

RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

Water

Continued improvement in climate change and water reporting

There has been an increase in stakeholder expectations and regulatory requirements related to climate change and water performance as well as reporting on that performance.



To meet the multiple and evolving stakeholder reporting requirements, ARM has decided to publish an additional climate change and water supplementary report on our website. This will use the Task Force on Climate Related Financial Disclosures' (TCFD's) recommendations and the ICMM Position Statement on Water Stewardship as the basis for reporting, but will also ensure that various other stakeholder expectations and requirements are met, including those of:

- » The ICMM's performance expectations and position statements;
- » The Transition Pathways Initiative (TPI);
- » The Johannesburg Stock Exchange (including the FTSE-Russel ESG Index);
- » The GRI; and
- » Other reporting expectations as they arise.

This supplement will include more detailed data on our energy, climate change and water performance allowing stakeholders to analyse the data according to their needs.

This supplementary report will replace our prior CDP responses in terms of climate change and water, as we believe that this process may be more dynamic and could be used more effectively to meet our stakeholders' needs which are continually evolving.

Water management

Water is a precious shared resource with high social, cultural, environmental and economic value. Access to water is a right; integral to wellbeing and livelihoods and the spiritual and cultural practices of communities. It is also essential to the healthy functioning of ecosystems and their services. Water resources are increasingly under pressure from industrialisation,

urbanisation, climate change and the needs of a growing global population.

We support the ICMM position statement on water stewardship and have implemented the Water Accounting Framework as part of the commitment.

Interactions with water

Water is a vital input for all mining and metals operations. We use water for milling, beneficiation, cooling and for dust suppression during blasting, on haul roads and at ore transfer points. We are committed to providing our employees with access to sufficient potable water for drinking and water, sanitation and hygiene (WASH) services. Water is critical for various users in our wider catchments, is a critical supply chain commodity and is needed in the production of other critical supply chain commodities such as electricity, chemicals and explosives.

Without access to water our business could not operate. Water is consequently a material operational and strategic concern, and water stewardship is fundamental to achieving our strategic objectives.

Water metrics

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

The second phase of implementation of the ICMM Water Accounting Framework was completed during F2019. As part of the process, water accounting definitions were implemented which allowed for better reporting on harvested rainfall and runoff from mining operations. Additional flow meters were also installed to improve accuracy of measurement. A detailed water reporting flowsheet was developed for each operation in

consultation with the engineering and environmental teams, to assist in this process.

As a result, F2019 water withdrawal volumes reported by operations increased by 19% to 21.8 million m³ from 18.3 million m³ in F2018.

The most material increases include:

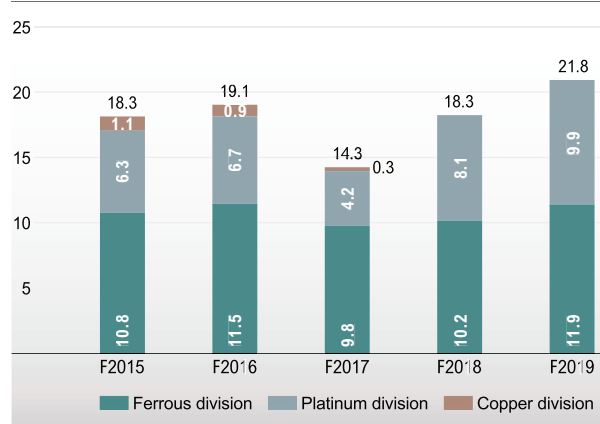
- » At Modikwa Mine, 2 million m³ of groundwater, which was previously not reported, was accounted for;
- » A further 1.2 million m³ increase in water withdrawal was reported at Beeshoek Mine, mainly due to dewatering of the pit to ensure safe mining conditions;
- » Nkomati Mine reported a 0.7 million m³ increase due to more efficient recovery of water from the tailings storage facility; and
- » Black Rock Mine reported an increase of 0.3 million m³ as a result of new flow meters being installed and improved accuracy of measuring.

As a result of the implementation of the Water Accounting Framework, we have improved our understanding of water re-use efficiency, which is above 70% and is a key indicator in monitoring and managing consumption and losses.

Beeshoek Mine accounted for 24% of total Group water withdrawal, Nkomati Mine 20% and Khumani Mine 21%. Water withdrawal by the Ferrous division increased by 17% to 11.9 million m³ (F2018: 10.2 million m³) and 22% in the Platinum division to 9.9 million m³ (F2018: 8.1 million m³). The reason for general increases is due, in part, to better reporting of harvested rainfall and runoff as a result of implementing the new ICMM-based water reporting system.

Outputs include flows to surface water, groundwater and supply to third parties as per ICMM definitions (volume of water which is removed from the operational facility after it has been through

WATER WITHDRAWAL BY DIVISION (100% BASIS)
(m³ million)



a task, treated or stored for use). "Discharges" in this report refer to discharges at operations as defined in their Water Use Licences (WULs). Discharges in F2019 are reported on page 86.

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

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

Some operations supply water to neighbouring communities, farms and other users. This is water not intended for primary mining activity use and is classified as a "diversion".

Metric	Source/destination/type	Volume of water by quality		
		High (m ³)	Low (m ³)	Total (m ³)
Withdrawal	Surface water (m ³)	4 720 458	2 285 234	7 094 735
	Groundwater (m ³)	7 869 186	6 809 520	14 678 706
	Total withdrawal (m³)	12 589 643	9 094 754	21 773 441
Output	Surface water (m ³)	4 534	429 279	433 813
	Groundwater (m ³)	0	215	215
	Supply to third party (m ³)	0	3 840	3 840
	Total output (m³)	4 534	433 334	437 868
Consumption	Evaporation (m ³)	350 888	1 607 272	1 918 247
	Entrainment (m ³)	0	4 680 141	4 680 141
	Other (m ³)	0	165 123	165 123
	Total consumption (m³)	350 888	6 452 536	6 763 511
Re-use efficiency	Total of all flows to tasks (m ³ /a)	6 946 468	63 912 089	70 858 557
	Total worked water flows to tasks (m ³ /a)	na	49 749 766	49 749 766
	Reuse efficiency (%)	na	na	70%
Diversions	Water diverted to neighbouring communities, farms and other users (m³)	504 376	942 348	1 446 724

RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

We aim to continually improve our measurement and reporting of water metrics according to the new ICMM framework. F2020 will include a focus on capturing all worked water flows, consumption sources, outputs and changes in water storage.

74 Water challenges and opportunities

Certain of our operations face significant catchment-level water risks that arise from poor existing water infrastructure, a lack of funding and capacity to deliver new infrastructure, and the impacts of climate change on supply of water to adequately meet the growing need. Water availability, consumption and pollution are regarded as key risks to the Group and are included in both the operational and the corporate risk registers. Water-related opportunities are identified through collective action at the catchment level.

Material water risks

Water is a material matter across the Group, although for different reasons at different operations.

Seven of our eight operations under direct or joint control are located in water stressed areas. In the Vaal Water Management Area (WMA) this includes Beeshoek, Khumani and Black Rock mines in the Northern Cape (representing 85% of EBITDA). In the Olifants WMA this includes Two Rivers Platinum and Modikwa Mines (representing 17% of EBITDA). And in the Inkomati-Usuthu WMA this includes Nkomati Mine and Machadodorp Works.

At Nkomati mine, excess water requires de-watering of the area around the open pit mine to keep it safe. Our priority is to minimise withdrawal from other sources by recycling water and using groundwater from the de-watering process. The physical risk of surface water contamination also presents a regulatory risk of non-compliance with the Water Use License (WUL) and reputational risk as discharge could potentially affect local farmers and the Vygeboom dam. Reduced production activities due to economic and market conditions have resulted in pressure put on the system at Machadodorp Works. There is reduced re-use and consumption and therefore any rainwater poses a potential risk of controlled discharge and associated non-compliance with the waste management and WULs.

At the operations in the Northern Cape (Beeshoek, Black Rock and Khumani mines), issues around water scarcity can potentially impede our growth plans and in addition, are a core concern for local communities. The key risk areas are water availability, uncertainty in the existing policy environment, the state of existing water infrastructure (including pump stations and pipelines), Eskom power disruptions and the related socio-economic impact. There is limited catchment management in the area and while the Tshiping Water User Association mitigates this risk there is not a good understanding of the catchment-level water balance. Water restrictions have been experienced at the operations. During the year, water had to be trucked in and bottled water bought for employees working underground at Black Rock Mine. The operations also face a relatively minor and localised risk of flooding during extreme weather events.

Water supply is at risk at Modikwa Mine due to 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. 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 not been successful.

Material water opportunities

Our focus on improving operational efficiency includes identifying opportunities to reduce water use. Investment in bulk water schemes have the potential to increase costs between four and fivefold. Specifically, these relate to:

- » The three mines in the Northern Cape via the Sedibeng pipeline; and
- » Modikwa Mine, as part of the Lebalelo Water User Association and the Olifants River Water Resource Development Project (ORWRDP phase 2) investments.

Reducing water consumption reduces costs and the need for investment in bulk water supply infrastructure in areas where water is scarce.

We are also increasingly looking beyond our operational borders to contribute to collective action at the catchment level. Ensuring adequate supply of water will build community resilience to adapt to a changing climate where projected water availability is expected to decrease (and demand is expected to grow). This is an opportunity to improve community relations and strengthen our social license to operate.

Commitment and response

Water challenges are shared and require collaboration by governments, civil society, business and local communities. We recognise that we need to manage water impacts at our operations and that responsible water stewardship and holistic risk mitigation requires collaboration and collective action at the catchment level.

Water stewardship is integrated into our strategy

We have integrated water considerations into our business strategy by considering water risks and opportunities at the company and asset levels, measuring and managing our water withdrawals, consumption, outputs and re-use efficiency and taking action to mitigate risks and take advantage of opportunities. Information on the level of risk or opportunity and capacity to manage these are tabled and discussed at the ARM Management Risk and Compliance Committee as well as the Social and Ethics Committee whose outputs feed directly into the strategy development process.

We have an important role to play in the sustainable management of water resources and aim to achieve this through a proactive and holistic water management strategy 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 use and minimising withdrawal of clean/potable/municipal water. Our goal is to recycle 100% of water and to have no discharges.

We have set a water target to reduce withdrawals of potable water (surface and municipal sources) by 10% by F2020 relative to F2011. This target includes all existing ARM operations except Machadodorp Works and excludes divested operations since F2011 (Dwarsrivier and Lubambe mines). As part of annual workshops at our operations, focusing on climate and water compliance, we explored the development of a new water target related to withdrawals. Operations were consulted on what would constitute an appropriate water target for ARM based on site-specific considerations of what is realistic but ambitious. A realistic target has been set and represents the first step on ARM's water target setting journey. Based on lessons learned in setting ARM's first target, the process of measuring performance in achieving the target and any new developments and best practice that emerge, ARM will set new more ambitious targets going forward. The new water reporting system, in line with the ICMM framework, has delivered more consistent metrics across the operations and will allow ARM to set more appropriate water targets in the future.

We have also adopted a more catchment-based approach and have thus become more collaborative in delivering on our strategic objectives. For example, at Khumani Mine, ARM engaged in the project management and engineering and maintenance issues around the provision of water (public/maintenance service). This is fundamental to our growth objectives. Similarly, we have increasingly recognised the value of water and resultant efficiencies achieved are therefore aligned with our strategic objectives relating to operational efficiencies. Where water is material, relevant KPIs have been introduced at operational level.

We invest in technology to reduce water requirements, considered as part of new/expansion projects, reducing our water dependency and competition with other water users. For example, Khumani Mine was designed with severely restricted water availability as a material consideration. The mine invested in a tailings paste disposal facility rather than a conventional tailings deposition facility to minimise water use and discharge, and to ensure maximum recycling and minimum evaporation losses.

Engagements around water

There is a growing awareness of the need for collective action to reduce water usage, fix leaks, restore ecosystem health, and to identify and manage water risks through stakeholder engagement. Investors and other stakeholders are increasingly calling for greater insight into catchment-level water balances, including projected demand and supply as well as water quality elements.

WATER-RELATED FORUMS IN WHICH ARM PARTICIPATES OR INTERACTS WITH INCLUDE:

- » The Gladdespruit Forum;
- » The Tubatse Environmental Forum;
- » The Lebalelo Water User Association;
- » The Olifants River Water Resources Development Project;
- » The Tshiping Water User Association; and
- » The Manganese Leadership Forum (engaging around the appropriate design of the Vaal Gamagara Water Supply Scheme).

ARM's commitment to water stewardship drives our engagements with various stakeholders to find solutions appropriate to all water users' needs. We engage with a broad range of water-related stakeholders to ensure the sustainability of water resources and that all operations have the necessary controls in place to ensure that the quality of water around them is not negatively affected. These stakeholders include the Department of Water and Sanitation, local communities, authorities at the local, provincial and national levels, water forums, irrigation boards, catchment management agencies, farmers and other industry users. Engagements with communities help us to understand and mitigate their concerns, identify how ARM can contribute to community water security and increase transparency regarding our operations. We partner with local and regional government structures where appropriate to mitigate water risks that arise outside mine boundaries.

ARM participates in forums that discuss issues relating to sustainable water supply in the region. These include climate change and the potential influence changing climate and potential regulation could have on the supply and cost of water.

ARM's operations engage with catchment level forums that estimate current and future catchment balances. The Inkomati-Usuthu Catchment Management Agency where Nkomati Mine operates is effective in facilitating this. Tshiping Water User Association in the Northern Cape serves this function reasonably well but other forums or catchment management agencies are less effective and catchment-level water availability and quality are less well understood.

RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

76



CASE STUDY

Collective investment in bulk water infrastructure in the Northern Cape

Increasing cost and unreliable supply of water in the Northern Cape present a material risk to our operations in the area. We have played an active role in a collaborative process to proactively mitigate this risk.

In 2017, Assmang¹ was instrumental in setting up the Mines Leadership Forum (MLF) as a collaborative platform under the MCSA. Funds were raised through the MLF/Mines to support ongoing technical, legal and financial engagements with the municipal water provider, Sedibeng Water. Due to the protracted finalisation of the offtake agreement, a capital raising fee was proposed by the MLF to address immediate funding requirements on the Vaal Gamagara Water Supply Scheme (VGGWSS), and a steering committee has been convened with Sedibeng Water to provide oversight on the ongoing VGGWSS work.

This capital raising fee will raise additional funds from the industry over 24 months, which will provide some relief to the immediate VGGWSS replacement funding costs.

Work is ongoing to agree on contributions from various stakeholders and to clarify the scope, expenditure outlook and available funds for subsequent investments.

¹ ARM Ferrous division trades as Assmang (Pty) Ltd, a joint venture with Assore Limited.



CASE STUDY

Improving our water reporting

2019

Further improvement in water accounting at operational level.

The ICMM released a Position Statement on Water Stewardship in January 2017, followed by the "Practical guide to consistent water reporting" in March 2017. The comprehensive guideline, based on the Water Accounting Framework (WAF) for the Minerals Industry of the Minerals Council of Australia, is at the core of Water Accounting Principles referred to in the Position Statement.

During May 2017, ARM commissioned a project to ensure that our water management and reporting methodology aligns fully with the commitments of the ICMM. One of the key commitments is for members to report consistently and transparently on water management and accounting. Phase 1 of the project (which was completed in F2018), focused on the quantitative water accounting process which included aligning the detailed water balances and classification of sources of water withdrawal at each operation. While each operation has an approved water balance which is used to report to the Department of Water and Sanitation, there is more detail in the Guidance from the ICMM and hence additional sources such as storm water were included in the water balances. This led to the identification of water withdrawal sources not previously included in the operational water balances, specifically in the Platinum division.

Phase 2 of the project (completed in F2019) focused mainly on the qualitative aspects of reporting, while further refining the water balances and ensuring consistent application of the methodology. This report represents the first publication of our water performance according to the WAF and ICMM requirements. In addition, we have decided to publish a climate change and water supplementary report on our website towards the end of 2019, aimed at providing a comprehensive corporate water summary in line with the ICMM water reporting guidelines.

As part of the next phase, we will continue to improve reporting as efforts to align frameworks, such as the ICMM and the GRI Standards, evolve and the MCA WAF user guide is updated.

Identifying and managing water risks at the operational level

The Enterprise Risk Management (ERM) process links ARM's strategic intent factors to the water risks that may help or hinder the operation from achieving its objectives. Water is inherently included in the strategic intent factors. Water availability is considered as part of each operation's five-year business plan and these assess the availability and use of appropriate technology to address water requirements or manage impacts.

In F2017 and F2018 ARM undertook 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 the World Resources Institute's Aqueduct tools were used to support the identification and assessment of water-related risks at the operations.

The ARM Risk management function has embarked on facilitating a process to identify risk associated with critical suppliers that may result in a business continuity impact to the operations. We have not identified our supply chain as presenting a material water-related risk to our organisation, based on experience and initial investigations into potential risks in the future other than the need to secure the supply of water.

Our focus on operational efficiencies emphasises the value of water and the need to use it efficiently. Water balances at operations manage and optimise water use and relevant KPIs are in place to incentivise increased water efficiency.

All operations run closed circuit water systems to the extent possible to maximise recycling and minimise discharge into the environment. Dirty and clean water are separated and operations implement a hierarchy of water use to ensure that "dirty" or process water is recycled for re-use before clean water is withdrawn from the natural environment. Where appropriate, technologies such as reverse osmosis (RO) been implemented to clean process water and we continue to investigate natural, sustainable alternatives such as wetland formation, particularly for mine closure plans and objectives. Surface water and groundwater quality is monitored to measure compliance with WUL conditions, assess our impact on the

receiving environment and flag the need for mitigation. Biomonitoring of aquatic/riverine environments is performed as appropriate and as stipulated in each operation's WUL conditions.

Mines use dust suppression surfactants to reduce evaporation as well as various other measures to reduce consumption, increase storage and mitigate production downtime.

Beeshoek Mine invested in mobile pumps, a new storm water dam and plans to build a new return water dam. Black Rock Mine invested in a RO plant and filters, and reuses process water for gland services. In addition to a design that uses a paste technology for tailings disposal (recovering up to 85% of water) Khumani Mine invested in long term on-site water storage and built additional storm water trenches and dams that also reduce safety risks during extreme weather, thus limiting production downtime.

Nkomati Mine invested in additional water storage and evaporation fans to manage excess water. Two Rivers Mine optimised flocculant and increased pump and pipe sizes to reduce spillage.

At Machadodorp works a water management project team has been established. The smelter has constructed cut off trenches, doubled the sump size and is investigating a RO plant to mitigate the risk of discharge to the environment.

We are increasingly looking beyond our operational boundaries to contribute to collective action at the catchment level. For both our Northern Cape and Platinum operations we are engaging in collective actions to ensure long term bulk water supplies.

ARM and its joint venture partners, through its operations, invest in local water infrastructure through their SLPs to improve community access to sufficient potable water and increase community resilience. The ARM Trust funds water provision projects and has facilitated the sinking and equipping of boreholes for various schools and communities around South Africa.



RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

78

Climate change

Climate change is recognised as a critical global challenge that will require leadership from all parts of society. In line with our values, ARM is committed to being part of the solution through industry collaboration towards a low carbon future.



ARM monitors evolving climate change risks, associated opportunities and adaptation measures to ensure that the Group is kept aware of these developments and to further integrate these aspects into our business strategy. Our assessments include risks and opportunities across our value chain and aim to meet the increasing expectations of investors communicated through initiative such as the Task Force on Climate Related Financial Disclosures (TCFD) and the Transitions Pathways Initiative (TPI).

Annual climate change and water workshops at each operation examine evolving climate change and water risks and opportunities. These workshops include explicit assessment of

upstream (supply chain) and downstream (customer) risks that have the potential to impact operations directly and our stakeholders. Feedback is incorporated in the ERM process and informs strategic planning processes.

ARM submitted responses in terms of climate change and water to the CDP in 2018 and received an A- score for Climate Change and a B score for Water Security. We have decided to replace our participation in the CDP with an online supplement (due by the end of 2019) on climate change and water to cover a wider agenda and address the needs of stakeholders. One such request was to disclose performance in these areas by the ARM Coal operations which are effectively managed by Glencore.

PRIMARY CLIMATE CHANGE RISKS

- » Water quality and availability, particularly in water-stressed regions such as the Northern Cape, which affects Black Rock, Beeshoek and Khumani mines.
- » Water shortages and electricity supply concerns have been identified as significant risks at operational level and these may be exacerbated by the physical effects of climate change.
- » Operations could be affected by extreme weather, such as storms, flooding and higher temperatures, causing shutdowns and lost production. Production at Nkomati Mine was affected by lightning during F2019.
- » Transport of products to customers and raw materials to our smelters could be affected by storms and floods as these are transported over long distances by rail, road and sea. Nickel shipments were delayed by bad weather in April and May 2019, affecting sales at Nkomati Mine.
- » Changing weather patterns could affect food security and change distribution of diseases such as malaria. This could create negative health implications, increasing costs and impacts on our workforce and the communities around our operations.
- » Failure to demonstrate responsible environmental stewardship could damage our reputation and relationships with customers, investors, business partners, regulators and broader society.
- » Global emission reduction initiatives and the move to cleaner mobility and energy could reduce demand for platinum group metals and thermal coal.
- » Increased compliance and energy costs arising from regulatory change.
- » The financial impact of carbon tax through both the direct tax and pass-throughs from electricity producers after 2020.

OPPORTUNITIES ARISING FROM CLIMATE CHANGE

- » Pollution concerns and tightening emission regulations globally could support the demand for high-quality bulk commodities, including high-grade iron and manganese ore.
- » Reputational benefits of an environmentally responsible approach.
- » ARM continues to evaluate new production technologies to reduce electrical energy consumption and carbon emissions.
- » Financial energy and climate change incentives, including tax incentives, research and development incentives and government grants.

Carbon tax

The Carbon Tax Act No 15 of 2019 has been signed into law and came into effect from 1 June 2019. The tax will play an important role in achieving the objectives set out in the National Climate Change Response Policy of 2011 and contribute to meeting the country's commitments to reduce GHG emissions. ARM is not expected to experience significant impact in the first phase to 2020, but once free allowances are removed beyond 2021, costs will increase. The MCSA and BUSA have identified a number of concerns with the carbon tax that are likely to limit effective implementation. These include a lack of policy alignment with the draft

Climate Change Bill, a lack of consultation regarding the post-2022 regime, concerns around administration of the Act, policy uncertainty regarding reporting requirements and a lack of clarity regarding allowances and offsets.

ARM supports the trend towards a low carbon economy and is committed to constructive engagement with government on the measures aiming to achieve this outcome. We remain concerned about the potential impact on local industry resilience and international competitiveness, as well as the significant direct and indirect costs of ensuring compliance with these new initiatives.

Carbon emissions

Emissions attributable to our operations arise primarily from the consumption of electricity produced by coal-fired power stations and the combustion of fossil fuels during mining, load and haul, materials handling and processing activities. Emissions data is monitored and reported internally every quarter, discussed at operational sustainability meetings and assessed as part of quarterly risk management workshops.



ARM's estimated annual carbon footprint is based on our calculation of greenhouse gas (GHG) emissions¹, which assesses three sources of emissions:

SCOPE 1

Direct GHG emissions from sources owned or controlled by the Company.

At ARM operations, Scope 1 emissions mainly relate to diesel consumption (for load and haul activities) and reductants (Cato Ridge Works).

SCOPE 2

Indirect GHG emissions related to purchased energy.

Electricity consumption comprises 79% of ARM's total carbon footprint.

SCOPE 3

All indirect emissions not included in Scope 2 that occur in the upstream and downstream value chain.

ARM's most material sources of Scope 3 emissions arise from processing of our sold products (particularly iron ore), transport and distribution (both upstream and downstream) and our investments, and we work closely with our joint venture partners to ensure risks are mitigated.

Carbon emissions have been calculated based on joint operational control and in accordance with the GHG Reporting Protocol. This is also consistent with the operational boundary required by the Mandatory GHG Reporting Regulations.

The carbon emissions from ARM's investment in coal mining will be specified in the Scope 3 inventory which will be available in a supplementary report, to be published by the end of 2019.

How we manage carbon emissions

ARM's strategic focus on cost efficiencies and operational cost reduction projects supports the focus on reducing energy consumption and emissions. ARM's energy and climate change strategy aims to identify and develop opportunities for long-term achievable emission reduction through investigating energy efficiency initiatives, alternative energy sources, new

technology and diversification into less energy-intensive products. Operational and capital budgets are allocated at operations for energy efficiency projects as appropriate and energy targets are set.

Engineers and production staff are incentivised on energy efficiency per tonne of ore milled, time of energy use and the use of alternative energy sources. Remuneration and incentive packages of production teams and other appropriate positions at the smelters include KPIs linked to emissions reduction initiatives.

In F2019, carbon emission performance targets were included in ARM's Remuneration Policy and in the conditional share plan for ARM executives. The incentives are based on actual savings defined in the GHG Protocol over three years, with a stretch target of 2%+ reduction from new and existing carbon reduction initiatives.

¹ ARM's GHG calculations are based on the Greenhouse Gas Protocol – Corporate Standard (GHG Protocol), published by the World Resources Institute and World Business Council for Sustainable Development in March 2004. The data collection process complies with the data quality requirements set out in ISO 14044, as well as the GRI Standards, and is verified externally on an annual basis.

RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

Evolving regulatory and policy developments include:

Department of Environment, Forestry and Fisheries (DEFF)

THE NATIONAL CLIMATE CHANGE ACT AND RESPONSE POLICY

The Climate Change Bill is closed for comment and scheduled to be presented to parliament in the second half of 2019. The Bill includes requirements for mandatory reporting and the establishment of Sectoral Emission Targets, Sectoral Emissions Reduction Plans and the associated budgets that will be allocated to companies. The current carbon budget was allocated for 2016 to 2020 under the policy.

GREENHOUSE GAS (GHG) REPORTING REGULATIONS AND POLLUTION PREVENTION PLANS

The requirements of regulations on GHG reporting and pollution prevention plans are incorporated into the carbon emissions monitoring and management programme. ARM submitted its annual GHG Emissions Report and first annual GHG Pollution Prevention Plan progress report to the DEFF in March 2019.

Department of Mineral Resources and Energy (DMRE)

ENERGY MANAGEMENT PLANS

Regulations requiring companies to measure and report energy consumption and develop and submit Energy Management Plans are being developed by the DMRE. ARM's operations consume more than the reporting threshold of 400 TJ per year and will be required to measure and report energy, develop Energy Management Plans and report on progress against those plans. The Regulations are not yet finalised and there is consequently uncertainty about what their final form will be. There is significant overlap between the DEFF's carbon budget and reporting processes and it is possible that these will be aligned with the DMRE's reporting and energy management plan processes.

ARM continues to engage regarding the developing policy framework directly with relevant stakeholders and through active participation in collective industry engagement processes with regulators through the MCSA, BUSA and the National Business Initiative (NBI), to comment and to gain clarity to prepare for potential impacts on business activities.

Carbon emission reduction targets



2019 Continued reduction in carbon emissions.

Working with operations to set long-term water and carbon targets.

During F2018, we set a revised carbon emission reduction target based on both a bottom-up assessment of opportunities to reduce GHG emissions at operations and a top-down assessment that included benchmarking of peer company targets and stakeholder expectations. The target is to achieve a 5% absolute reduction of Scope 1 and 2 emissions by F2020 against a F2014 baseline through emission reduction initiatives (excluding divestments). We plan to set science-based targets in the future, as part of a phased approach.

ARM's F2019 estimated carbon footprint (Scope 1 and 2 attributable emissions) increased 7% to 1.10 million equivalent tonnes of CO₂ (mtCO₂e) from 1.03 mtCO₂e in

F2018. This represents a 10% decrease compared to the F2014 baseline.

We will provide further information in this regard in an online water and climate change report that will be published by the end of 2019.

Cato Ridge Works contributed 31% of the Group's total Scope 1 and 2 emissions. Nkomati Mine contributed 20% and Khumani Mine 15%, mainly as a result of diesel consumption during mining, load and haul activities in the open pits.

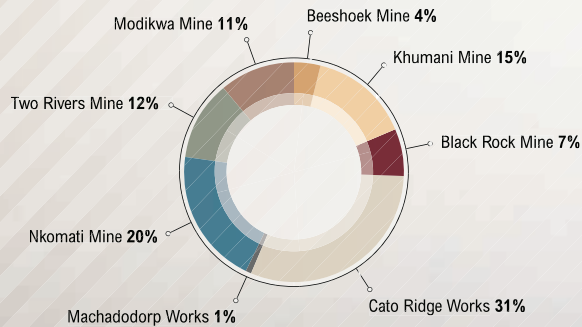
The graphic on the next page shows F2019 Scope 1 and 2 attributable emissions for ARM operations expressed in tCO₂e.

2019

Continued reduction in carbon emissions. (continued)

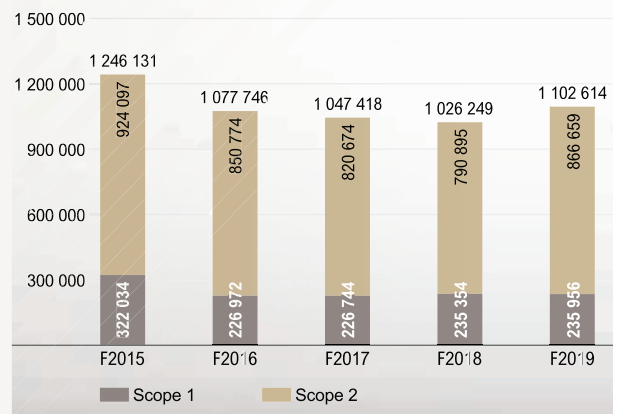
Working with operations to set long-term water and carbon targets.

SCOPE 1 AND 2 CARBON EMISSION CONTRIBUTION BY OPERATION (%)



Scope 1 and 2 emissions are stated on an attributable basis.

SCOPE 1 AND 2 CARBON EMISSIONS (tCO₂e)



CARBON EMISSIONS PER OPERATION

(Scope 1 and 2 attributable tonnes CO₂e)

- Platinum division operations
- Ferrous division operations
- Corporate office



MODIKWA MINE

121 683

TWO RIVERS MINE

131 271

BEESHOEK MINE

42 352

MACHADODORP WORKS

6 514

BLACK ROCK MINE

77 265

NKOMATI MINE

224 904

KHUMANI MINE

160 409

CATO RIDGE WORKS

337 490

ARM CORPORATE OFFICE

726

* ARM acquired Machadodorp Works effective from 28 February 2019.

RESPONSIBLE STEWARDSHIP OF ENVIRONMENTAL RESOURCES continued

**2019 Continued reduction in carbon emissions. (continued)****Working with operations to set long-term water and carbon targets.**

ARM's systems consider Scope 3 activities, upstream and downstream of our operations, to assess and mitigate greenhouse gas-related risks in our value chain, and include more targeted climate change-related engagement with partners in our value chain. Sources of Scope 3 emissions are purchased goods and services, fuel and energy-related activities not included in Scope 1 or 2, upstream transportation and distribution, employee commuting, business travel, waste generated in our operations, downstream transportation and distribution, generated in operations, processing of sold products, and investments.

Scope 1 and 2 emission intensity

We calculate and track carbon emissions intensity ratios per full-time employee and per unit of production or processing to adjust for changes in production activity levels. Scope 1 and 2 carbon emissions per tonne of manganese alloy produced, increased by 2.4% to 1.5 tCO₂e/tonne in F2019 from 1.4 tCO₂e/tonne.

Scope 1 and 2 emissions per tonne of iron ore produced was 0.023 tCO₂e/tonne (F2018: 0.020 tCO₂e/tonne). Scope 1 and 2 emissions per tonne of manganese ore produced increased to 0.045 tCO₂e/tonne from 0.038 tCO₂e/tonne in F2017.

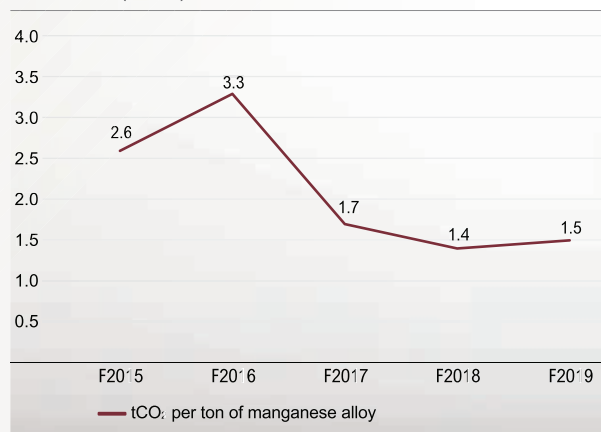
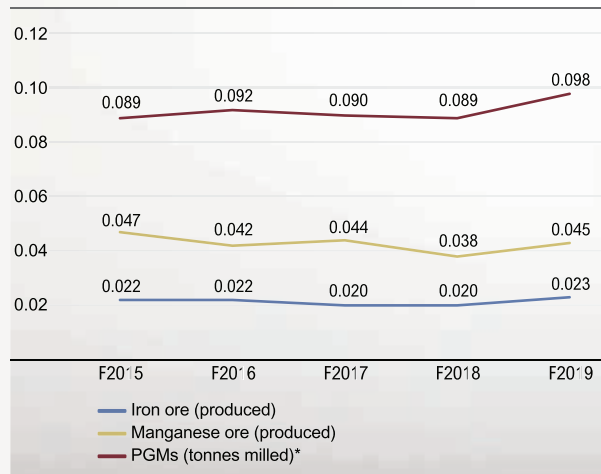
Carbon emissions per tonne of ore milled at our two primary platinum mines, Modikwa and Two Rivers mines, increased to 0.098 tCO₂e/tonne (F2018: 0.089 tCO₂e/tonne). Scope 1 and 2 emissions per full-time employee (FTE) increased by 16% to 197.1 tonnes CO₂e (F2018: 169.4 tCO₂e).

Scope 1 and 2 emissions per man-hour worked increased to 52 kg CO₂e (F2018: 43 kg CO₂e).

Direct emissions

Direct emissions arise from the smelting process at Cato Ridge Works and include carbon dioxide, nitrous oxide, sulphurous oxide and particulates. ARM's F2019 and historical direct emissions are shown in the table on page 5 of this report. Cato Ridge Works has an approved Air Emission Licence, issued in terms of the National Environmental Management: Air Quality Act. An air

cleaning system is in place to manage emissions and the system's availability is continuously monitored and regularly reported to local and provincial authorities as required by their licence conditions.

SCOPE 1 AND 2 CARBON EMISSIONS PER TONNE PRODUCED – SMELTERS (tCO₂e)**SCOPE 1 AND 2 CARBON EMISSIONS PER TONNE PRODUCED – MINES (tCO₂e)**

* Two Rivers and Modikwa Mines only.

Energy

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 the machines that crush and mill ore. The energy used for heating is one of the biggest cost inputs in the smelting process at Cato Ridge Works.

The increasing cost of electricity and diesel have a significant impact on production costs and future increases. The operations also have to budget for carbon tax as well as the potential for pass-through of carbon tax to consumers by Eskom.

