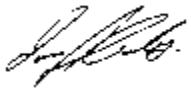
GLENCORE

Pathway to net zero

Climate Report 2020

At Glencore, we are responsibly sourcing the commodities that advance everyday life. Our portfolio enables the transition to a low-carbon economy, while meeting society's energy needs as it progresses through the transition.

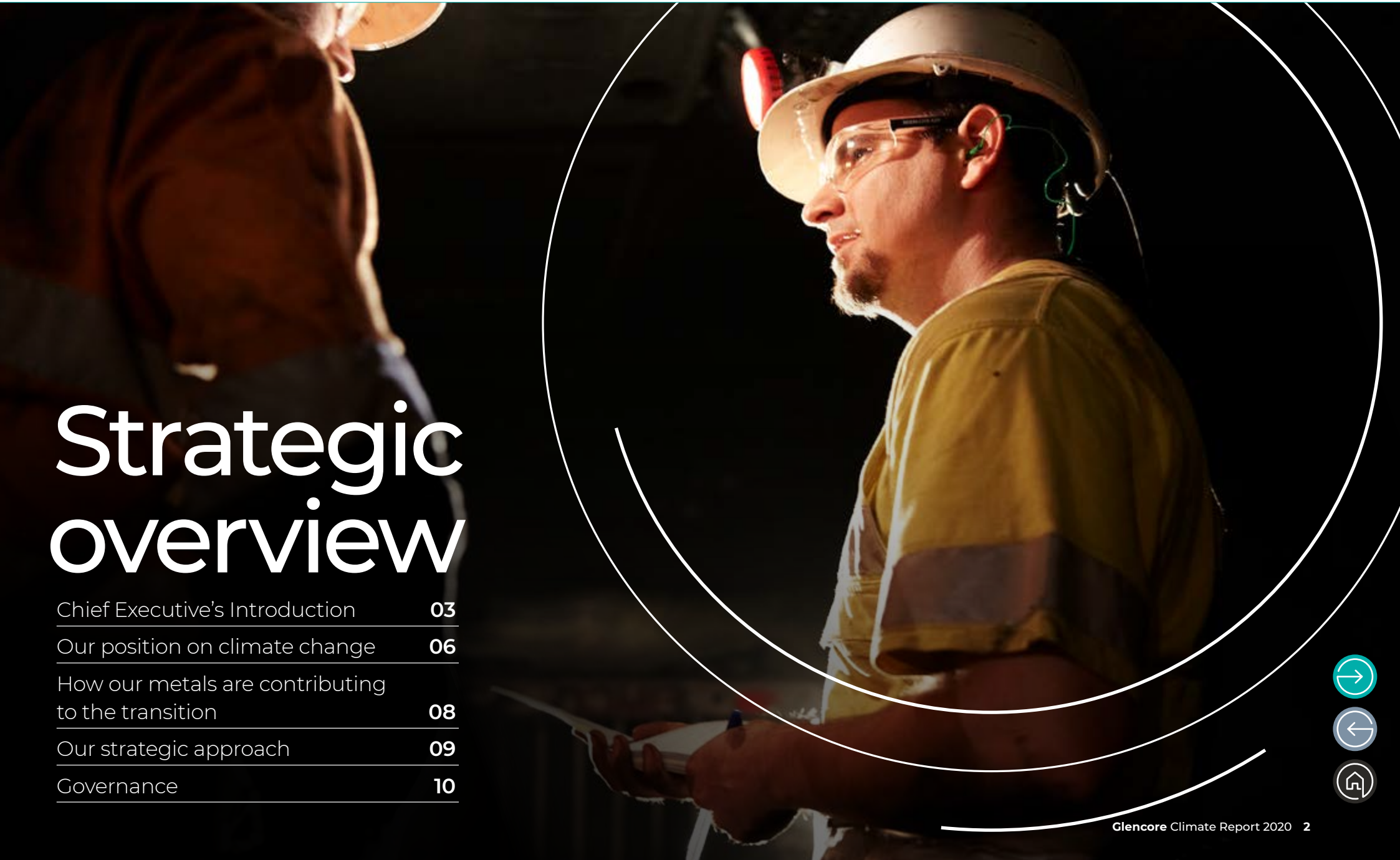


Ivan Glasenberg
Chief Executive Officer

Our target and ambition

Reach net zero emissions by **2050**

40% reduction of total emissions by 2035



Strategic overview

Chief Executive's Introduction

"The metals and minerals we produce enable the transition to a low-carbon economy."

Ivan Glasenberg
Chief Executive Officer

Read more
Our position on climate change

Read more
Delivering our ambition

We are pleased to introduce this publication, our third report on climate change. We originally planned for this year's report to be an assessment of our portfolio's resilience against the revised nationally determined contributions (NDCs) that governments were due to announce during 2020. However, the pandemic has not only delayed the COP26 UN climate change conference by a year, but has also postponed the publication of the updated NDCs. Instead, we have chosen to focus this report on how we will deliver a 40% reduction in total emissions by 2035 on 2019 levels and our ambition, with a supportive policy environment, to be a net-zero total emissions company by 2050.

Enabling the transition to a low-carbon economy

The majority of our earnings comes from the metals and minerals that enable the transition to a low-carbon economy. We are one of the largest producers of copper, nickel and cobalt. These commodities are essential for the infrastructure and batteries associated with electric vehicles and energy storage. Energy storage is crucial in supporting the efficiency and scalability of wind and solar power generation.

We continue to prioritise investment into these commodities. The growing deployment of renewable electricity generating technologies, electric mobility and batteries for enhancing grid stability is expected to increase demand for the metals we produce, trade and supply. Our metals business is well positioned to grow as the world transitions to a low-carbon future. In addition, our recycling centres and processing smelters can play a fundamental role in the circular economy by reducing new metal consumption and waste generation. We will simultaneously implement initiatives to reduce our carbon footprint.

Meeting society's energy needs as it progresses through the transition

The world currently depends on fossil fuels (coal, natural gas and oil) for around 80% of its primary energy demand. Coal currently accounts for about 25% of global energy use, and while this will decline over time, it continues to make a contribution in all climate change scenarios to 2050. For many countries, a cheap, secure energy source is key to their socio-economic and industrial development by providing their populations with access to affordable and reliable electricity and a solid pathway to economic growth, development of key infrastructure and higher standards of living.

Our thermal coal business represents less than 5% of our revenues and currently in the region of 10-15% of our EBITDA in the medium term. Future demand for coal through the transition

will be a key determinant in the continued operation of our mines. Selling our coal mines does not remove their associated emissions. While there is demand for coal, and it is economic to do so, we will continue to operate our mines until they reach the end of their lives. Through responsible stewardship of these assets and a commitment to a managed decline of our coal portfolio, including maintaining a focus on our high-quality coal assets in Australia, we will deliver on our ambition to reduce our total emissions in line with the goals of the Paris Agreement.

Going forward

Overall, we expect our well-positioned business to thrive under the various policy and commodity demand scenarios we model in this report.

As we work to deliver on our ambition to achieve total net zero emissions by 2050, we will continue to operate in line with our Purpose, Values and Code of Conduct, as well as relevant international standards, and to be a responsible operator in our host countries. We will be transparent about our performance and progress through our annual publications and on our website.

Ivan Glasenberg
Chief Executive Officer

Our ongoing journey to manage our carbon footprint

2008

Began capturing methane from our Australian coal mines to convert into electricity and reduce emissions through flaring, abating 28 Mt CO_2e in the last ten years

2009

CTSCo, our wholly-owned CCUS project in Australia, initiated

Investing in carbon capture

2014

Raglan Mine, which is off-grid and mainly produces electricity from diesel, built a 3 MW wind turbine

2017

Ferroalloys piloted energy generation from combusting waste carbon monoxide

Began developing the Onaping Depth nickel underground project with a fleet of battery-powered EVs

Our ongoing journey to manage our carbon footprint

Reach net zero emissions by **2050**

2017

Announced our first target of reducing our greenhouse gas emissions intensity by 5% by 2020 compared to a 2016 baseline

Reduce emssions by 5% by 2020

2018

Raglan Mine built a second 3 MW wind turbine

2019

Announced a commitment to align capital allocation discipline with the goals of the Paris Agreement

2020

Announced in February a projected reduction of Scope 3 emissions of 30% by 2035 on 2019 levels

Confirmed that we remain on track to meet our 2017 intensity reduction target

Completed the c. $400m refurbishment of hydropower infrastructure in the DRC, in partnership with the government, which is expected to deliver economic growth and employment opportunities

CTSCo undertook fieldwork to assess a potentially viable location for long-term, large-scale CO_2 storage

Announced a 1.5°C-aligned target of an absolute 40% reduction of total emissions by 2035 on 2019 levels and ambition of achieving a net zero total emissions footprint by 2050

Our position on climate change

We support the global climate change goals outlined in the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.

We support the global climate change goals outlined in the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. We believe that only through collective global action can the world achieve the goals of the Paris Agreement and limit the impact of climate change. Demand for renewables technologies, and the metals and minerals required to build them, is expected to grow exponentially in response to the decarbonisation of global energy supply and electrification of key sectors, including mobility and its associated infrastructure.

We recognise global climate change science as laid out by the Intergovernmental Panel on Climate Change (IPCC) and the need to meet the goals of the Paris Agreement. The world requires a global transformation of energy, industrial and land-use systems to achieve these goals. As one of the largest diversified natural resource companies in the world, we can support the achievement of the goals by producing, trading and supplying the metals and minerals that are essential to the transition to a low-carbon economy and to meeting the needs of everyday life.

Under all credible scenarios, fossil fuels (coal, gas and oil) will continue to be a part of the global energy mix for many years to come. Facilitating investment into deploying low emission technologies, carbon capture and adaptation efforts should be a priority. As a member of the International Council on Mining and Metals, our assets considers their Integrated Mine Closure: Good practice guide, which includes a focus on social provision in closure planning, in their management systems. We recognise the need to collaborate with national and regional governments, as well as our communities, to ensure a just transition through the transition to a low carbon economy.

We recognise our responsibility to contribute to the global effort to achieve the goals of the Paris Agreement by decarbonising our own operational emissions footprint. We believe that our contribution should take a holistic approach and have considered our commitments through the lens of our total emissions footprint. **In line with the ambitions of the 1.5-degree Celsius (°C) scenarios set out by the IPCC[1], we target a 40%[2] reduction of our total (Scope 1, 2 and 3) emissions by 2035 on 2019 levels. Post 2035, our ambition is to achieve, with a supportive policy environment[3], net zero total emissions by 2050.**

We have formulated our climate change strategy in partnership with key stakeholders. Our ongoing engagement activities are core to our commitment to inform stakeholders on our progress towards meeting our 2035 emissions target and our ambition to achieve net zero total emissions by 2050, as well as demonstrating our portfolio resilience under a range of scenarios.

[1] IPCC Special Report: Global Warming of 1.5°C; Table 2.4 – CO_2 from fossil fuels and industry (gross)
[2] Midpoint of 1.5°C pathway
[3] Coordinated government policies, including incentives to drive accelerated uptake of lower carbon and decarbonisation technologies, and market based regulations governing industrial practices that drive a competitive, least cost emissions reduction approach, are critical to our ability to achieve our ambition of net zero total emissions by 2050

Our position on climate change cont.

Our Purpose

To responsibly source the commodities that advance everyday life.

Reach net zero emissions by **2050**

Our Ambition

To become a net zero total emissions business by 2050

Our Actions

- Managing our operational footprint, Scope 1 and 2 emissions
- Reducing our Scope 3 emissions
- Allocating capital to prioritise transition metals
- Collaborating with our value chains
- Supporting uptake and integration of abatement technologies
- Utilising technology to improve resource use
- Transparent approach

How our metals are contributing to the low-carbon transition

Metal	Glencore production[1]	Global supply[2]
Copper	1.26Mt	22.6Mt
Cobalt	28kt	132kt
Nickel	114kt	2.45Mt

Metal	Glencore production[1]	Global supply[2]
Aluminium	c.4Mt[3]	64.7Mt
Zinc	1.16Mt	13.8Mt
Vanadium	8.7kt	180kt

[1] Third Quarter 2020 Production Report, mid-point of 2020 production guidance, Page 17.
[2] All data 2020 estimates. Sources: Morgan Stanley, The Price Deck – 4Q2020, September 23, 2020; vanadium supply Glencore estimate; coal – IEA Coal 2019 – Analysis and forecast to 2024, assuming 78% of global coal production is steam coal.
[3] Data based on 2019 marketed volumes as reported in Glencore Preliminary Results 2019, Page 12. Aluminium marketed volumes reflect non-China traded metal.

Our strategic approach[TCFD]

Our purpose is to responsibly source the commodities needed for everyday life

We understand the role the commodities we produce and market have in meeting the needs of daily lives. The diversity of our portfolio underpins our strategic ambition to play a leading role in enabling the decarbonisation of global energy demand through providing metals such as copper, cobalt, zinc and nickel that are essential to the transition to a low-carbon economy.

We recognise the need for action. We have set ourselves a 1.5°C pathway aligned target of an absolute 40% reduction of our total emissions (Scope 1, 2 and 3) by 2035 on 2019 levels, consistent with the midpoint of IPCC's 1.5°C scenarios and the 1.5°C pathways set out by the International Energy Agency (IEA).Post 2035, we set ourselves the ambition to achieve, with a supportive policy environment, net zero total emissions by 2050.

We plan to deliver our ambition of net zero total emissions by 2050 through seven core actions:

Managing our footprint

Footprint

Managing our operational footprint
Reducing our Scope 1 and 2 emissions

Reduction

Reducing Scope 3 emissions
Our diverse portfolio uniquely allows us to address this portion of our footprint through investing in our metals portfolio, reducing our coal production and supporting deployment of low emission technologies

Capital

Allocating capital to prioritise transition metals
Growing the metals that the world needs

Contributing to global decarbonisation

Partnership

Collaborating with our value chains
Working in partnership with our customers and supply chain to enable greater use of low-carbon metals and support progress towards technological solutions

Abatement

Supporting uptake and integration of abatement
An essential contributor to achieving low – or net zero carbon objectives

Technology

Utilising technology to improve resource use efficiency
Contributing to the circular economy

Transparency

Transparent approach
Reporting on our progress and performance

Read more
Delivering our ambition

Governance[TCFD]

We integrate climate considerations, such as energy and climate policies in countries where we operate and sell our products, expectations of our value chains, and the various commitments to achieve the goals of the Paris Agreement, into our strategic decisions and day-to-day operational management:

Board Overview

Board

Climate change is a standing agenda item for Board meetings, with the Board's Health, Safety, Environment and Communities Committee overseeing Glencore's climate change programme and performance.

The Board discussed climate change at all of its meetings, including:

- Progress in meeting our carbon targets and performance
- External policy developments
- Engagement with stakeholders on climate-related topics

Strategy

Strategy development

The Climate Change Working Group, which our Board Chairman oversees and includes our CEO and senior management team, is responsible for key decisions on delivering our programme.

During the Working Group's 2020 meetings, it reviewed:

- Capital allocation in 2019, and resulting Scope 3 projections
- Target-setting process
- Development of scenarios, including key inputs and assumptions
- Risks and mitigation actions relating to climate change

Risk management

Assessing climate change-related risks and opportunities is part of our Group risk management and strategy development processes. Effective and strategic management of climate change-related risks and opportunities across all aspects of our business is vital to our continued ability to operate.

Operational

Industrial leadership team

When relevant, meetings, led by the Head of Industrial Assets, include discussions on decarbonisation strategy and carbon performance.

Our ongoing work plan and requirements we place across our asset portfolio, give substance to our corporate approach and commitments on climate change.

Implementation

Our strategy aligns with the goals of the Paris Agreement

Our capital allocation processes prioritise the commodities essential to the transition to a low-carbon economy. Our Annual Report details our approach to capital allocation.

We support policy mechanisms aimed at achieving cost-efficient emissions reductions without compromising the development goals of nation states.

We continue to strengthen systematic consideration of local regulation and carbon price sensitivities as part of our ongoing business planning for existing industrial assets, new investments and as part of our marketing activities.

We integrate risk management throughout our business through a structured risk management process that establishes a common methodology for identifying, assessing, treating and monitoring risks.

We incorporate climate scenarios into our strategic operational planning and review process. In 2020, we assessed the resilience of our industrial operations against operational and regulatory risks under Current Pathway (STEPS) and Rapid Transition (SDS) and Radical Transformation (Net Zero) scenarios.

Metrics and targets

We are committed to reporting transparently on our progress in meeting our climate change objectives and data on our Scope 1, 2 and 3 emissions in our Annual and Sustainability Reports.

We also publish data on our performance on our website. Details on our performance from 2017 to 2019 can be found in Appendix One.

We are considering how our climate change objectives can be reflected in the design of the relevant remuneration schemes for executive management and will provide further details in our 2020 Annual Report.

External context

The journey to 2050 – **what does net zero mean?**

We have adopted the IEA's global energy and emission scenarios and extended the scenario analysis to include the evolution of metals demand as the world transitions to greater electrification and adoption of metal-intensive wind, solar and battery technologies

[1] While our approach draws principally on IEA scenarios, our benchmarking of these against those of other experts, including Bloomberg New Energy Finance and the International Renewable Energy Agency (IRENA), shows broad alignment on the energy and emissions trajectory being fashioned by current policy and ambition.

No single pathway can define how individual economies and the world will transition. These scenarios describe a range of potential outcomes dependent on the rate at which transition policies are implemented. We use each of these scenarios to test the resilience of our portfolio.

Three scenarios[1]:

Scenario 1

Current Pathway:
Adopting the IEA's Stated Energy Policies Scenario (STEPS), which the IEA describes, "STEPS is designed to take a detailed and dispassionate look at the policies that are either in place or announced in different parts of the energy sector. It takes into account long-term energy and climate targets only to the extent that they are backed up by specific policies and measures." The Current Pathway has been assessed as being consistent with global temperatures rising on average by 2.7°C by the end of the century.

Scenario 2

Rapid Transition:
Adopting the IEA's Sustainable Development Scenario (SDS). The SDS is based on the same economic outlook as STEPS but works backwards from climate, clean air and energy access goals, examining what actions would be necessary to achieve those goals. The IEA's description: This Rapid Transition delivers the goals of the Paris Agreement through accelerated adoption of renewables delivering global net zero emissions in 2070 and limiting the rise of global temperatures to 1.5°C by the end of the century.

Scenario 3

Radical Transformation:
Adopting the IEA's Net Zero Emissions by 2050 Scenario (NZE2050), which the IEA states, "sets out what additional measures would be required over the next ten years to put the world as a whole on track for net zero emissions by mid-century.

Achieving this goal would involve a significant further acceleration in the deployment of clean energy technologies together with wide-ranging behavioural changes." This Radical Transformation would place the world on a pathway consistent with delivering global net zero emissions in 2050 and limiting the rise of global temperatures to 1.5°C by the end of the century.

In 2019, the global energy mix was dominated by fossil fuels, which provided just over 80% of primary energy demand. With governments having announced investment support for renewables technologies, all scenarios require the full mix of energy sources to meet the global needs, with proportions varying for each scenario.

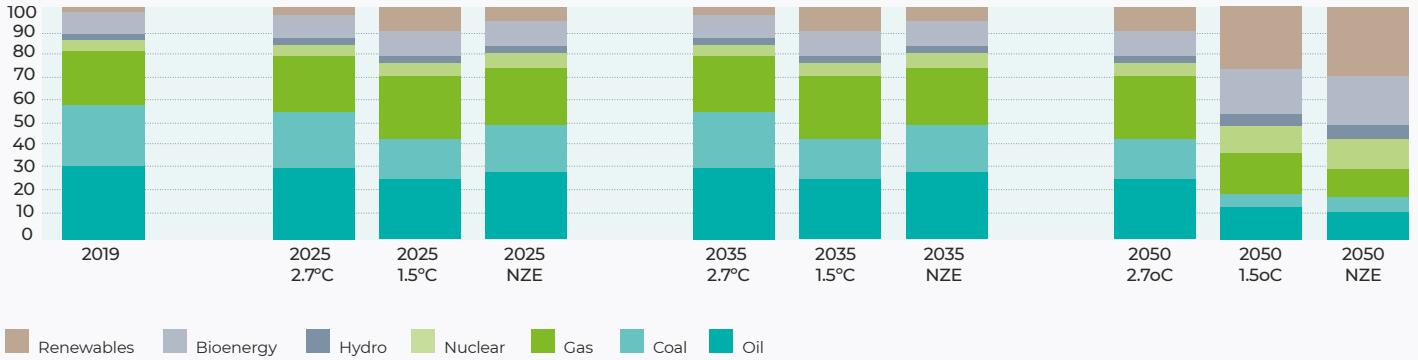
All three scenarios are based on the same economic and population assumptions and while the IEA focuses on addressing the transformation of global energy and emissions in its World Energy Outlook, we have used the scenario foundations together with the IEA's Special Report on Carbon Capture, Utilisation and Storage (CCUS) and IEA's Energy Technology Perspectives 2020 to extend our analysis and to consider the following key trends:

- The impacts from the accelerated adoption of renewables power generation and electric vehicles on metals demand
- Abatement as an essential contributor to achieving global net zero carbon objectives

To deliver an energy system that meets the dual requirements of satisfying the energy needs of a growing global population and reducing carbon emissions, it will be necessary for nuclear, wind and solar power generation to grow more rapidly, as well as heavy investment in CCUS. The Rapid Transition pathway requires investment in renewables technologies and CCUS at nearly triple the rate committed under the Current Pathway by 2030.

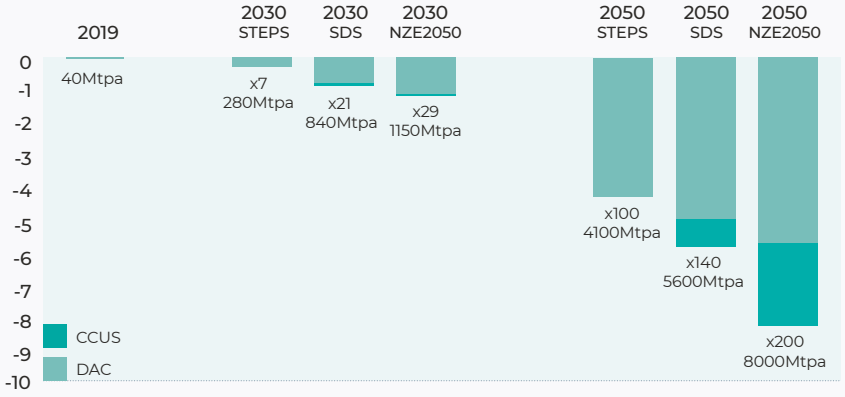
Evolution of the global energy systems to meet increasing demand and transition to low-carbon sources

Primary Energy Demand by Source IEA Scernarios



Carbon capture is an essential contributor to achieving global net zero carbon objectives

Installed Annual CO_2 Storage Capacity

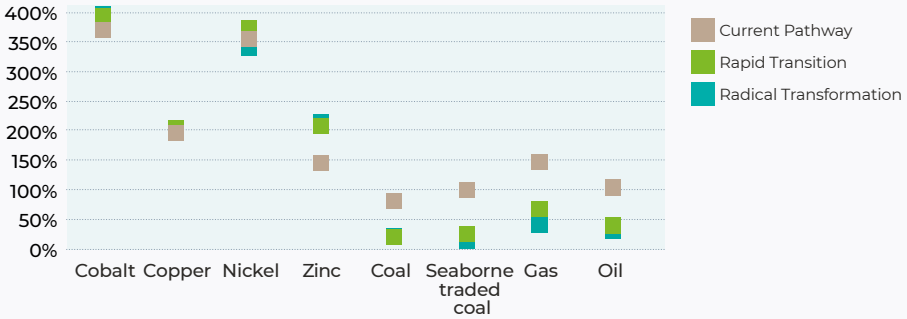


Since 2017, Glencore has reviewed more than 20 global energy and climate change scenarios. While adopting the IEA scenarios as the basis for assessing business resilience, we believe the range of outcomes presented by these scenarios captures the range of potential outcomes presented by other credible sources.

Meeting future energy needs with renewables and battery technologies is metals intensive and is expected to drive primary demand for cobalt, copper, nickel and zinc to multiples of current levels. Only gas is expected to see demand growth under the Current Pathway, while all other fossil fuels decline under the Rapid Transition and Radical Transformation.

Contrasting demand for metals in energy generation, transmission and storage versus fossil fuels

Commodities demand in 2050 versus 2019 (2019 = 100%)



Scenario 1

Current Pathway
(IEA STEPS)

The Current Pathway considers the NDCs under the Paris Agreement and incorporates the energy components of announced stimulus or recovery packages (as of mid-2020).

This scenario considers country-level net zero emissions targets announced prior to mid-2020, capturing Europe and South Korea but excluding China and Japan. The Current Pathway falls short of delivering targets under the United Nations Sustainable Development Goals (UN SDGs) with many less developed nations remaining in energy poverty without access to clean cooking or modern energy. Global temperature rise in this scenario is projected at 2.7°C by 2100.

Technology investment:

The Current Pathway incorporates substantial, accelerated investment in renewable energy technologies with investment in wind, solar and bioenergy power generation with battery backup enabling a reduction in fossil fuel use for primary energy from the current 80% to 70% of the projected global energy demand in 2050. While the scale of the investment in renewables is substantial, it is insufficient to meet the incremental energy demand growth, thus requiring additional gas consumption stable oil production and a 20% decline in coal use. This results in gross fossil fuel CO_2 emissions continuing to increase until 2050.

Use of carbon abatement:

Accelerated adoption of carbon capture technology is critical to ensuring global CO_2 emissions do not contribute to a greater temperature increase. The Current Pathway requires a 30-fold increase in CCUS installations by 2035 and a 100-fold increase by 2050. With this CCUS investment CO_2 emissions in 2050 would be 3.9 billion tonnes per annum below 2019 levels and total emissions captured by 2050 would be 48 billion tonnes.

Transport electrification:

Electrification of passenger, two wheeler, bus and commercial vehicle fleets is integral to the Current Pathway with passenger electric vehicles (EVs) and plug-in electric vehicles (PEV) fleet expanding from the current 6.9 million vehicles to 300 million vehicles by 2035. Excluding the incremental demand for charging capability, EVs and PEVs are three to four times more copper intensive when compared to internal-combustion engine vehicles giving rise to strong demand for copper, together with nickel and cobalt in the batteries.

Current Pathway	2019	2035	2050*
Passenger EV Fleet	6.9 million	300 million	> 850 million
Battery Demand	126 GWh	c. 3,700 GWh	c. 7,800 GWh
Installed Solar PV	600 GW	2,700 GW	6,800 GW
Installed Wind	620 GW	1,500 GW	3,000 GW
Installed CCUS	40 Mtpa	1,200Mtpa	4,000Mtpa

*Glencore 2050 projection

Scenario 2

Rapid Transition
(IEA SDS)

"Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems."[4]

The Rapid Transition outlines a major transformation of the global energy system necessary to achieve the goals of the Paris Agreement and the UN SDGs. This scenario illustrates the effective action and investment needed to avoid the worst impacts of climate change by limiting the rise in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase by 2100 to 1.5°C, with net zero emissions achieved in 2070.

Realising a carbon neutral future requires a large-scale transition to low-carbon and negative-carbon technologies, including:

- Accelerated adoption of renewable technologies such as solar and wind power generation, which depend on metals such as copper, cobalt, nickel, zinc, chrome and vanadium for the generation, transmission and storage of low-carbon energy
- Electrification of transportation through widespread deployment of EVs and charging infrastructure, requiring further advances in battery technology and the development of low-carbon energy networks
- Decarbonisation of energy used by industrial systems, through optimising energy use, the uptake of new technologies, and use of abatement to offset or capture residual emissions.

Technology investment

The Rapid Transition scenario sees investment into new renewables power generation increase by more than 160% versus the Current Pathway. The use of fossil fuels declines to 63.5% of primary energy by 2035 and to 37% by 2050. Reliance on increased intermittent power generation sources increases battery demand by nearly 50% in 2035.

Use of carbon abatement

Ongoing use of fossil fuels requires negative carbon technologies, including CCUS and Direct Air Capture (DAC) to achieve net zero emissions and limit global temperature rise to 1.5°C. To mitigate global CO_2 emissions from hard to abate industries, the Rapid Transition pathway requires a 50-fold increase in CCUS installations by 2035 and a 130-fold increase by 2050 on 2019 levels. With this CCUS investment, CO_2 emissions in 2050 would be 23 billion tonnes per annum below 2019 levels and total emissions captured by 2050 would be 62 billion tonnes.

Transport electrification

The Rapid Transition requires passenger PEV and EV sales to be 17 million vehicles per annum greater by 2035 than is achieved in the Current Pathway, lifting the total PEV fleet to 450 million by 2035. A rapid transition is expected to accelerate hydrogen production technologies enabling earlier adoption of fuel cell vehicles. By 2050, the combined passenger EV, PEV and FCEV fleet passes one billion vehicles.

Material use reduction

Achieving the net zero ambition requires a transformation of today's consumption patterns, moving from reliance on newly produced commodities towards reuse and recycling. Metals that increase the sustainability and durability of key technologies, such as cobalt and nickel, could be important to reducing overall material use.

Rapid Transition	2019	2035	2050*
Passenger EV Fleet	6.9 million	~450 million	> 1,000 million
Battery Demand	126 GWh	c. 5,400 GWh	c. 9,200 GWh
Installed Solar PV	600 GW	4,300 GW	~9,900 GW
Installed Wind	620 GW	2,300 GW	>4,600 GW
Installed CCUS+DAC	40 Mtpa	2,000Mtpa	5,600Mtpa

*Glencore 2050 projection

[4] IPCC 1.5C report, Section C.2: https://www.ipcc.ch/sr15/chapter/spm/

Scenario 3

Radical Transformation
(IEA NZE2050)

The Radical Transformation scenario examines what more is needed beyond the Rapid Transition to put the world on a pathway to achieve global net zero emissions by 2050.

The challenge of delivering net zero global emissions by 2050 cannot be overstated. It requires a speedy and large-scale transition to renewable energy sources, investment in and deployment of negative carbon technologies, including CCUS and DAC, as well as an accelerated electrification of mobility and rapid development and deployment of carbon neutral hydrogen production.

Use of carbon abatement

To mitigate global CO2 emissions from hard to abate industries the Radical Transformation requires a 70-fold increase in CCUS installations by 2035 and a 1200-fold increase by 2050. With this CCUS investment, CO_2 emissions in 2050 would be 25 billion tonnes per annum below 2019 levels and total emissions captured by 2050 would be 75 billion tonnes.

Transport electrification

The Radical Transformation incorporates accelerated adoption of carbon neutral hydrogen and brings forward sales of fuel cell electric vehicles (FCEV). In the Radical Transformation, PEVs, EVs and FCEVs sales need to be 23 million vehicles per annum greater by 2035 than is achieved in the Rapid Transition, lifting the combined EV fleet to 640 million vehicles by 2035. By 2050, the combined passenger EV, PEV and FCEV fleet passes 1,000 million vehicles with the early adoption of FCEVs reducing total battery demand.

Behavioural and lifestyle changes

In addition to large-scale investment and technological changes, behavioural and lifestyle changes are essential to achieving the pace and scale of emissions reductions required to deliver the Radical Transformation. These account for around 30% of the difference in emissions reductions between the Rapid Transition and the Radical Transformation in 2030 and demand a concerted effort by all governments, as well as active global societal participation. The transport sector could deliver substantial emissions reductions, through speed reductions and ride sharing. Radical Transformation also requires changes to air conditioning and adjusting heating and cooling temperatures by 3°C.

Radical Transformation	2019	2035	2050*
Passenger EV Fleet	6.9 million	~640 million	> 1,000 million
Battery Demand	126 GWh	~ 6,400 GWh	~ 7,400 GWh
Installed Solar PV	600 GW	~5,200 GW	>10,000 GW
Installed Wind	620 GW	~3,000 GW	>4,800 GW
Installed CCUS+DAC	40 Mtpa	2,800Mtpa	8,000Mtpa

*Glencore 2050 projection

Metals Demand Outlook

Under any scenario, transitioning to a low-carbon future implies a material uplift in demand for metals such as copper and cobalt, aluminium and nickel, as low-carbon and carbon-neutral technologies are significantly more metal intensive than fossil fuel technologies.

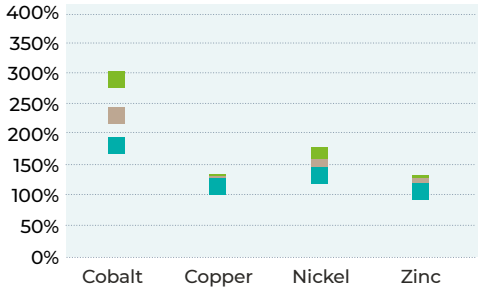
Copper is a critical element for realising a low-carbon future, being used in a wide range of applications from wind generators and transformers, to solar photovoltaic (PV) installations, EV infrastructure and, critically, the wiring and cabling connecting renewable power generation with energy storage devices and the grid. By 2025, copper demand under the three scenarios is expected to be at least 15% above 2019 levels. The Current Pathway could increase copper demand by 45% and by 95% on 2019 levels by 2035 and 2050 respectively. In the Rapid Transition, copper demand increases by 50% and 100% versus 2019 in 2035 and 2050 respectively.

Cobalt is currently a key constituent in mainstream chemistries for EV battery applications; it adds thermal stability, energy density and battery life. While battery technology is constantly evolving, and ways to reduce or eliminate cobalt from the cathode are being explored, bottlenecks, including compromised safety, stability and reduced cell life, remain. By 2025, an increase in EV sales in line with the Rapid Transition results in cobalt demand more than doubling from 2019 levels and almost trebling in the Radical Transformation. While there is sufficient confidence in battery metals demand levels in the medium term, projected increases between 2030 and 2050 are subject to technological change.

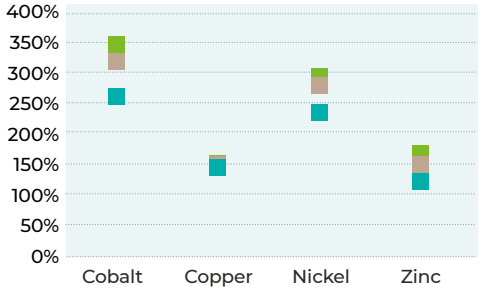
Nickel is alloyed with steel, which in turn is used in the shafts, rotor hubs, gears and base plates for wind power generation. Nickel is also used in batteries for EVs and energy storage systems. By 2025, nickel demand is projected to increase by 32% on 2019 levels in the Current Pathway. By 2035, the Current Pathway requires 135% more nickel with a 200% increase in demand under the Rapid Transition. In 2050, the Current Pathway shows nickel demand increasing to 250% above 2019 levels, this increase to 270% in the Rapid Transition.

Zinc is used predominantly as a galvanising agent to protect steel from corrosion. A low carbon future will increase demand for galvanised metals used in ground based solar installations and near-to-coast or offshore wind installations. In 2025, there is a projected 106% increase in zinc demand on 2019 levels. By 2035, the Current Pathway would require 20% more zinc, increasing to 50% under the Rapid Transition. In 2050, increasing wind and solar installations in the Current Pathway could drive demand for zinc to 45% above 2019 levels, and a 100% demand increase under the Rapid Transition.

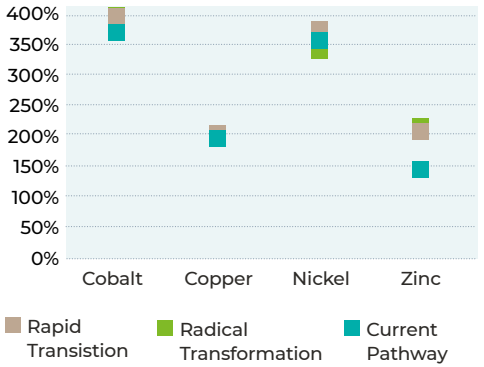
Demand in 2025 versus 2019
(2019 =100%)



Demand in 2035 versus 2019
(2019 =100%)



Demand in 2050 versus 2019
(2019 =100%)



Portfolio Resilience

Using scenario testing in planning
The scenarios provide for a range of outcomes in relation to energy demand, the energy mix, metals demand and climate. We continuously assess our business against these scenarios as part of our decision-making processes.

Incorporating carbon prices
Carbon pricing will enable and support the transition to a lower emissions world. Glencore successfully operates in a number of jurisdictions with a price on carbon, either explicitly in the form of tax, or as levies on imported products. Increases to carbon pricing, together with enhanced local regulation and policies, will drive investment to lower emissions technologies. The IEA provides a range of carbon prices that support the Current Pathway and Rapid Transition:

Current Pathway

Power sector CO_2 prices – US$/t (2019)	2019	2035	2050*
Europe	22	34	52
Japan	11*	34	52
Korea	40*	34	52
China	-	17	35
South Africa	-	10	24

*Levied as an import tax on coal and LNG

Rapid Transition

Power Sector CO_2 prices – US$/t (2019)	2025	2040
Advanced and developing economies	63	140

To achieve the net zero total emissions ambition, the development of holistic and equitable mechanisms requires globally coordinated action that considers the interconnectedness of supply chains worldwide, as well as balancing decarbonisation with mitigation and abatement opportunities. Emerging technologies that enable enhanced traceability, including carbon footprints, will help to make these mechanisms more effective.

We take into consideration the various potential impacts on our operating costs arising from existing and planned carbon pricing regulation. It is unclear what future mechanisms for carbon pricing will be as there is limited to no uniformity between existing structures. The manner in which carbon pricing is implemented will determine the competitiveness of different energy sources and the role of fossil fuels, as well as having impacts across our full value chain.

Results of scenario testing

The increasing deployment of renewable energy technologies, electric mobility and its associated infrastructure, and batteries to enhance grid stability, will all increase demand for many of Glencore's key commodities. Under all policy scenarios, the material uplift in metals demand offsets the decline in demand for coal.

Commodity businesses (2021 illustrative EBITDA contribution)	Scenario	Outlook	Scenario impacts
Copper (40%)	Current Pathway	↑	Growth in renewables power generation capacity, EV sales and associated infrastructure to underpin our forecasted 15% increase in copper demand by 2025 on 2019 levels. The Current Pathway is projected to increase demand by 45% by 2035 and 95% by 2050.
	Rapid Transformation	↑↑	The required greater acceleration in investments to decarbonise economies under the Rapid Transition and Radical Transformation could further drive copper demand and support rises of 50% and 100% on 2019 levels in 2035 and 2050 respectively.
	Radical Transition		
Ferroalloys (not financially material)	Current Pathway	→	In South Africa, rising electricity prices and carbon taxes will exacerbate the pressure currently felt in ferrochrome smelting, leading to potential plant closures with associated job losses. Continuing demand for chrome will support the ongoing operation of ferrochrome mines in South Africa.
	Rapid Transformation	→	The accelerated adoption of renewable technologies such as solar and wind power generation, which depend on chrome and vanadium, amongst other metals, for the generation, transmission and storage of low-carbon energy underpins demand growth for our ferroalloys business (good for mining activities) in the Rapid Transition and Radical Transformation, balanced by pressures on ferrochrome smelting in South Africa.
	Radical Transition		
Nickel (6%)	Current Pathway	↑	Nickel's use in batteries, EVs and energy storage systems will result in its demand rising in the Current Pathway to 130% of 2019 levels by 2025. By 2035, the scenario requires 135% more nickel and by 2050, cobalt displacement leads to increases in nickel demand of 250% above 2019 levels.
	Rapid Transformation	↑↑	The adoption of policies needed for the Rapid Transition and Radical Transformation could drive a 200% increase in demand growth by 2035 on 2019 levels and a continued growth to 270% by 2050.
	Radical Transition		

Results of scenario testing cont.

Commodity businesses (2021 illustrative EBITDA contribution)	Scenario	Outlook	Scenario impacts
Zinc (21%)	Current Pathway	↑	The electrification, industrialisation and urbanisation of developing economies supports demand growth for zinc, due to its anti-corrosive properties and use as an alloy in materials used in automobiles, electrical components, and household fixtures. This leads to zinc demand rising to 106% of 2019 levels by 2025. By 2035, the Current Pathway requires 20% more zinc, and by 2050 demand reaches 145% of 2019 levels.
	Rapid Transformation	↑↑	The major transformation of the global energy system necessary to achieve the goals of the Paris Agreement is zinc's use in offshore wind-energy generating facilities. These scenarios show zinc demand growing to 150% of 2019 levels by 2035 and to 200% by 2050 on 2019 levels.
	Radical Transition		
Coal (11%)	Current Pathway	→	Up to 2030, the Current Pathway sees coal demand growth in Asia offsetting further declines in the Atlantic markets and demand exceeding supply capacity in the absence of substantial investment to mine extensions.
	Rapid Transformation	↓↓	Policies supporting the Rapid Transition and Radical Transformation will lead to significant coal demand decline over the longer term. The ongoing use of existing coal power generation facilities will require negative carbon technologies, including CCUS and DAC, to achieve net zero emissions and limit global temperature increases.
	Radical Transition		
Marketing (21%)	Current Pathway	↑	Marketing remains core to our business model, differentiating Glencore from its mining peers. Marketing and trading margins are expected to adapt with climate initiatives. The agility of our marketing business enables it to adapt to changing circumstances and benefit from various trading and arbitrage opportunities that will inevitably arise as economies transition at different rates. Our marketing business will continue to expand into new areas, as already evidenced with the addition of LNG into our portfolio. Under any scenario, our marketing business is well-positioned to support the responsible sourcing and delivery of products needed for the low-carbon economy.
	Rapid Transformation		
	Radical Transition		

[1] – refer 2020 Investor Update 4 December 2020

Delivering our ambition

Delivering our ambition

We have set ourselves a 1.5°C pathway aligned target of an absolute 40% reduction of our total emissions (Scope 1, 2 and 3) by 2035. Post 2035, we set ourselves the ambition to achieve, with a supportive policy environment, net zero total emissions by 2050.

We expect to deliver our target and ambition through seven core actions:

Managing our footprint

Managing our operational footprint:

Reducing our Scope 1 and 2 emissions

Our group-wide Marginal Abatement Cost Curve (MACC) model captures existing and possible GHG reduction opportunities across our portfolio.

Reducing Scope 3 emissions:

Our diverse portfolio uniquely allows us to address this portion of our footprint through investing in our metals portfolio, reducing our coal production and supporting deployment of low emission technologies

Our responsibly produced energy products will deliver near- and medium-term energy needs, essential to the advancement of developing economies and the delivery of the UN SDGs.

Allocating capital to prioritise transition metals:

Investing in the commodities the world needs

We recognise the importance of disclosing how we ensure our material capital expenditure and investments align with the goals of the Paris Agreement, including our material investment in the exploration, acquisition or development of fossil fuel production, resources and reserves, as well as the metals associated with the transition to a low-carbon economy.

SDG 15: Life on hand

SDG 12: Responsible consumption and production

SDG 11: Sustainable cities and communities

[5] https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter2_Low_Res.pdf

Contributing to global decarbonisation

Collaborating with our supply chains

Working in partnership with our customers and supply chain to enable greater use of low-carbon metals and support progress towards technological solutions

We are identifying opportunities to work with respected corporates, our customers and suppliers, policy bodies and standards-setting organisations to support and promote greater use of low-carbon metals, and to form strategic partnerships that enable critical transitions in transportation, infrastructure and energy systems.

Supporting uptake and integration of abatement

An essential contributor to achieving low – or net zero carbon objectives

Achieving our emissions reduction target and ambition, as well as adapting to emerging pricing mechanisms. We recognise the importance of abatement mechanisms such as CCUS to achieving the goals of the Paris Agreement. Development and deployment of these mechanisms requires collective action; we are supporting these efforts directly and through policy advocacy.

Utilising technology to improve resource use efficiency

Contributing to the circular economy

As both policy and consumer demands drive the move towards emissions reductions and a circular economy, technological developments are required to meet these ambitions. There is increasing recognition of the need to increase the use of secondary metals, which our recycling business is well placed to meet.

Transparent approach

Reporting on our progress and performance

Through regular clear and accurate disclosure of our actions to reduce emissions, we can support the understanding of our performance and progress, as well as set out how policy and technology developments create opportunities and risks for our portfolio.

SDG 17: Partnerships for the goals

SDG 7: Affordable and clean energy

SDG 9: Industry, innovation and infrastructure

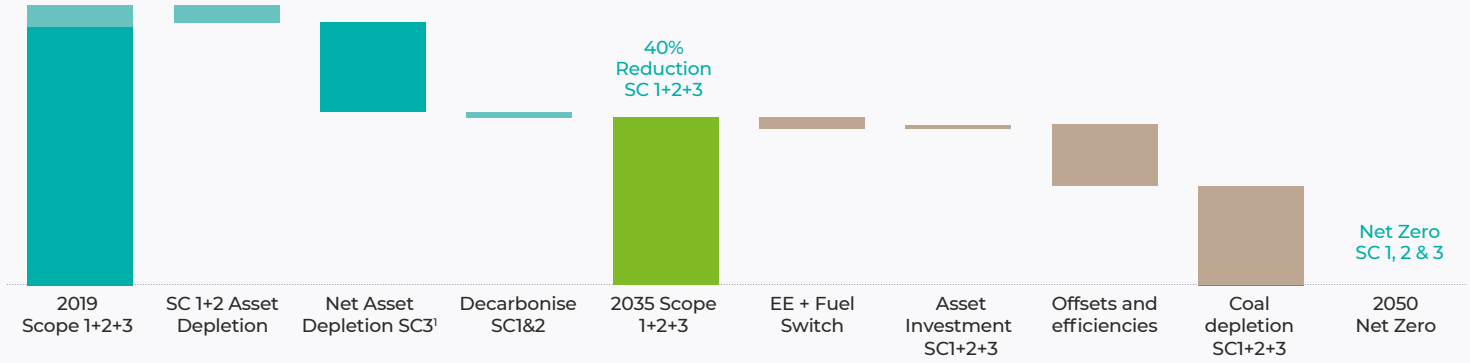
SDG 13: Climate action

In 2017, we set our first carbon reduction target of a 5% reduction of carbon intensity (Scope 1 and 2 emissions) by 2020 against a 2016 baseline. We have successfully achieved this target and while final figures are subject to balance of year data, we anticipate exceeding the reduction.

As the end of this target period neared, we conducted a review of opportunities to continue reducing our carbon footprint across our operations. Recognising the importance of a holistic view of our emissions footprint, we also considered the future strategy for our portfolio. We also mapped a range of available climate scenarios to assess the global decarbonisation efforts required to achieve a 1.5°C outcome. Appendix 2 demonstrates the alignment of our target with the Rapid Transition and IPCC scenarios, and with the Radical Transformation scenario over the longer term.

The chart below illustrates our pathway to achieve our medium-term target and long-term ambition.

Glencore decarbonisation pathway to net zero total emissions
(million tonnes CO_2)



[1] Investment to mines for extraction of marketable reserves will offset near and medium term mine closures while maintaining a declining trend to 2035.

Managing our operational footprint

We work with global specialists and draw on the local expertise within our operational teams to identify ways to further reduce our Scope 1 and 2 emissions.

This approach has led to the implementation of initiatives that reduce these emissions, while continuing to meet our obligations to our customers.

Our group-wide MACC identifies and quantifies opportunities to reduce our carbon footprint. This includes utilising more power from low-carbon sources and delivering operational improvements and technologies that enhance efficiencies, resulting in emissions reductions.

We are continuing to manage our assets responsibly and to collaborate with governments and local communities to deliver sustainable economic benefits.

Decarbonising our footprint:
Our ferroalloys business is our highest Scope 1 and 2 emitting industrial business. It has set a specific target of a 10% reduction of its Scope 1 and 2 emissions by 2025 on a 2016 baseline as part of the broader Glencore commitment. Ferroalloys is currently investigating the feasibility of working with a third party independent power purchaser for the installation and supply of approximately 400 MW of renewable power, with the potential to reduce Scope 2 emission by approximately 1.17 million tonnes per annum. Its Rhovan operation is working on a potential community involvement project to install a solar farm onsite that will deliver 11 MW for nearly nine hours a day at 80% efficiency. The ferroalloys business is also investigating a number of projects to convert waste gas into power at its smelters.

Rolling out new technologies in our mining operations:
In Canada, our Onaping Depth Project, a deep nickel mine currently under development, has been designed to utilise state of the art battery electric mobile mining equipment, maximised real-time remote operation, monitoring and management utilising advanced Wi-Fi systems. The benefits include the elimination of diesel emissions and the reduction of noise pollution. The design includes the use of innovative ventilation technology, with cooling systems designed to be energy efficient, while coping with ambient rock temperatures that can reach 40°C at depth.

We expect that battery electric vehicles (BEVs) with zero emissions could play an increasingly important role in underground operations and that going forward new mines will look to utilise this technology. The benefits of battery electric power in an underground mining operation are numerous. There are a number of industry initiatives promoting the development and uptake given the environmental benefits and the collective goal to reduce employee exposure to airborne diesel particulates. There will also be greater energy efficiency in operating a fleet of electric mobile equipment as the use of BEVs enables savings in ventilation and cooling costs which can be a significant portion of a mine's cost structure.

Responsible operator:
We believe that responsible asset stewardship supports environmental and emissions management. As such, our coal business focuses on integrating rehabilitation and mine closure into its operational processes.

Our Australian coal business has a strong focus on returning mined land to either self-sustaining native ecosystems, agricultural use or other suitable purposes that meet regulatory requirements and the expectations of our host communities. Planning for rehabilitation starts as early in the mine life as possible, often before first coal is mined. Rehabilitation is then incorporated into daily mine plans and annual plans to ensure the work is adequately resourced, budgeted and delivered.

Over the last four years, our Australian coal business has achieved over 1,000ha of rehabilitated land each year. Further information on some of the initiatives is available:

- Mangoola open cut mine
- Rolleston open cut mine
- Westside mine
- Ulan open cut mine

Reducing Scope 3 emissions

When considering our carbon footprint, we recognise the material emissions arising from the use of our products (Scope 3 emissions).

Our unique portfolio allows us to address this portion of our footprint through dynamic operational planning and Paris-aligned capital discipline.

Managing the decline of our coal business: Glencore will oversee a managed decline of its coal business. As our assets in Colombia and South Africa come to the end of their economic lives, our Australian business is expected to continue to supply the high quality coal required to meet ongoing global steel production and energy demand.

Under all credible scenarios, fossil fuels (oil, gas and coal) will continue to be an important part of the global energy mix for many years to come.

Coal's share of the global energy mix will decline but for many countries it continues to drive economic and social development as an input to steel and cement and through provision of reliable, safe and affordable energy.

Glencore has a world class coal business. We are a responsible miner of coal, having established a track record of operational excellence and being a recognised industry leader in rehabilitation and closure. The business continues to make a significant positive socio-economic contribution to employees, suppliers and communities where we operate. We will continue to assess and develop coal portfolio projects against strict criteria consistent with meeting our climate change targets and goals.

Future demand for coal through the transition will be a key determinant in the continued operation of our mines. Our long-term investment in battery and transition metals also delivered strong and improving earnings. As a result, our thermal coal business currently represents in the region of 10-15% of our EBITDA in the medium term, down from 25-30% in the recent past.

Glencore currently accounts for less than 2% of total global annual coal production. While there is demand for coal, and it is economic to do so, we will continue to operate our mines until they reach the end of their lives. Selling our coal mines does not remove their associated emissions.

Through responsible stewardship of these assets and a commitment to a managed decline of our coal portfolio including maintaining a focus on our high-quality coal assets in Australia, we will deliver on our ambition to reduce our total emissions in line with the goals of the Paris Agreement.

Allocating capital to prioritise transition metals

We recognise the importance of disclosing how we ensure our material capital expenditure and investments align with the goals of the Paris Agreement, including our material investment in the exploration, acquisition or development of fossil fuel production, resources and reserves, as well as for the metals essential to the transition to a low-carbon economy.

As a major producer of the commodities that underpin the current battery chemistry and infrastructure growth initiatives that are expected to power electric vehicles and energy storage systems our capital expenditure (currently and into the future) is heavily weighted towards energy transition metals, including various South American copper projects, African copper and cobalt, Kazakhstan polymetallic investments and nickel projects in Canada.

Collaborating with our value chains

As an integrated mining and trading company, we are uniquely positioned to work directly with our value chain, including our customers and suppliers, policy bodies and standards-setting organisations, to support and promote greater use of low-carbon metals, and to form strategic partnerships that enable critical transitions in transportation, infrastructure and energy systems.

Enabling the transition by providing strategic commodities:
Cobalt is a key lithium-ion battery raw material that is an essential constituent in batteries that power electronics and electric cars. Cobalt adds thermal stability, conductivity and energy density, thereby contributing significantly to the performance of rechargeable batteries. It is also a key driver for the battery recycling industry, as its relatively higher value makes recycling facilities and infrastructure economically attractive.

At Glencore, we have focused on developing long-term partnerships with our customers. This has the dual advantage of enabling companies that are critical to the electrification of mobility to plan and roll out technologies, and helping us plan our production timeline, preventing supply disruptions in the market. In line with our commitment to operate responsibly, we are commissioning an independent audit of our DRC cobalt operations against the Cobalt Refinery Supply Chain Due Diligence Standard, defined by the Responsible Mining Initiative.

Promoting low-carbon sources:
Our diversified commodity marketing portfolio includes aluminium. Approximately 60% of the aluminium we supply to the market comes from low-carbon sources including a new brand, Natur-Al™, recently developed by our associate Century Aluminium at its Norðurál smelter in Iceland, using geothermal energy.

Supporting uptake and integration of abatement

Achieving our emissions reduction target and ambition, as well as complying with emerging pricing mechanisms, will require the monitoring and deployment of carbon abatement opportunities.

Abating residual emissions:
We are working to deepen our understanding and engagement with carbon offsets and other carbon instruments to abate our residual carbon footprint. Currently, the offset market is relatively immature.

We are using small-scale offset investment initiatives as a means to explore the opportunities available. For example, in Peru, our Antapaccay copper asset is investing in a tree-planting project that will see 1,100 hectares planted and contribute to 12,000 tonnes CO_2 savings per year. To date, 147 hectares have been planted delivering savings of around 3,142 tonnes of CO_2 each year.

Developing CCUS technology:
Meeting the energy requirements of a rising global population while simultaneously reducing emissions is a key challenge. We support a technology-neutral approach to address this challenge. The IPCC and the IEA analysis identifies CCUS as an essential technology to support the delivery of the goals of the Paris Agreement. The IEA notes that the more stringent climate targets are driving greater interest in mitigation options, including CCUS, which deliver emissions reductions in hard to abate but essential industries.

We have been a long-term supporter of CCUS technology to reduce emissions from fossil fuels and to service the hydrogen economy. Our wholly owned subsidiary, the Carbon Transport and Storage Company Pty Ltd (CTSCo), is aiming to demonstrate CCUS on an industrial scale in Queensland. It is Australia's most advanced onshore CCUS project and focuses on:

- Capturing CO_2 from a coal-fired power station
- Permanently storing the CO_2 deep underground in Queensland's southern Surat Basin

CTSCo has the potential to store significant volumes of CO_2 and deliver the critical infrastructure to reduce and remove existing and future sources of industrial emissions. This storage component provides a potential pathway to an industrial scale storage hub in Queensland capable of servicing multiple industrial users including coal, natural gas and hydrogen.

Since the project's inception, CTSCo has brought together a range of scientific and technical experts from the Universities of Queensland, Melbourne and Texas to review independent modelling, testing and analysis in order to determine the suitability of storing CO_2 deep underground.

Glencore's CTSCo Project is expected to lay the foundation for commercial-scale onshore CCUS from industrial processes and power generation in Queensland's Surat Basin. It can also provide a technology pathway for establishing a hydrogen hub, materially reducing Australia's overall carbon footprint, help federal and state governments achieve their stated emissions reductions targets, and provide a technology pathway for many of our international end-use customers to reduce CO_2 emissions.

We are working with our customers to identify opportunities to progress the implementation of CCUS and reduce emissions.

Utilising technology to improve resource use efficiency

As both policy and consumer demands drive the move towards emissions reductions and a circular economy, technological developments are required to meet these ambitions.

Existing understanding of lifecycles for metals such as copper, nickel and cobalt supports their recyclability and reuse as secondary metals.

Contributing to the circular economy: As the world's population increases and countries continue to develop and industrialise, society consumes increasing volumes of metals and minerals. Both policy and consumer demands are driving the move towards a circular economy. Our recycling business, one of North America's leading recycling operations, is already responding to the growing need for secondary materials.

As one of the world's leading recyclers of electronics and a major recycler of secondary copper, gold, silver, platinum and palladium, we play an important role in the circular economy, giving a second life to these commodities, diverting materials from landfill and minimising environmental impacts. Our business sources recyclable materials from original equipment manufacturers (OEMs), other end-of-life sources and processors.

Glencore Recycling's technical capabilities are adaptable, making it possible to accurately sample and treat a wide range of complex materials. Its smelting and refining capabilities enable it to produce London Metal Exchange grade copper and precious metals. In addition, copper produced from recyclable sources has approximately 80% lower emissions than mined copper when considering the entire copper production cycle.

In 2019, Glencore Recycling recovered around 25,000 tonnes of copper, 127,000 ounces of gold, 1.3 million ounces of silver, 20,000 ounces of palladium, and 6,000 ounces of platinum from recyclable input feeds. Since the 1990s, it has recycled more than one million tonnes of discarded scrapped electronics, preventing them from going to landfill.

In addition to Glencore Recycling, our nickel and zinc commodity departments also undertake a number of recycling activities. Our nickel smelters in Canada and Norway can treat complex feeds such as lithium-ion or nickel metal hydride batteries, catalysts and plating sludges.

In Italy, our lead and zinc smelter processes electric arc furnace steel dust, which is a zinc-containing by-product of the steel production process. Our recycling and processing of this material avoids it being sent to landfill. We treat any lead recovered from this process, together with spent car battery paste, mined lead concentrates and zinc smelter residues to produce refined lead.

Transparent approach

We engage with interested stakeholders, particularly on our understanding and mitigation of our climate change related risks.

Over the past few years, we have seen growing interest in climate change and its related topics from the financial community, including our investors, insurers and relationship banks. We regularly discuss climate change with these stakeholders and incorporate feedback from these meetings into the development of our climate change strategy.

We recognise the importance of transparently reporting on our approach towards managing climate change within our business and progress towards delivering our targets and ambitions. Glencore was an early supporter of the voluntary guidance on consistent climate-related financial disclosures produced by the Taskforce on Climate-related Financial Disclosures (TCFD). We are pleased to support the TCFD guidance and implement its recommendations in our annual reporting.

We track climate policy and regulatory developments, including changes to NDCs, in both our operating countries and our products' end markets.

We believe that it is appropriate that we take an active and constructive role in public policy development, either directly or indirectly through our membership of industry organisations. Evolving regulatory developments and scrutiny of our advocacy activities require that we hold consistent positions on policy. We communicate these positions both directly through our engagement with government representatives and policy makers, as well as through the industry organisations in which we hold membership.

Each year, we undertake an assessment of both our direct and indirect lobbying on climate-related topics and evaluate any statements, both internally generated or made by an external organisation in which Glencore is a member, on alignment with our support for the goals of the Paris Agreement. Our approach improves our understanding of the positions and advocacy undertaken on climate change by our industry organisations. We publish an annual review on our findings on our own statements on the goals of the Paris Agreement, as well as the positions taken by our industry organisations.

We take an active role in the working groups of our industry organisations, including those on climate change. Glencore is the Co-Chair of the Minerals Council of Australia's (MCA) Climate Change & Energy Committee. The Committee developed MCA's Climate Action Plan (CAP), which its Board approved and MCA published earlier this year.

The CAP reaffirmed the Australian mining industry's commitment to the Paris Agreement and its goal of net zero emissions. The CAP outlines a series of actions focused on three key themes:

1. Support developing technology pathways to achieve significant reductions in Australia's greenhouse emissions through encouraging substantial investment across a broad range of low-emission technologies
2. Increased transparency on climate change related reporting and informed advocacy by providing timely, accurate and reliable information to enhance members' capacity to act
3. Knowledge sharing of the sector's responses to addressing climate change to improve members' understanding of global climate change initiatives and partnerships

Risk management TCFD

Assessing climate change-related risks is part of our Group risk management and strategy development processes. Effective and strategic management of climate change-related risks and opportunities across all aspects of our business is vital to our continued ability to operate.

We integrate risk management throughout our business through a structured risk management process that establishes a common methodology for identifying, assessing, treating and monitoring risks.

In 2020, we conducted assessments of physical and regulatory risks to our operations against the Current Pathway and Rapid Transition scenarios. The table below details the risks and opportunities identified across the business, as well as the mitigating actions.

Risk and opportunities

Mitigation

Regulatory developments

Government regulatory and policy developments to support emissions reductions has the potential to affect the ability to keep operating or growing assets as a result of restricting operating permits, energy regulation or emissions caps.

We play an active and constructive role in public policy development on carbon and energy issues, both directly and through our industry organisations. We seek to ensure that there is a balanced debate with regard to the ongoing use of fossil fuels.

Carbon pricing

Pricing carbon, either through direct taxes or leakage avoidance mechanisms (such as border taxes) may create additional costs through the value chain, as well as provide opportunities to promote lower-carbon products.

Variations in carbon pricing mechanisms between multiple jurisdictions can affect both the cost and the importing of our products.

We operate successfully in multiple jurisdictions that have direct and indirect carbon pricing or regulation.

We have identified some parts of our business that would likely have financial stress in a high carbon price environment. However, our conclusion is that our business overall remains resilient. We consider local regulation and carbon price sensitivities as part of our ongoing business planning for existing industrial assets, new investments and as part of our marketing activities.

We utilise our MACC to identify opportunities to identify and act on cost ranked emission reduction opportunities to mitigate high carbon prices.

In addition, increasing demand for our metals commodities is likely to drive higher prices, in turn offsetting increases to processing costs arising from the implementation of carbon pricing instruments.

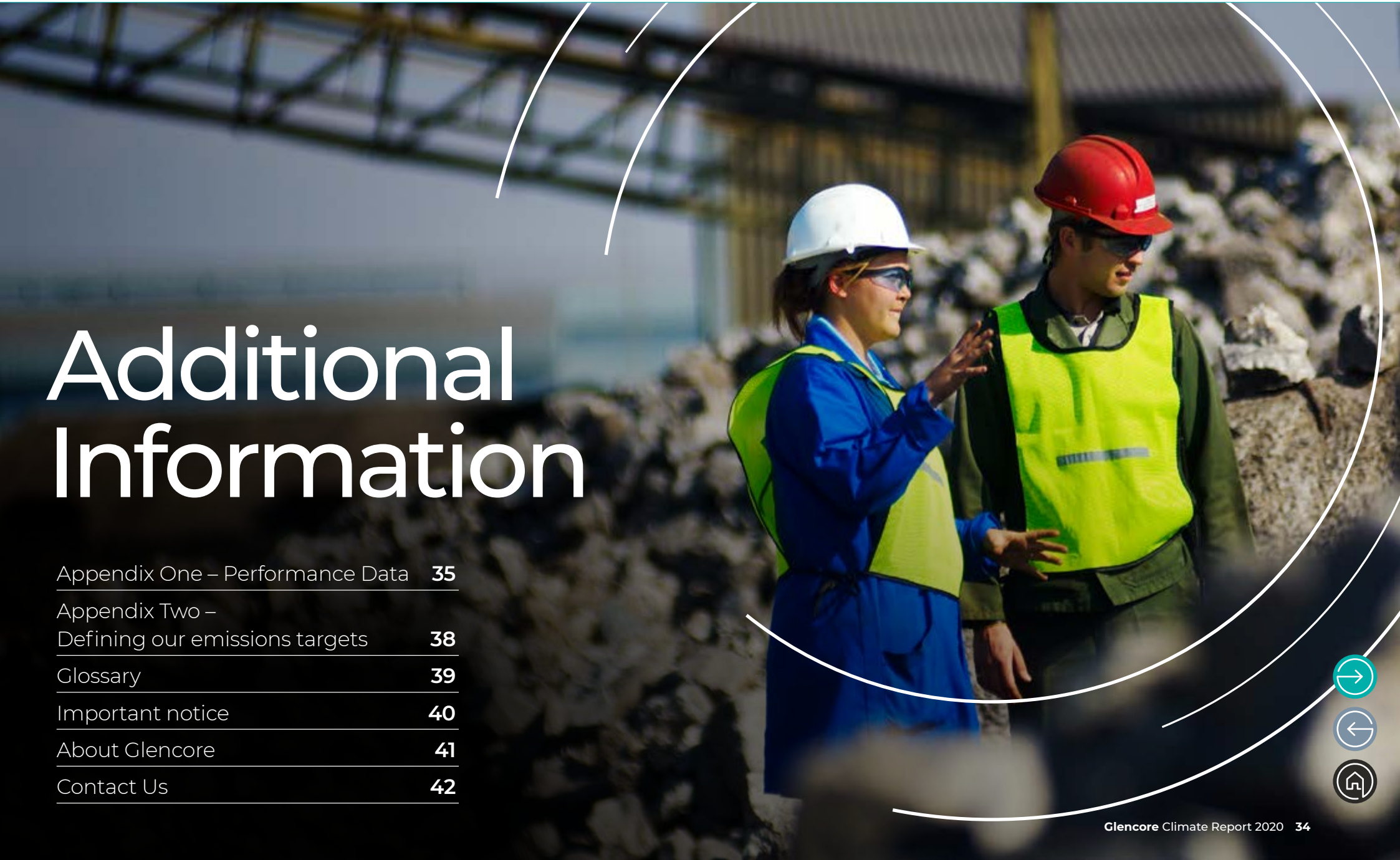
We are working with relevant industry organisations on developing lifecycle analysis to calculate our commodities' carbon footprint.

Read more
Incorporating carbon prices (p19)

Risk management cont.

Risk and opportunities	Mitigation
Energy costs	
We are a significant energy consumer. Energy is a key input and cost to our business as well as being a material source of our carbon emissions. Governments may impose taxes or levies on procured energy sources, limit supplies/ imports or introduce required purchasing or generation of renewable energy.	As the global patchwork of energy and climate change regulation evolves, we closely monitor international and national developments and their potential to affect our business. We consider energy costs and our carbon footprint into our annual business planning process. Commodity departments are required to provide energy and GHG emissions forecasts for each asset over the forward planning period and provide details of mitigation projects that may reduce such emissions, including identifying and developing renewable energy generation opportunities. Our assessment of potential mitigation and abatement projects underpins the basis of our internal Marginal Abatement Cost Curve.
Physical impacts	
Extreme weather events, such as floods, hurricanes and droughts, as well as changes in rainfall patterns, temperature, and storm frequency can affect our industrial assets' operating processes, related infrastructure, and the communities living close to our operations.	We track changing weather conditions and amend operating processes as appropriate, as well as incorporate climate risk into our design and planning. We regularly review the integrity of our assets, including tailings storage facilities, against the potential impact of extreme weather events. We have established ongoing processes to review our operational mitigating measures and to consider opportunities, where necessary, to strengthen these.

Risk and opportunities	Mitigation
Access to capital	
Activism may impact our access to capital or insurance, an increase in the cost of finance or divestment of our shares as banks and other financial institutions discontinue working with companies involved in fossil fuels.	We regularly review our banks' climate change-related policies and evolving applicable restrictions, if any. Through maintaining a strong relationship with our lenders, we continue to have a broad range of sources from which to access funds.
Permitting risk	
Negative stakeholder perception around the role of the extractive sector in contributing to climate change may result in delays or restrictions to permit approvals, as well as the loss of customers and/or sales contracts.	We engage with a broad range of stakeholders on diverse topics including climate change and related areas of concern. Our engagement with our local communities and those directly affected by our operations is transparent and honest. Where we identify differing opinions, we look for opportunities to find constructive solutions.
Product demand	
Variations in commodity use from emerging technologies, move towards renewable energy generation and policy changes may affect demand for our products, both positively and negatively.	We track and respond to regulatory and technology developments. There are near-term opportunities in positively repositioning many of our products that enable the decarbonisation transition.
Litigation	
Litigation (including class action), in which climate change and its impacts are a contributing or key consideration, including administrative law cases, tortious cases and claims brought by investors may affect our business. Delays or refusals of project due to legal challenges	Our climate change programme strives to ensure that we identify, understand and monitor our emissions and climate change issues, in order to meet international best practice standards, ensure regulatory compliance and meet our commitments that support the goals of the Paris Agreement.



Additional Information

Appendix One – Performance Data[TCFD]

Scope	2017	2018	2019	Comment
Direct (Scope 1) emissions – thousand tonnes CO_2e	21,818	18,778	**18,295**	
Indirect (Scope 2) location based emissions – thousand tonnes CO_2	11,547	11,782	**10,944***	This applies the grid emission factor to all our purchased electricity, regardless of specific renewable electricity contracts, as per the updated guidelines from the GHG protocol for Scope 2 emissions. The year-on-year decrease mainly reflects reduced smelter operations in the Ferroalloys business in South Africa.
Indirect (Scope 2) market based emissions – thousand tonnes CO_2	12,534	12,586	**11,431**	Where applicable and available, this applies the supplier-specific emission factor regarding the purchased electricity contract, especially at operations with large volumes of purchased electricity in Australia, Chile and Europe. Otherwise, it applies the country's residual emission factor (for EU countries) or the grid emission factor. This calculation rule has been implemented in line with the updated guidelines from the GHG protocol for Scope 2 emissions.
Other relevant indirect (Scope 3) greenhouse gas emissions total – thousand tonnes CO_2e	289,998	313,043	**343,368**	This Scope 3 total includes all categories of our Scope 3 emissions which are relevant and material to our operations. The most material category is the use of sold products, relating to the use of produced coal and oil. Scope 3 emissions refer to data from industrial operations, as defined in further detail on p. 224 of the annual report.
Scope 3 Purchased goods and services – thousand tonnes CO_2e	743	753	**787**	This covers the estimated Scope 3 emissions from third party copper, lead, nickel and zinc feeds into our combined mine and smelting/processing facilities.
Scope 3 – Fuel- and energy-related activities – thousand tonnes CO_2e	919	930	**853***	A major source of fuel- and energy-related Scope 3 emissions results from transmission and distribution losses of purchased electricity. The related CO_2 emissions are calculated by applying the country specific transmission and distribution losses as presented by the World Bank and multiplying these losses with the country specific emissions from Scope 2 electricity purchased.
Scope 3 – Upstream transportation & distribution – thousand tonnes CO_2e	720	661	**1,280**	This concerns marine fuel consumed for time-chartered shipping, applying GHG protocol emission factors for the specific fuel types. This shipping concerns both upstream and downstream transportation.
Scope 3 – Downstream transportation & distribution – thousand tonnes CO_2e	720	661	**1,280**	This total was 50% allocated to upstream transportation, whilst the other 50% is allocated to downstream transportation. The increase from 2018 to 2019 is a result of reclassification of non-controlled vessels' emissions from Scope 1 to this Scope 3 metric.

Appendix One – Performance Data cont.

Scope	2017	2018	2019	Comment
Scope 3 – Processing of sold products – thousand tonnes CO_2e	11,222	11,180	**11,139**	This concerns further processing by clients of copper, nickel, zinc, ferrochrome and lead concentrates and metal which we've produced, applying GHG Protocol's 'average data' method. To estimate the Scope 3 emissions, our produced volumes are multiplied by the relevant embodied carbon coefficient. For concentrates, embodied carbon coefficients of primary (virgin) product are applied, representing the emissions of cradle-to-gate processing. For metals, embodied carbon coefficients of secondary (recycled) product are applied as a proxy for processing the metals into the product's dominant use, like copper wire in case of copper metal. The ICE database (2011) from University of Bath provides these coefficients for copper, zinc, lead and stainless steel. As ferrochrome and nickel are predominantly used in production of stainless steel, the embodied carbon coefficient of stainless steel is allocated to these two products by applying the average content percentages of these two products in stainless steel. The reported values incur some level of overlap with Glencore's Scope 1 and 2 emissions.
Scope 3 – Use of sold products – operational control – thousand tonnes CO_2e	273,161	296,246	**325,705**	Scope 3 emissions from the use of sold products relate to the use of saleable fossil fuels (coal and oil), produced by industrial operations under Glencore operational control, on a 100% basis except for joint ventures, where the Group's attributable share of production is included. The volumes of saleable products are taken from Glencore's publicly available Production Report. Regarding coal, the emissions value includes emissions from use of both thermal and metallurgical coal produced. Regarding oil, the emissions value relates to the gross production basis of our Glencore operated oil production entity, excluding emissions related to oil refinery activities. The increase from 2018 to 2019 is related to Australian coal operations acquired during that period.
Scope 3 – Investments – thousand tonnes CO_2e	2,464	2,546	**2,236**	This represents Glencore's share of Scope 1 and 2 emissions of the following investments: Antamina (Copper), Century (Aluminium), Cerrejón (Coal) and Collahuasi (Copper). Where available, the Scope 1 and 2 total values reported most recently by these companies were taken as input. In case no such data was available, the Scope 1 and 2 emissions from a comparable Glencore asset (e.g. within same country and same business) were extrapolated based upon production totals.
Scope 3 – Other downstream: Coal seam emissions sent to third party operated power plant – thousand tonnes CO_2e	49	64	**89**	This value concerns GHG emissions from sending coal seam emissions (e.g. methane) from our coal operations to third party operated power plants.

Appendix One – Performance Data cont.

Scope	2017	2018	2019	Comment
Other Scope 3 categories				Other categories of Scope 3, as structured by the Greenhouse Gas Protocol, are not relevant or immaterial to Glencore. This applies to: · Capital goods · Business travel · Employee commuting · Upstream leased assets · End of life treatment of sold products · Downstream leased assets · Franchises · Other upstream emissions
Scope 3 – Use of sold products – attributable basis – thousand tonnes CO_2e	273,161	296,246	**347,206**	Scope 3 emissions from the use of sold products on attributable basis relate to the use of saleable fossil fuels (coal and oil), produced by industrial operations according to Glencore's attributable share of production. Differing from Scope 3 emissions from the 'use of sold products – operational control', this alternative metric includes attributable production from non-operated joint ventures, most notably Cerrejón. The volumes of saleable products are taken from Glencore's publicly available Production Report. Regarding coal, the emissions value includes emissions from use of both thermal and metallurgical coal produced. Regarding oil, the emissions value relates to the net production basis of Glencore's operated and non-operated oil production entities, excluding emissions related to oil refinery activities. This metric is a key component of Glencore's projection of reductions in Scope 3 emissions by 2035. As such, this metric should be regarded as an alternative metric to Scope 3 emissions from the 'use of sold products – operational control' and should not be aggregated into our reported total Scope 3 emissions. The increase from 2018 to 2019 relates to the acquisitions made in our Australian coal operations.
Carbon Scope 1 and Scope 2 location based intensity – tGHG/tCu	4.40	4.13	**3.93**	Further synonyms of this metrics used in our reporting include 'carbon emissions intensity' and 'greenhouse gas emissions intensity'. The GHG emission intensity is calculated as a ratio of Scope 1 and 2 location-based emissions of Glencore operated industrial assets which were owned by the end of the reporting year, divided by their copper equivalent production. Copper equivalent production is weighting the commodity's production volume by the baseline year ratio of the average price of that commodity, divided by the fixed 2016 baseline average price of copper. The baseline GHG intensity in 2016 was 4.35tGHG/tCu.

Appendix Two – Defining our emissions targets

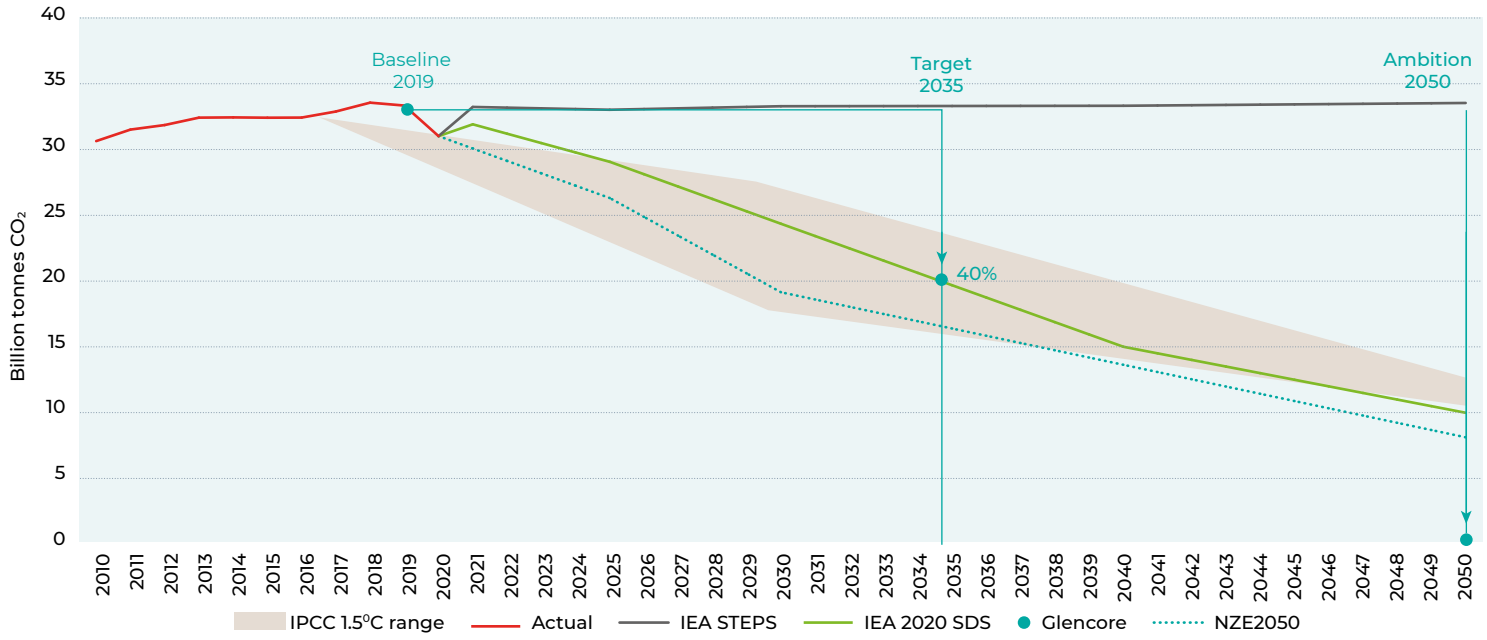
Emissions reduction targets and ambitions have multiple interpretations. For clarity, Glencore has considered the range of 1.5°C benchmarks as reported by the IPCC Special Report: Global Warming of 1.5°C, table 2.4 and the IEA's WEO 2020 SDS and NZE2050 scenarios and, specifically, the gross global CO_2 emissions from fossil fuel combustion.

Working from actual fossil fuel CO_2 emissions as reported by IEA up to 2019 and including their latest estimate for 2020, below are linear interpolations of the upper and lower ranges (shaded region) for the IPCC 1.5°C scenarios. Also added are the three IEA scenarios – Current Pathway (STEPS); Rapid Transition (SDS) and Radical Transformation (NZE2050).

Using 2019 as a baseline, the IPCC defines an emissions reduction range in 2035 of between 27.5% (1.5°C high overshoot) and 51.5% (below 1.5°C, matching IEA's NZE2050) giving a mathematical midpoint of 39.5%, close to the 41% defined by IEA's SDS and just shy of the IPCC's no/limited overshoot scenario.

Using this analysis, Glencore has adopted a target of 40% Scope 1, 2 and 3 emissions reduction by 2035. Glencore's net zero Scope 1, 2 and 3 emissions ambition in 2050 is substantially greater than the fossil fuel combustion emissions reduction range defined by the IPCC and well below the IEA's NZE2050, at 8 billion tonnes CO_2 per annum, which are offset by CCUS and DAC to deliver a net zero emissions outcome.

Global CO_2 emissions from fossil fuel combustion (gross)



Source: IPCC AR15 and IEA WEO 2020

Glossary

CCUS
Carbon Capture, Utilisation and Storage

CO_2
Carbon dioxide

DAC
Direct air capture

EVs
Electric vehicles

FCEV
Fuel cell electric vehicles

GHG
Greenhouse gas

HELE
High-Efficiency Low Emission

IPCC
Intergovernmental Panel on Climate Change

ICE vehicles
Internal-combustion engine vehicles

IEA
International Energy Agency

MACC
Marginal Abatement Cost Curve.

NDCs
Nationally determined contributions

PEVs
Plug-in electric vehicles

solar PV
Solar photovoltaic

Supportive policy environment
Coordinated government policies, including incentives to drive accelerated uptake of lower carbon and decarbonisation technologies, and market based regulations governing industrial practices that drive a competitive, least cost emissions reduction approach, are critical to our ability to achieve our ambition of net zero total emissions by 2050

UNFCCC
United Nations Framework Convention on Climate Change

UN SDGs
United Nations Sustainable Development Goals

Important notice

Important notice concerning this report including forward-looking statements

This document contains statements that are, or may be deemed to be, "forward-looking statements" which are prospective in nature. These forward-looking statements may be identified by the use of forward-looking terminology, or the negative thereof such as "outlook", "plans", "expects" or "does not expect", "is expected", "continues", "assumes", "is subject to", "budget", "scheduled", "estimates", "aims", "forecasts", "risks", "intends", "positioned", "predicts", "anticipates" or "does not anticipate", or "believes", or variations of such words or comparable terminology and phrases or statements that certain actions, events or results "may", "could", "should", "shall", "would", "might" or "will" be taken, occur or be achieved. Forward-looking statements are not based on historical facts, but rather on current predictions, expectations, beliefs, opinions, plans, objectives, goals, intentions and projections about future events, results of operations, prospects, financial condition and discussions of strategy.

By their nature, forward-looking statements involve known and unknown risks and uncertainties, many of which are beyond Glencore's control. Forward-looking statements are not guarantees of future performance and may and often do differ materially from actual results. Important factors that could cause these uncertainties include, but are not limited to, those disclosed the Principal Risk and Uncertainties section of the Annual Report 2019.

For example, our future revenues from our assets, projects or mines will be based, in part, on the market price of the commodity products produced, which may vary significantly from current levels. These may materially affect the timing and feasibility of particular developments. Other factors include (without limitation) the ability to produce and transport products profitably, demand for our products, changes to the assumptions regarding the recoverable value of our tangible and intangible assets, the effect of foreign currency exchange rates on market prices and operating costs, and actions by governmental authorities, such as changes in taxation or regulation, and political uncertainty.

Neither Glencore nor any of its associates or directors, officers or advisers, provides any representation, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statements in this document will actually occur. You are cautioned not to place undue reliance on these forward-looking statements that only speak as of the date of this document.

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No statement in this document is intended as a profit forecast or a profit estimate and past performance cannot be relied on as a guide to future performance. This document does not constitute or form part of any offer or invitation to sell or issue, or any solicitation of any offer to purchase or subscribe for any securities.

The companies in which Glencore plc directly and indirectly has an interest are separate and distinct legal entities. In this document, "Glencore", "Glencore group" and "Group" are used for convenience only where references are made to Glencore plc and its subsidiaries in general. These collective expressions are used for ease of reference only and do not imply any other relationship between the companies. Likewise, the words "we", "us" and "our" are also used to refer collectively to members of the Group or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies.

About Glencore

We are one of the world's largest natural resource companies. We fulfil our purpose through our strategy to be active at multiple stages of the commodity supply chain.

Our diversity by geography, product and activity, maximises the value we create for our business and its diverse stakeholders.

We have around 150 mining and metallurgical sites and oil production assets in 35 countries and employ 160,000 people. We recognise that our business activities make a significant contribution to the national and local economies in which we operate. We believe that our presence can deliver long-term, sustainable benefits to our host countries.

Our culture

We fulfil our purpose and deliver on our strategy in a manner that reflects our values of safety, integrity, responsibility, openness, simplicity and entrepreneurialism. Only by actively living and breathing these values are we able to ensure our culture is conducive to fulfilling our purpose and delivering on our strategy.

Our purpose

Glencore's purpose is to source responsibly the commodities that advance everyday life. We do so through our strategy of sustainably growing total shareholder returns while maintaining a strong investment grade rating and acting as a responsible operator.

Our values

Our values reflect our purpose, our priorities and the beliefs by which we conduct ourselves and carry out our business activities. They define what it means to work at Glencore, regardless of location or role. They are the fundamental basis of our sustainability management system along with our Code of Conduct and our Group policies.

Safety: We never compromise on safety. We look out for one another and stop work if it's not safe

Integrity: We have the courage to do what's right, even when it's hard. We do what we say and treat each other fairly and with respect

Responsibility: We take responsibility for our actions. We talk and listen to others to understand what they expect from us. We work to improve our commercial, social and environmental performance

Openness: We're honest and straightforward when we communicate. We push ourselves to improve by sharing information and encouraging dialogue and feedback

Simplicity: We work efficiently and focus on what's important. We avoid unnecessary complexity and look for simple, pragmatic solutions

Entrepreneurialism: We encourage new ideas and quickly adapt to change. We're always looking for new opportunities to create value and find better and safer ways of working

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