emissions abatement opportunities for our operational Scope 1 GHG emissions.

This included, as part of the considerations for implementation, an assessment of the commercial and technological readiness for prioritised emissions abatement opportunities.

This assessment has been undertaken against the backdrop of:

- The evolving regulatory environment – in recognition of the Australian Government's revised emissions reduction target and the establishment of state-based emissions reduction targets.
- The need for reliable and secure energy – given the significant and enduring role coal will play in the global energy market and in supporting access to energy and electricity for economic development, this work has explored emissions abatement opportunities in the context of continued production for current and planned mines.

Assessment methodology

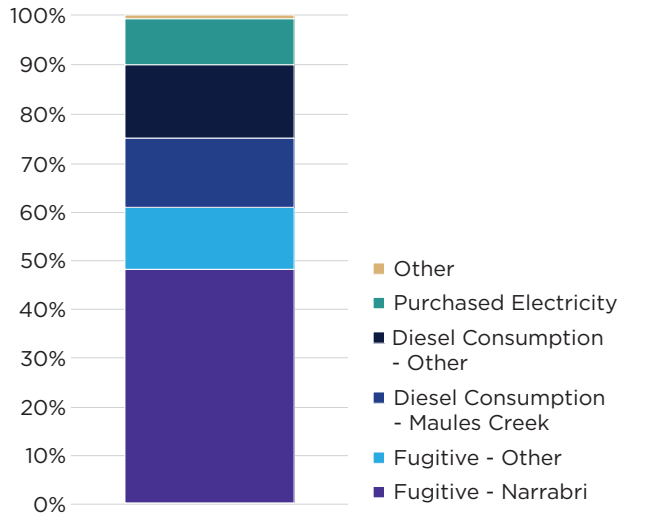
Key features of Whitehaven's abatement opportunities assessment methodology include:

- Data insights – we used our internal emissions tracking system for the most recent and sophisticated operational emissions measurements and future estimates. Both current and planned mines were included in future emissions estimates to understand the totality of potential emissions Whitehaven would need to abate.
- Baselining and pathways – FY21 emissions were used as a baseline year, given the availability of representative, reliable, and verifiable emissions data. The potential emissions glidepaths to 2050 were assessed from this initial starting point.
- Opportunity identification - potential abatement opportunities and their associated barriers, enablers and other practical considerations were identified for each material operation, energy consumption sources, and emissions source. Abatement projects were identified with input from a range of sources, including:
  - Internal stakeholder engagement – engagement was undertaken across the business, including corporate workshops (involving functional areas including Finance, Legal, Corporate, Government & Community Affairs, Project Delivery and Health, Safety & Environment) and engagement with our leaders from our operations.
  - Synthesising work done to date – using insights from recent assessments of potential opportunities, developed through our continuous improvement processes.
  - Consideration of industry practice and peer analysis – we considered the literature regarding the most recent and applicable technologies, drawing on the growing body of research regarding options to decarbonise mining operations.
- Opportunity prioritisation - opportunities were reviewed and prioritised based on several key parameters to isolate the options most appropriate and credible for Whitehaven to consider as part of an emissions reduction pathway. These included:
  - alignment to Whitehaven's operations, emissions sources and ambitions
  - capital intensity, decarbonisation potential and complexity
  - implementation sequencing to achieve a pathway to emissions reduction to meet net zero by 2050.

Our potential emissions reduction pathway

Our assessment has determined that between 2020 and 2050, Whitehaven's total Scope 1 and Scope 2 emissions will range from between 1 to 3 $MtCO_2e$ per year. Cumulative emissions throughout the period would be approximately 57 $MtCO_2e$.

Cumulative emissions breakdown for Whitehaven (2020–2050)



A significant share of our emissions are hard to abate. Roughly 60% of estimated emissions over the assessed period will be fugitive, largely from operations at Narrabri. The remaining 40% will come from the combustion of diesel for haul trucks, mining equipment and a handful of other processes. Each of these emissions sources require different abatement processes that vary in their technological and commercial readiness. Carbon offsets, while a mature and commercially available abatement opportunity, present a range of challenges including costs, permanence, quality, and competition with other land uses.

Whitehaven is considering the technological, commercial, and practical considerations of abatement opportunities in alignment with its potential emissions education pathway.

In addition to technological maturity and commercial availability of the abatement opportunities, we identified a range of internal factors that could potentially impede implementation and achievement of the emissions abatement task.

- We are reliant on technological and commercially mature technology being available. Any roadmap for limiting emissions in line with an emissions reduction target would require the staged implementation of abatement opportunities which are emerging in their technological maturity and commercial availability.
- Implementing abatement opportunities will require significant capital investment. This challenge is exacerbated by the long-term and uncertain nature of the options being considered.
- Not all available abatement opportunities are suitable for implementation at Whitehaven's assets, given challenges due to physical mine layout and operational conditions. Future operations may be more suited to abatement options given the longer time horizons – when technologies will be further advanced.

A potential emissions reduction pathway should address the key sources of emissions in a staged manner, consistent with the materiality of source emissions and the readiness of solutions. Key potential options, in order of feasibility, include:

1. Electricity production and sourcing:
   Existing initiatives at Whitehaven, such as carbon neutral electricity and onsite solar.
2. Driving down emissions from materials movement:
   Limiting emissions from diesel haulage and transport through measures such as optimising and electrifying material movement processes are potential medium-term options, however emissions would remain from other sources.
3. Solving the hard-to-abate fugitive emissions issue:
   Significant quantities of carbon offsets would be required to address emissions which don't have an economical option for abating at the source. Direct air capture or other onsite sequestration may be an option in the longer term.

Possible Scope 1 abatement opportunities

Emissions source	Potential abatement opportunity	Description	Share of total abatement task (to 2050)
Diesel (off-road)	Electrified mining equipment	This technology uses electric motors and batteries to replace the diesel engine in machinery such as excavators, dozers and graders.	13%
	Electrified other equipment	Electrification of diesel-power equipment such as pumps and drills.	3%
	Battery electric haul trucks	This technology uses electric motors and batteries to replace the diesel engine in mining haul trucks.	17%
Diesel (road)	Battery electric light vehicles (passenger and commercial)	This technology uses electric motors and batteries to replace the internal combustion engine in the vehicle.	0.18%
	Battery electric heavy vehicles (road trucks)		0.16%
Fugitive and residual emissions	Offsets – Current ACCU price	Utilisation of Australian Carbon Credit Units (ACCUs) at an indicative current price to meet future emissions reduction commitments.	66%
	Offsets – Indicative IEA carbon price	Cost to meet emissions reduction commitments using the price of offsets as per the IEA SDS scenario from WEO 2021.	
	Direct Air Capture	A process of capturing carbon dioxide directly from the ambient air and generating a concentrated stream of CO_2 for sequestration or utilisation or production of carbon-neutral fuels.	

Considering the requirements of an Australian net zero target

Whitehaven recognises that to achieve net zero emissions by 2050, Australia will need to introduce legislative and regulatory mechanisms that would eventually require us to reduce operational emissions.

Recognising this, we have been considering what we would need to have in place to align with a net zero emissions target – in alignment with the expectations of a company of our size and the sector in which we operate.

Whitehaven appreciates that any emissions reduction target should be composed of criteria that enable stakeholders to transparently assess a company's ambition, including baseline period, target metric, and target year for net zero. Any target should be supported by the organisation's strategy and consider multiple internal and external factors.

These include:

- the achievability of reaching the target based on the rate of decarbonisation
- cost required to reach the target
- stakeholder acceptance of the target
- any potential competitive advantage against other organisations.

Before establishing a target we will analyse these factors and any impact resulting from the new Safeguard Mechanism regulations.

Supporting our communities

Being a responsible operator involves working with our neighbours, Traditional Owners and other stakeholders with openness and transparency, and in a meaningful and respectful way.

Community contribution

We believe the local community should be the main beneficiary of our presence.

We're focused on building local prosperity, improving quality of life, and ensuring our regional towns thrive – so the benefits of our presence go beyond our workforce and beyond the life of any single mine. Ultimately, our compact is to leave an economic and social legacy that outlives our mining operations, and lives on in the areas of education, health, skills and infrastructure.

Investing in Australian communities

Our comprehensive approach

- Identify, develop and operate high-quality, long-life, lower-cost coal projects
- Promote local economic growth and sustainability through permanent job creation and local procurement
- Help build local community capacity and viability through direct and indirect intergenerational investment in education, health, skills and infrastructure
- Instill community trust through responsible environmental stewardship and community partnerships
- Leave an economic and social legacy that outlives mining operations

$461.1 million
contributed to federal, state and local governments in taxes and royalties[1]

$8.73 million
spent with 14 indigenous businesses

$354.5 million
spent with regional suppliers[2]

$1.53 million
in corporate community partnerships and donations

$232.9 million
in wages paid

1. Approximately $0.6 billion of taxes and royalties in relation to FY22 will be paid in FY23, bringing the total royalties and taxes paid or payable for FY22 to ~$1 billion.
2. Includes suppliers across North West NSW and Central QLD

Community engagement

Local residents hold legitimate concerns about mining in their community. To work in partnership and instill trust, we engage with a range of stakeholders early on and share information in a timely, meaningful and respectful way.

We communicate through multiple channels. These include Community Consultative Committee meetings for each mine site, the minutes of which are published on our website, as well as newsletters and factsheets. The outcomes of environmental monitoring, assessments and audits are also available on our website. Members of the public are invited to seek information or provide feedback online, by phone, or in person at our Gunnedah community shopfront, which is open Monday to Friday.

We regularly provide operational and development updates to local councils, business chambers, and through other local forums. We aim to have a presence at community events, and while COVID-19 has continued to restrict activities, we periodically invite community members to our mines for tours and planning is underway for a community and family day at Maules Creek in FY23.

Community feedback is key to our approach, and we draw upon insights from independent sentiment testing undertaken approximately every 18 months. This feedback was central to developing our Stakeholder Engagement and Community Investment Strategy 2021-2023, which we continue to implement by conducting regular stakeholder engagement activities, including one-on-one meetings, consultation groups (issue based), written communications and mine tours.

Gunnedah High School students see science in action and career opportunities at Tarrawonga

SEE MORE ›

We continue to work to improve community understanding of our operations, the ways we invest in the community and how we operate in harmony with a thriving agricultural industry. To that end, in FY22 we significantly updated our Community Investment approach to be more structured and open, involving community representatives in the funding allocation process. Read more about our Community Investment here.

We are also working to improve our frequency and quality of communication.

In FY22 we revamped our website to make updates more visible, created a rehabilitation hub with information on each of our operations, and increased the frequency of our community newsletter.

In FY23 we will look at how we can further improve frequency of communication and transparency, including through an online environmental dashboard for our Maules Creek mine to more clearly share performance data.

Importantly, our engagement encompasses developments and modifications to our existing mines. During FY22, the NSW Independent Planning Commission approved the Stage 3 Extension of our Narrabri underground mine.

During that process the majority of submissions from the local area and wider region supported the proposal. We have also applied to modify the closure and rehabilitation plan for our Werris Creek mine, to provide better long-term environmental outcomes. We also continue to work with a range of stakeholders on our Winchester South development, which is progressing through the Queensland Government's approval process.

Complaints and grievance mechanisms are in place across all of our operating assets. We continue to build on our community complaints process that was centralised in FY21, to streamline how we capture and address all concerns, complaints and grievances received through our community engagement channels.

Listening to our communities

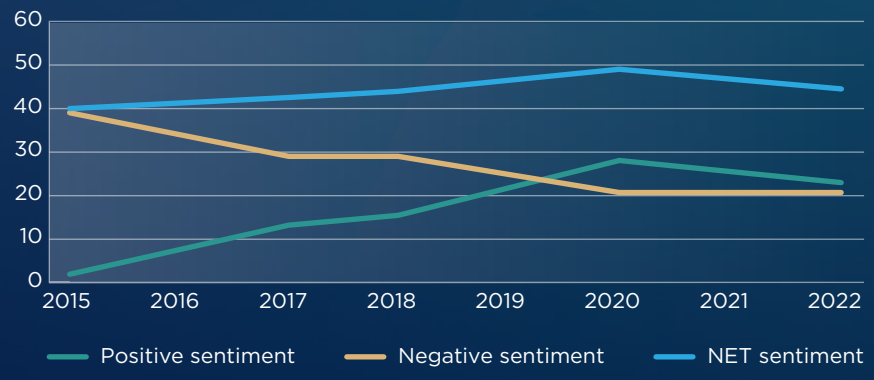
We undertake independent qualitative and quantitative sentiment testing in our local community approximately every 18 months. This statistically significant polling across the Gunnedah, Narrabri, Tamworth and Liverpool Plains Local Government Areas (LGAs) shows our reputation has improved since 2015.

The latest polling, in 2022, indicates the proportion of people aware of Whitehaven who hold a positive view of the company is 44% (down from 49% in 2020), with only 21% having a negative opinion (unchanged from 2020). Despite net sentiment decreasing very slightly in 2022, our polling demonstrates a clear trend of improvement in positive and net sentiment since 2015. Support for our Vickery Extension Project has increased to 43%, up from 36%, whereas negative views are mainly attributed to concerns about the long-term impacts of mining.

Most have an awareness of Whitehaven's community investment activities, indicating effectiveness of improved engagement efforts over recent years. Nonetheless, locals want to know more about our environmental strategies, current and future plans, commitment to local employment and further information around our community investment, among other things.

On the future of coal mining more broadly, almost three quarters of those polled agree that mining jobs are essential for the local economy. Most believe coal mining will be an important part of the local economy for the longer term – with three quarters believing it will be important for at least the next 10 years, about half believe it will be important for at least the next 20 years.

Local commmunity sentiment toward Whitehaven Coal



Source: Independent quantitative research conducted by Newgate Research. Base: All participants who are aware of Whitehaven Coal: 2022 (n=575), Tamworth (n=136), Gunnedah (n=148), Narrabri (n=147), Liverpool Plains (n=144). 2020 (n=561), 2018 (n=568), 2017 (n=565). 2015 (n=574).

Contributing to local prosperity and sustainability

Alongside other industries, we help build a more diversified, skilled and sustainable regional economy and community because we:

- Hire local where possible, with around 75% of our people living in the areas surrounding our operations
- Work with local businesses to offer new opportunities and help them grow
- Partner with community groups, including local Aboriginal and/or Torres Strait Islander community organisations, to leave a lasting positive legacy
- Invest in local education, health, skills and infrastructure.

The economy in our main region of North West NSW has two major industries – mining and agriculture – which work together to offer employment, skills and income during periods of cyclical downturn. Many members of our workforce are also farmers and we are able to provide a valuable second income during difficult economic times such as drought, mouse plague and flooding.

Eventually our mines will reach their end-of-life and close (read about rehabilitation here). Our pipeline of projects, including the Vickery Extension Project, Narrabri Stage 3 Extension in North West NSW, and the Winchester South Project in the Bowen Basin, will offset these closures to ensure our contribution can continue. We are confident that we will leave a positive economic and social legacy that outlives our mining operations because of our focus on sustainable economic diversification today.

Narrabri mine extension will support local jobs, livelihoods

SEE MORE ›

Working with local business

In FY22 we spent $354.5 million with local suppliers in North West NSW and regional QLD. Of this, $8.73 million was spent with 14 Aboriginal and/or Torres Strait Islander businesses for goods and services ranging from onsite training to office supplies.

We seek to support local businesses beyond our day-to-day operations. For example, during FY22, we offered $250 gift cards redeemable at local businesses to members of our workforce who are fully vaccinated against COVID-19 – injecting more than $400,000 into the Narrabri, Boggabri and Gunnedah communities in the process.

To collaborate on current and future opportunities, we actively participate in the local business chambers. Where possible, we also host business groups at our mine sites and at supplier briefings run by our Procurement team.

Much-needed cash injected into local economy thanks to Whitehaven vaccination drive

SEE MORE ›

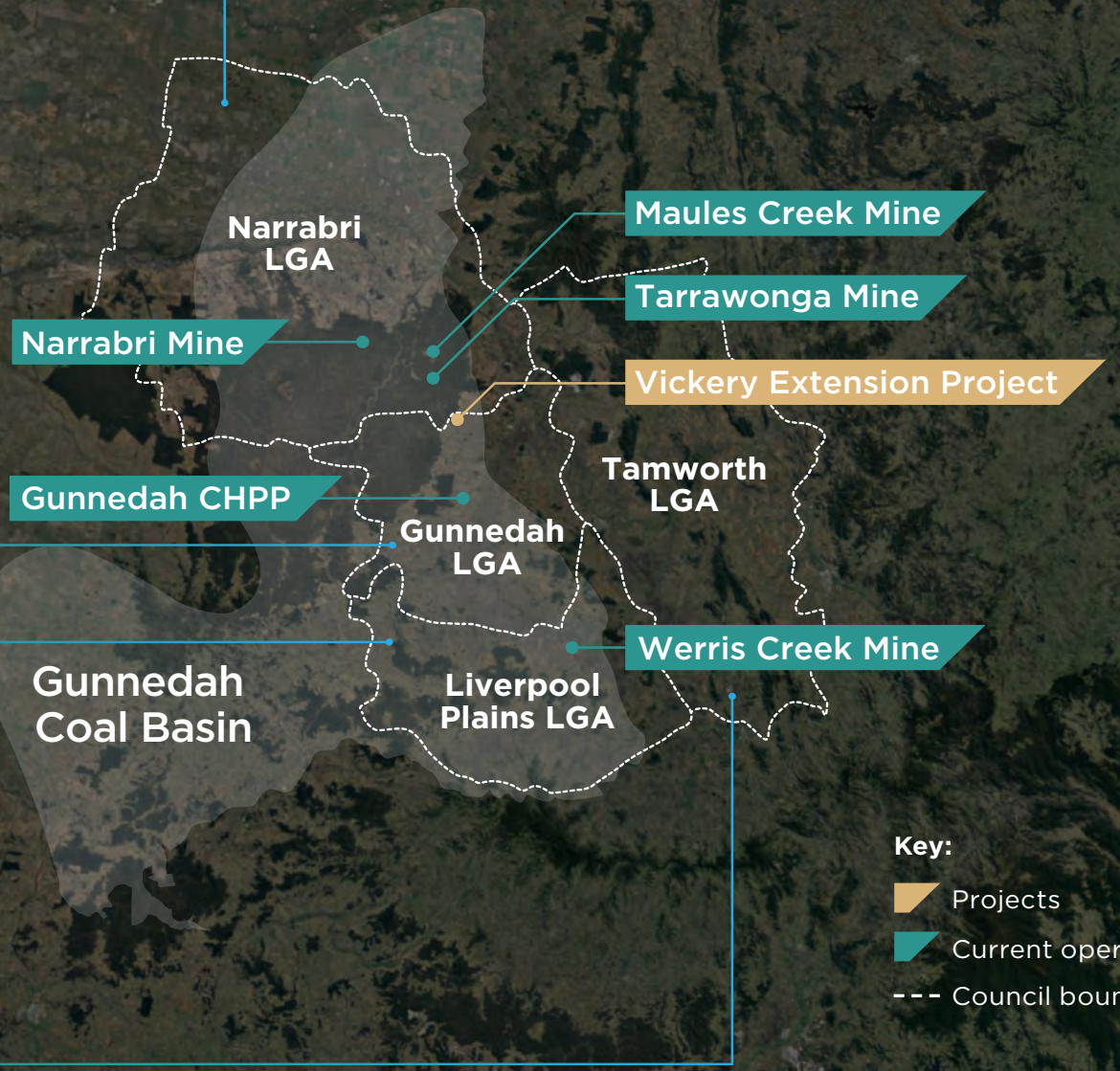
We directly contributed $510 million to the North West NSW economy in FY22

Narrabri LGA	
Wages and salaries	$48.2m
Number of suppliers	88
Procurement spend	$51.3m
Council rates & VPA payments	$1.9m

Gunnedah LGA	
Wages and salaries	$74.9m
Number of suppliers	142
Procurement spend	$259.2m
Council rates & VPA payments	$1.5m

Liverpool Plains LGA	
Wages and salaries	$8.5m
Number of suppliers	15
Procurement spend	$2m
Council rates & VPA payments	$0.5m

Tamworth LGA	
Wages and salaries	$21.4m
Number of suppliers	70
Procurement spend	$40.7m
Council rates & VPA payments	$0.03m



Empowering Aboriginal and Torres Strait Islander People

Our operations in North West NSW take place on Gomeroi Country (also known as Kamilaroi, Gamilaroi or Gamilaraay), one of the four largest Aboriginal nations in Australia. In Queensland's Bowen Basin, our proposed Winchester South Project is located on Barada Barna Country.

We acknowledge Aboriginal and Torres Strait Islander peoples as the First People of Australia. We recognise the Gomeroi People of North West NSW and the Barada Barna People of Central Queensland as the Traditional Owners of the land on which we operate and recognise their role as custodians of the land and water.

We also recognise the challenges many Aboriginal and Torres Strait Islander communities face, including in relation to employment, health, education and protection of cultural heritage – and are committed to doing our part to help overcome these challenges.

Our vision is to ensure Aboriginal and Torres Strait Islander peoples stay connected to Country, community and culture by obtaining economic independence through long-term and rewarding careers in our mining operations.

To achieve this vision, we work in partnership with Aboriginal and Torres Strait Islander peoples to improve employment and economic opportunities, creating a stronger future together. This involves input from our Board, management team, employees, members of the local community, the Local Aboriginal Land Councils within our areas of operation and their peak representative bodies such as the NSW Aboriginal Land Council, elected representatives, business leaders, Reconciliation Australia and other stakeholders.

As the largest private sector employer in the Gunnedah Basin, we have a unique opportunity to meaningfully progress this vision by offering stable, rewarding and long-term employment in a growing company with a strong future. Through our partnerships with Aboriginal and/or Torres Strait Islander-owned and run businesses and with a range of charitable and local organisations, we are able to make a positive contribution to reconciliation beyond our operations and for future as well as current generations.

1. FY15 represents the launch of our first Reconciliation Action Plan

$8.73 million
spent with 14 Aboriginal and Torres Strait Islander suppliers
Up from $0.44 million in FY15[1]

Winanga-Li Aboriginal Child & Family Centre

$152,490
donated to Aboriginal and/or Torres Strait Islander organisations
Up from $14,209 in FY15[1]

1,655
Cultural Awareness Training participants
Up from 280 in FY15[1]

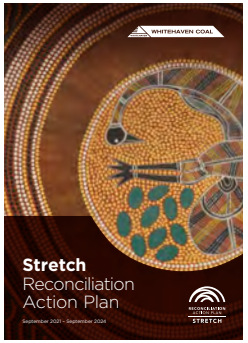
11.8%
of workforce identify as Aboriginal and/or Torres Strait Islander
Up from 8% in FY15[1]

FROM LITTLE THINGS BIG THINGS GROW
clontarf foundation

Our third Reconciliation Action Plan

In early FY22, we launched our third Reconciliation Action Plan (RAP), which is our second Stretch RAP. Our RAP details our specific initiatives, focused on the areas where we can make a substantial and sustainable difference, including across health and wellbeing education, employment and procurement. A key objective of this RAP is to embed and strengthen our existing activities to make them 'business as usual'.

We have also been invited to contribute to Reconciliation Australia's Leadership in RAP Delivery Group, formed in FY23 to gather insights from organisations consistently delivering on their RAP commitments. The Group will inform Reconciliation Australia's guidance to and work with organisations developing their RAPs.



Read our latest Reconciliation Action Plan

SEE MORE >

National Reconciliation Week Week 2022

with Gerard Neesham OAM, CEO, Clontarf Foundation

WATCH NOW

Building understanding amongst our workforce

We aim to cultivate an inclusive and knowledgeable workplace where our workforce understand and respect the importance of the connection of Aboriginal and Torres Strait Islander people to the land. One way we do this is through cultural awareness training delivered to all new team members, as well as periodic personalised on-Country cultural immersion for senior leaders, in recognition of the importance of the depth of knowledge of sites, places and objects that are significant to telling the story of First Nations People. We work in partnership with external stakeholders such as local schools and education partners, such as the Clontarf Foundation, to deliver a holistic cultural experience.

In FY22 we have also sought to give more of our people an opportunity to hear from external stakeholders, despite COVID-19 travel and site access restrictions, by using video content – particularly during NAIDOC and National Reconciliation Weeks.

NAIDOC Week 2022

with Lyn Trindall, CEO, Narrabri Local Aboriginal Land Council

WATCH NOW

Health and wellbeing

We continue to support the Winanga-Li Aboriginal Child and Family Centre in Gunnedah and Narrabri, a non-profit, self-managed, Aboriginal community organisation. The team delivers support programs across family, disability, health services, education and care and since 2015 we have supported program delivery through infrastructure investments and property access. More recently we have connected Winanga-Li with experts who continue to provide advice on a pro bono basis, to support priority initiatives identified by the Board and the new CEO.

We also contribute to other local initiatives that support health and wellbeing, including funding to the Nungaroo Local Aboriginal Land Council to establish a community garden at Quirindi, which will benefit the Elders group and wider Aboriginal community by providing opportunities for connection and Cultural learning.

Education

Since 2016, we have supported the Clontarf Academies at Tamworth and Quirindi High Schools. These academies are run by the Clontarf Foundation, which exists to improve the education, discipline, life skills, self-esteem and employment prospects of young Aboriginal and Torres Strait Islander men and by doing so equips them to participate more meaningfully in society.

In 2019 we committed $120,000 over three years to help establish an academy at Narrabri High School. The first year saw 56 students participate, increasing to 78 by 2022. School attendance amongst Clontarf students at Narrabri High is 70% compared to 53% amongst Aboriginal and Torres Strait Islander students before the Academy was established. In 2022 we extended our partnership for a further three years as a national partner organisation, with Clontarf working towards opening an academy in Gunnedah in the near future.

From 2017 to 2020 we supported the Girls Academy, a program to support young Aboriginal and Torres Strait Islander women, at Gunnedah High School. Gunnedah High decided to place its participation on hold in 2021. We continue to work with the school to identify an alternative initiative to support young Aboriginal and Torres Strait Islander women in our region.

Employment and skills

We actively recruit Aboriginal and Torres Strait Islander people to our workforce, and despite the labour shortages experienced economy-wide, the proportion of our workforce identifying as Aboriginal and/or Torres Strait Islander is now just under 12%. This increase reflects the close work between our Aboriginal Community Relations and Recruitment teams throughout FY22. Read more in the Talent & diversity chapter.

Procurement

Through our targeted procurement program, we spent $8.73 million with 14 Aboriginal and/or Torres Strait Islander businesses in FY22. This increase reflects our team's evolving approach, focused on targeted engagement with local businesses through our procurement workshops and one-to-one engagement. We also connect local businesses to other organisations that offer services to support business establishment and development, and that offer advice on how to supply the mining industry.

Whitehaven and Clontarf extend support for young Aboriginal and Torres Strait Islander men across North West NSW

SEE MORE ›

Kelaher Industrial Services embracing Aboriginal heritage and creating work pathways in North West NSW

SEE MORE ›

Cultural heritage

Traditionally, investigations of Aboriginal cultural heritage values have limited their scope to the tangible archaeological aspects of Aboriginal cultural heritage. As a result, intangible cultural values have often been neglected. Intangible cultural values such as stories of connection to place enhance conservation of Aboriginal cultural heritage qualities and also articulate the long historical connection to traditional lands of Aboriginal people.

In recognition of the connection to land by local Gomeroi People and shared histories, in FY22 we installed interpretive signage at the Kurrumbede homestead as part of our recognition of Traditional Owners. The signage explains the meaning of the name 'Kurrumbede' in Gomeroi language ('laughter') and gives visitors insight into the origin of the story *The Red Chief* by Ion L Idriess.

Throughout FY22 we conducted a range of activities to preserve and manage culturally significant sites on our operations. In addition to our existing processes of due diligence assessments prior to disturbance and annual inspections of previously identified sites, this year we conducted an additional sites of significance assessment for all of our operational areas as an added layer of verification.

Community investment

We invest in our communities in a range of ways, including through Voluntary Planning Agreements and rates with four Councils in the Gunnedah Basin as well as activities as outlined in our Reconciliation Action Plan and discretionary funding of initiatives across health, education, the environment, indigenous empowerment, regional sport and activities with a whole-of-community benefit.

We support community groups and events, in large partnerships and small community-based projects – all done voluntarily, over and above regulatory requirements.

In 2022, Whitehaven Coal invested more than **$1.53 million** in corporate and community partnerships:

$30,000
in health

$126,000
in education

$101,000
in sport

$152,000
on Aboriginal and Torres Strait Islander empowerment

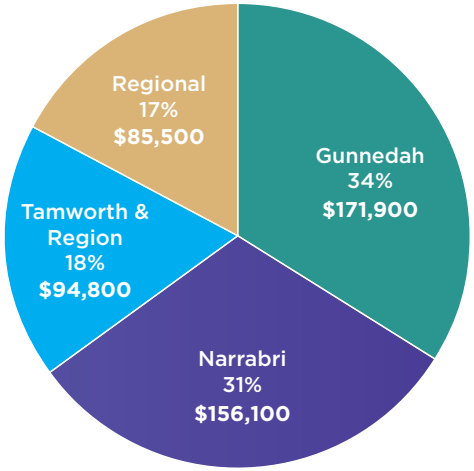
$219,000
on whole-of-community benefit and environment

$400,000
on COVID-19 relief

$500,000
in emergency response

The majority of our investments were spread across the Narrabri, Gunnedah, Liverpool Plains, Tamworth and other regions.

Community investment by region



The above includes local investment in health, education, sport, indigenous empowerment, environment and whole of community benefit.

In early FY22, we established a Community Investment Committee (CIC) to oversee a new approach to community investment. The committee meets four times each year to review and determine applications for donations and sponsorships, with $50,000 available per round, for a total of $200,000 annually.

The Committee includes an Indigenous representative, as well as one general community representative and one representative each from the Narrabri, Gunnedah and Liverpool Plains Local Government Areas.

New Boggabri childcare centre a game-changer for local workforce

SEE MORE ›

We invest in community initiatives beyond those considered by the CIC. We have long-term partnerships with the Clontarf Foundation, Westpac Rescue Helicopter Service, Country Education Foundation and more. We also make financial contributions to areas outside of our direct community in times of need; during FY22 this included supporting recovery efforts following flooding across eastern Australia, as well as humanitarian assistance to Ukraine.

Supporting flood relief efforts across eastern Australia

SEE MORE ›

Community	FY22	FY21	FY20	FY19	FY18
Taxes and royalties paid to governments ($m)	461.1	189.2	244.2	323.8	283
Payments to businesses and suppliers in North West NSW ($m)	353.2	344.1	365.4	333.9	293.2
Payments to businesses and suppliers in Central QLD ($m)	1.0	0.6	–	–	–
Payments made to all other suppliers ($m)	1310.6	1111.9	1270.1	1202.9	1107.4
Number of suppliers in North West NSW	315	310	336	328	315
Number of suppliers in Central QLD	6	8	–	–	–
Payments made to Indigenous suppliers ($m)	8.73	5.15	3.15	1.83	–
Number of Indigenous suppliers	14	14	9	18	–
Corporate community partnerships and donations ($m)[1]	1.53	0.39	0.41	0.51	0.45
Voluntary planning agreement expenditure in North West NSW ($m)	0.86	0.71	0.61	0.73	1.75

1. Reporting updated in FY22 to include corporate donations. In FY22 this included $500,000 of emergency response donations to support Ukraine and NSW flood appeals, and $400,500 in 'Why Leave Home' COVID-19 relief vouchers to support local communities and employees.

Whitehaven-owned Kurrumbede listed on NSW Heritage Register

SEE MORE ›

Contributing $400,000 to the Australian Red Cross Ukraine Crisis Appeal

SEE MORE ›

Minimising environmental impacts

At Whitehaven we are focused on avoiding adverse environmental impacts across our operations.

Our environmental management is intended to mitigate unavoidable impacts, rehabilitate disturbed areas, and offset residual impacts that cannot be avoided, minimised or rehabilitated.

Mining is a highly regulated industry in Australia. Extensive stakeholder consultation, environmental assessments and environmental management plans are required by law for each stage of a project – from construction and operations to rehabilitation and closure, requiring us to comply with more than 7,000 individual controls. To drive a reduction in non-compliances within our operations we continue to build capacity in this space, which has resulted in a clear focus and improvements.

Environmental assessments are undertaken and plans are put in place for managing any potential impacts to surface water, groundwater, flora and fauna, Aboriginal cultural heritage, historic heritage, air quality, noise, agriculture and geochemistry.

We engage with independent subject-matter experts to undertake the assessments and provide planning advice. This advice informs our environmental management plans. Our adherence to those plans is monitored and independently audited every three years.

Our environmental assessments, management plans, monitoring and audits for each of our sites are available on our website.

We are committed to ongoing engagement on environmental issues with our community, and we manage this through Community Consultative Committee meetings, the minutes of which are published on our website.

We also have a formal complaint process, available online, by phone, or in person at our Gunnedah community shopfront.

Consultation, both formal and informal, further informs our decision making.

In FY22, our approach to environmental management and compliance was further enhanced by:

- Continuing to focus on additional resources to support improved compliance – an ongoing focus for Whitehaven.
- Implementing our Health, Safety & Environment Strategy for FY22 to FY26. This strategy introduces a more comprehensive framework to deliver consistent and improved environmental performance and identifies specific initiatives.
- Introducing specific key leading and lagging performance indicators (KPIs) for all employees on environmental performance. Everyone at Whitehaven is responsible for ensuring proactive environmental compliance.
- The further development of our enterprise risk management framework including the identification and verification of Critical Controls for environmental risks.

Water stewardship

Water in the regions in which we operate is shared with neighbouring landholders, farmers, businesses and residents.

The Gunnedah region has recently been subject to above average rain, including a flooding event in the Namoi River and its tributaries after the wettest November on record in 2022. This was reflected in the signficant increase in mine water run-off in FY22 compared to FY21. The flooding caused access issues to some of our operations, however the mine sites' infrastructure was able to manage inventories with minimal impact to operations and no non-compliant events.

To ensure responsible water management, we have a water strategy in place for all operating mine sites. Implementation of the strategy is the responsibility of our Group Manager Water and Property, supported by our Water Specialist.

This year saw significant improvements in the water management systems at our sites, including:

- construction of the Maules Creek clean water diversion dams in accordance with an enforceable undertaking
- upgrades to the mine water system at Tarrawonga including the ability to treat and release dirty water in compliance with the mines EPL
- deployment of additional brine treatment at Narrabri to increase sites water recycling.

During wet periods, we employ initiatives that minimise operational impacts while maintaining compliant water management. In FY22 a series of measures were implemented during wet periods to manage excess water including increased use of dust suppression, irrigation, treatment to discharge and employment of mechanical evaporators. While recent rainfall has shifted the focus from scarcity to surplus, we continue our work on future proofing our operations through the use of life-of-mine water balance models to forecast future water needs.

Water use

We own 11,788ML of water allocation licenses, with allocations from groundwater (bore water and 'passive take') and the Namoi River. In FY22, our operations used approximately 2,389 megalitres (ML) of their water allocation licenses. The majority of this use (60%) is the licensing of 'passive take' into the mine workings, with the remainder from licensed extraction points (bores and river pumps). This represents around 20% of our total water allocation licenses.

A system of drains and dams collects clean water from undisturbed areas and diverts the water around the mining operations into existing water courses. Rainfall run-off from disturbed areas of our mining operations is collected within open pits and onsite dams.

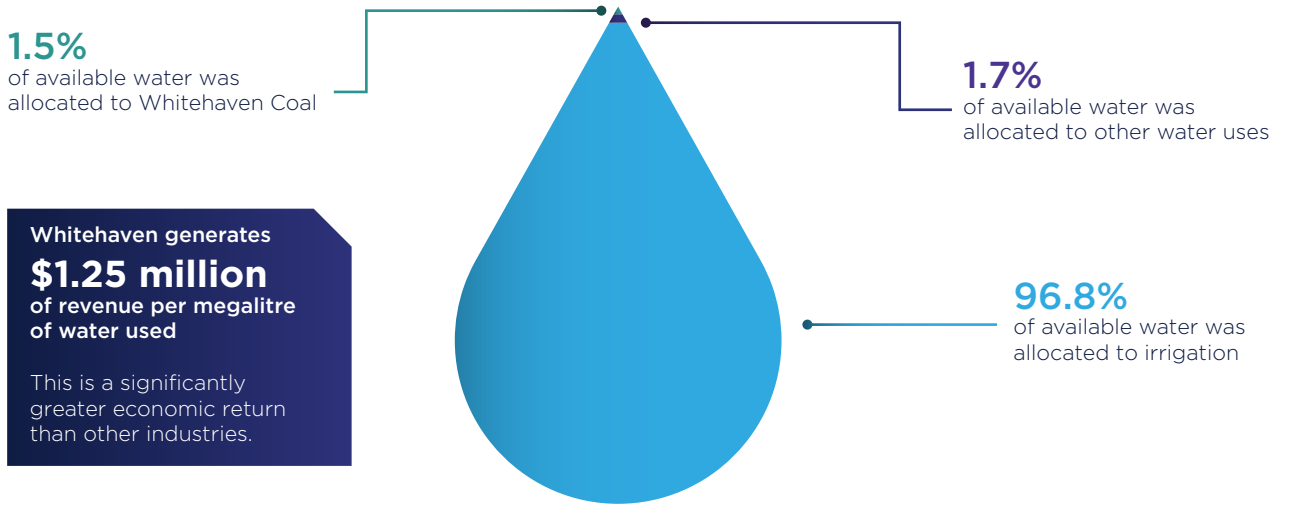
This water is used on site for dust suppression and in the Coal Handling and Preparation Plants (CHPPs). In FY22 the bulk of our increased water use was due to volume of coal washed through our CHPPs.

We look to recycle water wherever we can. The prime operational area for water recycling is the CHPPs, where about 70% of water is recycled. Where possible, our water is also beneficially reused. The Werris Creek Mine has a 20 hectare pivot irrigation system used by a local farmer. In FY22, 55ML was used to irrigate crops.

When licensed water allocations are not used in our operations, we can trade the allocations locally for irrigation purposes. In FY22, about 1,500ML was traded to local farmers.

Water use in North West NSW

In FY22, 253,247 megalitres of water from the Lower Namoi River was allocated or made available to licensed water users in the region



Whitehaven generates
$1.25 million
of revenue per megalitre of water used

This is a significantly greater economic return than other industries.

Water stewardship continued

Water allocation and extraction

		FY22	FY21	FY20	FY19	FY18
Water licence allocation (ML)	Upper Namoi Alluvial	1,622	1,572	1,810	–	–
	Gunnedah Oxley Basin	4,448	4,448	4,428	–	–
	Great Artesian Basin – Southern Recharge	248	248	322	–	–
	River water	5,440	5,440	3,873	–	–
	Other	30	30	30	–	–
	Total	**11,788**	**11,738**	**10,463**	**9,978**	**9,978**
River/bore water extraction (ML)	Bore extraction	237	479	1,651	–	–
	River extraction	736	541	427	–	–
	Passive take (groundwater)	1,417	1,310	1,281	–	–
	Total	**2,389**	**2,330**	**3,359**	**4,183**	**3,034**
Water used (ML)	CHPP (gross)	4,628	3,511	3,428	–	–
	Dust suppression	1,929	2,648	2,370	–	–
	Other	627	423	467	–	–
	Total	**7,184**	**6,582**	**6,265**	**6,826**	**5,316**
Water withdrawal by source (ML)	Groundwater	1,654	1,789	2,932	–	–
	River water	736	541	427	–	–
	Surface water (mine water run-off)	8,344	5,050	1,255	–	–
	Total	**10,733**	**7,380**	**4,614**	–	–
Water exported for irrigation (ML)		55	60	80	102	42
Water recycled (ML)	CHPP recycled water	3,240	2,458	2,392	–	–
Water recycled (%)		30	37	38	23	22

The values presented in this table are a combination of metered, estimated and modelled data.

Waste and recycling

We generate various types of waste during exploration, construction, operation and closure activities across our mine sites.

The main waste products are:

- overburden and interburden, the material that lies above and between coal seams
- coal-reject, the material generated from separating coal from other minerals
- recyclable and non-recyclable general waste
- other waste from mining and workshop-related activities (e.g. used large equipment tyres and waste hydrocarbons).

We do not own or operate any active tailings dams.

Mineral waste

To manage mineral waste, such as overburden and coal-reject, we segregate and store the materials in waste emplacements on each mine site.

This waste is generally non-hazardous however, as a precaution, geochemical tests are conducted on these materials to determine if they present any risks as a source of pollution.

The waste emplacements are designed to be safe, stable and non-polluting; they are progressively shaped by dozers to enable land rehabilitation.

General waste

For general waste, recyclable materials are segregated. Licensed waste contractors collect and process the recyclable waste and dispose of the non-recyclable waste at municipal waste disposal facilities (such as the Narrabri or Gunnedah waste management facilities). We maintain a register of waste collected by contractors.

Hydrocarbon waste

Waste hydrocarbons, including oils, greases, degreasers and kerosene, are collected and stored in hydrocarbon storage tanks. They are periodically removed by licensed contractors.

Used heavy tyres

In FY22 we reviewed alternative approaches to disposing of oversized off-road tyres. As part of our review, we investigated the feasibility of tyre recycling. Through our review and consultations it was determined that recycling was not feasible at this time as there are no operating heavy tyre recycling facilities in Australia.

Our ongoing practice remains, as outlined in our Environmental Impact Statements for each site, to dispose of such tyres in overburden emplacements as the open cut mine advances or in spoil emplacements. It is important to note that we recycle other light vehicle tyres.

We ensure that disposal takes place in a way that does not compromise the stability of final landforms or pose unacceptable environmental risks.

We acknowledge the interest in, and importance of, good tyre stewardship. It is an area the mining industry is actively working in partnership with Tyre Stewardship Australia. We are committed to reviewing our approach regularly to assess the feasibility and cost-effectiveness of alternative approaches.

WASTE	FY22
Total weight of non-mineral waste generated (kt)	17.0
Total weight of tailings produced (kt)	3,429.7
Total weight of waste rock generated (kt)	128,550.8
Total weight of hazardous waste generated (kt)	1.8
Total weight of hazardous waste recycled (kt)	1.7
Number of significant incidents associated with hazardous waste management	None

Air quality

The air quality within any region is affected by multiple factors. We limit our impacts by employing a range of methods to minimise our impact on air quality.

These include using:

- water carts on mine roads
- dust suppressants on mine roads and stockpiles
- sprays on stockpiles
- dust suppression on drills
- measures to generally limit air quality disturbances.

In adverse weather conditions, such as excessive winds or dust storms, we modify our onsite activities to minimise the generation of dust. We also rehabilitate mined land progressively to minimise areas exposed to dust generation.

All our operational sites monitor air quality in real time. These systems set trigger levels for air quality, below approved criteria, to allow operations to respond in advance and to ensure criteria levels are not exceeded.

Compliance monitoring results are publicly available through the Whitehaven and NSW Environment Protection Authority websites. To make this information more accessible, we will launch an online air and noise quality performance dashboard.

Run by the NSW Environment Protection Authority, the Namoi Region Air Quality (NRAQ) Monitoring Project also provides data to the public on the ambient air quality. The data is supplied by privately owned monitoring stations in the Naomi region at Werris Creek, Breeza, Wil-gai and Maules Creek.

Whitehaven is involved in the project in a voluntary capacity as a member of the NRAQ Advisory Committee. Project monitoring results indicate that, in the absence of dust storms brought on by drought, air quality in the Namoi Valley is among the best in NSW.

Noise management

Whitehaven operates under the requirements of the Protection of the *Environment Operations Act 1997* which governs noise emissions in NSW. We manage compliance through Noise Management Plans for each operating site.

Our plans operate to minimise our noise impacts through a range of measures, including using:

- predictive meteorological systems to plan our operations
- sound attenuation on mining mobile equipment and infrastructure
- real-time monitoring, allowing us to adapt our activities.

Land use and biodiversity

Whitehaven owns over 84,000 hectares of land in North West NSW and Queensland. The majority of this land is not involved in mining. In FY22 only 4.7% of land owned was used for mining activities.

Around half of the land we own is leased to local farmers for agricultural activities such as grazing or cropping and around 33% is managed for biodiversity conservation.

Biodiversity managed areas (such as biodiversity stewardship sites and those under conservation agreements as offsets) compensate for the biodiversity impacts that cannot be avoided or mitigated, also known as residual impacts. The total area managed for biodiversity purposes is greater than that disturbed for mining operations to achieve a net gain in biodiversity value.

We select and incorporate offset areas into our biodiversity estate based on advice from independent experts. These offset areas are approved by the NSW and federal governments. Approved offsets ensure that like-for-like or better biodiversity values are maintained and conserved into the future.

All existing Whitehaven offset areas are now secured in perpetuity, protecting and enhancing biodiversity values, including threatened ecological communities and threatened species.

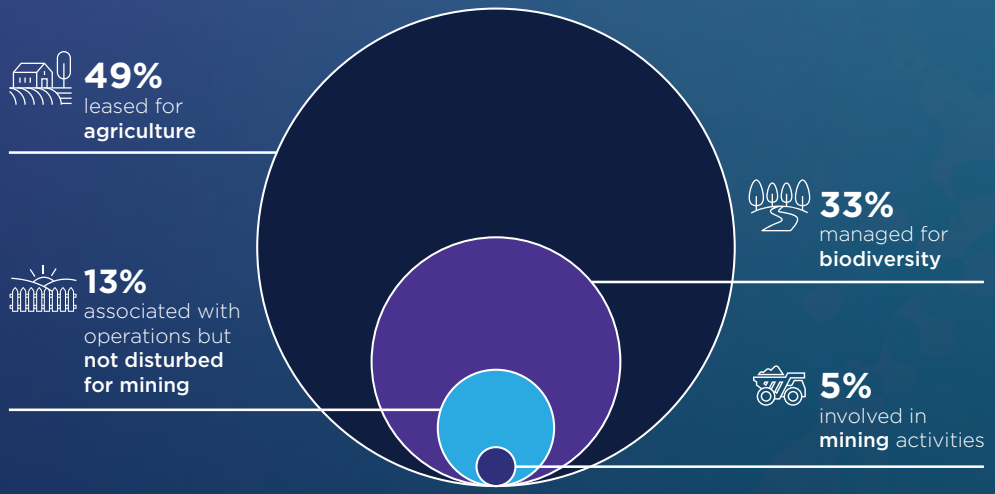
We continue to implement feral animal management, fire management, weed management and revegetation programs throughout our biodiversity managed areas.

To track our progress, we collect biodiversity management metrics from our fencing, pest animal and weed control activities, and assess survey data from our flora and fauna monitoring programs. This adaptive management approach allows us to ensure survival rates from tree planting activities is as high as possible.

Since 2017, and as part of the federal conditions of approval for our Maules Creek mine, we have provided $1.3 million in funding to the Australian National University, the NSW Department of Planning, Infrastructure and Environment, and BirdLife Australia to undertake research and share information on the regent honeyeater, swift parrot and south east long eared bat.

Whitehaven Coal land use FY22

Whitehaven owns 84,769 hectares of land.



	FY22	FY21	FY20	FY19	FY18
Total land owned in QLD and NSW (hectares)	84,769	84,406	79,421	74,499	75,460
Total land leased in QLD and NSW (hectares)	41,943	42,581	42,144	37,768	32,101
Total land leased for agriculture in QLD and NSW (hectares)	41,250	42,158	41,721	37,345	31,711
Land disturbed for mining in QLD and NSW (hectares)	4,014	3,920	3,636	3,559	3,168
Land involved in mining activities (%)	4.7	4.6	4.6	4.8	4.2
Total land rehabilitated in financial year (hectares)	228	267	216	133	83
Total land rehabilitated – cumulative (hectares)	1,569	1,341	1,100	884	751
Total land managed for biodiversity (hectares)	27,616	27,322	22,087	21,037	20,430
Trees planted in land managed for biodiversity	23,989	58,633	106,917	109,895	146,453
Area revegetated in land managed for biodiversity (hectares)	423	898	1,709	1,370	2,040
Biodiversity credits retired towards approvals	1,318	-	-	–	–

Rehabilitation

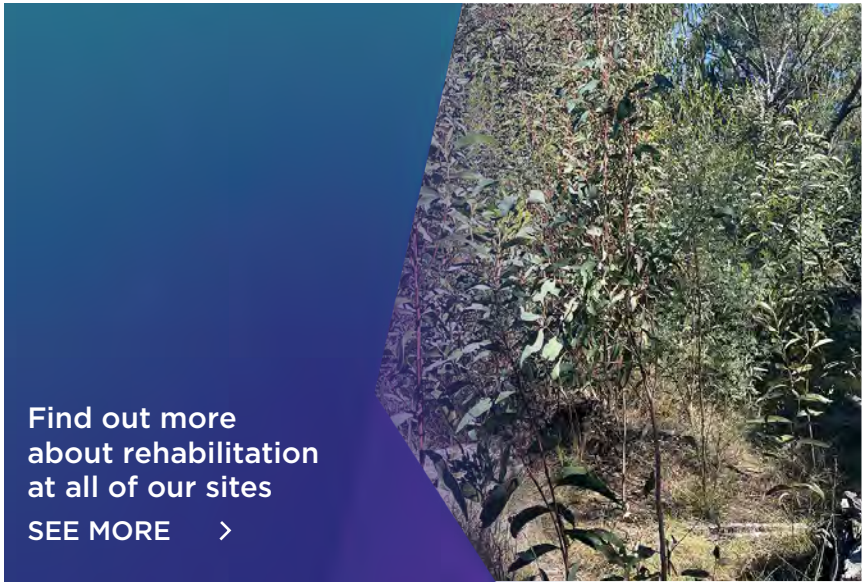
Rehabilitation is part of the lifecycle of a mine and, as temporary custodians of the land, we take our responsibility to rehabilitate the land seriously.

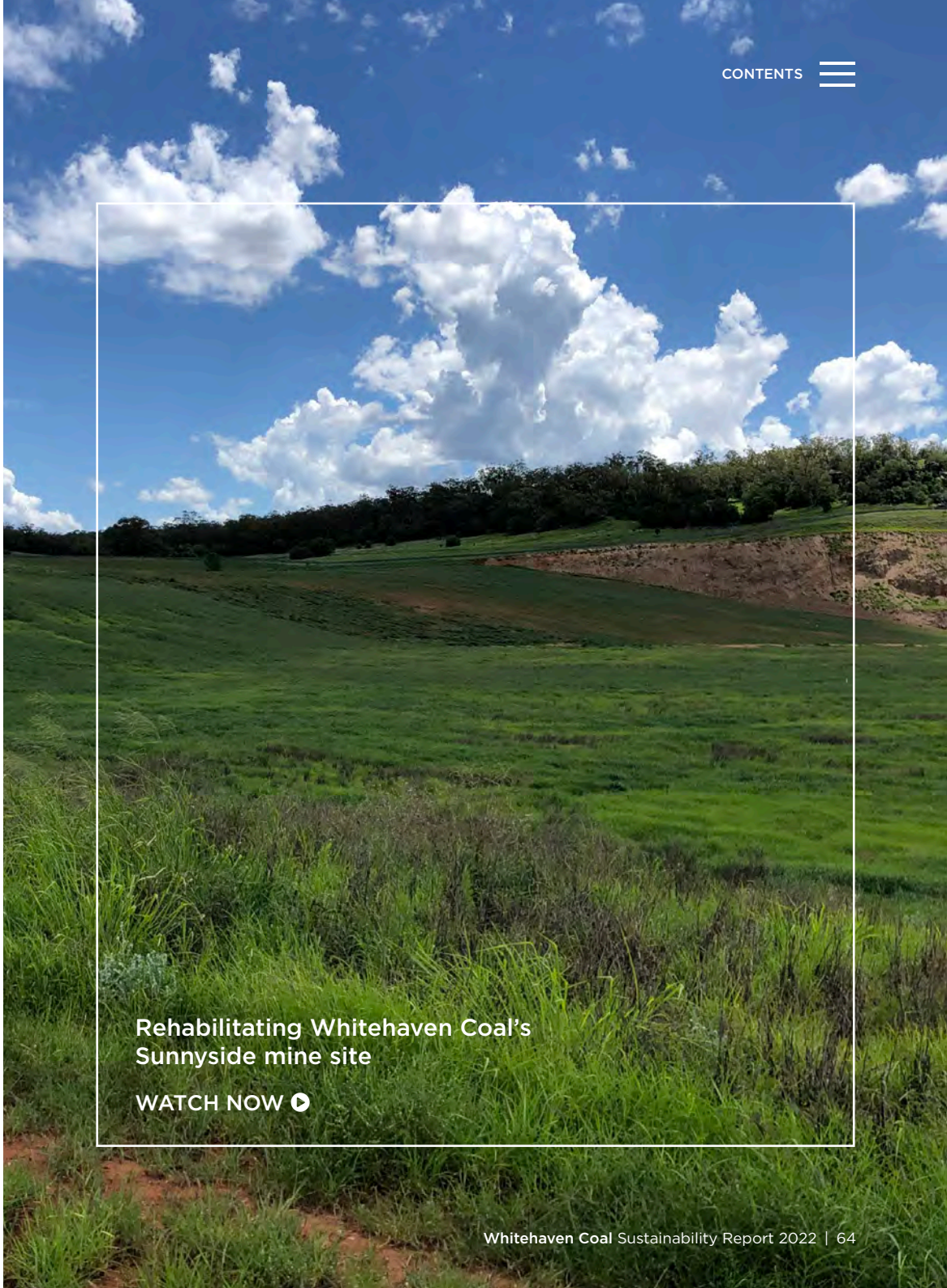
Our rehabilitation activity is carried out in consultation with the traditional custodians of the land, the Gomeroi people of North West NSW.

Plans for rehabilitation form part of the approval process for mining, and rehabilitation takes place progressively throughout the life of a mine and well after it has closed. The objective is to ensure the resulting landform is safe, stable and non-polluting and reflects the surrounding landscape, or improves on it.

During FY22, we undertook significant progressive rehabilitation, including rehabilitating 228 hectares of land formerly used for mining activities and planting over 90,000 trees in rehabilitation areas.

We work hard to improve rehabilitation methods and look to the latest technology, particularly when trying to advance rehabilitation during periods of drought.





Compliance

In both NSW and QLD, where we have operational and development projects, mining is a highly regulated industry subject to strict environmental and workplace health and safety controls.

Every day, we are required to comply with more than 7,000 individual controls across various licence conditions and management plans. We are committed to strong performance in this critical area. In the regrettable instances where non-compliances do occur, we always seek to work cooperatively with relevant regulators and take steps to address all controllable factors that contributed to the non-compliance.

We were subject to a number of Enforcement Actions[1] in FY22.

We received:

- an official caution and a penalty notice in relation to not conducting rehabilitation in accordance with an exploration mining operations plan (MOP) requirements
- a prevention notice restricting blasting activities to minimise fume generation
- a penalty notice in relation to blast fume leaving the premise
- two cautions in relation to clearing outside the mining lease and development consent boundary.

We also received the following for historical breaches of conditions of approval that occurred during FY20:

- two Penalty Infringement Notices for one event relating to the discharging of water
- an official caution relating to blast fume leaving the premise.

We have introduced appropriate management measures to ensure the breaches are not repeated.

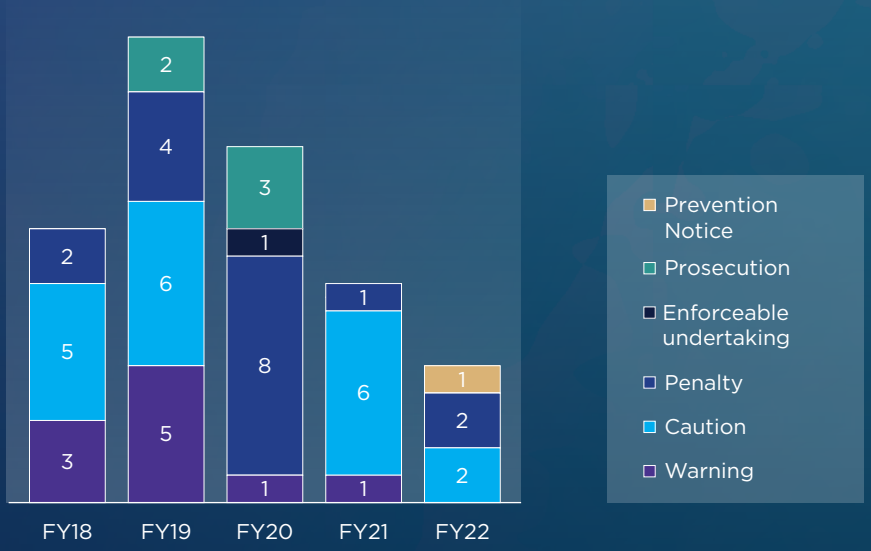
In early FY22, two Whitehaven Coal subsidiaries were convicted of offences under the *Mining Act 1992* (NSW) related to activities at the Narrabri Coal Mine, as published in our Sustainability Report 2021.

In November 2021 Whitehaven Coal subsidiary Maules Creek Coal Pty Ltd was fined a total of $187,500 and ordered to pay legal costs for a breach of the *Water Management Act 2000* (NSW). See the full publication order in the Appendix.

In March 2022 Maules Creek Coal Pty Ltd was convicted of three offences under the *Protection of the Environment operations Act 1997* (NSW) and ordered to pay a total of $158,750 to the Environmental Trust. For further information please see our website.

Focused improvement efforts, including strengthened capability and leadership in recent years, are delivering results, as shown by the reduction in Environmental Enforcement Actions since FY19.

Environmental Enforcement Actions



Notes:

Actual Environmental Enforcement Actions (EEAs) relate to the year in which the incident occurred e.g. a prosecution is reported for the year in which the incident occurred, not the year that the prosecution was concluded.
For remuneration purposes, actual and expected EEA events (excluding warnings and cautions) are reported whereas the above captures the actual number of enforcement actions (including warnings and cautions).

1. Enforcement Actions include cautions, warnings, directions, pollution reduction programs, penalty infringement notices, clean-up orders, enforceable undertakings, suspensions, prevention notices and prosecutions.

Health & safety

The safety and wellbeing of our people, workplaces and communities is our number one priority. We believe every single member of our workforce should expect to be able to come home safely to their loved ones at the end of each day.

In FY21 we established a five-year Health Safety and Environment strategy, with key objectives being: adopting the principles of a High Reliability Organisation, establishing a mature interdependent culture founded on psychological safety, and measuring performance through robust and simple systems.

Through our annual planning process, we identify initiatives to support these objectives, continuing to improve our approach to health and safety.

Our approach is risk-based, pragmatic and oriented to those areas where we are accountable and can have a positive impact. Through our risk management framework, we systematically identify, assess and manage health and safety hazards associated with our operational activities. Our workforce is expected to understand and comply with controls, and our Safehaven Rules support our people in understanding the minimum expectations.

In late FY22, a working group was established to ensure the Safehaven Rules are aligned with our material risks and critical controls. The rules will be re-launched to the workforce in FY23.

We continuously develop our capability in Safety Leadership, which helps us to create and maintain physical and psychologically safe workplaces for our entire workforce.

We also educate and support our workforce in making healthy lifestyle choices and understanding the importance of mental wellness.

Safety of our workforce

We aim to execute on the fundamentals of safety to the highest standards, including investigating all safety incidents, prioritising peer and leadership safety interactions and creating a culture where unsafe work environments are identified and remedied.

In FY22 we introduced a new reporting metric aimed at increasing the identification, reporting and rectification of hazards with the potential to cause single or multiple fatalities. Through this we saw an increase in the number of hazards identified, and a decrease in the number of near miss events.

Our overall safety performance improved in FY22. Contributing to this, as demonstrated by our leading indicators, were:

- 336 hazards with the potential to cause a serious injury were identified and rectified across our operations.
- More than 28,000 in-field safety interactions were undertaken, helping to embed our safety culture.

In our lagging indicators, we saw a 38% decrease in near miss events, and zero fatalities.

Whitehaven's Total Recordable Injury Frequency Rate (TRIFR) at 30 June 2022 was 5.4, a 22% decrease over the last five years, and well below the NSW coal mining average.[1]

With regard to injuries, we drive positive change by focusing our efforts in the areas where we can have the most impact. In FY22 more than 40% of the recordable injuries were in relation to musculoskeletal injuries; our Movement for Improvement program to prevent such injuries will continue throughout FY23.

Reducing risk around vehicle interactions

One of the most significant risks in our business is the interaction between coal and overburden haulage trucks with smaller heavy equipment and passenger vehicles. These types of interactions are frequent and have resulted in fatalities across the industry.

The trucks used to transport coal and overburden are left-hand drive trucks, which means if they follow NSW Road Traffic rules there is decreased visibility of light vehicles at intersections. To improve the visibility of passenger vehicles to heavy vehicles and reduce the likelihood of a heavy vehicle and light vehicle collision at an intersection, a system called 'vehicle hierarchy' is being introduced at open-cut operations. Vehicle hierarchy uses a system where vehicles lower on the hierarchy, such as passenger vehicles, give way to vehicles higher on the hierarchy.

In early FY22 our Maules Creek mine transitioned to the use of vehicle hierarchy road rules, successfully reducing the risk of collisions between light vehicles and heavy equipment at intersections. Building on this successful change, in FY23 our Tarrawonga mine will also transition to the use of vehicle hierarchy road rules.

	FY22	FY21	FY20	FY19	FY18
Fatalities	0	0	0	0	0
Total recordable injury frequency rate per million hours worked (TRIFR)	5.4	5.9	4.1	6.2	6.9
Near miss frequency rate per million hours worked[2]	4.2	–	–	–	–

1. https://www.resourcesregulator.nsw.gov.au/sites/default/files/2021-12/Mine-safety-performance-report-2020-2021-overview.pdf
2. Near miss frequency rate represents the frequency of events that could have resulted in a serious injury per million hours worked. This metric has not previously been reported by Whitehaven.

Managing the risks of COVID-19

During FY22 COVID-19 remained a significant risk to business operations.

To mitigate this risk during the height of the pandemic, from December 2021 to February 2022, we formed a partnership with the scientists at Aspen Medical to provide expert guidance on pandemic modelling and best practice response to managing the spread of the virus.

From late 2021 into early 2022, we also encouraged our people to get vaccinated against COVID-19, by offering $250 'buy local' gift cards to members of our workforce who were double-vaccinated. In addition to encouraging vaccination, these gift cards supported local businesses, injecting more than $400,000 into the Narrabri, Boggabri and Gunnedah communities. At the end of the period we had more than 80% participation from our employees and contractors.

Whitehaven also coordinated a PCR testing clinic in Gunnedah that serviced our employees, contractors and their families. This enabled results to be turned around within 24 hours in most instances, while the result time in the community was around five to seven days. The positive impact of this initiative was immeasurable for our effective control of the transmission of COVID-19 within our workforce and broader community.

In January 2022 we implemented a rapid antigen testing program at all Whitehaven operations and offices. This program involved members of the workforce testing prior to attending the workplace and also on a set frequency throughout their roster. The testing program was effective in minimising the number of people attending the workplace while infectious, and minimised workplace transmissions. The program also provided data that supported our ongoing reviews of COVID-19-related controls.

Leading into winter, we offered our workforce flu vaccinations and COVID-19 booster shots, through onsite clinics.

Combined, these measures allowed us to navigate COVID-19 in a way that limited the risk of infections across our workforce, and community.

Health, wellbeing and resilience

Our people are our greatest asset and an equitable, diverse and inclusive workforce facilitates effective performance, including problem solving, creativity and innovation.

Supporting the mental health and wellbeing of our workforce can improve organisational adaptability, and general health and safety, and reduce staff turnover.[1]

Our psychological hazard management capability can impact our people, performance, shareholders and other stakeholders.

Over recent years we have made significant progress in increasing mental health awareness and improving the quality of service from our Employee Assistance Provider (EAP). Nonetheless we need to take further steps to reduce psychological hazards in our workplaces, build a culture of resilience, and equip our people with positive coping strategies to manage their health and wellbeing.

That is why we are developing an evidence-based psychological hazard management framework, to be embedded within relevant business procedures and protocols.

A key initial initiative is our bespoke Mental Health First Aid Program, developed in partnership with our EAP provider and refined in FY22 to:

- further educate our leaders on how to identify and manage psychological hazards in the workplace
- integrate key components of the Psychological Wellbeing Trigger Action Response Plan, a tool that helps frontline leaders identify the appropriate course of action to support a team member who may be struggling with their wellbeing.

We have also partnered with our EAP provider to develop a holistic health and wellbeing program, The Complete Miner. The program aims to increase awareness of risk behaviours, motivate our people to make positive change, and facilitate connections to resources to help achieve health and wellbeing goals, in a sustainable way. The online, evidence-based learning modules will be supplemented by one-to-one coaching with a qualified psychologist to support behaviour change.

These programs, alongside other initiatives across the business, will contribute to the safety and wellbeing of our people, workplaces and communities.

1. https://www.minerals.org.au/sites/default/files/MCA_Mental_Health_Blueprint.pdf

Talent & diversity

We recognise that building a safe and sustainable business requires ongoing investment in our people and culture.

We continue to drive changes to develop and support an inclusive culture in which every individual feels safe, supported and aligned with our values.

Our STRIVE values of Safety, Teamwork, Respect, Integrity, Value and Excellence shape the way we work and the decisions we make. Our values also help us attract and retain diverse talent in an increasingly competitive market.

Over the past year we have developed a program to further communicate and embed our values across the business. This program, being rolled out in FY23, will be led by our CEO and include a strong leadership development component, along with the launch of a company-wide reward and recognition program to encourage values-aligned behaviours.

To ensure ongoing employee engagement, this year we amended our approach to how we seek feedback and input from our people. In addition to an extensive survey every three years, last undertaken in FY21, we now include a pulse survey undertaken in alternate years to better understand our progress against key indicators.

Consistent with our approach to community engagement, we seek to use qualitative and quantitative insights to guide our activity in this space. Our FY22 survey measured overall engagement, together with individual measures on goal setting, management support, and recognition.

Overall, our level of engagement has improved slightly since last year, which is positive considering disruptions including COVID-19 and flooding in North West NSW during the year, however we still have work to do.

Other key findings included:

- We are doing a good job on goal setting, meaning a large proportion of our people have an understanding of why their work is important and clear direction on their priorities and their potential impact.
- There is room for improvement on management support, including to strengthen the working relationship between managers and employees.
- Most importantly, we need to focus on recognition and making sure our people feel valued, which we are addressing through introducing a company-wide reward and recognition program aligned to our STRIVE Values in FY23.

We are developing our existing employee engagement action plans based on these new insights to continue to drive engagement across sites and offices, tailored to experience and feedback from our diverse teams.

	FY22	FY21	FY20	FY19	FY18
Number of employees	1,227	1,171	1,187	1,062	1,027
Number of full-time equivalent contractors	1,229	1,363	1,364	1,362	1,224
Wages and salaries ($m)	232.9	210.5	209.1	189.9	172.1
Female employee representation (%)	15.3	12.9	12	13	10
Proportion of workforce[1] identifying as Indigenous (%)	11.8	9	9	9	11
Total employee turnover (%)	24.5	22	17	23	22

1. Workforce defined as employees and FTE contractors.

Attraction, retention and development

Throughout FY22 we have made significant progress on initiatives to support recruitment as well as retention.

Our internal recruitment function continued to grow, continuing a trend of Whitehaven relying less on external recruiters to support our workforce needs. We also introduced our new human resource information system, Dayforce, in October 2021 to assist with critical HR processes such as management of leave and performance, and to support a more streamlined recruitment process.

In early 2022, we introduced our Employee Referral Policy which provides incentives to existing staff for successfully referring new talent to the business. The program focuses on operational, technical and leadership roles, and is designed to assist recruitment in the current tight labour market.

We also signed up to the Circle Back Initiative in mid-2022, committing to respond to every candidate on the outcome of their job application. As part of this, we are implementing the Initiative's BenchmarkCX tool, which involves surveying unsuccessful candidates about their experience and using the results, benchmarked against other employers, to improve how we interact with candidates.

Our contractor workforce fills a number of critical short and longer term skills and capability gaps across our operations. To ensure we retain and continue to develop the talent needed to support our strategic agenda, we continue to convert contractors to full-time Whitehaven employees. In FY22 we hired more than 150 contractors. To help address the labour shortage, in FY22 we introduced quarterly retention bonuses for members of our operational workforce; these are continuing into FY23.

We also continued to deliver our Trainee Operator Program, a two-year program that offers entry-level employment and a nationally recognised CERT III in Surface Extraction Operations.

Following the launch in 2021, this year the program has gained real momentum with 83 new local trainees commencing the program.

The recruitment for our CY23 graduate program commenced in June 2022. This two-year program offers graduates from a range of disciplines the opportunity to gain work experience through structured rotations around the organisation.

Leadership training and development remains a focus, reinforced by the results of the recent employee engagement survey, which highlighted a desire for more support to strengthen the working relationship between managers and employees. As a result, in FY22 we launched two new leadership training and development programs in conjunction with the Australian Institute of Management.

Our Frontline Leader Training Program is a three-day course for existing and high potential leaders, tying the achievement of commercial outcomes with STRIVE values-based behaviour. Two cohorts have already participated in this program.

We have also launched a one-day Leadership Essentials course for all managers at site, covering the fundamentals of leadership. This training has started with senior site management and will be progressively rolled out to all site managers in FY23.

A data-driven approach to Human Resource information

Dayforce is our new data-driven Human Resource Information System that helps automate and modernise several people processes such as recruitment and onboarding, leave, and performance. The system is helping us to get an even more accurate picture of our workforce, with the data helping to inform decisions that deliver real value to the business.

Employee relations

Whitehaven has eight collective agreements across the business and approximately 62% of the workforce is covered by enterprise agreements. We have a strong relationship with our employee representatives.

We launched our revised Employee Relations Strategy towards the end of FY21, and as a result have focused our efforts on improved communication and engagement with the workforce, including sharing company performance and industry trends.

8
collective agreements within the business

~62%
of the workforce is covered by enterprise agreements

Diversity and inclusion

Through the implementation of our Diversity Policy, Whitehaven continues to set measurable objectives to effectively enhance our workplace diversity.

Gender diversity

During FY22, we continued our focus on improving gender diversity and we are starting to see results. Additional rigour in the recruitment process to focus on increased gender diversity has also delivered positive outcomes, with women representing 20% of new hires during FY22 compared to 19% in FY21.

15.3%
of our employees are female
up from 12.4% in FY21

20%
of new hires were female
up from 19% in FY21

Women now represent 15.3% of our employees, still below the coal mining industry average of 17.5%[1] but an improvement on previous years. In early FY22 we set a target of lifting female participation to 20% and women in leadership roles to 20% by the end of FY26. Leadership roles are defined as anyone with direct reports or those reporting to an EGM or GM and in FY22 10.6% of our leaders were female. These are stretch but achievable targets for Whitehaven, representing an approximate doubling of the proportion of female employees, and in leadership roles, at the start of FY22.

These targets recognise that we have more to do to meet the coal mining industry average, and also the broader recruitment challenges we have faced in North West NSW for some time.

Nonetheless, as with all areas of our business, we will review and update both our targets and our supporting initiatives over time. We will also continue to work on measures that make Whitehaven a more attractive place to work.

In recognition of the importance of paid parental leave in supporting equality and attracting talent, we launched an industry-leading paid parental leave policy in FY22. The new policy offers primary carers 26 weeks of paid leave, including superannuation, secondary carers two weeks' paid leave including superannuation, and superannuation on the unpaid portion of an employees' parental leave.

Whitehaven employees set to enjoy industry-leading Paid Parental Leave Policy

SEE MORE ›

1. Workplace Gender Equality Agency

In FY22 we became a platinum member of Women in Mining (WIMnet) continuing our long association with the organisation. This includes sponsorship and participation in WIMnet's Mentoring Program. The program provides females across the sector with the opportunity to be mentored and network with leaders in the mining industry. This year, six of our emerging female leaders participated as mentees in the six-month program and one as a mentor.

Along similar lines, to increase the capability of our female talent, we launched an in-depth Women's Leadership Development Program in partnership with the Inkling Group, which draws on best practice performance psychology and behavioural science to lift self-awareness, build resilience, clarity and help participants take their performance to the next level. The program has two cohorts. The Aspire cohort for emerging talent and the Inspire cohort for senior female leaders. In FY22, eight females were involved in Aspire, and five in Inspire.

Investing in Whitehaven women

SEE MORE ›

We also continued our women's mentoring and coaching program with Right Management, with five women undertaking the program this year.

We launched a domestic and family violence policy, offering 10 days of paid leave among other supports, recognising that females are disproportionately affected by this kind of abuse and that it can deeply inhibit career progression. Finally, in early FY23 we were endorsed by WORK180 for our commitment to making real progress for women in our workplace.

Progress on Aboriginal and Torres Strait Islander employment

Our Reconciliation Action Plan sets out our commitment to supporting Aboriginal and/or Torres Strait Islander empowerment, with a key focus on employing and training local Aboriginal and/or Torres Strait Islander people.

11.8%

of workforce identifying as Aboriginal and/or Torres Strait Islander

^ from 9% in FY21

We continue to exceed our ambitious target to have more than 10% of roles at Maules Creek Mine filled by Aboriginal and/or Torres Strait Islander people, with approximately 20% of the workforce (comprising employees and contractors) identifying as Aboriginal and/or Torres Strait Islander. Company-wide almost 12% of our workforce identifies as Aboriginal and/or Torres Strait Islander, an increase on FY21. Females make up 15% of our Aboriginal and/or Torres Strait Islander employees, consistent with the proportion of women across our whole workforce.

This outcome is one we are particularly proud of, given the labour shortages experienced economy-wide throughout FY22 but also by Whitehaven in our region of North West NSW for some time, and is a result of strong teamwork between our Recruitment and Aboriginal Community Relations teams, as well as key contractor partners.

We also continued to run initiatives to promote roles to local Aboriginal and Torres Strait Islander people and deliver mentoring opportunities to help existing employees develop their careers.

This included a focus on recruiting Aboriginal and Torres Strait Islander students to our Trainee Operator Program, and continuing work with the Clontarf Academy and other education partners to encourage local students to consider a career in mining.

As we look to expand our workforce with the Vickery Extension Project, we have committed to a 10% Aboriginal and/or Torres Strait Islander employment target onsite. This initiative will further solidify our position as a major employer of Aboriginal and Torres Strait Islander people in the North West region.

Appendix

Maules Creek Coal Pty Ltd (ACN 140 533 875) (“Maules Creek Coal”) was convicted and fined in the New South Wales Land and Environment Court (“the Court”) on 24 November 2021, for a breach of s 60A(2) of the Water Management Act 2000 (“the WM Act”) relating to the taking of water from the Maules Creek Water Source without an access licence for that water source between about 1 July 2016 and 30 June 2019.

Following an investigation by the Natural Resources Access Regulator (NRAR), Maules Creek Coal was prosecuted in the Court, where Maules Creek Coal pleaded guilty. Maules Creek Coal was fined a total of $187,500 and ordered to pay legal costs.

All property owners, companies and water users should be aware of the serious consequences for committing offences against the WM Act. NRAR undertakes ongoing auditing and investigations to ensure that activities involving the taking of water are authorised by means of licences so as to ensure the equitable sharing of water from water sources in line with the objects of the WM Act and the welfare of the environment.

SASB Index

In 2018, the Sustainability Accounting Standards Board (SASB) published a set of 77 globally applicable industry-specific standards which identify a minimum set of sustainability issues most likely to impact the operating performance or financial condition of the typical company in an industry, regardless of location. Use of the SASB standards is voluntary in Australia.

Whitehaven has used the Coal Operations Sustainability Accounting Standard 2021 to inform our FY22 disclosures.

This index references where SASB-aligned disclosures have been made in the FY22 Sustainability Report.

Greenhouse Gas Emissions		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-110a.1	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Refer to the Climate section. The Federal Government Safeguard Mechanism requires baselines to be set for specific facilities with large emissions. Whitehaven has baselines covering the Narrabri underground mine and the Maules Creek open cut mine. 84.5% of Whitehaven's emissions were covered by the Safeguard Mechanism in FY21, the most recent year of data available.
EM-CO-110a.2	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Refer to the Climate section.
Water Management		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-140a.1	(1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress	Refer to the Minimising environmental impacts section. Additionally, Whitehaven does not operate mines in areas with high or extremely high baseline water stress as defined by the World Resource Institute.
EM-CO-140a.2	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Refer to the Minimising environmental impacts section.
Waste Management		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-150a.2	Total weight of non-mineral waste generated	Refer to the Minimising environmental impacts section.
EM-CO-150a.3	Total weight of tailings produced	Refer to the Minimising environmental impacts section.
EM-CO-150a.4	Total weight of waste rock generated	Refer to the Minimising environmental impacts section.
EM-CO-150a.5	Total weight of hazardous waste generated	Refer to the Minimising environmental impacts section.
EM-CO-150a.6	Total weight of hazardous waste recycled	Refer to the Minimising environmental impacts section.

SASB Index cont.

Waste Management		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-150a.7	Number of significant incidents associated with hazardous waste management	Refer to the Minimising environmental impacts section.
EM-CO-150a.8	Description of waste management policies and procedures for active and inactive operations	Refer to the Minimising environmental impacts section.
Biodiversity Impacts		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-160a.1	Description of environmental management policies and practices for active sites	Refer to the Minimising environmental impacts section.
EM-CO-160a.2	Percentage of mine sites where acid rock drainage is: (1) predicted to occur, (2) actively mitigated, and (3) under treatment or remediation	Whitehaven has no mine sites which include acid rock drainage.
EM-CO-160a.3	Percentage of (1) proved and (2) probable reserves in or near sites with protected conservation status or endangered species habitat	Whitehaven does not have any reserves in or near sites with protected conservation status or endangered species habitat.
Rights of Indigenous Peoples		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-210a.1	Percentage of (1) proved and (2) probable reserves in or near indigenous land	Whitehaven uses the definition of Aboriginal community from the Australian Bureau of Statistics (ABS). Under this definition we have no reserves near indigenous land. In addition to this we note that there are two Native Title agreements in place: • the Narrabri Underground NT Agreement; and • the Maules Creek NT Agreement. Whitehaven notes that Red Chief LALC (Gunnedah) has a Travelling Stock Route claimed under the Land Claims process on Maules Creek mine (in overburden emplacement) which we have a compensation agreement with them on.
EM-CO-210a.2	Percentage of mine sites where acid rock drainage is: (1) predicted to occur, (2) actively mitigated, and (3) under treatment or remediation	Refer to the Supporting our communities section.

SASB Index cont.

Community Relations		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-210b.1	Discussion of process to manage risks and opportunities associated with community rights and interests	Refer to the Supporting our communities section.
EM-CO-210b.2	Number and duration of non-technical delays	There have been no non-technical delays in FY22.
Labour Relations		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-310a.1	Percentage of active workforce covered under collective bargaining agreements, broken down by U.S. and foreign employees	Refer to the Talent and diversity section.
EM-CO-310a.2	Number and duration of strikes and lockouts	There were no strikes or lockouts at Whitehaven's operations during FY22.
Workforce Health & Safety		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-320a.1	(1) MSHA All-Incidence rate, (2) fatality rate, and (3) near miss frequency rate (NMFR)	Refer to the Health and safety section.
EM-CO-320a.2	Discussion of management of accident and safety risks and long-term health and safety risks	Refer to the Health and safety section.
Reserves Valuation & Capital Expenditures		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-420a.1	Sensitivity of coal reserve levels to future price projection scenarios that account for a price on carbon emissions	Refer to the Climate section.
EM-CO-420a.2	Estimated carbon dioxide emissions embedded in proven coal reserves	Whitehaven's reserves are published on our website as required under the Joint Ore Reserves Committee (JORC). The standard Intergovernmental Panel on Climate Change (IPCC) factors are available here.
EM-CO-420a.3	Discussion of how price and demand for coal and/or climate regulation influence the capital expenditure strategy for exploration, acquisition, and development of assets	Refer to the Climate section.

SASB Index cont.

Tailings Storage Facilities Management		
SASB Code	**Accounting Metric**	**WHC Response**
EM-CO-540a.1	Tailings storage facility inventory table: (1) facility name, (2) location, (3) ownership status, (4) operational status, (5) construction method, (6) maximum permitted storage capacity, (7) current amount of tailings stored, (8) consequence classification, (9) date of most recent independent technical review, (10) material findings, (11) mitigation measures, (12) site-specific EPRP	Whitehaven does not operate any facilities that meet the definition of a 'tailings storage facility' under the Global Industry Standard on Tailings Management (SISTM).
EM-CO-540a.2	Summary of tailings management systems and governance structure used to monitor and maintain the stability of tailings storage facilities	
EM-CO-540a.3	Approach to development of Emergency Preparedness and Response Plans (EPRPs) for tailings storage facilities	

Glossary

ACCU	Australian Carbon Credit Unit
AHS	Autonomous Haulage System
ASX	Australian Securities Exchange
ATO	Australian Taxation Office
CCC	Community Consultative Committee
CCUS	carbon capture, utilisation and storage
CHPP	coal handling and processing plant
CO_2-e	carbon dioxide equivalent
CV	calorific value
CY	calendar year
EA	enterprise agreement
EBITDA	earnings before interest, tax, depreciation and amortisation
EPL	Environment Protection Licence
FY	financial year
GHG	greenhouse gas
GW	gigawatt
HELE	high-efficiency, low-emissions
IEA	International Energy Agency
JV	Joint Venture
LETA	Low Emissions Technology Australia
LGA	Local Government Area
MCA	Minerals Council of Australia
ML	megalitres
Mt	million tonnes
Mtpa	million tonnes per annum
MWh	megawatt hour
NDC	Nationally Determined Contribution
NGER	National Greenhouse and Energy Reporting
NPAT	net profit after tax
NPS	New Policies Scenario
PAYG	pay as you go
PCI	pulverized coal injection
ROM	run of mine
SASB	Sustainability Accounting Standards Board
SC	supercritical
SDS	Sustainable Development Scenario
STEPS	Stated Policies Scenario
SSCC	semi-soft coking coal
TCFD	Task Force on Climate-related Financial Disclosures
TRIFR	Total Recordable Injury Frequency Rate
UNFCCC	United Nations Framework Convention on Climate Change
USC	ultrasupercritical
vol	volatile matter
VPA	voluntary planning agreement
WCA	World Coal Association
WEO	World Energy Outlook
WGEA	Workplace Gender Equality Agency