Rio Tinto

2025 Climate Action Plan

Contents

This document is a complete extract of pages 41–75 of the *2024 Annual Report*. All pages remain numbered as they are in the Annual Report, and any references to page numbers not in this extracted document refer to other sections of the *2024 Annual Report*.

Many of our operations are located on land and waters that have belonged to Indigenous and land-connected Peoples for thousands of years. We respect their ongoing deep connection to, and their vast knowledge of, the land, water and environment. We pay our respects to Elders, both past and present, and acknowledge the important role Indigenous and land-connected Peoples play within communities and our business.

Our 2024 reporting suite

Scan the QR code or visit riotinto.com/reports

On the cover: Rincon Lithium Project, Argentina.

Image below: The solar photovoltaic and wind power plants at our Diavik diamond mine in Canada's Northwest Territories.

Our 2025 Climate Action Plan

The materials we produce and the way we provide them to society matter. We have ambitious emissions reduction targets and are now delivering against those.

Decarbonisation is good for our business and gives us confidence in the future. We are a significant energy user and parts of our portfolio are hard-to-abate, so it is exciting to see some real momentum this year, in both reductions in emissions and project approvals.

Since we set our targets, we have delivered 5Mt CO_2e in operational emissions abatement, and our gross emissions are now 14% below 2018 levels, primarily from renewable electricity contracts. Additionally, in 2024 we have committed to abatement projects, totalling 3.6Mt CO_2e which are expected to contribute to our target to reduce net emissions by 50% by 2030.

The challenge is not straightforward – we need to navigate a complex, rapidly evolving regulatory landscape – but we are making progress and maintaining financial discipline while we do this. Despite the fragmented policy landscape, decarbonisation can still be good economics. Our projects are typically net present value positive or neutral and enhance the value of our business by reducing our exposure to volatile fossil fuel prices and higher carbon penalty costs. Our decarbonisation investment process is rigorous and rational and it aims to secure structural, long-term, cost-efficient, low-carbon alternative energy supplies.

We are also supporting our customers and suppliers in reducing emissions from our value chain, particularly those from steelmaking. We are acting now and investing in breakthroughs such as BioIron™ and electric smelting to scale up these new technologies.

While we still have a long way to go, I am proud of the progress our teams have made so far. Our Climate Action Plan creates long-term value for our shareholders which is why we are recommending it for their approval at our annual general meetings.

Jakob Stausholm
Chief Executive

About this Climate Action Plan and our reporting obligations

Our first Climate Action Plan (CAP) was approved by investors at our 2022 AGMs. At that time, we included a commitment to report on our progress annually and update the CAP every 3 years. This updated 2025 CAP retains our commitments to decarbonise our assets and work with customers and suppliers to reduce our value chain emissions. It also shows how the energy transition is at the heart of our strategy.

The Board will put this updated CAP to shareholders for a non-binding advisory vote at the 2025 AGMs.

In 2024, for the first time, we have fully integrated climate disclosures into our Annual Report. This aligns with our commitment to continually improve our reporting and align with emerging standards, including the International Sustainability Standards Board (ISSB) International Financial Reporting Standard (IFRS) for climate-related disclosures (S2).

We support the ISSB's goal to harmonise disclosures about transition plans, and have also considered the key principles of the Transition Plan Taskforce (TPT) Framework in setting out our CAP. Our reporting is also guided by the CA100+ Net Zero Company Benchmark and their Standard for mining companies.

2024 at a glance

Gross Scope 1 and 2 emissions

30.7Mt CO_2e
(adjusted equity),
(2023: 33.9Mt CO_2e)

Scope 3 emissions

574.6Mt CO_2e
(2023: 572.5Mt CO_2e)

Percentage electricity from renewable sources

78%
(2023: 71%)

Total decarbonisation spend

$589m
(2023: $425m)

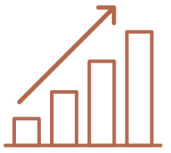
Our 2025 Climate Action Plan at a glance

Grow production of materials essential for the energy transition

26 Fe Iron	29 Cu Copper	03 Li Lithium	13 Al Aluminium
287.7Mt	624kt	3kt*	3,296kt

2024 production (Rio Tinto share basis, *2025 capacity at Rincon)

Grow production by ~3% per year



Ambition for compound annual growth rate for copper equivalent production from 2024 to 2033, including inorganic lithium growth.

Reduce emissions from our own operations

50% by 2030, net zero by 2050

Increase **renewable power to >90%**

Develop **low-carbon technologies** for minerals and metals processing, refining and smelting

Invest in sustainable **biofuel supply** chains. Transition to **zero emissions** mining vehicles

Invest in and develop nature-based solutions projects in the regions where we operate

Estimated $5-6 billion decarbonisation capex by 2030

Partner to decarbonise our value chains

Helping our customers and suppliers to achieve their targets earlier and reach net zero by 2050

Steel value chain

Develop **existing, emerging and future technologies** to decarbonise steel production

Invest $200-350m in steel decarbonisation between 2025-2027

Shipping

Reach net zero shipping by 2050

Working across our value chains

Drive decarbonisation at **50 of our highest-emitting suppliers**

Partner with bauxite customers to reduce emissions

Policy

Actively engage on climate and energy policy aligned with net zero ambitions

People

Embedding just transition principles in our decarbonisation strategy

Governance

Decarbonisation in short- and long-term incentives

Board engagement on climate

Enhancing our physical resilience to a changing climate

Supporting the viability of our assets, our people and communities

Grow production of materials essential for the energy transition

Our portfolio

Copper, lithium, aluminium and high-quality iron ore are fundamental to renewable energy infrastructure, electric vehicles, and energy storage solutions. This global shift to a low-carbon economy is driving unprecedented demand for our commodities. Our ambition is to grow total production by ~3% per year on a copper equivalent basis[1].

Highlights across our portfolio

Iron ore

- High-grade iron ore from Iron Ore Company of Canada (IOC) and Simandou in Guinea is essential for the production of low-carbon steel.
- Investment in the development of our Pilbara operations and the technology needed to produce low-carbon steel.

Aluminium

- Acquisition of a 50% stake in Matalco in 2023 supports the growing demand for low-carbon and recycled products.
- A US$1.1 billion investment in expanding the AP Technology™ AP60 aluminium smelter in Quebec.
- Investment in ELYSIS™ technology development and trials.

Minerals

- The Rincon lithium project in Argentina achieved first production.
- Acquisition of the Burra™ Scandium Project in Australia.
- Our recent agreement to acquire Arcadium Lithium plc will, subject to acquisition completion, enable us to provide many of the key materials that go into electric vehicle batteries.

Copper

- Having increased our equity in 2022, the expansion of the Oyu Tolgoi underground mine in Mongolia is a cornerstone of our copper strategy.
- Expanding underground mining at Kennecott, targeting an additional 250,000 tonnes of copper production over the next decade[2].
- Joint venture with First Quantum Minerals on the La Granja project in Peru, one of the world's largest undeveloped copper deposits.

1. Ambition for compound annual growth rate (CAGR) for copper equivalent production from 2024 to 2033, including inorganic lithium growth.
2. The production target of around 250,000 tonnes of additional mined copper over the next 10 years (2023 to 2033) at Kennecott was previously reported in a release to the Australian Securities Exchange (ASX) dated 20 June 2023 titled "Rio Tinto invests to strengthen copper supply in US". Rio Tinto confirms that all material assumptions underpinning that production target continue to apply and have not materially changed.

Using scenarios to identify climate risks and portfolio opportunities

Although climate change presents clear growth opportunities for our commodities, it also presents both physical and transition risks to our portfolio if we fail to align our business with a net zero future. The transition to a low-carbon economy impacts the commodities we produce and how they are processed in our value chains – particularly for carbon-intensive steel and aluminium production. Carbon pricing regulation is currently applied to our operations and our customers. Increasing climate policy ambition can therefore affect our operational costs, markets and technology development. Physical risks such as extreme weather events, rising sea levels and temperature fluctuations can disrupt our supply chains, damage infrastructure and impact the availability and cost of raw materials.

We use scenarios to identify and assess risks and opportunities, including climate, that may affect our business in the medium and long term. To assess transition risks, we use market analysis for our short-term outlook, and our Conviction and Resilience scenarios for our medium- and long-term assessment. For physical risks, we use an intermediate and high emissions scenario. For planning purposes, we define short-term as up to 2 years, medium-term as 2 to 10 years and long-term as beyond 10 years.

Our short-term timeframe aligns with our annual planning process. The medium-term timeframe aligns to extended planning horizons for our growth projects and emissions abatement projects. Our long-term timeframe considers the full lifespan of our mining assets and infrastructure, and the continued impact climate risks and opportunities are expected to have on the business. Inevitably there is increasing uncertainty in the assumptions and projections further into the future, so there is inherent uncertainty in the assessment of risks and opportunities presented below.

Short-term assessment: While scenarios provide a valuable long-term perspective, our short-term outlook is guided by market analysis. This allows us to respond swiftly to immediate market conditions and trends, ensuring we are agile and competitive in the near term.

Medium- and long-term assessment:
We use these scenarios to:

- **Identify and evaluate risks:** These include climate-related physical and transition risks, both of which can impact our business model, financial performance and market positioning.
- **Assess opportunities:** Explore opportunities for innovation and adaptation, such as the development of low-carbon technologies and the transition to renewable energy sources.
- **Inform strategic planning:** Inform our strategic decisions and investments, ensuring our business remains resilient and able to adapt to, and mitigate, the challenges posed by climate change.

Our scenario approach is reviewed every year as part of our Group strategy engagement with the Board. We do not undertake climate modelling ourselves, rather we determine the approximate temperature outcomes in 2100 by comparing the emissions pathways to 2050 in each of our scenarios with the Shared Socio-Economic Pathways (SSP) set out in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report. We also consider the carbon budgets associated with different temperature outcomes which are inevitably uncertain.

In 2024, we updated the scenario framework used to assess the resilience of our business under different transition-related scenarios.

Our Conviction and Resilience scenarios translate our beliefs of the future into macroeconomic drivers and improve our understanding of policy impacts. These scenarios underpin our fundamental assumptions about long-term trends and we believe they cover a realistic range of future outcomes. They reflect what we anticipate will happen rather than our aspirations. Our core scenarios are crucial in guiding our investment strategies and overall portfolio strategy.

Additional scenarios (including our 1.5°C-aligned Aspirational Leadership scenario) are used to further evaluate the positive and negative effects of the energy transition across our portfolio. By considering various future scenarios, we can identify risks and opportunities, adapt to changes, and maintain a resilient portfolio.

Our short-term carbon pricing assumptions align with consensus price forecasts in each region, accounting for transitional assistance, such as free allocation, where appropriate. Medium- to long-term carbon prices are determined by national climate targets, and our understanding of the marginal abatement costs and objectives for each scheme.

The temperature outcomes of scenarios and sensitivities are derived from complex modelling which continues to evolve and is inherently uncertain. The emissions pathways in Conviction and Resilience limit temperature rises to around 2.1°C, and around 2.5°C by 2100 respectively, roughly aligning with IPCC's intermediate emissions scenario (SSP2-4.5). We also use the SSP2-4.5 and highest emissions scenario (SSP5-8.5) in our bottom-up asset-level physical risk and resilience assessments. See pages 66-69 for more information.

Our core scenarios

Conviction

This is our "central case" scenario and underlies strategic planning and portfolio investment decisions across the Group. Consequently we limit disclosure of our assumptions in Conviction. In this scenario, countries will decarbonise at a moderate pace, with greater awareness of climate-related physical damage triggering more radical climate action over time. Real gross domestic product (GDP) grows at 2.5% between 2023-2050, but energy intensity of GDP reduces approximately 2.7% per year due to sectoral shifts and greater efficiency. For the next decade, greenhouse gas (GHG) emissions are slightly higher than those in the Resilience scenario due to a higher GDP, but emissions then decline at a rapid rate due to increased low-carbon electrification which supplies around half of final energy by 2050. In Conviction, climate policies become more ambitious and effective over time resulting in a temperature rise of around 2.1°C in 2100. The impact on corporate balance sheets will be mixed - overall, although carbon pricing varies by region, it will increase costs. GDP growth and the global energy transition are expected to increase demand for copper, lithium and aluminium through to 2050. Steel demand is expected to grow more modestly, and incentives to recycle scrap increase. Lower quality iron ore products are expected to receive greater discounts.

Resilience

Although described as a scenario, Resilience is simply a sensitivity analysis that is designed to test our annual plan and investment proposals. Weaker governance, declining global trade, and lower economic growth lead to less effective climate action. Real GDP growth only averages 1.6% between 2023 and 2050. Lower economic growth and a slower energy transition lead to lower commodity demand and prices across all time periods compared to Conviction. Lower policy ambition and the inability of the international community to tackle carbon leakage without resorting to protectionism leads to climate policies advancing sporadically and in an uncoordinated way. Overall there is only a 30% reduction in GHG emissions by 2050. The result is a temperature rise of around 2.5°C by 2100. Consequently, climate-related weather events and natural disasters become more frequent and severe in this scenario but are met by fragmented and variable policy responses.

Aspirational Leadership scenario 1.5°C

This scenario reflects our view of a world of high economic growth, significant social change and accelerated climate action that achieves net zero emissions by mid-century. While GDP growth is similar to that in our Conviction scenario, significantly more ambitious climate policy limits warming to 1.5°C (aligning with SSP1-1.9). This scenario affects our balance sheet in different ways and is subject to great uncertainty. Overall, in Aspirational Leadership the Group's economic performance would fall between Conviction and Resilience. While higher scrap use reduces the medium-term demand for Pilbara products, increased carbon pricing and penalties boost long-term demand for high-grade iron ore. Aluminium demand growth is limited in the short term, but increases in the longer term. Copper demand grows due to increasing electrification, strong GDP growth, and accelerated electric vehicle (EV) penetration. These trends also support minerals projects.

Despite global agreements reached in Glasgow and Dubai, emissions today continue to rise, making the 1.5°C goal of the Paris Agreement unlikely to be achieved. Our operational emissions targets align with 1.5°C, and consequently, so do our decarbonisation investment decisions. However, we do not use Aspirational Leadership in our broader strategic or investment decision-making and so did not update all the assumptions Aspirational Leadership in 2024. Overall, based on the Aspirational Leadership scenario pricing outcomes, and with all other assumptions remaining consistent with those applied to our 2024 financial statements, we do not currently envisage a material adverse impact of the 1.5°C Paris-aligned sensitivity on asset carrying values, remaining useful life, or closure and rehabilitation provisions for the Group. It is possible that other factors may arise in the future, which are not known today, that may impact this assessment.

Additional scenario parameters

The next table shows some of the key data points that define our scenarios. The new central case "Conviction" scenario assumes climate policy ambition is almost equal to that in our previous scenario "Competitive Leadership". This reflects our observation of higher carbon price expectations and more concrete national mitigation plans. These data points are derived from our internal macroeconomic and energy models and form the basis for all our long-term commodity analysis.

Key scenario metrics	Base year	Conviction		Resilience	
	2023	2030	2023–2050 CAGR	2030	2023–2050 CAGR
Average exposed carbon price, (2023 US$/t CO_2e)[1]	35	78	8%	66	5%
Global GHG emissions, Gt CO_2e	54	55	-3.2%	51	-1.8%
Global CO_2 combustion emissions, Gt CO_2[2]	33	32	-4.6%	31	-2.7%
Global final energy demand, exajoule (EJ)	398	423	0.1%	414	0.2%
Electricity share of final energy, %	27%	32%	3.8%[3]	32%	2.2%[3]
Non-fossil share of electricity generation, %	46%	63%	6.5%[3]	60%	4.2%[3]

1. Simple unweighted average across Australian, European and North American national carbon schemes.
2. While total GHG emissions is the primary metric for estimating global warming, CO_2 combustion emissions give a clearer picture of the energy transition in the power and industrial sectors.
3. Indicates annual % growth of total electricity generation and non-fossil electricity generation.

Transition risks and opportunities are broadly higher in the Conviction scenario than in the Resilience scenario due to greater volatility. In addition to the demand outlook, the main factors which influence whether operations stand to gain or lose from the energy transition include how emission-intensive an operation is relative to its industry peers, its geographical location (affecting which climate policies it will be subject to), and how suitable the product is for downstream decarbonisation.

There are no portfolio adjustments made to the Group's medium to long-term plan under the various scenarios. Additionally, as our macroeconomic modelling involves a range of variables, isolating and measuring the impact of specific climate risks and opportunities is challenging. Therefore, the potential quantitative financial impacts are not disclosed. Furthermore, we do not publish our commodity price forecasts as this would weaken our position in commercial negotiations and might give rise to concerns from regulators and market participants. As good practice on scenario analysis and climate modelling evolves, we will continue to evaluate the robustness of our assessments of climate-related risks and opportunities drawing on more recently published studies and analysis.

Portfolio risks and opportunities in the low-carbon transition

Impact ● Opportunity/positive impact ● Neutral/no or minimal impact ● Risk/negative impact

	Short-medium term (0–10 years)	Long-term (beyond 10 years)
Cross-commodity	● The energy transition contributes to near-term demand growth across most of our commodity portfolio, especially in Conviction. Our ambition is to grow total production by ~3% per year on a copper equivalent basis from 2024 to 2033. ● Climate policy-related costs are rising in all regions, but considerably faster in OECD countries. These are likely to rise quickly in Conviction, creating financial incentives to undertake decarbonisation at many of our operations. In Resilience, carbon prices in developing countries increase more slowly. ● By 2030, carbon penalties are projected to cost $0.3 billion annually, rising to $0.6 billion by 2040 assuming there is no reduction in our emissions.	● Recycling and end-use efficiency improvements put downward pressure on demand, especially in Conviction, displacing some high-cost supply in our key markets. This will not be enough to offset growth in demand for primary supply. ● In Conviction, decarbonisation will become increasingly important to gain a social licence to develop new greenfield projects and for existing operations to remain profitable. However, carbon costs will be offset by higher commodity prices, and the potential for low-carbon operations to gain a competitive advantage in some markets. In Aspirational Leadership, demand for transition materials in the long-term offsets slightly lower demand for lower grade iron ore.
Iron ore	● Carbon costs are expected to rise at our Australian operations, but they represent a small component of our overall costs, and will therefore only have a limited impact on our margins during this time period. ● Steel producers are protected from rising carbon prices by transitional assistance (eg Europe) or exemption mechanisms (eg China), resulting in a slower rate of transitioning to low-carbon steelmaking. This limits any potential impact on consumer preferences for different kinds of iron ore. ● There is lower GDP growth and lower demand for iron ore in Resilience compared with Conviction in the medium and long-term.	● Rising carbon prices, especially in Conviction, will become more material at our Australian and Canadian operations, and at the Simandou project approximately a decade later. In Resilience, Simandou is likely to remain unaffected by carbon costs for several decades. ● As carbon prices rise, and transitional assistance is phased out, carbon costs on steel producers will increasingly favour low-carbon steelmaking and higher-quality ores. This will increase demand for our high-grade iron ore from the Simandou and Canadian operations which also has lower energy requirements when used in a blast furnace. ● The impact of low-carbon steelmaking on the relative economic value of different iron ore products, particularly lower grades, depends on the different technologies that reach a mature phase of development. Although consumer preferences may change, we also have some flexibility to alter our products' technical specification.
Aluminium	● Carbon costs are expected to rise, particularly at our refineries and smelters in Eastern Australia which currently rely on emission-intensive electricity. This will result in increased energy costs. ● Policies to prevent carbon leakage are likely to emerge, supporting the continued production of aluminium in OECD countries, but the implementation is highly uncertain. ● The contribution of aluminium to Group EBITDA averaged 11% over the period 2019-23 (using long-run consensus pricing). Given our ambition to diversify our portfolio, we expect its contribution to rise to around 15% by 2033 (on a consistent basis).	● In Conviction, carbon prices will push aluminium producers in OECD countries to switch to renewable and zero-carbon power and look for alternatives to current anode technology (eg ELYSIS™). Lower prices in Resilience may delay hard-to-abate decarbonisation by a decade or more ● Our hydro-based production in Canada and decarbonisation projects in Australia will find markets in regions with a low-carbon premium such as Europe. ● Annual demand for low carbon aluminium in Conviction is projected to be approximately 1.8 times greater by 2050, while demand in demand in Aspirational Leadership is expected to be higher than this.
Copper	● Electrification is supportive of near-term demand for copper, which is crucial to products such as renewable energy infrastructure and electric vehicles. Electric vehicles use 3-4 times more copper than conventional vehicles. ● Carbon costs at our operations (in the US, Mongolia, and Chile) are currently low and unlikely be to material until the mid to late 2030s in all scenarios. ● The contribution of copper to Group EBITDA averaged 9% over the period 2019-23 (using long-run consensus pricing). Given our ambition to increase copper production, we expect its contribution to rise to around 20% by 2033 (on a consistent basis).	● Electrification continues to support copper demand in both scenarios, supporting prices and incentivising growth projects. Electricity consumption growth is almost twice as strong in Conviction due to a higher GDP and a faster energy transition. ● Annual copper demand in Conviction is projected to be approximately 1.8 times greater by 2050, while demand in demand in Aspirational Leadership is expected to be higher than this. ● Copper smelting is less energy-intensive relative to other metals, further supporting demand.
Minerals	● Increasing use of EVs supports strong growth in the demand for battery minerals such as lithium. ● Carbon costs are expected to rise at our mineral operations in South Africa. ● Higher demand and prices for transition materials in Conviction and Aspirational Leadership than in Resilience in the medium to long term. ● The net impact of climate policy on our diamond business is likely to be minimal as carbon costs are unlikely to be a large fraction of their market value. ● Lithium is expected to significantly contribute to the Group's production growth, and we expect its contribution to rise to over 10% of Group EBITDA by 2033 (using long-run consensus pricing, including inorganic lithium growth).	● Even though battery technologies will develop over time, demand for primary lithium supply will be robust, with EVs dominating the market in Conviction over the next couple of decades, especially in China and Europe. ● Long-duration energy storage may support demand for lithium and other battery materials, but there are competing alternative technologies. ● Carbon costs will increase at energy-intensive titanium dioxide mining and processing operations in South Africa and Canada, making continued use of fossil fuels economically unattractive. ● Digital technologies and ride sharing may lower the demand for personal vehicle ownership in some markets. ● Lithium demand is expected to grow more than 6 times by 2050 in Conviction.

Strategic alignment with the low-carbon transition

With higher GDP growth and a faster low-carbon transition, our economic performance is stronger in Conviction than in Resilience. Higher carbon penalties and the potential impact on demand for mid and lower grade iron ore result in weaker economic performance in Aspirational Leadership than in Conviction. Overall, our portfolio is resilient under scenarios aligned with 1.5°C, 2.1°C and 2.5°C outcomes. The low-carbon transition is at the heart of our strategy. This mitigates risks associated with stricter carbon regulations and changing consumer preferences and positions us to capitalise on the growing demand for transition materials.

Transition materials metrics

Our products are classified as key transition materials (KTM) and other transition materials (OTM), aligning with the CA100+ Net Zero Standard for Diversified Mining Companies. Iron ore and gold are classified as transition neutral materials (TNM). We divested the last of our coal assets in 2018. Production of KTMs and OTMs increased by 11% and 2% respectively in 2024 on a copper equivalent basis.

Commodity	Classification	Year ended 31 December	Emissions Mt CO_2e[5,6]	Production[1]	Consolidated sales revenue[2] US$millions	Capital expenditure[3] US$millions	Operating assets[4] US$millions	2025 guidance Rio Tinto production share, unless otherwise stated
Lithium ('000 tonnes)	KTM	**2024**	–	–	–	**155**	**1,098**	–
		2023	–	–	–	27	834	–
Copper[7] (mined) ('000 tonnes)	KTM	**2024**		**624**				Copper (mined and refined, consolidated basis): 780 to 850kt
		2023		562	**2024: 4,728**			
Copper[7] (refined) ('000 tonnes)	KTM	**2024**		**248**	2023: 3,218			
		2023		175				
Silver (mined) ('000 ounces)	OTM	**2024**		**4,236**				
		2023		3,811	**2024: 98**			
Silver (refined) ('000 ounces)	OTM	**2024**	**2024: 1.0**	**2,314**	2023: 53	**2024: 2,055**	**2024: 22,124**	
		2023	2023: 1.0	1,407		2023: 1,976	2023: 21,050	
Molybdenum ('000 tonnes)	OTM	**2024**		**3**	**2024: 159**			
		2023		2	2023: 130			
Gold (mined) ('000 ounces)	TNM	**2024**		**282**				
		2023		282	**2024: 797**			
Gold (refined) ('000 ounces)	TNM	**2024**		**144**	2023: 476			
		2023		74				
Aluminium[8] ('000 tonnes)	OTM	**2024**	**16.0**	**3,296**	**9,363**	**1,256**	**12,017**	3.3 to 3.5Mt
		2023	17.4	3,272	9,239	847	11,919	
Alumina[8] ('000 tonnes)	OTM	**2024**	**5.7**	**7,303**	**1,522**	**279**	**804**	7.4 to 7.8Mt
		2023	5.8	7,537	1,204	325	1,315	
Bauxite[8] ('000 tonnes)	OTM	**2024**	**1.0**	**58,653**	**2,110**	**159**	**2,289**	57 to 59Mt
		2023	0.9	54,619	1,533	159	2,649	
Minerals[9] ('000 tonnes/carats)	OTM/TNM	**2024**	**1.7**	See footnote 10	**2,954**	**379**	**3,662**	Titanium dioxide slag: 1.0 to 1.2Mt
		2023	3.2		3,242	380	4,063	
Iron ore ('000 tonnes)	TNM	**2024**	**3.7**	**287,676**	**30,804**	**5,108**	**20,903**	IOC[11] iron ore pellets and concentrate: 9.7 to 11.4Mt Pilbara iron ore (shipments, 100% basis): 323 to 338Mt
		2023	3.7	290,171	33,772	3,193	20,594	
Thermal and metallurgical coal	Not applicable	**2024**	–	–	–	–	–	–
		2023	–	–	–	–	–	–

Further notes on production and capacity

Mined copper: On track for 1Mt copper production within 5 years.
Lithium carbonate (Rincon 3000): System capacity of 60kt; first production in 2028 with 3 year ramp up to full capacity. The production target of approximately 53kt of battery grade lithium carbonate per year for a period of 40 years was previously reported in a release to the ASX dated 4 December 2024 titled "Rincon Project Mineral Resources and Ore Reserves: Table 1". Rio Tinto confirms that all material assumptions underpinning that production target continue to apply and have not materially changed. Plans are in place to build for a capacity of 60kt of battery grade lithium carbonate per year with debottlenecking and improvement programs scheduled to unlock this additional throughput.
Iron ore (Pilbara System): System capacity of 345-360Mt mid-term.

Notes:

1. Production figures are measured according to Rio Tinto's ownership % share of each site. For further details on the % share, see pages 275 and 276 where these have been highlighted.
2. Consolidated sales revenue by product, as defined within Consolidated sales revenue by product on page 179, include 100% of subsidiaries' consolidated sales revenue and Rio Tinto's share of the consolidated sales revenue of joint operations but exclude equity accounted units. The product analysis above does not include certain other products and freight services disclosed in note 6 on page 179, which are not considered material.
3. Capital expenditure by product is the net cash outflow on purchases less sales of property, plant and equipment, capitalised evaluation costs and purchases less sales of other intangible assets as derived from the Consolidated Cash Flow Statement. The details provided include 100% of subsidiaries' capital expenditure and Rio Tinto's share of the capital expenditure of joint operations but exclude equity accounted units. The product analysis above excludes amounts that are not directly attributable to individual commodities.
4. Operating assets by product recorded above are the net assets of subsidiaries, joint operations and the Group's share relating to equity accounted units adjusted for net (debt)/cash and post-retirement assets and liabilities, net of tax, after the deduction of non-controlling interests. The product analysis above excludes amounts that are not directly attributable to individual commodities.
5. Scope 1, 2 and 3 emissions are measured on an equity basis and align to the Rio Tinto ownership % share used to record production values. For additional information on our emissions methodology, see our *2024 Sustainability Fact Book*.
6. The emissions in this table are Scope 1 and 2 GHG emissions (market-based) for the operating sites producing the commodity listed. The total differs from the full Group share reported numbers as these exclude development, closure sites, marine and corporate emissions.
7. Copper production from Oyu Tolgoi, Rio Tinto Kennecott and Escondida has been certified under the Copper Mark system. The Copper Mark certification for Escondida has been obtained via BHP which is the majority partner.
8. For a list of assets certified under the Aluminium Stewardship Initiative, see our *2024 Sustainability Fact Book*.
9. Minerals comprise titanium dioxide slag (OTM), borates (TNM), salt (TNM) and diamonds (TNM).
10. 2024 mineral production is as follows:
    (a) Titanium dioxide slag ('000 tonnes): 990 (2023:1,111)
    (b) Borates ('000 tonnes): 504 (2023: 495)
    (c) Salt ('000 tonnes): 5,823 (2023: 5,973)
    (d) Diamonds ('000 carats): 2,759 (2023: 3,340)
11. Iron Ore Company of Canada continues to be reported at Rio Tinto share.

Scope 1 and 2 emissions: Reduce emissions from our own operations

We aim to reduce our net Scope 1 and 2 emissions by 50% by 2030 (relative to 2018 levels), and to reach net zero by 2050.

We follow the principles of the mitigation hierarchy, prioritising abatement of emissions from electricity generation and use, process emissions and direct fuel consumption. In line with the IFRS standard on climate-related disclosures (S2), we report gross and net emissions separately. Our target applies to our net operational emissions on an equity share basis. Our gross Scope 1 and 2 emissions reductions are expected to be at least 40% by 2030, and the use of carbon credits towards our target will be limited to 10% of our 2018 baseline. In 2024, our net emissions include the use of Australian Carbon Credit Units (ACCUs) by our Australian assets to comply with the Safeguard Mechanism in the calendar year 2024[1]. Our targets cover more than 95% of our operational emissions and are calculated using the market-based Scope 2 method. To ensure a focus on real reductions and comparability over time, we adjust our 2018 baseline to exclude emissions reductions achieved by divesting assets and allow increases associated with acquisitions.

While there is no universal standard for determining the alignment of targets with the Paris Agreement goals, we concluded that our Scope 1 and 2 target for 2030 was aligned with efforts to limit warming to 1.5°C when we set it in 2021. At that time, KPMG provided limited assurance over the alignment of this target with efforts to limit warming to 1.5°C. Our targets were not set using a sectoral decarbonisation approach as there was no sector-specific methodology then. This remains the case today.

We use emissions metrics and other measures to track our progress towards our targets. We monitor and report this progress to the Executive Committee through an internal quarterly reporting process, which includes operational emissions and progress on abatement projects across our decarbonisation programs. KPMG provided limited assurance over our 2024 progress reporting against our Climate Action Plan in addition to its reasonable assurance of our Scope 1 and 2 emissions, and limited assurance of Scope 3 emissions. KPMG's statement is included at the end of the report.

The 4 most significant sources of operational emissions are:

- electricity (purchased and generated) - 37%
- carbon anodes in aluminium and reductants in titanium dioxide furnaces - 25%
- fossil fuels for heat at our processing plants and alumina refineries - 23%
- diesel consumption by our mining equipment and rail fleet - 13%.

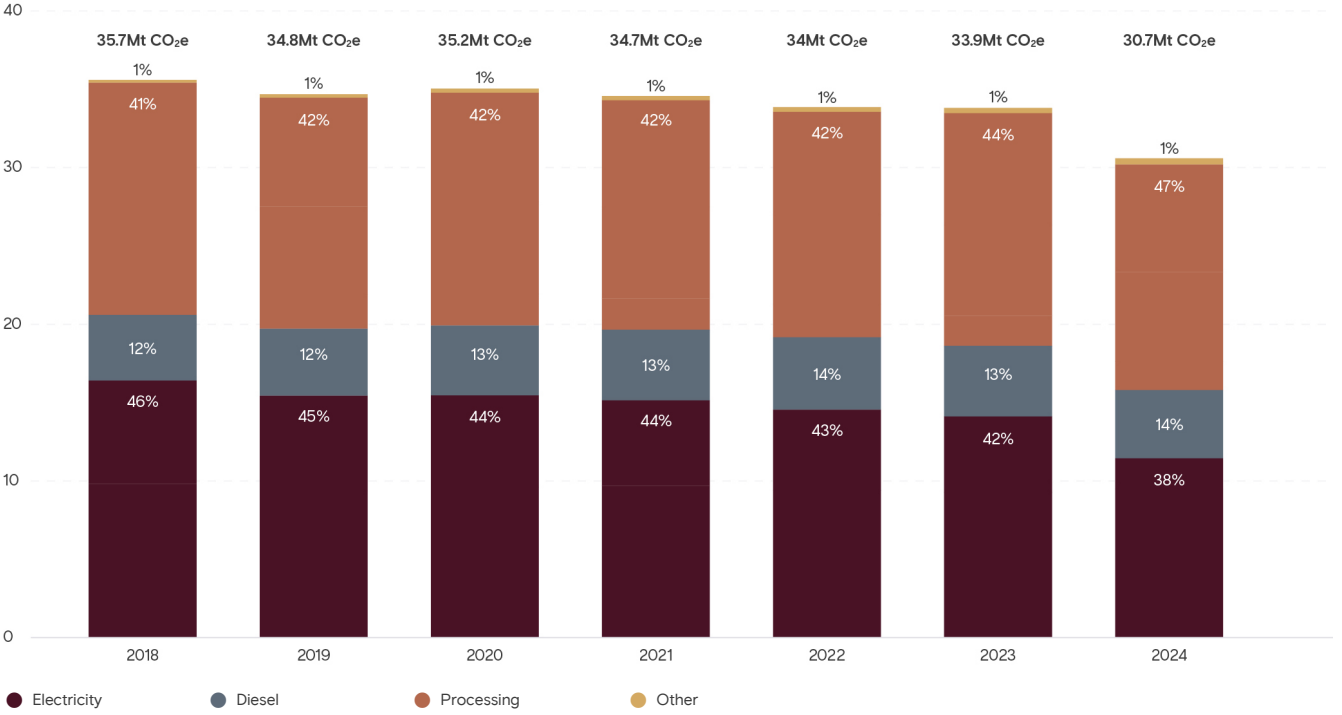
While our asset portfolio has evolved since 2018, as we orient our growth to transition materials, the share of emissions from our different commodities has remained stable. Today, approximately two-thirds of our emissions are generated from our Aluminium business.

Our Group-wide consumption of electricity is approximately 4 times that of other global diversified mining majors, due to the high energy intensity of the Aluminium business. However, 78% of the electricity we use is from renewable sources and we are making investment and supply decisions to increase this to around 90% by 2030.

2024 gross Scope 1 and 2 emissions (adjusted equity basis)

30.7Mt CO_2e

2023: 33.9Mt CO_2e (adjusted for acquisitions)



Note: Emissions are presented on an adjusted equity basis.

1. The compliance period for the Safeguard Mechanism is from 1 July to 30 June and does not align with our calendar year reporting. So the carbon credits used towards our 2024 net emissions calculation include Australian Carbon Credit Units (ACCUs) that were retired for compliance for the period 1 January to 30 June 2024 plus a projection of the number of ACCUs we expect to retire for the period 1 July to 31 December 2024. See Nature-based solutions section on pages 56-57 for further detail.

Progress, lessons learned and our approach today

Our approach to decarbonising our operations has evolved since 2021 when we first set our targets and CAP. This is partly due to the challenge of developing new technologies and implementing large-scale physical infrastructure projects. We have also found opportunities to contract renewable electricity and use renewable diesel.

Highlights from our 2021 CAP	Progress, lessons learned and our approach today
Aim to install 1GW of wind and solar capacity in the Pilbara (using our capital)	The emissions reductions we have achieved since 2018 are mostly the result of decarbonising power, but developing large-scale renewables projects in the Pilbara has taken longer. We need time to engage with Traditional Owners and to find appropriate sites. In addition, as we do not expect to deploy battery-electric haul trucks in the Pilbara before 2030, we now estimate we require approximately 600-700MW of renewable power capacity to displace 80% of our gas consumption for power generation. We are making progress and have now completed construction of a 34MW solar power plant at Gudai-Darri along with battery storage at Tom Price. Together with the Ngarluma Aboriginal Corporation, we are progressing the development of an 80MW solar PV facility near Karratha. We are also exploring a renewable energy project with the Yindjibarndi Energy Corporation (YEC) consisting of 75MW of solar on a greenfield site near Millstream Chichester National Park. Beyond the Pilbara, we have made substantial progress on renewables deployment around the world with our own capital investments and through commercial agreements. This includes projects at Kennecott and Diavik, PPAs at Gove, Amrun, QIT Madagascar Minerals, Richards Bay Minerals, Escondida and in the US. In addition, we have procured and retired bundled and unbundled energy attribute certificates (EACs, including Renewable Energy Certificates and Guarantees of Origin) for select locations around the world, though these represent less than 5% of our total electricity use.
Develop green repowering solutions for the Boyne Island and Tomago smelters	For our Gladstone assets, we have signed PPAs for a combined 2.2GW of renewable energy, catalysing the development of new large-scale renewable energy in Queensland. Government support for repowering is needed to maintain competitiveness of the highly energy-intensive, low-margin smelters. We secured a standalone support agreement with the Queensland Government in August 2024, and in early 2025, the Australian Government announced an aluminium production credit to help sustain and grow aluminium smelting in Australia. Together these initiatives provide critical support for our Gladstone aluminium operations' transition to renewable energy. Early in 2024, Tomago launched a Request for Proposal process seeking proposals from market participants for renewable energy and storage solutions. The process highlighted significant cost and schedule complexities in the New South Wales energy market, introducing risks to finding a competitive repowering solution for the Tomago smelter. We continue to partner with industry, energy market participants and governments to identify repowering pathways for a competitive, low-carbon future for aluminium in New South Wales.
Advance the deployment of zero emissions trucks	We continue to work with BHP, Caterpillar and Komatsu to accelerate the development of battery-electric haul trucks. In addition we have invested in the deployment of 8 smaller-sized battery-swap electric trucks at Oyu Tolgoi. However, we do not expect wide-scale deployment if large-scale electric trucks before 2030 due to technology maturity globally. Given this slower pace of technology development, we are developing alternative solutions in the interim. We have invested in renewable diesel with Kennecott switching to this in 2024, following the successful transition at our Boron mine in California the year before. We have also started to develop our own biofuel supply with an investment in 3,000 hectares in Queensland, Australia to plant Pongamia saplings.
Advance the use of hydrogen in our alumina refineries	Research, development, scale-up and deployment of new low-carbon technology can take decades and can also take longer than expected, particularly for industrial heat and process emissions that are hard to abate. Even if successful developments are unlikely to contribute substantial emissions abatement before 2030 target but will need to be commercially viable for widespread deployment to reach net zero by 2050. We are working with Sumitomo and the Australian Renewable Energy Agency (ARENA) to build a 2.5MW electrolyser at our Yarwun refinery to supply more than 125 tonnes of hydrogen per year and test its use in alumina calcination. In addition, we are progressing double digestion technology at Queensland Alumina Limited. This will involve process changes that can lower the temperature of the process and reduce energy consumption and carbon intensity. Beyond alumina refining, we are also trialling BlueSmelting™ at our RTIT Quebec Operations - a pre-reduction process for ilmenite. Our new joint venture with Aymium, Évolys Québec Inc. will manufacture a biocarbon product sourced from biomass residues, as an alternative for anthracite currently used in ilmenite smelting processes at Rio Tinto's Critical Minerals and Metallurgical Complex in Sorel-Tracy.
Bring ELYSIS™ to commercial scale by 2024 at our Alma smelter	ELYSIS™ is a breakthrough technology that removes the carbon anodes in aluminium smelting - a process that has been used globally for over 100 years. It continues to experience the scaling challenges and learning rates typical of major technology changes. We continue to make progress in developing ELYSIS™ technology with our partners and in 2023 commissioned prototype (100kA) cells at Alma. We continue work to commission commercial scale 450kA cells - this is now expected in 2025, having originally aimed for commissioning in 2023. In addition, we are also investing in the deployment of 10 smaller-scale 100kA cells at Arvida.
Build capability to invest in and develop nature-based solutions projects	Our abatement projects continue to be complemented by investment in nature-based solutions and the purchase of high-quality carbon credits. We are also applying our integrity screening criteria to the ACCUs we procure to meet our Safeguard Mechanism obligations in Australia. The IFRS S2 reporting standard now requires that companies with net emissions targets should be explicit about the gross reductions they are targeting and provide the reader with detail on the quality of the carbon credits that are used towards the net emissions targets. The use of carbon credits towards our 2030 target is limited to up to 10% of our 2018 emissions baseline. For more information about our use of offsets, see pages 56-57.
We estimated capital investment in decarbonisation of $7.5bn by 2030	Our target to reduce emissions by 50% by 2030, relative to 2018 levels, remains unchanged. However, we believe achieving this will require less capital investment, which is now estimated at the lower end of $5-6bn over the period 2022-2030, and more operating expenditure. We need to be disciplined about our capital investment and make a commercial case for each mitigation project. Our experience shows that we cannot solve this simply by allocating capital. To accelerate our emissions we will take advantage of commercial solutions that can be ready in the market this decade which includes the use of renewable diesel in our mining fleets, or PPAs for renewable electricity alternatives. Since 2021, our energy contracts have underpinned new investment in wind, solar and energy systems with an aggregate value of over $8bn.
Incorporate climate into the Chief Executive's short-term incentive plan (STIP) up to 5% of the total	Decarbonisation makes up 10% of our STIP today and now applies to 27,000 of our people, including our CEO. It has also been incorporated into senior leadership Performance Share Awards in the long-term incentive plan (LTIP).
Report emissions using a hybrid of location- and market-based approaches	In 2023, we updated our reporting methodology and now use market-based Scope 2 emissions in our primary metric and target. Consequently, the Bell Bay Aluminium and ISAL smelters, which are physically co-located and contracted with hydropower facilities, now report emissions under this new methodology.

We face two underlying challenges in delivering net reductions in absolute emissions. First, production growth increases emissions and we need additional abatement to address this. This growth may be brownfield (such as in the Pilbara) or greenfield (such as Simandou). And secondly, in our existing mining operations, increasing work indexes, with longer haul distances and declining ore grades, typical for the mining sector, mean that more energy is required to achieve the same level of production output.

Our adjusted gross Scope 1 and 2 emissions were 30.7Mt CO_2e in 2024. In 2024 we made significant progress and reduced our emissions by 3.2Mt CO_2e. This has primarily been achieved by new renewable energy contracts, including the limited use of unbundled renewable energy certificates in locations where new generating assets are under development or where power purchase agreements have been agreed.

In addition we have made commitments to projects that are expected to deliver abatement of around 3.6Mt CO_2e per year in future periods mostly through renewable electricity and biofuels. In addition, imminent investment decisions could deliver further abatement by 2030 and include new energy solutions at BSL and fuel-switching and electrification in the Queensland Alumina Limited (QAL) and Yarwun alumina refineries.

Our 2025 target is to reduce net emissions by 15% below 2018 levels. In 2023, we reported that while we expected to have committed to abatement projects representing more than 15% of group emissions, that delivered abatement would lag this target. Since then, we have executed a number of commercial partnerships and transactions that have allowed us to decarbonise faster. We have now reduced gross operational emissions, by 14% below our 2018 levels. After applying high integrity offsets our net Scope 1 and 2 emissions are 17% below our 2018 baseline.

Progress on abatement will not be linear. Delays are the result of a range of factors, including engineering and construction challenges, pace of development of new technology and energy systems in the locations in which we operate, and the need to carefully balance our ambitions with the needs of our local communities and stakeholder groups. In response to this, we continue to work with our partners, governments and others to progress abatement opportunities, and, in parallel, we are adopting commercial solutions, such as PPAs and biofuels, that can deliver emissions reductions faster. We anticipate abatement from these to rise between 2025 and 2030.

Our roadmap to 2030

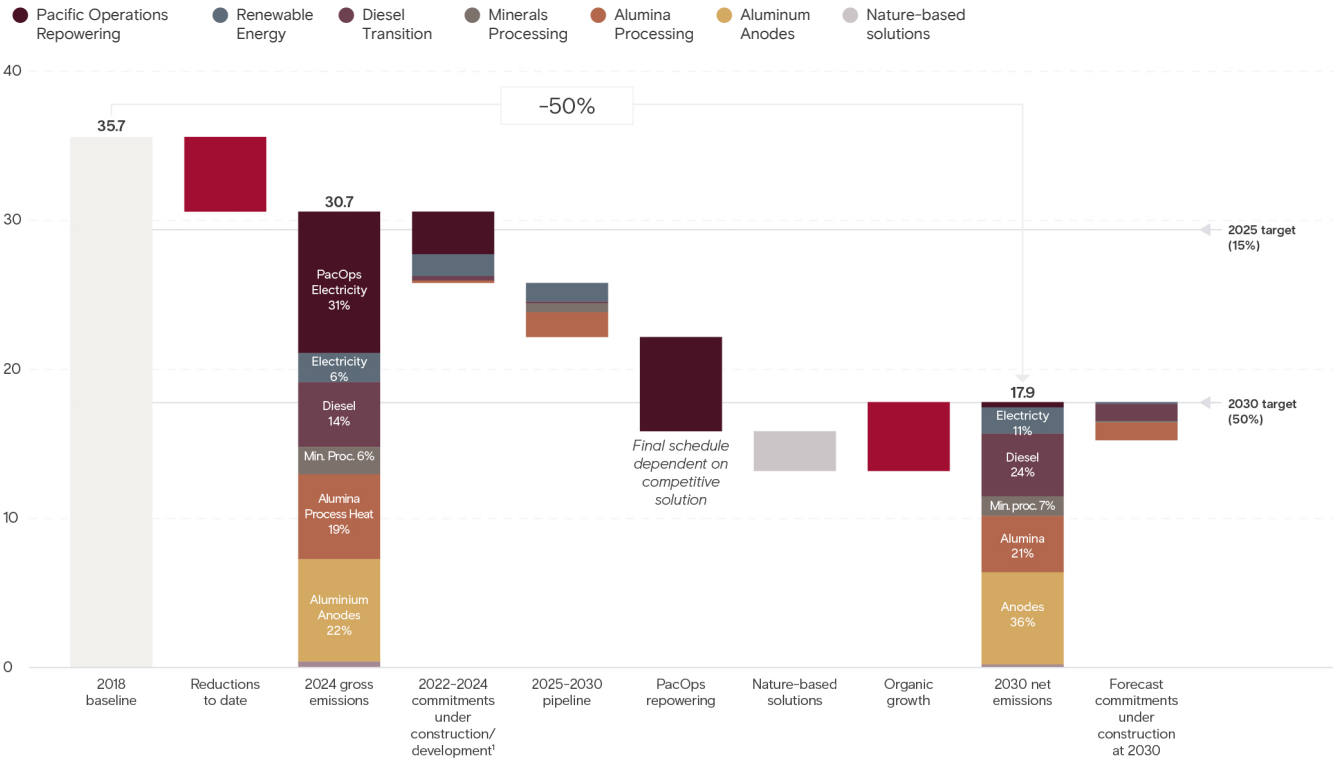
Between now and 2030, the most significant opportunities to reduce our Scope 1 and 2 emissions are to switch the electricity we generate or purchase to renewables, and to address process heat emissions from our alumina refineries. We have a pipeline of projects and committed investments that support our 2030 target of a 50% reduction in emissions. To reach our 2030 target, our single largest lever – accounting for around one-quarter of our emissions – is at the Boyne and Tomago aluminium smelters in our Pacific Aluminium Operations.

We must also make progress with other key projects in our pipeline related to renewable electricity contracts (for example Richards Bay Minerals PPAs) and alumina processing heat reductions (for example QAL double digestion), to meet our 2030 target. Production growth and growth from new projects also need to be accommodated within our absolute emissions reduction target. Collectively, this represents around 4.6Mt CO_2e to our baseline to 2030.

In addition, we now expect to use high-quality carbon credits from nature-based solutions towards our Scope 1 and 2 net emissions target to 2030. These will be limited to up to 10% of our 2018 baseline emissions and are expected to be predominantly carbon credits (ACCUs) used by our Australian operations for compliance with the Safeguard Mechanism. Our emissions reporting will continue to transparently distinguish between our gross operational emissions and net emissions for the Group, as well as meeting transparency standards regarding the volume and type of carbon credits retired.

Pathway to 2030 target

(Mt CO_2e equity basis)



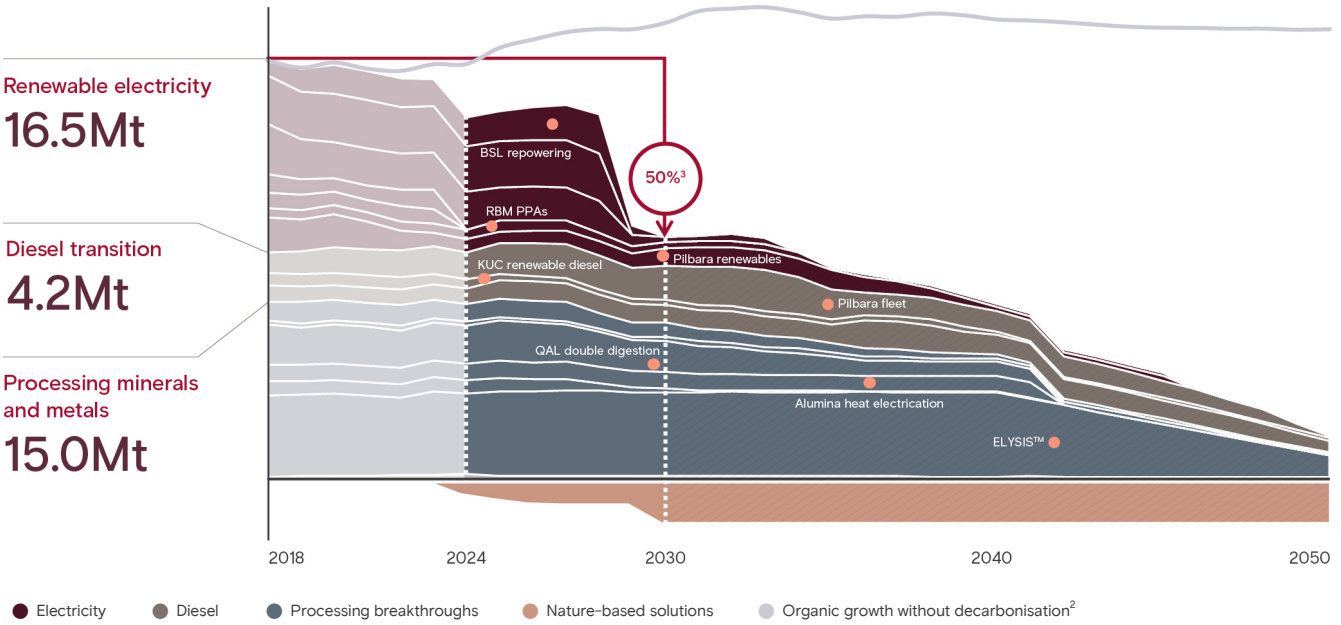
1. 2022-2024 commitments exclude 1Mt abatement for projects either fully or partially captured in 2024 actuals, including Oyu Tolgoi RECs, Kennecott renewable diesel, Boron renewable diesel and Gudai-Darri solar.

Our roadmap to 2050

We are targeting net zero emissions from our operations by 2050, with a pathway to net zero for each area of our carbon footprint. This is challenging given approximately half of our Scope 1 and 2 emissions will require technology breakthroughs, but we are determined to be a catalyst for their development.

Group decarbonisation pathway[1]

(Mt CO_2e equity basis, 2018 baseline)



1. Totals shown represent 2018 baseline emissions, reflecting increased equity at BSL, NZAS.
2. Baseline emissions extended post-2040 using assumed asset life extensions.
3. Represents net emissions reduction vs 2018 baseline.

By 2030, we expect to have made significant reductions in our electricity-related emissions (both Scope 1 and Scope 2). Beyond 2030, the outlook for emissions abatement is more uncertain. However, we have achieved breakthroughs in low-carbon technology that provide us with at least one visible pathway to net zero for all our major sources of emissions. This is a significant achievement. However, technology development is complex and these breakthroughs may not all turn out to be scalable and competitively deployable. As such, we continue to pilot and demonstrate these technologies with our partners, while maintaining research and development initiatives across industry to find alternatives that may prove more promising. Given the uncertain timing of suitable, proven and commercial-scale technology, our roadmap to 2050 allows for future opportunities to be defined post-2040.

Carbon removals

By 2050, small sources of hard-to-abate emissions may remain and will therefore require carbon removals to achieve net zero. This may be through natural or technological removals and storage.

In the short to medium term, we are investing in high-integrity nature-based solutions in the regions where we operate, and will voluntarily retire carbon credits to complement other decarbonisation investments (see pages 56-57 for further detail).

In the medium to long term, technological removals may offer a more permanent solution to any remaining emissions from fossil fuel consumption. We are also exploring the potential of carbon capture and mineralisation technologies. In 2024, we focused on finding the best technologies to capture the low concentration carbon dioxide (CO_2) from our aluminium smelters' flue gas. This requires either the adaptation of direct air capture technologies to higher concentration CO_2 or the adaptation of point source technologies to lower concentrations. In both cases, the technology readiness level is often low.

In early 2025, we signed a partnership agreement with Hydro to identify and evaluate carbon capture technologies for future implementation in the aluminium smelting process. Separately, in partnership with Carbfix, the characterisation of the ISAL site for mineralisation is progressing, aiming for first injection in 2028.

The assessment of the CO_2 mineralisation potential of our co-owned Tamarack project in Minnesota has progressed with the completion of a 1,137 meter exploratory well. More work is planned in 2025 to investigate the carbonation behaviour of the rock.

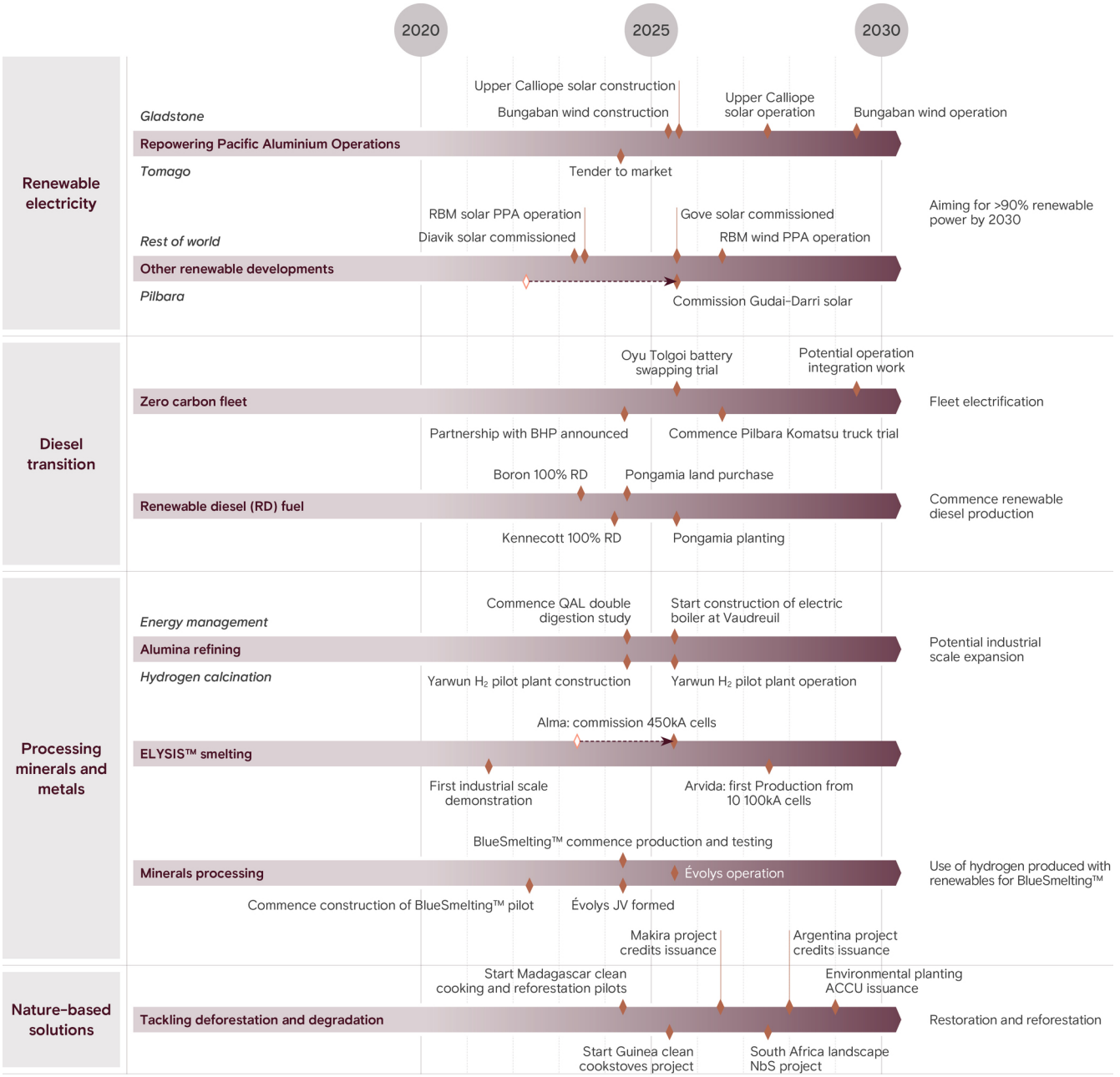
Action to reduce our emissions

The three main areas of our abatement work are: firstly, developing renewable electricity solutions at our Pacific Aluminium Operations and other assets that rely on gas or coal-based power; secondly, transitioning away from diesel in trucks, trains and mobile equipment; and thirdly, tackling hard-to-abate emissions from processing minerals and metals. Additionally, we are developing and investing in nature-based solutions projects.

Progress in 2024	Action in 2025
Renewable electricity	
Repowering Pacific Aluminium Operations	
– Announced 2 renewable PPAs for 2.2GW to supply our Boyne aluminium smelter in Gladstone and secured in-principle Queensland government support. – Further explored commercial sourcing strategy at Tomago to secure an energy solution for the energy supply contract which expires on 31 December 2028. – Signed long-term PPAs to supply our New Zealand Aluminium Smelters with electricity generators for a total of 572MW of hydro electricity.	– Secure remaining renewable and firming portfolio for Boyne smelter, pending government support. – Continue to engage with governments and energy market participants on the future energy supply for Tomago. – Develop a renewable energy strategy for Gladstone alumina refineries (previously 2024).
Other renewable electricity developments	
– Commenced construction of solar PV at Gove (10MW) and Amrun mine (12MW). – Executed wind Virtual Power Purchase Agreement (VPPA) (78.5MW) at Monte Cristo in the US to abate our regional Scope 2 emissions. – Completed construction and commenced operating Diavik diamond mine solar plant (3MW). – Commissioned a 5MW solar plant and commenced construction of Kennecott solar Phase 2 (25MW). – Signed a 230MW wind PPA at Overberg for Richards Bay Minerals (RBM). – Signed a 140MW wind PPA at Khangela for RBM. – Construction was progressed on the 148MW solar PV project at Bolobedu for RBM (PPA signed in 2022). – Commenced a pilot program for rooftop solar installation at our operations in the Pilbara. – Executed new contracts for EACs across global assets while developing new PPAs and Build Own Operate (BOO) solutions.	– Complete commissioning of solar PV at Amrun and Gove. – Complete construction of Kennecott solar Phase 2 (25MW). – Complete construction of the 16MW wind facility at QIT Madagascar Minerals. – Commence construction of the 230MW wind PPA at Overberg for RBM. – Finalise an agreement to secure energy from a 75MW solar farm being developed by Yindjibarndi Energy Corporation. – Progress development of Karratha Solar Farm (80MW) with Ngarluma Aboriginal Corporation. – Execute additional renewable energy PPAs, while construction continues on the 78.5MW US wind VPPA.
Diesel transition	
– Transitioned 100% of Kennecott heavy mining equipment to renewable diesel (95% of operations transitioned). – Collaborated with BHP on battery-electric haul trucks pilot program, including receipt of trucks for local options and assembly in Western Australia. – Acquired land to pilot production of renewable diesel in Australia, using Pongamia trees. – Developed a partnership with China's State Power Investment Corporation (SPIC) to demonstrate a fleet of battery swap electric haul trucks and associated infrastructure at Oyu Tolgoi.	– Progress Caterpillar battery-electric haul truck trial at BHP Jimblebar mine site in the Pilbara. – Deploy fleet of battery swap electric trucks at Oyu Tolgoi. – Progress planting of Pongamia saplings in Queensland, Australia.
Processing minerals and metals	
Aluminium anodes	
– Progressed start-up of the industrial scale 450kA ELYSIS™ cells at Alma. – Announced the project at Arvida for 10 ELYSIS™ cells operating at 100kA, a $285 million investment in partnership with Investissement Québec. Significantly progressed on site preparation and ordering long lead items for this project.	– Commission an industrial scale 450kA cell at Alma (previously 2024). – Perform further tests of the 100kA cell at Arvida. Finalise technical package, site preparation and building construction at Arvida for the additional 10 cells.
Alumina processing	
– Completed double digestion pre-feasibility study at QAL. – Completed 95% of detailed design and engineering for the Yarwun Alumina refinery hydrogen calcination project, including awarding major construction packages and commencing electrolyser site works. – Progressed feasibility study for electric boiler project at Vaudreuil after delays due to power requirements and scope changes. – Progressed electric steam and thermal energy storage (TES) studies for refineries. – Executed bio-pellet trials at Yarwun and progressed energy crop growing trials.	– Start QAL double digestion feasibility study (previously 2024). – Begin hydrogen calcination trials at Yarwun. – Final approval of, and commence work on, electric boiler project in Vaudreuil. – Commence small-scale electric calcination pilot in Vaudreuil.
Minerals processing	
– Validated phase 1 of BlueSmelting™ technology for ilmenite ore and safely transitioned from smelter gas to hydrogen. – Established new joint venture Évolys™ to manufacture biocarbon products. – Completed long-term 5% replacement trials to qualify biocarbon as a raw material at RBM and RTIT Quebec Operations. – Completed an industrial trial of replacing coke with biocarbon (25% replacement) for pelletisation.	– Develop bioenergy supply sources (biofuel and biocarbon) to support the industrial ramp-up of the new joint venture Évolys™. – Complete phase 2 of the BlueSmelting™ technology validation. – Complete the installation and commissioning of an electric boiler at IOC.

Progress in 2024	Action in 2025
Nature-based solutions	
– Feasibility studies completed in Guinea, with South Africa study delayed by elections and now due in mid-2025. – Dual pilot-feasibility approach continued in Madagascar for the protection and restoration of the Tsitongambarika Forest including clean cooking, reforestation and conservation activities, with learnings to be applied to other regions in 2025. – Voluntary agreements finalised, including an investment in the Makira Natural Park REDD+ Project in Northern Madagascar, through a partnership with the Wildlife Conservation Society and Everland. – Finalised ACCU offtake agreements for high-quality human-induced regeneration and with savanna fire management project developers. Invested in the Silva Carbon Origination Fund securing access to large-scale, high-integrity environmental planting ACCUs. – Published details on our project development and carbon credit sourcing strategy, including our due diligence process and planned volumes.	– Assess South Africa feasibility study and move into pilot phase if feasible. – Deliver first cookstoves for Guinea and Madagascar clean cooking pilots. – Begin pilot programs for reforestation in Guinea and Madagascar. – Initiate pilot-feasibility study for a sustainable agro-forestry project in Guinea. – Secure offtake agreement for Argentina native grasslands management carbon project. – Expand our environmental planting ACCU pipeline in Australia.

Operational decarbonisation project tracker



Milestones post-2025 are indicative, based on current goals and plans, subject to investment decisions and so they may change – there is increasing uncertainty further into the future.

Renewable electricity

11.5Mt CO_2e
emissions from power generation (2023: 14.2Mt CO_2e)

28%
percentage of Group emissions from electricity at Boyne and Tomago smelters and Gladstone Power Station

78%
percentage of electricity from renewable sources (2023: 71%)

$79m
decarbonisation spend on renewable electricity projects in 2024

Repowering Pacific Aluminium Operations

Our Boyne and Tomago Smelters operate in a third-party-operated coal-based power grid which is undergoing a complex transition to renewable generation sources.

Securing long-term renewable power solutions for the smelters supports the energy transition required for the Gladstone region to maintain jobs and increase opportunities for industrial growth.

Emissions reduction across the aluminium value chain in Australia is complex. It relies heavily on the availability of large-scale, competitive, firmed renewable power, alongside significant investment, collaboration and partnership with governments, technology developers and industry peers to support innovation breakthrough. We cannot do this alone.

Contracts for the current supply of electricity to our Boyne smelter expire in 2029, and for Tomago by end of 2028, and the smelters must develop low-cost renewable energy solutions to maintain their long-term viability. Decarbonising these assets requires solutions supported by state and federal governments.

Our Boyne smelter requires up to 975MW of power, equivalent to 3-4GW of high-quality wind and solar capacity paired with appropriate and competitive firming assets and contracts.

In 2024, we announced PPAs for a combined 2.2GW of renewable energy to repower BSL, catalysing the development of new large-scale renewable energy in Queensland. These comprise 1.1GW of solar electricity from European Energy's Upper Calliope solar farm to be built near Gladstone and 1.1GW from Windlab's Bungaban wind project. Once the projects are developed, they could generate energy equivalent to 10% of Queensland's current power demand.

In August, we made arrangements with the Queensland Government on a support package for Boyne Smelter to assist with the transition to a competitive and repowered future. These arrangements would come into effect in 2029. They are supported by the Australian Government's aluminium production credit as announced in early 2025, and contingent on our investment in further renewable energy and the approval of our joint venture partners.

Other renewable electricity developments

We rely on renewable and non-renewable electricity to power our mines, processing plants and supporting infrastructure. We are working to displace gas and coal-fired power with solar PV, wind and other renewable technologies.

We are focusing on the transition to renewable energy sources in 5 main regions: the Pilbara in Western Australia, RBM in South Africa, bauxite operations in Weipa, Australia, Kennecott in the US, and Oyu Tolgoi in Mongolia. Total electricity-related emissions from these assets were 0.9Mt CO_2e in 2024.

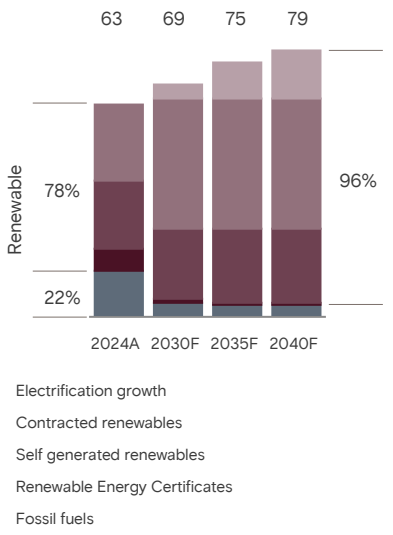
In 2024, RBM signed two renewable energy agreements: a 20-year 140MW wind PPA at Khangela and a 20-year 230MW wind PPA at Overberg. We also purchased EACs to cover the period until these assets are commissioned. At Kennecott, a 78.5MW wind VPPA and a 25MW solar PV facility were approved. Additionally, commissioning of a 5MW solar PV plant was completed in 2024, after undergoing rectification works and commissioning throughout the year. Construction on a second 25MW plant started in late 2024. At Amrun, a 12MW solar farm is under construction, and at Gove, 10MW of solar is being built.

Decarbonising the electricity at each of these locations has varying degrees of complexity, including whether the power is externally or internally generated, land access requirements (including permitting and Traditional Owner engagement) and availability of commercial solutions. A 100MW solar PV facility can require a land area of approximately 200 hectares, equivalent to the operating footprint of one of our mines in the Pilbara. Although renewables benefit from established construction methods, are lower technical risk and relatively low impact on the ground, the sheer scale of the renewables footprint means that we must take the time required to find suitable sites and engage with Traditional Owners.

We invest our own capital in renewable energy projects while also using other renewable energy procurement methods (such as PPAs and EACs) that align with global standards and practices. Under the GHG Protocol, renewable electricity must either have an EAC or be derived from renewable generation that is not contractually committed to another party. In alignment with the GHG Protocol we report eligible energy supplies as renewable and include them in our Scope 2 emissions reporting.

Group electricity use

(TWh, equity basis)



Diesel transition

4.4Mt CO_2e
Scope 1 and 2 emissions in 2024 (3% decrease from 2023). The Diesel Transition program also addresses marine fuel and some other smaller emissions sources.

$64m
decarbonisation spend on diesel transition programs in 2024

5%
percentage of global diesel supply transitioned to renewable diesel

1.6 billion litres
diesel consumed at our major managed operations in 2024

Diesel use from our mobile equipment and rail fleet represents around 13% of our total Scope 1 and 2 emissions.

Although electrification is the preferred long-term solution for reducing diesel emissions, it is not technically or financially feasible at all mining operations today, or for all types of equipment. Electrification is well suited to our greenfield applications where we have large fleets, but less so to brownfield operations with smaller fleets, shorter mine life or other operational complexities. Complementary pathways are therefore in development and include the use of renewable diesel to more immediately reduce diesel-sourced emissions.

Electrification

The electric vehicles required to support meaningful emissions reductions for the mining industry are unique from those deployed in the transportation or logistics sectors, or consumer vehicles with fixed routes and operating conditions. Mining solutions must be adaptable to changing mine plans, supported by flexible charging locations and powerful enough to support intense work cycles with high operating hours and loads. Most importantly, they need to be safe, reliable and have sufficient battery capacity and run-time between charging cycles.

Charging infrastructure must also be dynamic and support evolving mine plans and equipment routes which may mean that charging stations cannot remain permanently in one location or must be complemented by mobile solutions. The charging network requires access to sufficient and reliable renewable energy.

In 2024, we progressed the following electrification activities:

1) **Battery-electric haul truck Pilbara collaboration**: We progressed our partnership with BHP to test battery-electric haul trucks in the Pilbara region. In 2025 and 2026 we will collect data on battery performance, charging systems, and overall productivity in Pilbara conditions, and share the information so we learn faster.
2) **China's State Power Investment Corporation (SPIC) partnership:** Battery swapping technology allows a battery-electric vehicle to quickly exchange a discharged battery pack for a fully charged one, instead of recharging the vehicle at a static charging station. The technology is already applied on haul trucks in mining operations across China. The 2-year project will demonstrate 8 mining haul trucks (91 tonne payload), 13 batteries (800kWh), and a robotic battery swap and charging station in non-production activities at the Oyu Tolgoi open pit copper mine in Mongolia.

Renewable diesel

Renewable diesel is a drop-in replacement fuel that can be used in existing equipment to significantly reduce emissions. While renewable diesel presents a compelling option, widespread adoption depends on development of a liquid market of sustainable feedstock. To support this, we are developing a sourcing strategy for commercially available renewable diesel from third-party suppliers while also developing organic supply options by identifying and cultivating sustainable feedstocks focusing on Australian-based options such as Pongamia.

In 2024, we progressed the following renewable diesel activities:

1) **Transitioned Kennecott operations to renewable diesel,** achieving 95% diesel displacement including all heavy mining equipment across the mine, concentrator, smelter, refinery and tailings.
2) **Continued renewable diesel use at Boron** following successful trials initiated in 2022.
3) **Purchased land for Pongamia seed oil feedstock generation pilot.** We acquired approximately 3,000 hectares of land in north Queensland to assess Pongamia viability and yield. We are partnering with Midway to oversee the planting and management of the Pongamia seed farms.

Given the potential timeframes and challenges associated with large-scale development and deployment of battery vehicles in some industries, policies must support market development and competitiveness of alternative fuels. The lack of a liquid market is a key constraint to widespread and accelerated use of alternatives to diesel fuels, both physically and economically. Support is needed to incentivise the production and use of biofuels at volume and grow this industry. Incentives could include support for research and development, pilot programs and direct support to landowners to develop advanced biofuel feedstock crops in suitable areas.

For further information see our climate briefing paper on transitioning our diesel fleet riotinto.com/climatechange

Processing minerals and metals

Aluminium anodes
6.9Mt CO_2e
(2023: 7.1Mt CO_2e)

Alumina refining
5.7Mt CO_2e
(2023: 5.8Mt CO_2e)

Minerals processing
1.8Mt CO_2e
(2023: 1.9Mt CO_2e)

$144m
decarbonisation spend on processing minerals and metals programs in 2024.

Aluminium anodes

We are working to develop a breakthrough aluminium smelting technology with no direct greenhouse gas emissions.

The ELYSIS™ partnership was established in 2018 with Alcoa, with support from Apple and the governments of Canada and Quebec, to develop the world's first direct emissions-free aluminium smelting process using inert anodes to replace carbon ones.

Work at Alma is now focused on scaling up the ELYSIS™ technology towards the demonstration of commercial-size cells. The smelting cells will operate on an electrical current of 450kA, which is the commercial scale for many large, modern aluminium smelters. As noted above, research and development is complex and sometimes takes longer than planned. Commissioning these cells was originally anticipated in 2023 but is now expected to be in 2025 due to delays in installing and commissioning some equipment. A plan is now in place to complete these crucial steps, and the fundamentals of the technology remain sound.

We also aim to grow capacity for our ELYSIS™ low-carbon smelting technology. Before 2030 our use of ELYSIS™ carbon free smelting technology will support new production and will not address emissions from existing carbon anodes. For all of our smelters, the deployment of ELYSIS™ technology is inextricably tied to the long-term plans for the underlying assets. For this reason, associated abatement is not currently reflected in the forecast 2030 plan, but we expect to phase out the use of carbon anodes at our smelters beyond 2030.

In June 2024, we announced an investment of $285 million to build a demonstration plant using the first ELYSIS™ technology licence, in partnership with the Government of Quebec. This plant will be built at the Arvida smelter in Quebec equipped with 10 carbon-free aluminium smelting cells operating at 100kA. The investment will support the ongoing development of the breakthrough ELYSIS™ technology and allow us to build expertise in its installation and operation.

Alumina processing

The alumina refineries in Gladstone; Yarwun and QAL are the largest source of process heat emissions in the Group. The refineries are currently reliant on coal and gas to generate heat for digestion (75% of refinery emissions) and use in the calcination phase (25% of refinery emissions) of the process.

The successful reduction of emissions in our Australian alumina refineries relies heavily on technology development, capital investment and the availability of large-scale renewable energy. Our preferred decarbonisation strategy, based on technical merit and commercial viability, is a combination of energy management, fuel switching and electrification.

We are focused on reducing the emissions of the digestion phase through 3 main projects:

1) **Reducing baseload energy requirements through double digestion.** In 2024, we completed a double digestion pre-feasibility study at QAL. The feasibility study was approved in Q4 2024 and therefore commencement of the study work will now occur in 2025.
2) **Upgrading energy with heat pumps and mechanical vapour recompression (MVR).** At QAL, the order of magnitude study for waste heat recovery using MVR will commence in Q1 2025 and is planned to complete in Q2 2025. The project is expected to commence pre-feasibility in Q3 2025.
3) **Fuel switching through electric steam generation (including electric boilers and thermal energy storage)**:
   - Final approval of the electric boiler project in Vaudreuil is now expected in 2025.
   - At Yarwun, the thermal energy storage (TES) industrial demonstration project has seen continued discussion with the technology supplier Rondo and Australian Renewable Energy Agency (ARENA). This project is expected to move to a feasibility study in 2025, pending additional support from ARENA.
   - At Yarwun, we executed a bio-pellet trial. A feedstock growing trial continues in North Queensland. We are progressing several partnership opportunities for bio-based energy supply to Gladstone.

To reduce emissions in the calcination phase, we are focused on 2 main projects:

1) **Substituting natural gas with green hydrogen.** At Yarwun, the design and engineering for the hydrogen calcination project have been completed and construction is in progress. Trials to burn hydrogen in the calcination process are planned to commence in the second half of 2025.
2) **Electric calcination.** At Vaudreuil, an electric calcination pilot is planned to commence in 2025.

For our climate briefing paper on decarbonising our Australian alumina refineries, see riotinto.com/climatechange

Minerals processing

A large source of our process emissions arises from processing titanium dioxide feedstocks (TiO_2) in Canada and South Africa.

Finding new and innovative technologies to support the decarbonisation of these facilities represents both a challenge and an opportunity. Carbon abatement can be partially realised by transitioning from fossil fuels to renewable energy sources for heating and operating these facilities.

We are partnering with the governments of Canada and Quebec to support technological innovations to decarbonise our operations by up to 70% and strengthen the critical minerals and metals value chains through the production of titanium metal and scandium. The BlueSmelting™ demonstration plant, which started in April 2023, employs world-first technology developed by Rio Tinto, to reduce emissions from RTIT Quebec Operations.

If successful, the technology could be applied to our RBM operations in South Africa, which use the same smelting process. There are other potential applications for BlueSmelting™ technology in decarbonising steelmaking.

In 2024, the BlueSmelting™ technology was fully validated for QMM ilmenite ore at our RTIT Quebec Operations, and reduction gas was safely transitioned from smelter gas to hydrogen. Several ilmenite ores were tested with hydrogen and the first tests with iron ore from IOC have been successfully completed.

Scaling up low carbon technology for minerals and metals processing is expected to require significantly more renewable energy. Access to hydroelectric power in Quebec requires support from the government-owned provider. In a tight market, access to this supply could be limited and the negotiation period can be time-consuming. Support to streamline discussions and consideration of the supply of additional renewable energy to hard-to-abate Canadian industries, where it can have the greatest impact, could underpin further investment in breakthrough technologies.

In 2024, we announced a new joint venture with Aymium named Évolys. We will manufacture a metallurgical biocarbon product to reduce carbon emissions in large-scale industrial processes. The biocarbon product will be used at RTIT Quebec Operations as an alternative to anthracite.

Biocarbon trials were successfully carried out at RBM and RTIT Quebec Operations sites this year, thus completing industrial qualification. And, at IOC, we completed a plant trial of substituting coke with biocarbon.

In 2025, we aim to develop bioenergy supply sources (biofuel and biocarbon) to support the industrial ramp-up of the new joint venture Évolys™. We also plan to complete phase 2 of the BlueSmelting™ technology validation and the installation and commissioning of an electric boiler at IOC.

For further information, see our climate briefing paper on decarbonising our minerals processing riotinto.com/climatechange

Nature-based solutions

Nature-based solutions and carbon credits decarbonisation spend[1]

$70m

(2023: $45m)

In 2022, we set up a team dedicated to developing and investing in nature-based solutions near our operations, because we believe they are a win for people, nature and climate. Over the last 2 years, we developed our high-integrity criteria – based on our own standards as well as international best practice, guidance and principles. We have identified new projects to develop and existing ones to scale up, and partnered with NGOs and other experts to deliver our program. Today, we are on track to enable 500,000 hectares of high-integrity nature-based solutions across Argentina, Australia, Guinea, Madagascar and South Africa by the end of 2025.

These projects are enablers for activities that support sustainable livelihoods for the communities where we operate, while protecting and restoring nature, and delivering high-quality carbon credits. Our projects complement structural abatement.

How we use carbon credits

We anticipate that we will retire approximately 1.1 million Australian Carbon Credit Units (ACCUs) for compliance with the Safeguard Mechanism for the calendar year 2024.

In alignment with our updated CAP, we will limit the use of voluntary and compliance carbon credits towards our 2030 climate target to up to 10% of our 2018 baseline emissions (~3.6 million). Carbon credits retired as offsets towards our climate targets must pass our due diligence assessment, including meeting our high-integrity criteria.

See our *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* report and our *2024 Sustainability Fact Book* for further detail on our carbon credits retirement methodology.

How we source carbon credits

We source carbon credits in 3 ways[2]:

- We develop new projects – we work with local partners and communities to develop and implement new nature-based solutions projects that address nature loss, while generating carbon credits and delivering benefits for local communities.
- We invest in and scale up existing projects – through commercial investments with project partners, we provide capital and support the development and scale-up of nature-based solutions projects in our operating regions.
- We source high-integrity carbon credits through spot carbon credit purchases and long-term offtake agreements from nature-based solutions projects that meet our high-integrity criteria. We aim to source the highest quality credits available in the market.

All our investments and purchases are subject to our high-integrity criteria, which forms the basis of our due diligence process[3]. To assess projects, we analyse publicly available data, geospatial data, and data and models from project developers. We also hold question and answer sessions with developers, combined with site inspections. This information is assessed against our requirements, and if at any stage the project fails to meet our criteria, we do not proceed with the investment.

Our criteria include an assessment of the potential impact of our projects, seeking to ensure that they do not result in negative unintended consequences for people, communities, their heritage or natural ecosystems. The risks and opportunities identified in the assessment must be addressed, managed, tracked and assessed periodically during the project.

In 2024, approximately 15% of all projects assessed met our criteria, highlighting our commitment to building a high-integrity and diverse project pipeline for Rio Tinto, including a variety of methodologies across a wide range of ecosystems and land uses.

Our high-integrity criteria

In 2024, we updated and expanded our high-integrity criteria[4], using our own learnings and the latest international best practice, guidance and principles, including the Core Carbon Principles by The Integrity Council for the Voluntary Carbon Market and the International Union for Conservation of Nature Global Standard.

1) **Additionality:** The project and its outcomes are made possible by climate finance and would not have happened otherwise.
2) **Quantification:** The project can generate real carbon reductions, removals, or both, supported by robust accounting practices.
3) **Permanence:** The project can deliver permanent carbon reductions, removals, or both, and reversal risks are realistic and well-managed.
4) **Governance, Social and Ecological Safeguards:** The project takes an integrated approach to protecting or restoring nature, or both, while supporting community livelihoods and respecting human rights.
5) **Sustainable Development and Nature Positive Outcomes:** The project supports multi-decade sustainability outcomes and a diverse project pipeline for Rio Tinto.

We also published more detail about our due diligence process, including the questions we ask project developers to evaluate their projects.

This information, including specific steps we take when assessing ACCU projects, is available at riotinto.com/naturesolutions

Our voluntary projects

Our development and scale-up projects include landscape-level protection and conservation, restoration and land-use management activities, covering clean cooking initiatives, reforestation and afforestation, forest and grassland management, sustainable forestry and agro-forestry. These projects follow the latest available voluntary carbon market methodologies.

In 2024, in partnership with The Government of Madagascar, BirdLife International, Asity Madagascar and other partners, we continued to support the development of the Tsitongambarika Forest REDD+[5] project in Southeastern Madagascar through a $2.1 million investment. And we committed $16 million to the Makira Natural Park REDD+ Project in the north, through a new partnership with the Wildlife Conservation Society and Everland.

In South Africa, we partnered with Peace Parks Foundation, Sayari Earth and WILDTRUST to carry out a feasibility study for a large-scale, landscape level nature-based solutions project in KwaZulu-Natal Province. The feasibility report will be delivered by mid-2025, when we will decide on the investment.

In Guinea, we completed feasibility work for a clean cooking, fuel-switching program, now preparing to move into pilot phase. We also identified a high-quality reforestation project, and we are working with local partners to investigate REDD+ and mangrove restoration projects.

Through a $2.1 million investment over 2 years, we are also working with BirdLife International and Aves Argentinas to scale up a large native grasslands management carbon project in Argentina.

In Mongolia, we partnered with EarthShot, URECA and the Wildlife Conservation Society to investigate opportunities for sustainable forest management projects.

1. Spend on carbon credits is initially treated as capital and expensed when these are retired. See pages 157-160 where we describe our accounting policies and the classification of climate-related items.
2. In 2024, we updated the way we outline our sourcing strategy, relative to 2023, in which we referred to the following 3 pathways to securing carbon credits: investment in Australian Carbon Credit Units; the development of our own voluntary projects; and commercial agreements with voluntary carbon credit developers.
3. Compliance market projects delivering credits for retirement against our net emissions target are tested to the extent possible with information available. If available project information is not sufficient to make an informed assessment, the project will not be considered further or will be excluded from consideration until such time as sufficient information becomes available.
4. In addition to Additionality, Quantification, Permanence, and Social and Ecological Safeguards, we now consider Governance (within the latter) and added Sustainable Development and Nature Positive Outcomes.
5. United Nations Climate Change: 'REDD' stands for 'Reducing emissions from deforestation and forest degradation in developing countries. The '+' stands for additional forest-related activities that protect the climate, namely sustainable management of forests and the conservation and enhancement of forest carbon stocks.

Meeting our regulatory obligations

We operate in many jurisdictions that have implemented carbon pricing regulations that cover our Scope 1 emissions. These include Australia, Canada, California, the EU and New Zealand where approximately 83% of our Scope 1 emissions or 64% of our total emissions are covered by these regulations.

Australia – Safeguard Mechanism

We have significant emissions in Australia, and are required to comply with the Safeguard Mechanism. We source high quality ACCUs from savanna fire management, human-induced regeneration (HIR) and environmental planting (EP) projects, while seeking to:

- **Partner for the long term with Indigenous project developers.** These projects can bring multiple benefits in addition to fire management and nature repair, with carbon finance reinvested into the communities to support training, employment and enhanced connection to Country. For example, near our operations in the Northern Territory we are supporting Arnhem Land Fire Abatement, an Aboriginal-created, owned and operated not-for-profit carbon business. Closer to our operations in Far North Queensland, we are supporting several projects, including the Aurukun Savanna Burning Project and the Oriners & Sefton Savanna Burning Project.
- **Continuously strengthen our due diligence process.** We use a range of geospatial tools and approaches to assess the design and performance of HIR and EP projects, including satellite imagery analysis and land cover classification. This enables us to assess the integrity of projects by monitoring, verifying and quantifying vegetation growth and land cover changes over time. Our site visits and engagement with developers give us additional information to support these assessments.
- **Invest in project development to reduce our overall reliance on spot transactions, move ACCU costs closer to the cost of development and have greater oversight of the integrity of projects.** This includes investing in carbon developers, such as Australian Integrated Carbon (in which we have a 14.15% interest) and the Silva Carbon Origination Fund, one of the first in Australia to provide investors with access to large-scale, high-quality carbon credits from land reforestation projects integrated with sustainable agriculture.

Other countries

Canadian Provinces have implemented different carbon pricing regulations, including the British Columbia Output-Based Pricing System and the Quebec Cap-and-Trade System which is linked with California's. In the California-Quebec system, offsets may be used for compliance purposes (limited to a fixed percentage of the allowances allocated to each installation).

Our aluminium smelters in Iceland and New Zealand are covered by Emissions Trading Systems. Offsets are not eligible for compliance use under these carbon pricing regulations.

Carbon credits retired towards net emissions calculation

Project description	Carbon credit type	Project type	Mitigation activity type	Certification scheme	Location	Vintage	Quantity retired for 2024 compliance	Quantity held for planned 2024 compliance (retired in 2025)[1]
Savanna fire management with Traditional Owner co-benefits	ACCU	Nature-based	Avoidance	Clean Energy Regulator	Australia	VY21-25	134,838	137,615
Human-induced regeneration	ACCU	Nature-based	Removal	Clean Energy Regulator	Australia	VY21-25	362,344	464,962
Total							**497,182**	**602,577**
Total credits counted towards net emission for the current reporting period (year-ended 31 December 2024)								**1,099,759**

1. This is estimated based on our Scope 1 emissions for the period 1 July – 31 December 2024. See our *2024 Sustainability Fact Book* and our *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* for further detail.

Scope 3 emissions: Partner to decarbonise our value chains

In 2024, our Scope 3 emissions were 574.6Mt CO_2e (equity basis), approximately 19 times higher than our Scope 1 and 2 emissions. This is compared to a restated 2023 number of 572.5 Mt CO_2e (equity basis).

The majority of these emissions (94%) stem from customers processing our products, particularly iron ore (69%) and bauxite and alumina (23%).

Specifically, emissions related to iron ore processing were 395.9Mt CO_2e in 2024, compared to 399.9Mt CO_2e in 2023. Emissions related to bauxite and alumina processing increased from 127.1Mt CO_2e (restated) in 2023 to 134.0Mt CO_2e in 2024, mostly as a result of increased bauxite sales.

Many of our customers have set public targets for their Scope 1 and 2 emissions (our Scope 3). About 55%[1] of our steel-producing customers by direct iron ore sales volume have set public targets to reach net zero or carbon neutrality by 2050. Meanwhile, nearly 33%[1] of our bauxite sales are to customers with net zero emissions targets, though only 11% of customers are aiming for net zero by 2050.

As things stand today, our analysis of our customers' targets and their governments' commitments to reduce their emissions shows a trajectory for those processing emissions that approaches net zero by around 2060. This is driven in large part by China (80% of Scope 3 emissions), which has pledged to be carbon neutral by 2060. Approximately 20% of our emissions come from countries such as South Korea and Japan, which have pledged to be net zero by 2050.

We are committed to partnering with customers and suppliers to help them achieve their targets earlier, reaching net zero by 2050. We have not set an overall Scope 3 emissions target due to the limited direct influence we have on the decarbonisation activities of our customers, required maturation of technology adoption and grid decarbonisation in customers' host countries. Instead, we are holding ourselves accountable on real and measurable commitments in the near term, which will ensure technologies are available to accelerate the longer-term transition.

Therefore, we have set near-term, action-oriented, and measurable targets in the areas where we believe we have agency and can support meaningful change. We take accountability and track our progress on individual projects and partnerships, and stay deeply connected across the value chain, ensuring we are up to date on developments and maintaining ambitious decarbonisation goals.

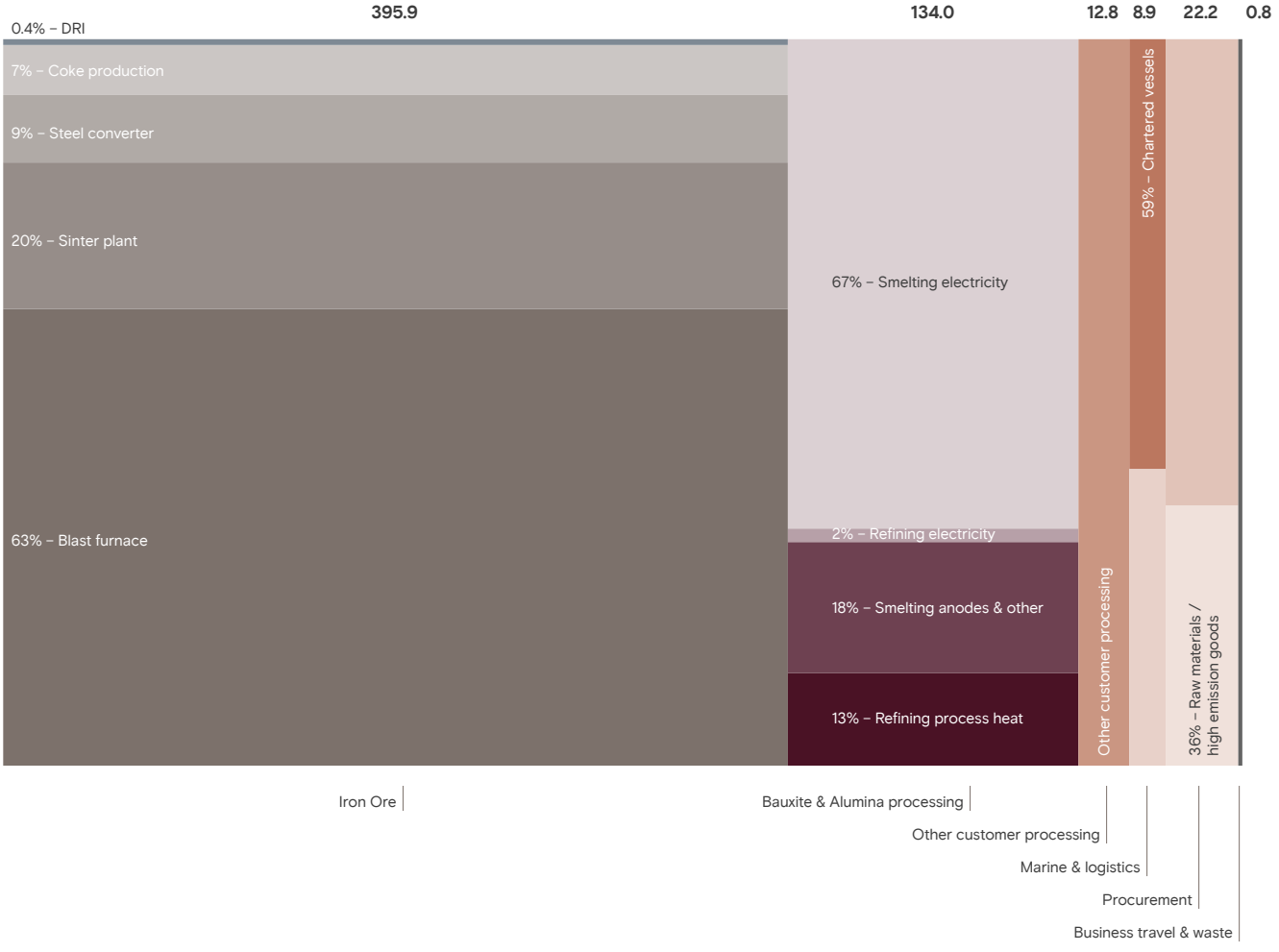
Our Scope 3 targets have not been derived using a sectoral decarbonisation approach. Instead, we have set these targets based on what we can achieve practically and effectively under each category. We engage KPMG to provide limited assurance on our Scope 3 emissions calculations and progress made in relation to the 4 most significant categories of our Scope 3 footprint: steel and aluminium value chains, shipping and procurement. The assurance statement is available on page 321.

1. This figure is dependent on our sales mix, so is not comparable year-on-year.

2024 Scope 3 emissions

574.6Mt CO_2e

(2023: 572.5Mt CO_2e)



Steel value chain

Steel decarbonisation targets

- Support our customers' ambitions to reduce their carbon emissions from blast furnace–basic oxygen furnace (BF–BOF) process by 20–30% by 2035[1].
- Reduce our net Scope 3 emissions from IOC high-grade ores by 50% by 2035 relative to 2022[2].
- Commission the Biolron™ pilot plant by 2026[2].
- Commission a shaft furnace (DRI) + Electric Smelting Furnace (ESF) pilot plant by 2026, in partnership with a steelmaker.
- Finalise study on a beneficiation pilot plant in the Pilbara by 2026.

Steel is one of the most cost-efficient construction materials and is essential in low-carbon infrastructure, transportation and buildings. With approximately 2 billion tonnes of crude steel produced globally in 2024, the industry overall emits over 3.5 billion tonnes of CO_2e annually, equivalent to around 8% of global carbon emissions.

As one of the world's largest iron ore producers, we have a key role to play in decarbonising the steel value chain. We aim to accelerate the development and adoption of low-carbon emissions technologies that both reduce our Scope 3 emissions and future-proof our iron ore business. Our approach is built on a platform of collaboration across the value chain. We are partnering with over 40 partners in about 10 countries to build a portfolio of options, from iron ore processing to iron and steelmaking.

We prioritise our project portfolio based on parameters such as ore suitability, technical and commercial feasibility, and emissions abatement potential, to ensure a disciplined approach to investing capital and effort.

Our strategy is framed under 3 pathways across different time horizons:

1. Existing pathways

We are actively working with our customers to help reduce their carbon emissions from the current blast furnace (BF) process. Our initiatives include optimising BF burden, improving energy efficiency, BF slag optimisation, and carbon capture, utilisation and storage (CCUS).

2. Emerging pathways

We are supporting early development and proliferation of emerging low-carbon DRI projects that use high-grade iron ores, such as those we produce at IOC, and, in the future, Simandou. We are committed to supporting these low-carbon projects that may otherwise face significant headwinds.

Our approach includes bringing together the right group of partners, supplying high-grade ore, bringing our technical and sales and marketing expertise, and investing in early-stage projects.

In November 2024, we entered agreements with GravitHy – an industrial start up establishing 2 Mtpa production of ultra-low-carbon DRI in Fos-sur-Mer, France. GravitHy's hydrogen-based DRI plant is expected to start production in 2028. The facility will feature ultra-low-carbon hydrogen production infrastructure, enabled by access to grid-connected nuclear power. By processing our iron ore with GravitHy, emissions are reduced by up to 90% compared to a typical BF-BOF pathway.

3. Future pathways

While low-carbon DRI technology is established for high-grade ores, there is currently no economic low-carbon iron and steelmaking technology for low- and medium-grade ores, such as those produced in the Pilbara. Low- and medium-grade iron ore accounts for more than 80% of global iron ore supply. Full decarbonisation of the steel industry therefore depends on the development and commercial proliferation of low-carbon ironmaking technologies that use low- and medium-grade ores.

We are supporting the development of these technologies with a focus on:

- Beneficiating our ores to remove impurities before ironmaking.
- Pelletising our ores to improve their suitability to proven shaft furnace technology
- Evaluating emerging fluidised bed technology. This technology may be a suitable process for our iron ore fines products, removing the need to pelletise prior to ironmaking.
- Developing a proprietary ironmaking process called Biolron™ which uses raw biomass[3], along with microwave energy, to convert Pilbara ores into metallic iron. This has potential to reduce carbon emissions by up to 95% compared to the BF-BOF if combined with renewable energy and fast-growing biomass.
- Jointly developing ESF technology, which is required for all of the above ironmaking pathways. The ESF removes impurities inherent in low- and medium-grade ores, as a second stage of ironmaking. We are progressing our partnership with BlueScope and BHP to build an ESF pilot facility in Australia. This will initially use natural gas to reduce iron ore to DRI, but once operational, the project aims to use lower-carbon emissions hydrogen to reduce iron ore. Reductions of up to 80% in carbon emissions are potentially achievable, compared to a typical BF-BOF. We are also working with Baowu to build an ESF pilot facility in China.

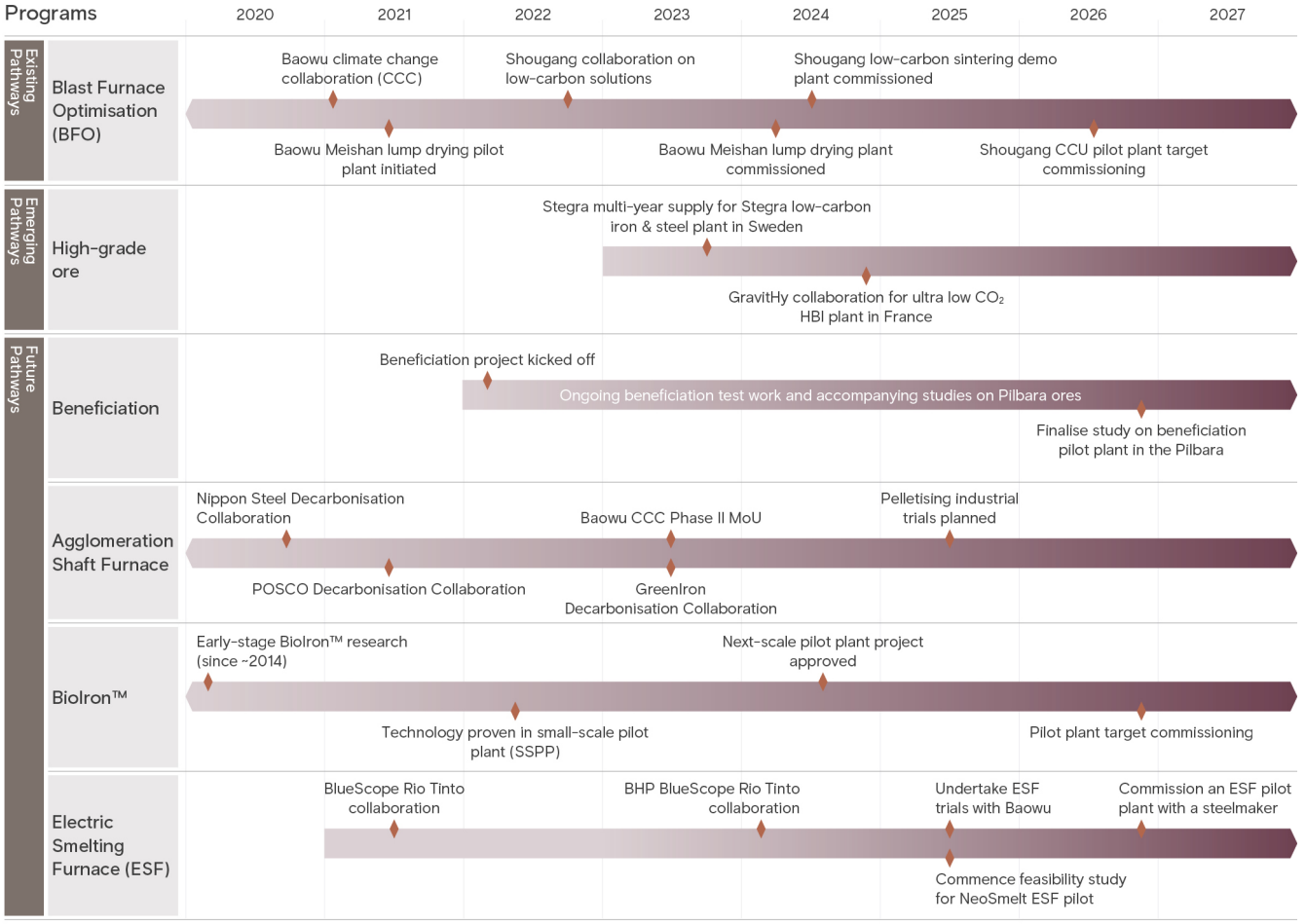
In 2024, we spent $65 million on steel decarbonisation initiatives. Over the next 3 years, 2025–2027, we plan to spend $200–350 million across our steel decarbonisation portfolio.

Decarbonisation of the steel sector will not happen in isolation; all stakeholders along the steel value chain will need to work together. Ultimately, Scope 3 emissions reductions are dependent on the deployment of these lower-carbon steelmaking technologies by our customers. A range of different policies is needed to support research and development, first-of-a-kind projects and commercial deployment of low-carbon steelmaking.

For more information see our climate briefing paper on decarbonising our iron ore value chain at riotinto.com/climatechange

1. The support will be in the form of direct technical support and co-developing technology solutions.
2. Subject to funding approval and technical feasibility.
3. Rio Tinto is aware of the complexities around the use of biomass supply and is working to ensure only sustainable sources of biomass are used.

Steel decarbonisation projects tracker



♦ Key milestones

Aluminium value chain

Alumina decarbonisation targets

- In 2025, partner with at least 2 bauxite customers with the goal of improving energy efficiency and reducing emissions, focusing on digestion improvement technology; controlling or removing organic compounds from the refining process; and technical options to reduce moisture content in our bauxite.

We regularly engage with our customers to understand their ESG priorities and requirements, and identify and agree on collaboration opportunities aligned with our capabilities. Energy efficiency is a key priority for our customers due to its direct impact on emissions.

In the alumina refinery process, steam is used to heat the bauxite slurry in the digestion unit to high temperatures, dissolving the alumina in the bauxite. This digestion process is a crucial aspect of the overall energy efficiency of the refinery. In addition, effective organic control is essential for achieving production rates and producing quality alumina, especially when processing Australian bauxites.

More than 85% of our 134.0Mt CO_2e Scope 3 emissions in the aluminium value chain come from the electricity- and emissions-intensive aluminium smelting process. However, the majority of our product is processed in China using coal-fired refining and smelting processes, where we have little influence over the power source for these electricity grids.

Our short- to medium-term focus is to help our customers improve the alumina refining process to increase energy efficiency and optimise use of our bauxite[1].

Strong demand for bauxite has resulted in almost double the number of refineries processing Rio Tinto bauxite over the past 3 years. As some of our bauxite sales are made through intermediaries, we have limited direct interaction with the end customer. Consequently, we have less influence and ability to engage on matters relating to decarbonisation with these refineries.

In 2024, digestion improvement technology was successfully implemented at one of our bauxite customers' operations. We also completed an overview and opportunity assessment of organics technologies, and conducted customer visits to present the portfolio of control options.

Another key ESG priority for our bauxite customers is the significant challenge of managing bauxite residue. We are supporting our customers in the development of processing and reuses for this residue to reduce the environmental and safety impact of residue storage. In 2024, we pursued a testing program with one of our customers on converting bauxite residue into soil products for agriculture.

1. This is mostly via sweetening and improved digestion. In the longer term, this will be mostly through using renewable energy for the heat source, via hydrogen calcination and electric boilers.

Shipping

Shipping decarbonisation targets

- Reach net zero shipping by 2050 across our shipping footprint.
- Fulfil First Movers Coalition (FMC) pledge of 10% of time-chartered fleet to be running on low-carbon fuels[1] by 2030 and progressing to 100% of time-chartered fleet by 2040[2].
- Reduce emissions intensity by 40% by 2025 (5 years ahead of the target set by the International Maritime Organization [IMO]), and deliver 50% intensity reduction by 2030[3].
- Enhance accuracy of emissions reporting by using actual voyage data for more than 95% of our cargo shipments by 2024.

Our Scope 3 emissions from shipping and logistics are 8.9Mt CO_2e. Of this, 5.2Mt CO_2e (59%) is generated by our chartered fleet, and around 1.9Mt CO_2e (21%) comes from shipping our products, where freight has been arranged by the purchaser. The remaining 1.8Mt CO_2e (20%) comprises other logistics elements such as truck, rail, container movement and other logistics-related emissions. An additional 0.4Mt CO_2e of Scope 1 shipping-related emissions is attributed to the vessels we own.

As a major charterer transporting over 300Mt of bulk products annually with a fleet of 230 chartered vessels and 17 owned ships, we recognise our vital role in decarbonising shipping and partnering with industry stakeholders to accelerate this journey.

To reduce emissions from shipping, we focus on:

Energy efficiency: While in mid-2024 we achieved a 40% reduction in emissions intensity against the IMO's intensity target baseline year 2008, we ended 2024 with a 39% reduction (up from 37% at end 2023), primarily by:

- **Incorporating larger vessels** such as Newcastlemax (210k deadweight tonnage (DWT), which have ~10% lower emissions intensity than standard Capesize (170-180k DWT).
- **Technical modifications** to the hull, propeller, and engine. As we improve the energy efficiency of our own vessels, we are also prioritising chartering vessels with design improvements, including those with energy-saving devices installed.
- **Speed and route optimisation:** We deploy sophisticated weather routing software and seek to continually optimise scheduling and reduce unneeded time waiting in port.

We have completed a recent dry dock program and energy-saving device installations on all 17 owned vessels. In 2025, we plan to trial further energy efficiency technologies such as shaft generators and air lubrication systems, while exploring opportunities to apply these to our chartered fleet.

Transitional fuels: We continue to explore opportunities for biofuels and liquefied natural gas (LNG). In 2024, we introduced 4 additional LNG Newcastlemax dual-fuelled vessels to our fleet (current total of 9 in the fleet), capable of delivering up to 15% to 20% CO_2e emissions reductions compared to traditional fuel oil.

We continue to work with our partners to progress commercially viable biofuel bunkering solutions as well as recycled fuel deployment.

End-state fuels: To achieve our aim of net zero shipping by 2050, our Marine team is focusing on end-state fuels. Although there is no clear, single end-state fuel solution for the shipping industry, low-carbon methanol and low-carbon ammonia are considered the more promising options[4]. We progress the availability and business case for end-state fuels (including value-chain split of opportunity/risk) through industry collaboration such as our leadership in the West Australia – East Asia Iron Ore Green Corridor.

Additionally, regulation is essential to facilitate the drive towards net zero shipping. In 2023, the IMO announced a heightened ambition, including guidance for net zero shipping "by or around 2050", with interim non-binding emissions reduction targets set for 2030 and 2040. To deliver on the reduction targets, the IMO is currently working on the development of a basket of candidate mid-term GHG reduction measures (eg fuel standard with GHG pricing mechanism), with a view to finalising these in 2025, with entry into force in 2027.

Through a range of industry partnerships and via direct government engagement we seek to positively shape regulatory measures that are sufficiently robust to catalyse and accelerate shipping's energy transition.

In 2024, we met our target to use actual voyage data (eg actual fuel consumption) rather than industry estimates for more than 95% of our cargo shipments[5].

1. Although the FMC currently employs the terminology "zero-emission" rather than "low-carbon", with a guiding principle of delivering a well-to-wake GHG emission reduction of 80% or more compared to fuel oil, we have updated our terminology to reflect that these fuels are unlikely to be fully net zero emissions on a lifecycle basis over the coming years. While we endeavour to achieve the guiding principle proposed by the FMC, we may initially consider fuel pathways with a lesser emission reduction with consideration to factors such as supply, availability of technology and regulatory developments from the IMO.
2. Subject to the availability of technology, supply, safety standards and a reasonable price premium.
3. Relative to IMO's 2008 baseline.
4. A range of fuels and technologies are likely to comprise shipping's "end state", which may also include drop-in biofuels, bio/e-LNG and even fossil fuels which may be complemented by carbon capture technology.
5. Where Rio Tinto manages the freight (excluding free on board shipments).

Procurement

Upstream Scope 3 emissions from procurement were 22.2Mt CO_2e (excluding business travel) in 2024, split between purchased fuels, goods and services. The goods and services are further divided between emissions related to operational expenditure purchases (such as caustic, explosives, coke, pitch) of 14.8Mt CO_2e, and capital expenditure purchases (such as machinery, electrical equipment) of 3.0Mt CO_2e. Due to the nature of our businesses, many of our purchased inputs are from hard-to-abate sectors, such as caustic, coke, pitch and steel.

Procurement decarbonisation targets

- Engage with 50 of our highest-emitting suppliers on emissions reduction, focused on driving supplier accountability for setting and delivering against their decarbonisation targets.
- Implement decarbonisation evaluation criteria for new sourcing in high-emitting categories[1].

In accordance with Rio Tinto's stated position to put the energy transition at the heart of our strategy, in 2024 we launched our Sustainable Procurement Principles and revised *Supplier Code of Conduct*, outlining the expectations we have for ourselves and our suppliers to strive to ensure that the procurement of our goods and services aligns with our commitment to strive for impeccable ESG credentials and responsible business practices. We expect our suppliers to share this commitment to environmental responsibility.

We work with more than 20,000 suppliers across complex multi-layered supply chains. To address upstream emissions, we are taking a systematic approach, prioritising engagement with 50 of our highest-emitting suppliers (representing over 40% of our procurement-related emissions), and referencing decarbonisation as evaluation criteria for new sourcing in high-emitting categories. The prioritisation of suppliers and categories followed the assessment of the sources of emissions across the Global Procurement portfolio (and available abatement pathways) and deliberately focuses our efforts on the largest sources. Ongoing refinement of the measurement and reporting methodology will inform our priorities in future.

In 2024, we issued a baseline questionnaire to inform our engagement with 50 high-emitting suppliers, and returned a 100% response rate. We validated and discussed responses in follow-up supplier engagements with a focus on understanding maturity, opportunities for partnership and improvement opportunities. We have now developed and implemented decarbonisation criteria to evaluate new sourcing in high emissions categories.

In 2025, we will sustain and deepen engagements with the 50 high-emitting suppliers, building on 2024 engagements and continue to reference decarbonisation criteria to evaluate new sourcing in high emissions categories.

1. High emitting categories: Raw materials, explosives, global equipment.

Progress in 2024	Action in 2025
Scope 3 emissions goals and customer engagement We are committed to partnering with customers and suppliers to help achieve their targets earlier, reaching net zero by 2050.	
Steel value chain	
Existing pathways	
– Commissioned lump drying plant using innovative microwave technology in Meishan, China with Baowu. – Commissioned low-carbon sintering demonstration facility with Shougang. The facility has proven a ~10% reduction in CO_2 emissions per tonne of sinter and is replicable across the industry. – Commissioned small-scale carbon capture and utilisation (CCU) pilot facility (100m^3/hr) with Shougang.	– Complete construction of large-scale (3,000 m^3/hr) CCU facility with Shougang. – Implement learnings on blast furnace burden optimisation and slag recycling to additional steel mills.
Emerging pathways	
– Entered into an agreement with GravitHy, an early-stage industrial company in France that will produce ultra-low carbon Hot Briquetted Iron (HBI). We will supply high-grade pellets from IOC and manage the sales and marketing of GravitHy's HBI production.	– Continue to support early development of low-carbon DRI projects that utilise high-grade iron ore, with a focus on locations that are proximate to our operations.
Future pathways	
– Approved spend of US$143 million to build a 1 tonne per hour research and development facility for BioIron™ in Western Australia. Secured location and progressed detailed design and engineering for the pilot plant. – Entered into the NeoSmelt collaboration with BlueScope, Australia's largest steel maker, and BHP to jointly develop Australia's first Electric Smelter Furnace (ESF) pilot plant. Commenced pre-feasibility study and confirmed the pilot plant's location in the Kwinana Industrial Area, Western Australia. – Began lab trials for pelletisation of Pilbara ores with Baowu. – Completed conceptual studies on building a beneficiation plant in the Pilbara.	– Progress construction of the BioIron™ pilot plant in Western Australia. – Complete pre-feasibility study and commence feasibility study for the NeoSmelt ESF pilot plant, subject to stage gate approval. – Undertake ESF trials with Baowu, utilising DRI produced from pellets containing Pilbara ores. – Begin next stage of studies and test work for a beneficiation pilot plant in the Pilbara.
Aluminium value chain	
– Digestion improvement technology successfully implemented at one of our bauxite customers' operations. – Completed organics technologies overview and opportunity assessment. – Customer visits completed in Q4 2024 to present the portfolio of control options. – Supported Pacific Aluminium Operations in looking at options to reduce bauxite moisture, and provided data and input from a customer perspective. A commercially available technology has been identified for a vacuum stockpile drainage system. A pre-feasibility study has been approved for implementation for Amrun's bauxite.	– Work with a further customer on implementing digestion improvement technology in 2025. – Work with select customers to improve organics management capabilities. – Continue to support Pacific Aluminium Operations in progressing technical options to reduce moisture content in our bauxite.
Shipping	
– Progressed to a 39% reduction in emissions intensity (from 37% end 2023; relative to IMO's intensity baseline year 2008). – Completed energy saving device installation program across fleet of 17 owned vessels. Introduced 4 more LNG dual-fuelled vessels into the fleet, bringing our current total to 9. – In conjunction with the Western Australia–East Asia iron ore green corridor, engaged with industry on a process safety deep dive on ammonia used as fuel and supported a ship-to-ship ammonia transfer trial in Western Australia. – Improved emission transparency using actual voyage data for over 95% of our cargo shipments for which we manage shipping, achieving our target.	– Accelerate energy efficiency drive, including through incentivising value-accretive energy saving device installations on chartered vessels. – Partner with stakeholders to progress economic frameworks for the development of the Western Australia–East Asia iron ore green corridor. – Mature ammonia health, safety, environment and communities (HSEC) risk and control framework, ahead of potential ammonia dual-fuel vessel charter.
Procurement	
– Engaged with 50 of our highest-emitting suppliers on emissions reduction, focused on driving supplier accountability for setting and delivering against their decarbonisation targets. – Implemented decarbonisation as evaluation criteria for new sourcing in high-emitting categories.	– Sustain engagements with 50 high-emitting suppliers. – Continue to embed and sustain decarbonisation criteria in standard processes to evaluate new sourcing in high emissions categories.

Capital allocation and investment framework

Total decarbonisation spend[1]	Capital expenditure, investments and carbon credits	Operational expenditure
$589m (2023: $425m)	**$283m** (2023: $191m)	**$306m** (2023: $234m)

Decarbonisation spend refers to the total cost of delivering our global decarbonisation projects, nature-based solutions and carbon credits, and select scope 3 activities. Expenditure must be incurred for decarbonisation purposes and can be either capital or operating in nature, based on financial accounting principles.

1. Total decarbonisation spend includes costs related to the purchase of offsets, renewable energy certificates, decarbonisation team costs and external decarbonisation investments.

Decarbonisation investment is derived from the Group's capital allocation framework and aligned to our 2025 and 2030 Scope 1 and 2 emissions targets. We make decisions under a dedicated evaluation framework which considers the following:

- impact of the investment on shareholder value and asset cost base
- level of emissions abatement
- maturity of the technology and delivery risk
- competitiveness of the investment as per the marginal abatement cost curve (MACC) and external benchmark
- policy context
- alternative options on the pathway to net zero.

We also assess projects against our approach to a just transition, with consideration to the impact on employees, local communities and industry. In line with our other investment decisions, governance of decarbonisation investments depends on the nature and size of the project.

Using this framework, we maintain our capital expenditure guidance of $5-6 billion between 2022 and 2030 and $0.5-1 billion in the period 2024-2026. This includes voluntary carbon credits and investment in nature-based solutions projects but excludes the cost of carbon credits bought for compliance purposes. We are also transitioning many of our significant fossil fuel contracts into various commercial contracts for renewable PPAs and biofuels.

Rio Tinto applies an internal cost of carbon when making our investment decisions. This includes current legislated carbon penalties, which apply to approximately half of our emissions, principally in Australia and Canada, plus future policies that could be introduced in the regions where we operate. See page 44 for more detail on our carbon prices used in our climate change scenarios and page 73 for our Scope 1 emissions covered by emissions-limiting regulations.

Our decarbonisation project portfolio is constantly evolving as new projects are added following further technical and commercial assessment. We are targeting a value accretive pathway to 2030 across the portfolio. The large scale investment in zero emissions technologies that is needed to progress towards our net zero target will require global carbon pricing or green premiums.

2030 decarbonisation spend

Our target to reduce emissions by 50% by 2030 relative to 2018 levels remains unchanged. We see decarbonisation as a key business imperative to manage our exposure to volatile fossil fuel prices and to mitigate the impact of inflationary carbon penalty costs. Meeting our 2030 targets will diversify our energy portfolio away from volatile, globally traded fossil fuels and towards structurally secure, long-term, cost efficient, low-carbon alternatives.

As per our 2023 climate change-related reporting, we believe achieving this will require less capital investment and an increasing number of commercial partnerships than expected when we set our targets in 2021.

To further accelerate our emissions abatement, we will take advantage of non-capital-intensive solutions that can be ready in the market this decade and avoid lengthy project development schedules. We anticipate that approximately 90% of our abatement by 2030 will be delivered by non-capital intensive solutions, including several renewable PPA contracts executed over the past 12 months.

For projects delivering on our 2030 abatement target, we anticipate incremental operating expenditure at a portfolio level to be breakeven, before application of carbon costs and savings. A significant amount of abatement will be delivered through entering into PPAs that can be cost-neutral or offer a cost saving relative to the fossil fuel alternative. This is offset by other contracts such as biofuels where we anticipate a cost premium will prevail this decade.

We also continue to make ongoing investments in studies, pilots and demonstration plants targeting long-dated and uncertain carbon reduction outcomes. Operational expenditure varies year on year, but across the decade we anticipate on average annual spend to be in the order of $0.2-$0.3 billion.

Pre-2030 abatement projects are predominantly expected to be delivered through non-capital-intensive solutions and proven technologies, while post-2030 abatement projects are generally characterised as high-cost, capital-intensive projects that require industry breakthroughs.

Just transition

We acknowledge that the low-carbon transition requires substantial investment and significant changes to our current energy systems and supply chains. These transition activities introduce new social risks and opportunities to host communities, employees, contractors and customers, and have the potential to disproportionately affect those that are most vulnerable to change.

Through our *Human Rights Policy* we have committed to "support a low-carbon transition that is rights-respecting, socially inclusive and just". We will embed just transition principles into our decarbonisation strategy, working to minimise impacts and optimise socioeconomic opportunities.

Our progress on our 2024 commitments was largely through establishing strong partnerships and working transparently with local communities.

Partnering to facilitate a just transition

The quantum of minerals needed to realise the global energy transition will require new mines, many of which will be located on the lands of Indigenous or land-connected peoples, or in vulnerable socioeconomic regions. Large areas of land will also be required for developing renewable energy projects. Respectful and ongoing engagement will be at the centre of these new developments.

In Australia, our agreements with the Yindjibarndi Energy Corporation and the Ngarluma Aboriginal Corporation are the first Indigenous partnerships in our renewable energy portfolio, and are important pathways into future energy projects.

We also have a growing portfolio of nature-based solutions projects, where we work with local partners to deliver high integrity projects which foster positive outcomes for people, nature, and climate. These partnerships are co-designed with communities to secure resilient and improved livelihoods through the protection, sustainable management, and restoration of nature.

Managing impacts and opportunities

When we make decisions on decarbonisation projects across our work streams (eg renewables, diesel transition, nature-based solutions) we aim to optimise environmental and social outcomes, while effectively managing expected and unintended impacts.

For communities more broadly, our Group social investment framework has an "economic opportunity and just transition" investment pillar supported by the regional economic development framework. There are multiple projects underway worldwide to strengthen regional economic diversification and equip communities to tackle the challenges of climate change. Through the social investment reporting system, data is already collected around how we contribute to "stable, beneficial work and economic opportunities" and delivering "diverse, inclusive and secure economies".

We also apply local and Indigenous participation requirements throughout our energy and other procurement processes. This ensures that local and Indigenous employment and procurement are optimised, thereby building capability within these groups to take advantage of transition-related opportunities.

For our workforce, this means we need to support affected employees to transition to other opportunities either within our business, with other resource companies in different locations, or to new industries altogether.

As an example, the introduction of the ELYSIS™ technology in Canada or battery-electric haul trucks at our mines will create an ecosystem of new opportunities and jobs. We will work closely with our employees and host communities to plan for these changes.

Engagement and transparency

We are currently rolling out an annual sentiment survey through our Local Voices program which was initiated in 2023. This survey includes questions around climate change and communities' understanding of the potential impacts and opportunities associated with decarbonisation.

We also facilitate civil society organisation roundtable events in 3 locations each year. These events provide a space for engagement around our work towards a just transition.

Action in 2025

Our future actions will focus on the following objectives:

- further embedding just transition principles and commitments into our project decision-making processes
- better understanding the social impacts of our decarbonisation strategy
- providing greater transparency for workers and communities affected by our transition activities.

Climate policy and advocacy

We support the goals of the Paris Agreement to pursue efforts to limit the global average temperature increase to 1.5 degrees, and do not advocate for policies that undermine this or discount Nationally Determined Contributions. Our high-level policy positions are:

- Business has a role to play in climate policy development; this should be ***effective, fair, pragmatic, market-based and support free trade.***
- ***Carbon pricing is the most effective incentive*** for business to reduce emissions, but may not be sufficient for hard-to-abate parts of our carbon footprint (for example carbon anodes, minerals processing).
- Climate policy ***should not undermine competitiveness*** and result in carbon leakage - carbon border adjustment mechanisms or alternative policies are necessary.
- Other policy tools are necessary to decarbonise minerals and metals: grant funding and tax incentives for research and development; product standards and procurement obligations to drive the deployment of pre-commercial technology.

While business has a vital role in managing the risks and uncertainties of climate change, governments can support the challenge by providing enabling frameworks, including policies and programs, which increase momentum to shared net zero goals.

Rio Tinto's direct engagement on climate policy is underpinned by the climate commitments and principles which represent a guide to the positions taken in both direct and indirect advocacy. Overall advocacy positions will balance the commitment to these principles and the climate targets set with the need for an efficient permitting process that is essential for project development. This includes projects that decarbonise our operations or those that produce transition materials and support local communities and jobs in the regions where we operate.

We actively engage on climate and energy policy with governments, industry and civil society in the countries where we operate in different ways to help shape policy, regulation and frameworks. We post all standalone submissions to government consultation processes on our website.

For more information on our climate position and advocacy, see riotinto.com/climateposition

We encourage industry associations to align all climate related advocacy with the goals of the Paris Agreement. We publish our review of the climate advocacy of industry associations annually.

Our approach to policy advocacy has been informed by our regular engagement with investors and stakeholders.

Our climate related advocacy is focussed on policy and other measures which enable decarbonisation of operational emissions, production of metals and minerals required for the energy transition and support for the goals of the Paris Agreement.

Below are examples of the focus areas and objectives for engagement on key climate policy areas.

Industry associations and civil society

Industry associations and civil society organisations play an important role in policy development and reform.

Industry associations' views will not always be the same as ours, so we periodically review our memberships in individual associations. This assessment may include:

- the purpose of the association and the value the membership may provide to our business and our investors
- appropriate governance structures within the industry association policy positions and advocacy of the industry association.

Where our membership is significant, we will work in partnership with industry associations with the aim of aligning these policy positions with our climate and energy policy. Where significant differences in policy positions arise we may:

- provide greater clarity on our own policy positions, through standalone direct company submissions on policy issues or direct engagement with policy makers
- work as part of that industry association to understand alternative points of view and to seek common ground or seek a broader balanced response to areas of difference
- seek a leadership position in the governance body of that industry association to further influence the policies and perspectives of that association, or
- suspend our membership, if it seems formal dialogue processes undertaken for more than 12 months will not resolve our differences in positions. In making this decision we would also consider other benefits (unrelated to climate change) membership of such associations brings to our business, our investors and other stakeholders.

For more information for more information on our work with industry associations, including our review of their climate change advocacy activities, see riotinto.com/industryassociations

Climate policy and advocacy governance

Our Climate Policy and Advocacy team engages with industry associations, civil society organisations, investors, government bodies, and other stakeholders on climate-related policies, regulations, and reporting.

Submissions to direct government consultations on climate related policy are typically developed by this team in conjunction with subject matter experts or decarbonisation project leads, reviewed by our government relations and legal teams, and then approved by the relevant country Director or senior executive.

The Board approves our positions on climate change policy, our approach to engaging with industry associations and our annual review of indirect advocacy. Management is responsible for comparing our positions with those of individual industry associations on a "comply or explain" basis.

	2024 Activities
Decarbonising energy systems Government's sectoral decarbonisation plans and policies should support investment certainty and drive an orderly transition of energy systems while supporting operational decarbonisation through the delivery of sufficient supply of competitively priced, reliable, low-carbon energy.	– In Australia, we participated directly and indirectly through industry associations in the development of the Electricity and Energy Sector Plan and conducted extensive engagement with a range of government bodies on the critical role of renewables in our operational decarbonisation pathways. – In Canada, we had industry-level discussion with Federal and Territory authorities on the importance of clean energy for the development of critical mineral mining projects. We have also proposed the expansion of inter- and intra-provincial power lines to provide renewable electricity for projects needed for the low-carbon industrial transition, as well as for the clean electricity tax credit to include intra-provincial power lines.
Development of carbon pricing schemes to support the transition In the absence of global carbon prices, country level carbon pricing or emissions reductions schemes must balance shared net zero emissions with competitiveness of our operations and risks of carbon leakage.	– We supported the transition of British Columbia's carbon tax scheme to an output-based pricing scheme while ensuring the competitiveness of our recently modernised aluminium smelter in Kitimat. Through industry associations, we also supported the use of high-quality regulated credits as an additional tool to meet compliance obligations and to support emissions reduction outside the scope of the Quebec Cap-and-Trade System.
Development of a sustainable low-carbon liquid fuels industry Displacing diesel use requires a range of options, including fleet electrification and the use of renewable diesel alternatives. Government policies are required to support the development of a competitive and sustainable low-carbon liquid fuels market.	– We published a briefing paper on Transitioning our Diesel Fleet, including outlining policy support required. – In Australia, we advocated for supply side mechanisms to support the development of a competitive renewable diesel market in our submission to the Future Made in Australia: Low Carbon Liquid Fuels consultation process, and the development of sectoral decarbonisation plans, and provided technical input into the development of an Australian renewable diesel standard. – We submitted support for the development of a new Australian Carbon Credit Unit methodology to incentivise sustainable biogenic feedstock projects in Australia. – We advocated for reporting frameworks that enable recognition of emissions reduction from biofuels use and certification of full value chain carbon intensity.

	2024 Activities
Progressing decarbonisation plans for the aluminium industry Decarbonisation of hard to abate energy intensive processing activities requires significant investment in technology development and deployment, and support which ensures global competitiveness of these sectors through the transition in the absence of a global carbon price.	– In Australia, we undertook extensive engagement with state and federal government departments to increase awareness of the aluminium value chain, decarbonisation pathways and economic considerations. We advocated for support for the transition and decarbonisaton of these industries in our submissions to the Future Made in Australia: Unlocking Green Metals Opportunities consultation and the development of the Industrial Sector Plan (ongoing).
Climate-related financial reporting We support the development of frameworks that encourage transparency and provide the key disclosures required for investors and other external stakeholders to compare progress against climate ambitions, enhance competitiveness in global markets, attract investment and accelerate the transition of economies.	– We provided feedback by our Australian industry associations on Treasury's Exposure Draft Legislation and the AASB S2 Exposure Draft supporting alignment with international standards to balance increased transparency with efficiency of reporting and comparability of data.
Providing the materials and minerals essential to the energy transition	– In Australia, we advocated for the inclusion of copper, aluminium, alumina and bauxite into Australia's revised Critical Minerals List as they are central to the clean energy transition (high-purity alumina was already on the list). Subsequently, aluminium and copper were included in a newly formed Strategic Materials List. – In Canada, we advocated for the inclusion of high purity iron ore on Canada's Critical Minerals List as a key input into low-carbon steel manufacturing.
	Additional areas of focus for 2025
Growing demand for low carbon products	– We will engage with the Australian government's development of the Renewable Energy and Product Guarantee of Origin certifications, to promote transparent and consistent disclosure of carbon intensity. – We will engage with the government of Quebec through public consultation on the future of the Cap-and-Trade scheme in Quebec, and support the inclusion of indirect emissions in the EU Carbon Border Adjustment Mechanism to support the production of low carbon aluminium.

Physical climate risk and resilience

We will continue to enhance our resilience to a changing climate, aiming to ensure the long-term viability of our assets, our people, communities and broader value chains. We will:

- Monitor risks across our operations and adapt our processes to make sure our sites are managed responsibly and safely for our people, surrounding communities, and the environments we work in, now and in the future.
- Undertake physical climate risk financial modelling and enhance the accuracy and completeness of the data used for the analysis where possible.
- Refine our physical resilience program based on the outcomes of the physical risk analysis.

Physical climate risk refers to the negative effects of extreme weather and changing climate conditions, classified as 2 main types:

- **Acute climate risks:** Sudden, severe events like tropical cyclones, wildfires, heatwaves, extreme rainfall, flooding, and hail. These can disrupt operations, damage infrastructure, impact communities, and increase operational costs.
- **Chronic climate risks:** Gradual changes such as rising sea levels, increasing temperatures, and altered precipitation patterns. These can reduce resource availability, increase costs, affect productivity and workforce health, and impact supply chain resilience.

Building resilience involves anticipating, adapting to, and recovering from these impacts to ensure the long-term viability of assets, people, communities and value chains.

Our strategy and approach

Our approach to physical climate risk and resilience is centred around 4 pillars that guide our risk management and our work on adaptation:

1. Weather/climate analytics and insights

Across the Group, we use advanced weather and climate data products. These include short-term weather forecasts and severe weather forecasts that aid in operational planning and emergency responses. Climate outlooks support mine planning and resilience by providing insights into rainfall and cyclone patterns. Catastrophe modelling estimates financial impacts from extreme events. Long-term climate change projections assess future extreme events and inform risk and resilience assessments, operational strategies and financial planning.

Climate change projections are available for every site in our portfolio (including non-managed assets). Down-scaled climate change projections are available for over 60 climate change variables and future emission scenarios from the IPCC Coupled Model Intercomparison Project 5 and 6 (CMIP5 and CMIP6). We have completed flood risk modelling for 100% of our managed and non-managed assets. These span present-day, medium and long-term time horizons.

2. Physical risk identification and assessment

Our approach to quantifying and assessing physical risk covers individual assets (bottom-up) and Group level (top-down). We first identify climate risks and opportunities across varying time horizons and emission scenarios. Next, we evaluate their potential financial and non-financial consequences and likelihood, then we prioritise these risks by materiality for effective risk management and appropriate resource allocation. This process is integrated within the Rio Tinto Risk Management Information System. The scope of our assessments includes our operations and the environments in which we operate, our people, the communities who host us and our supply chain.

3. Resilience planning and adaptation

Our resilience planning identifies the most appropriate resilience measures to manage climate risks and adapt to them. We comprehensively evaluate an investment decision before funding is approved. This includes prioritising projects and engaging key stakeholders to seek alignment on the investment and its implementation.

4. Monitoring and evaluation

We actively and regularly monitor risks, with clearly defined roles and responsibilities. We continually evaluate the latest generation of climate change data and emerging technologies to assess the risk profile of our assets and infrastructure over time. Where we have identified a material change to the economic, social, environmental or physical context of the risk, we revisit the assessment process.

Risks and impacts

We have identified 8 Group-level material physical climate risks.

The table below takes into account both the short-term risk that could emerge during current operations and the long-term risk associated with climate change.

Key ● Short term (0–2 years) ● Medium term (2–10 years) ● Long term (10+ years)

Risk, impact and time horizon	Environmental triggers	Risk management
Tailings storage facility (TSF) containment breach/failure due to geotechnical instability or significant erosion event ●●	Extreme rainfall, flooding	Our facilities comply with local laws and regulations and have risk management protocols in place, including a Group safety standard for tailings and water storage facilities. We regularly update this standard and undergo internal and external assurance checks. Our operational TSFs have, or are developing, tailings response plans and follow strict business resilience and communications protocols.
Water shortages, supply and availability impacting operations and production, water treatment and environmental compliance, dust control and community relations ●●	Rainfall, temperature	We use a water risk framework to identify, assess and manage water risks across our portfolio of managed operations (see page 36). The framework requires us to consider whether sufficient water is available to supply both our operational demands and the demands of other stakeholders within the broader catchment. We apply rigorous standards and processes to ensure effective controls are in place at all sites. This includes our Group water quality protection and water management standard, and a standardised Group water management control library which describes all controls identified to manage our water risks. Asset-specific climate change risk and resilience assessments further enable continued improvement of water risk management over time.
Damage to critical coastal infrastructure (shipping berths, ship loaders, stackers/reclaimers, conveyors) resulting in operational and supply chain disruption ●●●	Tropical cyclone/storm, wind, storm surge	Our coastal infrastructure is designed to withstand the wind loading and other impacts associated with extreme events, including severe tropical cyclones. Established business resilience management plans offer frameworks for response, continuity, and recovery in the event of a natural catastrophe scenario, aiming to minimise damage and resume operations swiftly. Our engineering risk assessment program, including asset-level critical risk assessments, considers natural catastrophe modelling and associated risks, if appropriate.
Damage and outages of critical electrical (motors, generators, cooling systems) **and power** (substations, transformers, transmission lines) **infrastructure** leading to operational downtime and damage to equipment ●●●	Tropical cyclone/storm, extreme rainfall, flooding, extreme temperatures, lightning	Electrical and power infrastructure is designed in accordance with local engineering and design standards and internal electrical safety standards and is considered in our asset-specific climate change risk and resilience assessments. Flood risk modelling (surface water, riverine and coastal inundation) incorporating future climate change projections has been completed across our portfolio of managed and non-managed operations.
Damage to critical mining and production infrastructure (eg fixed plant, conveyors) resulting in operational disruption ●●●	Tropical cyclone/storm, extreme rainfall and/or flooding	Critical mining and production infrastructure is designed in accordance with local engineering and design standards and considered in our asset-specific climate change risk and resilience assessments. Assets located in tropical cyclone-affected regions have appropriate controls to minimise damage and operational downtime. Flood risk modelling incorporating future climate change projections has been completed across our portfolio of managed and non-managed operations.
Health and safety and productivity of workforce resulting in reduced productivity, dehydration and impaired ability to work safely and efficiently ●●	Extreme heat	Controls are in place to manage the risk of extreme heat for our workforce, including adequate acclimatisation prior to starting work. Those undertaking high-risk heat tasks are monitored daily for signs or symptoms of heat illness and stress. Operator checklists ensure adequate hydration and work area management. Provision is made for cool rest areas with access to cool drinking water. Our workforce is able to self-pace their workload ensuring regular breaks.
Disruption to transport routes (maritime, rail, air and road access) **and supply chain** (supplies and critical spares and access to direct customers) ●●●	Tropical cyclone/storm, extreme heat, extreme rainfall, flooding	We are working to better understand the interdependencies across our entire operation. We operationalised analytics that provide real-time natural hazard impacts for over 50% of our tier 1-3 goods suppliers. Being alerted to potential supply disruption in real-time allows our teams to make informed decisions to reduce supply chain disruption. This work aims to identify critical components of our product group supply chains and manage the potential adverse impacts from physical climate risk.
Acute and chronic climate change impacting closure objectives ●●	Tropical cyclones/storm, temperature, rainfall, flooding, sea level rise	We consider these impacts when planning and executing closure. We use latest-generation climate change projections specific to the site to inform appropriate landform design, water management and vegetation selection. This is to support modelling per local regulatory requirements and internal closure standards. Ongoing and regular monitoring and maintenance of the site is essential to ensure the effectiveness of closure measures, including monitoring water quality, soil erosion, vegetation growth and any potential contamination or instability issues.

Modelling financial exposure to physical climate risk

In 2022, we launched the Physical Resilience Program, starting with resilience assessments in the Pilbara and Saguenay–Lac-St-Jean. In 2023, we expanded to a Group-wide assessment to understand climate risks and financial impacts. We continue to improve financial risk modelling and enhance asset-level climate resilience assessments.

We update our scenario analysis for physical risk assessments in line with our strategic planning cycles or when there are significant changes to our assets or sites. This year, there have been no material changes to our business or operations, so our current assessment remains relevant. However, we have revised our assessment to confirm our business remains resilient to the identified physical risks.

Our climate physical risk modelling analysis, performed in collaboration with Marsh, estimated the expected financial losses from damage to individual assets, across various time horizons and emission scenarios caused by physical climate hazards. This analysis used modelling from XDI (Cross Dependency Initiative). Losses associated with business interruption or productivity loss were excluded due to the complexity of our value chain and the increased subjectivity of loss attribution.

This modelling process and methodology considers the following:

1) **Asset portfolio:** Includes a significant breadth of assets, including mining assets and critical infrastructure components integral to our operations. Only active industrial and mining facilities were modelled, including non-managed operations. Corporate offices and remote operation centres have been modelled but are not presented in this analysis. Assets in our closure portfolio have not been modelled, but are considered in bottom-up physical risk and resilience assessments.
2) **Climate scenarios, time horizons and hazards:**

Emission scenario	Description and outcome
Intermediate emissions scenario IPCC Representative Concentration Pathway 4.5 (RCP4.5)	Emissions peak around 2040, then decline. Relative to the 1986–2005 period, global mean surface temperature changes are likely to be 1.1°C–2.6°C by 2100.
High emissions scenario IPCC Representative Concentration Pathway 8.5 (RCP8.5)	Emissions continue to rise throughout the 21st century and is considered a worst-case climate change scenario. Relative to the 1986–2005 period, global mean surface temperature changes are likely to be 2.6°C–4.8°C by 2100.

Multiple future time horizons are modelled, including 2030 (medium term), 2040 and 2050 (long term). Eight climate hazards are modelled in this analysis, including flooding (riverine and surface water), coastal inundation, including sea level rise, extreme heat, cyclonic wind, extreme wind, forest fire and freeze-thaw.

3) **Annualised damage (AD)**: The output of the modelling is calculated for each asset under various climate scenarios, time horizons and hazards. AD, expressed as a percentage, represents the expected average annual damage to an asset attributable to climate-related hazards relative to a fixed value (eg $1 million). As such, an AD of 0.5% would mean that for every $1 million of exposure, $5,000 could be damaged, on average, in any given year.

   Asset-specific outputs have been aggregated to the site, region and Group level. Risk categorisation is based on the AD values, with thresholds set at <0.2% for low AD risk, 0.2–1% for medium AD risk, and >1% for high AD risk.

   Estimates consider a stationary "do nothing" approach for our operating assets and do not consider present or future controls, or adaptation or resilience projects that will likely materially impact our AD cost.

Annualised damage risk scores

At the Group level, present day AD losses fall within the initial range of the medium AD risk category (0.2–1%). Considering projected future emission scenarios by 2050, we expect increases in AD. This places the Group's AD in the intermediate range of the medium AD risk category, potentially exceeding a two-fold rise from present values.

Currently, across 9 core climate geographies where we operate, the risk of AD is low in 3 regions, medium in 5 and high in 2. Notably, sites in Asia, the Middle East and Guinea are the primary contributors to the highest risk classification. In both the intermediate and high emissions scenarios, by 2050, eastern Australia and New Zealand are also expected to be classified as high risk with up to a four-fold increase in AD. This is principally due to the potential effects of coastal inundation, surface water flooding and cyclonic winds. Other notable increases in risk are in Europe and the Middle East (an approximate 60% increase). The risk trend in Asia is steady through time.

In assessing the risk of various hazards under different emissions scenarios projected for 2050, there is a notable shift in the risk profile for various perils across our operating sites. The number of sites at risk from coastal inundation, riverine flood and surface water flood increase under both future emission scenarios. Of all hazards, riverine flood sees the largest increase by 2050 under a high emissions scenario. The number of operating sites at risk from cyclonic wind, extreme wind, forest fire, freeze-thaw and soil subsidence is not expected to materially change with future emissions scenarios.

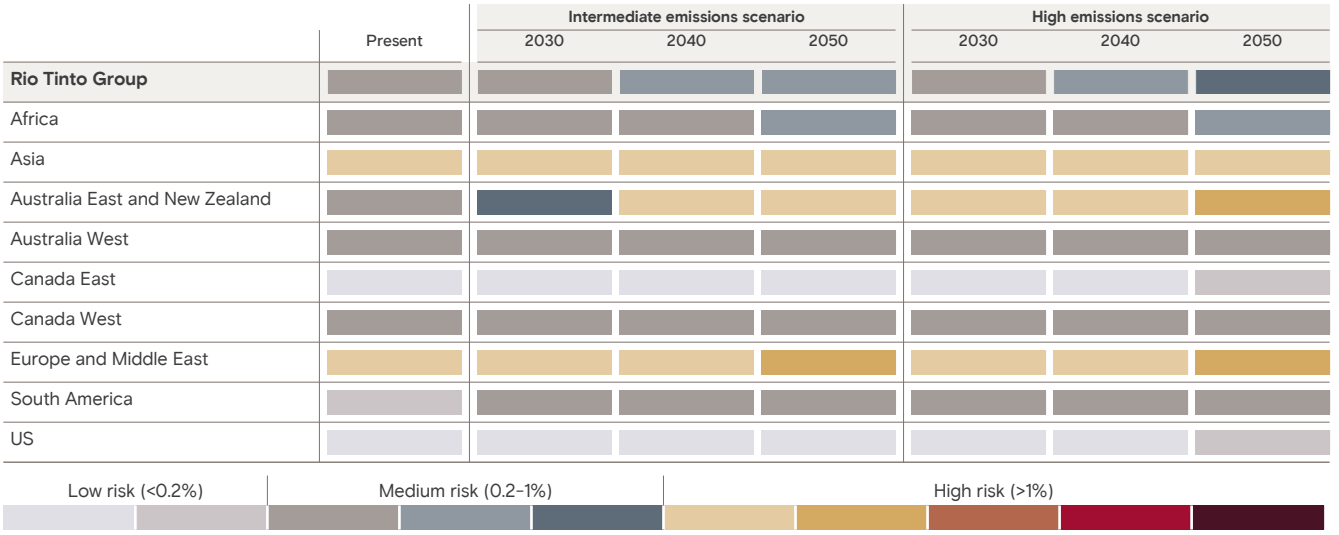
Considerations and limitations

Our climate physical risk modelling acknowledges limitations and uncertainties due to the dynamic nature of the Earth's climate and unpredictable future GHG emissions. These models represent plausible futures, not predictions, and are useful for assessing risks and informing strategic decisions.

The accuracy of our analysis depends on the quality of asset data and assumes no changes in operations or design standards. Each asset is assigned an archetype, which may not fully capture its unique characteristics, affecting the risk profile.

This analysis is iterative, evolving with new insights and projections. We plan to update it regularly to reflect changes in our asset base, guiding our physical resilience program.

Annualised damage risk | Group and regional



We remain resilient to identified physical climate risks due to our robust adaptation and resilience measures. See page 158 for more on our resilience to physical risk impacts.

2024 progress

Throughout 2024, we made progress on managing and adapting to our physical climate risks.

- **Global Industry Standard on Tailings Management (GISTM):** In accordance with GISTM guidelines, we continue to make progress on the climate resilience assessment process for our tailings storage facilities (TSFs). This approach tests the design basis of each TSF component, considering future climate change. We have completed assessments for high priority TSFs and are continuing to progress with assessments for all remaining facilities, which are expected to be completed by August 2025.
- **Supply chain:** This year, we operationalised analytics that provide real-time natural hazard monitoring for 50% of our supply chain (tier 1-3 goods suppliers). Being alerted to potential supply disruption in real time provides our teams with the opportunity to make informed decisions to reduce supply chain disruption.
- **Water supply:** In 2024, we continued to enhance our water risk management by evaluating our ability to maintain a reliable power supply from external hydropower providers. This includes assessing power generation and electricity transmission. To support this, we conducted a climate risk assessment at our ISAL smelter.

Action in 2025

In 2025, we will progress our bottom-up physical risk and resilience assessments across our operating sites and TSFs, in accordance with the GISTM. We will continue to refine and enhance the data inputs and estimates used in our modelling to generate more accurate and meaningful results that will help focus our activities in 2025 and beyond.

- **Extension of Value at Risk (VaR) analysis/financial risk:** We advanced the Global VaR top-down risk assessment with more detailed financial risk modelling at a product group level. We have completed the assessment of our Iron Ore product group and have started work on the Aluminium product group and expect to complete this in 2025. In addition to asset damage, the product group level assessment also evaluates the impacts of business interruption on Group revenue.
- **Bottom-up risk assessments:** Asset-level climate resilience assessments are advancing across all product groups as part of a broader multi-year program. In 2025, we plan to perform a comprehensive review of the methodologies and governance processes supporting climate risk management and resilience measures. This will focus on strengthening the integration of climate resilience analysis and planning into asset-level risk assessment frameworks and processes.
- **Water supply:** In 2025, we will conduct 2 climate risk assessments on non-managed hydropower supply for the NZAS and Bell Bay aluminium smelters. We will also assess our water supply at our operations in Gladstone.

For more information on physical risk and resilience, see riotinto.com/climaterisk

Climate-related governance

The Board

The Board has ultimate responsibility for our overall approach to climate change. This includes the oversight of climate-related risks, opportunities, strategy, projects, partnerships, physical resilience, engagement, reporting, and advocacy as per the Schedule of Matters. Climate change and the low-carbon transition present material risks and opportunities for our business, forming a key part of our strategy and ESG objectives. The Board approves our overall strategy, policy positions, and climate disclosures within this report, delegating specific responsibilities to committees and the Chief Executive. These factors are considered in strategy discussions, risk management, financial reporting, investment decisions, and executive remuneration.

The Board regularly receives updates on climate-related matters at board meetings. The CFO presents a performance report, including a dashboard of KPIs and a detailed decarbonisation scorecard covering, but not limited to, operational emissions, offsets, abatement projects and Scope 3 emissions.

In the past 12 months, the board agendas have included climate-related items, such as discussions on the Boyne Smelter repowering solutions and NZAS electricity arrangements. The Board balances environmental goals with financial and social implications. For example, we secured 2.2 GW of renewable energy for the Boyne Island smelter through PPAs. Although the Pacific Aluminium Operations average is in the 4th quartile of the aluminium cost curve, repowering the smelter should help it move lower down the cost curve. This decision highlights the trade-offs between advancing decarbonisation goals and supporting local employment in the Gladstone region. Climate-related matters are also a key part of the biannual strategy sessions.

In 2022, our shareholders supported the CAP put forward to them by the Board, in a non-binding advisory vote on our ambitions, emissions targets and actions to achieve them. The Board further committed to repeating this vote every 3 years, at a minimum, unless there were significant changes in the interim, in which case the CAP would be returned to the next immediate AGM. The principles which formed the basis for the development of the 2025 CAP were presented to the Board in October and approved as part of the Annual Report preparation and review process.

Progress against commitments in the CAP is reported once a year to our stakeholders via the climate disclosures in the Annual Report. These disclosures are supplemented with briefing papers, our Quarterly Operations Review, press releases and other reports on our progress. In addition, we consulted our shareholders and CSOs during the work to update this 2025 Climate Action Plan.

Given the importance of climate-related matters, we have specifically considered candidates with experience in climate and renewable energy when hiring directors. When considering the composition of the Board, we used an external consultant to identify where we need particular strengths and skills on the Board in relation to climate and the Group's forward strategy. We also request updates from our Directors biannually regarding any training they have undertaken, maintaining a register of this information. We expect our Directors to remain informed and up to date on relevant matters.

To further support the Board's strategic oversight of climate risk, we also conduct teach-in sessions for new projects and key updates on decarbonisation initiatives. These sessions are focused on strategic priorities and are also held when critical decisions need to be made. For example, during the Pacific Aluminium Operations repowering project, the Chief Decarbonisation Officer briefed the Board on our objectives. While these teach-ins contribute to capacity building, there is a need for more formal training. We will define measures taken to further enhance Board competencies with respect to managing climate-related matters.

For additional information see our Strategic context and strategy sections on pages 6-7.

Summary of 2024 activities:

- Updated the Group's operational decarbonisation pathway and associated expenditure.
- Engaged with investors and civil society organisations following the publication of our 2023 Climate Change Report.
- Approved the 2023 Climate Change Report and climate-related disclosures in the 2023 Annual Report notes to the financial statements.
- Approved the principles for inclusion in our 2025 CAP.
- Approved various projects that support the growth in production of transition materials and our internal decarbonisation objectives.
- Approved the Group's strategy and scenarios, including the use of climate scenarios and the impact and opportunities arising from the energy transition.
- Incorporated new long-term decarbonisation metrics in the 2024 Performance Share Awards (PSAs) to incorporate 20% of the award being based on decarbonisation (People & Remuneration Committee).
- Approved Group physical resilience program (Sustainability Committee).

For more information on the Board, their activities and composition see pages 100-118.

Sustainability Committee

The Sustainability Committee is responsible for the oversight of key sustainability issues including social and environmental matters that are impacted by climate change, particularly those relating to water and biodiversity. An updated Terms of Reference has been drafted to reflect these responsibilities including oversight of physical resilience to climate change.

For more information see pages 117-118.

Audit & Risk Committee

The Audit & Risk Committee is responsible for risk management systems and internal controls, financial reporting processes and the relationship with the external auditors as noted in its committee charter. This involves the oversight of significant issues of judgement relating to the financial statements including those relating to climate, consideration of climate policies, and stress testing our strategy against selected scenarios. It also includes appointing and maintaining our relationship with the external auditors who assure GHG emissions and ensure the effectiveness of the risk management framework.

People & Remuneration Committee

The role of the People & Remuneration Committee includes the oversight of the Group's remuneration structure, including the use of short- and long-term incentive plans for the Executive Directors, as reflected in its charter. This will include performance against strategic measures linked to decarbonisation. In 2024, 10% of the short-term incentive plan (STIP) and 20% of the long-term incentive plan (LTIP) were weighted towards decarbonisation, including the progress of our carbon abatement projects. See pages 119-145 for four 2024 remuneration outcomes and the incorporation of climate-related measures in the STIP and LTIP.

Management role

Investment Committee

The Investment Committee reviews and approves the Group's capital expenditure in relation to abatement projects and climate change research and development. Decarbonisation investment decisions are made under a dedicated evaluation framework that considers the value of the investment and impact on cost base, the level of abatement, the maturity of the technology, the competitiveness of the asset and its policy context, and alternative options on the pathway to net zero. Projects are also assessed against our approach to a just transition, with consideration of the impact on employees, local communities and industry.

For more information see our Capital allocation and investment framework on page 63 for more detail.

Chief Executive and Executive Committee

The Chief Executive is responsible for delivering the CAP, as approved by the Board, with the Executive Committee supporting this role. Risk management, portfolio reviews, capital investments, annual financial planning and our approach to government engagement are integrated into our approach to climate change and emissions targets. The annual financial planning process focuses on the short term (up to 2 years). The new growth and decarbonisation strategy is part of the medium-term planning process.

Remuneration: Our Chief Executive's performance objectives in the STIP include delivery of the Group's strategy on climate change. These are cascaded down into the annual objectives of relevant members of the Executive Committee, including the Chief Technical Officer, and other members of senior management. Decarbonisation is also included as a performance measure in the STIP and LTIP as described above. See pages 119-145 for our 2024 remuneration outcomes and the incorporation of climate-related measures in the STIP and LTIP.

As part of our updated evaluation approach approved by ExCo and the Board in April 2024, we will hold a decarbonisation review session once or twice a year as part of the regular ExCo schedule to discuss the overall decarbonisation roadmap and abatement portfolio. This will also cover projects and investment proposals related to mitigating Scope 3 emissions. The review session will consider any future changes to our targets or commitments should they be necessary. The Chief Decarbonisation Officer and Rio Tinto Energy and Climate team will organise and facilitate the forums, with inputs from our Commercial team on Scope 3 projects.

Energy and Climate team

In 2022, we established a central team, Rio Tinto Energy and Climate (RTEC), to deliver progress on our CAP. This is led by the Chief Decarbonisation Officer, who reports to the Chief Technical Officer and is accountable for all aspects of the CAP. The RTEC team is structured according to the main areas of our abatement work that drive decarbonisation across our operations, including a Nature-based Solutions team.

Two additional teams complete the RTEC organisation: a Decarbonisation Office that monitors and forecasts GHG emissions, tracks investment decisions and coordinates our approach to physical climate risks; and a Climate Policy and Advocacy team that is responsible for engaging with industry associations, civil society organisations, investors, government and other stakeholders on climate related policies, regulation and reporting. Rio Tinto Commercial drives the approach to Scope 3 emissions, given its responsibility for procurement, shipping and sales to our customers. The Decarbonisation Office prepares a quarterly progress report for the Executive Committee, which includes operational emissions and progress on abatement projects and other areas of our CAP.

Management of climate-related risks and opportunities

The Board approves our risk appetite and oversees our principal risks, and is supported in monitoring material risks by the Audit & Risk and Sustainability committees.

Climate-related risks and opportunities are integrated in our enterprise-wide risk management framework. These are identified by the product group or supporting functions, then included in the appropriate risk register. These will be assigned a Risk owner and evaluated on the maximum reasonable consequence and likelihood of the risk. Consequences may include the impact on Group free cash flow or business value, or reputation and licence to operate. These risks are escalated to the appropriate level of management for oversight and action. See pages 88-91 for more detail on our risk management process, emerging risks, materiality matrix and assessment of principal risks.

We actively monitor and assess the potential impact of climate risks and opportunities on our operations and business through scenario planning. See pages 43 and 66 for more detail on how we use scenarios to identify climate-related transition and physical risks and portfolio opportunities.

Climate change and the low-carbon transition remain critical emerging risks, with potential to have a significant impact on our business and the communities where we operate. Emerging risks that could materially impact strategic objectives are incorporated within our principal risks and, where possible, we develop responses to mitigate threats and create opportunities for the Group. Climate-related risks and opportunities linked to several of these principal risks are listed below:

- 2. Preparing our Iron Ore business to meet the demand for low-carbon steel.
- 4. Minimising our impact on the environments we work in and building resilience to changes in those environments, including climate change and natural hazards.
- 7. Delivering on our growth projects.
- 8. Achieving our decarbonisation targets competitively.
- 10. Conduct our business with integrity, complying with all laws, regulations and obligations.

See pages 91-98 where we have described the risk or opportunity, the key regions impacted, our risk management responses, and the relevant groups with oversight of each process.

These risks or opportunities, if material, are linked to one of the above Group principal risks and reviewed on a quarterly basis by the Risk Area of Expertise and the Risk Management Committee (RMC). All employees are empowered to own and manage the risks that arise within their area of responsibility. Our Centres of Excellence, comprising our 2nd line of defence, provide deep subject matter expertise, for example steel decarbonisation. Our Internal Audit function provides independent assurance. Where required by law, or where deemed appropriate, we also engage third parties to provide independent assurance. Where risks are material to the Group, they are escalated to the RMC and, as appropriate, to the Board or its committees.

For more information see pages 88-98 on our approach to risk.

Climate-related metrics and data

We have established key metrics to help us track our progress against our decarbonisation targets, ensuring we are advancing towards a sustainable and low-carbon future.

Our metrics help us manage and monitor our climate risks and opportunities including metrics for transition-related opportunities (the increased demand for transition materials) provided on page 46 (transition materials metrics), and physical risks metrics including the financial exposure metric and annualised damage metric detailed on pages 68-69.

We have also disclosed other ESG-related KPIs, metrics and targets that integrate with our objective of striving for impeccable ESG credentials within the respective Environment, Social, and Governance sections of this Annual Report. A summary of these metrics is found on page 34 with other Group KPIs on pages 12-14.

Scope 1 and 2 emissions:

Our operational emissions targets are ambitious - to reduce emissions by 50% by 2030 relative to 2018 levels, reaching net zero by 2050. Our targets cover more than 95% of our reported Scope 1 and 2 emissions and are aligned with 1.5°C pathways. We adjust our baseline to exclude reductions achieved by divesting assets and to account for acquisitions.

Our definition of net zero applies to our operational (Scope 1 and 2) emissions on an equity basis. See pages 49-57 for detail on how we are reducing emissions in our own operations.

Scope 1 emissions are direct GHG emissions from facilities fully or partially owned or controlled by Rio Tinto. They include fuel use, on-site electricity generation, anode and reductant use, process emissions, land management and livestock. Scope 2 emissions are GHG emissions from the electricity, heat or steam brought in from third parties (indirect emissions). This is consistent with the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD)'s Greenhouse Gas (GHG) Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) (2015).

Performance against target: Scope 1 and 2 GHG emissions – adjusted equity basis (Baseline[1])

Equity GHG emissions (Mt CO_2e)	2024	2023	2018
Adjusted (Baseline) Scope 1 and 2 emissions[2]	30.7	33.9	
Carbon credits[3]	1.1	0	
Baseline net Scope 1 and 2 emissions	29.6	33.9	
Emissions target base year (Baseline, adjusted for acquisitions and divestments)			35.7

See our *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* report and our *2024 Sustainability Fact Book* for further detail on our emissions reporting methodology. We engaged KPMG to provide reasonable assurance over the 2024 Scope 1 and 2 data. The assurance statement can be found on page 321.

Changes to our 2018 baseline include: Review of Scope 1 emissions factors and greater alignment with regional factors specified in government reporting (<1% change to emissions).

Acquisitions and divestments: Addition of Matalco aluminium metal recycling assets into reporting and baseline. Acquisition of Mitsubishi's interest in Boyne Smelters (11.65%), Sumitomo Chemical's interest in New Zealand Aluminium Smelter (20.64%) and Boyne Smelters (2.46%), taking NZAS equity to 100% and BSL to 73.5%. Equity increase for the Ranger mine to 98.43%. Divestment of Lake MacLeod Dampier salt operations (removal from the baseline).

1. Rio Tinto share (equity basis) as a Baseline represents emissions from our benefit or economic interest in the activities resulting in the emissions. Emissions accounted for represent current equity and ownership for the full year.
2. The baseline value is based on the current equity in each asset, including zero equity in divested assets. Scope 2 emissions in the baseline are calculated using the market-based method.
3. Carbon credits used towards our 2024 net emissions calculation include Australian Carbon Credit Units (ACCUs) that were retired for compliance for the period 1 January to 30 June 2024 plus a projection of the number of ACCUs we expect to retire for the period 1 July to 31 December 2024. This projection is based on our Scope 1 emissions for the period 1 July – 31 December 2024. Rio Tinto retires ACCUs for liability under the Australian Safeguard Mechanism. Baselines for sites are calculated using known production intensity factors combined with actual reported production. Liability is determined when actual emissions exceed these baselines. Due to the misalignment of timing (Safeguard being July-June), carbon credits reported against the net emissions number include actual ACCUs retired for liability in the Jan-Jun 2024 part of the reported NGER FY24, and calculated liability using actual production and emissions for Jul-Dec 24. For details, refer to the table "Carbon credits retired towards net emissions (equity basis)" in our *2024 Sustainability Fact Book*.

2024 actual equity GHG emissions (Mt CO_2e)	Scope 1	Scope 2	Total
Consolidated accounting group	13.6	0.6	14.1
Other investee (e.g. investment in associate and joint venture)	9.4	6.3	15.7
Total (equity share method)	**23**	**6.9**	**29.8**

This table is the disaggregation of Scope 1 and Scope 2 GHG emissions between the consolidated accounting group and other investees. The grouping is determined by the financial definitions, but the emissions are calculated using the equity share method and percentages of emissions per site align with the carbon accounting protocol.

Scope 1, 2 and 3 GHG emissions – actual equity basis

Equity greenhouse gas emissions (Mt CO_2e)	2024	2023	2022	2021	2020
Scope 1 emissions[1]	23	23.3	22.7	22.8	22.9
Scope 2: Market-based emissions[2]	6.9	9.3	9.6	10.1	10.4
Total gross Scope 1 and 2 emissions	29.8	32.6	32.3	32.9	33.4
Carbon credits[3]	1.1	0	0	0	0
Total net Scope 1 and 2 emissions (with carbon credits retired)	28.7	32.6	32.3	32.9	33.4
Scope 2: Location-based emissions[4]	7.8	7.8	8.2	8.5	8.6
Scope 3 emissions	574.6	572.5	572.3	558.3	576.2
Operational emissions intensity (t CO_2e/t Cu-eq)(equity)[5]	6.1	6.8	7	7.2	6.9
Direct CO_2 emissions from biologically sequestered carbon (eg CO_2 from burning biofuels/biomass)[6]	0.05	0.03	0	0	0

Queensland Alumina Limited (QAL) is a tolling company and is 80% owned by Rio Tinto and 20% owned by Rusal. However, as a result of the Australian Government's sanction measures, QAL is currently prevented from tolling for Rusal and Rio Tinto is currently utilising 100% of the tolling capacity at QAL. Our 2024 equity emissions and our 2018 baseline include QAL emissions on the basis of Rio Tinto's 80% ownership. In 2024, the additional emissions associated with Rio Tinto's additional tolling capacity were 0.8Mt.

1. Scope 1: Emission factors are consistent with the most applicable national or regional reporting guidance or schemes. For emissions not covered by government reporting, factors from the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories are used. A full list of references is included in the *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* report. In 2024 as part of the implementation of a new GHG reporting tool, the Scope 1 factors for all sites were re-visited. Some adjustments were made to provide greater alignment with government reporting and regional factors.
2. Scope 2: Market-based method counts commercial decisions to purchase the unique rights to renewable energy as zero emissions and applies a residual mix factor (or similar) to the remaining MWh purchased. The residual mix factor is typically equivalent to the grid intensity with renewable attributes that have been sold removed from the factor. Scope 2 emission factors are consistent with the Australian National Greenhouse and Energy Reporting Measurement Determination 2008 for Australian operations location-based reporting. For non-Australian operations, where possible, factors are sourced from public grid level data or electricity retailers. For market-based reporting, Scope 2 includes the use of renewable electricity certificates (RECs) and all contracts where we have the exclusive rights to the renewable energy attributes.

   Market-based emissions reported as zero include Oyu Tolgoi, ISAL aluminium, Resolution Copper, Weipa, Richards Bay Minerals and Kennecott Copper with surrendered RECs. Escondida and QMM have renewable energy PPA contracts with energy attributes.
3. Carbon credits used towards our 2024 net emissions calculation include Australian Carbon Credit Units (ACCUs) that were retired for compliance for the period 1 January to 30 June 2024 (retired) plus a projection of the number of ACCUs we expect to retire for the period 1 July to 31 December 2024 (planned). This projection is based on our Scope 1 emissions for the period 1 July – 31 December 2024. For details, refer to the table "Carbon credits retired towards net emissions (equity basis)" in our *2024 Sustainability Fact Book*.
4. Location-based method reflects the emissions grid intensity of the location which the operation is located and includes the percentage of renewables that make up the total unadjusted grid intensity. Scope 1 and 2 equity emissions total – location-based: 30.8Mt CO_2e.
5. Historical information for copper equivalent intensity has been restated in line with the 2023 review of commodity pricing to allow comparability over time.
6. GHG Protocol Corporate Accounting and Reporting Standard recommends disclosure of CO_2 emissions from biologically sequestered carbon for transparency. These are from biofuel use and are not classified as our Scope 1 emissions.

2024 actual equity GHG emissions by location (Mt CO_2e)	Scope 1 Emissions (Mt CO_2e)	Scope 2 Emissions[1] (Mt CO_2e)	Total Emissions (Mt CO_2e)
Australia	12.9	6.7	19.6
Canada	6.1	0.1	6.2
Africa	0.6	0	0.6
US	0.9	0	0.9
Europe	0.3	0	0.3
South America	0.6	0	0.6
Mongolia	0.2	0	0.2
New Zealand	0.5	0	0.5
Other	0.9	0.1	0.9
Total	23	6.9	29.8

1. This table is a breakdown of Scope 1 and 2 equity emissions. Credits are not included in these values. Scope 2 emissions are calculated using the market-based method.

Note: The sum of the categories may be slightly different to the Rio Tinto total due to rounding.

Scope 1 GHG emissions covered under an emissions-limiting regulation (Mt CO_2e), equity based	2024
Total gross global Scope 1 GHG emissions (CO_2e) covered under emissions-limiting regulations (Mt CO_2e)	19.2
Total gross global Scope 1 GHG (Mt CO_2e)	23
% Global Scope 1 GHG emissions covered under an emissions-limiting regulation	83%

Emissions limiting regulations applicable to Rio Tinto are listed in the *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* report.

2024 equity GHG emissions by GHG type (Mt CO_2e)	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	NF_3	Total
	22.24	0.03	0.06	0.01	0.62	0	0	22.97

Note: The sum of the categories may be slightly different to the Rio Tinto total due to rounding. GHG emissions are the 6 groups of gases we report against as included in the Kyoto Protocol: carbon dioxide, hydrofluorocarbons, methane, nitrous oxide, perfluorinated carbon compounds and sulphur hexafluoride. Nitrogen trifluoride emissions are not present/ applicable in Rio Tinto's inventory.

Total energy use (PJ), equity basis	2024
Renewable electricity generated and consumed [1]	72
Contracted renewable electricity purchased and consumed [2]	
– Renewable electricity with surrendered RECs or GOs	23
– Renewable electricity contracted with energy attributes	6
Grid electricity purchased[3]	
– Grids that are materially all renewables	76
– Other grids	27
Renewable energy from biomass based fuels	4
Non-renewable energy (generated electricity)	70
Other non-renewable energy[4]	211
Total energy consumed (PJ)	**490**

Energy consumption includes energy from all sources, including energy purchased from external sources and energy produced (self-generated). Energy reported excludes exports of energy to third parties.

1. Includes our equity share of renewable energy generated and consumed.
2. Contracted renewable electricity is split into energy where we have purchased and surrender Renewable Energy Certificates (RECs), and contracts where we have the unique rights to the energy attributes.
3. Grid electricity includes all grid consumed electricity (grids contain a mixture of renewable and non-renewable energy sources). Energy consumed from grid electricity purchased was 21%.
4. Other renewable energy includes stationary fuels, heat, anodes and reductants.
   Renewable energy consumed as per the IFRS S2 Climate Related Disclosures guidance includes renewable energy the entity purchased under PPAs with RECs or GOs surrendered or cancelled, and renewable energy consumed from biomass based fuels. The renewable energy % under this definition is 5%.
   Unlike the GHG Protocol, this guidance does not recognise the following as renewable energy: 1) renewable energy contracts where unique energy attributes are contracted without a certificate or 2) where renewable electricity such as our hydro power generation assets supply our sites as it must be supplied specifically with RECs and GOs.

Scope 3 GHG emissions – equity basis

Total equity Scope 3 greenhouse gas emissions (Mt CO_2e) [1]	2024	2023	2022	2021	2020
Scope 3 emissions – upstream	29.8	29.5	30.1	32.3	30.4
Scope 3 emissions – downstream	544.8	543	542.2	526	545.8
Total	**574.6**	**572.5**	**572.3**	**558.3**	**576.2**

See pages 58-62 for detail on progress made against our Scope 3 targets and objectives and our main actions for 2025. Scope 3 emissions are prepared on an equity basis, taking into account our economic interest in all managed and non-managed operations. Scope 3 emissions are indirect greenhouse gas (GHG) emissions generated as a result of activities undertaken across the value chain. Scope 3 emissions are divided into 15 categories, covering activities both upstream and downstream of our operations. Of these categories, Category 10 – Processing of sold products – accounts for about 94% of the identified emissions across our value chains. For further details, refer to our *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* report.

We engaged KPMG to provide limited assurance on Scope 3 emissions estimates in 2024. The assurance statement can be found on page 321.

1. To identify and calculate Scope 3 emission sources across our operations, we have used the WRI and WBCSD, Greenhouse Gas (GHG) Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) (2015), GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2013) and the Technical Guidance for Calculating Scope 3 Emissions (version 1.0).
   We estimate the emissions from our customers' processing of iron ore, bauxite, alumina, titanium dioxide, salt and copper concentrate using a combination of internal emissions modelling, regional and industry level emissions factors and production and sales data. Third party shipping and transportation of our products to our customers, intercompany transport of products and transport of fuel and other supplies are also calculated and reported. Emissions associated with the manufacture and supply of purchased and capital goods are included in the Scope 3 inventory.
   Scope 3 emissions deemed to be material at Group level are reported on an equity basis as part of our disclosures in the Annual Report and our submission to the Carbon Disclosure Project. Where there are significant changes to the calculation methodology of Scope 3 categories to improve the maturity and accuracy of reported emissions, an approximate equivalent to the historical reported numbers using the new methodology will be provided.

Sources of Scope 3 equity GHG emissions (Mt CO_2e)	2024	2023	2022	2021	2020
Upstream emissions					
1. Purchased goods and services	14.8	15.2	16.7	19.5	19.3
2. Capital goods	3.0	2.2	1.8	1.9	1.4
3. Fuel and energy-related activities	4.4	4.4	4.5	4.5	4.5
4. Upstream transportation and distribution	6.8	6.8	6.5	5.9	5.1
5. Waste generated in operations	0.1	0.1	0.1	0.1	0
6. & 7. Business travel and employee commuting	0.7	0.8	0.5	0.4	0.1
Downstream emissions					
9. Downstream transportation and distribution	2.1	2.4	2.3	2.7	3.0
10. Processing of sold products					
– Iron ore	395.9	399.9	386.6	364.6	376.4
– Bauxite and alumina	134.0	127.1	138.2	144.5	152
– Titanium dioxide feedstock	4.5	4.9	5.9	4.9	5.8
– Copper concentrate	0.7	0.5	0.5	0.5	0.6
– Salt	6.6	7.0	7.1	7.2	6.0
– Other	1.0	1.2	1.6	1.6	2.0
Total	**574.6**	**572.5**	**572.3**	**558.3**	**576.2**

Note: The sum of the categories may be slightly different to the Rio Tinto total due to rounding.

The following categories are excluded for the reasons provided:

Category 8: Upstream leased assets. Rio Tinto does not lease significant upstream assets.

Category 11: Use of sold products. This category is not applicable since Rio Tinto does not produce any fossil fuels or manufacture products applicable to this category.

Category 12: End-of-life treatment of sold products. Rio Tinto's products include metals and minerals with minimal emissions at end of life. This category is not applicable since Rio Tinto does not produce any fossil fuels or manufacture products applicable to this category. Final products related to Rio Tinto's material value chains (steel, aluminium and copper) produce materials with established recycling industries.

Category 13: Downstream leased assets. This category is not applicable since Rio Tinto does not lease significant downstream assets.

Category 14: Franchises. This category is not applicable since Rio Tinto does not have franchised operations.

Category 15: Investments. This category is for reporting emissions from company investments not already reported in Scope 1 and 2. Rio Tinto reports using the equity share approach, so all Scope 1 and 2 emissions from managed and non-managed investments are included in Scope 1 and 2 reporting and Scope 3 emissions within other applicable categories of Scope 3 reporting.

In 2024, emissions have been restated to ensure comparability with the material change in the spend-based emissions methodology. Amendments have been made in Category 10 bauxite and alumina processing due to identified double counting of emissions for non-equitable bauxite and alumina. For further details on Scope 3 reporting refer to the *2024 Scope 1, 2, and 3 Emissions Calculation and Climate Methodology.*

Calculation methodology – Scope 3 emissions categories

The calculation methodology for Scope 3 emissions categories associated with a target or goal is provided below. See our *2024 Scope 1, 2 and 3 Emissions Calculation and Climate Methodology* report for detail on all Scope 3 emissions categories.

Category	Calculation boundary	Calculation methodology and notes
1. Purchased goods and services, and 2. Capital goods	– Includes emissions associated with relevant purchased goods and services. – Excludes emissions associated with other Scope 3 categories (fuel, energy and transport). – Includes emissions associated with the upstream goods purchased or acquired by the business for capital projects.	– Spend data method using operating business costs for managed sites on equity basis using EXIObase, US Environment Protection Agency, UK Government spend-based factors. – Scope 3 emissions are calculated for major consumables and raw materials using quantity based reporting. – Where unavailable, non-managed site costs are estimated using costs from similar production facilities.
3. Fuel and energy-related activities	– Includes emissions from the production and transportation of purchased fuels, including natural gas, diesel, coal and energy sources not included in Category 1. This includes transmission losses from purchased electricity.	– Fuel and energy consumption data from Rio Tinto business systems. Factors are sourced from the Australian National Greenhouse Accounts Factors (Australian NGA), UK Government, International Energy Agency (IEA) and National Renewable Energy Laboratory (NREL).
4. Upstream transportation and distribution	– Total Scope 3 GHG emissions from upstream transportation and distribution of Rio Tinto products. – Includes all inbound transport, all inter-company transport paid for by Rio Tinto and all outbound product transport paid for by Rio Tinto (e.g. under cost, insurance and freight (CIF, CRF) or similar terms). – Includes emissions from bulk marine shipping, containerised shipping, road and rail transport of sold products and inbound transport emissions of major consumables. – Excludes emissions from Rio Tinto owned vessels (this is included in Scope 1 emissions).	– For our managed fleet (period-chartered and spot), actual emissions are derived from consumed fuel reported from each individual voyage. Estimated emissions from non-managed voyages (FOB and similar terms) are calculated using the Energy Efficiency Operational Indicator (EEOI) guidelines including vessel type-size, cargo volumes and distances. Generic EEOIs are sourced from the 4th International Maritime Organization (IMO) GHG Study. – For containership, road, rail and air, UK Government conversion factors have been utilised. Transport emissions estimated by spend data and EXIObase emission factors are also included in this section.
10. Processing of sold products	– Includes emissions related to the processing of iron ore, bauxite, alumina, TiO_2 feedstocks, copper concentrate and salt. "Other" includes an estimate for processing emissions related to Rio Tinto's other products, including molybdenum and minor minerals.	– Emissions calculated as described in this report. – High purity products like gold, silver and diamonds, which are low volume and have minimal amounts of further processing, are considered not material.

Task Force on Climate-related Financial Disclosures Index

This section complies with the requirements of the Financial Conduct Authority's Listing Rule UKLR 6.6.6(8)R by reporting in line with the Task Force on Climate-related Financial Disclosures' (TCFD) recommendations and recommended disclosures. To determine that we comply with all 11 of the TCFD recommendations and recommended disclosures, we have considered section C of the TCFD "Guidance for All Sectors" and section E of the "Supplemental Guidance for Non-Financial Groups".

These disclosures also comply with the requirements of the Companies Act 2006 as amended by the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022. We aim to continually improve our reporting and align with emerging standards, including the International Sustainability Standards Board (ISSB) International Financial Reporting Standard (IFRS) for climate-related disclosures (S2). In addition, climate change matters are integrated into other parts of the Annual Report, such as in the Key performance indicators, Principal risks and uncertainties and Notes to the financial statements.

Recommended disclosure

Governance

Describe the Board's oversight of climate-related risks and opportunities.

- Climate-related governance, pages 69-71.
- Board of Directors (including Executive Committee) composition, skills, and experience, pages 102-105 and 112.
- Board activities specifically related to climate activities, page 109.
- Directors' attendance at scheduled Board and committee meetings, page 110.
- Nominations Committee report (including ESG expertise assessment), page 111.
- Audit & Risk Committee report, page 113.
- Sustainability Committee report, page 117.
- Remuneration report, page 119.

Describe management's role in assessing and managing climate-related risks and opportunities.

- Climate-related governance, pages 69-71.
- Management of climate-related risks and opportunities, page 71.
- Our approach to risk management, pages 88-98.
- Group governance framework, page 101.
- Remuneration report, page 119.

Strategy

Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.

- Using scenarios to identify climate risks and portfolio opportunities, pages 43-44.
- Portfolio risks and opportunities in the low-carbon transition, page 45.
- Physical climate risk and resilience, pages 66-69.
- Emerging risks, pages 89-90.
- Principal risks and uncertainties, pages 91-98.

Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning.

- Strategic context and our strategic framework, pages 6-7.
- Progressing our 4 objectives, pages 10-11.
- Using scenarios to identify climate risks and portfolio opportunities, pages 43-44.
- Portfolio risks and opportunities in the low-carbon transition, page 45.
- Strategic alignment with the low-carbon transition, page 46.
- Scope 1 and 2 emissions: Reduce emissions from our own operations, pages 47-49.
- Progress, lessons learned and our approach today, pages 48-49.
- Action to reduce our emissions, pages 51-52 and 62.
- Scope 3 emissions: Partner to decarbonise our value chains, page 58.
- Capital allocation and investment framework, page 63.
- Physical climate risk and resilience, pages 66-69.
- Impact of climate change on the Group, pages 157-160.

Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

- Strategic alignment with the low-carbon transition, page 46.
- Scope 1 and 2 emissions: Reduce emissions from our own operations, pages 47-57.
- Scope 3 emissions: Partner to decarbonise our value chains, pages 58-62.
- Capital allocation and investment framework, page 63.
- Physical climate risk and resilience, pages 66-69.
- Impact of climate change on the Group, pages 157-160.

Risk management

Describe the organisation's processes for identifying and assessing climate-related risks.

- Using scenarios to identify climate risks and portfolio opportunities, pages 43-44.
- Physical climate risk and resilience, pages 66-69.
- Management of climate-related risks and opportunities, page 71.
- Our approach to risk management, pages 88-90.
- Emerging risks, pages 89-90.
- Principal risks and uncertainties, pages 91-98.

Describe the organisation's processes for managing climate-related risks.

- Physical climate risk and resilience, pages 66-67.
- Management of climate-related risks and opportunities, page 71.
- Our approach to risk management, pages 88-90.
- Principal risks and uncertainties, pages 91-98.

Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.

- Management of climate-related risks and opportunities, page 71.
- Our approach to risk management, pages 88-90.
- Principal risks and uncertainties, pages 91-98.

Metrics and targets

Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.

- Key performance indicators, page 12.
- 2024 performance against ESG targets, page 34.
- Environment, pages 35-40.
- Transition materials metrics, page 46.
- Scope 1 and 2 emissions: Reduce emissions from our own operations, pages 47 and 53-57.
- Annualised damage risk scores, pages 68-69.
- Scope 3 emissions: Partner to decarbonise our value chains, page 58.
- Climate-related metrics and targets, pages 71-74.
- STIP measures, pages 130-133.
- LTIP, pages 134-136.

Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions, and the related risks.

- Climate-related metrics and targets, pages 71-74.

Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.

- Key performance indicators, page 12.
- 2024 performance against ESG targets, page 34.
- Environment, pages 35-40.
- Grow production of materials essential for the energy transition, page 43.
- Scope 1 and 2 emissions: Reduce emissions from our own operations, page 47.
- Scope 3 emissions: Partner to decarbonise our value chains, pages 58-62.
- Climate-related metrics and targets, pages 71-74.
- STIP measures, pages 130-133.
- LTIP, pages 134-136.

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