

**Module: Introduction****Page: Introduction**

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**CC0.1****Introduction**

Please give a general description and introduction to your organization.

Vodacom Group Limited (herein after referred to as Vodacom) is an African unified communications provider, providing a wide range of services, including mobile voice, messaging, data, financial and converged services to over 66 million customers.

From its roots in South Africa, Vodacom has grown its operations to include networks in Tanzania, the Democratic Republic of Congo ('DRC'), Mozambique and Lesotho, and its mobile networks cover a total population of approximately 220 million people. Through Vodacom Business Africa (VBA), Vodacom offers business managed services to enterprises in 32 countries across the continent.

Vodacom is majority owned by Vodafone (65% holding) and was listed on the South African Stock Exchange (JSE) on 18 May 2009. Its head office is in Johannesburg, South Africa.

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**CC0.2****Reporting Year**

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

**Enter Periods that will be disclosed**

Fri 01 Apr 2016 - Fri 31 Mar 2017

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**CC0.3**

**Country list configuration**

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

**Select country**

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**CC0.4**

**Currency selection**

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

ZAR (R)

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**CC0.6**

**Modules**

As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.

If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email [respond@cdp.net](mailto:respond@cdp.net).  
If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

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**Further Information**

**Module: Management**

**Page: CC1. Governance**

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**CC1.1**

**Where is the highest level of direct responsibility for climate change within your organization?**

Board or individual/sub-set of the Board or other committee appointed by the Board

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**CC1.1a**

**Please identify the position of the individual or name of the committee with this responsibility**

(i) Position of the individual or name of the committee  
Board appointed Social and Ethics Committee.

ii) A description of their/its position in the corporate structure  
The Board appointed a Social and Ethics Committee, chaired by an independent non-executive director, who has the responsibility for good corporate citizenship which includes corporate social responsibility, ethical behaviour and managing the environmental impacts of the group, including climate change.

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**CC1.2**

**Do you provide incentives for the management of climate change issues, including the attainment of targets?**

Yes

CC1.2a

Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Corporate executive team	Monetary reward	Emissions reduction target	The key performance indicators for responsibility towards natural resources include greenhouse gas reduction targets, which are included in executive performance scorecards. The achievement of the targets positively impacts bonuses or discretionary pay; hence there exists a strong incentive to reach the emission reduction targets.
Business unit managers	Monetary reward	Emissions reduction target	The key performance indicators for responsibility towards natural resources include greenhouse gas reduction targets, which are included in employee's performance scorecards. The achievement of the targets positively impacts employee's bonuses or discretionary pay; hence there exists a strong incentive to reach the emission reduction targets.
Environment/Sustainability managers	Monetary reward	Emissions reduction target	The key performance indicators for responsibility towards natural resources include greenhouse gas reduction targets, which are included in employee's performance scorecards. The achievement of the targets positively impacts employee's bonuses or discretionary pay; hence there exists a strong incentive to reach the emission reduction targets.
All employees	Monetary reward	Efficiency target	All employees whose direct or indirect line function responsibilities have environmental impacts are empowered to manage environmental issues as integral part of their job and to establish systems that allow for employee training to ensure that they are up to date with the latest information regarding impacts and greenhouse gas reduction targets. The responsibility and accountability for environmental performance affects their performance scorecards, which in turn affect bonuses or discretionary pay.

Further Information

Page: CC2. Strategy

CC2.1

**Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities**

Integrated into multi-disciplinary company wide risk management processes

**CC2.1a**

**Please provide further details on your risk management procedures with regard to climate change risks and opportunities**

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	Risk and control procedures are implemented in each operation of Vodacom, i.e. South Africa, Mozambique, Lesotho, Tanzania the DRC.	3 to 6 years	

**CC2.1b**

**Please describe how your risk and opportunity identification processes are applied at both company and asset level**

At company level the Board Directors consider risks and opportunities when they formulate strategy, approve budgets and monitor progress against business plans. The process is overseen by the Risk Management Committees (RMC) in each operation, which is chaired by the respective Managing Directors and include the Executive Committee members in each country.

An Enterprise Risk Management Framework was developed to provide context and guide the identification, analysis, evaluation, treatment, communication and ongoing monitoring of risks in all business units. The risk management framework is in alignment with ISO 31000 and other risk management best practices and is being rolled out across the Group.

The Group Risk division reporting to the Chief Risk Officer assists in identifying, assessing and recording the risks and opportunities facing the Group and, where appropriate, monitors mitigating actions.

At asset level risks and opportunities are identified and managed at four different levels within the organisation, namely at project, process, operational and tactical levels. These risks and opportunities are periodically reviewed and updated. A filtering and reporting process ensures that the relevant risk items are reported to the Audit, Risk and Compliance Committee (ARC Committee).

The day-to-day responsibility for the management of enterprise risk lies with the head of the business unit or support function, which conducts the activity which

gives rise to the risk. Line management is guided and assisted by the Risk Group division, which reports to the Chief Risk Officer.

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### CC2.1c

#### How do you prioritize the risks and opportunities identified?

Risks and opportunities are prioritized through the following process:

- Define the risks - Various levels of management in each operating company define risks and opportunities at project, process, operational, tactical and strategic levels.
- Risks are assessed based on their potential impact on the operation (customers, business systems and employees) and reputation (stakeholders and brand). At level 1 the risk impact is seen as insignificant and at level 5 as catastrophic.
- Assess their likelihood - Risks are assessed based on the likelihood of them happening after taking into account the controls that are already in place to mitigate them. A scale from 1 to 5 is used to assess the likelihood of the risk, where 1 is “never” and 5 is “almost certain”. When a risk is rated with a likelihood as “5”, it means the controls in place will not prevent the risk from happening due to factors outside our control or the control effectiveness is poor.
- Classify the risk - Risks are classified as critical, high, medium and low based on the impact and likelihood score.
- Treat the risk - Management reviews all critical and high risks to determine which of these need additional treatment to reduce the risk to a medium or low. One such type treatment is the implementation of additional controls.

All risks are captured on the risk management system, continually monitored and reviewed every six months. Quarterly risk reports are provided to the ARC Committee and the Board.

In order to enhance the process of identifying, assessing and reporting on risks and opportunities, the concept of ‘principal risks’ was introduced during FY2017. The top 10 risks that have the most significant impact on Vodacom’s ability to achieve its strategic objectives in the long-term (‘macro risks’), and in the short- to medium-term (‘tactical sub-risks’) are listed on a heatmap with risk appetite statements for each. Risks are also analyzed for its speed of impact.

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### CC2.1d

Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future

Main reason for not having a process	Do you plan to introduce a process?	Comment
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**CC2.2****Is climate change integrated into your business strategy?**

Yes

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**CC2.2a****Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process**

i) Vodacom undertook a structured process to identify and integrate the most material sustainability issues, including climate change, into its business strategy. The resultant Sustainability Strategy document is a living document that is constantly updated to reflect the most pressing issues in the external environment that can affect business. It also includes a short section on 'strategy implementation' that provides a summary of the process by which the strategy is operationalized in the business.

The process of developing the strategy involved four key steps, namely; identifying the inputs that would feed into the strategy, collecting data from the various sources that represent the different inputs, analysing the data using a set of defined criteria, and developing a set of strategic sustainability priorities.

Various tools and frameworks that guide the governance of overall business were identified and four key sources of inputs emerged as the key building blocks; the external business environment, the issues that stakeholders consider most material to them, the current business strategy and the principles of the Enterprise Risk Management (ERM) process.

The data collection process involved consulting widely from a number of different sources, including sources external to the company, such as an extensive media search and internal sources, such as Vodacom's integrated report and corresponding supplementary reports.

The bottom-up process of data collection produced a 'long list' of issues that could potentially be material to the company. Subsequently, a structured process was used to analyse the data and distil the most critical issues to produce a set of ten strategic sustainability priorities.

ii) Influencing Vodacom's business strategy is the Carbon Management Strategy which was defined during FY2016 to manage internal energy and carbon performance and contains a set of 9 guiding principles on how to work efficiently with dedicated resources to effectively track, manage and report performance.

Vodacom has strengthened its commitment to the sustainable use of resources, by establishing a Carbon Management Implementation Plan containing all projects that relate to energy and carbon emissions. As a living document, it is designed to evolve as the business and its context changes, staying true to the business strategy and strategic sustainability priorities.

iii) Information, communications and technology companies such as Vodacom are significant energy users and are therefore a source of greenhouse gas emissions associated with climate change. Vodacom's strategy is influenced by the need to reduce greenhouse gas emissions through determining its carbon footprint, be energy efficient, develop and use alternative energy sources and sustainable resource utilization including water consumption.

To assist with tracking progress Vodacom now participates in the Group reporting process where electricity, diesel, fuel cells and water consumption are tracked systematically and reported to its majority shareholder, Vodafone, at six monthly intervals.

iv) Short term strategy influenced by climate change relates to improving energy efficiency and reducing emissions across the network and activities as well as the setting of targets to reduce Vodacom's carbon emissions by 5% per base station site per year. This will be achieved by investing in new technologies, free cooling, and using alternative energy sources such as generator-battery power hybrid units, and wind and solar generation for remote base station sites.

v) Long term strategy changes relate to deploying the technologies that Vodacom and its suppliers have developed which now makes it possible to build a site powered by renewable energy that makes economic sense. Coupled with the environmental benefits of reduced diesel usage and subsequent reduced emissions, green power solutions provide a promising opportunity for operators. Further, this will allow Vodacom to service undeveloped areas not on the electricity grid, with the bare minimum environmental footprint.

Another long term strategy relates to the renewal of the radio access network (RAN) to add single RAN (SRAN) and software defined radio (SDR) technologies to the network as well as fibre-optic cables and high speed IP-microwave transmission at base stations. SRAN allows the accommodation of 2G, 3G and LTE on the same base station and together with SDR the network can be upgraded to newer technologies such as 4G or LTE. The RAN renewal programme improves energy efficiency, drives down operational cost and helps to expand data coverage.

The marketplace is changing rapidly with significant levels of digitalisation and highly connected consumers who can minimise their own energy needs, particularly through Internet of Things (IoT) intelligent networked devices and processes. To succeed in this emerging digital era Vodacom will deploy new network technologies, while rolling out a national IoT network and developing new IoT applications and solutions to help customers reduce their emissions.

vi) Vodacom believes that strategic advantage can be obtained through providing technological innovative solutions that can reduce operating costs from fuel and electricity consumption, thereby reducing carbon emissions and Vodacom's impact on the environment while providing products and services that help customers to live and work more efficiently and flexibly. Its technological solutions have the potential to replace traditional, carbon-intensive methods of doing business and include cloud computing, video conferencing and Internet of Things (IoT) solutions.

vii) In November 2016 Vodacom commenced its network build of the narrowband Internet of Things (NB-IoT), a low-power wide-area network technology that will reduce Vodacom's energy consumption and carbon emissions as well as reduce IoT users' carbon emissions through the use of e-health, connected agriculture, smart metering and logistics applications.

viii) How the Paris Agreement has influenced the business strategy?

Vodacom's holding company, Vodafone, is a signatory to the Paris Pledge for Action, recognising its readiness to play its part in limiting global temperature rises to below 2°C. Vodacom is committed to playing its role in the attainment of the UN Sustainable Development Goals on energy security, climate change and sustainable consumption.

ix) Do you use forward-looking scenario analyses, including a 2oC scenario, to inform your organization's businesses, strategy, and/or financial planning? Vodacom aims to engage with the Risk and Business Continuity Management team to build the 2oC scenario into business strategy decisions, network and financial planning.

Please explain why climate change is not integrated into your business strategy

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**CC2.2c**

**Does your company use an internal price on carbon?**

No, but we anticipate doing so in the next 2 years

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**CC2.2d**

Please provide details and examples of how your company uses an internal price on carbon

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**CC2.3**

**Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)**

Trade associations

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**CC2.3a**

On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
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**CC2.3b**

**Are you on the Board of any trade associations or provide funding beyond membership?**

No

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CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
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CC2.3d

Do you publicly disclose a list of all the research organizations that you fund?

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CC2.3e

Please provide details of the other engagement activities that you undertake

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CC2.3f

**What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

Vodacom has specialist regulatory and government relations teams who engage with Government, Regulators, and Business Partners such as Business Unity South Africa (BUSA) and the National Business Initiative (NBI) on policy issues impacting the business including climate change. They participate actively through written submissions and formal hearings on legislative and regulatory changes. Feedback on issues is reported as per Vodacom's risk management framework.

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CC2.3g

Please explain why you do not engage with policy makers

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**Further Information**

**Page: CC3. Targets and Initiatives**

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**CC3.1**

**Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?**

Intensity target

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**CC3.1a**

**Please provide details of your absolute target**

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
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**CC3.1b**

**Please provide details of your intensity target**

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1+2 (location-based)	100%	5%	Other: metric tonnes CO2e per base station site	2016	29.71	2017	No, but we anticipate setting one in the next 2 years	This target relates to fuel and electricity consumption per base station site taking growth into account.

### CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Increase	0.46	No change	0.00	The target relates to Scopes 1&2 (location-based) only taking growth in base stations into account.

### CC3.1d

Please provide details of your renewable energy consumption and/or production target

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
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**CC3.1e**

**For all of your targets, please provide details on the progress made in the reporting year**

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Int1	100%	0%	Vodacom's emissions increased by 5.08% year-on-year, thereby not meeting the target of a 5% reduction per base station site per year. Due to growth in business and the growing demand for data and mobile services, Vodacom's networks, in particular the access, core and data centres continue to consume more energy. Measuring carbon emissions relative to number of base stations is no longer relevant.

**CC3.1f**

**Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years**

**CC3.2**

**Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?**

Yes

CC3.2a

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Group of products	SMART METERING: Smart meters give end users detailed, real-time information about their daily electricity use, which could result in behaviour changes and reductions in energy consumption, Scope 2 carbon emissions and cost.	Avoided emissions	Other: Methodology for calculating the impact of the solutions and services are based on the GeSI Assessment Methodology using Defra emission conversion factors		Less than or equal to 10%	
Group of products	SMART LOGISTICS: Remote tracking systems: Wireless, GPRS-enabled vehicle tracking devices feed data about each vehicle's position and the latest traffic information into a centralised fleet management system. This then generates routes that cover the shortest distance and alerts drivers about optimum driving speeds that result in reduced fuel consumption, Scope 1 carbon emissions and cost.	Avoided emissions	Other: Methodology for calculating the impact of the solutions and services are based on the GeSI Assessment Methodology using Defra emission conversion factors		Less than or equal to 10%	
Group of products	SMART WORKING: Vodacom offers products that contribute to saving energy and reducing CO2 emissions for clients by working differently from the traditional, carbon-intensive methods of doing business. Vodacom launched cloud solutions five years ago and tremendous growth lead to the development of a Cloud Monitor for Virtual Environments to allow the user's in-	Avoided emissions	Other: Methodology for calculating the impact of the solutions and services are based on the GeSI Assessment Methodology using Defra emission conversion factors		Less than or equal to 10%	

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	house administrators to monitor the complete virtual environment of server loads and generate customised reports. It also gives customers a view on performance, resource utilization and Scope 2 emissions of their workloads in each geographical location.					
Group of products	INTERNET OF THINGS (IoT): Significant levels of digitalisation and highly connected consumers can minimise their own energy needs, particularly through Internet of Things (IoT) intelligent networked devices and processes. Vodafone's research in 2016 found that 76% of businesses surveyed say that IoT will be 'critical' to their success and nearly 50% are already using IoT to support large-scale business transformation. IoT solutions can help customers reduce their GHG emissions by two tonnes for every tonne of GHG generated from operations.	Avoided emissions	Other: Methodology for calculating the impact of the solutions and services are based on the GeSI Assessment Methodology using Defra emission conversion factors		Less than or equal to 10%	

### CC3.3

**Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)**

Yes

### CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	2	
To be implemented*	1	81
Implementation commenced*	1	9045
Implemented*	2	11715
Not to be implemented	0	

### CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Building services	Vodacom installed 840 smart meters at base stations in South Africa to improve the quality and reliability of energy data that resulted in energy savings.	1450	Scope 2 (location-based)	Voluntary	1667000	1556000	<1 year	6-10 years	
Energy efficiency:	Vodacom has implemented Project Rhees to reduce energy	10265	Scope 2 (location-	Voluntary	11805000	21200000	1-3 years	6-10 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Building services	consumption at sites by replacing old equipment, such as DC fans, resulting in reduced air-conditioning run time.		based)						

### CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Other	Financial optimization taking energy consumption into account. A key consideration in the RAN (Radio Access Network) equipment renewal programme is that every item of the existing radio network and core network is re-evaluated in terms of energy consumption and included in all decisions for roll-out and replacement. Upgrading the RAN will be according to available budgets, depreciation rates, asset write-offs and other business drivers including the energy consumption analysis.
Employee engagement	Employees are empowered to manage environmental issues as an integral part of their job and to investigate more efficient technology interventions to lower operational costs through energy efficiency.
Partnering with governments on technology development	Vodacom makes use of the Eskom Demand Side Management (DSM) subsidies and rebates where available to help defray the capital costs of equipment and the NBI's Private Sector Energy Efficiency Project (PSEE) to leverage off the knowledge and skills of experts.

### CC3.3d

If you do not have any emissions reduction initiatives, please explain why not

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**Further Information**

**Page: CC4. Communication**

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**CC4.1**

Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s)

Publication	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Vodacom Integrated Report 2017: pages 1 – 67	<a href="https://www.cdp.net/sites/2017/02/22902/Climate%20Change%202017/Shared%20Documents/Attachments/CC4.1/Vodacom%20Integrated%20Report%202017.pdf">https://www.cdp.net/sites/2017/02/22902/Climate Change 2017/Shared Documents/Attachments/CC4.1/Vodacom Integrated Report 2017.pdf</a>	
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Vodacom Sustainability Report 2017: pages 1 – 51	<a href="https://www.cdp.net/sites/2017/02/22902/Climate%20Change%202017/Shared%20Documents/Attachments/CC4.1/Vodacom%20Sustainability%20Report%202017.pdf">https://www.cdp.net/sites/2017/02/22902/Climate Change 2017/Shared Documents/Attachments/CC4.1/Vodacom Sustainability Report 2017.pdf</a>	

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**Further Information**

**Module: Risks and Opportunities**

**Page: CC5. Climate Change Risks**

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**CC5.1**

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Risks driven by changes in regulation  
 Risks driven by changes in physical climate parameters  
 Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Carbon taxes	The long awaited South African carbon tax is envisaged to be implemented during 2018 at a rate of R120 per ton of CO <sub>2</sub> e above a basic tax-free threshold of 60 per cent during the first phase of implementation – until December 2020. Offsets of between 5% to 10% will allow emission-intensive and trade-exposed industries to invest in projects outside their normal	Increased operational cost	1 to 3 years	Direct	Very likely	Low	It is anticipated that only companies with Scope 1 emissions of more than 100 000 tCO <sub>2</sub> e per annum will be subjected to the carbon tax on stationary combustion. Further, diesel and petrol-related greenhouse gas emissions will be included in the fuel tax regime. It is therefore anticipated that	Vodacom has a Government and Stakeholder Relations department that actively engages with policy makers on issues that affect its business, including new legislation such as carbon taxes. Vodacom provided input to the SA National Treasury Carbon Tax Policy Paper by the due date. Some of the network cooling systems and air conditioning systems in offices and shops use refrigerants. Vodacom has phased out the use of	No direct costs are associated with government liaison other than staff salaries.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>operations to help reduce their carbon tax liabilities. From 2021, the five-year phase 2 will be applied.</p> <p>According to the draft Carbon Tax Bill released in November 2015 only scope 1 emissions are expected to be liable to tax, suggesting the direct impact on Vodacom will be minimal.</p> <p>However, Eskom might be taxed too and will most likely pass on the costs, which will increase operational costs (electricity bills). Further, the carbon tax may prompt an increase in prices generally, leading to reductions in the disposable income of consumers and a potential slowing</p>						<p>Vodacom will have a nil liability in terms of carbon tax due to its small amount of Scope 1 emissions.</p>	<p>chlorofluorocarbons (CFCs) in most buildings and plans to phase out the use of R22 gas. These actions are not expected to affect the likelihood or magnitude of the risk.</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	in consumer spend.								
Emission reporting obligations	<p>The Department of Environmental Affairs (DEA) on 3 April 2017 gazetted regulations for mandatory reporting of greenhouse gas emissions under the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004). The purpose of the regulations is to introduce a single national reporting system for greenhouse gas emissions. The South African Revenue Service (SARS) will be the main implementing administrative authority on the tax liability assessment while the DEA will lead the monitoring,</p>	Increased operational cost	1 to 3 years	Direct	Very likely	Low	<p>Additional cost relate to penalties for non-compliance to submit GHG inventories and data which is estimated to be capped at R5 000 000 for a first offence. However, there is no potential financial impact for Vodacom as current resources would be able to cope with the emissions reporting obligation.</p>	<p>Vodacom appointed external consultants to determine its organizational carbon footprint. The processes of obtaining the required data are continually refined to ensure accurate and consistent data capturing. During 2016 Vodacom had its Carbon Footprint Inventory verified by an independent third party to ensure it is free of material misstatements. These actions are not expected to affect the likelihood or magnitude of the risk.</p>	<p>Costs of about R435 000 per annum have been incurred relating to the appointment of external consultants to compile the carbon footprint and disclosure thereof well as the external verification of the carbon inventory.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>reporting and verifying emissions process, which will form the tax base. DEA will directly collect the process emissions information while the Department of Energy (DOE) will supply the energy combustion data. All information will feed into the National Atmospheric Emissions Inventory System (NAEIS). According to the draft Carbon Tax Bill, companies will self assess and submit their emissions to SARS and if found to be incorrect, could be penalized. In order to assess the carbon tax accurately, reporting of GHG emissions will be required together</p>								

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	with verification of the reported emissions. This will place a financial compliance burden on Vodacom, while non-compliance could be met with penalties. Further, emission reporting could lead to more stringent licence to operate criteria, e.g. for inclusion in the FTSE/JSE Responsible Investment Index.								
Fuel/energy taxes and regulations	The SA National Treasury introduced a levy for using non-renewable energy sources to cover generation costs for renewable energy. This levy was increased to 5.5c/kWh during the 2015 Budget Speech and is supposed to be withdrawn when the electricity	Increased operational cost	1 to 3 years	Direct	Very likely	Low	Based on current consumption levels, a 2c/kWh increase in the non-renewable energy levy will increase operational expenses by an additional approx. R10 million per annum whereas repealing the 5.5c/kWh levy	In South Africa, approximately 94% of Vodacom's CO2 emissions are generated from purchased electricity consumed. The network consumes approximately 83% of electricity whereas the data centres and offices consume about 6 & 11% respectively. Energy savings initiatives therefore focus on network	Vodacom staff had a capital budget of R250 000 to develop the electricity reporting and evaluation mechanism. Installing the 840 smart meters required a capital investment of R1 556 000.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>shortage was over. However, the risk exists that this levy would not be withdrawn or could be increased in the future. The draft Carbon Tax Bill proposes that the carbon tax on diesel and petrol non-stationary emissions be included in the fuel tax regime. In order to assist SA's national power supplier (Eskom) with electricity supply, large annual electricity cost increases have been experienced in the last few years as demand-side management schemes have been placed on the backburner. A constant supply of energy is critical to Vodacom's operations and network</p>						<p>would reduce electricity costs in South Africa by approx. R27.5 million per annum.</p>	<p>infrastructure, but small changes in buildings and operations can have a positive effect that over time makes a big difference. In order to reduce electricity consumption and manage costs Vodacom in 2015 started developing a reporting and evaluation mechanism to analyse and manage electricity consumption and reconcile costs. To improve the quality and reliability of energy data Vodacom, during FY2017, installed 840 smart meters at base stations in South Africa (FY2016: 331). The reporting and evaluation mechanism and smart meters will reduce the magnitude of the risk.</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>infrastructure. Electricity outages or mandatory quotas could disrupt operations and paying levies or penalties for energy consumption will affect profitability, both current operations and proposed expansion projects in South Africa. Power disruptions could also affect customers' demand for and use of Vodacom's products.</p>								

**CC5.1b**

**Please describe your inherent risks that are driven by changes in physical climate parameters**

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
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Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) temperature	Vodacom, an information, communications and technology company, is a large user of energy in operations. To reduce energy consumption, Vodacom has installed free cooling technology at its base stations in Mozambique, Lesotho, Tanzania and the DRC and installed 1500 free cooled sites in South Africa during FY2017. Free cooling is when electronic air-conditioning is supplemented with fresh air to reduce the temperatures of equipment resulting in about 45% reduction in energy consumption. Higher temperatures will	Increased operational cost	3 to 6 years	Direct	About as likely as not	Low	To date the equipment was installed at a capital cost of approximately R91 million. With higher average temperatures the energy use and cost could increase and the equipment may become obsolete. The cost savings from the free-cooling equipment installed during FY2017 was about R78 000. Should the energy use increase by 2%, then the operational expenses could increase by approximately R1.2 million per annum while a 10% redundancy rate of the equipment could result in a	Free cooling technology reduces the need for powered air-conditioning at base-stations by monitoring the external air temperature and when possible shuts down air-conditioning units to use ambient air to do the cooling whenever the outside temperature falls below 20°C. To manage an increase in temperatures Vodacom is upgrading its network with components that can withstand higher temperatures and is installing individual battery coolers rather than	The installation of the free-cooling equipment and smart meters at 18 base stations required capital investment of R723 000.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>result in lesser usage of free cooling with the resultant increase in electrical energy consumed. This could make the free cooling equipment obsolete as well as increase the maintenance and replacement intervals on cooling equipment resulting in higher operational cost.</p>						<p>R9.1 million loss of capital invested.</p>	<p>cooling the whole facility. Technicians are working on free cooling systems that will work even when the outside temperature is 30°C. To date 3 893 free-cooling units were installed at base stations to help reduce air-conditioning use and during FY2017 free cooling units were installed at 18 base stations. The technology reduced air-conditioning run-time and energy consumption by up to 45% as well as extended maintenance and replacement intervals on cooling</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								equipment. With the free cooling installation smart meters are installed to have remote performance monitoring capability. For additional cost and carbon emission savings at base stations Vodacom is exploring innovative energy solutions such as fuel cells, flow batteries, DC power cooling and investigating alternative power generation. These actions will reduce the magnitude of the risk.	
Change in mean (average) precipitation	Currently unreliable grid power exists in Mozambique,	Reduction/disruption in production capacity	1 to 3 years	Direct	About as likely as not	Low-medium	A shortage of diesel at the base stations could lead to	In order to reduce the reliance on diesel for	To date Vodacom invested capital of

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>Lesotho, DRC and Tanzania. The mobile network base stations therefore rely extensively on diesel generators for electricity. The huge distances between the sites and the challenging terrain makes the logistics of refuelling and maintenance costly with today's infrastructure. With more frequent rainfall the infrastructure could be negatively impacted making access to refuel and maintain the base station generators difficult. This could result in a disruption of operations and the non-availability of the network. Higher temperatures will</p>						<p>the non-availability of the network and negatively impact customer usage resulting in a loss of profit. A cumulative one day shutdown of operations could result in loss of revenue of approx. R47.5 million based on current revenue levels in Mozambique, Lesotho, DRC and Tanzania.</p>	<p>electricity generation Vodacom is actively looking at deploying small scale renewable and alternate energy technologies. In the last two years smaller, portable sites that are totally off-grid and operate on battery and solar power only were installed in rural areas. Installations take only a few days and at a cost of almost half of what it would cost for a normal base station. There are 976 solar sites across the Group (2016: 955). During FY2017 the number of solar sites in the DRC was</p>	<p>about R400 million on the solar sites across the group. The capital costs for the 10 solar sites in DRC and 14 sites in Lesotho was in the region of R6 million.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>require more cooling at the mobile base stations resulting in more frequent refuelling of generators. Not only will the logistics of refuelling and maintenance increase operational costs, but it could impact on the network quality.</p>							<p>increased to 798 (2016: 788), further reducing the reliance on diesel. Vodacom Lesotho has embraced the renewable technology in the largely rural country. The operation now has 74 solar sites (2016: 60), accounting for 25% of the total of 292 sites in the country. Vodacom Mozambique has 84 solar sites. The solar sites provide a 'greener' solution when compared to a site powered by a diesel generator. They require no refuelling, less maintenance and monitoring which greatly</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								reduces ongoing operational costs. These actions will reduce the magnitude of the risk.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Vodacom's carbon footprint emanates from energy and fuel used in operations and fuel used in transport. Other environment	Reduced demand for goods/services	Up to 1 year	Direct	Likely	Medium	The potential financial implication from reputational risk is difficult to quantify, but it will emanate from a loss of customer confidence and loyalty and higher operational costs for electricity, fuel, waste and resources. Vodacom's 2016 brand value is estimated at R21 970 million – according to Brand Finance South Africa. An estimated 1% loss in reputation could result in a loss of brand value of approx. R220 million together with actual revenue. <a href="http://www.bizcommunity.com/Article/196/82/150904.html">http://www.bizcommunity.com/Article/196/82/150904.html</a>	To manage reputational risk and to reduce the likelihood and magnitude thereof, Vodacom is annually measuring, assessing and verifying	Vodacom spent about R435 000 per annum to appoint external consultants to compile the carbon footprint and disclosure

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>al consequences relate to resource consumption and waste. Vodacom therefore has a responsibility to minimise the associated environmental impacts and through proactive actions be seen as a champion of and environmental “thought” leader in South Africa and Africa.</p>							<p>its carbon footprint and is publicly disclosing its practices and performance through the Carbon Disclosure Project. Vodacom also has a Carbon Management Strategy, which was defined during FY2016 to manage internal energy and carbon performance . It contains a set of 9 guiding principles on how to work efficiently with dedicated resources to effectively</p>	<p>thereof as well as the external verification of the carbon inventory. ISO certification costs and site inspection costs are considered part of operational spend.</p>

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>track, manage and report performance . Vodacom has strengthened its commitment to the sustainable use of resources, by establishing a Carbon Management Implementation Plan containing all projects that relate to energy and carbon emissions. As a living document, it is designed to evolve as the business and its context changes, staying true</p>	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>to the business strategy and strategic sustainability priorities. Vodacom's ISO 14001:2004 certified environmental management system (EMS) provides direction on the management and control of key environmental aspects in the planning, design, construction and operation of the network. During FY2017 an ISO 14001:2015 gap analysis was</p>	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>conducted and a transition from ISO 14001:2004 to ISO 14001:2015 is in progress, with the aim of completion by September 2018. Operations comply with applicable environmental legislation and environmental compliance is monitored through site inspections. In South Africa the level of compliance averages at 90% (2016: 75%).</p>	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Changing consumer behavior	Shifts in consumer attitude towards a low carbon economy and environment could affect Vodacom's service offering to its customers. Given that ICT infrastructure, particularly broadband access, is a powerful driver of GDP growth and has enormous potential to address socioeconomic imbalances, governments are prioritising the roll out	Wider social disadvantages	1 to 3 years	Indirect (Client)	About as likely as not	Medium	Without sustainable agriculture and improved productivity there could be fewer jobs created in future coupled with reduced incomes. This could lead to a reduction in demand for Vodacom's solutions and services. An estimated 0.25% decrease in sales could result in a decrease in revenue of approx. R200 million per annum based on current revenue levels.	Vodacom is assisting the shift to a low carbon economy by providing communities with alternative ways of conducting business. During FY2017 Vodacom partnered with the GIZ and launched the 'Connected Farmer' cloud-based platform that will link thousands of smallholder farmers in South Africa to the commercial agriculture value chain. In South Africa, over 200 000	Vodacom and GIZ's combined investment in the 'Connected Farmer' platform, a cloud-based web and mobile software solution, is estimated to be around R21 million over three years.

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>of broadband services to all. The positive impact on people's lives – through better education, healthcare, enabling commerce or simply providing street lighting – will be felt for generations. Vodacom believes that its technologies can make a significant impact in the education, health and sustainable agriculture sectors and will continue</p>							<p>smallholder farmers and an estimated 2 million subsistence farmers have an important role to play in food security and poverty reduction, yet their access to markets, information and finance is limited or non-existent. There is also a lack of available data on smallholder farmers and their supply chains, which is a barrier to informed decision-making. Sourcing from</p>	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	its support for communities and help shift behaviour and attitudes towards a more sustainable, carbon friendly environment in Africa.							smallholder farmers as a result becomes more realistic and executable for food manufacturers and retail businesses, increasing the number of smallholders and subsistence farmers in commercial agricultural value chains. Further, enterprises will have real time visibility of their supply chains, as well as the ability to engage and communicate with smallholders	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>directly. This initiative leverages off similar projects that have been implemented across Kenya, Tanzania and Mozambique through Vodafone, which is making an important contribution in improving agricultural productivity and food security, creating jobs and increasing incomes in the agriculture sector. These actions are expected to reduce the magnitude</p>	

Risk driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								of the risk of changing consumer behaviour.	

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CC5.1d

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

## Further Information

### Page: CC6. Climate Change Opportunities

#### CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation

Opportunities driven by changes in physical climate parameters

Opportunities driven by changes in other climate-related developments

#### CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Fuel/energy taxes and regulations	Energy and fuel taxes could increase Vodacom's operational costs substantially. However, energy savings will result in large operational costs savings while	Reduced operational costs	Up to 1 year	Direct	Virtually certain	Low	The potential financial implications will emanate from energy costs savings and tax allowances that can be claimed on the equipment. The implementation	Vodacom is continuously renewing its network and data centres to support future technologies and services. To benefit from tax and regulatory	Vodacom invested capital of about R21.2 million on the various energy efficiency equipment.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>benefits from potential tax allowances and incentives or subsidies for energy-efficient equipment and renewable energy technologies will add to an organization's bottom line. Compliance with energy reduction schemes (PCP) will reduce load shedding by Eskom resulting in less frequent disruptions in operations and improve the network quality in South Africa. These cost savings could add to Vodacom's cost competitiveness in South Africa.</p>						<p>of Project Rhees reduced carbon emissions and electricity consumption during the year with cost savings of about R11.8 million per annum.</p>	<p>opportunities while at the same time combat the increases experienced in energy tariffs, Vodacom implemented Project Rhees to reduce energy consumption at sites by replacing old equipment, such as DC fans, resulting in reduced air-conditioning run time. The initiative is aimed at reducing energy consumption and costs, carbon emissions and where possible, take advantage of the promulgated S12I tax allowances for energy efficiency.</p>	

CC6.1b

Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) precipitation	The network is the backbone of Vodacom's business and the quality of its network allows Vodacom to distinguish it from the competitors. It attracts new customers and ensures retention of the existing customer base. Change in average precipitation could influence the network quality and the demand for Vodacom's solutions and services. Vodacom is therefore strengthening its resilience as an organisation by renewing the	Increased demand for existing products/services	1 to 3 years	Direct	Likely	Medium-high	The potential financial impact will emanate from an increased demand for Vodacom's solutions and services. An estimated 0.5% increase in revenue could result in additional revenue of approx. R400 million per annum based on current revenue levels.	To deliver exceptional network quality Vodacom continued with its RAN renewal programme after the completion of its six year radio access network (RAN) renewal project to add single RAN (SRAN) and software defined radio (SDR) technologies to the network. SRAN allows for the accommodation of 2G, 3G and LTE on the same base station; and together with SDR the network can be upgraded to newer technologies such as 4G or LTE. Less equipment in a base station means the influences of weather on equipment could be less severe. During FY2017 3G and 4G network	The RAN renewal project required capital investment of about R9 billion over the six years. During FY2017 Vodacom invested R11.3 billion across all markets to widen 3G and 4G data coverage, improve voice quality and increase data speeds.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	radio access network (RAN) to incorporate newer technologies that could withstand weather influences.							coverage was extended to South Africa, Tanzania and Lesotho, and 2G and 3G coverage in Mozambique and DRC. In South Africa, there is 75.8% of 4G coverage, and fibre-optic is in the process of being rolled out. The RAN renewal programme improves energy efficiency, drives down operational cost, helps to expand data coverage and improve the customer experience. The transmission network is enhanced by installing base stations with fibre-optic cables and high speed IP-microwave transmission. These technological changes help to reduce operational energy costs and carbon emissions, while providing solutions and services that help customers to live and work more efficiently	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								and flexibly.	
Induced changes in natural resources	Organisations are competing for natural resources, which are becoming one of scarcity. Vodacom is presented with opportunities to innovate solutions that use resources optimally and reduce operational costs.	Reduced operational costs	Up to 1 year	Direct	Likely	Low	An innovative energy solution will result in reduced energy consumption and cost as well as carbon emissions. A 1% reduction in energy consumption across operations could result in a cost saving of approximately 5 708 MWh per annum with cost savings of about R6.5 million.	In order to use scarce resources optimally, Vodacom has a Site Solution Innovation Centre (SSIC) focused on energy and site infrastructure efficiency. They work with a number of businesses, innovators and entrepreneurs to explore alternative power generation sources, energy storage solutions and lower-cost base station site infrastructure that are then trialed in the local market. Development projects in FY2017 include: <ul style="list-style-type: none"> <li>• solar PV upgrades for existing base stations, both on-grid and off-grid;</li> <li>• fuel cells; and</li> <li>• alternative energy storage technologies such as lithium-ion batteries. A number of SSIC innovations are now operational,</li> </ul>	During FY2017 the SSIC spent opex of about R270 000 on trials and the PowerCube as well as R88 000 on solar trials.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>such as the deployment of approximately 300 hydrogen fuel cells in South Africa, the majority of which are methanol-based. Fuel cells remain an emerging technology that is not yet at scale, and we continue to work with various manufacturers to assist in developing their products for application in the telecoms environment. Other SSIC innovations include the recent standardisation of hybrid energy technologies and high security and low cost site infrastructure, soon to be deployed in South Africa. One example of a hybrid technology deployed is the 'PowerCube'. This integrates energy supplies from grid electricity, solar PV and diesel together with on-site</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								battery storage, reducing the running time of a diesel generator by up to 80%, saving up to 90% on servicing costs and cutting fuel consumption and emissions by more than 50%.	
Induced changes in natural resources	Changes in the availability of natural resources and a continued increase in the cost of resources may affect Vodacom's cost of operation and competitiveness. By identifying waste streams that can be reused and recycled, less waste is directed to landfill and behavior of customers, suppliers and the broader business community can	Reduced operational costs	1 to 3 years	Direct	More likely than not	Low	Recycling or reusing equipment will reduce operational costs while reducing the number of third party waste deliveries to landfill sites and related carbon emissions. The sale of old and obsolete equipment will generate a small amount of income.	As technology advances, Vodacom replaces network equipment with new, more energy efficient equipment that improves the network service and makes operations more efficient. This generates electronic waste (e-waste) - in FY2017 69 tonnes of network equipment and handsets were reused or recycled (2016: 1 006 tonnes). In FY2017 Vodacom developed a new waste management strategy to guide the establishment and implementation of leading waste management practices across the	No direct costs other than staff salaries are associated with developing the Waste Management Strategy.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	be influenced.							<p>business. The strategy focuses on:</p> <ul style="list-style-type: none"> <li>• managing waste-related risks;</li> <li>• achieving leading waste management practices;</li> <li>• collaborating with and supporting the value chain to enable change; and</li> <li>• identifying and enabling opportunities to further our progress.</li> </ul> <p>The strategy guides employees at all levels on how to improve day-to-day waste related activities and proactively identify opportunities. The focus is to reduce waste sent to landfill by identifying waste streams that can be reused and recycled. As such recycling/destruction certificates were obtained for all e-waste, fluorescent light tubes and ink cartridges. In FY2017 52 tonnes of paper (2016: 74</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								tonnes) were purchased as a result of the introduction of electronic billing. South African stores use plastic bags made from recycled material with a message to customers to reuse the bags. In Tanzania responsible waste management was promoted through awareness campaigns with staff and dedicated programmes for the reuse and resale of old and obsolete equipment.	

CC6.1c

Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Vodacom is	Increased	Up to 1	Direct	Likely	Low-	A reputation as a sustainable brand and	In order to	Vodacom

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
n	committed to managing the environmental impacts of its solutions and services and would like to be seen as a leader in environmental issues in the ITC industry. The reputational benefits of being a sustainable brand and responsible corporate citizen will result in market growth and opportunities for expansion in South Africa and the rest of Africa.	demand for existing products/services	year			medium	responsible corporate citizen is reflected in the economic value Vodacom creates and distributes to its stakeholders such as its employees and the local communities in which it operates. Vodacom's 2016 brand value is estimated at R21 970 million – according to Brand Finance South Africa. An estimated 0.5% gain in reputational benefits could result in a gain of brand value of approx. R110 million together with actual revenue. <a href="http://www.bizcommunity.com/Article/196/82/150904.html">http://www.bizcommunity.com/Article/196/82/150904.html</a>	enhance its reputation as a sustainable brand and responsible corporate citizen, Vodacom Mozambique continues to support the fight against malaria and farmers affected by floods. During FY2017 Vodacom distributed 10 000 treated mosquito nets across communities and partnered with the Ministry of Health to launch a malaria spraying campaign supported by a mobile	contributed R3.7 million worth towards relief efforts as well as R1.6 million to enable customers to communicate for free with family and friends.

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>application. To complement this, Vodacom provided 2 000 smartphones with an application loaded, as well as provided uniforms for the 2 000 field workers that will be spraying during the campaign. Farmers affected by earlier floods in the Namaacha and Chokwe districts received over 405 kilograms of seeds. Cyclone Dineo devastated Inhambane province in</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								Mozambique in February 2017, affecting more than 550 000 people. Vodacom provided disaster relief that included food, accommodation, essential building materials as well as enabled customers to communicate for free with family and friends.	
Changing consumer behavior	Mobile data traffic has grown 18-fold over the past five years and will continue to rise at a rapid rate. By 2020 it is predicted	New products/business services	Up to 1 year	Direct	Likely	Medium-high	According to the report, The Mobile Economy 2017 from GSMA Intelligence, the mobile industry contribution to global GDP will grow from the current \$3.3trillion or 4.4% of GDP in 2016 to \$4.2trillion or 4.9% of GDP in 2020. Should this 0.5% growth result in a corresponding increase in demand for Vodacom South Africa's services, then revenue could increase by approx. R325 million per annum based on current revenue levels.	During FY2017 Vodacom aligned its Vision 2020 strategy to ensure that they are best positioned to seize the opportunities	Vodacom has a capital budget of about R82 million for FY2018 to build the narrowband Internet of Things

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>that:</p> <ul style="list-style-type: none"> <li>mobile data traffic will be equivalent to 15 times the volume of all data carried in the entire global internet in 2005;</li> <li>global IP traffic will have increased nearly 100-fold from 2005; and</li> <li>the number of mobile connections will increase to 8.9 billion, up 22% from 2015</li> </ul> <p>As new technologies such as the Internet of Things (IoT) continue to spread through</p>							<p>presented by significant levels of digitalisation and highly connected consumers who can minimise their own energy needs, particularly through Internet of Things (IoT) intelligent networked devices and processes. It is envisaged that customers can reduce their GHG emissions by two tonnes for every tonne of GHG Vodacom generates from own operations. Vodacom's</p>	<p>(NB-IoT) network.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>every aspect of daily life – bringing network intelligence and optimised energy use to a wide variety of machines, devices and processes – the beneficial climatic effects of the global ICT industry will increase. One recent estimate is that the industry could account for a 20% reduction in total global GHG emissions by 2030, in effect maintaining</p>							<p>strategy is thus to deploy new network technologies, while rolling out a national IoT network and developing new IoT applications and solutions to help customers reduce their emissions. In November 2016 Vodacom commenced its network build of the narrowband Internet of Things (NB-IoT), a low-power wide-area network technology that will reduce Vodacom's energy consumption and carbon</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>emissions at 2015 levels despite a further 15 years of global population growth and increasing urbanisation and industrialisation in emerging markets. Research in 2016 found that 76% of businesses surveyed say that IoT will be 'critical' to their success and nearly 50% are already using IoT to support large-scale business transformation. Digital technology is disrupting traditional</p>							<p>emissions as well as reduce IoT users' carbon emissions through the use of e-health, connected agriculture, smart metering and logistics applications. Vodacom partnered with PTC, a recognised leader in Industrial IoT, augmented reality and connected solutions to implement a local version of PTC's ThingWorx® IoT platform in order to develop new IoT applications and</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>business models and significantly reshaping consumer behaviour. Vodacom is presented with exciting new opportunities beyond connectivity, and requires it to rethink the networks and technology of the future, redefine customer engagement and develop a company culture that attracts the best digital talent. It also presents opportunities to drive positive social</p>							<p>solutions. ThingWorx® contains a comprehensive set of integrated IoT-specific development tools and capabilities to enable developers to rapidly connect, build and deploy smart, connected solutions for the IoT that can enable improved operational efficiency.</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct / Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	change in areas such as education, healthcare, financial services and agriculture.								

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**CC6.1d**

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

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**CC6.1e**

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

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**CC6.1f**

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

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#### Further Information

**Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading**

**Page: CC7. Emissions Methodology**

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#### CC7.1

**Please provide your base year and base year emissions (Scopes 1 and 2)**

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Tue 01 Apr 2008 - Tue 31 Mar 2009	26907.12
Scope 2 (location-based)	Tue 01 Apr 2008 - Tue 31 Mar 2009	339462.16
Scope 2 (market-based)	Tue 01 Apr 2008 - Tue 31 Mar 2009	0

---

#### CC7.2

**Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions**

**Please select the published methodologies that you use**

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

---

**CC7.2a**

**If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions**

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**CC7.3**

**Please give the source for the global warming potentials you have used**

<b>Gas</b>	<b>Reference</b>
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-134a	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: R407c	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: R404a	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: R410a	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: Novac 1230	IPCC Fourth Assessment Report (AR4 - 100 year)

---

**CC7.4**

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Diesel/Gas oil	2.67620	kg CO2e per liter	Defra 2016 - Guidelines to Defra's GHG Conversion Factors for Company Reporting, Fuels, updated June 2016. Available: <a href="http://www.ukconversionfactorscarbonsmart.co.uk">www.ukconversionfactorscarbonsmart.co.uk</a>
Motor gasoline	2.30250	kg CO2e per liter	Defra 2016 - Guidelines to Defra's GHG Conversion Factors for Company Reporting, Fuels, updated June 2016. Available: <a href="http://www.ukconversionfactorscarbonsmart.co.uk">www.ukconversionfactorscarbonsmart.co.uk</a>
Electricity	1.00	Other: kg CO2e per kWh	South Africa - Eskom Holdings SOC Limited Integrated Report 2016. Available: <a href="http://www.eskom.co.za/IR2016/Documents/Eskom_integrated_report_2016.pdf">http://www.eskom.co.za/IR2016/Documents/Eskom_integrated_report_2016.pdf</a> - p136
Electricity	0.58198	Other: kg CO2e per kWh	Mozambique, Tanzania, Lesotho and DRC: Defra 2015 - Guidelines to Defra's GHG Conversion Factors for Company Reporting, Overseas Electricity, African (average), updated June 2015. Available: <a href="http://www.ukconversionfactorscarbonsmart.co.uk">www.ukconversionfactorscarbonsmart.co.uk</a>

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#### Further Information

**Page: CC8. Emissions Data - (1 Apr 2016 - 31 Mar 2017)**

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#### CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Equity share

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#### CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e

30663.49

---

**CC8.3**

**Please describe your approach to reporting Scope 2 emissions**

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We have no operations where we are able to access electricity supplier emissions factors or residual emissions factors and are unable to report a Scope 2, market-based figure	Vodacom produces renewable energy from solar PV installations in South Africa and Mozambique as well as a hydro in DRC.

---

**CC8.3a**

**Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e**

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
541699.10	0	

---

**CC8.4**

Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

CC8.4a

Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Data Gaps Assumptions Extrapolation Data Management	The emissions from diesel used in generators are derived from the litres of diesel purchased as per the records. This number may be overstated as it does not account for theft of diesel. The litres of fuel consumed were used to calculate emissions from petrol and diesel used in fleet vehicles. In Tanzania and Mozambique the quantity of air-conditioning gas refills was not available.
Scope 2 (location-)	More than 2% but less than or equal to 5%	Extrapolation Data	The kWhs purchased is not always specified on the utility bill as some electricity accounts are paid as part of the rental payment. Electricity charges are often based upon estimates from municipal councils

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
based)	to 5%	Management	and Eskom. Recalculations were performed to ensure accuracy. Electricity Transmission & Distribution losses have been calculated and incorporated as Scope 3 emissions as per Defra's guidance.
Scope 2 (market-based)	Less than or equal to 2%	No Sources of Uncertainty	No emissions in this scope.

#### CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

#### CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2017/02/22902/Climate Change 2017/Shared Documents/Attachments/CC8.6a/Vodacom Assurance Report 2017.pdf">https://www.cdp.net/sites/2017/02/22902/Climate Change 2017/Shared Documents/Attachments/CC8.6a/Vodacom Assurance Report 2017.pdf</a>	Independent Assurance Report, pages 49-51	ISAE 3410	34

**CC8.6b**

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emission Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission
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**CC8.7**

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

**CC8.7a**

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-	Annual	Complete	Limited	<a href="https://www.cdp.net/sites/2017/02/22902/Climate Change">https://www.cdp.net/sites/2017/02/22902/Climate Change</a>	Independent	ISAE	93

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
based	process		assurance	2017/Shared Documents/Attachments/CC8.7a/Vodacom Assurance Report 2017.pdf	Assurance Report, pages 49-51	3410	

#### CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Other: Key performance indicators	

#### CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

#### CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

---

**Further Information**

**Page: CC9. Scope 1 Emissions Breakdown - (1 Apr 2016 - 31 Mar 2017)**

---

**CC9.1**

**Do you have Scope 1 emissions sources in more than one country?**

Yes

---

**CC9.1a**

**Please break down your total gross global Scope 1 emissions by country/region**

Country/Region	Scope 1 metric tonnes CO2e
South Africa	11145.91
Mozambique	4426.65
Lesotho	367.28
Tanzania	1988.43
Congo, Democratic Republic of the	12735.22

---

**CC9.2**

**Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)**

By activity

---

**CC9.2a**

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
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---

**CC9.2b**

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
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**CC9.2c**

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
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**CC9.2d**

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
Stationary fuel combustion	25850.00
Fugitive emissions	806.69
Mobile fuel combustion	4006.80

---

**Further Information**

**Page: CC10. Scope 2 Emissions Breakdown - (1 Apr 2016 - 31 Mar 2017)**

---

**CC10.1**

Do you have Scope 2 emissions sources in more than one country?

Yes

---

**CC10.1a**

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market- based approach (MWh)
South Africa	501161.20	0	501161.20	0
Mozambique	19977.33	0	34326.50	0
Lesotho	5604.86	0	9630.67	0
Tanzania	8041.51	0	13817.50	0
Congo, Democratic Republic of the	6914.20	0	11880.48	0

#### CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division

#### CC10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
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<b>Business division</b>	<b>Scope 2, location-based (metric tonnes CO2e)</b>	<b>Scope 2, market-based (metric tonnes CO2e)</b>
Access Network	353735.02	0
Core Network	95066.77	0
Data Centres	33800.98	0
Offices	58726.83	0
Retail	369.50	0

---

**CC10.2b**

Please break down your total gross global Scope 2 emissions by facility

<b>Facility</b>	<b>Scope 2, location-based (metric tonnes CO2e)</b>	<b>Scope 2, market-based (metric tonnes CO2e)</b>

---

**CC10.2c**

Please break down your total gross global Scope 2 emissions by activity

<b>Activity</b>	<b>Scope 2, location-based (metric tonnes CO2e)</b>	<b>Scope 2, market-based (metric tonnes CO2e)</b>

---

**Further Information**

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CC11.1

What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

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CC11.2

Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	0
Steam	0
Cooling	0

---

CC11.3

Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

118920.58

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CC11.3a

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Diesel/Gas oil	114157.96
Motor gasoline	4762.62

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#### CC11.4

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Other	1224.37	0.00	Radio sites in Lesotho operate with renewable energy systems owned by Vodacom while Mozambique, DRC and South Africa generated electricity from owned, on-site solar PV systems.

---

#### CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
572040.72	570816.35	1224.37	1224.37	1224.37	Radio sites in Lesotho operate with renewable energy systems owned by Vodacom while Mozambique, DRC and South Africa generated electricity from owned, on-site solar PV systems.

#### Further Information

#### Page: CC12. Emissions Performance

#### CC12.1

How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Increased

#### CC12.1a

Please identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	2.28	Decrease	Scope 2 emissions reduced by 11 715 tCO <sub>2</sub> e as a result of the implementation of smart meters and Project Rhees, which replaced old equipment, such as DC fans, resulting in reduced air-conditioning run

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
			time and reduced energy consumption at sites. Last year 11 715 tCO2e were reduced by the emission reduction projects. Total Scope 1 & 2 emissions in the prior year were 514 192 tCO2e. We therefore arrived at 2.28% through $(11\,715 / 514\,192) * 100 = 2.28\%$ .
Divestment			
Acquisitions			
Mergers			
Change in output	13.59	Increase	The number of base stations increased by 5.75% resulting in an increase in Scope 2 emissions. Further, network traffic increased by 44.38% resulting in increased Scope 2 emissions. Total Scope 1 & 2 emissions for 2016 were 514 192 tCO2e. We therefore arrived at 13.59% through $(69\,886 / 514\,192) * 100 = 13.59\%$ .
Change in methodology			
Change in boundary			
Change in physical operating conditions			
Unidentified			
Other			

---

#### CC12.1b

**Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?**

Location-based

---

#### CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.0000070420	metric tonnes CO2e	81278000000	Location-based	9.67	Increase	An 11.31% increase in Scope 1 & 2 emissions mainly as a result of an increase in base stations and network traffic, offset by emission reduction initiatives (2.28%), reduced by a 1.50% increase in revenue earned, resulted in an increased intensity figure for revenue.

### CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
2.99	metric tonnes CO2e	Other: Terabyte of network traffic	142419.64	Location-based	21.18	Decrease	Scope 1 & 2 emissions for the network increased by 13.8% due to a 5.75% increase in the number of base stations. However with the energy efficiencies obtained from Project Rhees and the installation of smart meters (2.28%), the intensity figure decreased due to a 44.38% increase in network traffic. Also see ICT2.3 in ICT module.

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**Further Information**

**Page: CC13. Emissions Trading**

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**CC13.1**

**Do you participate in any emissions trading schemes?**

No, and we do not currently anticipate doing so in the next 2 years

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**CC13.1a**

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership

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**CC13.1b**

What is your strategy for complying with the schemes in which you participate or anticipate participating?

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**CC13.2**

**Has your organization originated any project-based carbon credits or purchased any within the reporting period?**

No

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance

Further Information

Page: **CC14. Scope 3 Emissions**

CC14.1

Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	227.92	Consumption of office paper Emission factors: Mondi Rotatrim Paper Profile and Sappi Typek Paper Profile - released May 2016 and January 2016 respectively indicating electricity usage and CO2 emissions per tonne of paper. Tonnes of paper purchased provided by the	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			service providers were used to calculate emissions according to the GHG Protocol using the provided emission factors. Assumptions: Data was provided for all operations and extrapolated according to the equity ratios.		
Capital goods	Relevant, not yet calculated				
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	53486.10	Transmission and Distribution losses from purchased electricity KWhs consumed were used to calculate emissions according to the GHG Protocol using Defra's 2016 emission factors for transmission & distribution, South Africa and Africa (average). Assumptions: This figure relates to transmission and distribution losses from electricity purchased in South Africa, Mozambique, Lesotho, Tanzania and DRC.	100.00%	
Upstream transportation and distribution	Relevant, calculated	13.34	Third-party transport Kilometres travelled in third party vehicles were used to calculate emissions according to the GHG Protocol using Defra's 2016 emission factors for passenger vehicles. Assumptions: Distances travelled in third party vehicles were calculated using the available records for 2016 for operations in Tanzania only.	100.00%	
Waste generated in operations	Relevant, calculated	9.75	Waste to landfill and recycled Tonnes of waste to landfill and recycled were used to calculate emissions according to the GHG Protocol using Defra's 2016 emission factors for waste disposal and Friedrich and Trois (2013), GHG emission factors developed for the collection, transport and landfilling of municipal waste in South African municipalities. Assumptions: Waste from operations was calculated using the available records.	100.00%	
Business travel	Relevant, calculated	8259.55	Business travel in rental cars, commercial airlines, hotel accommodation Car rental - kilometres travelled, engine	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			size and type of fuel used provided by service provider. Defra's 2016 emission factors for business travel - land used. Air travel - flight information provided by service provider, including class of travel, departure dates and destination of each leg. Carbon Calculated determined the distance travelled. Defra's 2016 emission factors for business travel - air used. Hotel accommodation - bednights provided by service provider. Emissions factor sourced from UNEP World Meteorological Organisation Climate Change And Tourism Report; A2.2.3 Accommodation. Emissions were calculated according to the GHG Protocol. Assumptions: Hotel accommodation was based on estimated number of nights away on business travel and calculations were based on 1 person occupying a room per night.		
Employee commuting	Relevant, calculated	11590.49	Employee commuting A commuting survey was completed for Vodacom South Africa in 2012. A total of 707 surveys were received with 696 useable surveys. Due to the low percentage of response, this figure was combined with the 2009 Vodacom South Africa employee commuting survey and an average of the two was used to extrapolate the emissions per FTE for the Vodacom group according to the GHG Protocol using Defra's 2016 emission factors for business travel - land.	100.00%	
Upstream leased assets	Relevant, not yet calculated				
Downstream transportation and distribution	Relevant, calculated	6541.49	Third-party transport Litres of diesel and petrol consumed by third party vehicles were used to calculate emissions according to the GHG Protocol using Defra's 2016 emission factors for fuel. Assumptions: Fuel	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			consumed by third party vehicles was calculated using the available records for South African operations only.		
Processing of sold products	Not relevant, explanation provided				Vodacom's services are not intermediate products that require further processing. It is not responsible for directly generating greenhouse gas emissions.
Use of sold products	Relevant, not yet calculated				Emissions from the use of goods and services sold by Vodacom, principally from the energy used by network equipment – such as routers – and the energy required to charge mobile devices.
End of life treatment of sold products	Not relevant, explanation provided				Vodacom sells mobile communication solutions and services. There is then no end of life treatment for sold products other than for handsets which make a up a small % of Scope 3 emissions.
Downstream leased assets	Not relevant, explanation provided				Vodacom does not have any equipment or assets that are owned and leased to third parties.
Franchises	Relevant, not yet calculated				
Investments	Not relevant, explanation provided				Vodacom accounts for emissions on the equity share approach.
Other (upstream)					

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Other (downstream)					

#### CC14.2

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

#### CC14.2a

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Limited assurance	<a href="https://www.cdp.net/sites/2017/02/22902/Climate Change 2017/Shared Documents/Attachments/CC14.2a/Vodacom">https://www.cdp.net/sites/2017/02/22902/Climate Change 2017/Shared Documents/Attachments/CC14.2a/Vodacom</a>	Independent Assurance	ISAE 3410	67

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
			Assurance Report 2017.pdf	Report, pages 49-51		

### CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

### CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Purchased goods & services	Emissions reduction activities	0.05	Decrease	Emissions from the consumption of office paper decreased as a result of the introduction of electronic billing.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in output	147.32	Increase	Emissions relating to electricity transmission and distribution losses increased as a result of the inclusion of T&D losses from purchased electricity in South Africa.

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Upstream transportation & distribution	Change in output	1.00	Decrease	Emissions from third party transport in Tanzania decreased as the actual kilometers travelled were reported and used to calculate emissions, compared to litres of diesel in the past.
Waste generated in operations	Change in methodology	0.03	Increase	Emissions relating to waste generated in operations were reported for the first time.
Business travel	Emissions reduction activities	1.93	Decrease	Emissions from business travel decreased as a result of a focus on behavioural changes by using technology instead of travelling to meetings.
Employee commuting	Change in output	0.21	Increase	The emissions factor calculated for 2012 and 2009 were used to calculate emissions from employee commuting taking into account an increase of 8.61% in the number of FTEs.
Downstream transportation and distribution	Emissions reduction activities	2.04	Decrease	Third party transporters in South Africa implemented route and load optimisation where feasible and have vehicle tracking systems to monitor fuel usage and driver behaviour to reduce emissions.

#### CC14.4

**Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)**

Yes, our suppliers

#### CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

#### CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Active engagement	35	25%	At this year's Health, Safety and Environment Forum in South Africa, Vodacom presented to suppliers on the reputational and environmental benefits of joining the global CDP initiative. We have aligned with the work that our parent company, Vodafone, is doing with CDP and strategic suppliers to manage climate change impacts in the supply chain through the disclosure process. A key supplier has signed up to disclose their emissions and how they intend to govern them as part of this process. This important milestone for both Vodacom and our supply chain is a leading example of how companies can work together to build reputation, brand loyalty and sustainable practices along our value chain. Screening suppliers using environmental criteria is very limited at the onboarding stage and is rather focused on during specific engagements where high environmental risks have been identified. During FY2017 one supplier involved in e-waste disposal was identified through the auditing process as being non-compliant with Vodacom's requirements and the contract was terminated.

CC14.4c

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

Further Information

**Module: Sign Off**

**Page: CC15. Sign Off**

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Suraya Hamdulay	Executive Head: Vodacom Group Sustainability	Environment/Sustainability manager

#### Further Information

**Module: ICT**

**Page: ICT1. Data center activities**

#### ICT0.1a

**Please identify whether "data centers" comprise a significant component of your business within your reporting boundary**

Yes

#### ICT1.1

**Please provide a description of the parts of your business that fall under "data centers"**

Enterprise IT Services is currently operating and maintaining close to 3000 square metres usable data centre space in Cape Town and Midrand for its internal cloud, excluding data centre space offered by Vodacom Business as hosted space to external customers, or data centre space primarily focussed on supporting the customer centric telephony/mobile data network infrastructure.

#### ICT1.2

**Please provide your absolute Scope 1 and 2 emissions and electricity consumption for the data centers component of your business**

Business activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
Data centers	50.14	29729.92	29729.92	Meter or submeter	

Business activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
				reading	

### ICT1.3

What percentage of your ICT population sits in data centers where Power Usage Effectiveness (PUE) is measured on a regular basis?

Percentage	Comment
25%	PUE is measured regularly in all South African data centres.

### ICT1.4

Please provide a Power Usage Effectiveness (PUE) value for your data center(s). You can provide this information as (a) an average, (b) a range or (c) by individual data center - please tick the data you wish to provide (tick all that apply)

Average

### ICT1.4a

Please provide your average PUE across your data centers

Number of data centers	Average PUE	% change from previous year	Direction of change	Comment
7	1.88	4.08	Decrease	The PUE decreased as a result of decommissioning of equipment and a number of energy saving strategies implemented in the data centres.

### ICT1.4b

Please provide the range of PUE values across your data centers

Number of data centers	PUE Minimum Value	% change of PUE Minimum Value from previous year	PUE Maximum Value	% change of PUE Maximum Value from previous year	Direction of change	Comment
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**ICT1.4c**

Please provide your PUE values of all your data centers

Data center reference	PUE value	% change from previous year	Direction of change	Comment
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**ICT1.5**

**Please provide details of how you have calculated your PUE value**

Other: Total DC Load/IT Load

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**ICT1.6**

**Do you use any alternative intensity metrics to assess the energy or emissions performance of your data center(s)?**

No

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**ICT1.6a**

Please provide details on the alternative intensity metrics you use to assess the energy or the emissions performance of your data center(s)

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**ICT1.7**

Please identify the measures you are planning or have undertaken in the reporting year to increase the energy efficiency of your data center(s)

Status in reporting year	Energy efficiency measure	Comment
Implemented	Power Management Efficiencies	Vodacom is focussing on energy efficiency in its core network and data centres. Project Light is in the process of being implemented with the aim to reduce the power usage effectiveness (PUE) reading at the mobile switching centre (MSC) sites from 2.0 to 1.8. The various interventions to achieve the energy savings are: - lighting optimisation that will include the latest technology fittings, lamps, control gear and occupancy sensors; - optimising the airflow paths to and from the data equipment, reducing air mixing and cooling loss, closing of redundant floor openings, and moving of return and supply air grills; - set point optimisation by setting the PCU's to a master/slave (LAN grouping) arrangement in order to turn off units where there is low load, and operating the other units at high loads; - installation of permanent intelligent meters at each site. Data, HVAC and site total power consumption, PUE, COP, Rectifier and UPS efficiencies, etc. are continuously logged, calculated and displayed on a reporting system via a VPN link; - retrofitting the induction motor fans with electronically commuted fans that allow for better control (fan speed, pressure and flow).

#### ICT1.8

Do you participate in any other data center efficiency schemes or have buildings that are sustainably certified or rated?

No

#### ICT1.8a

Please provide details on the data center efficiency schemes you participate in or the buildings that are sustainably certified or rated

Scheme name	Level/certification (or equivalent) achieved in the reporting year	Percentage of your overall facilities to which the scheme applies

#### ICT1.9

Do you measure the utilization rate of your data center(s)?

Yes

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**ICT1.9a**

**What methodology do you use to calculate the utilization rate of your data center(s)?**

Cabinet footprint per the GHG Protocol and fixed space ratio per cabinet

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**ICT1.10**

**Do you provide carbon emissions data to your clients regarding the data center services they procure?**

No

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**ICT1.10a**

**How do you provide carbon emissions data to your clients regarding the data center services they procure?**

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**ICT1.11**

**Please describe any efforts you have made to incorporate renewable energy into the electricity supply to your data center(s) or to re-use waste heat**

Vodacom has a solar panel array on the roof of its Century City office in Cape Town. The 500 kWp system is the largest array on a single building in Africa and is expected, at its peak, to provide up to 75% of the building's power. A display panel installed in the reception area of the building will display information such as power currently being produced and carbon emission savings. To ensure the effective utilisation of the excess energy generated by the solar panels, Vodacom introduced an ice plant that produces ice, which is used for cooling the building's HVAC system. Vodacom is also exploring the feasibility of solar panels to power data centres.

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**Further Information**

**Page: ICT2. Provision of network/connectivity services**

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**ICT0.1b**

Please identify whether "provision of network/connectivity services" comprises a significant component of your business within your reporting boundary

Yes

### ICT2.1

Please provide a description of the parts of your business that fall under "provision of network/connectivity services"

Vodacom South Africa is a leading mobile communications company providing voice, messaging, data and converged services to just over 37.1 million active customers in South Africa. The network that provides these services is made up of the access and core network. The access layer is the first layer of the network that customers connect to and the core forms the central aggregation and control system of the network. There are 12 122 base station sites in South Africa.

### ICT2.2

Please provide your absolute Scope 1 and 2 emissions and electricity consumption for the provision of network/connectivity services component of your business

Business activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
Provision of network/connectivity services	8415.30	417776.14	417839.15	Meter or submeter reading	The access network relies on grid power. A small percentage (5%) of sites consume self-generated renewable energy.

### ICT2.3

Please describe your gross combined Scope 1 and 2 emissions or electricity use for the provision of network/connectivity services component of your business as an intensity metric

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change	Comment
2.99	metric tonnes CO2e	Terabyte of network traffic	21.18	Decrease	Scope 1 & 2 emissions for the network increased by 13.8% due to a 5.75% increase in the number of base stations. However with the energy efficiencies obtained from Project Rhees and the installation of smart meters (2.28%), the intensity figure decreased due to a 44.38% increase in network traffic.	

#### ICT2.4

**Please explain how you calculated the intensity figures given in response to Question ICT2.3**

Fuel and electricity consumed in network operations (Scope 1 and 2) were converted to tonnes CO2e emissions per the GHG Protocol and divided by terabytes of network traffic to obtain the intensity figure.

#### ICT2.5

**Do you provide carbon emissions data to your clients regarding the network/connectivity services they procure?**

No

#### ICT2.5a

How do you provide carbon emissions data to your clients regarding the network/connectivity services they procure?

#### Further Information

**Page: ICT3. Manufacture or assembly of hardware/components**

#### ICT0.1c

**Please identify whether "manufacture or assembly of hardware/components" comprises a significant part of your business within your reporting boundary**

No

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**ICT3.1**

Please provide a description of the parts of your business that fall under "manufacture or assembly of hardware/components"

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**ICT3.2**

Please provide your absolute Scope 1 and 2 emissions and electricity consumption for the manufacture or assembly of hardware/components part of your business

Business activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
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**ICT3.3**

Please identify the percentage of your products meeting recognized energy efficiency standards/specifications by sales weighted volume (full product range)

Product type	Standard (sleep mode)	Percentage of products meeting the standard by sales volume (sleep mode)	Standard (standby mode)	Percentage of products meeting the standard by sales volume (standby mode)	Standard (in use mode)	Percentage of products meeting the standard by sales volume (in use mode)	Comment
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**ICT3.4**

Of the new products released in the reporting year, please identify the percentage (as a percentage of all new products in that product type category) that meet recognized energy efficiency standards/specifications

Product type	Standard (sleep mode)	Percentage of new products meeting the standard (sleep mode)	Standard (standby mode)	Percentage of new products meeting the standard (standby mode)	Standard (in use mode)	Percentage of new products meeting the standard (in use mode)	Comment
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ICT3.5

Please describe the efforts your organization has made to improve the energy efficiency of your products

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ICT3.6

Please describe the GHG emissions abatement measures you have employed specifically in your ICT manufacturing operations

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ICT3.7

Do you provide carbon emissions data to your clients regarding the hardware/component products they procure?

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ICT3.7a

How do you provide carbon emissions data to your clients regarding the hardware/component products they procure?

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**Further Information**

**Page: ICT4. Manufacture of software**

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**ICT0.1d**

Please identify whether "manufacture of software" comprises a significant component of your business within your reporting boundary

No

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**ICT4.1**

Please provide a description of the parts of your business that fall under "manufacture of software"

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**ICT4.2**

Please provide your absolute Scope 1 and 2 emissions and electricity consumption for the software manufacture component of your business

Business activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
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**ICT4.3**

Please describe your gross combined Scope 1 and 2 emissions for the software manufacture component of your business in metric tonnes CO2e per unit of production

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change	Comment
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**ICT4.4**

What percentage of your software sales (by volume) is in an electronic format?

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**ICT4.5**

Do you provide carbon emissions data to your clients regarding the software products they procure?

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**ICT4.5a**

How do you provide carbon emissions data to your clients regarding the software products they procure?

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**Further Information**

**Page: ICT5. Business services (office based activities)**

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**ICT0.1e**

Please identify whether "business services (office based activities)" comprise a significant component of your business within your reporting boundary

Yes

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**ICT5.1**

Please provide a description of the parts of your business that fall under "business services (office based activities)"

Office based activities contribute around 15% of our reporting boundary however we can only accurately report on office based activities in South Africa.

This include a wide range of activities including corporate services (finance, legal, HR, corporate affairs, strategy), customer care, enterprise business management, consumer business management and network management. These activities provide operational support (50%) and revenue generating activities (50%).

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**ICT5.2**

Please provide your absolute Scope 1 and 2 emissions and electricity consumption for the business services (office based activities) component of your business

Business activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
Business services (office based activities)	0.00	53655.14	54320.43	Meter or submeter reading	Some offices consume self generated renewable energy.

### ICT5.3

Please describe your gross combined Scope 1 and 2 emissions for the business services (office based activities) component of your business in metric tonnes per square meter

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change	Comment
0.3867483097	metric tonnes CO2e	Square meter	4.85	Increase	Scope 1 & 2 emissions increased by 4.85% while office space in South Africa remained constant, resulting in an increased intensity figure.	

### ICT5.4

Please describe your electricity use for the provision of business services (office based activities) component of your business in MWh per square meter

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change	Comment
0.391543738	MWh	Square meter	6.08	Increase	MWhs consumed increased by 6,08% while office space in South Africa remained constant, resulting in an increased intensity figure.	

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**Further Information**

**Page: ICT6. Other activities**

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**ICT0.1f**

**Please identify whether "other activities" comprise a significant component of your business within your reporting boundary**

No

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**ICT6.1**

Please provide a description of the parts of your business that fall under "other"

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**ICT6.2**

Please provide your absolute Scope 1 and 2 emissions and electricity consumption for the identified other activity component of your business

Activity	Scope 1 emissions (metric tonnes CO2e)	Scope 2 emissions (metric tonnes CO2e)	Annual electricity consumption (MWh)	Electricity data collection method	Comment
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**ICT6.3**

Please describe your gross combined Scope 1 and 2 emissions for your defined additional activity using an appropriate activity based intensity metric

Activity	Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change	Comment
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**ICT6.4**

If appropriate, please describe your electricity use for your defined additional activity using an appropriate activity based intensity metric

Activity	Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change	Comment
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**Further Information**

**CDP 2017 Climate Change 2017 Information Request**