SOUTH AFRICA

FIRST NATIONALLY DETERMINED CONTRIBUTION UNDER THE PARIS AGREEMENT

Updated September 2021

REPUBLIC OF SOUTH AFRICA

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1. Introduction

1 (a) Mandate and scope

By this communication, South Africa updates and enhances its nationally determined contribution (NDC) under the Paris Agreement, meeting its obligation under Article 4.9 to communicate NDCs every five years, and responding to the requests in paragraphs 23 to 25 of decision 1/CP.21. South Africa's intended nationally determined contribution (INDC) (RSA 2015) was submitted on 25 September 2015 prior to COP 21, and became our first NDC (RSA 2016) on 1 November 2016, following our ratification of the Paris Agreement. The INDC and first NDC are identical. For simplicity we refer to the "first NDC" in the following, and "update" means both updating and enhancing the first NDC[1]. This document is not our second NDC – this will be communicated in 2025. The structure of the update is consistent with the first NDC, including components on adaptation, mitigation as well as support requirements for both. We continue to assume "that implementation and ambition will be enabled by finance and technology and capacity building support", as stated in the first NDC, and stipulated in the Paris Agreement. This update of the first NDC is consistent with the principles and provisions of the Paris Agreement and the UNFCCC. South Africa is not listed in Annex I of the UNFCCC, and is a developing country in terms of the Paris Agreement, and updates this NDC "[i]n pursuit of the objective of the Convention, and being guided by its principles, including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances" (Paris Agreement, preamble). South Africa emphasises the importance of the provision of multilateral support in the implementation of this updated NDC as provided for in the Paris Agreement, to meet both both our adaptation and mitigation goals.

South Africa's second (next) NDC will be communicated in 2025 as specified in UNFCCC decision 1/CP.21.

1 (b) Taking into account the Talanoa Dialogue, the IPCC Special Report on 1.5°C and the United Nations Sustainable Development Goals

We have heeded the Call to Action issued by the COP 23 and COP 24 Presidencies following the Talanoa Dialogue, a facilitative dialogue in 2018 to take stock of the collective efforts towards the long-term global goal for mitigation (Article 4.1) and to inform updating of NDCs (Article 4.8) under the Paris Agreement. South Africa has considered all the principles and provisions of the Paris Agreement in updating its first NDC. We affirm that successful implementation of the Paris Agreement requires implementation by the international community of measures to achieve *all* the long-term goals of the Paris Agreement, on temperature, capacity, mitigation, adaptation and finance. South Africa takes the view that ambition should not only apply to setting goals, but also to their implementation.

We have warmly welcomed the IPCC's special report on global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. South Africa considers the IPCC reports to be of the highest importance in guiding our actions. Our approach has consistently been guided by science and equity. As the Call for Action by the Presidents of COP23 and COP24 states, "we must achieve a just transformation towards a better world." We believe this to be true globally. In South Africa, a just transition is core to shifting our development pathway to increased sustainability, fostering climate resilient and low greenhouse gas emissions development, while providing a better life for all. The Sustainable Development Goals (SDGs) were adopted in 2015, the same year as the Paris Agreement, and include urgent action to combat climate

[1] "Updating" means updating the information in our NDC, to account for developments during the last five years since it was submitted; and "enhancing" means increasing the ambition of our NDC. We use the term "update" here to refer to both.

change and its impacts. The context of development is critical to implementing and achieving climate goals in South Africa and elsewhere. As highlighted in our National Development Plan, South Africa faces a triple development challenge of poverty, inequality and unemployment.

1 (c) Progression and highest possible ambition, in the light of equity and national circumstances

It is in this context that the update of our first NDC must be understood. The update represents a progression within our first NDC, and reflects our highest possible level of ambition, based on science and equity, in light of our national circumstances. As communicated in section 4 (c) the updated mitigation targets demonstrate considerable progression. South Africa shifted from BAU-based targets for 2020 and 2025 in terms of the Cancun Agreement under the UNFCCC, to a fixed level target range under the Paris Agreement. This update demonstrates further progression, reducing the upper range of South Africa's 2025 and 2030 targets. These near- to medium-term targets are further informed by a long-term perspective contained in South Africa's recently-communicated Low Emissions Development Strategy (LEDS)[2] to the UNFCCC, and sets the country on a pathway to implement this Strategy.

South Africa's updated NDC also contains our first adaptation communication in terms of Article 7 of the Paris Agreement in section 3, which serves as South Africa's adaptation NDC. The adaptation communication provides detailed information on South Africa's planned contribution to the global adaptation goal during the NDC period, anticipated climate impacts, a description of our recently-approved National Climate Change Adaptation Strategy, and details of planned adaptation actions over the next decades and their associated costs for key areas of the economy that are likely to be most impacted by climate change (health, agriculture and forestry, human settlements, biodiversity, and water). The section also contains information on the extent of risk and vulnerability, recognition of how South Africa's has responded to efforts towards addressing the impacts of climate change thus far, as South Africa's contribution to the global adaptation goal. The section further outlines the adaptation priorities for South Africa, ranging from policy, planning, enhancing governance and implementation of adaptation programmes.

2. Context: national priorities and circumstances

South Africa's NDC will be implemented in a context in which significant development challenges need to be addressed. Low economic growth over the last decade has been accompanied by high levels of unemployment and persistent poverty and inequality. The recent advent of the COVID-19 crisis has exacerbated these challenges – in common with other countries, South Africa's economy is expected to contract significantly before beginning to recover from 2021 onwards. At the same time, this has created an opportunity to, in the words of South Africa's President Ramaphosa, "..not merely return to where we were before the pandemic struck. We are instead looking at actions that will build a new, inclusive economy that creates employment and fosters sustainable growth" (President Ramaphosa in a letter to the nation on climate change, 24 August 2020).

South Africa is already experiencing the impacts of climate change, and faces multiple challenges in relation to climate change over the next decade. Since 1990, the national average temperature has increased at a rate of more than twice that of global temperature increases, which is already resulting in more frequent droughts and extreme weather events (Wolski 2019; Engelbrecht, Adegoke, Bopape, Naidoo, Garland, Thatcher, McGregor, et al. 2015). South Africa's economy and energy system is one

[2] South Africa has recently communicated its long-term Low greenhouse gas Emission Development Strategy (LEDS), pursuant to Article 4.19 of the Paris Agreement, building on national and sectoral climate change policies. The LEDS is available at https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf

of the most coal-dependent in the world, and features a large stock of high-carbon infrastructure, particularly in the energy sector. South Africa is also fortunately blessed with abundant renewable energy resources, and developments in the economics of renewable energy technologies over the last decade are very favourable to low-carbon development in the country, but a well-resourced just transition strategy will be needed to shift to low-carbon technologies, to maximize benefits and minimize adverse impacts on communities, workers and the economy. Programmes to achieve this will require climate finance and other forms of support provided to developing countries as specified in Articles 9, 10 and 11 of the Paris Agreement.

The revisions and enhancements in South Africa's NDC are a reflection of several trends in the country with respect to climate change. First, more information is available on climate change impacts and the costs of addressing these, which is reflected in South Africa's first adaptation communication, included here as the adaptation component of the updated NDC. Climate impacts have become a reality over the last decade rather than purely a risk to be prepared for. Second, lower than expected GHG emissions have been estimated over the last decade, which are partly a result of lower economic growth, but also a result of a drop in GHG intensity in the economy. The latter suggests the start of the process of relative decoupling economic growth from GHG emissions, which is as a result of increased energy efficiency, investment in renewable energy and a shift in economic growth to less energy-intensive sectors. South Africa aims to capitalise on the national and global shift to the green economy, through green industrialisation and by creating new opportunities for South Africa's rich mineral endowment, many of which are vital for low emission and climate resilient development.

Since 2015, South Africa has made significant progress in implementing its response to climate change. The mitigation system continues to be further developed. Our national energy efficiency strategy has been updated for post-2015, and will be reviewed every five years. Procurement of renewable energy since 2015 has seen rapidly falling prices for wind and solar photovoltaics. On legislation, in 2016 GHGs were formally declared priority air pollutants under the existing National Environmental Management Act. This was followed in 2017 by the gazetting of GHG reporting regulations, together with the requirement that large emitters submit annual pollution prevention plans detailing plans to cut GHG emissions, and progress made in doing so. Company-level carbon budgets were introduced for large emitters on a voluntary basis in a first phase, as indicated in the first NDC. Our Green Transport Strategy was adopted in 2018, including policies to promote bus rapid transit, road to rail and electric vehicles. South Africa convened a Job Summit in 2018, which agreed to establish a Presidential Climate Commission to oversee South Africa's just transition. The Commission has been approved by Cabinet and is in the process of being established through the Climate Change Bill. More details on the implementation of climate change policy in South Africa and its impacts can be found in South Africa's Fourth Biennial Update Report to the UNFCCC.

The Climate Change Bill, which has been considered by both houses of Parliament from 2018, is planned to be finalised in 2021, and as framework legislation, will provide a firm legal basis for further action, including mandatory second and subsequent phases of the carbon budget programme, as well as the establishment of sectoral emissions targets (SETs). In 2019, South Africa passed a Carbon Tax Act, and started pricing GHG emissions in all sectors other than waste and AFOLU. South Africa's 2014 national mitigation potential analysis is in the process of being updated, and is now maintained within government. Planning for the decarbonization of the electricity sector advanced with the gazetting of an updated Integrated Resource Plan in 2019, considering climate change mitigation amongst multiple objectives, and allocating large shares of the future energy mix to renewable energy technologies. Further details on sectoral policies and measures are reported in South Africa's Fourth Biennial Update Report, summarised in its Table ES-3. By implementing these domestic measures, South Africa is showing that implementation is part of our ambition.

The long-term decarbonization of the South African economy will in the 2020s focus primarily on the electricity sector; in the 2030s, a deeper transition will take place in the electricity sector, coupled with a transition in the transport sector towards low emission vehicles; while the 2040s and beyond will be characterized by the decarbonization of the hard-to-mitigate sectors. The key challenge during the implementation periods of this first NDC (2021 to 2025, and 2026 to 2030) will be the transition in the electricity sector, seeking early investment in and preparing for mitigation in harder-to-mitigate sectors, and addressing the economic and social consequences resulting from this transition in coal-producing areas. South Africa's electricity is currently mostly provided by a number of large coal plants located in the Mpumalanga province, where most of the country's coal resources are to be found.

Implementing the NDC will require the implementation of South Africa's Integrated Resource Plan (most recently finalised in 2019), which contemplates a massive investment in renewable energy over the next decade. This will also result in a number of co-benefits, such as reduced air pollution in the key pollution hot spots of the country, with health co-benefits; lower water use in a water-scarce country; and rapidly adding additional electricity generation capacity to the South African electricity system, which is currently capacity constrained.

A just transition means leaving no-one behind. It requires procedural equity to lead to equitable outcomes. A just transition is at the core of implementing climate action in South Africa, as detailed in both the mitigation and adaptation goals presented below. As South Africa indicated at the UN Secretary General's Climate Action Summit in 2019, as part of ensuring a just transition we will need to put measures in place that plan for workforce reskilling and job absorption, social protection and livelihood creation, incentivising new green sectors of our economy, diversifying coal dependent regional economies, and developing labour and social plans as and when ageing coal-fired power plants and associated coal production infrastructure are decommissioned. Similar measures will be necessary to adapt to the impacts of climate change. Our National Planning Commission undertook extensive consultations over two years to develop a draft '2050 vision and pathways for a just transition to a low carbon, climate resilient economy and society'. Based on this process, we will be finalising our Just Transition Plan, including defining pathways compatible with pursuing efforts to limit temperature increase to 1.5 °C. The just transition will also need international cooperation, and requires solidary and concrete support. Ensuring that no one is left behind as we move from a high GHG emission, low-employment energy development pathway to a low emission, climate-resilient and job-rich pathway, is central to our national work on development and climate change.

3. South Africa's first Adaptation Communication, serving as the Adaptation component of the NDC

South Africa submits its first adaptation communication as a component of its Nationally Determined Contribution (A-NDC) in line with the Paris Agreement in Article 7, paragraph 11. Furthermore, this update to the South African A-NDC outlines goals that are aligned to Elements A-D as contained in the Annex to decision 9/CMA.1. As a developing country, the A-NDC further presents information in respect of adaptation efforts for recognition as provided for in Element E (ii) of decision 9/CMA.1. In following the guidelines of decision 9/CMA.1 on further guidance in relation to adaptation communications, South Africa emphasizes the relevance of information contained in this A-NDC as an input to the global stocktake outlined in paragraphs 23(b) and 36(c) of decision 19/CMA.1.

The adoption of the National Climate Change Adaptation Strategy (NCCAS) in 2020 by the South African government is a milestone responding to this challenge, in order to inform climate change adaptation planning in the country (DEFF 2020a). The NCCAS will serve as South Africa's National Adaptation Plan and fulfils South Africa's commitment to its obligations in terms of Article 7.9 of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). It will further provide

a policy instrument in which national climate change adaptation objectives for the country can be articulated to provide overarching guidance to all sectors of the economy in implementing adaptation.

The NCCAS is aligned with the country's policy and legislation, building on principles contained therein, including international agreements South Africa is party to. Relevant domestic legislation and policy include the National Climate Change Response Policy (NCCRP) (DEA 2011a), National Development Plan (NDP) (NPC 2011), National Strategy for Sustainable Development (NSSD) (DEA 2011b), sector adaptation strategies/plans, as well as provincial and municipal adaptation strategies/plans. The NCCAS is grounded in the South African Constitution, particularly Section 24, of the Bill of Rights which includes, the right to a safe and healthy environment. The draft Climate Change Bill provides a legislative basis for the implementation of the NCCAS, as such will foster institutional coherence and enhance climate change adaptation governance across the spheres, national and sub-national layers of government in South Africa.

3 (a) The extent of climate change associated risk and vulnerability

The global average temperature reached 1.2^{o}C above pre-industrial levels in 2020[3]. South Africa is already experiencing significant impacts of climate change, particularly as a result of increased temperatures and rainfall variability, and is warming at more than twice the global rate of temperature increase (Wolski 2019)(Engelbrecht, Adegoke, Bopape, Naidoo, Garland, Thatcher, Mcgregor, et al. 2015) This increase is more pronounced for the western parts and the northeast of the country. There is evidence that extreme weather events in South Africa are increasing, with heatwave conditions found to be more frequent, dry spell durations lengthening slightly, and rainfall intensity increasing.

In the near future, average rainfall accumulation is expected to remain within historical ranges over most of South Africa, except for a decline over the Western Cape and some increases over the far eastern parts of Kwa-Zulu Natal. The country is projected to experience increased severity and frequency of drought in the central interior area. The water sector is likely to be impacted specifically in the south-western Cape and West Coast making lower priority water users (e.g. irrigation) more vulnerable. While groundwater supplies are generally more robust, warmer temperatures and lower river levels during drought are likely to lead to deteriorating water quality. The frequency of heavy precipitation events is also projected to increase in most of the country with increased chances of flooding risk.

A plausible increase in "extremely hot days" (a hazard indicating an increase in days where health will be at risk from exposure to high temperature) is projected in the north, north-east and north-east interior of the country. For human health, "modifying factors" such as age, nutritional status, access to services and underlying health conditions are known to exacerbate the impacts of climate, and these call for adaptation actions in the sector. The projected changes in temperature extremes put additional strain on the health system, including the increasing burden of disease, and affect aspects such as infrastructure, services, availability of medicines and medical supplies and emergency services. Vulnerability and risk assessment for the health sector positions subgroups such as the elderly and children as the most vulnerable to temperature extremes. It especially recognizes rural livelihoods and outdoor labour, including women, as the most exposed to extreme temperature hazards leading to adverse effects such as heat stroke.

South African settlements are susceptible to the effects of climate variability, and since 1980 have recorded 86 noticeable weather-related disasters that have affected more than 22 million South

Africans and have cost the economy in excess of R113 billion (US$6.81 billion) in economic losses. It is anticipated that a growing number of South African cities and towns will be exposed to the impacts of weather-induced hazards such as flooding, heatwaves, droughts, wildfires, and storms. This is partly due to the projected increase in the frequency and intensity of weather-related hazards, but also due to the high socioeconomic vulnerability inherent within communities, as well as poor land-use practices, growing informality, and a failure to rapidly deploy resilient infrastructure associated with accommodating a growing urbanising population. It is undeniably the poor and vulnerable communities that will experience the most severe setbacks from the impacts of climate change, eroding their livelihoods, and thus threatening their resilience.

Agriculture, forestry and fisheries sectors are critical in attracting foreign exchange, job creation and production of raw material for the economy. Across South Africa, the increase in temperatures and changing rainfall patterns will bring about distinct risks for different crops and commodities in different growing areas. The most important impacts in the near future will be on crops, tree species and livestock produced in marginal growing areas where growing conditions are already close to temperature and water availability thresholds. More significant changes are expected in average maximum and minimum temperatures, as well as the frequency of extremes such as heatwaves. This will have major implications for crops, tree species, livestock, game and fisheries as well as the prevalence of pests and diseases.

The current projections show a considerable increase in temperature and more erratic rainfall leading to biodiversity loss within the biodiversity sector, which contributes about 418 000 jobs (NBA, 2018). The risk to biodiversity is expected to increase in future, as explained by various projected climatic variables in the form of increased fire frequency and severity, erratic rainfall and increased evaporative demand on account of elevated temperatures. These are compounded by land use and exchange patterns. Limpopo, Western Cape, Mpumalanga, Free State and KwaZulu Natal provinces experienced the highest biodiversity loss. The highest risk of biodiversity loss has been evident both currently and in future in these provinces. Fynbos and the Indian coastal belt experienced high biodiversity losses relative to their sizes. About 3 and 4.5 per cent of habitat was lost between 1990 and 2018 in the fynbos and the Indian coastal belt biomes respectively, whilst a higher risk of biodiversity loss is projected in the Savanna and Grasslands. Some of this biodiversity loss is occurring in the vicinity of protected areas.

3 (b) Update to the first A-NDC

The NCCAS, having been developed post the conclusion of the 2015 Paris Agreement and its Work Programme adopted in 2018, is aligned with the Paris Agreement's Article 7 and the associated aspects of the Paris Rulebook. The Strategy further outlines nine strategic objectives to which sectoral responses need to be aligned. The NCCAS, therefore, is the key domestic policy instrument to guide implementation, and informs this update to South Africa's first A-NDC (RSA 2016). The goals submitted herein (see Table 1 below) are largely informed by the strategic objectives of the NCCAS.and are consistent with elements of decision 9/CMA.1. The columns in Table 1 provide information as follows:

- Elements - these correspond to the elements of the Annex to decision 9/CMA.1 on "Elements of an adaptation communication"
- Undertaking for the period 2021-2030 – these goals comprise South Africa's contribution to the global goal for adaptation, in light of the country's projected risk and vulnerability for the period
- Assumptions / Methodology / Context – contextual information, including any further information on methodological approaches and assumptions
- Efforts – actions to be taken / measures to be implemented in achieving the goals outlined in the "undertakings" column
- Adaptation investment – total national estimated investments required to adapt to climate change and repair damages induced by climate change and associated extreme events.

Table 1 - South Africa's First Adaptation Communication

Elements	Undertaking for the period 2021-2030	Assumptions / Methodologies / Context	Efforts	Adaptation investment (2021 - 2030)
Element (a) of the Annex to decision 9/CMA.1 National circumstances, institutional arrangements and legal frameworks.	**Goal 1:** Enhance climate change adaptation governance and legal frameworks	South Africa has a three-tier system of government, which includes national, provincial and local tiers. The national Department of Environment, Forestry and Fisheries[4] is the focal point for climate change and is responsible for climate change adaptation planning. Sector departments, provincial and local government have the concurrent responsibility of developing and implementing adaptation strategies and plans. Three key climate change adaptation institutional structures in the Climate Change Bill – namely the Presidential Climate Commission (PCC); the Inter-Ministerial Committee on Climate Change (IMC) and the Provincial Forum on Climate Change – are designed to improve both coherence coordination, as well as the implementation of adaptation responses across government, and in engaging with business, civil society and research institutions.	1. Enhancement of institutional arrangements laid out in the Climate Change Bill for adaptation, including the establishment of the Presidential Climate Commission and Inter-Ministerial Committee on Climate Change by 2025; 2. Provincial Forum on Climate Change and Municipal Forums on Climate Change to be completed in 2025. 3. Implementation of the provisions of the Climate Change Bill, effective operationalization of climate change adaptation governance frameworks and systems by 2025.	USD13 million to build evidence-based support for policy implementation for the period 2021 to 2030.

[4] The Department changed its name to DFFE with effect from 1 April 2021; changing the sequence from DEFF. In 2019, there had been a merger of the Department of Environmental Affairs (DEA) with the forestry and fisheries components of the Department of Agriculture, Forestry and Fisheries. Various documents are referenced to DEA, DEFF and DFFE, referring to the same national Department.

Elements	Undertaking for the period 2021-2030	Assumptions / Methodologies / Context	Efforts	Adaptation investment (2021 - 2030)
Element (b) of the Annex to decision 9/CMA.1 Impacts, risk and vulnerability.	**Goal 2:** Develop an understanding of the impacts on South Africa of 1.5 and 2°C global warming and the underlying global emission pathways through geo-spatial mapping of the physical climate hazards, and adaptation needs in the context of strengthening the key sectors of the economy. This will constitute the scientific basis for strengthening the national and provincial governments' readiness to respond to climate risk as driven by the change in climate parameters, including extreme rainfall, temperature events, and extreme events in the context of sustainable development and poverty eradication	Climate change risk vulnerability assessments are presently based on a prevailing global emissions trajectory, RCP 8.5, taking into account extreme climate indices and developing sector-specific climate-based risk and vulnerability matrices for the period 2011 – 2040. Future assessments will take into account the shared socio-economic pathways (SSPs) scenarios in the projection of the impacts of local impacts of the 1.5 and 2°C global warming levels. An adaptation needs costing methodology is described in the technical document (CSIR 2020). The methodology used in determining adaptation needs is based on the projection of physical climate hazards include extreme events (wildfires, storms, droughts and floods). Costs functions associated with high impact climate events (wildfires, storms, droughts and floods), including both direct and downstream costs were calculated. These adaptation needs were estimated based on the cost functions for the present-day climate and for the near future under the low mitigation scenarios. The costs estimated are in terms of the 10th, 50th and 90th percentiles covering uncertainties with a multi-model ensemble . Sectors covered are Water, Agriculture, Forestry, Settlements, Biodiversity, Disaster Risk Reduction.	Prioritise understanding of impacts, risk and vulnerability for the key sectors, and the development of climate response plans. The specific sectors recommended for prioritisation are health, water, biodiversity, agriculture and human settlements. The following efforts will lead to the realization of the goal: 1. Development of the climate change planning tools and systems to guide and support national climate change adaptation across tiers of government through mainstreaming in growth and development strategies, Integrated Development Plans (IDP) and the development of provincial and local Adaption Plans; 2. Update of the country's Long-Term Adaption Scenarios; 3. Undertake Climate Change Needs and Response Assessments; 4. Operationalise the National Climate Risk & Vulnerability Assessment Framework (DEFF 2020b) 5. Rollout of specific tools such as the CSIR Green Book, and Let's Respond Toolkits, National Climate Change Information systems; National Framework on Climate Services System	USD 8 million for developing tools, strategies and rollout for the period 2021 to 2030

Elements	Undertaking for the period 2021-2030	Assumptions / Methodologies / Context	Efforts	Adaptation investment (2021 - 2030)
Element (c) of the Annex to decision 9/CMA.1 National adaptation priorities, strategies, plans, goals and actions	**Goal 3:** Implementation of NCCAS adaptation interventions for the period 2021 to 2030[5]	The local government plays a key role in climate change response, and therefore building the capacity of the local sphere of government will be significant in achieving adaptation goals. This capacity support should be inclusive of human resources; institutionalisation of climate change response; financial resources and technological and/or technical support. The cities will play a pivotal role in leading climate change response in the country by virtue of urbanisation trends and services offered to the community. The National Climate Change Adaptation Strategy (NCCAS) which was approved by Cabinet in 2020 for implementation identifies priorities, which are also informed by the Global Framework on Climate Services (GFCS). The priority sectors are identified as, biodiversity and ecosystems; water; health; energy; settlements (coastal, urban, rural); disaster risk reduction, transport infrastructure, mining, fisheries, forestry and agriculture. The NCCAS identifies interventions that are used as the basis for meeting South Africa's obligations to meet and outlined adaptation goals. The interventions address both highly vulnerable sectors as well as geographic areas.	The NDC will prioritise specific sectors and work towards the development of climate response plans to address the specific sector priorities. The priority sectors are health, water, biodiversity, agriculture and human settlements. **Water sector:** enhance water security; effectively deploy flood protection measures, and hydro-metrological monitoring systems. **Agriculture**: development of early warning systems for small scale farmers; and supporting climate-smart agriculture. The development of a multi-hazard early warning system; capacity building for the farming sector on climate change; and full implementation of a climate-smart agriculture framework should be prioritised. **Health**: monitoring, surveillance and early warning systems for climate-induced diseases. **Biodiversity**: Enhance the Monitoring of Climate Change impacts on Biodiversity and Ecological Infrastructure, **Human Settlements**: ensure urban planning and design incorporates climate change concerns. Consideration of climate risk in the new settlement and mainstreaming of climate science into the building standards will be catalytic to facilitate climate-resilient human settlement. Coastal Settlement: urban and rural	USD 3 - 4 billion required for the implementation of the NCCAS for a period 2021 to 2030 to support South Africa.

[5] Goals and actions are covered in each elements contained in this NDC as per the National Climate Change Adaptation Strategy published on: www.environment.gov.za

Elements	Undertaking for the period 2021-2030	Assumptions / Methodologies / Context	Efforts	Adaptation investment (2021 - 2030)
			settlements should be prioritised in addressing climate risks such as sea-level rise and flooding. **Infrastructure:** Ensure the development and deployment of climate-resilient infrastructure that enhance water and energy security. Integration of climate information into infrastructure development planning. South Africa should ensure that climate-proof of all new infrastructure development projects and facilities retrofitting of old infrastructure to achieve climate-resilient society. 1. Enhance early warning, vulnerability and adaptation monitoring system for period of 2021 to 2030; 2. Promote research and development in application, localization, transfer and adoption of technology within key climate-sensitive sector for the period 2021- 2030; 3. Enhance the national system of reporting as part of the BTR on climate change adaptation for the period of 2021 -2030; 4. Mainstream and integrate climate considerations in national development, sub-national and sector policy frameworks for the period 2021 to 2030; 5. Strengthen the institutional capacity for climate change response planning and implementation for the period 2021 to 2030; 6. Improve the understanding and awareness of climate change impacts and capacity to respond to these impacts for the period of 2021 to 2030;	

Elements	Undertaking for the period 2021-2030	Assumptions / Methodologies / Context	Efforts	Adaptation investment (2021 - 2030)
			7. Develop pipeline of climate change adaptation activities for the period 2021 to 2030 to Support South Africa's Just Transition to a climate resilient economy and society.	
Element (d) of the Annex to decision 9/CMA.1 Implementation and support needs of, and provision of adaptation support to South Africa	**Goal 4:** Access to funding for adaptation implementation through multilateral funding mechanisms	The 2009 UNFCCC report estimates that developing countries such as South Africa will require between U$23-67 billion by 2030 to adapt to climate change. The domestic financial sector should play a pivotal role in terms of helping investors in adaptation space to satisfy funding requirements to meet the NDC goals. Direct unilateral access to advance adaptation finance by the private sector is still a major major issue. The National Treasury, South African Reserve Bank, financial sector regulators and Department of Forestry and Environment (DFFE) work collaboratively on issues of Sustainable finance initiatives in the sphere of private finance. This initiative considers climate and green finance as well as the social issues, governance, and financial stability considerations. Treasury will provide coordination and leadership in this initiative to develop the necessary requirements, starting with an understanding of climate risks. Consistent investment requirements are put in place to reduce transaction costs and enable financial market participants to identify and respond to investment opportunities that contribute positively to green objectives. Progress still needs to be made towards direct unilateral access to adaptation finance in the face of decline dept free funding such as grants.	Development of climate change adaptation investment pipeline projects.	Adaptation needs and costs for the period 2021 – 2030 is USD 16 – USD 267 billion. Adaptation needs and costs adapted by a minimum of 4% GDP impact is USD 122 billion by 2025 and USD 37 5 billion by 2030.

Elements	Undertaking for the period 2021-2030	Assumptions / Methodologies / Context	Efforts	Adaptation investment (2021 - 2030)
Element (e) of the Annex to decision 9/CMA.1 Implementation of adaptation action and plans including (ii) Adaptation efforts of developing countries for recognition.	**Goal 5:** Quantification and acknowledgement of the national adaptation and resilience efforts.	The adaptation efforts have been quantified using the core sub-programmes adaptation expenditure. The sub-programmes support the implementation of policy instruments, enhancement of adaptation governance and implementation of adaptation interventions.	The national records on expenditure on adaptation, within the past five year period, reflect that the country spent approximately USD 6 billion on adaptation efforts. This includes expenditure on national and provincial programs on adaptation and extreme events responses. In particular: •The National core sub-programs adaptation spent for the period 2015 – 2020 is USD 3.1 billion. •The provincial core sub-programs adaptation spent for the period 2017 – 2020 is USD 2.9 billion.	(not applicable to historical efforts up to 2020)
Equity	The Paris Agreement in its Article 2 and 7.1 provides for increasing the ability to adapt to the adverse impact of climate change in line with the goals towards limiting global average temperature increases; the agreement further in Article 7.2 recognizes the global nature of the adaptation responsibility. In this respect, Africa and South Africa, are warming at a rate that is about twice the global average temperature increase (Wolski 2019). The driver of this trend is the collective effect of global emissions, as such South Africa and the African continent bear a disproportionate share of the adaptation burden, both because of the uneven global distribution of climate impacts and because of the skewed historical responsibility for GHG emissions. Equity in adaptation, therefore, requires a strong multilateral response in the context of the UNFCCC and its Paris Agreement, including the provision of support to developing countries for adaptation and the detailed evaluation of progress against the global goal for adaptation in the global stocktake and in the work of relevant constituted bodies under the UNFCCC and its Paris Agreement.			

4. Mitigation component of the NDC

In addition to the narrative account below, more specific details on South Africa's updated mitigation targets for 2025 and 2030 are provided in Table 3 below, in accordance with the guidance specified in Annex I of decision 4/CMA.1.

4 (a) Approach to setting updated NDC target ranges

The mitigation component of this update of South Africa's first NDC is our contribution to the long-term goal for mitigation, as stated in Article 4.1:

> "In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty."

Parties agreed in Paris that this goal is to inform the preparation of NDCs (decision 1/CP.21, paragraph 20). As noted above, South Africa's mitigation NDC target is also informed by the Talanoa Dialogue and the IPCC special report on 1.5°C.

South Africa has updated its NDC target ranges taking into account our status as a developing county, our national circumstances and common but differentiated responsibility and respective capability, and the long-term temperature goal, as specified in the Paris Agreement's Article 2, in the light of the latest science. South Africa considers these updated mitigation goals as our highest possible ambition in the light of our national circumstances, and as South Africa's fair contribution to the long-term mitigation goal. Targets have been set on the assumption that support will be provided to South Africa as a developing country as set out in the Paris Agreement's Articles 9, 10, 11 and 13 for implementation of the targets, for the required just transition policies and measures, and for both developing capacity to report on implementation and achievement of the targets.

4 (b) Methodological consistency in setting and accounting for NDC targets

Coverage, scope and the methodological basis for estimating and projecting emissions to inform South Africa's NDC targets are based on the national GHG inventory. Our initial NDC communicated in 2015 referred to South Africa's GHG inventory in terms of scope and coverage, and indicated the use of IPCC methodologies, as well as reflecting some uncertainties. The NDC target range was methodologically based on the latest national inventory report at the time (covering emissions for the years 2000-2010), submitted to the UNFCCC as part of SA's first Biennial Update Report (2014). The mitigation component of the NDC has been updated consistent with our latest GHG inventory in terms of coverage, scope and methodological approaches. South Africa communicated its latest National Inventory Report (NIR) (reporting emissions for the year 2000-2017) as part of its Fourth Biennial Update Report, with one notable exception, noted below in respect of the land sector.

As with the first NDC, coverage and scope of the mitigation targets in this updated NDC are on the same basis as the most recent National Inventory Report (as above). Coverage of the NDC is thus economy-wide, including the land sector (see note below), and includes the five gases currently covered by the NIR (CO_2, CH_4, N_2O, HFCs, PFCs). The current NIR uses Global Warming Potential (GWP) values from the IPCC's 2nd Assessment Report, which have been used for setting the updated NDC targets. In accounting for NDC targets, South Africa will use an inventory-based approach for all sectors, which is described in more detail in the 'information to facilitate clarity, transparency and understanding' (contained in Table 3 below).

The NDC targets will be accounted for on the basis of national GHG inventories for the relevant years (2025 and 2030) compiled and submitted to the UNFCCC under the Paris Agreement with South Africa's Biennial Transparency Reports, in accordance with Article 13 of the Paris Agreement and decision 18/CMA.1, and any subsequent relevant CMA decisions. Target levels have been set considering that these will be accounted for using GWP values as specified in the Annex to decision 18/CMA.1, from the IPCC's 5th Assessment Report. Use of updated GWP values in place of the current values is expected to *increase* South Africa's total emissions estimate in the target years by 10-20 Mt CO_2-eq.

For accounting against our NDC target, land sector emissions arising from natural disturbances will be *excluded* from total land sector emissions/sinks (IPCC 2006 guidelines categories 3B and 3D). This is expected to *reduce* South Africa's total emissions estimate in the target years by 5-30 Mt CO_2-eq, depending on the occurrence of wildfires during these years. South Africa intends to take this approach to accounting for land sector emissions/sinks to take into account significant interannual variations in emissions from natural disturbances – in the case of South Africa, stemming mainly from wildfires. Emissions from this source vary considerably and unpredictably from year to year, and this variability is likely to grow with further climate change. The overall target will therefore be accounted for by comparing the target value with the GHG emissions total without the land sector (excluding categories 3B and 3D), plus the values for these categories *excluding* emissions from natural disturbances, which will be reported separately for each corresponding land sector category, in the NIRs accompanying South Africa's Biennial Transparency Reports.

4 (c) Mitigation targets for 2025 and 2030

South Africa's first NDC placed mitigation targets in the context of common but differentiated responsibilities and respective capabilities, and "takes the form of a peak, plateau and decline GHG emissions trajectory range. South Africa's emissions by 2025 and 2030 will be in a range between 398 and 614 Mt CO_2 eq, as defined in national policy", containing mitigation targets for two years (2025 and 2030), corresponding to two periods of implementation (2021-2025, and 2026-2030). This update contains targets for the same two years, corresponding to the same periods of implementation.

South Africa's updated mitigation targets are contained in Table 2 below, with further information contained in Table 3, which contains the information to facilitate transparency, clarity and understanding as specified in Annex I to decision 4/CMA.1 :

Table 2 - South Africa's updated NDC mitigation targets

Year	Target	Corresponding period of implementation
2025	South Africa's annual GHG emissions will be in a range from 398-510 Mt CO_2-eq.	2021-2025
2030	South Africa's annual GHG emissions will be in a range from 350-420 Mt CO_2-eq.	2026-2030

Note: "GHG emissions" are defined as total net GHG emissions as specified in the national inventory report for 2025, including all sectors, and excluding emissions from natural disturbances in the land sector.

By comparison to the targets contained in South Africa's first NDC submitted in 2015, South Africa's updated mitigation targets represent a very significant progression. The upper end of the target range in 2025 has been reduced by 17%, and the upper end of the target range in 2030 has been reduced by 32%, and the lower range by 12%. The range between upper and lower bounds narrows significantly, from 216 Mt to 112 Mt in 2025 and 70 Mt CO2-eq in 2030. Meeting these targets will require South Africa to implement a range of policies and measures, including a very ambitious power sector investment plan as set out in the 2019 Integrated Resource Plan, the Green Transport Strategy,

enhanced energy efficiency programmes, and the recently-implemented carbon tax. As stated in section 1, the implementation of these ambitious mitigation targets will require substantial multilateral support, as provided for in the Paris Agreement. South Africa is updating these mitigation targets in the expectation that such support will be available. Our Low Emissions Development Strategy provides a long-term perspective on these near- and medium-term mitigation targets.

4 (d) Information to facilitate clarity, transparency and understanding of mitigation

In communicating this update of our first NDC, South Africa is voluntarily providing information to facilitate clarity, transparency and understanding (ICTU) as specified in Annex I of decision 4/CMA.1, responding to the strong encouragement to apply ICTU guidance when updating NDCs by 2020, pursuant to paragraph 7 of the decision (UNFCCC 2018a). South Africa will account for its NDC in accordance with Annex II of the same decision, from time of submission of its first Biennial Transparency Report in terms of decision 18/CMA.1.

The table presenting ICTU below enhances the information provided when communicating the INDC in 2015. We note that ICTU as agreed shall be provided for the second and subsequent NDCs, and look forward to all Parties doing so. South Africa submitted its Third Biennial Update Report in 2019, will be submitting its Fourth Biennial Update Report in 2021, and will continue submitting Biennial Update Reports until transitioning to Biennial Transparency Reports (under the Paris Agreement, in terms of decision 18/CMA.1) in 2024. In the first Biennial Transparency Report, we will specify indicators consistent with the modalities, procedures and guidelines (MPGs) for reporting on the implementation and achievement of our NDC (UNFCCC 2018b) and account for the NDC, including in reporting tables once those are agreed in on-going negotiations. South Africa will continue to pursue domestic mitigation measures to achieve its NDCs (see also section 2 above). This update to South Africa's first NDC is consistent with provisions of the Paris Agreement and associated decisions.

ICTU has been provided in Table 3 below. Each row in the table corresponds to a provision / sub-provision of Annex 1 to decision 4/CMA.1. "Not applicable" has been entered against sub-provisions which do not apply to the South African NDC, with an explanation provided as to why these do not apply.

Table 3 - Information to facilitate clarity, transparency and understand of South Africa's updated NDC

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
1. Quantifiable information on the reference point (including, as appropriate, a base year):	This section is not applicable to the South African NDC, since the first NDC and this update, do not define mitigation targets in relation to a reference point, but as a fixed level GHG emissions range in 2025 and 2030. Therefore, each entry below is marked "Not applicable".
(a) reference year(s), base year(s), reference period(s) or other starting point(s)	Not applicable, as above.
(b) Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year;	Not applicable, as above.
(c) For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or polices and measures as components of nationally determined contributions where paragraph	Not applicable, as above.
(d) Target relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction;	Not applicable, as above.
(e) Information on sources of data used in quantifying the reference point(s);	Not applicable, as above.
(f) Information on the circumstances under which the Party may update the values of the reference indicators.	Not applicable, as above.
2. Time frames and/or periods for implementation:	
(a) Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA);	The South African NDC is defined as having **two** time frames of **five years each** (2021-2025 and 2026-2030). This update maintains the same two periods of implementation: 1 January 2021 to 31 December 2025 1 January 2026 to 31 December 2030.
(b) Whether it is a single-year or multi-year target, as applicable.	South Africa's NDC contains mitigation targets for two single years, 2025 and 2030.

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
3. Scope and coverage:	
(a) General description of the target	South Africa's NDC updated mitigation targets for 2025 and 2030 are specified in section 4 (c) above. Details are replicated here for transparency, clarity and understanding. In 2025, South Africa's annual GHG emissions will be in a range from 398-510 Mt CO_2-eq. In 2030, South Africa's annual GHG emissions will be in a range from 350-420 Mt CO_2-eq. Note that "GHG emissions" are defined as total net GHG emissions as specified in the national inventory report for 2030, including all sectors, and excluding emissions from natural disturbances in the land sector. These targets for 2025 and 2030 correspond to two five-year time frames, and corresponding periods of implementation, from 1 January 2021 to 31 December 2025, and 1 January 2026 to 31 December 2030.
(b) Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines	South Africa's first NDC covers sectors, gases, categories and pools consistent with our national inventory report (NIR) submitted together with SA's Fourth Biennial Update Report, excluding emissions from natural disturbances in the land sector. **Sectors covered:** • Energy • IPPU, • AFOLU • Waste The NDC is economy-wide. A few subcategories are not estimated due to either activities not occurring in South Africa or lack of data. These are reported in the NIR. **Gases:** all gases covered in the NIR as above, which includes five greenhouse gases – CO_2, CH_4, N_2O, HFCs and PFCs. The South African NDC does not include SF_6 or NF_3 for these implementation periods due to lack of data. If data becomes available, inclusion of additional gases will be considered for the 2026-2030 implementation period, or for the next NDC. The land sector is included in the NDC, excluding emissions from natural disturbances. The NIR takes a land-based approach.

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
	Pools: All carbon pools are included in the NDC and NIR, with the exception of dead organic matter – litter is included but dead wood is not currently included, as stated in the NIR.
(c) How the Party has taken into consideration paragraph 31(c) and (d) of decision 1/CP.21;	South Africa's approach is inventory-based, hence all categories of anthropogenic emissions or removals included in the national inventory report (NIR) are included in the NDC, with the exception of emissions arising from natural disturbances in the land sector. Table H in the NIR transparently reports the "Activities in the 2017 inventory which are not estimated (NE), included elsewhere (IE) or not occurring (NO)." A common reason for 'not estimated' is lack of data, and detailed explanations are provided in the NIR. South Africa has used the same approach for its previous NAMAs under the UNFCCC for 2020 and 2025.
(d) Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans.	Not applicable to South Africa's NDC, which is not defined in terms of mitigation co-benefits of adaptation actions and/or economic diversification plans.
4. Planning processes:	
(a) Information on the planning processes that the Party undertook to prepare its nationally determined contribution and, if available, on the Party's implementation plans, including, as appropriate:	
(i) Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner; if available, information provided on a Party's implementation plans	**Institutional arrangements and planning process for the NDC:** The Department of Forestry, Fisheries & the Environment (DFFE) is the focal point for climate change in South Africa, and led the planning process in preparing this update to South Africa's first NDC. The process for updating SA's first NDC had five parts: technical analysis (UCT 2021b; CSIR 2021), consultation within government, consultation with broader stakeholders, provincial public stakeholder workshops, and finalisation in government and Cabinet. **Public consultation and participation:** DFFE conducted stakeholder consultations by way of a hybrid model (due to challenges brought about by the COVID pandemic) using in-person consultations and virtual participation in all nine provinces, accessible to local government and undertaken in a gender-responsive manner. The stakeholder

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
	consultations were launched at the National Climate Change Committee, and the NDC was presented to the Presidential Climate Commission; and to stakeholders across business, labour and civil society, including women and youth constituencies. Plans implemented since 2015 are outlined in section 2 above.
(ii) Contextual matters, including, inter alia, as appropriate: a. National circumstances, such as geography, climate, economy, sustainable development and poverty eradication; b. Best practices and experience related to the preparation of the nationally determined contribution; c. Other contextual aspirations and priorities acknowledged when joining the Paris Agreement;	See section 2 above.
(b) Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement;	Not applicable. South Africa has not reached any agreement to implement its NDC jointly with any other country.
(c) How the Party's preparation of its nationally determined contribution has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement;	Since South Africa's NDC and the current update were completed before the first global stocktake, due to be held in 2023, South Africa has taken into account the outcome of the Talanoa Dialogue and the IPCC's Special Report on 1.5 degrees. This informed the update of our first NDC, and consideration of fair share and levels of ambition.
(d) Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	Not applicable.
(i) How the economic and social consequences of response measures have been considered in developing the nationally determined contribution;	Not applicable.

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
(ii) Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	Not applicable.
5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals:	
(a) Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	South Africa will use a GHG inventory-based approach in accounting for its mitigation targets for 2025 and 2030. Currently, South Africa's national inventory reports are produced using the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* and the *2013 IPCC Kyoto Protocol Supplement* (for guidance on accounting for harvested wood products), and GWP-100 values from the IPCC's 2nd Assessment Report. South Africa will apply the modalities, procedures and guidelines contained in the Annex to decision 18/CMA.1 in estimating GHG emissions from the first Biennial Transparency Report onwards (due in December 2024), and will use guidelines and GWP values as specified in the Annex to decision 18/CMA.1 (or subsequent CMA decisions) to estimate emissions for it national inventory report. Progress and achievement will be accounted for by comparing the target ranges in 2025 and 2030 with the annual emissions contained in South Africa's GHG inventory for all sectors, excluding emissions arising from natural disturbances in the land sector. Emissions arising from natural disturbances will be disaggregated in the NIR for each relevant IPCC category and reported separately, and used as the basis for accounting for implementation and achievement of the NDC targets. South Africa intends to perform corresponding adjustments in accounting for its NDC targets in accordance with relevant decisions taken by the CMA in relation to Article 6

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
	and the structured summary for implementation and achievement of its NDC, both currently being negotiated under the Paris Agreement. The target range for 2026-2030 may be updated when SA communicates its second NDC in 2025, in accordance with relevant decisions and provisions of the Paris Agreement, and in response to changes in the GHG inventory, its national circumstances, and to the latest science, the 2023 global stocktake, and the availability of support for implementation. South Africa will account for its first NDC in accordance with the guidance contained in Annex II to decision 4/CMA.1.
(b) Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;	Not applicable to South Africa's NDC. South Africa's NDC target is expressed in GHG emissions terms rather than in terms of policy goals.
(c) If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;	Information on accounting is contained in 5(a) above.
(d) IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;	**IPCC methodologies:** 2006 IPCC Guidelines for National Greenhouse Gas Inventories; 2013 Kyoto Protocol Supplement (for harvested wood products). **Metrics:** South Africa currently uses 100-year Global Warming Potential (GWP) values from the IPCC's 2nd Assessment Report. South Africa will switch to using GWPs from the IPCC's 5th Assessment Report for future reports under the Paris Agreement (from 2024 onwards), as specified in the Annex to decision 18/CMA.1, or as specified in subsequent CMA decisions.
(e) Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	
(i) Approach to addressing emissions and subsequent removals from natural disturbances on managed lands:	In South Africa's NIR, South Africa's entire land area is considered "managed" for purposes of estimating emissions and removals from the land sector. CO_2 emissions from biomass burning are included under *losses due to disturbance* in the land section (3B) and not in the *biomass burning* (3C1) section of the national inventory report at present. Emissions from wildfires are estimated and included in each relevant land

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
	category. For the purposes of accounting for South Africa's NDC target, emissions from natural disturbances will be excluded from the total.
(ii) Approach used to account for emissions and removals from harvested wood products;	South Africa uses a production approach, following the updated guidance provided in the 2013 IPCC Kyoto Protocol Supplement (IPCC, 2014).
(iii) Approach used to address the effects of age-class structure in forests;	Not applicable – South Africa does not use this approach.
(f) Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	
(i) How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources and models used;	Not applicable – South Africa does not have a reference indicator.
(ii) For Parties with nationally determined contributions that contain non- greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable;	Not applicable – South Africa does not include non-GHG components in its NDC mitigation target.
(iii) For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	Not applicable – South Africa does not include black carbon, since it is not a substance controlled by the UNFCCC or Paris Agreement.
(iv) Further technical information, as necessary;	Not applicable.
(g) The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	Any international transfers of mitigation outcomes to other Parties will be accounted for as specified in decisions of the CMA. South Africa currently hosts a number of CDM projects under the Kyoto Protocol. Whether these will be recognised in terms of Article 6 of the Paris Agreement is still a subject of ongoing negotiations. It is expected that South Africa will host Article 6.4 projects under the Paris Agreement, and may enter into co-operative approaches under Article 6.2 with other countries.

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
6. How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances:	
(a) How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances;	The updated NDC has outlined how SA considers its contribution to be fair and ambitious, in sections on adaptation, mitigation and support, as well as a dedicated section on equitable access to sustainable development, below. How the NDC relates to fairness, science, ambition, progression and other elements of the Paris Agreement should be considered holistically. Here, information to facilitate clarity, transparency and understanding of fairness and ambition is provided. South Africa is strongly of the view that equity should be a primary consideration when considering countries' fair shares of remaining global emissions space. Analysis of relative fair shares for South Africa in relation to mitigation was reviewed in the process of updating the NDC (UCT 2021a). The analysis reviewed relevant literature and drew on two publicly available tools. First, the independent *Climate Equity Reference Calculator* (CERC) was used, on account of its transparency, ease of access and usability, as well as its alignment with the equity principles South Africa values and prioritises – taking into account responsibility and capability, as well as the right to promote sustainable development and the need to prioritise development for those living in poverty. This was augmented and validated by referring, secondly, to the aggregation of multiple current and historic effort-sharing studies that have been compiled by the Climate Action Tracker (CAT), whilst identifying certain *caveats* regarding CAT's methodology. A range of GHG emissions levels for 2025 and 2030 were derived from these tools as a guide to South Africa's "fair share" of global emissions, based on long-term emission pathways which are consistent with global temperature limits of "well below 2 °C" (assuming a 66% probability below 2 °C) and 1.5 °C, i.e. the long-term temperature limits contained in Article 2.1(a) of the Paris Agreement. It should be noted that these relative fair shares for South Africa imply corresponding fair shares for other countries. The upper end of South Africa's target range for 2025 lies above the CERC 2 degree allocation (adjusted to include land use), and below the CERC 2 degree allocation for

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
	2030 (adjusted to include land use).[6] South Africa's whole updated target range for 2030 (as contained in Table 2) lie within the 2 °C fair share range based on the post-September 2020 version of CAT (UCT 2021a). The lower end of South Africa's 2030 target range lies within CERC's 1.5 degree assessment (UCT 2021a). South Africa bears a disproportionate burden of adaptation to the adverse impacts of climate change (CSIR 2020). It is an injustice that with a relatively small share of historical cumulative emissions, our economy has been disproportionately negative affected by climate change. Poor communities have low capacity to adapt and thus suffer the most from impacts. Nevertheless, we have invested in adaptation, and thus made a fair contribution to the global effort (see section 3). South Africa expects that the global stock-take will take into account the adequacy and effectiveness of adaptation and the support provided for adaptation. South Africa expect that adequate international support will be provided for both adaptation and mitigation, as a matter of fairness, as provided for in the Paris Agreement.
(b) Fairness considerations, including reflecting on equity;	As above, in 6(a).
(c) How the Party has addressed Article 4, paragraph 3, of the Paris Agreement; *(Article 4.3 states that "Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.")*	South Africa's updated mitigation targets as contained in Table 2 represent a significant progression. The upper end of the target range in 2025 has been reduced by 17%, and the upper end of the target range in 2030 has been reduced by 32%, and the lower range by 12%. The range between upper and lower bounds narrows significantly, from 216 Mt to 112 Mt in 2025 and 70 Mt CO2-eq in 2030. In communicating its second NDC in 2025, SA will consider whether the level of ambition for 2030 can be increased further, in the light of national circumstances, technology developments, and the availability of international support.
(d) How the Party has addressed Article 4, paragraph 4, of the Paris Agreement; *(Article 4.4 states that "Developed country Parties should continue taking the lead by undertaking economy-wide absolute emission reduction*	South Africa has updated its mitigation targets, which are economy-wide emission reduction or limitation targets for 2025 and 2030.

[6] It is understood that the CERC calculator will be updated with post-COVID growth rates in the latter part of 2021, and that this will very likely have an impact on SA's fair share range according to CERC. A comparison of the expected updated values (provided by the CERC team) with existing values and sensitivity analysis, can be found in (UCT 2021a).

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
targets. Developing country Parties should continue enhancing their mitigation efforts, and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances.")	
(e) How the Party has addressed Article 4, paragraph 6, of the Paris Agreement. *(Article 4.6 states that "6. The least developed countries and small island developing States may prepare and communicate strategies, plans and actions for low greenhouse gas emissions development reflecting their special circumstances.")*	Not applicable, since South Africa is neither a least developed country, nor a small island developing state.
7. How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2:	
(a) How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2; *(Article 2 of the UNFCCC states that "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.")*	South Africa reaffirms its commitment to the objective of the Convention, as indicated in our first NDC. NDC targets have been chosen to reflect South Africa's fair contribution towards the long-term temperature goal of the Paris Agreement, as detailed above, in the context of equitable access to sustainable development. In the context of COVID-19, we highlight the importance of global solidarity, in fighting the virus and climate change. In recommitting ourselves to the multi-lateral rules based system, we highlight the importance of ensuring that "food production is not threatened and to enable economic development to proceed in a sustainable manner." We also reaffirm that the achievement of the objective of the Convention must be guided by its principles, as stated in the preamble of the Paris Agreement. Parties to the Paris Agreement are Parties to the Convention.
(b) How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.	This update of our first NDC is South Africa's contribution to the global temperature goal of keeping temperature well below 2 °C and pursuing efforts to 1.5 °C below pre-industrial levels. Both of these agreed global temperature limits have informed our analysis of fairness and ambition, as explained above. Clearly, Article 2.1 (a) of the Paris Agreement contains two global temperature limits – limiting global temperature increase to "well below 2°C", and "pursuing efforts to limit the temperature increase to 1.5 °C". There is a single aim, to limit global temperature increase, with two quantified goals – well below 2 and 1.5 °C. In our first NDC, we

Provisions and sub-provisions of Annex I to decision 4/CMA.1	Information provided in respect of the updated South African NDC
	referred to findings from the IPCC's 5th Assessment Report on global temperature limits. Since then, the IPCC's Special Report on 1.5°C has made clear the small remaining future global carbon budget, even smaller than for 2°C. We note that the special report assessed "the comparison between global warming of 1.5°C and 2°C above pre-industrial levels", but did not assess the agreed global temperature limit of "well below 2 °C" explicitly, and look forward to more information on "well below 2 °C" in the IPCC's 6th Assessment Report. The recently-released IPCC 6th Assessment Report's Working Group I Report found that that global temperature in the last decade is already 1.09 [0.95 to 1.20] °C higher than preindustrial levels, due to 2390 ± 240 Gt CO_2 emitted historically. We note that there is still no internationally-agreed equity reference framework, with takes into account historical emissions and responsibility for the future. Within the context of the Paris Agreement's principles of equity and common but differentiated responsibility, in the light of different national circumstances, we update the first NDC to reflect our highest possible ambition. The long-term global goal for mitigation in Article 4.1 refers to global peaking, recognising this will take longer for developing countries. The reference to a balance of sources and sinks highlight the importance of sinks, globally and in South Africa. Our National Planning Commission undertook an extensive process to develop a vision 2050, considering goals of net zero or zero emissions for South Africa. In our long-term Low Emissions Development Strategy (LEDS), communicated voluntarily under Article 4.19, South Africa committed "to ultimately moving towards a goal of net zero carbon emissions by 2050, which will require various interventions to reduce greenhouse gas emissions. This goal, how it will be achieved to ensure a just transition, and how the economic advantages of the transition will be maximised, will be formally communicated in future iterations of this strategy." Consistent with the emphasis in Article 4.1 on equity, and the context of sustainable development and efforts to eradicate poverty, our national process aims at a just transition. We have established a Presidential Climate Commission to oversee the just transition. It is by leaving no-one behind that South Africa collectively will contribute to achieving the goals of the Paris Agreement. We urge all Parties to treat with the utmost seriousness the considerations of equity, sustainable development and poverty eradication.

5. Support requirements under the Convention and Paris Agreement

Effective multilateral co-operation was identified by the IPCC's Special Report on 1.5°C as a key factor in achieving the temperature goals of the Paris Agreement. South Africa's NDC is premised on continued effective multilateral cooperation in the context of the UNFCCC and its Paris Agreement, and the provision of support, both for implementation by developing countries, and for the UNFCCC Secretariat and constituted bodies under the UNFCCC and its Paris Agreement, by developed countries and others in a position to do so. The role which the constituted bodies and other bodies under the UNFCCC and its Paris Agreement, supported by the UNFCCC Secretariat, play in providing support to the implementation of climate policy in developing countries will be critical if developing countries are to implement their NDCs effectively over the next decade. These include the Adaptation Committee, the Adaptation Fund Board, the Executive Committee for the Warsaw Mechanism for Loss and Damage, the Consultative Group of Experts, the Katowice Committee of Experts on the Impacts of the Implementation of Response Measures, the Least Developed Countries Expert Group, the Facilitative Working Group of the Local Communities and Indigenous Peoples Platform, the Standing Committee on Finance, the Technology Executive Committee, the Paris Committee on Capacity-Building and bodies of the Financial Mechanism, including the Global Environment Facility and the Green Climate Fund.

The Paris Agreement specifies that support be provided to developing countries in relation to mitigation (Article 4.5, "..recognizing that enhanced support for developing country Parties will allow for higher ambition in their actions"), the conservation and enhancement of sinks (Article 5.1), adaptation (Article 7.13), loss and damage (Article 8.3) and transparency (Articles 13.14 and 13.15), through the provision of finance (Article 9), technology development and transfer (Article 10) and capacity-building (Article 11). The basis for South Africa's NDC is the assumption that support will be provided for the implementation of the targets and goals specified above, for mitigation, adaptation and loss and damage. South Africa expects developed countries to continue to provide and mobilize climate finance and to support country-driven strategies, consistent with Article 9. South Africa will require support for a just transition towards net zero CO_2. We also expect developed countries to show progression beyond previous efforts, to set a new collective quantified goal from a floor of USD 100 billion per year, taking into account the needs and priorities of developing countries.

The overall costs of implementing South Africa's climate policies associated with the achievement of this NDC's targets and goals are partially estimated above and below. A detailed description of current policy implementation-related needs is provided in South Africa's Biennial Update Reports under the Convention and in the forthcoming Biennial Transparency Reports under the Paris Agreement.

This update increases South Africa's level of mitigation ambition. While some investments are already being made domestically and will continue, international support will be required. The key to this increased level of mitigation ambition is the electricity sector. So far, South Africa's Renewable Energy Independent Power Producer Procurement Programme (REI4P) has, as of March 2020, approved 112 renewable energy IPP projects, with a total of 6422 MW procured in four large-scale and three small-scale bid windows. 4201 MW of electricity generating capacity has been connected to the grid. This has attracted investments of ZAR 209.7 billion (ca. USD13 bn), of which 80% was domestic and 20% foreign investment The REI4P has created 50 984 job-years in SA; contributed ZAR1 200 million (USD 75m) in socio-economic development contributions, reduced carbon emissions of 47.7 Mt CO2 and saved 56.3 million litres of water (IPP office 2020). Over the next decade, the NDC will require a much greater investment programme, as specified in IPR 2019, of between R860 billion and R920 billion (in 2019 Rands; USD60-64 billion). The shift away from coal that IRP 2019 requires, will require support in the form of transition finance, and associated technology and capacity-building. In addition, South Africa will invest in energy efficiency, a range of green transport measures including electric and hybrid

vehicles, mode shifting and the enhanced provision of safe and affordable public transport. All of these measures will be accompanied by just transition programmes to ensure that the costs of these measures to workers and communities are minimised and the benefits maximized.

The just transition in South Africa will require international cooperation and support. In the first NDC, South Africa identified various technologies that could help us to further reduce emissions. In addition to these, we update to indicate the need for support in the form of concessional finance for low carbon projects; debt restructuring; support by the international climate and development and finance community for non-fossil-fuel development in Mpumalanga and elsewhere, and infrastructure to support energy efficiency, transmission and green hydrogen in support of electric vehicles, and public transport. South Africa will seek to develop small, medium and micro-enterprises, including energy service companies, to implement innovative technologies and create sustainable employment. In addition to implementation of emissions reductions in the 2020s pursuant to the updated NDC target ranges contained in Table 2 above, support will also be required for longer term decarbonization, which will require investments in the 2020s in infrastructure, technology development and capacity-building.

The projected costs of adaptation over the 2021-2030 period are detailed in the adaptation communication above, and include the costs of adaptation measures themselves, as well as the costs of building the relevant human and institutional capacity. In addition, South Africa will face significantly higher costs as a result of climate impacts which cannot be avoided during this period, and further work is underway to accurately quantify the costs.

Support required for implementation includes the building of institutional and human capacity. Capacity-building is a continuous activity and initially focusing on the period of implementation – in our case, 2021-2025 and 2026-2030. A long-term perspective is important, to continue to build capacity for deep and rapid decarbonisation, and for adaptation to the impacts climate change. Long and deep transformations, for example in producing green steel, require international cooperation and support. In such transformations, we will seek to raise further awareness of the financial and technical support available for promoting the strengthening of gender integration into climate policies, including good practices to facilitate access to climate finance for grassroots women's organizations and indigenous peoples and local communities. Support for implementation of transparency and building of transparency-related capacity should be provided on a continuous basis, pursuant to Article 13.14 and 13.15 of the Paris Agreement.

As detailed in South Africa's 4th BUR, during the years 2018-2019, South Africa received USD4.886 billion in climate finance, or around USD2.4 billion per year, the majority of which was in the form of loans (11.% of this total was received in the form of grant finance, and the remainder in the form of loans). The overwhelming majority of this support was provided for mitigation projects.

South Africa's key goal for its updated first NDC is to access significantly higher levels of climate finance during the periods of implementation of the first NDC, with a view to achieving a floor of USD 8 billion per year by 2030. This is in line with Article 4.3 of the Convention and Article 9.1 of the Paris Agreement. These resources will be equally distributed balanced between adaptation and mitigation, in line with Article 9.4 of the Paris Agreement. Additional finance will be mobilized on this basis, including Article 9.3 of the Paris Agreement as well as other forms of support from bilateral and multilateral sources as required.

6. Equitable access to sustainable development

The core principles of equity, responsibility, capability and sustainable development are the basis of South Africa's first NDC. Equity relates to adaptation, mitigation and all forms of investment and support. Equity does not only relate to Parties' respective mitigation actions, as those least responsible for the problem of global climate change, namely poor countries and communities, are

most vulnerable to its impacts. The Paris Agreement recognises "that the current need for adaptation is significant and that greater levels of mitigation can reduce the need for additional adaptation efforts, and that greater adaptation needs can involve greater adaptation costs" (Article 7.4). Those who have a greater responsibility for cumulative emissions that have driven up GHG concentrations in the atmosphere should, as a matter of fairness, assist those less responsible.

An assessment of equity also needs to take into account means of implementation. Generally, South Africa needs time for sustainable development, which is necessary to eliminate poverty, reduce inequality, increase employment and promote inclusive economic growth, while simultaneously seeking to contribute to mitigation and assist our vulnerable communities in adapting to climate impacts. South Africa has developed policies in key sectors on mitigation and adaptation focused on both reaching climate goals and ensuring a just transition in which no-one is left behind. It is assumed that international support will be available as specified in Articles 9, 10 and 11 of the Paris Agreement to ensure that both development and climate goals can be met within the timeframe of this NDC, for mitigation, adaptation and loss and damage.

Regarding mitigation, South Africa has undertaken further detailed analysis of its relative fair share, updating the information provided in the first NDC. A fair share framework was developed, as a lens on how South Africa's mitigation contribution represents a fair share of global mitigation efforts (see Table 3, section 6a above; and UCT 2021a).

The Paris Agreement in its Article 2 and 7.1 provides for increasing the ability to adapt to the adverse impact of climate change in line with the goals towards limiting global average temperature increases; the agreement further in Article 7.2 recognizes the global nature of the adaptation responsibility. In this respect, Africa and South Africa, are warming at a rate that is above twice the global average temperature increase (Wolski 2019). The driver of this trend is the collective effect of global emissions, as such South Africa and the African continent bear a disproportionate share of the adaptation burden, both because of the uneven global distribution of climate impacts, and because of the skewed historical responsibility for GHG emissions.

Equity in adaptation therefore requires a strong multilateral response in the context of the UNFCCC and its Paris Agreement, including the provision of support to developing countries for adaptation and the detailed evaluation of progress against the global goal for adaptation in the global stocktake and in the work of relevant constituted bodies under the UNFCCC and its Paris Agreement

Fairness and adequacy of the South African NDC should therefore be looked at holistically, where the contributions by the country are not only looked at from an emissions reduction perspective but also an adaptation perspective.

7. Uncertainties

With COVID-19, there has been a reduction in GHG emissions globally, but there is very high uncertainty on how long it may take the economy to recover, and for emissions to potentially rise again. While these factors have been taken into account as far as possible, this has added additional uncertainties to emissions projections for the 2020s. Another key implication relates to support. While the socio-economic consequences of COVID-19 are highly uncertain, it is very likely that South Africa will be more highly indebted than prior to the crisis, which will add additional strain to the South African fiscus, constrain local capital markets and potentially increase the cost of borrowing.

While the South African greenhouse gas inventory system has consistently improved in its coverage and in the detail and quality of estimation of greenhouse gases, considerable uncertainties remain in estimating GHGs, especially in the land sector. As South Africa improves its systems for estimating land sector emissions, recalculations may result in significant changes in previously reported GHG estimates.

In addition, more accurate land sector reporting will lead to higher variability in GHG emissions from natural disturbances from wildfires, which will also become more common in South Africa as a result of climate change.

The extent to which adaptation measures will need to be implemented will depend on what is achieved globally in terms of mitigation.

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