



THE WORLD BANK GROUP

SOUTH AFRICA

FINANCIAL SECTOR ASSESSMENT PROGRAM

January 2022

TECHNICAL NOTE

CLIMATE RISKS AND OPPORTUNITIES

Prepared by Martijn G.J.
Regelink
**Finance, Competitiveness, and
Innovation Global Practice,
WBG**

This Technical Note was prepared in the context of a joint IMF-World Bank Financial Sector Assessment Program (FSAP) mission in South Africa during March, 2020 led by Jennifer Elliott, IMF and Eva M. Gutierrez, World Bank, and overseen by the Monetary and Capital Markets Department. IMF, and the Finance, Competitiveness, and Innovation Global Practice, World Bank Group. The note contains the technical analysis and detailed information underpinning the FSAP assessment's findings and recommendations. Further information on the FSAP program can be found at www.worldbank.org/fsap.

CONTENTS

Glossary	3
Executive Summary	5
I. Introduction.....	9
II. Climate change, government response and green finance developments.....	10
A. Vulnerabilities to climate change.....	10
B. Current government initiatives and financial arrangements	15
III. Climate risks for the financial sector	21
A. Physical risks.....	23
B. Transition risks.....	25
C. Current sector practices on climate change and environmental risks.....	30
IV. Supervisory response.....	33
A. South Africa Reserve Bank and Prudential Authority.....	33
B. Financial Sector Conduct Authority – Pension Supervision	41
V. Deepening markets for green growth and resilience.....	43
A. The challenge.....	43
B. Stimulating green finance	46
APPENDIX 1. Overview of relevant laws, regulations, programs, and financial arrangements	56
APPENDIX 2. Policy options to stimulate green loans in the banking sector	62

GLOSSARY

AUM	Assets under management
CAGR	Compound Annual Growth Rate
CIS	Collective Investment Schemes
CO ₂	Carbon Dioxide
CRA	Climate Risk Assessment
CRO	Climate Risks and Opportunities
DBSA	Development of Bank of South Africa
DEFF	Department of Environment, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DRF	Disaster risk finance
DTIC	Department of Trade, Industry and Competition
DMRE	Department of Mineral Resources and Energy
E&S	Environmental and Social
ESG	Environmental, Social and Governance
EU	European Union
FSE	Financing a Sustainable Economy draft technical paper
FI	Financial Institution
FSAP	Financial Stability Assessment Program
FSB	Financial Services Board
FSCA	Financial Sector Conduct Authority
FTSE	Financial Times Stock Exchange
FSB TCFD	Financial Stability Board - Task Force on Climate-related Financial Disclosures
GDP	Gross Domestic Product
GEPF	Government Employee Pension Fund
GHG	Green House Gasses
GWP	Gross Written Premiums
IAIS	International Association of Insurance Supervisors
IEA	International Energy Agency
IFC	International Finance Corporation
IOSCO	International Organization of Securities Commissions
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
RCP	Representative Concentration Pathway
IRP	Integrated Resource Plan
JSE	Johannesburg Stock Exchange
MPCI	Multi-Peril Crop Insurance
NAS	National Adaptation Strategy
NCCRP	The National Climate Change Response Policy
NCFS	National Climate Finance Strategy
NDC	Nationally Determined Contribution
NDP	National Development Plan

NGFS	Central Banks and Regulators Network for Greening the Financial System
NPL	Non-performing loan
NT	National Treasury
PIC	Public Investment Corporation
PA	Prudential Authority
RAM	Risk Assessment Matrix
REIPPPP	Renewable Energy Independent Power Producers Procurement Program
SA	South Africa
SARB	South Africa Reserve Bank
SARB FSD	SARB Financial Stability Department
SBN	Sustainable Banking Network
SETs	Sector Emissions Targets
SDGs	Sustainable Development Goals
SIF	Sustainable Insurance Forum
SOE	State-Owned Enterprise
UNEP FI	United Nations Environment Program Finance Initiative

EXECUTIVE SUMMARY¹

South African banks and insurance companies are vulnerable to transition risks due to significant investments in carbon intensive industries. South Africa's economy is highly CO₂-intensive - with the 13th highest total emissions and the 40th highest emissions per capita in the world, exposing the financial sector to risks from efforts to realign economies with the commitments under the Paris agreement. These transition risks arise from local sources (e.g. the country's carbon tax) as well as global trends, such as a structural reduction in demand for fossil fuels and highly CO₂-intensive products (potentially affecting trade), and the rise of renewable energy. Research shows South Africa's energy value chain is particularly vulnerable, including its mining industry and struggling power production. A high-level exposure assessment shows that banks have about 16 percent of their credit portfolio in CO₂-intensive sectors, including energy production, fossil fuels, heavy industry, transport and agriculture. Combined exposures of insurers to bonds and equities in these industries add up to about 15 percent of respective portfolios. An abrupt energy transition could also affect government exposures, including guaranteed loans and investments in SOEs, real estate, and indirect exposures to CO₂-intensive sectors via financial sector investments.

Even though financial institutions' limited exposure to the agriculture sector have kept physical risks – including from drought impacts - manageable, climate change is expected to significantly amplify and broaden the impact of droughts and other physical hazards. Physical risks relate to the impacts of climate change and weather-related disasters on the value of real and financial assets. An ongoing five-year period of intense droughts has affected agricultural credit and underwriting portfolios of banks and insurers, respectively. The Land Bank – the state-owned agricultural bank - has been particularly impacted and requested a R22 billion (approx. US\$1.3 billion or ~0.5% of South Africa's 2020 GDP) cash injection from National Treasury in May 2020 due to a liquidity crisis. In most cases though, drought impacts have been manageable, in part due to the relatively small and geographically diversified agricultural exposures of banks and insurers – less than 3 percent and 1 percent of credit and liability portfolios, respectively. However, climate change is expected to significantly amplify the impacts of a range of weather-related stress and natural catastrophes, such as droughts, floods, fires and hail. The Cape Town water crisis in 2018, which led to water rations for all households and sectors to avoid a 'Day Zero', offers an example of broader potential future impacts of droughts on investment and lending portfolios beyond the agriculture sector.

South African authorities are pursuing various initiatives to mitigate climate risks albeit tangible action in the financial sector sphere is still limited. The National Climate Change Response Policy, the government's vision for an effective response to climate change, sets out programs in key areas, including renewable energy, energy efficiency, waste management, carbon capture and sequestration, and water conservation. Plans to address climate change-related

¹ This Technical Note has been prepared by Martijn Regelink, with remote support from Henk Jan Reinders, Samantha Power, Owen Nie, Barry Patrick Maher and Emma Dalhuijsen.

challenges have been integrated in the government's National Development Plan 2030, calling for an equitable transition to a low-carbon economy, and the 2019 Carbon Tax Act is a step toward incentivizing a clean energy transition. The financial sector's climate change awareness is high but tangible action to mitigate risks – by market players and supervisors alike – is limited.

As the prudential supervisors – responsible for financial stability and soundness of banks and insurers – the SARB and PA should strengthen their understanding and management of climate risks. Already, significant progress has been made since SARB joined the NGFS in 2019, including on a governance structure and strategy on climate risk. The SARB and PA can deepen their understanding of climate risks through a comprehensive Climate Risk Assessment (CRA) and buildup of climate stress test capacity. This should be supported by improved data collection and monitoring of sectoral and regional exposures to climate and disaster risks. Additionally, the SARB and PA could take steps to further integrate material aspects of climate change and environmental issues into supervision, including through: i) introducing guidelines for the financial sector on climate risk management, stress testing, governance and disclosure; and (ii) climate and environmental risks in the PA's supervisory dialogue, onsite inspections and supervisory ratings. SARBs internal strategy could be expanded to give guidance to a phased approach of implementing these reforms.

FSCA's prudential supervision of pension funds could follow a similar trajectory, building on its existing guidance on ESG disclosures. It is advisable for FSCA to perform a Climate Risk Assessment of the impacts of climate change on the pension sector. To support a CRA, improvements in data collection are critical, as FSCA has no information available on sectoral and geographical breakdowns of pension fund portfolios. FSCA should also consider strengthening, and potentially mandating, the existing ESG guidelines for pension funds to include climate risk disclosure, in line with the Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) recommendations. FSCA should also begin to monitor uptake of the current ESG guidelines. Over time, oversight could be further strengthened, building on a better understanding of climate risks and adherence to the guidelines.

South African authorities should also explore ways to deepen financial markets to support green and resilient investment. Green finance initiatives have gained momentum in South Africa over the past decade, with total investments in renewable energy reaching USD 20.5 billion as the result of successful public auctions, the launch of several green bonds, supportive guidance by Africa's largest stock exchange and industry associations, and investor aligning with international principles and initiatives. While this progress is encouraging, there is a need – and an opportunity – to scale up these initiatives, with an estimated investment opportunity of USD 566 bn, in climate mitigation alone, in South Africa between 2016 and 2030. A draft roadmap on Financing a Sustainable Economy (FSE) was published by NT in 2020, and subsequent follow-up working group, to provide a comprehensive framework and platform to align the financial sector with climate targets. To ensure its successful implementation and address green finance barriers, authorities should pursue several initiatives:

- Improve the business case for green projects. To improve the risk / return profiles of green projects and therewith incentivize green investments, the government should provide clarity on credible,

long-term climate and energy plans. For example, it should lay out a long term pathway to carbon neutrality and climate resilience, by advancing the National Climate Change Bill; strengthen the carbon tax by phasing out fossil fuel-related allowances and consider tax increases; and stimulate investment in renewable energy by advancing the successful Renewable Energy Independent Power Producers Procurement Program.

- Advance work on a National Climate Finance Strategy (NCFS). In 2019, authorities launched an initiative to work on a NFCS. The NCFS could provide clarity on the financing gap for the Nationally Determined Contribution (NDC)²; the role of private investment; the pipeline of investable projects; and ways to leverage government spending.
- Foster transparency by introducing climate risk disclosures and a green taxonomy. Disclosure requirements for listed firms in line with the TCFD recommendations should be introduced, preferably through regulation to make it enforceable for supervisors.³ To support disclosures and standardization of green financial products, South Africa should advance the introduction of its green taxonomy which is currently being finalized by the NT Taxonomy Working Group.
- Stimulate the use of innovative green finance instruments. The government could incentivize the uptake of green finance by further exploring the application of labeled instruments, including further issuance of sovereign green bonds (within the framework of NT's debt management strategy) and engagement in blended finance arrangements. It should also explore ways to incentivize the use of green loans, such as green mortgages and energy efficiency loans. Although the banking sector has been involved in financing renewables, product innovation is lagging other markets.
- Implement NT's National Disaster Risk Finance (DRF) strategy to explore the use of risk financing instruments to increase financial resilience to climate shocks. Linked to this broader strategy, the NT and the Department of Agriculture, Land Reform and Rural Development are reviewing a pilot agriculture insurance program. Expediting the launch of this program would reduce Government's financial exposure to drought and budget volatility and in tandem strengthen the financial resilience of emerging farmers to drought.

² NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each country to prepare, communicate and maintain successive NDCs. South Africa' first NDC was submitted to the UN in 2016, and an [updated draft NDC](#) has been published in 2021 for consultation.

³ The TCFD developed climate-related financial risk disclosures to investors and other stakeholders, for use by companies.

Table 1. South Africa: Key Recommendations

Recommendations		Responsible Authorities	Time*
Supervisory Response			
1	Perform an in-depth climate risk assessment of the impact of climate risks on banks, insurers and pension funds.	SARB/PA/FSCA	NT
2	Improve information collection and monitoring of relevant climate risk metrics.	SARB/PA/FSCA	NT
3	Develop capacity to stress test prudential impacts of climate risks, including physical and transition risks, on banks and insurers.	SARB	NT
4	Issue guidelines for banks and insurers on climate risk management, stress testing, governance and disclosure - taking into account the FSB TCFD recommendations.	PA	NT
5	Integrate climate risks in off-site monitoring, thematic on-site reviews and supervisory ratings.	PA	MT
6	Introduce a strategy on climate risk management and build further internal capacity through training	SARB/PA	ST
7	Consider strengthening – including TCFD alignment – and mandating the existing ESG guidelines for pension funds and introduce oversight.	FSCA	NT
Deepening Markets for Green Inclusive Growth and Resilience			
8	Introduce a National Climate Finance Strategy	DEFF/NT	NT
9	Introduce a taxonomy of green or sustainable economic activities and start monitoring flows.	NT/SARB/FSCA	ST
10	Strengthen disclosure requirements for listed firms in line with the FSB TCFD recommendations, considering binding regulation.	FSCA/JSE / NT/ /Parliament	NT
11	Introduce a national standard for green buildings and subsequent labeling.	DMRE	MT
12	Explore ways to stimulate and use innovative green finance instruments, including sovereign green bonds and green loans.	NT	NT
13	Strengthen financial resilience to climatic shocks through a national disaster risk finance (DRF) strategy, including agriculture insurance.	NT/DALRRD	NT
14	Advance the auctions for renewable energy as part of the Renewable Energy Independent Power Producers Procurement Program.	DMRE/NT	NT
15	Strengthen climate mitigation and adaptation commitments by passing the National Climate Change Bill, and strengthening the effectiveness of the carbon tax	Parliament, NT, DEFF	NT
* Short Term (ST) = within one year; Near term (NT) = 1–3 years; Medium term (MT) = 3–5 years. Timelines may be dependent on the development of the COVID-19 situation.			

INTRODUCTION

1. Globally, there is increasing attention being paid to the impact of climate change and environmental risks and opportunities on financial sectors. Regulators and central banks –through the Network for Greening the Financial System (NGFS) among other fora – are warning of the impact of climate change and environmental risks on the stability and soundness of financial sectors. These calls follow attention paid to this topic by the FSB Task Force on Climate-Related Financial Disclosures (TCFD) and the G20 Sustainable Finance Working Group. At the same time, there is global recognition of the importance of financial sectors in mobilizing capital for green objectives, including those related to the Paris Agreement and the Sustainable Development Goals (SDGs).

2. This technical note explores the consequences of climate risks and opportunities (CRO) for the South African financial sector. It does so from the perspective of risks for the sector and opportunities for green financial sector development. On the risk side, the note provides a high-level assessment of the impact of climate change and natural disasters, on financial stability and soundness. Moreover, a high-level assessment of the supervisory responses by financial sector regulators is used to provide actionable guidance based on emerging international good practices. The note also explores opportunities for deepening financial markets to mobilize green finance at scale, in line with South Africa's Nationally Determined Contribution (NDC) to the Paris Agreement and environmental sustainability objectives.

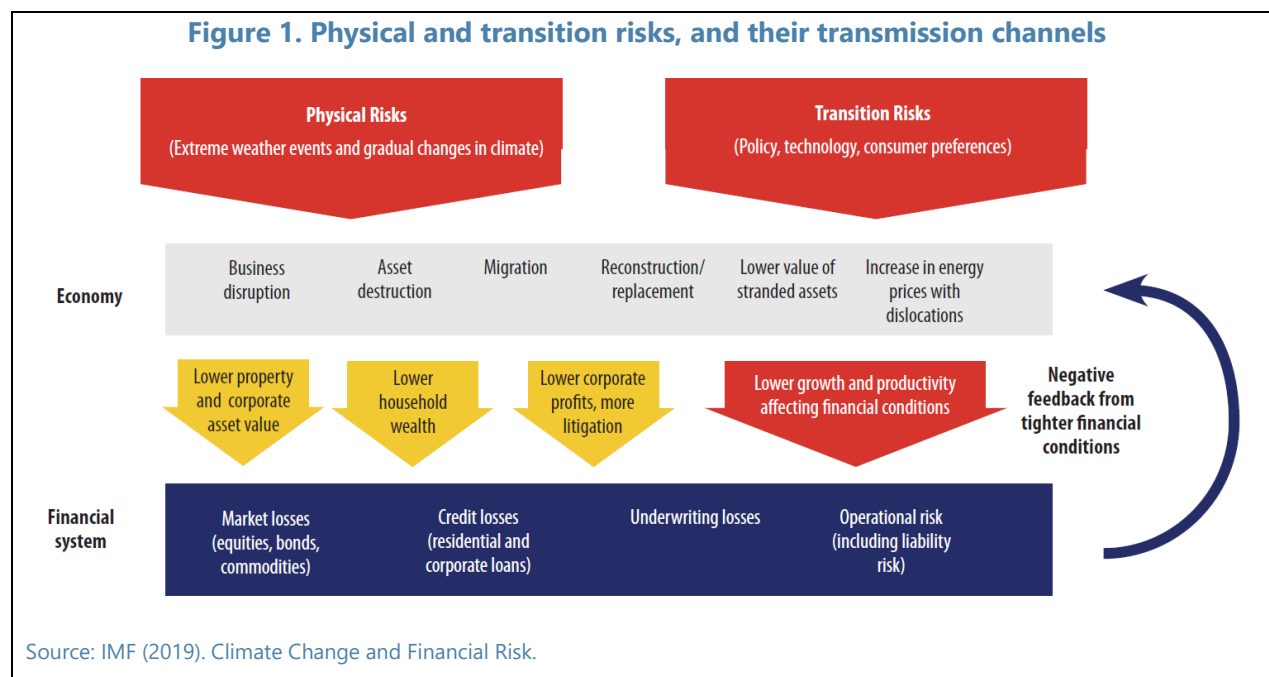
3. The note focuses on both physical and transition risks of climate change, with a primary focus on the banking sector, but also considers impacts on non-bank financial institutions (FIs) and capital markets. Under climate-related risks, both the gradual impacts of climate change and weather-related catastrophes are covered (i.e. physical risks), as well as the risks that arise from the alignment of economies with a 2-degree Celsius goal (i.e. transition risks). These risks can affect the financial system through different channels (see Figure 1). Broader environmental risks, whether human-induced (e.g. air, land and water pollution and biodiversity loss) or naturally occurring (e.g. geophysical risks like earthquakes and tsunamis), are not in the scope. However, it should be noted that actions to address climate risks and capitalize on opportunities overlap with approaches for addressing these broader environmental risks and opportunities in the financial sector. The note focuses primarily on banking, but also considers non-bank FI sectors where relevant for prudential supervision and mobilization of capital for green growth.

4. CRO assessments have only been introduced recently as part of FSAP missions. Therefore, the mission team does not have definitive answers, nor is there a definitive, agreed-upon framework for such an assessment. Based on emerging global sound practices, this analysis provides a picture of the current state of climate-related financial risks in South Africa, the response by prudential supervisors and the potential for scaling up green finance through the financial sector.

5. The note is informed by a mission that took place soon before the full impact from the COVID-19 crisis became clear.⁴ At this point in time, it is not possible to fully factor in outcomes or

⁴ The mission took place in March 2020. This Technical Note and its recommendations were updated in Q2 2021.

impacts of the unfolding crisis on climate risks and opportunities for the financial sector. While prioritization and timelines could be affected, the importance of taking actions to address climate risks and opportunities remains. Climate risk is likely to be amplified by weakened response capacity, while an economic recovery may offer opportunities to further align the financial system with green objectives. Wherever relevant, the note makes some tentative suggestions on these points.



CLIMATE CHANGE, GOVERNMENT RESPONSE AND GREEN FINANCE DEVELOPMENTS

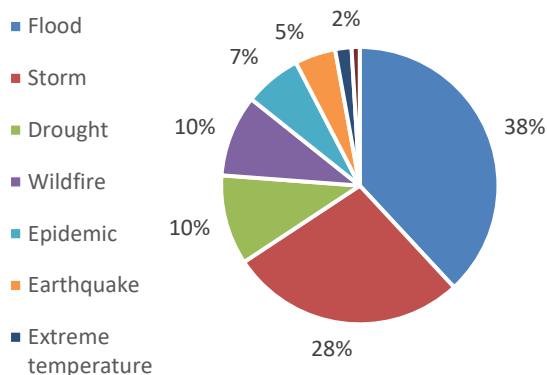
A. Vulnerabilities to climate change

6. South Africa is vulnerable to weather-related disasters and climate change. The country's mostly arid climate, geographical position and its high economic dependence on fossil fuel production and consumption renders it vulnerable to both physical risk and transition risk from climate change. As of 2019, the country tops the ranking in Africa in terms of both total CO₂ emissions and per capita emissions.⁵ Droughts, floods, storms and wildfires are among the most common natural catastrophes in South Africa, compromising the delivery of basic services and the functioning of infrastructure. Bounded to the south by a coastline stretching over 3,000 km along the South Atlantic and Indian Oceans, the country is also affected by heavy waves and storm surges, especially in the Cape Peninsula area.

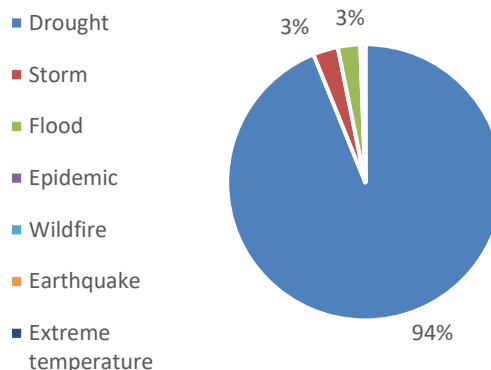
⁵ Global Carbon Atlas. Gilfillan et al. (2019). UNFCCC (2019), BP (2019).

Figure 2. Disasters by frequency and disaster type

Frequency of Disasters in South Africa Between 1952-2019

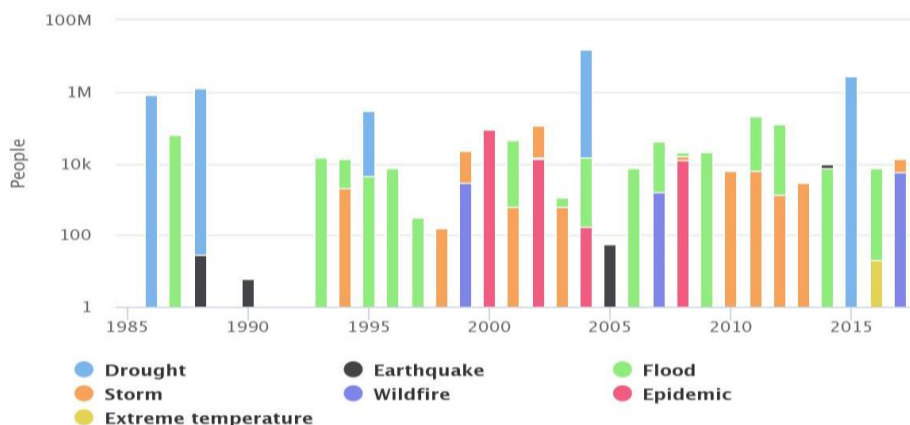


Of Total People Affected, % Affected by Disaster Type Between 1952-2019



EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium

Total Number of People Affected by Disaster Type Between 1985 and 2018



CRED, World Bank Climate Change Knowledge Portal.

7. South Africa is facing rapidly rising temperatures and dwindling precipitation, increasing the frequency and intensity of weather-related natural disasters. The observed rate of warming across Southern Africa has been twice the global average.⁶ By mid-century the South African coast is expected to warm by around 1 to 2°C, and the interior by around 2 to 3°C.⁷ This temperature increase will cause the western and interior parts of the country to become even drier and thus experience a decrease in water availability. Under a low mitigation scenario, (IPCC RCP 8.5, High

⁶ DEA (2019). Draft National Adaptation Strategy – Republic of South Africa.;

⁷ Department of Environmental Affairs (2010). National Climate Change Response Green Paper.

Emission scenario), mean annual temperature is predicted to rise by 4°C across South Africa, potentially up to 6°C for Western, Northern and Central territories, by the end of the century. This will be accompanied by a rise in extreme hot days and dryer overall conditions, while extreme precipitation events are likely to increase for the interior.

Table 2. Observed climate trends and projections for South Africa

Element	Observed trends	Projections
Temperature rise	<ul style="list-style-type: none"> Warming across Southern Africa has been doubling global average over past four / five decades. Significant warming in South Africa between 1931-2015. Strongest trends observed in the west (North Cape and Western Cape) and northeast (Limpopo, Mpumalanga, east coast of KwaZulu-Natal), with observed warming above 2 °C - twice the global rate. 	<ul style="list-style-type: none"> Under low mitigation [RCP8.5], for the 2080–2099 period: Temperatures increase by more than 4°C across South Africa. Increases greater than 6°C possible in western, central and northern interior regions. Increases in the number of heat-wave days and very hot days. Under high mitigation [RCP4.5]: temperature rises in the interior could be limited to 2.5 to 4°C.
Changing rainfall patterns & extreme events	<ul style="list-style-type: none"> Average rainfall trends have changed positively for the central southern interior and to some extent north; and negatively for the northern parts of Limpopo. In other cases, changes in total rainfall are insignificant. Extreme events are increasing in South Africa, including more heat waves, slightly longer periods of drought, and rainfall intensity increase. 	<ul style="list-style-type: none"> Under low mitigation [RCP8.5], for the 2080–2099 period: South Africa to experience drier conditions overall, while extreme rainfall events to increase over the interior. Under high mitigation [RCP4.5]: more uncertainty, both wetter and drier conditions are predicted.

Sources: DEFF (2019). Draft National Adaptation Strategy – Republic of South Africa;

8. The economic and social impacts associated with climate-related vulnerabilities are wide-ranging, but the agricultural sector has been the most affected to date. Over 14 million people – 25 percent of the South African population – are affected by drought, the highest fraction in Southern Africa.⁸ The 2015/16 El Niño, which was declared a drought disaster in five out of nine provinces (Kwa Zulu Natal, Eastern Cape, Northwest, Free State and Northern Cape), reduced GDP by 1.5 percent and employment by 1.3 percent. Since then, a series of droughts has been particularly harsh for commercial and smallholder farmers. Impacts on harvest and profit margins have resulted in an observed drop of 12 percent in agricultural value-add between 2014 and 2019.⁹ While the direct contribution of agriculture to GDP is only 2.2 percent as of 2019, the sector has broad economic

⁸ World Bank (2016). South Africa – Toward a National Agricultural Insurance Program. Initial Diagnostic Study.

⁹ National Treasury (2020). Gross Domestic Product 4th Quarter 2019.

relevance through indirect impacts on manufacturing, exports and consumer food prices.¹⁰ Beyond the 40,000 large commercial farms which are responsible for 95 percent of output, the sector is of high relevance for the livelihood of an estimated 1.5 million smallholder farmers.¹¹ With limited financial resilience, this group is particularly vulnerable to the impacts of climate change.

9. Wide-ranging economic impacts were observed in 2018, when Cape Town came close to 'Day Zero', i.e. the day the city would run out of water. The event provided insights into how a severe drought, combined with poorly managed local water resources, can ground an economy, as water rationing impacted a broad range of actors and sectors, including tourism revenue. According to estimates from the government's Department of Agriculture, Forestry and Fisheries (DAFF), the impacts of the drought on the economy of the Western Cape Province totaled an estimated USD 492 million, with a decline in exports between 13 percent and 20 percent in 2018.¹² In 2019/20 drought is again threatening the water supply in several towns in the Western, Northern and Eastern Cape provinces and the Limpopo Area, while posing additional challenges to the agricultural sector.¹³

10. Beyond droughts, flash floods, storms, and wildfires are affecting both coastal and inland cities and towns and have led to economic damage to infrastructure and properties. Major flood events include flooding in the Western Cape (2011-2014), in Mpumalanga (2014-2017) and Gauteng (2015-2018). The damages from these events appear manageable, though local impacts can be significant, with the floods in the Western Cape, for example, causing ZAR 1.6 billion in losses, primarily for farmers and municipalities. Wildfires also cause economic damage through a variety of channels such as losses related to properties, agricultural products and the environment. In 2017, over 500 homes were destroyed as a result of wildfires in Western Cape. Over time, impacts from floods, storms and wildfires will likely be exacerbated by changes in extreme weather and the effects of sea-level rise, further affecting real estate, infrastructure and tourism, among other sectors.¹⁴

11. Weather-related disasters are having a growing impact on government spending as well. Over the 2016-2019 period, the government of South Africa granted ZAR 6.57 bn (~0.1 percent of South Africa's 2019 GDP) to drought relief, 10 times larger than the amount provided for flood relief, ZAR 686 million. Most of the drought relief went to Kwazulu-Natal (31 percent), Western Cape (24 percent) and Eastern Cape (22 percent). Government spending on disaster relief has negatively affected the country's fiscal outlook.

12. With a highly CO2-intensive economy, South Africa is also exposed to transition risks. The country ranks 13th globally in terms of total CO2 emissions, with 468 megatons emitted in 2018,

¹⁰ Food and non-alcoholic beverages are a significant part of the headline inflation in South Africa, accounting for 17.2 percent. A shock to food prices was observed from the 2015/2016 drought. SARB (2020). Food prices after the crisis – improving the forecasts.

¹¹ World Bank (2016).

¹² Masimba Tafirenyika. UN2018) Cape Town water taps running dry.

¹³ South African Weather Service (2020). Historical Rain.

¹⁴ A study by the DOE estimates that national accumulated economic impact of potential sea level rise is between ZAR 50.5 billion and ZAR 169 billion by 2050, with the largest impact on private real estate, while public infrastructure and tourism are also affected. It should be noted that these figures are based on a 50-year accumulation. The yearly loss of ZAR 1bn – ZAR 3 bn seems manageable, though could be sizable on a local level. Expected total losses could reach ZAR 428 bn by the end of the century the same study estimates. DEA, GIZ, SANBI (Unknown, draft). Climate Change Adaptation: Perspectives for Disaster Risk Reduction and Management in South Africa.

and 40th in emissions per capita, at 8.1 metric tons of CO₂ per person in 2018.¹⁵ As can be seen in figure 3, electricity generation accounted for 56% of CO₂ emissions in South Africa in 2015, surpassing the total emissions of other sectors combined. This is due to the prevalence of coal-fired, low-cost power generation in the country – a sector which contributes heavily to employment in South Africa. Other sectors with significant carbon footprints include transport, manufacturing and construction, manufacturing of solid fuels, while the build environment also contributes significantly. A recent study by the Climate Policy Initiative (CPI) attempts to quantify transition risks for the energy value chain.¹⁶ It finds a cumulative impact of a low carbon transition on South Africa of USD 120 bn in value at risk (measured as the net present value of earnings, with 60 percent already incurred) between 2013 and 2030. A particularly significant impact from a global energy transition on South African coal exports is highlighted. Planned investments in mines, infrastructure and refineries could add a further USD 25 billion of value at risk. The study notes that the government will face 16 percent of downside risks, while the rest is borne by investors.

13. Eskom Holdings (Eskom), South Africa’s state-owned utility, plays a central role in the development and operation of power infrastructure in the country, and hence its actions have a major impact on the country’s carbon footprint. Eskom is the world’s 11th largest utility in terms of generation. It generates, transports, and distributes 95% of electricity consumed in South Africa¹⁷, amounting to 42% of the country’s GHG emissions in 2018.¹⁸ Eskom is at the heart of the country’s power supply problems, whereby prolonged load shedding due to maintenance of aging infrastructure is having significant impacts on GDP growth.¹⁹ Operational issues and financial viability concerns have also contributed to overall uncertainty and a delay in the development of renewable energy capacity. The company’s continued reliance on a coal-based business model could expose it to significant transition risks as the country commits to reducing its carbon footprint.

14. Like physical risks, transition risks from climate change could have outsized impacts on the poor and vulnerable segments of the population. Agriculture, fossil fuel production, and fossil fuel power generation employ a large proportion of South Africa’s low-income population. These sectors are vulnerable to both physical climate impacts and climate policy reform, contributing to potential economic and social risks in the country. Hence, South Africa faces the challenge of ensuring a ‘just transition’, which will ensure protection of its workforce and the creation of decent work opportunities in different sectors, such as renewable energy.

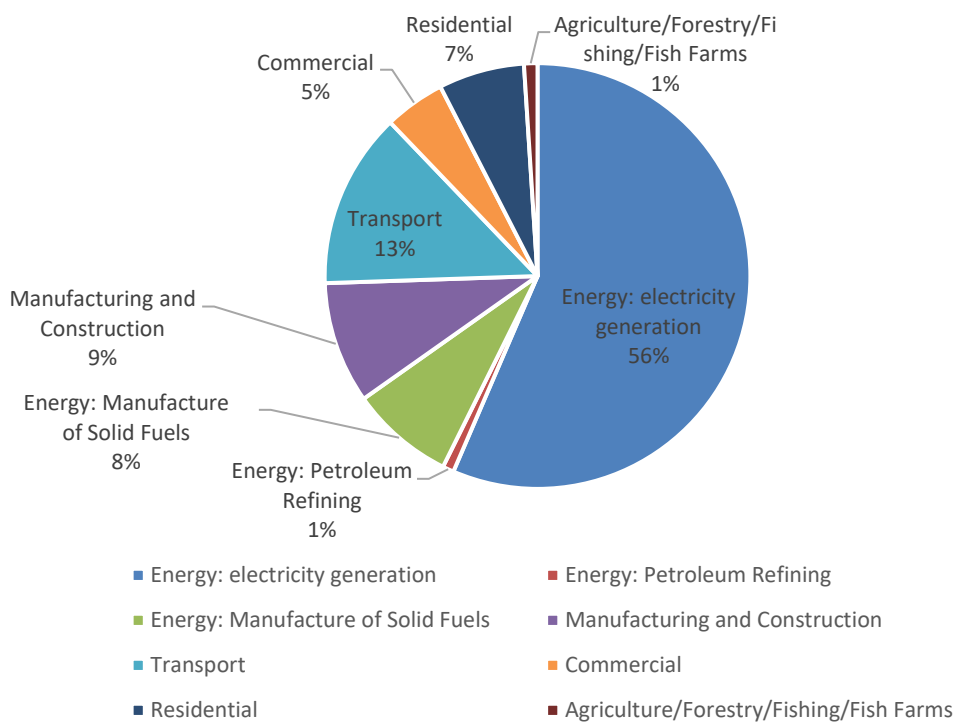
¹⁵ Global Carbon Atlas. Gilfillan et al. (2019), UNFCCC (2019), BP (2019).

¹⁶ Climate Policy Initiative (2019). Understanding the Impact of a Low Carbon Transition on South Africa.

¹⁷ Eskom website: <http://www.eskom.co.za>

¹⁸ Bloomberg. (2019) Eskom, Sasol Emit Over Half of South Africa’s Greenhouse Gas.

¹⁹ For 2019 a SARB Economic Note predicted an impact of load shedding on the economy of 0.4 – 1.08 percent of GDP. SARB (April 2019). Economic Note: Estimating the economic impact of electricity shortages.

Figure 3. CO2 emissions by sector in South Africa

Source: IFC (2019); Department of Environmental Affairs, South Africa

B. Current government initiatives and financial arrangements

15. South Africa recognizes the climate and catastrophe risk challenges it faces and has published several key strategy and policy documents in this regard.²⁰

- The National Climate Change Response Policy (NCCRP), outlined in the government's Green Paper, presents the government's vision for an effective climate change response. The NCCRP laid the groundwork for the implementation and action plans for flagship programs in key areas of environmental and climate concern in the country, including renewable energy, energy efficiency, waste management, carbon capture and sequestration, transport, climate change response public works, water conservation and demand and adaptation research.²¹
- The South African government also integrated plans to address the climate and environmental challenges facing the country in its National Development Plan (NDP) 2030, which details plans of

²⁰ See Annex I for an overview of relevant initiatives, policies, regulations and laws in this regard.

²¹ National Climate Change Policy Response. South Africa.

“an equitable transition to a low-carbon economy.” The plan also discusses sustaining the country’s key ecosystems, efficiently managing natural resources and enhancing the national mitigation and adaptation response. The NDP envisages that greater investment in energy infrastructure will promote economic growth and development. It also discusses increased targets for protected areas.²²

- South Africa ratified the Paris Agreement in 2016 and committed to a Nationally Determined Contribution (NDC)²³ which includes a national emissions target of between 398-614 MtCO₂e (17-78 percent above 1990 levels) by 2030. Its NDC built on the NCCRP and the NDP, and follows a peak, plateau and decline trajectory which aims to stabilize emissions between 2025-2035. The country’s NDC then commits to reducing emissions to between 212-428 MtCO₂e by 2050 (35% below to 25% above 1990 levels). In 2021, an updated draft NDC was published for consultation with amended targets for climate mitigation and adaptation.²⁴ The updated draft indicated that South Africa could raise the ambition of its mitigation targets, including a 28% reduction in the upper end of the target range in 2030 (i.e. annual GHG emission to be in a range from 398-440 Mt CO₂-eq by 2030).
- South Africa’s Department of Environment, Forestry and Fisheries (DEFF), published a draft Climate Change Bill (Climate Bill) and a National Adaptation Strategy (NAS). Building on the NCCR White Paper, the Climate Bill includes a provision for the identification and mapping of risks and vulnerabilities across geographies, ecosystems, communities, and households, as well as the setting and achievement of adaptation and mitigation targets. The Bill went out for public consultation in June 2018 and has not yet been approved by Parliament. The NAS provides a framework for action to address the physical impacts of climate change and was approved in 2020.

16. Decarbonization efforts are supported by the landmark 2019 Carbon Tax Act, though high allowances – up to 95 percent – weaken its current impact.²⁵ An economy-wide carbon tax starting at USD 8/tCO₂e was implemented in June 2019 – the first carbon tax in Africa. The tax rate is expected to increase until 2022 by the amount of consumer price inflation plus 2% annually. After 2022, only inflationary adjustments are envisioned. The tax covers combustion emissions, industrial processes and product use emissions and fugitive emissions, such as those from coal mining. Its immediate impact is likely to be limited, as up to 95 percent of emissions are eligible for exemption during the first phase, until 2022.^{26 27} While a welcome step towards pricing the externality of carbon

²² National Development Plan 2030. National Planning Commission. South Africa.

²³ The first NDC can be found here:

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf>

²⁴ The updated draft NDC can be found here:

https://www.environment.gov.za/sites/default/files/reports/draftnationallydeterminedcontributions_2021updated.pdf

²⁵ Other supporting instruments include a 3.5 SAR per kWh Electricity Levy introduced in 2008/2009, which introduces a tax at the source of generation, except for renewable energy generation. Most of the tax is passed through to consumers. The country has also introduced a motor vehicle tax in 2009 based on fuel consumption. A labeling system on fuel consumption and CO₂-emissions is also in place.

²⁶ On average National Treasury estimates the carbon tax will provide allowances for around 80-85 percent of emissions.

²⁷ ESKOM is expected to pay a negative tax rate under the Carbon Tax Act’s first phase. Apart from allowances adding up to 80 percent, they can deduct the electricity levy, adding up to a zero or negative tax rate in the first phase.

emissions, this tax rate is still substantially lower than the ideal rate. According to IMF analysis,²⁸ a USD 75/tCO₂e carbon tax around the world would be consistent with global warming of 2°C.²⁹ ³⁰ Such a tax rate is estimated to lead to a 45 percent reduction of CO₂ emissions below the 2030 baseline. The carbon tax is one of South Africa's key instruments intended to be applied in meeting its NDC. Its revenues – estimated to be around ZAR 1.75 billion³¹ per annum under the current allowance structure and net of electricity levy deductions – are foreseen to be used to lower other taxes and support low carbon programs. On top of a carbon tax, the DEFF is finalizing a proposal for carbon budgets and Sector Emissions Targets (SETs) in South Africa.³² The former would set limits for the maximum emissions a company would be allowed to emit over a certain period. Discussions are ongoing between DEFF and Treasury on how to align this system with the carbon tax.

17. The South African government has also taken steps to begin moving the country's energy sector away from coal consumption in order to reduce the sector's carbon footprint. The country's coal-fired fleet is aging and planned new projects will not fully compensate for the decline of the existing fleet.³³ In the National Development Plan 2030, the government has set targets to decommission 35 GW (of 42 GW currently operating) of coal-fired power capacity and supply at least 20 GW of the additional 29 GW of electricity needed by 2030 from renewables and natural gas.³⁴ This new energy mix includes wind and solar power, both of which South Africa is strategically positioned to take advantage of.³⁵ In its Integrated Resource Plan 2019 (IRP2019), the government confirmed the trend in power sector planning by proposing detailed plans for decommissioning a number of coal-fired plants and extending the operational lifetime³⁶ of South Africa's sole nuclear power plant.³⁷ By 2030, the plan proposes the addition of 15.8 GW of electricity-generation capacity by wind, 7.4 GW by solar, and 2.5 GW by gas.

18. In addition, the government has put measures in place to help Eskom address its existing challenges and, in turn, smooth its transition away from a carbon-intensive business model. First, the government has provided various forms of financial support. The Treasury has earmarked ZAR 26 billion (USD 1.7 billion) for Eskom in the current financial year, which ends in March 2020 as part of a special legislation to inject ZAR 59 billion over a two-year horizon. This amount is in addition to a ZAR 23-Billion-per-year bailout approved for the next three years.³⁸ Second, the government has indicated in several policy initiatives that Eskom would be put on a less CO₂-intensive development

²⁸ International Monetary Fund. (2019) Fiscal Monitor – Chapter 1.

²⁹ A 2014 study suggested that a phased-in tax of USD 30 per ton could help South Africa reach reduction targets that were set for 2025. Theresa Altona, T., Arndt, C., Davies, B., Hartley, F., Makrelova, K., Thurlow, J., and Ubogu, D. (2014). Introducing Carbon Taxes in South Africa. Applied Energy. Vol. 116.

³⁰ The High-Level Commission on Carbon Prices convened by the World Bank also concluded that the explicit carbon price level consistent with achieving the Paris temperature target is at least US\$40–80/tCO₂ by 2020 and US\$50–100/tCO₂ by 2030, provided a supportive policy environment is in place.

³¹ Per estimate by NT, provided during an interview to FSAP.

³² This is done as part of South Africa's post-2020 Climate Change Mitigation System.

³³ IEA. (2019) South Africa Energy Outlook.

³⁴ National Development Plan 2030.

³⁵ IEA (2019). South Africa Energy Outlook.

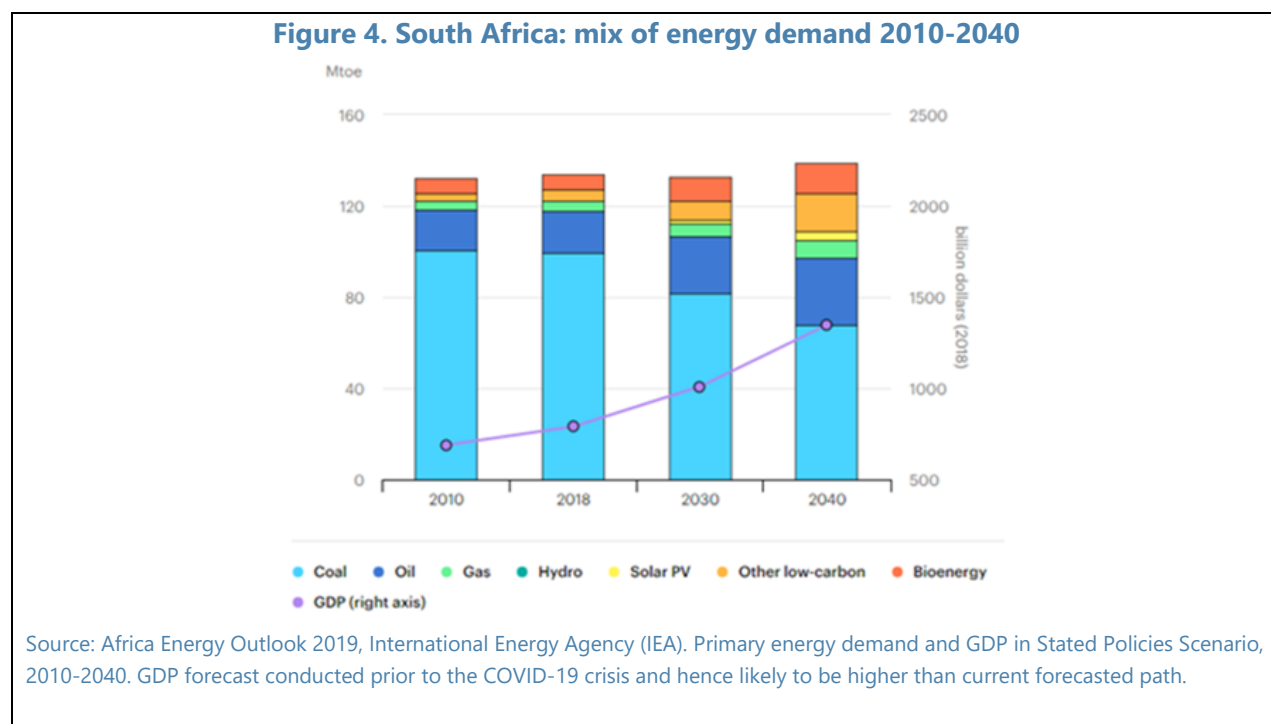
³⁶ By 20 years, up to 2044.

³⁷ Department of Energy (October 2019). Integrated Resource Plan (IRP2019).

³⁸ Roelf, Wendell. Reuters (2019). South Africa's Eskom may need more bailouts if funding plan fails.

path. President Ramaphosa appointed an Eskom Sustainability Task Team in December 2018 to provide recommendations to address Eskom’s many operational, structural, and technical challenges. In 2019, the government announced that Eskom will be split up into three distinct nationally owned entities: the generation, distribution and transmission units. The Eskom reform agenda indicates a major shift away from coal to renewable sources of energy.

19. Although South Africa is expected to make significant progress on the use of renewable sources of energy, the country is still projected to rely heavily on coal in the future. In IRP 2019, the government includes plans for a substantial portion of the country’s coal capacity to run beyond 2050. Figure 4 shows the IEA’s projected change in the energy mix of South Africa for 2030 and 2040 under the State Policies Scenario. The importance of renewable sources of energy (gas, solar, bioenergy, hydro and other low-carbon sources) is projected to increase substantially over the next 20 years, and hence the relative importance of coal is projected to decrease accordingly. Even though according to IEA coal is still expected to account for half of South Africa’s energy mix by 2040, the Government published “South Africa’s Low Emission Development Strategy 2050”³⁹, which includes plans to reduce the country’s reliance on coal, and ultimately reach a net zero carbon economy by 2050.



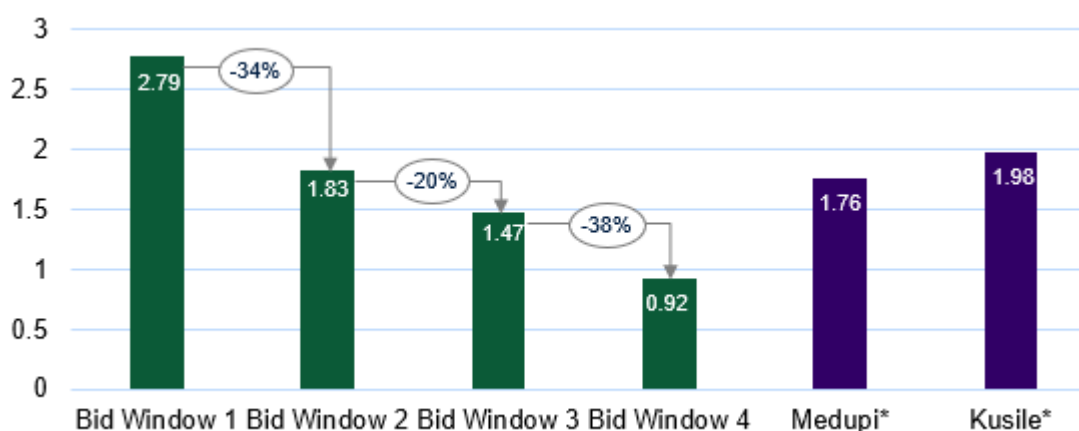
20. Renewable energy uptake has been supported by a highly successful – though at this point in time, stalled – auction program. South Africa’s Renewable Energy Independent Power Producers Program (REIPPPP) is seen as a blueprint for incentivizing growth in renewable energy.

³⁹ Further information can be found here:

https://www.environment.gov.za/sites/default/files/docs/2020lowemission_developmentstrategy.pdf

Overseen by an Independent Power Producers Office (set up by Treasury and the Department of Energy), the REIPPPP has introduced multiple bidding rounds (bid windows) in which the producer with the lowest tariff is offered a government guarantee. To date the program has supported the delivery of 6,422 MW over 112 projects across South Africa, including in some of the poorest areas, mainly in solar and wind energy. Between 2004 and 2018 the program mobilized around USD 20.5 bn in renewable investments.⁴⁰ Over the years, winning tariffs have dropped significantly, and renewable energy producers are able to provide energy at near to half the cost of new coal power plants being built by Eskom (see Figure 5). Despite its massive success, new bid windows have stalled over the past few years. The last bidding round – which signed after 3 years of delay – was in 2018, attracting USD 3.8 bn in investments and projects.

Figure 5. Costs for renewable auctions vs. costs for latest coal-fired power stations (average weighted costs in ZAR/KWH)



*Based on NT discount rate; real post-tax discount rates, 8.2%. Treasury notes that the levelized costs of electricity for Medupi and Kusile could be conservative in light of new information regarding unauthorized expenditure and rectification costs for design, execution and construction problems

Source: Figures from National Treasury (2020). Financing a Sustainable Economy. Technical Paper; based on IPP Quarterly Report, March 2019; Bid windows 1-4 (as at April 2018): Medupi and Kusile, Meridian Economics *figures adjusted for inflation to provide comparable numbers).

21. Overall, the government of South Africa finances a significant proportion of green economy initiatives in the country. One study estimates that authorities finance half of all green projects in the country.⁴¹ Beyond the REIPPPP, programs funded and/or supported by the government include the Green Fund, the Jobs Fund, the National Empowerment Fund and the Green Energy Efficiency Fund. South Africa's Green Fund provides grant and loan finance to public and private actors to support initiatives that advance the country's transition to a low carbon economy. Established in 2011, the Fund was capitalized at ZAR 1.1 billion to be invested over four years. The Fund is managed

⁴⁰ Bloomberg NEF (2019). Climate Scope 2019.

⁴¹ Green Economy Coalition and Africa Center for a Green Economy. (2018) The Green Economy Barometer 2018 South Africa.

by the Development of Bank of South Africa (DBSA) on behalf of the Department of Environmental Affairs. There has been significant demand for funding from the Green Fund, with 590 project development applications totaling ZAR 10.9 billion (USD 1.09 billion) received in its opening round of request for proposals (2012).⁴² However, the last round of disbursements took place in 2018 and there are currently no plans in place to replenish its resources.

22. A combination of industry-led initiatives and government spending has mobilized private sources of funding for climate action. South African banks and investors made up the bulk of investments in the government led USD 20.5 billion REIPPP auctions for renewable energy over the 2004-2018 period. Green bond issuances were piloted in South Africa by the Industrial Development Cooperation and the cities of Cape Town and Johannesburg. Two major banks and one private firm followed suit, also issuing green bonds, bringing its total amount investments to ZAR 13.3 bn for the 2012-2020 period. Proceeds have been mainly used to finance renewable energy, energy efficiency and green buildings. To stimulate local issuance, the Johannesburg Stock Exchange (JSE) launched green bond listing requirements in 2014. JSE also launched index products to further stimulate broader Environmental, Social and Governance investments.

23. Voluntary codes and principles have further stimulated sustainable finance practices in South Africa. Listed firms, including the major banks, are required by the Johannesburg Stock Exchange to comply with the King Code of Corporate Governance (King IV), which expects governing bodies to demonstrate integration of environmental and social aspects in value creation and integrated reporting. In another initiative, the Banking Association South Africa introduced voluntary Principles for Environmental and Social Risk in 2014, to which many of its members signed up. The big FIs also participate in various international initiatives, including a UNEP FI program on reporting in line with FSB TCFD recommendations on climate risk disclosure. The five biggest banks, comprising of more than 90 percent of banking sector assets, also endorsed the Paris Agreement and Sustainable Development Goals, and signed up to the Equator Principles – a risk management framework for project finance more geared to social issues.

24. At the same time, the role of regulators and supervisors in stimulating climate risk management has been limited to an ESG clause in the Pension Act and subsequent ESG guidelines for pension funds by the FSCA. While not specifically geared towards climate change, the 2011 update of Regulation 28 requires proper understanding and communication on all risks relevant to a pension fund, including Environmental, Social and Governance (ESG) risks, with reasonable due diligence and understanding of risks over time. In 2019 the FSCA, published voluntary guidelines on how to integrate risks highlighted in Regulation 28 in reporting and investment policies. So far, the SARB / PA has not yet provided direction to the banking and insurance sectors on environmental or climate risks. However, SARB recently became the second African member of the NGFS, expressing its ambition to further integrate the topic in macro and micro prudential operations. The PA also started to raise awareness on TCFD recommendations, by publishing a survey on uptake among insurers and banks.

⁴² DEA & DBSA (2012).

25. A recent draft technical paper by National Treasury defines sustainable finance for South Africa and lays out a vision for its implementation, including regulations and supervisory actions that would help address climate risks.⁴³ Supported by a working group (with representatives from public authorities, including SARB, PA and FSCA, as well industry associations), the paper indicates that “sustainable finance encompasses financial models, products, markets and ethical practices to deliver resilience and long-term value in each of the economic, environmental and social aspects and thereby contributing to the delivery of the sustainable development goals and climate resilience.” Subsequently, the National Treasury established the Sustainable Finance Initiative to implement the vision set out in the technical paper. The Initiative includes five working groups:

- WG1 Taxonomy: Develop or adopt a taxonomy for green, social, and sustainable finance initiatives, consistent with international developments, to build credibility, foster investment and enable effective monitoring and disclosure of performance.
- WG2 Disclosure: Incorporate the recommendations of the TCFD and include disclosure of progress in environmental and social risk management, including climate risks, in supervisory activities carried out by the PA and FSCA. Incorporate voluntary codes of principles – or acknowledged benchmarks for good practice, into regulatory regimes.
- WG3 Stress Test: Develop benchmark climate risk scenarios for use in stress tests by the sector.
- WG4 Sustainable Finance: Mobilize the financial sector to move towards more responsible practices that will ensure a stable, resilient, and competitive economy (e.g., through climate finance, environmental and social risk management, green bonds)
- WG5 Capacity building: Build sector capacity and competency for good climate risk governance, management and disclosure across the sector and the implementing arms of government.

CLIMATE RISKS FOR THE FINANCIAL SECTOR

26. Climate change and environmental issues are increasingly recognized as important sources of risk and opportunity for the financial sector. A growing number of central banks and regulators have issued warnings on the impact of climate and environmental risks on the stability of their financial systems, based on both physical and transition risks.⁴⁴ Physical risks stem from the gradual and abrupt impacts of climate change and natural disasters – such as droughts, floods and hurricanes – on the value of real and financial assets. Transition risks originate from efforts to mitigate climate change and improve local environmental conditions by decarbonizing the economy, which may create significant economic adjustment costs in a broad range of sectors. These costs can create

⁴³ National Treasury (2020). [Financing a Sustainable Economy. Technical Paper.](#)

⁴⁴ The Central Banks and Regulators Network on Greening the Financial System, which consists of 65 members and 12 observers, urges regulators and policymakers to act to mitigate climate risks. Previously, this topic was put on the global agenda by the G20 Green Finance Study Group and FSB Task Force on Climate-Related Financial Disclosures.

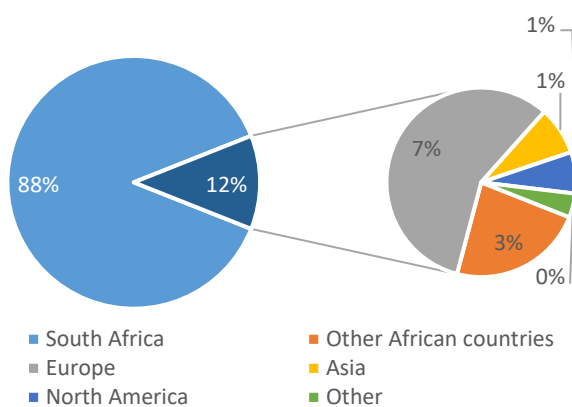
financial risks for firms and investors that did not anticipate such a transition and ultimately jeopardize the well-functioning and stability of the financial system.

27. This chapter aims to identify the most relevant climate risks for South Africa, with a focus on the impact of domestic assets. Within the South African financial sector there is an emerging awareness of climate related risks, however the understanding of these risks and steps for appropriate management are still nascent. While South African FIs, including banks and insurers, have operations across Africa, in terms of total balance sheet exposures, the majority sits within South Africa (see Box 1). Hence, the focus of the analysis below is mainly on the impacts of climate change on operations and assets domestically.

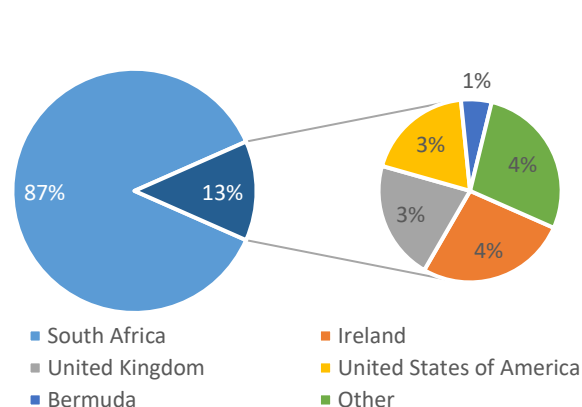
Box 1. SA banking and insurance sectors' cross-border exposures

The South African banking and insurance sectors are mostly exposed to domestic climate risks. 88 percent and 87 percent of their asset holdings, respectively, are classified as domestic. For banks, the largest international exposures are to European countries (6.9 percent) and to other African countries (2.8 percent). 2.6 percent of all assets are outside Africa and Europe. For insurers, the largest international exposures are to Ireland (3.5 percent), the United Kingdom (2.8 percent), and the United States (2.5 percent). 4.4 percent of all assets are in other countries. For the assets for which a look through is available, the equity portfolio is the most internationally diversified (21 percent) while the bond portfolio (9 percent) and sovereign debt portfolio (3 percent) are highly domestically oriented. Insights on geographical asset distribution of investment funds were not available. However, for pension funds regulatory requirements prescribe a minimum of 70 percent of investments in South Africa.

Bank assets, by region in 2019



Insurance assets, by region⁴⁵



Source: Team calculations based on data provided by SARB

⁴⁵ Numbers do not add up because of rounding

A. Physical risks

28. The insurance sector is first in line to bear the costs of physical risks, and is exposed to weather-related catastrophe losses through the insurance of property and motor vehicles, albeit impacts appear manageable for now.⁴⁶ Non-life insurance in South Africa is largely based on property and motor vehicle insurance, together accounting for 72 percent of all Gross Written Premiums (GWP) in 2018. Other common types of insurance are liability (6 percent) and accident and health (4 percent). Over the last four years South African insurers have seen catastrophe losses materializing as a result of floods, storms (hail) and fires. 2017 was a particularly bad year for the insurance sector, with an estimated ZAR 8 billion in gross catastrophe claims from flood and fire. Based on more detailed data for one of South Africa's largest insurers, the largest contributors to gross catastrophe losses were floods (56 percent of all catastrophe losses), followed by hail (28 percent) and fire (13 percent) in the period 2001 to 2019⁴⁷ (see figure 7). While losses put pressure on the profitability of the insurance sector, overall these impacts have been manageable, amongst other things due to geographically diversified portfolios and sufficient reinsurance, which can be obtained at a relatively inexpensive level (experts estimate costs to be equal to 2-3 percent of written premiums, which is comparatively low to other jurisdictions⁴⁸). That being said, the industry recognizes that risk profiles of weather-related events are changing, which could put further pressure on profitability, may increase technical reserves and capital requirements and ultimately may lead to an increase in the cost of providing insurance. Premiums may especially increase in disaster prone areas, which in some cases may even become uninsurable.

29. Agricultural insurance is underdeveloped, only accounting for 1 percent of gross written premiums (GWP), with insurers further limiting their exposures as a result of drought risk. Most agricultural premiums are for hail insurance, which includes coverage for a set of perils. Drought is insurable in South Africa as part of a multi-peril crop insurance (MPCI). However, its uptake is limited. Penetration was estimated to be around 17 percent for larger commercial farmers, and less than 1 percent for smallholder farmers.⁴⁹ Overall, the profitability of the MPCI portfolio is under severe pressure in South Africa, amongst others due to losses as result of the ongoing droughts. During the last El Nino drought, several insurance companies reported large amounts of claims and high loss ratios in their agriculture portfolio. For example, of the three insurance companies underwriting agriculture risk, one company reported a loss ratio in their agriculture portfolio of 239 percent. The increasing claims are leading to a negative spiral - insurance companies are forced to increase premiums reducing the affordability for commercial farmers, thereby reducing the size of the market and increasing fixed costs. To manage the risks, non-life insurers are bundling MPCI with hail insurance and limiting their exposure to droughts as part of their risk management.

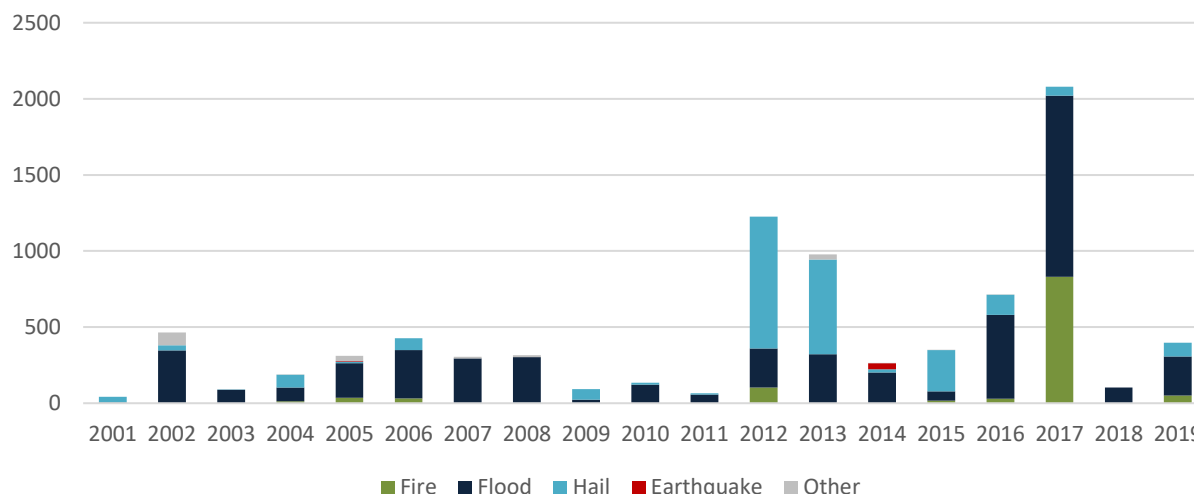
⁴⁶ In its Financial Stability Review First Edition 2019, SARB recognizes risks for the insurance sector, but concludes they appear not systemic at present.

⁴⁷ Figures are based on data from a large insurer covering about a quarter of the total market. Experts have noted that this is roughly representative for the South African insurance market.

⁴⁸ Reinsurance experts indicate that premiums in EU and US these are up to 5-6 percent.

⁴⁹ (SAIA, 2013).

Figure 7. Insurance claims from catastrophe events (gross) other than drought for one major South African insurer, ZAR million



Source: Santam.

Note: Santam covers about a quarter of the total non-life insurance market in SA.

30. Even though the impact of physical risks – particularly droughts – on banks may have been limited due to banks’ geographically diversified portfolios and low exposure to the agriculture sector, these risks could still be significant given the potential impact of droughts on the broader economy. While the big five banks provide about 62 percent of all loans to the agricultural sector, the agriculture sector’s share of the credit portfolio’s is relatively small for most banks, standing at 1.8 percent total corporate credit portfolio. Some banks are more vulnerable as they have larger portfolios (see also Figure 9). When the up- and downstream value chains of food production are included, experts estimate the total average loan exposure to be around 6-7 percent of loans. Moreover, droughts can lead to more widespread impacts on the economy, as was seen during the Cape Town water crisis, potentially affecting much larger parts of the bank balance sheet via loans to mining (3.2 percent of loans), power production (2.6 percent of loans, water utilities (percentage of loans unknown), and tourism (percentage of loans unknown). A follow-up sensitivity analysis conducted by the FSAP, suggests that drought risk is indeed a source of credit risk for various economic sectors in an affected region, beyond only the agriculture sector (see Box 2).

31. The Land Bank is among the most severely affected institutions by droughts. The Land and Agricultural Development Bank of South Africa (Land bank), is the country’s agricultural development bank. It provides an estimated 28 percent of all loans to the agricultural sector (the big banks 62 percent and the small banks 10 percent), with a modest balance sheet valued at ZAR 47.7 billion as of October 2018. Land Bank estimates that 80 percent of lending is designated for large

farmers, with small holder farmers accounting for about 15 percent. The bank highlights the impacts of droughts on the agricultural sector as an important driver behind a significant rise in NPLs over the past few years, rising from 6.7 percent at the end of 2017 to 9.9 percent in December 2019. Land Bank has dealt with these impacts by temporary holds on repayment of principle and restructuring of loans. Landbank also requested a R22 billion (approx. US\$1.3 billion) cash injection from National Treasury in May 2020 due to a liquidity crisis. Moody's downgraded Land Bank's credit score in 2020 to junk status, listing concerns about South Africa's government to support the bank and continuing pressures on its operating model, "including high environmental risk from droughts."⁵⁰

32. Apart from droughts, floods, storms and wildfires could also particularly impact the large residential and commercial real estate portfolios of banks, standing at 23 percent of total loans. However, the requirement for a borrower to obtain mandatory property insurance for a real estate loan, including mortgages, lowers the probability of default as well as the loss given default from natural catastrophe impacts

33. Banks as well as investors could run risks due to exposures to government securities. Large-scale disasters and environmental risks can affect the future creditworthiness of the South African government, including sub-sovereign issuers, contributing to a downgrade of its debt. Particularly, drought risks and water shortages are material for the country's sovereign risk ratings. Moreover, drought risk is particularly relevant for local governments which depend directly on the revenue from water supplies (up to 10 percent of revenue) and can also be affected by drops in tourism as was shown during the 2018 Cape Town water crisis.⁵¹ Domestic government debt held by South African banks totals approximately ZAR 741 billion (12.6% of total assets).⁵² The insurance sector has ZAR 210 billion of South African sovereign debt on its balance sheet (7.2% of total assets) while pension funds have 17% of their assets in government bonds.⁵³ Further exploration of these risk channels is needed to determine materiality for FI balance sheets.

B. Transition risks

34. As a resource-rich country, South Africa's economy and financial sector are vulnerable to both global and local decarbonization trends. With a high dependency on CO₂-intensive exports, including coal, South Africa's transition risks are, to a significant degree, dependent on factors beyond its control. These include global developments in renewable energy and geo-politics, including the strengthening of commitments by trading partners to climate change policies and mitigating regulations. Transition risks from domestic factors have started to materialize in South Africa, with the introduction of the 2019 Carbon Tax Act. This requires large emitters to report greenhouse gas (GHG) emissions and pay a tax, however subject to several sectoral adjustments and rebates. The Carbon Tax Act is intended to drive the economy and financial sector to incorporate the

⁵⁰ Moody's Investors Service (January 21, 2020). [Rating Action: Moody's downgrades Land Bank's ratings to Ba1; outlook negative](#); Moody's Investors Service (April 24, 2020). [Rating Action: Moody's downgrades Land Bank to B1; on review for further downgrade](#).

⁵¹ Moody's Investors Service (April 1, 2020). [Rating Action: Moody's takes action on 8 South African sub-sovereign issuers](#)

⁵² Total SA banking sector assets were ZAR 5,886 billion in 2019 (year-end).

⁵³ Total SA insurance sector assets under management were ZAR 2,919 billion in 2018 (including life, non-life, and composite insurance). Pension figures obtained from the SARB financial stability review (second edition 2019).

risks associated with climate change and promote an orderly and just transition from high to low carbon investments. Financial institutions could be affected both by increased credit and market risks on transition sensitive assets, as well as a deterioration of the general macro-economic environment when a disorderly decarbonization process takes place.

35. Sectors that are especially vulnerable to an energy transition are fossil fuels, electricity production, mining, heavy industry, transport and agriculture. Electricity production in South Africa is highly dependent on coal, which should largely be phased out by 2040 in order to meet the Paris targets, leaving the country with stranded assets in the form of coal fired power plants and related infrastructure. For the energy sector alone, a study by the Climate Policy Initiative estimates that the cumulative impact on South Africa of a global low-carbon transition over the period of our analysis (between 2017 and 2035) could be more than USD 120 billion, in present value terms. While half of this loss is already priced in, the report estimates large (remaining) potential losses for the coal mining sector, while also highlighting impact on the broader energy value chain. One of the most affected regions would be the Mpumalanga province, having the highest coal power emissions in the world. Also, various types of fossil fuel mining span a large part of South Africa including Northern Cape, Gauteng, Mpumalanga, Free State, Limpopo and the Northwest. Some of these regions also have heightened physical risk.⁵⁴

36. While data is limited, a high-level exposure assessment of bank and insurance data reveals various channels by which these sectors could be affected. Data from high-level sector exposures was used to identify credit risk for banks for their lending portfolios, and market risk for insurers from their bond and equity portfolios. Box 2 also includes insights from a follow-up sensitivity analysis on several transition risk scenarios as part of the FSAP stress test.

37. Banks are exposed to transition risk, which could materialize as increased credit risk, through sizable holdings in climate-sensitive sectors, with about 16.1 percent of their private sector credit exposure directly to transition-sensitive industries. Total credit exposure in the South African banking system is ZAR 6,582 billion as of 2019, of which ZAR 1,059 billion is in transition-sensitive industries.⁵⁵ Compared to other countries with similar data available, this is on the high-end of the spectrum. The largest transition-sensitive credit exposures are manufacturing (5.2 percent), transport (3.3 percent), and mining and quarrying (3.2 percent), followed by electricity, gas and water supply (2.6 percent) and agriculture, forestry and fishing (1.8 percent). A bit over two-thirds (69 percent) of credit exposures is on balance sheet, with the remainder categorized as off-balance sheet exposure, repurchase and resale agreements, and derivative instruments. Specifically, for mining and quarrying a large share of the credit exposure is off balance sheet (60 percent). See figure 8.

38. For five major banks in South Africa, transition-sensitive credit exposure ranges between 11.9 percent and 18.7 percent of total credit exposure, with differences observed in industry allocation. For example, Investec Bank has the largest relative exposures in transport,

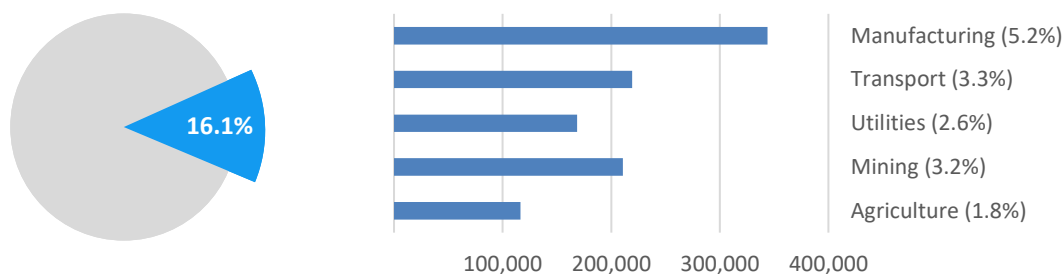
⁵⁴ Matthew Huxham, Muhammed Anwar, David Nelson (2019). Understanding the Impact of a Low Carbon Transition on South Africa.

⁵⁵ Total credit exposure in 2019 exceeds total assets, due to off balance sheet exposures, repurchase and resale agreements, and derivative instruments. On balance sheet credit exposures were ZAR 4,569 in 2019.

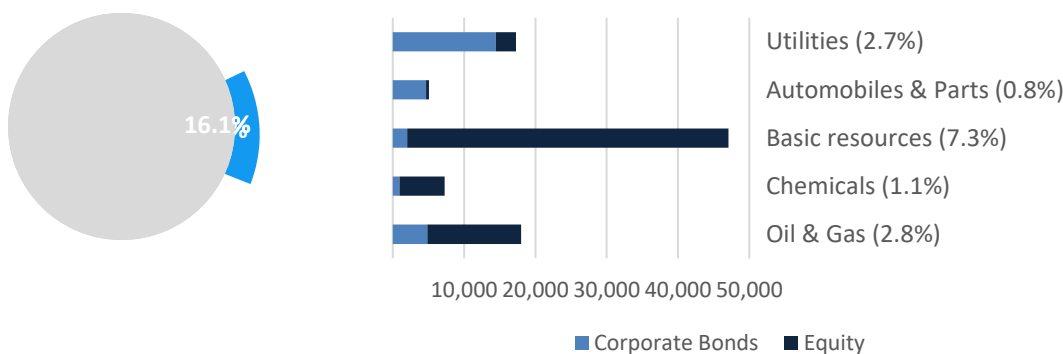
storage and communication (6.6 percent), while Absa bank is most exposed to agriculture, hunting, forestry and fishing (4.5 percent). Nedbank has a relatively high exposure to electricity, gas and water supply (4.0 percent). All banks except Firststrand bank have relative high exposures to manufacturing (ranging between 5.0 percent and 5.8 percent). See figure 9.

Figure 8. Transition-sensitive exposures

Transition-sensitive exposures in the corporate credit portfolio in the banking sector (ZAR million, 2019)

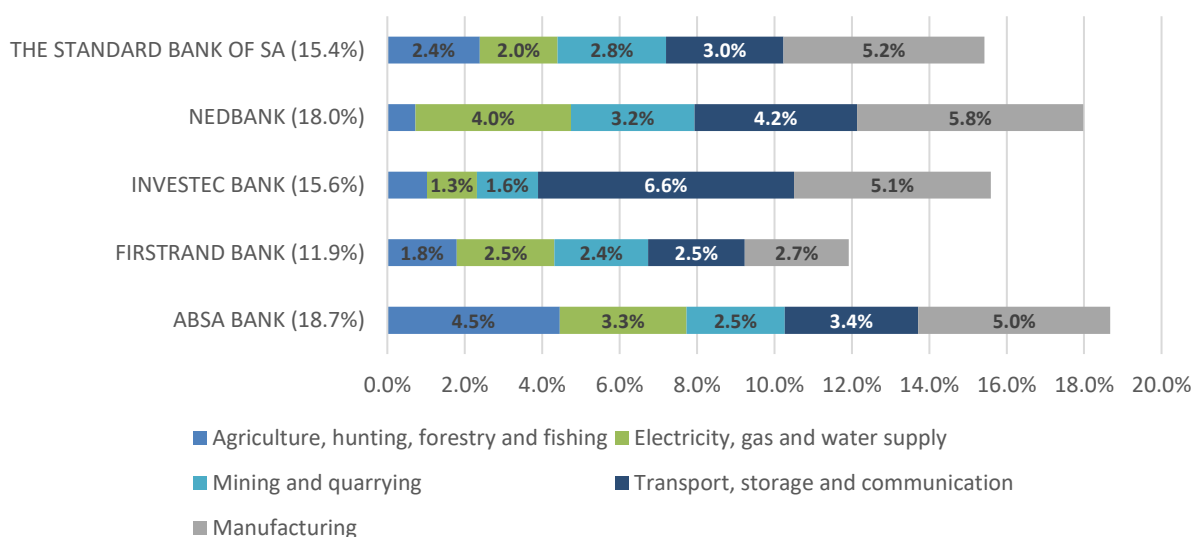


Transition-sensitive exposures in the corporate bonds and equity portfolios in the insurance sector (ZAR million, 2018)



Note: percentages are a fraction of the respective portfolio (corporate credit for banking, and corporate bonds and equity for insurance). Only high-level breakdowns are available. The industry classification differs between the banking and insurance sectors. For banking, shortened descriptions are used in the graph. Transition-sensitive industries for banking include: agriculture, hunting, forestry and fishing, mining and quarrying, electricity, gas and water supply, transport, storage and communication, and manufacturing. Not all subsectors within the manufacturing industry are equally transition sensitive. According to Statistics South Africa the manufacturing industry includes petroleum and chemical products (24%), basic iron and steel (19%), wood products, paper and printing (11%) and motor-vehicles, parts and accessories (7%) based on total value added in 2018. Other subsectors include food and beverages (26%), glass and non-metallic mineral products (4%), furniture and other manufacturing (3%), textiles and clothing (3%), and electrical machinery (2%). For insurers, the industrial goods & services category was not included in the main analysis but does include some transition-sensitive subsectors (e.g., industrial transportation). The whole category accounts for 6.4% of the corporate bonds and equity portfolios.

Source: SARB

Figure 9. Transition-sensitive credit exposures per bank, 2019

Note: not all subsectors within the manufacturing industry are equally transition sensitive. According to Statistics South Africa the manufacturing industry includes petroleum and chemical products (24%), basic iron and steel (19%), wood products, paper and printing (11%) and motor-vehicles, parts and accessories (7%) based on total value added in 2018. Other subsectors include food and beverages (26%), glass and non-metallic mineral products (4%), furniture and other manufacturing (3%), textiles and clothing (3%), and electrical machinery (2%).

Source: SA

39. Sectoral exposures by banks to transition sensitive public companies, as well as equity exposures, appear relatively low. Total public company exposures amount to ZAR 129 billion, as of June 2019, about two percent of total assets. The most carbon intensive company, Eskom, accounts for ZAR 26 bn (about 0.4 percent of total bank balance sheets). Of that, banks highlight that 85 percent is backed by a government guarantee, limiting the effective exposure to 0.1 percent but increasing the net exposure to the government as a guarantor. Total equity exposure in the SA banking system is also low, at ZAR 9 billion, of which ZAR 0.65 billion (6.9 percent) is in transition sensitive industries.

40. Transition risks are not limited to highly-CO2 intensive industries, however, and could over time start affecting a broad range of sectors and assets. Specifically, risks could also play out via significant exposures to the government. While this is currently not yet the case, decarbonization could potentially affect sovereign creditworthiness, in particular due to the official sector having a major stake in the energy sector (e.g., through its ownership of Eskom)). This exposes financial institutions to transition risks through their sovereign debt holdings and their stakes in government-owned enterprises. As mentioned, domestic sovereign debt held by South African banks totaled approximately ZAR 741 billion, or 11.2 percent of balance sheets. The overall government exposure is likely higher, if local and municipality exposures, as well as guarantees on public entity debt (see above) are considered.

41. Another channel through which transition risk might arise is via exposures to real estate.

For example, investments in real estate can be affected if energy efficiency requirements are introduced for residential or commercial real estate, potentially rendering older buildings less valuable or even unrentable (e.g., for commercial real estate).⁵⁶ This underlines the importance of careful climate policymaking, including their timely announcement and smooth introduction. Mortgage loans (commercial real estate (ZAR 344 bn) and home loans (ZAR 1049 bn)) make up 23 percent of the total asset holdings of South African banks.⁵⁷

42. Transition risk could also materialize indirectly, via exposures to other FIs. Interlinkages between financial sector institutions are high due to a substantial share of investments in and credit extended to other financial institutions. This increases secondary exposures to climate sensitive asset classes. 10 percent of the credit of the five largest South African banks is to the financial sector.

Box 2. Sensitivity Analysis of Climate Risks for the Banking Sector

As part of the FSAP stress test, various sensitivity tests were conducted to further assess the impacts of physical and transition risks on bank balance sheets. Outcomes suggest that:

- **Physical risks are a source of credit risk.** A difference-in-difference econometric analysis shows that banks assign significantly higher Probabilities of Defaults to economic sectors more vulnerable to water shortages provinces affected by drought events.
- **Transition risks could arise from both technological and policy perspectives.** A sensitivity analysis of transition risk scenarios on bank's sectoral exposures suggest that transition from coal-based production of electricity to green energy could lead in the near-term to electricity shortages and sustained price hikes, which could squeeze non-financial corporates' margins and increase credit risk. In the medium-term such a transition could result in jobs and output losses in regions where coal mining is concentrated albeit most large banks have limited exposures to such regions. A third scenario investigated an increase of the carbon tax to a mid-point estimate needed to stabilize carbon equivalent emissions. Outcomes suggest that if implemented in a short period of time, firms' production costs would be impacted.

Source: See South FSAP Update Aide Memoire for additional details

43. The insurance sector is also exposed to transition risks, as it holds about 14.7 percent of its corporate bond and equity portfolio directly with transition-sensitive industries, while also holding sizable exposures to the government securities. The total corporate bond and equity portfolio in the SA insurance sector is ZAR 643 billion as of 2018, of which ZAR 95 billion is in

⁵⁶ DNB (2017) Waterproof – an exploration of climate-related financial risks for the Dutch financial sector.

⁵⁷ Per February 2020, from the publication "selected South African banking sector trends" Home loans amount to ZAR 1,049 billion and commercial mortgages amount to ZAR 334 billion in 2020. Total banking sector assets were ZAR 6,074 billion.

transition-sensitive industries. This is in line with exposures found for other institutional investors in benchmark countries. The largest transition-sensitive exposures are in basic resources (7.3 percent) and oil and gas (2.8 percent). For those two industries, most of the funding is equity, and hence exposed to first losses. The financing of the utilities sector is more debt oriented, with a total exposure of 2.7 percent. See figure 8. Not all sub-sectors are accounted for, since only a high-level breakdown of data is available. This excludes especially some subsectors in the industrial goods & services category (e.g., industrial transportation). Industrial goods & services account for 6.4% of the corporate bonds and equity portfolios of insurers.

44. Investment funds, including pension and mutual funds, are exposed as well to transition risk – although no breakdown to industrial sectors is available. Pension funds hold almost half of their assets in shares, while also holding 15-20 percent of their assets in government bonds, as of 2019. Specifically, for the government pension fund, around 5 percent of its total ZAR 1.7 trillion asset portfolio is invested in debt instruments related to Eskom. This amounts to about 20 percent of the total debt of Eskom.

45. Besides risks from investing in activities that are incompatible with a low-carbon future, there are also risks connected to green investments. Primarily this is related to a risk of “greenwashing”: namely to label green products as such that do not adhere to strict national and international criteria. This is relevant for green bonds, amongst other instruments. A total of ZAR 13.3 billion in green bonds have been issued in South Africa between 2012 and 2020. Some of the early green bonds in South Africa were self-labelled. There is not currently a national taxonomy to judge green investments and loans against, but the National Treasury has published a working draft green finance taxonomy for public consultation⁵⁸. Banks estimate that approximately 3-4 percent of their credit portfolio is in green projects, particularly as part of the domestic auctions for renewable energy, but in some cases also as part of broader investments across Africa.⁵⁹ Investors also highlight increasing investment in green projects, again often tied to the renewable auctions. Although these are laudable developments in principle, the supervisory authority should also scrutinize such investments and beware of the potential risks inherent to them.

C. Current sector practices on climate change and environmental risks

46. While the awareness is high, the readiness to deal with climate risks in the South African financial sector is still limited. A thorough assessment of the response by individual financial institutions to climate risks is beyond the scope of this FSAP. However, based on a recently published survey by the PA on FSB TCFD awareness and integration (see Box 3 below), as well as interviews with regulators and several industry representatives, the following observations were made:

- **There is high awareness of transition and physical risks among the largest banks, insurers and investors.** Transition risk is seen as an important macro-economic risk for the whole country, as well as a risk for particular industries, while also an important area of opportunity for investment

⁵⁸ The draft taxonomy can be found here: <https://sustainablefinanceinitiative.org.za/wp-content/uploads/2021/06/Draft-Green-Finance-Taxonomy.pdf>

⁵⁹ This estimate is based on interviews held by FSAP with the top 4 banks.

across Africa (see Section V). Direct exposures to Eskom and other state-owned assets are deemed manageable, due to the limited size of exposures and state guarantees on loans. Risks to broader investment categories, like mortgages and commercial real estate, are recognized, though not all industry players are convinced that transition risk will affect these loan categories. Drought is seen as the most significant physical risk, though apart from the Land Bank, the bigger banks view their low exposure as an effective risk mitigant.

- **Banks, investors and associations, have been active in promoting and signing up to voluntary international standards and local initiatives related to climate and environmental risk management and awareness.** This includes several FIs joining the UNEP FI TCFD implementation pilot, the UNEP FI Principles for Responsible Banking, as well as the UN Principles for Sustainable Insurance and UN Principles for Responsible Investment. The South Africa banking and insurance associations actively support such initiatives. Earlier, they supported the creation of a framework for broader Environmental and Social Management.
- **The larger banks are keen to reduce highly-CO2 intensive exposures and increase green investments, but also face challenges.** Banks have been active in investing in renewables (estimated to be around 3-4 percent of lending portfolios), with energy portfolios tilting towards greener options. Some banks have launched policies to limit their coal exposure. At the same time, they note that in the South Africa political and social context, it is difficult – if not impossible – to fully avoid such exposures.
- **The big four banks have started to reflect climate risks in their strategies and governance.** The top four banks the team spoke to, all signal heightened board interest in the topic, and have set up internal governance mechanisms, ranging from committees, to hub and spoke models with dedicated units on the topic and experts in various core departments. All banks report a heightened interest in further product development and are keen to expand investments in green projects.
- **Despite these developments, integration of climate risk in core risk management and lending practices is low.** So far none of the banks have integrated climate risk in core risk management functions, including credit risk. Moreover, they have not performed portfolio-level deep dive analysis to climate risk, beyond high-level exposure assessments (i.e. mapping industry exposures). There is limited, to no use of forward-looking tools, like scenario analysis and stress testing applied to climate risk. While ultimate responsibility for adequately managing climate risk lies with the institutions, a lack of guidance on this topic by the supervisor was mentioned as an important reason for limited action so far.
- **According to the TCFD survey, reporting exposures to climate risks and climate risk management metrics is emerging in the banking sector, but limited in terms of overall sector coverage.** The TCFD survey shows that 56 percent of banks provide TCFD-aligned disclosures. At the same time, the large banks do not yet report on climate risk metrics, explaining that only 12 percent of assets are covered. Although, most of these institutions reported to FSAP

they have started exploring the topic, including as part of the UNEP FI TCFD pilot. Banks and investors also report increasing pressure from advocacy groups to start disclosing their exposures.

- **The insurance sector is highly aware of climate risk and limits its exposure to the agricultural sector but has not yet factored climate change into its modeling.** As indicated, drought-related insurance is more and more seen as unprofitable, without government intervention. As part of its risk appetite setting, the insurance industry has limited its exposures in order to manage risk. Reinsurance is seen as sufficient to cover for other perils, though not available for drought products. Modeling capacity to estimate impacts of climate change, and stress test balance sheets, is limited.

Box 3. Results TCFD survey

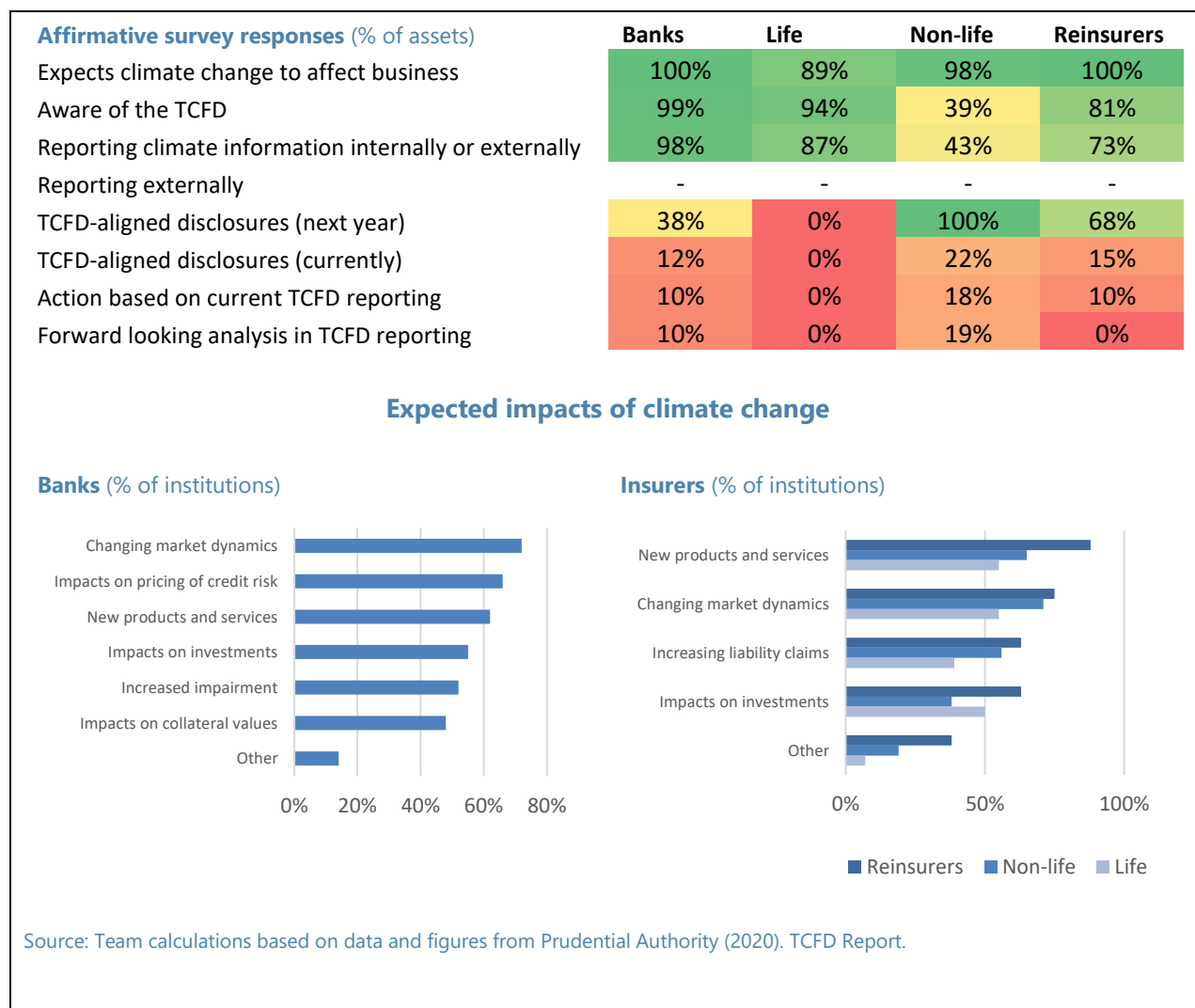
The Prudential Authority (PA) conducted surveys in the South African banking and insurance sectors to gather a representative view of their progress with respect to the TCFD recommendations.

Specifically, the surveys aim to understand institutions' awareness, understanding, level of uptake and implementation of the TCFD recommendations. The surveys included banks, life insurers, non-life insurers and reinsurers and were distributed over the course of 2019. Although voluntary, the outcomes represent a significant portion of each industry with response rates of 83 percent (banks) and 66 percent (insurers). In terms of assets under management, the coverage is even higher (99 percent and 87 percent respectively) indicating that larger firms completed the questionnaire more often than smaller ones.

In general, the surveys showed that there is high awareness in the financial sector related to climate risks and the TCFD, but follow-up actions are limited so far. Both banks and insurers are largely aware of the TCFD and expect climate change to affect their businesses. However, only a limited number of firms take actions based on their current TCFD reporting. None of the South African life insurers that responded to the survey stated that they have or plan to do TCFD-aligned reporting. For all institutions, forward-looking analyses are rare as part of TCFD reporting. Amongst the most cited expected impacts of climate change are changing market dynamics, the pricing of credit risk, and the creation of new products and services.

Awareness and uptake of TCFD recommendations

Affirmative survey responses (% of institutions)	Banks	Life	Non-life	Reinsurers
Expects climate change to affect business	83%	66%	87%	100%
Aware of the TCFD	72%	50%	42%	75%
Reporting climate information internally or externally	45%	36%	31%	75%
Reporting externally	31%	32%	20%	25%
TCFD-aligned disclosures (next year)	67%	0%	100%	50%
TCFD-aligned disclosures (currently)	56%	0%	57%	25%
Action based on current TCFD reporting	44%	0%	40%	13%
Forward looking analysis in TCFD reporting	20%	0%	25%	0%



SUPERVISORY RESPONSE

A. South Africa Reserve Bank and Prudential Authority

47. To provide actionable guidance, the FSAP assessed the supervisory responses of the SARB and the PA to climate risks in the South African financial sector against a set of emerging good practices. At this point in time, there are no global standards or principles against which to assess the supervisory approach on climate-related risks. However, good practices are emerging from central banks and regulators concerned about the impact of climate risks on the financial sector. For this assessment we particularly build on recommendations provided by the NGFS⁶⁰, which has published a guide for supervisors, providing practical recommendations on integrating climate-related and environmental risks into prudential supervision. It sets out current best practices as

⁶⁰ NGFS (2020). Guide for supervisors: Integrating climate-related and environmental risks into prudential supervision.

identified by the international supervisory community. In addition, all major standard setting bodies have started to engage on climate-related risk and/or sustainable finance (see Box 4 below for the relevant publications), which further informs the framework and provided recommendations, including sector specific guidance.

Box 4. Publications and guidance by standard setting bodies on climate-related risk

- **Basel Committee on Banking Supervision (BCBS)**⁶¹, [Climate-related financial risks: a survey on current initiatives \(2020\)](#)
- **Bank for International Settlements (BIS)**, [Turning up the heat: Climate risk assessment in the insurance sector \(2020\)](#); and [The Green Swan: Central banking and financial stability in the age of climate change \(2020\)](#)
- **International Association of Insurance Supervisors (IAIS)**, [IAIS & Sustainable Insurance Forum \(SIF\) Issues Paper on Climate Change Risks to the Insurance Sector \(2018\)](#); and [IAIS & SIF Issues Paper on the Implementation of the Recommendations of the TCFD \(2020\)](#)
- **International Organization of Securities Commissions (IOSCO)**⁶², [Sustainable Finance and the Role of Securities Regulators and IOSCO \(2020\)](#); and [Sustainable Finance in Emerging Markets and the Role of Securities Regulators \(2019\)](#)
- **International Organisation of Pension Supervisors (IOPS)**, [IOPS Supervisory Guidelines on the Integration of ESG Factors in the Investment and Risk Management of Pension Funds](#)

48. Table 3 provides a high-level overview of the assessment framework and scores for SARB / PA. For the categorization of good practices, we loosely follow the structure of the Basel Core Principles on Effective Supervision: making a distinction between supervisory powers and activities (elements I-V), and the supervisory expectations to the sector (elements VI-VIII).

49. Qualitative scores are attached to each of the eight elements:

- ‘On track’ means the initiatives deployed are on average aligned with, or ahead of, international good practices. Obviously, given the state of environmental and climate-related supervisory practices, this does not mean that no improvements can be made.
- ‘Emerging’ means that initiatives have been deployed, but these are either not aligned with good practices or not implemented fully.

⁶¹ BCBS recently established a high-level Task Force on Climate-related Financial Risks

⁶² IOSCO set up a Sustainable Finance Network to allow exchange between members on sustainable finance.

- 'Not in place' means that most of the activities mentioned in a category have not yet been taken up by the regulator, or serious issues are identified.

50. Though important steps have been taken, the assessment shows that substantive efforts to integrate climate risks in SARB's supervisory activities and guidance are still lacking. On the positive side, the SARB / PA set up a board-level driven governance structure and strategy on climate risk and has begun to raise awareness on the topic among industry participants. Publications like the TCFD survey and a study on implications of climate change for central banks in EMs further supports such efforts and helps to build up knowledge within the SARB / PA.⁶³ In 2019, SARB also joined as the second African member of the NGFS and the PA is a member of the Sustainable Insurance Forum, expressing its ambitions to further integrate the topic in macro and micro prudential operations. At the same time, the topic of climate risk is relatively new and substantive regulatory and supervisory actions have not yet been rolled out, including deep dive risk assessments, build up proper tools and data to do so, and guidance to the sector on climate risk management, governance and disclosure.

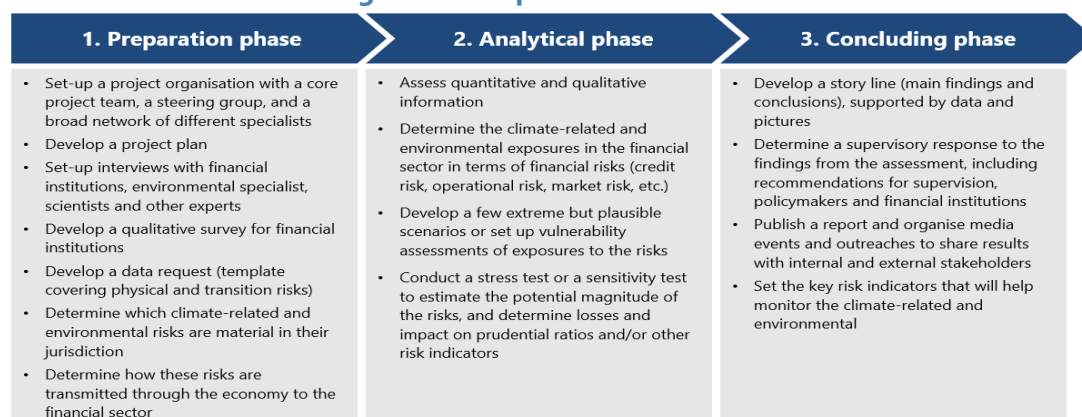
51. To further build knowledge and raise awareness about the impact of climate risks on its supervisory practice and supervised entities, SARB should perform a deep dive Climate Risk Assessment (CRA). Institutional knowledge on specific climate financial risks is limited. SARB has no integrated overview of how physical and transition risks affect the stability and soundness in the sector. Following examples by several central banks and regulators that have taken the lead in this area⁶⁴, it should perform an in depth CRA, that could include (i) an exploration of relevant risk channels and scenarios, (ii) measurements of financial exposures at risk under various climate-related scenarios, (iii) a sensitivity analysis or stress test of impacts on balance sheets (see also Paragraph 54), (iv) in-depth assessment of climate risk management, disclosure and governance practices in the sector, and (v) a set of recommendations for its prudential objectives, regulated institutions and policymakers.⁶⁵ The report should be published to further raise awareness among market participants and policymakers on material risks. Figure 10 provides a step-by-step approach for such an assessment based on good practices by other supervisors. Note that a CRA may potentially be extended by other environmental considerations (e.g., local air pollution) if desired.

⁶³ PA (2020). TCFD Report; SARB (2020). Climate change and its implications for central banks in emerging and developing economies. Working Paper Series WP/20/04.

⁶⁴ See for example DNB (2017). [Waterproof: An Exploration of Climate-related Risks for the Dutch Financial Sector](#); Bank of England (2018). Transition in thinking: The impact of climate change on the UK banking sector.

⁶⁵ Inputs for scenario's should be based on insights from various stakeholders throughout the South African Economy, including the Weather Service, Bureau for Food and Agricultural Policy etc., to obtain a forward look into sectoral impacts that could affect the financial sector.

Figure 10. Steps in a climate risk assessment



Source: NGFS (2020) Guide for supervisors, based on author's inputs.

52. To adequately perform risk assessments and stress tests, the SARB / PA should have more information available to track climate-related financial risk exposures. The PA has high-level industry breakdowns and some regional information on insurers that can be used for climate risk assessments. It also has data available on group level FI exposures per country, which are useful to assess potential cross-border climate exposures. That being said, for more advanced assessments the data availability and quality should be improved. Improvements to consider include:

- **Further breakdowns in industry level datasets.** For assessing potential transition risks, a deeper granularity in industry data is needed to be able to track CO₂-intensive activities. This includes breakdowns of the loan categories in mining and utilities, to get a better look at exposures towards fossil fuel extraction and other fossil fuel-based industries. SARB/PA could also explore the use of databases at the asset level, including a loan by loan database and / or a securities holdings database, that would allow for more precise analysis of bank and insurance exposures to highly CO₂-intensive industries.
- **Introduce regional exposure data at the country level.** SARB / PA does not have datasets available that would allow for a breakdown of loan and investment portfolios at granular, geospatial levels. For assessments of physical risks, including the impacts from drought and flooding, a granular distribution of loan origination and collateral is needed. This should include proper risk metrics that are relevant for stress testing, such as probability of default (PD), loss given default (LGD), non-performing loans (NPLs) and the term of the loans. For proper assessments, exposure data per region should also allow for industry breakdowns to better pinpoint the impacts.
- **Improve coverage of regional insurance data.** The PA has data available on policies per category and region, including motor and property insurance. To better understand climate and other natural disaster impacts, information could be collected on claims per region, plus further breakdowns in claims per peril (i.e. damages from hail, floods, droughts etc.). Given its high exposure to physical risk, agricultural insurance policies and related claims – available at the national level – could be added as a line item under regional breakdowns.

- **Introduce qualitative reporting.** Next to improving the availability of quantitative data, the PA should aim to improve qualitative data points on the integration of climate and environmental risks in risk management, strategy, governance and reporting. Here the PA can build on its recent TCFD survey.

Conducting a CRA will help SARB / PA to better define what data sources need to be in place on a structural basis.

53. SARB needs to develop its stress testing capacity to quantify climate-related risks and be able to assess impacts on financial stability on a structural basis. Macro-prudential stress testing at SARB is done by its Financial Stability Department (FSD). Stress tests are done periodically on a bank-by-bank basis, calculating expected losses and capital positions based on shocks to the probability of default, loss given default and exposure. Results are published in the Financial Stability Review. Recently, the FSD identified climate risks for the SA financial sector in its Risk Assessment Matrix (RAM), highlighting it as a medium-term slow burning issue. This is an important step, as the RAM shapes the department's attention on climate risk going forward in their Financial Stability Review, research agenda, and the way they deal with the topic in stress testing. As of yet, periodic stress tests do not include climate-related scenarios, though scenarios are under development including as part of discussions under the NT Working Group on Scenario Analysis. Given the country's exposure, it is advisable to develop both transition and physical risk stress tests, including attention to droughts. Some of these advancements and outcomes of a stress tests could be presented in the earlier discussed CRA. More structurally, outcomes should also be included in the Financial Stability Review and used to inform the micro prudential supervision approach to climate risks. Results and the methodology from the sensitivity tests conducted on drought and transition risk (performed by the IMF as part of this FSAP) could help inform the design of the SARB stress test going forward.

54. Over time, insurance and pension stress tests could also be developed. At the moment, the SARB is working on a stress test framework for the insurance sector, expected to be finalized in 2023. Once in place, scenarios could be introduced to explore the vulnerabilities of the insurance sector to physical risk scenarios, as well as transition risks (for the investment portfolio). As there are plans to also include pension oversight in the PA's activities, the scope of climate stress test could be further expanded to include all institutional investors over time.

55. Follow-up should focus on integrating climate risks in supervisory guidance. Globally, supervisors are increasingly issuing specific guidelines – either voluntary or mandatory in nature – to financial sector participants on how to address climate risks.⁶⁶ Given the materiality of these risks in South Africa, and limited integration in risk management, the PA should consider issuing guidance on climate risk management for banks and insurers. Expectations should be commensurate with the risk profile and size of each financial institution. Key elements to consider include:

⁶⁶ See for example Bank of England (2019). Enhancing banks' and insurers' approaches to managing the financial risks from climate change. Supervisory Statement SS3/19.

- **Corporate governance and strategy.** This would provide guidance on governance structures and high-level strategies that should be in place within regulated institutions. Elements include board-level commitment and engagement, the presence of tailored organizational structures (e.g., dedicated units), and the integration of climate risks in corporate policies and strategies.
- **Risk management and stress testing.** This entails the supervisory expectations and guidance on processes within financial institutions that deal with the identification, assessment, and mitigation of climate change and environmental risks. Elements include guidance on the integration of these risks in core risk management practices and expectations about organizational awareness with respect to climate scenarios, their potential (long-term) impact on the institution and data availability. Specifically, the PA can encourage the increased use of and provide more detailed guidance on forward-looking risk management tools, such as scenario analysis and stress testing.
- **Prudential reporting and disclosure.** This entails the supervisory expectations and guidance on the reporting and disclosure of material climate-related risks by financial institutions (both to the supervisory authorities and the general public), as well as dialogues with policymakers on disclosure in the broader economy (i.e., including non-financial corporates) to enable investors and loan-originators to better understand, price and manage the risk in their portfolios. Elements include voluntary and mandatory disclosure and reporting requirements, and guidance on disclosures. The latter could be aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), which provides the leading framework for climate-related financial disclosures. The TCFD includes both qualitative and quantitative risk information on governance, risk management and strategies.

56. In the long run, it is advisable that the PA further integrates climate risks in its supervisory framework and activities. This includes integration in off-site monitoring, on-site supervision and supervisory rating systems. It could also be integrated in existing instruments that are part of supervisory frameworks (e.g., the ICAAP for banks and the ORSA for insurers). Reference to these instruments could be made as part of the previously discussed guidelines. Once more specific guidance has been issued, the PA should build capacity to monitor its uptake, providing its supervisors with adequate training and information to perform such activities. It could, for example, consider publicly disclosing uptake of climate risk management by FIs in order to raise awareness about practices. It could also introduce on-site supervision of compliance with the guidelines. This could be done in the form of a thematic inspection for all supervised FIs. To further support the process, a manual and training should be introduced for supervisors explaining how to assess Climate Risk Management practices. Results of off-site monitoring, on-site inspections and stress tests could also be further integrated into the supervisory scoring models that the PA uses.

57. To plan for and guide additional activities related to climate and environmental risks, the SARB / PA could further develop an organizational strategy to detail its approach. This strategy could further describe how the SARB / PA will approach climate and environmental risks within its organization and which elements are prioritized. It can then serve as a roadmap for further work to develop. It could consider a phased approach, starting with building further knowledge, tools and capacity; followed by setting expectations and monitoring and mitigating risks. It should give due

consideration to building capacity across the organization, to support supervisors and facilitate the proper integration into the supervisory framework. This strategy should be closely aligned with the board and specifically the board member responsible for the topic. It could also be part of a broader supervisory strategy document.

58. Over time, consideration could be given to how to further strengthen the governance structure and coordination around climate risks. During the past year, climate risk has been embedded in the governance of SARB, with the Governors Executive Committee providing strategic guidance, a dedicated PA 'Climate Think Thank' working group to provide guidance on supervisory implementation, and a cross-bank research committee on climate risk. At this point in time, this appears a proportional coordination structure. As the agenda develops and grows, considerations could be given to the step taken by a number of leading central banks – including the Bank of England, Banque de France, and the European Central Bank – to set up dedicated climate risk / sustainable finance teams/ centers.

Table 3. Assessment of supervisory activities and expectations on financially related climate and environmental risks in South Africa

Element	Score	Examples of global good practices*	Description of SARB practices
I. Strategy and policy formation	Emerging	<ul style="list-style-type: none"> • Conducting a Climate Risk Assessment (CRA) to determine impact on prudential objectives • Integrating climate risks in supervisory strategies 	<ul style="list-style-type: none"> • A set of high-level actions and commitments is part of the FSE Technical Paper • While no CRA has been performed, a PA climate risk position paper is in the make, which will outline a strategic response. The paper will be informed by a survey of banks and insurers on climate risk integration.
II. Internal governance, capacity building and cooperation	On track	<ul style="list-style-type: none"> • Board-level commitment and engagement; clearly defined roles and responsibilities • Presence of governance structures relating to climate change issues and integration of topic in internal governance model (e.g. hub-and-spoke model) • Raising awareness and building capacity internally and externally with financial institutions • Building knowledge capacity through research related to the topic 	<ul style="list-style-type: none"> • Board signals commitment and ambition and climate risk is embedded in the governance of SARB, with the Governors Executive Committee providing strategic guidance • The PA's Climate Think Thank (a working group) is guiding the supervisory implementation • A cross-bank research committee on climate risk has been set up. • Awareness raising and knowledge buildup activities include attention

Element	Score	Examples of global good practices*	Description of SARB practices
		<ul style="list-style-type: none"> • Training for supervisors • Engagement with other policymaking bodies (e.g., ministries, water-boards) • National and international collaboration (knowledge sharing platforms and networks, conferences) • Public reporting on climate and environmental risks and trends 	<p>to climate risk in 2019 editions of the SA Financial Stability Review, a PA FSB TCFD survey in 2020, a study on implications of climate change for central banks in EMs, and internal information sessions. Some capacity on climate risk within different functional areas, including FST and PA, however no standardized training in place</p> <ul style="list-style-type: none"> • SARB/PA has representatives in the SA Sustainable Finance Working Group (SFWG), which is led by National Treasury, but no specific national peer exchange platform on the topic is facilitated. SFWG has held outreach sessions with the industry, including on risk related topics. • SARB is a member of the NGFS and the PA is a member of the IAIS Sustainable Insurance Forum • SARB has deployed various initiatives around its own impact on the environment, as part of broader ESG initiatives
III. Supervisory approach	Not in place	<ul style="list-style-type: none"> • Engaging with firms through supervisory dialogue • Explore how to integrate elements in supervisory review process • Integration of climate risks in onsite supervision • Applying appropriate mitigating actions as supervisor, incl. application of Pillar II capital add-ons • Integration climate risk elements in fit and proper tests 	<ul style="list-style-type: none"> • No further integration in supervisory ratings, methodologies to assess climate risks, or (thematic) on-site supervision of climate risk management • No notions were made on integration of climate risk in fit and proper testing
IV. Supervisory tools and techniques	Not in place	<ul style="list-style-type: none"> • Development and deployment of tools and methods for assessing risks both at the micro and macro level, e.g. stress tests, exposure measurements • Integration into process ICAAP and ORSA process 	<ul style="list-style-type: none"> • No exposure assessments • No stress testing for climate risks in place at SARB, albeit climate risks have been added to the FST Risk Assessment Matrix (RAM) and plans have been drafted to start

Element	Score	Examples of global good practices*	Description of SARB practices
			developing physical and transition risk scenario's for macro-prudential stress testing
V. Supervisory reporting and information systems	Not in place	<ul style="list-style-type: none"> Regional and sectoral data relevant for risk assessments is readily available Development of taxonomies that support identifying green, brown and neutral economic activities and financial products 	<ul style="list-style-type: none"> Lack of data for risk assessments, including on regional banking data, and disaggregate industry data No taxonomy on green or brown assets in place
VI. Corporate governance and strategy	Not in place	<ul style="list-style-type: none"> Policy and corporate governance guidelines - demanding clearly identified roles and responsibilities regarding the theme. 	<ul style="list-style-type: none"> No policy or corporate governance guidelines in place for banks and insurers with explicit reference to climate risk
VII. Risk management	Not in place	<ul style="list-style-type: none"> Guidelines on climate risk management and integration of those elements in core risk management practices Expectations on awareness on climate scenarios and data availability 	<ul style="list-style-type: none"> No climate risk management guidelines in place No specific guidance on climate or national catastrophe stress scenarios
VIII. Disclosure	Not in place	<ul style="list-style-type: none"> Climate disclosure framework in place Disclosure framework aligned with FSB TCFD recommendations Providing guidance on green loan and bond definitions 	<ul style="list-style-type: none"> No prudential disclosure framework in place No guidance is given on relationship to climate risk exposure and FSB TCFD recommendations

B. Financial Sector Conduct Authority – Pension Supervision

59. A review of the FSCA's response to climate risk is limited to its prudential mandate on pension fund supervision. As part of the establishment of the FSCA under the 'Twin Peaks' system in 2018, it was established that the FSCA will exercise powers of the Prudential Authority (PA) regarding pension fund oversight for a period of at least three years. A review of these activities has been performed along the lines of the assessment framework above, taking note of relevant guidance provided by the NGFS and IOSCO. A detailed assessment on the conduct activities by the Financial Sector Conduct Authority is out of scope of this technical note as the focus is on prudential measures to mitigate climate risk.⁶⁷ That being said, some relevant items for conduct supervision – related to

⁶⁷ Globally, capital market regulators are starting to incorporate environmental and climate aspects in their market guidance and regulations. Currently, there are no clearly defined standards or principles that help to define the role of capital market regulators in promoting sustainable finance, let alone proper risk management of environmental risks. However, globally, capital market regulators have started to issue guidance on environmental aspects – often as part of Environmental, Social and Governance aspects – particularly in relation to disclosure of related risks and opportunities by capital market participants and be involved in guidance on green finance

(continued)

guidance on disclosure of publicly-listed firms and fostering transparency using a green taxonomy, in particular – will be addressed in the next chapter.

60. While the FSCA offers guidance to pension funds on integration of ESG in investments, climate risks are not explicitly addressed in its oversight activities. Regulation 28 requires boards of funds to consider ESG factors before making an investment, while the FSCA 2019 Guidance Note⁶⁸ provides guidance on including ESG in investment policy statements and subsequent reporting on these statements. The guidance is voluntary in nature as it encourages pension funds to incorporate ESG factors in its investment policy statement and to adopt sustainability reporting. It does not explicitly refer to climate risks, nor is there oversight on the current guidelines as part of the pension supervision by FSCA.

61. Like for the PA, it is advisable for FSCA to perform a Climate Risk Assessment into the impacts of climate change on the pension sector. This could be done in collaboration with the SARB / PA and include broader capital market risks, including for the mutual fund industry. This could be combined with an assessment of green market trends and their effects on investors. Given capacity constraints, more advanced tools, like stress testing, could be developed once the pension oversight moves to the PA, leveraging the existing infrastructure to perform such analyses within the SARB.

62. To support oversight on climate risk, the FSCA needs to improve data collection. The FSCA was not able to provide industry or geographic breakdowns of pension fund portfolios, noting such information is currently not collected. Such data should be more structurally available to be able to perform adequate monitoring of climate risks. Therefore, it is advisable to start requesting industry and graphical breakdowns of pension portfolios. Industry and geographic information can be collected at the asset class level or even more detailed at asset level, using a security holdings database to collect information.

63. Consider strengthening, mandating and monitoring the existing ESG guidelines for pension funds, including alignment with the FSB TCFD recommendations. The current ESG guidelines are not aligned with specific disclosure frameworks, including the FSB TCFD. They are high-level and not tailored towards reporting on qualitative information on strategies, risk management, and governance relating to climate risks and opportunities. Nor are there specific requirements regarding qualitative measures, such as exposures to highly CO₂-intensive sectors, results from stress tests, and CO₂-intensity of portfolios. To facilitate the usefulness of disclosures, FSCA should amend the guidelines and further align it with internationally recognized disclosure frameworks, including FSB TCFD. To ensure uptake, a mandatory clause could be considered.

instruments, such as green bond guidelines. Recently, the Growth and Emerging Markets Committee (GEMC) of the International Organization of Securities Commissions (IOSCO) launched a guidance paper on the role of securities regulators in emerging markets on sustainable finance. This work lays down guidance on how to deal with market developments, disclosure practices and internal capacity building as capital markets supervisor. This work is used to inform some of the recommendations below.

⁶⁸ FSCA (2019). Guidance Notice on: Sustainability of Investments and Assets in the Context of a Retirement Fund's Investment Policy Statement.

64. Introduce capacity and guidance to supervise uptake of guidelines. As of yet, FSCA has no capacity or tools integrated to monitor and supervise ESG integration, let alone climate risk. As a first step, it could start monitoring uptake of the current ESG guidelines. Over time, oversight could be further improved, following better understanding and guidelines on climate risks as outlined above. Familiarizing staff with the climate risk concepts, through dedicated training programs and selective hires, should be an important part of building up sufficient supervisory capacity.

DEEPENING MARKETS FOR GREEN GROWTH AND RESILIENCE

A. The challenge

65. Financing climate mitigation and adaptation measures in South Africa will require significant mobilization of public and private capital. On climate mitigation alone, an IFC study identified USD 566 bn in investment opportunities in South Africa, between 2016 and 2030, resulting from the objectives set out in South Africa's Nationally Determined Contribution to the Paris Agreement (Figure 11).^{69 70} Key sectoral investments include USD 80 billion for greening the built environment, USD 24 billion for renewable energy power generation and USD 458 billion for sustainable transport solutions.⁷¹ With limited tax revenue, these estimates highlight the great need and significant opportunity for the private sector to contribute to green inclusive growth in South Africa.

66. Green investments have been picking up over the past decade in South Africa. Positive developments include the significant green lending and investments that have taken place as part of the REIPPPP. Of the total USD 20.5 bn in investment, 45 percent is financed by banks and the rest by other investors, including institutional investors and insurers. 70 percent of this financing took place via local institutions. Green bond issuances have totaled ZAR 13.3 bn, including muni-bonds (Johannesburg being the first in 2014 with a self-labeled green bond, followed by Cape Town with the first labeled bond); private bonds by banks (Nedbank on the JSE in 2019 and Standard Bank on the London Stock Exchange). JSE has supported growth in green investments by issuing a Green Bond segment and listing rules in 2017, and a FTSE/JSE Responsible Investment Index.

67. However, green finance activities have not yet reached the scale and depth to support the transition to a greener, more resilient economy. Total green lending is not well measured, but based on information provided by banks, green investments⁷² in clean energy lending stand at around

⁶⁹ Without specifying the source of funding, the South Africa NDC highlights the following decarbonization costs: USD 30 bn for the REIPPPP between 2015-2025; USD 349 bn for decarbonizing electricity production between 2010 and 2050; USD 513 bn for electric vehicles for the 2010-2050 period; and USD 488 bn for hybrid vehicles between 2015-2030; and USD 0.45 bn for carbon capture and storage.

⁷⁰ Likely, there is significant overlap in funding for adaptation. The SA NDCs predict that medium costs of adaptation will rise from USD 2.31 bn in 2015 up to USD 2.8-2.9 bn in the period 2020-2030, and up to USD 3 bn in the period till 2050.

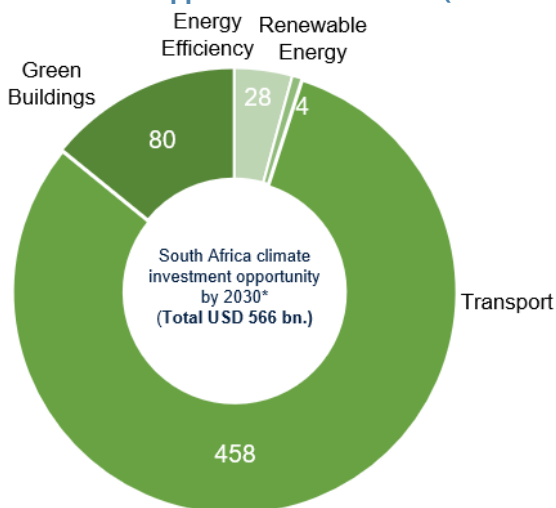
⁷¹ IFC (2018). Raising \$23 Trillion Greening Banks and Capital Markets for Growth.

⁷² 'Green' meaning supportive of activities that have a positive impact on the environment, including impacts on climate mitigation and adaptation.

3-4 percent of total loan portfolios. That proportion is far from an IFC estimate of what will be required in order to fulfill NDC requirements. Irrespective of feasibility, IFC estimates that ~42 percent of SA bank and investor debt portfolios in South Africa will need to be green in order to reach the country’s NDC objectives.⁷³ At the same time, limited insurance penetration, particularly in the vulnerable agricultural sector, reduces climate adaptation capacity and financial resilience in the country.

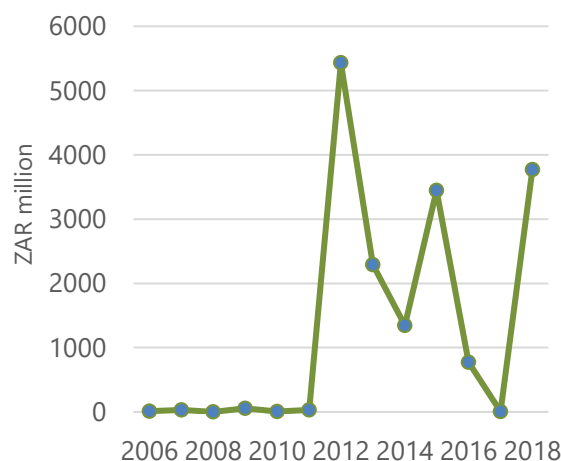
Figure 11. South Africa green finance opportunities and developments

Green Finance Opportunities 2016-2030 (in USD bn)



Sources: IFC (2017) Climate Investments Opportunities in South Asia; and IFC (2016) Climate Investment opportunities in Emerging Markets (Estimations on RE investments opportunities have been updated according to new methodology)

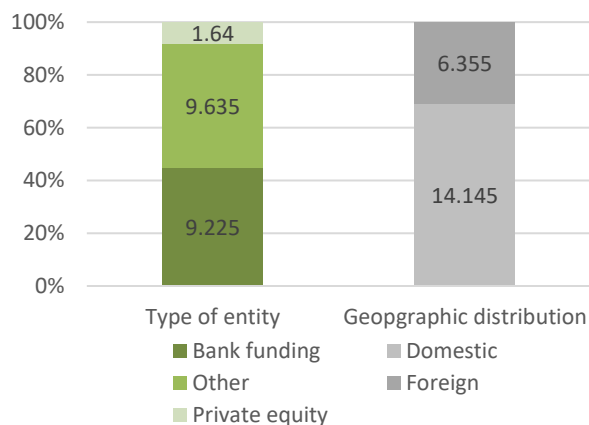
Clean Energy Investments 2006-2018 (in ZAR mln)



Source: Bloomberg NEF, Climatescope

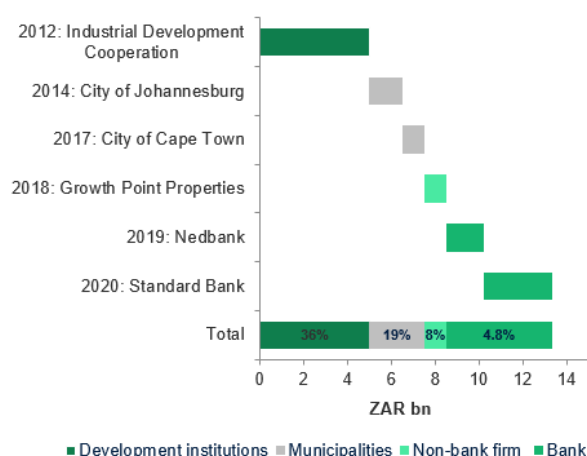
Clean energy investments, breakdown per type of investor and geography 2004-2018 (% and ZAR bn)

Out of 20.5 bn total investments in SA



Source: Team calculations based on data from Bloomberg NEF, Climatescope

SA green bonds issuers, 2012-2020, ZAR bn



Source: Team calculations based on data provided by SARB.

⁷³ IFC (2018). Raising \$23 Trillion Greening Banks and Capital Markets for Growth. On average IFC estimates that ~30 percent of bank balance sheets in emerging markets should be green by 2030 to meet global climate goals. Detailed data from this study was obtained by FSAP, which estimates the percentage of green lending and debt instruments on balance sheets of SA banks and investor portfolios.

68. To scale up green finance, while also deepening insurance for climate resilience, institutional barriers in and outside the financial sector need to be addressed. Identified issues include:

- **Uncertainty and limitations in climate and energy policies and government direction undermine the business case for green finance.** Banks and investors alike, mention the lack of government direction and action as the key barrier for green finance, undermining the build-up of a pipeline of green investable projects, limiting proper pricing of externalities by FIs and increasing investment costs due to uncertainty around long term climate plans. While a full exploration of fiscal, economic and climate measures goes beyond this FSAP, notable and specific challenges include: i) the ongoing need for regulatory reform and tailored incentives in the energy market, allowing for further growth in the production of renewable energy; ii) the need for long-term plans and concrete projects and investment targets for the implementation of the country's NDC; and iii) limited impacts from the carbon tax due to high levels of allowances during its first phase and a relatively low overall tax-rate.⁷⁴
- **Absence of clarity on financial sector investments needed to achieve climate objectives (incl. the NDC), policies to address market barriers and clarity on an investable pipeline.** More clarity could be provided on the concrete targets for the private financial sector in financing the country's NDCs, and other climate and environmental objectives. It is also important to further specify how specific market barriers to scaling up green finance will be addressed by different authorities.
- **A lack of transparency and disclosure on climate risk and opportunities.** A lack of disclosures in corporate reporting makes it difficult for financial institutions to identify green assets, projects and companies. As of yet, there is no mandatory regulatory framework in place for companies to disclose climate risks in South Africa. JSE listed companies follow the King IV Corporate Governance Code, which provides some guidance on corporate disclosures regarding environmental and social value creation in integrated reporting. However, King IV lacks specific guidance on climate risks, and does not prescribe comparable metrics (e.g. public disclosure of GHG emissions, which are now only made private to the government). Also lacking is a green taxonomy, i.e. a categorization of green economic activities, which can help label green finance products, help banks and investors identify sustainable and green assets, and allow for measurement of green finance flows. Labels for green assets of value, in particular buildings, could be another element to help banks better identify green investments. So far, such practices have been limited to a handful of buildings that obtained international energy efficiency certification.
- **Limited capacity and skills at financial institutions to originate climate and green assets and manage climate-related risks.** As highlighted in the previous sections, the financial sector, in particular its bigger banks and investors, are at the forefront of climate risk awareness. However, integrating such practices in risk management and reporting has not yet been implemented. This will demand further prioritization and the development of skills and capacity, which might lead to

⁷⁴ See also Section II, Paragraph 20.w

particular challenges in smaller institutions. At the same time, it is notable that product development by banks is limited, with green investment now mainly tied to renewable energy solutions. The banks that the FSAP spoke have not yet introduced specific loan products that would stimulate the decarbonization efforts of households and industries, such as green mortgages or results-based loans for industry energy efficiency.

- **Limited use of green instruments that can both leverage public spending and attract a growing group of environmentally conscious investors.** Most notable is the lack of specific green loan instruments such as green mortgages or green performance-based lending instruments. Banks note that they are considering these instruments but have not yet taken steps to develop these products. Moreover, while local governments – like a few firms – have issued green bonds, sovereign green bonds have not yet been issued by the national government. While the government has used vehicles like the Green Investment Fund to support green projects, it does not make use of blended finance instruments at scale that would support leverage private sector investments in green projects.
- **Shortages of early stage funding, due to low availability of venture capital and private equity.** Venture capital and private equity are key to the development of the innovative solutions needed to stimulate green growth. Industry participants reiterated findings from a 2013 study by the National Business Initiative, which points out to the limited availability of such funding in South Africa.⁷⁵
- **Limited financial support and risk transfer mechanisms for the agricultural sector and rural areas to adapt to impacts of climate change, particularly drought risk.** Drought risk is insurable as part of multi-peril crop insurance (MPCI), but this is seen as a dwindling business by insurers, with low levels of profit from increasingly expensive policies, due to claim increases and difficulty to obtain reinsurance. The penetration of MPCI has been reported at 17 percent for large commercial farmers, which covers 95 percent of production. However, agricultural insurance penetration for small farmers – on which an estimated 1.5 million households depend – is less than 1 percent. The lack of affordable insurance deprives these farmers of financial resilience in the face of heightened risks, as well as the potential risk of financial exclusion as banks might limit lending to the uninsured.⁷⁶

B. Stimulating green finance

69. Recognizing a number of these challenges, Treasury's Technical Paper on Financing a Sustainable Economy, provides a holistic strategy to start addressing some of these issues. As mentioned in Section I, this recently published paper provides a definition for sustainable finance in South Africa, while also listing priority actions around regulatory guidance, supervisory actions,

⁷⁵ Business Commission on Sustainable Development (2017). Better Business Better World Report.

⁷⁶ World Bank (2016). Toward a National Agricultural Insurance Program: Initial Diagnostic Study

disclosure and defining common scenarios for stress testing and capacity building. The paper is deliberately high-level and recognizes the need for further action plans.

70. Below several options are given to support green finance and resilience, and thereby also the implementation of the FSE Technical Paper.⁷⁷ The selected actions aim to address some of the key barriers listed above. They are based on observed emerging global good practices to stimulate green finance, while taking note of proportionality and the South Africa context.

Raising demand for green finance: improve the business case of green projects

71. To improve the business case for green investments, the government should advance and improve key legislation. As mentioned, the lack of green projects, or projects identified as green, is one of the main barriers for further uptake of green finance, and a key barrier for the country to achieve its climate goals. The Carbon Tax Act, 2019 (Act No. 15 of 2019), enables South Africa to price carbon emissions, and therewith improve the attractiveness of green projects. However, it is not effectively contributing to the attractiveness of green projects in its current form. To improve its effectiveness, it is important that – in line with the act – tax allowances for highly CO₂-emitting companies are brought down when the act enters its second phase. This could have the additional benefit of simultaneously addressing potential transition risks. Moreover, even with the planned annual 2 percent increase in taxes up to 2022 (plus the increase in inflation), substantial changes should be considered to the tax rate. As noted, according to an IMF analysis⁷⁸, an effective global carbon tax of USD 75/tCO₂e is needed to limit global warming to 2°C.⁷⁹ Such a tax rate is estimated to lead to a 45 percent reduction in CO₂ emissions below the 2030 baseline in South Africa. In addition, it would lead to significant additional government revenue from the tax that could be used to further support climate mitigation and adaptation efforts (see Figure 12).

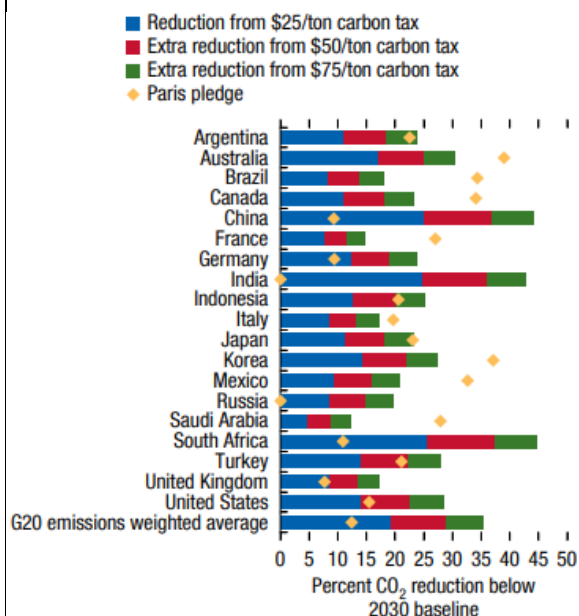
⁷⁷ See Section II C for an overview of actions prioritized under the FSE.

⁷⁸ IMF (October 2019). Fiscal Monitor, Chapter 1.

⁷⁹ A 2014 study suggested that a phased-in tax of US\$30 per ton could help South Africa reach reduction targets that were set for 2025. Theresa Altona, T., Arndt, C., Davies, B., Hartley, F., Makrelov, K., Thurlow, J., and Ubogu, D. (2014). Introducing Carbon Taxes in South Africa. Applied Energy. Vol. 116.

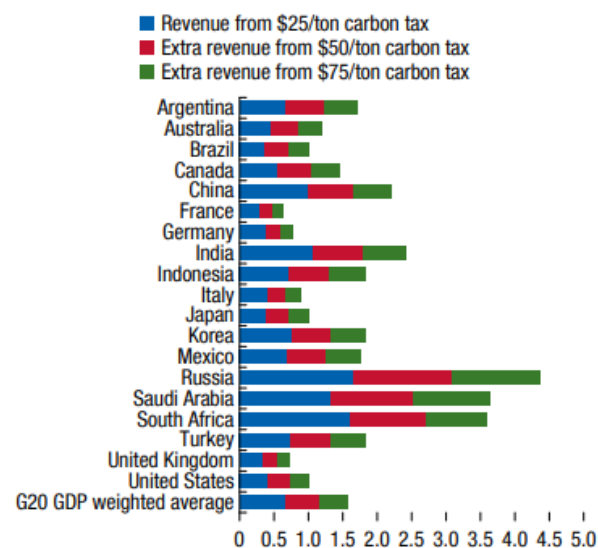
Figure 12. Reductions in CO₂ and revenue from carbon taxation in 2030

Reduction in fossil fuel CO₂ from carbon taxes in 2030, selected countries



Revenue from comprehensive carbon taxation in 2030, selected countries

(Percent of GDP)



Source: IMF (2019). Fiscal Monitor. How to Mitigate Climate Change.

Note: Note: Paris pledges indicate the percent reduction in CO₂ emissions below the baseline (that is, no mitigation) levels in 2030 if countries' mitigation pledges submitted for the Paris Agreement are met. Bars indicate the percent reduction in CO₂ emissions below baseline levels under carbon taxes with alternative tax levels. CO₂ = carbon dioxide;

G20 = Group of Twenty.

72. The government should also lay out a long-term pathway towards carbon neutrality and climate resilience, by advancing the National Climate Change Bill.

Financial institutions and non-financial firms alike benefit from long-term security. Uncertainty regarding long-term government plans around climate mitigation and adaptation paths raises the risks, and therewith costs, for green investments. The proposed Climate Change Bill would commit South Africa to such a long-term transition and provide an opportunity to align climate change policies with the country's social challenges (i.e. a 'just transition'). Once a long-term pathway is laid out, consideration could be given to how the financial sector could commit or contribute to these goals. For example, by establishing a

monitoring process of the climate impacts of loan and investment portfolios and their alignment with the 1.5°C or 2°C temperature goals.⁸⁰

73. Stimulate further uptake of renewable energy via advancing the REIPPPP's bidding procedures. South Africa has abundant renewable energy resources. While a deep-dive on the country's ongoing energy issues – including the many challenges posed by the monopoly of Eskom in energy generation and distribution – is beyond the scope of this FSAP, government and market participants consistently highlighted the importance of advancing stalled bidding procedures of the Renewable Energy Independent Power Producers Procurement Program (REIPPPP). The REIPPPP has been particularly successful in crowding in investors and engaging independent renewable power producers (see also Section II). Other actions, like allowing homeowners to sell back to the grid, should be supported, and can help financial institutions to start developing financial products to stimulate uptake of renewables and energy efficiency measures.

74. The post-pandemic economic recovery momentum could be leveraged to drive green policy changes. In the medium-run the recovery from the COVID-19 crisis may provide opportunities to drive green policy reforms (see box) and preparations to do so should start now so they are ready to be incorporated in further stimulus packages. Specifically, for South Africa, the government could consider tilting support measures towards sectors that are in line with decarbonizing its economy. The development of a taxonomy could provide a foundation for such differentiated measures. If such an approach would yield enough green benefits, parts of the stimulus may potentially be funded by originating green sovereign bonds. Finally, South Africa could consider increasing the ambition of its carbon pricing program. The sharp decline in coal prices would allow for this with limited short-term financial burden for consumers.

⁸⁰ An example of this is provided by the financial sector in the Netherlands, where 50 banks, insurers and investors committed to the Dutch government climate goals. This commitment includes for mandatory reporting on the climate impact of their loans and investments from 2020 onwards. In addition, these FIs committed to have plans in place by 2022 that contribute to reducing CO2 emissions. See for more information: Dutch Banking Association (2021). [50 financial institutions sign up for climate goals](#).

Box 3. Policy measures to green the recovery

Even though the full impact of the COVID-19 pandemic only became clear after the initial FSAP mission, the resulting crisis has made clear that (1) tail-risks may look remote but can strike quickly, (2) the cost of preparing is dwarfed by the cost of not preparing, and (3) preparedness is essential. These elements all apply to the climate change as well.

Some principles can guide the efforts to green recovery measures:

- **Choose to support green, rather than brown activities.** This approach can be taken for example in public investment projects, public work programs, and the extent to which financial support is granted to brown industries/activities.
- **Make support for brown activities conditional on making progress on climate.** Crisis support to carbon-intensive industries could be accompanied by commitments to emissions reduction targets or other greening activities (e.g., innovation).
- **Better price carbon.** Low oil prices and the need to rebuild fiscal position make raising carbon taxes more attractive than before. The same goes for eliminating fossil fuel subsidies.
- **Assess the climate impact of support measures.** Stimulus measures should be screened for their climate impact and environmental standards should not be relaxed.
- **Make financing greener.** When supporting financial institutions, it could be required that those receiving support work towards greening their business models, including through climate-related disclosures. Some support measures may be funded by green-labeled products.

Source: IMF (2020) *Greening the Recovery. Special Series on Policies to Respond to COVID-19.*

Introduce a National Climate Finance Strategy

75. Treasury and government should also advance work on a National Climate Finance Strategy (NCFS). In the second half of 2019, DEFF, launched an initiative to work on a National Climate Finance Strategy.⁸¹ A multi-stakeholder working group appointed by DEFF, Treasury, and the Department of Planning, Monitoring and Evaluation is foreseen to support drafting of the strategy. From a financial sector perspective, it is important to advance this work, as it could provide clarity on the financing gap⁸² for NDC implementation and needs from private sources to augment public

⁸¹ Based on a Terms of Reference presentation of the 1st NCFS workshop, 2 October 2019, which was shared with the FSAP.

⁸² The NCFS could explore how it can benefit from a strategic partnership between the DBSA and the World Bank to quantify the funding needs for closing the service gap in affordable and environmentally responsible infrastructure to reach the SDG targets by 2030.

spending to address gaps. A climate finance strategy could help identify a pipeline of investable projects, while also outlining some of the instruments and institutions that the government could mobilize in order to leverage limited public funding (see also Par. 89 and 90 on instruments). Particular attention could also be given to how to green potential recovery spending from the current COVID-19 crisis. It could also consider additional objectives related to a ‘just transition’.

Facilitate knowledge sharing and capacity building in the financial sector

76. Consider membership of the Coalition of Finance Ministers for Climate Action. The Coalition is a group of over 50 Finance Ministers that have committed to promoting cohesion between domestic and global action on climate change, reaffirming national commitments, and accelerating actions to implement the Paris Agreement. In 2019, the Coalition endorsed the “Helsinki Principles” which identify steps member countries will take to achieve the Paris goals, including principles on mobilizing green finance and pricing externalities. The South Africa Treasury – which is not a member – could benefit from the Coalition’s work and insights on both fiscal and financial sector actions taken by other members, while it also has compelling insights to share with this group (e.g. their experiences with the carbon tax and the FSE).

Foster transparency through introducing climate risk disclosures, a green taxonomy and further labeling of economic activities

77. Strengthen disclosure requirements for listed firms in line with the FSB TCFD recommendations. Fostering transparency on climate risks via company disclosures is widely seen as key to fostering better management of climate risk in- and outside of the financial sector. Investors and lenders need adequate information on climate-related and environmental risks and opportunities to understand, price and manage the risk in their portfolios and operations. Therefore, it should be a key priority for South African authorities, and as mentioned, is not well captured in the current draft of the FSE. Key international initiatives have already laid the foundation to start implementing disclosure and reporting regimes. In particular, disclosure guidance should be aligned with the recommendations of the Task Force on Climate-related Financial Disclosures. Adhering to recognized international frameworks allows for wider acceptance and comparability of institutions’ climate disclosure or sustainability reporting.

78. It is advisable to first explore the different options most feasible in the SA context.

Options to consider include:

1. *Strengthen the voluntary disclosure regime under the King IV Corporate Governance Code.* King IV’s recommendations on integrated reporting, could be augmented with more specific guidance on climate risk disclosure aligned with the FSB TCFD recommendations. As part of the listing requirements of the JSE, most companies would then comply with such guidance. One of the advantages of this option would be that it is likely easier to update the code, than updating a law, and it fits with a long tradition in South Africa of self-regulation in the industry. The drawback would be that there is still no formal disclosure regime, enforceable by supervisory authorities.

2. Introduce mandatory disclosures of climate risk via an update of the Companies Act.⁸³ Ideally climate risk and broader sustainability disclosures are part of company regulations. For South Africa, this would demand an amendment to the Companies Act, as it does have a formal disclosure regime, but relies on an industry led disclosure regime (see option 2).
3. Alternatively, it could consider a specific disclosure law around climate risk, which would augment the Companies Act and other relevant disclosure regulations, potentially covering both firms as well as all investors. This is the approach taken by France in 2016, which has introduced the Energy Transition Law 173⁸⁴, providing requirements for listed-firms, banks and investors. In any case it is advisable, to align a potential regulatory disclosure regime for firms with specific financial sector guidelines / and or regulation provided by prudential regulators on climate risk disclosure, by adding relevant references.

79. Introduce a green or sustainable taxonomy – in line with recommendations in the FSE - to better define green and sustainable financial products. A taxonomy is a classification of sustainable (and unsustainable) economic activities. It could form the backbone of labeling for sustainable finance products, set prudential regulations or build benchmarks. Recently, the European Union and China introduced such taxonomies and useful insights can also be drawn from green bond taxonomies.⁸⁵ The introduction of a taxonomy for green, social and sustainable finance initiatives, is part of the FSE's recommendations.⁸⁶ In line with what is written in the FSE, it is advisable to build on, and align a SA taxonomy as much as possible with global best practices. Coordination will help to provide investors with consistency, which will better stimulate investment. At the same time, a key challenge in designing the taxonomy will be the incorporation of relevant context specific social elements, including the importance of ensuring a 'just transition'.

80. The most advanced example of a taxonomy to date, that of the EU, provides learning points on how to use and introduce a taxonomy. Amongst other things, the expert group behind this detailed document highlights the importance of a taxonomy being flexible and adaptable over time, to new insights on what is sustainable and what is not. It also highlights that a taxonomy should be detailed and granular enough to provide clarity. The EU also shows that such a taxonomy can be incorporated in regulations in order to formalize labeling for sustainable finance products and provide a basis for enforcement.⁸⁷ In terms of scope, the EU taxonomy is mainly focused on environmental sustainability and climate considerations. However, based on a review, it could be broadened to include other sustainability criteria, including social issues. The review notes reflect the importance of not limiting the taxonomy to green or sustainable economic activities, by also laying out a framework for unsustainable activities. This makes the taxonomy of better use to investors and regulators

⁸³ The Companies Act 71 of 2008.

⁸⁴ Article 173 of the Law for the Energy Transition and Green Growth.

⁸⁵ EU Technical Expert Group on Sustainable Finance (2019). Taxonomy Technical Report.

⁸⁶ After finalizing this Note, a draft green taxonomy was published by the National Treasury for public consultation in June 2021.

⁸⁷ EU Commission (2018). Proposal for a regulation of the European Parliament and of the Council on the establishment of a framework to facilitate sustainable investment.

interested in identifying potentially riskier assets. It can also incentivize firms and issuers who fall in the unsustainable bucket to pursue green practices.⁸⁸

81. To provide standards on what can be considered ‘green’, the authorities (DMRE) could also introduce energy efficiency labeling for buildings. Labels for green assets, for example for buildings and motor vehicles, can help banks and other investors better identify green investments and develop financial products related to them. They may also provide an additional indicator of the quality of collateral (e.g., the vulnerability of assets to tightened energy efficiency standards and potentially increasing prices of utilities). Already, banks in South Africa take international certifications for sustainability of buildings into account when financing commercial real estate projects. This is however limited to a handful of the most expensive buildings, such as offices, hotels and malls. A more generic label for all commercial, residential and government buildings, could support the financial sector in further developing and pricing relevant green financial products.

Stimulate and explore the use of innovative green finance instruments

82. Authorities could explore ways to incentivize product innovation in the banking sector. Globally, banks are increasingly scaling up efforts to introduce green loan products and debt instruments, such as green mortgages, green mortgage-backed securities, and performance-based green loans⁸⁹ in which climate or broader environmental outcomes are tight to incentives like interest rate discounts and increased loan to value. Annex II provides an overview of examples of global practices that are used by financial sector authorities to stimulate green lending, including via fiscal and financial measures, technical assistance, financial sector regulation and enabling policies. Authorities could explore the relevance of some of these measures for the South African context, to address and stimulate the relatively low levels of product innovation observed in the banking sector.

83. Treasury could also explore the use of innovative green finance instruments to leverage limited government spending and benefit from the additionalities of green disclosure. The South African government could incentivize the uptake of green finance by further exploring the application of labeled instruments, including issuance of sovereign green bonds and government engagement in blended finance arrangements. With significant investments needed to finance climate mitigation and adaptation targets and a growing investor base focused on green investments, opportunities arise for government to profit from the use of specific green finance instrument. Potential options to explore include:

- **The issuance of sovereign green bonds (within the framework of NT’s debt management strategy) to tag government spending.** Green bonds have proven to be an effective instrument for an increasing number of emerging markets in mobilizing funding to achieve climate and sustainability targets.⁹⁰ Initially kicked off by MDBs, and later corporates, in the last few years an

⁸⁸ NGFS (2019). A Call for Action: Climate Change as a Source of Financial Risk.

⁸⁹ Another increasingly popular instrument is sustainability-linked loans, in which lower interest rates are dependent on an overall ESG score of company.

⁹⁰ Sustainable Banking Network (2018). Creating Green Bond Markets – Insights, Innovations, and Tools from Emerging Markets

increasing number of sovereign actors have successfully issued green bonds.^{91 92} Amongst other things, South Africa could use sovereign green bonds to obtain financing for climate adaptation projects which are often not commercially viable and need to be financed from public sources.⁹³ By aligning with international transparency and disclosure standards related to the use of proceeds and environmental impact of projects, the Government would set an important precedent for South Africa public and private sector issuers. Moreover, with sizable interest by foreign institutional investors in green and sustainable investments, green bonds could help to broaden the investor base for its South African sovereign bonds. Recent issuances by other countries confirm large investor demand, with sizable oversubscriptions.⁹⁴ A sovereign green bond could raise awareness globally of sustainable investment opportunities in South Africa and projects aligned with its Nationally Determined Contribution (NDC) targets, highlighting the Government's efforts to meet its Paris Agreement commitments. While there is a cost involved in setting up a green bond framework to monitor use of proceeds, much of the costs involve a one-time investment. Meaning fixed costs will be much lower in case of multiple issuances.

- Blended finance instruments / green investment funds to tackle a lack of VC / PE spending and scale up green infrastructure investments.** Blended vehicles can be used to share some of the risks of projects with private sector investors, otherwise unwilling or unable to invest. Following international examples, but also based on its own experiences with the Green Fund amongst others, South Africa could consider scaling up the use of strategic green investment funds. Such vehicles would leverage government funding, by blending concessional finance with private capital to invest in strategic green priorities set by the government.⁹⁵ Structured as a venture capital or private equity fund, it could tap into growing interest from foreign investors in green development and provide investments for the country's infrastructure and climate agenda, particularly where investments are more constrained, such as at the regional level. A fund should be set up in such a way that it can help to build a pipeline of investable projects, offering technical assistance on the ground to originate and label green projects. Moreover, global best practices show that a fund should be independently managed, to benefit from market efficiencies and avoid conflicts of interest.

⁹¹ The World Bank (IBRD) issued the first labeled green bond in 2008. Since then the market has reached a total volume of over USD 167 bn in 2018 with a broad range of issuers — from private companies and banks, to utilities and governments, and has catalyzed a change in investor behavior focused more on transparency and use of proceeds. Annual global green bond issuance has already surpassed the USD100 bn mark in 2019 and is expected to continue to grow.

⁹² To date nine countries have issued sovereign green bonds: Poland (2016), France (2017), Fiji (2017), Nigeria (2017), Indonesia (2018), Belgium, Lithuania (2018), Netherlands (2019) and Chile (2019). Poland, France and Indonesia have tapped the markets multiple times since the first issuance. A number of other countries are in the preparation stage.

⁹³ Green bonds could specifically target the greening of infrastructure investments, as was recently highlighted by Public Works and Infrastructure Minister Patricia de Lille, when she highlighted that the government is exploring Green Infrastructure Bonds. South African Government News Agency (June 23, 2020). [Breaking ground for economic growth](#).

⁹⁴ For example, in April 2019 a EUR 6 bn issuance by the Netherlands received over EUR 21 bn in investor demand.

⁹⁵ See for more general information on strategic investment funds: Halland, H., Noel, M., Tordo, S., and Kloper-Owens, J. J. (2016). Strategic Investment Funds: Opportunities and Challenges. World Bank Group - Policy Research Working Paper 7851. A model on a pooled vehicle to stimulate green investments is offered in ADB (2017). Catalyzing Green Finance: A Concept for Leveraging Blended Finance for Green Development.

A feasibility study could be commissioned – potentially as part of a Climate Finance Strategy – into the rationale for South Africa to scale-up, structure and/or issue these instruments and solutions.

Introduce a disaster risk finance strategy and support agricultural insurance

84. Strengthen financial resilience to climatic shocks through a national disaster risk finance (DRF) strategy, including agriculture insurance. Given the government’s implicit and explicit fiscal exposure to drought and other shocks, the National Treasury is now developing a national disaster risk finance strategy to strengthen its financial resilience. The DRF strategy will strengthen the effectiveness of existing risk financing instruments, such as the contingency reserve in the budget (c. ZAR 6 billion) and explore additional risk financing instruments, such as contingent credit and sovereign insurance, as part of a risk layered approach. Linked to this broader strategy, the National Treasury and the Department of Agriculture, Land Reform and Rural Development are finalizing the launch of a pilot agriculture insurance program targeting emerging farmers. Expediting the launch of this program would reduce Government’s financial exposure to drought, budget volatility and in tandem strengthen the financial resilience of emerging farmers to drought. To strengthen the financial resilience of commercial farmers, the government could also explore public-private partnerships which would broaden access and ensure affordability or consider supporting the existing Multiple Peril Crop Insurance (MPCI) portfolio, but this should be considered in light of the strained fiscal position in South Africa.⁹⁶

⁹⁶ Over the last several decades, several proposals for agricultural insurance have been put forward demonstrating the longstanding interest from insurers and the government to develop the market. All these proposals included government financial support, in the form of premium subsidies and/or a stop loss facility. Estimations for annual fiscal costs range from ZAR 48 million for smallholder crop and livestock producers, up to ZAR 361 million (premium subsidy and stop loss insurance) to support the development of a Multiple Peril Crop Insurance (MPCI) program for commercial farmers. For an overview of solutions see: World Bank (2016) South Africa – Toward a National Agricultural Insurance Program. Initial Diagnostic Study.

APPENDIX 1. OVERVIEW OF RELEVANT LAWS, REGULATIONS, PROGRAMS, AND FINANCIAL ARRANGEMENTS

National laws, regulations, policies and financial arrangements	
Policies & Initiatives	
National Climate Change Response Policy (NCCRP)	NCCRP, outlined in the government’s Green Paper, presents the government’s vision for an effective climate change response. It commits the country to a “fair contribution” to global GHG mitigation and to responsive national adaptation programs. The NCCRP laid the groundwork for the development of implementation plans and action plans for flagship programs in key areas of environmental and climate concern in the country. These areas include renewable energy, energy efficiency, waste management, carbon capture and sequestration, transport, climate change response public works, water conservation and demand, and adaptation research. This legislation was passed in 2011. ⁹⁷
National Development Plan 2030	The South African government integrated plans to address the climate and environmental challenges facing the country in its National Development Plan 2030, which details plans of “an equitable transition to a low-carbon economy.” The plan also discusses sustaining the country’s key ecosystems, efficiently managing natural resources, and enhancing the national mitigation and adaptation response. There is an emphasis on expanding technology innovation to address the causes and impacts of climate change. The NDP envisages that greater investment in energy infrastructure will promote economic growth and development. It also discusses increased targets for protected areas. This plan was released in 2012. ⁹⁸ The plan also set targets to decommission 35 GW (of 42 GW currently operating) of coal-fired power capacity and supply at least 20 GW of the additional 29 GW of electricity needed by 2030 from renewables and natural gas. ⁹⁹ This new energy mix adds wind and solar, including concentrated solar power (CSP). ¹⁰⁰
Nationally Determined Contribution (NDC) to the Paris Agreement	South Africa has ratified the Paris Agreement and committed to a Nationally Determined Contribution (NDC) that targets national emissions of between 398-614 MtCO ₂ e (17-78% above 1990 levels) by 2030. South Africa’s NDC built on the NCCRP and the NDP, summarized above, and follows a peak, plateau, and decline trajectory that aims to stabilize emissions between 2025-2035. The country’s NDC commits to reducing emissions to between 212-428

⁹⁷ National Climate Change Policy Response. South Africa.

⁹⁸ National Development Plan 2030. National Planning Commission. South Africa.

⁹⁹ National Development Plan 2030. National Planning Commission. South Africa.

¹⁰⁰ South Africa Energy Outlook. IEA. Analysis from Africa Energy Outlook 2019. November 8, 2019.

	<p>MtCO₂e by 2050 (35% below to 25% above 1990 levels). South Africa has stated its intention to enhance the ambition or action of its NDC in 2020.¹⁰¹</p> <p>Without specifying the source of funding, the South Africa NDC highlights the following decarbonization costs: USD 30 bn for the REIPPPPP between 2015-2025; USD 349 bn for decarbonizing electricity production between 2010 and 2050; USD 513 bn for electric vehicles for the 2010-2050 period; and USD 488 bn for hybrid vehicles between 2015-2030; and USD 0.45 bn for carbon capture and storage. South Africa has requested technology transfer, financial support, and capacity building to meet its NDC.¹⁰²</p> <p>In 2021, an updated draft NDC was published for consultation with amended targets for climate mitigation and adaptation.¹⁰³ The updated draft indicated that South Africa could raise the ambition of its mitigation targets, including a 28% reduction in the upper end of the target range in 2030 (i.e. annual GHG emission to be in a range from 398-440 Mt CO₂-eq by 2030).</p>
National Climate Change Adaptation Strategy (NCCAS)	The NCCAS provides goals and priority areas for climate change adaptation and resilience for the country. The NCCAS came out in 2020. It provides guidance across all levels of government, sectors, and stakeholders affected by climate change. It also provides a policy instrument through which national climate change adaptation objectives can be articulated to provide overarching guidance to all sectors of the economy.
The DBSA's Climate Finance Facility (CFF)	The DBSA's CFF is applying a blended finance approach, to increase climate related investment in the Southern African region. The CFF is a debt facility that aims to de-risk and increase the bankability of climate projects in order to crowd in private sector investment.
Financing a Sustainable Economy	Supported by a working group (with representatives from public authorities, including SARB, PA and FSCA, as well as industry associations) the paper lays out a framework for sustainable finance in South Africa. ¹⁰⁴
Renewable Energy Independent Power	REIPPP is public-procurement program that enables private investment in renewable energy. The program allows Independent Power Producers (IPPs) to submit competitive bids to design, develop and operate large-scale renewable energy power plants across South Africa. Over eight years REIPPP has enabled

¹⁰¹ Taryn Fransen and David Waskow. Which Countries Will Strengthen Their National Climate Commitments (NDCs) by 2020? World Resources Institute. September 20, 2019.

¹⁰² South Africa's Intended Nationally Determined Contribution (INDC). UNFCCC

¹⁰³ The updated draft NDC can be found here:

https://www.environment.gov.za/sites/default/files/reports/draftnationallydeterminedcontributions_2021updated.pdf

¹⁰⁴ National Treasury (2020). [Financing a Sustainable Economy. Technical Paper.](#)

Procurement Program (REIPPP)	ZAR 209.4 billion (approx. USD 14.2 billion) in private sector investment in renewables and the creation of 38,701 jobs. ¹⁰⁵
The Green Fund	South Africa's Green Fund is a national fund that provides grant and loan finance to public and private actors to support initiatives that advance the country's transition to a low carbon economy. The Green Fund, established in 2011, was capitalized with ZAR 1.1 billion to be invested over four years. The Fund is managed by the Development of Bank of South Africa (DBSA) on behalf of Department of Environmental Affairs. There has been significant demand for funding from the Green Fund, with 590 project development applications totaling ZAR 10.9 billion (USD 1.09 billion) received in its opening round of request for proposals. ¹⁰⁶
The Jobs Fund	The green economy is one of the target sectors of the Jobs Fund (launched in 2011), which aims to co-finance projects by public, private and non-governmental organizations that will significantly contribute to job creation. This involves the use of public money to catalyze innovation and investment on behalf of a range of economic stakeholders in activities that contribute directly to enhanced employment creation in South Africa. ¹⁰⁷
Integrated Resource Plan (IRP2019)	In its latest Integrated Resource Plan ¹⁰⁸ (IRP2019) the Energy Ministry confirmed the trend in power sector planning, by proposing detailed plans for decommissioning several coal-fired plants and extending the operational lifetime ¹⁰⁹ of South Africa's sole nuclear power plant. The plan proposes the addition of 15.8 GW of wind, 7.4 GW of solar, and 2.5 GW of gas capacity be added to the grid by 2030, with no further nuclear capacity being procured. The plan also includes the development of nearly 6 GW of coal capacity, which is currently under construction, and the commissioning of another 1.5 GW of new coal capacity by 2030. ¹¹⁰ IRP2019 shows the government's plans for substantial amounts of coal capacity to run beyond the year 2050. Compliance with Paris requires that coal must be phased out globally, at the latest by 2040. ¹¹¹ The Eskom reform agenda and the targets set out in the IRP2019 indicate a major shift in South African energy policy.

¹⁰⁵ Eberhard, Anton; Kolker, Joel; Leigland, James. 2014. South Africa's Renewable Energy IPP Procurement Program : Success Factors and Lessons. World Bank Group, Washington, DC. World Bank.

¹⁰⁶ South Africa. Green Finance Measures Database - Green Growth Knowledge Platform.

¹⁰⁷ Jobs Fund. South Africa. Jobsfund.org.za

¹⁰⁸ Published October 2019

¹⁰⁹ by 20 years, up to 2044

¹¹⁰ Integrated Resources Plan. South Africa Ministry of Energy. October 2019.

¹¹¹ South Africa. Climate Action Tracker.

Eskom Sustainability Task Team	President Ramaphosa appointed an Eskom Sustainability Task Team in December 2018 to provide recommendations to address Eskom's many operational, structural, and technical challenges. In 2019, the government announced that Eskom will be split up into three distinct nationally owned entities: generation, distribution, and transmission units. ¹¹²
National Legislation and Corporate Codes	
Carbon Tax Act 15	An economy-wide carbon tax starting at US\$8/tCO ₂ e was implemented in June 2019 – the first carbon tax in Africa. The tax covers combustion emissions, industrial processes and product use emissions, and fugitive emissions, such as those from coal mining. Its immediate impact is likely to be limited, as up to 95% of emissions are eligible for exemption during the first phase, until 2022. The increase of the carbon tax rate until 2022 is now stated as the amount of consumer price inflation plus two percent annually. After 2022, only inflationary adjustments are envisioned. The carbon tax is one of South Africa's key instruments intended to be applied in meeting its NDC. ¹¹³
National Disaster Management Act (NDMC)	South Africa passed the Disaster Management Act in 2002, which established the National Disaster Management Center (NDMC) with centers and advisory forums in eight provinces. The NDMC falls under the Department of Cooperative Governance. Through its Early Warning and Capability Management Services (EWCMS), NDMC publishes a periodical Seasonal Hazard Risk Profile, which provides dynamic information on short-term weather-related hazard development nationally. The profile is released quarterly and is used in disaster risk mitigation planning. ¹¹⁴ The NDMC presents the profile at the National Disaster Management Advisory Forum (NDMAF), a technical forum for coordination between the Ministry, the NDMC, and officials from provincial and local government. The Forum makes recommendations on the national disaster management framework to the Intergovernmental Committee on Disaster Management (ICDM – political Forum). The Forum may also advise other parts of government, NGOs, community organizations, or the private sector. ¹¹⁵
Draft Climate Change Bill	Released in June 2018, the bill calls for the establishment of a Ministerial Committee on Climate Change. The bill calls for a framework for the implementation of the national climate change response, that would include

¹¹² Verisk Maplecroft Financial Sector Risk Service – February 19, 2020.

¹¹³ World Bank Group. 2019. State and Trends of Carbon Pricing 2019. Washington, DC: World Bank.

¹¹⁴ The National Disaster Management Advisory Forum Final Meeting of 2017. South Africa Cooperative Governance Traditional Affairs. December 11, 2017.

¹¹⁵ South Africa National Platform. Prevention Web.

	sectoral emissions targets. The government has not yet communicated a timeline for the law's adoption. ¹¹⁶
National Environmental Management Act	The Act, passed in 1998, established principles for decision-making on matters affecting the environment. It provides a framework for institutions to promote cooperative governance and procedures for coordinating environmental functions exercised by organs of the state. ¹¹⁷
Amendment to South Africa's Pension Funds Act	An amendment to South Africa's Pension Funds Act in 2011 implemented the requirement of pensions funds or other institutional investors acting on a trustee's mandate to consider the effects of ESG factors on the long-term performance, as part of their fiduciary duty. ¹¹⁸
The King IV Code on Corporate Governance	The King IV Code on Corporate Governance was updated in 2016 to align South Africa's corporate governance regime with the OECD's principles of corporate governance, including on environmental and social impact disclosure. The King IV Code also replaced the 'apply or explain' principle with an 'apply and explain' principle, which requires the substantiation of claims regarding governance outcomes. ¹¹⁹
Private or Sub-national Initiatives of Note	
Johannesburg Stock Exchange (JSE) Requirements for Green Bond Segment	<p>Once a Green Bond is listed on the JSE interest rate market, an issuer can apply to be eligible for the Green Bond Segment. JSE issuer regulation will assess whether the application complies with the Green Bond standard. The segment criteria are summarized in the following principles:</p> <p>(1) Disclosure of proceeds: Provide clear disclosure that proceeds will be used for financing or refinancing of new or existing eligible green projects that have a positive environmental and/or climate benefit.</p> <p>(2) Provide an external review: An independent assessment on the use of proceeds, the selection process and management of proceeds is required. This can take the form of a second opinion, certification, verification or rating report by a qualified third party.</p> <p>(3) Commit to regular post-issuance reporting: The first post-issuance reporting is required one year after listing a security and should cover the actual use of proceeds and, if possible, the expected impact of the allocated projects against the KPIs/benchmarks disclosed ex-ante.¹²⁰</p>

¹¹⁶ Climate Change Bill 2018. South Africa Government Gazette. June 8, 2018.

¹¹⁷ National Environmental Management Act. gov.za

¹¹⁸ South Africa. Green Finance Measures Database - Green Growth Knowledge Platform.

¹¹⁹ South Africa. Green Finance Measures Database - Green Growth Knowledge Platform.

¹²⁰ South Africa. Green Finance Measures Database - Green Growth Knowledge Platform.

GreenCape – Western Cape	GreenCape is a publicly funded SPV in South Africa that plays an important role in enabling private investment in green sectors through providing market intelligence and facilitation services as a public good. The organization was established in 2010 by the Western Cape Government to support the development of the green economy in the region. GreenCape’s stated goal is to increase investment and job creation in the green economy in South Africa and to position the Western Cape Province as the green economic hubs of Africa. GreenCape works with businesses and local, provincial, and national officials. It provides detailed market information and facilitates market/funding access for businesses. It also provides government officials with support on the development of standards, regulations, tools, and policies. ¹²¹
Municipal green bonds	Johannesburg issued South Africa’s first green bond in 2014 for ZAR 1.5 billion to finance sustainability related activities. Cape Town issued its green bond in 2017 for ZAR 4.3 billion. ¹²²

¹²¹ [GreenCape](http://GreenCape.co.za). Green-cape.co.za

¹²² The Green Economy Barometer 2018 South Africa. Green Economy Coalition.

APPENDIX 2. POLICY OPTIONS TO STIMULATE GREEN LOANS IN THE BANKING SECTOR

Financial mechanisms

Energy efficiency loan guarantee schemes

Governments can use these schemes to provide guarantees for end- users (small businesses or households) on the energy savings from installed EE measures, which are used to cover loan repayment. This can increase demand for EE lending while mitigating risks to the commercial lenders. Partial-risk loan guarantee programs supported by governments can help kickstart energy efficiency financing programs through local banks.

[Case study](#): China's Utility-Based Energy Efficiency Finance programme (CHUEE).

Industrial and corporate guarantees

Energy efficiency investments for large industrials and corporates often require significant amounts of upfront financing, which commercial banks are reluctant to offer. Governments can protect banks against non-payment risk by providing specific guarantees for these types of loans.

[Case study](#): Chile Fondo de Garantía de Eficiencia Energética

Green credit lines

Public (finance) authorities can provide green credit lines to commercial banks, which can be on-lent to end-borrowers for green purposes. Such credit lines aim to demonstrate the commercial viability of green financing as an attractive business model, thus laying the basis for a self-sustaining market for financing sustainable energy and energy efficiency projects.

[Case study](#): China - Financing Energy Efficiency, lessons from Brazil, China, India; and [report](#) on green credit lines.

Co-lending and credit enhancement mechanisms

Governments can directly co-invest alongside a commercial bank in green projects to improve project economics. This funding can have different structures, terms and longer tenors. Taking a subordinated position or providing first loss capital structures can further mitigate the risks and provide additional incentives for banks to step into the market.

[Case study](#): Australia Clean Energy Finance Corporation, and Turkey Clean Technology Fund.

Other blended finance tools

Authorities can stimulate green bank lending by creating other blended finance options, offering green lending products jointly with the banking sector. They have a range of tools at their disposal which could be tailored to enhance attractiveness of green lending products on the supply and demand side, e.g. by offering interest rate reductions, increasing loan tenors or providing risk guarantees.

[Case study](#): Green banks in emerging economies.

Technical assistance and market development

Project aggregation

Green lending opportunities (e.g. residential or small business energy efficiency or sustainable agriculture lending in rural areas) are often small scale, dissimilar and geographically dispersed

projects and therefore not cost-effective for banks to underwrite. Public authorities can aggregate small projects into larger green loan portfolios, which will be more attractive for lenders to underwrite.

[Case study](#): Sweden Kommuninvest Aggregation of Swedish Local Government Investment Projects; and [report](#) on aggregation.

Standardization of lending processes

Authorities can provide standard loan terms or establish common legal, documentation or design standards to simplify the underwriting process and stimulate green lending by the banking sector. Facilitating standardization in the lending process can also help to reduce transaction costs.

[Case study](#): US and Europe, Investor Confidence Project.

Pipeline development and project preparation

Project preparation is essential to develop a pipeline for green lending opportunities. Governments can act as a catalyzer by providing financial and technical assistance support for the project preparation phase, through e.g. risk assessments, advisory or feasibility studies.

[Case study](#): Green Climate Fund, Project Preparation Facility.

Data provision

Facilitating the provision of data required for the underwriting process can be a key enabler to stimulate lending, as relevant data is often lacking. E.g. energy efficiency ratings in the building sector or collection and distribution of loan performance data to give lenders better intelligence on actual risks and performance.

[Case study](#): UK Government National Energy Efficiency Data-Framework (NEED).

Capacity building programs for the banking sector

Governments should look to actively improve banks' understanding of the opportunities in the green loan market and address their inability to identify and classify projects. There is a need to increase the level of expertise in the evaluation and underwriting processes for green lending, in particular for energy efficiency projects which have bespoke structures. Authorities can also enhance awareness about underserved sectors, which offer potential to expand the green loan product offering, such as sustainable agriculture lending or biodiversity and ecosystem finance (link to South-Africa [here](#)).

[Case study](#): Financing Sustainable Land Use.

Demand-side capacity building

Stimulating green bank lending needs to be complemented by an increase in demand for green loans. Educating energy end-users (households, small/medium commercial) is an important prerequisite to stimulate demand for e.g. energy efficiency loans. In addition, authorities can ensure that end-users face minimal complexity when considering a clean energy solution. This can be a long process, and the economic benefits are often not clearly understood. They can therefore help build the bridge between green loans and consumer demand by developing accessible processes to connect green lending programmes to customers.

[Case study](#): Capacity building measures and support for bankers and investors in Thailand, Vietnam, Indonesia, the Philippines and India.

Fiscal measures

Tax advantages

Fiscal authorities can offer tax breaks for businesses or households to boost demand for green loans. Introducing capital allowances can e.g. enable businesses to write off the full cost of a new energy efficient plant or machinery against the business's taxable profits in the financial year. On the retail side, investments in green funds can be made tax-exempt at the condition that banks use these funds to on-lend to green projects.

[Case study:](#) United Kingdom's Enhanced Capital Allowance Scheme for Energy Efficient Technologies

Energy-related waivers or rebates

Waivers are a flexible tool, which can be tailored for different purposes. They can e.g. be applied to lending programmes for improving efficiency in energy-intensive industry, where the fiscal measure is a waiver on energy taxes subject to the company implementing specified energy saving measures.

[Case study:](#) Sweden, Programme for Improving Energy Efficiency in Energy-Intensive Industry

Reorientation of subsidies

Subsidies to banks for specific sectors (e.g. clean transportation, renewable energy, sustainable land use) can boost supply of green lending and implicitly reduce the risks for banks, making green lending more attractive. Governments can also provide subsidies or rebates to end-consumers (e.g. homeowners) through subsidized lending programs. At the same time, it is imperative to phase-out environmentally harmful and uneconomical subsidies for high-carbon sectors to reallocate lending towards green projects.

[Case study:](#) Subsidies for sustainable agriculture EU, US, China, India, Brazil

Financial sector regulation and central bank measures

Green mortgage lending

Financial regulators can introduce flexible mortgage lending rules, allowing households to borrow an extra amount to purchase or retrofit low-carbon homes, or set a higher loan-to-value (LTV) ratio for green mortgages. Similarly, LTV ratios may be capped for high energy efficient homes.

[Case study:](#) Netherlands green mortgages

Adjustments to capital measures

Capital measures can be adjusted to stimulate green bank lending by making sustainable projects more attractive. E.g. a (sustainable) infrastructure supporting factor: reducing capital requirements for banks' exposures to such projects, provided they comply with a set of criteria (related to risk or green credentials).

[Case study:](#) EU proposal Capital Requirements Regulation for Infrastructure supporting factor

Green securitization

Creating favorable regulatory conditions for green securitization creates significant potential for banks to free up balance sheet capacity by and allow for increased green lending.

[Case study:](#) Green securitization market in Europe

Green credit allocation instruments [dependent on CB mandate]

Central banks can use dedicated credit allocation instruments to scale-up green lending. They can employ targeted refinancing lines for green loans, introduce credit floors which require commercial banks to allocate a percentage of their loan portfolio to specified green sectors classes of assets, or set credit interest rate ceilings for lending to green priority sectors.

[Case studies:](#) China, Green Credit Guidelines issued by the China Banking Regulatory Commission and the People's Bank of China

Enabling policies

Minimum energy efficiency standards for commercial and residential buildings

By introducing minimum energy efficiency standards for the commercial and residential building sector (in specific urban areas or where feasible), governments can create an opportunity for banks to offer green loan facilities for customers to make energy efficiency home improvements. These measures could be phased-in overtime to allow for adjustment. It will also stimulate green mortgage lending for homes with higher EE standards, as demand will rise, and these homes will likely carry less credit risk.

[Case study:](#) UK government Minimum Energy Efficiency Standards.

Automotive sector policies and regulations

Standards to ban the sale of diesel or combustion engine vehicles, tightening engine emissions policies or introducing subsidies for Electric Vehicles will increase the share of green bank lending secured on low-carbon vehicles.

[Case study:](#) Netherlands Electric Vehicles policy

Renewable energy targets

Targets for a minimum share of renewable energy in a country's energy mix or requiring energy companies to source a larger proportion of their energy from green sources focuses banks' attention on lending opportunities in the green energy sector.

[Case study:](#) Australia Renewable Energy Target Scheme

Low risk collection mechanisms for energy efficiency measures

Authorities can help banks with collecting green loan repayments (i.e. energy efficiency-related loans) by developing on-bill repayment programs – where the loan gets repaid through (savings on) the monthly energy bill – or repayment programs linked to property taxes, where the property serves as collateral.

[Case study:](#) US On-bill Financing and Repayment Programs; and [Property Assessed Clean Energy](#) programs.