



## CARBON MANAGEMENT FOR A SUSTAINABLE FUTURE

December 2017

Sibanye-Stillwater considers climate change is one of the most pressing global environmental challenges of our time. Sibanye-Stillwater recognises the importance of proactively managing its carbon footprint in the global context and is committed to contributing to a global solution through the deployment of responsible strategies and actions.

To this effect, Sibanye-Stillwater has been voluntarily monitoring, and reporting on its carbon emissions in our Integrated Report and voluntary investor reports like the CDP<sup>1</sup>. Sibanye-Stillwater uses the World Resources Institute, Greenhouse Gas Protocol for determining its carbon inventory.

During 2017, the South African Department of Environmental Affairs promulgated regulations for the mandatory reporting of carbon emissions on an annual basis. The primary purpose of the submissions is to inform the national inventory. The first annual report is scheduled for submission by 31 March 2018.

The South African government has set out the country's nationally determined contributions to follow a peak, plateau, decline trajectory where greenhouse gas emissions peak in 2020 to 2025, plateau for a ten-year period from 2025 to 2035 and decline from 2036 onwards.

Notwithstanding this, Sibanye-Stillwater strives to reduce its carbon emissions year-on-year. During 2017, the Sibanye-Stillwater 2010 base year<sup>2</sup> emissions were reviewed and restated

in accordance with the greenhouse gas protocol to incorporate Kroondal and the Rustenburg operation.

The base year<sup>3</sup> scope 1 and 2 emissions amounted to 7,705,116 tonnes carbon dioxide equivalent (t CO<sub>2</sub>e). Emissions reduction is not legislated. However, the South African government has set out the country's nationally determined contributions to follow a peak, plateau, decline trajectory where greenhouse gas emissions peak in 2020 to 2025, plateau for a ten-year period from 2025 to 2035 and decline from 2036 onwards.

In support, the Intergovernmental Panel on Climate Change predict that emissions in 2050 need to decrease from 49% to 72% relative to 2010 levels to limit the global average temperature increase to within 2°C. Sibanye-Stillwater has aligned its carbon emissions reduction objectives accordingly and aims to reduce emissions on average by 2.1% year on year from its 2010 base year.

Sibanye-Stillwater's carbon emissions from the SA region for 2017 amounted to 6,382,640t CO<sub>2</sub>e. The scope 2 emissions form the bulk of our carbon emissions (>90%) and have therefore been the focus of our drive to reduce carbon emissions.

<sup>1</sup> The CDP (formerly the Carbon Disclosure Project) is an organisation based in the United Kingdom which supports companies disclose the environmental impact of major corporations. It aims to make environmental reporting and risk management a business norm, and drive disclosure, insight and action towards a sustainable economy.

<sup>2</sup> A base year is a reference point in the past with which current emissions can be compared. In order to maintain the consistency between data sets, base year emissions need to be recalculated when structural changes occur in the company that change the inventory boundary (such as acquisitions or divestments). Sibanye-Stillwater uses a base year of 2010 and the base year emissions were restated to include the Kroondal and Rustenburg Platinum Mines acquisitions.

<sup>3</sup> Scope 1 emissions are greenhouse gas emissions that occur from sources that are owned or controlled by the company, such as emissions from combustion in owned or controlled vehicles or boilers. Scope 2 emissions are greenhouse gas emissions from the consumption of energy that is generated upstream of the company (purchased electricity).

## SA region – electricity purchased 2017

Metric	2017	2016 <sup>1</sup>	Variance
Purchased electricity (MWh)	5,768,946	5,787,698	18,752
Carbon dioxide equivalent emissions (tCO <sub>2</sub> e) <sup>2</sup>	5,653,567	5,787,698	134,131

<sup>1</sup> The 2016 annualised quantities are illustrated for comparison with the 2017 annual quantities. These quantities differ from the quantities reported in annual integrated report, as the annual integrated report only accounts for the period from the acquisition of the Kroondal and RPM operations (4,720,000 MWh and 5 423 000t CO<sub>2</sub>e).

<sup>2</sup> The emission factors for the South African electricity purchased, was sourced from the utility supplier, Eskom. A factor of 1 was used in 2016 and 0.98 in 2017. Eskom adjusted the electricity grid emission factor in 2017 to account for the increase in renewable energy feeding into the grid.

Sibanye-Stillwater spent some R39 million in 2017 and successfully implemented a number of energy efficiency initiatives and projects, thereby reducing scope 2 emissions.

Notwithstanding these energy efficiency initiatives, the SA region's gold operations also undertook expansion projects such as the decline dropdown project at Driefontein and the deepening of Kloof 4 shaft, which resulted in the addition of a new energy load of 55,330MWh during 2017. This translated to carbon emissions of 54,223t CO<sub>2</sub>e.

The electricity consumption savings and emissions reductions from the energy efficiency initiatives and projects, implemented at our gold operations during 2017 are tabulated below. This list is not exhaustive and lists the major projects.



## SA REGION – GOLD OPERATIONS

### Energy efficiency projects 2017

	Savings (MWh)	Emissions (t CO <sub>2</sub> e)
Air and water circuits optimisation	682	668
Variable speed drive controls on drive motors	1,170	1,146
Ventilation fans and cooling networks optimisation	29,191	28,607
Three chamber pump systems deployment	1,188	1,164
Efficiencies from utilisation of turbines	10,975	10,755
Installation of energy efficient lighting	4,190	4,106
Installation of heat pumps	934	915
Reduction of electrical distribution footprint	4,490	4,400
Upgraded mill discharge pumps	864	847
<b>Total</b>	<b>53,683</b>	<b>52,610</b>

Ezulwini Mining Company (EMC), a wholly-owned subsidiary of Sibanye-Stillwater, operates the Ezulwini Mine (also known as Cooke 4) on the West Rand. The closure of Cooke 4 has resulted in a decrease in electricity consumption of 34,754MWh with emissions reducing by 34,059t CO<sub>2</sub>e.

### Production change (gold operations)

2017 Energy and emissions reduction	MWh Savings (MWh)	Emissions (tCO <sub>2</sub> e)
Termination of Cooke 4 mining	34,754	34,059
<b>Total</b>	<b>34,754</b>	<b>34,059</b>

## SA REGION – PGM OPERATIONS

In addition, Sibanye-Stillwater, in partnership with ETA Operations (ETA), has implemented energy-efficiency initiatives at the Rustenburg operations. The initial focus has been on compressed air energy saving initiatives.

### Energy efficiency project (PGM operations) – 2017

	MWh Savings (MWh)	Emissions (t CO <sub>2</sub> e)
Compressed air – Peak demand management	3,700	3,626
<b>Total</b>	<b>3,700</b>	<b>3,626</b>

Phase two of this initiative has begun, focusing on underground savings opportunities to further reduce compressed air demand. The excellent cooperation between ETA and Sibanye-Stillwater clearly produces valuable savings that could be extended throughout the group.

A summary of the variables that impacted electricity consumption and emissions in 2017 is as follows.

## SA REGION

### Major variables impacting on 2017 emissions

	Electricity (MWh)	Scope 2 emissions (t CO <sub>2</sub> e)	% scope 2 change from the 2016-2017 variance
Energy saving initiatives at gold operations	53,683	52,610	39
Energy saving initiatives at platinum operations	3,700	3,626	3
Reduction from Cooke 4 closure	34,754	34,059	25
Reduction total	92,137	90,295	67
Addition of new loads	(55,330)	(54,223)	(40)
<b>Total</b>	<b>36,808</b>	<b>36,071</b>	<b>27</b>

*Note: Figures may not cast due to rounding*

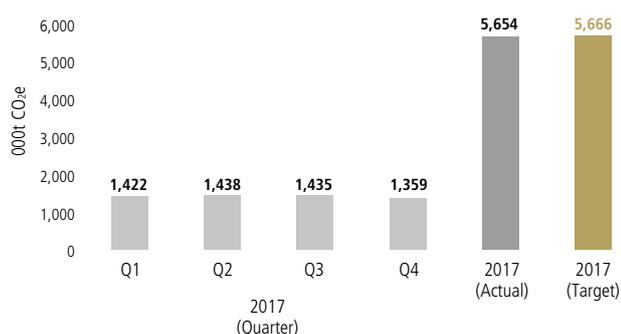
Following energy saving initiatives, Sibanye-Stillwater SA region has seen an overall 2.0% reduction in scope 2 emissions from 2016 to 2017. During the same period, the scope 1 annualised emissions increased marginally by 0.1% from 728,370t CO<sub>2</sub>e to 729,073t CO<sub>2</sub>e as a result of an increased fuel usage related to increased mechanical reclamation and transport of the surface operations.

In conclusion, The scope 1 and scope 2 combined annualised emissions decreased from 2016 to 2017 by 2.0%. The average year on year decrease from the base year (2010) to 2017 stands at 2.7% (ahead of the minimum 2.1% target).

The cumulative emissions reduction from the 2010 base year to 2017 stands at 17.2% (well on track with the global drive to decrease emissions from 49% to 72% relative to 2010 levels by 2050).

Sibanye-Stillwater, as an energy intensive company, recognises that energy management is critical to the sustainability of its operations and seeks to stay at the forefront in this field. Sibanye-Stillwater and in addition to current initiatives, has issued a Request for Information to selected service providers on the energy management and project service offerings available in South Africa for the SA region's Gold and PGM operations with the intention of checking and having the best-fit model in place. This process will continue into 2018.

### Carbon emissions from purchased electricity (000t CO<sub>2</sub>e)



<sup>4</sup> ETA Operations is an energy services company that is contracted to assist with the energy efficiency initiative on compressed air optimisation at the Rustenburg platinum operations.