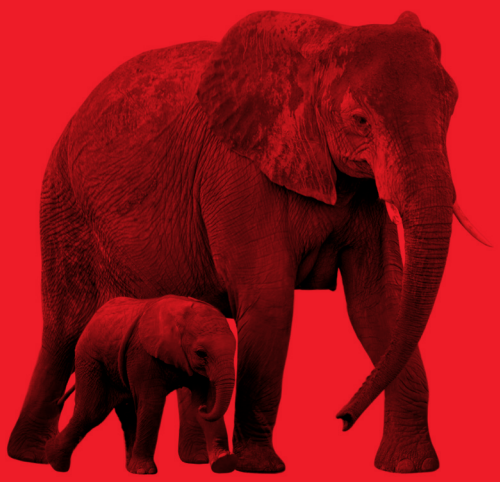
# IN PURSUIT OF SUSTAINABLE STAKEHOLDER VALUE

Environment and energy supplementary report



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We encourage feedback on our integrated and supplementary reports. Kindly direct feedback to Mr Anashrin Pillay, group head of investor relations, tel +27(11) 386 9000 and email anashrin.pillay@ppc.co.za.

For further details on sustainability matters, please contact Ms Tshilidzi Ligaraba, general manager: group sustainability services, tel +27(11) 386 9122, and email tshilidzi.ligaraba@ppc.co.za.

Details for obtaining copies of the integrated report from the PPC company secretary can be found on the inside back cover of the integrated report.

## Environment and energy review

### *Highlights*

- **All PPC's cement and lime operations in South Africa and Zimbabwe maintained their ISO 14001:2015 certification**
- **Installation of the Slurry Kiln 8 (SK8) bag filter at Slurry reduced particulate matter (PM) emissions to below 30mg/Nm$^3$**
- **Improvement in fugitive emissions at Slurry and Harare due to construction of material sheds**
- **The Slurry Kiln 9 (SK9) kiln line, a state-of-the-art six-stage preheater kiln with a large calciner, was started up early in the financial year. Pleasingly, this clinker production line significantly reduced thermal energy usage at our Slurry operations by approximately 15%. In addition, dust (PM) and $SO_2$ emissions are well below the 2020 limits**
- **Water consumption improved by 11% within the group**
- **Group dust emission burden improved by 64% during the year**
- **PPC received four separate section 12L tax certificates for energy saving initiatives implemented at the Dwaalboom and Slurry operations**
- **Thermal-specific heat consumption decreased by 4,8% within SA cement**

| Challenges | Strategic responses |
|---|---|
| NOx emissions remain a challenge at De Hoek and PPC Barnet<br>Visible stack emissions at Colleen Bawn operations in Zimbabwe<br>Section 21A fine was issued at our Pronto drying plant<br>Carbon tax, implemented in South Africa from June 2019, is a significant business risk to our cement operations in this region | Continue to optimise process performance at De Hoek. Modification to reduce the NOx emissions at PPC Barnet during the kiln shut down in June 2019<br>Commitment to upgrade dust abatement equipment during 2020/21<br>Applied for atmospheric emission licence (AEL), which was issued by the City of Johannesburg<br>Implementing measures, such as our energy management policy, to mitigate $CO_2$ emissions. Focus is also on improving and aligning our monitoring system to address carbon tax requirements |

## Environmental management approach

PPC is committed to operating a sustainable business, which leads to us reducing the impact of our operations on the environment while also continually improving our environmental performance. Sustainability is inextricably linked to our business strategy, and we strive to minimise or eliminate impacts and maximise benefits. We encourage all our stakeholders, including our customers, suppliers and business associates, to meet similar environmental goals.

PPC remains committed to:

- Embedding environmental management into management practices throughout the company
- Implementing environmental best practice to reduce the adverse impact of our operations and, where practical, prevent pollution
- Identifying significant environmental impacts, setting objectives and targets, and reviewing environmental performance to effect positive change within our group
- Complying with environmental legislation and other standards to which we subscribe
- Responsible stewardship by managing natural resources through efficient energy strategies and implementing waste reduction and recycling where possible
- Effective and transparent communication through internal communication and environmental management stakeholder forums
- Train and educate our employees in environmental responsibilities and build capacity among our stakeholders to identify, report and act on opportunities to minimise environmental impacts
- Managing our land through concurrent rehabilitation and protecting biodiversity
- Encouraging our employees and contractors to play a fundamental role in achieving environmental objectives by:
  - Taking ownership of, and participating in, environmental management programmes and initiatives
  - Integrating environmental concerns into everyday practice

## OUR ENVIRONMENTAL ISSUES

**Based on internal and external factors, as well as compliance obligations, PPC has identified its key environmental issues.**

### COMPLIANCE

Complying with rapidly changing environmental regulatory frameworks, both in southern Africa and the Rest of Africa (RoA).

### ENERGY MANAGEMENT AND CLIMATE CHANGE

Committed to efficient energy usage at all our operations, optimising the use of both thermal and electrical energy.

### EFFICIENT AND RESPONSIBLE USE OF WATER RESOURCES

Efficient water use and conservation measures to ensure sustainability of operations.

### AIR QUALITY MANAGEMENT

Committed to identifying, monitoring, managing and reporting air emission performance of our operations.

### RESOURCE CONSERVATION AND ALTERNATIVE FUELS

Managing our environmental footprint, as well as proactive land and resource stewardship, throughout the lifecycle of our operations.

We set out our responses to our key environmental issues below.

## Compliance

PPC identifies operational environmental aspects and risks, which we link to compliance requirements. We track and maintain compliance through the implementation of operational plans, which we monitor by conducting audits.

PPC remains committed to environmental compliance based on sound environmental management. To track our compliance, we developed environmental legal registers that identify relevant risks and obligations associated with our business. These registers are linked to environmental management systems, and are regularly reviewed.

Our compliance monitoring is verified through dedicated assessments or audits, such as environmental management plan reviews (EMPRs) and authorisations, which includes water use licences (WUL), AEL and waste management licences (WML). We also conduct internal assurance audits to ensure we assess the effectiveness of our controls. During 2019, internal legal audits were conducted at De Hoek, Riebeeck, Dwaalboom and Slurry. The outcomes are used to ensure compliance and inform continual improvement measures across our operations.

Local legislation has not yet been fully developed in all of the international regions where we operate. Therefore, we monitor our operations' compliance against international standards, which are informed by the requirements of the International Finance Corporation and other lender institutions.

We conducted authority compliance inspections at our Dwaalboom, Hercules, Riebeeck, De Hoek, Lime Acres, Pronto, Mooiplaas and Laezonia operations in South Africa. Our Pronto operation was issued a section 21A fine for operating without an AEL. Similar inspections were conducted at our Colleen Bawn and Bulawayo plants in Zimbabwe, as well as our PPC Barnet plant in the Democratic Republic of the Congo (DRC). No formal reports were issued.

We continue optimising process performance at De Hoek to improve our NOx emissions and meet compliance standards and also engaged international specialists to advise on appropriate measures that could be implemented. Co-processing with tyres can reduce NOx emissions by between 20 to 30%. Unfortunately, the tyre supply from the Waste Bureau was temporarily discontinued, which created plant process instability and impacted on emission performance. We continue to engage with the Department of Environmental Affairs (DEA) to seek an agreeable solution to tyre supply. In addition to the waste tyre initiative, we are exploring and sourcing suitable suppliers of alternative fuels to meet operational requirements.

## Energy management and climate change

PPC remains committed to efficient energy usage. Our energy policy was approved during 2018. In 2019, the focus has been on embedding the policy throughout the business.

Our energy policy can be accessed at **www.ppc.africa/.**

In summary, our energy policy stipulates the following:
PPC is an energy intensive business and recognises the relationship between its energy consumption and carbon footprint. PPC will ensure effective management of all energy streams and the development of energy solutions in manufacturing for purposes of improved competitiveness, a commitment to clean energy, and the potential for viable linked businesses to benefit all stakeholders.

To this end, PPC will:

- Implement an effective and optimum energy management system (EnMS) which will:
  - Focus on monitoring and evaluating all energy-related activities
  - Ensure the credibility, reliability and usefulness of energy data to support prioritisation of interventions and improved decision-making
  - Ensure all personnel are aware of the nature, meaning and value of an effective EnMS throughout the group
  - Identify priority energy saving options and implement on an ongoing basis
- Drive continuous improvement of its thermal and electrical energy footprint by:
  - Implementing optimum alternative thermal fuels, site by site, and developing their use to maximum viable levels to achieve lower emissions levels, maintain product quality, and cost improvements
  - Investigating and implementing, where viable, the potential to produce own electricity, using both renewable and non-renewable resources
- Investigate entry into, and enter viable energy-linked growth industries, with a key focus on:
  - Providing energy-related environmental solutions
  - Electricity production to extend from self-sufficiency to group value creation

### *Energy consumption and performance in South Africa*

Direct energy usage decreased by 6% in 2019, mainly due to starting up of SK9 early in the financial year, as well as discontinuing less efficient kiln lines. Indirect energy usage increased by 2,7% as a result of increased number of fans on grate cooler kiln lines, as well as more kiln lines converting to bag filters.

### Energy consumption – *PPC SA Cement*

| Energy terajoules (TJ) | 2019 | 2018 | 2017 |
|---|---|---|---|
| Direct (thermal/coal) | **12 253** | 13 041 | 12 752 |
| Indirect (electrical) | **1 736** | 1 691 | 1 651 |
| Total | **13 989** | **14 732** | **14 403** |

During 2019, thermal-specific heat consumption decreased by 4,8% from 2018, while electrical-specific energy consumption increased by 4,8%.

### Energy performance – *PPC SA Cement*

| Energy intensity | 2019 | 2018 | 2017 |
|---|---|---|---|
| Thermal-specific heat consumption (MJ/kg clinker) | **3,78** | 3,97 | 3,95 |
| Electrical-specific energy consumption (kWh/kg cement sold) | **110** | 105 | 104 |

Together with the National Cleaner Production Centre (NCPC) (a division of the Council for Scientific and Industrial Research), PPC successfully implemented an ISO 50001-based EnMS, aimed at identifying priority energy saving options, at all fully integrated cement plants in South Africa. We aim to roll out the EnMS at all cement milling facilities during the next financial year. The EnMS consistently assesses PPC's energy consumption and, where applicable, recommends remedial actions to improve any shortcomings.

The NCPC also provided its first multi-site energy expert training to eight candidates across the group, based on periodic webinars and three class modules, followed by a final examination for certification through UNIDO energy expert training.

During the year:

- Internationally, cement companies provide sustainable waste management solutions to municipalities, and almost zero-waste solutions. The use of modern processing technologies results in the efficient use of alternative fuels to achieve higher thermal substitution rates. In light of the international trends, there has been a higher focus to leverage this trend to support PPC future energy mix
- We completed a feasibility study at De Hoek to identify opportunities to move away from fossil fuels and use refuse-derived fuels to produce clinker
- We initiated a feasibility study for alternative solids fuels for SK9, with a target to have 80% thermal substitution rates for the calciner (or 48% of kiln system) as an alternative fuel supply. The supply chain of alternative fuels is currently not established in South Africa and we have therefore channelled efforts into developing this supply chain. This project is aligned to South Africa's waste management legislation, which provides much needed alternative solutions to redirect high calorific value materials away from landfill and reduce the need to combust the quantities of fossil fuels. This project aligns with reduction in carbon emissions
- We responded to the Waste Bureau tender to provide co-processing solutions with 15 000 tonnes of waste tyres per annum allocated to De Hoek operations, and 22 000 tonnes per annum allocated for co-processing at our Slurry operations
- Metering is the foundation of successful energy management. Therefore, we are installing smart meters on main incomers in all clinker and milling operations in South Africa. At the moment, metering is expanded to downstream feeders for the identified significant energy users (SEUs) or plant sections
- In an effort to increase our usage of renewable energy, and to align with our energy policy, we have conducted a concept evaluation. This involved investigating solar projects by requesting proposals across our operations. Based on the outcomes of the initial study, PPC decided to prioritise a feasibility study for implementation of solar photovoltaic (PV) at the Bulawayo and Colleen Bawn factories in Zimbabwe
- The implementation of EnMS and energy improvements allow for the application of a section 12L tax incentive, which has been realised at both Dwaalboom and Slurry where tax certificates were awarded. Based on the brownfield project for SK9, PPC applied for the section 12I tax allowance incentive project. These tax incentives support our energy policy and motivate us to continue implementing future energy saving opportunities

### *Energy management in the Rest of Africa*

We are in the process of installing smart meters at our international operations and, in 2019, we completed installation at our Bulawayo and Colleen Bawn factories in Zimbabwe. Subsequent to this installation, our Bulawayo plant accurately measured its energy consumption and, after monitoring the maximum demand, was able to respond by shifting loads during peak periods to realise cost savings. We are also in the process of installing an energy monitoring system in Rwanda.

PPC acknowledges the risk of rising energy costs and the challenge of sustainable supply across Africa, both in South Africa and internationally. As part of our energy strategy, we conducted a feasibility study into the use of solar PV power to supplement a portion of the downstream feeders that are supplying reliable and stable power to the essential sections within our operations for the electricity supply requirements in PPC Zimbabwe.

### *Our approach to climate change*

PPC recognises the global threat of climate change. Emissions that result from our thermal and process activities have an unavoidable effect on the environment. It is therefore imperative that we consistently improve the way we do business to address climate change. In light of this, our energy management policy and systems, alternative fuel programme and clinker factor reduction is a testament to our commitment to a safer environment. The PPC product mix has evolved to also include products that allow for further reduction of the clinker factor. There are also operationally focused projects to improve in-process quality variations and allow for improved extension levels of cement.

We ensure that we embed our alternative energy management policy throughout PPC, understand and identify the risks and opportunities associated with our operations, engage and collaborate with our stakeholders, align with government policies and implement short and long-term solutions to climate-change threats.

### *Carbon footprint*

Understanding our carbon footprint is essential for identifying the areas where we can improve. We consistently monitor our carbon footprint through data collection, assessing our direct and indirect carbon emissions and energy consumptions. We conduct regular internal verification audits to improve accuracy and assurance of our data collection and analysis.

**FY2019**

| $CO_2$ emissions | Total | Direct | Indirect |
|---|---|---|---|
| Cement, lime and dolomite | 4 216 847,87 | 3 722 089,76 | 494 758,11 |
| Cement SA | 3 313 292,51 | 2 885 638,39 | 427 654,12 |
| Cement Zimbabwe | 536 465,27 | 504 029,11 | 32 436,16 |

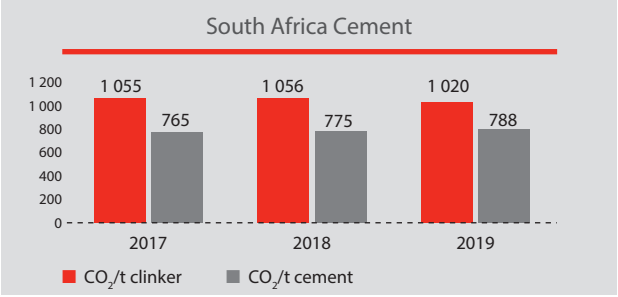
### Pollution Prevention Plans

We have been participating in the voluntary budget for over four years. In December 2017, we submitted our pollution prevention plans, explaining our mitigation strategies up to December 2020, which was approved by the DEA. We report on our performance on an annual basis.

### Greenhouse gasses (GHG)

National GHG Emission Reporting Regulations published in 2017 in terms of the National Environmental Management: Air Quality Act require companies to submit annual GHG reports to the DEA. These regulations are one of the implementation tools that will be used to regulate the reporting of atmospheric emission data, with a view to compiling atmospheric emission inventories to inform carbon tax. Our annual GHG report was submitted to the DEA.

$CO_2$ intensity improved from the previous year due to the implementation of our mega-plant strategy – ie clinker production from efficient facilities. The carbon emission intensity for our South African cement operations is detailed below.




We also disclose the scope 1 and 2 emissions of our South African cement operations to the CDP (formerly the Carbon Disclosure Project). The CDP introduced a new set of reporting requirements for the cement sector. Unfortunately, in 2019 PPC's rating was downgraded from B to D, due to more stringent requirements.

### Carbon tax

In 2019, the South African Minister of Finance announced the carbon tax implementation for June 2019. We are still uncertain about the level of allowances PPC will qualify for. Given the stoichiometry of the cement manufacturing process, an unavoidable considerable amount of emissions emanates from calcination known as process emissions. The estimated amount of carbon tax exposure for lime and cement is expected to be R135 million per year.

## Efficient and responsible use of water resources

### *Management approach*

Our operations are based in regions that differ in terms of availability and supply of water resources. Considering the impact of climate change and extreme weather conditions, we consistently evaluate how we can contribute towards sustainable water security. Our water management strategy is continually reviewed and improved to ensure optimum protection of this natural resource, while generating value.

We have adopted an integrated approach to water management, the foundation of which considers every aspect of our business. We manage water-related impacts beyond our operational boundaries through:

- **Identifying** water sources and uses
- **Monitoring** quantity and quality
- **Managing** according to monitoring results
- **Reusing and augmenting alternative sources** (treated sewage and quarry water, where feasible)
- **Securing and adhering** to WUL conditions or permits and other applicable requirements
- **Risk assessments**, including agility on emerging legal requirements for issues of national and sustainability interest

### *Our performance*

During the reporting period, PPC extended its target to include the RoA operations and aimed to reduce water consumption across the group by 5 %. During the year, we exceeded this target and successfully reduced water consumption by 11 % due to continuous water saving initiatives and effective management, including:

- Harvesting of rainwater for ablution facilities reuse in Port Elizabeth
- Recycling of sewerage effluent water as process water at Colleen Bawn

- Adoption of Western Cape drought water restriction initiatives as an operational method
- Conversion of SK8 electrostatic precipitator to a baghouse
- Completion of a cooling water recycling project at CIMERWA, whereby the main kiln cooling water is recirculated in a closed loop

### *Dual benefits from modern technology*

Converting SK8's electrostatic precipitator to a baghouse, commissioned in January 2019, resulted in dust emissions meeting minimum standards. Furthermore, a significant reduction in water use is expected. This will only be fully visible in the next financial year.

### *Water use authorisation*

In 2018, we engaged the Department of Water and Sanitation (DWS) on outstanding information for the Dwaalboom WUL application. In 2019, the WULs for both Hercules and Dwaalboom were presented to the water use assessment advisory committee (WUAAC) for recommendations.

### *Our commitment to environmental management systems*

We identify and evaluate operational risks and opportunities relevant to our business by utilising an environmental management system (EMS) and manage these to ensure ongoing improvement and environmental compliance.

Our operations maintained their ISO 14001:2015 certification in 2019, except CIMERWA in Rwanda and PPC Barnet in the DRC, where the principles of ISO 14001 apply. Our management framework responds to the nature and scale of our various operations. Our aggregates facilities are accredited in line with the About Face programme of the Aggregate and Sand Producer Association of South Africa (ASPASA), which is aligned with ISO 14001.

PPC completed the development of our safety, health, environment, risk and quality (SHERQ) systems during 2019. We aim to standardise risk assessment, non-compliance, action management, and management reviews. The system will also enhance transparency in managing audit findings tracking and outstanding non-compliances.

## Air quality management

PPC manages air quality by:

- Identifying and creating an **inventory** of emissions monitoring requirements
- Consistent **monitoring** of emissions from stacks, kilns and legislated points
- **Converting**, **aligning** and **upgrading** existing technology to align to new compliance standards
- **Continuous assessment** and setting targets through our energy management system

Our cement and lime operations release air emissions such as dust (PM), $SO_2$, and NOx. Our South African operations consistently monitor all point sources for these emissions, except for Port Elizabeth and Riebeeck where kiln gases are monitored with a portable analyser. We also focused on improving the efficiency and reliability of continuous emission monitoring systems at our international operations. Our aim is to equip all stacks with continuous emission monitoring equipment by 2020.

We are committed to complying with minimum emission standards and therefore monitor the performance of our South African cement kilns (including lime) year on year. We also use gas analysers to monitor our South African operations' NOx emissions.

Due to the lack of service providers and long turnaround times to repair equipment, some of our continuous monitoring was compromised in the review period. Emission factors were used to calculate NOx and $SO_2$ emissions at Riebeeck 2, Port Elizabeth 4 and SK9.

| | Dust | | NOx | | $SO_2$ | |
|---|---|---|---|---|---|---|
| | **2019** | 2018 | 2019 | 2018 | 2019 | 2018 |
| Tonnes | 267 | 744 | 8 648 | 9 815 | 693 | 685 |

With the introduction of Slurry's new SK9 and retirement of SK7 in 2019, our dust (PM) emissions are well below the minimum emission standard. Construction of material sheds as part of the SK9 kiln line and Harare operations improved the ambient air quality in the surrounding environment which, in turn, reduced dust fallout from stockpiles. This improved the total dust burden for the group by 64%. With the retirement of PE Kiln 4 in June 2019, and due to the limited run for Hercules 5, we anticipate dust emissions to improve further.

The National Atmospheric Emission Inventory System is an internet-based reporting system, part of the South African Atmospheric Emission Licensing and Inventory Portal, and provides a platform for regulated industries and authorities to report atmospheric emissions such as air pollutants and GHG emissions. All PPC's cement, aggregate and lime operations are registered on this portal, and we complied with all reporting requirements in 2019.

The construction of SK9, as well as the SK8 upgrade, improved the overall air emissions at our Slurry operations. The commissioning of SK9 improved the emission performance well below 2020 minimum emission standards. Although NOx emissions were, at times, not compliant with AFR standards, we currently have not introduced AFR in this kiln line. Performance was far below the conventional fuel

standards. Dust (PM) emissions for both kilns are well below 15mg/Nm$^3$. The NOx emissions performance will be optimised during kiln shutdown.

## Resource conservation and alternative fuels

### *Rehabilitation*

Most of our operations are based in low-sensitivity environments. We are committed to proactive land and resource stewardship and consider the impact of our mining operations throughout the entire business cycle – from exploration, operations, decommissioning and closure.

We monitor our environmental footprint through annual fly-over surveys, ad hoc minimum standard assessments, as well as projects for maintaining firebreaks and rehabilitated land every six months.

PPC's mine rehabilitation remains on track, with 95 % of disturbed land restored. We continue to lease rehabilitated land to neighbouring farmers for suitable for land use.

We completed our review of our current rehabilitation, decommissioning and closure plans and the alignment thereof to the proposed regulations of the National Environmental Management Act 107 of 1998 (NEMA), as amended, and related financial provisioning regulations (government notice 1228 gazetted on 10 November 2017). Once the current revision is gazetted, PPC will align itself to the new regulations.

### *Waste management*

In 2019, we generated 2 674 tonnes of general waste, of which 24% was recycled by our operations, and 1 469 tonnes of hazardous waste, predominantly oil contaminated waste, of which 55% was recycled. We remain committed to optimal recycling of hazardous waste.

We improve our approach to waste management by identifying waste streams and monitoring general and hazardous waste produced by our business activities. We focus on recycling, reducing and using alternative sources in our activities, including slag and fly ash as raw materials and extension for our cement and concrete production. We adhere to the conditions of our waste management licences, permits, and other requirements.

PPC continues to focus on programmes that comply with the waste hierarchy set out in legislation, which is also informed by the general principles of waste management and continued focus on reducing the amount of waste disposed to both municipal and on-site landfills.

Cement manufacturers are in a unique position to enhance this hierarchy by adding co-processing – a cost-effective method of substituting coal to reduce negative impacts on the environment. Furthermore, co-processing can sustainably preserve natural resources while providing solutions to treating different types of waste in the long term. Co-processing programmes are continuing at our De Hoek and CIMERWA operations, focusing on tyres and biomass.

## Stakeholder engagement

Regulatory processes such as environmental impact assessments (EIAs) and environmental management plans involve engaging with local communities as well as interested affected parties. These engagements were conducted at Riebeeck, De Hoek, Slurry, Pronto, Jupiter, Dwaalboom and Hercules

At group level, our inclusive authority engagement process through various bodies, including the Association for Cementitious Material Producers (ACMP), The Minerals Council South Africa (the Environmental Policy Committee), as well as Business Unity South Africa (BUSA) resulted in reforms that are informed by sector inputs. In 2019, topics for engagement included carbon tax, minimum emission standards, climate change bill, development of low emission development strategy and GHG performance guidelines.

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