



2023

Climate change
and water report



OUR 2023 SUITE OF REPORTS

IAR 2023 integrated annual report

A holistic assessment of ARM's ability to create sustainable value, with relevant extracts from the annual financial statements, the environmental, social and governance (ESG) report and Mineral Resources and Mineral Reserves report.

AFS 2023 annual financial statements

The audited annual financial statements have been prepared according to International Financial Reporting Standards (IFRS).

ESG 2023 ESG report

A detailed review of our performance on key environmental, social and governance matters. The ESG report includes the full remuneration report and should be read in conjunction with the GRI Index.

CCW 2023 climate change and water report

A detailed review of our performance on our key climate change and water matters, in line with the Task Force on Climate-related Financial Disclosures (TCFD).

 Information available on our website www.arm.co.za

 Information available elsewhere in our reports

KING 2023 King IV™* application register

A summary of how ARM implements the principles and practices in King IV to achieve the governance outcomes envisaged.

MRMR 2023 Mineral Resources and Mineral Reserves report

In line with JSE Listings Requirements, ARM prepares Mineral Resources and Mineral Reserves statements for all its mining operations as per SAMREC guidelines and definitions (2016).

AGM 2023 notice to shareholders

- Notice of annual general meeting
- Form of proxy
- Commitment to good governance
- Board of directors
- Report of the audit and risk committee
- Report of the social and ethics committee chairman
- Summarised remuneration report
- Summarised directors' report
- Summarised consolidated financial statements.

*™ Copyright and trademarks are owned by the Institute of Directors in South Africa NPC and all its rights are reserved.

All monetary values in this report are in South African rand unless otherwise stated. Rounding may result in computational discrepancies on management and operational review tabulations.

African Rainbow Minerals (ARM) is a **leading South African diversified mining and minerals company** with operations in South Africa and Malaysia. ARM mines and beneficiates iron ore, manganese ore, chrome ore, platinum group metals (PGMs), nickel and coal. It also produces manganese alloys and has a strategic investment in gold through Harmony Gold Mining Company Limited (Harmony Gold).

Contents

Overview

About this report	4
Social and ethics committee chairman's statement on the climate change and water report	6
Our approach	10
Our climate-change journey to date	13
Our water journey to date	16
Risk management	17
Climate and water compliance and reporting programme	19
Annual climate change and water workshops	20

Governance

Oversight	24
Delivering on our decarbonisation ambitions	26
Assurances	27
Stakeholder engagement	28
Supply chain engagement	28
Public/policy engagement	28
Engaging with our partners	29

Climate change

Our position on climate change	32
Strategy	34
Transition planning	34
Scenario analysis	35
Operation-specific decarbonisation pathways	35
Exploring renewable energy opportunities	38
Managing change	38
Carbon pricing and decarbonising future capital expenditure	38
Risk management	40
Climate transition risks and opportunities	40
Physical climate risks and opportunities	45
Integration of climate change risk into ARM's ERM processes	51
The impact of risks and opportunities on business and financial planning	52
Considering climate-change risks in ARM's investments	53
Enhancing community resilience	54
Targets and performance	55
GHG emissions	55
Energy	69
Future climate-change focus areas	71
TCFD index	72

Water

Water stewardship policy	76
How we use and manage water	78
Strategy	82
Context-based water targets	82
Water stewardship	82
Risk management	86
ARM's water risks	86
Water and TSFs	88
Catchment-level risks	89
Integrating water risks into ARM's ERM processes	95
ARM's water opportunities	95
Detrimental water-related impacts	95
Targets and performance	96
Progress towards ARM's water target	96
Water withdrawals	98
Future water focus areas	103
List of acronyms	104
Contact details	IBC

 ARM's reporting against the United Nations Global Compact, sustainability data tables, the United Nations Sustainable Development Goals (SDGs) and GRI index are available on www.arm.co.za

Overview

Tailings Storage Facility at Black Rock

About this report	4
Social and ethics committee chairman's report	6
Our approach	10
Our climate-change journey to date	13
Our water journey to date	16
Risk management	17
Climate and water compliance and reporting programme	19
Annual climate change and water workshops	20

As its core framework, this report uses the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and the position statements of the International Council on Mining and Metals (ICMM) on water stewardship and climate change.

About this report

This report details our climate-change and water-management strategies, risk-management processes, and targets and performance measurements between 1 July 2022 and 30 June 2023 (F2023).

 It should be read with our F2023 integrated and ESG reports, available on our website at www.arm.co.za.

It covers operations that we either directly control or jointly manage, including those that form part of our ARM Ferrous and ARM Platinum divisions. During this financial year, we included Bokoni Platinum Mine (acquired in September 2022) in various programmes related to climate change and water. In this report we include Bokoni Mine in our greenhouse gas (GHG) targets, and in the integration of climate change into our enterprise risk management (ERM) processes. Performance data for Bokoni Mine will be detailed in the F2024 report.

Like our ESG report, this report does not address the operations, joint ventures or investments that we do not manage directly – such as ARM Coal, the Sakura ferroalloys smelter and Harmony Gold – or projects that are in exploration, development or feasibility phases. These investments are part of our scope 3 GHG emissions inventory and included in our assessment and management of indirect climate and water-related risks and opportunities. All information is provided on a 100% basis throughout.

In our climate-change and water-management strategies and

reporting, we draw on various frameworks, guidelines, good-practice measures, and regulatory compliance requirements. We also seek to continually meet the reporting expectations of our varied and evolving stakeholder base.

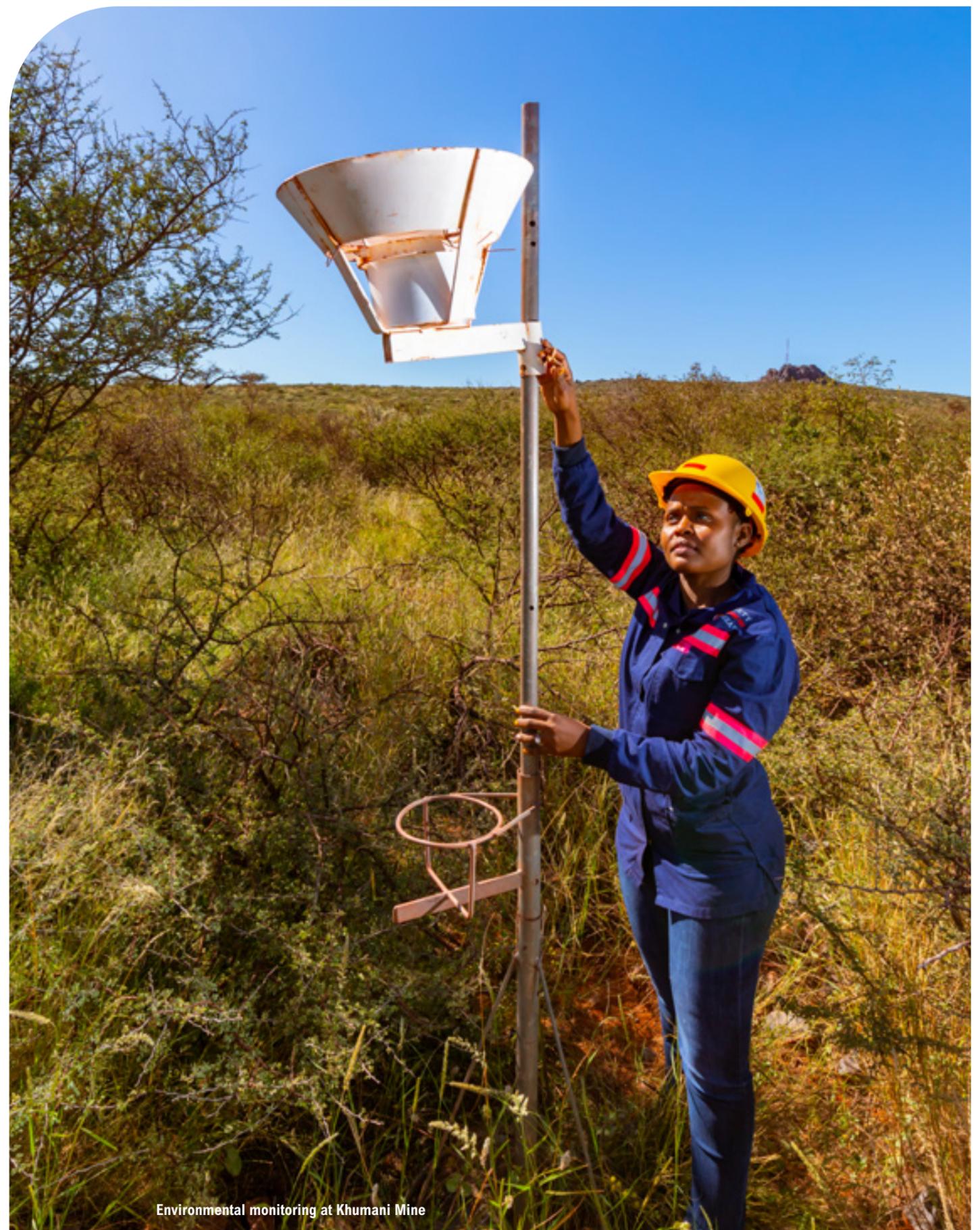
As its core framework, this report uses the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and the position statements of the International Council on Mining and Metals (ICMM) on water stewardship and climate change. The climate-change and water-disclosure expectations have been evolving significantly in recent years. Accordingly, in F2023, we reviewed climate change and water-related frameworks and standards to inform the drafting of this report. Relevant frameworks and standards considered include:

- CDP (formerly the Carbon Disclosure Project)
- FTSE-Russell ESG Index Series and the FTSE-Russell TPI Climate Transition Index Series
- GRI sector standard project for mining
- ICMM membership requirements and principles and related-performance expectations, including the ICMM Water Reporting Good Practice Guide, 2nd edition

- IFRS S2 Climate-related Disclosures, particularly volume 10 (Metals & Mining, page 71–78) of the industry-based guidelines
- JSE Guidance for Climate Disclosure
- Transition Pathway Initiative (TPI)
- Minerals Council of South Africa (MCSA) position on climate change
- World Economic Forum's (WEF) stakeholder capitalism metrics
- The United Nation's Sustainable Development Goals
- Engagements with non-governmental organisations (NGO), non-profit organisations and other stakeholders
- Regulatory reporting requirements
- Other evolving reporting expectations.

Through this report, we justify and explain how and where we have used a comparative basis of reporting with previous years. We also cross reference content to relevant TCFD recommendations.

For illustrative purposes, the values in the report graphs are rounded to two decimal places. For exact percentages of year-on-year changes, please refer to the numbers detailed in the text.



Environmental monitoring at Khumani Mine

Social and ethics committee chairman's statement on the climate change and water report

ARM welcomes the increased focus on environmental and social responsibility by shareholders, funders, customers, civil society and other stakeholders as a sign that the importance of sustainability is becoming more widely accepted. ARM's motto of 'We do it better' includes an unwavering commitment to ethical and responsible practices.



Dr Rejoice Simelane
Chairman of the social and ethics committee

As ICMM members, ARM is committed to mining within the required principles. Our strategic priorities to operate safely, responsibly and efficiently, and to partner with host communities and other stakeholders, are founded on responsible environmental, social and governance (ESG) practices. As the rest of this report shows, we also consider many other global and local frameworks, both statutory and voluntary, emphasising our commitment to integrate all aspects of sustainability in our business for the benefit of all our stakeholders.

Responsibilities

The ARM board is ultimately responsible for monitoring the effective management of sustainable development and delegates this responsibility to the social and ethics

committee. The committee is constituted under regulation 43(5)(c) of the Companies Act.

The committee operates according to its terms of reference, which are regularly updated. It monitors and reports on the manner and extent to which ARM protects, enhances and invests in the economy, society and natural environment to ensure its business practices are sustainable. It holds responsibility for monitoring specific activities under relevant legislation, other legal requirements and codes of best practice including:

- Social and economic development
- Responsible corporate citizenship, including promoting equality, preventing unfair discrimination, implementing measures to address any incidents, and

contributing to the development of communities in which ARM operates

- Sustainable development, including environmental management, occupational health and wellness and safety
- Stakeholder relationships
- Labour and employment.

In addition, the committee assumes responsibility for matters assigned to it by the board. It draws relevant matters to the board's attention and reports to shareholders at annual general meetings. In its responsibilities, it is supported by executive management and relevant management committees and governance structures, including the employment equity and skills development committee.

The committee oversees the management of ESG risks identified through the enterprise risk management (ERM) process, which considers internal and external stakeholders as well as governance processes.

Member	Appointed
Dr RV Simelane (chairman)	February 2007
JA Chissano	August 2019
AK Maditsi	June 2012
DC Noko	August 2019
JC Steenkamp	April 2018

Composition

The committee's terms of reference provide for a minimum of three members, with a majority of independent non-executive directors. The committee currently comprises five independent non-executive directors who bring extensive experience in mining operations, human resources, sustainable development and stakeholder engagement.

Invitees to meetings include the chief executive officer, finance director, executive: investor relations and new business development, divisional chief executives, executive: risk, executive: sustainable development, group executive: human resources, group executive: legal and executive: compliance.

The committee met four times in F2023.

Assurance

In line with its terms of reference, the committee had oversight of ARM's appointment of a new independent external sustainability assurance provider for the 2023 ESG report and reported to ARM's audit and risk committee that the appointment was made.

F2023 focus

During the year, in relation to climate change and water, the committee:

Monitored tailings storage facilities (TSF) at our managed operations and progressed in conformance to the Global Industry Standard on Tailings Management (GISTM)

Monitored ongoing initiatives to reduce carbon emissions and further improve our corporate water and climate-change reporting process. This included refining operation-specific decarbonisation pathways, setting short and medium-term company and operational GHG emission-reduction targets, and assessing performance against operation-specific water targets

Execution of responsibilities

Based on its activities, we believe the social and ethics committee has executed its duties and responsibilities during the financial year in line with the Companies Regulations promulgated under the Companies Act and its terms of reference.

Working together to entrench good ESG practice

Sustainability is embedded in ARM's strategy and a principle deeply integrated into our operational ethos. We recognise that the company's long-term success and ability to create value are inherently tied to how responsibly and ethically we act.

The traditional core factors of production, particularly in the mining industry, expand to recognise the importance of ESG factors such as the environment, human capital and our relationships with our host communities and broader society. Our activities help to realise the value in the country's mineral reserves to catalyse growth and development. In the process, we are committed to operating sustainably, ethically and with full regard for the interests of our stakeholders and mindful of our responsibility to manage and

mitigate potential negative impacts arising from our activities and operations. ESG targets are included in the remuneration packages of relevant executives to align management and stakeholder interests.

We are proud to be a member of the ICMM and share its commitment to mining with principles. ARM has implemented the ICMM's sustainable development framework and, since F2019, our operations (except for Bokoni Mine which was acquired in September 2022) and the corporate office have completed self-assessments against the ICMM's 38 performance expectations. ARM determined that the operations prioritised for validation will follow the ESG Report assurance process, with the undertaking that all operations will be subject to the external performance-expectations validation process over a three-year cycle. In F2023, self-assessments of performance expectations for Modikwa and Khumani mine were validated as part of the external assurance over ESG data.

Social and ethics committee chairman's statement on the climate change and water report continued

Responsible stewardship of natural resources

Protecting and preserving our natural resources is integrated into our business strategy. It is becoming increasingly clear that climate risks are escalating rapidly, underscoring the urgency of changing the way we work and consume natural resources.

We recognise the critical global challenges that climate change presents and the effects these may have on our business, our stakeholders and the world. We are committed to participating in the global response to reduce carbon emissions and to mitigating the physical impacts caused by climate change.

We announced our long-term GHG emission-reduction target at the start of F2022, which aims to achieve net-zero GHG emissions (scope 1 and 2) mining by 2050. This year we focused on refining our operation-specific decarbonisation pathways, and setting short and medium-term scope 1 and 2 emission-reduction targets. We are working to identify contextually appropriate and just mitigation options for each operation.

Over the last year, ARM's absolute scope 1 and 2 emissions decreased by 4% and electricity consumption decreased by 4%. The current level of scope 1 and 2 emissions (1.8 million tonnes of carbon dioxide equivalent; tCO₂e) represents a 14% decrease compared to our F2018 baseline and a 28% decrease on the previous baseline in F2014. Although we fell short of meeting our short-term (F2023) target (achieving a 3.5% rather than 4% reduction in scope 1 and 2 emissions), we are confident that our current initiatives

to decarbonise are more ambitious than before, and that our evolving strategy is in line with our long-term commitment and will ensure future targets are achieved.

In F2024, we will explore and set appropriate scope 3 targets in line with the ICMM 2021 climate change position statement, with guidelines due to be released by the ICMM in F2024. We will also contribute to advancing partnerships that enable credible target setting and emission reductions across our value chains.

Over the past three years, we have deepened our understanding of the resilience of our business to climate transition and physical risks. South Africa's heavy reliance on electricity from coal-fired power stations and serious constraints on the national power grid limit our ability to reduce our carbon footprint through business-as-usual methods.

In April 2023, ARM platinum division concluded a 20-year power purchase agreement (PPA) to wheel 100MW of solar photovoltaic (PV) power to its platinum operations, which is expected to save circa 4 800 000tCO₂e over 20 years. ARM ferrous division is investigating a possible energy blend for our Northern Cape operations, including the combination of solar, battery storage, wind and gas. Additional medium-term emission reduction plans include possible collaborations and further optimising energy efficiencies at our operations.

Globally, water systems are under threat from rising consumption, pollution, weak governance and climate change. ARM is exposed to greater water-related risks that could affect production, increase

costs, constrain growth, disrupt our supply chains and place our communities under strain. We have made significant advances in measuring water impacts and water reporting over the last four years. We now comply with updates to the ICMM's Water Accounting Framework (WAF). From this report, we are following the guidelines of the ICMM's recently revised water reporting good practice guide.

Operational water withdrawals, excluding other managed water (water that is actively managed without intent to supply operational water demand) increased by 9% due largely to improved rainfall accounting and activities associated with the Merensky Project at Two Rivers Mine. Following implementation of the new ICMM water reporting guidelines, total water withdrawals – including operational and other managed water – increased by 22% compared to F2022, primarily due to the increases at Two Rivers Mine and the inclusion of water in the pit at Nkomati Mine. Our water-reuse efficiency, a key indicator in monitoring and managing consumption and losses, was at 78%.

Over the past two years, and aligned with the ICMM's Water Reporting Good Practice Guide, we have set operation-specific water targets for all operations except the newly-acquired Bokoni Mine (targets will be set in F2024). Our assessments this year show that the majority (81%) of these targets have been met or are on track to be met.

Responsible tailings management is a priority for ARM, the mining industry and stakeholders.

We have made significant advances in measuring water impacts and water reporting over the last four years. We now comply with updates to the ICMM's Water Accounting Framework (WAF).

In addition to the critical compliance requirements set in the guidelines of the Department of Mineral Resources and Energy (DMRE) and the South African National Standard on the management of mine residue (SANS 10286), ARM is implementing a TSF management policy and standard that align with appropriate good-practice standards nationally and internationally, including the GISTM.

Reviews by Independent Tailings Review Boards for each TSF were performed in F2023 and conformance to the GISTM was self-assessed at Nkomati, Two Rivers, Modikwa and Khumani mines during the year, followed by GISTM conformance verification third party validation in July 2023.

In August 2023, we released the ARM Report on conformance to the GISTM (available on our website) to provide public disclosure and confirmation that ARM operations have implemented effective risk management processes and systems to ensure that TSFs are managed effectively and that any risk to people and the environment is identified and mitigated. Bokoni Mine is planning to conform to the GISTM by August 2024. The TSFs at Black Rock and Beeshoek mines are classified as lower risk and these mines will conform by August 2025.

For further information regarding how we continue to integrate measurable greenhouse gas emission reduction

targets into executive remuneration, please see the remuneration report in the ESG report.

We believe this is the most effective and sustainable way of aligning executive and stakeholder interests, offers a simpler way to assess performance, and gives management a clearer understanding of what they can practically drive at the operations to achieve ARM group-level GHG emission reduction targets.

Ethics and compliance

ARM's long-term success and reputation depend on our unwavering commitment to ethics and integrity. The code of conduct is built on our values and emphasises our dedication to the highest moral, ethical and legal compliance in dealing with our stakeholders. Directors and employees are required to maintain these standards to ensure the company's business is conducted honestly, fairly, legally, reasonably, in good faith and in the best interests of all stakeholders. The committee reviews reports of calls made to the independent anonymous whistleblower facility and the outcomes of resulting investigations.

We regard legal compliance as the minimum requirement and engage with regulators to ensure that licences and permit applications are approved and in place, so that we continue to comply with the conditions of these authorisations.

Amendments to licences and permits is an ongoing process as operations expand and projects evolve, underpinned by internal and external compliance monitoring processes. Environmental incidents and ARM's response are discussed on page 71 of our ESG report.

The ARM group human rights policy, which was approved by the board in April 2023, formalises our commitment already set out in the code of conduct to conducting business in a manner that respects and gives utmost consideration to the rights and dignity of all people, while centrally embracing the values and principles of ubuntu. It promotes respect for human rights and instills a culture of human rights between and among employees and the group's stakeholders.

Acknowledgements

I extend my sincere gratitude to my fellow committee members and the entire board for their support and contribution during the year. On behalf of the board, I thank management and employees for their diligence and ongoing commitment to operating responsibly, and our shareholders for their support and constructive engagements.

Dr RV Simelane

Chairman of the social and ethics committee

Our approach

We are committed to contributing to global efforts to reduce carbon emissions and mitigating the physical impacts of climate change. We are equally committed to contributing to a water-secure future that is socially and culturally equitable, environmentally sustainable, and economically beneficial.

To meet these commitments each year, we strive to better monitor and mitigate our environmental impacts, improve our understanding of and response to risks and opportunities, and comply with reporting and regulatory requirements.

We house climate change and water together in this single report given that they are inextricably linked. For the sake of clarity, we describe our climate-change and water journeys separately, in this and subsequent sections. However, where relevant, we describe how the respective activities and analyses intersect.

Our climate-change journey to date

The need for an urgent global response to the threat of climate change is clear, across all areas of society and the economy. We are committed to being part of the solution.

Setting targets

We have taken many notable GHG target-setting steps since we first

tracked and reported on GHG emission-reduction initiatives to the CDP in 2010. In F2020, we revised our carbon emission-reduction target based on a bottom-up assessment of opportunities to reduce GHG emissions at our operations, and a top-down assessment that included benchmarking against peer company targets and stakeholder expectations.

In F2021, ARM committed to achieving net-zero GHG¹ emissions (scope 1 and 2) from mining by 2050 (figure 1). To achieve this commitment, we undertook to develop operation-specific decarbonisation pathways and associated short-term and medium-term targets. We recognise that decarbonisation cannot happen at all costs, particularly in the context of a developing country, and are working to identify contextually-appropriate and just mitigation options for each operation.

We began developing these **decarbonisation pathways** in F2022. This year, we have focused on improving our underlying data (projected GHG emissions) and conducting additional assessments of GHG mitigation potential. We have also prioritised three main mitigation options within our decarbonisation pathways: energy-efficiency measures, renewable energy and emission-reducing new energy vehicles.

We used these pathways to set **short and medium-term scope 1 and 2 targets** that include operation-specific plans (figure 3). As part of these initiatives, by F2026 we will make incremental improvements to our energy efficiency, secure large-scale renewable energy solutions and battery storage, and pilot battery electric vehicles underground.

Some of our most advanced explorations have focused on different opportunities to invest in renewable energy technologies and to procure clean energy from renewable sources.

By F2030 we plan to have sustained energy savings, to scale up existing and additional renewable energy solutions and new energy vehicle solutions, including appropriate opencast technologies.

In F2024, we will also explore and set appropriate **scope 3 targets** in line with the ICMM 2021 climate change position statement, and contribute to advancing partnerships that enable credible target setting and emission reductions across our value chains.

To track our progress and performance, this year we continued to improve the functionality of our **ESG data system**. This included incorporating financial metrics, and exploring options for integrating wider ESG-relevant metrics and related management activities. We are in the latter stages of choosing a preferred data solution and intend to roll-out the data system in F2024.

We consider **executive incentives** as an important mechanism for ensuring our GHG targets are achieved. This year, we have explored a methodology to integrate short-term targets into the climate-change component of the long-term incentive scheme. This method offers a simple process for assessing performance and provides management with a clear picture of what they can practically drive at the operations to achieve the ARM group-level GHG targets.

Other emission-reduction activities underway include: internal carbon pricing; energy efficiency projects and capital allocation; and explorations into low-carbon technologies and products.

Performance

Our actual emissions have decreased over time due largely to Nkomati Mine moving to care and maintenance and Machadodorp Works stopping the metals recovery plant. However, for deeper insights into our performance, we consider a business-as-usual baseline that isolates the impacts associated with our emission-reduction initiatives.

Based on these assessments, our performance has varied over the years. Between F2013 and F2018, our emissions reduced steadily (figure 5 – carbon footprint scope 1 and 2). These reductions slowed in F2019 due to challenging market conditions, limited viable options and implementation of many “quick-win” initiatives. However, due to additional investments and improved measurement and reporting, we registered significant additional emission savings in F2020, F2021 and F2023.

Despite these emission savings, we fell short (by 0.5%) of meeting our F2023 target. The target included a 4% absolute reduction of scope 1 and 2 emissions by F2023 against an F2018 business-as-usual baseline through emission-reduction initiatives implemented from F2019. To determine our performance relative to this target, we calculated the percentage of emission reductions that could be attributed to our emission-reduction initiatives, and found a 3.5% absolute reduction of scope 1 and 2 emissions compared to the business-as-usual baseline.



We anticipated not meeting this target, given a reduction of only 1.8% up to F2022 (figure 9). The near-doubling of emission reductions in F2023 is linked to implementing some of the new decarbonisation measures (page 63), as well as improved measurement and GHG reporting at Cato Ridge Works (which helped to identify emission-reduction opportunities). These reductions were achieved despite emission increases caused by changing operating conditions (such as higher stripping ratios, or mining deeper and farther), expansion projects (Merensky project at Two Rivers Mine), as well as demand and product transport-related instability at our iron ore mines in the Northern Cape.

Our current work to develop decarbonisation pathways and set operation-specific targets represents a more ambitious decarbonisation strategy that includes a larger suite of more effective mitigation options. This strategy is in line with our long-term commitment, and characterised by clearer plans and associated resources and systems. Following this strategy will ensure future targets are achieved.

Managing risks

Over the last 12 months, and building on the climate-scenario analysis first done in F2021, we have made notable progress in explicitly incorporating climate change into our ERM processes. We have started engaging with the businesses to highlight the need to explore operation-specific impacts from projected physical climate changes. Extreme weather events (eg heavy rainfall, drought, flooding) have already affected most of ARM's mining sites (see table 2) and, by assessing different climate futures,

we are gaining a stronger understanding of the physical climate risks to which some of our operations and suppliers will be exposed. Our work involves exploring appropriate response measures, and developing systems to ensure more structured, ongoing assessments of climate risks, through corporate webinars, operation training webinars, and operation-specific workshops.

Reporting

One of our primary focus areas involves improving our accounting and reporting processes. This year, we continued to improve emissions accounting at Cato Ridge Works, where process emissions represent 44% of ARM's scope 1 emissions and 10% of its scope 1 and 2 emissions on an operational control basis. We have also worked to:

- More accurately estimate the carbon content of dust and slag from production
- Add carbon contents from fine ore sources (Gloria and Nchwaning)
- Subtract carbon captured in metal recovery plant product
- Add metal recovery plant production to calculate emissions intensity
- Use tapped (hot) metal tonnes to calculate emissions intensity (ie removing the impact of losses on the mass balance calculation).

Operations and investments outside our operational control are again included under the scope 3 emissions category. This includes emissions associated with coal investments (based on percentage equity in Goedgevonden (GGV), Participative Coal Business (PCB) and ARM Coal, Harmony and Sakura).

¹ This includes ARM's scope 1 and 2 emissions associated with operations under direct or joint direct operational control.

Our approach continued

We have also continued to improve the accuracy and completeness of our scope 3 GHG inventory. This year, our scope 3 GHG emissions were externally assured for the first time. We continue to engage in ICMM working groups and, in F2024 we will set appropriate scope 3 targets in line with the ICMM 2021 climate change position statement. In addition, we contribute to advancing partnerships that enable credible target setting and emission reductions across our value chains.

We continue to comply with South African carbon budget requirements. In previous years, we complied with phase 1 of the carbon budget (voluntary, non-legislated phase), and the Department of Forestry, Fisheries and the Environment's (DFFE) extension phase, and were working to align to the legislated phase 2 of the carbon budget. In F2023, we received confirmation of

our extension-phase carbon budget which covers calendar years 2020 to 2024. The DFFE used its product-level carbon-intensity benchmark to provide a draft carbon budget for our smelters. We have had a series of engagements with the DFFE about this draft budget, but it has yet to be finalised. We have not yet received a carbon budget for our mines, and mandatory carbon budgets are likely to come into effect only once the climate change bill has been promulgated. Until then, we will continue to comply with existing requirements, prepare for future budgets, engage with the DFFE and interrogate its budget-allocation methods.

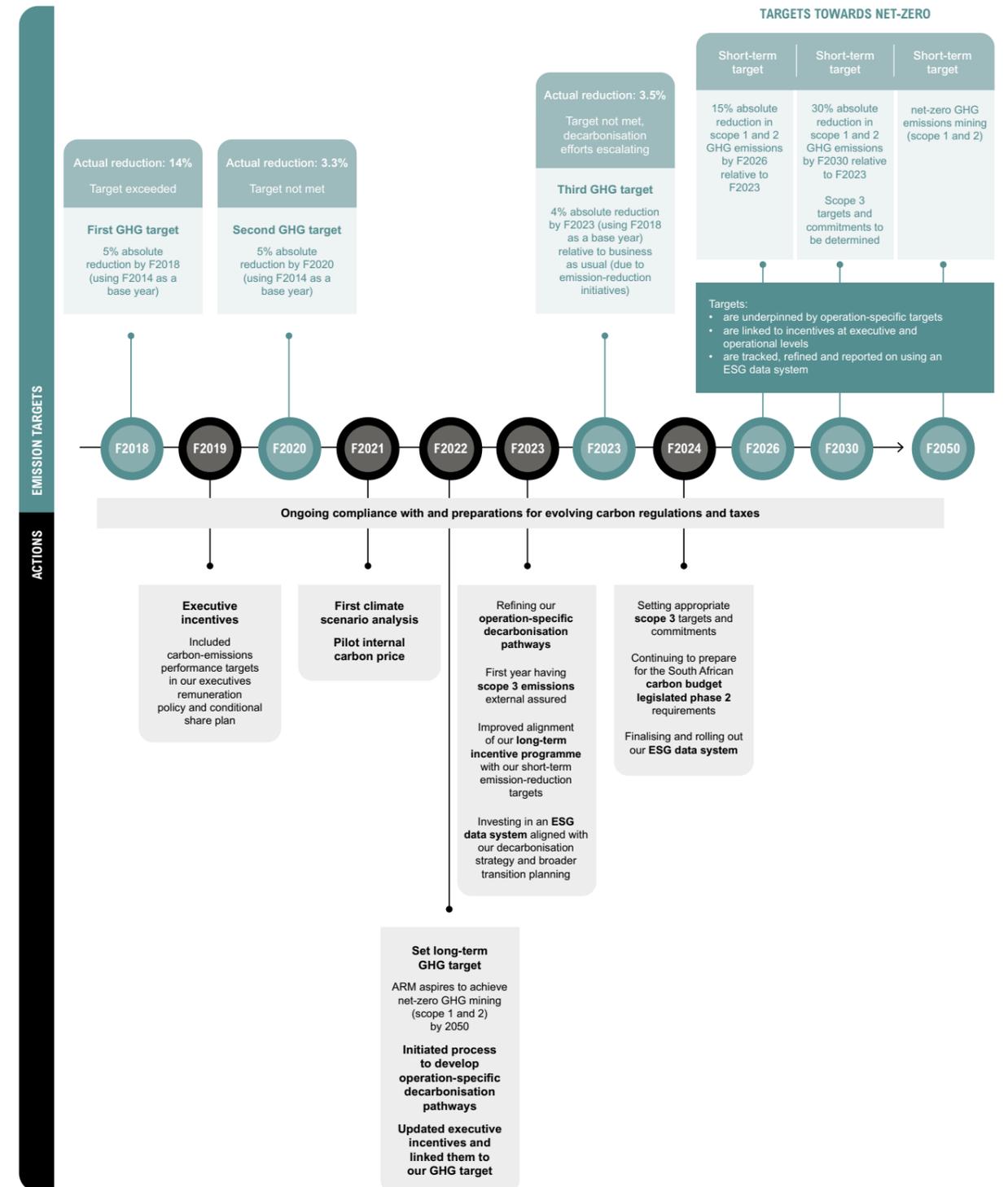
Enhancing community resilience
We continue to investigate ways in which we can leverage our local economic development (LED) and corporate social investment (CSI) spending to enhance community

resilience to climate change. During our climate-scenario analysis process, we identified transformation initiatives (specifically enterprise and supplier development, LED, social and labour plan, CSI and community trusts) as having the potential to contribute to improved resilience of vulnerable host communities to adapt to climate change. This year, we furthered a process to identify where existing initiatives contribute to this objective and can be scaled up, and where positive resilience outcomes can be driven by new transformation initiatives. Going forward, and to embed "climate resilience first" thinking across the organisation, we intend to co-develop a strategy that encompasses climate and development activities, and to develop practical tools that can support implementation of this strategy.



Environmental monitoring at Khumani Mine

Figure 1: Our climate-change journey



OUR PRODUCTS ARE CONTRIBUTING TO A LOW-CARBON FUTURE

SAVING ENERGY, REDUCING EMISSIONS

- Higher-quality ores optimise production and generate lower emissions
- Our high-quality lumpy iron lowers transport emissions
- Our high-grade manganese requires less energy to process.

ENABLING THE HYDROGEN ECONOMY

- Hydrogen fuel cells use platinum to generate energy from hydrogen and oxygen; water is the only emission
- Our platinum can be used to create hydrogen fuel-cell electric vehicles, which offer a zero-emissions alternative to the internal combustion engine.

STORING ENERGY EFFICIENTLY

- Lithium-ion energy storage supports the growth of renewable energy and electromobility
- Our nickel and manganese are used in these batteries.

Our water journey to date

Water is essential to all mining and metals operations. Without access to water, ARM cannot function. We are increasingly exposed to water-related risks that could affect production, increase costs, constrain growth, disrupt our supply chains, and place our communities and employees under strain.

Our proactive and holistic water-management strategy facilitates how we sustainably manage our water resources. It is built around identifying and mitigating water-related risks, exploring opportunities, and engaging with partners to achieve collective action. We focus on water balances, a hierarchy of water uses, and minimising withdrawal of clean, potable or municipal water. Our goal is to recycle 100% of water – excluding losses due to evaporation, seepage and entrainment – and to have no uncontrolled discharges. This year we had one high impact (level 4) and no major impact (level 5) water-discharge incidents (page 99).

Setting targets

As an ICMM member, and in line with our water stewardship policy (page 76), we use water targets to better manage our withdrawals, consumption, outputs and reuse efficiency. Our initial target was set at the ARM-level in F2018, and included a 10% reduction of potable water withdrawals (surface and municipal sources) by F2020, relative to a baseline (set at F2011 levels; figure 2). Over the ensuing years, we increased the ambition of this target, in F2020 aiming for 15% less than the baseline by F2021, and in F2021 aiming for 17% less than the baseline by F2022. In both instances, we met the targets and exceeded our ambition. However, without covering the multidimensional risks specific to each operational context (even mines in the same catchment areas face different water challenges), our operations did not find the targets useful for measuring and driving their water performance.

So, as a next step on our target journey, we focused on setting context-based water targets for

operations with material water-related risks. Starting in F2021, and in line with ICMM guidance, we have worked with operations and technical teams to develop process-oriented targets that include commitments for stakeholder engagement, and that detail collective action to address community access to water. By F2022, we had set context-based water targets for 75% of our operations, and this year, through operation-specific workshops, we evaluated the progress made towards these targets figure 13; page 96. The majority (81%) of these targets have been met or are on track to be met. This year, we also set targets for the two operations excluded from the F2022 target-setting process (Cato Ridge Works and Machadodorp Works). Targets for the newly-acquired Bokoni Mine will be set in F2024.

Managing risks

Another of our key activities focuses on water-related risks and opportunities, which we consider at company and asset levels.

In F2017 and F2018, we completed site-specific risk assessments at Beeshoek, Black Rock, Khumani, Nkomati, Modikwa and Two Rivers mines as part of a water-performance and reporting gap analysis and compliance project. In F2019, we used the WWF water risk filter* to support the identification and assessment of water-related risks at the operations. Water risks were discussed again as part of climate and water workshops in F2022. This year, we used detailed projections to understand the impact of climate change on the resilience of our business, which included considering different water-related futures (eg projected average annual rainfall, peak rainfall intensity, evapotranspiration, droughts) for each operation. Details of emerging or ongoing risks and/or opportunities, and our capacity to manage these, are discussed at our quarterly management risk and compliance committee meeting, and our social and ethics committee meetings. Meeting outputs and decisions feed directly into the strategy development process.

We are also increasingly looking beyond our operational borders to manage risks. Beginning in F2022, and continuing this year, we are leveraging the preliminary results of our climate-scenario analysis to reassess water-related risks in our supply chain. We are also using a catchment-level approach to manage some of the significant catchment-level water risks that some of our operations face. These include poor existing infrastructure, lack of funding and capacity to deliver new infrastructure, and the impacts of climate change on water supply. We regard water availability, consumption and pollution as key risks and include these in both our

operational and corporate risk registers. We partner with local and regional government structures, where appropriate, to mitigate water risks outside of our mine boundaries.

Water stewardship and community resilience

Investors and other stakeholders are increasingly calling for greater insight on catchment-level water balances, including projected demand and supply, as well as water-quality elements. ARM's commitment to water stewardship drives our engagements with various stakeholders to find solutions appropriate to all water users' needs and to ensure the sustainability of water resources. These stakeholders include: the Department of Water and Sanitation (DWS); local communities; authorities at local, provincial and national levels; water forums; irrigation boards; catchment management agencies (CMA); farmers and other industry users.

Engaging with communities helps us understand and mitigate their concerns, identify how we can contribute to community water security, and increase transparency of our operations. Along with our joint-venture partners, and through our operations, we invest in local water infrastructure to improve community access to sufficient potable water and increase community resilience. The ARM Rural Upliftment Trusts also fund water-provision projects, including sinking and equipping boreholes for schools and communities around South Africa.

Following our climate-scenario analysis, we are investigating opportunities to enhance community resilience to water-related impacts

through our LED and CSI spend programmes. These actions have the additional benefit of improving community relations and strengthening our social licence to operate.

Reporting

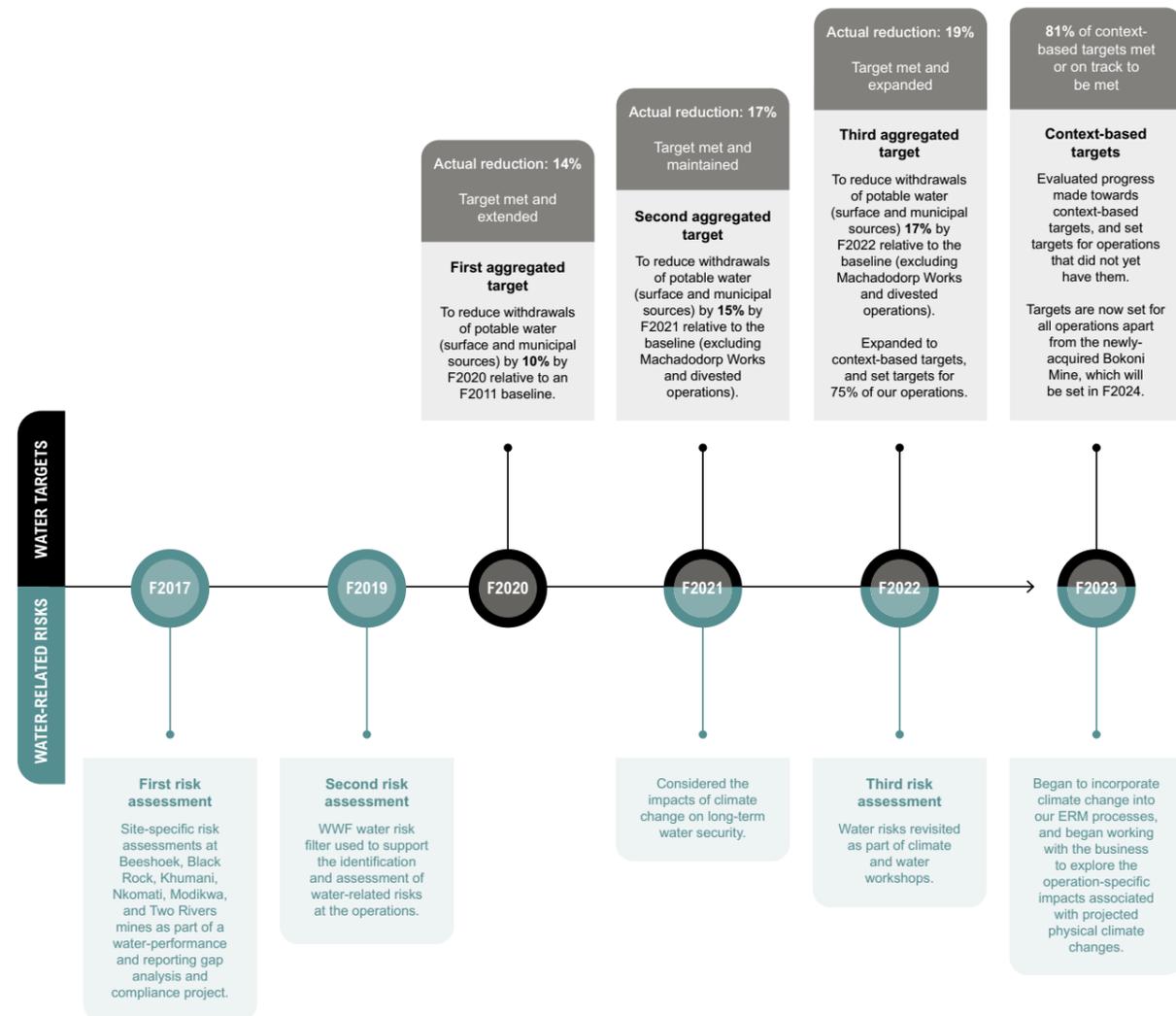
External water-reporting requirements have evolved. Substantial work has been undertaken by the owners of various reporting initiatives to align reporting platforms and metrics. Given this evolution, the ICMM updated its Water Reporting Good Practice Guide, which includes guidance for more holistic and aggregated reporting. As an ICMM member, we responded to this by sensitising our operations to the changes and to prepare for reporting in line with the updated guidance. This report includes the revised format prescribed in the guidance, as well as the previous format (to facilitate year-on-year comparisons). Going forward, we will only include the revised format.

For improved accounting and clarity, we now distinguish between operational water withdrawals (water that enters the operational water system used to meet operational water demand; page 77) and the withdrawal of other managed water (water that is actively managed without intent to supply the operational water demand). We continue to report on aggregated water metrics for all sites, and we have started to collect and report on changes in operational water storage.

We have also ensured compliance with updates to the ICMM's WAF released in 2021.

* WWF's water risk filter (<https://waterriskfilter.panda.org/>) is an online tool that helps companies and investors assess and respond to water-related risks facing their operations and investments across the globe. The tool rates operational and basin risk on a scale of 1 to 5 and considers physical, regulatory and reputational water risks. Aggregated risk scores for catchment stress are computed by applying industry-specific weightings. Operational risks scores are calculated based on operation-specific responses to the WWF water risk filter questionnaire.

Figure 2: Our water journey



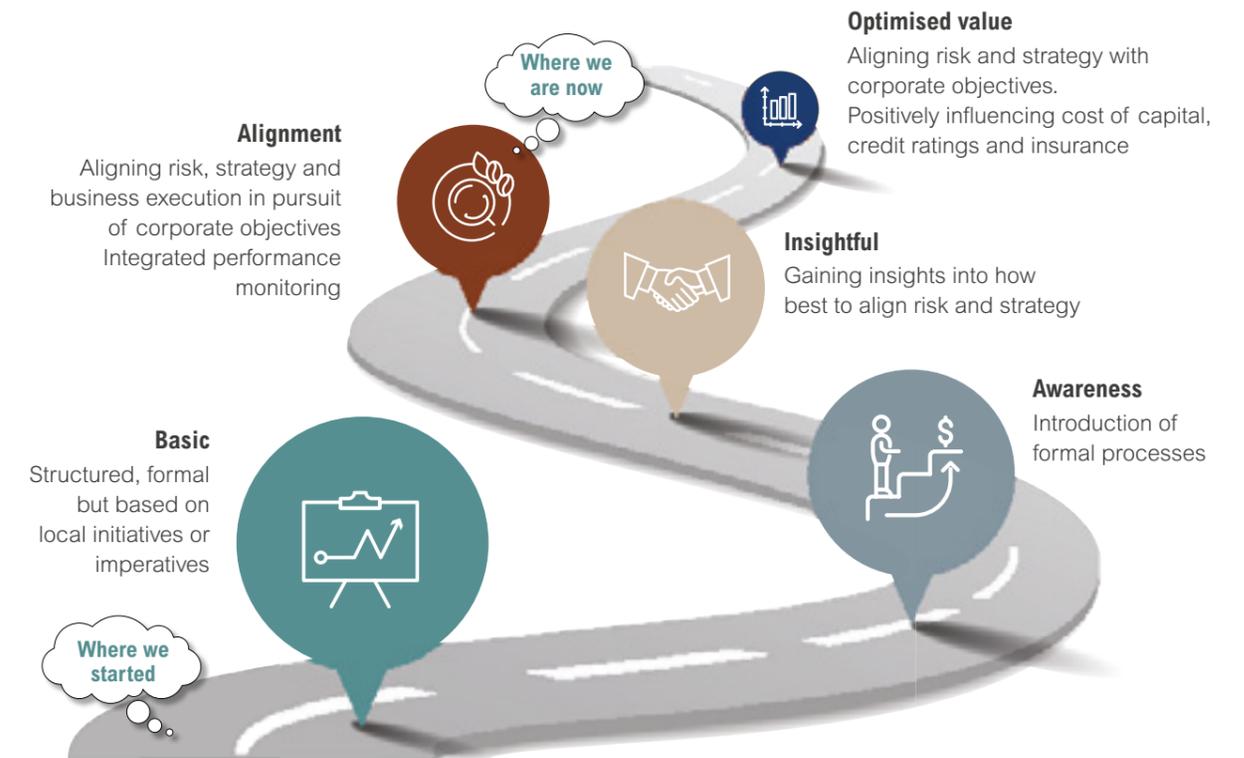
REPORTING

Through all our efforts we report on water using the ICMM water accounting framework guidelines. Up until F2022, our reporting was based on the 2019 guidelines, but in F2023 we began reporting data according to the revised guidelines.

Risk management

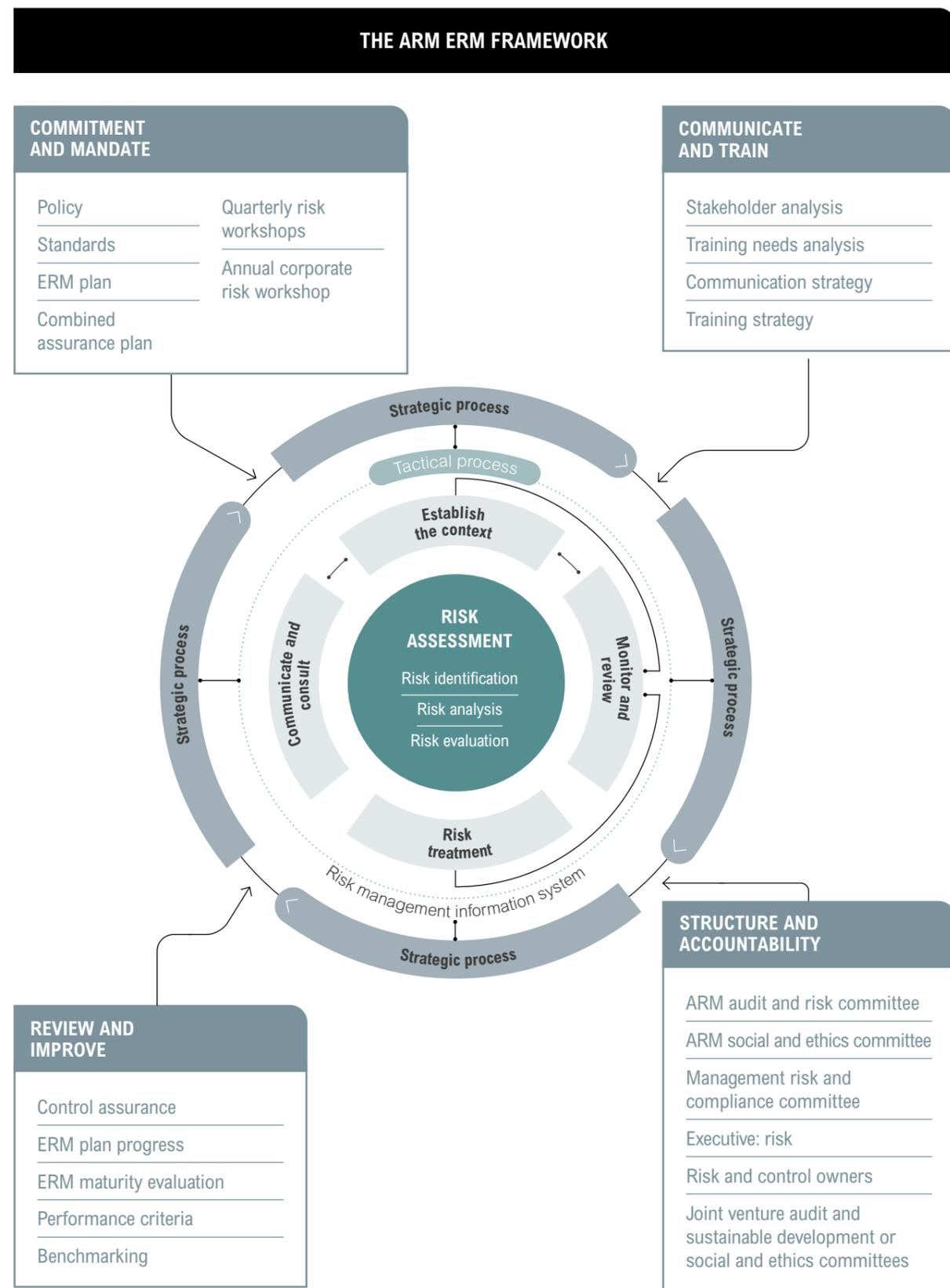
ARM instituted a risk management strategy in 2018 that continues to evolve to position the group as a mature risk-intelligent and optimised value organisation by 2025.

The ARM risk assessment universe and hierarchy*



* Further detail can be found in the ESG report on pages 36 to 41.

On this road to an optimised ERM value proposition, ARM continues to work on integrating the various parts of the risk department's strategic drive to integrate leadership effectiveness, strategy, risk management, asset management, resilience and assurance. By maintaining and sustaining these processes, we strive at being better than our peers in achieving greater levels of risk management maturity. Equally, we continue to strive towards an integrated risk management and sustainability strategy to achieve benefits and efficiencies in the way we approach and manage ERM and ESG matters that are addressed by our sustainable development unit.



Over the last 12 months, we made notable progress in incorporating climate change into our ERM processes. We are engaging with the businesses to highlight the need to explore operation-specific impacts associated with projected physical climate changes. This involves exploring appropriate response measures, and developing systems to ensure more structured, ongoing assessments of climate risks via corporate webinars, operation training webinars and operation-specific workshops.

Climate and water compliance and reporting programme

In 2017, we launched a programme to comply with current and evolving regulations, reporting expectations, and non-negotiable but voluntary requirements related to climate change and water. The programme initially aimed to comply with the requirements to: submit our GHG pollution prevention plan and GHG emissions to the DFFE; identify gaps in climate and water-risk assessment, management and reporting; and comply with ICMM member commitments on climate change and water. The programme has evolved and phase 7, conducted in F2023, was informed by a variety of drivers affecting our business.

Specific components included:

- **Component 1: Developing decarbonisation pathways and new GHG targets**
To deliver on our commitment to net-zero mining by 2050, we are developing a robust decarbonisation strategy that encompasses decarbonisation pathways and operation-specific targets. We see remuneration as a critical enabler of this decarbonisation strategy, and are striving to attain greater clarity and

coherence between executive incentive targets and the group's on-the-ground actions. We are also working to ensure that executives have a clear understanding of what they can do at the operational level to earn group-level rewards.

- **Component 2: Carbon budget compliance and engagement**
We continue to comply with phase 1 extensions, and are engaging with the DFFE on the mandatory phase 2 and seeking clarity on its form and timing.
- **Component 3: Scope 3 emissions and target setting**
We have taken steps to improve our accounting and management of scope 3 emissions, which were externally assured for the first time this year. We are also driving a more significant work programme for F2024 in line with the ICMM's plans for improved reporting and target setting.
- **Component 4: Climate and ERM integration**
We have started engagements with the business to highlight the need to explore operation-specific impacts associated with projected physical climate changes. This involves exploring appropriate response measures, and developing systems to ensure more structured, ongoing assessments of climate risks, using corporate webinars, operation training webinars, and operation-specific workshops.
- **Component 5: ESG data system development**
We are developing an efficient data system that can build capacities, as well as streamline and improve reporting. This system will enhance our management of energy and

climate-change related elements, as well as broader ESG elements. We are also working to incorporate financial metrics in the system.

- **Component 6: Enhancing LED and CSI spend to build community resilience**
Given the kinds of physical climate impacts we have seen in the world in the last year, we consider it increasingly important to contribute to the resilience of our host communities. Using LED and CSI spend, we are exploring ways that communities can thrive given the risks and opportunities associated with physical climate change and the transition to net-zero GHG emissions.
- **Component 7: Supply-chain risk assessment (climate and water)**
Through a number of the other components, such as ERM integration (page 51), we are exploring climate and water risks in our supply chain.
- **Component 8: Context-based water targets for Machadodorp Works and Cato Ridge Works**
In F2023, we initiated a process to develop context-based water targets for Machadodorp Works and Cato Ridge Works. This means we now have context-based water targets for all operations, apart from the newly-acquired Bokoni Mine (targets to be set in F2024).
- **Component 9: Water reporting**
We have ensured compliance with updates to the ICMM's WAF released in 2021.
- **Component 10: Reporting workshops**
We continue to conduct annual climate-change and water workshops.



Our approach continued

- **Component 11:**

- **Disclosure**

- We continue to respond to increasing requirements and specific requests for information on our climate-change and water performance.

- **Component 12:**
Raising awareness and conducting training

- We have initiated a process at Bokoni Mine to build capacity and develop systems to enable reporting on climate and water-related performance. We held a workshop to tailor the necessary reporting templates with an emphasis on ensuring compliance with the ICM's WAF. Given the expected expansions in operations, we are exploring ways to build capacity and develop systems that can support future water stewardship, climate-change and energy management.

- **Component 13:**
Engagement

- We continue to engage with internal divisions and operations as well as joint venture and investment partners, as part of initiatives to mainstream climate change through processes of collective sense-making and path-setting.

Annual climate-change and water workshops

As part of our climate and water compliance and reporting programme, we conduct annual workshops with each division and operation, facilitated by an external

specialist consultant. Representation at these workshops includes senior management, engineers, the corporate environmental manager, on-site environmental managers, the executive: sustainable development and divisional safety, health, environment and quality (SHEQ) managers. This year, we included representatives from other functions – including stakeholder affairs, procurement, marketing and finance – because managing climate-change issues needs to be mainstreamed into more of the business.

Given the increasing number of expectations and requirements related to both climate change and water, we continue to explore these issues separately.

In the context of climate change particularly, the number of new components to which we have had to respond has necessitated additional component-specific engagements and working sessions (eg decarbonisation pathway development). As a result, the F2023 workshops focused less on content, and more on capacity building, awareness raising, and the ongoing processes of gathering information for reporting.

The water context has been similar, though there have been fewer new work components. Here, our F2023 emphasis was more on progressing climate change-related elements.



Water treatment at Khumani Mine

Governance

Operations at Two Rivers Mine

Oversight	24
Executive remuneration	26
Assurances	27
Stakeholder engagement	28
Supply chain engagement	28
Public/policy engagement	28
Engaging with our partners	29

The ARM social and ethics committee provides oversight by monitoring and reporting on the manner and extent to which we protect, enhance and invest in the wellbeing of the economic, social and natural environments in which we operate.

Oversight

Dr Rejoice Simelane, as the chairman of the social and ethics committee of the board is responsible for board oversight of climate change and water. The responsibility for implementing this work rests with the chief executive officer (CEO), who delegates to the chief executives of each division and the executive: sustainable development. This executive is responsible for reviewing ARM's sustainable development policies, strategies and targets, including our revised GHG and water targets, and ensuring these are aligned with the board's commitment to zero tolerance for harm to employees, host communities and the environment. The ARM social and ethics committee provides oversight by monitoring and reporting on the manner and extent to which we protect, enhance and invest in the wellbeing of the economic, social and natural environments in which we operate.

Assmang, a joint venture between ARM and Assore South Africa Proprietary Limited, has established a social and ethics committee that monitors environmental performance in Assmang. During F2023, it was chaired by the executive director: investor relations and new business development. It reports to the Assmang executive committee and Assmang board as well as the ARM social and ethics committee. In the ARM Platinum division, every operation has a sustainable development committee, which is chaired by the ARM executive: sustainable development, and reports to the executive committee or board of the respective joint venture, as appropriate, as well as to the ARM social and ethics committee.

Climate-related issues are reported to the ARM social and ethics committee and the remuneration committee, and form part of the agenda of quarterly board meetings. Recent meetings have considered:

- ARM's operation-specific decarbonisation pathways and

associated short and medium-term emission-reduction targets

- Proposed amendments to remuneration policy, including changes to climate-change incentives linked to ARM's new short and medium-term emission-reduction targets
- Approving the annual ESG and climate change and water reports
- Receiving/monitoring quarterly reports on climate change and water performance and compliance.

The senior executive team evaluates growth opportunities and plans the content for a two-day strategy session with the board. Chaired by the CEO, the committee meets regularly and provides feedback to the executive chairman.

The timing of our climate-change risk management process is aligned with our assurance and corporate governance requirements. Climate-risk management, however, is not an activity that takes place periodically, but continuously through all phases of our work and with every major change in our business and operations. All ARM-managed operations and divisions conduct quarterly risk reviews as part of the ERM process. These are supported by six-monthly corporate risk reviews and an annual group-level risk workshop. Climate-specific processes to augment these steps include annual climate and water risk assessments and management workshops with the divisions and operations, as well as climate-scenario analyses to explore the long-term transition and physical risks associated with different climate futures. The management risk and compliance committee (a committee of the board audit and risk committee) monitors our ERM process, which includes climate-change risks. Company-level risks, such as evolving climate-change mitigation regulations (including the carbon tax and carbon budgets), are tracked by the risk department.

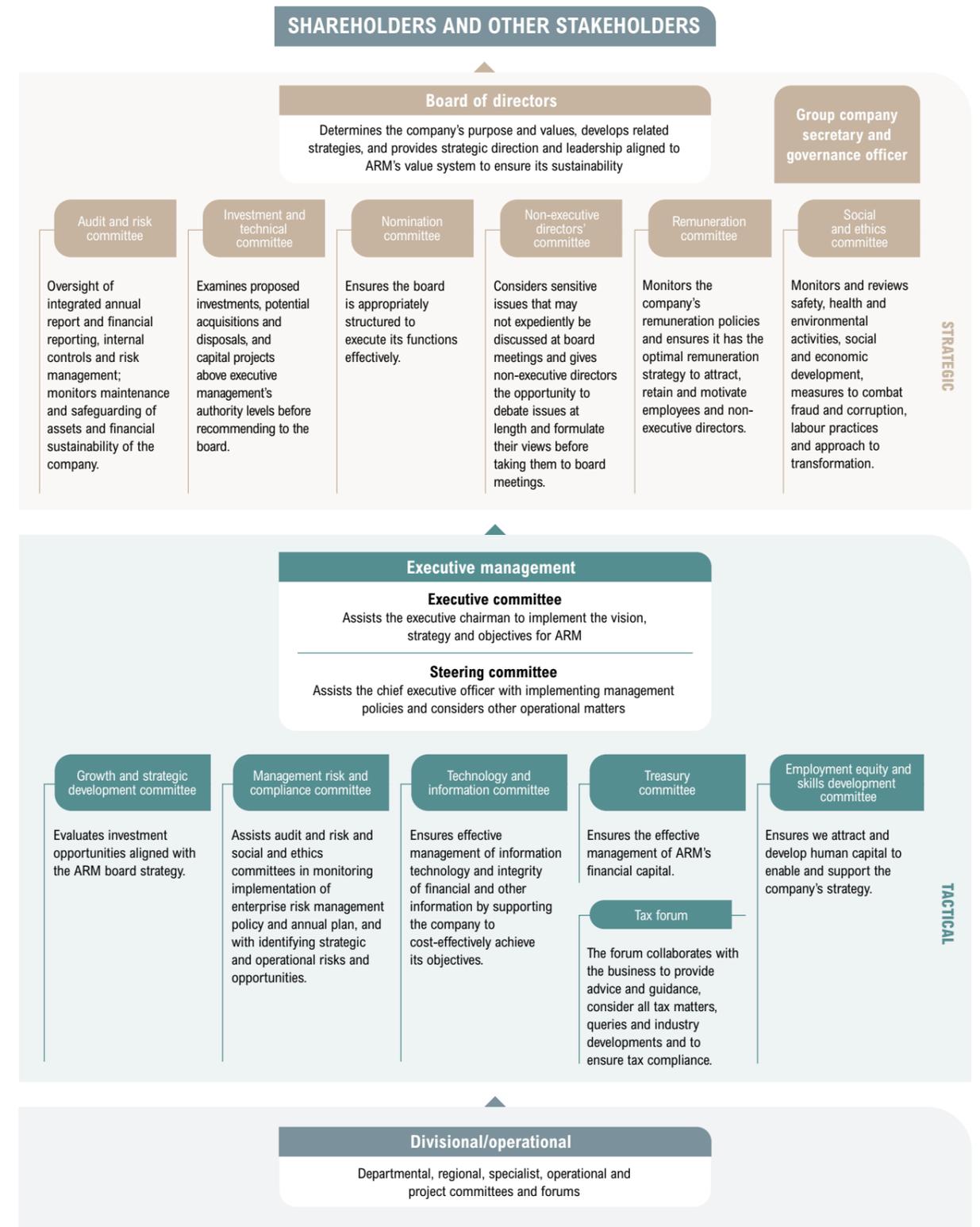
The executive: sustainable development also reports to the management risk and compliance committee on matters and activities related to climate change and carbon emissions. This includes an update on carbon tax and progress on the development of decarbonisation pathways.

We continue to disclose our performance according to the TCFD framework, have completed an initial climate-scenario analysis process, and have set a long-term emission-reduction target in line with the goals of the Paris Agreement. We plan to fully implement TCFD recommendations by F2024, subject to clarity on how the mining industry should integrate climate risks and opportunities into mainstream filings.

Our focused programme to comply with new climate-change regulations, as well as non-negotiable but voluntary requirements and reporting expectations for climate change and water, originated in 2017 and has continuously been reviewed and updated. Given that regulatory and voluntary requirements are related, we have aimed to embed a methodical process for developing systems, reporting and building capacity to meet current and evolving requirements.

We have begun the process of reporting on F2023 data according to the revised ICMM WAF. The corporate environmental manager and climate change and water consultant are members of the ICMM water working group, which considers emerging issues driven by new legislation or society, and uses these to develop corresponding good-practice, policy or position statements for collective industry.

Governance framework



Delivering on our decarbonisation ambitions

To deliver on our commitment to net-zero mining by 2050, we are developing a robust decarbonisation strategy that encompasses decarbonisation pathways, company and operation-specific targets, and transparent governance and reporting structures to ensure that we meet those targets (page 37).

We regard incentives as a critical enabler of this decarbonisation strategy, and are using the long-term incentive plans (LTIPs) (which include the 2018 conditional share plan (CSP) and the 2018 cash-settled conditional share plan) and operational key performance indicators (KPIs) to ensure our employees are sufficiently incentivised to achieve our short and medium-term targets, and support our long-term commitment.

For each operation, we have developed specific targets associated with specific projects and are in the process of developing specific KPIs linked to these targets and plans.

We are now striving to attain greater clarity and coherence between ARM executive incentive targets and these on-the-ground actions, and to ensure that ARM executives have a clear understanding of what they can do at operational level to earn rewards. As in previous years, the climate change targets in the LTIPs are linked to ARM's short-term GHG reduction target.

ARM's new short-term GHG reduction target is expressed as a 15% reduction in absolute greenhouse gas emissions by F2026 relative to F2023 (the detailed emissions targets and decarbonisation pathways are described in Figure 3 on page 37).

The GHG-related performance conditions in the LTIPs are described on page 156 of the remuneration report in the 2023 ESG report.

Executive remuneration is therefore explicitly aligned to ARM's decarbonisation strategy, which is a component of our transition plan (page 34).

Going forward, we will continue to refine the remuneration systems described above. We will also allocate capital to decarbonisation.

Refer to page 156 of the remuneration report in the 2023 ESG report.



Conveyor at Black Rock

Assurances

KPMG Inc. provided independent limited assurance over selected performance information and related disclosures in our F2023 ESG report. This assurance was aligned to the ICMM mining principles, the ICMM assurance and validation procedure, GRI Standards, and international assurance standards for sustainable development assurance engagements (ISAE 3000 and ISAE 3410).

The climate change-related indicators assured in F2023 included total scope

1 and 2 GHG emissions (100% basis), total scope 3 emissions, total energy used, total electricity consumption, total diesel consumption, and total volume of water withdrawal.

KPMG's independent assurance statement is on page 190 of the F2023 ESG report, available on our website at www.arm.co.za.

The emission savings associated with our reduction initiatives have also been subjected to independent third-party assurance. Our performance on our F2023 emission-reduction target and the associated

executive share incentive are based on actual (reported) emission reductions relative to a business-as-usual baseline. Carbon emission-reduction initiatives implemented over a particular period are included in the scope, but only if they are active at the end of the period. The target is at a company level. This means there are no operational targets, but savings from our operations are aggregated to determine company-wide performance.



Aerial view of Bokoni Mine

Stakeholder engagement

Supply-chain engagement

We have always worked closely with our key suppliers to ensure we collectively strive to mitigate climate risks in our supply chain, and that we use the best technology available.

Relevant and new technology might help our operations increase energy efficiency, reduce our GHG emissions, or increase our resilience to physical climate-change risks.

We are engaging with our suppliers to reduce diesel consumption at our mines, for example through additives or new technology options, and are exploring ways to reduce our transport-related emissions while accommodating increased production at Black Rock and Two Rivers mines.

In F2019, we assessed the emissions of each of our operation's top five suppliers by spend to understand their climate change-related performance. We found that, while information was available on larger suppliers, limited public information could be obtained for smaller, more local suppliers. Our larger suppliers also did not provide information on emissions at a product level.

In F2021, we included a preliminary assessment of supply-chain risk in our climate-scenario analysis. In F2022, we worked to better understand and manage climate-change risks in our supply chain, particularly exposure to physical climate changes. We are currently using both bottom-up and top-down approaches to identify priority suppliers to focus on in our analyses. Once selected, we will model impacts on the suppliers, assess their risk profiles, and propose mitigation (or other) recommendations.

With the growing emphasis on scope 3, we are also investing in improving our inventory. In F2022, we drew on expenditure and leveraged relevant emission factors to achieve more complete assessments of scope 3 categories 1 (purchased goods and services) and 2 (capital goods). We plan to refine these assessments to focus on specific purchased goods and services, and capital goods. We also included emissions associated with Sakura for scope 3 category 15 (investments) (page 65). We have been exploring climate and water risks within our supply chain.  Developing an appropriate strategy will form part of our work plan in F2024/2025. This will also form part of the work needed to meet our ICMM member commitments to set targets associated with our scope 3 emissions.

The security of electricity supply in South Africa is a material risk, specifically the reliability and cost of power from Eskom, our primary supplier of electricity, which has demonstrated and reported problems in its financial and operational management. There is uncertainty about the utility's future as Eskom is currently structured as a vertically-integrated electricity utility, encompassing generation, transmission and distribution. However, there are far-reaching plans to restructure the electricity supply industry to comprise: a diversified, competitive generation sector; an independent transmission system operator; an independent market

operator; an electricity, capacity and ancillary services market; and an electricity trading and distribution sector.

The level of debt, and lack of proven historical reduction in emissions, present significant risk to our emission-reduction target and long-term objectives. The grid emission factor has not improved over the past 10 years even though there was approximately 6GW of renewable electricity connected to the grid. To mitigate this, quarterly liaison meetings are held with Eskom representatives.

Public/policy engagement

ARM supports the move to a low-carbon economy and is committed to constructively engage with the government on measures aimed at achieving this. Important issues to consider in South Africa, however, would be the use of carbon tax to support targeted mitigation actions, alignment with other mechanisms such as carbon budgets, and clarity on how these mechanisms will integrate.

ARM is engaging directly with the DFFE and has been supportive in disclosing information that fed into the design of various climate-related policy developments. There is also further engagement in these processes through industry associations.

Participation in business and industry initiatives enables collective engagement with

regulators and stakeholders, promotes benchmarking and sharing good environmental practice. ARM participates in a number of initiatives, including the Minerals Council South Africa (MCSA) and its environmental policy committee, Ferroalloys Producers Association and the ICMM.

Stakeholders and various reporting frameworks have highlighted the importance of ensuring consistency between our climate-change policy and positions taken by industry associations to which we belong. Involvement in these associations also serves as a sharing and learning opportunity in addition to being an advocacy mechanism for engaging with climate-change policy development processes.

We commit to publicly disclosing where our position differs to that of the ICMM and MCSA on climate change. We continue to engage as an active member of the ICMM through the climate-change and water working groups. We have provided feedback and comments on the ICMM's draft scope 3 GHG accounting and reporting guidance for the mining and metals sector. This guidance is expected to be published in the first half of F2024. Our policy and commitments are aligned with the ICMM, and we have further committed to updating our long-term target in line with pending updates to the ICMM climate change

position statement. We also provided input and reviewed the MCSA position statement on climate change, and member guidelines for the climate-change action plan, which were published in February 2023.

In F2022, we reviewed the climate-change positions of industry associations to which ARM belongs. We assessed the climate-change policies and positions of the five industry associations of which ARM is a member or where our joint ventures are members to see how these align with ARM's 12 climate-change statements/commitments. We found that ARM's positions are largely congruent with most other industry associations that have public positions on climate change.

 See page 21 of our 2022 report.

We also found positions on carbon pricing to be largely outdated or absent, and that most South African industry associations reviewed oppose the design of the carbon tax or seek greater certainty.

There is value for ARM in engaging with these associations to learn about climate-change policy developments for industry and to help shape the enabling environment, while showing climate-change leadership.

Engaging with our partners

We work with our joint-venture partners to collectively assess and mitigate climate-change risks and capitalise on climate-related opportunities. This includes ongoing management interactions during the ordinary course of business, monthly executive management meetings, and quarterly board meetings, depending on the shareholder agreement.

Our joint-venture partnership with Assore South Africa Proprietary Limited provides access to important industry initiatives such as the life-cycle assessment and life-cycle inventory studies, waste-management initiatives, and the energy-efficiency initiatives of the International Manganese Institute.

In F2020, we disclosed GHG emissions from our direct investment in coal and in ARM Coal operations, managed by Glencore, for the first time. In F2021, we expanded disclosure to cover our interest in Harmony Gold and, in F2022, expanded it further to cover our interest in Sakura.

We hold ourselves to the highest ethical and governance standards in dealings with all stakeholders, including our joint-venture partners.



Climate change

The use of solar at Black Rock

Our position on climate change	32
Strategy	34
Scenario analysis	35
Operation-specific decarbonisation pathways	35
Exploring renewable energy opportunities	38
Managing change	38
Carbon pricing	38
Risk management	40
Climate transition risks and opportunities	40
Physical climate risks and opportunities	45
Integration of climate-change risk into ARM's ERM processes	51
The impact of risks and opportunities on business and financial planning	52
Considering climate-change risks in ARM's investments	53
Enhancing community resilience	54
Targets and performance	55
GHG emissions	55
Energy	69
Future climate-change focus areas	71
TCFD index	72

In the last financial year, and galvanised by our net-zero commitment, we have seen significant mainstreaming of climate change across the organisation. Employees across levels are working more coherently towards the same goals.

Our position on climate change

At ARM, we are keenly aware of the critical global challenges that climate change presents and the effects these challenges may have on our business, our stakeholders and the world.

As a result, we are committed to participating in the global response to reduce carbon emissions and to mitigating the physical impacts caused by climate change. We view climate change as a business imperative and are grateful that this agenda is centre stage.

We have implemented robust processes to measure and report on carbon emissions at our operations and identify opportunities to reduce these emissions. We are actively developing technology and processes to enhance energy efficiency at our operations while improving fuel efficiency and reducing our carbon footprint through other targeted initiatives.

We are not making any new coal investments and will continue running existing assets to the end of their current economic lives. We are continually looking for opportunities to be more responsible and efficient in our coal-related activities. We continue to produce the metals that are critical to a low-carbon future. We are exploring and investing in energy transition and critical minerals that could be value accretive (eg, copper).

Our climate-change policy recognises:

- The need for an urgent global response to the threat of climate change across all areas of society and the economy. We are committed to being part of the solution
- The need to support the goals of the Paris Agreement to limit the increase in the global average temperature to 2°C and pursue efforts to limit it to 1.5°C

- The critical role that the mining and metals sector plays in supporting the global transition to a low-carbon economy by contributing to the sustainable production of commodities essential to the energy and mobility transition, working with partners and key suppliers along our value chains
- The need to reduce emissions from the extraction and use of mining products and support collaborative market-based approaches to accelerate the use of low-emission technologies as part of a transition to a low-carbon energy mix
- The practical challenges that South Africa, as a developing country with domestic supplies of fossil fuels, will face in making that transition to a low-carbon economy
- That climate and energy policy should be technology neutral and rely on market-based approaches to enable least-cost abatement solutions
- The vital role that a broad-based, predictable, long-term carbon price can play, alongside other market mechanisms to drive reduction of GHG emissions and incentivise innovation
- The importance of providing climate-related disclosure to measure and respond to climate-change risks and opportunities. We welcome the transparency on climate-related risks and opportunities brought by the TCFD and more recently through the IFRS S2 Climate-related Disclosures
- The prioritisation of emission-reduction initiatives and technologies, recognising the role for carbon offsets in hard-to-abate emissions

- The role of a circular economy in reducing emissions associated with the extraction and use of mining products by increasing resource efficiency in production and promoting reuse and recycling.

We commit to:

- Engaging with our peers, governments and others to develop effective climate-change policies. We support the movement towards a low-carbon economy and are committed to constructive engagement with government on measures aimed at achieving this. Important issues still under consideration and discussions with government include using carbon tax to support targeted mitigation actions, alignment with other mechanisms such as carbon budgets, and clarity on carbon tax allowances and offsets
- Implementing governance, engagement and disclosure processes to ensure climate-change risks and opportunities are considered in business decision making
- Supporting carbon pricing and other market mechanisms that drive the reduction of GHG emissions and incentivise innovation. We support global efforts to address systemic challenges that inhibit this transition, such as: a lack of willingness to pay for lower-carbon products; limited alternatives and options to reduce emissions, especially in hard-to-abate industrial sectors; and a lack of incentives and support to facilitate expensive, long-term investments in new technologies

and processes. These will require collective efforts and we will collaborate, to the extent appropriate, to drive the changes necessary to achieve a net-zero carbon industry

See page 28.

- Demonstrating leadership by advancing operational-level adaptation and mitigation solutions through, for example, researching, developing and piloting new technologies

See page 34.

- Engaging with host communities on our shared climate-change risks and opportunities and helping host communities adapt to the physical impacts of climate change

See pages 44 and 54.

- Supporting initiatives to mitigate GHG emissions, both in collaboration with our peers and individually, by promoting innovation, developing and

deploying low-emissions technology, and implementing projects that improve energy efficiency and incorporate renewable energy supply in our energy mix

See pages 34 and 62.

- Disclosing scope 1 and 2 emissions annually and setting emission-reduction targets informed by the scientific requirements to achieve the 1.5°C by 2050 global temperature goal, and associated efforts towards a net-zero carbon industry

See pages 37 and 62.

In F2021, we set a long-term target in line with the scientific requirements and included commitments to various actions needed to achieve this target. We are using decarbonisation pathways to inform short and medium-term targets, based on operation-specific emission-reduction measures, to ensure we meet our long-term commitment

- Engaging with stakeholders to determine a preferred approach to reporting scope 3 emissions and exploring our role in reducing those emissions

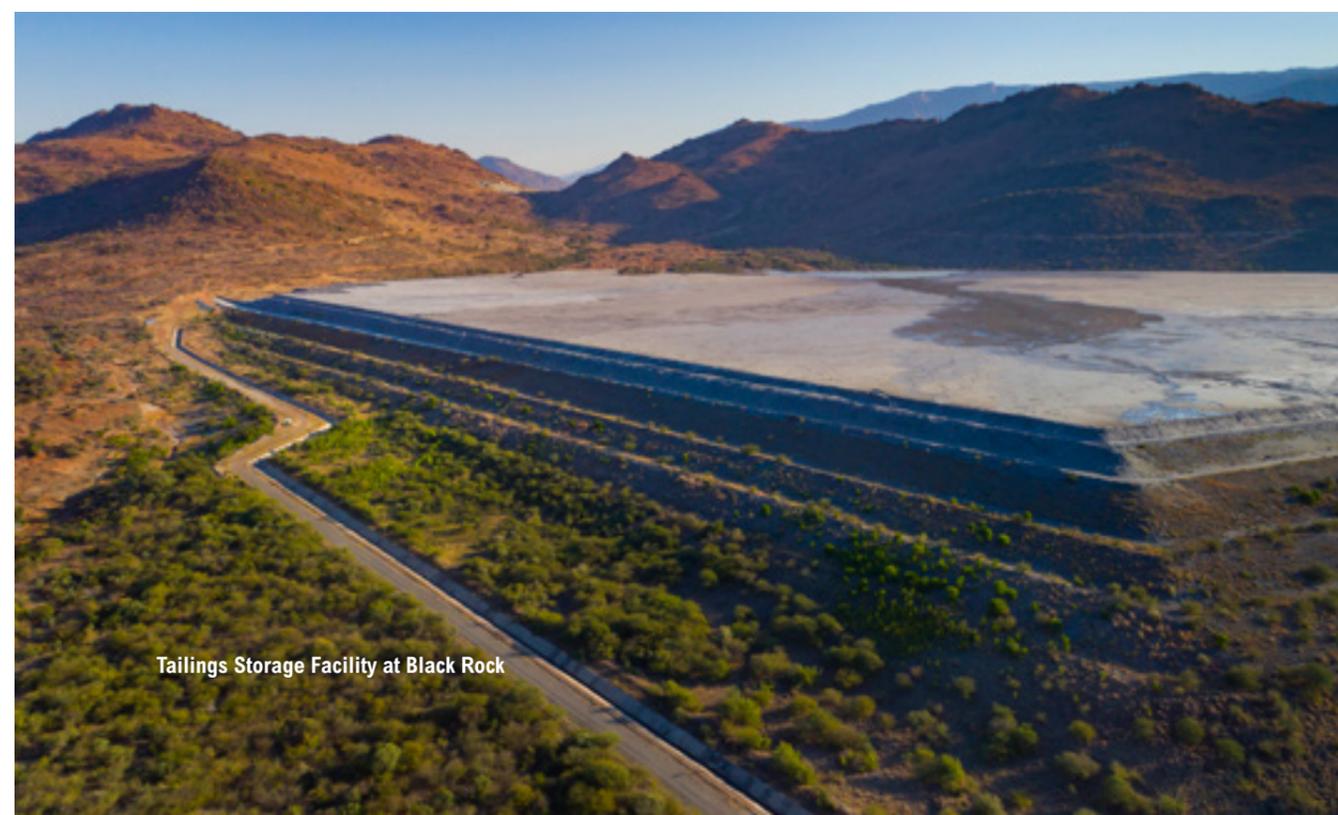
See page 64.

In F2022, we significantly improved our scope 3 emissions accounting, and our first scenario-analysis process informed a range of commitments towards addressing our role in reducing GHG emissions across our value chain

- Supporting the global transition to a low-carbon economy by contributing to the sustainable production of commodities essential to the energy and mobility transition, and by working with the partners and key suppliers along our value chains.

See page 28.

ARM is a formal supporter of the TCFD (<https://www.fsb-tcfd.org/supporters/>).



Tailings Storage Facility at Black Rock

OUR BUSINESS STRATEGY

Our business strategy is to deliver competitive returns and sustainable value by:

Operate our portfolio of assets safely, responsibly and efficiently

Allocate capital to value-creating investments

Focus on value-enhancing and integrated growth.

Transition planning

In the last financial year, and galvanised by our net-zero commitment, we have seen significant mainstreaming of climate change across the organisation. Employees across levels are working more coherently towards the same goals, as demonstrated by the way the decarbonisation pathways and executive incentives link on-the-ground actions with group-level targets. There is also greater coherence across functions. Originally, climate change was purely a focus for sustainability, but it is increasingly coming through in other areas such as capital allocation and investments, community development, procurement, finance, and more.

At this point of our transition journey, we are consolidating and refining the different pieces of our transition plan, and increasing our focus on implementation. Some parts of the plan are more advanced than others, but we will continue to move them forward simultaneously, focusing on the following three key areas.

Resilience of our strategy to climate change

We are not making any new coal investments and will continue running existing assets to the end of their current economic lives. During this time, we will continue to look for opportunities to be more responsible and efficient in our coal-related activities.

We are allocating capital to prioritise metals consistent with the transition. Although there is a decrease in autocatalyst demand, we are expecting an increase associated with the green hydrogen economy and have, for example, been allocating capital to expand Two Rivers Mine.

We are also exploring lower-carbon metals that the world needs, while exploring energy transition and critical minerals that could be value accretive (eg copper).

Decarbonisation strategy

We have developed our decarbonisation pathways, and set short and medium-term targets that marry actions with our long-term commitment. We are focusing on ways to implement these

pathways, including allocating capital to renewable energy and other measures, developing executive incentives to drive operational action, and developing data systems to improve the quality and efficiency of our reporting.

These actions help us mitigate risks associated with climate change, but also enable us to take advantage of opportunities related to demand for low-carbon minerals. Going forward, we will explore ways of decarbonising our value chain, and will set scope 3 targets in F2024.

Resilience to the physical impacts of climate change

To develop the resilience of our operations, we have been working to comply with GISTM and integrate climate change into our ERM processes. This is allowing us to work across functions to explicitly recognise the risks associated with physical climate changes, and to enable our operations to respond appropriately and in a structured, ongoing way.

To develop the resilience of our value chains, we are exploring how we can apply a climate lens to our development spending to actively build the resilience of our communities to climate change. We are also investigating exposure in our supply chains and determining appropriate responses. In light of the challenges faced in the movement of products, particularly in the Northern Cape, we will have a strong focus on transport.

Scenario analysis

To better integrate climate-change considerations into our business strategy, and in response to and in line with TCFD recommendations, in F2021 we assessed the resilience of our business to climate transition risks (risks related to actions in response to the threat of climate change) and physical climate risks (direct risks to operations and the supply chain, and indirect risks to value chains stemming from changing or extreme climate patterns) under five different scenarios. These scenarios, detailed in our F2022 report, ranged from supportive (tracking a 1.5°C average global temperature increase by 2100 with rapid changes to 2030 and net-zero GHG emissions by 2050) to business-as-usual (tracking a 4°C average global temperature increase by 2100 and seeing dangerous climate change).

Our focus is to be below the 50th percentile of the global cost curve

per commodity. We are using the results of our scenario analysis to inform strategic decisions on our portfolio and to explore opportunities to invest in low-carbon technology minerals.

The scenario-analysis process led to ARM committing to a long-term target to achieve net-zero scope 1 and 2 GHG emissions from mining by 2050 (figure 1). It also serves as the foundation for a roadmap to integrate climate change into ARM's ERM processes, and for developing operation-specific decarbonisation pathways (next section).

 See page 51.

Lastly, it has emphasised the need for ARM to participate in and drive efforts to ensure an enabling policy environment, and to ensure our ambition and commitments align with our joint-venture partners.

Operation-specific decarbonisation pathways

In F2021, ARM committed to achieving net-zero GHG emissions (scope 1 and 2) from mining by 2050.

In October 2021, ICMM published a commitment to net-zero scope 1 and 2 GHG emissions by 2050 or sooner in line with the ambitions of the Paris Agreement. ICMM acknowledges members have individual decarbonisation targets which, in some cases, go beyond collective commitment. To achieve this commitment, ARM undertook to develop decarbonisation pathways (operation-specific measures to reduce GHG emissions over time, indicating emission-reduction potential, associated financial costs and benefits and implementation requirements) and associated short-term and medium-term targets.



Charging station for the battery electric vehicles.

We began developing these decarbonisation pathways in F2022. In 2023, we focused on improving the underlying data (projected GHG emissions), conducting additional assessments of GHG mitigation potential, moving to prioritise options within the decarbonisation pathways, and then setting appropriate targets. We have also focused on exploring ways to integrate the new targets into the ARM LTIP.

The decarbonisation pathways include operations where ARM has operational or joint operational control: Beeshoek, Khumani, Black Rock, Two Rivers Platinum, Modikwa and Bokoni ¹ mines and Cato Ridge Works. Machadodorp Works and Nkomati Mine are excluded due to being on care and maintenance.

Decarbonisation pathways and emission-reduction targets

In the short and medium term, we are considering three main mitigation options: energy efficiency measures, renewable energy and new energy vehicles.

Energy efficiency

The mines are already leveraging many available energy-efficiency options, and we have identified an additional incremental saving of up to 5% (figure 3).

At Cato Ridge Works, in the short term, there are significant efficiency benefits associated with the introduction of the new sinter plants which offset the need for 1) carbonate ore, 2) the introduction of biocarbon to offset coke, and 3) other furnace efficiencies. In the longer term, operations will look

to sustain these energy savings while leveraging emerging opportunities linked to evolving technologies (eg digitisation and artificial intelligence).

Renewable energy

Renewable energy is the best available mitigation lever in the short to medium term, especially for the platinum division, where scope 2 emissions are the largest contributor to the operations' GHG footprint. Plans are underway to source significant amounts of renewable energy, particularly – but not exclusively – through solar photovoltaic (PV) power.

 See page 38.

New energy vehicles

We are exploring technology options to mitigate emissions associated with the mobile combustion of diesel. Battery electric vehicles are a particularly good technology option in underground mines. We are piloting these vehicles at Black Rock Mine and plan to roll them out across our platinum division once appropriate technologies are available.

We are also exploring different technologies to decarbonise our yellow fleet. However, the limited number of options currently available prevents us from including yellow-fleet decarbonisation in our short and medium-term decarbonisation pathways.

Detailed plans are being developed with specific measures, timelines, roles and responsibilities and implementation requirements (eg capital allocation, KPIs and other system elements).

In the long term, there is a high degree of uncertainty on the nature and type of technology options to be deployed and therefore operations have not agreed on detailed plans beyond F2030.

Assumptions and uncertainties

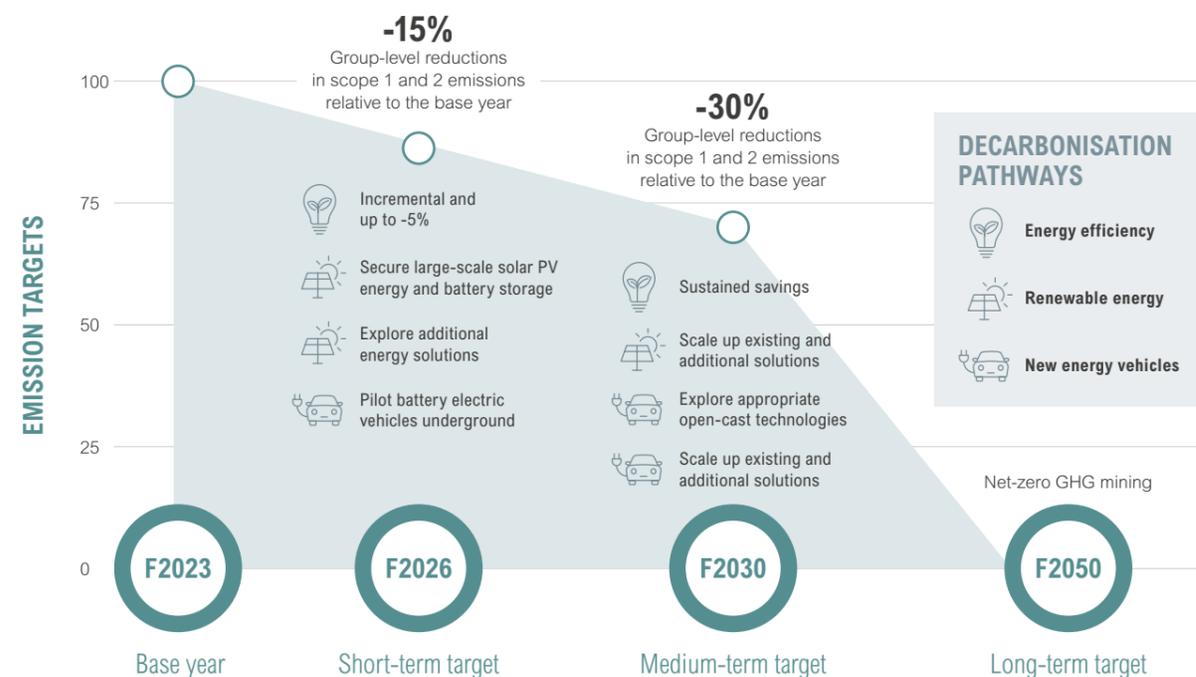
A key uncertainty relates to the grid emission factor over time. We remain reliant on Eskom to a large extent, and our targets are therefore exposed to a level of grid-decarbonisation uncertainty beyond our control.

Secondly, as described above with respect to new energy vehicles, we rely on the market to make available technologies that can help us decarbonise within the context of our operations.

Aligning the new targets and the ARM long-term incentive plans (LTIPs)

Executive long-term incentives are an important mechanism to ensure decarbonisation plans are implemented and the short, medium and long-term company targets are achieved. We have been exploring a methodology for integrating the new ARM emission-reduction targets into the climate-change component of the long-term incentive performance criteria. The new methodology builds on the previous method, offers a simpler way to assess performance, and gives management a clearer understanding of what they can practically drive at the operations to achieve ARM group-level GHG targets.

Figure 3: Emission targets and decarbonisation pathways



About our emissions targets:

- The group-level target is underpinned by detailed operation-specific targets based on decarbonisation pathways. It includes operations within ARM's operational control boundary as well as the Board approved Early Ounces project at Bokoni Mine. It excludes Nkomati Mine and Machadodorp Works which are on care and maintenance.
- We will explore and set appropriate scope 3 targets in line with the ICMM 2021 Climate Change Position Statement. We will also contribute to advancing partnerships that enable credible target setting and emission reductions across our value chains.
- The baseline year and targets will be adjusted for any material acquisitions and divestments, material changes to planned operating conditions, and to reflect progressive refinement of GHG reporting methodologies. Adjustments are expected following the detailed feasibility study at Bokoni Mine and following a Board decision regarding future activities at Machadodorp Works.
- We are ensuring that our employees are sufficiently incentivised at both operational and executive levels to achieve our targets, and support our long-term commitment.

To support and complement our decarbonisation pathways and deliver on our long-term ambition, we commit to:

- Work collectively to ensure enabling policy environments.
- Work collectively to secure financial and technical support, especially for mining and metals operations in developing countries.
- Engage with suppliers to ensure the availability of feasible decarbonisation technologies relevant to our specific operations.
- Collaborate across our value chains to determine the most appropriate role we can play in contributing to net-zero scope 3 emissions.
- Engage with our joint-venture partners to ensure alignment with their commitments, provided these are in line with our overall level of ambition.

¹ Decarbonisation pathways at Bokoni Mine include plans associated with the approved early-ounces project. The pathways will be updated based on the outcomes of the detailed feasibility study and associated decisions.

Exploring renewable energy opportunities

We are continually exploring options to invest in renewable energy-generation technologies or to buy electricity from renewable sources. Our feasibility considerations include capital and operational costs, electricity generation relative to our operations' load requirements, GHG and environmental impacts, and the alignment of green investments with the remaining economic lives of our assets. The latter is particularly important as operations with a short life-of-mine are not suitable candidates.

ARM Platinum

At ARM Platinum mining operations, we explored specific options to wheel renewable energy. We found that over 20 years wheeling 100MW of renewable energy would generate some 4 900 000MWh of electricity and save around 4 800 000tCO₂. In the second half of F2023, we concluded a 20-year power purchase agreement with an independent power producer for wheeling 100MW of solar PV power to ARM Platinum's mining operations. This renewable power supply will be split among the operations. Construction of the power plant will begin in F2024.

Eskom is building a new 132kV transmission line to meet increased electricity requirements associated with the Two Rivers Merensky project. Construction completion and commissioning is planned in F2024 in time to meet the new Merensky concentrator plant's power requirements. This investment in network infrastructure would further contribute to the potential for wheeling renewable power to the mine.

ARM Ferrous

In line with ARM's decarbonisation pathway process, investigative work is underway, looking at a possible energy blend for our Northern Cape operations, including the combination of solar, battery storage, wind and gas. These investigations will take into account carbon implications (carbon credits, carbon taxes and international benchmarks), assess energy security potential, and evaluate different cost models (eg outright ownership versus sourcing power from independent producers).

Parallel processes have been initiated to secure the necessary environmental authorisations to enable the timeous delivery of the chosen solution/s following these initial investigations and subsequent detailed feasibility study. We expect some renewable solutions to be implemented from F2027.

With a view to reducing emissions in the medium term, we are considering collaborations with others while optimising energy efficiencies at our operations.

Managing change

We manage rising operating costs associated with climate risks as part of our short-term strategy (to F2026). Our medium-term strategy (F2027 to F2030) is influenced by expected changes in regulations and market demands that pose both risks and opportunities. For instance, regulatory changes will affect the price and supply of energy and water. This is especially true for geographies where climate changes are expected to be severe, and where resulting regulatory changes will impact our ability to operate.

In terms of market demands, in recent years we have seen how making higher-grade "cleaner" products that yield fewer emissions gives us a competitive advantage in the growing Asian market. As the global economy becomes more carbon-constrained, we expect this demand will become increasingly material. For example, and as per our climate-scenario analysis, demand for manganese is projected to increase because it is a key component in lithium-ion batteries used in electric vehicles. As demand for electric vehicles grows, so will demand for manganese. Demand for platinum is expected to increase given its key role in the hydrogen economy, and given climate-related drivers in transport and industry. The supply and price of thermal coal is also likely to be materially impacted going forward. We integrated all these factors into our strategic and operational planning processes in F2023.

Carbon pricing and decarbonising future capital expenditure

Carbon pricing is now universally accepted as critical for driving decarbonisation towards the global 1.5°C climate goal. Projections on the potential carbon price in different jurisdictions vary and there is considerable uncertainty on how governments will set prices over time. It is expected that, even under business-as-usual conditions, carbon prices will translate into increased operating costs for ARM.

Our F2021 scenario analysis explicitly considered how different potential carbon prices affect the costs of supplying our commodities to global markets, the potential impact of these costs on demand for our products, and the possibility of border-tariff adjustments to create level playing fields in these markets.

ARM range of assumed internal carbon prices (US\$) in F2021 scenario analysis

	2025	2030	2040	2050
South African carbon tax (business-as-usual scenario)	10	12	20	33
1.5°C – supportive	45	83	160	200

In the case of avoided power supplied by the Eskom grid, it is assumed that a carbon price could only be passed through the electricity price, but the timing of it is uncertain.

We modelled a range of carbon tax pass-through costs, assuming a grid emission factor based on South Africa's integrated resource plan's technology mix, and a range of effective tax costs that could be passed by Eskom. Avoided costs, based on the zero-carbon electricity generated and consumed by our operations, were considered over the life of the assets to determine a range of impacts on the project's internal rate of return.

The actual carbon price in South Africa, reflected in the carbon tax, has been incorporated into our internal carbon price. In F2023/24, we are using this internal carbon price to evaluate new projects and acquisitions, applying a range of carbon prices to our prefeasibility studies for energy solutions in the Northern Cape, for example.

Initial evaluations provided some insight into the financial implications of a project that reduces carbon-tax liability, and generated lessons for integrating an internal price of carbon into ARM's new projects and acquisitions. Our internal carbon-price assessments are parallel processes to the feasibility studies that demonstrate the internal rate of return when considering potential avoided carbon tax costs.

We also identified a range of potential carbon prices relevant to developed-country markets of up to US\$75 in 2025, US\$130 in 2030, US\$205 in 2040 and US\$250 in 2050. As part of the next iteration of our climate-scenario analysis, we will undertake further quantitative analyses to explore the implications on demand for our products. We will incorporate our range of carbon prices into subsequent renewable energy and other feasibility studies

at our operations to consider the potential reduction in carbon liability and the contribution to our emission-reduction ambitions on the overall feasibility of projects.

We will continue to explore the ways in which our future capital expenditure can support the delivery of our climate-change strategy. Key parts of this include the phasing out of coal at the end of our mine's lives, and investments in renewable energy and low-carbon metals. Climate-change risks and opportunities are also contributing to our impetus to invest in innovation, and we are investigating and testing technology that may reduce energy requirements in the smelting process. To take this forward, we will develop a strategy and plan to explicitly align our future capital expenditure with our decarbonisation goals.

Risk management

ARM faces material risks and opportunities linked both to the transition and physical climate impacts. We have described these risks in the sections that follow, detailing their causal factors and residual risk ratings, our risk treatments, and how the risks affect ARM's strategic objectives.

Climate transition risks and opportunities

The global transition to low-carbon energy and low-carbon industry presents multiple risks for ARM, including: changing demands for platinum group metals (PGM) and thermal coal; divestment from carbon-intensive activities; increased operating costs associated with carbon pricing; high costs and carbon intensities of key energy

sources; limited availability and high cost of mitigation measures; and social unrest and disruptions. Yet, transition opportunities exist too, including: increasing demand for commodities in our portfolio, including bulk and base metals; demand for zero- and low-carbon mining and metals products; and increasing access to low-cost capital for activities aligned with global climate objectives.

In our F2022 report, we detailed how demand for our current portfolio of products is expected to change under different climate scenarios.

 See page 29 of the 2022 report.

In table 1, we detail our responses to key climate-transition risks and opportunities.



Generator repair at Khumani Mine

Table 1: Responding to climate-transition risks and opportunities

CATEGORY: Policy and legal	
RISK	Carbon tax: increase in carbon tax cost profile, or costs to achieve carbon neutrality
RESIDUAL RISK RATING	High
CAUSAL FACTORS	IMPACTS
Exceeding energy generation threshold (10MW installed capacity) at various operations or undertaking a specified activity (eg ferromanganese smelting)	Financial: In F2023, ARM paid just under R3 million indirect carbon tax (through Assmang, its joint venture with Assore South Africa Proprietary Limited). In F022, Two Rivers Mine paid carbon tax only as part of the fuel levy
Progressive expansion of carbon tax coverage into other areas (eg electricity price)	Threatens the sustained profitability of the business
Capex-intensive process to achieve carbon neutrality	Increased capital demand in a fluctuating commodity cycle to support/build emission-reduction initiatives
Carbon-neutral strategy is not aligned with the government carbon tax roll out.	Financial: exposure to greater carbon tax cost burden
External local and international regulatory evolutions in response to just transition targets and initiatives	Financial: mismatch in budgets/benefits; financial outlay in preparation for mandatory phase of climate-change bill may not be realised in the anticipated period
Anticipated changes in international carbon tax structures and systems	Financial (upside): proactive investment may reap financial benefits for ARM. The benefits of participating in phase 1 of the
Carbon budgets and associated mitigation plans	carbon budget include a 5% tax-free allowance for first phase of carbon tax
	Legal compliance and reputation: ARM has a mature GHG reporting system that complies with regulations.
	Additional and onerous reporting regulations.
	Resource efficiency incentives: financial benefits associated with resource efficiency measures (eg Income Tax Section 12I)

RISK TREATMENT

Developing decarbonisation pathways and operation-specific targets that are key for mitigating carbon-tax liability and mitigating risks associated with carbon budgets and GHG emissions

Exploring emission-reduction initiatives, setting remuneration incentives for employees, and exploring opportunities to invest in renewable energy technologies (eg solar PV energy) in all operations

Procuring clean energy from renewable sources (eg wheel renewable energy to ARM's Platinum division, possible energy blend at ferrous division operations, page 38).

Implementing rigorous measurement and monitoring process GHG emissions

Proactive measures: ARM has developed individual mass balances for Cato Ridge Works and Cato Ride Alloys to improve measurement and reporting of process GHG emissions. This also enables compliance to requirements to improve emission calculations from tier 1 (default) to a higher tier. Both operations are currently reporting on tier 3 and complying with requirements

Participating in the extension-phase carbon budget, interrogation of and compliance with draft carbon budgets for our smelters and upcoming carbon budgets for our mines, followed by allocation and management of operation-specific carbon budgets once phase 2 carbon budgets are legislated

CATEGORY: Technology	
RISK	Technology substitution (electric vehicles) could lead to increased or decreased demand for PGMs, depending on the technology. Other markets will need to be found for those where demand drops
RESIDUAL RISK RATING	High
CAUSAL FACTORS	IMPACTS
<p>Evolving and disrupting technologies are continually being evaluated to deal with decarbonisation objectives</p> <p>Changes in demand and supply of various metals driven by commodity prices and changing demand and supply patterns</p> <p>Our 1.5°C-supportive scenario sees global sales of electric cars increasing 18x by 2030 relative to 2020 (subject to availability of critical minerals). Even in our business-as-usual scenario, we see growth in electric vehicle deployment affecting demand for palladium and rhodium in autocatalysts</p> <p>Additionally, driven by commodity prices, substitution risks remain where certain autocatalysis may be substituted by manufacturers</p>	<p>Financial: increase or decrease in revenue and return on investments</p> <p>Growth: access to new markets (platinum). Despite existing barriers, energy companies continue to invest in green hydrogen as it is seen as critical for climate transition and key for achieving our global climate goal</p> <p>Financial: opportunity to invest in electric vehicle technology for mining fleets</p>
RISK TREATMENT	
<p>ARM would need to move towards more PGM production (eg at Two Rivers Mine)</p> <p>Growth direction: any additional investments in PGMs will consider operations with the potential to be competitive in terms of cost position</p>	<p>As PGM prices continue to fluctuate, underlying analysis in market fundamentals remains standard practice</p> <p>Investigations as an industry into the practicality of swapping diesel fleets to electric-vehicle fleets for both opencast and underground mining operations</p>

CATEGORY: Markets	
RISK	Access to growing markets for high-quality iron and manganese ore
RESIDUAL RISK RATING	Medium to high (opportunity)
CAUSAL FACTORS	IMPACTS
<p>Lumpy iron ore enables steel producers to reduce energy consumption and GHG emissions by about 10%</p> <p>High-grade manganese ore required for battery storage purposes</p> <p>Increased demand for higher-grade ores due to lower carbon emissions and improved process efficiencies</p>	<p>Financial: increase in revenue and return on investments. ARM is a preferred supplier due to higher-grade ore mined</p>
RISK TREATMENT	
<p>ARM has an established pool of global long-term contract iron-ore customers that are considered as value-in-use customers as they derive additional value from our high-grade iron ore products</p> <p>ARM is well positioned to meet increasing demand for high-grade iron ores. The 65% lumpy iron ore (industry benchmark: 62%) and 64% iron ore fines (industry benchmark: 62%) that ARM produces can reduce carbon</p>	<p>emissions from the steel-making process. 58% of ARM's total iron ore product is lumpy, and 42% is fines. Lumpy ore attracts a premium of 10–15% and an additional grade premium of 4.8%, with the grade premium for iron ore fines 4% over the base price for 62% fines</p> <p>Using scenario-analysis results to inform strategic decisions on the composition of ARM's future portfolio</p>

CATEGORY: Markets	
RISK	Access to new markets (eg PGM and critical minerals for energy transition)
RESIDUAL RISK RATING	Medium to high (opportunity)
CAUSAL FACTORS	IMPACTS
<p>Platinum is expected to play a key role in the green hydrogen economy and demand is expected to increase to support climate-related changes in the transport sector (rising demand for fuel-cell electric vehicles) and in industry</p>	<p>Financial: increase in revenue due to diversification of markets</p> <p>Sustainability: threatened sustainability due to investment in commodities that feed "future" technologies</p>
RISK TREATMENT	
Regular monitoring of developments in the platinum market as well as initiatives to stimulate and support the hydrogen economy	

CATEGORY: Reputation	
RISK	Increased stakeholder expectations and interest on climate change
RESIDUAL RISK RATING	High
CAUSAL FACTORS	IMPACTS
<p>Not adequately responding to evolving, and increasing, climate change-related stakeholder expectations. In particular, we face growing pressure from investors to proactively manage climate-change risks and opportunities, which are increasingly seen as material to shareholder value</p> <p>Unrealistic expectations by external stakeholders</p>	<p>Financial: diminishing share performance</p> <p>Reputation: negative perception of ARM's commitment to climate change</p>
RISK TREATMENT	
<p>Regularly engage and partner with stakeholders through a range of approaches to understand their concerns and challenges, and identify avenues for achieving resilience</p> <p>Production and dissemination of an annual ESG report that details ARM's strategy and results relating to ESG and climate change</p> <p>Integrated approach (systems, reporting, capacity building) to comply with evolving climate-change regulations and meet reporting expectations on climate change and water</p>	<p>Communities receive additional benefits from the mines and smelters through our CSI and local economic development (LED) investment programmes. We are developing social and labour plans that focus on sustainable initiatives. We are conducting social studies to ensure sustainable social initiatives are undertaken, and to better understand community requirements.</p> <p>We are running climate-change risk workshops to better understand the impact of climate change from a social perspective</p>

CATEGORY: Reputation	
RISK	Shifts in consumer preferences and ESG-related priorities
RESIDUAL RISK RATING	Medium to high
CAUSAL FACTORS	IMPACTS
<p>By affecting global demand for several major commodities, global climate action will have severe business impacts for mining groups</p>	<p>Financial: diminishing share performance</p> <p>Reputation: negative perception of ARM's commitment to climate change</p>
RISK TREATMENT	
<p>Using scenario-analysis results to inform strategic decisions on ARM's portfolio</p> <p>Developing ambitious and operation-specific decarbonisation pathways to ensure ARM's products can compete in global markets increasingly demanding zero- or low-carbon mining products</p> <p>Continuous improvements through our ESG initiatives has a positive spin-off on our emission-reduction measures</p>	

Physical climate risks and opportunities

This year, there has been increased focus on the physical impacts of climate change given impacts that are being experienced around the world. Record-breaking temperature and extreme weather events have significantly impacted people and economies. There is a sense that the impacts of climate change are going to be more significant than many have anticipated, and that they may materialise sooner.

All our operations are vulnerable to physical climate risks. Changing or extreme climate patterns pose direct and indirect risks to ARM, including: damage to fixed assets and equipment; compromised operational performance of facilities with long life spans (eg TSFs, water and waste-rock storage facilities); output disruptions and damage; and disrupted supply chains. The impact of extreme weather events has already been felt across most of ARM's mining sites, and some of our operations will face increased risk exposure in future.

In F2023 and continuing in F2024, ARM is investing in better understanding the physical impacts of extreme temperature, extreme rainfall and evapotranspiration on each operation up to and beyond 2030.

 See page 51.

We describe our responses to key physical climate risks in table 2.



In the pit at Beeshoek Mine

Table 2: Responding to physical climate risks

CATEGORY: Acute	
RISK	
RESIDUAL RISK RATING	
CAUSAL FACTORS	
IMPACTS	
RISK TREATMENT	
Increased severity of weather events: drought or reduction in available water	
High	
<p>Long-term decrease in annual rainfall (drought)</p> <p>Rainfall intensity and magnitude worsens</p> <p>Increase in extreme weather (severe storms, high winds)</p> <p>Impacts on water-supply infrastructure</p> <p>Vegetative invasion in dams</p> <p>Increased demand for water after implementing projects</p>	<p>More frequent and severe drought conditions and increased aridity</p> <p>Greater risk of more frequent and severe flash floods</p> <p>Compromised water availability, paired with regional water infrastructure problems</p> <p>Disruptions to production</p> <p>Safety risks</p> <p>Limited operational expansion</p> <p>Impact on supplies</p> <p>Greater investment in risk-reduction measures</p> <p>Possible reputational damage: for example, due to the perception that Khumani Mine uses all of neighbouring Sishen's water and that Beeshoek Mine is not optimising water consumption</p>
<p>Investment in bulk-water infrastructure as part of industry/government collaboration</p> <p>Participation in the Vaal Gamagara Water Supply Scheme (VGWSS) – a public-private collaboration to improve water supply in the Northern Cape</p> <p>Khumani Mine is accessing a once-off total of 2.1 million m³ of water (process water and rain) from neighbouring Sishen mine</p> <p>Paste technology used at Khumani Mine for TSF (recovering up to 85% of water), and long-term investment for on-site water storage</p> <p>Beeshoek Mine has invested in pumping capacity and revised road designs to improve water drainage during heavy rainfall</p> <p>Black Rock Mine is investing in a combined sewage treatment plant that will provide potable water for the village and reduce quantity of potable water withdrawals from the Vaal Central Water Board. However, approval for this licence is still pending.</p>	<p>In the interim, Black Rock Mine is focused on constructing the centralised wastewater system. Investment in a system to divert grey water to the village for irrigation will further reduce the mines' withdrawals from the Vaal Central Water Board.</p> <p>Participation in Lebalelo Water User Association (WUA) to supply bulk raw water</p> <p>Two Rivers Mine is conducting more active cleaning of pollution-control dams, buffer, and settling dams to build capacity</p> <p>Modikwa Mine has maintained its focus on removing alien vegetation to improve the availability of water to users in the catchment</p> <p>Nkomati Mine has commissioned numerous studies to address water challenges associated with the mine being under care and maintenance and, ultimately, closure (page 92)</p>



CATEGORY: Acute	
RISK	
RESIDUAL RISK RATING	
CAUSAL FACTORS	
IMPACTS	
RISK TREATMENT	
Increased severity of extreme weather events: flooding or high rainfall	
Medium to high	
<p>Floods with higher peaks and shorter lag times that occur fast and with little warning</p> <p>Designs of various equipment and infrastructure (eg TSFs) do not account for increased rainfall</p> <p>Low freeboard and inadequate stormwater management</p>	<p>Operational interruptions</p> <p>Structural instability</p> <p>Uncontrolled discharge of excess water into the environment</p> <p>Controlled discharge</p> <p>Legal non-compliance</p> <p>Reputational and financial consequences</p> <p>Increased financial investments in dewatering processes, construction of water-related infrastructure with large retention capacity, and improved treatment of discharge water required</p>
<p>Proactive water use management in line with licences and regulatory commitments</p> <p>All operations run closed-water circuits and have developed tools to optimise use and management of water</p> <p>Discharges only take place in line with permits in times of extreme precipitation or in emergency situations, and are reported to authorities</p> <p>Nkomati Mine is exploring options to mitigate discharge of water during the care and maintenance phase and as it moves to closure. In May 2023, Nkomati Mine reported that discharge is certain post April 2024</p>	<p>Machadodorp Works has established a water management project team and constructed cut-off trenches to capture and redirect any dirty run-off water to the sump first, and then to stormwater dams</p> <p>After flooding in the Beeshoek Mine community (Boichoko) in F2023, Assmang committed R6.5 million to assist the Tsantsabane local municipality with constructing stormwater channels. This commitment should benefit over 18 200 community members and create 20 temporary jobs.</p>

Risk management continued

CATEGORY: Acute	
RISK	Increased severity of extreme weather events affecting electricity costs and supply
RESIDUAL RISK RATING	Medium
CAUSAL FACTORS	IMPACTS
Supply of coal and other products used in generating power are interrupted	Exacerbated existing power-supply risks
Damage to infrastructure	Operational interruptions
Increased use of diesel for alternate power supply given ongoing load curtailment	Reputational and financial consequences
	Threatened sustainability of the business and failure to achieve objectives
RISK TREATMENT	
Monitoring extreme weather events	
Emergency plans in place to respond	
Mitigating unplanned electricity-supply interruptions by using diesel generators and ring-feeder power supplies	
Exploring on-site renewable power options	
Quarterly meetings with Eskom to communicate with the group electrical engineer about power outages that may affect the various operations	

CATEGORY: Chronic	
RISK	Changing rainfall patterns in Vaal catchment
RESIDUAL RISK RATING	High
CAUSAL FACTORS	IMPACTS
Northern Cape operations are fed by the Vaal Central Water Board which sources water from the Vaal River. Drying is expected in the north and west parts of the catchment, but increased rainfall is expected in the south and east	Shifted hydrogeological balances in the catchment which lead to stress on these water resources
	Threatened long-term security of water supply
	Impacts on production
	Limiting operational expansion
	Impact on supplies
	Investment in risk-reduction measures
RISK TREATMENT	
Along with the Vaal Gamagara Water Supply Scheme (VGWSS), exploring extent to which relevant authorities have considered projected impacts of changing rainfall on future supply from the Vaal River	
Determining the role ARM can play in ensuring appropriate response measures are put in place	
Khumani Mine is undertaking studies to explore whether projects are needed to manage higher rainfall levels	
Lesotho Highlands phase 3 has been approved	

CATEGORY: Chronic	
RISK	Rising mean temperatures affecting our workforce
RESIDUAL RISK RATING	Medium
CAUSAL FACTORS	IMPACTS
Temperatures are expected to increase 2.5–5°C by 2100 along with increases in the occurrence, duration and magnitude of heatwaves	Halting or downscaling operations to prevent heat stress during extreme high temperatures
	Requirement for investment in under- and above-ground cooling solutions
	Operational and workforce efficiency issues
	Inability to access reserves and resources, especially if they are deep
RISK TREATMENT	
Weather data monitored continually and action taken if temperatures exceed a threshold to prevent heat stress	awareness about the risks of increased temperatures and importance of staying hydrated during extreme heat events
Results of climate-scenario analysis used to inform more robust climate-impact assessments	Ventilation management for underground operations
After heatwaves in the Northern Cape led to multiple deaths in January 2023, Beeshoek Mine has been working to raise	Heat tolerance assessments for employees

CATEGORY: Chronic	
RISK	Increasing social unrest related to climate-change impacts on wellbeing of communities in which we operate
RESIDUAL RISK RATING	High
CAUSAL FACTORS	IMPACTS
Livelihoods and wellbeing of communities through, for example: reduced food security; higher temperatures affecting health; increase in chronic illnesses and diseases; and increasing costs of living	High levels of social unrest and destruction of assets and infrastructure
Social pressure for communities to be involved in, and benefit from, alternative-energy (eg solar PV) projects	Compromised ability to source local workforces and secure mining rights
	Exacerbated employee relations issues
	Industrial action and production losses
	Additional capex or investments in decarbonisation and resilience
RISK TREATMENT	
Employee relations policies	Broader contribution to South Africa's economic development through the mining charter and dtic
Engagement with communities, government and other stakeholders	Identifying where existing work to improve community resilience can be scaled up, and where new transformation initiatives are needed
Investments in line with our social and labour plans	Guided by the community chief, and through their CSI budget, operations contribute to community resilience through various avenues (eg bursaries, health support, water storage and toilets for schools)
BEE compliance	
Leveraging LED and CSI spending	

CATEGORY: Chronic	
RISK	Supply-chain interruptions due to climate change-induced events (storms, rainfall, high wind, supply-chain disruptions)
RESIDUAL RISK RATING High	
CAUSAL FACTORS	IMPACTS
Droughts and extreme rainfall events	Impacts to our value chain, operation logistics, and product sales Interruptions to supplies and shipment of materials
RISK TREATMENT	
Prioritising suppliers/supply chains to include in our risk analysis	
Modelling impacts, assessing risk profiles, and developing mitigation measures/other recommendations	

CATEGORY: Acute	
RISK	Operational interruptions from infrastructure failure due to climate-induced weather events
RESIDUAL RISK RATING High	
CAUSAL FACTORS	IMPACTS
Extreme flooding and storm damage Damage to Transnet, Eskom and water infrastructure Poor service delivery from municipalities to repair infrastructure	Cost increases and financial and operational inefficiencies
RISK TREATMENT	
Contingency plans in place to mitigate disruption	
Logistics planning	
Engagement with Transnet and service-level agreements	

Integrating climate-change risk into ARM's ERM processes

During the scenario-analysis process, it became clear that climate risks have real financial implications for our business, both through the potential capital investments we may require to continue operating, as well as potential operational interruptions. It was apparent that identifying, evaluating and managing these risks required detailed quantified information. We also realised that a well-developed risk severity scale, able to incorporate climate risk impacts, may be necessary to communicate physical climate risks at operational and corporate levels. Although the current scales we use largely meet these requirements, we will continue to review and refine them to ensure they are fit for purpose and accommodate climate change-related causes and impacts.

Climate risks and climate resilience will be assessed in all relevant aspects of ARM, including existing processes, practices, standards and guidelines, in all phases (planning/design, operational and closure). Ultimately, these climate-change

risks and opportunities will also be integrated into mainstream filings, including income statements, cash flow statements and balance sheets.

A roadmap to integrate climate change fully into our ERM process was finalised in August 2021, and implementation began in F2022. This roadmap includes improving data on climate impacts, and refining risk-rating scales to accommodate climate-specific impacts. It also includes assessments of climate-impact thresholds at operations and mitigation measures necessary for negating risks. These have fed into developing a climate knowledge base which is being used to meet the climate-related requirements of the GISTM.

In F2023, we concentrated on incorporating climate change into our ERM processes, and began working with the business to explore operation-specific impacts associated with projected physical climate changes.

We have scheduled risk workshops with each operation to help employees understand current and future physical climate risks (to the

business, and to the operation's supply chain and product transport system) associated with extreme temperature and extreme precipitation. An example of this analysis is provided in figure 4. Employees will also consider some social aspects given that communities within the examined geographical area are vulnerable to the same climate risks as the operations, and that their responses to these risks can present additional risks for the operations.

We plan to complete the risk profiles by March 2024. We expect that, at least initially, the workshops may yield more questions than answers, and that subsequent actions will be needed to enhance our detailed understanding of the potential risk. However, as we refine the risk profile, a more comprehensive view of the risk will develop.

Going forward, we will also place more emphasis on assessing risks in the supply chain, and developing systems to ensure more structured, ongoing assessments of climate risks.

Figure 4: Example of operation-specific climate projections

Long-term trends at this operation indicate that average temperatures and the duration of heatwaves will increase significantly. At the same time, higher rates of evapotranspiration (and therefore less surface water) and less rainfall will increase the risk of drought (currently medium risk) and water stress (currently high risk). More intense late-season rains will increase the likelihood and magnitude of return events, particularly from overland flows from higher terrain.

	CURRENT	UP TO 2030	BEYOND 2030	
Annual average rainfall	944 mm <small>Anomaly of:</small>	961 to 844 mm <small>1.8 to -6.4%</small>	956 to 883 mm <small>1.3 to -6.5%</small>	The major changes occur from September to January.
Peak rainfall intensity (February)	7mm/hour <small>Results in an increase in the magnitude of the 1:100 extreme return event of:</small>	-0.7 to 2.3% <small>1.8 to 1.9%</small>	4.3 to 5.9% <small>2.1 to 2.5%</small>	Despite the low percentage values, the increase in peak rainfall intensity will be significant. This will lead to already extreme events becoming more extreme.
Annual average temperature	21.9 °C	22.0 to 22.6 °C	22.4 to 23.1 °C	The largest anomalies are noted mostly in the winter months, but the more extreme events are in the summer months.
Heatwave duration	4.7 days	6.1 to 15.2 days	10.9 to 20.5 days	
Peak temperature	30.8 °C	32.1 to 32.3 °C	34.13 to 34.14 °C	
Evapotranspiration	1 126 mm	1 125.4 to 1 149.3 mm	1 151.6 to 1 178.7 mm	

Source data: Christensen OB, Gutowski B & Nikulin G. 2012. CORDEX Archive Design, version 2017/2012.

The impact of risks and opportunities on business and financial planning

Impacts on ARM's financial position and performance

In recent years, climate change has had an impact on ARM's financial position and performance. At Nkomati Mine, we have experienced exposure related to rehabilitation and water management post-closure. In F2023, we completed a study to determine the costs associated with constructing a water-management plant, and are working to amend our WUL so that it permits us to decant the water. We have also had to respond to carbon tax legislation.

However, with the exception of Cato Ridge Works and Two Rivers Platinum Mine, most of our operations fall below the carbon-tax registration threshold, and our direct carbon tax liability is around R3 million per year.

In F2024, apart from capital required for the Vaal Gamagara Water Supply Scheme (VGWSS) refurbishment project, we expect no material adjustments relating to climate-related risks and opportunities. We are pre-empting climate-change risks and taking advantage of opportunities by investing in solar PV power at all our operations, working to reduce our reliance

on Transnet, and working to produce zero- and low-carbon metals.

In the short term, given that most of our products go to countries that do not have stringent climate-related requirements (eg China, India), we do not expect climate-driven market changes to negatively affect our financial position and performance.

On the positive side, market trends driven by climate change, among other issues, have seen an increase in demand for certain commodities. We continue to invest in PGMs and anticipate an increase in demand for platinum associated with hydrogen

to reduce GHG emissions in the transport and hard-to-abate industrial sectors.

Assmang has also recorded higher demand for better-quality iron and manganese ores as steel producers – most notably those in China – are driven to improve efficiencies, reduce emissions and curb air pollution.

Climate-change risks and opportunities have also contributed to the impetus to invest in innovation. We are investigating and testing technology that may reduce energy requirements in the smelting process.

Disruption to operations, suppliers and communities

In recent years, our operations, suppliers and communities experienced disruptions related to climate change.

In F2022, Two Rivers Mine, Black Rock Mine, Nkomati Mine, Beeshoek Mine and Machadodorp Works recorded unusually heavy rainfall and/or high winds that led to production losses, dam overflows and discharge events. Flooding in KwaZulu-Natal delayed the delivery of spare parts (particularly associated with Caterpillar and Toyota machinery) at various ARM operations. Although these delays generated challenges, for most mines they did not result in any production stoppages or other material impacts. Cato Ridge Works, however, was heavily impacted by flooding and inclement weather. Its stormwater-management systems were pressurised, furnace batch plants were overwhelmed, feed chutes were blocked, cables failed, and material feeding into the furnace had high moisture contents. These challenges significantly reduced efficiencies (including the need to adjust to lower-quality ores and lower-quality sinter), and led to an estimated production loss of

R42 million, and repair costs of R2.5 million.

Production at Cato Ridge Works was also affected by excessive regional rainfall and high temperatures in F2023. A combination of direct production losses (furnace out due to water leaks as a result of high temperatures and blocked feed chutes) and indirect production losses (power lost due to warm-up cycles following lengthy downtimes) is estimated to be 1 800 tonnes of high-carbon ferromanganese.

In 2023, increased rainfall at Modikwa Mine led to flooding in underground operations, overflow of all stormwater facilities, and road damage along with the supply chain. Fortunately, the mine responded quickly and was able to switch off operations in time to prevent equipment damage. The impact on production was minor, and the mine recovered operations quickly.

Across our operations, loadshedding required greater use of backup generators that support critical functions, such as ventilation fans, which increased diesel consumption and associated emissions.

Social unrest and strikes have impacted the resilience of our operations and of the communities in which we operate. For example, the Lebalelo pipeline in Limpopo province was damaged in 2015 by local communities that had social funding expectations beyond the prescripts of Two Rivers Mine's social and labour plans. Incidents continue sporadically, though less significantly.

Considering climate-change risks in ARM's investments

ARM Coal

ARM's investment in coal has an effective 20.2% share in the Participative Coal Business

(PCB) and an effective 26.01% in Goedgevonden (GGV). Our partner, Glencore Operations South Africa (GOSA), owns the remaining stakes.

GGV is an open-pit mine producing around 7Mt of saleable thermal coal per year, with a life-of-mine of 20 years. PCB includes Impunzi (open-pit operation), and Tweefontein (open-pit operation following the discontinuation of underground operations in F2022). PCB produces some 15.3Mt of saleable thermal coal per year and has a life-of-mine of approximately 13 years. Export coal is marketed and sold by Glencore International to various markets, mainly in India.

Information on coal resources and reserves appears on page 95 of ARM's IAR.

GGV is governed by a management committee controlled by ARM Coal, with ARM and GOSA representatives. Operational management is contracted to GOSA. PCB is governed by a supervisory committee with representatives from both ARM and GOSA, and is operated by GOSA.

Climate-change risks are assessed and tabled as appropriate at quarterly steering committee meetings. GHG emissions associated with the operations are measured and then consolidated by GOSA during its mandatory reporting for all its South African operations. ARM has reported on GHG emissions attributable to its investment in ARM Coal.

See page 67.

ARM and Glencore have both committed to net-zero total emissions by 2050 and have decided to continue operating their coal mines until they reach the end of their lives. Initiatives continue to decarbonise PCB and GGV. Options include collaborating with supply chains, supporting uptake

and integration of abatement, using technologies to improve resource efficiency, and being transparent in reporting on progress and performance. In addition, the operations have commissioned a 300KW solar project and are investigating additional projects with an estimated capacity of 60MW.

ARM recognises that global emission-reduction initiatives and the move to cleaner mobility and energy are expected to put pressure on thermal coal demand. But they also create opportunities for other commodities in our portfolio.

Harmony

ARM owns 12.12% of Harmony's issued share capital. Harmony is run by its own management team who are responsible for its mineral resources and reserves, which are reported on annually. In F2022, we engaged with Harmony to report on our scope 3 emissions attributable to this investment, and explored its approach to identifying and managing climate-related risks.

Currently, Harmony monitors and reduces energy use and GHG emissions. In line with its strategy of moving towards an alternative energy supply mix within the next five years (page 68), Harmony is actively reducing its grid-electricity consumption and GHG emissions

with both year-on-year and multiyear targets.

The company has also completed a climate-scenario analysis and determined that its greatest physical climate impacts will be water related. Increasing temperatures – which could affect underground ambient temperatures, particularly in deeper-level operations – will also have an impact.

Harmony has identified climate-transition risks that could increase business costs and undermine the long-term viability of operating deep-level mines. It continues to undertake robust business planning to consider these risks.

In F2022, Harmony published its third report on climate change in line with TCFD requirements.

Other

ARM's risk processes do not include African Rainbow Capital and African Rainbow Energy and Power. They are separate companies, not part of ARM group, with their own processes for assessing and managing climate change-related risks and opportunities.

Enhancing community resilience

ARM is committed to fostering climate resilience and sustainability,

and contributing to a just energy transition. To this end, we are working to integrate climate change into our existing development programmes and transformation initiatives, with the goal of improving the resilience of our host communities to physical and transitional climate risks.

In F2023, to initiate this integration process, sustainability and community affairs teams from each operation participated in a workshop where they were introduced to ARM's climate analyses, and where they discussed options for improving collaborations between the two teams and the benefits of doing so. They highlighted the need for improved climate awareness, and for a climate lens through which they could view their development and transformation activities. They also emphasised that, by exchanging knowledge across teams, they could leverage their collective expertise.

Going forward, and to embed "climate resilience first" thinking across the organisation, the integration work will involve co-development of a strategy that encompasses climate and development activities, and the development of practical tools that can support implementation of the strategy.

GHG emissions

Improved emissions accounting at Cato Ridge Works and Cato Ridge Alloys

The carbon tax requires that Cato Ridge Works (CRW) and Cato Ridge Alloys (CRA), as separate legal entities, disclose emissions and pay carbon tax separately. Additionally, mandatory GHG reporting regulations require that we adopt a Tier 3, or mass balance, approach to account for emission sources.

While we have historically applied a Tier 3 approach to calculate process emissions for Cato Ridge Works as a whole, we were previously unable to split CRW and CRA using this approach and therefore applied a Tier 1, or default, emissions approach for the two entities.

In F2021, we implemented measures to apply a Tier 3 approach, with the net effect being that carbon tax liability increased

significantly for CRW and decreased significantly for CRA. This is because, in a Tier 1 approach, emissions associated with producing molten metal are included in the medium-carbon ferromanganese default emission factor, while in a Tier 3 approach the only input into the CRA mass balance calculation is molten metal (high-carbon ferromanganese), and the only outputs are dust and slag (MCFeMn). The embodied emissions in the molten metal (ie the process emissions used to produce that molten metal) are included in the CRW account.

In F2023, we have continued to refine the Tier 3 approach, and engaged with the DFFE on the process for submitting and obtaining approval. We have also continued to improve emissions accounting at Cato Ridge Works where ARM's process emissions represent 44% of our scope 1 emissions and 10% of our

scope 1 and 2 emissions on an operational-control basis. Additional improvements include:

- More accurate estimations of carbon content of dust and slag associated with production
- Adding carbon contents from fine ore sources (Gloria and Nchwaning)
- Subtracting carbon captured in metal recovery plant product
- Adding metal recovery plant production to calculate emissions intensity
- Using tapped (hot) metal tonnes to calculate emissions intensity (ie removing the impact of losses on the mass balance calculation).
- We submitted calendar year 2022 GHG data, based on this Tier 3 calculation approach, to the DFFE. This data, along with supporting documentation including the methodology used, was accepted.

Scope 1 and 2 emissions

Our GHG calculations are based on the GHG Protocol, first published by the World Resources Institute and World Business Council for Sustainable Development in March 2004. Our data-collection process also complies with the data-quality requirements set out in ISO 14044, as well as GRI Standards. Our total scope 1 and 2 GHG emissions are externally assured each year.

Until now, our targets have used F2018 as a base year. Going forward – including for the short and medium-term targets presented

in this report – targets will use F2023 as a base year.

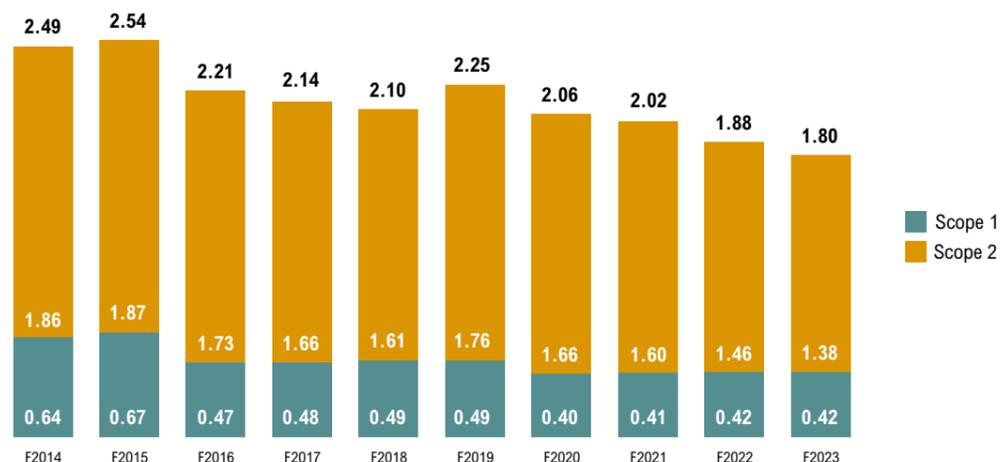
The emissions attributable to our operations primarily come from the consumption of electricity produced by coal-fired power stations and the combustion of fossil fuels during our mining, load-and-haul, materials handling and processing activities. We monitor and report on our emissions data internally every quarter, and discuss them at operational sustainability meetings and at quarterly meetings of the ARM social and ethics committee.

Scope 1 emissions mainly relate to diesel consumption for load-and-haul activities and reductants, such as at Cato Ridge Works. Electricity consumption (scope 2 emissions) comprises 77% of our total carbon footprint.

GHG emissions changes over time

Over the last year, ARM's absolute scope 1 and 2 emissions have decreased by 4.0% (figure 5). This represents a 14% decrease compared to our F2018 baseline and a 28% decrease on the previous baseline in F2014.

Figure 5: ARM's carbon footprint scope 1 and 2 (100% basis), measured in MtCO₂e



Scope 1 emissions increased 1% year-on-year while scope 2 emissions decreased 5% year-on-year. The Eskom grid emission factor decreased by 2%. The carbon intensity of South Africa's grid remains a concern, as do the cost and security of supply drivers. We continue to explore lower-carbon power alternatives. Our electricity consumption (MWh) decreased by 4%.

reduced some of the efficiency benefits associated with the BRIX plant, resulting in relative reductions of 21 615tCO₂e for that year. Efficiencies were further reduced in F2022 as the operation had to adjust to lower-quality sinter, as well as to lower-quality ores, but also higher moisture contents in materials due to flooding.

See page 53.

Changes in emissions year-on-year are primarily due to:

- Changing furnace efficiencies at Cato Ridge Works:**
 In December 2019, ARM invested in a BRIX plant at Cato Ridge Works, to enable optimal reduction conditions. The process at the plant includes bonding "bricks" that contain nine streams, including metal fines, in optimal ratios. The bricks enable consistent sizing, which optimises air flow for the reduction of manganese. This has improved furnace efficiencies, and contributed to a reduction of 25 643tCO₂e in F2020 relative to F2018. The decision to process lower-quality ores in F2021



The new sinter plant, which became operational in F2023, improved sinter quality and contributed to addressing some of these efficiency challenges. The BRIX plant also continues to deliver efficiency benefits associated with bed porosity, relative to briquettes. The substitution of carbonate ore with sinter and of coke with biocarbon, along with various optimisation measures (page 63), delivered significant emission reductions in F2023 relative to F2022. An 10% reduction in absolute emissions (combined scope 1 and 2 emissions at Cato Ridge Works and Alloys) was achieved despite a 6% increase in the production

of high-carbon ferromanganese, and a 2% increase in the production of medium-carbon ferromanganese. Additional reductions are expected in F2024 once the improved sinter and biocarbon measures have been fully deployed.

- Changes in production output:**
 Production changes at various operations contributed to other changes over time. These include a 3.9% increase in PGM milled tonnes at Two Rivers and Modikwa mines, a 14.3% reduction in iron ore produced at Khumani and Beeshoek mines, a 3.5% increase in manganese ore at Black Rock Mine, a 6% increase in high-carbon ferromanganese and a 2% increase in medium-carbon ferromanganese at Cato Ridge Works. The metal recovery plant at Machadodorp Works ceased operating in February 2023.
- Projects:** Emissions at Two Rivers Mine increased 9.5%. This was partially explained by the 3% increase in tonnes milled, but the larger driver was additional activities associated with developing the Merensky project. On account of the focused effort

at Modikwa Mine to reduce the consumption of compressed air by over 10%, electricity at the mine decreased by 4% despite an increase in production (tonnes milled). Mobile diesel consumption increased by 17%.

- Changing operating conditions:**
 Mining deeper and further increased diesel consumption at several operations including Two Rivers, Khumani and Black Rock mines. A planned shutdown at Khumani Mine in December resulted in reduced electricity consumption.
- Electricity supply disruptions:**
 Load curtailment in F2023 necessitated the use of generator sets, particularly at Black Rock Mine, which has a 14MW-capacity diesel generator. ARM's stationary diesel increased by over 400% between F2022 and F2023 as a result.
- GHG emission-reduction initiatives:** Initiatives implemented since the beginning of 2019 are still actively contributing to savings, with 64 759tCO₂e saved in F2023. This contributed

a 3.5% reduction to the change in our scope 1 and 2 emissions compared to what they would have been had the initiatives not been implemented.

In F2023, Cato Ridge Works contributed 33% of the group's total scope 1 and 2 emissions. Modikwa Mine contributed 18%, Khumani Mine 17% and Two Rivers Mine 16%, mainly as a result of diesel consumption during mining and load-and-haul activities.

Table 3: GHG emissions per operation

Operational control boundary (100% basis)	F2023			F2022		
	Scope 1	Scope 2	Scope 1 and 2	Scope 1	Scope 2	Scope 1 and 2
(tCO ₂ e)						
Ferrous division						
Beeshoek Mine	42 000	34 265	76 266	39 513	38 957	78 469
Khumani Mine	118 212	194 861	313 073	111 195	212 847	324 042
Black Rock Mine	23 317	157 716	181 033	25 026	153 565	178 592
Cato Ridge Works	188 215	407 976	596 191	209 603	455 532	665 135
Machadodorp Works*	944	10 372	11 316	1 184	12 643	13 827
Total	372 689	805 189	1 177 878	386 520	873 544	1 260 064
Platinum division						
Nkomati Mine	583	6 854	7 437	334	7 911	8 245
Modikwa Mine	14 050	310 781	324 831	11 986	330 250	342 236
Two Rivers Mine	37 725	261 207	293 932	17 062	251 488	268 550
Total	47 358	578 841	626 200	29 381	589 649	619 030
ARM Corporate Office	52	398	450	12	396	408
ARM total	420 099	1 384 429	1 804 528	415 913	1 463 590	1 879 503

* 100% basis as Machadodorp Works is wholly owned by ARM.

Going forward, on account of our decarbonisation pathway (figure 3), we anticipate reductions in emissions despite plans to increase production (associated with the Merensky project at Two Rivers Mine and the development of Bokoni Mine).

Case study: Understanding GHG emissions at Cato Ridge Works

Through Cato Ridge Works (CRW), and Cato Ridge Alloys (CRA) ARM produces ferromanganese (FeMn) (IPCC Category 2C2).

CRW produces high-carbon ferromanganese which it sells to CRA as hot metal, and to market as final product. CRA further refines the hot metal to produce medium-carbon (and, in future, possibly low-carbon) ferromanganese.

To comply with the requirements of mandatory GHG reporting regulations to shift from Tier 1 (default) to a higher tier, CRW and

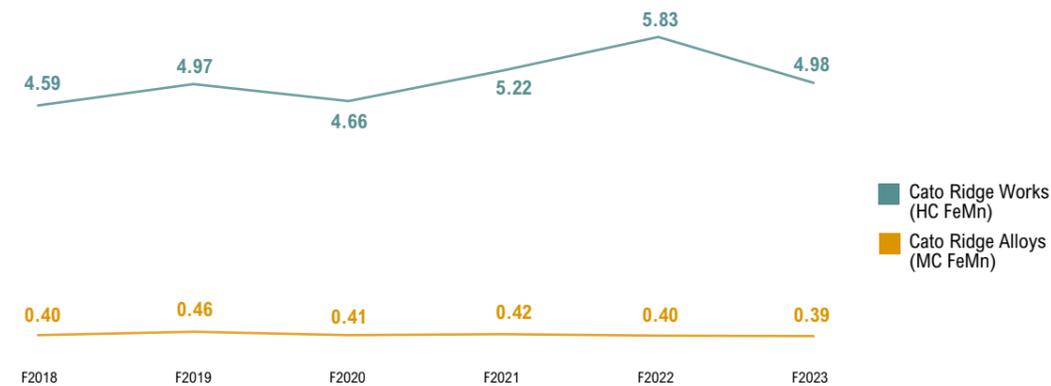
CRA now report data (via the DFFE's South African Greenhouse Gas Emissions Reporting System) calculated using a mass balance (Tier 3) approach.

CRW reports all process emissions associated with the production of high-carbon ferromanganese (regardless of where it is sold). CRA reports process emissions as the additional CO₂ released when

further refining the hot metal from CRW. Because of this relationship, the process emissions intensity that CRA reports for medium-carbon ferromanganese (figure 6) is significantly lower than IPCC default value (1.5tCO₂e/tonne).

Tier 3 data reported in March 2023, along with supporting documentation, was approved by DFFE.

Figure 6: GHG emissions intensity (scope 1 and 2) for CRA and CRW, measured in tCO₂e/tonne product



HC FeMn: high-carbon ferromanganese; MC FeMn: medium-carbon ferromanganese

GHG emissions intensity

Scope 1 and 2 emissions for ferromanganese production decreased from 3.8 to 3.3tCO₂e/tonne of product (figure 7). This was due to improved furnace efficiencies and the replacement of carbonate ore with sinter, and coke with biocarbon.

Scope 1 and 2 emissions per tonne of iron ore production increased 12.4% year-on-year (figure 8). This increase is partly explained by mining deeper and farther, but the bigger driver was production impacts associated with fluctuating demand and product-transport challenges. Energy consumption decreased but to a lesser extent than production decreases given the continuation of activities not linked to production, and inefficiencies associated with the instability caused by these drivers.

Scope 1 and 2 emissions for manganese ore production decreased 2.1% year-on-year (figure 8).

Scope 1 and 2 emissions for PGM ore milled at our two primary platinum mines, Modikwa and Two Rivers, decreased 2.5% year-on-year (figure 8).

Figure 7: Scope 1 and 2 carbon emissions for smelters, measured tCO₂e per tonne produced

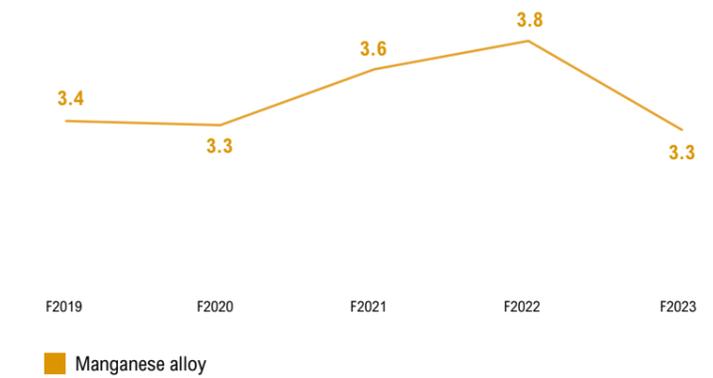
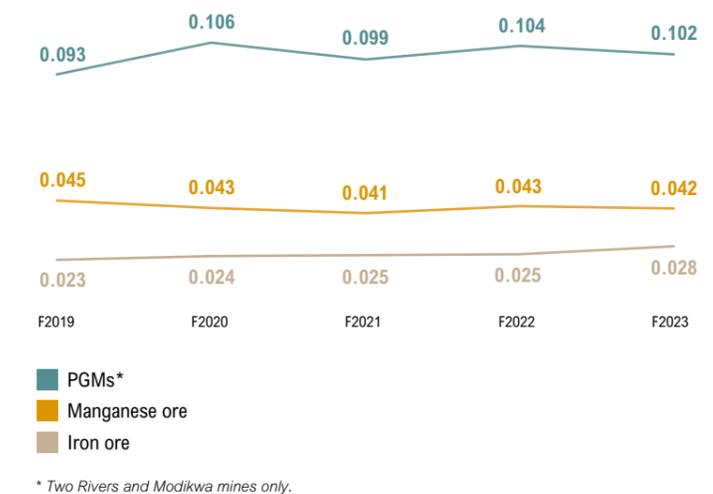


Figure 8: Scope 1 and 2 carbon emissions for PGM, iron ore and manganese ore, measured in tCO₂e/tonne produced or milled



Targets and performance continued

GHG targets and emission-reduction initiatives

Our strategic focus on cost efficiencies and operational cost-reduction projects supports our initiatives to reduce energy consumption and emissions. Our energy and climate-change management strategy aims to identify and develop opportunities for long-term achievable emission reductions. It does this by investigating energy-efficiency initiatives, alternative energy sources, new technologies, and considering our diversification into less energy-intensive products. Our decarbonisation pathway development process is ramping up these efforts, in recognition that we need urgent, more ambitious reductions if we are to achieve our net-zero commitment.

This process spans multiple financial years and involves feasibility or product comparisons, budgeting, capital allocation, and finally procurement or construction depending on the nature of the project.

We drive investment in emission-reduction activities in the following ways:

- **Remuneration incentives:** Our 2018 conditional share plan and 2018 cash-settled conditional share plan connects corporate executive share incentives to our GHG emission-reduction target. The plan has been updated to include yearly executive incentive targets aligned with pathways to achieving our target. At our operations, remuneration and incentive packages for engineers and production employees are linked to energy

Other GHG (scope 1 and 2) intensity metrics

Metric	F2023	F2022	% change
tCO ₂ e/full-time employee (FTE)	91.21	95.99	-5%
kg CO ₂ e/man-hour worked	45.50	48.72	-7%
tCO ₂ e/GJ	0.23	0.25	-5%
tCO ₂ e/MWh	0.84	0.89	-5%

efficiency and GHG emission reductions. The 2024 award, measuring performance from F2024 to F2026, now aligns with ARM's new short-term emission-reduction targets.

- **Internal carbon price:** We have taken steps to establish an internal carbon price for evaluating new projects and acquisitions. The pilot exercise provided some insight into the financial implications of a project that reduces carbon tax liability, and generated lessons for integrating an internal carbon price into our new projects and acquisitions. In F2023, we further considered carbon price in our investigations into appropriate alternative energy solutions (eg in the Northern Cape).
- **Climate-scenario analysis:** This analysis demonstrated the importance of identifying an appropriate decarbonisation pathway in line with the global 1.5°C climate goal.
- **Dedicated budget:** We have a capital allowance for energy-efficiency projects at our operations. In our new emission-reduction targets, we are allocating additional budget for more ambitious reductions and their associated projects.

- **Energy-efficiency plans:** Our operation-specific decarbonisation pathways include incremental energy-efficiency improvements in the short term, and are being refined to drive operation-specific projects.
- **Leveraging incentives and innovative models:** We have benefited from the section 12L energy-efficiency incentives offered by the South African government, and we continue to explore direct support opportunities and engage with third parties on innovative models for procuring renewable energy.
- **Research and development and supply-chain engagement:** We are exploring, internally and with our partners, innovative technologies that deliver low-carbon products or help our operations by indirectly reducing their energy consumption and environmental impacts.
- **ESG data system:** We have been refining our data system to serve a more proactive function to enable planning, assigning clear roles and responsibilities for implementation, track progress and performance, and facilitate reporting.

GHG emissions performance

Existing targets

Long-term target: net-zero GHG³ emissions from mining by 2050.
F2023 target: 4% absolute reduction of scope 1 and 2 emissions by F2023 against F2018 baseline through emission-reduction initiatives implemented from F2019 (provided they are still delivering active savings; excluding Nkomati Mine which is under care and maintenance).

New targets

Short-term target	Medium-term target	Caveats
15% absolute reduction in scope 1 and 2 GHG emissions by F2026 relative to F2023 base year.	30% absolute reduction in scope 1 and 2 GHG emissions by F2030 relative to F2023 base year.	<ul style="list-style-type: none"> • The targets include operations within ARM's operational control boundary as well as the Board approved Early Ounces project at Bokoni Mine. It excludes Nkomati Mine and Machadodorp Works which are on care and maintenance. • The baseline year and targets will be adjusted for any material acquisitions and divestments, material changes to planned operating conditions, and to reflect progressive refinement of GHG reporting methodologies. Adjustments are expected following the detailed feasibility study at Bokoni Mine and following a Board decision regarding future activities at Machadodorp Works.

³ This includes ARM's scope 1 and 2 emissions associated with operations under direct or joint direct operational control.

We did not meet our F2023 target, which included a target of 4% absolute reduction of scope 1 and 2 emissions by F2023 against an F2018 business-as-usual baseline through emission-reduction initiatives implemented from F2019.

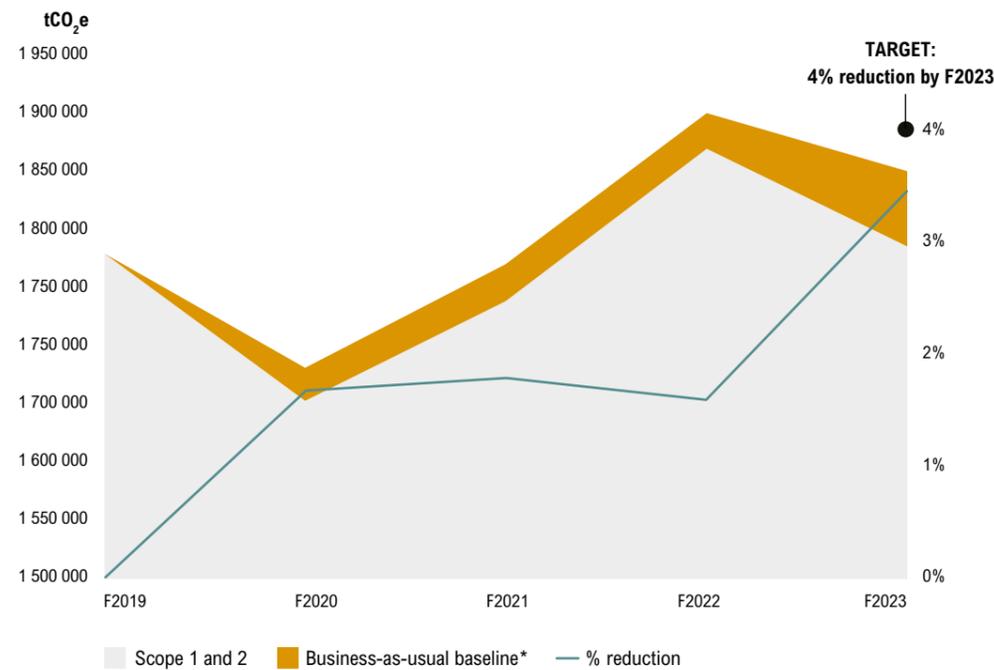
To determine our performance relative to this target, we calculated the percentage of emission reductions that could be attributed to our emission-reduction initiatives, and found a 3.5% absolute reduction of scope 1 and 2 emissions compared to F2018.



We anticipated not meeting this target, given that a reduction of only 1.8% was achieved up to F2022 (figure 9). The near-doubling of emission reductions in F2023 are linked to implementation of some new decarbonisation measures (page 63), as well as improved measurement and GHG reporting at Cato Ridge Works (which helped to identify emission-reduction opportunities).

The increase in the business-as-usual baseline emissions (figure 9) – which excludes the impact associated with Nkomati Mine moving to care and maintenance – is largely due to increased production associated with expansion activities at Black Rock, Two Rivers and Modikwa mines, increased stripping ratios and haulage distances at Khumani Mine, and reduced furnace efficiencies at Cato Ridge Works.

Figure 9: GHG emission reductions relative to short-term F2023 target



* The business-as-usual baseline reflects what ARM would have emitted had it not implemented emission-reduction initiatives (referred to as an ex-post baseline according to GHG Protocol Policy and Action Standard).

Our current work to develop decarbonisation pathways and set operation-specific targets represents a more ambitious strategy. This is in line with our long-term commitment, and characterised by clearer plans and associated resources and systems. Following this strategy will ensure that future targets are achieved.

GHG savings from new initiatives per year

Significant additional savings and carbon emission-reduction initiatives were implemented in F2023, particularly at Cato Ridge Works where work to investigate and invest in opportunities to reduce the carbon content of furnace inputs and improve furnace efficiencies are bearing fruit. The most significant of these include the new sinter plant,

enabling the substitution of carbonate ore and improved efficiencies as well as the introduction of biocarbon. Many of the projects implemented in F2023 have a payback period of less than three years. No new renewable energy was deployed or consumed during the year. However, significant progress has been made on leveraging renewable energy in the near future.

See page 38.

New initiatives implemented in F2023	Additional savings per year (tCO ₂ e)	Energy savings (unit per year)
Various measures have contributed to improved furnace efficiencies in F2023, as measured by the electricity required per tonne of product produced. These include introducing sinter to replace carbonate ore, introducing biocarbon, and more optimal combinations of furnace inputs coupled with relatively stable operating conditions.	27 336	26 284 500kWh
Enabling a more efficient mix of reductants used in the furnaces and replacing carbonate ore (4.61% carbon) with sinter (0% carbon) directly reduces carbon and indirectly reduces carbon needed per tonne of product produced. Cato Ridge Works has been replacing carbonate ore with sinter from the new plant since March 2023.	5 461	N/A (process emissions savings)
Using biomass as a reductant in the ferromanganese smelting process to help reduce scope 1 process emissions. Cato Ridge Works has been ramping up use of husk-based carbon brix since January 2023 to over 350 tonnes/month by the end of F2023, replacing over 400 tonnes/month of coke.	3 172	N/A (process emissions savings)
Replacing coolers in houses with inverter air conditioners at Black Rock Mine.	236	226 670kWh

Additional projects being developed include:

- Investigating the feasibility of renewable energy solutions in the Northern Cape and for our platinum operations See page 38.
- Piloting electric vehicles with multiple benefits (see ARM's F2020 supplementary report on climate and water)
- Reducing vehicle numbers: Beeshoek Mine will replace trucks to reduce the size of the fleet while handling the necessary tonnages

- Energy efficiency: at Black Rock Mine, we are moving fans closer to working places, installing motion detectors for existing LED lights, investing in additional LED lighting, automatically stopping conveyors when not in use, and installing vent fans with variable speed drives. The development of the Merensky project at Two Rivers Mine includes investing in energy-efficient equipment and best-practice design
- Optimisation: we are looking into surface-fan relocation, right-sizing hauling vehicles (eg, improved

- road conditions, reducing idling time, using batteries to support air-conditioning systems and lighter bowls to reduce diesel consumption at Khumani Mine), replacing haul roads with underground conveyor belts (eg at Modikwa Mine), and moving fans closer to working places (at Two Rivers Mine)
- Reducing emissions in our value chain (scope 3 – transportation).

Targets and performance continued

Energy and carbon audits

For our platinum division mines, in F2022 we completed energy and carbon audits to identify and quantify mitigation options at Two Rivers and Modikwa mines. We will do the same for Bokoni Mine once plans for this mine have been finalised. These audits will not be done for Nkomati Mine as it is on care and maintenance.

For our ferrous division, we contracted an external service provider to conduct energy and carbon audits at our Northern Cape mines, Cato Ridge Works and Cato Ridge Alloys (South Africa), and Sakura (Malaysia). They explored a range of decarbonisation initiatives that could reduce scope 1 and 2 GHG emissions, and under two climate scenarios. They focused on interventions that could reduce electricity consumption, process emissions (from smelters), and diesel combustion in mobile fleets. For each operation, they determined the blend of initiatives that would need to be implemented over the short term (2023–2024), medium term (2025–2029) and long term (2030–2050) to achieve net-zero GHG emissions by 2050. They also determined the capital and operating expenditure associated with the initiatives.

These audits have yielded long lists of mitigation options, each with marginal abatement cost curves (which consider the net-present value of costs over the net-present value of emission reductions over the life of the initiative) to aid decision making. Our next steps are to determine operation-specific mitigation priorities, convert them into operation-specific mitigation plans that have the budgets, systems and target-specific KPIs needed to ensure the options can be effectively implemented, tracked

and reported. Targets will likely be expressed on an intensity basis, based on the bottom-up decarbonisation pathways and with reference to pathways required by science.

Improving our ESG data system

Investing in data systems is necessary for two reasons. The first relates to increasingly stringent reporting requirements for carbon and energy, and the need for more robust, structured and streamlined processes that support the accurate use of data for diverse outputs. The second relates to improved performance in GHG emissions.

In F2020, we started developing a formal data system that identifies, prioritises, implements and reports on measures that save energy and GHG emissions. Over time, we have refined the system to serve a more proactive function to enable planning, assign clear roles and responsibilities for implementation, track progress and performance, and facilitate reporting.

In F2022, we began exploring data solutions that could improve the functionality of the system, and that would ultimately enable us to integrate wider ESG-relevant metrics and related management activities into it. At the same time, and continuing into F2023, we began incorporating financial metrics into the system to inform the prioritisation of decarbonisation measures and to aid development of our decarbonisation pathway. Going forward, we will also use the system to track the progress of targets associated with operation-specific decarbonisation plans, and to identify cost-effective opportunities for improving energy and emissions performance.

We are in the latter stages of choosing a preferred solution and intend to roll-out our ESG data system in F2024. The system will initially be used at the corporate level but, in due course, will ultimately be used by a wide range of employees involved in the operational and financial management of energy, GHG and carbon.

Scope 3 emissions

The TCFD recommends that organisations should assess the potential direct effects of climate change on their operations, as well as the potential second and third-order effects on their supply and distribution chains. It explicitly recommends that organisations disclose scope 3 emissions, which refer to indirect emissions not included in scope 2 that occur in upstream and downstream value chains.

We calculate scope 3 emissions according to the GHG Protocol – corporate value chain (scope 3) accounting and reporting standard. We use the latest emission version factors from the United Kingdom Department for Business, Energy and Industrial Strategy, and source other emission factors from organisations such as the World Steel Association and International Manganese Institute.

We either gather or directly estimate source data, depending on its availability or the materiality of the scope 3 category. Our approach to addressing scope 3 emissions is evolving and includes initiatives to improve the completeness and accuracy of data gathering and reporting. These developments can make it difficult to compare emissions value directly year-on-year (table 4). We also intend to focus on material sources in line with our promise to collaborate with stakeholders to reduce emissions.

Improved scope 3 accounting

This year, our scope 3 GHG emissions have been externally assured for the first time. We have also continued to improve the accuracy and completeness of our scope 3 GHG inventory.

In F2021, we focused on the completeness and accuracy of our most material scope 3 categories. We also included emissions associated with transmission and distribution losses (fuel and energy-related activities), and restated F2020 and F2019 to include these sources.

In F2022, we continued this work, drawing on expenditure and leveraging relevant emission factors to achieve more complete assessments of scope 3 categories 1 (purchased goods and services) and 2 (capital goods). We also included emissions associated with Sakura for scope 3 category 15 (investments), resulting in an increase compared to F2021. We shifted our reporting of scope 3 emissions to an operational-control basis, which required restating F2021 numbers (previously reported on an equity-share basis). Emissions

associated with category 15 (investments) were however reported based on ARM's proportional share of investments in those operations⁴ and companies, as per the GHG Protocol's corporate value chain (scope 3) standard.

This year, we refined our assessments to focus on specific purchased goods and services, and capital goods. Going forward, we will investigate ways to decarbonise our value chain, and set scope 3 targets in F2024.

Table 4: Scope 3 emissions

Category	Scope 3 (100%) (tCO ₂ e)			
	F2023	F2022	F2021	F2020
1 Purchased goods and services	669 043	679 289	52 305	53 645
2 Capital goods	565 953	652 462		
3 Fuel and energy-related activities	200 023	220 413	211 774	216 426
4 Upstream transport and distribution	962 409	985 728	962 031	859 903
5 Waste generated in operations	1 528	1 371	1 432	1 130
6 Business travel	2 561	1 584	1 724	2 765
7 Employee commuting	24 642	13 613	14 637	14 255
8 Upstream leased assets*	–	–	–	–
9 Transport and distribution of sold products	279 017	314 149	323 836	367 364
10 Processing of sold products	54 978 467	55 105 803	63 232 082	20 795 435
11 Use of sold products*	–	–	–	–
12 End-of-life treatment of sold products*	–	–	–	–
13 Downstream leased assets*	–	–	–	–
14 Franchises*	–	–	–	–
15 Investments**	912 711	939 823	759 885	161 076

* Not relevant or not material. ARM makes limited use of leased assets and associated emissions are estimated to be immaterial (category 8). ARM's products feed into various end uses, many are recycled and we have limited influence over the end-use (categories 11 and 12). ARM has no leased assets (category 13). ARM does not have any franchises (category 14).

** This includes scope 1 and 2 emissions for ARM Coal and Sakura, and scope 1, 2 and 3 emissions for Harmony.

Emissions associated with Sakura

Sakura Ferroalloys' smelter in Sarawak, Malaysia, is managed by Assmang. ARM owns 27% of Sakura (Assmang, in which ARM is a 50% joint-venture partner, owns 54%). ARM includes Sakura in our scope 3 inventory (category 15: investments). Emissions are reported in proportion to ARM's 27% investment in the operation.

Sakura includes two closed submerged arc furnaces producing high-carbon ferromanganese. Sources of emissions include: process emissions (calculated using a Tier 3 approach); mobile

diesel combustion; acetylene used in workshops; and electricity sourced from the Sarawak Energy Company.

The operation is highly mechanised and requires limited use of vehicles. Power from the Sarawak Energy Company is largely generated by hydro (with an emission factor of 0.33tCO₂e per MWh). Some of the carbon monoxide gas from the furnaces is used to cure ladles and has in the past been used to dry raw materials when needed.

To feed into initiatives to develop an operation-specific decarbonisation pathway, in F2023 Assmang collated material categories of Sakura's scope

3 emissions, and historical and projected scope 1, 2 and 3 emissions. It then assessed short, medium- and long-term mitigation options, costs and implementation requirements. The pathway modelling considered a business-as-usual scenario (including incremental energy efficiency and renewable energy deployment) and a sustained case, which includes organic growth beyond the current life-of-asset plan as well as additional, more aggressive decarbonisation initiatives for achieving net-zero emissions.

Through its participation in the Assmang carbon-neutrality steering committee, ARM is playing an active role in developing and driving Sakura's decarbonisation strategy.

tCO ₂ e – proportional basis	F2023	F2022
Direct (scope 1)	79 398	71 592
Indirect – purchased electricity (scope 2)	38 321	32 510
Total	117 719	104 102

Reporting on ARM's attributable GHG emissions associated with investments in coal

Scope 3 category 15 (investments) includes emissions associated with our direct investment in PCB, GCV, and our investment in ARM Coal.

For the fourth year, we are reporting GHG emissions associated with our effective 20.2% investment in PCB and

our effective 26.01% investment in GGV. PCB includes Impunzi and Tweefontein. Glencore has operational control and reports its GHG emissions to the DFFE as part of reporting on all its operations in South Africa.

After engaging with Glencore, we have received GHG emissions-related data for the operations relevant to ARM. Data is associated with Glencore's financial year (1 January to 31 December 2022) but included in ARM's financial year reporting (1 July to 30 June).

Operation tCO ₂ e attributable	F2023 direct	F2023 indirect	F2023 total	F2022 total	F2021 total
PCB	36 513	43 464	79 977	85 727	91 445
GGV	25 596	18 639	44 235	41 378	46 064
Total	62 109	62 103	124 212	127 105	137 509

Emissions include the following sources for each operation:

- Direct emissions (scope 1 for the operations): fugitive methane – production (underground) using an emission factor of 0.77m³ CH₄ per tonne; fugitive methane – post-mining (underground) using an emission factor of 0.18m³ CH₄ per tonne; and diesel (mobile) using

an emission factor of 0.00315tCO₂e/litre for mobile combustion and 0.00268tCO₂e/litre for stationary combustion

- Indirect emissions (scope 2 for the operations): purchased electricity using a grid emission factor of 928g CO₂/kWh.

Fugitive emissions at the opencast operations are no longer reported by Glencore, in line with the South African legislative requirement

(these were last included in F2021). Liquefied petroleum gas and petrol are not included as Glencore deems them immaterial to the footprint.

Emissions have been apportioned to ARM, based on our effective shareholding in each operation.

Reporting on emissions associated with ARM's investment in Harmony

We have a 12.12% investment in Harmony Gold. Emissions attributable to ARM have been calculated based on this shareholding and are included in our scope 3 inventory (category 15: investments).

tCO ₂ e – proportional basis	F2023	F2022	F2021
Direct (Harmony scope 1)	24 283	21 819	16 499
Indirect – purchased electricity (Harmony scope 2)	520 637	557 566	515 228
Indirect – value chain (Harmony scope 3)	125 860	129 230	90 660
Total	670 780	708 616	622 386

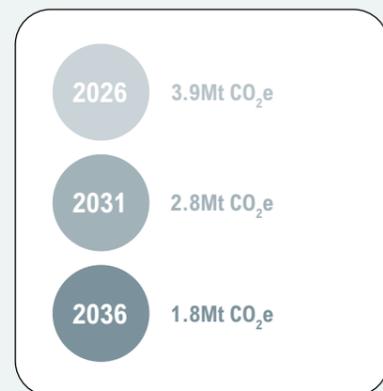
Harmony's scope 1 emissions include those associated with diesel, petrol, explosives and fuel/heating oil, calculated using the annual Department of Environment, Food and Rural Affairs conversion factors for Papua New Guinea, and technical guidelines for monitoring, reporting and verification of GHG emissions by industry for South Africa.

Harmony's scope 2 emissions include those associated with purchased electricity in South Africa (1.04kg CO₂/kWh) and in Papua New Guinea (0.68kg CO₂/kWh).

Harmony's scope 3 emissions include those associated with a range of purchased goods and services (embodied emissions in explosives, cement, timber/lumber, cyanide, caustic soda and lime), fuel and energy-related activities (transmission and distribution losses in South Africa and Papua New Guinea), and business travel (rental vehicles, and domestic, international, commercial and charter air travel).

Scope 2 emissions account for the bulk (78%) of Harmony's emissions. This is aligned with energy consumption in South Africa, where energy is sourced from the state power utility, Eskom.

In January 2022, Harmony submitted its net-zero target to SBTi (Science Based Targets initiative) for validation. Its target aligns with the SBTi business ambition for 1.5°C, and aims to decrease Harmony's total emissions by 206kt CO₂e annually (a 4.2% reduction relative to the base year). This results in the following interim emission targets:



If the same rate of emission reduction continues beyond 2036, Harmony can achieve net-zero emissions in 2045. Based on emissions forecasts, Harmony is projected to meet the 2026, 2031 and 2036 targets, provided that South Africa's grid decarbonises as projected in the integrated resource plan, and the company implements its planned initiatives. Beyond 2040, a range of challenges will need to be addressed, including considerations of further mitigation action needed outside of Harmony's value chain.

As part of the transition to renewable energy, Harmony secured significant green funds that will boost its journey to net-zero. These funds are linked to specific KPIs aimed at reducing emissions, water consumption and reliance on fossil fuels. Specifically, its phased decarbonisation strategy linked to this funding includes constructing a 30MW solar power plant (phase 1), a 137MW solar energy plant (phase 2), and a 56MW solar power plant with the possibility of 100MW through wheeling from renewable energy, predominantly wind and solar (phase 3).

Since 2016, Harmony has implemented over 200 energy-savings initiatives that have yielded estimated savings of R1.4 billion and reduced GHG intensity by 32% and 1.5Mt CO₂.

Harmony also works to ensure that companies in its supply chain observe laws and regulations governing water and air quality, and use all reasonable measures to avoid polluting and degrading the environment. It has also engaged with its top 20 suppliers on their carbon and water footprints, with the intention of improving their processes and building their resilience to climate change.

Energy

The primary sources of energy consumed in our value chain are electricity and diesel. Electricity is used in mining activities to power ventilation fans, pumps for processing and dewatering, conveyor belt motors and machines that crush and mill ore. Diesel is used to power mobile equipment (trackless machines and vehicles used for mining, loading, hauling and logistics) and standby electricity

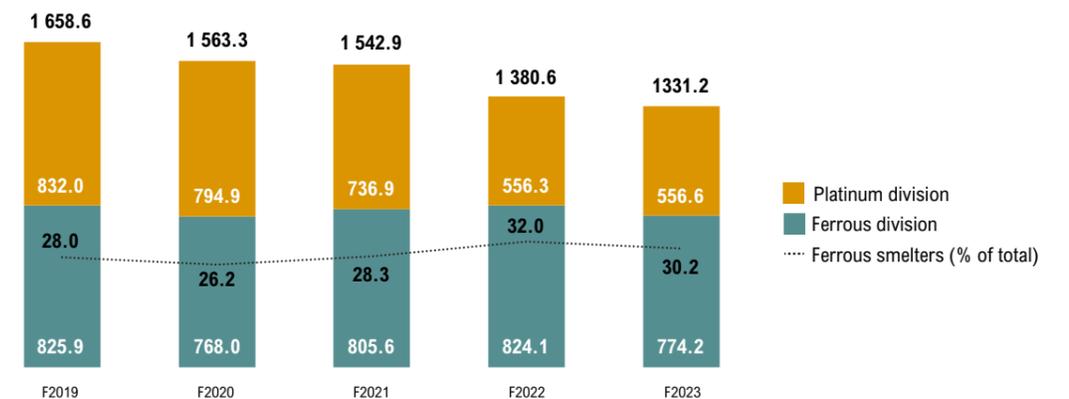
generators. The energy used for heating is one of the biggest cost inputs in the smelting process at Cato Ridge Works.

Total energy consumed in F2023 was 7 692 678GJ (including diesel, electricity, liquefied petroleum gas, petrol, acetylene and paraffin).

Total electricity consumed by the operations was 1 331GWh (figure 10; 100% basis), a decrease

of 4% compared to F2022 (1 381GWh). The ARM Ferrous division contributed 58% to total group electricity consumption: the three ARM ferrous mines contributed 28%, Cato Ridge Works contributed 29%, and Machadodorp Works contributed 1%. ARM platinum division accounted for 42% of total electricity consumption: Modikwa Mine accounted for 22%, Two Rivers Mine 19%, and Nkomati less than 1%.

Figure 10: Electricity consumption by division (100% basis) measured in GWh



Diesel consumption contributed 52% to total scope 1 carbon emissions in F2023.

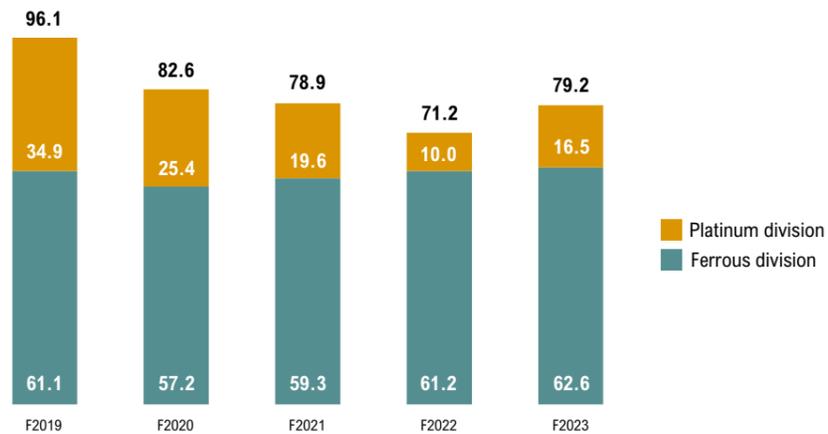
Total group diesel consumption increased 11% to 79.2 million litres in F2023 (figure 11). The biggest diesel consumers were Khumani Mine (50%), Beeshoek Mine (18%)

and previously Nkomati Mine (0.3%; now on care and maintenance). These are large open-pit mines that use diesel mainly to haul run-of-mine material to the concentrator plants. Black Rock Mine contributed 10%.

Diesel consumption at Two Rivers Mine increased by 98% due

to construction and mining activities for the Merensky project. This includes significant stationary diesel consumption given the need for generators to meet increased demand until investments in the network have been completed.

Figure 11: Diesel consumption by division (100% basis) measured in millions of litres



Energy consumption intensity (100% basis)

Energy consumption is expected to increase at many of ARM's operations. Khumani Mine and Beeshoek Mine are mining at deeper levels and mining lower-quality ore, which increases stripping ratios.

Two Rivers Mine has invested in: a new mill, which increases energy demand by 3.5MW; more ancillary equipment; and a new TSF, which has increased electricity for pumping requirements by 1.7MW.

The decision to mine the Merensky Reef is resulting in a significant increase in energy consumption (from 35MVA to 64MVA by CY2024). The electricity demand at Two Rivers Mine is set to increase from 35MVA to 40MVA with the completion of the new 132/11kV substation in August 2023 (originally planned for March 2023). Diesel generators are currently installed in the plant to supply the shortfall between the available 35MVA and required 40MVA. The new Merensky Mine and concentrator will significantly

increase energy consumption from 40MVA to 64MVA by CY2024. This will rise incrementally to 70MVA as the mine builds up to full production towards CY2027.

Energy production

ARM currently produces and consumes less than 1% of its power needs from renewable sources. This will change significantly given the renewable energy plans within the platinum division and the research underway in the ferrous division.

Energy consumption for each product type in F2023

Type	F2023	F2022	Metric
Iron ore	0.20	0.17	GJ/tonne iron ore
Manganese ore	0.19	0.20	GJ/tonne manganese ore
Manganese alloy	8.69	9.35	GJ/tonne FeMn (high-carbon, medium-carbon and recovered metal)
PGMs	0.42	0.40	GJ/tonne milled



Maintenance at Two Rivers Mine

Future climate-change focus areas

Progress made on the areas of focus detailed in our F2022 report is provided under **Our climate-change journey to date on page 10**.

Our areas of focus in F2024 and F2025 include:

- Finalising operation-specific decarbonisation action plans. These plans will formalise emission-reduction measures, include assigned roles and responsibilities, and have allocated budgets. We will also put in place refined systems and sufficient resources to ensure plans are achieved and that, ultimately, emission-reduction targets are met
- Developing a strategy and plan to explicitly align our future capital expenditure with our decarbonisation goals

- Continuing to prepare for the South African carbon budget legislated phase 2 requirements
- Finalising and rolling out the preferred solution for our ESG data system. The initial priority of this system will be on climate change and carbon management and reporting, and incorporating financial metrics. Ultimately, the system will include ESG-relevant metrics and related management activities to enable ARM to proactively drive improved performance
- Driving a more significant work programme in line with the ICMM's plans for improved scope 3 reporting (implementing the ICMM scope 3 GHG accounting and reporting guidance for the mining and metals sector) and target setting, as well as setting appropriate scope 3 targets and commitments in F2024

- Better understanding the physical impacts of climate change and developing appropriate responses for our operations, and beginning the process of understanding the risks and responses for our broader value chain
- Continuing to investigate and implement ways of leveraging our LED and CSI spending to enhance community resilience to climate change
- Continuing to assess climate-related risks in our supply chain and to implement the roadmap to fully integrate climate change into our ERM process.

TCFD index

The table below provides references for our disclosures in terms of the TCFD recommendations.

TCFD RECOMMENDATION	REFERENCE TO DISCLOSURE	PAGE 
STRATEGY – Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's business, strategy and financial planning where such information is material		
a) Describe the board's oversight of climate-related risks and opportunities	Governance Board-level oversight and management responsibility	24 and 25
b) Describe management's role in assessing and managing climate-related risks and opportunities	Governance Board-level oversight and management responsibility	24 and 25
RISK MANAGEMENT – Disclose how the organisation identifies, assesses and manages climate-related risks		
a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium- and long-term	Risk management Material climate-change risks Material climate-change opportunities	40 40 40
a) Describe the impact of climate-related risks and opportunities on the organisation's business, strategy and financial planning	Risk management The impact of risks and opportunities on business and financial planning	40 52
c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Our scenario analysis	35
STRATEGY – Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's business, strategy and financial planning where such information is material		
a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium- and long-term	Risk management Material climate-change risks Material climate-change opportunities	40 40 40
a) Describe the impact of climate-related risks and opportunities on the organisation's business, strategy and financial planning	Risk management The impact of risks and opportunities on business and financial planning	40 52
c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Our scenario analysis	35
RISK MANAGEMENT – Disclose how the organisation identifies, assesses and manages climate-related risks		
a) Describe the organisation's processes for identifying and assessing climate-related risks	Risk management Integrating climate change into the risk management process	40 and 51 51
a) Describe the organisation's processes for managing climate-related risks	Risk management Integrating climate change into the risk management process	40 51
c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management	Strategy Integrating climate change into the business strategy Carbon pricing Risk management Integrating climate change into the risk management process	34 52 38 40 51

TCFD RECOMMENDATION	REFERENCE TO DISCLOSURE	PAGE 
METRICS AND TARGETS – Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material		
a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process	Metrics and targets GHG emissions	51 and 55 56 and 57
a) Disclose scope 1, scope 2 and, if appropriate, scope 3 GHG emission and the related risks	Metrics and targets GHG emissions Energy	55 56, 57 and 65 69
c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets	Metrics and targets GHG emission-reduction target Emission-reduction initiatives	13 and 55 13 and 37 63



Battery operated loader at Black Rock

Water

Tailings Storage Facility at Black Rock

Water stewardship policy	76
How we use and manage water	78
Strategy	82
Context-based water targets	82
Water stewardship	82
Risk management	86
ARM's water risks	86
Catchment-level risks	89
Integrating water risks into ARM's ERM processes	95
ARM's water opportunities	95
Detrimental water-related impacts	95
Targets and performance	96
Progress towards ARM's water target	96
Water withdrawals	98
Future water focus areas	103

The global pressure on life's most important resource cannot be overemphasised. All over the world, water systems are under threat from rising consumption, pollution, weak governance and climate change. We are seeing shifting weather patterns, changes to water supplies, and an increase in extreme weather events such as floods and droughts.

Water stewardship policy

Our water stewardship policy recognises that:

- Water is a precious shared resource with high social, cultural, environmental and economic value. Access to water is recognised as a human right that is integral to the wellbeing and livelihoods, as well as spiritual and cultural practices, of many communities. It is also essential to the healthy functioning of ecosystems and the services they provide
- Water is a vital input for all mining and metals operations. It is required for the health and wellbeing of employees and at every stage of an operation's life cycle, including closure. The dependency and impact on a shared resource creates a material risk for ARM's operations that requires effective management
- Water challenges are increasing around the world. Freshwater resources are finite and under pressure from industrialisation, urbanisation, climate change and the needs of a growing global population
- These challenges are shared across countries, industry sectors and society. To meet demand, a change is needed in the way water is used, managed and shared. This will require collaboration and concerted action from all parties, including government, civil society, business and local communities
- Through the United Nations' Sustainable Development Goals, world leaders have publicly acknowledged the urgency of using and managing water sustainably. ARM can play a significant role in supporting this approach that includes ensuring access to clean water, sanitation

- and hygiene for employees in the workplace. There is further opportunity to support government initiatives by leveraging capital or expertise to improve community access to clean water, sanitation and hygiene, and other water-related outcomes
- Water-related risks and impacts are predominantly experienced by people and ecosystems at local or catchment levels. Therefore, we look beyond traditional operations-based water management to the dynamics and interactions of water users in the wider catchment
- ARM plays an important role in the sustainable management of water resources where we operate. Proactive and holistic water-management strategies will create substantial competitive advantage by reducing water-related risks, identifying opportunities, attracting investment and building trust through improved transparency.

We also commit to:

- Applying strong and transparent corporate water governance by:
 - Publicly disclosing our approach to water stewardship through this report, as well as through our ESG and IAR reports
 - Allocating clear responsibilities and accountabilities for water – from the board to our operations (page 24)
 - Integrating water considerations in business planning – including ARM's strategy, life-of-asset and investment planning (page 86)
 - Publicly reporting our water performance, material risks, opportunities and management response using consistent industry metrics and recognised approaches (pages 86-89 and 95)

- Managing water at our operations effectively by:
 - Maintaining a water balance and understanding how it relates to the cumulative impact of other users at each operation. All operations maintain a water balance, considered in the context of a catchment balance (pages 78 and 100-102)
 - Setting context-based targets or objectives for operations with material water-related risks (page 82)
 - Proactively managing water quantity and quality to reduce potential socio-environmental impacts and realise opportunities. ARM began reporting publicly on water quality in F2019 (page 16)
 - Ensuring all our employees have access to clean drinking water, gender-appropriate sanitation facilities and hygiene at their workplaces
- Collaborating to achieve responsible and sustainable water use by:
 - Identifying, evaluating and responding to catchment-level water-related risks and opportunities (page 89)
 - Identifying and engaging proactively and inclusively with stakeholders who may influence or be affected by our operations' water use and discharge (page 28)
- Actively engaging on external water governance issues, with governments, local authorities and other stakeholders, to support predictable, consistent and effective regulation that underpins integrated water-resource management (pages 82 and 86)

- Supporting water-stewardship initiatives that promote better water use, effective catchment management and by contributing to improved water security and sanitation (page 89).

We support the ICMM position statement on water stewardship and report our performance against the commitments in this report. We recognise the importance of transparency on water given increasing pressure on these resources, growing societal concerns about water access, and rising expectations on the stewardship of this vital resource. We regard transparency on our water dependencies and performance as foundational for effectively engaging stakeholders and enabling informed decision making. We therefore support, and have started to implement, the ICMM's updated practical guide to consistent water reporting.

Water-related terminology

Operational water withdrawal: water that is used to meet operational water demand.

Other managed water: water that is actively managed (eg physically pumped, actively treated or has material consumptive losses) without intent to supply operational water demand.

Output: includes flows to surface water and groundwater, and supply to third parties (volume of water removed from the operational facility after it has been through a task, treated or stored for use).

Consumption: includes evaporation and transpiration, water incorporated into product and/or waste streams, and other operational losses.

Reuse efficiency: the volume of untreated water used in tasks that has already been worked by the site as a percentage of total volume of all water used in tasks. Reuse efficiency varies across operations and is underreported as some operations do not measure flows of worked water back into tasks.

Discharge: refers to unauthorised flows into the natural environment, as defined by operation WULs.

Change in storage (delta storage): the net change (positive or negative) in the volume of water in storage (operational water and other managed water) in the reporting period.

Diversion (no longer used from F2023; page 78): includes water supplied to neighbouring communities, farms and other users.



Tailings Storage Facility at Two Rivers Mine

How we use and manage water

At ARM's operations, water is used in milling, beneficiation, cooling and for dust suppression during blasting, on haul roads, and at ore-transfer points. Our employees need access to water for drinking, sanitation and hygiene.

It is also a critical component in our supply-chain commodities, including electricity, chemicals and explosives. Operations withdraw water from a range of sources defined in the terms of their WULs, which include rivers, boreholes and municipal supplies. Water is also essential for users in our wider catchments. All our operations have water management plans in place.

Water uses at our operations have not changed significantly over time, except at Machadodorp Works where no smelting operations have been conducted since F2016, and Nkomati Mine, which moved to care and maintenance in F2021.

Evaporation is high at Cato Ridge Works, which requires water to cool its furnaces. However, only two of its

six furnaces are currently operating (furnace 1 was shut in F2023). Our Northern Cape mines are exposed to high evaporation rates (linked to dry, hot and windy conditions) and a number of these operations supply water to third parties, such as villages and farms.

Case study: Improving our water accounting and reporting

External water-reporting requirements have evolved. Substantial work has been undertaken by the owners of various reporting initiatives to align reporting platforms and metrics. Given this evolution, the ICMM updated its water reporting good practice guide.

Two key changes include guidance on:

- Holistic reporting of the withdrawal, discharge and consumption of water associated with operational demands and active water management
- Reporting aggregated water metrics for all sites within the company and for all sites in water-stressed areas.

Over F2022, ARM started to sensitise operations to the changes and to prepare for reporting in line with updated guidance. This report includes the revised format prescribed in the guidance, as well as the previous format (to facilitate year-on-year comparisons).

Going forward, we will only include the revised format.

We now distinguish between operational water withdrawals and the withdrawal of other-managed water (previously termed diversions). The terminology, detailed on page 77, has been revised to:

- Better distinguish water that is actively managed (eg physically pumped, actively treated or has material consumptive losses) but that is not intended to supply operational water demand
- Enhance understanding as the term diversions was commonly misunderstood to include surface water that is physically diverted in the landscape (eg culverts and stream realignments) but not actively managed.

We have continued to report on aggregated water metrics for all sites, and we have started to collect and report on changes in operational water storage.

Main water activities at ARM's operations

Operation	Catchment	Main operational* water activities
Beeshoek Mine (iron ore)	Vaal Water Management Area (WMA)	<ul style="list-style-type: none"> • Dewatering • Dust suppression • Ore processing • TSF management
Khumani Mine (iron ore)	Vaal WMA	<ul style="list-style-type: none"> • Dewatering • Dust suppression • Ore processing • TSF management
Black Rock Mine (manganese ore)	Vaal WMA	<ul style="list-style-type: none"> • Dewatering • Dust suppression • Mining, screening, and washing • TSF management • Domestic use (village and irrigation)
Cato Ridge Works (ferroalloys)	Pongola-Umzimkhulu WMA	<ul style="list-style-type: none"> • Cooling • Dust suppression • Scrubbing (air-quality requirement) • Jigging (in metals recovery plant)
Machadodorp Works	Inkomati-Usuthu WMA	<ul style="list-style-type: none"> • Jigging (in ferrochrome metals recovery plant)
Nkomati Mine (nickel, PGMs and chrome) <i>On care and maintenance</i>	Inkomati-Usuthu WMA	<ul style="list-style-type: none"> • Dewatering • Ore processing (stopped in last quarter of F2021) • Dust suppression (ad hoc, under care and maintenance) • TSF management
Modikwa Mine (PGMs)	Olifants WMA	<ul style="list-style-type: none"> • Dewatering • Water in underground processes (drilling) • Dust suppression • Ore processing • TSF management • Domestic use in mine villages and farms/third parties
Two Rivers Mine (PGMs)	Olifants WMA	<ul style="list-style-type: none"> • Dewatering • Dust suppression • Ore processing • TSF management

* Operations under joint control or operational control.

The reporting metrics in tables 5 and 6 include Cato Ridge Works (which is not a water-stressed operation) but exclude the newly-acquired Bokoni Mine. A process is underway to develop systems to enable reporting for Bokoni Mine according to the ICMM's WAF and updated guidelines, and these metrics will be provided in F2024.

How we use and manage water continued

Table 5: ARM F2023 ICMM water-reporting metrics

Metric	Source/destination/type	Volume of water by quality (ML)		
		HIGH	LOW	TOTAL
All sites				
Operational water withdrawal	Surface water	2 777	2 527	5 304
	Groundwater	2 526	3 730	6 256
	Seawater	0	0	0
	Third-party water	6 732	0	6 732
	Total	12 036	6 256	18 292
Other managed water withdrawal		550	2 433	2 983
Total output	Surface water	27	118	145
	Groundwater	0	24	24
	Seawater	0	0	0
	Third-party water	550	15	564
	Total	1 126	2 590	3 716
Total consumption				9 199
Operational water reuse/recycle				48 979
Operational water use				62 534
Change in storage (delta storage)				2 598
Sites in water-stressed areas				
Operational water withdrawal	Surface water	2 777	2 527	5 304
	Groundwater	2 526	3 730	6 256
	Seawater	0	0	0
	Third-party water	6 533	0	6 533
	Total	11 836	6 256	18 093
Other managed water withdrawal		550	2 433	2 983
Total output	Surface water	0	118	118
	Groundwater	0	24	24
	Seawater	0	0	0
	Third-party water	550	15	564
	Total	1 099	2 590	3 689
Total consumption				8 943
Operational water reuse/recycle				48 883
Operational water use				62 239
Change in storage (delta storage)				2 598
Water-stress exposure				
Number of sites in water-stressed areas				7

Table 6: ARM water-balance summary (comparative)

Metric	Source/destination/type	Volume of water by category (m³)				
		F2023			F2022	F2021
		High	Low	Total	Total	Total
Withdrawal	Operational Surface water	5 940	2 527	8 467	7 011	8 023
	Operational Groundwater	6 095	3 730	9 825	10 382	12 011
	Other Managed Water	550	2 433	2 983	N/A	N/A
	Total withdrawal	12 585	8 689	21 275	17 394	20 035
Output	Surface water	27	118	145	196	796
	Groundwater	0	24	24	31	33
	Supply to third party	550	15	564	16	37
	Total output	577	157	733	243	867
Consumption	Evaporation	266	4 087	4 353	5 152	5 771
	Entrainment	0	2 317	2 317	4 123	4 273
	Other	0	(69)	(69)	133	109
	Change in storage	0	2 598	2 598	N/A	N/A
	Total consumption	266	8 934	9 199	9 408	10 153
Reuse efficiency	Total of all flows to tasks (ML/a)	7 821	54 713	62 534	78 676	89 437
	Total worked water flows to tasks (ML/a)	na	48 979	48 979	62 507	69 359
	Reuse efficiency (%)	N/A	N/A	78%	79%	78%
Diversions	Water diverted to neighbouring communities, farms and other users	N/A	N/A	N/A	590	654

Context-based water targets

In F2021 and F2022, in line with ICMM guidance, we worked with operations and technical teams to develop process-oriented targets.

These include commitments for stakeholder engagement, and detail collective action to address community access to water. By F2022, we had set context-based water targets for 75% of our operations (figure 2 on page 16).

Cato Ridge Works and Machadodorp Works were initially excluded as the former was not classified as being in a water-stressed area and there was uncertainty on future activities at the latter. However, this year, the ARM sustainably department worked with relevant operational teams to develop context-based water targets for both operations.

Machadodorp Works commits to:

- Not exceed abstraction levels of 195 000m³/annum from the Leeuspruit and 225 000m³/annum from boreholes, as per the WUL condition
- Commission a reverse osmosis plant by October 2023 and have it fully operational by January 2024
- Develop an integrated water-management strategy based on outcomes of the reverse osmosis monitoring plan. This would prioritise use of affected and recycled water, and consider catchment-level stewardship requirements
- Endeavour to minimise water consumption with technologies employed for future production expansions.

Cato Ridge Works commits to:

- Install planned reverse osmosis plant by the end of the first quarter in F2025. Based on measurements of the plant's effectiveness at reducing municipal water consumption,

a revised water-management plan will be set in F2026

- Reduce reliance on the municipal source (Umgeni Water via the eThekweni Metropolitan Municipality)
- Use impacted stormwater from dams as a replacement for municipal water in furnace cooling.

Targets for Bokoni Mine will be set in F2024.

Water stewardship

At ARM, water stewardship is integral to our business strategy. Our approach is catchment-based and aims to be collaborative in delivering on our strategic objectives. For example, at Khumani Mine, we engage in project management and engineering and maintenance issues for the provision of water, which supports our growth objectives.

For operations where water availability is constrained, relevant operation-level KPIs have been introduced. Operations invest in technology to reduce their water requirements, and consider these investments as part of new or expansion projects to reduce water dependency and competition with other water users. Khumani Mine was

designed with severely restricted water availability as a material consideration. As a result, and compared to conventional TSF disposal facilities, its TSF paste-disposal facility was designed to minimise water use and discharge, ensure maximum recycling, and significantly reduce evaporation losses.

We also believe that water-related challenges should be owned collectively. These issues are shared and, to be properly resolved, they require collaboration by governments, civil society, the private sector and local communities. We therefore continue to manage water impacts at our operations, while regularly engaging with our partners and other stakeholders on water stewardship and holistic risk mitigation at the catchment level.

Accordingly, our operations participate in forums that discuss issues on sustainable water supply in their regions, including ways that the availability and cost of water could potentially be influenced by climate change and shifts in regulation.

Water-related forums in which ARM operations participate or interact, include:

Gladdespruit Forum	Northern Cape Mines Leadership Forum
Inkomati-Usuthu CMA	Olifants River Water Resources Development Project
Lebalelo WUA	Tshiping WUA
Kgalagadi Catchment Management Forum	Tubatse Environmental Forum
Manganese Leadership Forum (engaging on the appropriate design of the VGWSS)	Vaal-Orange CMA

We are assessing the processes and outcomes of our pilot of the ICMM water stewardship roadmap tool.

 See page 93.

Based on this, and as the broader programme unfolds in the ICMM, in F2024 we will update our water-stewardship approach.

 See page 103.

Our operations also engage with catchment-level forums that estimate current and future catchment balances. The Inkomati-Usuthu CMA where Nkomati Mine operates is effective in facilitating this. The proposed Vaal-Orange CMA will take on this responsibility for the catchment where our Northern Cape operations are situated. Tshiping WUA and the relatively new Kgalagadi Catchment Management Forum in the Northern Cape contribute to this function reasonably well. The latter is still developing relationships with mines. Other forums or CMAs are less effective and catchment-level water availability and quality are not as well understood.

At the Black Rock and Khumani mines, there are concerns about the security of water supply. The Vaal Central Water Board is unable to supply operations with contracted volumes due to the condition and capacity of infrastructure, as well as managerial challenges of the pipeline. This is impacting the ability of Khumani Mine to meet business objectives. Assmang, under the leadership of ARM Ferrous division, and other stakeholders are engaging with the Vaal Central Water Board and DWS for a plausible and sustainable solution.

Mines also make direct investments in improving water supply. For example, in F2022, Khumani invested over R200 000 and provided other non-financial resources to support the Vaal Central Water Board in fixing valves, fixing leaks and improving data systems. Several new mines have been developed near Black Rock Mine, but this has had a limited impact on water supply to the mine to date. In F2023, Black Rock Mine had fewer water issues on account of the new pipeline. However, catchment-level management will be critical to ensure security of supply as these operations ramp-up.

Khumani Mine is using excess water from Kumba Iron Ore for dust suppression (see case study below). Beeshoek Mine also regularly engages with Kumba Iron Ore's Kolomela Mine to ensure any challenges at that mine with the potential to disrupt water supply to Beeshoek Mine can be addressed as early as possible. Black Rock Mine and Kumba Iron Ore are discussing ways that Kumba Iron Ore can be better equipped when it faces water challenges. For example, in F2022, there were two instances where Kumba Iron Ore had issues with pump stations that affected Black Rock Mine's water supply, and that resulted in potable water restrictions at the village. There were no such incidents in F2023. Communication between the two entities is good.

Modikwa Mine engages through a quarterly environmental forum established to help the local municipality with service-delivery issues. Along with other stakeholders in the area, Modikwa Mine also responds to the municipality's requests where possible.

Case study: Collective action to address water scarcity

To tackle water-scarcity challenges collaboratively, Khumani Mine is pursuing a solution to secure 2.1 million m³/year from neighbouring Sishen Mine (Kumba Iron Ore). This amount would offset some 50% of Khumani Mine's current supply from the Vaal Central Water Board.

In F2023, the DWS issued a directive permitting the once-off use of this amount of water, and Khumani Mine has put in place the necessary infrastructure on its side. A portion of the total amount (345 104m³) was transferred

between January and June 2023, before the water in the Sishen South pit dried up. To access the remaining 1.7m³ of authorised water we are proceeding with Phase 2 which, by December 2023, will include the installation of a booster tank at the pit and a pipeline to Khumani Mine.

Before the ongoing 2.1 million m³/year can be secured, Sishen Mine needs to amend its WUL. However, both mines remain committed to the process.

Case study: Viable public-private partnership helps meet catchment needs

ARM is represented on the Lebalelo WUA by Two Rivers and Modikwa mines. Through this representation, we are interested in securing adequate water supply for our mines and for other users in the catchment while ensuring costs are suitably apportioned.

Involvement in the Lebalelo WUA is also important from a strategic expansion perspective, as it provides the potential flexibility to enable our growth in the area.

The combined demand for potable water at ARM's Modikwa and Two Rivers mines is expected to increase marginally per year, primarily due to production from the Two Rivers Merensky project. These mines need bulk raw water at a transparent,

predictable and cost-effective tariff to maintain and expand their operations. In F2022, it was confirmed that the Lebalelo WUA would supply this water.

Investment in research and development to mitigate water-related risks

Two Rivers and Modikwa mines have collectively invested R13.9m in a feasibility study for a project in Limpopo Province. The project sees a partnership between Lebalelo WUA and the DWS, and is focused on providing potable water to host communities and raw water to mining companies.

In F2022, to provide water to 5 500 households in Kuruman and surrounding areas, Khumani Mine, in partnership with the Ga-Segonyana local municipality, Kumba Iron Ore and Black Rock Mine constructed a 13.5km pipeline with a diameter range of 300–500mm. Khumani Mine contributed R34 million of the total project cost of R110 million.

Community water

In F2023, facilitated by the ARM Rural Upliftment Trusts, we invested in seven new community boreholes at a cost of R1.6 million, and repaired three boreholes at a cost of R32 962.

After flooding in the Beeshoek Mine community (Boichoko) in F2023, Assmang committed R6.5 million to assist the Tsantsabane local municipality with constructing stormwater channels. This commitment should benefit 18 248 community members and create 20 temporary jobs.

Case study: Piloting the ICMM water stewardship roadmap tool

The ICMM is developing a water stewardship roadmap tool to assist companies in evaluating their water-management practices, benchmark their water-stewardship performance, identify areas for improvement, implement targeted actions, and invest in actions that will improve overall catchments and business outcomes.

As a member of ICMM, ARM is committed to reporting our water use and management practices according to the ICMM WAF. We see this tool as a way to help us more effectively manage water as a shared resource, to understand and integrate our water use across our diverse agendas (eg climate resilience, cultural heritage, nature-positive approaches, social performance and

inclusion, operational excellence), and to ensure that our reporting is standardised and aligned with industry best practices.

This year, we piloted the tool in workshops with relevant stakeholders from our operations. During the pilot, we determined that Nkomati Mine is the most mature of our operations in water stewardship. This is due to the work done during care and maintenance

to ensure compliance with legislation, but also because the operation is part of Inkomati-Usuthu Catchment Agency which has a track record of being one of the most efficient agencies.

The ICMM is reviewing inputs from this pilot (and other pilots), and expects to launch the final tool by August 2023.



Aerial view of Modikwa Mine

Risk management

ARM's water risks

All of our operations are exposed to context-based, water-related risks. Operations can be impacted by too much water in a short period (flooding), not enough water over an extended period (droughts), and the respective impacts of these natural hazards on ground and surface water. Consequently, our strategic objectives at group and operational levels include various water considerations including availability, protection and management of water sources, and the use of appropriate technologies and other mitigating factors to address water needs or manage water impacts.

Direct water risks and mitigation measures

Our operations use water balances to manage and optimise water use. Where appropriate, KPIs incentivise improvements to water efficiency.

To the extent possible, all operations run closed-circuit water systems to maximise reuse and minimise discharge into the environment. Dirty and clean water are separated, and operations implement a hierarchy of use to ensure that dirty or process water is recycled and reused before clean water is abstracted from the natural environment.

Where appropriate, technologies such as reverse osmosis have been implemented to clean process water.

We continue to investigate natural, sustainable alternatives, such as wetland formation, particularly for our mine closure plans.

A reverse osmosis plant at Machadodorp Works will be commissioned in October 2023 and fully operational by January 2024. It will treat and clean all contaminated water with high chrome-6 from dam 1, the borehole below the slag dump and the river dam. This clean water will be regularly released to the wetlands. Some of the clean water will be stored in the dams once the dirty water is treated. A reverse osmosis plant will also be commissioned by Cato Ridge Works by the end of Q1 F2025.

Surface and groundwater quality are monitored to measure compliance with WUL conditions, assess our impact on the receiving environment, and flag the need for mitigation actions. Biomonitoring of aquatic and riverine environments is performed as per the conditions of each operation's WUL.

Various measures are in place to reduce water consumption, increase storage and mitigate production downtime, including the use of dust-suppression surfactants to reduce evaporation.

Main water measures at ARM's operations

OPERATION	MEASURES
Beeshoek Mine	To provide greater flexibility as areas are mined out, Beeshoek Mine has applied for an amendment to its WUL to allow for additional dams and new boreholes. These measures would help reduce reliance on water from Kolomela Mine via the Vaal Central Water Board. The outcome of this application is pending. The new stormwater dam, commissioned in F2020, enabled the mine to better separate clean and dirty water during flooding events in F2021. In F2022, additional investments were made in pumping capacity and road designs were revised to improve water drainage. Previously, the mine has also invested in mobile pumps and software to optimise dust suppression using water trucks.

OPERATION	MEASURES
Khumani Mine	<ul style="list-style-type: none"> In addition to a design that uses paste technology for TSF disposal (recovering up to 85% of water), Khumani Mine has invested in long-term, on-site water storage and built additional stormwater trenches and dams. These initiatives reduce safety risks during extreme weather and limit production downtime The mine has upgraded the return-water line between its King and Parsons plants, and the line carrying Sishen Mine water. Improvements are being made to stormwater management at the mining sections: Bruce improvements are 90% complete, and improvements at King are underway. The load-out and pollution-control dam pumping system at Parsons (to speed up pumping and reduce seepage losses) and the paste disposal facility's pumping systems have been upgraded. The mine has also implemented a turret decant system at the TSF that allows the decanting/removal of excess water off the tailings dam from smaller-sized pools. Upgrades to filling points to reduce losses (spillages) are planned but have not yet started The mine is securing 2.1 million m³ water from neighbouring Sishen Mine, which will offset about 50% of Khumani Mine's current supply from the Vaal Central Water Board. A portion of the total amount (345 104m³) was transferred between January and June 2023, before water in the Sishen South pit dried up. Before any further progress can be made, Sishen Mine needs to amend its WUL. However, both mines remain committed to the process.
Black Rock Mine	<ul style="list-style-type: none"> ARM's Ferrous division invested in and successfully commissioned two high-density thickening units at the Black Rock Mines (Nchwaning and Gloria). The Assmang project team completed the Nchwaning thickening unit in early 2020, and the Gloria thickening unit in 2021. Both units are currently in operation and form an integral part of optimal process-water clarification and recovery at these mines Black Rock Mine reuses process water for gland services at the Nchwaning plant. The mine will invest in pipelines to do the same for the Gloria plant. Further efforts to separate dirty water to feed to the plants at Nchwaning and Gloria will be investigated. The new lined TSF is complete, and is improving water performance by reducing loss through seepage. The mine has allocated significant capital expenditure to water metering, with an additional 54 flow meters installed between F2021 and F2022, and roll-out is almost complete Black Rock Mine is also investing in a combined sewage treatment plant that, subject to authorisation, will treat effluent using the reverse osmosis plant to provide potable water for the village and reduce the quantity of potable water withdrawals from the Vaal Central Water Board. However, approval for this licence is still pending. In the interim, the mine is focused on constructing the centralised wastewater system. Investment in a system to divert grey water to the village for irrigation will further reduce the mines' withdrawals from the Vaal Central Water Board. Following a discharge after an extreme rainfall event in F2021, the mine developed a new stormwater-management plan to encourage better separation of clean and dirty water, and to reuse captured water in the process. A project, in feasibility and design stage, aims to centralise the mine's wastewater treatment plant and to use treated sewage water for irrigation at the village. This will reduce potable water currently being used for this purpose.
Cato Ridge Works	Cato Ridge Works plans to install the reverse osmosis plant by end Q1 F2025 and will subsequently measure its effectiveness at reducing municipal water consumption. Based on this, it will set a revised water-management plan from F2026. It plans to use impacted stormwater from the dams as a replacement for municipal water for furnace cooling.
Machadodorp Works	Machadodorp Works has constructed cut-off trenches, doubled the sump size and, by January 2024, will have a fully operational reverse osmosis plant to mitigate the risk of discharges to the environment.

OPERATION	MEASURES
Nkomati Mine	Nkomati Mine has desilted existing trenches to minimise exposure of water to mining activities, and introduced drifts to control water flows through the operation. Numerous studies have been commissioned to address water challenges from being under care and maintenance and, ultimately, closure.
Modikwa Mine	In F2022, Modikwa Mine drilled scavenger boreholes to intercept potential pollution plumes as part of initiatives to rehabilitate mine-affected water. This water will be reused in the process, pending approvals. To inform the approvals process, the mine is investigating ways of monitoring the movement of the water and better understanding the water balance. Project completion is expected in early F2024. As part of its biodiversity plan, it is also continually removing alien vegetation to improve water availability for other catchment users.
Two Rivers Mine	Two Rivers Mine has lined its new TSF to reduce water seepage. The mine started using the new TSF in March 2022. The pollution-control dams are now all lined. With the development of the Merensky project, the mine is looking to better integrate across shafts by upgrading pumping systems. Other initiatives include: treating sewage water so that it can be used as service water; installing more water-efficient equipment in change houses; removing silt from settling dams; and more active cleaning of pollution-control dams, buffer and settling dams to build capacity for more-frequent big rainfall events.

Water and TSFs

We currently have 13 TSFs at our operations: four at Black Rock Mine, two at Nkomati Mine (Onverwacht and Co-disposal), two at Two Rivers Mine (De Grootboom and Old TSF), two at Bokoni Mine (Dam 5 and Dam 6), and one each at our Beeshoek, Khumani and Modikwa mines. Black Rock Mine is commissioning a fifth facility.

GISTM is the first global standard on TSF management and focuses on achieving the goal of “zero harm to people and the environment. It requires companies (operators) to take responsibility by prioritising the safety of their TSFs through all phases of the mine life cycle”. This goal is well aligned with ARM values, policies and standards.

We have produced a public GISTM disclosure document that confirms ARM operations have implemented effective risk management processes

and systems. These systems are being used to ensure TSFs are managed effectively and that any risks to people and the environment are identified and mitigated. Along with our joint-venture partners, we have adopted GISTM at all our operations and good progress has been made in achieving full conformance.

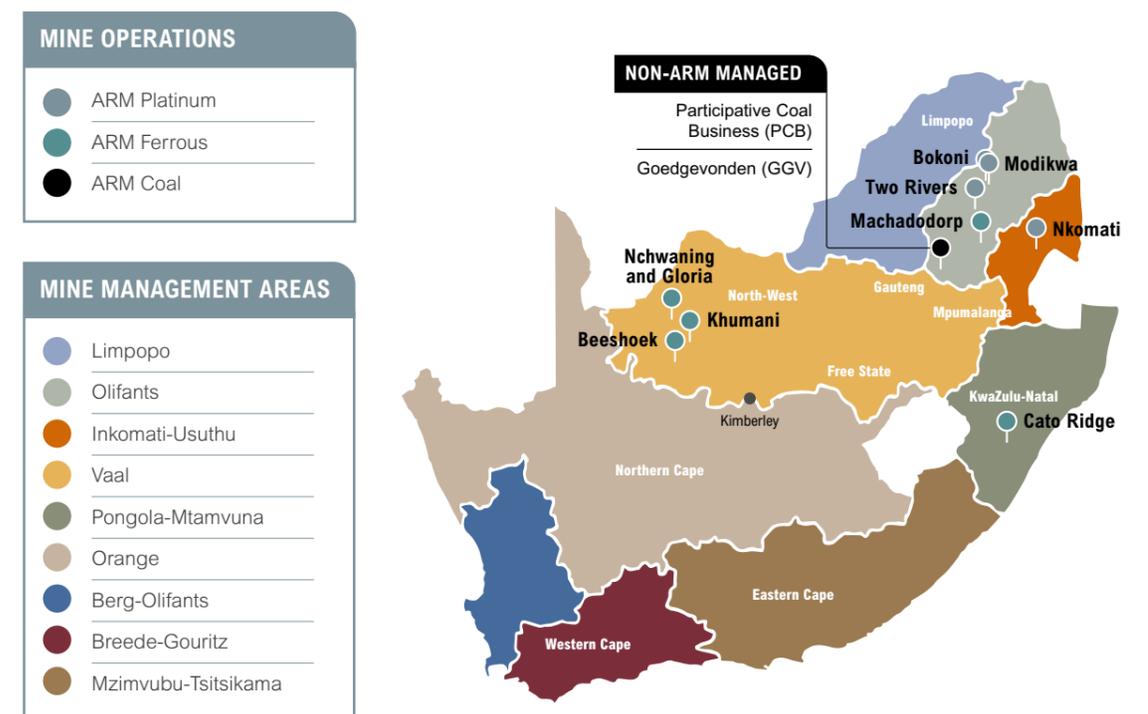
In the process of implementing GISTM, the level of awareness of mine personnel and surrounding communities of risks posed by TSFs was elevated. Along with our joint-venture partners, we will build on this foundation and ensure TSFs continue to be operated safely and responsibly to the benefit of all stakeholders.

 For more information, refer to the report on conformance to GISTM on the ARM website.

Indirect water risks and mitigation measures

In F2019, to better understand water risks associated with our supply chain, we assessed risks faced by each operation’s top five suppliers (by spend). Our F2021 scenario analysis then considered projected physical impacts of climate change on water supply, and identified critical areas that require additional investigation and collective efforts. These areas include the projected impacts of climate change on the Vaal River that feeds supply to our Northern Cape mines, as well as on other areas depicted in figure 12. This year, we started to use preliminary results of the climate-scenario analysis to reassess water-related risks in our supply chain.

Figure 12: South African water management areas as they relate to our areas of operation



Catchment-level risks

Water is a material matter across the group, although for different reasons at different operations. Some key risks to our business value and performance relate to: potential non-compliance with WULs, especially where mines have a positive water balance and risk discharge events; adequate water supply; and climate and water-related disruptions that cause production stoppages.

Our primary concerns are the availability of water, uncertainty in the existing policy environment, the

state of existing water infrastructure, and the socio-economic impacts of these risks. On the residual risk dashboard, the unreliability of water supply in the Northern Cape is classified as one of our top ten risks (impact: critical; likelihood: almost certain).

We anticipate that the likelihood and impact of our water-related risks will increase over time as climate change results in more extreme weather events (particularly floods and droughts). We continue to take steps to mitigate these risks.

Corporate

In the Northern Cape, we have played a leading role in securing long-term bulk-water supplies (see case study). This is in addition to our operations’ investment in water purification and storage, and the various efficiency measures implemented. In Limpopo, an ARM executive participates in the Lebalelo WUA, a section 12 entity set up by mining companies to supply bulk raw water to member mines and other clients.

Case study: Leading collective investments in bulk-water infrastructure in the Northern Cape

The increasing cost and unreliable supply of water in the Northern Cape presents a material risk to our operations in the area. We are participating in a process to proactively mitigate this risk.

Phase 2 of the Vaal Gamagara Water Supply Scheme (VGWSS) refurbishment project is progressing well. This project is a public-private collaboration between the government (DWS), the Vaal Central Water Board (previously Bloem Water), and commercial users.

implementing agent, the establishment of a project steering committee, and the engagement of commercial users to solicit commitment on the 56% capital contributions. The project steering committee is also appointing a service provider to optimise the project scope.

to respond to current challenges is placing the operation and maintenance of the VGWSS pipeline at risk. Fortunately, financial support from Assmang has prevented total collapse of the pipeline. The NCMLF is engaging with stakeholders and other commercial users to find sustainable solutions and additional financing.

Key milestones include the appointment of the Development Bank of South Africa as the

The VGWSS assets are the responsibility of the Vaal Central Water Board, but its inability

Operations

Eight of the nine operations under our direct or joint control are in water-stressed areas, namely: Beeshoek Mine, Khumani Mine and Black Rock Mine (in the Vaal WMA); Two Rivers Mine, Modikwa Mine and Bokoni Mine (in the Olifants WMA); and Nkomati Mine (under care and maintenance) and Machadodorp Works (in the Inkomati-Usuthu WMA).

The risk registers overleaf indicate the water-related risks and/or

opportunities for each of these mines apart from:

- The newly-acquired Bokoni Mine (which will be included in the F2024 reporting process)
- Cato Ridge Works (which is in the Pongola-Umzimkhulu WMA and therefore not in a water-stressed area).

In the risk registers, we provide an ARM risk rating (based on ERM methodology) for the respective WMA, and indicate catchment stress

and operational risks. We used the WWF water risk filter¹ to determine ratings and indexes for catchment stress, and ratings for operational risks. For catchment stress, we provide an overview of potential risks at the WMA scale. For operational risks, we detail primary and secondary risks associated with each operation.

In future risk reviews, we will consider including additional sources, and increasing consideration of climate aspects such as floods, droughts and supply of surface water and groundwater.

¹ WWF's water risk filter (<https://waterriskfilter.panda.org/>) is an online tool that helps companies and investors assess and respond to water-related risks facing their operations and investments across the globe. The tool rates operational and basin risk on a scale of 1 to 5 and considers physical, regulatory and reputational water risks. Aggregated risk scores for catchment stress are computed by applying industry-specific weightings. Operational risks scores are calculated based on operation-specific responses to the WWF water risk filter questionnaire.

Risk register for the Olifants WMA

Catchment stress				
Operation	ARM risk rating	Rating	Description	Index
Modikwa	Medium	Moderate	There is limited catchment management (no CMA). Operations technically need to contribute to the establishment and effective functioning of a CMA as part of their WULs, but failure to achieve this is due mainly to governance challenges and capacity constraints of the regulator.	3.33
Operational risk				
		High	Primary risk Physical: water shortage (driven more by socio-economic dynamics in access to water and services rather than drought); indirect risks related to water and its impacts on TSF stability Secondary risk Physical: underground flooding due to positive water balance underground Regulatory: lack of established CMA Reputational: vandalism of Lebalelo pipeline	4.0

Catchment stress				
Operation	ARM risk rating	Rating	Description	Index
Two Rivers	Medium	Moderate	There is limited catchment management (no CMA). Operations technically need to contribute to the establishment and effective functioning of a CMA as part of their WULs, but failure to achieve this is due mainly to governance challenges and capacity constraints of the regulator.	3.33
Operational risk				
		High	Primary risk Physical: water scarcity; extreme weather events, including increased spillages Secondary risk Regulatory: lack of established CMA, poor catchment management (Dwarsrivier Catchment Management Forum, of which the mine is a part, is conducting a study to determine a sub-catchment balance)	4.06

Water availability is at risk at Modikwa Mine for socio-economic reasons rather than drought. Community unrest and vandalism could impact water supply to the mine. Inadvertent discharge also presents a regulatory and reputational risk. This risk is being adequately managed.

Two Rivers Mine is less exposed to water-supply risks, but the area faces poor catchment management and efforts to develop a sub-catchment balance have been unsuccessful. In F2020, water in the Dwarsrivier, the mine's main source of water supply, fell to very low levels, and a pipeline was installed

to secure an alternative water supply. The new Two Rivers Merensky project requires additional water and the mine has entered into an agreement to be supplied 5ML per day from the Lebalelo pipeline.

Risk management continued

Risk register for the Inkomati-Usuthu WMA

Operation	ARM risk rating	Catchment stress		
		Rating	Description	Index
Nkomati	High	Moderate	The catchment has one of the few effective CMAs in the country, which helps mitigate overall catchment risk.	3.00
		Operational risk		
		High	<p>Primary risk Physical: surface-water contamination (too much water, inadequate storage/space) Regulatory: challenge in obtaining an amended WUL as the mine has moved into care and maintenance</p> <p>Secondary risk Reputational: managing stakeholder concerns on care and maintenance and ultimately closure</p>	3.96

Operation	ARM risk rating	Catchment stress		
		Rating	Description	Index
Machadodorp Works	Medium	Moderate	The catchment has one of the few effective CMAs in the country, which helps mitigate overall catchment risk.	3.00
		Operational risk		
		High	<p>Primary risk Physical: surface-water contamination (limited production activities to manage high rainfall events)</p>	3.8

Nkomati Mine has a net-positive water balance, and now that the mine is on care and maintenance, it is accumulating excess water. This water will ultimately need to be discharged, and the mine is exploring the most efficient, effective and sustainable ways to do so.

Machadodorp Works is on care and maintenance. Any rainwater therefore runs the risk of controlled discharge and associated non-compliance with waste management and the WUL.

Risk register for the Vaal WMA

Operation	ARM risk rating	Catchment stress		
		Rating	Description	Index
Black Rock	High	Moderate	ARM's company-specific risk assessment rates the basin risk higher, as the Vaal Central Water Board pipeline infrastructure requires investment and the source catchment faces water stress.	3.13
		Operational risk		
		High	<p>There is limited catchment management as there is no CMA for this WMA. Improvements are expected with the proposed establishment of the Vaal-Orange CMA.</p> <p>Primary risk Physical: water shortage (including future depletion of underground source – particularly in shallow aquifers (boreholes)); discharge events due to heavy rainfall (resulting in directives from DWS)</p> <p>Secondary risk Regulatory: limited catchment management, but improvements are expected given the proposed inclusion of the Tshiping WUA; heavy rainfall events leading to surface-water contamination affecting neighbouring farmers; flooding affecting bulk-water infrastructure. A new stormwater-management plant was approved, but implementation is pending financing</p>	4.04

Operation	ARM risk rating	Catchment stress		
		Rating	Description	Index
Khumani	High	Moderate	ARM's company-specific risk assessment rates the basin risk higher, as the Vaal Central Water Board pipeline infrastructure requires investment and the source catchment faces water stress.	3.13
		Operational risk		
		High	<p>There is limited catchment management as there is no CMA for this WMA. Improvements are expected with the proposed establishment of the Vaal-Orange CMA.</p> <p>Primary risk Physical: water shortage (need for long-term supply and storage)</p> <p>Secondary risk Regulatory: limited catchment management</p>	4.01

Operation	ARM risk rating	Catchment stress		Index
		Rating	Description	
Beeshoek	High	Moderate	ARM's company-specific risk assessment rates the basin risk higher, as the Vaal Central Water Board pipeline infrastructure requires investment and the source catchment faces water stress. There is limited catchment management as there is no CMA for this WMA. Improvements are expected with the proposed establishment of the Vaal-Orange CMA.	3.13
		High	<p>Primary risk Physical: water shortage (need for long-term supply and storage) Regulatory: reliance on an agreement that neighbouring Kolomela Mine, which has reduced Beeshoek Mine's groundwater supply by dewatering, provides water to the mine via the Vaal Central Water Board (this agreement is not included formally in each mine's WUL but Kumba Iron Ore reconfirmed its commitment to this agreement in F2022)</p> <p>Secondary risk Physical: flooding (resulting in production disruptions) and other extreme weather events and periodic excess of supply</p>	

At our Beeshoek, Black Rock and Khumani mines in the Northern Cape, issues with water scarcity have the potential to affect current operations and future expansion or growth plans. There is also the relatively minor risk of flooding during extreme weather events. Water is a core concern for our local communities and employees.

Beeshoek Mine has an agreement that secures water from neighbouring Kolomela Mine. If Kolomela Mine experiences challenges, then the supply of water to Beeshoek Mine via the Vaal Central Water Board can be affected, as happened in F2021. Good relationships and communication with Kolomela Mine, together with work to formalise this agreement in each mine's WUL, are aimed at mitigating this risk.

At Khumani Mine, water security improved in F2023 on account of the transfer of water from neighbouring Sishen Mine (page 83) and improved management of the Vaal Central Water Board. The Water Board also more effectively communicated planned maintenance. These

initiatives helped to drastically reduce production downtime from 425 lost hours in F2022 to 140 lost hours in F2023.

Assmang has offered to contribute a portion of the capital required for the VGWSS infrastructure upgrade (page 90). Due to this capital infrastructure cost, our Northern Cape mines are trying to reuse water as much as possible. Black Rock Mine is focused on getting the villages, which currently consume around 50% of the potable water supplied by the Vaal Central Water Board, to use water that has been treated by the mine's reverse osmosis plant. However, the plant approvals have been delayed and, in the interim, the mine is focused on constructing a centralised wastewater system.

In F2022, Black Rock Mine had to institute water restrictions in the villages. Extreme rainfall events have, over the past two years, contaminated surface water flowing into a neighbouring farm and caused the overflow of sewage treatment plants. The mine is in the final stages

of getting design approval for a central sewage plant. If all goes according to plan in terms of authorisation, construction and financing, the sewage plant is expected to be operational in the next two to three years.



There is limited catchment management in the area. However, in May 2022, the minister of water and sanitation signed the gazette proposing the establishment of the Vaal-Orange CMA by extending the boundaries and operational area of the Vaal River CMA. While the Tshiping WUA and Kgalagadi Catchment Management Forum mitigate this risk, there is not a good understanding of the catchment-level water balance. This is evidenced by instances where the Vaal Central Water Board is unable to supply water to meet mine allocations (in addition to instances caused by infrastructure and management challenges). There are concerns that future supply from the Vaal River is not well understood.

Joint ventures and investments
ARM has an effective 20.2% share in PCB and an effective 26.01% share in GGV. Glencore Operations South Africa owns the remaining stakes. Where appropriate, water risks are considered and reported on during PCB and GGV's quarterly steering committee meetings.

Integrating water risk into ARM's ERM processes
We are working to include and integrate identified water risks in the ERM process. In F2022, we redefined our risks to fit within ARM's risk assessment methodology, and related the risks to an ARM-specific risk prioritisation methodology. This year, we used detailed projections to understand the impact of climate change on the resilience of our business, which included considering different water-related futures (eg projected average annual rainfall, peak rainfall intensity, evapotranspiration, droughts) for each of our operations. We also began working with employees to explore the operation-specific impacts associated with projected physical climate changes.

At the corporate level, we are identifying risks associated with critical suppliers that may have

a business-continuity impact on our operations. Our initial investigations reveal that, other than the direct supply of water, our supply chain does not present significant water-related risks to our organisation.

ARM's water opportunities
As part of improving our operational efficiencies, we focus on identifying opportunities to reduce water use. Some of these opportunities are cost effective. For example, by decreasing water consumption, we minimise the need for costly investments in bulk-water schemes (which have the potential to increase costs 4x to 5x). We also recognise that our catchment-based approach provides an opportunity to improve community relations and strengthen our social licence to operate.

Detrimental water-related impacts
ARM recorded the following detrimental water-related impacts in F2023:

- High rainfall led to increased pumping costs at Beeshoek Mine (to dewater pits), but provided other benefits (eg greater availability of water for mining, and reduced dependence on water from Kolomela Mine)

- Increased rainfall towards the end CY2022 led to flooding in Modikwa Mine's underground operations, and the overflow of all stormwater facilities. The mine was able to switch off operations in time to prevent equipment damage. The impact on production was minor, and the mine quickly recovered its operations. Increases in rainfall are also worsening road conditions, and leading to fleet and equipment damages. The level of damage is tolerable at present, but this issue will need to be addressed as extreme rainfall becomes more common
- Khumani Mine recorded stoppages due to the impact of rain on loading and hauling, but these did not affect production targets or add costs
- Excessive regional rainfall and high temperatures impacted production at Cato Ridge Works. A combination of direct production losses (furnace out due to water leaks after high temperatures and blocked feed chutes) and indirect production losses (power lost due to warm-up cycles after lengthy downtimes) is estimated to be 1 800 tonnes of high-carbon ferromanganese.

Targets and performance

Progress on operational water targets

As a member of the ICMM, ARM is committed to setting context-based water targets. These can include quantitative and/or qualitative (eg process steps) targets and commitments.

Below we report on progress towards context-specific targets set in F2022. We also present new targets for operations that were excluded from last year's target-setting processes (Cato Ridge Works was not classified as being

in a water-stressed area, and there was uncertainty on future activities at Machadodorp Works). Targets for Bokoni Mine will be set in F2024.

Figure 13: Progress on operational water targets*

MINE	TARGET	STATUS	DETAILS
Beeshoek	0.9m ³ water/tonne run-of-mine fed to the crushing plants	●	1.6m ³ water used
	1.3m ³ water/tonne product	●	1.7m ³ water used
	0.6m ³ make-up water/tonne run-of-mine	●	0.6m ³ water used
	1.0m ³ make-up water/tonne product	●	1.05m ³ water used
	To not exceed the volumes as per the agreement to receive water from Kolomela via Sedibeng Water	●	The installation of auto valves ensures that Beeshoek Mine does not exceed its allocated volumes.
	To maintain the good relationships and agreement with Kolomela	●	The relationship with Kolomela remains very good and has improved further since the installation of the auto valve.
Khumani	0.064m ³ water/tonne mined (including waste/stockpiled material)	●	0.058m ³ water used
	0.22m ³ water/tonne run-of-mine fed to the crushing plants	●	0.229m ³ water used
	0.319m ³ water/tonne product	●	0.326m ³ water used
	To continue to support collective actions to help the Vaal Central Water Board manage water supply more effectively	●	Water Board assisted financially and with technical expertise (eg artisans, boilermakers).
Black Rock	To not exceed groundwater dewatering and abstraction volumes as per the WUL (1 126 486m ³ /year)	●	Groundwater dewatering and abstraction volumes as per the WUL.
	To set a baseline in F2023 (following deployment of additional flow meters)	●	The installation of the flow meters is complete and the mine is in the process of automating the flow meter data reporting process. As most flow meters have only been recording for about three months, there is insufficient data to set baseline or quantitative targets.
	To set a quantitative target in F2024	●	Preliminary targets to be set in the second half of F2024.
Nkomati	Monitor water quality over time to understand the longer-term impact of water in pits on salts	●	Ongoing monitoring of water quality on monthly (surface water) and quarterly (boreholes) intervals.
	Undertake progressive rehabilitation	●	The mine is implementing the rehabilitation plan in a phased approach. In F2022 the rehabilitation of the top wall of the TSF at Onverwacht was completed. The construction of the stormwater channel is 82% complete. The mine is tendering for the capping and vegetation of the Waste Rock dump Area 13.
	Explore alternative water management options	●	The mine is in the process of acquiring and constructing a water treatment plant (environmental authorisation and WUL for the plant is in progress).
	Engage with the authority to determine the necessary long-term water management strategy	●	Initial engagement with the authorities has commenced.

* Targets for the newly-acquired Bokoni Mine will be set in F2024.

MINE	TARGET	STATUS	DETAILS
Two Rivers	Set F2023 KPIs for the General Manager, linked to the target	●	Complete
	Educate the staff on the importance of saving water through meetings, posters, water conservation campaigns and community engagements	●	Posters and notices were placed in change houses, public spaces and bathrooms.
	Implement water management measures to prevent water leakages and unnecessary water use	●	Water management measures such as early detection of leaks and curtailing unnecessary water use are controlled through ongoing maintenance and inspection as well as encouraging stewardship through monthly water-saving champions. Installation of water efficiency technology in change rooms, toilets and bathrooms is underway. Stormwater-management measures are almost complete, which will also ensure the separation of clean and dirty water. A mine-wide push/pull pumping system to increase water recycling opportunities are underway and should be completed towards the end of 2025.
	Implement improved water management, monitoring and reporting by F2024, with the aim to develop a plan to reduce water importation	●	The installation of the water meters is almost complete. These meters would allow for monitoring the water balance which will aid with achieving water targets.
	0.5m ³ water/tonne milled	●	0.2m ³ water/tonne milled
Modikwa	Undertake a water audit and gap analysis in F2023	●	Complete
	Develop a new water management plan based on the gap analysis and audit by F2023	●	Developed and being implemented
	Revise the target and qualitative commitments, including contributions to collective actions in the catchment by F2023	●	
	Set F2023 KPIs for the General Manager, linked to the targets	●	KPI has been allocated to the Engineering Manager who is the custodian of water management.
	0.5m ³ water/tonne milled	●	Submitted actions plans that detail what is needed to meet the targets.
Machadodorp Works	Not exceed abstraction levels of 195 000m ³ /annum from the Leeuspruit and 225 000m ³ /annum from the boreholes as per the WUL condition	●	
	Commission a reverse osmosis plant by October 2023 and have it fully operational by January 2024	●	
	Develop an integrated water management strategy based on the outcomes of the reverse osmosis monitoring plan. This strategy will prioritise use of affected and recycled water and consider catchment-level stewardship requirements	●	The progress of these newly set targets will be evaluated in F2024.
	Endeavour to minimise water consumption with technologies employed for future production expansions	●	
Cato Ridge Works	Commission a reverse osmosis plant by the end of the first quarter of F2025 and measure its effectiveness at reducing municipal water consumption. Based on this, set a revised water management plan in F2026	●	
	Reduce reliance on the municipal source (Umgeni water via eThekweni municipality)	●	The progress of these newly set targets will be evaluated in F2024.
	Use impacted stormwater from the dams as are placement for municipal water for furnace cooling	●	

Targets and performance continued

Water withdrawals

Operations withdraw water from a range of sources defined in the terms of their WULs, which include rivers, boreholes and municipal supplies.

In F2023, total water withdrawals (including operational water and other managed water) increased by 22% year-on-year (figure 14). This increase was largely related to a shift in the way we report on water withdrawals. In line with the new ICMM Water Reporting Good

Practice Guide, we now include a breakdown of operational and other managed water withdrawals and report on the change in storage at operations. As a result of this shift, this year we included water in the pit at Nkomati Mine into our calculations (to prevent overflow or discharge while the mine is on care and maintenance).

Total water withdrawals at the platinum division (figure 14) increased by 29% due to the inclusion of water in the pit at Nkomati Mine, improved

rainfall accounting at Two Rivers Mine, and activities associated with the Two Rivers Merensky project. Withdrawals decreased at Modikwa Mine due to underground dams that enabled more efficient water use at the shaft level.

Water withdrawals by the ferrous division decreased 2% due to efficiency measures, production disruptions and despite deeper mining at Black Rock Mine (increased the need to dewater fissure water for safety purposes).

Beeshoek Mine accounted for 21% of total group water withdrawal, and Khumani and Modikwa mines for 19% each. When considering only operational withdrawals, Beeshoek Mine accounted for 25%, and Khumani and Modikwa mines for 22%.

Total operational water withdrawals increased by 9% (figure 15). This excludes what was previously reported on as 'diversions' (water diverted to neighbouring communities, farms and other users) and the water in the pit at Nkomati Mine.

We achieved an overall water-reuse efficiency of 78% through further improvements in implementing the ICMM's WAF and water stewardship roadmap tool (page 85), and greater focus to reuse water. This reuse efficiency level is comparable to what

we achieved in F2022 (79%) and F2021 (78%), and up from F2020 (72%) when the metric was introduced. Reuse efficiency is a KPI used in monitoring and managing consumption and losses.

Water-discharge incidents

While all operations run closed-water circuits to maximise recycling and reuse, discharges are unavoidable in certain instances, such as during heavy rainfall. ARM categorises these discharges using level 1 to level 5 classifications of environmental incidents which are based on the size/scale of the impact, sensitivity of receiving environment, and remediation/clean-up requirements. Level 1 to level 3 incidents (insignificant to moderate impact) are reported internally at operations. Level 4 (high

impact) and level 5 (major impact) incidents are reportable to relevant authorities.

One level 4 incident occurred at Modikwa Mine. A tailings slurry pipe leak was detected on 10 July 2022, replaced and the spillage cleaned. No level 5 incidents occurred.

Water-balance summaries

This year, we reported according to the new ICMM guidelines. The key difference is a distinction between operational water withdrawals and other managed water (previously called diversions; see terminology definitions on page 77). A combination of the new and old formats has been included overleaf for comparative purposes.

Figure 14: Total water withdrawal by division (100% basis) measured in m³ million

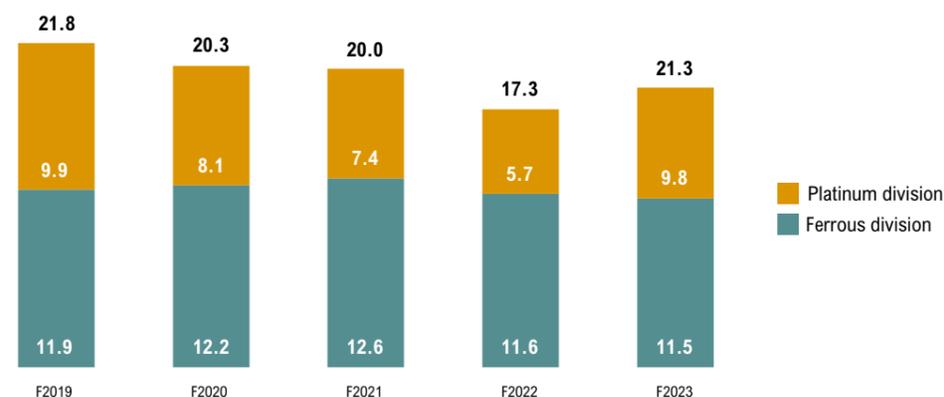
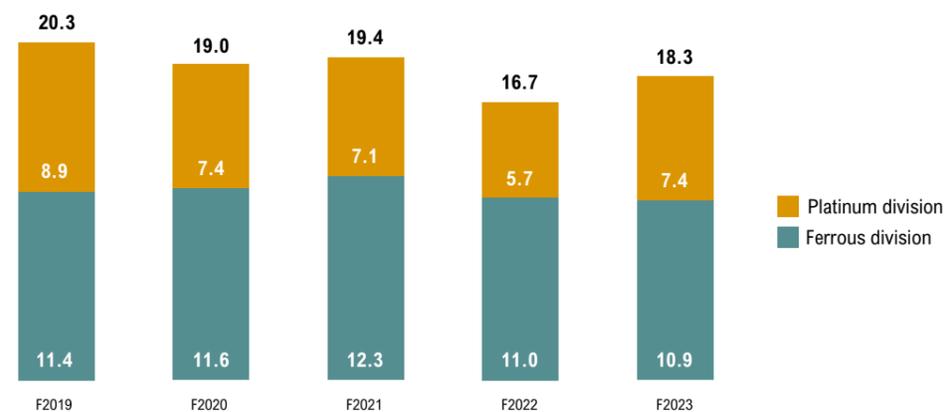


Figure 15: Total operational water withdrawal by division (100% basis) measured in m³ million



Water-balance summary for ARM operations in the Vaal WMA*

Metric	Source/destination/type	Volume of water by category (m ³)			F2022 Total	F2021 Total
		F2023		Total		
		High	Low	Total		
Withdrawal	Operational surface water	2 964	468	3 432	3 618	4 037
	Operational groundwater	5 803	1 408	7 212	7 681	8 269
	Other managed water	550	0	550	N/A	N/A
	Total withdrawal	9 317	1 877	11 194	11 299	12 306
Output	Operational surface water	0	118	118	164	135
	Operational groundwater	0	24	24	31	33
	Supply to third party	550	15	564	16	4
	Total output	550	157	706	211	172
Consumption	Evaporation	106	2 133	2 239	2 175	2 246
	Entrainment	0	1 685	1 685	782	1 621
	Other	0	(69)	(69)	133	109
	Change in storage	0	0	0	N/A	N/A
	Total consumption	106	3 750	3 855	3 090	3 976
Reuse efficiency	Total of all flows to tasks (ML/a)	4 507	42 279	46 787	63 367	66 419
	Total worked water flows to tasks (ML/a)	N/A	38 878	38 878	53 165	55 534
	Reuse efficiency (%)	N/A	N/A	83%	84%	84%
Diversions	Water diverted to neighbouring communities, farms and other users	N/A	N/A	N/A	590	360

* Includes Beeshoek, Khumani, and Black Rock mines.

Targets and performance continued

Water balance summary for ARM operations in the Pongola-Umzimkhulu WMA*

Metric	Source/ destination/type	Volume of water by category (m ³)				
		F2023			F2022	F2021
		High	Low	Total	Total	Total
Withdrawal	Operational surface water	199	0	199	255	253
	Operational groundwater	0	0	0	0	0
	Other managed water	0	0	0	N/A	N/A
	Total withdrawal	199	0	199	255	253
Output	Operational surface water	27	0	27	32	16
	Operational groundwater	0	0	0	0	0
	Supply to third party	0	0	0	0	0
	Total output	27	0	27	32	16
Consumption	Evaporation	160	96	256	254	250
	Entrainment	0	0	0	0	0
	Other	0	0	0	0	0
	Change in storage	0	0	0	N/A	N/A
	Total consumption	160	96	256	254	250
Reuse efficiency	Total of all flows to tasks (ML/a)	199	96	296	315	313
	Total worked water flows to tasks (ML/a)	N/A	96	96	60	60
	Reuse efficiency (%)	N/A	N/A	33%	19%	19%
Diversions	Water diverted to neighbouring communities, farms and other users	N/A	N/A	N/A	0	0

* Includes Cato Ridge Works (note that the operation is not in a water-stressed area).

Water balance summary for ARM operations in the Inkomati-Usuthu WMA*

Metric	Source/ destination/type	Volume of water by category (m ³)				
		F2023			F2022	F2021
		High	Low	Total	Total	Total
Withdrawal	Operational surface water	0	32	32	32	608
	Operational groundwater	48	218	266	204	1 473
	Other managed water	0	2 433	2 433	N/A	N/A
	Total withdrawal	48	2 683	2 731	235	2 080
Output	Operational surface water	0	0	0	0	645
	Operational groundwater	0	0	0	0	0
	Supply to third party	0	0	0	0	0
	Total output	0	0	0	0	645
Consumption	Evaporation	0	7	7	78	652
	Entrainment	0	27	27	45	46
	Other	0	0	0	0	0
	Change in storage	0	2 548	2 548	N/A	N/A
	Total consumption	0	2 582	2 582	123	698
Reuse efficiency	Total of all flows to tasks (ML/a)	48	53	101	140	8 097
	Total worked water flows to tasks (ML/a)	N/A	16	16	33	4 334
	Reuse efficiency (%)	N/A	N/A	16%	23%	54%
Diversions	Water diverted to neighbouring communities, farms and other users	N/A	N/A	N/A	0	294

* Includes Machadodorp Works and Nkomati Mine.

Targets and performance continued

Water balance summary for ARM operations in the Olifants WMA*

Metric	Source/ destination/type	Volume of water by category (m ³)				
		F2023			F2022	F2021
		High	Low	Total	Total	Total
Withdrawal	Operational surface water	2 777	2 026	4 804	3 107	3 126
	Operational groundwater	244	2 104	2 347	2 498	2 269
	Other managed water	0	0	0	N/A	N/A
	Total withdrawal	3 021	4 130	7 151	5 605	5 395
Output	Operational surface water	0	0	0	0	1
	Operational groundwater	0	0	0	0	0
	Supply to third party	0	0	0	0	33
	Total output	0	0	0	0	34
Consumption	Evaporation	0	1 851	1 851	2 645	2 624
	Entrainment	0	605	605	3 297	2 606
	Other	0	0	0	0	0
	Change in storage	0	50	50	N/A	N/A
	Total consumption	0	2 506	2 506	5 941	5 229
Reuse efficiency	Total of all flows to tasks (ML/a)	3 067	12 284	15 351	14 854	14 608
	Total worked water flows to tasks (ML/a)	N/A	9 989	9 989	9 249	9 432
	Reuse efficiency (%)	N/A	N/A	65%	62%	65%
Diversions	Water diverted to neighbouring communities, farms and other users	N/A	N/A	N/A	0	0

* Includes Modikwa and Two Rivers mines, but excludes the newly-acquired Bokoni Mine (will be included in F2024 reporting process).

Future water focus areas

Progress made on areas of focus detailed in our F2022 report is provided under **Our water journey to date** on page 16.

Areas of focus in F2024 and F2025 include:

- Setting context-based water targets for Bokoni Mine
- Assessing the processes and outcomes of our pilot of the ICMM water stewardship roadmap.

Based on this, and as the broader programme unfolds in the ICMM, in F2024 we will update our water-stewardship approach

- Further investigating and implementing ways in which we can leverage our LED and CSI spending to enhance community resilience to climate change and associated impacts on water

- Continuing processes initiated in F2022 of leveraging preliminary results of the climate-scenarios analysis to inform a revised assessment of water- and climate-related risks in our supply chain, and implementing the roadmap to fully integrate climate change into our ERM process.



Tailings Storage Facility at Black Rock

Acronyms

CEO	Chief executive officer
CRA	Cato Ridge Alloys
CRW	Cato Ridge Works
CMA	Catchment management agency
CSI	Corporate social investment
CSP	Conditional share plan
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
ERM	Enterprise risk management
GGV	Goedgevonden
GHG	Greenhouse gas
GISTM	Global Industry Standard on Tailings Management
ICMM	International Council on Mining and Metals
KPI	Key performance indicator
LED	Local economic development
MCSA	Minerals Council of South Africa
NCMLF	Northern Cape Mines Leadership Forum
PCB	Participative Coal Business
PGM	Platinum group metals
PV	Photovoltaic
SHEQ	Safety, health, environment and quality
TCFD	Task Force on Climate-related Financial Disclosures
TSF	Tailings storage facilities
VGWSS	Vaal Gamagara Water Supply Scheme
WAF	Water accounting framework
WUA	Water users association
WUL	Water use licence



Contact details

African Rainbow Minerals Limited

Registration number: 1933/004580/06
 Incorporated in the Republic of South Africa
 JSE share code: ARI
 A2X share code: ARI
 ISIN: ZAE000054045

Registered and corporate office

ARM House
 29 Impala Road
 Chislehurst
 Sandton 2196

PO Box 786136, Sandton 2146
 Telephone: +27 11 779 1300
 Email: ir.admin@arm.co.za
 Website: www.arm.co.za

Group company secretary and governance officer

Alyson D'Oyley BCom, LLB, LLM
 Telephone: +27 11 779 1300
 Email: cosec@arm.co.za

Investor relations

Thabang Thlaku
 Executive: Investor relations and new business
 development
 Telephone: +27 11 779 1507
 Email: thabang.thlaku@arm.co.za

Auditors

External auditor: Ernst & Young Inc.
 Internal auditors: Deloitte & Touche
 and BDO South Africa

External Assurance Provider over ESG reporting

KPMG Services Proprietary Limited

Sustainability

Tshegofatso Tyira (executive: sustainable development)
 Tel: +27 11 779 1300
 Email: tshegofatso.tyira@arm.co.za

Bankers

Absa Bank Limited
 FirstRand Bank Limited
 The Standard Bank of South Africa Limited
 Nedbank Limited

Sponsor

Investec Bank Limited

Transfer secretaries

Computershare Investor Services Proprietary Limited
 Rosebank Towers
 15 Biermann Avenue
 Rosebank 2196
 Private Bag X9000, Saxonwold 2132
 Telephone: +27 11 370 5000
 Email: web.queries@computershare.co.za
 Website: www.computershare.co.za

Directors

Dr PT Motsepe (executive chairman)
 VP Tobias (chief executive officer)
 F Abbott*
 M Arnold**
 TA Boardman*
 AD Botha*
 JA Chissano (Mozambican)*
 WM Gule*
 B Kennedy*
 AK Maditsi*
 TTA Mhlanga (finance director)
 HL Mkatshana
 PJ Mnisi*
 DC Noko*
 B Nqwababa*
 MP Schmidt
 Dr RV Simelane*
 JC Steenkamp*

* Independent non-executive.

** Non-executive.

ARM's whistleblowers' facility

Toll-free: 0800-006-7925
 Facsimile: 086-5222-816
 Online: www.whistleblowing.co.za
 SMS: 33490
 SMS callback: Send a "please call me"
 to 0826-777-531

Forward-looking statements

Certain statements in this document constitute forward-looking statements that are neither reported financial results nor other historical information. They include statements that predict or indicate future earnings, savings, synergies, events, trends, plans or objectives. Such forward-looking statements may or may not take into account and may or may not be affected by known and unknown risks, uncertainties and other important factors that could cause actual results, performance or achievements of the company to be materially different from future results, performance or achievements expressed or implied by such forward-looking statements. Such risks, uncertainties and other important factors include: economic, business and political conditions in South Africa; decreases in the market price of commodities; hazards associated with underground and surface mining; labour disruptions; changes in government regulations, particularly environmental, health and safety and tax regulations; changes in exchange rates; currency devaluations; inflation and other macro-economic factors; electricity supply disruptions, constraints and cost increases; supply chain shortages and increases in the price of production inputs; the unavailability of mining and processing equipment or transportation infrastructure; the impact of the Covid-19 pandemic; and the impact of tuberculosis. The forward-looking statements apply only as of the date of publication of these pages. The company undertakes no obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after the date of publication of these pages or to reflect any unanticipated events.