ADDRESSING CLIMATE CHANGE

Our approach to climate change is integrated with our strategy and is designed to protect and unlock long-term value, build operational resilience, and enhance our competitiveness in a low-carbon world. As a global mining and metals company, we have an important role to play in responding to the risks and opportunities of climate change: to produce the metals that support the transition to a low-carbon world; and to do so in a way that seeks to minimise our impact.

IN THIS SECTION

CLIMATE CHANGE ACTION PLAN

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ICMM Principle

South32 supports the UN SDGs

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UNGC Principle

ENVIRONMENT

This section of the Sustainable Development Report sets out our Climate Change Action Plan (the Plan) which describes the actions we are taking to address the risks and opportunities that climate change presents and has been prepared in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

This Plan will be the subject of a non-binding advisory resolution at our 2022 Annual General Meeting. The Board retains ultimate responsibility for our strategy. The vote on the resolution provides shareholders with an opportunity to discuss and provide feedback on the Company's approach to climate change. The Board will take the outcome of the vote and shareholder feedback into consideration when determining the Company's approach to climate change going forward.

We intend to put our Plan to a non-binding advisory vote every three years. This Plan also forms a part of our Sustainable Development Report, which we will continue to use to provide annual updates of our progress on delivering this Plan in accordance with the recommendations of the TCFD.

We will continue to regularly review our approach to climate change in the context of the United Nations Framework Convention on Climate Change (UNFCCC) actions, credible sources of climate science and emerging regulation.

In line with our ICMM membership requirements and transparency commitments, we obtain independent assurance over selected sustainability information.

Learn more about **our FY22 Independent Assurance Report** in our 2022 Sustainability Databook at www.south32.net

About this Climate Change Action Plan

This section of the Sustainable Development Report outlines South32's Climate Change Action Plan (CCAP) and is intended to assist its investors with understanding South32's policies and practices in responding to climate change. It has been prepared by South32 for submission to a shareholder advisory vote at South32's 2022 Annual General Meeting. It has not been prepared as financial or investment advice or to provide any guidance in relation to the future performance of South32.

In this CCAP (on pages 69 to 101 of the Sustainable Development Report), metrics describing GHG emissions are dealt with in the following manner: unless otherwise stated, (a) metrics describing our operational GHG emissions (i.e. Scope 1 and 2 GHG emissions) apply to 'operated operations' that are wholly owned and operated by South32, or that are operated by South32 in a joint arrangement[1][2], and (b) metrics describing GHG emissions in the value chain (i.e. Scope 3 GHG emissions) apply to all of our operations including those that are wholly owned and operated by South32, and those that are operated and not operated by South32 in a joint arrangement.

Forward-looking statements and scenario analysis

Like certain other sections of the Sustainable Development Report, the CCAP contains forward-looking statements, including statements in relation to climate change and other environmental and energy transition scenarios. These forward-looking statements reflect South32's expectations at the date of this CCAP (including with respect to its strategies and plans regarding climate change), and they are not guarantees or predictions of future performance or outcomes, or statements of fact. They involve known and unknown risks and uncertainties, which may cause actual outcomes and developments to differ materially from those expressed in such statements. For further information regarding South32's approach to risk, see pages 26 to 35 of our Annual Report.

South32 makes no representation, assurance or guarantee as to the accuracy, completeness or likelihood of fulfilment of any forward-looking statement, any outcomes expressed or implied in any forward-looking statement or any assumptions on which a forward-looking statement is based.

There are also limitations with respect to the scenario analysis which is discussed in this CCAP, and it is difficult to predict which, if any, of the scenarios might eventuate. Scenario analysis is not an indication of probable outcomes and relies on assumptions that may or may not prove to be correct or eventuate. Except as required by applicable laws or regulations, South32 does not undertake to publicly update or review any forward-looking statements. South32 cautions against reliance on any forward-looking statements or guidance, particularly in light of the long time horizon which this CCAP discusses and the inherent uncertainty in possible policy, market and technological developments in the future.

Please see the inside front cover of this Sustainable Development Report for other important information regarding South32's approach to reporting on climate change and sustainable development generally.

Information prepared by third parties

Certain information contained in this CCAP is based on information prepared by third parties. South32 does not make any representation or warranty that this third party material is accurate, complete or up-to-date.

(1) In this CCAP, references to 'joint arrangements' mean operations that are not wholly owned by South32, such as joint ventures and joint operations. Joint arrangements are classified in accordance with IFRS 11 Joint Arrangements.
(2) This CCAP refers to commodities 'we produce' and commodities in 'our portfolio', which include commodities such as bauxite, alumina, aluminum and copper that may form part of, or be produced by, entities not operated by South32. References in this CCAP to commodities 'we produce' or in 'our portfolio' should be read in this context.

OUR PROGRESS ON CLIMATE CHANGE

Since starting out, we've been taking action to address climate change.

FY16

We committed to supporting the goals of the Paris Agreement within 12 months of South32 being established.

We developed Our Approach to Climate Change, focusing on climate change opportunity, resilience and emissions reduction.

We set our long-term goal of achieving net zero operational GHG emissions (Scope 1 and 2) by 2050.

We published our first GHG emissions reduction target to keep our Scope 1 GHG emissions below the FY15 baseline by FY21.

FY17

We published our inaugural 'Our Approach to Climate Change' disclosure, in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

We committed not to develop any new greenfield energy coal basins.

FY18

We announced that we would manage South Africa Energy Coal (SAEC) as a standalone business, to sustainably improve its financial performance, broaden its ownership and simplify our portfolio.

We published our second 'Our Approach to Climate Change' disclosure, including analysis of physical resilience for our Australian operations.

We rolled out new emissions reduction initiatives at our operations, including the Cannington solar farm and Worsley Alumina biomass fuel trial to reduce energy coal consumption.

FY19

We completed analysis of physical resilience for all operations outside Australia.

We completed decarbonisation concept studies for Worsley Alumina and Illawarra Metallurgical Coal.

We set contextual water targets for Hillside Aluminium, Mozal Aluminium and Worsley Alumina in response to projected physical impacts of climate change.

FY20

We published our policy positions in support of the goals of the Paris Agreement.

We undertook a review of the climate change positions of our industry associations.

FY21

We achieved our first GHG emissions reduction target, keeping our Scope 1 GHG emissions below the FY15 baseline.

We announced our medium-term target to halve our operational GHG emissions by 2035 compared to our FY21 baseline.

We exited carbon intensive and lower returning businesses, completing the divestments of SAEC and Tasmanian Electro Metallurgical Company (TEMCO).

We assessed the resilience of our portfolio in a 1.5°C scenario.

FY22

We added copper to our portfolio and increased our exposure to low-carbon aluminium.

We completed a trial of the AP3XLE energy efficiency technology at Hillside Aluminium and commenced its deployment.

We linked long-term executive remuneration to progress on our climate change commitments.

We updated physical climate risk assessments for our operations.

We updated our Sustainability Policy, reaffirming our commitment to sustainable development.

FY23

We set a goal of net zero Scope 3 GHG emissions by 2050.

We made a commitment not to develop or invest in greenfield metallurgical coal projects.

Our Climate Change Action Plan will be the subject of a non-binding advisory resolution at our 2022 Annual General Meeting.

Employees inspecting a bauxite stockpile at our Worsley Alumina operation.

Our approach to climate change

The science is clear – human activity is causing climate change and the impacts are affecting ecosystems, biodiversity, and communities around the world. The recent Intergovernmental Panel on Climate Change (IPCC) report shows that the case for change has never been so compelling, and the time for action never so critical. The challenge we face will require a coordinated effort across governments, businesses, and communities to transition to a low-carbon[1] world in a just manner.

Within 12 months of South32 being established, we committed to supporting the objectives of the Paris Agreement and set a long-term goal[2] to achieve net zero operational greenhouse gas (GHG) emissions by 2050. Our first emissions reduction target[3] was to keep our FY21 Scope 1 GHG emissions below our FY15 baseline. In FY21, we achieved our first emissions reduction target and stepped up our ambition by setting our medium-term target – to halve our operational GHG emissions by 2035 from our FY21 baseline[4]. Recognising that we have a critical role to play in contributing to the decarbonisation of the value chain, in partnership with our customers and suppliers, this year we have set a new goal of net zero Scope 3 GHG emissions by 2050.

Our goals and target are delivered through the work described in this Plan, which is a continuation of work underway since 2015. This Plan sets out our approach, our commitments, our progress to date, our unique risks and opportunities, and the actions we are taking to play our part in addressing climate change.

Delivering on our climate change commitments is fundamental to our purpose – to make a difference by developing natural resources, improving people's lives now and for generations to come. We are trusted by our owners and partners to realise the potential of their resources.

We are doing this by managing the risks and capturing the opportunities which climate change presents, including protecting and unlocking long-term value and producing metals that support the transition to a low-carbon world in a way that minimises our impact.

Our approach to climate change is aligned to our purpose and integrated with our strategy, and is focused on:

- Reshaping our portfolio to the base metals that are critical in the transition to a low-carbon world;
- Decarbonising our operations, with a focus on the four operations within our portfolio which account for the majority of our emissions profile;
- Understanding and responding to the potential physical impacts of climate change on our business to build operational resilience; and
- Working with others to innovate and address shared challenges across industry, and to decarbonise the value chain.

The actions we are taking in each of these areas are set out in this Plan.

Our Board, together with its standing Committees, has oversight of our work on climate change as a material strategic and governance issue. The Board oversees the Company on its approach to delivering its decarbonisation commitments, recognising that it must be both ambitious – which is necessary to achieve our net zero goal – and realistic, recognising that there is no definitive 'best pathway' to net zero and some of the innovations we will need are not yet fully developed. Our CEO, together with our Lead Team, is accountable for execution of our approach to climate change.

The remuneration of our Lead Team is directly linked to our performance on climate change and the transition of our portfolio towards the metals critical for a low-carbon future. Performance against these measures accounts for 20 per cent of the long-term incentive plan performance hurdles, with outcomes intended to reflect the achievement of significant milestones and long-term value protection and creation.

We regularly engage our investors on our material environmental, social and governance topics and to hear their views on our approach to climate change, our progress, and our governance.

Key strategic decisions and investments are assessed within our capital allocation framework, including those which support our climate change commitments. Investment decisions to decarbonise our operations consider both project returns and the protection of portfolio value, incorporating our carbon pricing assumptions and an assessment of transition risk. In FY22, we invested US$6 million to improve energy efficiency and reduce emissions intensity at our operations. We expect to invest US$30 million in FY23, and more than double this expenditure in FY24. Over time, we expect our decarbonisation expenditure will also include a greater proportion of operational expenditure, for example, through long-term power purchase agreements, in combination with our capital investments.

(1) In this Plan, low-carbon refers to lower levels of GHG emissions when compared to the current state. Where used in relation to South32's products or portfolio, it refers to enhancement of existing methods, practices and technologies to substantially lower the level of embodied GHG emissions as compared to the current state.
(2) In this Plan, 'goal' is defined as an ambition to seek an outcome for which there is no current pathway(s), but for which efforts will be pursued towards addressing that challenge, subject to certain assumptions or conditions.
(3) In this Plan, 'target' is defined as an intended outcome in relation to which we have identified one or more pathways for delivery of that outcome, subject to certain assumptions or conditions.
(4) FY21 baseline adjusted to exclude GHG emissions from SAEC and TEMCO, which were divested in FY21.

Reshaping our portfolio

Part of our strategy is to identify opportunities to sustainably reshape our business for the future, increasing our exposure to metals critical to the transition to a low-carbon world.

In FY22, we added copper to our portfolio with the acquisition of a 45 per cent interest in the Sierra Gorda copper mine in Chile. Copper is a key metal for electric vehicles, charging infrastructure and renewable energy.

With aluminium expected to benefit from higher intensity of use in electric vehicles, increased use in renewables, and substitution of plastics in packaging, in FY22 we invested to double our share of low-carbon aluminium production. We participated in the restart of Brazil Aluminium smelter, with our share fully powered by renewable energy, and we increased our shareholding in Mozal Aluminium in Mozambique to 63.7 per cent, which is primarily powered by renewable energy.

We are also exploring options to produce high quality, battery grade raw materials, supporting energy storage. At our Hermosa project in Arizona initial studies have confirmed the potential for battery-grade manganese, as well as zinc, silver and lead.

Subsequent to the end of the reporting period, we announced that we will not proceed with an investment in the Dendrobium Next Domain project at our Illawarra Metallurgical Coal operation in Australia, following our consideration of recently completed study work and extensive analysis of alternatives.[5] We will continue to focus our efforts on optimising Dendrobium and the broader Illawarra Metallurgical Coal complex to extend the mine life within approved mining areas. While we believe metallurgical coal will be required in the steelmaking process for at least the next two decades, until low-carbon steelmaking becomes economically viable on a commercial scale, we will not develop or invest in greenfield metallurgical coal projects.

We assess the resilience of our portfolio[6] in accordance with the recommendations of the TCFD. In our last assessment, we included a 1.5°C scenario to inform our assessment of the potential impact of a rapid global transition to a low-carbon world. This assessment was conducted in FY21 and showed that demand for most of our commodities would grow significantly under our 1.5°C scenario despite a rise in recycling rates, reflecting the critical role of many of our commodities as the world decarbonises.

Decarbonising our operations

Decarbonising our operations is fundamental to the delivery of our strategy as we optimise and unlock the full value of our business. Our priority is to invest in reducing our operational GHG emissions over the use of carbon offsets, in line with our mitigation hierarchy. Our operational decarbonisation pathway to support delivery of our medium-term target and long-term goal consists of three steps: efficiency initiatives in the near term, transition to lower-carbon energy in the medium-term, and technology solutions in the longer-term.

Four of our operations account for 93 per cent of our Scope 1 and Scope 2 emissions: Hillside Aluminium (59 per cent), Worsley Alumina (17 per cent), Illawarra Metallurgical Coal (10 per cent), and Mozal Aluminium (six per cent).[7] We are focusing our efforts on achieving material reductions in our operational GHG emissions at these operations.

Hillside Aluminium and Worsley Alumina utilise energy sources that are dependent on fossil fuels, including energy coal. We are studying and executing energy efficiency projects at both operations but their decarbonisation is, for the most part, tied to a transition to low-carbon energy.

At Hillside Aluminium, we are focused on transitioning the energy source from coal-based power supplied via the South African electricity grid to secure, reliable and affordable low-carbon energy in the medium-term. The existing power agreement for Hillside Aluminium expires in 2031 and the transition to a low-carbon energy source will be technologically and commercially complex due to the smelter's constant high energy demand. We will work with Eskom, government, and commercial partners to develop and implement an energy solution at the scale required for a large aluminium smelter.

We are also studying options to transition Worsley Alumina's energy source, but there are technical complexities to be addressed. Large-scale deployment of renewable energy such as solar photovoltaic (PV) and wind, which do not generate steam directly, would require a change to Worsley Alumina's process and energy infrastructure, and substantial expansion and modification of the energy grid would be required to deliver renewable power at the necessary scale for industrial users in the region. Therefore, we expect to decarbonise Worsley Alumina in two stages. We are working towards a conversion of the onsite boilers to natural gas which would reduce operational GHG emissions in the medium term. Longer-term, to help achieve our net zero goal, we are seeking new technologies to support increased electrification and renewable energy for the refinery, which would require broader investment in shared energy infrastructure in the region.

The focus on reducing or replacing our use of energy coal at Hillside Aluminium and Worsley Alumina creates both risk and opportunity for their respective communities. Hillside Aluminium, in South Africa, directly or indirectly employs an estimated 29,000 people, and plays a central role in the domestic aluminium value chain. However, it risks becoming internationally uncompetitive over time if we are unable to secure an affordable source of low-carbon electricity. At Worsley Alumina, our plan to transition away from energy coal aligns with the Western Australian Government's announced intention to retire the state-owned Muja and Collie coal-fired power stations. Coal mining has been a significant contributor to the economy of the region with the town of Collie playing a significant role for more than 100 years. Both transitions create the potential for job losses connected to the shift away from fossil fuels, and also the potential for the creation of new industry, employment and investment in low-carbon alternatives.

By working with governments, communities, and other stakeholders we aim to support a fair and just transition for the regions surrounding Worsley Alumina and Hillside Aluminium. Our just transition planning for both operations is underway and is based on a set of guiding principles that are aligned with the objectives of the Paris Agreement.

Given the complexities in decarbonising energy sources for Hillside Aluminium and Worsley Alumina, we have not set a short-term emissions reduction target. We will continue to evaluate our options but will only set a short-term target when we are confident that the pathway to meet a short-term target is credible, viable and just.

Beyond our two largest emitting operations, we are focused on increasing the efficiency of coal seam gas drainage and reducing ventilation air methane (VAM) at Illawarra Metallurgical Coal, through innovative new technologies.

(5) Refer to market release dated 23 August 2022 at *www.south32.net*
(6) Scenarios are hypothetical and are not forecasts, but rather a tool used to enhance critical thinking, refine our strategy and support key business decisions.
(7) The sum of the categories may vary to the total figure due to rounding. See page 79 for further information on FY22 operational GHG emissions.

At Mozal Aluminium, the smelter is already using renewable energy, and we are working to extend the hydroelectric power contract beyond its current expiration date of 2026. We are also investigating and assessing additional emissions reduction projects and technologies, such as inert anodes and anode coating technology.

Our decarbonisation planning also encompasses our development options, such as the Hermosa project, where our focus is on the application of low-carbon design principles.

Physical climate risk

Physical climate risks have the potential to affect the integrity and performance of our equipment and infrastructure, compromise productivity, and disrupt business continuity (including our supply chain activities). There may also be broader environmental and socio-economic impacts on key stakeholders, including local communities.

We completed our first physical climate risk assessments for our operations in FY18 and FY19, and updated these in FY22. The high-level themes that emerged across our operations relate to land and terrain, physical assets and infrastructure, water and transport routes.

Further work is planned to implement additional controls and inform adaption options, and to support future reporting on material physical climate risk, our management responses and, over time, potential financial impacts.

Working with others

While there is much we are doing ourselves to manage the risks and capture the opportunities of climate change, many of the challenges can be solved more quickly in partnership with others. By working with customers, suppliers, industry peers, technology partners and stakeholders, we can bring together our expertise, resources and learnings to address our shared challenges at speed.

Having set a new goal of net zero Scope 3 GHG emissions by 2050, we are progressing near-term actions including to work with customers and suppliers to support and co-design emissions reduction programs, contributing to industry decarbonisation and product stewardship initiatives, and supporting the development of innovative technology solutions. Our approach is based on the materiality of Scope 3 GHG emissions in each reported category and the level of control or influence we have on the associated activities.

We have defined focus areas to address the complex challenges associated with decarbonisation in the downstream value chain, including entering into four partnerships with key customers to collaborate on emissions reduction initiatives by FY25 and participating in relevant stewardship and innovation initiatives to develop net zero pathways for our key commodities.

Partnering on innovations to decarbonise our own operations will be key to delivering on our net zero operational GHG emissions by 2050 goal, as some of the innovations we need are not yet technologically or commercially feasible. This creates a real opportunity for us and the whole industry to develop and trial innovative solutions and support scaling them up to become commercially viable. We are actively engaged in this work through the trialling of new technologies at our own operations, sharing our findings and experiences, engaging our stakeholders on potential opportunities and participating in several industry forums.

We are a member of various industry associations where we contribute to knowledge sharing, proactive advocacy, and tangible action on climate change. We promote greater transparency on climate change positions to improve alignment, and directly advocate and seek to influence on issues in a way that is consistent with our approach to climate change. To remain consistent with our support for the objectives of the Paris Agreement, we do not support direct advocacy from our industry association memberships on energy coal expansion or energy coal subsidies, particularly in the absence of an associated position on technology development.

> “At South32, we understand the need for bold action on climate change and we are responding by addressing our biggest challenges. Our Climate Change Action Plan describes how we are working in collaboration with our stakeholders to prepare our business for the global energy transition, meet our climate change commitments and achieve a just transition for our people, our business and our communities.”
>
> **Karen Wood, Chair**

Reshaping our portfolio

We are continuing to reshape our portfolio to increase our exposure to metals that play a critical role in the transition to a low-carbon world.

This year we added copper to our portfolio with the acquisition of a 45 per cent interest in the Sierra Gorda copper mine in Chile. We also invested to double our share of low-carbon aluminium production, by participating in the restart of the Brazil Aluminium smelter and increasing our shareholding in Mozal Aluminium in Mozambique to 63.7 per cent. Copper and aluminium are expected to gain from increases in electric vehicle penetration and renewable power generation.

We are exploring options to produce high quality, battery-grade raw materials that support energy storage, with initial studies at our Hermosa project confirming the potential for battery-grade manganese at the Clark Deposit, as well as zinc, silver and lead at the Taylor Deposit.

Subsequent to the end of the reporting period, we announced that we will not proceed with an investment in the Dendrobium Next Domain project at Illawarra Metallurgical Coal in Australia.[8] This decision increases our capacity to direct capital towards other opportunities, including our world class development options in North America that have the potential to underpin a significant growth profile to produce metals critical to a low-carbon future.

We believe metallurgical coal will be required in the steelmaking process for at least the next two decades, until low-carbon steelmaking becomes economically viable on a commercial scale. The reconfiguration of steelmaking blast furnaces and the installation of renewable energy and associated power infrastructure requires significant capital investment and will take time. During this time, steel will continue to be essential for the development that supports economic growth and to build the infrastructure to support the transition to a low-carbon world, but it will need to be produced in way that is less emissions intensive. The premium-quality, hard coking coal that we produce and our investment in our gas capture and emissions abatement technology to lower the intensity of our product can support steelmakers to reduce their emissions intensity.

While we intend to focus our efforts on optimising Dendrobium and the broader Illawarra Metallurgical Coal complex to extend the mine life within approved mining areas, we will not develop or invest in greenfield metallurgical coal projects.

Expenditure and capital allocation

Our capital allocation framework is used to consider all investments and strategic decisions, including those designed to support our climate change commitments.

Our investments to reshape our portfolio demonstrate how we are allocating growth capital to commodities that support the global transition to a low-carbon world, including aluminium, copper and battery-grade raw materials.

Investment decisions to decarbonise our operations consider project returns and the protection of portfolio value, incorporating our carbon pricing assumptions and an assessment of transition risk. Where viable we intend to align our expenditure plans to achieve our operational decarbonisation target and goal.

In addition to investing operational expenditure to mature and expand our pipeline of decarbonisation initiatives, we also invested US$6 million of capital expenditure in initiatives to improve energy efficiency and reduce emissions intensity at our operations in FY22. We expect to invest US$30 million in FY23 and more than double this expenditure in FY24 to execute key decarbonisation projects, including our energy efficiency and coal boiler conversion projects at Worsley Alumina and deployment of energy efficiency technology at Hillside Aluminium. We expect our spend on decarbonisation initiatives to increase as additional projects mature to execution in coming years.

Our decarbonisation expenditure is likely to involve a greater proportion of operational expenditure when compared to others in the sector. Converting the electrical grid infrastructure that delivers power to Hillside Aluminium and Worsley Alumina is outside of our strategy and core capability. Therefore, we are seeking to partner with entities that focus on utility-scale energy projects and support their investments through long-term power purchase agreements, subject to them being financially viable.

(8) Refer to market release dated 23 August 2022 at *www.south32.net*

Scenario analysis

Since 2017, we have been using scenario analysis to stress-test the potential impacts of climate change on our business and to inform stakeholders about potential risks and opportunities. We use a set of plausible, evidence-based and divergent scenarios that describe a spectrum of global temperature change outcomes, against which we test the resilience of our portfolio[9].

While we support the objectives of the Paris Agreement, current global signposts continue to point towards a trajectory of at least 2°C warming, which forms our base case. It assumes, based on current trends and technology developments, that there will be increased commitment to climate action which accelerates the transition towards a low-carbon economy, raising the necessary investment in infrastructure to support the transition. This probable trajectory forms our base case for commodity and carbon price forecasts, planning, budgeting, investment decisions and valuation assessment.

In FY21, we developed a 1.5°C scenario to inform our assessment of the resilience of our portfolio under a rapid global transition to a low-carbon world. The outcomes from this assessment are described on page 77 and will be updated in FY23.

The scenarios we apply for our physical climate risk assessment are informed by the IPCC Representative Concentration Pathways (RCPs)[10]. These include RCP4.5, which equates to between 1.1°C and 2.6°C of warming by the end of the century and broadly aligns with our base case scenario, and RCP8.5, which equates to between 2.6°C and 4.8°C of warming by the end of the century. The RCP8.5 scenario reflects an emissions trajectory where the world fails to meet the goals of the Paris Agreement and the physical impacts of climate change are more severe.

Learn more about **our Physical Climate Risk assessment** on page 93.

Carbon pricing

Carbon pricing is a key policy tool and enabler to support the global transition to a low-carbon world. We use an internal carbon price to inform our strategic business decisions.

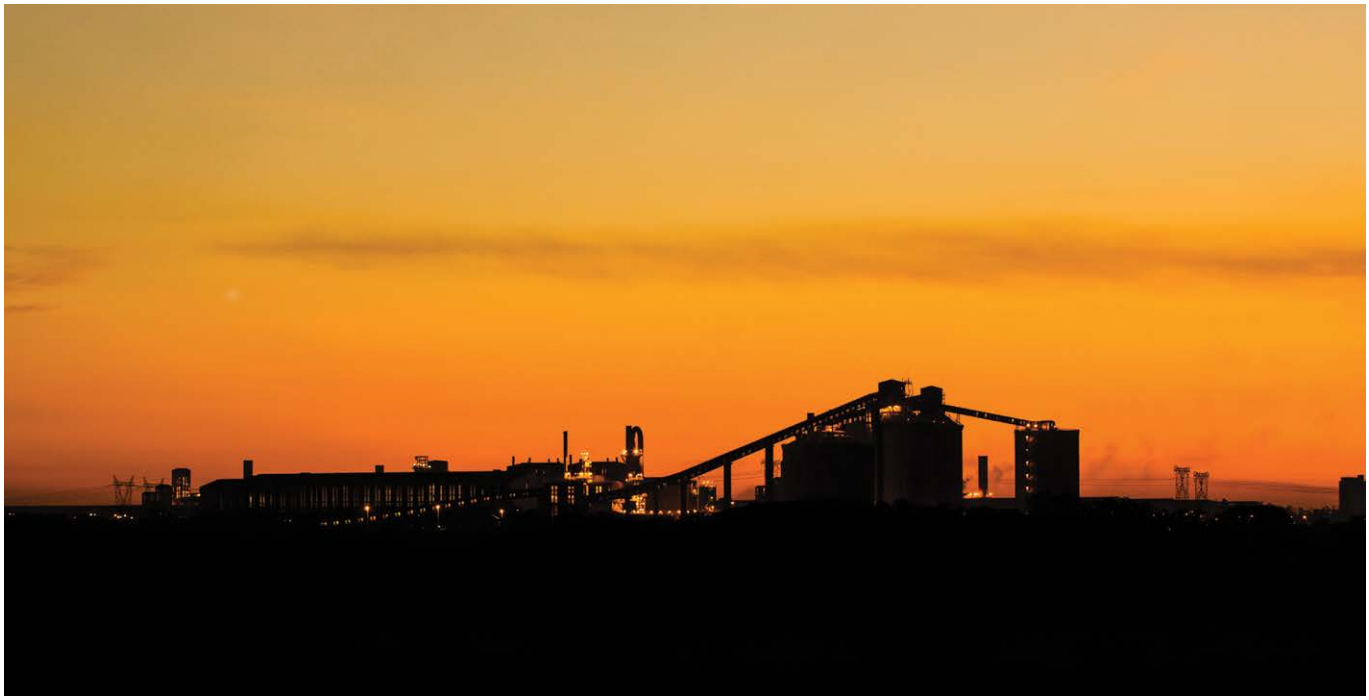
In the short-to-medium-term, our base case applies a carbon price in our key operating regions that is based on existing regulation and an expectation that emissions allowances will reduce over time.

In the long-term, our base case assumes a single global carbon price from FY40, based on an assessment of policy-driven costs, market price benchmarks, technological innovation, and the cost of abatement. In FY22, our long-term base case global carbon price assumption increased from US$40 to US$60 per tonne. This price reflects an assumption of no carbon leakage and is therefore applied to all South32's Scope 1 and 2 GHG emissions.

Our view is that higher carbon prices are likely to be required to accelerate the pace of global decarbonisation. Reflecting this, and to stress test for outcomes aligned to the temperature goals of the Paris Agreement, we adopt a long-term global carbon price from FY40 of US$100 per tonne in a below 2°C scenario and US$160 per tonne in our 1.5°C scenario. A higher carbon price than those used in our scenario analysis would trigger re-evaluation of the viability of new projects and the costs of existing operations under accelerated transition scenarios.

We continue to assess and update our carbon price forecasts in response to changes in policy, technology and price benchmarks.

Learn more about **our analysis that underpins our internal carbon price** in our 2022 Sustainability Databook at www.south32.net



(9) Our climate scenarios are not intended to represent a full and definite description of the future, but rather highlight the main elements of a possible future landscape and draw out the key factors that could drive future developments. It's important to note that scenarios are hypothetical, they are not forecasts but rather a tool used to enhance critical thinking, refine our strategy and support key business decisions.

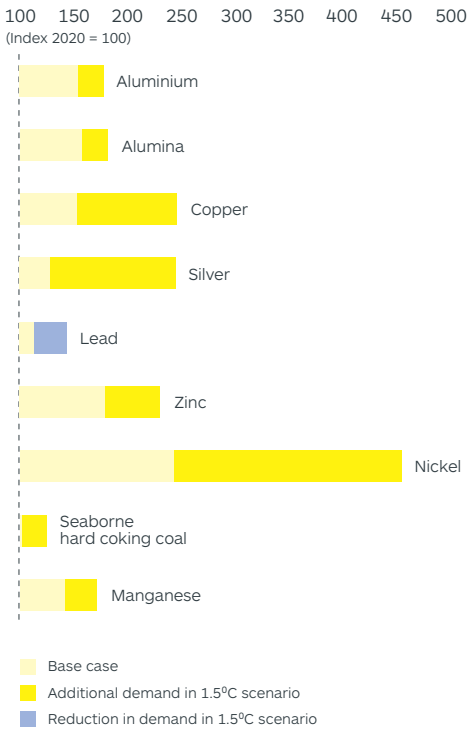
(10) The most recent and widely used scenarios are the IPCC's RCPs. These were developed in 2007 and used in the IPCC's 5th Assessment Report. There are four RCPs which represent possible future GHG emissions and concentration scenarios: RCP8.5, RCP6.0, RCP4.5 and RCP2.6. Each RCP defines a specific emissions trajectory and subsequent 'radiative forcing'.

Our portfolio in a low-carbon world

In our 1.5°C scenario, the transition to a low-carbon world occurs at a much more rapid pace across all major sectors than in our base case. Demand for most of our commodities grows significantly in this scenario despite a rise in recycling rates, reflecting the critical role of many of our commodities as the world decarbonises. The increased demand would be driven by the uptake of mineral-intensive low-carbon technologies, led by the electrification of passenger vehicles and supporting generation and transmission networks.

Key outcomes in our 1.5°C scenario, compared to our base case, are shown in the table below.

2050 average global commodity demand in 1.5°C scenario versus base case



1.5°C scenario anchored on rising electric vehicle (EV) penetration (from 4% to 100%) and proliferation of renewables generation (six fold increase to 20TW) from 2020 to 2050

Aluminium benefits from higher intensity of use in EVs, substitution of plastics in packaging and increasing use in renewables

- Aluminium intensity in EVs is ~40% higher than internal combustion engine (ICE) vehicles (from 111kg/car in 2020 to 256kg/car in 2050) due to light-weighting

Copper is a key metal used in EVs, charging infrastructure and renewable energy

- Copper intensity in EVs is ~3x that of ICE vehicles (23kg/car)
- Copper intensity for offshore wind generation is ~12x for coal and gas

Silver is used in solar panels due to its superior electrical conductivity

Lead impacted by reduced demand for lead batteries in motor cars as ICE fleet is phased out by 2050, partly offset by higher demand for use in energy storage systems

Zinc protects metals against corrosion

- Wind and solar energy could increase >10x by 2050 in 1.5°C scenario, equivalent to adding 3x the capacity of the USA each year
- Zinc intensity in offshore wind and solar installations is ~300x and 200x higher, respectively, than in autos (10kg/car)
- Zinc demand could double to 24 Mt by 2040, akin to adding three Taylor sized projects[1] each year in the currently supply constrained environment

Nickel is used as an alloy in renewables such as wind, solar, and geothermal power infrastructure; Nickel-rich batteries are critical for rapid adoption of EVs

Seaborne hard coking coal is required to support GHG emissions reduction targets and new integrated capacity in the steel industry; steel feeds into construction of renewable energy infrastructure and pipelines for carbon capture and storage.

Manganese benefits from higher use in infrastructure to improve steel quality and also has the potential to displace cobalt in lithium-ion batteries with ~7x higher intensity in manganese-rich[2] cathode chemistries than nickel-based chemistries

(1) Based on Taylor Deposit pre-feasibility study with 130kT per annum steady state payable zinc production.
(2) Manganese-rich chemistry is represented by NMX 370 with seven parts of manganese, compared to nickel-rich chemistry represented by NMC811 with on part in manganese.

Our analysis indicates that our base and precious metals and manganese businesses would benefit from commodity price upside in the 1.5°C scenario, with only a modest carbon price impact due to their lower carbon intensity. While our alumina and aluminium businesses would also benefit from higher commodity prices, the carbon price impact will depend on their energy intensity and the ability to decarbonise. For example, Hillside Aluminium would be uncompetitive in the 1.5°C scenario without an affordable source of low-carbon energy, while the carbon impact on Mozal Aluminium would be lower given its access to low-carbon energy. Our analysis also indicated that Illawarra Metallurgical Coal would face a high carbon price burden, but without the benefit of commodity price upside.

Learn more about **the key assumptions used in our 1.5°C scenario** in our 2022 Sustainability Databook at www.south32.net

Operational decarbonisation

Our decarbonisation target and goal

In the first year after South32 was established, we set a long-term goal of achieving net zero operational GHG emissions by 2050 and our first emissions reduction target to keep our FY21 Scope 1 GHG emissions below our FY15 baseline.

In FY21, we achieved our first emissions reduction target and set a medium-term target to halve our operational GHG emissions from an FY21 baseline[11] by 2035. Our medium-term target and long-term goal[12] guide our decarbonisation planning and activities and we assess all portfolio and major investment decisions against them.

Ninety three per cent of our operational GHG emissions are generated from four operations – Hillside Aluminium, Mozal Aluminium, Worsley Alumina and Illawarra Metallurgical Coal – and we are focusing on these operations in order to achieve a significant reduction in our emissions.

Delivery of our medium-term target is reliant upon transitioning the energy source for the Hillside Aluminium smelter from coal-based power to secure, reliable and affordable low-carbon energy and maintaining a low-carbon energy source for the Mozal Aluminium smelter beyond its current hydroelectric power contract.

Technology and innovation will also be critical to achieving our long-term goal of net zero operational GHG emissions. We are reviewing, developing and trialling technology solutions for our operations and where appropriate, collaborating and partnering with industry and research and development organisations.

Our medium-term target signals our focus on achieving a step-change in emissions reductions by 2035. However, we do not expect our emissions to reduce in a gradual or linear trajectory towards our medium-term target, and in some years they may increase. We have developed and will continue to evolve our decarbonisation plan to reflect all reasonable and practicable measures to decarbonising our business to deliver our medium-term target.

Short-term target

In FY22, we evaluated options for establishing a short-term operational GHG emissions reduction target for the business to guide our near-term action. Our assessment of what might constitute a credible short-term target was informed by a review of various international frameworks and guidelines.[13] We evaluated this guidance against our group-wide decarbonisation planning.

Hillside Aluminium and Worsley Alumina generate 77 per cent of our Scope 1 and 2 GHG emissions. The high energy demand of these operations means that transitioning to low-carbon energy sources is both technically and commercially complex. In addition, just transition considerations for both Hillside Aluminium and Worsley Alumina require the switch to low-carbon energy to be planned in collaboration with a broad range of government and community stakeholders. Resolving the technical, commercial and social challenges will take time, therefore we are not confident that we would achieve sufficiently material emissions reduction within the timeframe of a credible short-term target. Accordingly, we have not set a short-term emissions reduction target at this stage.

We will continue to evaluate our options, but will only set a short-term target when we are confident that the pathway to that target is credible, viable and just. In the interim, we remain committed to prioritising efforts to reduce emissions across our operations in the near term – from energy efficiency programs, to the maturation and execution of energy switching and technology-solutions, and low-carbon design principles that have the potential to materially reduce the GHG emissions footprint of our operations in line with our medium-term target.

Considering climate science in developing our target and goal

In developing our medium-term GHG emissions reduction target, we reviewed science-based emissions reduction pathways that seek to align with the goals of the Paris Agreement and limit global warming to well below 2°C, while pursuing efforts to limit the increase to 1.5°C. We recognise this is a critical step as we continue to assess options to align our business to prosper in a low-carbon world.

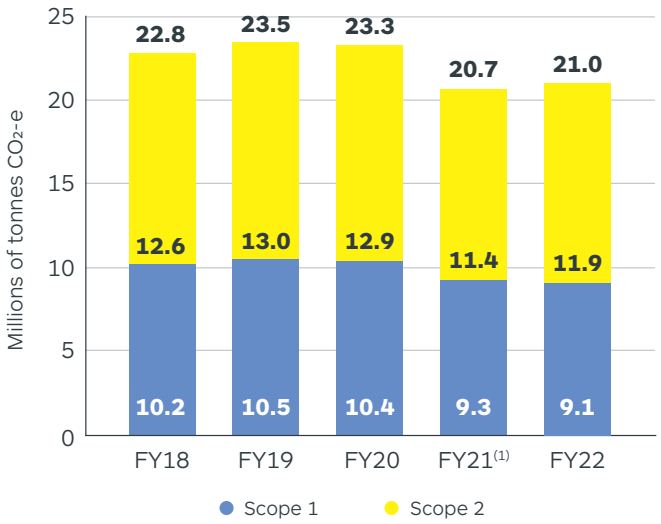
The IPCC Special Report *Global Warming of 1.5°C* indicates that, relative to 2010 levels, total global GHG emissions will need to decline by about 45 per cent by 2030 to limit global warming to 1.5°C. This includes deep reductions in methane emissions. The Special Report also presents a number of illustrative model pathways for how these net emissions reductions may be achieved, based on different mitigation strategies. These indicate that carbon dioxide emissions from fossil fuel and industry sources will need to decline sharply by approximately 50-70 per cent by 2030. This represents an annual average reduction of approximately 2.5 per cent to 3.5 per cent, applying an absolute contraction approach. The scale of reductions required depends in part on the rate of development and uptake of bioenergy with carbon capture and storage.

Our medium-term target is to reduce our operational GHG emissions by 50 per cent from FY21 levels by 2035. This equates to an annual average reduction of approximately 3.6 per cent (noting that some stakeholders consider full alignment with a 1.5°C goal would include Scope 3 GHG emissions)

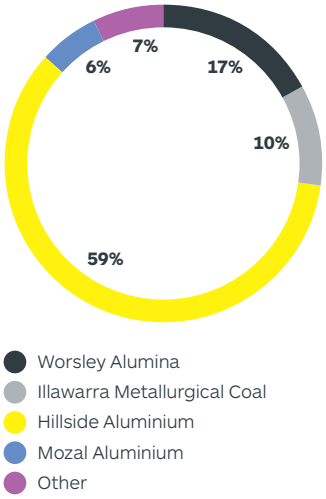
(11) FY21 baseline adjusted to exclude GHG emissions from SAEC and TEMCO, which were divested in FY21.
(12) Our medium-term target and long-term goal apply to our group-wide business. They are separate to, but take into account, facility specific regulatory targets, baselines, carbon budgets, and other emission related indicators, that are set by, or comply with, various national and sub-national regulatory schemes across the jurisdictions in which we operate.
(13) For example, Say on Climate Children's Investment Fund Foundation guidance; Australian Council of Superannuation Investors, December 2021 Guidelines; ISS International Climate Proxy Voting Guidelines; Glass Lewis 2022 Policy Guidelines; Investor Group on Climate Change 2022 Corporate Climate Transition Plans: a guide to investor expectations; Climate Action 100+ Net Zero Company Benchmark

FY22 operational GHG emissions

Scope 1 and 2 GHG emissions



FY22 Scope 1 and 2 GHG emissions by asset[2]



(1) FY21 emissions adjusted to exclude GHG emissions from SAEC and TEMCO, which were divested in FY21.
(2) The sum of the categories may vary to the total figure due to rounding.

A **breakdown of GHG emissions by source and operation** is available in our 2022 Sustainability Databook at www.south32.net

Our reported Scope 1 and Scope 2 GHG emissions for FY22 were 21.0 Mt CO_2-e, a 1.4 per cent increase from our adjusted FY21 GHG emissions[14].

Direct emissions from activities at our operations (Scope 1) decreased by 0.2 Mt CO_2-e largely due to reduced fugitive emissions from Illawarra Metallurgical Coal and an increase in the use of natural gas at Worsley Alumina along with the consumption of biomass in place of energy coal.

While our Scope 1 emissions declined, there was an increase of 0.5 Mt CO_2-e in emissions from electricity used by our operations (Scope 2). The primary driver was the increase in the grid emission factor[15] for the South African electricity grid, with Hillside Aluminium's Scope 2 emissions increasing by 0.4 Mt CO_2-e despite energy use at the smelter remaining steady. Scope 2 emissions from Mozal Aluminium also increased as a result of planned maintenance impacting the availability of hydroelectric power.

Cerro Matoso's operational GHG emissions increased by 0.2 Mt CO_2-e following a return to normal production after disruptions in FY21 due to COVID-19 and planned maintenance.

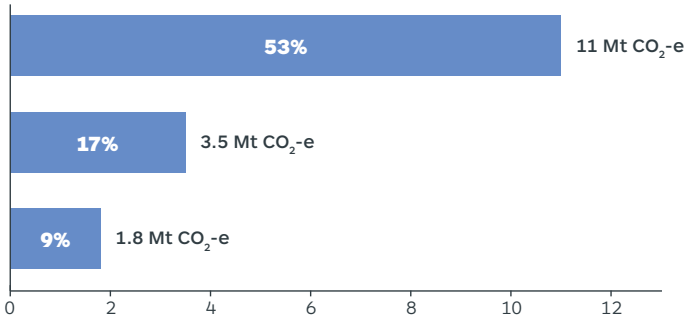
Operational GHG emissions sources

The largest single sources of our operational GHG emissions in FY22 are depicted below.

Consumption of coal-generated electricity from the South African grid at our Hillside Aluminium smelter.

Combustion of energy coal and natural gas to generate steam for the alumina refining process at Worsley Alumina.

Fugitive emissions at Illawarra Metallurgical Coal, due to the release of gases from underground coal seams during mining.



The remaining GHG emissions (4.5 Mt CO_2-e) are attributable to a range of activities, including consumption of carbon anodes at Hillside Aluminium and Mozal Aluminium, and electricity or fuel consumption at our other operations.

(14) Exclude GHG emissions from SAEC and TEMCO, which were divested in FY21.
(15) The GHG grid emission factor is the total amount of GHGs emitted per unit of electricity generated for and distributed by an electricity grid.

Reducing our operational GHG emissions

Our decarbonisation plans focus on the four operations that generate the vast majority of our Scope 1 and Scope 2 GHG emissions, and are shaped by their differing production methods and the energy markets and regulations to which they are exposed. Article 4 of the Paris Agreement recognises that peak GHG emissions will take longer in developing countries, creating additional complexity for Hillside Aluminium and Mozal Aluminium.

Our approach to decarbonisation applies the mitigation hierarchy. This means we prioritise avoidance of emissions and, where avoidance is not possible, we mitigate GHG emissions through efficiency initiatives or transition to low-carbon energy. We intend only to use voluntary carbon offsets after these options have been fully explored. Carbon credits may be used to comply with regulatory requirements in South Africa and Australia.

Learn about **our approach to the use of carbon credits and carbon offsets** on page 89.

Our operational decarbonisation pathway to support delivery of our medium-term target and long-term goal consists of three elements: efficiency initiatives in the near term, transition to low-carbon energy in the medium-term, and technology solutions in the longer-term. Some decarbonisation options common to the diversified mining sector, such as electrification of mobile fleet, do not present an opportunity for material emissions reduction for us due to the nature of our operations. Our decarbonisation planning encompasses growth projects, such as the Hermosa project, where our focus is on low-carbon design principles.

Operational decarbonisation pathway

Operation	Near-term	Medium-term 50% by 2035[1]	Long-term Net zero by 2050[2]
Worsley Alumina	Mud-washing project Waste to heat digestion	Coal to gas conversion	Renewables or hydrogren Processing technologies
Hillside Aluminium	AP3XLE implementation	Transition to low-carbon energy	Processing technologies (e.g. inert anodes)
Mozal Aluminium	AP3XLE implementation	Extend current hydropower contract beyond 2026	Processing technologies (e.g. inert anodes)
Illawarra Metallurgical Coal	Improved gas drainage	Commercial solution for ventilation air methane	

Efficiency projects · Low-carbon energy · Technology

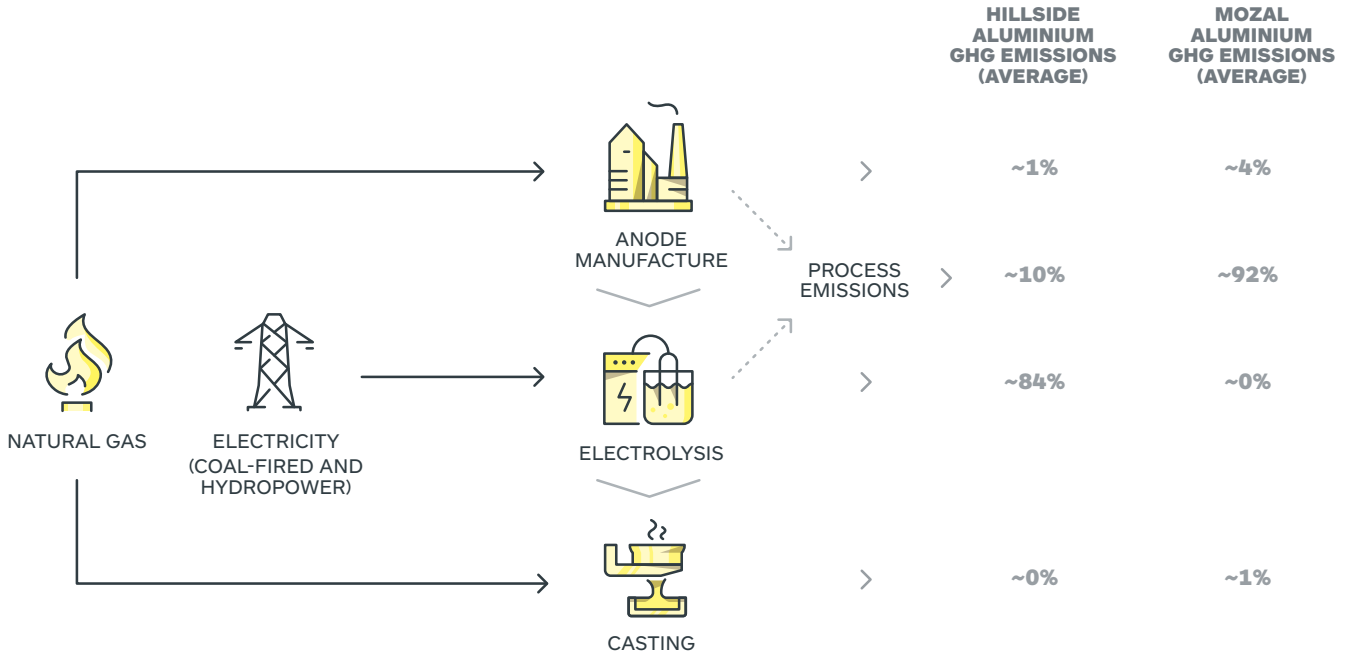
(1) Our target to halve operational GHG emissions from our FY21 baseline by 2035.
(2) Our goal of net zero operational GHG emissions by 2050.

There are a number of potential pathways to net zero and some of the innovations we need to achieve our long-term goal are not yet technologically or commercially feasible. We will continue to evaluate new and existing decarbonisation initiatives against a number of criteria including safety, technical performance, operability, emissions reduction, maturity, scale, cost, external policy and time required for adoption.

Aluminium smelters

Aluminium smelting involves an electrical current being applied to an alumina solution that is heated to around 960°C. This process consumes large amounts of electricity, while also producing carbon dioxide as a by-product of the consumption of carbon anodes.

The other material source of GHG emissions in aluminium production arises from the electrolytic reduction of alumina. Alternative processing technologies, such as inert anodes, which are not currently commercially available, will be required to avoid these emissions.



Note: Chart is a simplified representation of material sources of emissions from the aluminium smelting process. 'Process emissions' includes GHG emissions from baking anodes and consuming anodes, and contributions from anode effects.

Hillside Aluminium

The Hillside Aluminium smelter is located in Richards Bay in the South African province of KwaZulu-Natal and is 100 per cent owned and operated by South32 with a solid metal production capacity of 720kt per year. It is the largest aluminium smelter in the southern hemisphere, and produces high-quality, primary aluminium for the domestic and export markets.

Source of GHG emissions

Hillside Aluminium sources its electricity from Eskom, the South African state-owned entity which owns and operates South Africa's national grid. Hillside Aluminium is one of the largest consumers of power in South Africa, with a large baseload demand of 1,205 megavolt amperes demand at 99 per cent load factor. The smelter supports the stability of the national electricity grid, as its power agreement gives Eskom the flexibility to interrupt supply in times of system emergency. Eskom is the only viable provider of electricity at the scale required, but as the grid is still reliant on energy coal, Hillside Aluminium's electricity supply is highly carbon intensive.

Decarbonisation planning

Near term decarbonisation initiatives at Hillside Aluminium are focused on energy efficiency, while we investigate options for an alternate low-carbon energy solution to be deployed in the medium-term. While we are encouraged by the ground-breaking Just Energy Transition Partnership described on page 82 and Eskom's aspiration to replace 47 per cent of coal-fired capacity with renewable sources by 2035, our decarbonisation plans do not rely exclusively on the decarbonisation of the South African energy grid.

Decarbonising the South African grid

The ambition to transition South Africa's national energy grid away from energy coal received funding support of US$8.5 billion, by a coalition of the governments of France, Germany, the UK, the US and the EU at the 26th Conference of the Parties (COP26) to the UNFCCC. Referred to as the Just Energy Transition Partnership, the funding is made up of financial instruments including government grants, concessional loans and "risk-sharing instruments" designed to mobilise the private sector, over a three-to-five-year period.

According to a report[16] published this year by the Centre for Sustainability Transitions at the Stellenbosch University in South Africa and Blended Finance Taskforce, South Africa will need US$250 billion over the next three decades to transform its coal-powered economy into a low-carbon energy system. While the report assessed that the energy transition should be triggered by public development financial institutions, such as the Government Employees' Pension Fund or the Development Bank of Southern Africa, it also emphasised that the majority of the US$250 billion needed will require private investment.

Energy and process efficiency

In FY22, Hillside Aluminium completed a trial of the AP3XLE energy efficiency technology and recently committed approximately US$18 million to commence deployment of the technology over the next five years. Once fully deployed, this technology is anticipated to abate approximately 150,000 to 200,000 tonnes CO_2-e per annum.

We are investigating the potential of EnPot technology to support decarbonisation of the South African grid. Traditionally, aluminium smelters are designed to be operated at constant power inputs, which can be easily achieved with conventional power but less so with variable renewable generation. EnPot is a heat recovery technology that enables smelter power modulation while maintaining a precise pot heat balance, potentially enabling Hillside Aluminium to be used as a 'virtual battery' by returning surplus power to the grid and playing an increased role in grid ancillary services.

We also continue to investigate and assess additional emissions reduction projects and technologies, such as inert anodes and anode coating technology.

Transition to low-carbon energy

Hillside Aluminium has a power agreement with Eskom until 2031, which provides energy certainty while a commercially viable alternate energy solution is sought.

In FY21 we completed studies on the technical feasibility of deploying renewables to power the smelter at Hillside Aluminium. Those studies showed that the smelter's consistent, high level of power consumption would require multiple gigawatts of renewable generation capacity, including an over-build to ensure sufficient energy to enable continuous operation. Large scale energy storage and transmission infrastructure would also be required. The land area required for renewable energy infrastructure renders the option of on-site renewables impractical.

On-balance-sheet development of the renewables, storage and associated infrastructure needed on such a scale is outside of our strategy and core capability. Instead, we are exploring potential collaborations with entities whose purpose and expertise lies in utility-scale energy projects and will look to support them through long-term power purchase agreements.

We are progressing three core streams of work to decarbonise Hillside Aluminium:

- Engaging with Eskom to explore opportunities to convert our existing power agreement to low-carbon energy (e.g. green certificates or other public-private partnership opportunities);
- Investigating options for sourcing and securing low-carbon power through power purchase agreements with independent power producers and aggregators of renewable energy; and
- Behind-the-meter technology options including energy storage.

Through our decarbonisation workstreams, we aim to secure a suitable source of low-carbon energy for Hillside Aluminium by the early 2030s, however, grid access capacity for viable projects, wheeling and securing affordable backup power are material considerations, all of which are dependent to some degree on market reform.

(16) *https://www.blendedfinance.earth/making-climate-capital-work*

Just transition

If we are unable to secure an affordable source of low-carbon electricity, Hillside Aluminium risks becoming internationally uncompetitive over time, given the emergence of carbon border tariffs and the likelihood of realised pricing reflecting end-user demand for low-carbon aluminium.

The smelter is one of the largest industrial employers in the province of KwaZulu-Natal - an area that experiences an official unemployment rate of 33 per cent - with approximately 2,500 employees and contractors, which in turn supports an estimated additional 26,500 indirect full-time equivalent opportunities. As the only primary aluminium smelter in South Africa, approximately 27 per cent of Hillside Aluminium's production is sold to the domestic market, including the supply of liquid aluminium to local downstream industry. Hillside Aluminium also supports the stability of the national electricity grid, through its constant high baseload demand and Eskom's frequent utilisation of a contractual term which permits the interruption of supply to the smelter in times of system emergency to minimise load shedding for other customers.

Given the economic and social importance of Hillside Aluminium to South Africa, our decarbonisation plans will include just transition considerations for our workforce, the region and upstream and downstream value chains.

In FY22, we participated in the National Business Initiative Just Transitions Pathway Project and conducted an initial baseline review of just transition considerations. In FY23, we intend to work with stakeholders to conduct risk and opportunity assessments, develop metrics to measure and report on our performance and undertake value chain analysis to support our just transition planning.

Learn more about **our approach to just transition planning** on page 89.

Mozal Aluminium

Mozal Aluminium is the only aluminium smelter in Mozambique, co-owned by South32, the Industrial Development Corporation of South Africa, Mitsubishi Corporation (through MCA Metals Holding GmbH) and the Government of the Republic of Mozambique. It is one of the largest employers and contributors to the national economy producing over 500,000 tonnes of aluminium every year.

Electricity supplied to Mozal Aluminium is generated by Hidroeléctrica de Cahora Bassa (HCB), a hydro-electric power generator situated on the Zambezi River in the north-west of Mozambique. The electricity is supplied via Eskom's South African grid under an agreement with MOTRACO, a transmission joint venture between Eskom and the national electricity utilities of Mozambique and Eswatini. Eskom also provides back-up energy to Mozal Aluminium for periods when HCB produces less than its contractual maximum supply of hydro power, for example due to hydroelectric plant maintenance or drought conditions in the Zambezi basin.

We are working to extend the power supply agreement for Mozal Aluminium beyond 2026, as there are no viable alternative suppliers of renewable energy at the necessary scale and, without extension of the agreement, we will be limited in our ability to achieve our medium-term target. The extension of the existing arrangement will underwrite Mozal Aluminium's ability to maintain its current market position as a supplier of low-carbon aluminium.

Energy and process efficiency

Deployment of the AP3XLE energy efficiency technology is well advanced at Mozal Aluminium, with the pot relining program continuing and the final conversion and amperage ramp-up expected to conclude by FY24. The successful deployment of this technology at Mozal Aluminium has provided key learnings for its application at Hillside Aluminium, where the technology will achieve emissions reductions given Hillside Aluminium's exposure to high emissions intensity electricity.

We also continue to investigate and assess additional emissions reduction projects and technologies, such as inert anodes and anode coating technology.

South African Energy Market Reform

South Africa has made positive steps towards market reform with the publication of the Electricity Regulation Amendment Bill in March 2022, which advocates for a competitive market and trading, and prosumer models, which has the potential to unlock more commercial options for large power users.

We are a member of the Energy Intensive Users Group (EIUG) of Southern Africa, which works with the South African government and Eskom to enable electricity market and regulatory reforms and address impediments to large scale deployment of renewable energy projects. The aim of EIUG is to transition South Africa to a low-carbon future in a manner and within a time-frame that protects and maintains the competitiveness of the South African economy.

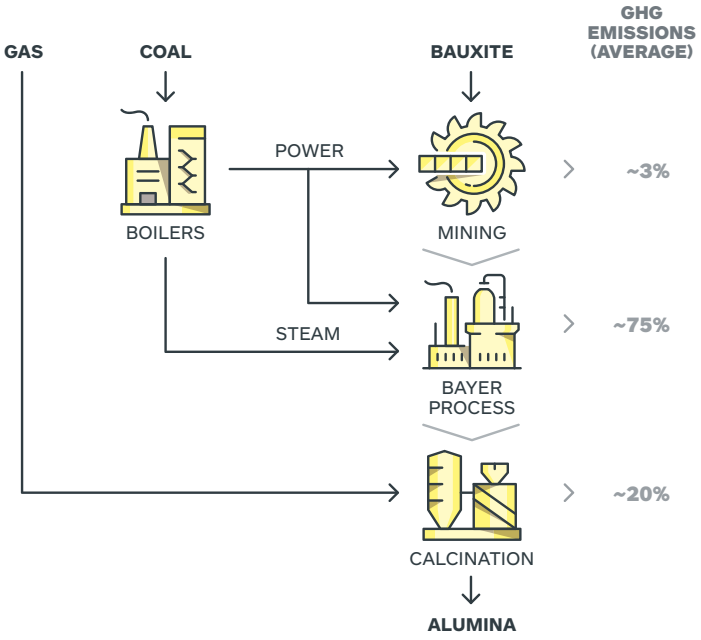
Worsley Alumina

Worsley Alumina is an integrated bauxite mine and alumina refinery located in the south-west of Western Australia. It is one of the largest alumina refineries globally, with production capacity of approximately 4.6 million tonnes per annum. The alumina we produce is shipped to aluminium smelters around the world, including our Hillside Aluminium and Mozal Aluminium smelters.

Source of GHG emissions

The primary source of GHG emissions for Worsley Alumina is the combustion of energy coal and natural gas (approximately 74 per cent of GHG emissions) to generate high pressure steam which is used in process heating in digestion and evaporation units. The generation of steam for processing also generates electricity as a by-product, most of which is consumed by the refinery and mine, with any excess (or shortfall) exported to (or imported from) the South West Interconnect System (SWIS) grid. Scope 2 emissions make up around two per cent of reported GHG emissions from the refinery.

On average, GHG emissions from bauxite mining make up around three per cent of Worsley Alumina's annual reported operational GHG emissions.



Note: Chart is a simplified representation of material sources of emissions from Worsley Alumina, it does not depict other sources of emissions which represent ~two per cent of operational GHG emissions.

Decarbonisation planning

Near-term decarbonisation efforts are focused on energy efficiency. We are pursuing energy transformation in the medium and long-term, while supporting a pragmatic, collaborative and just transition for people, local communities and the south-west region where the coal industry makes a significant economic contribution.

Energy and process efficiency

Worsley Alumina is pursuing initiatives to reduce the operational demand for steam and to improve efficiency through more effective use of industrial heat, which could reduce the operation's GHG emissions by between 10 and 20 per cent. Reducing the need for operational steam also reduces water consumption.

In FY22, Worsley Alumina commenced a dilution reduction project which reduces energy demand related to evaporation in the Bayer process at the refinery. Once fully commissioned (by FY24), this project has the potential to abate more than 80,000 tonnes of CO_2-e per year.

Two of the most material and advanced energy efficiency studies relate to mud washing and waste heat to digestion. Our mud washing efficiency study moved to feasibility stage in FY22 and is investigating the replacement of flat bottom washers with new high efficiency washers to reduce the amount of coal-fired steam required to evaporate water out of the circuit. Initial study estimates indicate a potential reduction in reported operational GHG emissions in the order of 295,000 tonnes of CO_2-e per year. The initiative is also expected to reduce water consumption by six per cent and improve workplace health and safety by reducing confined space maintenance work.

The waste heat to digestion concept study was completed in FY22 and is currently in pre-feasibility stage. The study is exploring options to retain low-grade heat within the circuit, to displace the coal-fired steam required for heating in digestion and desilication. Early estimates of potential GHG emissions reductions range from 60,000 to 250,000 tonnes of CO_2-e per year across the various options being considered.

We are also studying potential efficiencies in mechanical vapour recompression and calciner flue gas heat recovery.

Worsley Mine Development

Worsley Alumina has continued to progress State and Commonwealth environmental approvals for the Worsley Mine Development, which would provide access to future bauxite reserves and resources.

A comprehensive Environmental Review Document (ERD) was released in June 2022 to enable assessment by the Western Australian Environmental Protection Authority (EPA), in accordance with State and Commonwealth environmental legislation.

The ERD includes a draft GHG management plan (among other key management programs) which provides more specific detail on Worsley Alumina's decarbonisation activities[17] and proposes the establishment of interim GHG emissions reduction targets for Worsley Alumina in line with guidance from the EPA's *Environmental Factor Guideline: Greenhouse Gas Emissions, 2020*.

The proposed interim GHG emissions reduction targets are intended to drive incremental reductions in operational GHG emissions at Worsley Alumina, supported by regular review and evaluation. They are aligned with South32's group-wide GHG emissions reduction target and long-term net zero by 2050 goal, but they do not replicate them, noting South32's group-wide decarbonisation strategy to meet our medium-term target has been developed at a whole-of-portfolio level.

Learn more about **the Worsley Mine Development** at www.south32.net

(17) Please note this Plan includes more up to date information and figures, for some items, than depicted in the ERD. This is not an error, but rather represents more recent information being available for inclusion in this Plan (e.g. full year reporting of FY22 GHG emissions, updated emission abatement numbers from recently completed studies).

Transition to low-carbon energy

Transitioning to lower carbon energy sources will be the key driver of decarbonisation at Worsley Alumina, given energy coal consumption contributes approximately 69 per cent of reported GHG emissions in FY22. We have been exploring options to replace energy coal as the primary fuel source at Worsley Alumina, with trials of an alternative fuel source underway since 2018. In FY22, the Western Australian Government announced its intention to retire the state-owned Muja and Collie coal-fired power stations by 2030, providing an additional driver for our own transition away from energy coal.

We are focusing our studies for Worsley Alumina's energy transition on increased electrification combined with renewable energy to meet our operational GHG emissions reduction target and goal. However a large-scale deployment of renewable energy such as solar PV and wind, which do not generate steam directly, would require a change to Worsley Alumina's process and energy infrastructure. Additionally, delivering the scale of renewable power required by Worsley Alumina and other industrial users in the south-west region of Western Australia would require substantial expansion and modification of the existing grid. Potential solutions include increased capacity of the electricity transmission network, new wind and solar farms, and significant energy storage. Some of these changes will occur as Synergy, Western Australia's state-owned electricity generator and retailer, transitions away from coal and we anticipate that there will be opportunities for industrial users to support this transition.

Increased electrification and renewable energy solutions will require investment in energy infrastructure at the refinery, and potentially shared energy infrastructure in the region and therefore any deployment would most likely take place in the longer term. We anticipate partnering with entities which have the expertise in converting the electrical infrastructures that deliver power and supporting them with long-term power purchase agreements.

As an interim solution, we are evaluating the technical and commercial feasibility of converting the primary fuel source of the onsite boilers from coal to natural gas. In FY22, we completed a pre-feasibility study on options to convert the fuel source for our conventional pulverised fuel boilers. Our studies estimate that natural gas as a replacement for coal could deliver a reduction in the order of 15 to 20 per cent of the operation's GHG emissions, in addition to the energy efficiency projects described above.

In FY22, Worsley Alumina continued to use modest amounts of biomass as a fuel source in the multi-fuel co-generation facility. We source biomass via various harvesting and chipping companies, including waste residues from saw log operations, mine site thinnings or energy crop material. Worsley Alumina has consumed 85,000 bone dry metric tonnes since we first trialled the use of biomass to displace energy coal in FY18 and estimates a total reduction of GHG emissions of 127,000 t CO_2-e in that time. Biomass is expected to remain a complementary option in the near term, while we pursue more material efficiency and energy transition projects. A previous study found increased biomass usage is technically feasible, but it also identified supply chain and safety challenges associated with sourcing and processing higher volumes.

We are assessing the use of hydrogen in difficult-to-electrify applications, but production costs, markets and associated infrastructure will need to develop substantially for it to become a viable alternative. Work to date has indicated that electrifying steam generation is likely to be preferable to the use of hydrogen. However, hydrogen may have a role in achieving the high processing temperatures required for calcination.

Partnerships

Collaboration between governments, industry and other stakeholders is necessary to develop an accelerated energy transition of the industries operating within the south-west region while meeting the needs of communities and other stakeholders. We are participating in a number of early stage collaborations and aim to enhance our involvement as the region's plans take shape. For example, as a founding member of the Heavy Industry Low-Carbon Transition (HILT) Cooperative Research Centre (CRC), we are participating in various projects to support our decarbonisation activities at Worsley Alumina.

Learn about **our technology and innovation partnerships** on page 88.

Just transition

Our plan to transition away from energy coal aligns with the Western Australian Government's announced intention to retire the state-owned Muja and Collie coal-fired power stations. South32 welcomes the Government's support and commitment to the people and businesses of Collie, and the certainty this provides to enable parties to work together to promote a just transition for the town and surrounding communities.

Coal mining has been a significant contributor to the economy of the region and we acknowledge the significant role Collie has played for more than 100 years. Supporting the Western Australian Government's initiatives and investments to diversify Collie's economy are key considerations in our decarbonisation planning.

We are an active participant in the Collie Just Transition Working Group, which is led by the Western Australian Government. In alignment with a pillar of the Collie Just Transition Plan, we recently announced an A$415,000 partnership with the Shire of Collie to activate the Collie Tourism Strategy and support the economic future of the region.

In FY22 we conducted an initial baseline review of just transition considerations for Worsley Alumina. To support the ongoing development of a just transition plan for Worsley Alumina, in FY23 we plan to undertake detailed stakeholder mapping, engage with internal and external stakeholders to conduct risk and opportunity assessments, and develop metrics to measure and report on performance. We are also planning to undertake a study of the potential workforce impacts and opportunities from our decarbonisation activities at Worsley Alumina, to inform our participation in the Collie Just Transition Working Group.

Learn more about **our approach to just transition planning** on page 89.

Illawarra Metallurgical Coal

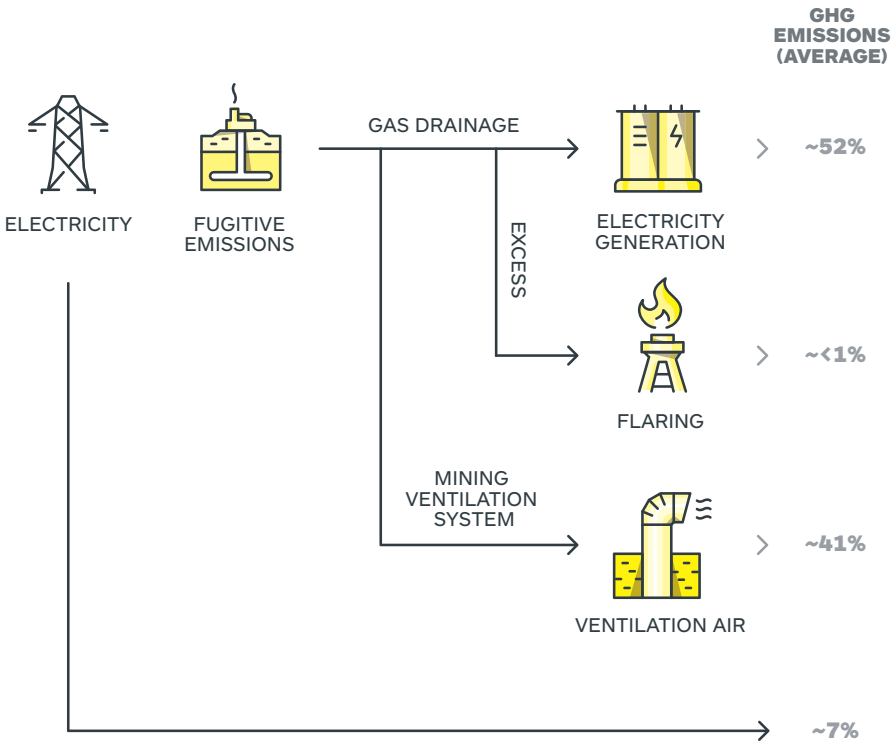
Illawarra Metallurgical Coal comprises two underground metallurgical coal mines, Appin and Dendrobium, located in the southern coalfields of NSW in Australia. IMC produces premium metallurgical coal, which is used to produce steel, a critical material for buildings, transportation and renewable energy infrastructure.

Source of GHG emissions

Illawarra Metallurgical Coal's Scope 1 GHG emissions are predominantly from fugitive emissions, which are gases released from underground coal seams during mining. Methane is a significant contributor to Illawarra Metallurgical Coal's reported operational GHG emissions with a global warming potential 28 times greater than carbon dioxide[18].

We measure fugitive emissions using certified instrumentation deployed on site and the amount can vary greatly between mining areas, based on the surrounding rock strata, depth and composition of the seam. Approximately 87 per cent of Illawarra Metallurgical Coal's FY22 reported Scope 1 emissions are from Appin, which has higher gas and methane content.

Illawarra Metallurgical Coal sources electricity to operate ventilation systems and conveyors through an existing partnership with EDL Energy, a producer of sustainable distributed energy, which utilises our coal mine waste gas to generate electricity. We also import electricity from the NSW grid, which represented around 15 per cent of Illawarra Metallurgical Coal's total reported Scope 1 and 2 emissions in FY22.



Note: Average GHG emissions include emissions captured and transferred to EDL for power generation. These are not reported as part of Illawarra Metallurgical Coal's operational GHG emissions inventory, in accordance with the Australian National Greenhouse and Energy Reporting (Measurement) Determination 2008.

Decarbonisation planning

Our decarbonisation plans are focused on increasing the efficiency of coal seam gas drainage and reducing ventilation air methane (VAM) through innovative new technologies, and remain unchanged as a result of the August 2022 announcement not to proceed with an investment in the Dendrobium Next Domain project at Illawarra Metallurgical Coal.[19]

In FY21, Illawarra Metallurgical Coal reviewed its decarbonisation opportunity assessment to determine if any new developments or technologies had emerged that warranted investigation. This work confirmed the focus on coal seam gas drainage efficiency and VAM abatement remains the most appropriate course of action, given the readiness of the technology.

Gas drainage

Gas is drained from coal seams before and after mining activity. The majority of the captured gas is piped to the surface and supplied to EDL Energy to generate electricity, with the remainder (less than 1 per cent in FY22) destroyed through flaring which converts the methane into carbon dioxide. The beneficial reuse of this waste gas allows us to redirect approximately two million tonnes of CO_2-e per annum for power generation, that would otherwise be released to the atmosphere or flared.

Through our drilling program, we are targeting an increase in equivalent coal seam gas capture to 67 per cent post-drainage capture efficiency at Appin by FY24, compared to 61 per cent in FY21. We are also evaluating drilling methods to increase post-drainage capture, as well as additional pre-drainage targets.

At Dendrobium mine, we recently received NSW Government approval to install additional coal seam gas drainage infrastructure, which will enable flaring and destruction of methane gas. Dendrobium has lower methane content than Appin and experiences greater variability of gas quantity and composition, so we cannot use the captured gas for power generation, which requires a stable supply at higher methane concentrations. Instead, we plan to use flaring technology to convert methane to carbon dioxide, reducing the potency of GHG released to the atmosphere.

(18) Australian Government, Clean Energy Regulator, National Greenhouse and Energy Reporting, Global Warming Potentials, 1 July 2020 amendments
(19) Refer to market release dated 23 August 2022 at *www.south32.net*

Ventilation air methane

While our gas drainage program is able to capture gas from the coal seams pre- and post-mining, some residual gases, including VAM, may still enter the underground mine ventilation system.

VAM occurs at low concentrations (0.15 to 1.5 per cent) which existing gas drainage technologies are unable to capture. While the concentration is low, the volume of air that moves through the ventilation system is high, so VAM is still a significant source of GHG emissions.

We have been working in partnership with Australia's national science agency, CSIRO, since 2013 to develop new VAM abatement technologies that can be deployed at scale.

A project to design, construct and test a commercial scale demonstration plant using CSIRO's VAM mitigator (VAMMIT) at Appin commenced in FY22. VAMMIT is a compact thermal flow reversal reactor with a regenerative bed, which oxidises methane to produce water and carbon dioxide.

The NSW Government and Coal Innovation NSW committed A$15 million of funding for the project, in addition to our A$4.5 million commitment. The proposed commercial-scale unit aims to reduce GHG emissions by an estimated 30,000 CO_2-e per year, based on an average VAM concentration of 0.33 per cent.

We are now moving to the final stage of developing the technology to be safely deployed in an underground coal mine. Once completed, the demonstration facility will remain on site for continuous operation to achieve further GHG emissions reduction, with potential for additional units to be installed across Illawarra Metallurgical Coal and other underground mines in Australia.

Other operations

The emissions profile and abatement challenges at our lower emitting operations arise from different sources and have site-specific characteristics that require tailored solutions. For example, Cerro Matoso's emissions arise from grid-sourced power and integrated ferronickel smelter gas consumption, while our South Africa Manganese operation produces emissions from a mix of surface and underground mining fleet, grid electricity imports and process emissions at the Mamatwan sinter plant.

Decarbonisation of these operations forms part of our annual planning and is supported by trials and collaborations, for example our 3 megawatt solar array at Cannington.

Technology and innovation

Technology and innovation are crucial enablers of the transition to a low-carbon world and will be critical to delivering against our decarbonisation plans. However, some of the innovations we need to meet our long-term goal are not yet technologically or commercially feasible.

This presents an opportunity for the whole industry and we are playing an active role by reviewing, developing and trialling technology solutions for our operations and our development options. We complement our own technology programs by collaborating with other companies, industry groups and research organisations with shared challenges that can potentially be addressed through innovation.

Our Innovate32 approach focuses on creating value through innovation with strategic focus areas including the Next Generation Mine mission, which seeks to reshape the way we mine. This mission studies the application of low-carbon design principles as part of the initial design and mine plan for the Hermosa project. Options include the use of electric mining equipment and vehicles, reduced operational footprint, low-carbon and renewable energy supply and energy efficiency technologies. Many of these options are being investigated through the collaborative initiatives set out below.

Learn more about **Innovate32** in our Annual Report at www.south32.net

Electric Mine Consortium

We are a founding member of the Electric Mine Consortium, which aims to accelerate progress towards a fully electrified, zero carbon, zero particulates, mine. The Consortium is pursuing workstreams aligned to our decarbonisation objectives, including mine design; light and auxiliary battery electric vehicles (BEV) and ancillary equipment; underground haulage; surface and long road haulage; energy storage; and electrical infrastructure. Participating in the consortium helps us make informed decisions about technology options through direct and indirect trials, and is one of the fastest ways to learn and leverage broader industry research for our business.

We are leading trials for underground light BEVs and associated electrical infrastructure at our Cannington operation. The installation of charging infrastructure, and fit-out and testing of the new BEVs was completed in FY22. The trial is planned to run for a minimum of 12 months, with the vehicles expected to continue at Cannington once the trial is complete.

For more information on **the Electric Mine Consortium**, visit www.electricmine.com.

BluVein

In FY22, we became a funding partner in the development of BluVein, an underground trolley assist system that seeks to accelerate the transition of heavy mining fleets to electrification. BluVein is a dynamic charging battery technology which aims to address some of the existing limitations of traditional heavy fleet batteries such as size, weight and cost, the requirement for in-shift recharging/battery swapping, and life cycle and disposal challenges.

Similar to the Electric Mine Consortium, our work with BluVein technology is being undertaken with the intention to support decarbonisation initiatives at our underground mines.

For more information on **BluVein**, visit www.bluvein.com.

Heavy Industry Low-Carbon Transition Cooperative Research Centre

We are a founding member of HILT CRC, a collaborative venture between industry, government and research organisations. HILT CRC was formed to develop and accelerate technologies for heavy industry to transition to net zero.

In FY22, we were an active partner in five of HILT CRC's QuickStart projects, covering topics such as low emission calcination and steam generation, energy storage, regulatory implications, and emissions profiling.

For more information on **HILT CRC**, visit www.hiltcrc.com.au.

Long Duration Energy Storage Council (LDESC)

The LDESC is an international council that was formed in 2021 at COP26 with the aim to accelerate nascent energy storage technologies that are required for the energy transition.

South32 joined the LDESC in 2022. Our participation provides access to solutions, technology and third-party investment that we are otherwise unable to pursue on our own, such as thermal storage for alumina heat.

For more information on **LDESC**, visit www.ldescouncil.com.

Carbon offsets

Our decarbonisation plans prioritise avoidance and mitigation, in accordance with our mitigation hierarchy. However, carbon offsets are likely to be required for residual emissions to deliver our long-term net zero operational GHG emissions by 2050 goal. Residual emissions may include 'hard to abate' emissions arising from chemical processes and fugitive emissions.

Use of carbon credits may be utilised in the near term to meet regulatory requirements in South Africa and Australia. In South Africa, the government extended the existing carbon credit exemption rules of the South African *Carbon Tax Act, 2019*. In Australia, we anticipate reform of the central climate change policy tool, the Emissions Reduction Fund, is likely to include tightening of emission limits under the Safeguard Mechanism which may promote demand for Australian Carbon Credit Units.

We may also use carbon offsets to support our ability to place products, should demand for carbon neutral base metals or aluminium emerge.

The agreement on the Article 6 mechanism at COP26 marked an important development in global carbon offset markets. The definition of a new form of carbon offset, double-counting safeguards and limits on use of carbon offset from the Kyoto Protocol's Clean Development mechanism, have clarified future global carbon market rules.

The private-sector led Taskforce on Scaling of Voluntary Carbon Markets (TSVCM) has made progress towards upscaling an effective voluntary carbon market. In late 2021, the TSVCM announced the creation of the Integrity Council for the Voluntary Carbon Market (the Council) as an independent governance body for the voluntary carbon market. The Council will have an initial focus on developing Core Carbon Principles (CCPs) and an accompanying threshold standard for voluntary carbon offsets. The CCPs are expected to set quality standards for the voluntary use of carbon offsets, including strong environmental and social integrity.

We will continue to monitor regulatory and market developments closely as we mature our approach to carbon offsets and credits, aligning with robust, credible standards and expectations. We will preference carbon offsets and credits sourced from jurisdictions in which we operate, from projects that benefit local communities or Indigenous, Traditional or Tribal Peoples, and provide co-benefits linked to our other sustainability objectives (e.g. just transition, social performance, biodiversity) to maximise value.

In FY22, we established a dedicated carbon markets team to monitor global and regional carbon market developments and procure carbon offsets and credits.

Just transition planning

Just transition is the fair, equitable and inclusive social transition towards a low-carbon global economy. We understand that our decarbonisation initiatives are likely to impact some of the communities and regions where we operate and that a well-planned and just transition can create new and long-term opportunities. We are committed to supporting a fair and equitable transition for people, communities and other stakeholders.

Our current just transition planning is focused on Hillside Aluminium and Worsley Alumina. These operations and connected businesses sustain significant energy coal supply chains that are large employers. The transition away from the use of energy coal creates both risk and opportunity for people, communities, regions and supply chains. We are working with governments, communities and other stakeholders to determine the best pathway towards a low-carbon future for these operations and regions.

Establishing a framework to support just transition

In FY22, we developed guiding principles which align with the objectives of the Paris Agreement and will be used to integrate just transition planning into our decarbonisation planning and decision making. These principles were developed following a review of technical papers[20], guidelines[21] and peer practices and will be integrated into our business processes and standards.

Our just transition guiding principles

NET ZERO PATHWAY	Alignment of the net zero pathway with just transition principles is critical to support access to clean energy and a safer, more sustainable world for generations to come.
WORKFORCE EVOLUTION	Plans should consider how to equip workers with skills for employment opportunities arising from the transition to a low-carbon economy, promote equitable and decent jobs and shield workers from adverse impacts as far as practicable.
COMMUNITY RESILIENCE	Plans should consider the impacts on communities of the transition through protecting the natural environment, providing support for local development, supply chains and infrastructure.
STAKEHOLDER COMMUNICATION AND COLLABORATION	Plans must be developed in collaboration with all material stakeholders, to co-create solutions that generate maximum value across the value chain.
GOVERNANCE AND TRANSPARENCY	Strong governance and accountability underpin just transition plans. Core outcomes are identified, monitored and reported.

(20) For example, the UNFCCC's Technical Paper on Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs
(21) For example, the International Labour Organisation's guidelines for a just transition towards environmentally sustainable economies and societies for all (2015)

Scope 3 GHG emissions

Scope 3 GHG emissions include those associated with upstream activities, such as embodied emissions in goods and services we use, and downstream activities such as the processing and end-use of our products by our customers. We have been reporting Scope 3 GHG emissions since FY17.

While we do not have direct control over Scope 3 GHG emissions, we have a critical part to play in contributing to the decarbonisation of the value chain for our commodities. To support this, we have set a new goal of net zero Scope 3 GHG emissions by 2050.

We are progressing near-term actions including partnering with customers and suppliers to support and co-design emissions reduction programs, contributing to industry decarbonisation and product stewardship initiatives, and supporting the development of innovative technology solutions. We will continue to assess the impact of our portfolio decisions on value chain emissions, and we expect that our Scope 3 GHG emissions intensity will decrease as we increase our exposure to base metals.

LONG-TERM SCOPE 3 GOAL: Net zero Scope 3 greenhouse gas emissions by 2050
with near-term actions in three strategic areas - Partnerships, Industry Engagement and Innovation

PARTNERSHIPS
Building meaningful partnerships with customers and suppliers to support and co-design emission reduction programs

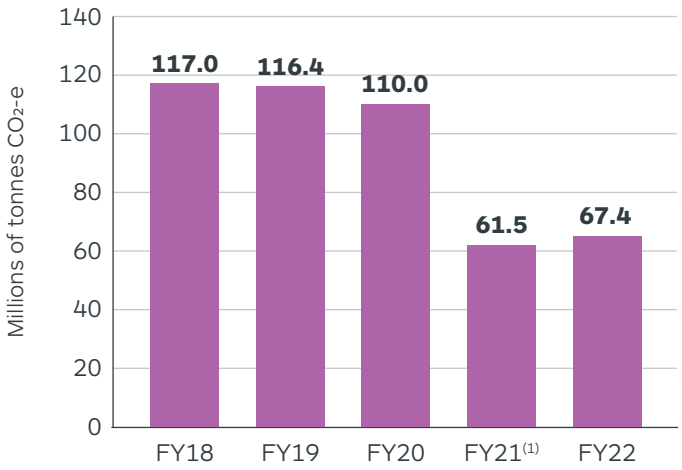
INDUSTRY ENGAGEMENT
Contributing to industry groups that support decarbonisation and product stewardship initiatives

INNOVATION
Supporting the development of technology solutions to address value chain emissions

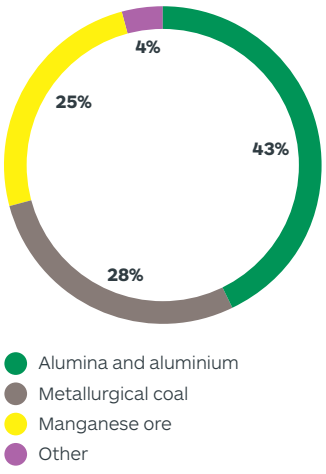
FY22 Scope 3 GHG emissions

In FY22, we reported Scope 3 GHG emissions of 67.4 Mt CO_2-e[22], ten per cent higher than the adjusted FY21 reported emissions of 61.5 Mt CO_2-e[23]. This is primarily due to changes in the global warming potentials for bauxite mining and electrolysis, an increase in spend profile related to purchased goods and services and upstream transportation and distribution. The acquisition of a 45 per cent interest in Sierra Gorda copper mine in Chile resulted in an increase in investment-related downstream emissions when compared to FY21.

Scope 3 GHG emissions



FY22 Scope 3 GHG emissions by commodity



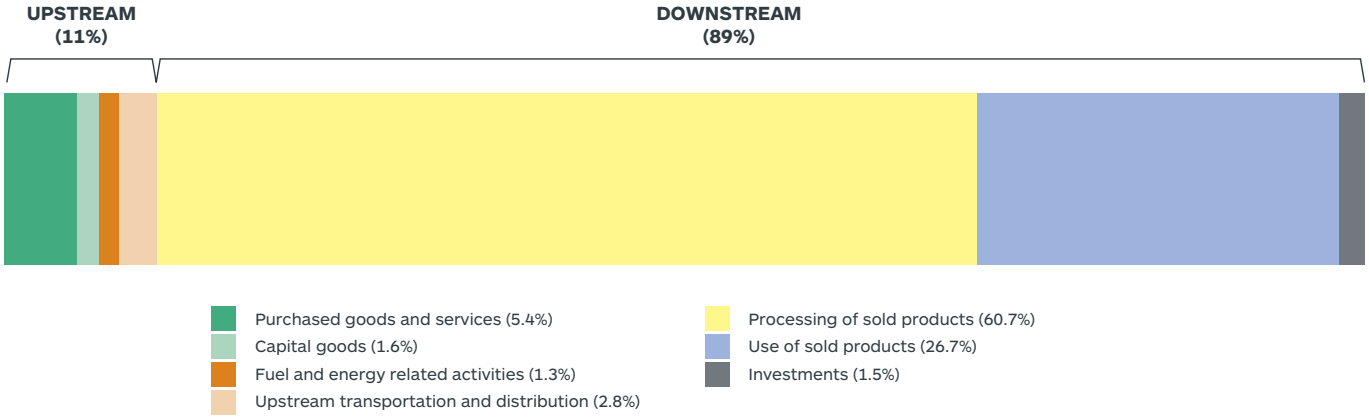
(1) FY21 emissions adjusted to exclude GHG emissions from SAEC and TEMCO, which were divested in FY21.

Notes: Estimate of Scope 3 GHG emissions by commodity are based on processing and use of sold products, and apportionment of other categories.

(22) Includes emissions associated with Sierra Gorda operations (South32 share).
(23) Reported FY21 Scope 3 GHG emissions adjusted to exclude SAEC and TEMCO which were divested in FY21. Unadjusted FY21 Scope 3 GHG emissions were 106 Mt CO_2-e.

In FY22, almost 90 per cent of reported value chain emissions were attributable to the downstream use and processing of our products, particularly the processing of alumina to manufacture aluminium ingots and use of metallurgical coal to make steel.

FY22 Scope 3 GHG emissions by position in the value chain



A **description of Scope 3 GHG emission categories and methodologies** is available in our 2022 Sustainability Databook at www.south32.net

Scope 3 GHG emissions reduction

Although we do not have direct operational control over upstream and downstream activities, we are committed to proactively collaborating with our suppliers, customers, industry peers and other value chain partners to make a meaningful contribution to the actions and innovations required to reduce these emissions.

To guide our progress towards our long-term Scope 3 goal, we have identified near-term actions across three strategic areas – partnerships, industry engagement and innovation. Our actions are underpinned by the:

- Current knowledge and understanding of the areas of material exposure, both from a Scope 3 category as well as a commodity portfolio perspective;
- Degree of control over upstream emissions and the ability to influence our downstream emissions;
- Level of support that we can provide towards the development of sectoral decarbonisation approaches; and
- Need to participate in activities to develop innovative technologies that will drive the transition of value chain emissions, despite the level of uncertainty.

In developing our approach, we considered the materiality of Scope 3 GHG emissions in each reported category and the level of control or influence we have on the associated activities. For example, purchased goods and services in the upstream value chain contribute 5 per cent of reported Scope 3 GHG emissions. We aim to influence emissions reductions in the upstream value chain and in FY23 we intend to define a vendor selection process that enables preferential sourcing of raw materials with a lower level of embodied GHG emissions, as compared to the current state. Our intention is to select key suppliers and collaborate to develop options to reduce their operational GHG emissions. Our collaboration with suppliers will also consider alternative metrics to plan and track interventions to achieve emissions reductions, such as engagement and other non-emission targets. Similarly, we are able to influence the emissions associated with transport and distribution of our products through our participation in maritime decarbonisation initiatives.

To address the complex challenges associated with decarbonisation activities in the value chain, where we have comparatively less ability to influence the use and processing of our products in the near term, we are planning to focus on:

- Our goal of entering into four partnerships with key customers to collaborate on emissions reduction initiatives in the downstream value chain by FY25;
- Our goal of working with at least four tier one suppliers to identify options to reduce GHG emissions in the value chain, commencing in FY23. This includes progressing our existing programs to support vessel owners and fuel suppliers in developing alternative or dual shipping fuels (see case study);
- Collaborating to improve accounting of GHG emissions associated with processing and use of our products. We will also explore the innovative use of data analytics, artificial intelligence and other smart technologies to manage complex data and identify potential improvement opportunities across the value chain;
- Participating in relevant stewardship and innovation initiatives to develop net zero pathways for our key commodities, including ResponsibleSteel, ICMM and the Aluminium Stewardship Initiative (ASI); and
- Implementing a continuous monitoring program for the shipping emissions baseline developed in FY22 to identify emissions reduction opportunities (see case study on page 92).

The near-term focus reflects the early stage of value chain decarbonisation planning. We intend to develop a longer-term pathway for value chain decarbonisation, building on insights gained from our near-term actions and reflective of relevant sectoral decarbonisation pathways.

Improving Scope 3 GHG emissions accounting

Understanding the quantum of GHG emissions in the value chain helps us to assess potential climate change transition risks outside of our operations and develop an informed approach to value chain decarbonisation.

Estimating emissions from activities under the operational control of others can be challenging in practice. Typically, limited information has been available on critical parameters such as fuel inputs, processing technologies and other essential operating inputs. There are also complexities in how emissions should be tracked and apportioned to different companies in a shared activity (sometimes referred to as carbon or emissions traceability). Improvements in both accuracy and traceability are necessary to evaluate results of Scope 3 emissions reduction activities at a number of levels, including individual organisations, sectoral initiatives, and global decarbonisation efforts.

We recognise that our customers want to understand the emissions associated with our sold products as one input into their GHG inventories and value chain decarbonisation plans. We continue to work on chain of custody requirements through product stewardship initiatives and are actively exploring options to participate in life cycle assessments to improve Scope 3 emissions calculation methodologies for our key products.

Industry groups

In 2022, Mozal Aluminium achieved ASI Performance Standard Certification (Provisional). ASI certification supports the responsible production, sourcing and stewardship of aluminium across the value chain, and Performance Standard Certification demonstrates that a facility's production practices are consistent with ASI's ESG criteria. ASI certification supports sales of our products to customers in the European Union. The standard includes a number of requirements linked to GHG emissions, including:

- Disclosure of independently verified energy and emissions data;
- Limits on emissions intensity for current operations and at future milestone years (2025 and 2030); and
- Establish and regularly review a publicly disclosed GHG emissions reduction plan.

We are also considering certification for our broader aluminium supply chain against the new ASI Performance Standard which was released in May 2022.

South32 joined ResponsibleSteel in July 2021 to support the development of pathways for the sustainable production and use of steel, including value chain emissions. ResponsibleSteel developed the steel industry's first global standard and certification initiative, to promote responsible sourcing and production of steel. During FY22, we provided input into the drafting of the revised ResponsibleSteel Standard alongside other commodity producers and steel makers, which includes responsible sourcing and GHG emissions requirements for site and steel certification.

Addressing GHG emissions associated with shipping of our raw materials and products

In FY22, we signed a contract of affreightment with Klaveness Combination Carriers (KCC) to develop and implement a carbon emissions adjustment factor mechanism from January 2023. The actual speed of a vessel is partly impacted by scheduling and customer requirements as well as KCC's speed optimisation preferences, which are determined by market earnings and fuel prices. The mechanism is used to adjust the freight rate per metric tonne upwards or downwards depending on actual emissions performance versus an agreed baseline. In doing so, KCC is able to implement operational and energy efficiency measures in the short-term to reduce emissions, enabling us to address GHG emissions associated with shipping caustic soda to our Worsley Alumina operation.

We also partnered with ZeroLab, a subsidiary of Klaveness, on a project to create a baseline and identify potential GHG emissions reduction opportunities. We created an interactive web-based dashboard that allows us to monitor GHG emissions associated with shipping raw materials (upstream value chain) and products (downstream value chain). The dashboard indicated that 85 per cent of GHG emissions associated with shipping activity in the downstream value chain are attributable to trades of manganese ore, alumina and metallurgical coal. In FY23 we will develop a baseline against which we can evaluate our progress in addressing shipping emissions and implement a continuous monitoring program.

Physical climate risks

Physical climate risks are driven or intensified by weather, climate variability or climate change. They include acute risks, resulting from increased frequency or severity of extreme weather events (e.g., drought or flood events) and chronic risks, resulting from longer-term changes in climate patterns (e.g., sustained higher temperatures, sea level rise).

Left unmanaged, physical climate risks may impact on the integrity and performance of our equipment and infrastructure, compromise productivity, and disrupt business continuity (including our supply chain activities). Financial implications could include asset impairments, increased maintenance costs and the impacts of supply chain disruption. Financial performance could also be affected by changes in water availability, food security, and extreme temperature changes impacting operations, supply chains, and employee health and wellbeing.

While physical climate risks may impact on our business directly, there are also broader environmental and socio-economic impacts on key stakeholders including local communities. Our assessment and management approach considers the potential vulnerabilities of surrounding communities, ecosystems, key suppliers and customers across the value chain.

Designing an assessment methodology

We published our first round of assessments of the physical risks of climate change across our operated assets in 2018 and 2019. Key outcomes were integrated into our strategic and operational planning, which informed infrastructure investments such as the construction of a pipeline from Wellington Dam to the Worsley Alumina refinery to improve the reliability of water supply, and installing desalination plants at our Hillside Aluminium and Mozal Aluminium smelters to mitigate potential water shortages.

In FY22, we revisited these assessments across our operated portfolio with a focus on:

- Integration of the latest climate data projections in our key areas of operation, under a range of emission scenarios;
- Incorporation of physical climate risk assessment methodologies developed across industry since 2019;
- Improved integration with existing business frameworks, to incorporate physical climate risk assessment, mitigation and adaptation planning into core business processes instead of as a periodic standalone activity; and
- Consideration of how the financial impacts associated with management of the physical risks of climate change may be meaningfully captured.

We worked with independent experts to design an assessment methodology that focused on identification and prioritisation of risk areas to inform both adaptation options and, over time, evaluation of potential financial impact. The methodology was informed by our existing business frameworks and procedures, and incorporated a mapping exercise to link identified risks to our strategic risks.

The assessment began with a review of the existing risk registers for each of our operated assets which identified existing risks that may be amplified by climate change, for example by altering the frequency of occurrence, severity of consequence and/or spatial distribution of a particular risk. New or more specific risks driven by climate change that were not already captured on the existing risk registers were identified and added. Both desktop analysis and interactive site workshops were used to explore these concepts, enabling an understanding of the incremental effects of climate change on each operation's risk profile.

Selection of climate models and parameters

Climate projections used for our FY22 assessment were sourced from a range of local and international data sources. For all locations, data from the Coupled Model Intercomparison Project 5 (CMIP5) was used, as it has widespread availability in a regional downscaled format.

Further information on the data sources used to develop our climate projections are detailed in our 2022 Sustainability Databook at *www.south32.net*

The data from CMIP5 assumes future climate changes in line with the IPCC RCPs, which project the effect of human activities on GHG concentrations in the atmosphere and subsequent radiative forcing by the year 2100. The data was assessed under RCP4.5 and RCP8.5[24] to provide a robust understanding of the potential scale of impacts, and subsequent mitigation and adaptative controls which may be required. RCP8.5 goes beyond our base case assumption of at least 2°C of warming, and assumes more severe physical impacts. When considering the resilience of critical infrastructure and requisite adaption planning, it is necessary to consider more severe impacts in line with the precautionary principle. There is relatively little divergence between the outputs from climate model simulations driven by different RCPs until after 2050, so RCP8.5-based climate scenarios do not provide notably different analyses on climate risks over planning timescales of 20-30 years.

The assessment highlighted the most significant climate parameters for each region. From this raw data, climate hazards[25] of concern were identified and a climate hazard assessment conducted. Hazards were categorised as acute or chronic risks, a timescale of when the hazard may manifest was provided, and impacts on assets, operations, supply chain logistics and safety of workers were identified.

Data and analysis will continue to be updated as new resources and techniques emerge. Findings from the recently released IPCC 6th Assessment Report (AR6) have informed qualitative projections for each site. Although AR6 made regional observations, the model that underpins AR6 and CMIP6 is currently only available at the global level, but once it becomes available at the regional level it will be incorporated into the data sources and our projections will be updated.

(24) Developed in 2007 and used in the IPCC's 5th Assessment Report. There are four RCPs representing possible future GHG emissions and concentration scenarios: RCP8.5, RCP6.0, RCP4.5 and RCP2.6. Each RCP defines a specific emissions trajectory and subsequent 'radiative forcing'. RCP4.5 equates to between 1.1°C and 2.6°C of warming by the end of the century. RCP8.5 equates to between 2.6°C and 4.8°C of warming by the end of the century. (*https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter12_FINAL.pdf*)

(25) According to the IPCC, climate risk results from the interaction of hazard, exposure and vulnerability. Hazard refers to the potential occurrence of climate-related physical events or trends that may cause damage and loss.

Selection of time horizons

Climate data projections used in our assessment were developed for 2030, 2050, and 2090. The 2030 and 2050 projections provide climate data for use in our operations and business planning. For physical risk beyond 2050, we maintain an RCP8.5 resilience scenario for consideration of sea-level rise. The 2090 projections provide an indication of the trajectory of emissions and warming potential expected over the long-term.

Climate hazards of concern were identified for each of our operations based on 2050 climate projections. Levels of confidence in that identification differed depending on the availability of data and the number and range of assumptions required. The assessment considered potential impacts on assets, operations, supply chain logistics and safety of workers, arising from acute risks (rainfall, drought, storms, flood risk, fire weather) and chronic risks (temperature, sea level rise). The climate hazard assessment informed our risk reviews across our operations.

Changes in climate hazard context by asset

	Temperature	Rainfall	Drought	Storms	Flood risk	Fire weather	Sea level rise
Cannington	●	○	○	○	●	●	●
Groote Eylandt Mining Company	●	○	○	○	●	○	●
Illawarra Metallurgical Coal	●	○	○	●	●	●	●
Worsley Alumina	●	●	●	○	○	●	●
Hermosa	●	●	●	○	○	●	●
Mozal Aluminium	●	●	●	●	●	●	●
South Africa Manganese	●	○	●	●	●	●	●
Hillside Aluminium	●	●	●	●	●	●	●
Cerro Matoso	●	○	○	●	●	●	●

● Likely noticeable change to the projected magnitude and/or frequency of the climate hazard, with a high level of confidence

○ Possible noticeable change to the projected magnitude and/or frequency of the climate hazard, with a moderate level of confidence

Note: Graphic applies climate projections developed for 2050 under the RCP8.5 scenario.

Outcomes and next steps

Using the assessment methodology described on page 93, approximately 1,000 risks were reviewed across our operations. Of these, approximately 220 were assessed to have an additional cause relating to physical climate risk, or an increase in the likelihood or impact of the event. Further work is planned to implement additional controls (such as the development of adaptation pathways) that address the additional causes for these risks, and to reduce the impact or likelihood of the risk event occurring.

This work will aim to further embed the consideration of physical climate risks into our business frameworks and processes, and support future reporting on material physical climate risk, our management responses and the potential financial impacts.

The high-level themes that emerged across our operations from our physical climate risk assessments are described in the table below.

High level outcomes of physical risk assessment

Land and terrain	Closure is a primary area of potential physical impacts from climate change for our business, due to impacts on closure likely to be more significant for long-horizon assets that are forecasted to close after 2050.
Physical assets and structures	Design of existing assets may be inadequate to cope with projected climate extremes, and mitigation or adaptation may be required.
Water	Climate change is likely to exacerbate the risks to water supply, storage and usage that we currently manage. Operations in areas of water scarcity may be particularly exposed, and increased severity of extreme rainfall events may increase risk of overtopping of storage facilities.
Transport routes	Climate change may increase risks to our logistics and supply chains across most of our operations, particularly at single points of failure.

In addition to updating our risk registers and undertaking deep dive reviews of material risks where appropriate, we are planning to also focus on network risk, closure and supply chain in FY23.

More resilient logistics chains support reliability of production and supply, but existing non-material risks become material when considered in a networked scenario. To consider the effect of networked risks, we intend to undertake physical risk assessments across our logistics chains for specific sites, to stress-test critical components of our logistics chains against extreme weather scenarios. For example, rail, road, conveyors and port outages at our Worsley Alumina operation are currently assessed independently but, should acute climate impacts manifest across the network simultaneously, operational continuity risk may become material.

We intend to review our governance frameworks to validate that our closure management practices adequately capture and address long-term climate effects. The impacts of climate change are projected to manifest generally over the same timeframes as the estimated closure date of many of our operations. Closure risks and climate change are projected to manifest slowly across our operations yet may carry high costs to our communities and stakeholders. Longer term assets are likely to face more significant challenges and rehabilitation costs given the effects of climate change on ecosystems and biodiversity.

We also intend to undertake an assessment of our critical suppliers, key supply routes and supply chain interdependencies to better understand and improve low points of resilience in the value chain. For example, Mozal Aluminium and Hillside Aluminium rely on Worsley Alumina's export capacity for their production. This means there is a critical interdependency between operational continuity at Worsley Alumina, production at our aluminium smelters and the stability of the supply chain connecting them.

Good governance is essential to the way we work – to our actions, decisions, communications and behaviours.

Our Board continues to acknowledge the unique relationship between resource companies and the communities in which they operate, and the standards and expectations of our Company to act lawfully, ethically and responsibly.

Read more about **our approach to corporate governance** at www.south32.net/who-we-are/risk-governance

Climate change governance

Board oversight

Climate change is a material strategic and governance issue that is overseen by our Board, with the support of its standing Committees. The Board considers that integration of climate change mitigation and adaptation into our strategy is integral and oversees this integration together with the appropriate management of relevant risks and opportunities. Our Board is responsible for our strategy and also approves the Group's overall climate change approach, policy positions and this Plan.

In April 2022, our Board participated in our annual CEO-led strategy day and discussed our strategy and vision for the future. Key themes included our response to climate change and other critical environmental, social and governance (ESG) issues, and how we address them by delivering on our strategy.

Climate change is routinely discussed in Board and Committee meetings and has been integral to our strategy since our establishment in 2015. It is a key consideration in strategy, annual budget, capital allocation, statutory disclosure and investment decision making and it is recognised and managed as a strategic risk. During FY22 Board and Committee meetings, discussions continued to focus on climate change risk management in the context of our strategy. An update to our Sustainability Policy was approved in FY22 with amendments made to reflect, amongst other things, evolving societal and shareholder expectations on ESG issues. The Sustainability Committee's Terms of Reference were also updated to include specificity on delivery against climate change related targets and objectives.

Climate change expertise

The composition of our Board seeks to bring together Directors with an appropriate range of skills, expertise and experiences from a diverse range of backgrounds necessary for the Board to discharge its role and responsibilities effectively given our purpose, strategy, size, operations and geographic footprint. This includes collective skills to address existing and emerging business and governance issues relevant to the Group including a fluency in the implications of climate change.

In FY22, the annual skills evaluation of the Board involved individual Director self-assessments, along with an external assessment of each Director's competencies. This information was then used to populate the Board skills matrix. The FY22 evaluation found that the majority of our Board members are either highly skilled or skilled in the environment and climate change competency in the South32 Board skills matrix.

Our Board members are also experienced in a number of other areas including mining and metals, commodity value chain, strategy, finance, risk management and regulatory and legal compliance, all of which are relevant to understanding the potential implications of climate change on our business and associated risks and opportunities.

Further details of the qualifications, skills and experience of our Directors are set out on pages 64 to 71 of our 2022 Annual Report and the Board skills matrix is on pages 10 to 12 of our 2022 Corporate Governance Statement, available at *www.south32.net*

Our Directors supplement their climate change experience and knowledge with quarterly updates from management on developments in climate-related physical, economic transition and liability issues. From FY23, these updates will be provided at every Sustainability Committee meeting. There is also an annual briefing facilitated by independent experts addressing emerging climate change issues and related societal expectations and trends. This equips our Directors with the insights to consider potential implications of climate change on the Company's strategy and our operations, the systemic risk and potential impacts on our portfolio, as well as the regulatory, policy and societal developments in the area.

Board committees

Board-led standing committees guide Directors in oversight and approval of our emissions reduction targets and goals, climate change risks and potential impacts on operations, remuneration considerations and disclosures.

The role of the Sustainability Committee is to assist the Board by overseeing the sustainability management, performance, assurance and reporting practices of the Group. The Committee receives regular reports from management on climate change progress, and updates from internal and external experts about developments in climate science, policy, regulation and technology. Our Board, together with the Sustainability Committee will oversee management's implementation and further development of this Plan, the development of subsequent Plans, and our progress in meeting our commitments.

The Risk and Audit Committee assists the Board in overseeing the corporate reporting, risk management and assurance practices of the Group, and has oversight of the Group's risk management framework. Our climate change and environment strategic risk, and its associated key risk indicators and management responses, are monitored and evaluated twice a year.

In addition, the Risk and Audit Committee discusses the approach to inclusion and integration of climate-related disclosures in financial reporting, with input from the external auditor.

The Remuneration Committee assists the Board to oversee the Group's remuneration policy and has responsibility for gaining assurance that our remuneration and benefits framework is aligned to the long-term interests of our shareholders, operates within our risk appetite and supports our purpose, strategy and values. The Remuneration Committee also makes recommendations to the Board on the annual business scorecard and associated outcomes, the remuneration outcomes for the CEO and approves the remuneration outcomes for the Lead Team taking into consideration any recommendations from the Sustainability Committee and Risk and Audit Committee.

The Nomination and Governance Committee assists the Board in periodically reviewing the composition of the Board to determine whether it remains appropriate for the Group's purpose and strategy and whether the Board possesses the skills needed to address existing and emerging business and governance issues relevant to the Group.

In 2022, the Nomination and Governance Committee approved revisions to the skills descriptions and their relevance to South32 in the Board skills matrix. In addition to changes to the environment and climate change skill, climate change and other ESG considerations were integrated into relevant skills (such as strategy, commodity value chain and risk management) to align with our governance documents and societal and stakeholder expectations of our Board.

Our Board receives reports from each of the Committees, which it uses as input into the discharge of its responsibilities and reserved functions in relation to our strategy, budget, allocation of capital, corporate development decisions, risk oversight and statutory disclosures.

Executive and Management

Our CEO, together with our Lead Team, is accountable for execution of our approach to climate change in accordance with their delegated authority. Lead Team performance is assessed through a range of measures including with respect to climate change (see below for more information). The Legal and External Affairs team advises the Lead Team on climate change and provides regular updates on our progress against our plans. The Lead Team may also seek additional advice from external climate change advisers on particular subjects.

Stakeholder engagement on climate change

Engagement is an integral part of our purpose – we are trusted by our owners and partners to realise the potential of their resources. Through our stakeholder engagements we benefit from the insights and feedback provided on our approach to climate change and our performance.

Our Board and management regularly engage with shareholders, investors and proxy advisers for feedback, with climate change a key topic of discussion. Board engagement takes place at our Annual General Meeting and through Director-led engagements throughout the year with investors and proxy advisers.

Management engagements include two financial results roadshows each year, investor briefings and investor one-on-one meetings throughout the year. Feedback from these stakeholde engagements is shared with all members of our Lead Team and Board.

In FY22, we provided a Strategy Briefing led by our CEO and our first Sustainability Briefing, jointly led by our Chair and CEO, with other Lead Team members also participating. Both briefings were attended by investors and other stakeholders. They provided an update on our approach to climate change, its integration with our strategy and the potential demand outlook for our commodities in a 1.5°C scenario.

Since the inclusion of South32 in the Climate Action 100+ (CA100+) list of focus companies, we have had regular and productive engagement with our lead investor at CA100+, HESTA. We also regularly engage with the broader CA100+ group, including supporting investors and investor networks. We have actively participated in the CA100+ Net Zero Company Benchmark (NZCB) assessment process of South32 and this benchmark has guided the disclosures in this Plan. More recently, we participated in the CA100+ NZCB diversified miners dialogue, which aims to develop a benchmarking approach that is suitable for the diversified mining sector.

Learn more about **our response to the CA100+NZCB** in our 2022 Sustainability Databook at www.south32.net

Other investor networks and initiatives we regularly engage with include the Investor Group on Climate Change, the Institutional Investors Group on Climate Change, the Science Based Targets initiative, Market Forces, the Australasian Centre for Corporate Responsibility and the Australian Shareholders' Association. Management also engages with industry associations to promote greater transparency of their climate change positions and enable more effective advocacy, knowledge sharing and on-ground action.

Advocacy and our climate change positions

Our approach is underpinned by our positions on key climate change matters. These positions inform our decision making, support our external engagement with stakeholders and guide our contributions to public inquiries either directly or indirectly through our industry associations.

Our current climate change positions are outlined below. We will continue to review these positions as may be necessary to reflect updates in our Sustainability Policy.

We support:

- The Paris Agreement objectives to limit global temperature rise to well below 2°C this century, and to pursue efforts to limit the increase to 1.5°C. We will regularly review our approach in the context of the UNFCCC actions, credible sources of climate science and emerging regulation;
- Principle-based carbon price mechanisms that promote least-cost abatement, collaboration and international transfers, that align with rules determined under Article 6 of the Paris Agreement. There should be bi-partisan policy linking to the Paris Agreement objectives, and flexibility in carbon market design during a transition period to accommodate sector- and country-specific challenges;
- Technology-neutral energy policy that balances affordable access to reliable energy and emissions reduction, and technology-banded policy or subsidies to accelerate technology deployment; and
- Collaboration across the value chain to strengthen product stewardship, encourage innovation and reduce emissions.

Industry associations

Participation in industry associations is an important avenue to engage and influence matters affecting South32, which complements our own activity to advocate for or seek to influence policy on issues consistent with our purpose and strategy, including climate change. Membership offers opportunities to understand and contribute to industry best practice and contribute to knowledge sharing.

We regularly engage with industry associations to promote greater transparency on our respective climate change positions to improve alignment, and contribute to knowledge sharing, proactive advocacy, and tangible action. *Our Approach to Industry Associations*, outlines how we govern this important area. The approach includes:

- A requirement that an industry association's purpose and policy positions are aligned with our own;
- The process we follow where a material policy difference or misalignment exists;
- Principles and procedures that guide our involvement; and
- A list of our material industry association memberships.

Read **Our Approach to Industry Associations** at www.south32.net/who-we-are/our-approach/industry-associations

We recognise that there is significant stakeholder interest in the advocacy and policy positions of industry associations. Industry associations are by nature representative of similar member interests, but often from varied backgrounds and perspectives, so consensus on all issues is not always possible. We believe healthy debate and discussion can often lead to better industry outcomes. We prefer to advocate for climate action within an industry association, but will consider, on balance, whether any identified inconsistencies are sufficiently material to instigate action such as membership termination.

Our material industry association memberships are available on our website, including a reference to the fee band applicable.

In FY22, we joined the Minerals Council of Australia (MCA), the peak body for minerals producing companies in Australia. Our membership is driven primarily by adding value to the business, consistent with our purpose and our contribution to the industry. The MCA's policy positions and recent advocacy taken on climate change, including support for the Paris Agreement objectives, were key considerations in taking up membership.

Since 2019, we have undertaken an annual review of our member industry associations' policies on climate change and published our findings in our sustainability disclosures. At our 2021 Annual General Meeting, we committed to strengthening this review. Our latest review of industry associations found no material misalignments on climate change policy or advocacy.

Reflecting the increased focus on climate change by industry associations, many of the associations we are a member of either released or revised new climate change positions in FY22. Where practical, we actively participated in their development. We believe we have an important role to play in contributing to and formulating industry-wide positions that inform advocacy priorities.

We do not support direct advocacy from our industry association memberships on energy coal expansion or energy coal subsidies, particularly in the absence of an associated position on technology development, to remain consistent with the Paris Agreement. However, we note that many of the industry associations we are a member of contain broad commodity representation, including energy coal producers, which can occasionally create differing views. Where advocacy for energy coal is undertaken, we manage potential misalignment consistent with *Our Approach to Industry Associations*, but on balance found no material instances in this year's review.

Learn more about **our FY22 review of industry associations** in our 2022 Sustainability Databook at www.south32.net

Climate Change Action Plan Resolution

A non-binding advisory 'Climate Change Action Plan' resolution will be included in our 2022 Notice of Annual General Meeting. While the vote on the resolution is non-binding and the Board retains ultimate responsibility for our strategy, it provides shareholders with an opportunity to discuss and provide feedback on the Company's approach to climate change. We will engage with shareholders to understand the outcome of the vote and the Board will take the outcome of the resolution and feedback from shareholders into consideration when determining the Company's approach to climate change going forward.

To provide transparency to shareholders, we will continue to report our progress on climate change annually in line with the TCFD recommendations. We remain committed to regular stakeholder engagement on our approach to climate change and the progress we are making. Annual updates will be provided in our Sustainable Development Report, and we will also publish data on our performance on our website.

It is proposed that we will prepare an updated Climate Change Action Plan at least every three years which will be submitted to Shareholders for a non-binding advisory vote. We will consider seeking an advisory vote prior to then if significant changes are made to the Plan.

Executive remuneration

We hold our Lead Team accountable for aligning our business practices with our climate change commitments. Our executive remuneration is directly linked to our performance on climate change and the transition of our portfolio towards the metals critical for a low-carbon world.

Long-Term Incentive (LTI)

Our executive remuneration framework reinforces our focus on climate change through strategic measures included in our executive LTI from FY22. Ten per cent of our FY22 LTI award (granted in December 2021) is contingent on performance against a set of climate change measures and ten per cent is contingent on performance of the transition of our portfolio towards base metals required for a low-carbon world. Our performance against these measures will be assessed by the Board at the end of the performance period and the outcome, with the Board's rationale, will be disclosed in the Remuneration report.

Linking our performance on climate change to LTIs is aligned with the timeframe for the delivery of our decarbonisation, energy transition and just transition programs that support achievement of our GHG emissions reduction commitments. Our remuneration outcomes are intended to reflect the achievement of significant milestones and long-term value protection and creation.

FY22 Business Scorecard outcome

The annual Business Scorecard, together with individual performance assessments and any applicable Business Modifier, determines the short-term incentive (STI) payments made to our CEO, Lead Team and Senior Leadership Team, including operational leaders.

We track our sustainability performance (primarily focusing on health, safety, community, and, from FY23, water performance) and our "Next Generation Mine" innovation missions' performance in the annual Business Scorecard using performance measures that are approved by our Board.

The Business Modifier considers overall business outcomes or other factors that are not specifically contemplated in the Business Scorecard, such as fatalities, significant safety events or environmental events. The Business Modifier, which is based on Board discretion, ensures that STI outcomes reflect overall performance, including both what has been achieved and how it has been achieved.

Climate change risk management

Climate change, and the social and economic responses to it, pose risks to our portfolio, physical assets and people, as well as the infrastructure, markets, communities and environment on which we rely.

Climate-related risks are managed at both the company-wide strategic level and the local level for operations, functions and projects. We regularly assess these dynamic risks through a framework that considers policy, market and physical factors.

We use scenario analysis to stress-test the potential impacts of climate change on our business and to inform stakeholders about potential threats and opportunities.

Risk management framework

Risk management is fundamental to maximising the value of our business and informing its strategic direction. Effective risk management enables us to identify priorities, allocate resources, demonstrate due diligence in discharging legal and regulatory obligations, and meet the standards and expectations of our stakeholders.

Our approach to risk management is governed by our risk management framework, which has been in place since 2015. The framework is delivered through our System of Risk Management which is aligned to the principles of the International Standard for Risk Management AS/NZS ISO 31000:2018. This approach applies to all employees, Directors and contractors.

We report real-time risk data through our risk management tool, Global360, which connects data relating to the management of our risks, events, hazards and assurance actions. Reliable data on material risks contributes towards the monitoring and management of our strategic risks, providing insight into trends and emerging themes that can trigger a review of our business plans or inform a change in strategic direction.

The effective management of our material and strategic risks is routinely assessed by our Lead Team. These risks are reviewed by the Risk and Audit Committee and the Sustainability Committee, which assist the Board to carry out its role of overseeing our risk management and assurance practices.

Potential climate change impacts on our strategic risks

Climate change and environment is a strategic risk for South32. We assess our resilience to both the potential physical impacts of climate change and the impacts of the transition to a low-carbon economy, using an approach aligned with TCFD recommendations.

The complex and pervasive nature of climate change means that climate-related risks and opportunities are reflected across our risk profile. The potentially significant impacts of climate change on our strategic risks are outlined in the table below.

Learn more about **risk management at South32** in our FY22 Annual Report at www.south32.net

Potential climate change impacts on strategic risks

South32's strategic risk	Impact type, risks and opportunities	Our management response
Climate change and environment	Climate change and our response, as well as that of our markets and broader society, presents both threats and opportunities to our portfolio (i.e. demand for our commodities, costs and profit margins, our societal value contribution, regulatory exposure), our people, physical assets, infrastructure, value chain and surrounding communities and ecosystems.	Our response is outlined in this Plan, our Sustainable Development Report and Annual Report. We support the objectives of the Paris Agreement and have set a medium-term operational GHG emissions reduction target of 50 per cent by 2035 from a FY21 baseline, and a goal of net zero operational GHG emissions by 2050. We identify, assess and manage physical climate risks through our risk management framework, as outlined in this Plan. We are actively shifting our portfolio towards those commodities that will be required in a low-carbon future (with a bias to base metals) as indicated by our scenario analysis, which included our 1.5°C scenario. We engage regularly with stakeholders and are transparent in our disclosure of our climate change approach and performance in accordance with the TCFD.
Ensuring that our people go home safe and well	The potential impacts of the physical risks of climate change could impact the safety or health of our people. Scientific evidence is increasingly indicating that anthropogenic GHG emissions are contributing to making certain weather events more frequent and/or more severe, with frequency and severity of these events projected to increase as concentrations of atmospheric GHG increase. Longer-term changes in climate patterns (typically referred to as chronic physical climate risks) such as increased average temperatures also pose a potential health and safety risk.	We conduct physical climate risk assessments across our operated portfolio against projected changes in climate under a range of emissions scenarios. Identified physical climate risks are managed in accordance with our risk management framework. Our safety system of work guides our operations and projects, so the health and safety risks of our people are managed appropriately through detailed planning and execution following risk assessment.

Climate change risk management continued

South32's strategic risk	Impact type, risks and opportunities	Our management response
Actions by government, tax authorities and political risks	Carbon pricing, emissions caps, and other actions by governments have the potential to increase the cost of operating. Changes to environment and planning, licensing, permitting or approval regimes, or their application, may impact on our ability to develop or expand operations. Policy or regulatory actions aimed at reducing GHG emissions also have the potential to positively or negatively impact our competitiveness, or our ability to trade in certain markets. Policy change may also affect the demand dynamics for some of our commodities, such as metallurgical coal and aluminium. Rapid changes in regulation or adoption of inconsistent policies across global markets may limit our capacity to prepare for a transition.	We assess policy risks in our portfolio resilience assessments using scenario analysis. We aim to manage this uncertainty through engagement with key stakeholders and industry associations, monitoring of political activity, policy, legislative and regulatory changes, and by accessing subject matter experts. We annually review changes in carbon pricing policy and how it may affect us. This includes progress against the Paris Agreement objectives, including just transition measures, and government policy and regulation. We prioritise an investment grade credit rating and a disciplined approach to allocating capital, which keeps our balance sheet strong, providing us with financial flexibility.
Portfolio reshaping	Changing demand for our commodities, changes to trade flows, climate policies, societal expectations and developments in technology have the potential to impact costs, revenues and profit margins. For emissions- intensive commodities and operations this may result in stranded asset exposures, and/or impact on our ability to continue to access competitive capital and insurance. For future-facing commodities and high quality products, new opportunities may emerge.	We are actively shifting our portfolio towards those commodities that will be required in a low-carbon future (with a bias to base metals). Our scenario analysis and forecasts consider a broad range of supply and demand outcomes, stakeholder expectations, technology developments, evolving climate policies and regulations.
Major events or natural catastrophes	The projected increase in the frequency and intensity of extreme weather events, and gradual onset impacts such as increases in average temperatures and changing precipitation patterns, present risks to the resilience of our operations, and the infrastructure, ecosystems and communities on which we rely. This may impact on our supply chains, communities, access to key operational inputs (e.g. water), access to new ore bodies, business continuity and distribution to market, while incurring additional costs to maintain, adapt, repair or replace our assets and infrastructure.	We utilise climate modelling data to conduct physical climate risk assessments of our operations and major projects. We have business continuity and disaster response plans in place with trigger action response scenarios. We have tested these to make sure we can respond rapidly to major events and safely restore our operations, protecting the health and safety of people and the communities in which we operate.
Predictable operational performance	We run established processing facilities and mine geologically bound ore bodies, connected by rail, road, ports and sea. These may experience production and logistics delays because of extreme weather and/or operating conditions outside plant and equipment design envelopes. Droughts, heat extremes or unseasonal weather variability could also create water stress or contribute to worker ill-health and the spread of disease in our workforce or surrounding communities. The potential impacts of the physical risks of climate change may increase rehabilitation and/or closure liabilities. Our exposure to physical climate risks may also impact the terms or availability of finance or insurance.	We use scenario analysis to assess how climate change may act as an additional stressor on existing operational risk profiles (e.g., by alternating the frequency of occurrence, severity of occurrence, severity of consequence or spatial distribution of risk) and/or create new risks. We are using the outcomes to improve business continuity planning, operational resilience and to better understand potential adaptation pathways. We use the World Resources Institute's Aqueduct Tool to screen our operations for water scarcity and oversupply risks and we seek to proactively manage or adapt accordingly. Each of our operations has a closure plan in place, which includes a risk assessment. These plans are reviewed as required by our standards, and where changes in circumstances demand.

South32's strategic risk	Impact type, risks and opportunities	Our management response
Maintain competitiveness through innovation and technology	Technology and innovation will play an important role in the transition to a low-carbon future and achieving net zero emissions. New technologies may create substitutes, change demand for our products, and enable us to provide new products to meet changing customer demands. We may experience challenges adopting new technologies necessary to support our emissions reduction targets into our existing systems or be limited in our ability to rapidly adopt those technologies due to obligations under prevailing contracts. The cost and unproven nature of new technology could reduce our productivity and profit margins. Efficiencies or innovative products enabled by new technologies could increase productivity and profit margins.	Our scenario analysis considers potential new technology impacts on our operations and commodities. Our assumptions under these scenarios are updated every two years. We use these insights in our strategic planning. We apply an integrated approach to evaluate the suitability of innovation and technology, which considers productivity, cost, safety and our environmental and social footprint. Our innovation process considers climate change when setting our priorities including for our 'low footprint; and 'next generation mine' innovation missions. We maximise our success in realising the benefits of new technologies by partnering and collaborating with a range of organisations developing the solutions to reduce emissions across our industry, such as CSIRO, the Electric Mine Consortium, HILT CRC and LDESC. Some future technologies have the potential to transform the industry, e.g. inert anodes in the aluminum industry. We continue to monitor these emerging technologies with the potential to significantly reduce our carbon footprint.
Security of supply of logistics chains, and critical goods and services	Stakeholders across our supply chain may experience similar changes in policy to those outlined above, and we may face changing regulatory requirements in jurisdictions outside of our own operating environments. The potential impacts of the physical risks of climate change may result in supply chain impacts or logistics delays. Costs associated with this may be passed on from an upstream perspective, but also may have a downstream impact on the relative competitiveness and demand for some of our commodities and/or operating margins.	Our scenario analysis incorporates potential policy-based impacts on our supply chain to test resilience of our portfolio to these climate transition risks. Our assumptions under these scenarios are updated every two years. We use the insights we gain from this analysis in our strategic planning. Our approach to physical risk emphasises resilience of systems and networks across our operations. In FY23, we will assess vulnerabilities in our operational networks to improve production continuity. We calculate and disclose Scope 3 GHG emissions annually to identify the scale and sources of supply chain emissions and evaluate the potential corresponding climate transition risks. We have established a carbon markets team to enable cost-effective engagement in regulatory and voluntary carbon markets.
Evolving societal expectations	Shareholders (including activist groups) and other stakeholders are increasingly focused on the credibility and effectiveness of companies' climate change plans, disclosures, risk management and the activities of their industry associations. If we do not set and implement effective plans to address and disclose our climate-related risks, our credibility and reputation with a range of stakeholders may suffer. Failure to manage the above risks may increase our legal exposures, while limiting our ability to access capital and insurances, retain and attract employees and grow our business in existing and new jurisdictions. The actions we take to reduce our operational GHG emissions, may have economic or social impacts on surrounding communities or businesses. Climate change can introduce social risks, such as conflict over access to natural resources such as water in periods of prolonged drought. Our operations in regions with poorly developed social support systems could be more vulnerable to the potential impacts of the physical risks of climate change. This may lead to decreased food and water security and create a challenging operating environment.	To understand evolving expectations and communicate our progress, we prioritise regular and open dialogue with our shareholders, proxy advisers, civil society groups, investor representative bodies and other stakeholders on climate change and broader ESG issues. We provide comprehensive, transparent information to stakeholders on our climate change position, policies, risks and management actions. We were early adopters of the TCFD Framework and have integrated this approach into our business processes. We assess and monitor the climate change and energy positions of our industry associations to test alignment with our own positions. We closely monitor legal developments and litigation trends and seek advice on major developments when necessary. This information is integrated into our climate-related risk assessments, management and disclosures. We assess potential climate change risks and impacts both to our operations and to our communities. Where transition decisions may impact the resilience and continued prosperity of our communities, we will seek to partner with them and others to manage those impacts. We seek to maximise the potential benefit to communities in assessing options for reducing emissions or improving resilience at our operations. We make contributions to development programs to help communities build resilience to the impacts of climate change.

Glossary of terms and abbreviations

Climate Change terms

Aluminium Stewardship Initiative (ASI)
The ASI works together with producers, users and stakeholders in the aluminium value chain to collaboratively foster responsible production, sourcing and stewardship of aluminium.

Carbon credit
A transferrable instrument representing an emission reduction of one metric tonne of carbon dioxide, or an equivalent amount of other GHGs, that has been created and verified in accordance with a regulatory program in which they can be used towards compliance with a legal obligation to limit emissions.

Carbon offset
An action that avoids, reduces or removes GHG emissions to compensate for emissions that occur elsewhere.

CCAP
Climate Change Action Plan.

CO_2-e
Carbon dioxide equivalent.

Decarbonisation
Avoiding or reducing the greenhouse gas emissions associated with an activity.

Energy coal
Used as a fuel source in electrical power generation, cement manufacture and various industrial applications. Energy coal may also be referred to as steaming or thermal coal.

Fugitive emissions
Greenhouse gases that are released to the atmosphere from underground coal seams during mining activities.

Goal
An aspiration to deliver an outcome for which we have not identified a pathway for delivery, but for which efforts will be pursued towards achieving that outcome, subject to certain assumptions or conditions.

Greenhouse gas (GHG) emissions
For our reporting purposes, GHG emissions are the combined anthropogenic emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). They are measured in carbon dioxide equivalent (CO_2-e). Hydrofluorocarbons (HFCs) GHG emissions are currently not relevant for our reporting purposes.

Intergovernmental Panel on Climate Change (IPCC)
The IPCC is the international body for assessing the science related to climate change. The IPCC was set up in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Program (UNEP) to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

Just transition
A fair, equitable and inclusive social transition towards a low-carbon economy.

Low-carbon
Refers to lower levels of GHG emissions when compared to the current state. Where used in relation to South32's products or portfolio, it refers to enhancement of existing methods, practices and technologies to substantially lower the level of embodied GHG emissions as compared to the current state.

Low-carbon aluminium
For the purposes of this Report, we define 'low-carbon aluminium' as aluminium produced in a process that results in less than 4t CO_2-e Scope 1 and Scope 2 GHG emissions per tonne of aluminium produced.

Metallurgical coal
A broader term than coking coal that includes all coals used in steelmaking, such as coal used for the pulverised coal injection process.

Net zero
Net zero greenhouse gas emissions are reached when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.

Operational GHG emissions
Scope 1 and 2 GHG emissions from our operated assets.

Paris Agreement
A legally binding international treaty on climate change that aims to bring all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so.

Physical climate risk
Physical climate risks are driven or intensified by weather, climate variability or climate change. They include acute risks, resulting from increased frequency or severity of extreme weather events (e.g., drought or flood events) and chronic risks, resulting from longer-term changes in climate patterns (e.g., sustained higher temperatures, sea level rise).

ResponsibleSteel
ResponsibleSteel is a not-for-profit organisation and the steel industry's first global multi-stakeholder standard and certification initiative.

Scope 1 emissions
GHG emissions from our own operations, including the electricity we generate at our sites.

Scope 2 emissions
Indirect GHG emissions from the generation of purchased electricity.

Scope 3 emissions
GHG emissions in the value chain.

South West Interconnected System
The electricity grid in the south-west part of Western Australia comprising transmission, owned by the Western Australian Government, and electricity generators. It is not connected to other large Australian grids.

Target
An intended outcome in relation to which we have identified one or more pathways for delivery of that outcome, subject to certain assumptions or conditions.

Task Force on Climate-Related Financial Disclosures (TCFD)
In 2017, the TCFD released climate-related financial disclosure recommendations designed to help companies provide better information to support informed capital allocation.

Transitional climate risks
Non-physical risks arising from changes to policy, technology, legal and markets as the world moves to a low-carbon energy system, in line with the Paris Agreement objectives.

United Nations Framework Convention on Climate Change (UNFCCC)
The UNFCCC is the United Nations entity tasked with supporting the global response to the threat of climate change.

VAM
Ventilation Air Methane.

Mining related terms

Alumina
Aluminium oxide (Al_2O_3). Alumina is produced from bauxite in the Bayer refining process. It is then converted (reduced) in an electrolysis cell to produce aluminium metal.

Bauxite
Principal commercial ore of aluminium.

Brownfield
An exploration or development project located within an existing mineral province, which can share infrastructure and management with an existing operation.

Coking Coal
Used in the manufacture of coke, which is used in the steelmaking process by virtue of its carbonisation properties. Coking coal is a form of, and may also be referred to as, metallurgical coal.

Greenfield
An exploration or development project that refers to a new venture or operation, without any association or proximity to a current operation.

Tailings
Those portions of washed or milled ore that are too poor to be treated further or remain after the required metals and minerals have been extracted.

TSF
Tailings Storage Facility.

Finance, marketing and general terms

ASX
ASX Limited or Australian Securities Exchange.

Baseline water stress
The ratio of total annual water withdrawals to total available renewable surface and groundwater supplies, accounting for upstream consumptive use.

Higher values indicate more competition among users. The values and definition of baseline water stress have been derived from World Resources Institute (WRI) Aqueduct 3.0: Updated Decision-Relevant Global Water Risk Indicators.

B-BBEE
Broad-Based Black Economic Empowerment.

Black People
As defined in the Broad-Based Black Economic Empowerment Amendment Act 2013 (South Africa), a generic term meaning Africans, Coloureds and Indians who are citizens of the Republic of South Africa by birth or descent; or who become citizens of the Republic of South Africa by naturalisation before 27 April 1994 or on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date.

Board
The Board of Directors of South32 Limited.

Catchment
The area of land from which all surface runoff and subsurface water flows through a sequence of streams, rivers, aquifers and lakes into the sea or another outlet at a single river mouth, estuary, or delta. Catchments include associated groundwater areas and might include portions of waterbodies (such as lakes or rivers). In different parts of the world, catchments are also referred to as 'watersheds' or 'basins' (or sub-basins).

CEO
Chief Executive Officer.

Community investment
Contributions made to support communities where we operate, or have an interest. Our contributions to community programs comprise direct investment, in-kind support and administrative costs.

Contractor
A contractor is an employee of a company contracted by the employer to do work on its behalf and under its control with respect to location, work practices and application of health and safety standards.

Contextual water target
A contextual water target is a specific timebound target that is set to deliver an intended outcome based on the environmental and social context of the local catchment.

COVID-19
Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus.

Dewatering
Aquifer interception and removal of water from beneath the earth's surface. Does not include the removal of sea water.

Employee
Any person in full-time, part-time or casual employment engaged by South32 on a temporary or permanent basis pursuant to a contract of service.

Energy consumption
Energy consumed where we have operational control includes fuel consumed for non-combustion and combustion activities, regardless of the use, i.e. stationary of mobile purposes. Where energy is consumed to generate a secondary energy stream (for example electricity generation or transfer of unprocessed natural gas to natural gas ready for distribution), only the primary energy consumption is reported.

Environmental incident
Any environmental event with an impact to land, biodiversity, ecosystem services, water resources or air.

ESD
Enterprise Supplier Development.

ESG
Environmental, social and governance.

EthicsPoint
A 24/7 confidential reporting hotline that is serviced by an independent provider.

Fatality
A health or safety event where an injury or occupational illness has caused the death of one or more person(s).

FYXX
Refers to the financial year ending 30 June 20XX, where XX is the two-digit number for the year.

GEMCO
Groote Eylandt Mining Company.

Global Reporting Initiative (GRI)
GRI is an international independent organisation that has established an international framework and standards for sustainability reporting. South32 prepares its Group-level annual Sustainable Development Report in accordance with the GRI Sustainability Reporting Standards.

HMM
Hotazel Manganese Mines.

Human rights
Human rights are the universal and inalienable rights and freedoms that every person is entitled to regardless of race, sex, nationality, ethnicity, language, religion or any other status. Human rights recognise the inherent value of each person, based on principles of dignity, equality and respect. We are committed to respecting all internationally recognised human rights as set out in the International Bill of Human Rights (comprising the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights) and the International Labour Organization Declaration on Fundamental Principles and Rights at Work.

ICMM
ICMM, previously referred to as the International Council on Mining and Metals, is an international organisation that leads through collaboration to enhance the contribution of mining and metals to sustainable development. As a corporate member, South32 commits to implementing and reporting on the ICMM Mining Principles and its Performance Expectations, which define environmental, social and governance requirements.

IMC
Illawarra Metallurgical Coal.

Indigenous, Traditional and Tribal Peoples
We use the defined term 'Indigenous, Traditional and Tribal Peoples' as per the definition and guidance set out in the Indigenous and Tribal Peoples Convention, 1989 (No. 169). We use this term inclusively to encompass the diversity of worldwide Indigenous, Traditional and Tribal Peoples, including but not limited First Nations, Native Americans, Traditional Owners, Aboriginal and Torres Strait Islander Peoples and other land-connected communities. We recognise that no single definition can fully capture the diversity of Indigenous, Traditional and Tribal Peoples.

Injury
An occupational injury occurs during a single work shift or a single exposure to an agent(s) causing an acute toxic effect, which can be identified by time and place resulting from direct contact with an object following an instantaneous event. Examples include cut, puncture, laceration, abrasion, fracture, bruise, contusion, chipping tooth, amputation, insect bite, electrocution, or a thermal, chemical, electrical or radiation burn. Sprain and strain injuries to muscles joints connective tissue are classified as injuries when they result from a slip, trip, fall or other similar accidents.

International Financial Reporting Standards (IFRS)
Accounting standards as issued by the IASB (International Accounting Standards Board).

LTI
Long-term incentive.

Management roles
Management roles are leaders with an identified job grading of 13 or higher based on the requirements of their role.

Material health exposures
Material health exposures include potential exposure to carcinogens and airborne contaminants.

Material topic
Topic that reflects a reporting organisation's significant economic, environmental and social impacts or that substantively influences the assessments and decisions of stakeholders.

MCA
Minerals Council of Australia

Modern slavery
Modern slavery is an umbrella term referring to situations of serious exploitation that a person cannot refuse or leave because of threats, violence, coercion, deception, and/or abuse of power (Walk Free Foundation). It includes forced labour, debt bondage, forced marriage, slavery and slavery-like practices, and human trafficking and the worst forms of child labour (which means situations where children are subjected to slavery or similar practices, or engaged in hazardous work).

Musculoskeletal occupational illness
Musculoskeletal disorders are injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and supporting structures of the upper and lower limbs, and spine - that are caused, precipitated or exacerbated by sudden exertion or prolonged exposure to physical factors such as repetition, force, vibration, or awkward posture.

MRN
Mineração Rio do Norte.

No net loss
The impacts on biodiversity caused as a result of a development project/activities are balanced (so that no net loss remains) by measures taken to:

1) avoid, minimise and mitigate negative impacts,
2) rehabilitate or restore affected areas, and
3) offset the residual impacts.

Occupational Exposure Limit (OEL)
The concentration of a substance or agent, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers.

Occupational illness
An occupational illness is any abnormal condition or disorder, other than one resulting from an occupational injury, caused or aggravated by exposures to factors associated with employment. It includes acute or chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion or direct contact.

Occupational Safety and Health Administration (OSHA)
The OSHA of the United States Department of Labor. To ensure that incident classification definitions are applied uniformly across our workforce, we have adopted the United States Government Occupational Safety and Health Assessment (OSHA) and the ICMM guidelines for the recording and reporting of occupational injuries and illnesses.

Operational Leadership Team
All General Managers and Managers reporting to Vice President Operations, and all Managers reporting to General Managers at an operation. Excludes: Functional Managers (such as Human Resources, Finance and Supply).

Our people
As defined in our Code of Business Conduct, our people includes South32 Directors, executive management, employees and contractor staff (e.g. labour hire, temporary or agency staff, and secondees).

Recordable illnesses
The sum of work-related (fatalities + permanent impairment >30 per cent of body + lost time illnesses + restricted work illnesses + medical treatment illnesses).

Recordable injuries
The sum of work-related (fatalities + permanent impairment >30 per cent of body + lost time injuries + restricted work injuries + medical treatment injuries).

SAEC
South Africa Energy Coal.

Senior Leadership Team
Presidents and Vice Presidents reporting to members of the South32 Lead Team.

Shared value
The identification of opportunities that create economic value while also advancing the environmental and social outcomes of the communities and regions in which we operate.

SMMEs
Small, medium and micro enterprises.

South32, South32 Group or Group
Refers to South32 Limited and its subsidiaries and operated joint arrangements, unless otherwise stated.

STI
Short-term incentive.

Sustainability Accounting Standards Board (SASB)
SASB Standards guide the disclosure of financially material sustainability information by companies to their investors. Effective August 1, 2022, the Value Reporting Foundation–home to the SASB Standards–consolidated into the IFRS Foundation, which established the first International Sustainability Standards Board (ISSB). SASB Standards are now under the oversight of the ISSB. In our Sustainability Databook we demonstrate how we are pursuing alignment with the Sustainability Accounting Standards Board (SASB) Metals and Mining Sustainability Accounting Standard.

Sustainable development
Defined as supporting the needs of the present without compromising the ability of the future generations to meet their own needs.

TEMCO
Tasmanian Electro Metallurgical Company.

Total Recordable Injury Frequency (TRIF)
(The sum of recordable injuries x 1,000,000) ÷ exposure hours, for employees and contractors. This is stated in units of per million hours worked for employees and contractors. We adopt the United States Government Occupational Safety and Health Administration (OSHA) guidelines for the recording and reporting of occupational injuries and illnesses.

Total Recordable Illness Frequency (TRILF)
(The sum of recordable illnesses x 1,000,000) ÷ exposure hours, for employees and contractors. This is stated in units of per million hours worked for employees and contractors. We adopt the United States Government Occupational Safety and Health Administration (OSHA) guidelines for the recording and reporting of occupational injuries and illnesses.

Transformation
A national strategy in South Africa aimed at attaining national unity, promoting reconciliation through negotiated settlement and non-racism.

Underlying EBITDA
Underlying EBIT (Earnings Before Interest and Tax) before underlying depreciation and amortisation.

United Nations Global Compact (UNGC)
UNGC is a voluntary initiative based on CEO commitments to implement universal sustainability principles on human rights, labour, environment and anti-corruption, and to take steps to support UN goals. South32 is a member of the UNGC (GC Active) and our 2022 Sustainable Development Report serves as our Communication on Progress (CoP).

UN SDGs
United Nations Sustainable Development Goals.

Water risk
As defined by the CEO Water Mandate, 2014; water risk is the possibility of an entity experiencing a water-related challenge (e.g. water scarcity, water stress, flooding, infrastructure decay, drought). The extent of risk is a function of the likelihood of a specific challenge occurring and the severity of the challenge's impact. The severity of impact itself depends on the intensity of the challenge, as well as the vulnerability of the actor.

Water scarcity
In accordance with the CEO Water Mandate, Corporate Water Disclosure Guidelines, September 2014, water scarcity refers to the volumetric abundance, or lack thereof, of freshwater resources.

Water stress
In accordance with the CEO Water Mandate, 2014; water stress refers to the ability, or lack thereof, to meet the human and ecological demand for freshwater. Stress comprises three primary components: availability, quality, and accessibility and is based on subjective elements and is assessed differently depending on societal values, such as the suitability of water for drinking or the requirements to be afforded to ecosystems.

World Resources Institute Aqueduct Tool
A global water risk mapping tool that helps companies, investors, governments, and other users understand where and how water risks and opportunities are emerging worldwide. The tool uses a peer reviewed methodology and the best available data to create maps of water risk.


SOUTH32