



SOUTH AFRICA

NDC IMPLEMENTATION IN SOUTH AFRICA THROUGH GREEN INVESTMENTS BY PRIVATE SECTOR

A SCOPING STUDY

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The African Development Bank

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FOREWORD

In 2015, the Paris Agreement on Climate Change brought all nations together for a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. The Agreement mandates signatory countries to commit to keep global warming below 2°C through the submission of Nationally Determined Contributions (NDCs).

To date, 54 African countries have committed to implement measures that mitigate GHG emissions and enhance adaptation amounting to an estimated cost of \$3 trillion by 2030. It is expected that 75% of this resource requirement will be financed by private capital. Although private capital is the largest contributor to climate finance globally, private sector investment in climate action in African countries requires strengthening and directing towards opportunities for investment in sectors and technologies that are traditionally well understood as well as those that are emergent and require innovation (eg. projects promoting adaptation and resilience). There is also an urgent need to grow indigenous private sector actors' share of investments in climate action on the continent.

With regards to its carbon footprint, the country is the continent's largest emitter of greenhouse gases (GHG) due to heavy reliance on fossil-fuel based energy consumption and production. In addition, South Africa, like most of the African countries, is vulnerable to climate change impacts and risks. Coastal development is increasingly vulnerable to sea-level rise and associated stresses.

The country is also water scarce and therefore anticipated reductions in the rainfall and variations in rainfall patterns are likely to have significant negative impact on economic growth in general and the major water- using sectors such as agriculture, industry, mining and domestic supply in particular. The agriculture sector is the most vulnerable sector with high dependence on water both for rain-fed and irrigated agriculture; the sector currently consumes approximately 40% of available surface water resources.

To address these issues, South Africa has made a commitment to reduce economy wide GHG emissions by 2030 through a peak-plateau-decline strategy. The country has also pledged to take adaptation action in the Water, Agriculture, Forestry, Energy, Settlements, Biodiversity, and Disaster Risk Reduction sectors. These commitments have been articulated in the country's first *Nationally Determined Contribution (2015)*, *Low Emissions Development Strategy 2050 (2020)*, and in several climate change adaptation and mitigation policy documents. Furthermore, the National Development Plan 2030 advocates for a *just transition* to a low carbon, climate resilient economy and society.

The Bank has supported climate change action in the country by investing in green projects and mobilising private capital as well as climate finance. Specifically, within the last decade, the Bank has supported the Government of South Africa's ambitions to promote renewable energy technologies in wind and solar. This support has been made in partnership with other



multilateral/international development finance institutions, the local financing institutions and the Clean Technology Fund in particular.

We are delighted that South Africa has participated in the initiative: *Identification of NDC Investment Challenges and Opportunities for the Private Sector* under the Private Sector Investment Initiative for NDCs financed by the Fund for Africa Private Sector Assistance (FAPA) of the Bank. The main aim of the study was to assist the stakeholders and actors in this space to understand what it would take for the local private sector to be fully involved in the implementation of the NDC. This study gives pointers to the opportunities available as well as the challenges that need to be addressed for the private sector to fully engage with climate action. We look forward to working with our partners in taking forward the opportunities identified in this Report.

Ms. Leila Mokadem

Director General for Southern Africa Region
African Development Bank





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LIST OF ACRONYMS

ACCF	African Climate Change Fund	GEF	Global Environment Facility
AF	Adaptation Fund	GHG	Green-house Gases
AFOLU	Agriculture, Forestry, and Other Land Use	GIZ	German Agency for International Cooperation
CDM	Clean Development Mechanism	GVC	Green Value Chain
CGEM	General Confederation of Enterprises of Morocco	IFIs	International financial Institution
CNST-CC	National Scientific and Technical Committee of Climate Change	IFC	International finance Corporation
CO₂	Carbon dioxide	IKI	International Climate Initiative
CO_{2e}	Carbon dioxide equivalent	IMF	International Monetary fund
COP	Conference of Parties	INDC	Intended National Determined Contribution
COVID	Coronavirus disease	IPCC	Intergovernmental Panel on Climate Change
CTF	Clean Technology fund	M	Million
DPSA	Dedicated Private Sector Set Aside	MRV	Monitoring Report Verification
EBRD	European Bank of Reconstruction and Development	NAMA	Nationally Appropriate Mitigation Actions
EE	Energy efficiency	NDC	Nationally Determined Contribution
EIB	European Investment Bank	NIF	Neighbourhood Investment Facility
EU	European Union	OECD	Organisation for Economic Cooperation and Development
FAPA	Fund for African Private sector Assistance	ONEM	National Environment Observatory
FDI	Foreign Direct Investment	OREDD	Regional Observatories of the Environment and Sustainable Development
GCF	Green Climate fund	PMR	Partnership for Market Readiness
GDP	Gross Domestic Product		
GEFF	Green Economy Financing Facility		
GEEREF	Global Energy Efficiency and Renewable Energy Fund		



PSF	Private Sector Facility
PPP	Public–private partnership
RE	Renewable energy
SEFA	Sustainable energy fund for Africa
TA	Technical assistance
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
ZAR	South African Rand

Exchange rates – August 2020

1 South Africa Rand (ZAR) = \$0.05743



EXECUTIVE SUMMARY

Context and objectives

The South African government remains committed to implement its NDC adaptation and mitigation commitments under the Paris Climate Agreement. The government sees the private sector as a very important partner in the NDC implementation process. The objectives of this scoping study are therefore to assess private sector challenges and opportunities as well as the needed support in accessing green financing for NDC implementation in South Africa. This study focuses on seven key sectors that include: climate-smart agribusiness and forestry, sustainable transport, green buildings and smart cities, renewable energy (RE) and energy efficiency (EE), waste management, water and irrigation and the financial sectors.

Private sector and climate finance landscape for NDC implementation

South Africa has a very diverse private sector, which is one of the most developed in Africa. A number of NDC-aligned projects are under implementation by large private companies and are financed by dedicated climate change funds (from GCF, CTF, GEF, DBSA, AfDB). Few initiatives target the direct involvement of SMEs in green investments. For example, the cleantech innovation program that supports SMEs and start-ups working on green solutions in the energy, building, waste management and water sectors. While significantly more climate finance is needed to implement South Africa's NDC, so far, the country has mobilised climate finance more than any other country in the continent with the exception of Morocco. Moreover, the National Business Initiative (NBI) provides a platform for the private sector and businesses in South Africa to build their capacity and engage in green investments and sustainable growth in the areas of climate change, energy and water.

Cross-cutting challenges for private sector involvement in NDC implementation

South African private sector faces several sectoral and cross-cutting challenges in the implementation of NDC-aligned actions. The specific challenges across the seven sectors are related to:

- **Insufficient access to climate funds:** a vast majority of South African large businesses and SMEs have had little success in directly or indirectly accessing dedicated climate funds and concessional green loans.
- **Insufficient policy guidance for private company's climate response efforts:** The government has made progress to define its adaptation and mitigation strategies. However, the private sector needs more clarity on specific sectoral laws, regulations and policies.



- **Increasing focus on COVID-19 and decreasing focus on green projects:** While some NDC and green projects are currently being implemented in South Africa, the negative impact of the COVID-19 in 2020 on South Africa has obliged the government to temporarily shift its priorities towards the post-Covid recovery with a strong focus on the health sector.
- **Weak business case for green investment in adaptation projects:** South Africa like many other African countries, finds it challenging to make a good business case for adaptation. This makes it difficult to attract private investment in adaptation projects.
- **Skills and capacity constraints:** There are generally issues with the limited private sector knowledge on climate change, limited technical capacity of implementation partners, and shortages of project development skills specific for green projects.
- **Overwhelming focus on energy:** There are far fewer non-energy related low carbon projects in South Africa. While it is justifiable to increase access to energy in order to run the economy, more attention should be paid to other areas with “low carbon” potential especially in sustainable transportation, green cities, waste management and climate-smart agribusinesses and forestry.
- **Additional challenges facing SMEs:** SMEs face additional challenges such as constraints related to use of appropriate clean technology and access to green line of credits.

Cross-cutting long-term strategic opportunities for private sector involvement in NDC

The Government of South Africa's long-term strategic opportunity for NDC implementation is presented in two climate policy strategy documents:

- The National Climate Change Adaptation Strategy (2019) – a national blueprint on climate resilient actions across different sectors.
- South Africa's Low Emission development (LED) Strategy (2020) – a national roadmap for greenhouse gas emission reduction up to 2050.

Closely aligned to the two strategies is the Presidential Climate Change Coordinating Commission (PCCCC) that is responsible for exploring opportunities for new upstream and downstream green jobs, green industries and climate resilience interventions. The participation and contribution of large businesses and SMEs is a key determinant of success.



Cross-cutting Recommendation

Pursue a “Build Back Better” post-COVID approach that promotes green investments: COVID emergency measures in the short term should focus on stopping the spread of the virus while medium and long-term COVID recovery plans should reduce regulatory obstacles to support inclusive green growth. COVID recovery funds should support innovation in green technologies and green businesses in the transport, agriculture, forestry, waste, energy, water and construction sectors.

Moving forward

The revision and implementation of South Africa’s NDC provide a unique opportunity for the government to work closely with large private companies and SMEs to address cross-cutting and sectoral challenges and boost green investments and green jobs. The process of engagement with the private sector should be coordinated, long-term, sector specific, disaggregated to micro, small, medium and large private sector actors. To strengthen the contribution of the private sector in NDC implementation, the government should see green investments by the private sector from a business perspective and not only from the environmental and development perspectives.



1. INTRODUCTION

1.1 Background

South Africa, like many other developing countries, is vulnerable to the effects of climate change, and has the task of balancing accelerating economic growth and transformation with sustainable use of environmental resources and responding to climate change (DEA, 2017). South Africa is vulnerable to natural disasters such as drought, flooding, extreme storms and fires and has faced a number of devastating climate-related disasters over the last few decades and their impacts have been varying. The country is projected to face a higher frequency of climate-related disasters that are increasing in intensity, and these events are likely to be associated with impacts that are on par with, if not worse than those already experienced (DEA, 2018). The impact of climate related disasters are wide-ranging and impact multiple sectors, including damage to infrastructure, damage to ecosystems, and contributing to water shortages, rising food insecurity and impacting public health.

In terms of GHG emissions, South Africa is the largest emitter in Africa. This circumstance therefore triggers just transition issues. South Africa continues to make significant strides toward transition to a climate resilient and low carbon economy. The country has taken numerous steps to respond to the climate change challenges in partnership with climate change stakeholders. South Africa is a signatory of numerous global climate change responses including the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement. South Africa progressed significantly in developing its policies to respond to climate change, through its National Climate Change Response White Paper (NCCRWP), Nationally Determined Contributions (NDC) and Climate Change Bill. Key developments, since the NCCRWP, have been the submission of the country's NDC (DEA, 2015) and the Draft National Climate Change Adaptation Strategy (NCCAS) which has been drafted and revised (DEA, 2019). The National Development Plan 2030 for a just transition to a low carbon, climate resilient economy and society, Carbon Tax Bill, Greenhouse Gas Emissions reporting, Climate Change Bill and Pollution Prevention Plan regulations are substantial policy steps undertaken by the country to curb GHG emissions and enhance climate resilience.

South Africa's NDC consists of an adaptation component, a mitigation component, and a support component. A key challenge highlighted in SA's NDC is the limited ability to catalyse finance and investment at an economy wide scale for the transition to a low carbon and climate resilient economy and society (DEA, 2015). The NDC identifies the major climate change adaptation and mitigation programmes that could be scaled-up to support this challenge, several of which correspond with the country's Climate Change Flagship Programmes.



Private climate finance plays a significant and important role in the country's response to climate change. Companies have made unilateral investments in energy efficiency, cogeneration and own renewable energy to reduce energy costs, as well as utilising national government or industry association programmes and incentives to invest in lower-carbon technologies, thereby contributing to the country's response to climate change (DEA, 2016). The extent to which private finance has supported the country's transition towards the envisaged lower carbon and climate-resilient economy and society is impeded by insufficient information on the opportunities (DEA, 2016).

1.2. Objective

In Africa it is estimated that the implementation of NDCs will cost about \$3 trillion by 2030. All projections indicate that about 75% of this cost will come from the private sector (FAPA 2020). By all accounts, engaging the private sector in climate-smart investments is a cornerstone to growing climate business opportunities. However, private sector participation in climate actions in South Africa and other African countries is currently weak. It is in this context that this scoping study is conducted to strengthen the private sector to take advantage of the abundant opportunities for green investments in South Africa.

The objectives of this scoping study are therefore: (i) to assess challenges and opportunities for NDC implementation by the private sector and (ii) to support the private sector in accessing green financing for NDC implementation in South Africa. This study focuses on seven (7) key sectors that include:

1. Climate-smart agribusiness;
2. Sustainable transport;
3. Green buildings and smart cities;
4. Renewable energy (RE) and energy efficiency (EE);
5. Waste management;
6. Water and irrigation; and
7. The financial sector.

Analyses and findings from this study can be a valuable resource in informing the revision, development and implementation of the national NDC process and actions in South Africa.

The report is structured in 9 chapters. The introduction and country context are presented in chapters 1 and 2 respectively. The institutional and policy framework for climate change follows in chapter 3 while an overview of NDC implementation in South Africa is covered in chapter 4. Chapter 5 presents an overview of the private sector landscape in green investment. The climate finance landscape in South Africa is covered in chapter 6.



The private sector challenges and opportunities for NDC implementation through green investments is presented in chapter 7 while chapters 8 and 9 respectively present the conclusions and recommendations.

1.3. Methodology

Data collection and analysis

Data for this study was collected from secondary and primary sources. Secondary data collection involved extensive identification and review of different policy, strategic, scientific, technical, project and program documents and reports. These documents were sourced from the web sites of governmental and non-governmental organizations, private sector, google scholar, web of science and bilateral and multilateral donor organizations operating in South Africa. Some of the key national policy documents analysed included the following:

- South Africa's Nationally Determined Contributions (NDC) 2015;
- South Africa's National Climate Change Response White Paper (NCCRWP);
- South Africa's National Climate Change Response Policy (NCCRP);
- National Communication to the United Nations Framework Convention on Climate Change (UNFCCC);
- National Climate Change Adaptation Strategy (NCCAS);
- Low-carbon Emission Development (LED) Strategy

Primary data collection was conducted mainly through virtual interviews (telephone, zoom, skype, google meet), e-mail exchanges, group and focus group discussions due to the COVID-19 pandemic situation which resulted in the country's lockdown. Some of the stakeholders contacted for this study came from South Africa's Department of Environment including the focal points on climate change, NDC and GCF, South Africa's Council for Scientific and Industrial Research (CSIR), National Business Initiative (NBI), African Development Bank's experts based in South Africa etc. In the process of primary data collection, an open questionnaire was used to guide interviews and discussions with focus on the project context, objectives and the key challenges, opportunities and recommendations for private sector involvement in NDC implementation and green investment in South Africa.

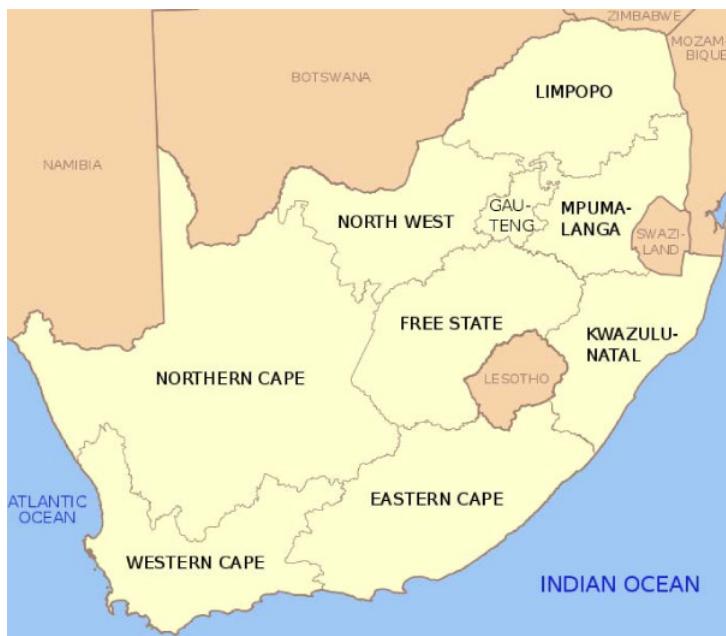
Limitation of the Study

This study was constrained by the COVID-19 lockdown, which made it difficult to meet respondents face to face during primary data collection. Another obstacle was the change of key resource persons at the Department of Environment that entailed restarting communication and discussions with the new leadership.



2. COUNTRY CONTEXT

2.1 Geography and population



South Africa occupies the most southern tip of Africa with its long coastline stretching more than 3 000 km from the desert border with Namibia on the Atlantic coast southwards around the tip of Africa and then north to the border of subtropical Mozambique on the Indian Ocean. Its surface area covers 1 219 602 km² stretching latitudinally from 22°S to 35°S and longitudinally from 17°E to 33°E. The country shares common boundaries with Namibia, Botswana, Zimbabwe, Mozambique and Swaziland, while the Mountain Kingdom of Lesotho is landlocked by South African territory in the south-east (see Figure 1).

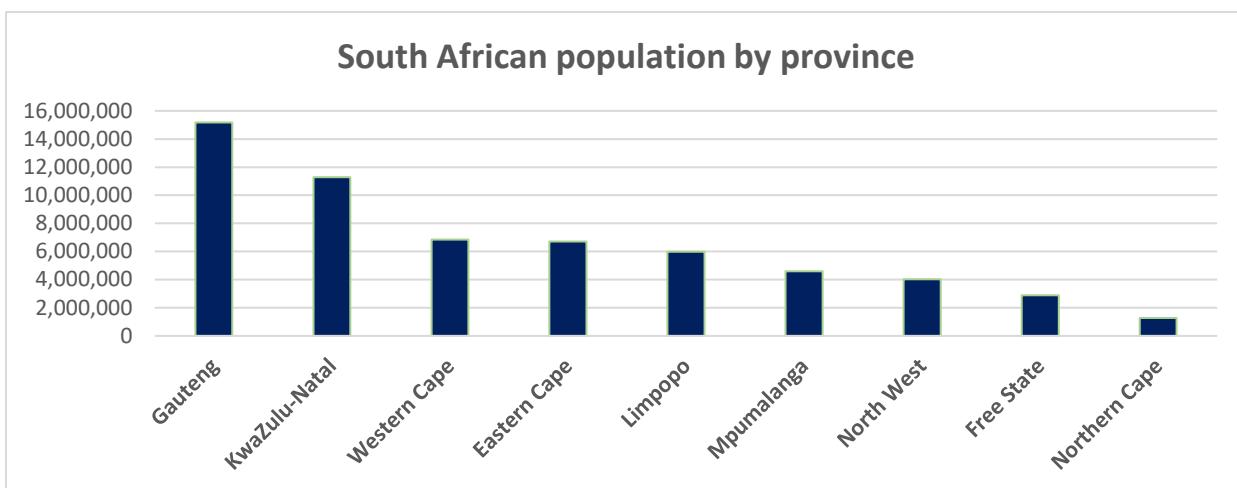
Figure 1: Map and Provinces of South Africa (source: Sartorius et al. 2011)

South Africa is a relatively dry country, with an average annual rainfall of about 464 mm. While the Western Cape gets most of its rainfall in winter, the rest of the country is generally a summer-rainfall region. While Johannesburg has an average summer temperature below 30°C., in winter, night-time temperatures can drop to freezing point or lower in some places. The coastal regions are relatively warm in winter while there is a striking contrast between temperatures on the country's east and west coasts, owing respectively to the warm Agulhas Current and cold Benguela Current that sweep the coastlines (GoSA 2020).



South Africa has an estimated population of 59,62 million people (Stats SA 2020). Around 51,1% (approximately 30,5 million) of the population is female, while 5,43 million people are aged 60 and over. South Africa has nine provinces. Figure 2 shows the population of South Africa by province according to Statistics South Africa, 2019.

Figure 2: Population by province



2.2 Economic and social development

The economy of South Africa is the second largest in Sub-Saharan Africa. As a regional development hub, it is the most industrialized and diversified economy on the African continent. South Africa represents an upper-middle-income economy (ie. one of only eight such countries in Africa). From 1996, South Africa's Gross Domestic Product almost tripled to peak at \$416 billion in 2011. However, it has since declined to approximately \$351 billion in 2019¹. In the same retro, the foreign exchange reserves increased from \$1 billion to nearly \$49 billion creating a diversified economy with a growing and sizable middle class. Additionally, in 2020 the top five challenges to doing business in the country were mainly, (i) electricity shortage (ii) restrictive labour regulations (iii) a shortage of skilled workers (iv) chronic structural

¹ World Bank national accounts data, 2021



unemployment (v) and corruption. Nonetheless, the country's strong banking sector is still rated as a strong positive feature of the economy. Consequently, the country is the only African member in the G20 group of countries.

In terms of Human Development Index (HDI), South African expected years of schooling increased from 11.4 to 13.8 between 1990 and 2019. Moreover, the South African HDI value increased from 0.627 to 0.709 in the same period. This denotes an overall increase of 13%. The Gross Domestic Product per capita in South Africa was last recorded at 12,481.80 US dollars in 2019 when adjusted by purchasing power parity (PPP). The GDP per Capita, in South Africa, when adjusted by Purchasing Power Parity is equivalent to 70% of the world's average. Regarding foreign direct investment (FDI), the lower global growth continues to impact on the overall size of the net FDI flows into South Africa. Statistics published by the South African Reserve Bank show that the lack of net investment income has been a large contributor to the South African current account deficit in recent years. In 2019, the FDI inflows to South Africa decreased by 15% to reach 4.6 billion US dollars, compared to a high inflow of 5.4 billion US dollars registered in 2018.

2.3 Climate vulnerability, risk and adaptation

Climate change poses significant social, economic and environmental risks and challenges globally. South Africa is vulnerable to the effects of climate change and has the task of balancing accelerating economic growth and transformation with sustainable use of environmental resources and responding to climate change. Climate change impacts that require adaptation responses include water shortages and drought, increased frequency and severity of floods, an increased frequency of extreme weather events, rising food insecurity, public health problems and damage to infrastructure and ecosystems.

A summary of the vulnerability of key socio-economic sectors in South Africa, *viz.* Agriculture and Forestry, Coastal Zones, Health, Terrestrial ecosystems, Urban and Rural Settlements and Water Resources, to climate change is shown in Table 1. Climate change poses a threat to physical assets, health and safety and business continuity. The impact of climate change on business in South Africa is felt in the following four key areas (NBI 2017):

- Decreased availability of raw materials, especially in relation to agriculture, forestry and fisheries;
- Risks to physical assets, including ports, pipelines, communication networks, mine infrastructure, transportation networks and electricity supply, and associated rising insurance costs;
- The interruption of operations, predominantly in relation to logistics, shipping, oil and gas, chemicals and retail environments;
- The health and safety of employees and communities, including in relation to extreme weather events, fatigue related accidents and changes in disease vectors.



Table 1: Summary of the vulnerability of key socio-economic sectors in South Africa to climate change (DEA 2018)

	SENSITIVITY ANALYSIS	EXPOSURE ANALYSIS			ADAPTATION PRIORITIES
Sector	Current stresses to the systems	Change in climatic driver (top priority)	Potential future consequences	Geographical Area	Actions required to cope
Agriculture and Forestry	<ul style="list-style-type: none"> Land use and change Water stress Invasive alien plants 	↓ rainfall	Reduction in yields	KZN, Mpumalanga, Western Cape	<ul style="list-style-type: none"> Climate Smart Agriculture Conservation Agriculture
		Δ rain distribution	Impact crop production	All 9 provinces	
		↑ heat waves	Increase pressure on water resources	All 9 provinces	
Coastal zone	<ul style="list-style-type: none"> Direct wave impacts, coastal flooding and inundation, and erosion and under-scouring Land use change 	Provinces with a coastline: <ul style="list-style-type: none"> Intrusion of saltwater Loss of or changes to coastal wetlands Higher (ground)water levels and limited soil drainage Flooding of low-lying areas and resultant damage erosion of beaches and bluffs 			<ul style="list-style-type: none"> Land use planning Designation of flood areas/ high risk areas and development - free zones Construction of dykes, groynes, bank protection, sea walls Beach nourishment, dune protection



Health	<ul style="list-style-type: none"> Quadruple burden of disease in SA and people from neighbouring countries Poor housing, infrastructure and service delivery 	<ul style="list-style-type: none"> A changing climate can have a myriad of impacts on the health sector There is a lack of understanding on the linkages between climate and health in South Africa (eg. quantitative link between high temperatures and mortality) 	<ul style="list-style-type: none"> Cross-sectoral cooperation and collaboration Tailored adaptation strategies to regions or communities based upon their risks and vulnerability
Terrestrial Ecosystems	<ul style="list-style-type: none"> Habitat fragmentation Land use change Invasive alien plants 	<ul style="list-style-type: none"> Rising temperature Temperature extremes Dec/increase in rain amount Rising CO₂ Changes in fire(?) 	<ul style="list-style-type: none"> Climate change will lead to changes across the biomes through the alteration of existing habitats, seasonal rainfall, species distribution, and changing ecosystems functioning. Threats vary in importance between the biomes, increase over time, and increase with the level of GHG.
Urban and Rural Settlements	<ul style="list-style-type: none"> Deficit in infrastructure and provision of services 	<ul style="list-style-type: none"> Different human settlement types and locations having varying vulnerabilities and capacities will experience the hazards Informal settlements and their population being the most exposed 	<ul style="list-style-type: none"> DRM Mainstreaming of no-regret interventions Principals of water sensitive urban design (WSUD) and consideration for ecological infrastructure



Water Resources	<ul style="list-style-type: none"> High water demand: current water usage already exceeds reliable yield High levels of variability in rainfall from year to year, resulting in frequent floods and droughts Deteriorating water quality of major river systems, water storage reservoirs and ground water resources (eg. acid mine drainage) 	↓ rainfall	Increase in water demand from agriculture, power generation, settlements	<ul style="list-style-type: none"> National water policies, plans and funds mainstream climate change adaptation monitoring and information needs to be appropriately designed Infrastructure development, operation and maintenance Groundwater needs to be protected by preventing groundwater degradation and unwise exploitation
		↑ intense rainfall	Increased erosions and sedimentation of dams and rivers	
		↑ temperature	<ul style="list-style-type: none"> Increase evaporation loss from dams Affect biological and microbiological processes 	



2.4 GHG emission

South Africa's aggregated net GHG emissions, including Forestry and Other Land Uses (FOLU), were 426 214 Gg CO₂ equivalence (eq) in 2000 and these increased to 512 383 Gg CO₂ eq by 2015 (Table 2). Between 2000 and 2015 the average annual growth was 1.43%, with the energy category being the main contributor to this increase. The Energy sector accounted for 79.5% of the total gross emissions for South Africa in 2015 with the main contributions coming from energy industries especially electricity generation and liquid fuels production from both crude oil and coal. Additional energy emissions come from transport, manufacturing industries, construction and fugitive emissions from fuels. Other contributing categories to the gross national GHG emissions in 2015 include Industrial Process and Product Use (IPPU) (7.7%), Agriculture, Forestry and Other Land Use (AFOLU) (9.0%), and Waste (3.6%) (DEA 2019a).

Presenting GHG emissions in terms of economic sector rather than emission categories, the highest contributor will be from electricity generation (42%), followed by industry (27%), agriculture (10%), transport (10%), while the remainder will come from the waste sector.

South Africa's economy is increasingly becoming less energy-intensive. Between 2000 and 2015, the carbon intensity of the economy and the energy intensity of the economy respectively decreased by 18.7% and 12.4%. This is due to declining manufacturing and mining sectors and the growth in the less energy intensive services and financial sectors (GoSA 2020).



Table 2: Changes in South Africa's gross and net emissions between 2000 and 2015 by sector

Greenhouse gas source and sink sector	Emissions (Gg CO ₂ e)		Difference (Gg CO ₂ e)	Change (%)
	2000	2015		
Total net emissions (incl. FOLU)	426 214	512 383	86 169	20.2
Total gross emissions (excl. FOLU)	439 238	540 854	101 616	23.1
1. ENERGY	343 790	429 907	86 117	25.0
2. IPPU	34 071	41 882	7 811	22.9
3. AFOLU (excl. FOLU)	50 539	49 531	-1 008	-2.0
3. AFOLU (incl. FOLU)	37 515	21 060	-16 455	-43.9
4. WASTE	10 838	19 533	8 695	80.2

Source: DEA 2019



3. INSTITUTIONAL AND POLICY FRAMEWORK

3.1 Institutional framework

The Inter-Ministerial Committee on Climate Change (IMCCC) is a committee that coordinates and aligns climate change response actions with national policies and legislation. The IMCCC consists of the Minister of Environment as the chair and a sub-committee of the full Cabinet. The National Committee on Climate Change (NCCC) advises and consults the Department of Environment, Forestry and Fisheries (DEFF) through the Deputy Director for Climate Change and Air Quality Management, on national matters relating to the implementation of the National Climate Change Response Policy and UNFCCC commitments.

The DEFF also plays a central coordinating and policy-making role as the designated authority for environmental conservation and protection in South Africa. It monitors national environmental information, policies, programs and legislation related to climate change. The department is responsible for providing guidance and ensuring that there is a clear alignment of policies and international obligations when it comes to climate change.

DEFF is responsible for co-ordination and management of all climate change-related information such as mitigation, adaption, monitoring and evaluation programmes. The Department leads the work on the ongoing preparation of National Communications (NCs) and Biennial Update Reports (BURs) under the Chief Directorate: International Climate Change Relations and Negotiations.

Recently in September 2020, the South Africa Cabinet approved the Presidential Climate Change Coordinating Commission (PCCCC) to coordinate and oversee the “Just Transition” of South Africa into a low-carbon and climate resilient future. The PCCCC will be chaired by a Presidential nominee and will align South Africa’s commitment to the NDC to contribute to the global goals on emissions reduction, adaptation and finance outlined in the Paris Agreement on Climate Change.

3.2 Policy framework

South Africa’s climate change response is guided by section 24 of the Constitution of the Republic of South Africa (1996), National Development Plan (NDP, 2011) and the National Climate Change Response Policy (NCCRP) (DEA, 2011) amongst others. NCCRP provides a clear framework for the mainstreaming of climate-resilient development and all government sectors have to ensure that all policies, strategies, legislation, regulations and plans are in alignment with the NCCRP (DEA 2011). Table 3 presents South Africa’s climate change policy framework, which supports the country’s low-carbon transition within the context of the NDP. It includes legislation, national policy and policies in draft, international commitments,



and voluntary instruments. Table 4 equally provides sectoral priorities policies, strategies and plans to create an enabling policy environment for the private sector.

Table 3: South Africa's climate change policy framework (DEA-NBI 2017)

YEAR	TYPE	NAME
1996	Legislation	The Constitution of the Republic of South Africa (Section 24)
2011	National Policy	National Climate Change Response Policy (NCCRP)
2011	Legislation	Energy Efficiency Building Regulations
2012	Legislation	National Development Plan (NDP) 2030 (for a just transition)
2014	Legislation	National Environmental Management: Air Quality Act, 2004 (as amended)
2015-2016	International Commitment	South Africa's Nationally Determined Contribution (NDC)
2016	Draft Policy	National Energy Efficiency Strategy (Post 2015)
2016	Draft Policy	Draft Integrated Energy Plan (IEP)
2016	Draft Policy	Draft Integrated Resource Plan (IRP)
2016-2020	Voluntary Instrument	Desired Emission Reduction Outcomes (Sectoral Emissions Targets)



2016-2020	Voluntary Instrument	Carbon Budgets
2017	Draft Policy	National Adaptation Strategy
2017	Draft Policy	Climate Change Legal Framework
2017	National Policy	Green Transport
2017	Legislation	GHG Reporting and Pollution Prevention Plans
2017	National Policy Study	National Employment Vulnerability Assessment
2018	National Policy Study	Policies and Measures (PAMs)
2018	Draft Legislation	Carbon Tax
2018	National Policy	Low-Emission Development Strategy 2050
2019	Draft Policy	National Climate Change Adaptation Strategy



Table 4. South Africa's sectoral priorities policies, strategies and plans in terms of attracting private sector development for green investment

MITIGATION				
WASTE				
POLICIES LINKED TO CLIMATE CHANGE	SUPPORTING POLICIES, STRATEGIES, PLANS	POLICY GOALS	TARGETS / OUTCOMES	IMPACTS
Waste Research, Development and Innovation (RDI) Roadmap (DST, 2014)	Waste Act 59 of 2008; Waste Act 26 of 2014; National Waste Management Strategy 2020; Bioeconomy Strategy 2013	Grow the waste sector from 0.62% of GDP to 1-1.5% of GDP by 2023 by accelerating the waste recycling economy and growing the waste to energy economy.	Strengthen identification, monitoring, evaluation and reporting on environmental impacts of waste and its management to inform effective responses	By 2025, have a network and inter-disciplinary RDI programmes which support the reduced impact of waste on the environment, with a particular emphasis on waste and climate change mitigation and adaptation



TRANSPORT				
Green Transport Strategy (GTS), 2018	The White Paper on National Transport 1996; National Freight Logistics Strategy 2005; Public Transport Strategy 2007; National Land Transport Act 2009; National Transport Master Plan 2016	Identify and propose key measures to substantially reduce GHG emissions and other environmental impacts from the transport sector by 5% by 2050. Actions are prioritised to expand the public transport network, while making public transport available, affordable, convenient and easily accessible.	20% shift of passenger transport from private to public transport; 30% shift of freight transport from road to rail; Convert 5% of the public fleet by 2025 and 2% annual increase to cleaner, low carbon and efficient technology vehicles	Contribute to the reduction of South Africa's total GHG emissions by committing to a 5% reduction of emission in the transport sector by 2050.
ENERGY				
Integrated Resource Plan, 2019	White Paper on Energy Policy 1998;	The IRP is an electricity infrastructure development plan based on least-cost electricity	IRP 2019 supports a diverse energy mix and sets out nine policy	1 500MW of new coal-fired power will be procured by 2030 through high efficiency, low emissions technologies,



(2010 version revised)	National Energy Efficiency Strategy 2008; Integrated Energy Plan 2016	supply and demand balance, taking into account security of supply and the environment (minimize negative emissions and water usage).The promulgated IRP 2010–2030 identified the preferred generation required to meet expected demand growth up to 2030.	supply and demand side decisions in the short term to minimise the risk of load shedding (power blackouts) and/or extensive use of diesel peaking plants.	gasification and carbon capture and storage; Procurement of 1 860MW of nuclear power to be commissioned by 2024; 6 000MW of new solar PV capacity and 1 4400MW of new wind power capacity will be commissioned by 2030; 5 000MW of battery storage will be commissioned by 2030; 1 000MW of new gas to power will be installed by 2023 and 2 000MW will be installed by 2027; Procurement of distributed generation up to 2022, capped at 500MW/year up to 2030; Purchase of 2,500MW of hydroelectric power from the Grand Inga Project in the Democratic Republic of Congo (DRC).
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ADAPTATION

WATER

POLICIES LINKED TO CLIMATE CHANGE	SUPPORTING POLICIES, STRATEGIES, PLANS	POLICY GOALS	TARGETS / OUTCOMES	IMPACTS
Climate Change Response Strategy for the Water and Sanitation Sector, 2019	National Water Resource Strategies (2004 and 2013); Department of Water and Sanitation Revised Strategic Plan, 2015/16 – 2019/20	Sets out the key strategic actions to be undertaken to address climate change in the water and sanitation sector	Good water management and governance for climate adaptation. Build resilience and reduce vulnerability to the water related impacts of climate change.	Conservation of water resources; Increased community climate resilience; Economic savings at both public and private sector levels due to increases in water efficiencies and quality;

CLIMATE-SMART AGRIBUSINESS AND FOREST

Draft Climate Change Adaptation and Mitigation Plan for South African	Draft Conservation Agriculture Policy 2017;	Reduce the harmful climate impacts by encouraging the introduction of	Agriculture sector Conservation agriculture; Developing water	Agriculture sector Greenhouse gas emissions are expected to reduce due to
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Agriculture, Forestry, and Fisheries Sectors, 2018	Agricultural Policy Action Plan (APAP) 2014; Integrated Growth and Development Plan 2012	adaptation measures to anticipate and lessen harmful climate effects	infrastructure and conservation measures; Rangeland and livestock management. <i>Forestry sector</i> Strengthening community-based forestry and diversification of livelihood skills; Fire mitigation; Disaster management and early warning systems; Landscape planning; Ecosystems-based adaptation.	increased climate-smart agriculture that lowers agricultural emissions is more resilient to climate changes and boosts agricultural yields. <i>Forestry sector</i> Reforestation projects can be registered with carbon standards and effectively act as an emissions sequestration method.
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Draft Climate Smart Agriculture (CSA) Strategic Framework, 2018	<p>Enhance resilience to climatic and weather shocks on the social, environmental, and economic aspects of agriculture, forestry and fisheries production and food systems</p>	<p>Mainstream CSA into agriculture, forestry and fisheries plans, programs and projects;</p> <p>Increase productivity; Enhance resilience to climatic and weather shocks; efficient use of agricultural, agribusiness, forestry and fisheries resources; Scaling-up of agroforestry contribution towards mitigation.</p>	<p>Strengthen governance and institutional coordination for effective CSA; Contribute to low carbon development;</p> <p>Reduced land degradation and soil erosion. Improve food security and health and economies.</p>
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GREEN BUILDINGS AND SMART CITIES

Department of Human Settlements' Environmental Implementation Plan 2015-2020	Draft National Spatial Development Framework, 2018; Neighbourhood Planning and Design Guide 2019.	Comply with environmental management principles for sustainable development outlined in Section 2 of NEMA	Environmentally sustainable land use development; Integrated Development Planning; Needs and priorities of people in informal settlements; Environmentally sound low-cost housing and planning for housing development	Reduce the environmental impacts on natural resources such as water, air and soil resources; Improved resilience of vulnerable communities to climate impacts, especially physical risks related to infrastructure and human health and, as a result improved community economies; Expected reduction in greenhouse gas emissions with environmentally sound housing and infrastructure development.
Department of Human Settlements' Climate Change Adaptation Sector Strategy for Rural Human Settlements, 2013		To create sustainable livelihoods that are resilient to the shocks and stresses caused by climate change and do not adversely affect the environment for present and future generations	Guidelines for municipalities and communities for incorporating climate risk and adaptation plans into human settlements planning; Effective spatial flood planning; Land rehabilitation; Climate resilient rural housing programmes; Climate-related disaster risk reduction and management .	



4. NDC IMPLEMENTATION

4.1 NDC commitments and key programs

South Africa's NDC consists of an adaptation component, a mitigation component, and a support component. The adaptation component of the NDC addressed adaptation through six goals for the period 2020-2030 which are underpinned by key elements of adaptation planning, cost of adaptation investment requirements, equity and means of implementation (DEA, 2015). The mitigation component of the NDC takes the form of a peak, plateau and decline GHG emissions trajectory range which is different from SA's "deviation from business-as-usual" form of commitment. The support component of the NDC includes the analyses of specific sectors and initiatives to report on indicative scales of finance and investment required for both adaptation and mitigation.

Key programmes identified that could assist in scaling-up the 'Support' component of South Africa's NDC correspond with the Climate Change Flagship Programmes are shown in Table 5. The Climate Change Flagship Programmes provide a focal point for attracting and leveraging investment from both the private and public sectors at the scale required to enable meaningful climate action (DEA, 2017). Public co-funding needs to be used to leverage funding from the private sector and climate finance mechanisms such as the GCF.

Table 5. Programs and response measures for scaling-up the 'Support' component of South Africa's NDC (DEA, 2017)

Component	Key Program and Measures to be Scaled Up as per the NDC	Corresponding Climate Change Near Term Priority Flagship Program
Adaptation	<ul style="list-style-type: none"> • Working for water • Working on wetlands • Land restoration • Water conservation and demand management 	<ul style="list-style-type: none"> • The WCWDM flagship program • Social protection systems and public works program



Mitigation	<ul style="list-style-type: none"> • Renewable energy independent power producer procurement program • Solar photovoltaic, solar water heater and wind • Decarbonised electricity by 2050 • Carbon capture and storage • Energy efficiency and advanced bio-energy • Investment in public transport infrastructure and electric vehicles • Working on fire 	<ul style="list-style-type: none"> • The RE flagship program • The EEED flagship program • The carbon capture and sequestration flagship program • The low carbon climate resilient transport systems flagship program • Low carbon, climate resilient built environment, communities and human settlement flagship program
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4.2 NDC-aligned actions implemented by the private sector

The following section presents examples and case studies that demonstrate successfully implemented green projects by the private sector that align with the proposed actions identified in the NDC of South Africa. Some of these projects have been implemented while others are still underway. The examples were selected based on: the direct or indirect involvement of the private sector / SMEs, success in securing green finance and their focus on one of the seven sectors covered in this study. The examples presented below are drawn from South Africa's First Annual Climate Change report (DEA, 2016), Second Annual Climate Change Reports (DEA, 2017) as well as the different banks and multilateral initiatives financing green investments in South Africa.



4.2.1. Agribusiness and forestry sector

CASE 1: SCALING UP ECOSYSTEM-BASED APPROACHES TO MANAGING CLIMATE INTENSIFIED DISASTER RISKS IN VULNERABLE REGIONS OF SOUTH AFRICA

ABOUT THE PROJECT

The climate adaptation project intends to: (i) rehabilitate vulnerable catchments and landscapes to reduce drought, flood and wildfire risk, (ii) Integrate ecosystem-based approaches into settlement planning and disaster risk reduction and preparedness to build resilience and (iii) Upscale pathways for integrated and transformative ecosystem-based approaches to climate intensified disaster risk reduction.

FINANCING STRUCTURE

The project is under consideration for funding by the GCF. If approved and funded by the GCF, the project will cost \$48.9 million, of which the GCF will provide \$20 million as grant while the remaining funds will come from the Natural Resource Management Program of Department of Environment Forestry and Fisheries (DEFF-NRM), National Disaster Management Centre, public and private sectors in South Africa and the Municipal Infrastructure Grant of the South African government.

OUTCOME AND IMPACT

The project is expected to increase the residence of 200,000 vulnerable people and ecosystems to impacts of climate change. The project will also strengthen government, institutional and regulatory systems for climate-responsive development planning.

Source: SANBI 2019



4.2.2. Transportation sector

CASE 2: SUSTAINABLE TRANSPORT AND SPORT THROUGH PUBLIC PRIVATE PARTNERSHIP

ABOUT THE PROJECT

The climate change mitigation project provides an effective, sustainable and environment-friendly urban public transport system in selected cities of South Africa by means of Public Private Partnerships. Three categories of transport system improvements addressed by the project included high-impact mode-shift projects to implement Bus Rapid Transit in two cities, transport system efficiency improvement by implementation of a High-Occupancy Vehicle lane in one city and Non-Motorised Transport provision in two cities. The project linked the low-income residential area of Mangaung with the central business district (CBD) and the industrial area as well as linking the two stadiums (the soccer stadium and the training stadium) that were to be used in the 2010 World Cup.

FINANCING STRUCTURE

The project was financed mainly through grant and state funds. The total budget of the project was \$334,941,313 with \$10,999,361 from GEF. A total of \$323,941,952 was available as co-financing contributions especially from the South Africa government's Department of Transport (DoT) Public Transport Infrastructure Fund (PTIF).

OUTCOME AND IMPACT

The project will lead to a reduction in direct GHG emissions associated with modal shifts and higher transport system efficiency at an estimated 423,000 tCO₂ over a ten-year lifespan. The air quality of the project area will also be improved as well reductions in ambient noise levels in the project areas.

Other outcomes included the construction of 94 km of Rea Vaya Bus Rapid Transit (BRT) in Johannesburg, 9 km of HOV lanes in Mbombela among others. Private Public Partnerships developed and working contracts in place for the operation of the system in Johannesburg and Port Elisabeth.

Source: GEF 2007



4.2.3. Green buildings and smart cities sector

CASE 3: GROWTHPOINT PROPERTIES LIMITED

ABOUT THE PROJECT

The project will finance the development and acquisition of properties for Growthpoint Healthcare Property Holdings Ltd (“GPHP”), South Africa’s first healthcare Real Estate Investment Trust (REIT). The properties include hospitals, clinics, diagnostics centers, laboratories and other healthcare related real estate. Growthpoint Properties is increasingly committing to sustainability and has pledged that all its developments will increasingly achieve at least a four-star Green Star South Africa rating from the Green Building Council South Africa and the green performance of its existing office buildings will be improved.

FINANCING STRUCTURE

IFC will finance the project with a loan of \$80 million. The proposed IFC financing package consists of: (i) a \$20 million equivalent equity investment in GPHP; and (ii) a \$60 million convertible C loan to Growthpoint. The C-loan investment shall be lent to Growthpoint for on-lending to GPHP. Upon the completion of the initial ramp-up phase of GPHP, which is expected to take 2-3 years, IFC will have the option to convert the C-loan or any portion of it into common equity in GPHP.

OUTCOME AND IMPACT

A reduction of the carbon footprint of all properties owned and managed by Growthpoint through energy efficiency, water efficiency, resource efficiency, occupants' health and well-being and sustainable site development.

Source: IFC 2020



4.2.4. Renewable energy sector

CASE 4: EMBEDDED GENERATION INVESTMENT PROGRAM (EGIP)

ABOUT THE PROGRAM

This climate mitigation program will provide credit support to private sector solar and wind Independent Power Producers established as special purpose vehicles that are backed by non-sovereign off-takers in order to enhance bankability of such renewable energy projects. Credit support will also be provided to special purpose vehicles, which are established and owned by Local Community Trusts (LCTs) and/or, Small, Medium and Micro-sized enterprises (SMMEs) to support such LCTs and SMMEs in obtaining and managing an equity ownership in local renewable energy sub-projects.

FINANCING STRUCTURE

The \$537 million (m) program is financed through loans and equity. GCF will contribute \$100m as loans while DBSA, who is the accredited entity and the executing entity for this program will contribute the rest of the loans and equity. DBSA will provide up to \$58m in form of subordinated debt and \$156m in form of senior loans DBSA's from its own funding resources, \$104,000,000 in form of senior loans from local private banks and financing institutions (LFIs), \$42m in the form of junior debt from DBSA, \$77,000,000 in the form of equity investments.

OUTCOME AND IMPACT

The program will support the implementation of renewable energy projects with a capacity of 330 MW, which is comprised of 280 MW Solar PV and 50 MW Wind. The program is expected to avoid 14.4 million tons of CO₂ equivalence emissions.

Source: GCF 2019



CASE 5: XINA SOLAR ONE PROJECT – SOUTH AFRICA

ABOUT THE PROJECT

The project aims at designing, constructing and operating a 100 MW concentrated solar power (CSP) plant using parabolic trough technology and a superheated steam cycle, that stores energy and dispatches during the South African peak load demand periods, as well as during base load hours. The facility is located 30km north east of the town of Pofadder in the Khai Ma Municipality in the Northern Cape Province.

FINANCING STRUCTURE

The \$908 million (M) program is partly financed by the African Development Bank to the tune of \$141.5m in the form of loans. The Bank provided \$100m from its own funding resources while \$41.5m is provided by the Climate Technology Fund (CTF). Other sponsors and borrowers include: XiNa Solar One (Pty) Ltd, Industrial Development Corporation of South Africa (IDC), Public Investment Corporation and a Broad Black Based Economic Empowerment company (BBBEE).

OUTCOME AND IMPACT

The project has development outcomes include: (i) stimulating the renewable energy industry in and contributing to an energy mix diversification; (ii) enabling BBBEE ownership in the Project; (iii) creating up to 1,370 local jobs during the construction phase; and (iv) sourcing 40% of the Project's materials from South African companies.

Source: AfDB 2014



4.2.5. Waste management sector

CASE 6: SOUTH AFRICA WATER REUSE PROGRAMME (WRP)

ABOUT THE PROGRAM

This climate change adaptation program will establish a national water reuse programme that will support the preparation, financing and implementation of municipal water reuse projects. It will also establish water reuse infrastructure as a new asset class. Some of the activities to be supported are: identification and conceptualization of large scale water reuse projects, project preparation support to progress municipal reuse projects to a bankable stage, blended finance solution that will allow municipalities an alternative and competitively pricing option as well as funding the implementation of water reclamation, sludge management / beneficiation, and biogas energy generation projects. The program got approval in April 2020 for additional project preparation funds the GCF Project Preparation Facility (PPF).

FINANCING STRUCTURE

This project is yet to be implemented. A blended financing of between \$3 to 5 billion is expected to be mobilised for the implementation. In terms of the details, a concessional loan portion will be co-funded by the GCF (\$150m) and the DBSA (\$50m)– 4% to 7%. A credit enhancement portion (subordinated debt) will be funded by DFIs (including DBSA) and MDBs of between \$600m and \$1 500m (20-30%). A senior debt portion will be funded by the private sector (commercial banks, pensions funds, asset managers) of between \$2 200 million and \$3 300 million (66% to 73%). The initial establishment and operational cost of the Water Reuse Programme Management Office will cost about \$4 million. The GCF and DBSA will respectively provide about 85% and 15% of the \$4 million.

OUTCOME AND IMPACT

WRP will establish a programmatic approach to water reuse in South Africa to ensure a long-term platform to scale, prepare and implement water reuse project in a sustainable manner in order to address the water scarcity challenges caused by Climate Change in South Africa. The project will increase the resilience of vulnerable communities, infrastructure and ecosystems to the impacts of climate change.

Source: DBSA 2019



4.2.6. Financial sector

CASE 7: DEVELOPMENT BANK OF SOUTHERN AFRICA (DBSA) CLIMATE FINANCE FACILITY

ABOUT THE FACILITY

The facility will address critical market barriers in accelerating private sector climate investments to help South Africa, Eswatini, Namibia and Lesotho achieve their NDCs. The facility will finance climate mitigation actions in the areas of renewable energy and energy efficiency, low emission transport and green buildings and cities while adaptation actions to be addressed by include health and well-being, food and water security as well as ecosystem and ecosystem services.

FINANCING STRUCTURE

The \$170.6 million (m) facility is financed through loans and grants as follow: DBSA, who is the accredited entity for this facility will contribute \$55m plus \$0.6m in kind contribution, GCF will contribute \$55.6m, other direct foreign investments will contribute \$59m while \$0.3m will be in the form of a grant.

OUTCOME AND IMPACT

The project is expected to reduce or avoid 29.7 million tons of CO₂ equivalence emissions and will benefit 466,400 people by increasing their adaptive capacity to climate change impacts.

Source: GCF 2018



5. PRIVATE SECTOR LANDSCAPE

5.1 Key players for climate action

South Africa has the second largest economy in Africa after Nigeria. Based on World Bank national account data, its GDP is estimated at \$351 billion in 2019. Prior to the COVID-19 pandemic, South Africa's growth rate averaged 1.6% between 2009 and 2017. South Africa's GDP growth had slowed from 1.3% in 2017 to 0.7% in 2018 and 0.2 in 2019, the weakest pace of economic expansion since the 2008/09 global financial crisis. Recent forecast by the African Development Bank indicates that South Africa's 2020 growth is expected to contract by 8.2% in 2020. The government of South Africa therefore has as a priority to address the constraints for private sector development in order to stimulate job creation and promote inclusive low-carbon and climate resilient economic growth.

South Africa has a diversified private sector with 28% of formal firms in manufacturing, 37% in services and 18% in commerce (IFC 2019). Large firms and SMEs each play very vital roles in creating jobs and supporting the South African Economy. Large and old firms account for the bulk of job creation in South Africa. Up to 56% of jobs are concentrated in the top 1,000 large companies while the share of people working in firms with fewer than 50 workers has been declining since 2000 (IFC 2019).

South African SMEs on the other hand represents a critical engine of the economy. They contribute about 39% to the GDP, create 25.8% of the private sector jobs, enable inclusive growth with 38% of SMEs owned by women, represent 98.5% of businesses, employ between 50 and 60% of the country's workforce across all sectors, and are responsible for a quarter of job growth in the private sector (McKinsey and Company 2019).

The National Business Initiative (NBI) represents a platform for the private sector and business in South Africa – both national and international companies. NBI is working towards the sustainable growth and development of South Africa. NBI has a dedicated “Environmental Sustainability Program” that focusses on climate change, energy and water initiatives to create thought leadership, build capacity and foster collective action. The program helps businesses to understand the risks posed by climate change and the opportunities that climate change presents.

Key actions taken by NBI in 2018 and 2019 include the following (NBI 2020):

- Raised awareness on climate impacts on the South African economy and society;
- Established a commitment to a net-zero carbon economy by 2050;
- Launched the NBI Climate mApp, which is available in your phone's app store;
- Solidified member understanding of transition risk and the Financial Stability Board Task Force on Climate-related Financial Disclosures (TCFD);
- Established a Just Transition partnership with WWF and Just Share;
- Participated in UNFCCC COP events;



- Co-hosted the South African Talanoa Dialogues;
- Established partnerships between business and government in three critical water scarce economic hubs (Johannesburg, Cape Town, Richards Bay);
- Completed a large partnership-driven programme to establish the case for PPPs in water treatment (Kopano ya Metsi);
- Established an energy efficiency partnership with three government departments (Energy, Public Works and Environment);
- Participated in the National Employment Vulnerability Assessment policy working groups.

NBI future activities on within its “Environmental Sustainability Program” are summarized below (Table 6).

Table 6. Future activities for the Environmental Sustainability Program (NBI 2020)

FOCUS AREA	FUTURE ACTIVITIES
Climate change	<ul style="list-style-type: none"> • Contribute to proposed climate and energy legislation and plans; • Build the capacity of member companies to implement appropriate ambition levels, including through guides on TCFD, Carbon Pricing and Science-based Target (SBT); • Provide support for government and business at United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP); • Facilitate the Carbon Disclosure Project (CDP) Climate Change reporting; • Continue delivery of commitments under We Mean Business; • Support the development of stakeholder alliances to develop South African solutions, including through the Alliances for Climate Action and Just Transition; • Continue thought leadership and capacity building work on Transition, Risk and a Just Transition.
Energy	<ul style="list-style-type: none"> • Facilitate workshops to raise awareness on energy transitions; • Cooperate with the World Business Council on Sustainable Development (WBCSD) and Climate Group on corporate-led solutions for energy; • Participate in establishing the Energy Efficiency in Public Buildings and Infrastructure Programme with the goal of adding a private sector portion;
Water	<ul style="list-style-type: none"> • Implement a Gauteng Water Alliance, based on the UWASP and Western Cape models and enhanced partnership;



- Advance the role of industry in catchment management, including the use of nature-based solutions;
- Support the implementation of best practices in corporate water management;
- Work with members to identify and foster commercial opportunities in key areas, such as industrial water reuse and the sanitation economy;
- Implement Water Stewardship, CDP Water and Ecological Infrastructure for Water Security' projects;
- Establish pilot projects for PPPs in wastewater treatment and reuse.

5.2 Why should the South African private sector be interested in green investment?

According to (Anbumozhi et al., 2019) the world needs approximately \$20 trillion in capital expenditure for the low carbon energy supply and energy efficiency to meet the Paris Agreement targets. Given the large scale of the investment required to decouple carbon emissions from economic growth, the private sector capital investment is needed to accelerate the global decarbonisation agenda. The carbon-intensive growth models indicate that developing and emerging economies like Asia and Africa are more vulnerable to challenges of climate change. Following the NDC targets under the Paris Agreement framework, policymakers are now more determined in advancing viable and scalable climate mitigation and adaptation scenarios (Anbumozhi et al., 2019). Many developing and Least Developed Countries (LDCs) do have the required capital expenditure required for addressing the climate change challenges. The planning exercises that combine the public and the private sectors and give some visibility to private actors (eg. mitigation and adaptation investment) that is dependent on public infrastructures like electric vehicle charging or transmission lines that can distribute power generated by the private sector (Vogt-Schilb and Hallegatte, 2017).

The analysis by the (World Resources Institute, 2015) highlights the following key justification for Private sector contribution to NDCs:

Getting on track toward the 2°C goal: The greater the number of countries that put forward contributions, the greater chance we have to limit warming to 2°C. There will be more emissions reductions covered and tracked globally, and political momentum can build, encouraging others and catalysing further action. As a result, there is no single formula for how the world can fairly and efficiently achieve the necessary global emissions reductions. However, what is clear is that it will require international cooperation, as countries have varying capacities and responsibilities to reduce emissions and adapt to climate impacts. If collective actions are perceived to be fair, further cooperation and action can be achieved. Moreover, the contribution from the private sector can accelerate the realisation of the 1.5°C target as well as reducing the South African carbon footprint.



Policy integration: Developing NDCs can empower South Africa to associate climate change to other national priorities such as sustainable development and poverty reduction initiatives. It can also help countries coordinate amongst sectors that currently work in isolation from each other, and allow decision-makers to identify synergies amongst different sectoral strategies. Additionally, sending a credible signal regarding plans to reduce GHG emissions and enhance carbon stocks can stimulate investment and international support for mitigation activities, encourage technological innovation, and engage the private sector. Submission of an INDC might also allow for access to possible incentives, such as access to any market mechanisms created under the United Nation Climate Change agenda under the Paris Agreement and capacity-building support.

Demonstration of a political commitment: The COP 17 Durban decision to launch a process to develop the 2015 Paris Agreement noted that to achieve accelerated decarbonisation will require an applicable policy to all Parties as well the political will. Climate change is a global problem, therefore, every country should participate in its solution. Given the significant risks posed by climate change particularly for the African continent, the costs of inaction are dangerously exceptionally high. The South African NDC revision process is an opportunity to further integrate private sector mitigation efforts. If the private sector adaptation component can be included in the NDC, the NDC can also advance the profile of adaptation as well as articulating a country's long-term vision for adaptation and mitigation and thus help the private sector to gain international recognition based on the carbon emissions reduction commitments and investments.

Realization of non-climate benefits associated with mitigating climate change: The NDCs can provide an opportunity to design policies that make economic growth and climate objectives mutually reinforcing the private sector contributions. This will ensure that the necessary emissions reductions needed by 2030 have multiple economic and development benefits (World Resources Institute, 2015). For example, policies that promote the adoption of renewable energy supply not only can lower emissions, but also can reduce countries' vulnerability to energy price volatility, supply disruptions, and can produce significant benefits for human health and ecosystems by curbing air pollution from those that burn biomass and paraffin to meet their basic energy needs. A similar trend can be achieved by several industrial sectors in the area of manufacturing, mining, agriculture etc. Policies that reduce emissions from deforestation and forest degradation also deliver significant benefits for maintaining biodiversity, ecosystem services, and proving support for livelihoods. Significant investments can be made by the private sector toward supporting the low carbon economy transition thus strengthen resilience capability of South Africa.

Strengthening institutional and technical capacity: The NDC preparation and implementation process has the potential to strengthen national institutional capacity and transfer knowledge to private and public sectoral institutions. The progress can be tracked toward the implementation of private sector NDCs-aligned actions over time, the capacity of technical staff will increase and a foundation will be built for tracking progress not only in implementing the contribution but other climate change interventions as well.



Informing key stakeholders: The communication of NDCs can provide the opportunity to advance the understanding of the private sector stakeholders, as well as the international community, regarding future policy prospects, implementation of carbon reduction strategies, and expected emissions reductions and non-climate benefits that may result from the South African NDCs. This can help build political will for mitigation and adaptation actions by the private sector. Moreover, the private sector targeted NDCs can encourage stakeholders to engage in climate change policy planning. This also provides an opportunity to highlight needs and priorities that can be addressed by the private sector through the implementation of NDCs.

Communicate resource needs: The communication of South African private sector NDCs represents an opportunity to develop country's Parties abilities to communicate the additional action that is required from private sector carbon emissions. It can help Parties describe support needs for completion and implementation of low emissions development strategies and national adaptation plans or activities. Additionally, communication of such needs might encourage a swift Paris "alignment" and thus mobilize public and private resources from both national and international sources.

Skill developments and expertise: Consultation with key stakeholders in the private sector is critical to ensure that the NDCs responds to skills required for an accelerated decarbonisation agenda. The private sector can play a significant role in enabling skill development required to fast-track long-term carbon reduction targets. Early and ongoing engagement with stakeholders, including all relevant public, private sector actors, civil society, and academia, can lay the groundwork for successful outcomes.



5.3 SWOT Analysis for green investment

For more than a decade, international companies have chosen South Africa as the preferred business gateway into Africa. Until 2017, South Africa was ranked as the biggest economy of the African continent. Its infrastructure and logistics continue to lead Africa, ranking first in Africa according to the Ernest and Young Africa Attractiveness Index 2018 (EY 2019). South Africa is ranked as the sixth most attractive investment destination on the continent according to the African Investment Index 2018. (Quantum Global 2018). South Africa scored well on the size of the economy, real interest rate, import cover, doing business, demographics and social factors. South Africa ranks 84th out of 190 countries in the World Bank Group's 2020 Ease of Doing Business report, down from 82nd in 2018 (World Bank 2020). In terms of competitiveness, the World Economic Forum's 2019 Global Competitiveness Index indicates that South Africa's competitiveness has regained momentum after the recent political landscape shift and climbs 7 places to 60th. The country is a regional financial hub, with well-developed equity, insurance and credit markets (WEF 2019).

The SWOT analysis presents more details on the strengths, weaknesses, opportunities and threats that South African companies in the private sector have to deal with. Internal factors are within the South African companies in the private sector while external factors refer to factors outside the companies immediate sphere of control.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Strong manufacturing facilities • Vibrant digital and business ecosystem hub • Diversified financial and capital markets • World class research and development capacity • Strong agro-food value chain and export sector 	<ul style="list-style-type: none"> • Insufficient knowledge on NDCs • Insufficient financial resources to invest in NDCs through green investments • Economic interest overriding NDCs objectives • Private sector enterprises, especially MSMEs, have limited capacity to access finance • Insufficient knowledge and capacity to develop viable business plans, especially MSMEs



OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Improve current delivery models • Government financing and sustained support to post-COVID recovery • Initiatives to improve the provision of human capital and address skills shortages • Trade agreement: SADC and Continental Free Trade Area (CFTA) • SA is well-positioned to profit from a vibrant digital economy and to become a regional digital hub • Use of digital and new technologies to enhance low cost efficiency and reach 	<ul style="list-style-type: none"> • Policy uncertainty • Below potential economy growth • Stagnant South African image or brand • COVID-19 pandemic economic downturn • Slowdown in global growth and weak commodity prices; • Trade wars between US and China and rise in protectionism can threaten access to South Africa's traditional export markets. • Competition from other African countries that are creating attractive business environment; • Weak human capital and infrastructure • Governance challenges confronting the public sector and State owned Enterprises • Outdated tertiary/vocational curriculum with poor links to industry needs

(Sources: Interviews, IFC 2019, McKinsey 2020, NBI 2020)



6. LANDSCAPE OF CLIMATE FINANCE IN SOUTH AFRICA

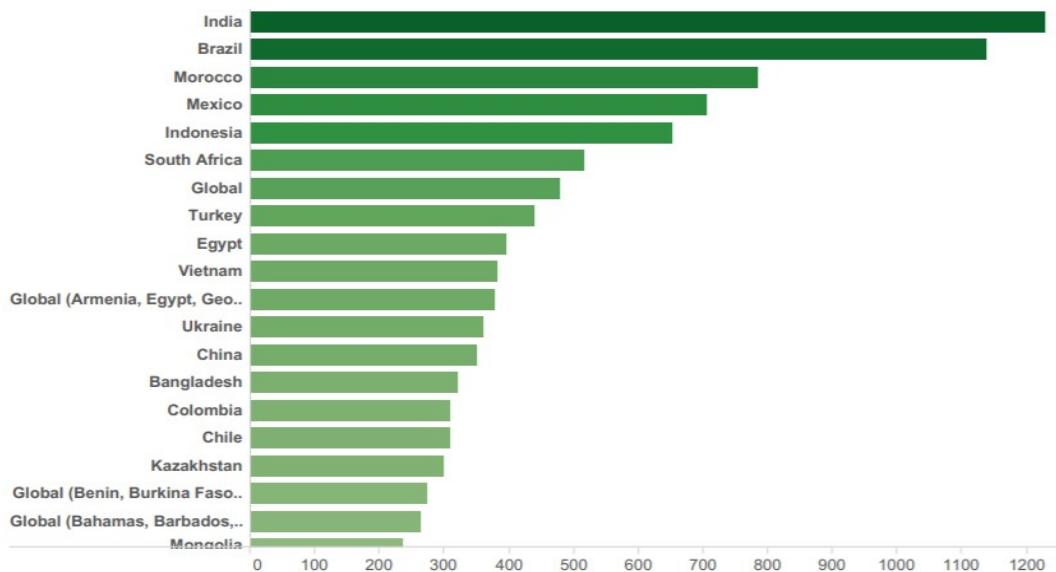
South Africa is the largest recipient of climate finance in Sub-Saharan Africa (see Figure 3). The main climate finance comes mainly from bilateral and multilateral sources as well as some local sources, in the form of grants, concessional loans and technical assistance. So far most of the funding comes from multilateral funds dedicated to fight climate change especially the Clean Technology Fund (CTF), Global Environmental Facility (GEF) and Green Climate Fund (GCF) and banks such as the African Development Bank (AFDB), International Finance Corporation (IFC), The European Investment Bank (EIB)International Bank of Reconstruction and Development (IBRD) and Development Bank of Southern Africa (DBSA) (see Table 7).

Bilateral agencies and funds on the other hand include: Australian Agency for International Development (AusAID), German Bank for Reconstruction and Development (KfW), German climate International Climate Initiative (IKI), United Kingdom (UK) Department for International Development (DFID), French Agency for Development, the Canadian Government, Japan International Cooperation Agency (JICA), Swedish International Development Agency (SIDA), and the U.S. Agency for International Development (USAID). At the local level, South Africa has the Green Fund (GF) that was established by the Department of Environmental Affairs and managed by the Development Bank of Southern Africa. South Africa also has the Industrial Development Corporation (IDC) Green Energy Efficiency Fund, which is the result of a partnership between the IDC and the German Development Bank (KfW) to fund energy efficiency and self-use renewable energy projects.

From an NDC perspective, South Africa is part of the NDC Partnership and the World Bank NDC Support Facility. These NDC initiatives facilitate the implementation of NDCs through the mobilization of financial and technical support.



Figure 3: Amount of Climate Finance approved by countries in \$ millions (CFU 2019)



A recent OECD study (McNicoll et al. 2017) on publicly mobilised private finance for climate action in South Africa, between 2010 and 2015 showed that domestic actors play the major mobilisation role. Between 2010 and 2015, South African public co-finance is estimated to have mobilised 64% out of a total of \$10.1 billion with loans being the primary mobilising instrument. International actors play a complementary mobilisation role through upstream fund-level investments and credit lines. The volumes of private finance mobilised by financial support through domestic policies (eg. tax incentives) are estimated to considerably outweigh volumes of private finance mobilised by public co-finance for both renewable energy and energy efficiency. The mobilisation effect of public co-finance in the renewable energy sector was estimated at 18%, compared to 95% for energy efficiency, while the mobilisation effect of financial support via policies was 82% for renewable energy versus 5% for energy efficiency. Climate-related international and domestic capacity building has had an indirect mobilisation effect on private investment. For instance, bilateral support for energy efficiency audit programmes helped to identify profitable investment opportunities in small and medium-sized enterprises, which have then benefited from tax incentives for energy efficiency improvements. In the water sector, incentives for climate adaptation-related private investment appear to be lacking, especially at the industry and household level.



Table 7: Example of funds for climate actions and green investment in South Africa

FUNDING SOURCE PROJECTS AND PROGRAMS	CLIMATE AREA	AMOUNT (\$ M)	FUND FOCUS	7 KEY SECTORS	COUNTRY AND FINANCIAL INSTRUMENT
GCF and DBSA • Climate Finance Facility	A+M	170.6	Private	Finance	• South Africa, Namibia, Lesotho and Eswatini • Loan and grant
GCF and DBSA • Embedded Generation Investment Program (EGIP)	Mitigation	537	Private	Energy	• South Africa (SA) • Loan and equity
GCF and German Development Bank (KfW) • Blue Action Fund (BAF): GCF Ecosystem Based Adaptation Programme in the Western Indian Ocean	Adaptation	65.3	Public	AFOLU, water, infrastructure,	• SA, Mozambique, Madagascar, Tanzania • Grant



GCF and French Development Agency (AFD)	A+M	775.5	Private	Energy, AFOLU, water, infrastructure, cities and waste	<ul style="list-style-type: none"> • SA and 16 countries • Loans and grants
BDSA	Adaptation	113	Public	Water	<ul style="list-style-type: none"> • South Africa • Loan and grant
DBSA and GEF	A+M	132.52	Mix	Cities, energy, waste	<ul style="list-style-type: none"> • South Africa • Loan and grant
DBSA	Mitigation		Private	Energy	<ul style="list-style-type: none"> • South Africa • Loan and grant



Adaptation Fund • Building resilience in the Greater uMngeni Catchment	Adaptation	7.5	Public	Water	• South Africa • Grant
CTF, AfDB, World Bank • Eskom 100 MW-capacity Western Cape wind power plant	Mitigation	185.6	Public	Energy	• South Africa • Loan
CTF, AfDB, • Eskom 100 MW-capacity Upington concentrated solar plant	Mitigation	264.4	Public	Energy	• South Africa • Loan
CTF, AFDB and IFC • Sustainable Energy Acceleration Program (SEAP)	Mitigation	143.5	Private	Energy	• South Africa • Loan and grant



CTF, AfDB and IBRD • Eskom Renewable Support Project	Mitigation	1900.65	Public	Energy	• South Africa • Loan
CTF and IFC • Sustainable Energy Acceleration Program	Mitigation	2219.79	Private	Energy	• South Africa • Loan
GEF, UNDP, DBSA, Government of SA, and Eskom • Leapfrogging South Africa's Markets to High Efficiency LED Lighting and High Efficiency Distribution Transformers	Mitigation	89.73	Public	Energy	• South Africa • Grant and loan
Special Climate Change Fund (SCCF) and GEF • Reducing Disaster Risks from Wildfire Hazards Associated with Climate Change	Adaptation	34.57	Public	AFOLU	✓ South Africa ✓ Grant



GEF and Public Transport Infrastructure Fund of South Africa • Sustainable Public Transport and Sport, a 2010 Opportunity	Mitigation	334.94	Public	Transport	✓ South Africa ✓ Grant
GEF, Banks, Private sector, Government of South Africa • Promoting Organic Waste-to-Energy and other Low-carbon Technologies in Small and Medium-scale Enterprises (SMMEs): Accelerating Biogas Market Development	Mitigation	46.196	Mix	Waste	✓ South Africa ✓ Grant, loans, equity
GEF, Private sector, Banks, DFID, SECO, SA Government • Industrial Energy Efficiency Improvement in SA through Mainstreaming the Introduction of Energy	Mitigation	44.265	Public	Energy	✓ South Africa ✓ Grant



Management Systems and Energy Systems Optimization					
GEF, SA local and national governments, private industries • Energy Efficient Low-carbon Transport	Mitigation	30.77	Public	Transport, energy	✓ South Africa ✓ Grant
GEF and UNIDO • Cleantech Programme for SMEs in South Africa	Mitigation	7,99	Public		✓ South Africa ✓ Grant

A+M= Adaptation and Mitigation



7. PRIVATE SECTOR CHALLENGES AND OPPORTUNITIES FOR GREEN INVESTMENT

Prior to the Paris Agreement and formalisation of NDCs in 2015, the South African private sector was already pursuing sustainability activities. However, the private sector sees the NDCs as being an opportunity to structure, prioritise and define activities in a way that can enable partnerships to implement the country's National Development Plan.

In general, larger private sector organisations tend to have made significant inroads in aligning with the Paris Agreement into the business. The public private partnership (PPP) training courses and training materials offered by the Government Technical Advisory Centre (GTAC) provide a strong entry point for getting to grips with PPPs in South Africa. While several actions have been taken by the Government of South Africa to create opportunities in the green investment space, existing challenges should be further addressed to attract new private sector investment as well as strengthen existing private sectors particularly the SMEs.

This section therefore presents the challenges and opportunities for the private sector to get involved in the implementation of South African NDC through green investments. Before getting into the specifics for each of the seven focal areas of this study, we first present some of the cross-cutting challenges and opportunities.

7.1 Cross-cutting challenges

Poor tracking of private sector and international climate finances: There is the absence of a systematic and up-to-date tracking of private sector finances, international flow of climate finance and projects related to South African NDC priorities. This makes it difficult for the government to have a true picture of private sector and international climate financial flows into green investment in general and NDC implementation in particular, hence making reporting under the climate convention as well as climate actions by businesses less robust.

Insufficient access to climate funds: While the implementation of some green projects including four GCF projects are ongoing with a strong involvement of the DBSA, a vast majority of South African large businesses and SMEs have had little success in directly or indirectly accessing dedicated climate funds and concessional green loans. The procedures and requirements to access these funds remain a big challenge for a majority of the businesses. This in turn makes it difficult for the Government of South Africa to meet its NDC contribution to fighting climate change.



The need for stronger policy and legislative frameworks to guide company climate response efforts:

The government has made progress to define adaptation and mitigation strategies including the climate bill. However, the private sector needs more incentives and clarity on specific sectoral laws, regulations and policies put forward by the government (NBI 2017). Moreover, there is often a misalignment between South Africa's green economy vision, industrial policy and structure of the financial system (KPMG and NBI 2013).

Increasing focus on COVID-19 and decreasing focus on green projects: While some NDC and green projects are currently being implemented in South Africa, the negative impact of the COVID-19 global pandemic has hit South Africa very hard, with one of the highest cases and deaths in Africa. South Africa experienced a decline of about 18% in employment between February and April 2020. Its economic activity is projected to contract by 7.2% in 2020 with a projected loss in government revenue of \$18.2 billion in 2020 (IMF 2020). To put the situation under control, the government of South Africa has shifted its priorities towards the post-Covid recovery with a strong focus on the health sector.

Weak business case for green investment in adaptation projects: South Africa just like many other African countries, finds it challenging to make a good business case for adaptation. This makes it difficult to attract private investment in adaptation projects. One area with high potential for private sector investment in adaptation is in the treatment and reuse of wastewater in urban communities and the related infrastructures.

Structural challenges: this is related to (a) financing early-stage (b) high risk projects and for moving projects from early development stages to commercialisation (c) funding for mid-size projects (d) sub-optimal coordination between commercial banks and development finance institutions (DFIs) (KPMG and NBI 2013, SADC and DBSA 2018).

Skills and capacity constraints: There are generally issues with (a) the limited technical capacity of implementation partners (b) project development skills shortages within project developers and (c) project sourcing and evaluation skills shortages within commercial banks (KPMG and NBI 2013). In addition, few businesses and SMEs have deeper understanding of climate change vulnerability, adaptation and mitigation processes, mechanisms, tools and frameworks related to their respective sectors.

Overwhelming focus on energy: There are far fewer non-energy related low carbon projects in South Africa. While it is justifiable to increase access to energy in order to run the economy of South Africa, more attention should be equally paid to other areas of low carbon transition potential especially in sustainable transportation, green cities, waste management and climate-smart agribusinesses and forestry.

Insufficient support for businesses to plan and respond to climate change: The response of businesses in terms of planning their climate change responses is constrained in terms of:



- Establishing the business case for adaptation planning, particularly where climate change is regarded as an environmental issue, rather than as a risk that could impact medium to long-term organisational survival;
- A lack of sector coordination and collaboration, which limits information sharing, regional adaptation planning and the achievement of economies of scale;
- The availability of locally relevant climate change data and tools, in particular the ability to access high resolution climate modelling data (both temporal and spatial) with known levels of uncertainty, in order to support decision making for business investments;
- Investment planning, and the difficulties associated with developing a sound financial case for spending on future anticipated risks (NBI 2017).

Additional challenges facing SMEs: According to the Banking Association of South Africa (2020), SMEs face additional challenges such: the use of appropriate clean technology and low production capacity (includes access to electricity), lack of management skills and in adequate skilled labour, access to finance and obtaining green line of credits, access to markets and developing relationships with customers, recognition by large companies and government bureaucracy, regulatory compliance, and weak governance of business operations.

7.2 Cross-cutting long-term strategic opportunities

The Government of South Africa's long term strategic opportunity for NDC implementation through green investments is presented through two policy strategy documents: one on adaptation and the other on mitigation (DEA 2019b, GoSA 2020). The two strategies are part of a comprehensive response by South Africa to the Paris Agreement's call for countries to set out long-term climate strategies and to implement their NDCs. Closely aligned to the two strategies is the Presidential Climate Change Coordinating Commission (PCCCC) that is responsible for exploring opportunities for new upstream and downstream green jobs and green industries, and climate resilience interventions that need to be expanded. For both strategies to enable the government to reach its NDC targets and contributions within the Paris Climate Agreement, the participation and contribution of large business and SMEs is a key determinant of success (DEA 2019b, GoSA 2020).



ADAPTATION:

South African Cabinet has recently approved a National Climate Change Adaptation Strategy (2019) – a national blueprint on how the country intends to enhance climate resilience and reduce climate vulnerability. The adaptation strategy covers 9 strategic interventions across the following areas:

- Reduce human and economic vulnerability, ensure resilience of physical capital and ecological infrastructure and build adaptive capacity;
- Develop a risk, early warning, vulnerability and adaptation monitoring system for key climate vulnerable sectors and geographic areas.
- Develop a vulnerability and resilience methodology framework that integrates biophysical and socio-economic aspects of vulnerability and resilience.
- Facilitate mainstreaming of adaptation responses into sectoral planning and implementation.
- Promote research application, technology development, transfer and adoption to support planning and implementation.
- Build the necessary capacity and awareness for climate change response.
- Establish effective governance and legislative processes to integrate climate change in development planning.
- Enable substantial flows of climate change adaptation finance from various sources.
- Develop and implement a monitoring and evaluation system that tracks implementation of adaptation actions and their effectiveness.

MITIGATION:

South African Cabinet approved a Low Emission development (LED) Strategy in September 2020. This document contains the plan of South Africa for emission reduction up to 2050. The LED strategy draws on existing policies, planning and research across economic sectors. LEDS centres on measures presently being implemented by government to address mitigation in the energy, industrial (including agriculture), forestry and land use and waste sectors. Various strategies, policies and sector plans have been developed for individual sectors of the economy, which will all contribute to driving emission reductions. In the long-term, sector departments will have to align, adjust, upscale and develop policies and measures to achieve Sector Emission Targets (SANews 2020).

Notable example of sectoral policies used in the LED strategy is the 2019 Integrated Resource Plan (IRP). The IRP focuses on how South Africa plans its electricity supply. The IRP outlines a transition from polluting coal generation to renewable sources like solar and wind. Currently, more than 90% of South Africa's energy is generated from coal, mainly mined and burned in the country's north-east by state-owned utility provider Eskom. The government wants to reduce this figure to 45% by 2030 and plans to shut down and repurpose several older coal power stations to achieve this (Jo 2020). Moreover, the government has



mobilized over \$15b of investment to get renewables built by private companies through its Renewable Energy Independent Power Producer (REIPP) scheme.

SMES:

In addition to the adaptation and LED strategies, the South African government is cognisant of the importance of SME's and has built frameworks for SME development and support. A few government initiatives have been put in place such as:

- The National Small Business Act of 1996, which defines SME's and provides for the establishment of the National Small Business Council and the Ntsika Enterprise Promotion Agency (Ntsika).
- Khula Enterprise Finance is charged with helping small and medium sized enterprises secure finance, primarily through the provision of security on behalf of small businesses to commercial banks, retail financial institutions, specialist funds and joint ventures, as well as offering loans through partner intermediaries.

There is a significant opportunity for government to work with entities such as the Small Enterprise Development Agency (SEDA) and the Small Enterprise Finance Agency (SEFA) to provide nuanced, sector-specific interventions to help SMEs get back on their feet post-crisis. Some sectors, for example, will need initial financing, while others may need more sustained support.

Several flagship programs and projects have been put in place by the government. One of the objectives of these programs and projects is to encourage private sector participation through green investment. Examples include: Biogas projects under the Climate Change Response Public Works flagship program, composting projects and landfill gas projects as well as the material recovery facilities under the waste management flagship program.



7.3 Sector specific challenges and opportunities

7.3.1 Climate-Smart Agribusiness and Forest Sector

Challenges faced by large businesses and SMEs in NDC implementation

Agriculture is estimated to currently consume in excess of 60 % of South Africa's surface water resources and a further significant fraction of ground water. Furthermore, demand for irrigation is predicted to increase by 15 – 30 % across the country. AFOLU activities are particularly at risk from climate change and create opportunities for programmes that link emissions reduction to resilience, food security and rural development goals (Tubiello 2014). However, many projects in this sector are both challenging and high risk, and therefore they currently do not attract the level of funding required to build resilience and address productivity while making good business case.

There is a need for meaningful platforms for effective collaboration within the Agribusiness and Forest sector across the private sector, with communities, and with the public sector to develop programmes to support the implementation of South Africa's NDC.

Another challenge for businesses and SMES is the limited understanding of the impacts of climate change on livestock. However, evidence from the recent drought in different parts of the country, for example, the KwaZulu Natal, showed large-scale devastation of livestock.

Opportunities for large businesses and SMEs in NDC implementation

The national government has different policies (DAFF 2017a, DAFF 2017b), approved and in draft form, that can be a lever for the private sector towards impactful participation in supporting the NDC implementation. They include:

- The draft Climate Change Sector Plan for the South African Agricultural and Forestry Sectors proposes the goal of afforesting 100,000 hectares of land in the Eastern Cape and KwaZulu-Natal. The intention is to expand small-grower community-based forestry by 100 000 hectares in these areas with the support of commercial forestry companies. This could amount to approximately 1.2 million tonnes of carbon sequestered.
- The DAFF Conservation Agriculture Policy of 2017 provides a sound basis for national and sector policy support for conservation agriculture (CA). Current CA adoption by grain growers is between 20 – 30% at a national scale.



- The DAFF Agroforestry Strategic Framework for South Africa 2017 presents a broad overview of the potential for agroforestry in a South African context by providing a set of principles and strategic themes and goals and further recognises the carbon sequestration potential role of agroforestry.
- The NDP 2030 highlights the AFOLU sector and emphasises natural resource management, rural employment opportunities, enhancement of agricultural value chains and renewable energy.

Furthermore, South African landscapes present opportunities for private sector investments in the promotion of large businesses, SMEs and Start-ups in the agricultural technology (AgriTech) area. Example of South African AgriTech Start-ups include:

- Aerobotics – provider of farm monitoring and pest management solution;
- Green Fingers Mobile – mobile-first SaaS platform for farmer data collection, credit scoring, and data analytics;
- MySmartFarm – cloud-based analytics software for farm data;
- Khula – online marketplace for agriculture products;
- WagyuX – online marketplace to buy wagyu cattle;
- Manstrat Agricultural Intelligence Solutions – digital platform for agronomy information for livestock and field crop farmers;
- Revolute Systems – provider of precision agriculture services.

7.3.2 Transportation Sector

Challenges faced by the private sector

The transportation sector remains one of the sectors in South Africa where emission levels are comparatively high. This means that if emission levels are to be reduced significantly, there is a need for both public and private investments to improve transport systems. Low confidence in the country's economic future hinders the private sector from venturing into the transportation sector. This is due partly to the uncertainty attached to government policies, particularly in the transportation sector such as regulatory uncertainty surrounding the continuity of the relative tax benefits of biofuels. The investment atmosphere, which is presently considered not to be the best, would need to be made as conducive as possible to attract private sector investment into sustainable green transportation. According to Tetani and Sifuba (2016), for the economic atmosphere to be conducive, the government would have to focus on advocacy, policy formulation, provision of incentives to overcome voluntary participation and development of infrastructure. This implies that borrowing costs may need to be made affordable, the potential risks should be made manageable and foreseeable.



Legislations and policies guiding the involvement of the private sector into development activities in SA have been termed cumbersome and complex, with issues of rule-bending and weak governance (Fombad, 2014). This has led to some organisations and / or institutions strictly adhering to the legislations, while others have not done so, which explains the slowdown in the private sector's interest to engage.

Insufficient tax incentives and funding options by the government towards the private sector discourages them from venturing into the green economy and transport sector, given that greening transport entails various sources of funds, as well as diverse activities. Such activities include transport technologies, capacity building, operations and infrastructure. Access to funding remains a challenge to private sector investment.

When public-private partnerships (PPPs) have been formed with the South African government, there has been a challenge of unclear or overlapping roles, which has made a few of such PPP projects unsuccessful. These PPPs usually have different stakeholders, each representing its own interest and when roles are not clearly defined from the onset, there is the risk of not having a consensus on what is to be done (Tetani and Sifuba 2016).

The government of SA finds it hard to release part of its control over the transportation sector to the private sector. It becomes hard for the private sector to engage while the government is in full control over the sector, implying that the government had preference for PPPs and not total privatisation of the transport sector. Some reasons have been advanced against relinquishing government control, which expresses preference of PPPs over complete privatisation. It is therefore left for the government and the private sector to find a common ground on ownership issues of the transportation sector.

Opportunities for the private sector in the transportation sector

The transport sector despite the challenges also presents opportunities from which the private sector could benefit, especially as it is one of those sectors that demands a large labour force to carry out low-emission development projects. This is because the switch to low-carbon technologies or transport systems entails infrastructural changes as well as technological transfer, where the private sector can be of great use. The private sector, through public-private partnerships could serve as a service delivery mechanism within the transportation sector, provide the necessary infrastructure that is needed to transform South Africa's transportation sector into a low-emission sector.

Capacity building which is usually an important part of low-carbon development both at the institutional and technical levels, presents a good opportunity for the private sector to step in. Awareness raising and training that is focused on sustainable transportation engineering and planning in SA also create space for private sector investment in the field of transportation (UNDP, 2010). This gives transport engineers and planners from the private sector an opportunity to provide support in the greening of SA's transportation sector.



The South African Green Transport Strategy for South Africa: 2018-2050, implemented through the sustainable transportation program, provides an overall policy orientation and the priority areas for potential private sector investments. Key areas include: decarbonizing the transport sector, reducing reliance on petroleum based fuels, designing of transport infrastructure, policy and governance alignment, extension of the rail network, provision of safe, efficient and reliable green rail transport, establishment of green procurement guidelines, norms and standards for green fuel economy, modal Shift to public transport, eco-mobility infrastructure as well as non invasive infrastructure.

7.3.3 Green Buildings and Smart Cities Sector

Challenges faced by the private sector

The GBCSA (2013) has launched the Green Star SA, known as Public and Education Building Rating Tool that will allow all public spaces to be rated whether they are publicly or privately owned. However, when it comes to “new” methods of developing sustainable construction, South Africa lacks the skills to achieve this successfully (GBCSA, 2013). Most small to medium sized companies cannot afford workers with technical and managerial skills as well as qualified professionals (Kats 2003) to address these sustainable construction needs of the industry. Major challenges uncovered by construction professionals that led to poor Green Building implementation in the South African building industry include the following (Mustapha 2016) :

- Green Buildings are too costly;
- Lack of proper knowledge of the advantages of Green Building;
- Lack of information about its benefit to the construction clients;
- Developers build to maximise profit only, not for users' comfort;
- Use of expensive technologies;
- Lack of stakeholders buy-in to the technology

Opportunities for the private sector

Advanced construction: Smart solutions for constructing housing for the future, such as 3D printed houses, can also be regarded under smart buildings. The 3D printed house, if proven beyond reproach, would revolutionize the housing market and improve the housing crisis that South Africa faces, in addition to possibly making the houses themselves smart by embedding ICT technologies during the “construction”.

Energy and water use efficiency solutions and technologies in building: The South Africa's building standards of 2016 requiring that at least 50% of the annual average hot water requirement of all new buildings must be met by sustainable or energy efficient technologies as opposed to electrical resistance heating technology. This opens up huge opportunities for the private sector to take the lead in terms of the



innovation, technology and investments in areas such as solar heating, heat pumps and heat recovery from other systems or processes. There is also the possibility of the private sector to collaborate with the Sustainable Energy Society of Southern Africa (SESSA) who has been working on this domain.

Smart minerals beneficiation for green/smart buildings: Some smart minerals that could play a crucial role in green building and smart cities are the following:

- **Silica and Lead:** These minerals are key components of crystalline-silica, which is the main constituent of about 92% of the current solar PV's on the market. Solar PV's would be one of the components of a smart building, enabling it to generate energy for own consumption and possibly feed to the grid. There are vast resources of silica dotted in and around Gauteng and Western Cape and some beneficiation of silica is currently in place in South Africa, mainly for the metallurgical, glass and construction industries. There is no production of electronic-grade silicon, despite the resources available. The country also has sufficient (7th largest in the world) resources of lead, located in the Northern Cape.
- **Cadmium and Tellurium:** Cadmium-Telluride is used to make another type of PV with about 5% market share. There are some tellurium resources reported in the Witwatersrand goldfields but no significant reports on cadmium.
- **Copper, Indium, Gallium, Selenium:** This combination of minerals makes up the Copper-indium-gallium-selenide (CIGS) class of PV's, which has about 2% market share in the PV industry. Of these, copper is mined in Phalaborwa, indium and gallium are found together with Zinc deposits in the Northern Cape, while selenium deposits are minimal and it is found in trace amounts in some PGM deposits on the Rustenburg belt.
- **Silver:** This mineral is used in a paste form in all types of solar panel as a conductor. South Africa is the twentieth largest producer of silver in the world and this is produced exclusively as a by-product of lead, copper, gold and PGM operations.

Roll-out of alternative technologies: The Council for Scientific and Industrial Research (CSIR) has been appointed to prepare the implementation plan for the roll-out of alternative building technologies (ABT) in terms of the Presidential Infrastructure Coordinating Commission (PICC) Council resolution. This requires 60% of Government's social infrastructure building to be constructed from ABT by 2017. The plan identifies the institutional arrangements that need to be made as well as the technical backing required to create a supportive environment for the use of ABT. ABT include, for example, framed panels fabricated off-site and assembled on-site. They are classified according to mass into heavy or light materials, and on-site or off-site fabrication (CSIR, 2013).



As a result, the plan recommends that an ABT Centre of Competence is established to develop the ABT sub-sector. It also recommends that an ABT Forum is created for stakeholders to communicate, and that a Government department is appointed to champion ABT. The stipulation to use ABT to construct 60% of new social infrastructure projects by 2017 was adopted by Cabinet in August. It arose out of the construction of 12 schools in the Eastern Cape during 2012 as part of a development agency IDT pilot project. A further 16 schools will be built in 2014 and the pilot project may result in the construction of an additional 30 schools. ABT are not covered by the building standards in the NBR. Therefore, they must either comply with the deemed-to-satisfy rules as set out by SANS, have a rational design, or be Agreement-certified (CSIR, 2014).

7.3.4 Water Resources and Irrigation Sector

Challenges faced by large businesses and SMEs in NDC implementation in South Africa

Drought and poor water service delivery are already constraining economic growth and hampering livelihoods in South Africa. Indeed, reliable water access is one of South Africa's major environmental and economic challenges. Some of the well-documented key challenges facing the water sector include: the deteriorating infrastructure, high levels of Non-Revenue Water and declining water quality. In addition, much of the water infrastructure was designed to support a considerably smaller population than it currently serves (NBI 2019a).

The water market is too risky at present, especially for prudent long-term investors like pension and provident funds. Despite this perception, the South African private sector is already playing a key role in the national water sector. Examples include helping to finance projects implemented by the Trans-Caledon Tunnel Authority, Water Boards and a number of municipalities, serving as the implementer of the two water concessions (located in Mbombela and iLembe respectively) and as a private operator of a number of municipal water assets (NBI 2019a).

Working collectively, South Africa need to improve the revenue flows of the municipalities that deliver water services. Much of this can be done through ensuring accurate metering and billing of customers. We can also combine a targeted subsidy for the poor with more cost-reflective tariffs for other users. The result of these measures will be to improve municipal income, encourage investment and support indigent households.

The NBI (2019a) lists four key barriers for the private sector with regards to PPP at set-up phase. These are: Lack of municipal capacity and political support; Lengthy PPP process; High initial transaction costs; Scepticism from trade unions. Furthermore, the three main barriers for PPP at the implementation phase. These are: Poor public sector contract management; Revenue risk from non-payment and absence of cost-reflective tariffs; contracting assumptions not holding up in implementation phase.



Opportunities for large businesses and SMEs to participate in NDC implementation

The report by the NBI (2019b) indicate that sector experts consistently raised desalination, any form of water reuse, wastewater treatment and non-revenue water as the major initial PPP opportunities in South Africa at present. These opportunities could be expanded upon to include for example, groundwater and conventional water treatment, over time (NBI, 2019b). Furthermore, this report indicated that the City of Johannesburg, eThekweni Municipality, City of Cape Town and Ekurhuleni Municipality are the most PPP suitable municipalities in the country. This short list is somewhat unsurprising given that it is made up of well-resourced large metropolitan municipalities that have considerable revenue base and strong levels of institutional capacity. Polokwane, Breede Valley, Witzenberg and Mangaung – were rated very good for PPP.

Major current challenges such as high levels of Non-Revenue Water (NRW) and failing wastewater treatment works represent enormous opportunities. The potential revenue that can be generated in tackling Non-revenue water (NRW) is R9.9 billion at latest estimates. Investments in this area could pay for themselves in months, not years. Revenue sharing models are also being used where both host municipalities and project implementers benefit financially from the water savings achieved in pressure management and leak reduction.

Run correctly, wastewater is a business that has a number of revenue streams. Revenue options include treatment charges, the use of nutrients in fertilisers, the generation of biogas and opportunities for water reuse. This is a key untapped opportunity for economic development and enhanced water security (NBI, 2019c).

7.3.5 Renewable Energy and Energy Efficiency Sector

Challenges faced by the private sector

Renewable energy is associated with the development of energy storage and in South Africa, energy storage is specifically mentioned in a few recent policy documents, such as the IRP 2019 and implied in others such as the White Paper on Renewable Energy (2003) and the National Energy Efficiency Strategy (2015), amongst others. However, there is currently no policy that deals specifically with energy storage in South Africa. This lack of policy has been flagged by some stakeholders as the reason for the slow development in the area of renewable energy and has caused inconsistencies in its implementation. Some of the barriers include:

Policy barriers

- **Existing environmental policies:** South Africa has several energy-related environmental legislation and policies, such as the carbon tax policy paper (2013) and the afore-mentioned white paper on



renewable energy, and other policies concerned with the blending of biofuels with conventional fuels. The promotion of renewable energy in these policies has direct implications for energy storage, but because the policy papers and legislation have been overtaken by events in the energy storage sector, they are largely silent on energy storage itself, apart from pumped hydro storage, which has been in existence for decades.

- **Lack of Energy Storage Policy:** The lack of a clear policy on energy storage has been flagged as one of the reasons for a lack of development in this area in South Africa. Enactment of policies and/or legislation to support energy storage development would elevate it to the priority list of national programmes, bring consistency to the energy storage market and accelerate development. This lack of a coherent policy cascades down to the regulatory framework, as elaborated on under the “Regulatory barriers” section.

Regulatory barriers

- **Licensing:** According to the Energy regulation Act (ERA), no entity may operate any power generation facility of between 1MW to 10MW without a license, issued by the National Energy Regulator of South Africa (NERSA). Entities generating capacities of 1MW and below need to be registered by NERSA. The majority of renewables and energy storage facilities operate within these capacities and are therefore impacted by NERSA regulations. There is a feeling amongst some that the blanket ministerial approval of up to 10MW for licensing should be increased to at least 100MW.
- **Administrative:** Municipal electricity tariffs are considered too low to encourage private customers to deploy renewables and energy storage to make the power system more efficient. In fact, municipal tariffs are below the Eskom purchase price, resulting in losses for the municipalities. This is again attributed to NERSA regulations on municipal incline block tariffs (IBTs). The tax regime has also been cited as a barrier to the deployment of renewables and energy storage systems. This market can be stimulated for key users of energy storage systems such as electric vehicles and independent power producers through a reduction and/or scrapping of import taxes of electric vehicles and allowing IPPs to develop standalone grid power systems, respectively. On the other hand, in order to stimulate local production, there could be a need to introduce levies/duties on complete import of Li-ion batteries from China of a size that are widely built or assembled locally.
- **Compliance and specifications:** The National Regulator for Compulsory Specifications (NRCS) is an entity of the Department of Trade, Industry and Competition established to administer compulsory specifications and other technical regulations with the view to protect human health, safety and the environment, and to ensure fair trade in accordance with government policies and guidelines. A need is identified to establish legislation through the NRCS for all imported Li-ion cells and renewable energy



technologies to be tested and validated to be safe. This not only prevents scrap and bad technology from being imported but also to protect the public and consumer from sub-standard technologies. On the other hand, NRCS is also encouraged to streamline its specifications with some of those in developed countries to avoid high standard equipment from falling foul of its regulations, thereby creating unnecessary red tape and as a result stifling development in the renewable and energy storage.

Lack of technology recognition

This is proving to be a barrier for the development of some of the energy storage technologies which are regarded as non-traditional. As part of the national Integrated Resource Plan (IRP) process, energy storage technologies outside of Power-to-Power should also be considered based on the sector-coupling approach (Power-to-Hydrogen, PtX, Power-to-Heat, Power-to-Transport).

The need for recognition of Compressed Air Energy Storage (CAES): Those involved in CAES indicate that their direct barrier is the fact that CAES is not considered by any institution in SA, government or academia as a viable product due solely to lack of knowledge on the part of these institutions.

Exclusion of Concentrated Solar Power Energy Materials: The exclusion of concentrated solar power (CSP) in the IRP is seen as a glaring omission because South Africa has the potential to become a world leader in this, coupled with the fact that the technology has already been piloted in SA.

Opportunities for the private sector

According to stakeholders, the following sections outline energy storage technologies that are currently being developed in South Africa for use with renewable sources, and those that are already being commercialised by various private entities.

Electrochemical energy storage

- Vanadium redox flow batteries;
- Lithium Ion Battery Components – LMO, LMNO, NMC, electrolytes and LFP cathodes; anodes (LTO and MnO_x – based)
- Lithium ion forklift batteries, the rest is protected IP but all involve batteries larger than 20kWh;
- Lithium ion battery control mechanisms; and
- Lead-acid technologies;
- Sodium-based technologies (Na-NiCl₂ Battery)



Chemical energy storage

- Hydrogen generation and storage.

Electrical energy storage

- Supercapacitors; and
- Ultracapacitors underpinned by nanotechnology and graphene.

Mechanical energy storage

- Adiabatic Compressed Air Energy Storage (above ground);
- Flywheels.

Thermal energy storage

- Heat storage;
- Thermal energy storage for waste heat recovery as well as Power-to-Heat sector coupling;
- Technology based on high temperature sensible heat storage in ceramic fixed beds; and
- Zeolite sorption heat storage.

7.3.6 Waste Management Sector

Challenges faced by big businesses and SMEs.

Below are the main challenges facing the private sector in the waste management sector in South Africa (DEA 2011, Makgae 2011, Godfrey and Oelofse 2017, NBI 2019d, Green Cape 2020) :

- **Increased complexity of the waste stream.** With the increasing urbanisation and industrialisation, the complexity of the waste stream directly affects the complexity of its management and related business opportunities, which is compounded when hazardous waste mixes with general waste.
- **Lack of reliable data for different waste:** The submission of waste data is not obligatory and where data is available, it is often unreliable and contradictory. This makes it very challenging for businesses and investors to analyse and fully understand the main waste flows and national waste balance.
- **The need for a stronger policy environment:** The policy and regulatory environment does not actively promote the waste management hierarchy. This has limited the economic potential of the waste management sector, which has an estimated turnover of approximately R10 billion per annum. Both waste collection and the recycling industry make meaningful contributions to job creation and GDP, and they can expand further.



- **Limited waste management infrastructure:** There is a limited presence or an absence of waste recycling infrastructure to enable separation of waste at source and diversion of waste streams to material recovery and buy back facilities. There is growing pressure on outdated waste management infrastructure, with declining levels of capital investment and maintenance in real terms.
- **Weak business case for waste management:** Waste management suffers from a pervasive under-pricing, which means that the costs of waste management are not fully appreciated by consumers and industry, and waste disposal is preferred over other options. Few waste treatment options are available to manage waste and so they are more expensive than landfill costs.
- **Organic waste:** Inadequate source of separation, difficult composting registration regulations; weak business confidence in bioenergy projects, competition for organics by pig farmers, difficult procurement / tender process, lack of market for by-products, lack of offtake for tailings, high tailings landfill disposal costs and lack of electricity grid feed-in.
- **Plastic waste:** Inadequate source of separation, contaminated recyclables means higher investment in waste removal equipment, delay in implementation of extended producer responsibility (EPR), low end-market growth, fluctuating virgin resin prices and saturated market for certain plastic recyclables.
- **E-waste:** Lack of reliable data, limited access to e-waste, difficulties in the licensing of recycling / recovery facilities, cherry-picking of high-value e-waste and the delay in implementation of EPR.
- **Challenges faced by municipalities affect private sector involvement in waste management:** The process of growing the waste sector starts with at the municipal level. Challenges faced by municipalities in the Wastewater Treatment Works (WWTWs) need to be addressed. They include: insufficient infrastructure, poor operations and maintenance, skills shortages, budgeting and financial management, legal compliance, governance challenges and poor management and (lack of) inter-governmental alignment.

Opportunities for big businesses and SMEs in the waste management sector

- **Organics:** Value-add to between 185 000 and 293 000 tonnes a year in the City of Cape Town (CCT) metropolitan area Municipal Solid Waste (MSW) organics. Value-add to cleaner / pre-processed organics Stellenbosch local municipality. Value-add to several hundred tonnes a day of low value digestate from some municipalities. Further value-add to 109 – 136 tonnes a day of CCT's dried.
- **Biosolids Beneficiation Facility digestate.** Value-add to several hundred tonnes a day of low value digestate from private MSW biogas solutions (currently not operational); De-packaging technologies for processing packaged organics.



- **Plastic:** Replacing virgin material with recyclate and exploring technology to increase recyclate quality.
- **E-waste:** National pre-processing and processing capacity; A licensed pre-processing / processing facility for the Western Cape; Processing of South African Development Community (SADC) feedstocks.
- **Builders' rubble:** Value-add to 9 million tonnes of builders' rubble for application as a secondary construction material – across all applications; Value-add to 2.25 million tonnes of builders' rubble for application as a road-building material; Manufactured building sand from rubble; Municipal builders' rubble crushing contracts for the CCT, and the Stellenbosch and Saldanha Bay municipalities.

7.3.7 Financial Sector

Challenges faced by large businesses and SMEs

First, there is a general limited understanding of some financial experts and institutions in South Africa of the risks posed by climate change to the economy and financial system of South Africa. More specifically:

- Insurance, economic and financial losses caused by climate-related events, which are likely to increase overtime and having the appropriate risks pricing as well as adequate reserves to cover the expected losses.
- Appropriate assessment of climate exposure of financial activities and assets as well as carbon footprint.

Second, trading in the carbon market in South Africa has been stagnant for the past years (Christie and Anstey 2019). Key issues to be addressed are related to: the design of the entire carbon offset mechanisms, monitoring reporting and verification (MRV) challenges, eligibility criteria, carbon leakages when the tax leads to a situation where companies displace domestic emissions as well as managing international competitiveness issues especially in countries where the carbon tax is not applicable or enforced.

Third, there is a need to overcome barriers to promote green lending by local financial institutions (LFI). These barriers are not unique to South Africa and they include amongst others: lack of integration of climate risks into most of the LFI, high cost of capital for low-carbon investment compared to returns, lack of understanding of climate investment opportunities, inadequate technical capacity on climate change adaptation and mitigation issues during the preparation, review and monitoring of green projects, low awareness and capacity to perform the operational steps involved in green lending investments, high upfront cost of developing business lines in green lending, inadequate risk management mechanisms and standards including credit ratings and risk transfer and pooling instruments, difficulty in accessing longer-



term financing, credibility of off-takers, high transaction costs for smaller projects, and difficulty in raising financing for technologies that have not been proven locally (DEFF 2019, Shishlove et al. 2017, Nicholls et al. 2015, Cloete et al. 2016).

Opportunities for large businesses and SMEs

- South Africa's decision to introduce a carbon tax is a milestone in the transition to a low-carbon and climate resilient economy and society. The carbon tax will be paid by companies if they exceed the threshold of carbon emissions and the payment is at a much lower rate of R120 per ton CO₂-eq. Multiple allowances, including a 60% "basic" tax-free allowance will allow big emitting companies to pay at most R48/ton. Other further "allowances" mean that several of South Africa's major emitting companies will pay a minimum of R6/ton. At current exchange rates, that is as little as \$0.42/ton, much lower than required globally. Energy-intensive companies in particular should be able to claim transitional assistance if they pay the full tax, contribute to socio-economic development, and agree to reduce where they can. By complying with the carbon tax policy, South Africa companies will increase their global brand in terms of doing good businesses with climate friendly practices.
- The creation of the Green Fund provides several opportunities to support the contribution and participation of large businesses and SMEs in the transition of South Africa to a low carbon, resource efficient and climate resilient development path. Key fund objectives include: promoting innovative and high impact green programs and projects, reinforcing climate policy objectives through green interventions, expansion of the green economy, and attracting additional resources to support South Africa's green economy development. The funding windows for the green fund focus on green cities and towns, renewable energy, energy efficiency, sustainable transport, and the AFOLU sectors.
- The issuance of green bonds is already ongoing in South Africa. The City of Cape Town and the City of Johannesburg have already issued green bonds and more is expected to be issued by the Johannesburg Stock Exchange with a total value of \$385 million (PWC, 2019; Khumalo, 2019)
- A comprehensive climate finance strategy is under development by the Government. The strategy will cover all aspects of climate finance, including: the volume of climate finance required; stakeholders and activities along the climate finance value-chain, increasing climate finance flows into the country, monitoring and evaluation, and climate finance governance structures. The strategy will ensure that climate finance frameworks are compatible with local conditions and ambition including the climate finance needs of large companies and SMEs.
- South Africa has well capacitated development finance institutions who have the experience in green investment and working with both large businesses and SMEs. An example is DBSA that managers the green fund as well as GCF funds worth more than \$700 million.



8. CONCLUSIONS

South Africa is very committed to implement its NDC adaptation and mitigation priorities under the Paris Climate Agreement. The government of South Africa sees the private sector (large businesses and SMEs) as a very important partner in the NDC implementation process. A considerable number of steps have therefore been taken by the government to promote and attract green investments from the private sector. Examples of cross-cutting strategic long term opportunities include the:

- Development of a climate change adaptation strategy that will act as a blue print to guide the private sector and other actors' actions and investments aimed at reducing climate risks and transiting South Africa into a climate-resilient future.
- Development of a low carbon development strategy to guide South Africa's transition to a low carbon economy by 2050.
- Building of frameworks for SME development and support through different government initiatives and by working with specialised SMEs institutions.
- Putting in place a climate finance strategy to promote financial institutions such DBSA to have more direct access to multilateral climate finance especially under the GCF.
- Promotion of green bonds and carbon market.
- Implementation of climate change flagship programs in renewable energy, energy efficiency, sustainable transport, waste management, water management, AFOLU, and infrastructure.

This document also presents very specific opportunities for each of the 7 sectors covered in this report: agribusiness and forestry, sustainable transportation and infrastructure, water resources and irrigation, green buildings and smart-cities, renewable energy, waste management as well as the financial sector.

From the private sector perspective, several NDC-aligned projects have been and continue to be implemented by the private sector. Some of the examples include: Growthpoint Properties Limited, South Africa Water Reuse Programme (WRP), Xina Solar One Project and Embedded Generation Investment Program (EGIP). The financing of many of these green projects was achieved through loans and grants from AfDB, GCF, CTF, GEF, DBSA, SCCF, IFC, IBRD and numerous bilateral donors through development assistance.



In the medium and long term, more green projects can be financed and successfully implemented with the strong participation, contribution and investment of the private sector. However, additional efforts need to be made especially by the government to address some of the existing sectoral and cross-cutting challenges. Examples of some of the cross-cutting challenges facing the private sector include amongst others:

- Poor tracking of and insufficient access to climate finance.
- The need for stronger policy and legislative environment.
- Increasing focus on COVID-19 and decreasing focus on green projects.
- Weak business case for green investment in adaptation projects.
- Skills and capacity constraints.
- Insufficient support for businesses to planned and respond to climate change.

Moving forward, South African government should work closely with the private sector, investors, donors and communities to address both sectoral and crosscutting challenges facing the large private companies and SMEs. The revision of South African NDC as required under the Paris Climate Agreement and the revision of other national sectoral policy processes seem to be avenues to address the challenges identified.



9. RECOMMENDATIONS

The following sectoral recommendations are proposed for the private sector to address the different challenges and build on new and existing opportunities.

9.1 Cross-cutting Recommendations

Pursue a “Build Back Better (BBB)” post-COVID approach that promotes green investment: While COVID emergency measures in the short-term focus on stopping the spread of the virus in South Africa, medium and long-term COVID recovery plans should put in place reforms to reduce regulatory obstacles to support the recovery and achieve inclusive green growth. Key areas to support large businesses and SMEs include: innovation in green technologies, raising productivity, seeking out export markets, leveraging public private partnerships in a fiscally responsible way to boost market access, and making it easier for businesses to hire. The government can use the green fund and other COVID recovery funds to support businesses in the areas of sustainable transportation, green cities, renewable energy, energy efficiency, climate-smart agribusinesses, waste management, ecotourism, and other green sectors. Banks can also provide green credit lines for large businesses and SMEs.

9.2 Sectoral Recommendations

9.2.1 Agribusiness and Forest Sector

- Conduct scientific and market research to explore business opportunities. For investment purpose, large businesses and SMEs should work with appropriate government and research institutions to understand the impact of predicted climate change as well as the business opportunities on commodity and location specific agricultural production systems taking into account both adaptation and greenhouse gas emissions of the values chains.
- Strengthen awareness and capacity on AFOLU adaptation businesses. Best adaptation business practices and opportunities should be shared and communicated with the large businesses and SMEs to attract them into AFOLU adaptation businesses. Targeted trainings on the best practices for developing and implementing AFOLU adaptation businesses should be conducted by the government in collaboration with NBI, donors and other technical actors on the ground especially from the civil society.



9.2.2 Transportation Sector

- **Roles and responsibilities for PPP should be clearly defined and respected.** The government should consider looking at policies regarding ownership and management of transport systems in the country. Policies in this regard need to clearly define the roles of the various institutions involved and both public and private institutions would need to be accountable for carrying out their respective tasks and respecting the legislations and policies. Accountability should be reinforced not only on the part of the private sector but government institutions as well. This will increase the confidence that the private sector has on the government and encourage them to venture into investments for the development of the transport sector. This will ensure that in a case of a PPP, both public and private partners understand each other's needs and objectives, while working in trust, mutual collaboration, shared responsibility, transparency, and open communication. Monitoring should also be a major part of all government development activities if the private sector is to engage.
- **Incentives to attract private sector investment.** It would be good if the government of South Africa designs a method of incentivising the private sector, either through tax incentives or “preferential funding”, as a way of encouraging them into investing in the transportation sector (GoSA, 2018). Such tax incentives could encourage the private sector to switch to the production of alternative fuels and low-emission technologies, within the transport system. The preferential funding arranged through finance institutions will help private sector firms to participate in the conversion of taxis to dual-fuel vehicles, carry out retrofit on existing filling stations or build new ones, build high speed inter- and intra-city rail networks amongst others.

9.2.3 Water Resources and Irrigation Sector

- **South Africa has untapped potential for the development of water PPPs,** both geographically and within the water value chain. However, in certain instances a PPP is not suitable, particularly where a municipality has limited capacity to undertake the procurement process required. The water and sanitation sector is currently not financially sustainable (Department of Water and Sanitation; 2018. National Water and Sanitation Master Plan, Volume I: Call to Action. Version 10.1, October 2018, p48). PPP is the entry point of private sector participation. Given the many challenges facing the water sector at present, it is clear that additional approaches and funding models are required. PPPs can play a meaningful role in attracting private sector investment and expertise, within contracts where the private party is required to meet certain performance standards. Private sector participation through PPPs is arguably a necessary component in addressing the current and future water infrastructure challenges.



9.2.4 Renewable Energy and Energy Efficiency Sector

- **Influencing the local energy market:** Supporting formation of a local market is essential to stimulate technology uptake in the domestic renewables and energy storage market. Production subsidies, tax incentives, and other mechanisms can lower barrier to market from a cost perspective. This will make affordable technologies more readily available and create a critical mass.
- **Creating new products through joint public and private ventures:** Public institutions are mostly funded to make technology readily available. The appetite of private sector to collaborate with public institutions in the form of joint ventures, intellectual property (IP) licensing and other means of supporting creation of new commercial products is essential. The role of the private and public enterprises is to create a market pull for energy storage technologies. Inclusion of energy storage technologies in resource planning by a big utility such as Eskom as an alternative form of energy provision in preference to other conventional sources would go a long way towards achieving the recognition and status that renewables and energy storage deserve. As these deployed technologies continue to meet the expectations, there will be a standardisation of operations and contracts with stored energy providers, which will improve revenue streams on both sides. As the technologies mature, financial institutions will be more comfortable in funding technologies perceived as low-risk, which will lower the costs of deployment and eventually lead to an acceleration of the adoption of renewables and energy storage as viable technologies.
- **The role of government in addressing market barriers:** Potential barriers to market entry where government could consider interventions may be in the form of: (i) Technological or legal barriers; (ii) Market size and entry costs; and (iii) Operating below minimum efficient scale. There is already an effort by the government to fund research and development in several areas of renewables and energy storage. The effort is directed towards generating IP and general know how in order to lower technological barriers to market. On the issue of market size and entry costs, it is important to note that the South African market is relatively small compared to the global renewables and energy storage market. It would thus be important for South African companies to capture the small market first to make it unattractive to external players at this early stage. This may require initial vertical integration of the existing renewables and energy storage technologies in similar disciplines to create several complete assembly programs for local market applications. Government subsidies may be significant where the production of such energy storage units is below the minimum efficient scale. There are subsidies in areas such as the automotive sector for locally manufactured components. There may have to be supplemental appropriations for local strategic markets such as renewables and energy storage in general, for example, in grid applications.



9.2.5 Green Buildings and Smart Cities Sector

- The concept of green development should be broadened into other spheres apart from planners. As such the Green Building Council of South Africa (GBCSA) should broaden the awareness to the construction clients and private investors on the strategic advantage of implementing Green Buildings for the comfort of end-users.
- Further research on green buildings and climate smart cities should be conducted in the planned and on-going public sector projects, such as the South African National and Provincial Departments of Public Works for purpose of comparison and improvement.

9.2.6 Waste Management Sector

- **Development of partnerships with the private sector** and implementing extended producer responsibility (EPR), whereby manufacturers of goods take more responsibility for their products, throughout the product lifecycle.
- **Promote circular economy through waste recycling and technologies.** Domesticating and commercialising ‘circular economy’ in the context of the waste sector management. The sector presents excellent opportunities for South Africa and crucial for South Africa to unlock the social, economic and environmental opportunities in alternative waste treatment technologies.
- **Promote public-private partnerships (PPP).** If well managed, PPP can: address waste management problems and achieve significant reduction of load of hazardous waste to landfills; find alternative uses for industrial waste generated in significant quantities with a high potential for environmental pollution and addressing the problem of reluctance from industries to disclose their hazardous waste streams and volumes.
- **Consider and strengthen recycling and waste minimization;** consider extended producer responsibility as a means to emphasize waste minimization; explore opportunities for energy recovery and ban some waste streams from landfill sites.
- **Use environmental levies to build infrastructure.** Part of the environmental levies that businesses pay should go back into the development of infrastructure and operational costs to support the public-private partnerships. This would mean that less waste ends up in landfills, and more revenue can be generated from modern recycling plants.



9.2.7 Finance Sector

- **Understand the climate risks and opportunities.** The South African financial institutions including banks need to devote greater attention to understanding the impact of climate change and its risks to different financial activities, and assets, including its implications for inflation dynamics as well as the integration of sustainability considerations within their operations and line of credits.
- **Navigate sector challenges and opportunities by acting proactively.** To capitalise on current and future green investment opportunities, large businesses and SMEs in South Africa should develop and implement internal policies and principles that align with international and domestic standards that are guiding climate change initiatives such as environmental, social and governance safeguards, voluntary carbon standards (VCS) and Gold standards as wells as emerging standards and mechanisms from the Paris Climate Agreement.



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