



Environmental Pillar: Caring for the environment and addressing the challenges of climate change

The Environmental Pillar promotes the taking care of our environment by creating sustainable practices to address the challenges of climate change, optimising our energy efficiency, water usage and emissions control.



“Rated ‘C’ by CDP on our carbon disclosure for 2020.”



Environmental standards

Our Environmental Pillar defines our way of entrenching environmental sustainability by identifying, measuring and mitigating actual and potential negative environmental impacts resulting from our operations. Our goal is to improve our performance on energy efficiency, waste management, water consumption, greenhouse gas emissions, and leverage the opportunities in environmental stewardship, such as efficiencies in alternative fuel, and the medium- to long-term cost efficiencies offered by the circular economy business model.

We seek to improve on our operational efficiencies and optimise our impact on the natural environment while also benefitting from cost reductions. We leverage improved business practices and processes that support host communities’ protection, preservation of air and water quality, and efficiency in the utilisation of energy and natural resources.

We strive to adhere to sustainability principles that drive continual improvement in addressing global and local environmental challenges and mitigate the negative impact of climate change.

Our business activities are undertaken with conscious thoughts for our natural environment and the need to consistently enhance our environmental stewardship while also leveraging the opportunities that this presents. While there are negative environmental fallouts from our business operations, including dust pollutions, CO₂ emission, and so on, we remain committed to continually improving our environmental stewardship.

Dangote Cement is a member of the Global Cement & Concrete Association (GCCA) and subscribes to its Sustainability Framework Guidelines. The GCCA issues performance enhancement guidelines, gathers and publishes data recording the industry’s sustainability commitments, and initiates research on five key issues that are material for the global cement industry, namely climate change and energy, social responsibility, environment and nature, circular economy, and health and safety.

2020 environmental performance: energy, water, emissions

We constantly disclose our environmental performance through our annual Climate Disclosure Projects (CDPs) and Sustainability Reports. This is to avail our stakeholders (internal and external) and interested parties outside our organisation with information that they require to assess the progress that we are making in our environmental sustainability journey and our continuous improvement commitments. As part of our progress measurement, we published our second CDP report in 2020 as a follow-up to the first edition published in 2019. Our 2020 CDP score (C) is an indication that we are aware of the risks and opportunities in climate change. Though the score is lower than the African regional average of B- and the Cement & Concrete sector average of B, our commitment and progress towards environmental stewardship, continuous improvement on our climate governance, and periodic performance benchmarking with local and global peers, is strong and unrelenting.

We will continue to make concerted effort towards managing our environmental footprints and improving on our CDP scores, including setting realistic targets towards reducing our energy and resource consumption and enhancing air quality within our operational environments.

Across all our locations, total energy consumption in 2020 was 92,515,735 GJ, an increase by 15.68% year on year, relative to 2019. This rise was basically due to a significant increase in production output compared to 2019, as detailed in our production output section of this report. With 71% of total, our Nigerian operations which host the larger part of our total cement production, were the highest energy consumer in the year under review.

Year	Total Energy Consumption (GJ)	Percentage Increase(+) or Decrease(-)
2018	81,246,507	
2019	79,976,174	-1.56%
2020	92,515,735	15.68%

“The Dangote Way” Environmental Pillar continued



2020 Total energy consumption (GJ) per location

Country	2019 Total Energy Consumption (GJ)	2020 Total Energy Consumption (GJ)*	Percentage of Total for Each Location
Nigeria – Gboko	63,428	300,722	0.33
Nigeria – Ibese	30,974,227	37,401,426	40.43
Nigeria – Obajana	24,798,884	27,708,443	29.95
Cameroon	316,707	336,180	0.36
Congo	948,846	1,406,697	1.52
Ethiopia	5,735,481	6,001,796	6.49
Ghana	84,709	38,091	0.04
Senegal	5,675,625	6,107,626	6.60
Sierra Leone	128,803	19,264	0.02
South Africa	5,007,105	4,587,838	4.96
Tanzania	5,712,833	4,583,176	4.95
Zambia	529,525	4,024,475	4.35
Total energy consumption (GJ)	79,976,174	92,515,735	100

* Increase in DCP's 2020 total energy consumption is mostly due to higher clinker production in some of our operations. For example, DCP Congo produced 320,600 MT in 2020, compared to 240,322 MT in 2019. However, the thermal energy consumed (Kcal/tonnes of clinker) remained fairly the same, at 733 Kcal/tonnes of clinker in 2019; and 732 Kcal/tonnes of clinker in 2020. Also in Senegal, clinker production was 1,154,852 MT in 2020, compared to 957,533 MT. The same was true for DCP Ethiopia. For Gboko, the plant was not in operation in 2019 but started full operation in the last quarter of 2020.

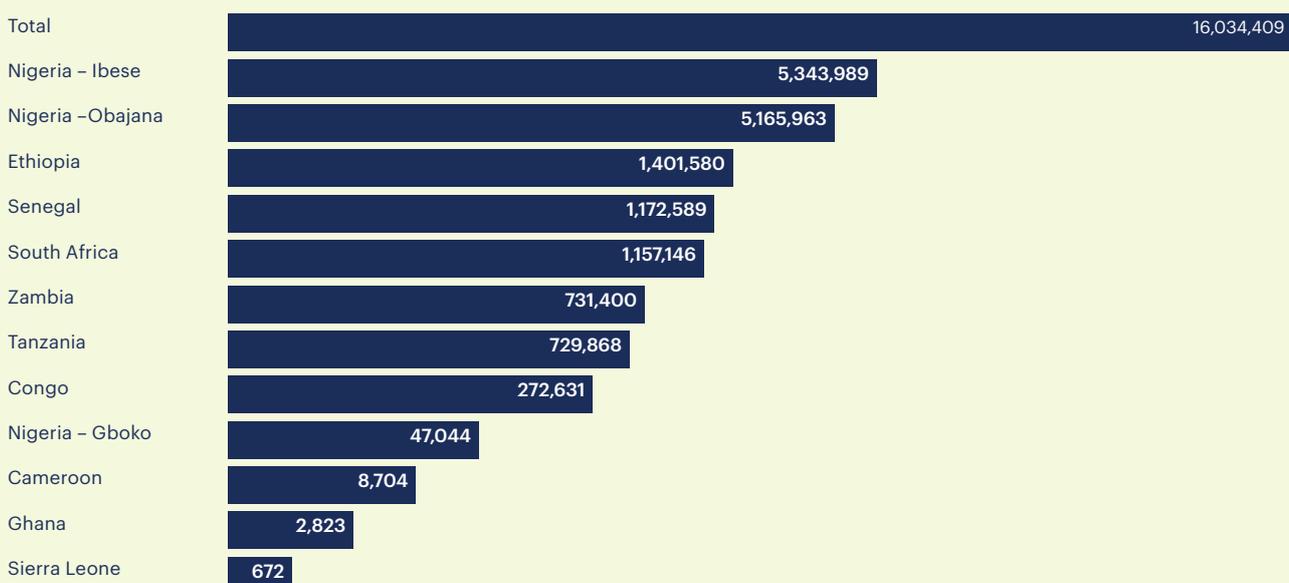
The manufacturing of cement is an energy process industry, with a large proportion of production costs spent on fuel sourcing for kilns operations. Our kilns, like others in the industry, require high energy for the conversion of raw materials such as limestone, laterite and other minerals into clinker in a heat-intensive process known as sintering. Sintering is an energy-intensive process that occurs at about 1,450°C. We acknowledge the fact that the amount of energy consumed cannot be out-rightly reduced. Hence our corporate strategy and commitment are to enhance our investments in alternative fuel sources and energy-saving initiatives, focusing on cleaner energy.

To guide our decision-making process, stimulate continuous improvement initiatives and ensure overall awareness, we collect, review and report monthly on our operational performance in key environmental indicators across all Plants. These Key Performance Indicators (KPIs) include data on Greenhouse Gas (GHG) emissions, Dust, Water, Energy Consumption, Waste, Environmental Incidents, and so on.

In 2019, our total greenhouse gas emissions from cement production activities, resulting from captive power plants and generators, kilns and vehicles used at the quarries and sites (Scope 1) was 14,903,613 (tonnes CO₂). This increased by 7.59% in 2020 to 16,034,409 (tonnes CO₂), due mostly to increased energy consumption as we increased production activities in the year under review.

Our plant in Gboko (Nigeria) resumed operations in 2020. A new line in our Obajana Plant (Obajana Line 5, Nigeria) also began productions in 2020. These had an upward impact on our energy consumption and CO₂ emissions (Scope 1) in the year under review.

2020 total direct CO₂ emissions (tonnes CO₂)*



* Higher clinker production resulted in increased energy consumption in some DCP Plants as explained above, resulting in higher total CO₂ emissions in 2020.

Environmental management and compliance

As the largest cement manufacturer in the African continent, we are committed to maintaining good environmental management standards and strict compliance with all relevant environmental regulations in the countries where we operate. Our commitment is in line with the principle of continuous improvement and protecting the environment for our collective good, particularly at and around our operation sites. We strive to minimise our consumption of energy and natural resources, and the negative environmental impacts our operations create.

In addition to achieving compliance with relevant regulations (i.e., permits, accreditations and licenses), we also sought ISO 14001:2015 EMS certification to provide an external assurance for our existing environmental management systems. We obtained approvals for Environmental & Social Impact Assessment (ESIA); Exploration Licences; as well as executed Environmental Compliance Monitoring.

The geographical spread of our operational plants indicates that we are subject to numerous local, regional and national regulations. We require a total of 263 environmental related permits, accreditations, and approvals to ensure compliance of our operations. We have also put in place a system to track emerging and future regulations which may impact our operations.

We understand the consequences of non-compliance with EMS standards and environmental laws and regulations. We know that non-compliance affects the Company's reputation, erodes shareholders' profit through imposed fines and penalties, affects our relationship with host communities and reduces our social licence to operate. We are committed to complying with all applicable laws and regulations in countries where we operate and ensuring that our operations align with the Group-wide Environmental policies that are designed in line with relevant international best practices on environmental management.

In 2020, there were no material incidents of environmental non-compliance (including fines, penalties, or sanctions) reported in any of our operations.

Operational efficiency

Achieving operational efficiency is one of our key environmental sustainability objectives aimed at reducing operational costs, reducing the consumption of production resources, while also minimising CO₂ emitted from our operational processes. We are implementing ISO 50001 Energy management system at DCP Ibese, Nigeria, as a pilot. This will systematise the effective management of energy in our operations.

We are aware that the production of cement has significant environmental impacts due to the high energy utilisation. Thus, we are committed to enhancing our energy efficiency practices. Despite the prevailing challenges of availability, as much as is practicable we endeavour to utilise natural gas and alternative fuels which are cleaner energy.

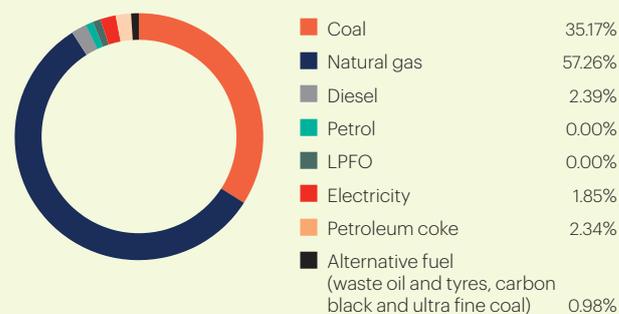
We made progress in using alternative fuels in kilns during the year under review through effective and fit-for-purpose reutilisation of wastes produced in our sites, such as old tyres and packaging materials. This is a positive step towards reducing the use of fossil fuels in order to minimise emissions of greenhouse gases and other pollutants. A detailed description of our alternative fuel enhancement project is contained in this report.

The majority of our plants were built in the last 15 years and designed to be intrinsically efficient by adopting cutting-edge technology in cement production. Innovative technologies in our plants include: (i) vertical roller mills for raw material, coal and cement grinding, which are 40-50% more efficient than traditional ball mills; (ii) pre-heater and pre-calcinate plants which are regarded as the most efficient technology in the cement industry; (iii) mechanical material transport and transfer system equipped only with conveyors and bucket elevators, which are up to 80% more efficient than the traditional pneumatic systems; (iv) major process fans provided with Variable Frequency Drivers (VFD) to vary the ventilation rate based on the actual demand/operating conditions, which can reduce the input power by 40-80% (depending on the % flow rate), compared to more traditional dampers; and so on.

2020 total energy consumption (GJ) = 92,515,735



2020 total energy consumption based on source



“The Dangote Way” Environmental Pillar continued



Operational efficiency continued

Also, at Dangote Cement, we use large, modern rotary kilns equipped with ‘preheaters’ that use exhaust gases from the kiln to heat raw materials as they pass down the pre-heater tower to the kiln. Using these modern heat recycling systems helps reduce time spent in the kiln and the amount of fuel used to convert raw material into clinker, as it guarantees that the raw material is heated to about 900°C before it enters the kiln. This process is good for costs and for the environment, resulting in less CO₂ emissions per ton of clinker and cementitious material produced at Dangote Cement.

Overall, these measures have resulted in operational cost savings and natural resource efficiency in our cement production, compared to traditional and less modern plants.

Dangote Cement is an increasingly environmentally conscious organisation. We do not rely solely on the ultramodern design of our plants. We desire to continuously explore innovative ways to reduce carbon footprints along our entire value chain.

Precautionary approach to environmental management

We take seriously the issue of the Precautionary Principle in our operations. We are committed to investing in innovative technologies, providing adequate responses and putting in place effective methods for dealing with risks and uncertainties in environmental management. We also understand the responsibility of carrying out the required actions to prevent serious and irreversible environmental damage as we carry out our operations, even before such harms can be scientifically demonstrated or economically assessed.

As a result, we are developing and utilising robust environmental management systems that identify, assess and manage the environmental impacts and risks associated with our operations. Our goal is to continually implement good management practices that prevent irreversible impairment to the environment, employees, host communities and the public.

Part of our precautionary approach includes investing in technologies and innovations that would enable us to improve our environmental footprints; conducting comprehensive Environmental & Social Impact Assessment (ESIA) on all new projects and existing ones with significant modifications to identify and mitigate potentially substantial environmental impacts and risks, as required by local regulations, Group policies and international standards.

Our Group environmental management team and external parties (such as Control Authorities, Certification Bodies, etc.) also carry out independent environmental audits on a routine basis to ascertain the site Environmental Management System (EMS) effectiveness and the necessary improvement actions.

Understanding and managing our carbon footprint

The cement manufacturing industry is one of the largest contributors to global warming and climate change due to the large amount of energy utilised and therefore, the carbon dioxide emitted. This occurs most especially during the conversion of limestone (CaCO₃), a key natural ingredient, to clinker (CaO), an intermediate component of finished cement and during the combustion of fossil fuels in the kiln and production of electricity to power the plant. However, our plants are mostly designed to be energy efficient using cutting-edge technology in cement production.

Dangote Cement is aware of the harmful effects of greenhouse gas emissions (CO₂, CH₄, NO₂, Fluorinated gases) on the ecosystem and global climate. We try to minimise these impacts by adopting energy efficiency measures such as use of Alternative Fuel.

Governance of climate change-related issues:

Our Board Technical & Sustainability Committee has the responsibility for managing and communicating climate-related issues to the Board, with specific recommendations for action, as may be required. Part of these climate-related recommendations made in 2020 was Dangote Cement’s adoption of 7 Priority UN Sustainable Development Goals (SDGs), aimed at improving and tracking our performance in climate-related Global Goals, such as SDGs 11, 12 and 13.

Tree planting campaigns

At Dangote Cement, we understand the critical role that trees play in supporting the fight against carbon emission. Trees are natural sequesters of carbon, and they play the additional role of releasing oxygen into the atmosphere, which is refreshing for humans and the physical environment. Tree planting and reforestation are therefore, some of our key environmental priorities.

In 2020, we increased the numbers of trees planted across our operations to reduce our carbon footprints and negative environmental impacts in host communities. For example, in Dangote Cement Tanzania, a total of 5,045 trees were planted around the Plant location in the year under review, to combat climate change and global warming, leveraging the carbon sink potentials of trees. For example, Sagwan tree with a width of 10–30 cm absorbs 3.70 tonnes of carbon dioxide from the atmosphere in its lifetime; Eucalyptus tree absorbs 2.46 tonnes of carbon dioxide; Neem tree has a CO₂ sequestration capacity of 1.45 tonnes in its lifetime.

In the year under review, over 450,000 trees were planted across six countries of operation, including Nigeria (Gboko, Ibese, Obajana), Congo, Ethiopia, Senegal, Tanzania and Zambia, as part of our 2020 tree planting campaigns.



Opportunities and challenges in climate change

The global cement industry is taking unwavering climate actions, encouraged by changes in policy, technology, and new opportunities to raise profits and cut costs by reducing greenhouse gas emissions. Climate changes and the response actions present risks and opportunities for our organisation, investors and stakeholders. Like our peers, Dangote Cement is making concerted efforts to participate in and stay updated on regulatory frameworks and policies to reduce emissions, climate change, and the impacts on business and the larger society.

There are several emissions mitigation options for cement manufacturers, including energy efficiency improvement, use of recycled and waste materials, deployment of low carbon fuels, and cement processing at lower temperatures. We are committed to integrating these climate change mitigation prospects into our carbon reduction plan and overall sustainability implementation roadmap in the coming years.

We consistently measure and calculate greenhouse gas (GHG) emissions from our operations and keep track of all fallouts from our operations that may have climate consequences. We organise training workshops and programmes geared towards improving how we manage and document our climate-related risks and opportunities. In 2020, we developed our Climate Change Policy to guide how we manage climate related risks and opportunities. From the Climate Change Risk Register developed by our Group HSSE, we are aware that these risks and opportunities can affect our business. The risks attributed to climate changes include physical (environmental), regulatory, financial (such as carbon taxes, offsetting costs, etc.), litigations, and other risk factors that could negatively impact competitiveness.

However, climate change and limits on greenhouse gas (GHG) emissions can also create opportunities, such as creating new technologies and markets. For example, our alternative fuel enhancement project will create an opportunity for diversifying into the evolving “renewable” waste management industry, leveraging on the advantage of energy reduction through efficient kilns and overall decreases in the cost of doing business.

Circular economy

A viable solution to the challenge of rapidly depleting natural resources due to industrialisation and rapid growth in global population and consumption is to move to a circular economy model. Circular economy ensures that resources are maximised for as long as possible through waste re-utilisation and recycling. This reduces overexploitation of the natural environment and its resources and also curbs negative climate changes.

Circular Economy is one of the five key areas of interest of the Global Concrete and Cement Association (GCCA), of which Dangote Cement is a member. Part of the principles of circular economy includes using waste as a resource, harnessing energy from waste and integrating eco-design to manage environmental impacts throughout the life cycle of products, in line with the evolving Extended Producer Responsibility (EPR) model.

The circular economy business approach supports the actualisation of the Sustainable Development Goals (especially SDGs 9, 11, 12, 13, 14 and 15), which are also in line with the global climate action. In 2020, we made remarkable progress in developing short, medium- and long-term plans for enhancing the use of alternative fuels in our kilns, through effective and fit-for-purpose re-utilisation of wastes produced in our sites.



Alternative fuel enhancement project

Although some of our operations still rely on high carbon fuel sources such as petroleum coke, gas and coal, in 2020, we increased corporate focus and strategies for reducing our footprints by committing to the use of alternative fuel sources in our energy mix.

In 2020 we started exploring fully the feasibility of significantly increasing the use of alternative energy in our cement production, through co-processing of wastes. The implementation strategy began with our Nigerian operations, and by the end of the year under review, it was already being replicated across other African operations.

Waste materials that have been identified as viable in the alternative fuel project and are available within a 450km radius of our operations include: saw dusts, agro-waste like palm kernel shells, rice husks, maize cobs, and cashew nutshells, commercial and industrial wastes, refuse-derived fuel (RDF), waste lubricants, polypropylene bags and scrap tyres. We are also considering the feasibility of utilising our cement bags plant rejects and the retrieval and re-utilisation of waste cement bags. Waste materials are currently sourced from nearby Dangote Cement operations sites; municipals close to the Plants; and nearby farms (for agro-wastes).

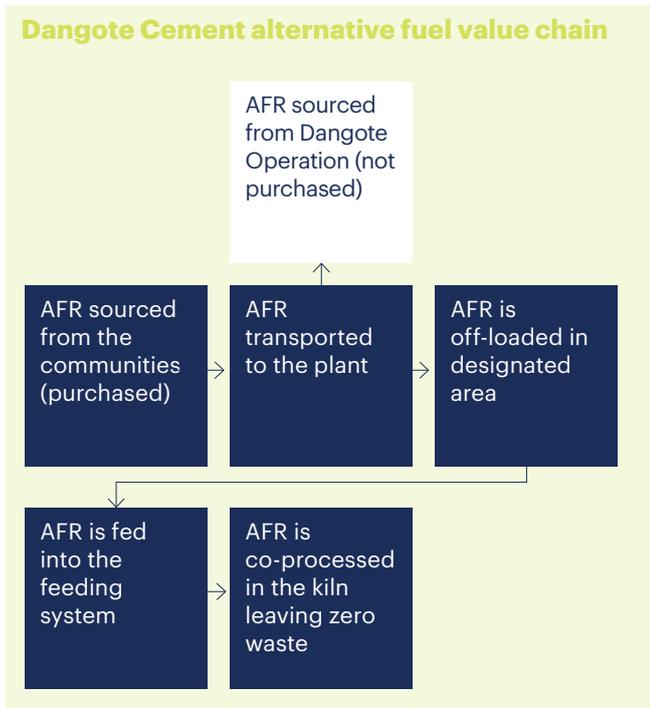
To effectively execute our alternative fuel project, we have developed an Alternative Fuel (AF) project Charter which entails the roadmap and milestones for the realisation of our AF strategy. Engineering of a modular concept for both short (pneumatic) and long-term (multi-fuel) AF feeding systems (which can be replicated across kilns in our plant operations) have been completed. Equipment are on order and those for our Nigerian plants have started arriving the ports. Various In-house, simple waste feeding systems like feed pumps and/or chutes and pneumatic systems have been developed and installed to maximise co-firing of waste lubricants, and to co-process waste polypropylene bags, carbon black, sawdust, cashew husks, sugarcane bagasse, scrap tyres, non-hazardous plant wastes, and so on.

In 2020, some milestones were recorded, such as alternative fuel sourcing and mapping, equipment/technology identification, ordering process, and installations of in-house AF co-processing systems at some specific sites like Ibese, Obajana, Zambia, Congo, South Africa, Ethiopia and Tanzania. Our ambition is that by end of 2025, alternative fuels will substitute approximately 25% TSR (thermal substitution rate) of fossil fuels currently used in our kilns for the production of clinker. Our focus is to maximise development of biomass and agro-waste streams and encourage local production of Refuse Derived Fuel (RDF).

“The Dangote Way” Environmental Pillar continued



Below is our current alternative fuel value chain showing the overall approach and process flow.



The potential benefits of the project are enormous, such as waste reduction, cost savings, improved environmental quality, operational optimisation, energy efficiency, cleaner energy and better energy mix, stronger return on investments, and reduction in greenhouse gas emissions. However, a few challenges have also been identified and are currently being tackled for effective project execution. They include high expectation from the government (from a revenue drive standpoint); awareness in communities; availability, quality and cost of sourcing alternative fuel materials; seasonality of required resources; logistics, lack of existing waste streams and collection system; and regulatory bottlenecks, such as inadequate national frameworks and standards, penalties and accessing the required government permits.

Dust emissions

Dust emission in cement plants is one of the biggest challenges faced during the cement production cycle. This is because dust emanates from across the production value chain – raw material handling, limestone crushing, kiln processing, clinker production and storage, finished cement grinding and power utilities, cement bagging, and so on. We strive to minimise the release of dust emissions into the atmosphere and ensure compliance with both legal requirements and international standards.

Our kilns have state-of-the-art dust abatement equipment, including baghouse filters and electrostatic precipitators. We also use other suppression methods in the effort to reduce dust emission. We are making huge investments to acquire the best available filter systems and newer technologies.

We carry out maintenance of the baghouse filters and electrostatic precipitators to reduce dust emissions from our operations. We also implement short-term mitigation measures like water sprinkling to reduce the effect of fugitive dusts on our environment.

2020 dust emission (mg/Nm³) per location

Country	2019 Dust Emission (mg/Nm ³) Annual average kiln dust emission	2020 Dust Emission (mg/Nm ³) Annual average kiln dust emission*	Comments
Nigeria – HQ	—	—	Corporate Centre
Nigeria – Gboko	—	—	No production for most part of 2020; production commenced in Dec 2020
Nigeria – Ibese	39	87	Average of 4 Kilns
Nigeria – Obajana	16	16	Average of 4 Kilns
Cameroon	—	—	No Kiln
Congo	11	17	1 Kiln
Ethiopia	20	56	1 Kiln
Ghana	—	—	No Kiln
Senegal	25	44	1 Kiln
Sierra Leone	—	—	No Kiln
South Africa	24	15	1 Kiln
Tanzania	34	97	1 Kiln
Zambia	21	26	1 Kiln

* In the year under review, DCP Senegal, Ethiopia and Tanzania emitted more dusts than in 2019 owing to faulty bag house and filters, issues which are now being addressed.

Water efficiency management

Cement production is generally regarded as a “dry” process because a relatively low amount of water per unit of the finished product is utilised. However, we know that water is fundamentally a vital resource with a significant impact on lives and livelihood. It is therefore, essential that we continue to drive sustainable water resource management in our operations.

We know that just 2.5% of the earth’s water is fresh water and that a significant rise in water demand also accompanies Africa’s fast-growing population and urbanisation. Especially now that lack of access to a reliable water supply is reaching unprecedented proportions in many parts of the world, we understand that scarcity of water is a very material global issue.

Although our operations do not require large quantities of water compared to other sectors, we are committed to reducing the amount of freshwater utilised in our business activities. Our efficient water management system involves periodic measurement of operational water footprints and efforts to reduce freshwater withdrawal and consumption through water recycling, rainwater harvesting, and stormwater management.

We understand that our responsible use of water will ensure more availability for the local communities, especially in those characterised by endemic water scarcity.

Dangote Cement’s total water consumption in 2020 for all operational locations was 6,789,816 cubic metres (m³); 1.29% lower than the total water consumption of 6,878,752 cubic metres (m³) in 2019.

2020 water efficiency campaign

In 2020 we executed an enterprise-wide water efficiency campaign geared at sensitising our employees, business partners, communities, and so on, on the critical need to preserve water for current and future generations. Over 3,000 of our employees in 10 African countries directly participated in this initiative. Through this initiative, we also supported the UN Sustainable Development Goals 6, 12 and 14 (“clean water and sanitation for all”; “responsible consumption and production”; and “life below water”).

The three-month campaign helped identify key water efficiency practices in Dangote Cement operations and the gaps that may require improvements and corrective actions. Three winners emerged based on the defined criteria for the campaign. Dangote Cement Transport division was the overall winner, followed by Cameroon and Ibese Plants in the second and third positions, respectively. Incentives for the winners included Executive Management’s recognition; virtual award ceremony presided over by our Group Managing Director, Michel Pucherco; congratulatory letters also signed by him; as well as Group-wide announcement of the achievements, to motivate other locations to continuously improve on their water efficiency practices, including impact measurements and documentation.



2020 Total water consumption/Utilisation (cubic metre) per location (all sources)

Country	2020 Total Water Consumption/ Utilisation (cubic metre) All Sources	2019 Total Water Consumption/ Utilisation (cubic metre) All Sources
Nigeria – Obajana	1,775,330	1,799,869
Nigeria – Ibese	1,415,460	1,723,536
Senegal	1,168,047	1,104,930
Zambia	1,112,820	999,789
Ethiopia	421,654	326,583
South Africa	270,462	251,000
Congo	267,540	224,763
Tanzania	218,902	279,924
Nigeria – Gboko	73,094	87,623
Cameroon	58,937	53,041
Ghana	7,269	27,124
Sierra Leone	301	570
Total	6,789,816	6,878,752

Total water consumption/Utilisation (cubic metre) based on sources*

Year	Surface water	Groundwater	Rainwater	Municipal water	Quarry	Dam
2019	27.00%	73.00%	0.00%	0.00%	0.00%	0.00%
2020	0.11%	67.38%	0.00%	9.47%	4.30%	18.74%

* In 2019, municipal water, water from quarry and dam were all captured under Surface Water. However, in 2020, we reclassified our sources of water, illustrating why there is a major difference between 2019 and 2020, as shown in this table.